PRACTICAL DIETETICS

DIET IN HEALTH AND DISEASE

ALIDA FRANCES PATTEE

To

Miss. M. M. Pickering, R.V.

With Compliments
of the Author

Lida Frances Allen,

November, 1924.

PRACTICAL DIETETICS WITH REFERENCE TO DIET IN HEALTH AND DISEASE

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BY LC

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Whose daily life is a
blessing to humanity

PHOOEY!

PREFACE TO THE FOURTEENTH EDITION

The steadily increasing demand for this work since its last complete revision in 1917 has resulted in the publication of successive editions almost annually until it has again become necessary to revise the entire work. The present edition, while preserving as far as possible the original plan of the work, has been condensed in some parts and rearranged in others, while special emphasis has been placed upon the source and value of vitamines and the grouping of diseases which are best treated by means of high calory, salt-free and other diets. In revising the work it has been arranged in accordance with the Dietetic Standard Curriculum for Schools of Nursing prepared by the *National League of Nursing Education* and the outline prepared by the *American Dietetic Association.*

In this new edition four professors of leading schools of Household Arts have assisted in the revision of the theoretical portion of the work, while for the first time the chapters on "Diet in Disease" have been arranged under the personal supervision of leading members of the medical profession.

The author takes this opportunity to acknowledge with thanks the valuable advice and assistance given by Mary Swartz Rose, Ph. D., Associate Professor, Department of Nutrition, Teachers' College, Columbia University, New York City.

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ALIDA FRANCES PATTEE.

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INTRODUCTION

In response to many requests from Superintendents of Training Schools and Dietitians, I have issued "Teacher's Dietetic Guide," containing the Dietetic Standard Curriculum for Schools of Nursing prepared by the *National League of Nursing Education* and the *American Dietetic Association.*

"Teacher's Dietetic Guide" also outlines the dietetic requirements of the various State Boards of Examiners of Nurses, together with their State Examination questions. The arrangement of Pattee's "Practical Dietetics" has been made to correspond with and meet these requirements, so that the book can be readily used in connection with these outlines.

These outlines arranged by the above authorities will prove of valuable assistance to the Superintendent and Dietitian in arranging the course of study in dietetics for the nurse, and will also prove helpful to the nurse in preparing for the State Examinations.

"Teacher's Dietetic Guide" is *given free* with every copy of Pattee's "Practical Dietetics" and if not received when "Practical Dietetics" (14th Ed.) is purchased notify the bookdealer who filled your order and he will furnish a copy gratis.

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CHAPTER I

FOOD

Functions of Food

The human body may be compared to a machine which is capable of transforming energy supplied in the form of fuel into other forms of energy, i.e., muscular work and heat. As the automobile engine burns gasoline for fuel so the human engine burns food.

Any machine in use is constantly wearing out, requiring the renewal of parts. In the body material for building new tissue and repairing worn out tissue is furnished by food.

Abundance of fuel and new parts are not all that is necessary for the running of an engine. Without the proper lubricants the machine can not work. Oil serves this purpose for the automobile. The lubricants which insure the smooth working of all parts of the human engine, which "regulate the body processes", are supplied by food.

Thus the chief functions of food are:

(1) to yield energy,
(2) to build body substance,
(3) to regulate body processes.

Definition of Food.—Foods are substances which when taken into the body supply the necessary elements for promoting its growth and replacing its waste, yield energy for muscular work and heat and regulate the body processes.

CLASSIFICATION OF FOOD

A. According to function

1. Fuel foods or sources of energy
    a. Carbohydrates
        i. Sugars
        ii. Starches
    b. Fats
    c. Proteins
2. Body builders or tissue formers
    a. Proteins
    b. Mineral salts
    c. Water
3. Regulators of body processes
    a. Mineral salts
    b. Water
    c. Vitamines

B. According to source

1. Animal
2. Vegetable
3. Mineral

C. According to chemical composition[1]

1. Organic
    a. Nitrogenous
        i. Proteins
    b. Non-nitrogenous
        i. Carbohydrates
        ii. Fats
    c. Organic salts
2. Inorganic
    a. Mineral salts
    b. Water

Carbohydrates

Definition.—Carbohydrates are foodstuffs which contain carbon, hydrogen and oxygen. The hydrogen and oxygen are usually present in the same proportions as in the water mole-

[1] The chemical composition of vitamines is still uncertain, hence they are not included in this classification.

cule, (H_2O). These compounds have therefore been named carbo-hydrates. The term "carbohydrates" covers all simple sugars and all substances which can be converted into simple sugars by hydrolysis.

Source.—Carbohydrates come from the vegetable kingdom almost entirely. There are a few exceptions such as glycogen and milk sugar. They form the chief constituent of roots, tubers and seeds. Important sources of carbohydrates for human use are cereals, potatoes, rice, tapioca, sago, sugar (cane, beet and maple), honey and sweet fruits.

Classification.—Carbohydrates include the monosaccharides such as dextrose or grape sugar, the disaccharides like sucrose or cane sugar, and the polysaccharides such as starch, dextrin and glycogen. (Glycogen is sometimes called animal starch.)

The term "monosaccharide" means that the sugar molecule contains only one sugar group or molecule. All such are called "simple sugars." The structure of the monosaccharides is represented by the formula, $C_6H_{12}O_6$. The "disaccharides" are sugars which on hydrolysis by enzymes or by boiling with dilute acids split into two molecules of simple sugar. Their chemical formula is $C_{12}H_{22}O_{11}$ and their relation to the monosaccharides is shown thus:

$$C_{12}H_{22}O_{11} + H_2O \longrightarrow C_6H_{12}O_6 + C_6H_{12}O_6$$

The "polysaccharides" are complex molecules which can be broken down into many molecules of simple sugar. Their formula is $(C_6H_{10}O_5)x$.

Carbohydrates
- Monosaccharides $C_6H_{12}O_6$
  - Grape Sugar (Dextrose or Glucose)
  - Fruit Sugar (Levulose)
    (A mixture of dextrose and levulose is called Invert Sugar. Honey is the best example in nature)
  - Galactose
- Disaccharides $C_{12}H_{22}O_{11}$
  - Cane sugar, Beet Sugar, Maple Sugar — Sucrose
  - Milk Sugar (Lactose)
  - Malt Sugar (Maltose)
- Polysaccharides $(C_6H_{10}O_5)x$
  - Starch
  - Dextrin
  - Glycogen
  - Gums
  - Cellulose

Function.—Carbohydrates when burned in the body yield energy in the form of work or heat. Carbohydrate in excess of the body's immediate needs for fuel is stored as glycogen, chiefly in the liver but also in the muscles and other organs. The body's capacity to store glycogen is limited and if more carbohydrate is eaten the surplus may be changed into fat.

Sugars

Sugars are soluble carbohydrates with a more or less sweet taste. When heated to a high temperature they form caramel. Dietetics is especially concerned with grape sugar (glucose or dextrose), milk sugar (lactose) and cane sugar (sucrose).

DEXTROSE (OR GLUCOSE)

Description.—Dextrose occurs in nature as a syrup. It is much less sweet than cane sugar. Other sugars have to be changed to this form before the body can use them.

Source.—It is found throughout the vegetable kingdom, chiefly in fruit and plant juices. It is especially abundant in grapes of which it often constitutes 20 per cent or more of the weight of the fresh fruit and considerably more than half of the solid matter. Commercially it is made from starch by hydrolysis with acids.

Use in the Diet.—Dextrose is a fuel food in a very readily absorbed form. Taken in large quantities it is liable to ferment or flood the system with sugar too rapidly but as naturally present in sweet fruits or in its artificial form in small quantities along with other foodstuffs it is a very economical source of energy. Being less sweet than cane sugar, when it is used to sweeten other foods a larger amount must be taken.

LACTOSE

Lactose (milk sugar) occurs in the milk of all mammals. It is less sweet and much less soluble than cane sugar and does not readily ferment. Because of its mild flavor and because it is less irritating to the digestive tract than sucrose it is widely used in feeding infants and invalids, where it is a valuable source of fuel.

SUCROSE

Description.—Pure cane sugar is chemically the same as beet sugar. Maple sugar would not be different from ordinary sugar if it were sufficiently purified to remove the flavoring matter. By boiling for a long time or in the presence of acids (whether naturally in the fruit or added to it) cane sugar is changed to invert sugar, which is a mixture of equal parts of dextrose and levulose. While dextrose is not as sweet as cane sugar, levulose is very much sweeter so that the mixture has a peculiar penetrating sweetness that is not as pleasing as the cane sugar flavor.

Source.—Sucrose is found in the sap or juices of a variety of plants, the sugar cane, the sugar beet and the sugar maple being the most important sources commercially, but many common fruits and vegetables contain considerable amounts. Whether obtained by collecting sap or by crushing, it is always at first a syrup and all solid sugar is made from these juices by evaporation and the process of refining.

Use in the Diet.—Cane sugar constitutes a very important part of the dietary of most people for table use, also in confectionery and in combination with other foods in cooking. It is a valuable source of energy but must be used with discretion because in too large amounts or in too concentrated a form it is irritating to the membrane of the stomach, is liable to ferment, and also because being quickly absorbed, it either satisfies the appetite before the need for food has been entirely met or blunts it so that other foods become distasteful. Sweet fruits are better than pure sugar, especially for children, since fruits contain important mineral salts which are wholly lacking in sugar.

Sugar should be avoided in gastric disorders and in diabetes, and since it is a very concentrated food it should not be used in cases of obesity.

Substitute for Sugar.—Since sugar is used not only as a fuel food but as a condiment, attempts have been made to secure a substitute for use in cases where carbohydrate is limited or denied. The best known of these is "saccharin" or "sweetina", a crystalline coal tar product. It is many times sweeter than sugar but has no food value.

Tests for Sugar.—A simple test for sugars, in general, consists of adding an equal volume of concentrated sodium-hydroxide solution to the suspected solution and boiling. A brown color indicates the presence of sugar.

The chief test for dextrose is Fehling's. A test solution should be on hand and may be obtained at any apothecary's. It should be fresh. The test is based on the fact that dextrose "reduces" salts of copper by depriving them of some of their oxygen and an insoluble oxide of copper is precipitated. To make the test, add to a portion of the test solution a few drops of the suspected solution in a test tube and boil. If a red precipitate forms dextrose is present. The sole use of this test for the nurse will probably be in connection with diabetes, when the nurse makes the test at the request of the physician.

Starch and Other Polysaccharides

Description.—Starch, unlike sugar, is insoluble but a portion may be made to pass into a soluble form by boiling in water, dry heating at high temperature or by certain digestive ferments. The first substances formed in the course of starch digestion are dextrins; these can be split into the disaccharide maltose which in turn will yield two molecules of dextrose. The polysaccharides which have nutritive value in the body are starch, dextrins and glycogen.

In its pure state, i.e., when isolated from proteins, cellulose, gums, and so forth, starch is a shiny white powder having a distinctive quality to the touch. Under the microscope it is found to consist of granules which are insoluble in cold water; on warming they absorb water and swell. Cooking in water ruptures the starch grains, rendering the contents more readily acted upon by the digestive juices.

Source.—Starch occurs widely in the vegetable kingdom. It is found in largest amount in seeds, roots, tubers, bulbs and sometimes in the stems and leaves of plants. It constitutes one-half to three-fourths of the solid matter of the ordinary cereal grains and at least three-fourths of the solids of mature potatoes. Commercial "starch" is obtained from wheat, corn, rice, potatoes and arrowroot.

Other Polysaccharides.—Cellulose, the framework of plants, has no nutritive value, but because it is not digested in the human body it forms the major part of the ballast which is so necessary to a normal intestinal movement. It stimulates peristalsis by acting as a gentle mechanical irritant, by helping to retain moisture and to keep the feces soft, and by giving such bulk that the intestinal muscles can act to good advantage. Unless it is desirable for some special reason to relieve the digestive tract of all work a certain amount of cellulose should be included in the diet. In constipation the addition of an increased amount of cellulose in some non-irritating form, like agar-agar, has proved a successful therapeutic measure. Much of our food as we eat it has had most of the cellulose naturally present removed in preparing it for the table. For this reason bran is frequently added to food by those having a tendency to sluggish intestinal movement. The same results can be secured by making the diet consist of a greater proportion of foods which contain large amounts of "roughage" or ballast, such as green vegetables, fruits and whole grain products.

Gums have little or no nutritive value in the human body and like cellulose act as ballast.

Principles of Cooking Starch.—The principles involved in the cooking of starch are of two types—chemical and mechanical.

Chemical Principles.—Since raw starch is digestible only to a slight degree, it is essential to good digestion that starchy foods be cooked.

In the presence of moisture starch becomes semi-soluble at the temperature of boiling water, i.e., 212 degrees Fahrenheit. Gruels are made by cooking cereal flours in water at or near the boiling temperature for a long time.

By dry heat, at a temperature of 300-400 degrees Fahrenheit, starch can be converted to dextrin. This principle is applied in making toast, a little dextrin forming on the outside of the slice. A small portion of the starch is further changed to caramel, giving a characteristic flavor to the crust of bread, toast, etc.

Mechanical Principles.—When foods composed largely of starch, such as flour, cornstarch, etc., are to be cooked with a liquid, care must be taken to prevent the formation of lumps, for these are not only unsightly but consist of an outer layer of cooked starch surrounding a center of unchanged material and preventing its being made digestible.

There are three methods of avoiding lumps:

1. By mixing the starch gradually with a small portion of cold water, so that a smooth paste is formed before adding the boiling liquid. This method is used in making gruels, etc.
2. By mixing with fat before adding liquid. The melting fat separates the starch granules. At least as much fat as starch must be used. The liquid is preferably added cold and all at once. If added hot it must be stirred in very gradually. This method is employed in making gravies, sauces, etc.
3. By mixing with sugar. The melting sugar serves to separate the starch grains. This is practicable only when the sugar is greater in amount than the starch and the liquid must be added gradually. This method is applied in the case of desserts, such as cornstarch pudding.

When foods consisting of a mixture of starch and cellulose, as cereal breakfast foods, are to be cooked, it is necessary to soften and break up the cellulose to enable the digestive juices to reach the starch. This necessitates long cooking at a temperature near the boiling point. The longer such a cereal food is cooked the easier of digestion it becomes. Hence it is an excellent rule to cook such foods for infants and others of feeble digestive powers twice as long as is commonly recommended.

Reheating of starchy foods, therefore, tends to promote their ease of digestion. Zwieback (twice baked bread) is more readily digested than fresh bread. Moreover the texture of hard, dry bread induces more thorough mastication than does the fresh, which is apt to be swallowed in soft, doughy lumps.

Test for Starch.—Starch is colored blue by iodine. Hence it is easy to detect its presence in any food. To make the test a small portion of the material should be placed in a test tube, boiled with a little water, cooled and two or three drops of dilute tincture of iodine added. If starch is present the blue color will immediately appear. Dextrin gives a port wine color with iodine, so that if any of this substance be present the color is modified, becoming more or less purplish or purple-red.

Fats and Oils

Definition.—Fats are composed of carbon, hydrogen and oxygen, but the oxygen is present in smaller proportion than in carbohydrates. Fats were formerly spoken of as hydrocarbons but this term is now reserved for substances which contain no oxygen at all, such as benzene.

Description.—True fats, whether solids or oils, are chemical compounds of fatty acids with glycerol, called glycerides, and differ among themselves according to the particular glycerides they contain. Those commonly found in considerable amount in edible fats are the glycerides of stearic, palmitic and oleic acids. The stearates or combinations of stearic acid with glycerol (sometimes called stearin) are solid fats as are also palmitates or palmitin. The oleate or olein, on the other hand, is liquid at ordinary temperatures. Butter, tallow, lard and other common fats are mixtures of glycerides. The softness of butter, oleomargarine, lard, etc., is largely due to the amount of olein which they contain. Suet and tallow owe their hardness largely to the amount of stearin present. Vegetable oils (olive, cottonseed, peanut, almond and cocoanut) contain large amounts of olein, as does also cod liver oil. Certain foods not usually thought of as fatty contain significant amounts of fats, for example, egg yolk, Indian corn and nearly all nuts.

Lecithin.—Besides the true fats there are many fat-like substances, closely related to the fats both chemically and biologically, which occur widely in nature. One of the most important of these from the standpoint of nutrition is lecithin which is found abundantly in egg yolk and also in brain and nerve tissue, blood, lymph, milk, many seeds and other plant and animal tissues. Besides glycerides of fatty acids it contains phosphorous. This is a necessary constituent of every living cell.

Volatile Oils.—These have little in common with true oils. They vary much among themselves in composition but all tend to disappear by evaporation. They are characterized by their odors, tastes and pungency. A few of them are used as flavoring. The oil of bergamot is obtained from a variety of orange, the oil of lemon from lemon peel, etc. Cooking tends to volatilize them, so that such flavoring should be added at the last moment.

Source of Fats.—The chief sources of fats in the diet are milk (yielding cream and butter), olive oil and other vegetable oils, meat fats (especially lard, bacon, salt pork, beef suet and drippings), and nuts.

Less Expensive Forms of Fats.—There are less expensive forms of fats than butter, olive oil and lard. Among them are oleomargarine and the various margarines made from vegetable fats, such as cocoanut, cottonseed and corn oils. Because they are less expensive they are used as substitutes for the more expensive fats. Oleomargarine is made of beef fat churned with milk. Cottonseed, cocoanut and palm nut oils are also used in the manufacture of butter substitutes.

Combinations of cottonseed oil and beef fat are made into fats similar in appearance and use to lard. The oils of corn, cottonseed, peanut and certain other seeds are now commonly used in place of olive oil.

Oleomargarine and the other butter substitutes have practically the same fuel value as butter. Olive oil, cottonseed and corn oils and lard are 100 per cent. fat and yield equal amounts of energy. Butter, however, and to a less extent beef fat, contain fat-soluble vitamine, a growth-promoting substance not found in lard, olive oil or any vegetable fat or oil to any appreciable extent. Milk, egg yolk and green vegetables are rich sources of fat-soluble vitamine and when they are included in the diet in liberal amounts substitutes for butter may be safely used. Otherwise there is a danger of deficiency in this vitamine.

Note: See discussion on Vitamines, page 21.

Function.—Fats are the most concentrated kind of fuel, furnishing two and one-fourth times as much energy as the same weight of carbohydrate or protein. Excess of any of the organic foodstuffs may be stored as reserve fuel in the form of body fat. Its most important function is to serve as an energy supply, but fat also serves as a protection to the body from mechanical injury and from too rapid loss of heat when exposed to cold as well as a packing and support to the visceral organs, particularly the kidneys.

Digestibility.—Fat tends to check the secretion of gastric juice and to retard the motility of the stomach, thereby retarding the rate of digestion. The softer fats and emulsified fats are digested more easily than those that are harder. Heating fats to too high a temperature in cooking may decompose them and produce substances irritating to the membrane of the stomach. Also foods fried in fat are coated with and possibly permeated by it and are thus more slowly digested.

Tests for Fats.—Fats are readily tested with paper—if they are present in a given substance a permanent grease spot appears. If to a suspected substance a little sodium hydroxide solution is added a white precipitate forms, which is a hard sodium soap.

Proteins

Chemical Nature.—Proteins are organic foodstuffs, compounds of the elements carbon, hydrogen, oxygen, nitrogen, sometimes sulphur and sometimes phosphorus or both. Carbohydrates and fats contain carbon, hydrogen and oxygen. Proteins, however, are the only source of organic nitrogen, which is an essential constituent of both animal and plant cells.

Proteins are made up of simpler substances containing nitrogen, called amino acids. They bear the same relation to proteins that dextrose does to starch, that is, amino acids are the last step in the breaking down of the protein molecule through digestion, but whereas all the molecules of dextrose which starch yields on hydrolysis are alike, one protein molecule may yield from 12 to 17 different amino acids.

Source.—Proteins are an important part of muscle tissue and of both animal and plant protoplasm. Plants can build their own proteins from inorganic materials which they derive from the soil and the air, but animals are unable to synthesize their body proteins directly from inorganic substances and must get them from the proteins in their food.

Man secures his proteins from two sources, animal and vegetable foods. Meat, fish, eggs and milk furnish large amounts of animal proteins. Egg proteins are found in both the whites and the yolks. Milk has two very important proteins, casein and lactalbumin. Animal foods are in general richer in proteins than vegetable foods. The only foods of plant origin which can compare with animal foods in this respect are the legumes (peas, beans, lentils, peanuts, etc.), and certain nuts, such as almonds and pine nuts.

Classification.—Proteins are usually classified as simple proteins, conjugated proteins and derived proteins. Some examples of proteins of each group are given below and the reader is referred to Sherman's "Chemistry of Food and Nutrition," Second Edition, pages 51-54, for the complete classification.

1. Simple Proteins.
   a. Albumins. Examples: egg albumin (egg white), lactalbumin (milk), serum albumin (blood).
   b. Globulins. Examples: muscle globulin, serum globulin (blood), edestin (wheat, hemp seed and other seeds), legumin (beans and peas).
   c. Albuminoids. Examples: collagen of connective tissue.
2. Conjugated Proteins.
   a. Nucleoproteins. Examples: proteins of glandular organs, such as sweetbreads.
   b. Phosphoproteins. Examples: casein (milk), ovovitellin (egg yolk).
   c. Hemoglobins. Examples: hemoglobin of blood.
3. Derived Proteins.
   a. Metaproteins. Examples: acid proteins, alkali proteins, albuminates.
   b. Proteoses.
   c. Peptones.

Nitrogenous Extractives.—Not all the nitrogen present in food is in the form of proteins. Substances found in muscle juice, consisting chiefly of creatin, creatinin and purins (uric acid and related substances), have little if any fuel value and are useful only as stimulants. They give to meats their characteristic flavor, hence are appetizing and stimulate the flow of gastric juice. For this reason extracts of meat, such as beef tea, beef juice and soups made from meat stock are valuable in feeding the sick.

Functions.—Proteins have two functions: (1) to yield energy, and (2) to build or repair tissue. The body is constantly losing nitrogen as a waste product from the metabolism of the cells and from the wear and tear of the cell structure. The nitrogen to make up for this loss must be supplied by protein foods.

Differences in Value in Nutrition.—There are marked differences in the value of the different proteins in respect to their ability to form body substance and these variations are due to the amino acids which they contain. Experiments with animals, in which the diet contained only one protein, show that gliadin (one of the proteins of wheat) will maintain a full grown animal in body weight but will not promote growth in the young, while zein (one of the proteins of the corn kernel) is inadequate for either maintenance or growth. Gliadin lacks lysine, an amino acid essential to growth, but it is sufficient for maintenance because it contains the amino acid tryptophane. Zein lacks both lysine and tryptophane. Casein and lactalbumin (milk), ovalbumin and ovovitellin (eggs) and edestin (grains) are examples of what are called "complete proteins" because they contain all the amino acids necessary for both maintenance and growth. Proteins capable of maintaining life but not of promoting normal growth are termed "partially incomplete". Gliadin is one of these. "Incomplete proteins" are those incapable of maintaining life or promoting growth. Zein and gelatin are examples of this class.

The amino acids lacking in certain proteins are supplied by a mixed diet containing more than one kind of protein, and in the case of certain grains such as corn the deficiency in one kind is corrected more or less by the other proteins of the whole grain. For example, glutelin, another protein of the corn kernel, which is "complete", supplies the tryptophane and lysine lacking in zein. In order to be certain that the diet contains an adequate supply of complete proteins the liberal use of milk, eggs and vegetables is important especially for growing children and invalids.

Cooking of Protein.—Care is necessary in the cooking of proteins in order to prevent toughening and to make them easy of digestion. The following experiment with egg albumin, which is one of the most familiar proteins, illustrates some of the properties of proteins in general.

Effect of Temperature on Protein.—Put some white of egg into a test tube, place in a sauce pan of cold water, heat gradually and observe all changes.

1. Raw egg white is a sticky, clear, pale straw-colored liquid and is readily digested.
2. When the water reaches the temperature of 134° F. white streaks will be seen in a semi-solid substance. It is still easily digested.
3. When the water reaches the temperature of 150° to 160° F. the egg white will be soft and jelly-like in consistency and is readily digested.
4. When the water reaches 212° F. the egg white will be tough white jelly and less readily digested.
5. When egg white is heated to 300° F. or higher (for example by putting the test tube directly over the flame), it will almost immediately become hard and tough.

These tests show that some proteins are hardened and toughened by high temperature and are most tender and readily digested when cooked at a low temperature.

Mineral Matter

Amount and Kind in the Body.—The mineral matter in the body amounts to about 5 or 6 per cent by weight, occurring chiefly in the bones but also in the tissues and in blood and other body fluids.

The body is composed of the elements oxygen, carbon, hydrogen, nitrogen, calcium, phosphorus, potassium, sulphur, sodium, chlorine, magnesium and iron, with minute traces of iodine, fluorine and silicon. Of these oxygen, carbon, hydrogen, nitrogen, sulphur and some phosphorus exist in the body in proteins. Phosphorus is also combined with calcium in the form of calcium phosphate which is the chief mineral constituent of bone. Magnesium also occurs in bone. Calcium and magnesium and some phosphorus are found in muscle tissue. The blood and other body fluids contain calcium, sodium, chlorine (chiefly as sodium chloride), magnesium, phosphorus and potassium. Blood is especially rich in iron, which is found in the hemoglobin of the red corpuscles.

Occurrence in Food.—All the elements which enter into the structure of the body must be furnished by the food. Carbon, hydrogen and oxygen are supplied by the proteins, fats and carbohydrates; nitrogen and sulphur by the proteins. Phosphorus is combined with some proteins (phospho-proteins), some fats (phosphorized fats) and some carbohydrates, and it also occurs in inorganic form, for the most part as calcium phosphate. Among the phosphorus-rich foods are milk, egg yolk, legumes, whole grain cereals, fruits, vegetables and lean meat.

Foods rich in calcium are milk (by far the best source, both because it is the richest in calcium of any of the common foods and because of the ease with which its calcium is assimilated), cheese, whole grains, legumes, vegetables, fruits and molasses.

Egg yolk and spinach are especially good sources of iron but green vegetables in general, legumes, whole grain products and fruits are fairly rich sources. Milk contains iron in rather small amount but in a form very easy to digest and assimilate. Lean meat is richer in iron but in a form less available to the body.

Sodium and chlorine, as sodium chloride or common salt, are added to food as seasoning in such quantities that the needs of the body for these elements are amply met.

Potassium and magnesium are so widely distributed in foods and such small amounts are needed by the body that they are adequately supplied by a *mixed* diet.

Calcium, iron and phosphorus are of such importance in nutrition and, calcium and iron especially, so often inadequately supplied by the diet, that they demand special attention to insure inclusion in the diet of sufficiently large amounts of foods rich in these three elements. Milk, vegetables, eggs and fruits, if used liberally, will furnish enough of these mineral constituents to meet the body's requirement.

Functions.—Mineral matter functions in the body in the following ways:[1]

1. As a constituent of the bones, giving rigidity and relative permanence to the skeletal tissues.
2. As essential elements in the structure of the soft tissues (muscles, blood cells, etc.)
3. As soluble salts held in solution in the fluids of the body, giving these fluids their characteristic influence upon the elasticity and irritability of muscle and nerve, supplying the materials for the acidity or alkalinity of the digestive juices and other secretions, and yet maintaining the neutrality or slight alkalinity of the internal fluids as well as their osmotic pressure and solvent power.

Water

Composition and Properties.—Water is composed of the elements hydrogen and oxygen, two parts of hydrogen to one of oxygen. Its chemical formula is written H_2O. Absolutely pure water is colorless, odorless and tasteless, but such water is not found in nature owing to its great solvent power, which causes it to dissolve substances with which it comes in contact. Water ordinarily therefore contains varying quantities of mineral and organic matter, including gases. To these substances in solution the characteristic flavor is due. Water from which the air has been expelled by boiling or long standing in a warm place has a "flat" taste.

Water freezes at 32° F. On heating, the ice melts and we may have ice water with a temperature of 32° F. When this water is warmed the air dissolved in it begins to expand and tiny bubbles appear, forming first on the sides of the vessel and tending to rise to the surface. If the water there is not yet warmed they contract but finally when the water is warm throughout come to the surface and escape. After the air is thus expelled, if heating is continued steam bubbles

[1] Quoted from Sherman, "Chemistry of Food and Nutrition," Second Edition, page 236.

form in a similar manner. At 185° F. water bubbles below the surface, or *simmers*. When the bubbles reach the surface and break, giving off a cloud of steam, the *boiling point*, 212° F., has been reached. Except under pressure water can then become no hotter. Fast boiling simply means rapid evaporation and waste of fuel.

Water Content of Foods.—The water content of foods varies widely. In green vegetables it constitutes from 85 to 95 per cent. of the whole substnce; in potatoes and some other starchy vegetables it is present in as large amount as 75 per cent. Even in seemingly dry foods like crackers there may be as much as from 5 to 10 per cent. But since the body itself contains a large amount of water and the water loss through the lungs, skin, kidneys, etc., is so great, water must be taken in addition to that contained in food. Under ordinary circumstances about 3 to 4 pints daily are necessary. The quantity of water excreted per day varies with atmospheric conditions and the amount of exercise, increasing with hot weather and violent exercise and decreasing in the bed-ridden and sedentary. Babies and delirious patients should be fed water as carefully as food. The liberal drinking of water with meals facilitates digestion, provided that it is not too cold and that it is not used to wash down food.

Functions.—Water serves the following important purposes in the body:

1. It is an essential constituent of the tissue cells and of all body fluids, such as blood, lymph and the digestive juices.
2. It dissolves nutritive materials in the course of digestion, making possible their absorption into the blood and lymph.
3. It furnishes a medium for the transportation of food to various parts of the body and for the removal of waste.
4. It keeps the various mucous membranes of the body soft and prevents friction of their surfaces.
5. It aids in regulating body temperature.

Vitamines

There are three substances or groups of substances, not yet chemically identified, which are necessary to normal growth and maintenance. A diet may be adequate in amount and kind of fuel, protein, mineral constituents and water and still fail to promote normal growth or maintain an animal in health if one or all of these substances is lacking. They are variously known as *vitamines, accessory food substances,* and *food hormones.*

One of them is soluble in fat and is found naturally in such fats as butter, cod liver oil, fat of egg yolk and of glandular organs such as the liver, but is not found in lard or in olive oil or any other fat or oil of vegetable origin to any appreciable extent. It is however found in the leaves of plants. The absence of this vitamine in the diets of growing animals results in retarded growth which is resumed when a food containing this growth-promoting fat is added. Full grown animals do not show a lack of the fat-soluble vitamine as quickly as do growing animals but eventually they give evidence of impaired health and nutrition, which disappears on the addition of this essential food factor. The best sources of fat-soluble vitamine are whole milk, butter, cod liver oil, egg yolk and the leafy vegetables. The ordinary temperatures used in cooking weaken but do not destroy this vitamine.

The second vitamine is soluble in water and insoluble in fat. Lack of it causes a disease known as beriberi which manifests itself as a degeneration of the nerves and which occurs among people living too largely on a diet of polished rice or refined foods. It can be prevented or cured by using unpolished rice instead of polished or white rice or by adding to the diet beans, peas, peanuts or whole grains. The water-soluble vitamine is more widely distributed in natural foods than the fat-soluble and there is much less danger of a deficiency in this respect than of the fat-soluble vitamine, provided that the food is not too highly refined.

Foods rich in this substance are yeast, vegetables, legumes, whole grains, fruits, egg yolk and milk. Nearly all vegetables contain some of this vitamine. There is little danger of destroying this vitamine with the usual cooking temperatures if the use of alkalies is avoided but there is danger of its partial or complete destruction in commercial canning or other high pressure cooking.

The third vitamine gives to certain foods their

Antiscorbutic Property

The occurrence of scurvy has been found to be coincident with a diet consisting largely of dried and cooked foods. It is cured by the use of fresh foods, such as oranges, lemons, limes, potatoes, cabbage and tomatoes in particular, and fresh fruits and vegetables in general. Cooked and canned fruits do not appear to have lost much of their "antiscorbutic property", but the ordinary cooking of vegetables has variable results, usually resulting in some loss and sometimes in complete loss. Potatoes and tomatoes stand heating very well. The heating of milk injures the antiscorbutic property and the use of pasteurized or boiled milk or proprietary foods in feeding infants frequently results in the development of infantile scurvy unless fresh raw milk is substituted or fresh fruit or vegetable juice is added to the diet. Orange juice is the most common antiscorbutic but tomato juice has been successfully used as a chief substitute, even with very young children. Recent work has been reported (Hess) which seems to show that dried milk may have an antiscorbutic value under certain conditions, i.e., provided that it was rich in antiscorbutic vitamine before drying, was dried quickly under proper conditions and packed in airtight containers.

The animal body can not manufacture vitamines; it can only gather them from its food. If the diet is deficient in any one of these necessary substances satisfactory nutrition is impossible.

The Essentials of an Adequate Diet

The Essentials of an Adequate Diet may be summarized as:

1. Sufficient material to yield the necessary energy.
2. Sufficient protein of the kind best suited to growth and maintenance.
3. Adequate amounts of ash constituents in the proper proportions.
4. An adequate supply of vitamines.

A Complete Food:

1. A complete food must contain all the nutritive elements of the body—proteins, carbohydrates, fats, mineral matter, water and vitamines.
2. It must contain these in their proper proportions.
3. It must contain in a moderate compass the total amount required daily.
4. The nutritive elements must be capable of absorption and yet leave a certain bulk of unabsorbed matter to act as intestinal ballast. It must be obtainable at a moderate cost.—Hutchinson.

A Mixed Diet therefore is necessary as no one food fulfills all the requirements of a "complete food." A mixed diet must be taken whereby one food may be used to supplement what is lacking in another. The foods best for health are those best fitted to the needs of the individual. The cheapest food is that which furnishes the largest amount of nutriment at the least cost. The best food is that which is both most healthful and cheapest.

Dietetics is the application of the science of nutrition to the feeding of individuals of different ages, under different circumstances, in health and disease.

FOOD ACCESSORIES OR ADJUNCTS

CONDIMENTS—BEVERAGES

Definition.—Food accessories or food adjuncts are substances which although they have no nutritive value are extensively used in the dietary to give flavor to foods, to increase the appetite and to furnish pleasing variety. Under the term are included condiments and beverages.

Condiments

If we consider appetizing substances of all kinds the number of condiments is very large. It includes the great variety of sauces, spices used in cooking (ginger, cinnamon, nutmeg and cloves), flavoring extracts (vanilla, oil of lemon, etc.), mustard, horseradish, pepper, salt and vinegar. Of these salt, strictly speaking, is a food. When it is used in excess of body needs simply to modify the flavor of food it is properly classed as a condiment.

The taste for condiments is largely an artificial one and their use should be limited. In moderation, for the sake of variety, or when the appetite is feeble, their addition to the diet is legitimate. They should be withheld (with the exception of salt) from the food of children because they destroy the appetite for milder foods and because they are irritating to the mucous membrane of the alimentary canal. For the same reason they should also be given with caution to invalids, especially those suffering from any inflammation of the digestive tract.

Beverages

These food accessories include tea, coffee, alcoholic drinks, lemonade and other acid drinks, aerated and carbonated drinks. Such beverages are useful, not because of their nutritive value for they have little or none, but because of their stimulating or thirst quenching qualities and their attractive flavor.

Milk, cocoa and chocolate though taken as beverages with meals are really foods, since they contain protein, fat, carbohydrate and animal matter.

CLASSIFICATION OF FOOD MATERIALS ACCORDING TO CHEMICAL COMPOSITION

Foods rich in proteins		Meat (especially lean meat) Poultry and game Fish Eggs Milk and cheese Dried beans, peas and lentils Cereals (corn, wheat, rye, oats, etc.) Nuts Gelatin
Foods rich in carbohydrates		Wheat and wheat products (bread, cake, crackers, pastry, macaroni, spaghetti, etc.) Corn and corn products (cornmeal, cornstarch, etc.) Rice Potatoes (white and sweet) Fresh fruits (grapes, oranges, pineapples, bananas, apples, etc.) Dried fruits (dates, raisins, prunes, currants, figs, apples, apricots, etc.) Sugar (cane, beet and maple) and sugar products (jellies, preserves, marmalade, candy) Honey
Foods rich in fats		Olive oil, cotton seed oil, peanut oil, corn oil, almond oil Butter, cream and cheese Eggs (yolks) Pork (including bacon and ham) Salmon (and all fatty fish) Nuts Chocolate Cocoanut
Foods rich in mineral matter	Nitrogen and Sulphur	Proteins (meat, eggs, milk, etc.)
	Carbon, Hydrogen and Oxygen	Proteins, fats and carbohydrates
	Phosphorus	Eggs (yolks) Milk Meat Fish Dried beans and peas Whole grain cereals (oatmeal, cornmeal, whole wheat, etc.) Nearly all vegetables and fruits

	Calcium	Milk and cheese Whole grain cereals Dried beans and peas Eggs (yolks) Molasses Vegetables Fruits
	Iron	Eggs (yolks) Green vegetables (spinach, asparagus, beet greens, peas, etc.) Potatoes Dried beans and peas Lean meat Oatmeal Whole wheat bread Whole wheat flour Dates Prunes Figs Raisins
	Potassium Magnesium Iodine	Associated with other mineral salts in food and amounts needed by the body will be furnished by the above list
	Sodium and Chlorine	Table salt (NaCl)
Foods rich in vitamines[1]	Fat-soluble Vitamine "A"	Sea food Butter Milk and cream Cod liver oil Eggs (yolks) Leafy vegetables (spinach, cabbage, etc.) Carrots Liver and kidney (beef and pig)
	Water-soluble Vitamine "B"	Yeast Eggs (yolks) Whole grain cereals Dried beans and peas Vegetables (spinach, cabbage, potatoes, celery, carrots, onions, parsnips, turnips, tomatoes, etc.) Fruits oranges, lemons, grapefruit, etc.) Nuts Milk
	Antiscorbutic Vitamine "C"	Oranges Tomatoes (fresh, canned or dried) Cabbage Lettuce Green peas Potatoes Spinach

[1] This list does not include all known sources but only those foods which are especially rich in vitamines.

QUESTIONS FOR STUDY

1. What are the functions of food? Name the sources of food.
2. Classify the foodstuffs according to function. Which foodstuffs yield energy in the body? Which may contribute to the formation of body fat?
3. Classify the foodstuffs according to chemical composition.
4. Define carbohydrates. How do they differ in composition from fats? From proteins?
5. Name five typical foods rich in carbohydrates.
6. Classify carbohydrates giving examples of each class.
7. Under what conditions has lactose an advantage over cane sugar and glucose in the dietary?
8. What are the principles to be followed in cooking starch?
9. Name five typical fat-rich foods.
10. What can you say of the fuel value of butter substitutes, and safety in using them?
11. Give three examples of animal proteins; three examples of vegetable proteins.
12. Discuss the differences in value of different kinds of proteins in nutrition. Name two complete proteins.
13. What are nitrogenous extractives? Of what use in the diet are they?
14. What are the functions of mineral matter in nutrition?
15. Give the composition of the body.
16. Give the composition of food.
17. Where in the body is calcium found? Phosphorus? Iron?
18. Name three foods rich in calcium; three rich in phosphorus; three rich in iron.
19. What part do vitamines play in nutrition?
20. Name three important sources of the fat-soluble vitamine. Name three important sources of the water-soluble vitamine. Name three important sources of the antiscorbutic vitamine.
21. Define the term *food accessories*.
22. Of what use are condiments in the dietary?
23. Define *dietetics*.

CHAPTER II

NUTRITION

DIGESTION—ABSORPTION—METABOLISM

Under this term is usually understood the digestion and absorption of nourishment, its assimilation and utilization, its storage in excess, and finally the elimination of the products of wear and tear, of combustion, and of nutriment or waste which cannot be utilized. Those processes of nutrition which occur after absorption are now included in the term metabolism. To restate this in a simple form (adapted from Thompson) nutrition involves:

1. The secretion of digestive fluids and their action upon food in the alimentary canal—in other words, digestion.
2. The passage of the ingredients of the digested food into the blood vessels and lymphathic vessels—absorption.
3. The utilization of the absorbed nutrition products by the cells—assimilation or upward metabolism.
4. The elimination of waste material—disassimilation or downward metabolism.

The subjects of digestion and absorption will be treated in detail for each food principle and then summarized at the end of each topic.

Digestion

Digestion of Proteins

Digestion in the Stomach.—Protein is not chemically altered in the mouth. The process of chewing simply moistens and divides it into small particles so that it is easily swallowed and more readily attacked by the secretion of the stomach. Passing down the œsophagus, through the cardiac sphincter guarding the entrance to the stomach, it enters that portion of the latter organ called the *fundus*. Here it rests quietly for some time. It is not immediately mixed with gastric juice as formerly taught but the outer portions of the mass are successively attacked and dissolved. These soft portions are then pressed into the intermediate and pyloric regions of the stomach and subjected to a thorough mixing.

The *gastric juice* is an acid fluid which may be secreted in large quantities—as much as one or two gallons in 24 hours. Its acidity is due to the presence of about 0.2 per cent. to 0.4 per cent. of hydrochloric acid. This of itself is capable of causing proteins to swell and to some extent dissolve, of hydrolyzing the collagen of connective tissue, of decalcifying bone, and of preventing bacterial action.

The gastric juice contains two enzymes which act on protein, *pepsin* and *rennin*. Pepsin can act only in the presence of a definite percentage of hydrochloric acid, while rennin acts in a neutral solution. The relations of rennin and pepsin are not yet very clearly understood. The function of rennin is to curdle milk, which causes it to remain in the stomach long enough to be partially digested by the pepsin.

Action of Pepsin.—The protein of the diet, more or less swollen, softened and dissolved by the action of hydrochloric acid, is changed chemically by pepsin into a series of increasingly simpler and more soluble products, namely, *acid proteins, proteoses* (often called albumoses) and *peptones*. The change to peptones is not complete, but these three products of peptic digestion tend to pass together into the intestine when the pyloric sphincter which guards the entrance to the duodenum opens to let them pass. The opening and closing of this sphincter is controlled by two factors:

1. The consistency of the partly digested food, solid particles tending to keep the pylorus closed.

2. The presence of free hydrochloric acid in the stomach contents. This is the more important factor.

Protein is capable of absorbing and uniting chemically with a certain amount of acid. When it is so saturated, free acid will be present, having now nothing with which to combine, and this free acid is the stimulus which causes the pyloric sphincter to relax and lets a little spurt of food into the duodenum. Once in the duodenum, this same acid acts as the stimulus to close the pylorus and no more food enters the duodenum until the first portion has been neutralized.

A clear understanding of the way in which the pyloric sphincter is regulated throws considerable light on stomach digestion. We can understand why a certain quantity of indigestible residue, such as is present in most of our staple foods—meats, vegetables, fruits, etc.—is of service in retaining food within the stomach for a time, giving the hydrochloric acid a chance to exercise its bactericidal power and favoring thorough gastric digestion. It also explains why a meal of "bolted" food or of food imperfectly masticated through absence of teeth, or a lack of free hydrochloric acid in the stomach contents, as in hypoacidity or achylia gastrica, may set up such a continuous state of pyloric contraction that the stomach remains unemptied for a long period, with a good prospect of fermentation and gas production, of relief by vomiting, or of an attack of acute indigestion, biliousness or diarrhœa. The nurse will understand why a diet of "liquids" for a person in relatively good health does not prove satisfactory. Liquids do not stay long enough in the stomach to give a sense of fullness, give the stomach little to do and tend to pass into the intestines poorly prepared for the action of the digestive juices there.

Digestion in the Intestines.—On entering the duodenum the acid chyme from the stomach meets three secretions, all alkaline in reaction, namely, the *pancreatic juice,* the *bile* and the *intestinal juice.*

The hydrochloric acid of the stomach is indirectly responsible for the flow of the pancreatic juice, for this begins only after acid food has entered the duodenum. The pancreatic juice contains an enzyme capable of digesting protein only after it has come into contact with the intestinal juice. This enzyme is then called trypsin, and the changes which it produces in protein are similar to those produced by pepsin. It acts, however, in an *alkaline* medium.

The products of tryptic digestion are therefore *alkali proteins, proteoses* (albumoses) and *peptones.*

The bile plays no significant part in protein digestion, except as it helps to neutralize the chyme.

The intestinal juice contains an enzyme called *erepsin,* which completes the digestion of protein, breaking down the proteoses and peptones formed by pepsin and trypsin into still less complex compounds called *amino acids.* These are the "end-products" of protein digestion. The digestive process can go no further. There are no enzymes acting on proteins in the large intestines.

Summary.—The chemical changes in proteins during the process of digestion are shown in the following table:

PART OF ALIMENTARY TRACT	NAME OF SECRETION	ENZYMES ACTING ON PROTEIN	PRODUCTS OF ENZYME ACTION
Mouth	Saliva	None	None
Stomach	Gastric Juice	Rennin	Coagulates Milk
		Pepsin and Hydrochloric acid	Acid Proteins Proteoses Peptones
Small Intestines	Pancreatic Juice	Trypsin (in alkaline medium)	Alkali Proteins Proteoses Peptones
	Bile	None	None
	Intestinal Juice	Erepsin (acts only on proteoses and peptones)	Amino Acids

Digestion of Fat

Fat is not acted upon by the secretions of the mouth nor to any great extent by those of the stomach. The gastric juice contains an enzyme called *gastric lipase,* which has the power of acting on emulsified fats, such as in cream or yolk of eggs. It plays a more important part in the digestion of infants than of adults.

The presence of fat in the stomach retards the secretion of gastric juice. Hence a certain excess of fat in the stomach is sufficient to close the pylorus for a longer or shorter time, due to the failure of the appearance of free hydrochloric acid. This doubtless accounts for the fact that fat in the diet often seems to retard and otherwise disturb digestion.

Digestion of fat takes place mainly in the small intestines. The pancreatic juice contains an enzyme called *steapsin* or *pancreatic lipase,* which has the power of emulsifying fats and also of splitting them into fatty acids and glycerine.

The bile contains no such enzymes, but it is nevertheless an important factor in the digestion of fat. It has the power of increasing greatly the activity of the pancreatic lipase (steapsin) and of holding in solution the fatty acids formed by its action, so that they are more perfectly absorbed. When bile is lacking, much of the fat fails of absorption and is excreted through the intestines. Emulsification is an important aid in the splitting of fat into fatty acids and glycerine, the forms in which fat is chiefly absorbed.

Digestion of Carbohydrates

1. *Digestion of Starch.*—There is little doubt that primitive man accomplished much of the digestion of starch in the mouth. The saliva contains an enzyme, *ptyalin.* By the action of ptyalin starch is changed to dextrins and these are later changed to maltose. The crude, uncooked food required prolonged mastication before it could be swallowed and during this mastication the enzyme had opportunity for action. Raw starch is so very slowly affected by enzymes that much of the food value of uncooked cereals is lost, so

that the practice of baking ground grain into bread developed very early. This fact in regard to starch digestion is often disregarded by advocates of a return to raw foods.

There is said to be some evidence that a pharyngeal reflex once existed which prevented the bolting of foods which are capable of salivary digestion, or which are not easily digestible without mastication. In recent years, Mr. Horace Fletcher has counseled a return to prolonged mastication, in order that salivary digestion may be carried to its fullest extent. It is claimed that the more perfect utilization of all food eaten necessitates the taking of a smaller amount. There is no doubt that thorough mastication renders the digestion of starch easier and more complete but it will not greatly alter the total food requirement.

The starchy food mixed with saliva passes from the mouth to the stomach and lodges in the fundus, the portions last eaten always going to the center of the mass. Thus, while the gastric juice is at work upon the outer layer, attacking the protein of the diet, the inner portions remain alkaline for a considerable time, so that salivary digestion may continue undisturbed.

From time to time the soluble products of salivary and gastric digestion pass into the small intestine. Here the conversion of starch and intermediate products into simple sugars is completed. The pancreatic juice contains an enzyme called *amylopsin,* which acts like ptyalin, i.e., changes starch to dextrins and finally to maltose.

The intestinal juice contains an enzyme called *maltase* capable of changing maltose to dextrose, the final product in starch digestion.

Summary.—The chemical changes in starch during the process of digestion are shown in the following table:

PART OF ALIMENTARY TRACT	NAME OF SECRETION	ENZYMES ACTING ON STARCH	PRODUCTS OF ENZYME ACTION
Mouth	Saliva	Ptyalin	Dextrins, Maltose
Stomach	Gastric Juice	None	
Small Intestines	Pancreatic Juice	Amylopsin	Dextrins, Maltose
	Intestinal Juice	Maltase	Dextrose

2. *Digestion of Sugars.*—Although sugars are perfectly soluble and easily absorbed, they must all be converted into monosaccharides or simple sugars (chiefly dextrose) before they can be utilized by the body. Hence we find a number of enzymes in the alimentary tract acting upon disaccharides. The intestinal juice contains three such enzymes; *sucrase,* acting on sucrose (cane sugar), *lactase,* acting on lactose, and *maltase,* acting on maltose.

Summary.—The chemical changes in sugar during the process of digestion are shown in the following table:

PART OF ALIMENTARY TRACT	NAME OF SECRETION	ENZYMES ACTING ON SUGARS	PRODUCTS OF ENZYME ACTION
Small Intestines	Intestinal Juice	Lactase	Dextrose, Galactose
		Maltase	Dextrose
		Sucrase	Dextrose, Levulose

Mineral Matter and *Water* require no changes to prepare them for absorption.

Resume of Digestion

The processes of digestion are both *mechanical* and *chemical.* By mechanical processes the foods are first softened and finely divided, so as to be non-irritating to the walls of the alimentary tract and to expose as much surface as possible to the action of the digestive enzymes; secondly, they are moved along the alimentary tract from time to time, to facilitate digestion and absorption and to expel indigestible residues. The movements of the mouth in mastication, of the œsophagus in swallowing and of the intermediate and pyloric regions of the stomach in mixing the food with the gastric juice, the rhythmic and peristaltic movements of the small intestines, by which the food is alternately churned in a stationary position and then pushed along to a new region to repeat the process, and finally the anti-peristaltic movements of the first part of the large intestines and the slow peristalsis throughout its entire length, form a series of events of tremendous importance to the welfare of the organism.

By chemical processes, complex food-stuffs are converted into simpler substances out of which the body can build the compounds essential to its persistence and activity. The digestive fluids and the enzymes contained therein, with the results of their activity, are most readily indicated by the following table;

PART OF ALIMENTARY TRACT	NAME OF SECRETION	REACTION TO LITMUS	ENZYMES PRESENT	FOODSTUFFS ACTED UPON	PRODUCTS OF ENZYME ACTION
Mouth	Saliva	Alkaline	Ptyalin	Starch	Dextrins, Maltrose
Stomach	Gastric Juice	Acid (0.2%–0.4% HCL.)	Pepsin	Proteins	Acid Proteins, Proteoses, Peptones
			Rennin	Protein (especially casein of milk)	Coagulated Protein
			Lipase	Emulsified Fats	Fatty acids and glycerine
Small Intestines	Pancreatic Juice	Alkaline	Trypsin	Proteins	Alkali Proteins, Proteoses, Peptones and Amino Acids
			Steapsin Lipase	Fats	Emulsified Fat, Fatty acids and glycerine
			Amylopsin	Starch	Soluble Starch, Dextrins, Maltose
	Intestinal Juice	Alkaline	Erepsin	Proteins in the form of Proteoses and Peptones	Amino Acids
			Sucrase	Sucrose	Dextrose and Levulose
			Maltase	Maltose	Dextrose
			Lactase	Lactose	Dextrose and Galactose

The bile contains no important enzymes, but greatly facilitates the digestion of fats. The intestinal juice contains an enzyme which makes trypsin an active enzyme, and a substance which helps to stimulate the flow of pancreatic juice.

Inspection of the table on page 31 shows that there are five so-called digestive juices, viz.: saliva, gastric juice, pancreatic juice, bile and intestinal juice. All are produced intermittently except the bile, which is secreted continuously into the gall-bladder and discharged at intervals into the intestine. All are alkaline except the gastric juice. All contain powerful enzymes except the bile. Enzymes which digest protein occur in the gastric juice (pepsin), the pancreatic juice (trypsin) and the intestinal juice (erepsin). Ferments which transform starch to sugar occur especially in the saliva and pancreatic juices and are commonly known as diastatic enzymes. Ptyalin is an old name for salivary diastase, amylopsin for pancreatic diastase.

The principal fat-splitting enzyme occurs in the pancreatic juice and is known as pancreatic lipase or steapsin. Numerous enzymes of minor importance occur in the gastric, pancreatic and intestinal juices. Bile in itself is able to emulsify fat as a step toward digestion.

Factors Determining Rate of Digestion

We know of the existence of many factors which influence salivary and gastric digestion but much less about intestinal digestion. Among these are the nature of the food, cookery, appetite, mastication, palatability, mental state, amount of fluid in the meal, the pyloric reflexes, etc. The nature of the individual plays a powerful role; some individuals can subsist almost wholly upon one or a few articles, while others quickly revolt against monotony of diet. Idiosyncrasy is another important factor; for example, some individuals cannot eat mutton, however disguised, while in others sugar is so strong a stimulant to peristalsis that it sets up a violent diarrhœa. The above being true of presumably healthy people, the factors which may influence digestion in the sick, invalid and convalescent must be still more uncertain. Hence tables which purport to give the relative digestibility of foods must be studied with allowances. We can study this problem in test tubes or by examining the washings from the stomach after definite meals or in fistula patients but the results can hardly be applied forthwith to all persons.

The direct stimuli to the secretion of saliva are the sight, odor or taste of food, or the mechanical irritation produced by contact of food-stuffs with the mouth. Indirectly, the thought of food may be a psychic stimulus to the flow of saliva. Excitement may so check the flow of saliva that it is impossible to swallow dry food.

The stimuli to the secretion of gastric juice are both psychic and chemical. Pawlov has demonstrated, in the case of dogs, that the sight of food or the chewing of food in the mouth may produce a very effective flow of gastric juice, to which he attributes great importance in digestion. How important this preliminary flow before food enters the stomach may be in the case of man has not been very clearly demonstrated but it seems reasonable that the desire for eating, the act of eating and the pleasure obtained therefrom exercise a favorable influence upon gastric secretion. It has recently been shown that the products of salivary digestion act as a stimulus to the flow of gastric juice and that once the process of gastric digestion is initiated, the products of peptic activity cause the continuance of the secretion as long as the food remains in the stomach. The mere mechanical irritation caused by the presence of food in the stomach is ineffective. Thus white of egg will cause no flow. But certain substances, such as meat extracts, bitters and condiments, promote secretion. Hawk has demonstrated that the drinking of water is a direct stimulus to gastric secretion. The use of meat broths, gelatin jellies, peptones (i.e., products of gastric digestion) and toast (containing dextrins or products of salivary digestion) and the taking of a glass of water at the beginning of a meal, or to promote feeble gastric digestion in an invalid, is therefore a rational practice.

Absorption

While absorption through a permeable animal membrane outside the body may be a simple physical process, following the ordinary laws of pressure, diffusion, osmosis, etc., the case is far otherwise in the alimentary tract, where the selective activity of the living cell becomes a positive factor. The pressure in secreting glands rises above blood pressure and substances pass inward to the body through the mucous membrane without a corresponding movement in the opposite direction. Thus blood serum placed in a loop of intestine is promptly absorbed, but if the loop be surrounded with serum it does not pass in a similar manner into the lumen of the section of intestine.

The stomach is not primarily an absorbing organ but a few substances, such as sugars and peptones, pass to a limited extent through its walls. The most important seat of absorption is the small intestine and second, the large intestine. Absorption in the small intestine is affected through the innumerable little projections known as "villi", which line the intestine, and which greatly extend the amount of surface. These villi contain a capillary network and a so-called lacteal space. The capillaries by converging into larger vessels eventually form the portal vein which passes through the liver. The lacteal spaces are prolonged into lymphatic vessels which similarly converge to form the thoracic duct. The lacteals are intended almost wholly for the absorption of the fats, all other digestive products passing through the liver before reaching the general circulation.

Absorption continues throughout the length of the large intestine, being especially favored by antiperistalsis in the upper portions. Constipation sometimes results from the great absorptive power of this region, the feces being left dry and hard and hence difficult to evacuate.

Absorption of Proteins.—It was long a matter of doubt as to the form in which proteins were absorbed but there was a strong inclination to believe that they were transformed before being transported by the blood, because it was almost impossible to detect amino acids in the blood or tissues. We now know that this was due to the imperfection of our chemical methods. It has recently been demonstrated by several independent investigators that amino acids are absorbed from the intestines, circulate in the blood and pass to the tissues, and that the cells of the body are able to take them up and use them according to their needs. Animals have been made to store protein when the only nitrogen supplied to the blood was in the form of amino acids.

Traces of protein, proteoses or peptones may be absorbed from the stomach or intestines but ordinarily the amount is negligible. Such products when present in the blood tend to pass quickly into the urine. The peculiar idiosyncrasy of poisoning from such foods as eggs, milk, fish, etc., is thought to be due to the influence of traces of absorbed proteins to which the subject shows an anaphylactic reaction.

Absorption of Fats.—It is now commonly believed that fats are absorbed in the form of the end products of its digestion, i.e., fatty acids and glycerine, and that somewhere in the intestinal wall these are recombined into neutral fats. It is possible that some of the finely emulsified fats are able to pass unchanged through the intestinal wall. In either case, minute fat droplets pass into the lacteals and finally into the blood stream by way of the thoracic duct. A small portion finds its way directly into the blood.

Fats having a low melting point are absorbed more quickly than solid fats and pure fat more readily than fat intermingled with other food principles, as in fat meat.

Absorption of Carbohydrates.—The end products of carbohydrate digestion pass to the blood by way of the portal system. The monosaccharides on reaching the liver enter the general circulation as dextrose if required for immediate use; otherwise they are stored in the liver in the form of glycogen, which can be again transformed into sugar when demanded by the system to furnish energy. Sugars are so readily absorbed that if taken in large quantities the body may be unable to utilize them and the excess is excreted in the urine. This is especially true in case of an excess of cane sugar or milk sugar. They may be absorbed before digestion and there are no enzymes in the blood capable of converting them into dextrose so that they can be burned or stored. Under such circumstances they are useless and must be gotten rid of. If maltose is absorbed too rapidly, it may still be changed to dextrose by enzymes in the blood or tissues and so be utilized.

Absorption of Mineral Matter.—As salts are not digested in the ordinary sense of the word they require nothing more than solution in the digestive fluids before absorption. The mineral matter is set free from food and diffuses more or less rapidly into the surrounding fluids. Common salt is most quickly absorbed. The chief locality for absorption is the small intestine. The older text books taught that salts were absorbed only by diffusion through the intestinal wall, which required that another solution must at the same time pass from the blood to the intestines until both fluids were of the same degree of concentration. It appears however that in the main, mineral matter is taken up in the intestinal wall without diffusion and as fast as it can be incorporated with certain peculiar solvents is absorbed into the blood.

Absorption of Water.—Water is not absorbed by the stomach but passes quickly in little spurts (if taken alone) into the intestines. Here it is very rapidly absorbed; it may be excreted through the kidneys within twenty minutes after ingestion. The rapidity of absorption may be considerably influenced by mineral matter dissolved in the water.

Summary.—Absorption is an active, not a passive process. It takes place mainly in the intestines, the larger part before the food reaches the ileo-cecal valve.

Proteins are absorbed by the villi, chiefly in the form of amino acids and pass through the portal vein to the liver.

Fats are absorbed by the lacteals, chiefly in the form of fatty acids and glycerine, but pass to the lymphatics as neutral fat and enter the blood stream from the thoracic duct.

Carbohydrates are absorbed by the villi in the form of sugar (chiefly dextrose) and pass through the portal vein to the liver.

Unabsorbed material passes out as part of the feces (see Excretion, page 45. Undigested proteins, fats and carbohydrates are liable to attack by putrefactive and fermentative organisms in the intestines. The products of such bacterial action are absorbed to a considerable extent. Carbohydrates which escape digestion tend to produce lactic and other acids. This fermentation is not altogether an evil, for it checks the putrefaction of undigested meat. The latter is undesirable, as the products are likely to prove toxic. It is for this reason that lactic acid, especially in the form of buttermilk and artificially fermented sour milk, is largely employed as a remedial agent in intestinal indigestion.

Metabolism

Metabolism is the sum of the chemical changes taking place in the cells of the body in connection with all biological processes, including growth, repair and waste, generation and maintenance of heat, all manifestations of functional activity, storage of surplus nutriment, etc. It comprises two phases, anabolism and katabolism.

Anabolism embraces the changes involved in the upbuilding of the cells and corresponds in a general way to nutrition. *Assimilation* is the selective act of the cells in appropriating the special form of nutriment in the circulating blood which is suited for their needs. The special phases of anabolism comprise the assimilation of nitrogen for growth and repair of protoplasm, the storage of a certain amount of fat and carbohydrate, the assimilation of oxygen for maintenance of heat and functional activity and the retention of inorganic salts in the bones and other tissues.

Katabolism comprises the changes involved in the continuous molecular waste of the cells, in the constant oxidation going on in the tissues resulting in the maintenance of animal heat, in the exercise of muscular, nervous and secretory activity and perhaps in the breaking up of protein into oxidizable carbohydrates and nitrogenous waste products. We speak less of the acts of katabolism than of the products of katabolism, which are a measure of those acts. The chief of these products are: (1) urea, the chief form of excretion of nitrogen, and (2) carbon dioxide and water, which represent the products of energy yielding oxidations.

Elimination is the escape or expulsion of the products of katabolism from the tissues into the blood, and corresponds to disassimilation or denutrition. Excretion is the final expulsion of the end products of katabolism from the excretory organs and includes the expulsion of unabsorbed aliment by the bowel.

In the case of certain products of metabolism, it is hardly possible to state positively whether they represent anabolism or katabolism. Here belong especially the substances formed in connection with secretion, as the digestive enzymes, the hydrochloric acid of the gastric juice, the iodothyrin of the thyroid gland and the adrenalin of the suprarenal gland. In all likelihood both factors participate, for certain substances must be assimilated from the food to form these bodies which in turn are set free in the blood. It is also true that some of these substances act by their mere presence, without apparent waste (catalytic action).

Metabolism of Proteins.—When fats and carbohydrates enter normally into the diet a relatively small proportion of proteins are consumed by oxidation in the formation of energy. If the diet lacks sufficient fats and carbohydrates to meet the demand of the body for energy, excess proteins are burned to supply this demand. Certain savages subsist wholly on meat and remain in good health, and in the so-called Salisbury treatment of obesity, etc., it can be demonstrated at will that a patient may subsist for weeks on raw beef without apparent detriment, provided plenty of water is drunk, the excess of water aiding in the elimination of unutilized nitrogen.

When absorbed proteins reach the liver, a large part of the nitrogen is split off and excreted as urea. The remaining portion goes to make good the small daily waste of body proteins. The portion of the protein molecules left after the nitrogen is split off is available as fuel. When carbohydrates and fats are liberally supplied, so that proteins are not required for fuel, the daily amount needed is comparatively small. Even when the body is losing nitrogen rapidly, as in certain fevers, it has been found that this is partly because the body proteins are being used as fuel, and the loss can be largely prevented by furnishing more energy in the form of carbohydrates or fats. Much confusion has arisen because the excess of nitrogen in the diet is to some extent identical in form with the waste products of cellular activity. Besides urea, some of the chief nitrogenous products of protein metabolism are ammonium salts, uric acid, creatin and creatinin.

The non-nitrogenous portion of conjugated proteins may be burned or possibly stored but the nitrogen excess must be eliminated. Because of the fact that excess of nitrogen throws work on the kidneys, it is assumed that an excessive protein diet is injurious to the integrity of these organs. This is evident in diseased kidneys but cannot be proved for healthy organs. However, it seems unnecessary to consume a great excess of protein and perhaps unwise, owing to the great frequency of fatal kidney diseases. At any rate, except where protein is specially advantageous for ease of digestion, it is unnecessary to make it a large part of the diet.

Metabolism of Fats.—Fats, which are passed into the blood from the thoracic duct, are carried over the body and deposited in many organs and tissues, unless needed for immediate uses as a source of energy, in which case they are oxidized to carbon dioxide and water. It has been shown that diet-fat may be deposited in the body in the same form as eaten, but the readiest means of forming body fat is usually to give an excess of carbohydrate. The ease with which carbohydrates form fat is shown in the case of cows, which produce large quantities of butter fat on an herbivorous diet. It is also possible to form fat from protein, but it is difficult, as a considerable part of the energy of the protein molecule goes to get rid of the nitrogen and protein increases the rate of metabolism. We know very little of the details of fat metabolism. Some investigators hold that it must be converted into dextrose before it can be oxidized. As already stated, an excess of carbohydrate may be stored in the form of fat.

Metabolism of Carbohydrates.—The blood maintains a constant sugar content of about 0.08—0.11 per cent.[1] As fast as this sugar is oxidized, it is replaced by more from the store of glycogen in the liver and muscles, or from newly formed sugar of recently digested food. The final products of carbohydrate oxidation are carbon dioxide and water, but several intermediate products (as lactic acid) are first formed, probably by the action of enzymes.

When the body is unable to store any more carbohydrate as glycogen, all further storage of excess is in the form of fat.

When sugar is lacking in the blood, as in starvation or failure to utilize carbohydrates, the sugar content is maintained at the expense of protein. This explains why the diabetic who is eating no carbohydrate, may still excrete sugar in the urine. There is some experimental evidence that sugar may be formed also from fat. At any rate, fat is oxidized in absence of carbohydrate and whether it is first changed to sugar or oxidized directly, it is a compact means of strong energy, since one gram of fat will yield 2¼ times as much as an equal amount of protein or carbohydrate.

Excretion

The waste products of metabolism and all unutilized food, along with the products of oxidation, are eliminated from the system in several ways. Water escapes through the lungs, skin and kidneys. Aside from the obvious fluid perspiration, a steady evaporation takes place from the skin (insensible perspiration). The carbon dioxide produced by oxidation escapes by the lungs and nitrogenous products of protein metabolism by the urine. The feces in health are made up of the secretions and excretions of the alimentary tract, bacteria, indigestible food waste, and a little undigested food material. When there is excessive putrefaction of the fecal matter, some of the soluble material is absorbed and elimi-

[1] Hawk's "Physiological Chemistry," page 274.

nated in the urine. Generally speaking, putrefaction (of nitrogenous food) and fermentation (of carbohydrates) hold each other in check. Starving people pass feces, thus showing that the bowel is a true excretory organ.

QUESTIONS FOR STUDY

1. What does the term "nutrition" include?
2. Name and describe the two processes concerned in digestion.
3. Describe digestion in the mouth. What enzymes are present? On what substances do they act? What products are formed?
4. What digestive fluid is secreted by the stomach? What enzymes does it contain? What changes in food do they cause?
5. What are the functions of the hydrochloric acid of the gastric juice?
6. What means have we of stimulating the flow of gastric juice? Of saliva?
7. What factors control the opening of the pyloric sphincter?
8. What digestive fluids are present in the small intestine? What enzymes does each contain? On what substances do they act? What products are formed?
9. Describe the part which bile plays in digestion.
10. Outline the digestion of protein, fat and carbohydrate from the time each enters the mouth until it is absorbed.
11. In what part of the digestive tract does absorption take place?
12. Describe the absorption of proteins, fats, carbohydrates, mineral matter and water.
13. Define the following terms: metabolism, anabolism, katabolism, assimilation, elimination, excretion.
14. Discuss the metabolism of protein. What becomes of the nitrogen? What becomes of the non-nitrogenous part of the protein molecule? What are the end products of protein oxidation?
15. Describe the fate of fat in metabolism. What products are formed when it is oxidized?
16. What becomes of carbohydrate after absorption? What are the end products of its oxidation?
17. In what ways does the body rid itself of its waste products?

CHAPTER III

FOOD VALUES

NITROGEN BALANCE—ENERGY VALUE OF FOOD

We are now in position to understand something of food values, which depend on the food actually utilized in the body, to the exclusion of food unabsorbed or eliminated because in excess of the demands of the system. Energy-yielding material which is not used at the time may be stored, but beyond a certain point stored nutriment must be regarded as undesirable, as in obese subjects.

As stated by Atwater, the food supplies body wants in five ways: (1) tissue-building, (2) tissue-repairing, (3) storage for future use, (4) oxidation to maintain animal heat and (5) oxidation to supply energy; or we may say that according to function, foods are classified as tissue-formers or body-builders, energy (or work and heat) producers, instigators and regulators of body processes. (See page 4.)

Nitrogen Balance or Nitrogen Equilibrium

In body building and repairing, the nitrogen of protein food is indispensable. In the other functions, nitrogen is not utilized. Carbohydrates and fats are the natural and convenient sources of energy, although the conjugated proteins contain in themselves non-nitrogenous material capable of oxidation. As already stated, however, to depend largely upon proteins for oxidizable food means the ingestion of an enormous quantity of unnecessary nitrogen, the getting rid of which involves waste of energy and is thought to necessitate a strain upon the excretory system. Furthermore, when the diet consists chiefly of proteins, much of the latter may not be digested and absorbed as such, but may remain in the intestine, there to undergo putrefactive changes. In the course of putrefaction certain soluble poisonous substances form and are absorbed, requiring elimination by the kidneys. The excess of nitrogen which cannot be utilized in tissue repair must also be eliminated by the kidneys. Thus while people may thrive on a diet rich in proteins, there is considerable evidence that vitality, endurance and resistance to disease are better attained with a diet in which the fuel foods (carbohydrates and fats) predominate.

Nitrogen cannot be stored to any extent and is constantly eliminated in the urine as urea and other nitrogenous substances. When the diet-nitrogen corresponds in amount with the eliminated nitrogen, the metabolism of nitrogen is balanced, or in a state of equilibrium. If too small a quantity of nitrogenous food is taken it does not compensate for the waste of body nitrogen which is inseparable from life. The same thing occurs when for any reason the food nitrogen is not absorbed, or is eliminated without being utilized. This condition of nitrogen starvation is characteristic of underfeeding, wasting diseases, defective assimilation, etc. Conversely equilibrium between food nitrogen and excreted nitrogen represents good nutrition, health and energy, for while nitrogen cannot be permanently stored it is possible for a balance to be maintained over long periods. It was once taught that increased elimination of nitrogen was due chiefly to the waste of tissue incidental to prolonged and severe muscular or nervous effort; at a later period, however, it became apparent that this waste was comparatively little and constant for the individual regardless of the amount of muscular exercise, so that the urea nitrogen depends chiefly on the amount of diet nitrogen. The loss of nitrogen, however, in wasting disease, starvation, etc., is extensive, so that in convalescence the body is able to store some nitrogen.

Nitrogen retention is greatly facilitated in all cases by a liberal supply of carbohydrates and fats.

Nitrogen metabolism can hardly be studied in the ordinary patient, on account of the number and variety of tests which must be accurately made, so that our only guide is the results of scientific investigation of the amounts of nitrogen required under given conditions, and the general well-being of the subject. If weight is maintained along with a healthy state of functions, the ration in question is suitable for the subject tested. If the individual be in the growing period, the ration should be such that the growth rate is normal. If he be convalescent, the recovery of the original weight should be constantly progressive. Of late years, however, the emphasis on nitrogen values alone has been largely superseded by greater attention to total fuel values as being of greater practical worth. It is known that a relatively small and easily obtained quantity of nitrogen is sufficient to repair waste in the average individual, but the food required for producing energy is very significant in amount. With a liberal supply of carbohydrates and fats, the ordinary daily waste of nitrogen in one adult may be reduced as low as 3 to 4 grams daily (corresponding to 20 to 25 grams of protein).

To insure a full supply of nitrogen and to maintain nitrogen equilibrium at a higher level than the bare maintenance requirement, considerably more than this amount is commonly taken. From 75 to 100 grams of protein per day is regarded as a liberal supply for an average man (weighing 70 kilograms or 154 lbs.) on an ordinary mixed diet of suitable energy value.

The Energy Value of Food

In Liebig's time it was recognized that animal heat was generated by carbohydrates and fats, but the physiologists of that day did not realize that these were the nutrients which furnished the body with energy for its activity. They thought that all muscular work was done at the expense of nitrogenous material. It has taken many years for us to realize fully that animal energy in all its forms is derived primarily from carbohydrate material, secondly from fats, and thirdly from proteins only in so far as they yield combustible, non-nitrogenous bodies.

Energy may be defined as the power to do work. This force manifests itself in different ways. It may be latent, or inactive; or it may be active in various forms, such as heat, chemical or electrical energy, or mechanical movement, which we call work. It may be changed from one of these forms into another without loss. The most convenient way to measure energy is by transforming it into heat. A unit has been devised to express different amounts of heat, corresponding to a definite number of work units. This is called the calorie. The large Calorie (spelled with a capital *C*) represents the amount of heat required to raise the temperature of one kilogram of water one degree Centigrade. This is the unit commonly used in determining the energy value of food. The small calorie (spelled with a small *c*) is $\frac{1}{1000}$ of a large Calorie.

Energy cannot be created. We must put into any machine as much force as we expect to get from it. Even in the most efficient machine we cannot recover all of the energy in the form of useful work; some of it is always transformed into heat, owing to friction. This is true even in the body, which is a most efficient machine, but here much of the waste energy in the form of heat is turned to good account in maintaining the body temperature.

The source of energy for the body is food, just as much as the source of energy for the engine is coal. Plants store up the sun's energy, it is transferred to animals which eat the plants, and eventually man gets it by eating the plant and animal foods. The amount of energy in any given food material is measured by the amount of heat which it will produce. In general, this is the same whether the food be burned outside or inside the body, the total result in any case depending upon the amount of the food-stuff which is utilized by the body.

An instrument devised for the measurement of heat is called a calorimeter. To determine the fuel value of any food material *outside* of the body a given amount is placed in a calorimeter, where it is burned in an atmosphere of pure oxygen in a vessel surrounded by water. The heat generated raises the temperature of the water and the change is observed with a very delicate thermometer. From this the total heat evolved is calculated. To determine the fuel value of this material *within* the body, the average amount which is lost in digestion and that which is not completely oxidized before excretion, are deducted from the fuel value outside the body. The result is the *physiological* fuel value. Many years ago, Rubner determined averages for proteins, fats, and carbohydrates from experiments on dogs. In recent times, further experiments made in this country on human subjects by Prof. Atwater and his associates have modified these factors somewhat. The following are therefore accepted today as the average energy values of food when utilized in the body:

1 gram of Protein	yields 4 Calories
1 gram of Fat	yields 9 Calories
1 gram of Carbohydrate	yields 4 Calories

Determination of Energy Value of Food

To determine the energy value of a given amount of any food, it is necessary,

First.—To know its composition, i.e., the percentages of protein, fat, and carbohydrate present. Tables are available giving the results of many analyses, as in Bulletin 28, Office of Experiment Station, United States Dept. of Agriculture, Washington, D. C., "The Chemical Composition of American Food Materials."

Second.—From these percentages to determine in *grams,* the weight of protein, fat and carbohydrate, which can be obtained from a given amount of the food material.

Third.—To multiply these weights by the energy value of one gram of each of the three food principles.

By way of illustration let us find the fuel value of one loaf of bread, weighing 12 ounces.

(1) By referring to Bulletin 28, we find that white bread (miscellaneous) yields on the average,

9.3 % protein.
1.2 % fat.
52.7 % carbohydrate.

(2) To get the weight of protein, fat and carbohydrate in grams, we must first convert the total weight of bread into grams:

	1 oz.	=	28.35 grams.
	12 oz.	=	340.2 grams.
Then	340.2 × 0.093	=	31.64 grams of protein.
	340.2 × 0.012	=	4.08 grams of fat.
	340.2 × 0.527	=	179.28 grams of carbohydrate.

(3) Multiplying the amount of each nutrient by the proper factor:

31.64	grams protein	× 4 =	126.56 Calories
4.08	grams fat	× 9 =	36.72 Calories
179.28	grams carbohydrate	× 4 =	717.12 Calories
	Total		880.40 Calories

Hence the total energy value of 1 loaf of bread weighing 12 ounces is 880.4 calories.

To calculate the total energy value of any *combination of foods,* it is necessary to compute the fuel value of each ingredient and take the sum of the whole group.

Thus for Egg Broth, page 308, it is necessary first to get the weight in grams of each of the following ingredients and then to estimate their energy value as indicated above.

Yolk of 1 egg	=	17 grams.
1 tablespoon sugar	=	13.12 grams.
1 cup milk	=	244 grams.
1 tablespoon brandy	=	14.17 grams.

In this book the food values of all the materials used have been incorporated in a table, page 58 to 76, so that by reference to this the value of any combination is readily ascertainable.

Yolk of 1 egg	=	60 Calories
1 tablespoon sugar	=	52 Calories
1 cup milk	=	169 Calories
1 tablespoon brandy[1]	=	42 Calories
Total energy value		323 Calories

To estimate the fuel value of any *diet,* it is simply necessary to compute the food value of each food material used and add the results together.

To calculate the energy value of an infant's diet it is necessary to know the amounts of proteins, fats and carbohydrates present. For example, given a formula with the following percentage composition:

Proteins	0.7%
Fats	2.7%
Carbohydrates	6.0%

Feedings per day 9. Amount at each feed 1½ ounces.

The total quantity for the 24 hours will be 1½ × 9 = 13½ ounces.

1 ounce	=	28.35 grams.
13.5 ounces	=	382.7 grams
Then 382.7 × 0.007	=	2.67 grams protein
382.7 × 0.027	=	10.33 grams of fat
382.7 × 0.06	=	22.96 grams of carbohydrate
Then 2.67 × 4	=	10.68 Calories
10.33 × 9	=	92.97 Calories
22.96 × 4	=	111.84 Calories

10.68 + 92.97 + 111.84 = 215.49 Calories = total fuel value for the 24 hours.

Work goes on continually in the living body, whether asleep or awake, idle or active, sick or well. In the resting body it consists of such internal work as that of digestion and absorption, circulation, respiration, muscular tension, and intracellular work. In youth these functions are more active than in adult life; in old age they are somewhat less active. For a man of average weight (154 pounds or 70 kilograms) from 1600 to 2000 calories daily are required

[1] The energy value of alcohol is 7 calories per gram. It is necessary, therefore, to know the per cent. of alcohol in any liquor.

to supply energy for these internal activities. Children require somewhat more in proportion to their body weight, aged persons somewhat less.

Beyond this, the factor of most significance in determining the total food requirement for any individual is the amount of muscular activity. A man requiring 100 calories per hour at rest may by hard work raise his energy requirement as high as 500 or 600 calories per hour. For this reason a person engaged in a sedentary occupation needs less food than one whose work is hard physical labor, as a farmer or a lumberman. Children are usually more active than adults and hence in proportion to their weight require more food, while inactive aged persons require very little. Averages obtained from many observations on the amount of food consumed by individuals under different conditions, show that the energy requirement of a sedentary man of 70 kilograms body weight is approximately 2500 calories, while that of a moderately active man of the same weight is about 3000 calories.

The most convenient means of calculating the energy requirement of an individual is afforded by the following table, determined for the adult man of average weight:

Average Normal Output of Heat From the Body

CONDITION OF MUSCULAR ACTIVITY	AVERAGE CALORIES PER HOUR
Man at rest, sleeping	65 Calories
Man awake, lying still	70-85 Calories
Man awake, sitting up	100 Calories
Man standing at rest	115 Calories
Man at light muscular exercise	170 Calories
Man at moderately active muscular exercise	290 Calories
Man at severe muscular exercise	450 Calories
Man at very severe muscular exercise	600 Calories

To illustrate the use of this table, let us calculate the energy requirement of a woman weighing 120 lbs. under the following conditions:

Sleeps 9 hours....................	$9 \times 65 = 585$ Calories
Works at desk 8 hours.............	$8 \times 100 = 800$ Calories
Walks or does light exercise 3 hrs..	$3 \times 170 = 510$ Calories
Reads or sits quietly sewing 4 hrs...	$4 \times 100 = 400$ Calories
	2295 Calories

Since these factors are for a man weighing 154 lbs., for a woman of 120 lbs. under above conditions, reduce this proportionately to her weight.

154 : 120 : : 2295 : X

X = 1788 Calories—total energy requirement for a woman of 120 lbs., under the above conditions.

In making estimates for any individual, age, weight, size and shape, season and climate, etc., must be considered as well as muscular activity.

As has been said, the energy requirements of children are high, due in part to the factor of growth and in part because they are more active than the average adult.

Energy Requirements of Children per Unit of Body Weight[1]

	Calories per kilogram	Calories per lb.
Under 1 year...............	100	45
1- 2 years..............	100-90	45-40
2- 5 years..............	90-80	40-36
6- 9 years..............	80-70	36-32
10-13 years..............	75-60	34-27
14-17 years..............	65-50	30-22
18-25 years..............	55-40	25-18

Total Energy Requirements of Children (Assuming Average Size at the Different Ages)[2]

Children of 1- 2 years, inclusive......	1000-1200 Calories per day
Children of 2- 5 years, inclusive......	1200-1500 Calories per day
Children of 6- 9 years, inclusive......	1400-2000 Calories per day
Girls of 10-13 years, inclusive......	1800-2400 Calories per day
Boys of 10-13 years, inclusive......	2300-3000 Calories per day
Girls of 14-17 years, inclusive......	2200-2600 Calories per day
Boys of 14-17 years, inclusive......	2800-4000 Calories per day

[1] Quoted from Sherman's "Chemistry of Food and Nutrition," 2nd Edition, page 196.

[2] Ibid. p. 197.

A tall, thin person requires more food than a short, fat person of equal weight. Also, the person of nervous temperament, in whom muscular tension is high, may require more food than one of phlegmatic temperament. More energy is lost in the form of heat in cold weather than in warm. Because of the numerous factors involved in any case, it is possible to calculate the absolute energy requirement only by rigid scientific experiment. The tables given above, however, are a useful guide to the approximate amount of food required by different individuals.

The protein requirement is conveniently estimated by providing 10-15 per cent. of the day's energy in the form of protein. Thus for a man whose energy requirement is 3000 calories per day, 360 calories from protein (12 per cent.) would correspond to 90 grams of protein, which would be a fairly liberal allowance.

As an aid to easy estimation of the food value of any diet, the following tables have been introduced, showing the nutritive value of the food materials used in the recipes in this book, calculated for the quantities commonly required in cooking for individuals.

The values for larger amounts will be easily obtained by simple multiplication.

QUESTIONS FOR STUDY

1. What are the functions of protein nitrogen?
2. What are the disadvantages of a high protein diet?
3. What is meant by nitrogen equilibrium? Nitrogen starvation?
4. How would you tell whether the diet of an individual contained enough protein?
5. Define energy. In what forms may it be manifested?
6. How is the energy in foods measured? What methods are used in determining the energy value of food, (a) outside the body, (b) within the body?
7. Give the definition of a calorie.
8. What are the physiological fuel values of protein, fat and carbohydrate?
9. Calculate the energy value of one quart of milk, weighing 975 grams. (The composition of whole milk is as follows: 3.3% protein, 4.0% fat, 5.0% carbohydrate.) Compare your answer with the table on page 69.

QUESTIONS FOR STUDY

10. What factors influence the total energy requirement of any individual? Which of these factors is most significant?
11. What is the energy requirement of a man weighing 70 kilograms, engaged in moderately active muscular work? Light work? Hard work?
12. What is the energy requirement of a woman doing light muscular work? Moderate work?
13. What is the energy requirement of an infant? Of a child of three years? Of an aged person?
14. Calculate your own energy requirement, using the table giving the number of calories required per hour for various degrees of activity.
15. Estimate your protein requirement.

TABLE SHOWING THE NUTRITIVE VALUE OF THE FOOD MATERIALS USED IN THE RECIPES IN THIS BOOK, CALCULATED FOR THE QUANTITIES COMMONLY REQUIRED IN COOKING SMALL PORTIONS[1]

FOOD MATERIAL (Uncooked, unless otherwise stated)	MEASURE [1]	WEIGHT [2]		PROTEIN	FAT	CARBO-HYDRATES	FUEL VALUE
A		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Almonds (15% Car.[3])							
"	10 small	0.35	10	2.1	5.49	1.73	63
" E. P.*	1 cup	4⅔	133	27.9	72.9	23.0	859
" E. P.	1 lb.	16	453.6	95.25	249.03	78.47	2936
Apples (15% Car.[3])							
" Raw	1 medium	5	150	0.5	0.5	16.0	70
" Fresh, E. P. . .	1 lb.	16	453.6	1.81	2.27	64.6	285
" Sauce, Cooked .	2 tbsp.	1	28.35	0.071	0.095	6.85	30
Apricots (15% Car.[3]) . .							
" Dried, Stewed .	¼ cup	2.7	76.5	1.0	0.22	23.5	100
" Dried, Stewed .	1 cup	5	142	6.6	1.4	88.5	391
" Dried, A. P.† . .	1 lb.	16	453.6	21.32	4.54	283.50	1260
" Fresh, E. P. . .	....	6.08	172.4	1.89	.....	23.10	100
" Fresh, A. P. . .	1 lb.	16	453.6	4.99	.....	60.70	263
Arrowroot, Uncooked . .	1 tbsp.	⅛	14.17	.....	.....	13.65	55
Artichokes (15% Car.) .	1 small	7.6	230	.6	.46	38.4	181
Asparagus (5% Car.[4])							
" Fresh . . .	6 stalks	4	113.4	2.04	.24	3.72	25

Food materials in this Table are *uncooked* unless otherwise stated.
* E. P. denotes "Edible Portion."
† A. P. denotes "As Purchased".
[1] The materials are measured in standard 8-ounce measuring cups, or tablespoons. The measures are exactly level unless otherwise stated. Note page 98 for measures, weights, and abbreviations.
[2] The weights assigned to the various measurements in this table have been determined carefully, but are the results of a limited number of experiments, and hence must be regarded as only approximate. The food values are given with sufficient accuracy to be within the limits of error of computations made on average analysis of food-stuffs. A number of the values stated are based upon the tables of Atwater and Bryant, Schall and Heisler, Arnold's Diet Chart, Dr. W. Coleman, Hill and Eckman.
Many of the pound calculations in this table are quoted from Dr. Rose's "Laboratory Manual of Dietetics," published by Macmillan Co., New York.
[3] Carbohydrates—For list of foods arranged approximately to per cent of carbohydrates note page 384. For list of foods in order of their carbohydrate content from the lowest to highest note page 385.
[4] Five-per-cent thrice-cooked (boiled) vegetables are considered carbohydrate free. Five-per-cent vegetables (cooked) "100 grams" are measured "2 heaping tbsp." although in reality the weight varies slightly.

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
A—(*Continued*)		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Asparagus, Fresh . . .	1 bunch	44 (2¾	1247 lbs.)	22.4	2.4	41.0	276
" Canned . .	½ cup	4	113.4	1.72	0.12	3.16	21
" Canned . .	5 stalks	7	200	3.0	0.20	5.6	36
B							
Bacon, Raw	2 slices	1	28.35	2.2	13.7	.....	132
" Cooked	2 slices	3/10	10	2.0	6.0	.....	62
" Raw, E. P. . . .	1 lb.	16	453.6	48.63	412.08	.....	2836
Bananas (20% Car.)							
"	1 medium	3½	100	0.8	0.4	14.0	64
Barley, Pearl	1 tbsp.	½	14.17	1.3	0.2	11.7	54
" Pearl	1 lb.	16	453.6	38.55	4.78	352.90	1610
" Crushed . . .	1 tbsp.	½	14.17	1.1	0.1	11.3	51
" Flour	1 tbsp.	3/5	17.01	1.78	.37	12.38	53
" Flour	1 cup	8	227	19.0	2.5	174.3	796
Bass, E. P.	1 serving	3½	100	18.6	2.8	.....	100
" E. P.	1 lb.	16	453.6	84.3	12.6	.....	452
Beans (20% Car.)							
" Baked, Canned . .	1 cup	8.22	233.4	16.11	5.85	45.75	300
" Navy, Dried, A. P.	1 cup	7	198.5	44.59	3.57	118.23	684
" Navy Dried . .	1 lb.	16	453.6	102.06	8.16	270.34	1564
Beans, Butter (20% Car.) .	1 serving	3	85	7.9	0.51	24.7	135
" Lima (10% Car.) Canned . .	....	4.58	129.7	5.19	0.39	18.94	100
" Lima, Canned . .	1 lb.	16	453.6	18.14	1.36	66.21	350
" Lima, Dried . .	2 tbsp.	1.01	28.6	5.17	0.43	18.85	100
" Lima, Fresh, E. P. .	½ cup	2.88	81.5	5.97	0.57	17.93	100
Beans, String (5% Car.)							
"	1 serving	4	113	2.4	0.3	5.8	44
" String, Fresh, E. P. .	2¼ cups (1 in. pieces)	8.50	241.0	5.54	0.72	17.83	100
Bean, Soy Bean Flour . .	1 tbsp.	¼	4	0.35	0.15	0.08	30
" Soy Bean Flour . .	1 cup	4	64	5.6	2.4	1.28	480

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
B—(*Continued*)		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Beef Broth	1 serving	3½	100	1.8	1.0	.....	16
" "	1 quart	32	907	16.5	9.3	.....	149
Beef, Dried, Salted, and Smoked, E. P.	4 thin slices (4 in. × 5 in.)	1.96	55.5	16.66	3.61	0.22	100
Beef, Dried, Salted, and Smoked, E. P.	1 lb.	16	453.6	136.08	29.48	1.81	817
Beef Juice	1 serving	3½	100	4.9	0.6	.....	25
" Soup	1 cup	6	170	7.4	6.1	1.8	43
Beef Liver, E. P.	1 lb.	16	453.6	92.53	20.41	7.71	584
Beef Marrow	1 tbsp.	½	14.17	0.3	13.1	.....	120
" "	1 lb.	16	453.6	9.9	420.8	.....	3828
Beef Roast, Cooked	1 slice (4½ × 1½ × ⅛ in.)	0.9	25.6	5.7	7.3	.....	89
" " A. P.	1 lb.	16	453.6	107.05	125.64	.....	1559
Beef Steak, Porterhouse	1 serving	3½	100	19.1	18.0	.....	238
" " Porterhouse	1 lb.	16	453.6	86.6	81.2	.....	1077
" " Rump	1 serving	3½	100	21.0	13.7	.....	207
" " Rump	1 lb.	16	453.6	94.8	62.1	.....	938
" " Sirloin	1 serving	3½	100	16.5	16.1	.....	211
" " Sirloin	1 lb.	16	453.6	74.8	73.0	.....	957
" " Top of Round	1 serving	3½	100	19.5	7.3	.....	144
" " Top of Round	1 lb.	16	453.6	88.4	33.1	.....	652
Beef Suet, A. P.	1 in. cube	0.47	13.2	0.62	10.83	.....	100
" " A. P.	1 lb.	16	453.6	21.32	371.04	.....	3425
Beets (10% Car.)							
" Cooked	2 hp. tbsp.	3.5	100	1.3	0.1	7.7	37
" Fresh, E. P	4 beets (2 in. diam.) 1⅓ cup sliced	7.66	217.1	3.47	0.22	21.10	100

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
B—(*Continued*)		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Beets, Fresh, E. P.	1 lb.	16	453.6	2.76	0.45	44.00	209
Beet Greens (5% Car.)							
" " Cooked	2 hp. tbsp.	3.5	100	2.1	0.3	3.2	23
Blackberries (10% Car.)							
"	½ cup	6.10	173.0	2.25	1.73	18.85	100
Blue Fish, E. P.	1 serving	3½	100	19.4.	1.2	.....	88
" "	1 lb.	16	453.6	87.8	5.4	.....	401
Brandy	1 tbsp.	½	14.17	.....	.....	.....	42
Bran	1 cup	2½	71	7.8	1.5	43.4	218
Brazil Nuts (10% Car.)							
" " Shelled	1 nut	¼	.....	1.2	4.7	0.01	47
" " Chopped	1 tbsp.	¾	.....	3.6	14.2	0.1	142
" " Shelled, E. P.	1 lb.	16	453.6	76.9	302.8	31.6	3162
Bread, White	1 slice ¾ in. thick	1	28.35	2.6	0.3	15.0	73
" White	1 slice 1 in. thick or 2 slices ½ in. thick	1⅖	39	3.6	0.46	20.39	100
" White	1 loaf	12	340	31.6	4.1	179.3	881
" Crumbs (White)	1 cup	4⅘	136	12.6	1.6	71.7	352
" Boston Brown	1 small slice	1	28.35	1.5	0.5	13.3	64
" Boston Brown	1 slice ¾ in. thick	1⅘	51.0	2.75	0.92	24.02	115
" Gluten	1 slice	1	28.35	8.4	0.3	8.5	70
" Gluten	1 loaf	13	386.5	114.0	4.0	116.3	957
" Graham	1 slice	1	28.35	2.5	0.51	14.7	74
Butter	1 tbsp.	⅖	13.0	0.13	11.05	.....	100
"	½ lb. (1 cup)	8	227	2.2	193.0	.....	1744
Buttermilk	1 cup	8½	240.9	7.22	1.2	11.56	88

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
B—(*Continued*)		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Butternuts (5% Car.)							
" E. P.	4–5 nuts	0.52	14.8	4.13	9.05	0.52	100
" E. P.	1 lb.	16	453.6	126.55	277.60	15.86	3086
Brussels Sprouts (5% Car.)	¾ cup	2.6	65	.97	.06	1.9	12
C							
Cabbage, (5% Car.) E. P.							
" Shredded	5 cups	11.20	317.5	5.08	0.95	17.78	100
" E. P.	1 lb.	16	453.6	7.25	1.36	25.40	143
Cantaloupe, A. P.	1 melon (4½ in. in diam.)	18	510.2	1.53	.....	23.5	100
Carrots (10% Car.)							
" E. P.	1 small	2	57	0.5	.....	4.2	20
" Cooked, E. P.	2 hp. tbsp.	3.5	100	1.1	0.4	9.3	45
" E. P.	1 lb.	16	453.4	4.99	1.81	42.18	205
Cauliflower (5% Car.)							
" E. P.	1 serving	4	113	2.0	0.6	5.2	35
"	1 lb.	16	453.4	8.16	2.27	21.32	138
" Cooked, E. P	2 hp. tbsp.	3.5	100	1.8	0.5	4.7	33
Celery (5% Car.)							
" E. P.	1 serving	2	57	0.6	.....	1.9	11
" Uncooked	6 pieces 4½ in. long or ¾ cup 1 in. pieces	3.5	100	1.1	.....	3.3	17
Cellu Flour	1 lb.	16	453.6	......	.....	.....	....
Cheese, American	1 tbsp.	½	14.17	4.0	5.0	.....	62
" American (Fresh Grated)	2 tbsp.	1	28.35	8.0	10.0	.....	124
" Cottage	2 tbsp.	1	28.35	5.9	0.2	1.2	31
" Cream	2 tbsp.	⅘	24	6.1	8.1	0.6	100
" Neufchâtel	½ block	1	28.35	5.3	7.78	0.42	92.8
Cherries (15% Car.)							
" Stoned	1 cup	4.5	127.57	1.27	1.02	21.3	100

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
C—(Continued)		Ozs.	Gms.	Gms.	Gms.	Gms.	Calories
Chestnuts (40% Car.)							
" Uncooked	....	3.5	100	6.2	5.4	42.1	243
Chicken, E. P.	1 serving	3½	100	21.4	2.5	.....	108
" E. P.	1 lb.	16	453.6	97.5	11.3	.....	492
" Fowl, E. P.	1 serving	3½	100	19.3	16.3	.....	224
" Fowl, E. P.	1 lb.	16	453.6	87.5	73.9	.....	1015
Chocolate, Unsweetened	1 square	1	28.35	3.6	13.8	8.5	173
" Unsweetened	1 lb.	16	453.6	58.5	220.9	137.4	2772
Clams, E. P.	1 serving	3½	100	8.6	1.0	2.0	51
" E. P.	1 cup	11.5	326.0	21.19	1.3	13.69	151
Clam Bouillon	1 serving	3½	100	0.2	.....	0.2	2
" "	1 quart	32	906	2.0	0.8	1 6	23
Claret (10% Alcohol)							
"	1 tbsp.	½	14.17	.....	.....	.....	10
Cocoa	2 tsp.	⅛	3.5	0.76	1.02	1.33	18
"	1 tbsp.	¼	7	1.5	2.0	2.5	35
"	1 lb.	16	453.6	97.98	131.10	171.00	2256
Cod, Fresh, E. P.	1 serving	3½	100	16.5	0.4	.....	70
" Fresh, E. P.	1 lb.	16	453.6	74.8	1.8	.....	315
Cod Fish, Salt, Boneless	1 serving	2	57	15.7	0.2	.....	64
" " Salt, Boneless	1 lb.	16	453.6	125.6	1.4	.....	515
Condensed Milk,							
Sweetened	2 tbsp.	1 1/12	30.6	2.7	2.54	16.58	100
Sweetened	1 can	16	453.6	36.3	43.7	250.6	1541
Consomme	1 serving	3½	100	2.5	.....	0.4	12
"	1 quart	32	906	23.0	.....	3.5	106
Corn (20% Car.)							
" A. P.	1 ear (6 in. long)	4.5	127.5	1.5	0.50	9.82	50

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
C—(*Continued*)		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Corn, Canned	2 tbsp.	1	28.35	0.79	0.34	5.39	27.8
" Canned	1 cup	9	253	7.8	3.0	48.1	248
Cornflakes, Toasted . .	1¼ cups	0.99	27.8	1.53	0.42	22.53	100
Cornmeal, Cooked . . .	⅔ cup	6.0	170.1	2.5	0.55	21.28	100
" A. P. . . .	1 tbsp.	0.33	9.45	0.87	0.18	7.12	34
" A. P. . . .	1 cup	5	141.75	13.05	2.70	106.9	504
"	1 lb.	16	453.6	41.73	8.62	342.01	1613
Cornstarch, Uncooked .	1 tbsp.	⅓	10	.....	.....	9.5	38
" Uncooked .	1 cup	5½	156	.....	.....	148.2	592
Corn Syrup	1 tbsp.	1	28.35	.....	.....	80.0	90
" "	1 cup	16	448	.....	.....	1280.0	1440
Crackers, Graham . . .	1 cracker	⅓	9.45	0.94	0.88	6.97	39.5
" Water . . .	1 cracker	⅓	9.45	1.2	0.05	7.6	40
" Wheatsworth .	1 cracker	.17	5	.475	.385	3.65	19.96
" Oyster . . .	....	1	28.35	3.20	2.98	10.98	119.5
" Saltine . . .	1 cracker	⅛	3	0.4	.05	2.4	15
Cracker Crumbs . . .	1 cup	5	151	16.5	9.0	110.0	588
Cranberries (10% Car.)							
"	2 tbsp.	1	28.35	.11	.17	2.81	13.2
" A. P. . . .	1 lb.	16	453.6	1.81	2.72	44.91	211
Cranberry Jelly . . .	2 tbsp.	1.5	42.5	.....	0.11	24.75	100
Cream, Thin (18%)							
" Single x . . .	1 tbsp.	½	14.17	0.4	2.8	0.7	29
" Single x . . .	1 cup	8	227	5.6	41.9	10.2	440
" Thick (40%)							
" Double xx . . .	1 tbsp.	½	14.17	0.3	6.0	0.5	57
" Thick (40%)							
" Double xx . . .	1 cup	8	226.8	5.0	90.7	6.8	864
Cucumbers (5% Car.)							
" Fresh, E. P. .	....	1	28.35	0.2	.06	0.8	5
Currants (15% Car.)							
" Fresh . . .	1 cup	5	142	2.1	.....	18.0	81

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
C—(*Continued*)		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Currants, Dried	1 cup	8	227	5.4	3.8	84.0	728
D							
Dandelion Greens (5% Car.)							
" Cooked	2 hp. tbsp.	3.5	100	2.1	0.3	3.2	23
Dates, with Stones	1 cup	7	200	3.8	5.0	140.0	623
E							
Egg, Average, Whole A. P.	1	2	56.7	6.74	5.26	.....	74
" Average, Whole E. P.	1	1.76	50	6.7	5.25	.....	74
Egg White, Average	1	1.2	33	4.05	0.066	.....	17
Egg Yolk, Average	1	0.6	17	2.66	5.66	.....	60
Egg Plant, (5% Car.) E. P.	....	1	28.35	0.34	0.09	1.44	7.9
" " E. P.	1 lb.	16	453.6	5.44	1.36	23.11	127
Endive (5% Car.)	....	1	30	.03	.....	.78	4.3
F							
Farina, Uncooked	1 tbsp.	⅓	10	1.0	0.1	7.2	34
" Uncooked	1 cup	6	170	18.7	2.3	129.8	616
Figs, Large	1 fig	1	28.35	1.3	0.1	22.2	95
"	1 lb.	16	453.6	19.5	1.36	336.5	1437
Filberts (10% Car.)							
" Shelled, Chopped	1 tbsp.	⅕	6	0.9	3.9	0.8	42
"	1 doz.	¾	21	3.3	13.8	2.7	150
" E. P.	1 lb.	16	453.6	70.7	296.2	58.9	3185
Fish,[1] Roe (Shad), A. P.	1 oz.	1	28.35	5.93	1.08	0.74	36
" Roe (Shad), A. P.	1 lb.	16	453.6	94.72	17.12	11.79	581
Flounder, Fresh	1 av.[2] helping	3½	100	6.4	0.3	.....	30
Flour, Barley	1 tbsp.	⅗	17.01	1.78	.37	12.38	53
" Barley	1 cup	8	227	19.0	2.5	174.3	796

[1] All fish listed under their various names.

[2] Average Portion.

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
F—*(Continued)*		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Flour, Cellu	1 lb.	16	453.6	......	.....	.....	....
" Gluten	1 tbsp.	⅓	8	3.4	.1	3.4	29
" Gluten	1 cup	5	142	60.0	2.3	63.0	512
" Gluten	1 lb.	16	453.6	191.0	7.3	200.0	1629
" Graham	1 tbsp.	⅓	8	1.2	0.2	5.7	30
" Graham	1 cup	5	142	20.2	3.2	101.2	509
" Rice	1 tbsp.	¼	7	0.6	0.5	5.1	27
" Rice	1 cup	4½	128	10.9	7.8	86.8	461
" Rye	1 tbsp.	⅓	8	0.5	.....	6.3	28
" Rye	1 cup	5	142	9.6	1.3	111.5	496
" Roller Process	1 tbsp.	⅓	8	0.9	.....	6.0	28
" Roller Process	1 cup	4½	126	15.2	3.2	84.8	445
" Roller Process	1 lb.	16	453.6	50.80	4.53	339.75	1603
" Soy Bean	1 tbsp.	¼	4	0.35	0.15	0.08	30
" Soy Bean	1 cup	4	64	5.6	2.4	1.28	480
" Wheat Entire	1 lb.	16	453.6	50.80	4.53	339.75	1603
G							
Gelatin, Granulated	1 tbsp.	3/10	8.5	7.8	.....	.....	31
" Granulated	1 box	1⅕	34	31.1	.....	.....	125
" Shredded	½ box	⅗	17	15.6	.....	.....	62
Gingersnap	....	1	28.35	1.84	2.44	21.55	116
"	1 lb.	16	453.6	29.48	39.0	344.6	1848
"	....	0.86	24.5	1.6	2.11	18.6	100
Gluten Noodles	1 cup	3½	100	45.0	4.2	32.5	350
Gooseberries (10% Car.)	....	8	226.8	.9	.....	27	144
Grapefruit (5% Car.)	½ medium	7.5	212.8	1.72	0.45	22.10	10[illegible]
Grapes, Concord, A. P.	1 serving	3.5	100	1.0	1.2	14.4	71
" Concord, A. P.	1 lb.	16	453.6	4.54	5.44	65.32	328
Grapes, Malaga	1 doz.	2	57	0.7	0.9	10.8	55
" Malaga	1 lb.	16	453.6	4.5	5.4	65.3	328
Grapenuts	3 tbsp	0.95	27.0	3.11	0.27	21.33	100
"	1 cup	5.0	141.75	16.3	1.40	111.95	526

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
G—(*Continued*)		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Grape Juice	1 tbsp.	½	14.17	.....	.....	3.8	15
" "	1 cup	8	227	.....	.....	60.0	240
Greens (5% Car.)							
" Cooked	2 hp. tbsp.	4	113	2.3	0.3	3.6	27
H							
Haddock, E. P.	1 serving	3½	100	17.2	0.3	.....	72
" E. P.	1 lb.	16	453.6	77.9	1.3	.....	324
Halibut, E. P.	1 serving	3½	100	18.6	5.2	.....	121
" E. P.	1 lb.	16	453.6	84.3	23.5	.....	549
Ham, Fresh (med. fat.)	1 serving	3.5	100	15.5	29.	.....	321
" Smoked, A. P.	Slice (4¾ in. × 4 in. × ⅛ in.)	1.25	35.4	7.15	7.93	.....	100
" Smoked, A. P.	1 lb.	16	453.6	91.62	101.61	.....	1281
Hickory Nuts (10% Car.),							
" " Chopped	1 tbsp.	½	.....	2.1	9.5	1.6	101
" " Chopped	¼ cup	1½	.....	6.5	28.5	4.8	303
" " Shelled, E. P.	1 lb.	16	453.6	69.7	305.6	51 8	3238
Hominy, Cooked	1 hp. tbsp.	½	14.17	1.2	0.1	11.2	50
"	1 cup	5½	157	13.0	1.0	110.0	565
Hominy Grits, Cooked	1 cup	9	255.2	3.25	0.22	31.5	141
" " Uncooked	1 cup	5½	155.9	12.93	0.93	123.1	553
Honey	1 tbsp.	1	28.35	0.1	.....	23.0	92
Huckleberries (15% Car.)	....	3.5	100	0.6	0.6	16.6	74
J							
Jell-O	1 serving	⅗	16	1.9	.....	14.4	66
"	1 box	3½	100	11.2	.....	86.4	395
K							
Kohl-rabi (10% Car.)							
" Fresh	¾ cup	3.45	98	1.96	0.098	5.39	30

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
K—(*Continued*)		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Kumyss	1 qt.	34⅖	975	2.2	2.1	1.5	328
L							
Lactose (Sugar of Milk) .	. . . .	. . .	1	. . . . .	. . . . .	. . . . .	4
" (Sugar of Milk) .	1 tsp. (av. size)	⅑	3	. . . . .	. . . . .	3.5	14
" (Sugar of Milk) .	1 tbsp.	⅓	10	. . . . .	. . . . .	10.0	40
Lady Fingers	3	½	14.17	1.24	.70	10	51.2
Lamb Chops	2 medium size	3½	100	18.7	28.3	. . . . .	329
" "	1 lb.	16	453.6	84.8	128.3	. . . . .	1494
" Roast	Slice 3½ x 4½ x ⅛	1.8	51	10	6.6	. . . . .	100
Lard	1 tbsp.	½	14	. . . . .	14.0	. . . . .	127
"	1 lb.	16	453.6	. . . . .	484.0	. . . . .	4083
Leeks (5% Car.) . . .	. . . .	1	30	.3	.12	1.8	10
Lemon Juice (10% Car.)							
" "	1 lemon (3 tbsp.)	1½	42	. . . . .	. . . . .	4.2	17
Lentils, Dried, A. P. . .	2½ tbsp.	1.01	28.7	7.37	0.29	16.98	100
" Dried, A. P. . .	1 lb.	16	453.6	116.57	4.54	268.52	1581
Lettuce (5% Car.)							
"	1 head	8	227	2.3	0.5	5.7	36
Lobster, E. P.	1 serving	3½	100	18.1	1.1	0.5	84
" E. P.	1 lb.	16	453.6	82.0	4.9	2.2	382
M							
Macaroni (20% Car.,							
" A. P. . . .	1 cup	3⅘	108	14.7	1.0	81.1	392
" A. P. . . .	1 lb.	16	453.6	60.78	4.08	336.12	1624
" Cooked . . .	1 cup	5.2	147.4	3.5	0.22	20.75	100
Macaroons	2	0.83	23.6	1.54	3.59	15.39	100

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
M—(*Continued*)		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Mackerel, E. P.	1 serving	3½	100	18.7	7.1	.....	139
" E. P.	1 lb.	16	453.6	84.8	32.1	.....	629
" Salted, E. P.	1 serving	3½	100	17.3	26.4	.....	307
" Salted	1 lb.	16	453.6	78.5	119.7	.....	1392
Malted Milk	1 tbsp.	½	14.17	2.3	1.2	9.6	61
Mayonnaise	1 tbsp.	½	15	.35	11.	.5	100
Milk, Condensed, Sweetened	1 tsp.	3/10	11	0.9	1.0	6.0	37
" Condensed, Sweetened	1½ tbsp.	1	28.35	2.3	2.7	15.6	96
" Condensed, Sweetened	1 can	16	453.6	36.3	43.7	250.6	1541
" Evaporated	1 tbsp.	3/5	17.01	1.6	1.6	1.9	27
" Evaporated	1 cup	8	226.8	21.75	21.0	25.4	379
" Skimmed	1 tbsp.	7/10	20	.7	.....	1.0	7
" Skimmed	1 cup	8⅗	244	8.3	0.7	12.5	89
" Skimmed	1 quart	34⅖	975	33.1	2.9	49.7	358
" Whole (4% fat)	1 tbsp.	7/10	20	0.6	0.8	1.0	11
" Whole (4% fat)	1 cup	8⅗	244	8.0	9.3	12.2	169
" Whole (4% fat)	1 quart	34⅖	975	32.2	39.0	48.8	675
Top Milk (7% fat)	1 tbsp.	.7	19.8	.61	1.5	.91	19.6
" " (7% fat)	1 cup	8.5	240	7.4	18.2	11.	238
Molasses	1 tbsp.	⅘	27	0.6	.....	18.7	77
"	1 cup	11	317	7.6	.....	219.7	909
Muskmelons, E. P.	½ (small)	8	226.8	1.36	.....	21.12	90
Mushrooms (10% Car.)							
"	11 (1 in. in diameter)	3.5	100	3.5	0.4	6.8	45
Mutton Chops	1 serving	3½	100	16.0	33.1	.....	362
" "	1 lb.	16	453.6	72.5	150.1	.....	1640
N							
Noodles, Gluten	1 cup	3½	100	45.0	4.2	32.5	434
O							
Oatmeal, Granulated	1 tbsp.	½	14.17	1.8	0.9	9.9	55

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
O—(*Continued*)		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Oatmeal, Granulated . .	1 cup	5½	156	25.1	11.2	105.2	623
" Cooked . . .	1 cup	7.9	223.9	4.25	1.77	16.75	100
" Gruel . . .	½ cup	4	113.4	1.3	.45	7.3	38.4
Oats, Rolled	1 tbsp.	⅕	5	0.7	0.3	2.7	16
" Rolled	1 cup	2½	71	11.8	5.2	46.9	282
" Rolled, Cooked . .	1 cup	7.9	224	4.2	1.8	17.	100
Okra (5% Car.)							
" Canned	⅔ cup	.4	115	1.6	.23	7.47	38
Olive Oil	1 tbsp.	⅖	11.1	.....	11.1	.....	100
Olives (20% fat)							
" Ripe Olives . . .	2 or 3	½	14.17	0.1	2.8	1.2	31
Onions (10% Car.)							
"	1 serving	4	113	1.8	0.3	11.2	56
" E. P.	3-4 medium	7.24	205.4	3.30	0.62	20.33	100
" A. P.	1 lb.	16	453.6	7.26	1.36	44.80	220
Orange, E. P. (10% Car.)							
"	1 medium	5	142	1.2	0.3	16.4	73
Orange Juice	1 tbsp.	½	14.17	.....	.....	1.6	6
" "	1 cup	8	227	.....	.....	25.6	104
Oysters	2	1	28.35	1.7	0.3	1.0	14
"	1 cup (solid)	8½	240	14.4	3.1	7.9	118
P							
Parsnips (15% Car.)							
" E. P.	1 medium	1	28.35	0.45	0.14	3.83	18
" A. P.	1 lb.	16	453.6	7.30	2.27	61.24	294
Peaches (10% Car.)							
" A. P.	1 medium	4	113	0.8	0.1	11.3	50
" Canned . . .	2 large halves and 3 tbsp. juice	7.50	213.2	1.49	0.21	23.03	100

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
P—*(Continued)*		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Colo-ries*
Peaches, Dried	1 cup	3	85	1.4	1.8	56.2	247
Peach Juice	1 tbsp.	½	14.17	.....	.....	1.1	5
" "	1 cup	8	227	.....	.....	17.6	80
Peanuts, E. P.	1 kernel	0.3	0.89	.22	.34	.21	5
" Shelled	1 cup	5	142	36.5	54.7	34.5	777
Peanut Butter	1 tbsp.	⅗	16.5	4.85	7.7	2.83	100
Pears (15% Car.)							
"	1 medium	3	85.05	.51	.42	12.	53.7
" Canned	2 halves, 2 tbsp. juice	3.2	91	.35	.3	15.5	66
Peas (15% Car.) Green	1 serving						
" Fresh, E. P.	½ cup	4	113	7.7	0.5	19.6	114
" Canned	1 cup	6¼	184	6.6	0.4	18.0	100
" Split, Dried	2 tbsp.	1	28.1	6.92	0.28	17.4	100
Pecans (10% Car.)							
" Shelled	1 cup	5½	156	15.0	110.0	23.8	1145
Pineapple (10% Car.)							
" Fresh, E. P.	....	8	227	0.9	0.7	22.0	98
" Canned	1 slice	1⅘	53	0.2	0.3	19.3	81
" Canned	1 cup	10⅕	290	1.2	2.0	10.6	444
" Canned	1 can	24	680	2.6	4.8	247.0	1044
Plums (20% Car.)							
" E. P.	3 large	3.5	100	1.0	.....	20.1	84
Popcorn, A. P	⅛ cup	0.6	17.01	2.75	1.22	19.5	100
" Popped	1½ cups	0.6	17.01	2.75	1.22	19.5	100
Pork, Loin Chops, Lean, E. P.	....	1.4	40	8.05	7.53	.....	100
" Tenderloin, A. P.	large serv'g	3.5	100	18.9	13.0	.....	193
Port Wine (10% Alcohol)							
"	1 tbsp.	½	14.17	.....	.....	.....	10

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
P—(*Continued*)		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Potato Chips, Cooked	8–10 large pieces	0.62	17.5	1.19	6.93	8.16	100
" " Cooked	1 lb.	16	453.6	30.85	180.50	211.80	2596
Potatoes (20% Car.)							
" White, E. P.	1 medium	3½	100	2.2	0.1	18.4	83
" White, E. P.	1 lb.	16	453.6	9.93	0.45	83.46	378
" Sweet	1 medium	3½	100	1.8	0.7	27.4	123
" Sweet, E. P.	1 lb.	16	453.6	8.16	3.18	124.29	558
Prunes (20% Car.)							
"	3 prunes	1	28.35	0.5	.....	17.6	72
"	1 cup	5	142	2.5	.....	88.1	363
Puffed Rice	1 cup	0.75	21.26	1.7	0.063	16.79	75
Puffed Wheat	1 cup	0.6	17.01	2.31	0.41	12.67	60
Pumpkin (10% Car.)							
" Fresh, E. P.	1 cup	6½	184.2	1.84	.184	9.57	48
Q							
Quail	1 serving	3½	100	21.8	8.0	.....	159
R							
Radishes (5% Car.)							
" A. P.	12 red button	4.3	121.9	1.09	.12	4.88	25
Raisins, E. P.	1 doz.	⅓	9.45	0.24	0.31	7.19	33
"	1 cup	5	142	3.3	4.3	97.1	440
Raspberries (15% Car.)							
" Fresh Black	1 cup	5	142	2.4	1.4	17.8	94
" Fresh Red	1 cup	8	226.8	2.26	.....	28.57	114
" Juice	½ cup	4	113.5	.....	.....	11.3	45
Rhubarb (5% Car.)							
"	¼ cup in 1 in. pieces	1	28.35	0.2	0.2	1.0	6
"	....	16	453.6	2.72	3.17	16.33	105

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
R—*(Continued)*		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Rice, (20% Car.)							
" Raw	1 tbsp.	½	14.17	1.1	.....	11.2	50
" Raw	1 cup	7	200	16.0	0.6	158.0	800
" Raw	1 lb.	16	453.6	36.02	1.36	358.34	1591
" Boiled	6 level tbsp.	2	56.7	1.1	0.05	11.2	50
Rum	1 tbsp.	½	14.17	.....	.....	.....	38
S							
Salmon, E. P., Fresh	1 serving	3½	100	22.0	12.8	.....	203
" Fresh	1 lb.	16	453.6	99.6	57.9	.....	922
" Canned, E. P.	....	1	28.35	6.18	3.43	.....	55.6
" Canned, E. P.	1 can (1 lb.)	16	453.6	98.87	54.88	.....	889
Saltines	1 wafer	⅛	3	0.4	0.5	2.4	15
"	1 lb.	16	453.6	48.08	57.60	310.70	1954
Sardines, Canned	1 small serving	1	28.35	6.72	3.43	.....	57.7
" Canned, E. P.	1 small box (8-sardines)	3.5	100	23	19.7	.....	269
Sauerkraut (5% Car.)							
"	¾ cup packed	4.05	115	1.95	0.57	4.37	30
Scallops, A. P.	1 cup	6.4	181.4	26.84	0.18	6.16	133
Shad, E. P.	1 serving	3½	100	18.8	9.5	.....	161
" E. P.	1 lb.	16	453.6	85.1	43.0	.....	729
Shad Roe	1 serving	3½	100	20.9	3.8	2.0	128
Sherry	1 tbsp.	½	14.17	.....	.....	.....	13
Shredded Wheat	1 biscuit	0.97	27.4	3.51	0.49	20.59	100
Shrimps, E. P	1 cup	6.3	181.4	45.42	1.8	0.36	200

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
S—*(Continued)*		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Soy Bean Flour	1 tbsp.	¼	4	0.35	0.15	.08	30
" " "	1 cup	4	64	5.6	2.4	1.28	480
Spinach (5% Car.)							
" Cooked . . .	1 serving ½ cup	4	113	2.36	0.36	3.64	27
" Fresh, E. P . .	1 lb.	16	453.6	9.52	1.36	14.50	108
Squabs	1 serving	3½	100	16.3	36.2	. . . . .	391
Squash (10% Car.)							
" Cooked	2 hp. tbsp.	3½	100	1.4	0.5	9.0	46
" Fresh, A. P . .	1 lb.	16	453.6	3.17	0.91	20.41	103
Strawberries (10% Car.) .	1 serving	4	113	1.0	0.7	7.9	42
" E. P . . .	1 cup	6	170	1.5	1.0	11.9	63
" Fresh, E. P .	1 lb.	16	453.6	4.54	2.72	33.57	177
Strawberry Juice . . .	1 cup	8	227	. . . . .	. . . . .	11.4	45
Suet	1 tbsp.	½	14.17	. . . . .	11.6	. . . . .	107
"	1 lb.	16	453.6	21.3	371.0	. . . . .	3425
Sugar, Granulated . . .	1 tbsp.	½	13.12	. . . . .	. . . . .	13.12	52
" Granulated . . .	1 cup	7½	210	. . . . .	. . . . .	210.0	840
" Granulated . . .	1 lb.	16	453.6	. . . . .	. . . . .	453.60	1814
" Loaf	1 lump (large)	¼	7.6	. . . . .	. . . . .	7.6	30
" Loaf	1 lump (small)	⅛	3.8	. . . . .	. . . . .	3.8	15
" Powdered . . .	1 tbsp.	½	14.17	. . . . .	. . . . .	14.17	57
" Powdered . . .	1 cup	6.5	184	. . . . .	. . . . .	184.0	736
Sugar of Milk [1]. . . .	⅓ tbsp.	. . .	1	. . . . .	. . . . .	. . . . .	4
" " "	1 tsp.	⅑	3	. . . . .	. . . . .	3.5	14
" " "	1 tbsp.	⅓	10	. . . . .	. . . . .	10.0	40

[1] For practical purposes, the milk sugar may be measured in a medicine glass. Each measured ounce equals 18 grams in weight. If milk sugar is added to water in the proportion of 24 grams to 3 c.c. and the water brought to the boiling point the milk sugar is completely dissolved. Such a solution made daily or just before use will be found convenient in administering the diet. (Coleman)

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
S—(*Continued*)		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Sweetbreads	1 serving	3½	100	16.8	12.1	.....	176
"	1 lb.	16	453.6	76.2	54.8	.....	798
"	1 pair (med. size)	8	227	38.1	27.4	.....	399
Syrup, Corn	1 tbsp.	1	28.35	.....	.....	80.	90
" Corn	1 cup	16	448	.....	.....	1280	1440
T							
Tapioca, Pearled, Raw .	1 tbsp.	½	14.17	.....	.....	12.3	49
" Pearled, Raw .	1 cup	6½	180	0.7	.....	158.4	640
" Minute, Raw .	1 tbsp.	½	14.17	.....	.....	12.2	49
Toast	1 slice (av. size)	1	28.35	2.6	0.3	15.0	73
Tomato (5% Car.)							
" Fresh, A. P. . .	1 medium	5	142	1.3	0.55	5.5	33
" Fresh, A. P. . .	1 lb.	16	453.6	4.08	1.81	17.69	103
" Canned . . .	1 tbsp. (raw)	½	14.17	0.2	.....	0.6	4
" Canned, Cooked .	2½ hp. tbsp	3.5	100	1.2	0.2	4.0	23
" Canned . . .	1 cup	8	227	2.7	0.5	9.0	51
Trout, E. P.	1 serving	3½	100	17.8	10.3	.....	164
" E. P.	1 lb.	16	453.6	80.6	46.7	.....	743
Turnip (10% Car.)							
" Cooked	2 hp. tbsp.	3½	100	1.3	0.2	8.1	39
" Fresh, E. P. . .	1 lb.	16	453.6	5.89	0.91	36.74	179
Turkey, Cooked, E. P. .	2 large slices	3½	100	21.1	22.9	.....	290
" A. P.	1 lb.	16	453.6	95.7	103.9	.....	1317
V							
Veal Loin, Medium Fat, A. P. . . .	1 slice (2× 2¾×⅛ in.)	2⅓	66.15	10.98	9.95	.....	100
Vegetables [1]	....	...	.....	.....	.....	.....	...

[1] Vegetables are listed under their various names. Note footnote, page 58

Food Material (Uncooked, unless otherwise stated)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
W		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Walnuts, Black (10% Car.)							
" E. P.	1 lb.	16	453.6	125.19	255.38	53.06	3012
" English (15% Car.)							
" E. P.	1 meat	...	1	.1	0.6	0.1	7
" English, E. P.	8–16 meats	0.5	14.17	2.61	9.13	1.84	100
" English, E. P	1 cup	5½	156	25.8	98.8	25.1	1093
" English, E. P.	1 cup chopped meats	3	85.05	15.66	54.77	11.07	600
" English, E. P	1 lb.	16	453.6	83.46	292.10	58.79	3199
Watercress (5% Car.)	¼ cup	.35	10	.07	.05	.37	2.2
Watermelon, E. P..	....	11.7	331.1	1.32	0.66	22.19	100
Wheat, Shredded	....	1	28.35	3.43	.51	21.31	103.6
Wheat Flakes	1 cup	1	28.35	3.80	.39	21.06	103
Wheatsworth Crackers	1 cracker	.17	5	.475	.385	3.65	19.96
Whey [1]	1 cup	6½	184	1.8	0.5	9.3	50
Whiskey (43% Alcohol)	....	...	50c.c.	.....	.....	.....	152
White Fish, E. P.	1 serving	3½	100	22.9	6.5	.....	150
" " E. P.	1 lb.	16	453.6	103.8	29.4	.....	681
Z							
Zwieback	3 small... slices	1	28.35	2.77	2.80	20.83	199.6

[1] Approximately 50 calories; depends on how much food value is left in whey after straining.

CHAPTER IV

FOOD SANITATION

SELECTION AND CARE OF FOOD—ADULTERATION OF FOOD

Selection and Care of Food

Selection of Food.—All foods administered to the sick must be of "good quality" and "known purity." That is, they should be bought in the freshest and cleanest condition, placed in clean containers and handled with clean hands. Special attention to fly pollution is necessary—buy only from reliable dealers where food has been kept in "properly-screened" stores or markets. The windows in kitchen and room where food is served must be properly screened and flypaper and similar precautions employed. Purchase foods where you are sure that your desire for purest and best foods will be respected.

Care of Food.—The care of food between the time of purchase and cooking and that of cooking and serving is highly important for two reasons. *First,* it represents an economic loss which we can ill afford. If good food is purchased but poorly prepared or badly cared for it means that the cost of food as eaten may be easily two or three times the purchase cost. One needs only to examine the garbage pails of some of our public institutions to be convinced of the force of this statement. *Second,* if good food is contaminated with germ life it may easily lead to food poisoning.

Dust from city streets abounds in germ life, therefore vegetables and certain fruits should be washed in one or several waters. To be absolutely safe all fruits and vegetables should be cooked before serving.

Cooking thoroughly, broiling, roasting or boiling, kills most of the bacteria but is usually ineffectual in removing the products of decomposition or in making them ineffective. Ordinary boiling does not kill all kinds of bacteria; most are readily killed but some resist even prolonged boiling. Bacillus botulinus is easily killed by heat, while bacillus paratyphlis produces a poison which cannot be eliminated even by boiling a long time. Food should be eaten as soon as convenient after cooking and should not be kept for long intervals. If necessary to keep food over, particularly in hot weather, it should be cooked again just before serving.[1]

Contamination of Food.—Food exposed to dust, insects, etc., may become contaminated with disease germs without becoming spoiled. The micro-organisms, which grow at such a rate as quickly to become visible to the naked eye, are chiefly molds. These are not always harmful to man and their chief significance is that they give to food a piquant flavor and cause a certain amount of disintegration. They attack food which is stored in dark, damp places. Certain butchers hang steaks until they become covered with mold, making the meat tender and highly flavored. These changes are due largely to the bacteria of putrefaction which are also present, thriving under the same conditions as molds.[1]

In the case of substances which have a natural protective covering, it is highly important that this should not be broken in handling. Thus when fruits and vegetables are bruised the pulp is quickly attacked by micro-organisms and local changes occur, resulting in economic waste, since such articles can be only partly utilized.

Foods should be stored in places which admit plenty of sunlight and air, for these elements tend to antagonize the growth of molds and putrefactive bacteria. Ice is a valuable aid in this sort of cleanliness, for it induces a temperature unfavorable for the growth of micro-organisms.

Food Poisoning.—Food poisoning is due to the presence

[1] Carter, Howe & Mason, "Nutrition and Chemical Dietetics," Lea & Febiger, Phila., Pa.

or formation of unusual chemical substances which may be present alike in raw, cooked, or frozen foods, and in fresh and preserved foods. Most cases of food poisoning are caused by bacterial infection of the food either before buying or after cooking. For example, decayed chicken, and the use of rotten eggs in cookery by bakers has sometimes caused severe poisoning. Personal susceptibility is often a factor in fish-poisoning. Sound, fresh food, thoroughly cooked and eaten at once seldom causes poisoning under any conditions. The articles which the ordinarily careful nurse must bear in mind in this connection are preserved foods of all kinds, *chicken, shell fish,* and *milk products,* the latter being of most signficance, since milk, fresh cream, ice cream, etc., are often given freely to invalids.

Special care in order to avoid fly pollution is necessary because of the part played by this insect in causing typhoid fever, cholera, dysentery, etc. Both the feet and the excrement of flies are sources of contamination. Cooking and careful washing of food that is to be eaten raw are our principal safeguards in respect to food as it is brought to the house by the dealer in foodstuffs. Then, too, the food when ready for consumption may be freshly contaminated. In order to avoid this, food must be carefully protected and covered until served. Flies are much more likely to abound in neighborhoods where manure, garbage, etc., are allowed to accumulate. These are more dangerous than ordinary dust.

If typhoid is epidemic in a neighborhood it is well to avoid raw food entirely, just as we avoid unsterilized water and milk.

Preserving of Food.—"In health the small amount of preservative used in certain canned and bottled foods would probably have little if any effect on the individual, but in sickness this is not always the case. . . . Not less than a 15 per cent. solution of salt should be used as brine for salting, and smoking food must be done very thoroughly, or in either case the bacteria will not be destroyed."

Foods to be preserved should be perfectly fresh, and the five following methods are in general use:

1. Dehydration.
2. Drying.
3. Exclusion of air, as dipping in wax and canning.
4. Freezing and cold storage.
5. Antiseptics, as smoking, salt, vinegar, alcohol, syrups, benzoate of soda, salicylic acid, etc., etc. The advisability of their use, even in minute quantities, is questionable.

Concentration.—Most foods can be reduced to a dry or otherwise condensed state without loss of nutritive value or danger of decomposition. Sugar, oil, starch and many cereal products are already in a state of concentration. Powdered milk, condensed milk and meat, egg powder, etc., are coming more and more into use as have already dried and evaporated fruits and vegetables. The chief use of many condensed products as mainstays will doubtless be in cases of temporary shortage of fresh foods, due to devastating storms, strikes, etc.

Predigestion of Food.—Much is written against the use of predigested foods as a steady diet for the well. The objection seems to rest on the theory that such foods give the digestive fluids and the muscles of the digestive organs very little to do, so that a sort of sluggishness is set up. It cannot be said truthfully that these claims have ever been backed up by facts. No one denies that thorough mastication is a great advantage and with thorough mastication much of the starch is predigested in the mouth or, after swallowing, in the fundus of the stomach. Predigested proteins are not used as staple foods, and as little is gained by the fine masticating of flesh foods, the stomach has plenty of work in digesting animal proteins. If there is fat in the diet the pancreas can never fall into a state of disuse. Hence the outcry against partially digested breakfast foods does not seem to be justified on this score. It is true, however, that their lack of flavor and the soft and pulpy character of some of them are recognized as possible drawbacks, for semi-solid and pultaceous foods are seldom thoroughly masticated, while their insipidity does not flavor a flow of digestive fluids. If adherence to these foods causes sluggish digestion and inability to deal with food in more natural condition, one would impute this not to predigestion, but to the fact that the tastelessness and the ease with which they may be bolted are the real factors which bring about a passive state of the digestive functions.

In a diet for the ill, the dyspeptic, the convalescent, etc., there can be no possible objection to predigestion; on the contrary, it is highly desirable up to a certain extent. But just as soon as possible the patient should return to foods in the natural state, bearing in mind that a great majority of patients, even the acutely ill, thrive on food which in theory would be hazardous to say the least. Apparently hopeless cases of sepsis have been rescued by placing patients on food suited only for the healthy. Such patients must, however, have a natural appetite and be able to tolerate the food.

Adulteration of Food

Adulteration of Food.—Adulterated food should never be served to patients suffering from pathological conditions. All articles should be of best quality and purchased from a reliable dealer. Special care should be taken as to the purity of milk, butter, cream and canned goods.

"Since the passage of the National Pure Food and Drugs Act, giving to the United States Government authority to enforce stringent laws against the adulteration and misbranding of foods which enter into interstate commerce, and the more rigid enforcement of similar state laws which regulate these matters in many of the states, a great burden has been lifted from the shoulders of the buyer. This legislation has enormously decreased the deceptions formerly practiced by some manufacturers, and since it insures that the name and description on bottle and package shall not misrepresent the contents, the buyer, if he knows what he wants, will have no difficulty in obtaining it, while the honest manufacturers and dealers (and they have without doubt always outnumbered the others) will also be protected. Table of Common Adulteration of Foodstuffs and tests for of the Bureau of Chemistry[1] of this Department."[2] For Table of Common Adulteration of Foodstuffs and *tests for* same, note Farmer's Bulletin No. 25, of the United States Department of Agriculture, Division of Chemistry, Washington, D. C.

Canned Goods.—Canned goods should never be used if the can is seen to have a convex top, as this is always due to imperfect sterilization, with resulting fermentation and putrefaction, the bulging being caused by the gas under pressure. These cans are called "swells" or "blows". All canned foods should be thoroughly cooked through before serving, to kill any possible organisms and if the entire canful is not used at one meal, the balance should be kept in stone or enamel ware on ice and not in the can.[3] It is well not to purchase cans that appear old, rusty, and soiled, as they are apt to be left over stock and are liable to be bad.[4]

QUESTIONS FOR STUDY

1. What precautions are advised in the selection of food, its care before using and its preparation for the table? What is the importance of this care?
2. State five methods by which food may be preserved.
3. Discuss the value of predigested foods.
4. What precautions are advised in the use of canned goods?
5. What causes food poisoning and how may we guard against it?
6. Why should food be cooked?

[1] U. S. Dept. Agriculture Bureau of Chemistry, Bulletin 100; Year Book 1907, p. 321.

[2] U. S. Dept. Agriculture Bureau of Chemistry, Bulletin 325, p. 19.

[3] According to the research laboratory of the National Canners' Asso. there is less danger resulting from leaving food in the can after opening than from transfer to other dishes as the can is more likely to be sterile than household utensils.

[4] Carter, Howe & Mason, "Nutrition and Chemical Studies," Lea & Febiger, Phila., Pa.

CHAPTER V

METHODS OF COOKING

Cooking is that part of the preparation of food for eating which involves the application of heat.

The reasons for cooking food are:

1. To make it more palatable and so stimulate appetite.
2. To increase its digestibility by softening tough fibers and by bringing about slight chemical changes by heat.
3. To destroy harmful bacteria and parasites sometimes found in raw food.

Success in cookery depends upon the quality of the food material, upon accurate measurements, upon care in combining ingredients, upon the method and time allowed and upon a knowledge of food composition.

Selection of Food.—Care should always be taken to choose foods of good quality—those which are fresh, free from adulteration and which have been kept under sanitary conditions. Dealers differ much in the care they give to foods.

Measurements to be accurate must be level. The cup or spoon should be filled and leveled off with the edge of a knife. This is the only way to insure uniform results.

Blending Ingredients.—There are several ways of accomplishing this purpose.

1. Stirring. This is simple mechanical mixing in which a mass of ingredients is made uniform.
2. Beating or whipping. This consists in so manipulating a soft mixture as to incorporate the air. A spoon or a special device is so applied that the bottom of the mixture is steadily lifted to the top.

3. Folding-in. This is a term applied to the method of introducing beaten white of egg slowly and gently into a soft mass, so as to render it light, the air being retained.
4. Cutting. This is used only in making pastry. Two knives are worked in opposite directions until the shortening is well incorporated in the flour.

The composition of the food material to be cooked should be known in order both to choose the best method for cooking it and to judge of the time and temperature that will give the best results. The digestibility of the food and its value to the body depend much upon the way it is cooked.

The Effect of Temperature upon Food Materials.—Albumin is toughened or hardened by a high temperature but is soluble in cold water. It is most easily digested when cooked below the boiling point of water. The effect of heat upon albumin is utilized in the cooking of meats, when the surface is exposed to a high temperature in order that a coating of coagulated albumin may be formed, thus sealing in the meat juices.

In the preparation of meats for broths and soups the meat is first allowed to stand in cold water to dissolve the albumin and a high temperature is avoided throughout the cooking.

A high temperature decomposes fats and produces substances that are quite irritating to the delicate mucous membranes of the digestive tract. It is so easy for this to happen in frying that fried foods are not advised in the diet of the sick.

Starch is rendered more easy of digestion by the action of heat, being partially converted into dextrin by dry heat as in the making of toast, and to a less extent by moist heat as in the cooking of cereals.

Cooking Processes:

1. Boiling, stewing and simmering are methods of cooking food in water. Water boils with bubbles bursting

above the surface, at a temperature of 212° F. This method is used in the cooking of almost all vegetables and some cereals. Gentle boiling is just as effective as rapid boiling and requires less fuel.

2. Stewing is much the same as boiling, except that less water is used and the vessel is usually left uncovered that evaporation may take place. This method is used in cooking the tougher cuts of meat and dried fruits.
3. Simmering is cooking in water slightly below the boiling point, about 200° to 210° F. It is the method used in the cooking of soups, broths and eggs.
4. Steaming is cooking by heat derived from the vapor of boiling water. The food may be placed in a steamer in direct contact with the steam, or in a double boiler where the steam surrounds the food container. In either case the temperature is slightly below that of boiling water. Cereals, fruits and all kinds of vegetables can be cooked by steam.
5. Baking and roasting are methods of cooking in the oven by means of heated air. Baking applies mostly to such foods as bread, cakes and pies. Roasting originally meant cooking before an open fire, but the term is now mostly applied to the cooking of meats in the oven.
6. Broiling or grilling is cooking by direct heat from a glowing fire or flame. This is mostly used for tender cuts of meat as chops and steaks.
7. Pan broiling is applied to the cooking of the same type of food in a hot frying pan or griddle, without fat.

In cooking meats by any of these methods, the surface is first seared by the high temperature and the cooking is completed at a lower temperature.

8. Frying and sautéing are methods of cooking in hot fat. For frying, the food is immersed in deep fat, as in the cooking of doughnuts and fritters, while sautéing is done in a small amount of fat in a frying pan, as for hash brown potatoes.

9. Fricasseeing is a combination of sautéing and stewing.
10. Brazing is a combination of baking and stewing. By both of these methods the juice is partially extracted, but is served with the meat as a gravy or sauce.
11. Poaching is a term applied to the cooking of eggs in shallow water. The egg is dropped into boiling water. This cools the water and the cooking is completed at a temperature below 212° F.

Utensils.—For convenience in measuring use a standard half pint cup. These are marked into thirds and fourths and are made in both glass and tin. The tin is safer to use for measuring very hot materials. Wooden spoons are better than metal ones for mixing and stirring. They are softer and pleasanter to use, they do not chip and are not acted upon by acids. They can be had in all sizes.

When beating eggs that are not separated, or egg yolk, a Dover egg beater or one of similar make is best to use. White of egg can be made lighter by the use of a wire egg whisk.

A double boiler should be used for cooking foods that are easily burned, such as cereals, milk and milk sauces. A double boiler should also be used where a high temperature is to be avoided as in custards.

When mixing batters a crockery bowl is preferable to one of lighter weight. Tin and iron utensils should never be used in cooking fruit or any acid material.

Enamel or earthenware pots are best to use in making tea and coffee.

Washing of Dishes.—All dishes and utensils should be scraped and piled, similar things together, before beginning the washing. Greasy dishes or utensils should be rinsed off with hot water or put to soak in hot water to which a little washing soda has been added; the alkali combines with the grease and makes it easy to remove. Soda should not be used in the cleaning of aluminum utensils. Since albumin is soluble in cold water and is hardened by heat, all dishes which have contained milk or eggs should be washed or soaked in cold water before being put into hot dish water. All dishes should be washed in hot soap suds and rinsed in clear, hot water in the following order: glass, silver, china, cutlery, cooking utensils. Dish water should be changed often and should never be allowed to become greasy.

Cloths and towels should be washed in hot soap suds and rinsed in clear water, and if possible hung in the sun to dry. The good accomplished by use of hot water in washing dishes may be quite undone by use of unsanitary dish towels.

Disinfecting Dishes.—All dishes or utensils used in the sick room should be disinfected before being sent to the kitchen to be washed. In case of infectious diseases all dishes and utensils should be boiled in water containing 3 per cent. of sodium bicarbonate for one-half an hour to one hour.

The ice box and all cupboards where food is stored should be kept scrupulously clean. All shelves and compartments should be washed once a week with soap and hot water and should be inspected daily to see that no food that has been spilled is allowed to remain. The ice box should be so constructed as to insure circulation of air. The ice chamber and drain pipes need especial attention and should be frequently washed and flushed out with hot soda water, using about one tablespoon of soda to a gallon of water. The part of the drainage pipe that can be removed should be taken out and cleaned with a brush.

The drain pipe from an ice box should not connect with the sewerage system.

Milk, butter and eggs absorb odors and flavors very quickly and if possible should be kept in a compartment separate from other food materials. Articles that have a very strong odor, such as onions and fish, should not be put into an ice box with other foods. It is well to test the temperature of an ice box frequently with a thermometer. A good average temperature is 50° F., although it is possible to have it slightly lower. Hot foods should not be put into the ice box as they raise the temperature, and may cause undesirable changes in the food itself.

Where a refrigerating system is used the disadvantages from unclean ice are avoided and a lower temperature is possible.

Keeping Ice in the Sick Room.—The very best plan is to have a small refrigerator or a Japanese ice box, which may be had for a few dollars. If these little luxuries are impossible, put the ice into a deep bowl, cover it with a plate, place in a larger bowl and cover all with newspapers.

QUESTIONS FOR STUDY

1. Name four methods used in blending food materials.
2. What is the effect of high temperature upon albumin? Upon starch? Upon fat?
3. What is the difference between boiling and simmering? Between pan boiling and frying?
4. Why are wooden spoons advised for mixing and stirring?
5. When is the use of a double boiler advised?
6. Describe the method of washing dishes and care of dish towels.
7. How should dishes used in a sick room be disinfected?
8. Describe the care of the ice box.
9. How may ice be kept in a sick room?

CHAPTER VI

THE TRAY

The writer's intention is only to suggest to the nurse the best and simplest methods of arranging the tray and a few of the important details.

These things may seem of small importance but the patient who has been long confined to his bed with a serious illness, thinks much of his immediate surroundings and his meals are the chief events of the day; therefore too much care cannot be bestowed upon their preparation and service. One feeds with the eyes quite as much as with the palate and some carelessness on the part of the nurse may entirely destroy the appetite of a refined, fastidious or nervous patient.

Attractive Arrangement of a Tray

The cover and the arrangement of the tray are of the utmost importance, and the slightest departure from regularity and immaculate cleanliness must be avoided. The following rules should be observed:

1. *The linen cover* for the tray and the napkin should be absolutely clean, without crease or wrinkle, and of the best quality you can afford.
2. *The Silver.*—Use the choicest silver, which must be clean and well polished. Warm slightly in cold weather as the chill of cold silver may spoil a delicate appetite.
3. *The China and Glassware.*—Use the daintiest china and glassware free from chips and cracks and not a collection of odd pieces, which give an untidy appearance to the tray. The china should be arranged neatly and conveniently and warmed in cold weather. The

arrangement should be the same at all meals, enabling the patient to find anything without trouble. It should be as nearly as possible like that of the conventional meal service to which the patient has been accustomed. The nurse should be able to tell at a glance whether everything is in place, thus saving herself steps and the patient the annoyance of waiting to have something brought.

When possible divert the patient's mind while he is eating by introducing cheerful and interesting topics of conversation. Business and disagreeable subjects must be rigidly excluded.

General Notes and Instructions

A fresh flower adds materially to the attractive appearance of the tray and should be provided whenever possible. If there is room for a small vase—as indicated on the dinner tray diagram—take care to choose one with a broad base so that it cannot easily be overturned.

The water glass has been omitted from each of the three trays illustrated, in order to prevent crowding. It is assumed that fresh water and a drinking glass are kept constantly on the invalid's bedside table so that an additional glass on the tray would be superfluous.

The use of a nested sugar bowl and cream pitcher, which can be obtained in nearly all glassware departments, effects a material saving in space.

In arranging silver, the various pieces should be placed in the order in which they will be used, starting at the point farthest from the plate on either side. Knives have the cutting edge turned toward the plate; spoons and forks are laid face up. All forks are arranged in order at the left with the exception of the oyster fork, which is placed either at the right of the soup spoon or diagonally across the handles of the spoon and knives. All spoons are laid at the right except those for beverages and desserts, which are laid across the rim of the saucer or dessert plate respectively. Butter spreaders are placed on the rim of the bread and butter plate as in diagram 2.

Not more than three knives and three forks may be included in the "cover". If additional silver is required it is placed at the right when serving the course for which it is to be used or on the plate containing the food, as mentioned above.

Small napkins are correct for breakfast, luncheon or supper. Large ones are required for dinner.

Breakfast

(Tray 16x22")

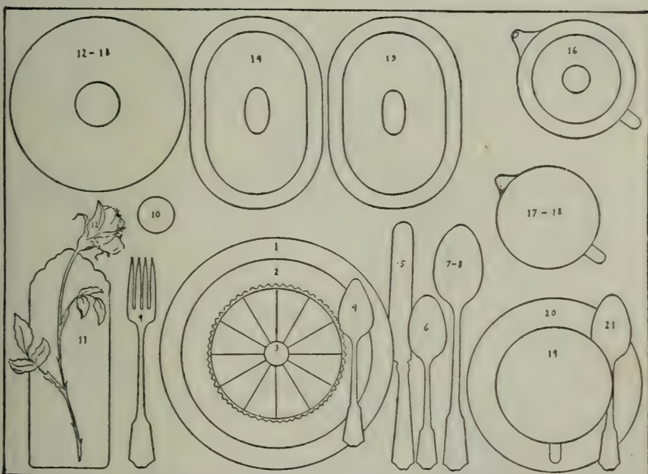


Diagram I

1. Breakfast plate
2. Fruit plate
3. Grapefruit
4. Fruit spoon
5. Breakfast knife
6. Cereal spoon
7-8. Two serving spoons, one nested in the other
9. Breakfast fork
10. Individual salt
11. Napkin
12. Single flower
12-13. Covered toast plate temporarily nested on top of empty cereal dish
14. Covered nappy containing hot cereal
15. Covered nappy containing hearty course
16. Individual coffee or chocolate pot

17-18. Individual nested sugar and creamer
19-20. Cup and saucer
21. Teaspoon

VARIATIONS

1. When the fruit course consists of grapes, the fruit spoon may be omitted. If apples or peaches are served, a fruit knife should replace the spoon.
2. Should a baked apple or stewed fruit be served with the meal instead of the regular fruit course, the cereal dish may be filled, covered and set in the breakfast plate and the individual dish of cooked fruit may then replace the covered nappy number 14.
3. In case no knife is required for the hearty course it may be omitted and the fork—or the egg spoon if a boiled egg is served—placed at the right of the plate. The egg, in an egg cup and covered with a cosy, would then take the place of the covered nappy number 15.

Luncheon
(Tray 16x22")

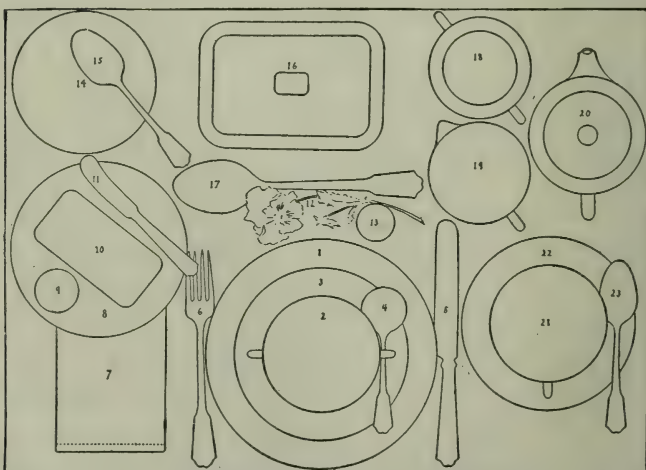


Diagram II

1. Luncheon plate
2-3. Bouillon cup and saucer
4. Bouillon spoon
5. Knife
6. Fork
7. Napkin

8. Bread and butter plate
9. Butter ball or pat
10. Roll
11. Butter spreader
12. Single flower
13. Individual salt
14. Dessert plate or pudding saucer
15. Teaspoon
16. Covered nappy for hearty course
17. Serving spoon
18. Individual sugar bowl
19. Individual creamer
20. Individual teapot
21-22. Teacup and saucer
23. Teaspoon

VARIATIONS

1. As in the case of the breakfast service, the knife may be omitted when not required and the fork then laid at the right of the plate.
2. Should the hearty course consist of a salad, it may be arranged either in a small salad bowl or on an individual plate, replacing the covered nappy number 16. A salad fork would then take place of the luncheon fork.

Dinner
(Tray 18x24")

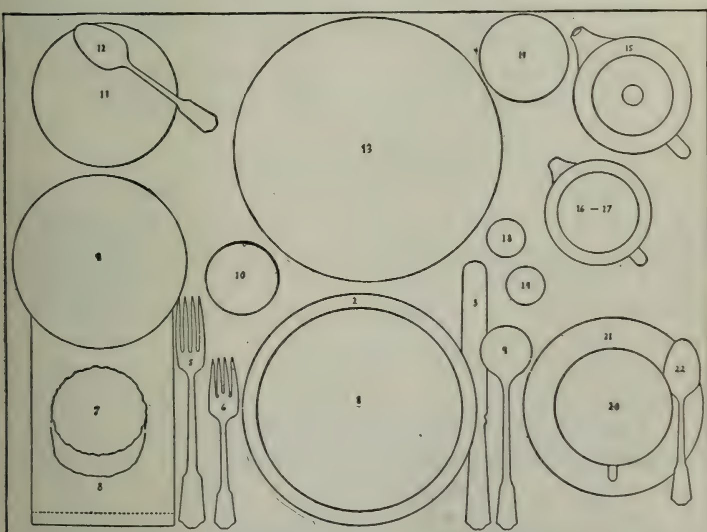


Diagram III

1. Soup plate
2. Service plate

3. Dinner knife
4. Soup spoon
5. Dinner fork
6. Salad fork
7. Dinner roll
8. Dinner napkin
9. Salad plate
10. Butter plate
11. Dessert plate
12. Teaspoon
13. Dinner plate
14. Vase
15. Individual tea or coffee pot
16-17. Individual nested sugar bowl and creamer
18-19. Individual salt and pepper
20-21. Cup and saucer
22. Teaspoon

VARIATIONS

1. In the "plate dinner" type of service illustrated in the diagram, the meat or fish is arranged with the vegetables on the dinner plate, which is covered with a second hot plate if no metal cover of suitable dimensions is available, thus effecting a saving in space. If this method is not approved, however, the dinner plate may replace the service plate beneath the soup service and the hearty foods may be arranged in covered dishes as illustrated in diagram 2.
2. For cream soups a cream soup server is preferred. This is somewhat smaller than a soup plate, has handles and stands in its own small plate. Bouillon cups, however, should never be used for dinner.

Formal Dinner Service

Occasion will seldom be found to serve a complete formal dinner on a tray but it is well to understand the principles by which such service is governed, as they supply the foundation of all other forms. The correct order of courses for an elaborate dinner is as follows: *hors d'œuvres,* soup, fish, entrée, roast, game, salad, sweet ices, fruit and coffee.

Following the rule that only three forks may appear on the table in advance, the *hors d'œuvres* fork, fish fork, and meat fork are shown in the diagram. Were melon or oysters to constitute the first course, the order of forks from left to right, would be, fish, entrée and meat. (The oyster fork is not counted as one of the three, because laid at the right of the plate). In either case only two knives would be in evidence, because neither the *hors d'œuvres* nor the entrée should require the use of a knife.

The salad fork and—in the form of service illustrated—the entrée fork, would be placed when the corresponding food was served. In tray service they should be placed on or beside the dishes containing these courses.

It would of course be impossible to arrange a six- or seven-course dinner on a tray, even in the form of single portions. The only solution would be to arrange the cover and the opening course on one tray and the remaining courses on a second.

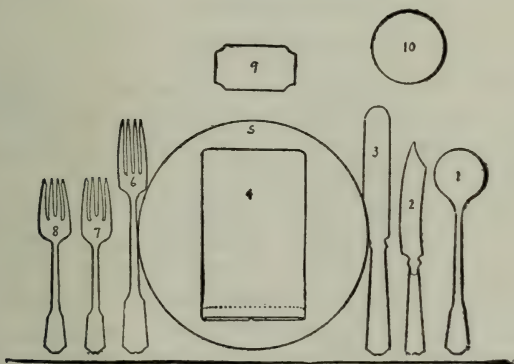


Diagram IV

1. Soup spoon
2. Fish knife
3. Dinner knife
4. Napkin
5. Dinner plate
6. Meat fork
7. Fish fork
8. Hors d'œuvres
9. Individual nut dish
10. Goblet

VARIATIONS

1. Oysters, usually served as a cocktail, may replace the *hors d'œuvres,* although considered less smart.
2. A sherbet is sometimes served between the roast and game courses, or with the game.
3. The salad may accompany the game if desired, the sherbet being omitted.

4. At less elaborate dinners, the roast and game courses are sometimes combined in the form of capon or guinea hen, and the entrée is likely to be omitted.

The bread and butter plate is omitted at the formal dinner, together with the butter spreader, and the dinner roll is placed on or in the napkin and eaten without butter. At informal dinners, however, butter is usually served since most people prefer it.

The napkin may be laid either on the service plate or at the left of the forks.

How to Serve

General Rules

1. The time of cooking food to be served should be carefully considered in relation to that of serving, for the most palatable food may be spoiled by allowing it to stand after being prepared.
2. Cover tray with a clean napkin or tray cover in carrying it to its destination. Avoid serving too many things or too large portions. When the nature of the dish permits it may be garnished with a sprig of green. When the dietary ordered is very limited in variety, the patient is often gratified and will eat more by having his food served in courses.
3. If possible, taste all foods and drinks before serving to see whether properly seasoned and at right temperature to serve. Always use separate spoon for tasting.
4. Hot food should be served *hot*. Lukewarm food is nauseating. Cold drinks and fruits are more healthful when served *cool* than ice-cold.
5. When fluid foods are to be given, other receptacles should be used than those used for medicine or the association of ideas may be strong enough to destroy what little appetite the patient has and even to produce nausea. Fill cups and glasses to within one inch of the

top—not full. For individual dishes, for a luncheon, or for drinks to be served alone, use a small tray or plate, covered with a doily or folded napkin.

6. Cover all foods and drinks left standing in the sick room. Half-emptied cups or glasses should never be left in the room.
7. The finger-bowl, one-fourth full of water, should be placed on a small plate covered with a dainty doily, with a few rose petals or green leaves in the bowl or on the plate.
8. The tray and all traces of a meal should be removed immediately after eating. Care however must be taken not to hurry the patient at his meal or to give the impression of haste, for with a nervous patient this may cause loss of appetite or indigestion.
9. The diet of the patient should be under the supervision of the physician and his directions followed implicitly. The nurse should make out the "diet sheet" for the day for all special cases requiring special diets and vary the food as far as possible in the preparation and serving. In hospitals the diet sheet is passed on to the dietitian, who carries out the directions laid down by the physician. The nurse should carefully check up the tray for mistakes sometimes occur, and giving the wrong food to a patient suffering from certain disorders may cause much unnecessary suffering or even death.

QUESTIONS FOR STUDY

1. What is gained by scrupulous care in the arrangement of the tray and the serving of food?
2. Mention at least five points which you consider important for the nurse to remember when serving the patient's meals.
3. Is there any advantage in serving the meal in courses?
4. When but one thing can be given a patient, how would you present it most attractively? Illustrate.
5. Why is a standard arrangement of dishes desirable?

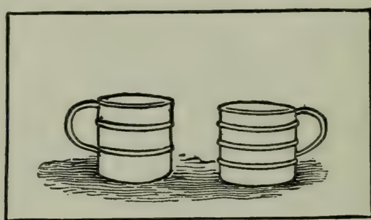
CHAPTER VII

MEASURES AND WEIGHTS

Accurate measurement is necessary to insure success in cooking.

All dry ingredients, such as flour, meal, confectioner's or powdered sugar, should be sifted before measuring.

Mustard, cream of tartar, soda, and salt should be stirred before measuring, to lighten and free from lumps.



A STANDARD MEASURING CUP

A standard measuring cup contains one-half pint and is divided into thirds and fourths.

To measure a cupful of dry material, put in the ingredients by spoonfuls, round slightly and level with back of case-knife, being careful not to shake cup.

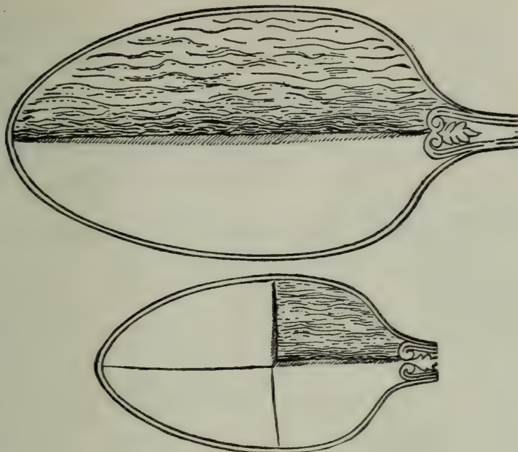
A cupful is measured level with the brim.

All ingredients measured by the tablespoon or teaspoon are measured level.

To measure a spoonful, fill the spoon and level it off with the back of case-knife.

To measure a half-spoonful, first measure a spoonful and then cut it in halves, lengthwise.

To measure a quarter-spoonful, measure a half-spoonful



and divide it into half, crosswise, allowing a little more for tip of spoon.

A saltspoon is one-fourth of a level teaspoon.

A speck is a little less than one-eighth of a teaspoon.

To measure butter, lard, and other solid fats, pack solidly into spoon or cup and level with knife.

When recipe calls for one tablespoon, or so, of *butter melted,* measure before melting. When recipe calls for one tablespoon, or so, of *melted butter,* measure after melting.

Household Measures and Weights

(Level Measurements)

¼ teaspoon	=	1 saltspoon, (ssp.)
4 ssp.	=	1 teaspoon, (tsp.)
3 tsp.	=	1 tablespoon, (tbsp.)
4 tbsp.	=	¼ cup (c.) or ½ gill.
16 tbsp. (dry or liquid ingredients)	=	1 c. or ½ pint, = 8 ounces = 226.8 grams.
8 tbsp.	=	½ cup or 1 gill.
2 gills	=	1 cup.
2 c.	=	1 quart, (qt.) = 453.6 grams, (gm.)

2 pt.	=	1 pint, (pt.) = a little less than one liter.
4 qt.	=	1 gallon (gal.)

APPROXIMATE MEASURES AND WEIGHTS

1 square Baker's unsweetened chocolate	=	1 ounce, (oz.) = 28.35 grams.
1 tbsp. *melted* butter	=	1 oz.
2 tbsp. butter (solid)	=	1 oz.
4 tbsp. butter (solid)	=	2 oz. = ¼ c.
2 tbsp. arrowroot	=	1 oz.
2 tbsp. barley flour	=	1 oz.
2 tbsp. buttermilk	=	1 oz.
2 tbsp. brandy	=	1 oz.
2 tbsp. cream	=	1 oz.
2 tbsp. grape juice	=	1 oz.
2 tbsp. lemon juice	=	1 oz.
(juice of one lemon)	=	about 3 tbsp.
2 tbsp. lime (powdered)	=	1 oz.
2 tbsp. malted milk	=	1 oz.
2 tbsp. molasses	=	1 oz.
2 tbsp. milk (skimmed)	=	1 oz.
2 tbsp. milk (whole)	=	1 oz.
2 tbsp. oatmeal	=	1 oz.
2 tbsp. olive oil	=	1 oz.
2 tbsp. orange juice	=	1 oz.
2 tbsp. rice flour	=	1 oz.
2 tbsp. sugar (granulated)	=	1 oz.
2 tbsp. wine	=	1 oz.
3 tbsp. corn meal	=	1 oz.
3 tbsp. farina	=	1 oz.
3 tbsp. gum gluten flour	=	1 oz.
3 tbsp. graham flour	=	1 oz.
3 tbsp. white flour (not sifted)	=	1 oz.
4 tbsp. cocoa	=	1 oz.
4 tbsp. coffee (powdered)	=	1 oz.
4 tbsp. flour (sifted)	=	1 oz.

A cubic centimeter of water weighs 1 gram; 28.35 grams	=	1 oz.
2 tbsp. liquid	=	1 fluid oz.
4 tbsp. liquid	=	1 wineglassful
1 tea cup	=	4 fluid oz.
1 coffee cup	=	8 fluid oz. or ½ pt.
1 ordinary glass	=	8 fluid oz. or ½ pt.
A liter of water weighs 1 kilogram; 1 kilogram of water	=	2.2 lb.
1 pt. milk or water	=	16 oz. = 1 lb.
2 c. butter (packed solidly)	=	16 oz.
2 c. finely chopped meat (packed solidly)	=	16 oz.
2 c. granulated sugar	=	15 oz.

2 c. rice	= 16 oz.
2¾ c. powdered sugar	= 16 oz.
2¾ c. brown sugar	= 16 oz.
2¾ c. oatmeal	= 16 oz.
4 c. sifted flour	= 16 oz.
4¾ c. rolled oats	= 16 oz.
8 eggs, average size (with shell)	= 16 oz.

(counting 1½ lbs. to 1 doz. eggs, which is standard weight of a dozen.)

Apothecaries' Weights and Measures

APOTHECARIES' WEIGHTS

20 grains	= 1 scruple, ℈
3 scruples	= 1 drachm, ʒ
8 drachms (or 480 grains)	= 1 ounce, ℥
12 ounces	= 1 pound, lb.

APOTHECARIES' MEASURES

60 minims (M)	= 1 fluid drachm, fʒ
8 fluid drachms	= 1 fluid ounce, f℥
16 fluid ounces	= 1 pint, 0 or pt.
2 pints	= 1 quart, qt.
4 quarts	= 1 gallon, gal.

APPROXIMATE MEASURES

1 teaspoonful	= about 1 fluid drachm.
1 dessertspoonful	= about 2 fluid drachms.
1 tablespoonful	= about 4 fluid drachms or ½ fluid ounce.
1 wineglassful	= about 2 fluid ounces.
1 teacupful	= about 4 fluid ounces.
1 cupful	= about 8 fluid ounces or ½ pint.
1 tumblerful	= about 8 fluid ounces or ½ pint.

The Metric System

The unit of weight in the metric system is the gram. A gram is about 1/30 (exact 28.35) of an ounce. The kilogram is 1000 grams. Kilogram is abbreviated to kg.; 1 kg. = 2.2 pounds. The unit measure of fluid volume is the cubic centimeter (c.c.). A cubic centimeter of water weighs 1 gram (1 gm.). A liter is 1000 c.c. This is a great help, as it makes it possible to either weigh fluids on a balance or measure them in a graduate. A good balance for weighing food is the Chatillon gram scale with movable disk.

Weights and Measures[1]

APPROXIMATE EQUIVALENTS

1	ounce	= about 30 gm. (exact 28.35).
2.2	pounds	= 1000 gm. or 1 kg.
1	fluid ounce	= 30 c.c. and weighs about 30 gm. (exact 28.35).
1	quart	= 1000 c.c. or 1 liter and weighs about 1000 gm.
1	teaspoon, fluid	= 5 c.c.
1	dessertspoonful, fluid	= 10 c.c.
1	tablespoonful, fluid	= 15 c.c.
1	large cup or tumbler.......	= 240 c.c.

To convert ounces to grams, multiply the ounces by 30.
To convert pounds to kilograms, divide the pounds by 2.2.
To convert kilograms to pounds, multiply the kilograms by 2.2.
To convert cubic centimeters to ounces, divide the number of cubic centimeters by 30.

Table of Equivalents

Below is given a table of denominations of weights and measures, opposite which are placed their equivalents in the metric system, with corresponding equivalents in wine measure and avoirdupois weights:

LIQUIDS	APPROXIMATE EQUIVALENT	EXACT EQUIVALENT
1 minim	0.06 cubic centimeter	0.061 c.c.
1 fl. drachm	4 c.c.	3.696 c.c.
1 fl. oz.	30 c.c.	29.574 c.c.
4 fl. ozs. or ¼ pint	118 c.c. (⅛ liter)	118.295 c.c.
8 fl. ozs. or ½ pint	236 c.c. (¼ liter)	236.590 c.c.
16 fl. ozs. or 1 pint	437 c.c. (½ liter)	473.197 c.c.
2 pints	1 liter (1000 c.c.)	.946 liter.
4 pints or ½ gallon	2 liters.	1.892 liters.
1 gallon	4 liters.	3.785 liters.
1 cubic centimeter.	16 minims.	16.23 mins.
4 c.c.	1 fluid drachm.	1.082 fl. drs.
30 c.c.	1 fl. oz.	1.014 fl. ozs.
470 c.c.	1 pint.	15.892 fl. ozs.
1000 c.c. (1 liter)....	2⅒ pints	2.113 pints.
4 liters	1 gallon.	1.056 gals.

[1] Modified from Wilder-Foley Elithorpe, "A Primer for Diabetic Patients," W. B. Saunders, Phila., Pa.

SOLIDS	APPROXIMATE EQUIVALENT	EXACT EQUIVALENT
1 gr.	0.065 gr.	0.064798 gm.
15 grs.	1.0 gr.	0.972 gm.
1 oz.	28.0 gr.	28.350 gm.
1 lb.	450.0 gr.	453.592 gm.
1 milligramme (0.001 gm.) ..	1/65 grain	0.015 grain.
1 gm.	15½ grs.	15.4324 grs.
28 gm.	1 oz. (437½ grs.)	432.107 grs.

CONVERSION TABLES—OUNCES AND POUNDS TO GRAMS[1]

A. OUNCES TO GRAMS

Ounces	Grams	Ounces	Grams
1/16	1.77	2	56.70
1/15	1.89	3	85.05
1/14	2.02	4	113.40
1/13	2.19	5	141.75
1/12	2.36	6	170.10
1/11	2.58	7	198.45
1/10	2.84	8	226.80
1/9	3.15	9	255.15
1/8	3.54	10	283.50
1/7	4.05	11	311.84
1/6	4.73	12	340.20
1/5	5.67	13	368.54
1/4	7.09	14	396.90
1/3	9.45	15	425.25
1/2	14.17	16	453.60
1	28.35		

B. POUNDS TO GRAMS

Pounds	Grams	Pounds	Grams
1	453.6	6	2722
2	907	7	3175
2.2	1000	8	3629
3	1361	9	4082
4	1814	10	4536
5	2267		

[1] Mary Swartz Rose, Ph.D., "A Laboratory Handbook for Dietetics," The Macmillan Co., New York.

CONVERSION TABLE—GRAMS TO OUNCES[1]

Grams	Ounces	Grams	Ounces
1	0.035	56	1.975
2	0.071	57	2.010
3	0.106	58	2.046
4	0.141	59	2.081
5	0.176	60	2.116
6	0.212	61	2.151
7	0.247	62	2.187
8	0.283	63	2.222
9	0.317	64	2.257
10	0.353	65	2.293
11	0.398	66	2.328
12	0.423	67	2.363
13	0.458	68	2.398
14	0.494	69	2.434
15	0.529	70	2.467
16	5.564	71	2.504
17	0.599	72	2.539
18	0.635	73	2.575
19	0.670	74	2.610
20	0.705	75	2.645
21	0.741	76	2.861
22	0.776	77	2.716
23	0.811	78	2.751
24	0.846	79	2.786
25	0.882	80	2.822
26	0.917	81	2.857
27	0.953	82	2.892
28	0.998	83	2.927
29	1.023	84	2.963
30	1.058	85	2.998
31	1.093	86	3.033
32	1.128	87	3.068
33	1.164	88	3.104
34	1.199	89	3.139
35	1.234	90	3.174
36	1.269	91	3.210
37	1.305	92	3.245
38	1.340	93	3.280
39	1.376	94	3.315
40	1.411	95	3.351
41	1.446	96	3.386
42	1.481	97	3.421
43	1.517	98	3.457
44	1.552	99	3.492

[1] Mary Swartz Rose, Ph.D., "A Laboratory Handbook for Dietetics," The Macmillan Co., New York.

CONVERSION TABLE—GRAMS TO OUNCES[1]

Grams	Ounces	Grams	Ounces
45	1.587	100	3.527
46	1.622	113	4
47	1.658	200	7
48	1.693	227	8
49	1.728	250	8.8
50	1.764	300	10.5
51	1.799	400	14
52	1.834	453.6	16
53	1.869	500	17.6
54	1.905	907	32
55	1.940	1000	35.2

Thermometry

The thermometers used by the nurse in cookery, in regulating the heat of the room or in taking the patient's temperatures are chiefly of the Fahrenheit scale. Scientists employ the Centigrade scale in most countries. While thermometers are made with both scales, it is a simple matter to translate the ordinary Fahrenheit to Centigrade.

The freezing point of the latter is 0°, while that of the former is 32° above 0°.

The boiling point of the latter is 100°, while that of the former is 212°.

In order to change Fahrenheit to Centigrade it is necessary first to subtract 32° from 212° in order that the freezing points may correspond. This gives 180° F. as equal to 100° C., or 1° F. equal to 100/180 or 5/9 of a degree C. Any number of degrees F. is therefore equal to 5/9 of the same number C.

Example: Change 212° Fahrenheit to Centigrade.

$$212° - 32° = 180°. \quad 180° \times 5/9 = 100° \text{ C.}$$

Conversely, 1° C. is equal to 180/100 or 9/5 of a degree F. Any number of degrees C. is therefore equal to 9/5 of the same number F.

Example: Change 100° Centigrade to Fahrenheit.

$$100° \times 9/5 = 180°. \quad 180° + 32° = 212° \text{ F.}$$

[1] Mary Swartz Rose, Ph.D., "A Laboratory Handbook for Dietetics," The Macmillan Co., New York.

QUESTIONS FOR STUDY

1. What difference does it make whether flour, meal, etc., are sifted before measuring?
2. Describe a standard measuring cup.
3. How would you measure a cupful of dry material?
4. How would you measure a spoonful of dry material? A half-spoonful? A quarter-spoonful?
5. Give the method for measuring solid fats.
6. What is the difference between one tablespoon of butter melted and one tablespoon of melted butter? Between one cupful of flour sifted and one cupful of sifted flour?
7. The following measures and weights are so frequently needed by the nurse that they should be memorized, but it is equally important that she familiarize herself with the entire contents of the tables, in order that she may know where to turn quickly for useful information.
   (a) How many tablespoons are there in one cup?
   (b) How many teaspoons are there in one tablespoon?
   (c) How many cups in one pint?
   (d) How many pints in one quart?
   (e) How many tablespoons of butter in one ounce?
   (f) How many tablespoons of flour in one ounce?
   (g) How many tablespoons of sugar in one ounce?
   (h) How many cups of butter in one pound?
   (i) How many cups of granulated sugar in one pound?
   (j) How many cups of sifted flour in one pound?
   (k) How many grams in one ounce?
   (l) How many ounces in one pound?
   (m) How many grams in one pound?
   (n) How many grams in one kilogram?
   (o) How many pounds in one kilogram?
8. Change 160 degrees Fahrenheit to Centigrade.
   Change 70 degrees Centigrade to Fahrenheit.

PART II

ANIMAL FOODS
VEGETABLE FOODS
NUTRITIOUS DESSERTS
BEVERAGES

CHAPTER VIII

ANIMAL FOODS

The important foods derived from the animal kingdom are: Meat—Poultry and Game—Fish—Shell Fish—Eggs—Milk and Milk Products—Sweetbreads—Gelatin[1]—Beef Preparations—Meat Broth and Jellies.

Animal foods as a class are rich in protein. Some of them contain also considerable quantities of fat. With the exception of the lactose in milk and glycogen in shell fish, the amount of carbohydrate present is negligible.

Meat

The term meat includes the flesh of all animals used for food, as beef, veal, mutton, lamb, pork, poultry and game.

Composition of Meat.

1. Muscle fibers, composed of proteins, extractives, inorganic salts and water.
   The principal protein is albumin. Muscle albumin is often called myosin.
2. The nitrogenous extractives include creatin, creatinin and purins. (See page 15-16.)
3. The inorganic salts are chiefly those of potassium, sodium, magnesium, phosphorus, chlorine, sulphur and iron.
   The greater part of the iron is in combination with the hemoglobin of the red blood corpuscles.
4. Connective tissue which binds together the muscle fibers; this consists chiefly of a protein called collagen which yields gelatin on boiling.
5. Fat interspersed between the fibers.

[1] For Gelatin, see chapter "Nutritive Desserts", page 275.

Nutritive Value.—Meat is rich in proteins of high value in nutrition (see page 15-16), is also more or less rich in fat, contains considerable iron, a moderate amount of phosphorus and is very poor in calcium.

Meat is lacking in carbohydrates and unless a large amount of fat is present is to be regarded as a source of nitrogen rather than of energy. It should be remembered however that protein can be burned in the animal body to supply energy (see page 15). Since protein is burned at a faster rate than fat and carbohydrate, and since very little of the nitrogen, beyond that necessary for growth and repair, can be stored in the body, it is most advantageously used in small amounts along with plenty of fats and carbohydrates.

It is a relatively poor source of vitamines especially of the antiscorbutic vitamine.

The nitrogenous extractives of meat have no nutritive value and in fact, represent products either of waste (katabolism) or of insufficient oxidation. Unless properly excreted they may cause an excess of uric acid or other disorders. However, they bestow upon meat its characteristic flavor and odor, act as stimulants to the secretion of gastric juice and exert on the nervous system a stimulating influence similar to that of tea and coffee.

Digestibility of Meat.—Meat usually is easily digested and shows a high percentage of absorption from the digestive tract. The extractives probably aid to some extent by stimulating the flow of gastric juice.

The amount of fat present influences the rapidity of digestion.

Absorption of Meat.—Meat is very readily absorbed and leaves little residue in the intestines, only 3 per cent. of meat taken being lost in the process of digestion.

Effect of Cooking Meat.—Proper cooking makes meat more digestible as it softens the connective tissues, thus causing a separation of the muscular fibers and enabling the digestive juices to act more advantageously. The color and flavor are improved. There is a loss of weight by evaporation of water and loss of mineral matter and some extractives. The loss of water concentrates the nutrients thus rendering cooked meat proportionally more nutritious than raw meat.

Objective Points and Methods in Cooking:

1. To retain the juice, as in baking, broiling, boiling and frying.
2. To extract the juice, as in soups.
3. To extract and retain the juice, as in stews.

The Principal Constituent of meat to be considered in cooking is the albumin. Note page 17 for albumin.

Cooking of Meat.—Heat penetrates meat slowly. At a temperature of 158 degrees Fahrenheit, the meat assumes a gray color as a result of the decomposition of the coloring matter of the blood. At the same time a peculiar odor of cooking develops, due to chemical changes produced by the heat.

At a temperature above 104 degrees Fahrenheit, meat begins to lose weight from the separation of water, which contains salts and nitrogenous extractives. This process continues as the temperature rises, except that coagulable proteins no longer separate with the water.

Coagulation of the albumin is an important factor in cooking meat and the degree varies with the mode of cooking.

As broiling is the preferred way of preparing meat for the sick and convalescent it is taken up in detail in this chapter.

Broiling.—In broiling, the meat is to be cooked in its own juices; it is therefore evident that these must be retained as completely as possible. At first the temperature should be sufficiently high quickly to coagulate, and even to harden the albumin on the outside surface, so as to form a layer or protecting coat over the whole; then the heat should be modified so that the interior will be raised to a temperature that will cook it properly without loss of its nutritive properties.

In broiling we partially sacrifice the outer layer of the meat in order to preserve the inner portion.

The time for cooking will be different for different kinds of meat. Beef and mutton require a shorter time than lamb, chicken or game.

A piece of meat properly broiled swells and when cut the liquid portion flows out readily, but if cooked too long the albumin inside coagulates and the meat loses its moisture, shrinks and becomes tough.

Effect of Cold and Hot Water on Meat.—Cold water draws out the soluble albumin, the extractives and some of the salts and flavor; thus in soups, broths and stews, where all the nutriment possible is desired in the liquid, the meat is first put into cold water and gradually brought to a higher temperature.

Hot water or dry heat coagulates albumin and since if subjected to too high a temperature this becomes tough and indigestible, we must note carefully the proper temperature of cooking. Often it is necessary to sacrifice a small amount of albumin by exposing the meat to a high temperature for a short time to form an outside coating in order to retain the rest of the juices more effectively, after which the connective tissue can be softened by gentle simmering for several hours.

The Quality of Meat depends upon the age, environment, care and feeding of the animal and the time of hanging after slaughtering. It also depends greatly on the cuts used.

The tougher and less expensive cuts, if properly cooked, are as nutritious and as easily digested as the expensive cuts. However, tough meats take long, slow cooking to make them palatable and tender and the fuel used must be taken into consideration in the expense. Tough meats are muscles which the animal uses most, as the legs (especially the lower part), neck, etc.; they are more highly flavored on account of the freer circulation of blood through these portions. Cuts from the neck and shin are used for soups and broths.

The tender and more expensive cuts are from the muscles which the animal uses least, as the upper portion of the hind quarter (rump, sirloin) and the fore ribs. The circulation of blood through these portions is less and they are not as juicy and well flavored nor are they any more nutritious than tougher portions. These tender cuts are used for steaks and roasts.

The remaining muscular portions of the animal (flank, shoulder and brisket) are not as tender as the upper portion of the hind quarter but are fully as nutritious. They require longer cooking and are used for stews, braising and pot roast.

Internal Organs or Animal Viscera used as food are the heart, tongue, brain, kidneys, liver, pancreas, thymus glands and paunch. Although some are as easily digested as most muscle tissue, they are not as nutritious and most of them produce large quantities of uric acid in the body.

The heart and kidneys are not as easily digested as other meats on account of their close and firm texture and should be eaten only by those of good digestive powers.

The tongue is not very easily digested, for although the lean meat is tender the fat is hard and tends to retard digestion in the stomach.

The brain and liver are usually easily digested.

The paunch is the third stomach of the ox and called tripe. When properly cooked it is easily digested.

The pancreas and thymus glands of the calf or lamb are sold under the name of sweetbreads. They are most easily digested, but give rise to considerable quantities of uric acid in the body. Note Chapter on Sweetbreads, page 130.

Beef.—The best beef is obtained from the steer of three or four years of age. After killing, the animal should hang for two or three weeks.

Test for Good Beef.—The flesh is firm and fine grained in texture; bright red in color when first cut and upon exposure to air; looks juicy and well-mottled and coated with fat, which is firm and of yellowish color.

Veal.—The flesh of the calf is difficult of digestion and should be used in the sick room only for making broth. It should never be eaten by those of weak digestion. It contains less albuminous substances and more gelatin than beef.

Test for Good Veal.—It should be of a pinkish color, with clear, firm, white fat, fine grained and tender. The cut most used for broth and soup is the lower part of the leg known as the knuckle.

Mutton.—The best quality of mutton comes from a sheep from three to five years old; after killing it should be allowed to hang in order to ripen and develop the flavor.

Test for Good Mutton.—The flesh is fine grained, bright pink in color, the fat is white, hard and flaky and the skin comes off easily. The bones of mutton are white and smooth and round at the joints.

Lamb.—Lamb is sold as "spring lamb" when killed at six weeks to three months old. It is very expensive and comes into the market early in the year—February and March. Lamb is usually killed when less than a year old and should be sold immediately after killing. In this respect it differs from beef and mutton, which should hang after killing to ripen and develop the flavor.

Test for Lamb.—Lamb can be distinguished from mutton by the pinkish color of the bone and the serrated joints.

Pork.—The flesh of the pig is the least digestible of all meats on account of the high percentage of fat which it contains. Consequently it is not used in cookery for the sick, with the exception of sometimes a small amount of ham, salt pork or bacon, the salty taste of which occasionally acts as a stimulant to the lost appetite of the convalescent. Bacon is more easily digested than other cuts of pork. It comes from the side and is cured by salting and smoking.

Next to butter and cream, bacon fat is the most easily assimilated of ordinary food fats.

Cuts of Meat.[1]—The method of cutting sides of beef, veal, mutton and pork into parts and the terms used for the different "cuts", as these parts are commonly called, vary in different localities. The diagrams show the positions of the different cuts, both in the live animal and in the dressed carcass, as found in the markets. The lines of division between the different cuts will vary slightly according to the usage

[1] This section is quoted from Atwater and Bryant, Bulletin No. 28, Office of Experiment Stations, United States Department of Agriculture, Washington, D. C.

of the local market, even where the general method of cutting is as here indicated. The names of the same cuts likewise vary in different parts of the country.

Cuts of Beef

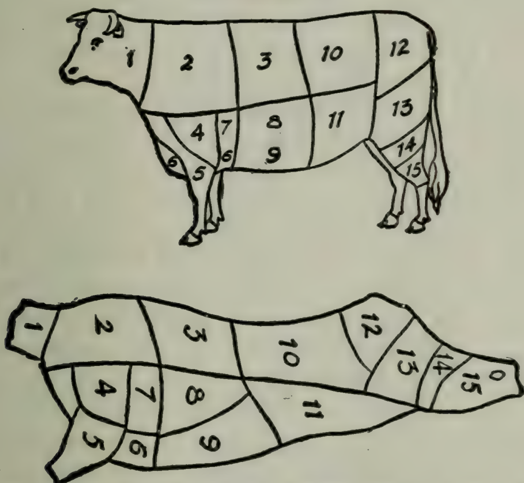


Fig. 5.—Diagrams of cuts of beef: 1, Neck; 2, chuck; 3, ribs; 4, shoulder-clod; 5, fore-shank; 6, brisket; 7, cross-ribs; 8, plate; 9, ravel; 10, loin; 11, flank; 12, rump; 13, round; 14, second cut round; 15, hind-shank.—(Atwater and Bryant, Bulletin No. 28, Office of Experiment Stations, United States Department of Agriculture.) Send for Bulletin for cuts of Veal and Pork.

The general method of cutting up a side of beef is illustrated in Fig. 5, which shows the relative position of the cuts in the animal and in a dressed side. The neck piece is frequently cut so as to include more of the chuck than is represented by the diagrams. The shoulder-clod is usually cut without bone, while the shoulder (not included in diagram) would include more or less of the shoulder blade and of the upper end of the fore-shank. Shoulder steak is cut from the chuck. In many localities the plate is made to include all the parts of the fore-quarter designated on the diagrams as brisket, cross-ribs, plate and navel while different portions of the plate as thus cut are spoken of as the "brisket end of plate" and "navel end of plate." This part of the animal is largely used for corning. The ribs are frequently divided into first, second, and third cuts, the latter lying nearest the chuck and being slightly less desirable than the former. The chuck is sometimes sub-divided in a similar manner, the third cut of the chuck being nearest the neck. The names applied to different portions of the loin vary considerably in different localities. The part nearest the ribs is frequently called "small end of loin" or "short steak." The other end of the loin is called "hip sirloin" or "sirloin." Between the short steak and the sirloin is a portion quite generally called the "tenderloin," for the reason that the real tenderloin, the very tender strip of meat lying inside the loin, is found most fully developed in this cut. Porterhouse steak is a term most frequently applied to a combination of the sirloin and the tenderloin. It is not uncommon to find the flank cut so as to include more of the loin than is indicated in the figures, in which case the upper portion is called "flank steak." The larger part of the flank, however, is very frequently corned, as is also the case with the rump. In some markets the rump is cut so as to include a portion of the loin, which is then sold as "rump steak." The portion of the round on the inside of the leg is regarded as more tender than that on the outside and is frequently preferred to the latter. As the leg lies upon the butcher's table, this inside of the round is usually on the upper or top side and is therefore called "top round." Occasionally the plate is called the "rattle."

Fig. 7 shows the relative position of the cuts in a dressed side of mutton or lamb and in a live animal. The cuts in a side of lamb and mutton number but six, three in each quarter. The chuck includes the ribs as far as the end of the shoulder blades, beyond which comes the loin. The flank is made to include all the under side of the animal. Some butchers, however, make a large number of cuts in the forequarter, including a portion of the cuts marked "loin" and "chuck" in Fig. 7, to make a cut designated as "rib," and a portion of the "flank" and "shoulder" to make a cut designated as "brisket." The term "chops" is ordinarily used to designate portions of the loin, ribs, chuck or shoulder, which are either cut or "chopped" by the butcher

Cuts of Lamb and Mutton

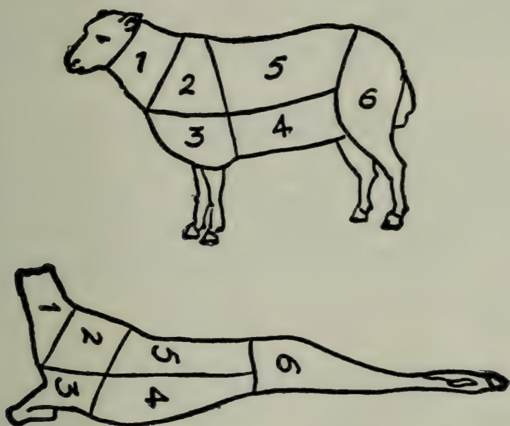


Fig. 7.—Diagrams of cuts of lamb and mutton: 1, Neck; 2, chuck; 3, shoulder; 4, flank; 5, loin; 6, leg.—(Atwater and Bryant, Bulletin No. 28, Office of Experiment Stations, United States Department of Agriculture.)

into pieces suitable for frying or broiling. The chuck and ribs are sometimes called the "rack."

Energy Value of Meat

See Table, under names of meat, as Beef—Mutton—Lamb—Bacon—Ham, etc.

See Table, page 58, for energy value of other ingredients.

TO BROIL STEAK

Wipe, trim off the superfluous fat. Heat and grease the broiler with some of the fat. Place meat in broiler with fat edge next to handle and broil over a clear fire, turning every ten seconds for the first minute, holding broiler near the coals that the surface may be well seared, thus preventing escape of juices; then cook at lower temperature, holding the broiler higher.

Steak cut one inch thick will take five minutes if liked rare, and eight minutes if well done; one and one-half inch thick, eight to ten minutes. Serve on a hot platter and season with butter, salt and pepper, or with Maître d'Hôtel Butter.

Note: Steak should be cut at least one inch thick; many prefer it much thicker. The most tender steaks are tenderloin, sirloin and cross-cut of rump. Sirloin, porterhouse (a thick slice of sirloin with tenderloin attached), cross-cut of the rump and top of the round are all good steaks. The top of round is solid meat and a cheap steak, is tender if cut from animal of right age and is the second or third cut from top of round.

MAÎTRE D'HÔTEL BUTTER, 405 CALORIES

¼ cup butter.
½ teaspoon salt.
⅛ teaspoon pepper.
1 tablespoon chopped parsley.
1 tablespoon lemon juice.

Rub the butter to a cream; add salt, pepper, parsley and lemon juice. Spread on hot beefsteak.

PAN-BROILED BEEF CAKES[1]

Use steak from upper part of round and with a small piece of suet put all through a meat chopper; without seasoning, shape into small, flat, circular cakes. Into sauté pan or frying-pan put a little beef fat; when smoking hot, put in the cakes and cook a few moments on each side and turn; it will take about five minutes to cook them. Season well with salt, pepper and butter and serve on hot platter. Do not add salt before cooking, as it toughens the meat.

MUTTON CHOPS BROILED[1]

Cut away the tough outside skin, trim off a part of the

[1] For Scraped Beef note page 125.

fat. Broil same as steak—that is, close to the glowing coals for about one minute, turning every ten seconds, then cook at a lower temperature, holding the broiler higher. Will take four or six minutes for a chop one inch thick. Mutton, like beef, should be served rare. Season chops with salt and pepper but not with butter as the meat is rich and fat and does not require it.

LAMB CHOPS BROILED[1]

Prepare and broil same as mutton chops, except that they are to be well done instead of rare. To accomplish this about three minutes longer cooking will be required; for a chop one inch thick, from eight to ten minutes.

FRENCH CHOPS[1]

Trim a chop until there is nothing left but the round muscle at the thick end, with a little fat about it. Cut away all the meat from the bone, which will then look like a handle with a meat morsel at one end. Broil and season. Serve on hot platter with paper handles on chops and garnish with parsley and peas.

PAN-BROILED CHOPS[1]

Chops are fairly good pan-broiled. The same principle is to be followed as in the cooking over coals—that is, a high degree of heat at first, to sear the outside before the juice escapes, and a lower temperature afterward—therefore, heat the sauté pan or frying-pan exceedingly hot (use no fat), drop in the chop, count ten and turn, repeating for about one minute, then draw the pan to the back or side of the stove and finish cooking slowly. A chop one inch thick will be perfectly done in from five to seven minutes. If the pan is hot enough at first there will be no loss of juice or flavor. Season and serve in the same manner as broiled chops.

[1] Chops average 300 Cal. per 100 gms.

CHOPS (OR BIRDS) BROILED IN PAPER[1]

Prepare a chop as for pan-broiling. Spread a piece of paper evenly and thickly with butter. Lay on it a nicely trimmed chop and double the paper with edges together. Fold and crease the edges on the three sides, then fold and crease again, so that the butter cannot run out. These folds should be half-an-inch wide. It will be necessary to have the sheet of paper—foolscap or heavy white paper—considerably more than twice as large as the chop. Broil over coals, not too near, *turning often* so that the temperature will not get so high as to ignite the paper. A chop broiled in this way is basted in the butter and in its own juices and is very delicate. A chop three-quarters of an inch thick will cook in five minutes; one an inch thick, in eight.

Should the paper ignite, it need not destroy the chop. Take it out and put into a fresh paper and try again. The chop should be served hot, seasoned with salt and pepper.

Note: Birds may be broiled in the same way.

BROILED BACON

Cut bacon into slices as thin as possible and remove rind. Put into broiler, placing broiler over baking pan and cook in hot oven until crisp.

CURLED BACON

Heat sauté pan very hot. Put in strips of very thin sliced bacon. As fat is drawn out, pour it off into cup; cook bacon until crisp and brown. Drain on brown paper.

BROILED HAM

Cut slices of ham one-third inch thick. If very salt soak fifteen minutes in lukewarm water; broil three minutes or until brown on both sides, turning frequently. A slice of boiled ham is very delicate cooked in this same way, cooking it less time.

[1] Chops average 300 Cal. per 100 gms.

ROAST MEATS

Prepare meat, put on rack in dripping pan, dredge with salt and flour and cook in hot oven until the surface is seared, reduce the heat and cook slowly the required time.

Beef, rare	13 minutes per pound.
Beef, rare (over 5 lbs.)	18 minutes per pound.

GRAVY FOR ROAST MEATS

1 tablespoon fat.
1 tablespoon flour.
1 cup boiling water.

Pour fat from baking pan and return to pan the quantity desired. Add flour and when well browned pour on gradually the boiling water, stirring constantly. Cook five minutes, season with salt and pepper, and strain.

Beef Preparations

BEEF JUICE — BEEF TEA — RAW BEEF

Beef Juice

Composition.—The juice of meat contains some proteins in addition to salts and extractives.

General Principles in Cooking.—From raw meat we cannot obtain as much meat juice as is easily taken from the same amount of meat when previously heated.

The reason for this is that the envelope of the muscular tissue is a tough substance, which swells and dissolves when heated, yielding gelatin, and the liquid portion of the meat is easily expressed. If cooked too long the protein largely coagulates and the meat loses most of its moisture and becomes tough.

A steak thoroughly heated through swells and when cut the liquid portion flows out readily. One pound of meat yields about four ounces of juice.

Care in Serving.—In administering beef juice great care should be taken in reheating not to heat it above 136 degrees

Fahrenheit, at which temperature albumin coagulates in flakes.

Substitutes for Beef Juice.—Prepared extracts of good make may be used to advantage with beef juice to add flavor and make it more appetizing.

Absorption.—Beef juice is readily absorbed. It has very little food value but is useful where the stimulating effect due to its extractives is desirable.

Comparative Food Value of Beef Juice and Beef Tea.—Beef juice, although fourteen times as rich in proteins as beef tea, is raw in flavor and is rejected by many palates. In such a case, add a small quantity of beef tea or prepared beef extract for flavor.

Thus by the union of two bodies, one rich in proteins and the other rich in flavor, we have a superior preparation. Make a small quantity at a time, as it does not keep well.

Beef Tea

Composition.—Meat treated with hot water contains only a small percentage of solids and almost no proteins but consists chiefly of nitrogenous extractives and soluble mineral matter and water. The clear liquid which remains when the coagulated albumin is strained out of beef tea contains only extractive or flavoring substances with the soluble mineral matter of the meat. Therefore it should not be strained and if properly prepared the albumin will not be coagulated to so great an extent.

Even in strong beef tea which is carefully made the amount of proteins present has been found to be less than two per cent.

Nutritive Value.—Beef tea is valuable in the sick room not as a food, but because of its appetizing flavor and stimulating qualities.

Beef Extracts are prepared in both liquid and solid form. They have very little nutritive value, containing but four to five per cent. of protein, but are useful for their flavor and as stimulants. They are used to advantage in combination with beef juice, adding flavor and making it more palatable and appetizing.

Raw Beef

Uncooked Meat.—Raw meat is not quite as easily digested as cooked meat and owing to color and flavor is not appetizing and could not be taken continuously. However, when chopped fine or scraped free from connective tissue, it is very readily digested and can be served disguised or very slightly cooked in many dainty ways.

Comparative Food Value of Raw Beef and Beef Tea.—It can readily be seen that raw meat served chopped fine or scraped contains all the nutriment of the meat, whereas beef tea as seen from the manner of preparation, contains only the extractives and soluble mineral matter of meat.

BEEF JUICE[1] (FOR INFANTS)

100 grams (3½ oz.)=25 Calories.

One pound of *rare* round steak, cut thick (no fat), slightly broiled until the outside is seared and the meat is hot throughout. Remove and cut into small pieces and press out by means of a lemon squeezer, potato ricer, or better still a meat press. This seasoned with salt may be given cold or warmed by placing the cup which holds it in warm water. It should not be heated sufficiently to coagulate the albumin which is in solution and which then appears as flakes of meat floating in the juice.

Composition: 0.60% fat, 2.90% protein, and considerable extractive matter.

Feeding: Begin with one teaspoon and increase to six teaspoons (1 ounce) per day. Beef juice often makes the baby restless at night. According to Morse & Talbot not more than 2 ounces per day should be given a baby even in its second year.

[1]Modified from Dr. L. Emmett Holt, "The Care and Feeding of Children", D. Appleton & Co., New York City.

Note: Dr. Koplik recommends beef juice mixed with equal parts of barley water and salted to taste. Useful in forms of diarrhœa and dysentery.

BEEF JUICE BY THE COLD PROCESS[1] (FOR INFANTS)

100 grams (3½ oz.)=23 Calories.

One pound of finely chopped *rare* round steak (no fat), six ounces of cold water, a pinch of salt; place in a covered jar and stand on ice or in a cold place, five or six hours, or over night. It is well to shake occasionally. This is now strained and all the juice squeezed out by placing the meat in a coarse muslin and twisting it very hard. It is then seasoned and served like beef juice.

Beef juice so made is not quite as palatable as that prepared from broiled steak but it is even more nutritious and is more economical, as fully twice as much juice can be obtained from a given quantity of meat. Beef juice prepared in either of these ways is greatly to be preferred to the beef extracts sold.

BEEF TEA WITH HYDROCHLORIC ACID

100 grams (3½ oz.)=25 Calories.[1]

Select one-half pound of good beef; remove everything that is not clear meat. Chop fine. Put in pint fruit jar and add one cup cold water and five drops *dilute hydrochloric acid.* Stir and set in refrigerator or any cold place for two hours to digest. Then strain, season with salt and serve in some dainty china cup on account of color. If one should object to color, heat the tea in a double boiler till color just changes. Do not strain. Beef tea made in this way is recommended by physicians for feeble children and patients much weakened by sickness.

BEEF TEA

½ pound steak.
1 cup cold water.
Salt.

[1] Modified from Dr. L. Emmett Holt, "The Care and Feeding of Children", D. Appleton & Co., New York City.

Wipe steak, remove all fat and cut in small pieces. Put into glass fruit jar, add the cold water and let stand fifteen minutes to draw out the juice. Cover jar, using rubber band and cover, place on trivet in a kettle and surround with cold water. Allow water to heat slowly to 150° F. (no higher), and keep at this temperature two hours. Strain and season with salt. Remove fat with soft paper or bread. Reheat over hot water to 130° F. and serve in heated cups.

Note: If possible cool beef tea before serving that fat may be removed more thoroughly.

BEEF TEA FROZEN

Beef tea may be frozen to the consistency of a water ice. Very grateful to a fever patient.

SCRAPED BEEF OR MEAT PULP (FOR INFANTS)

100 grams=142 Calories.

A piece of rare round or sirloin steak (no fat), one-half to one inch thick. Lay it on a meat board and with a large, heavy mixing spoon scrape the soft part of either side, leaving the tough fibers. From one-half to one tablespoonful may be given, well salted, to a child of eighteen months. Scraping is much better than cutting the meat fine.

For use on a large scale, as in institutions, a Hamburg-steak cutter may be employed.

Scraped beef for the adult may be shaped into small, round cakes one-half inch thick and broiled two minutes or cooked in a hot, dry frying-pan, never in fat. A little salt and butter may be added if desired. Serve plain or on rounds of toast.

RAW BEEF SANDWICHES

1 ounce scraped beef............... = 40 Calories
1 ounce bread (1 slice)............ = 73 Calories

Prepare meat as for scraped beef, season and spread on bread cut very thin. Put slices on top, sandwich-fashion, and cut in fancy shapes. Serve in this manner or toast daintily.

Broth and Meat Jellies

Broth is a liquid containing the juices of soluble parts of meat and bone which have been extracted by long, slow cooking.

This liquid is more or less solid when cold, according to the gelatinous nature of the ingredients. It varies greatly in quantity, according to the manner in which it is prepared and the material used. The cheaper cuts of meat are usually taken for this purpose.

Composition.—Broth contains almost no proteins. It consists chiefly of extractives and soluble mineral matter with a little gelatin.

Objective Point and General Principles in Cooking.—The chief object in making broth is to obtain the largest possible amount of nutriment from the meat. This is best accomplished by observing the following rules:

1. Cut meat into small pieces.
2. Soak in cold water before heating.
3. Use a careful selection and proportion of meat, bone and water. (The usual proportion is one pint of water to one pound of meat.)
4. Season judiciously.
5. Use steam-tight kettle; simmer (not boil), that the juice may be fully extracted.
6. Make it the day before using, that the fat may be removed more easily.
7. Cook long and slowly.

Broth may be made from beef, mutton or chicken. Rice, barley, white or whole egg, etc., may be added, if allowed, to increase the quantity of nourishment.

Comparative Value of Broth and Beef Tea.—Broth differs from beef tea in that it contains gelatin, besides the extractives or flavoring substances and soluble mineral matter that are found in beef tea. Gelatin is obtained from meat and bones by long, slow cooking and is useful in convalescence and in febrile states. (Note "Gelatin," p. 275.)

Meat Jellies are a condensed form of broth and form an agreeable way of serving broth to an invalid. Although they contain little nourishment they are appetizing and stimulating.

Energy Value of Broth

Very few analyses of broths are available, hence no attempt has been made to state the calories under each recipe. The following table gives an approximate idea of their energy value:

Beef broth	100 grams yield 16.5 Calories
Beef juice	100 grams yield 25 Calories
Clam bouillon	100 grams yield 2 Calories
Consomme	100 grams yield 12 Calories

Food that may be added for extra nutriment

1 whole egg (average)	50 grams yield 74 Calories.
White of 1 egg (average)	33 grams yield 17 Calories.
Yolk of 1 egg (average)	17 grams yield 60 Calories.
1 tablespoon rice	15 grams yield 50 Calories.
1 tablespoon barley flour	17.01 grams yield 53 Calories.
1 tablespoon soy bean flour	4 grams yield 30 Calories.

MUTTON BROTH (FOR INFANT OR ADULT)

2 pounds lean mutton, cut from fore quarter with bones.
1 quart cold water.
2 pinches of salt.

Wipe meat, remove skin and fat and put through a meat chopper, add water and salt. Simmer (do not boil) for four hours over a slow fire down to one pint, adding more water if necessary; strain through muslin and when cold carefully remove the fat, adding more salt if required. It may be reheated in a double boiler and served hot, or cold in the form of a jelly.

A very nutritious and delicious broth is made by thickening this with cornstarch or arrowroot, cooking for ten minutes and then adding three ounces of milk, or one ounce of thin cream, to a half pint of broth.

For the Adult more seasoning may be used; salt, pepper and if desired a teaspoon of chopped parsley and one teaspoon of hot cooked rice just before serving. Strain broth through a coarse sieve in place of muslin.

BEEF AND VEAL BROTH

These are made and used in precisely the same manner as mutton broth. (Use cut from loin or knuckle of veal).

CHICKEN BROTH

3½ pounds chicken.
3 pints cold water.
2 tablespoons rice.
1 teaspoon salt.
Speck pepper.

Thoroughly clean a chicken (see "Poultry," p. 134), removing skin and fat; separate at the joints and wipe with a wet cloth. Put in kettle, add the cold water and let stand one-half hour. Heat very slowly and simmer three hours, or until meat is tender. When half-cooked skim off fat and add the rice and seasonings (and if desired, a small onion). When meat is tender, skim off fat and strain, taste and season properly and serve hot. When possible, make broth the day before using, that it may be thoroughly cooled and the fat removed easily. Reheat in a double boiler. The rice may be cooked and rubbed through strainer before adding to broth, or it may be omitted if desired. An old fowl, not too fat, is best for broth.

CLAM BROTH NO. I

Take five clams, wash and scrub well and put in saucepan with cold water to cover. Cook until shells open, remove from pan and take out clams. Chop and put them back into broth. Cook fifteen minutes. Strain through muslin; serve hot. If too strong flavor, add hot water.

Note: If made in large quantity, use two or three clams to one cup of water. Clam broth ready for use is put up in bottles and called Burnham's Clam Bouillon. Broth may be frozen to the consistency of a frappé.

CLAM BROTH NO. II

½ cup clam broth or Burnham's Clam Bouillon.
1 cup water or milk.
Pepper.
¼ teaspoon butter.

Blend the clam broth and water (or milk) and heat to the boiling point. Season with salt to taste and if allowed, a little pepper and the butter. Serve hot in dainty cups.

EGG BROTH

If one cannot conveniently get protein from meat, a broth may be made by means of hot water into which an egg has been stirred. Heat three tablespoons of water to not above 149 degrees F. (below the simmering point) and pour it gradually into a raw egg. The liquid is milky if the yolk is used; clear if only the white is used. It has little taste, which is an advantage with many patients. This broth may be flavored with beef extract or hot prepared broth may be used in place of the hot water.

Note: See discussion of the digestibility of raw egg under "Albuminous Beverages," page 305.

CALVES' FOOT JELLY

100 grams=65 Calories.

2 small calves' feet.
1 quart cold water.
3 cups sherry wine[1] (best Topaz).
Juice of one lemon.
Rind of ¼ lemon (yellow part only).
½ cup cut or cube sugar.

Clean calves' feet and put into the cold water; bring slowly to boiling point, and boil five hours; skim if necessary, while cooking. Strain through cheese-cloth and allow it to stand until firm and remove the fat.

Mix lemon juice, wine, the whites and shells of eggs, sugar and beat all together until the sugar is dissolved, then add to the jelly. Place on the fire in an enamel stewpan and stir constantly until the mixture is very hot, but not boiling; strain through a jelly bag made of cotton flannel and allow the jelly to drip through same slowly. Pour into molds or glass jars and put in cold place to harden.

[1] Several varieties may be made by substituting the different flavors, brandy, rum, port wine, champagne, orange and lemon juice. Sugar may be omitted from above recipe and one-half fowl, one-half stick of cinnamon and one cup of Rhine wine added.

Calves' foot jelly, scientifically prepared in the flavors of sherry, port, rum, cognac and plain, ready for immediate use, is put up by Gordon & Dilworth, New York.

CHICKEN JELLY

3 pounds chicken.
1 quart cold water.
8 peppercorns.
Salt.

Prepare chicken as for chicken broth and cut flesh and bone into small pieces. Put into saucepan with cold water and peppercorns and let stand one-half hour. Bring slowly to the boiling point, remove scum and cook five or six hours or until meat is very tender and water is reduced to one pint. While cooking keep it below the boiling point. Skim frequently while cooking, strain through double thickness of cheese-cloth, season to taste and let stand until firm. Remove fat, reheat and turn into glass fruit jars or individual molds and cool; put in ice box until jellied.

Additional flavor may be added if desired. A stalk of celery or a small piece of bay leaf may be cooked with the chicken.

Note: Mutton Broth Jelly may be treated in the same way.

BEEF JELLY

3 pounds solid meat from the shoulder or shin.
3 pounds bone from same.
4 quarts cold water.
2 teaspoons salt.

Take off the dried skin and any soft or bloody portion. Cut the meat into small pieces and put it with the cracked bone into an earthen jar. Cover with the cold water. Set in slow oven and cook from eight to twelve hours. Strain through a colander. Add salt to taste; cool quickly. When cold remove the fat. Serve cold as a jelly, or reheat in double boiler.

Sweetbreads

Among epicures sweetbreads are considered a dainty and are certainly a most acceptable food for the sick, as they are easily digested, but they must not be used to excess on account of the large amount of uric acid which they produce.

Definition.—Sweetbreads are the pancreas and thymus glands of the calf, the word being used for either one or both organs. The thymus glands are removed and used for food while the animal lives on milk. The pancreas of the calf is sometimes called stomach sweetbread and the thymus gland the neck or throat sweetbread. The latter is considered somewhat more easily digested than the former.

Digestibility.—It is an error to state that sweetbreads are more digestible because they contain digestive ferments in life, for these are destroyed by cooking. The tenderness of these bodies is doubtless due to the delicate character of the connective tissue and to the soft character of the gland tissue itself, which is rich in nucleo-protein. The presence of this nuclein is objectionable in cases of gout and other uric acid disorders, but this is no contra-indication for an occasional use of them by invalids.

Energy Value of Sweetbreads

100 grams (3½ oz.) sweetbreads	=176 Calories
1 pair sweetbreads, medium size (8 oz.)	=399 Calories

One pair sweetbreads, medium size (8 oz.), when cooked, freed from membrane, pipe, etc., and cut into cubes, measures three-fourths cup.

TO PREPARE SWEETBREADS

(To Parboil.)

Remove from paper as soon as received from market, plunge into cold water and allow to stand one hour. Drain. Place immediately in boiling salted water to cover, allowing one-half tablespoon each of salt and vinegar to a pair of sweetbreads. Simmer twenty minutes; again drain and plunge into cold water that they may keep white and firm. Free fat and veins from membrane and serve as desired.

Sweetbreads are always prepared in this way for subsequent cooking and are spoken of as parboiled.

BROILED SWEETBREADS

Parboil and cut in halves cross-wise. Sprinkle with salt and pepper, place on a greased fine wire broiler and broil five minutes over a clear fire. As soon as sweetbread is heated brush both sides with a little melted butter. Serve with creamed butter to which has been added a little lemon juice or simply spread with soft butter.

CREAMED SWEETBREADS NO. I, 284 CALORIES

(Individual Rule.)

½ tablespoon butter.	¼ cup milk.
½ tablespoon flour.	⅓ cup sweetbreads.

Melt the butter, add flour and pour on gradually the scalding milk. Cook thoroughly and season. Add the parboiled sweetbreads cut in small pieces, reheat and serve on toast and garnish with parsley.

Note: For scalloped sweetbreads put creamed sweetbreads in small baking dish; cover with cracker crumbs and dot with bits of butter; bake until crumbs are a golden brown.

CREAMED SWEETBREADS NO. II, 1095 CALORIES[1]

(Three Servings.)

1 cup thin cream or milk.	½ teaspoon salt.
2 teaspoons butter.	¾ cup sweetbreads.
2 tablespoons flour.	

Parboil sweetbreads and cut into one-half inch cubes. Blend flour with a little cold milk to make a smooth mixture; scald cream in double boiler, add the flour mixture and cook thoroughly. Just before serving add the prepared sweetbreads, salt and butter. Serve hot on toasted rounds, and garnish with parsley, or use as a filling for Swedish timbales.

Note: May use equal proportions of cold cooked chicken and sweetbreads, reheat and serve in the cream sauce.

[1] Calculated with cream.

FRICASSEED SWEETBREADS, 214 CALORIES[1]

(Three Servings.)

Parboil and cut sweetbread into one-half inch pieces. Make a sauce using:

2 teaspoons butter.
1 teaspoon flour.
½ teaspoon lemon juice.
¾ cup hot strong chicken broth.
¼ cup cream.
Salt and pepper.

Melt the butter, add the flour, allow it to simmer until a golden brown, then add the hot broth gradually, stirring constantly, lastly the cream. Season with salt, pepper and lemon juice. A speck of curry powder may be added if desired.

Put the cut sweetbread into the sauce, simmer five minutes and serve on sippets or squares of dry toast; garnish with parsley.

SWEETBREADS WITH PEAS

1 cup of canned peas = 100 Calories.

Parboil and broil sweetbreads, arrange in center of platter and serve the peas (cooked and seasoned) around them.

Poultry and Game[2]

Poultry and game are generally classed together, poultry being applied to domesticated birds raised for their flesh or eggs or both. Wild birds are all classed as game.

Digestibility.—Chicken may be introduced early into the dietary of the convalescent, for it is one of the most easily digested of meats. Chicken is more easily digested than fowl. The white meat of the breast is particularly free from fat, has short tender fibers and small amount of connective tissues, and is therefore somewhat more rapidly digested than the dark meat.

Squab, quail, pigeons and the white meat of turkey are also fairly easily digested.

[1] Calculated without the sweetbreads.
[2] For further information, note "Poultry as Food." Farmer's Bulletin, No. 182, Dept. of Agriculture, Washington, D. C.

Duck and goose contain a large quantity of fat and are not as rapidly digested.

Game is comparatively easy of digestion but too highly flavored for most invalids. The cuts from the breast are the best for an invalid.

Test for Selecting a Chicken.—The cartilage at the end of the breast bone must be soft and pliable, the skin smooth and the feet soft. Chickens are used for broiling and roasting.

Test for Selecting a Fowl.—The cartilage at the end of the breast bone is firm, the feet are hard and dry. An old fowl, not too fat, is best for broths. One from six to eight months is best for roasting, or where the meat is desired. The proportion of bone to meat in chicken under this age makes them expensive eating.

Principles of Cooking.—In general same as for cooking of other meats.

When the layer of meat over the bones is very thin, as in young chickens or squabs, broiling is preferable to roasting.

An old fowl can sometimes be made tender without having all its flavor stewed into the broth, by cooking in a small amount of water in a double boiler for a long time, or in a fireless cooker.

A general rule for roasting chickens or turkeys is twenty minutes to the pound. Ducks and geese, having tougher fibers, require a longer time for thorough cooking.

GENERAL RULE FOR CLEANING POULTRY

Cut off head and feet and pull out pin feathers. If the bird has not been drawn, make an incision below the breast just large enough to admit the hand (or finger for the small birds). With the hand or finger, draw all the entrails out at one time. Care must be taken not to break them, especially the gall-bladder. Turn down the skin of the neck, cut off neck close to body and pull out wind pipe and crop. Cut out the oil bag which lies just above the tail. Cut through skin of the leg a little below the joint (not cutting the tendons), press against table and break and pull off foot with tendons, which will come out in breaking if chicken is young. In fowls you may have to pull them out separately with a skewer. Singe the bird by holding it over a tablespoon of burning alcohol, or paper (holding over sink). Wash by allowing the cold water to run through and over it and dry well inside and out and prepare further for broiling or roasting, etc.

DRY DRESSING FOR STUFFING, 1109 CALORIES

1½ cup stale bread crumbs.
⅓ cup butter (not melted).
Salt, pepper.
Powdered sage, marjoram, and summer savory.

Thoroughly mix ingredients and season to taste. Fill in both openings of bird, sew the skin at both ends, turn the skin of neck over and fasten to back. Oysters may be added to dressing if desired, omitting all seasonings but the salt and pepper.

TO TRUSS POULTRY

After stuffing and sewing up the openings, draw the thighs close to body and secure in place by putting a skewer through them and the body. Fold wings under back by taking end of wing and placing in under back, which fastens it. Cross the drum-sticks and tie with long string and fasten to the tail, tying string so that it will hold thighs close to the body. Cut and remove string before serving the bird.

ROAST POULTRY

Clean, stuff and truss bird and place it on its back on rack in dripping pan. Rub surface with salt and a butter and flour mixture (mix three tablespoons of butter and two tablespoons of flour and stir until creamy). Dredge bottom of pan with flour. Place in hot oven and in about ten minutes the flour should be well browned, then reduce heat of oven and cook more slowly. Baste every ten minutes with one-fourth cup of butter melted in three-fourths cup of water;

after this has been exhausted use fat in pan. Turn bird often while cooking that it may brown evenly. When cooked, remove to *hot* platter and make the gravy.

A chicken four to five pounds will require about one and one-half to two hours for cooking. Turkey (nine pounds) two and one-half to three hours. Ducks (domestic), one to one and one-half hours. Duck (wild), twenty-five to thirty minutes. Goose (nine pounds), two to two and one-half hours.

GRAVY FOR ROAST POULTRY

Clean the heart, liver and gizzard by removing the membrane, blood vessels and clotted blood from the heart. Cut liver from the gall bladder and remove all green on liver. Clean gizzard and cut through edge carefully to sac, and remove, taking care not to break it, wash giblets (that is, the heart, liver, gizzard) and the neck and put on to cook in two and one-half cups of cold water; cook slowly at the simmering point until tender.

After chicken has been removed from pan, pour off all the fat, strain and return to pan four tablespoons of fat and add four tablespoons of flour, brown together thoroughly and add gradually the water the giblets were cooked in. Cook five minutes, stirring constantly. Add hot water if gravy is too thick and salt and pepper to taste and the finely-chopped giblets.

TO BONE BIRDS

Select bird that is fresh-killed, dry-picked and not drawn. Cut off head and feet, singe and remove pin feathers, crop and oil bag. Cut off wings close to body. Lay on board breast down and cut to bone the entire length of spine. Scrape the flesh from backbone the entire length of body, working toward the breast, cutting the tendinous portions as reached. When edge of breastbone is reached, care must be taken not to break through skin. Scrape flesh from second joint and drumsticks, laying flesh back and pulling out bone (as if turning glove off inside out).

Scrape flesh from lower part of back and withdraw from carcass. Put flesh in original shape and broil, following directions for broiled quail; or stuff bird with stale bread crumbs and tie in shape with string and bake in hot oven. When cooked, remove string and tie in shape with a bit of white baby ribbon and garnish with parsley and lemon.

BROILED QUAIL

100 grams=160 Calories.

Clean, cut off the head and feet, singe and wipe with a damp cloth. With a sharp-pointed knife split the quail down the back, beginning at back of neck and cutting through the backbone the entire length of bird. Lay bird open and remove contents. Cut through tendons at joints. Wipe thoroughly. Season with salt and pepper, rub thickly with softened butter and dredge with flour. Broil ten minutes over clear coals. Serve on hot buttered toast. Garnish with toast points, parsley and currant jelly.

BROILED SQUABS

100 grams=390 Calories.

Prepare, cook and serve the same as quail.

BROILED SMALL BIRDS

All small birds can be broiled according to the directions for quail, remembering that for very small ones it takes a very bright fire, as the birds should only be browned and the time required for cooking is brief.

BIRDS BROILED IN PAPER

See chapter on Meats and follow directions for "Chops Broiled in Paper." Page 120.

BROILED CHICKEN

100 grams=108 Calories[1]

Dress for broiling, following directions given under

[1] Edible portion.

Broiled Quail. Season well with salt and pepper and rub all over with softened butter, especially breast and legs. Put in a well-greased broiler and broil over a clear fire about fifteen minutes, turning often. The flesh side must be exposed to the fire the greater part of the time as the skin side burns easily. When chicken is nicely browned, place in a dripping-pan, skin side down, in a moderate oven twelve minutes. Put on a hot dish, season with salt, pepper and butter and serve immediately.

This rule is for a chicken weighing about two and a half pounds, yielding 725 calories.

CREAMED CHICKEN, 201 CALORIES[1]

(Individual Rule.)

⅓ cup cold cooked chicken.	½ tablespoon butter.
Speck celery salt.	½ tablespoon flour.
Salt.	¼ cup rich milk.
Pepper.	

Melt butter in saucepan, add flour and gradually pour on the scalded milk. Cook thoroughly. Add chicken cut into dice and seasonings. Heat well and serve on toast rounds, garnished with toast points and parsley; or use as a filling for Swedish timbales.

Note: Chicken may be used that is removed from chicken broth when it is tender. Chicken broth may replace part of the milk in making the sauce.

SCALLOPED CHICKEN

Put creamed chicken into a small baking dish, cover with dried bread or cracker crumbs, dot with small pieces of butter and brown in oven.

JELLIED CHICKEN, ABOUT 100 CALORIES

(Individual Rule.)

1 teaspoon gelatin.	¼ cup chopped chicken.
2 tablespoons cold water.	Salt, celery salt.
	8 tablespoons strong chicken broth.

[1] Calculated with 1½ ounce of fowl.

Soak gelatin in the cold water five minutes, add the boiling hot broth and stir until dissolved. Season to taste. Dip mold into cold water and pour in enough gelatin to cover bottom. Put in ice box to harden and when firm decorate with a slice of hard-cooked egg; or cook a couple slices of carrots and cut a small round from one slice to form the center of a daisy cutting the other slice into strips to represent the petals and put in bottom of mold, add a few drops of gelatin to keep the decoration in place and put on ice to harden. Mix the chicken with remainder of gelatin and pour into mold and set to harden. Serve on leaf of lettuce or garnish with parsley.

LARDED GROUSE

Clean and wash the grouse. Lard the breast and legs. Run a small skewer through the legs and tail. Tie firmly with twine. Dredge with salt, rub the breast with softened butter, then dredge with flour. Put into a quick oven. If desired rare, cook twenty minutes; if well done, thirty minutes. Serve on hot platter garnished with parsley and Bread Sauce.

LARDED QUAIL

The directions for cooking and serving are the same as for grouse, except that quail cooks in fifteen minutes. Larding gives richness to dry meat that does not have enough fat of its own.

BREAD SAUCE FOR GAME, 527 CALORIES

Crumbs

⅓ cup coarse dried bread crumbs.
½ tablespoon butter.
⅛ small onion.
1 tablespoon butter.

Sauce

1 cup milk.
¼ cup fine bread crumbs.
Salt.
Pepper.

Prepare Crumbs. Dry in a warm oven; sift. Cook the coarse bread crumbs in the butter until a delicate brown and use to cover breast of bird.

Prepare Sauce. Put the fine bread crumbs, milk and onion on to scald ten minutes, then skim out the onion, add the butter and seasoning and serve as a gravy for birds.

Fish

Fish is one of the important protein foods. The term is usually applied to all kinds of water animals used for food. They may be classified as follows:

- Classes
  - 1. Scaly or Vertebrate
    - White or lean, e. g.
      - Halibut
      - Haddock
      - Flounder
      - Turbot
      - White Fish
      - Smelt
      - Cod
    - Dark or oily, e. g.
      - Salmon
      - Mackerel
      - Blue Fish
      - Shad
      - Herring
      - Eel
  - 2. Shell-fish.
    - Mollusks, e. g.
      - Oysters
      - Clams
    - Crustaceans, e. g.
      - Crabs
      - Lobsters
      - Shrimps
      - Turtles
      - Terrapin

In the white-fleshed fish the fat is found principally in the liver. This is the only class usually considered in the cookery for the sick.

In the dark-fleshed fish the fat is found distributed throughout the body. A considerable amount of the protein of fish is in the form of gelatin. Fish is less rich in extractives and hence less stimulating than meat.

Digestibility.—The digestibility of scaly fish depends upon the quantity of fat present and the coarseness of the fiber.

Oily (fatty) fish should not be eaten by those of weak digestion or given to the sick. In some cases it may be served during advanced convalescence.

Salt fish is not as easily digested as fresh fish, as the fibers are likely to be hardened in the process of salting. Salt codfish is an exception, for if finely divided and served in an appetizing manner it is a valuable and inexpensive form of protein food. As a rule, dried, smoked or pickled fish should not be given to the sick.

By some persons, fish cannot be eaten without causing indigestion. The fat sometimes disagrees, causing acidity and eructations of the stomach.

Composition.—In composition fish is similar to meat, containing protein, extractives, fats, mineral matter and water.

Nutritive Value.—The chief nutritive constituents of fish, as of meat, are their proteins and fats. Their energy value depends largely on the amount of fat they contain.

When Fish are in Season.—Halibut, haddock, flounder and cod are in season all the year; turbot, October to May; shad, February to May; salmon, May to September; blue fish and mackerel, May to October; sturgeon, April to September; trout (lake), April to August.

Test for Freshness.—In fresh fish the gills are red, the eyes bright and protruding, the flesh is firm and there is no unpleasant odor. The first two tests disappear after the fish has been out of water a short time and although the flavor of the fish is not as good, it is not spoiled. But if the last two tests are not present the fish should not be used. Great care should be taken that fish is perfectly fresh, in season, and thoroughly cooked, or it will be indigestible and sometimes poisonous. Unless these conditions are known to exist, fish should not be served to the sick.

"In many European cities fish are sold alive, the customer selecting his fish as it swims in a tank. It would seem that this excellent method might be used in our cities, especially those situated on the seaboard, at least for customers who are fastidious and who are willing to pay an extra price for a special article when it is warranted." (Farmer's Bulletin No. 375.)

Principles to be Observed in Cooking Fish.—As in meat, albumin is the principal constituent to be considered in the cooking of fish. Hence the same principles which apply to the cooking of meat apply also to the cooking of fish.

See page 17, for effect of heat on albumin.

Objective Points and Methods:

To Retain the Juice.—Baking, Broiling, Boiling and Frying.

To Extract the Juice.—Soup.

To Extract and Retain the Juice.—Chowder.

Energy Value of Fish

See Table, under names of fish, as Halibut, Salmon, etc.

See Table, page 58, for energy value of other ingredients.

BROILED FISH

White fish, trout, small blue fish, mackerel, shad and small cod should be split down the back and broiled whole and if preferred, cut off the head and tail. Halibut and salmon should be cut into inch slices and turned often while broiling.

Clean Fish. Wipe with a cloth wet in salt-water and dry on a fish towel. Season; oily fish need only salt and pepper, but dry white fish should be spread with oil and salt and pepper before broiling. Use a double wire broiler greased well with salt pork rind. Put thickest edge of fish next middle of broiler, turn often while broiling; with split fish sear the flesh side first and then turn.

The time of cooking will vary with the thickness of fish. Fish is done when flesh separates easily from the bone.

The fire should be hot and clear. When ready to serve, loosen the fish from broiler on each side. Open broiler, slide fish or platter, having flesh side uppermost. Spread with butter, salt and pepper. Garnish with parsley and slices of lemon. Or serve with butter cream and a border of potato balls.

Note: "Fish Sauces" for butter cream. Page 145.

BAKED FISH

Clean fish. Wipe with cloth wet in salted water, dry on a fish towel and bake on a greased fish sheet, placed in a dripping pan. A strip of cotton cloth, by which it may be lifted from the pan, may be substituted for the fish sheet. Sprinkle with salt and pepper, brush over with melted butter, dredge with flour and place around fish small pieces of fat salt pork. Bake in hot oven until fish separates from bone when lifted with fork. Baste every ten minutes. Serve plain with melted butter, or with egg sauce.

Note: "Fish Sauces" for egg sauce. Page 146.

HALIBUT A LA CREOLE, 406 CALORIES

½ pound of halibut.	1 clove.
½ cup tomatoes.	½ teaspoon sugar.
¼ cup water.	¾ tablespoon butter.
Small piece onion.	¾ tablespoon flour.
Sprig parsley.	Salt and pepper.

Tomato Sauce. Blend tomatoes, water, onion, parsley, clove and sugar and cook ten minutes.

Melt the butter, add the flour and gradually pour on the hot mixture. Add salt and pepper to taste, cook five minutes and strain.

Clean fish. Wipe with cloth wet with cold salted water and dry thoroughly. Put in baking tin, pour around half the sauce and bake until fish separates easily from bone, basting often. Serve on hot platter, pour around it the remainder of the sauce and garnish with parsley.

CREAMED FISH

(Individual Rule.)

½ cup cooked fish, remove skin and bone, and flake the flesh with a fork; season with salt, pepper, and a little lemon juice.

¼ cup cream or white sauce (note Fish Sauces, p. 145).

Blend the fish and white sauce, reheat and serve on toast, garnish with parsley and half-slice of lemon; or serve in bread cases made of slices of bread cut two inches thick, round off edges, scoop out center, leaving case, brush with softened butter and brown in oven.

Note: White sauce may be poured on one egg yolk before adding fish.

SCALLOPED FISH

Put creamed fish into small baking dish, cover with dried bread or cracker crumbs; dot with bits of butter and brown in oven.

CREAMED CODFISH

Flake salt codfish into small pieces, remove the bone; the fish should be put into several cold waters to remove some of the salt. Prepare the potatoes, cutting them into eighths, or if small into fourths, add the shredded fish and boiling water to cover; cook until potatoes are tender, drain off the water (saving it for the sauce), add a little butter and season with pepper, mash lightly and heap in center of platter.

SAUCE

1 pint fish and potato water.
4 tablespoons butter.
4 tablespoons flour.
Pepper.

Melt the butter, add the flour and gradually pour on the potato water. Cook thoroughly, season with pepper, pour about the codfish and garnish with slices of hard-cooked egg and parsley.

DIABETIC—CREAM CODFISH, 276 CALORIES

½ cup flaked codfish.
1 cup milk or cream.
½ teaspoon butter.
½ teaspoon gluten flour.
Yolk 1 egg.
Pepper.

Soak the fish in two waters; melt the butter, add the flour and gradually pour on the scalded milk; cook thoroughly, add codfish and egg, cook five minutes, season and serve on gluten toast or fresh bread.

DIABETIC—CREAMED FISH

½ cup cooked fish.
Salt, pepper, lemon juice.
½ cup cream sauce.
Gluten bread crumbs.

Season fish with salt, pepper and lemon juice, add cream sauce, put into ramikins or cups, sprinkle with gluten crumbs and bake.

DIABETIC—BAKED FISH

For baked fish make a dressing with one cup of gluten bread crumbs, one-half an onion, chopped fine, one tablespoon celery, chopped fine, one tablespoon butter, pepper, salt, lemon juice and parsley. Stuff fish and bake.

DIABETIC—PAN BROILED FISH

Fish should be rubbed with salt and pepper and dipped in gluten flour, or rolled in egg and gluten cracker crumbs. Sauté (or fry) in oil or butter.

Fish Sauces

BUTTER CREAM

Cream a little butter; season with salt, cayenne, lemon juice (speck salt and pepper, one-half teaspoon lemon juice). Add finely minced parsley or chopped pickle, such as cucumber or olive. Prepare quantity according to size of fish. Put it on the fish and place in oven a moment until butter is melted.

CREAM OR WHITE SAUCE, 120 CALORIES

(Individual Rule.)

½ tablespoon butter.
½ tablespoon flour.
⅓ cup hot milk.
Salt.

Melt butter, add flour, remove from fire and gradually pour on the milk, stirring constantly. Bring to the boiling point, cook thoroughly and season.

Note: Extra milk may be added if a thinner sauce is desired, using one-half cup milk.

DIABETIC—CREAM SAUCE, 128 CALORIES

½ cup milk.
1 teaspoon Hoyt's gluten flour.
1 teaspoon butter.
Salt.
Cayenne.

Melt the butter, add the flour and gradually pour on the scalded milk; cook thoroughly and season.

EGG SAUCE, 440 CALORIES

2½ tablespoons butter.
1½ tablespoons flour.
¼ teaspoon salt.
Speck pepper.
¾ cup hot water.
2 eggs.

Melt one-half the butter; add flour and seasoning and gradually pour on the hot water. Boil five minutes and add remainder of butter in small pieces. Add two hard-cooked eggs cut into one-fourth inch slices, or the beaten yolks may be added to hot sauce with one-half teaspoon lemon juice.

Note: One hard-cooked egg chopped fine or a yolk slightly beaten may be added to cream sauce. Also a few drops of lemon juice if desired.

TOMATO SAUCE, 77 CALORIES

½ tablespoon butter.
½ tablespoon flour.
¼ cup strained tomato juice.
Few grains salt.
Few grains pepper.

Brown butter, add flour and stir until slightly browned; remove from fire and, stirring constantly, gradually pour on the heated tomato. Cook thoroughly and add salt and pepper.

Note: A sprig of parsley, one clove and a small piece of onion may be added to tomato while heating.

CUCUMBER RELISH, 15 CALORIES

Grate one-half cucumber and add a small piece of red pepper chopped fine; season with salt, pepper and vinegar and serve with fish.

HOLLANDAISE, 460 CALORIES

1 egg yolk.	1/8 teaspoon salt.
2 tablespoons butter.	White pepper.
1/2 tablespoon vinegar.	3 tablespoons boiling water.

Put one tablespoon butter in top of double boiler. Add the other ingredients, place over hot water and stir constantly while butter is melting. Add second tablespoon of butter and stir until melted, repeating this process until all butter is used. As soon as the mixture begins to thicken remove from hot water. Vary by adding a little chopped parsley or grated horse-radish root.

Shell-Fish

MOLLUSKS AND CRUSTACEANS

Only the mollusks are considered in this book, because the crustaceans not being easily digested are not suitable for an invalid diet.

Crustaceans.—The most popular of the crustaceans are the crab and the lobster. They are highly nutritious, but at the same time difficult to digest.

Mollusks

Oysters.—Oysters are a valuable food for invalids and convalescents. Their nutritive value is not high, but they are easily digested and possess a delicate flavor which is acceptable to most palates.

Composition.—The composition of oysters, reckoned as "solids," i. e., removed from the shell, is as follows: 88.3% water, 6.0% protein, 1.3% fat and 3.3% carbohydrate.

The carbohydrate is in the form of glycogen, being found in the liver, which constitutes a large proportion of the oyster.

Digestibility.—The soft part of the oyster or clam is made up largely of the stomach and liver and is easily digested when cooked in a variety of ways—broiling, roasting, stewing, panning and steaming—but not fried when served to the sick.

The hard part of shellfish is the muscle which fastens the animal to the shell. This is rendered tougher by all forms of cooking; therefore, when whole oysters are to be eaten, they are more easily digested when served raw or broiled slightly in the shell. They can be digested by fever patients and those suffering from many forms of gastric disorders.

It is desirable in acute illness to serve only the soft part of the oyster, but in the later stages of convalescence the whole oyster may be served raw or in stew and soups, which are recommended on account of their liquid form and their warmth.

When in Season.—Oysters are in season from September to May. During the rest of the year they are insipid and soft, and unfit for food.

Principles to be Carefully Observed in Serving and Cooking Oysters for the Sick:

1. Make every effort to have the oyster alive when used, or as fresh as can be obtained from a reliable dealer. Many serious cases of illness and even death have been caused by eating oysters so long dead that poisonous substances had formed in them. Great care should also be taken that oysters are not procured from beds where the water has been contaminated in any way. "As it is in general impossible to learn their origin the rule of never eating them in the raw state is adopted by many. The practice of fattening or 'floating' oysters in fresh or in brackish water robs them of much of their fine flavor and since the most accessible supply

of such water is at the outlet of streams, and as such streams are frequently polluted by sewage, many persons believe that this practice should be forbidden by law."[1]

2. Oysters contain an albuminous substance which increases in hardness with an increase of temperature, just as does the albumin of an egg. When oysters are cooked with reference to this albuminous substance, they are also cooked in the best possible manner with reference to their other constituents; therefore subject them to a low temperature, for a short time, bearing in mind that 160 to 180 degrees Fahrenheit is the cooking temperature of albumin.

General rule is to remove the oyster from heat as soon as the body grows plump and the edges curl; if cooked beyond this stage they are over-cooked.

Varieties.—In Massachusetts the "Cape" Oyster is considered the finest for serving raw. They come from Buzzards Bay and the Cape.

Clams. Clams are similar in composition to the oyster and same general rules followed in preparing and serving. They are much used for food and considered a great delicacy. They contain a tough portion that is not used in sick-room cookery, but the clear juice, on account of its digestibility and stimulating properties, is invaluable in the sick room. Clams are in season all the year around.

Varieties.—There are two varieties, the hard and the soft shell clams. The hard shell are known as quahaugs. The small or round "little neck clams" take the place of "Cape" Oyster to serve raw when oysters are out of season.

Energy Value of Oysters

2 oysters	= 14 Calories
100 grams oysters	= 50 Calories
1 cup (solid) oysters (8½ oz.)	= 118 Calories

See Table, page 58, for energy value of other ingredients.

[1] Farmer's Bulletin No. 375.

RAW OYSTERS

Wash, scrub the shells well under a stream of water with a vegetable brush. With a hammer break the thin edges of the shell so that a knife may be inserted to sever the muscle which holds the two parts of the shell together; when this is cut remove the upper half and wipe the edges free from any grains of sand. Then sever the muscle which joins the oyster to the other shell, so that it may be easily lifted out without the necessity of cutting. Arrange six oysters on an oyster-plate on crushed ice and serve with salt, black pepper and lemon juice. A quarter of lemon cut lengthwise may be placed in the center of plate and a bit of parsley.

OYSTERS ROASTED IN THE SHELL

Wash the shells very carefully with a brush. Put them in a wire broiler over glowing coals, the round side of shell down so as to hold the juice. Cook them quickly, turning once or twice until the shell opens. They may also be cooked in a hot oven. When done remove the upper half of the shell; season them quickly with salt, pepper and a tiny bit of butter and vinegar, if liked, and serve them while very hot.

The true oyster flavor is delightfully developed by preparing in this way. They may also be served with melted butter, salt, pepper and lemon juice.

TO WASH OYSTERS

Place oysters in strainer over a bowl and pour one tablespoon of water over each one-half cup of oysters. Take each oyster up in fingers and remove any particles of shell that may adhere to tough muscle.

PAN ROAST OYSTERS

Wash oysters and put in sauté pan or chafing dish and stir gently with spoon. When bodies grow plump and the edges curl remove from heat. Season with salt and pepper and a little butter and serve on rounds of toast, with eighth of lemon for individual dishes; or serve on platter and garnish with toast points, watercress and lemon.

BROILED OYSTERS, 308 CALORIES

(Individual Rule.)

4 oysters	4 teaspoons butter.
¼ cup cracker crumbs.	Salt and pepper.

Select large oysters. Wash, drain and dry between towels. Melt butter. Season cracker crumbs with salt and pepper. With silver fork lift each oyster by tough muscle and dip first in butter, then in crumbs. Place on a buttered fine wire broiler and broil, turning often until brown and the juice begins to flow. Serve plain, garnished with parsley and a piece of lemon or prepare cream toast and sprinkle with fine chopped celery and place the broiled oysters on top.

CREAMED OYSTERS, 276 CALORIES[1]

(Individual Rule.)

8 oysters.	½ cup rich milk or thin cream.
1 tablespoon butter.	Salt.
1¼ tablespoon flour.	White pepper.

Wash, drain and dry oysters between towels. Melt butter and remove from fire, add the flour and gradually pour on the scalded milk. Season with salt and pepper. Cook thoroughly. Add the oysters and heat until the edges curl and the bodies grow plump. Serve at once on rounds of toast garnished with toast points and parsley or in crisped "bread cases." See "Creamed Fish," page 144.

CREAMED OYSTERS NO. II, 337 CALORIES[2]

(Individual Rule.)

½ cup thin cream or rich milk.	1 teaspoon butter.
1 tablespoon flour.	8 oysters.
¼ teaspoon salt.	

Wet the flour with a little cold milk; scald the cream, add the flour and cook well. Just before serving add the drained

[1] Calculated with whole milk.
[2] Calculated with thin cream.

oysters and cook until they grow plump and the edges curl; add the salt and butter. Serve in Swedish timbale shells, little scooped-out buns, or on rounds of toast.

SCALLOPED OYSTERS, 365 CALORIES

(Individual Rule.)

½ cup oysters.	Salt.
¼ cup cracker crumbs.	Pepper.
⅛ cup stale bread crumbs.	½ tablespoon thin cream.
1 tablespoon melted butter.	1 tablespoon oyster liquor.

Prepare the oysters. Stir together crumbs and melted butter. Butter a small baking dish and sprinkle part of the crumbs in it. Put in half the oysters, sprinkle with salt and pepper, then a layer of crumbs, pour over enough cream or oyster liquor to moisten well, add the remaining oysters, season and finish with a layer of crumbs on top. Bake in a hot oven about ten minutes, till oysters are plump and crumbs browned. Serve hot.

Never allow more than two layers as they will not cook evenly. A sprinkling of mace or nutmeg is considered an improvement by some. Sherry wine may be used in place of cream.

OYSTER SOUP, 265 CALORIES

(Individual Rule.)

½ cup oysters.	1 tablespoon butter.
¼ cup water.	¾ tablespoon flour.
½ cup milk.	Grating of mace.
Bit of onion.	Salt and pepper.

Scald the milk. Melt the butter, add the flour and gradually pour on the scalded milk; add mace and onion, and cook thoroughly.

Put oysters in a strainer placed over a bowl, add water and carefully pick over oysters to remove particles of shell. Heat liquor which has drained from oysters to the boiling point, strain through two thicknesses of cheese-cloth and return to saucepan, add oysters and cook until plump and edges curl.

Drain off liquor and add to soup. Season, add oysters and serve immediately.

DIABETIC—OYSTER SOUP, 140 CALORIES

(Two Servings)

One-half pint of oysters, heated in their own liquor; strain. Put in saucepan one-half teaspoonful butter and a scant half-teaspoonful gluten flour, add liquor and, when slightly thick, oysters, pepper and salt. For variety, add occasionally a tablespoonful of cream.

OYSTER STEW, 222 CALORIES

(Individual Rule.)

½ cup oysters.	¼ teaspoon salt.
⅔ cup milk.	Speck pepper.
¾ tablespoon water.	½ tablespoon butter.

Scald the milk. Put oysters in a strainer placed over a bowl and add water. Carefully pick over oysters to remove particles of shell. Heat the liquor which has drained from the oysters to the boiling point and strain through the finest strainer and cheese-cloth; return to saucepan and put in the oysters and simmer, but *do not boil,* until they begin to grow plump and the edges curl and separate. Strain the liquor into the scalded milk, season, add oysters and serve immediately.

Clams.

Energy Value of Clams

½ dozen clams	=40 Calories
3⅓ ounces clam bouillon	= 2 Calories.
1 quart clam bouillon	=23 Calories.

See Table, page 58, for energy value of other ingredients.

LITTLE NECK CLAMS

Serve raw on the half-shell in same manner as raw oysters.

STEAMED CLAMS

For steaming, clams should be bought in the shell. Wash in several waters, scrubbing thoroughly. Put into kettle, allowing one-fourth cup water to one quart clams. Cover closely and steam until clams partially open. Care should be taken not to overcook them. Serve with melted butter. A few drops of lemon juice may be added to butter.

CLAM BROTH

(Individual Rule.)

1 dozen clams.	2 tablespoons cold water.

Wash clams and scrub with a brush, changing the water several times. Put in saucepan, add water, cover and cook until shells open. Remove clams from shell, adding liquor which comes from them to liquor already in saucepan. Strain liquor through double thickness of cheese-cloth. Serve hot, cold or frozen.

CLAM WATER

(Individual Rule.)

¾ cup cold water.	Clam broth.[1]

To the water add the required amount of the clam broth to make the strength desired. Serve hot, cold or frozen. When necessary, serve in small quantity and repeat at short intervals.

Note: Clam broth served in several ways (as a variety) is invaluable in case of weak stomach, indigestion and general debility.

CLAM WATER NO. II, 16 CALORIES

(Individual Rule.)

¼ cup clam broth.[1]	Pepper.
1 tablespoon milk.	⅛ teaspoon butter.
½ cup hot water.	

Blend the clam broth, milk and hot water, season with pepper and add the butter. Serve hot.

[1] Clam broth, ready for use, is put up in bottles and called Burnham's Clam Bouillon.

Note: The pepper and butter may be omitted when necessary.

CLAM STEW, 246 CALORIES

(Individual Rule.)

½ cup clam broth.
½ cup scalded milk.
1 tablespoon butter.
½ tablespoon flour.
⅛ teaspoon salt.
Speck pepper.
Soft part of ½ dozen clams.

Melt butter, add flour, add gradually the scalded milk and clam broth and cook thoroughly. Season, add clams and serve hot.

CLAM SOUP, 273 CALORIES

(Individual Rule.)

½ dozen clams.
⅛ cup cold water.
1 cup milk.
½ tablespoon butter.
½ tablespoon flour.
Salt and pepper.

Wash and scrub clams and put in kettle with cold water. Cook until shells open. Take from shell and cut off the tough parts; save the soft parts for the soup and keep warm. Scald the milk. Melt the butter, add the flour and pour on gradually the hot milk. Cook thoroughly; add soft parts of clams and juice, season with salt and pepper and serve hot immediately.

CLAM BOUILLON, 41 CALORIES[2]

(Two Servings.)

¾ cup cold water.
½ cup clam broth.[1]
⅛ cup scalding milk.
½ teaspoon butter.
Salt.
Pepper.
Celery Salt.
White of egg or whipped cream.

Blend the water and clam broth, heat to the boiling point, then add the scalding milk, the butter and stir well; season with salt, pepper and celery salt to taste. A small quan-

[1] Clam broth, ready for use, is put up in bottles and called Burnham's Clam Bouillon.

[2] Calculated without white of egg or whipped cream.

tity of cracker crumbs may be added to thicken it. Serve in heated bouillon cups and garnish with two teaspoons of whipped cream or well-beaten white of egg.

CLAM BOUILLON BISQUE, 240 CALORIES

(Two Servings.)

½ tablespoon butter.	½ tablespoon flour.
1 tablespoon chopped onion.	1 cup boiling water.
½ tablespoon chopped carrot.	Yolk 1 egg.
1 cup clam broth.	¼ cup thin cream.

Melt the butter, add the finely chopped onion and carrot, cover and cook until the onion and carrot are tender, stirring it occasionally. Add the flour, blending well; then pour on gradually the boiling water and the clam broth. Cook five minutes, strain and return to saucepan. Mix the yolk of egg with the cream and add it slowly to the bisque. Pour into heated bouillon cups and serve with small oyster crackers.

ALBUMINIZED CLAM WATER

See "Albuminized Beverages" for recipe. Page 305.

CLAM BROTH NO. II

See "Meat Broth and Jellies" for recipe. Page 128.

CLAM BROTH ON TOAST

See "Toast" for recipe. Page 221.

CLAM FRAPPE

See "Ices" for recipe. Page 295.

CLAM SHERBET

See "Sherbets" for recipe. Page 292.

Eggs[1]

Composition.—Eggs contain protein, fat, mineral matter,

[1] For further information, note, "Eggs and Their Uses as Food," Farmer's Bulletin No. 128, U. S. Dept. of Agriculture, Washington, D. C.

water and fat-soluble and water-soluble vitamines (see page 21). The composition of the hen's egg is as follows:

	PROTEIN %	FAT %	CARBOHY-DRATE %	CAL-CIUM %	PHOS-PHOROUS %	IRON %
Whole egg edible portion	13.4	10.5	....	0.067	0.180	0.003
White	12.3	0.2	....	0.015	0.014	0.0001
Yolk	15.7	33.3	....	0.137	0.524	0.0086

From this table it may be seen that the white of egg consists of eight-tenths water, the remaining portion being principally protein, with a little mineral matter; the yolk is about half water, one-third fat and nearly one-sixth protein, with almost twice as much mineral matter as the white.

Varieties.—By eggs the product of the domestic fowl is commonly meant. The eggs of the duck, goose, turkey, etc., are edible but are hardly suited for the sick, because of their stronger flavor. The color of the shell is due to a pigment and has no connection with the composition of the egg. Other things being equal, the edible portions of brown-shelled and white-shelled eggs have the same food value.

Digestibility.—Eggs are easily digested and very thoroughly absorbed in the intestines. If the absorption is delayed, decomposition follows with production of hydrogen sulphide and ammonia, which causes considerable gastroenteric disturbance. The yolk is usually the cause of this disturbance. The digestibility of an egg depends upon its freshness and the manner in which it is cooked.[1] Carelessness in cooking and serving may make an egg difficult of digestion and unappetizing, when if properly cooked it would be more palatable and easier to digest. Raw eggs are added to various foods, as milk and broth, etc., to give extra nutriment. Eggs are freely prescribed for those suffering from loss of flesh and strength, as the convalescent, anæmic, or tubercular.

A soft-cooked egg digests very quickly. A hard-cooked

[1] See Albumin, p. 17.

egg as commonly cooked is slower to digest, but cooked at proper temperature and chopped *very* fine will digest about as quickly as a soft egg.

Nutritive Value.—Eggs are a very nutritious food, comparable with meat, milk, cheese and other animal foods. They are not a cheap food but their nutritive value is such that they furnish a good return for the money expended. Many persons will be satisfied with an egg who would not be with the equivalent food value in the form of meat, while eggs are valuable for giving variety to the diet and for furnishing an easily digested protein food, especially for the sedentary. For children they are much better than meat, because the fat is an emulsified form and hence easily digested, because of their ash constituents, and because they do not contain the stimulating extractives which are present in meat. The yolk is rich in compounds of iron, phosphorus, calcium and magnesium. The protein of egg yolk is combined with lecithin, a phosphorized fat which has come to be regarded as an important constituent of food, especially for the growing animal. Egg yolk is a valuable source of both the fat-soluble and the water-soluble vitamines. Egg yolks are frequently prescribed for invalids requiring an easily assimilated, concentrated food. It should be remembered that when fat is barred from the diet, egg yolk should not be given.

Egg white is valuable chiefly as a source of protein. Because of its mild flavor it can be combined with many substances, especially milk and other beverages (see "Albuminous Beverages," page 305).

Principles to be Observed in Cooking.—The principal constituent of the egg white is albumin, which should be cooked in such a manner as to require the least possible expenditure of force in digestion. Those who are ill cannot afford to waste energy, and whether they are forced to do so or not depends much upon those who prepare their food.

Effect of Temperature on Albumin.—See "Albumin," page 17.

The proper cooking temperature of egg albumin is 160 to 180 degrees Fahrenheit, when it is found to be tender, soft, jelly-like and in an easily digested state.

But cooked at the boiling point of water, 212 degrees Fahrenheit, albumin is found to be firm, compact, tough and difficult of digestion. With this knowledge we can appreciate the necessity of cooking eggs at a temperature below that of boiling water. It is often advisable to cook the white and yolk of eggs separately, as the yolk when hard-cooked (at proper temperature) and mealy is more easily digested than the soft-cooked yolk and the white more easily digested soft-cooked.

Suggestions.—Eggs should be kept in a cool, dry place. Always wash eggs just before using. When using several eggs break them separately in a saucer to test the quality of each.

In beating fresh eggs to a stiff froth the albumin entraps the air, forming bubbles which expand and stiffen when blended with batter and dough and exposed to heat thus making the food light and spongy. Stale eggs lose this quality of frothiness.

Test for Fresh Eggs.—To test the freshness of an egg hold it in front of an electric light or a candle in a dark room. If the egg is perfectly translucent throughout it is fresh.

The principle upon which the various methods of preserving eggs are based, is the covering of the surface of the egg with a preparation which prevents air from entering the egg and carrying with it the bacteria which cause decomposition.

Energy Value of an Egg[1]

	Calories
1 egg (with shell) average size	74
1 egg (without shell) average size	74
1 white of egg average size	17
1 yolk of egg average size	60

CODDLED EGG (FOR INFANTS), 74 CALORIES

In a cup or small saucepan boil one cupful of water to one

[1] Range from 60 to 100 calories according to size of egg.

egg. Remove pan from fire and put in egg. Cover closely and allow to stand seven to eight minutes. The egg cooks slowly in the water, which gradually cools. The white should be jellied and the yolk should be soft.

For a delicate digestion the white only should be given, with salt; it can be easily separated from the yolk.

SOFT COOKED EGGS NO. I.

Wash one egg and put it in a small saucepan of boiling water to cover; remove to back of stove, or where the water will keep very hot but not boil. Cook seven to ten minutes, according to consistency desired. Serve in slightly heated cups.

Note: A stone crock is nice to use, as it keeps more even heat. A double boiler may be used, putting boiling water in top and bottom. Set on back of stove and cook six to seven minutes, according to size of egg.

Care must be taken that the size of utensil is in accordance with the number of eggs to be cooked so that the cold eggs will lower the temperature of the boiling water. Keep temperature about 160 degrees Fahrenheit or a little above.

SOFT COOKED EGGS NO. II

Wash one egg and put it in a small saucepan of cold water to cover. Bring just to boiling point, remove and serve in slightly heated cups.

HARD COOKED EGGS

Follow directions for soft cooked eggs No. 1, allowing egg to remain in water forty-five minutes. Chop fine and add one-half teaspoon butter and a few grains salt, serve in slightly heated cups.

STEAMED EGGS

Butter an egg shirrer or a small sauce-plate and pour in the eggs. Salt, place in steamer over boiling water and cook till white is firm. Cooked in this manner, the white is tender and light and can be eaten by invalids.

BAKED EGGS

Plain baked eggs make a pretty breakfast dish. Take a deep earthen plate, butter it and break in the eggs, adding salt, pepper, bits of butter and bake in a moderate oven until the white is set. Garnish with curled parsley and serve with buttered toast. Use a small dish to prepare one egg.

Note: Before cooking ½ tablespoon of cream to each egg may be poured over them and in serving a little grated cheese may be sifted over the top.

DIABETIC—BAKED EGGS

Break an egg into a baking-cup, pour gently over it a large tablespoonful of melted butter sauce; then add a thick layer of grated cheese; sprinkle with gluten cracker crumbs and dot with bits of butter. Bake until the egg is set and serve at once.

GOLDEN-ROD EGGS

1 hard-cooked egg=74 Calories. 2 slices toast=146 Calories.
Sauce=166 Calories.

2 teaspoons butter.
½ tablespoon flour.
½ cup scalded milk.
Speck white pepper.
Salt.

Prepare the sauce. Add the white of egg chopped fine, pour over the toast and rub the yolk through a strainer over the top. Serve at once.

Sauce: Melt butter, add flour and gradually the scalded milk; cook well and season with salt and pepper.

EGG NESTS, 155 CALORIES

1 egg.
¼ teaspoon butter.
Salt to taste.
1 round of toast with toast points.

Toast bread. Separate egg. Beat white to a stiff froth. Salt to taste. Spread toast with butter and put white of egg on in shape of nest. Make a depression in center, put in the butter and drop the yolk in the hollow. Cook in a moderate oven three or four minutes.

Note: May be cooked in tumbler placed in pan of water, allowing the water to heat gradually and as the white rises, make a depression and drop in yolk.

It may be served with Tomato Sauce.

FOAMY OMELET, 154 CALORIES

1 egg.	½ saltspoon salt.
1 tablespoon milk.	Speck pepper.
2 teaspoons butter.	

Separate egg and beat white to a stiff froth. Beat yolk till light, add milk, salt and pepper; fold the yolk lightly into the white. Put butter into sauté pan, when it bubbles pour in the mixture. Shake pan gently so omelet will not adhere to it; lift up at sides with a knife to see when done and when a delicate brown set pan in oven a minute to absorb moisture on top. Fold omelet half over, turn out on a hot dish and serve immediately.

Variations. Mix one tablespoon ham or other meat chopped fine with foamy omelet and cook as directed. Or when omelet is cooked, the chopped meat may be spread over before folding. A little chopped parsley may be added. Oysters either whole or chopped, creamed chicken, stewed or sliced tomatoes, asparagus tips, peas or jelly may be used.

OMELET SOUFFLE, 185 CALORIES

½ tablespoon butter.	Speck pepper.
½ tablespoon flour.	¼ cup milk.
⅛ teaspoon salt.	1 egg.

Melt butter and add flour, mix smooth. Pour on the milk and stir over heat till of the consistency of thick cream. Cool and add beaten yolk. Fold in stiff whites very lightly. Put in individual frying-pan made very hot with one-half teaspoon butter. Stand on top of stove till very light brown on bottom. Finish in hot oven till firm to touch of finger. Fold and turn out on hot plate.

BAKED MEAT OMELET

Prepare Foamy Omelet and add to it the chopped meat. Put it into a buttered pudding-dish, set it in a pan of hot water and bake until firm.

POACHED OR DROPPED EGGS

Toast a square or round piece of bread and four toast points; put on hot plate with points at each side and garnish with a sprig of parsley. Have a shallow pan two-thirds full of boiling salted water, allowing one teaspoon salt to one pint water. Put a slightly buttered muffin ring on a buttered skimmer in the water. Break an egg into the ring. The water should cover the egg. When there is a film on top and the white is firm, carefully take up skimmer, remove ring, loosen egg with a knife and place on the toast; salt slightly. The toast may be buttered if desired.

EGG POACHED IN MILK, 468 CALORIES

1 egg.
1½ teaspoons butter.
½ cup thin cream.
Salt.
2 tablespoons grated cheese.

Melt butter in top of double boiler, add cream and when hot drop in the egg carefully. Cook until white is nearly firm, add salt and sprinkle with cheese. Serve on toast. Cheese may be omitted.

SCRAMBLED EGGS, 192 CALORIES

1 egg.
½ cup milk.
1 teaspoon butter.
¼ teaspoon salt.
Speck pepper.

Beat egg in top of double boiler until light, add milk and rest of ingredients and stir over boiling water until it thickens; allow it to stand a few minutes, without stirring, to set. Serve on toast or hot rice.

EGG SANDWICHES, 107 CALORIES

1 hard-cooked egg.
¼ teaspoon salt.
Speck paprika.
⅛ teaspoon mustard.
3 drops vinegar.
1 teaspoon butter.

Mince the egg very fine with a silver fork, add seasonings and butter and mix thoroughly. Butter very thin slices of bread, spread with egg mixture, cover it with watercress leaves, bits of nasturtium leaves or lettuce. Cover with another slice of bread and cut in triangles or rounds. Serve on small plate and doily.

Note: Minced ham may be added to egg mixture.

SHIRRED EGGS NO. I

Butter an egg shirrer, ramikins, or small earthen cups; put one egg in each without breaking yolk; dust with salt and white pepper, put in pan of hot water and cook on back of range or in a moderate oven until white is set. If baked, cover with a buttered paper to keep from browning.

SHIRRED EGGS NO. II

Butter small, deep earthen dishes and line with fine white bread crumbs moistened to a paste and seasoned with salt and pepper. Break an egg in each, sprinkle with a few grains of salt, cover with more paste and bake in a pan of hot water placed in the oven. When egg is set, serve with two tablespoons of tomatoes or cream sauce poured over and garnish with a sprig of parsley.

FILLED EGGS, 107 CALORIES

1 hard-cooked egg.
1 teaspoon butter *or*
1 teaspoon olive oil.
⅛ teaspoon mustard.
Paprika.
Salt.

Remove the shell and cut the egg in halves lengthwise. Take out the yolk carefully without breaking the white. Rub the yolk to a smooth paste adding the butter or oil and the seasonings and mix thoroughly. A small quantity of finely chopped ham, tongue or chicken may be added. Fill the whites with the mixture and serve on lettuce, or in a bed of parsley.

EGG DESSERTS

See "Nutritious Desserts" for recipe. Page 254.

ALBUMINOUS BEVERAGES

See "Albuminous Beverages" for recipe. Page 305.

Milk and Milk Products[1]

"Milk is the only article of diet whose sole function in nature is to serve as food." It contains all the compounds necessary to support life, in remarkably good proportions and in very assimilable forms. It is a complete food for infants, and is specially suited to the needs of certain classes of invalids. For the normal, healthy adult it is undesirable as the sole article of diet, because the proportion of water is so high that too large quantities must be taken to supply the necessary energy, iron and antiscorbutic vitamines, because the proportion of protein is unnecessarily high and because it furnishes no indigestible residues to supply bulk for the perfect functioning of the intestines.

Composition.—Milk contains all the essentials of an adequate diet. The proportions of the different nutrients vary somewhat with different species and also with individuals of the same species. Cow's milk, which is most extensively used, is the only kind which will be considered here. Milk has a specific gravity of 1.027 to 1.035.

The chief bulk is water, which averages 87 per cent. The solid matter is made up of proteins, fats, carbohydrates and mineral matter. The average percentages are as follows: protein, 3.3 per cent.; fat, 4 per cent.; carbohydrates, 5 per cent.; mineral matter, 0.7 per cent.

The principal protein is casein, a compound containing both phosphorus and sulphur. Casein is precipitated or

[1] For further information, note, "The Use of Milk as Food," Farmer's Bulletin No. 363, U. S. Dept. of Agriculture, Washington, D. C.

coagulated by the addition of acid or, in neutral solutions, by rennet. Milk also contains lactalbumin, averaging about 1/5 of the total protein. The character of the curd depends largely on the relative proportions of casein and lactalbumin.

The fat of milk varies widely in amount. It is found throughout the milk in globules, i. e., as an emulsion. On standing, the fat rises to the top and forms cream chemically. Several fats are present, chiefly stearin, palmatin and olein, with smaller amounts of others, such as butyrin, which gives the characteristic flavor to butter.

The chief carbohydrate is lactose or milk sugar. This remains in the whey when the casein and fat are removed.

The ash constituents include all of the inorganic elements necessary to normal nutrition.

Digestibility.—While milk is taken as a liquid, it should really be regarded as a solid food, for in the stomach it is coagulated by the action of the enzyme, rennin, in the gastric juice. If the milk is swallowed hastily, a large, tenacious curd may form, which will remain long in the stomach and the milk will be regarded as difficult of digestion. If the milk is sipped slowly—or eaten with a spoon—the curds will be small and hence readily acted on by the gastric juice. For this reason, the combination of milk with another food material, as bread or cereal gruel, may render it more easily digestible. Many persons think that they cannot digest milk. This is seldom true if the above precautions are taken.

Nutritive Value.—Milk is a rich source of protein. Moreover, its proteins are of high biological value because they contain all the amino acids essential to good nutrition. Milk is the most valuable source of protein from infancy throughout the entire period of growth. It is non-stimulating and less liable to putrefaction in the alimentary tract than meat proteins. Given a quart of milk and an egg each day, a child under eight years of age on a suitable diet of proper fuel value will have sufficient protein for all body needs.

The fat of milk, being in an emulsified form, is more readily digested than the fat of meats and other similar foods.

The carbohydrates of milk require only transformation to simple sugars by the intestinal enzyme, lactase, to be perfectly utilized. Often the energy value of milk is increased for infants and invalids by addition of this soluble, mild-flavored compound.

The ash of milk contains the elements necessary to the body in particularly assimilable forms. It contains only a small amount of iron but the iron present is in an especially valuable form. When milk is the chief source of nutriment, as with infants and young children, iron must be supplied by the addition of other foods such as egg yolk and spinach.

The value of milk as a food is unappreciated by many people. It is frequently regarded as a beverage rather than a food, when in fact a quart of milk is equivalent in fuel value to approximately nine ounces of white bread, one pound of lean beef or nine eggs. It contains as much protein as about one-third of a pound of lean beef and in addition about as much fat as is supplied by one and one-half ounces of butter, over one and one-half ounces of milk sugar and valuable mineral salts. Compared with other animal foods milk is a cheap food, even at present prices, and should enter freely into the dietary. It may be flavored with cocoa or coffee or it need not be used as a beverage, but may be combined with other materials in soups, sauces for vegetables, custards and the like, or used in place of water in cooking cereals.

The value of skimmed milk as a food also needs to be emphasized. It has lost most of the fat in the skimming process but has practically the same amount of protein, carbohydrate and ash as whole milk. It is not as rich in flavor as whole milk but used in combination with other foods it forms a very inexpensive source of valuable nutriment.

Care of milk.—The importance of keeping milk clean cannot be over-emphasized. Aside from all esthetic considerations, absolute cleanliness is essential as a protection to health. Milk is an excellent culture medium for bacteria and these organisms may be not only types producing changes in the character of the milk, such as alterations in flavor, odor, color, decomposition of proteins, formation of gases, alcohol, lactic acid, etc., but also disease germs, especially those of tuberculosis, scarlet fever, typhoid fever, diphtheria and septic sore throat.

Commercially the care of milk has an important effect on the keeping qualities. For all these reasons, milk should come from a healthy animal in a sanitary environment. Milking must be done under conditions which protect the milk as fully as possible from contamination through impurities on the cow herself, on the hands or clothing of the milker, in the receptacles used for the milk, and in the air in the place where the milking is done. Milk should be immediately cooled and transported to the consumer in sealed bottles. Cooling prevents the growth of bacteria. Such cautions necessarily increase the price of milk but even so milk is a cheap food and the additional security is worth paying for.

Grades of Milk.—On account of the great variation in the quality of milk sold a system of grading has been developed to enable the public to choose a milk supply more intelligently. Unfortunately there is no nation-wide uniformity in grading, some of it being voluntary and some compulsory. The terms in most common use are Grade A, Grade B, certified and pasteurized.

In New York City the Health Department requires that all milk sold in the city shall conform to certain minimum standards set forth in their ordinances.

Grade A, raw or pasteurized, whether full or skimmed, "shall be from tuberculin tested cows and contain not more than thirty thousand (30,000) bacteria (colonies) per cubic centimeter when delivered to the consumer or at any time prior to such delivery. Cream of this grade and designation shall contain not more than one hundred and fifty thousand (150,000) bacteria (colonies) per cubic centimeter." (Sanitary Code, Dept. of Health, New York City, Regulation 24.)

By "modified milk" is meant milk of any subdivision of the classification known as "Grade A; for Infants and Children," which has been changed by the addition of water, sugar of milk, or other substance intended to render the milk suitable for infant feeding. (Ibid. Sec. 155.)

For Grade B, pasteurized, the minimum bacterial content is "one hundred thousand (100,000) bacteria (colonies) per c.c., for either full or skimmed milk and five hundred thousand (500,000) for cream." (Ibid. Reg. 79.)

Grade C, pasteurized, not to contain "an excessive number of bacteria (colonies)" is used for manufacturing purposes only. (Ibid. Reg. 96.)

All grades of milk must be produced under prescribed conditions as to health of cows, cleanliness of stables and workers, water supply for cows, utensils and containers, etc.

Certification of Milk.—To insure a milk free from infection, the method of certification and pasteurization has been widely adopted.

Certification involves supervision by medical milk commissioners who require a specific testing of milk against all accidental and harmful contamination. To secure this the services of chemists, bacteriologists and veterinary surgeons are required. The most vital object is the exclusion of tubercle bacilli from milk, which involves a special inspection of dairy herds and rejection of tubercular cows. Other pernicious germs, pus corpuscles, etc., are also sought for.

Certification of milk requires periodical inspection of dairies, of bottled milk bought in open market, etc. All milk must correspond to a number and variety of tests, too numerous to be mentioned in this connection. Every branch of the milk trade is covered. Such milk receives a certificate showing the date of milking and is naturally expensive, but it should be used whenever possible for infants and little children and for all purposes in households which buy the best grades of other food materials.

Pasteurization.—This is the process by which milk is rendered more or less sterile through destruction of active bacteria by heat. Various standards as to temperature and time have been adopted, but in general the milk is heated to a temperature not exceeding 145° F., for a period of 20 to 30 minutes and then rapidly cooled to 45° F. or lower. The Department of Health of New York City requires that in pasteurization the milk be heated to at least 142° F. and held at such temperature for thirty minutes or more.

Most harmful bacteria and lactic acid bacteria are killed. Spores are not killed, however, and if the milk is not kept cold or is allowed to stand too long, putrefactive organisms develop. These putrefactive changes are very undesirable, so that the care of pasteurized milk is just as important as that of fresh milk. If carelessly handled, the fact that it does not sour readily is a menace to health rather than a benefit.

Commercial pasteurization is a cheap and effective means of preventing the spread of ordinary infectious diseases. The degree of heat specified does not materially change the flavor or the chemical composition of the milk. It does destroy the antiscorbutic property. (See "Antiscorbutic Property of Foods," chapter 1, page 22.) When clean, fresh milk cannot be absolutely insured, it is safer to pasteurize. But this process cannot make bad milk good or dirty milk clean. If bacteria have already produced poisonous products it will not destroy them.

Sterilization.—Sterilization is accomplished by keeping milk at boiling temperature (212 degrees F.) for 10 or more minutes, preferably in the vessel in which it is to remain. This will kill all living bacteria, but will not destroy spores. Hence to render milk absolutely sterile, repetition of the process on successive days is necessary. This is rarely done, as the spores are not likely to develop if the milk is kept at a temperature of 40 degrees F. or less.

Sterilized milk is not an ideal food. Boiling changes the taste and the cream does not rise as quickly; the chemical nature of the milk is also altered. It is less easily coagulated by rennet, since the calcium salts are changed. The antiscorbutic property is destroyed. Sterilization should be regarded as an emergency measure for hot weather when cooling facilities are lacking.

Milk Products

Butter.—Butter consists almost entirely of separated milk fat. Churning causes the fat globules to unite into a solid mass. The cream is first allowed to ripen for some hours. This process gives the characteristic taste and odor, which is due to action of bacteria. When kept, butter tends to turn rancid, owing to the fermentation of a small quantity of the butyrin present. Salt is added largely to prevent this change. Butter is very palatable and one of the most digestible forms of fat.

Cheese.—Cheese is made from full milk, skimmed milk or cream. It consists of the casein of the milk and more or less of the fat and mineral matters. The flavor is due to the action of enzymes in molds or bacteria. Cheese is a very concentrated, nutritious food and very thoroughly assimilated. It is not usually well borne by invalids and convalescents, however.

Cream.—Cream is the fatty layer which forms at the top of milk which is allowed to stand undisturbed. It contains the fat of the milk, water, some protein, carbohydrates and mineral matter. The percentage of fat is exceedingly variable, ranging from about 16 per cent. to 40 per cent. The cream which rises on milk after 24 hours is called gravity cream and the top five ounces contain about 16 per cent. fat. The richer creams are obtained by centrifugalizing the milk. Cream in large quantities is less easily digested than an equal amount of whole milk because of the large amount of fat, but this form of fat is easily digested compared with other food fats and hence is often ordered by physicians.

Curds.—When milk sours, owing to the formation of lactic acid by the action of lactic acid bacteria upon the sugar, or when the enzyme, rennet, is added to fresh milk at body temperature and the clot is stirred, the curds separate from the whey.

Curds consist of coagulated casein, which commonly carries with it the fat, and gentle heat facilitates this separation, but a high temperature renders the curd tough and indigestible. With or without the addition of cream, curds are used as cottage cheese, which is a very cheap, nutritious food.

Junket.—If sweet milk is allowed to stand undisturbed after the addition of rennet, the thickened, custard-like mass is called junket. This is a valuable method of using milk, especially for invalids, children and those who from personal idiosyncrasy cannot drink milk.

Whey.—This substance may be either sweet when formed by junket or sour when otherwise produced. It contains most of the lactose, lactalbumin and ash constituents of the milk, but has less nutritive value, owing to the removal of the milk fat and casein, and may be regarded as a beverage. See page 166.

Sour Milk.—When whole milk sours, with the formation of "curds and whey," the entire product is known as clabber or bonny-clabber. It is wholesome and nutritious, since it contains all the ingredients naturally present in milk. By some it is used as a beverage. When not so relished, it can be used to good advantage in cooking, adding its nutritive value to any dish in which it is incorporated.

Buttermilk.—True buttermilk, which is common on farms, is seldom found in commerce. Unless produced where sold, its genuineness may be a matter of question. Those who are familiar with the genuine article state that the delicacy of its flavor, its consistency, etc., are much superior to the so-called buttermilk of commerce. The composition of the two articles is practically the same. When milk from which the cream has been removed by the separator is allowed to sour, it is said to resemble ordinary buttermilk, and the fluid which goes by the latter name, sold extensively throughout Greater New York, is said to be skimmed milk especially soured.

Metschnickoff Artificially Soured Milk.—The announcement some years ago by Metschnickoff that the foregoing products were of very great hygienic and therapeutic value in disinfecting the intestines has resulted in the wholesale production of a substance which differs from ordinary sour milk in that it is prepared from a pure culture of lactic-acid germs. This product is doubtless destined to replace the older ones on account of its freedom from undesirable forms of bacteria. The technique for preparing it, devised originally by Metschnickoff himself, also places it in a higher class than the older preparations. Pure cultures are sold in the natural liquid form or are desiccated and sold as tablets.

Fermented Milk.—Milk which has been fermented is really a derivative of native milk, and in parts of Europe and Asia constitutes an important article of diet. The fermentation is either the lactic alone or the lactic and alcoholic together.

The ferments used consist chiefly of various "leavens" or cultures which cause lactic acid fermentation. People who have subsisted on this milk for centuries simply use a portion of old fermented milk to leaven fresh milk. These leavens vary considerably in composition and the milk used may be from one of several domestic animals. Some leavens contain yeast germs, so that alcohol may or may not be present. The native preparations which have been imitated in this country are kumyss, kefir and matzoon.

Kumyss was prepared originally from mares' milk. The leaven contains lactic acid germs and yeast. The product therefore contains lactic acid, alcohol and carbonic acid gas, representing an acid, effervescing and mildly alcoholic beverage. The casein curd is finely broken up and partially digested. Kumyss has been imitated in America by adding yeast to milk and allowing fermentation to proceed twenty-four hours or over.

Kefir was made originally from cows' milk with a leaven. This has been sold in tablet form like the rennet ferment.

Matzoon differs from the preceding chiefly in containing no alcohol.

Modified Milk is milk containing definite proportions of fat, sugar, protein, etc., put up usually according to the formula of a physician, who prescribes the quantity of the different constituents he desires.

For sick children and in convalescence it is of great value to obtain a modification in which the composition is definite and accurate. It can then be known what mixtures will agree with the patient.

Malted Milk is a pure food prepared from rich full milk, combined with the valuable nutritive extracts of malted barley and wheat. This product being highly concentrated and partially predigested, supplies a large amount of nutrition with little tax upon the digestive organs. It is a valuable nutrient in dyspepsia or impaired digestion, for fever and wasting diseases, the convalescent, the nursing mother, and the aged.

Peptonized Milk is milk in which the casein or curd has been made partially soluble and diffusible by means of the peptonizing tubes. In these peptonizing tubes, extractum pancreatis, containing the pancreatic ferment which acts especially upon the proteins of milk, is combined with bicarbonate of soda in due proportion and each tube contains sufficient peptonizing powder to peptonize a pint of milk. Milk may be peptonized by various methods—by the "cold process," "immediate process," "warm process," etc. The method and degree of peptonization suitable for any special case is soon determined by experience, by the agreeability of the milk and its digestibility.

Condensed Milk.—Preservation of milk by condensation constitutes a very extensive commercial industry. There are several processes in vogue and the product is either sweetened or unsweetened. Ordinary unsweetened condensed milk contains about 12 per cent. each of protein and fat and 16 per cent. of the native milk sugar, making the total solids 40 per cent. Cane sugar may be added to the amount of about 40 per cent. more, making the total solids 80 per cent.

Evaporated Milk is made of pure milk, fresh from the cow, nothing taken from it to lessen its nourishing qualities and nothing added. It is sterilized by the application of a higher degree of heat than is used in ordinary pasteurization.

Energy Value of Milk

1 cup of whole milk	=169 Calories
1 cup skimmed milk	= 89 Calories
1 cup cream (18%)	=440 Calories
1 cup cream (40%)	=864 Calories

PASTEURIZATION

Methods of Preparing.—Put bottle into kettle of cold water and bring slowly to the boiling point. Boil ten minutes, after which fill immediately nearly full with milk; cork with absorbent cotton which has been baked in the oven until a delicate brown. Place bottles on a rest in a deep pan so that they will not touch bottom and fill the pan with cold water to reach as high as the milk in bottles. Heat water gradually to 145 degrees Fahrenheit, or until small bubbles appear in the milk next to the glass. Remove to back of stove and keep milk at same temperature 20 to 30 minutes; then cool quickly to 45 degrees or lower. To cool rapidly put bottles first into lukewarm water and then cold water until milk is cold, then surround with ice water. Keep in cold place and do not remove stoppers until ready to use. Note: Pasteurization, page 169.

Utensils.—A convenient form of apparatus for pasteurization can be purchased or a covered tin pail answers well for the larger vessel, and an inverted pie pan with perforated bottom may serve as the false bottom. A hole may be punched in the cover of the pail, a cork inserted and a chemical thermometer put through the cork so that the bulb dips in the water, thus enabling one to watch the temperature closely without removing the cover, or an ordinary dairy thermometer may be used from time to time by removing the lid.

STERILIZATION

The utensils and methods for sterilizing milk are the same as for pasteurizing, except that the water is heated to the boiling point (212° F.) and the time for boiling is ten or more minutes. Note: Sterilization, page 170.

EVAPORATED MILK

It is sometimes of advantage, as in cases of dilated stomach or whenever the total amount of fluids must be cut down to a given point, to heat the milk in a pan over which is placed an inverted funnel. Much of the water of the milk passes off as vapor, while the solids remain in the pan.

BAKED MILK

Into a stone jar put one-half gallon of sweet milk; cover with writing paper and tie it on. Bake in moderate oven nine to ten hours. It will be the consistency of thick cream.

MALTED MILK, 122 CALORIES

Mix two tablespoons of Horlick's Malted Milk powder with a little tepid water to make a smooth paste; add three-fourths cup water, hot or cold, stirring briskly and serve.

Note: May be prepared with hot milk instead of water and a little cream added if desired.

PARTIALLY PEPTONIZED MILK,[1] 338 CALORIES

1 pint milk.
Peptonizing powder
or
1 peptonizing tube.

4 oz. water.
{ Pancreatin gr. v.
{ Sodium bicarbonate gr. x.

Mix water and powder. Put in clean jar or bottle with a cover. Add the milk. Shake well. Set in water bath of 115° F. for 20 minutes. Bring immediately to the boiling point. Remove and put on ice.

FULLY PEPTONIZED MILK[1]

When fully peptonized milk is desired, the milk prepared

[1] "St. Luke's Dietary," St. Luke's Hospital, New York City.

as above should remain in the water bath for one hour. This is used for rectal feeding.

JUNKET (FOR INFANTS), 338 CALORIES

1 pint fresh cow's milk.
Pinch salt.
2 teaspoons granulated sugar.
2 teaspoons essence of pepsin, *or* liquid rennet, *or* one half junket tablet.

Heat the milk to blood heat (100° F.), add salt, sugar and the essence of pepsin *or* liquid rennet. (If the junket tablet is used dissolve in a tablespoon of cold water.) Stir mixture for a moment and then allow it to stand at the temperature of the room for twenty minutes, or until firmly coagulated; place in the ice box until thoroughly cold. For older children this may be flavored with nutmeg.

Note: If it is desired to have as little fat as possible, skimmed milk should be used and whey should be strained through fine, white muslin without pressure. For the adult, junket may be served as directed on page 262.

WHEY[1] (FOR INFANTS)

The coagulated milk may be prepared as for junket. It is then broken up with a fork and the whey strained off through muslin. If some stimulant is desired, a little sherry wine may be added. Whey is useful in many cases of acute indigestion with vomiting, but not generally in diarrhœa.

For the adult, note: Whey Preparations, page 300.

CURD[1] (FOR CHILDREN)

After all the whey has been drained off or removed by squeezing, the dry curd, with the addition of a little salt, is palatable and often useful in cases of diarrhœa. One round tablespoonful may be given to older children three or four times a day either plain or spread on thin toast. It should not be used for this condition unless freshly made. No sugar should be added before coagulation.

[1]L. Emmett Holt, M.D., "The Care and Feeding of Children," D. Appleton & Co., New York City.

MARTIN'S MILK,[1] 676 CALORIES

½ gm., 7½ grains, rennin *or* 1 dram (4 c.c.) liquid rennet.	1 pint (500 c.c.) milk.

Heat milk to 98° F. Add rennin dissolved in cold water. Allow to coagulate. Beat thoroughly with dover egg beater. Season with salt and chill.

PROTEIN MILK (EIWEISS-MILCH),[2] 676 CALORIES
(Finkelstein)

1 junket tablet *or*	1 pint boiled water (cooled)
2 teaspoons rennet.	1 pint fat-free buttermilk.
1 quart milk.	

Add the junket tablet dissolved in one tablespoon cold water, *or* the rennet, to the milk. Allow to stand for one-half hour at temperature of 100° F. The whey is then removed from the curd thus formed and discarded. The boiled water is then added to the curd and by constant and easy stirring this mixture is rubbed through a sieve. This last process is repeated at least once and the mixture must now have the appearance of milk and the curd should be finely divided. The fat-free buttermilk is then added and thoroughly mixed.

The approximate percentages of the constituents of Eiweiss milch and the caloric value are as follows:

Protein	Fat	Carbohydrates	Cal. Val. per. oz.
3.0	2.5	1.5	12

Protein milk is useful at times, in conditions of intestinal disturbances associated with diarrhœa, for infants, children and adults where milk, either alone or with the usual admixtures, is not well borne.

Note: In making Protein milk some authorities recommend from one to four teaspoons of rennet. One teaspoon rennet gives a very delicate flavor but is found to take a great deal of time to coagulate mixture.

[1] Dr. Herbert Carter, "Presbyterian Diet Lists," New York City, W. B. Saunders Co., Phila., Pa.
[2] "St. Luke's Dietary," St. Luke's Hospital, New York City.

BUTTERMILK[1] (BULGARIAN)

1 cup (whole milk buttermilk)=88 Calories

1 quart fresh whole milk, *or* skimmed *or* entirely fat-free, *or* pasteurized milk.

1½ to 2 ounces (Bulgarian) starter, *or* 1 buttermilk tablet, *or* 1 tube (1 c.c.) of lactobacillin.

Dissolve the tablet *or* lactobacillin in one gill of cold water or if the buttermilk starter is used stir it into the cold milk and place in a one-half gallon glass jar, place the cover on loosely and allow to stand in warm room (80° to 90° F.) 12 to 24 hours until it is well clabbered. When this is accomplished place the jar in the ice box. When thoroughly cold put rubber and cover over jar and "churn" by shaking it vigorously for a minute or two. Or the milk may be prepared in a bowl or pitcher and beaten with an egg beater until smooth and creamy. Save about 4 ounces to use as culture for next supply. If buttermilk is made daily, a new culture need not be bought oftener than once a month.

Note: If the acid flavor is too mild, let stand cold another day. If desired the buttermilk may be diluted with one-fourth water. A pinch of salt may be added. This buttermilk may be kept on ice or in refrigerator for a week or longer. Where fat is not well borne the cream should be removed from milk before using. For large quantity, use one-half bottle of lactobacillin to can of milk.

LACTONE BUTTERMILK

1 cup (whole milk buttermilk)=88 Calories

1 quart fresh whole milk.

1 lactone tablet.

Prepare as for Buttermilk but allow mixture to stand at temperature of 70°-75° F. for 24 to 36 hours, shaking the bottle occasionally to keep the cream from rising. When sufficiently fermented pour the milk into a bowl and beat briskly for 5 to 6 minutes with egg-beater or with churn, and place on ice until ready to serve.

[1] Modified from "Infant Care," U. S. Dept. of Labor, Children's Bureau, Washington, D. C.

KUMYSS

1/6 cake Fleischmann's yeast.	1 tablespoon water.
1½ tablespoons sugar.	1 quart milk.

Make a thin syrup of the sugar and water and cook one minute. Soften the yeast in two tablespoons of lukewarm milk. Heat the milk until lukewarm, add other ingredients and shake. Put in sterile patent beer bottles, place in upright position for twelve hours, at 70 degrees Fahrenheit (or comfortably warm room); then turn on side at heat 50 degrees Fahrenheit (lower part of ice-box). Ready for use after the first twenty-four hours; often kept several days, but the longer it is kept the less palatable it is. Open a bottle of kumyss with a champagne tap, or the cork may be punctured with a stout needle to let the gas escape. It should look like thick, foamy cream.

Kumyss is especially suited for many forms of indigestion, nausea, fever and gastric trouble, pulmonary consumption and other wasting diseases.

Dr. Brush's prepared kumyss is recommended on account of its superiority over the home-made preparations, as the milk supply is controlled and the method of preparing is carried out upon scientific basis. It is also more convenient, as it is ready for immediate use.

CASEIN-CALCIUM MILK[1] (STOELTZNER'S)

6 ounces, 4% milk, *cold.*	10 ounces, 4% milk, *hot.*
20 grains casein-calcium.	

Dissolve the casein-calcium in the cold milk and pour into the hot milk. Boil the mixture five minutes, stirring constantly. This makes a smooth, homogeneous mixture of thin creamy consistency; to this add one pint of boiled water or cereal decoction.

The approximate percentage of the constituents and the caloric value are as follows:

Protein	Fat	Carbohydrates	Cal. Val. per. oz.
3.4%	1.7%	2.2%	12

[1] "St. Luke's Dietary," St. Luke's Hospital, New York City.

HYDROCHLORIC MILK,[1] 676 CALORIES

Milk	1 quart
Water	1 pint
Dilute hydrochloric acid	m xxv

After adding acid to water, mix with milk and heat to boiling point. Cool before serving.

MEDICATED MILK[1]

Cerium oxalate	gr. x
Sodium bicarbonate	gr. xx
Milk	℥ viii

DELAFIELD'S MILK MIXTURE[2]

(Feeding in Nausea)

Milk	120 c.c.	(4 oz.)
Cream	120 c.c.	(4 oz.)
Vichy	120 c.c.	(4 oz.)
Soda bicarbonate	1⅓ gm.	(20 gr.)
Cerium oxalate	⅔ gm.	(10 gr.)

Delafield's mixture is often serviceable in the feeding of gastric cases accompanied by much nausea and vomiting, beginning with dram doses every twenty minutes and gradually increasing the dose and later lengthening the intervals.

DIABETIC MILK[2] (WRIGHT'S)

Definite quantity of milk diluted with three to four volumes distilled water, to which 1 : or 2 :1000 glacial acetic acid has been added (6-12 c.c., dr. 1½-3, glacial acetic acid; 1 pint or 500 c.c. water). This precipitates all casein and fat.

Allow to settle, then strain through muslin. Wash repeatedly. Redissolve curd in a 1 per cent. solution of the following mixture, enough to make the original amount of milk:

[1] "St. Luke's Dietary," St. Luke's Hospital, New York City.
[2] Dr. Herbert Carter, "Presbyterian Diet Lists," New York City, W. B. Saunders Co., Phila., Pa.

Sodium chloride	11.5
Potassium chloride	9.9
Monopotassium phosphate	13.8
Dipotassium phosphate	10.0
Citrate of potassium	5.9
Dimagnesium phosphate	4.0
Magnesium citrate	4.4
Dicalcium phosphate	8.0
Tricalcium phosphate	9.6
Calcium citrate	25.5
Calcium oxide	5.5
Sodium carbonate	40.0

Analysis of Wright's Diabetic Milk[1]

Specific gravity, 1011.

Ash	0.200 per cent.
Fat	3.600 per cent.
Protein	1.907 per cent.
Carbohydrate	0.015 per cent.
Total solids	5.722 per cent.
NaCl	0.110 per cent.

THICKENED MILK

See Flour Gruel. Page 200.

RICE MILK, 454 CALORIES

1 ounce rice.
1 pint scalded milk.
¼ teaspoon salt.
1 teaspoon sugar.

Soak rice twelve hours, strain and add the scalded milk, salt and sugar. Stir well and cook slowly one hour. Rub through a fine sieve (thin with more hot milk if desired). Taste and add more seasoning if necessary. Sago or tapioca may be used in the same way.

RUM AND MILK, 182 CALORIES

¾ cup milk.
¾ tablespoon rum or brandy.
1½ teaspoon sugar.

Use fresh or pasteurized milk. Put ingredients into a lemonade shaker or fruit jar, using rubber band and cover; cover well and shake until frothy. Serve in glass three-fourths filled.

SHERRY OR BRANDY AND MILK, 172 CALORIES[1]

¾ cup fresh milk.
¾ tablespoon brandy or
⅓ wineglass of sherry.
¾ teaspoon sugar.
Nutmeg.

Blend as for Rum and Milk. Fill glass three-fourths full and add a grating of nutmeg on top.

CINNAMON AND MILK, 132 CALORIES[2]

¾ cup new milk.
Stick cinnamon.
Sugar.
⅓ teaspoon brandy.

Boil milk, with sufficient cinnamon to flavor pleasantly, and sweeten. This may be taken cold with the brandy. Very good in cases of diarrhœa. Children may take it warm without brandy.

Soup and Soup Accompaniments

Soup is a light and suitable form of food for the sick. There are two classes—those made with meat and those without meat.

The soups with meat are an infusion of meat, flavored with salt and some condiment. They are treated in the chapter on broths.

The foundations of soups without meat are milk, vegetables and water. They are dainty and nutritious and an excellent way of serving milk and the starch and mineral matter of the vegetable.

They may be served as a luncheon, with crisp crackers, or as the first course of a dinner. Serve daintily in heated bouillon cups, partly filled, on small plate and doily.

General Rules for Blending Cream Soup:

Foundation of Cream Soups is a sauce and a stock. The stock gives the flavor and names to the soups, as Cream of Chicken, Cream of Pea, etc.

(*a*) *Preparation of Vegetable Stock.* The vegetables are

[1] Calculated with brandy.
[2] Without sugar.

cooked until very soft, usually rubbed through a strainer and except potatoes and such as have a strong odor, are used with a part or all of the water in which they are cooked. This water is called vegetable stock.

(*b*) *Preparation of White Sauce.* There are two methods of blending White Sauce. 1. Melt butter, add the flour and gradually the scalded milk or water, cooking thoroughly. 2. Scald the milk, wet the flour with a little cold milk to make a smooth paste and add gradually to the hot milk. Cook well. The amount of flour (thickening) used in making the white sauce varies with the density of the pulp. The flour and fat are called the "binding material."

(*c*) Blend (*a*) and (*b*). Season, strain and serve immediately.

One-fourth, one-third, one-half or even equal parts as much vegetable stock and pulp as white sauce may be used.

For the Diabetic.—*Cream* soups for the diabetic are made by using 25 to 30 grams of vegetables cooked and pressed through a sieve, with stock and cream added and thickened with the yolk of one egg. This is the method of making all diabetic cream soups. *Clear* soups are made by omitting the egg and cream. Salt, pepper, a little onion, chopped parsley or chicken or beef stock may be used for seasoning these soups.

Cream Sauce[1] for soups may be prepared as follows: Blend one cup of cream, three-fourths cup water and two egg yolks in top of double boiler and cook until of a creamy consistency, stirring constantly. When the mixture coats a silver spoon remove from fire. Calories, 560.

CREAM OF ASPARAGUS SOUP, 309 CALORIES

(Two Servings)

¼ bunch asparagus.	¾ tablespoon flour.
1 cup milk.	Salt.
½ tablespoon butter.	Pepper.

(*a*) Wash the asparagus and cook in boiling salted water,

[1] "St. Luke's Dietary," St. Luke's Hospital, New York City.

boiling gently thirty minutes. Take from the water, cut off the tips and put them into the serving dish; press the remainder through a colander.

(*b*) Scald the milk. Melt the butter, add the flour and gradually pour on the scalding milk. Cook thoroughly, stirring often.

Blend (*a*) and (*b*); reheat, season to taste, strain over tips and serve at once with crisped wafer crackers.

CREAM OF CORN SOUP, 481 CALORIES

(Two Servings)

½ cup corn.	1 cup milk.
½ cup cold water.	1 tablespoon flour.
¼ slice onion.	1 tablespoon butter.
Salt and pepper.	Yolk 1 egg.

(*a*) Chop corn, add water and simmer twenty minutes; rub through a sieve.

(*b*) Scald milk with onion; remove onion. Melt butter, add flour and gradually pour on milk.

Blend (*a*) and (*b*); cook thoroughly, season to taste with salt and pepper and pour over the beaten yolk. When well blended, serve hot.

Note: The yolk of egg may be omitted.

CREAM OF CELERY SOUP, 308 CALORIES

(Two Servings.)

4 stalks celery.	1 tablespoon butter.
½ cup boiling water.	1 tablespoon flour.
Salt and pepper.	1 cup milk.

(*a*) Wash and scrape the celery and cut into small pieces, add the water and cook until very tender and soft. Renew the water if it boils away. Mash the celery in the water in which it was cooked.

(*b*) Scald milk. Melt the butter in a saucepan, add flour and gradually pour on the scalded milk. Cook thoroughly, stirring carefully.

Blend (*a*) and (*b*); season to taste; strain and serve immediately with croûtons or crisped crackers.

CREAM OF PEA SOUP, 208 CALORIES

(Individual Rule.)

½ cup peas.
½ teaspoon sugar.
⅓ cup cold water.
Salt and pepper.
½ cup milk.
½ tablespoon butter.
½ tablespoon flour.

(*a*) Drain peas from their liquor, rinse thoroughly, add sugar and cold water and simmer twenty minutes. Rub through a sieve; reheat.

(*b*) Scald milk. Melt butter, add flour and gradually pour on the scalded milk. Cook thoroughly, stirring carefully.

CREAM OF POTATO SOUP, 241 CALORIES

(Individual Rule.)

¾ cup milk.
¼ slice onion.
¼ cup mashed potatoes.
½ tablespoon butter.
½ tablespoon flour.
¼ teaspoon salt.
Pepper.

(*a*) Scald milk with onion in it, remove onion and add milk slowly to potatoes. (*b*) Melt butter, add flour and gradually pour on the hot mixture. Cook thoroughly and season to taste. A little celery salt may be added if desired. A little finely-chopped parsley may be sprinkled over top of soup.

CREAM OF RICE SOUP, 294 CALORIES

(Individual Rule.)

1 tablespoon rice.
1 cup milk.
¾ tablespoon butter.
⅛ small onion.
Stalk celery.
⅛ bay leaf.
Salt.
Pepper.

Scald the milk, add the well-washed rice and cook in double boiler thirty minutes, covered closely.

Melt butter in sauté pan, add the sliced onion and cook till tender, but not brown. Add celery sliced, and turn into scalded milk; add the bay leaf, cover and let stand on back of stove fifteen minutes. Strain, season with salt and pepper, reheat and serve.

Note: If soup is too thick, add a little heated milk.

MOCK BISQUE SOUP, 316 CALORIES

(Individual Rule.)

½ cup tomatoes.
1/16 teaspoon soda.
Salt and pepper.
1 cup milk.
1 tablespoon butter.
¾ tablespoon flour or cornstarch.

(*a*) Steam tomatoes until soft enough to strain juice; strain, add soda and allow gases to pass off. This prevents the acid of the tomato from curdling the milk.

(*b*) Scald milk; melt butter in quart size saucepan, add the flour and gradually pour on the scalded milk. Cook thoroughly, stirring carefully.

Blend (*a*) and (*b*); reheat, season to taste, strain and serve immediately with croûtons or crackers.

DRIED FRUIT SOUP, 191 CALORIES[1]

¼ cup dried apricots.
¼ cup prunes.
1 cup cold water.
Sugar to taste.

Pick over and wash fruit until perfectly clean. Cook in the water until very soft. Strain and squeeze out all the juice; sweeten to taste. Thicken if liked.

Thickening.—1 slightly rounding teaspoon rice flour to 1 cup liquid. Cook twenty minutes to remove raw taste of starch.

TOMATO SOUP (WITH BROTH), 104 CALORIES

(Individual Rule.)

½ cup strained tomatoes.
½ tablespoon butter.
½ slice onion.
1 tablespoon flour.
1 cup water or stock.
¼ teaspoon salt.
Speck pepper.

(*a*) Cook and strain tomatoes, obtaining one-half cup juice.

(*b*) Melt butter, add the onion and brown slightly; add the flour; gradually pour on the boiling water or stock.

Blend (*a*) and (*b*); cook thoroughly, season with salt and pepper, strain and serve.

[1] Without sugar.

Note: Two tablespoons of cream may be added.

Beef or mutton broth strained may be used in place of water if desired.

VICTORIA SOUP (WITH BROTH), 581 CALORIES

(Two Servings.)

½ cup lean chicken meat.
1 cup strong chicken broth.
½ teaspoon salt.
Pepper.
1 cup milk.
¼ cup cracker crumbs.
Yolks 2 eggs.

Soak the crumbs in a little of the milk. Cook yolks of eggs in hot water until hard. Chop the chicken, mix with the soaked cracker crumbs, press the hard-cooked yolks through a coarse strainer, add the seasonings and the broth and cook all together five minutes over direct heat or one-half hour in double boiler. Serve hot.

VEGETABLE SOUP (FOR INFANTS)

1 cup of carrots, 1 cup turnips, handful of spinach (other vegetables may be substituted), 1 teaspoonful of salt, water to cover. Water drained from rice makes a more nourishing soup than plain water. Add 1 soup bone or one-half cup scraped or chopped beef if desired. Chop vegetables until fine or put through a meat grinder. Cover with water, using as little as possible, and boil slowly until very soft. For young infants, strain, pressing the vegetables with the back of a large spoon. The liquid will be cloudy. For older infants press the vegetables through a sieve, adding one or more teaspoonfuls of pulp to small cup of liquid.

When thus prepared this soup may be kept from three to four days except in hot weather, if the entire quantity is heated to the boiling point every day before using.

Well cooked rice, barley or bread crumbs may be added for infants. Egg may be given in soup, if desired, by stirring 1 well-beaten egg into 1 cup of hot soup until the egg becomes finely curded.

MALT-SOUP MIXTURE[1] NO. 1

10 oz. 4% milk.
20 oz. water.
1 oz. (by weight) wheat flour (1½ tablespoonfuls).
1 oz. (by weight) malt-soup extract.

MALT-SOUP MIXTURE[1] NO. 2

15 oz. 4% milk.
20 oz. water.
1 oz. (by weight) wheat flour (3 tablespoonfuls).
1½ oz. (by weight) malt-soup extract.

MALT-SOUP MIXTURE[1] NO. 3

20 oz. 4% milk.
20 oz. water.
½ oz. (by weight) wheat flour (3 tablespoonfuls).
1½ oz. (by weight) malt-soup extract.

Directions for Preparing Malt-Soup Mixture[1]

The flour should be mixed with 15 oz. of the water and allowed to boil for twenty minutes. The malt-soup extract should be mixed with 5 oz. of the water and then, together with the milk, added to the cooked cereal. Allow the whole mixture to simmer in a double boiler and stir thoroughly ten minutes. Add enough boiled water to make up the deficiency from boiling and strain through a sieve.

The approximate percentages of the constituents and the caloric values of the above mixtures are as follows:

	F.	C.	P.	Cal. per oz.
Mixture No. 1	1.4	5.4	1.4	11
Mixture No. 2	1.8	7.5	1.9	15
Mixture No. 3	2.1	7	2	16½

DIABETIC—CREAM OF CELERY SOUP, 208 CALORIES

(Three Servings.)

6 stalks celery.
1 slice onion.
1 cup water.
1 cup hot milk.
Speck cayenne pepper, salt.
½ teaspoon butter.
½ teaspoon gluten flour.

Boil, mash and strain the first three ingredients, add the

[1] "St. Luke's Dietary," St. Luke's Hospital, New York City.

hot milk or cream. Melt the butter, add the flour and gradually pour on the hot soup stock; season and cook thoroughly.

DIABETIC—ONION SOUP, 30 CALORIES

One Bermuda or three green onions boiled until tender in stock or water; mash and strain. Add one-half teaspoon Gum Gluten Flour, one-half teaspoonful butter and a little chopped parsley. One tablespoon of cream, if desired.

DIABETIC—CREAM OF PEA SOUP,[1] 32 CALORIES

⅓ cup canned peas.
Salt.
1½ ounces (45 c.c.) water.
6 ounces (180 c.c.) milk.
1 dram (4 gm.) butter.
1 dram (4 gm.) flour.
1 dram (4 gm.) lactose.

Boil first three ingredients, strain, and add milk, melted butter, flour and lactose; season. Bring to the boiling point and strain. 30 c.c. (1 oz.) equals protein, 2.6 gm., calories, 32.

DIABETIC—BLACK BEAN SOUP,[1] 40 CALORIES

Part one.
2 tablespoons black beans.
1 cup cold water.
Seasoning—onions, celery salt, salt and pepper.

Part two.
⅔ cup milk.
2 drams (8 gm.) butter.
1 dram (4 gm.) flour.
Salt and pepper, q. s.

Boil ingredients of part one until tender, strain and add part two. Cook thoroughly and serve hot. 30 c.c. (1 oz.) equals protein, 1.98 gm., calories, 40.

DIABETIC—CREAM OF TOMATO SOUP, 217 CALORIES

(Two Servings.)

½ cup tomatoes.
1 slice onion.
1 cup milk.
½ teaspoon butter.
½ teaspoon gluten flour.
Salt, pepper.

Stew and strain the tomatoes and onion, reheat and add a tiny pinch of soda. When effervescing subsides add milk. Melt the butter, add the flour and gradually pour in the hot stock. Season and cook thoroughly.

[1] Dr. Herbert S. Carter, "Diet Lists of the Presbyterian Hospital," New York City; W. B. Saunders, Phila, Pa.

OYSTER SOUP

See "Oysters" for recipe. Pages 152-153.

OYSTER STEW

See "Oysters" for recipe. Page 153.

CLAM SOUP

See "Clams" for recipe. Page 155.

CLAM BOUILLON

See "Clams" for recipe. Page 155.

CLAM BOUILLON BISQUE

See "Clams" for recipe. Page 156.

MEAT SOUPS

Foundation for same, see "Broths." Pages 127-128.

Soup Accompaniments

CRISPED CRACKERS

1 Saltine=15 Calories.

Split common crackers or use saltines. Put in pan and bake until thoroughly heated. Serve plain or buttered slightly.

TOASTED CRACKERS

Butter crackers, put in pan and bake until a delicate brown. Serve on small plate with doily.

CROÛTONS

1 slice (1⅗ oz.)=100 Calories.

Take a slice of stale bread about half an inch thick, cut into half-inch cubes; put them in a shallow pan and dry thoroughly, then brown delicately. Stir often to brown evenly. Serve on small plate with doily. A little butter may be spread on the bread if desired.

DIABETIC—NOODLES FOR SOUP, 597 CALORIES

1 egg.
1 tablespoon milk.
5 ounces Hoyt's gluten flour.

Beat the egg very light, add the milk and gluten flour. Roll very thin and cut in straws. Cook in any soup.

QUESTIONS FOR STUDY

1. What are the disadvantages of a diet consisting very largely of animal foods?
2. Discuss the digestibility of meat. What do you understand by the term "digestibility"?
3. Discuss the nutritive value of meat.
4. What are the objective points in cooking meat? Illustrate each point by outlining a method of cooking meat.
5. What is the effect of hot and cold water on meat? In what methods of cooking meat are these effects taken advantage of?
6. What factors affect the quality of meat?
7. What animal organs are used for food?
8. Mention the points by which you would judge of the quality of beef, veal, mutton.
9. From what part of the animal do the following come: round steak, porterhouse steak, sirloin steak, sweetbreads?
10. Compare the digestibility of beef and pork. Give reasons for your answer.
11. Describe a method of obtaining meat juice. How much juice can be obtained from one pound of meat?
12. Discuss the nutritive value and the place in the diet of beef preparations.
13. Outline the principal points in the method of making broth.
14. Name three substances which can be added to broths to increase their nutritive value.
15. Discuss the digestibility of chicken.
16. What is a general rule for the time to be allowed in roasting fowl?
17. Discuss the digestibility and nutritive value of fish; shell-fish.
18. How would you tell whether fish is fresh?
19. When are oysters in season?
20. Give a recipe for oyster soup. Mention the special points to be observed in cooking oysters.
21. Discuss the nutritive value of eggs. In what forms is egg yolk most digestible? Egg white?
22. Compare the composition of egg yolk and egg white. What is the energy value of a medium sized egg? Of an average yolk? Of an average white?
23. How would you prepare a soft cooked egg? A poached egg?
24. What is the percentage composition of whole milk?
25. What can you say of the digestibility of milk?

26. Discuss the nutritive value of milk.
27. Why is care in the handling of milk important?
28. What is certified milk? Do you think its cost is justified?
29. What is pasteurized milk? What effect has pasteurization upon milk? Describe the method of pasteurizing milk.
30. When would you advise the sterilization of milk? How is this done? How does it affect the milk?
31. What is modified milk? Buttermilk? Peptonized milk? Malted milk? Condensed milk? Evaporated milk? Dry milk?
32. What is the fuel value of one cup of whole milk? Of one quart? Of one cup of skimmed milk? How many tablespoons are there in a 100-calorie portion of thin cream (18%)? In a 100-calorie portion of thick cream (40%)?
33. State briefly the method of preparation of cream soups. Discuss their food value.

CHAPTER IX

VEGETABLE OR PLANT FOODS

The important food products derived from the vegetable kingdom are the Cereals—Legumes—Roots and Tubers—Leaves and Stems—Fruits—Nuts—Fungi—Lichens.

Comparative Value of Animal and Vegetable Diets.—An animal diet is concentrated and easily digested. If the animal foods taken are eggs and milk, no serious objection can be urged against them, except that they lack roughage or ballast. The food is so fully absorbed that the large intestine has less stimulus to action and no material for its muscles to act upon, and serious complications are likely to arise from constipation. If the animal food is largely meat, it is undesirable, not only for the reason above mentioned but (1) because excessive quantities of nitrogenous extractives are taken, which are likely to cause uric acid disorders and other disturbances; (2) because of the excess of proteins, the elimination of which is a strain on the kidneys; (3) because of the danger of intestinal putrefaction from a high protein diet; (4) because important mineral salts are lacking (such as calcium, which carnivorous animals get by *eating bone*); (5) because of the preponderance of acid-forming elements. (See page 14.)

A strict vegetable diet, on the other hand, while free from these objections, is necessarily very bulky, owing to the high percentages of water and cellulose, and also to the fact that extra allowance must be made because it is less perfectly absorbed. Vegetable proteins are not of as high biological value as animal proteins, and unless special care is taken a vegetable diet is also likely to be low in proteins. Legumes and nuts must form a considerable part of the dietary to prevent this. When eggs, milk and milk products are added to the vegetable foods, the diet becomes mixed and these objections no longer hold.

An Ideal Diet is a mixture of animal and vegetable foods, so that protein, fat, carbohydrate and mineral matter and vitamines are supplied in proper proportions and in available forms and sufficient roughage is afforded for proper intestinal action.

Cereals

GRUELS—STARCHY JELLIES—BREAKFAST FOODS—MACARONI

Wherever it is possible to grow grains, they are staples of man's diet. No other food product of the vegetable kingdom equals them in importance. They are cheaply and easily grown.

They can be kept for long periods, are not difficult to cook and furnish a palatable and digestible article of diet. Cereals alone supply nearly one-fourth of the total food in a large number of the American families. Wheat, corn, rye, oats, barley, rice and buckwheat are in most common use.

The natural grain is surrounded by an indigestible husk which is always removed. Grains simply hulled or husked and slightly crushed are called groats or grits; more finely crushed, they constitute meal; ground to a powder and sifted they form flour.

Composition.—The chemical composition of some of the most common cereals is shown in the following table:

	Water %	Protein %	Fat %	Carbohydrate %	Calcium %	Phosphorus %	Iron %
Wheat flour	12.4	11.2	1.0	74.9	0.02	0.092	0.001
Rice	12.3	8.0	0.3	79.0	0.009	0.096	0.0009
Rolled oats	7.7	16.7	7.3	66.2	0.069	0.392	0.0038
Barley, pearled	11.5	8.5	1.1	77.8	0.02	0.181	0.0020
Cornmeal	12.5	9.2	1.9	75.4	0.018	0.190	0.0009

The nutrients in largest proportion are the carbohydrates, which frequently constitute 75 per cent. of the whole. The ash content is fairly large, especially in the whole grain products, as rolled oats and barley.

Generally speaking, cereals are moderately rich in proteins, 10-15% of their total calories being calories of protein.

Cereal Breakfast Foods are very similar in composition to the grains from which they are made, except that finely milled cereals contain little cellulose and are relatively poor in ash.

Macaroni is much like wheat breakfast foods in composition and food value.

Principles of Cooking.—Cooking improves cereals in many ways. For the average person, proper cooking has almost as much to do with the nutriment finally obtained as the proportions of nutrients originally present. Flavor and appearance are improved, with the gain in digestibility that comes from appetizing foods which stimulate the flow of digestive juices. Cooking to convert nutrients into more digestible forms is very important in the case of cereals which contain so much starch, and since the starch in these foods is surrounded by cell-walls of crude fiber, largely cellulose, upon which the digestive juices are unable to act, these walls must be broken down. Part of this disintegration may be accomplished in milling and part by thorough mastication, but complete digestion of the starch is assured only by thorough cooking.

Parching is one of the simplest methods of cooking grains. The invisible moisture in the cells is expanded by the heat and the cell walls burst. Some of the starch is also made soluble or changed to dextrin by this process. The digestibility of protein seems to be lessened by cooking at high temperatures, but the starch can be made almost perfectly digestible.

The softening of cellulose is more perfectly accomplished by cooking *for a long time* in the presence of a large amount of moisture, as in steaming, or cooking with water or milk in a double boiler. The glutinous material which surrounds the starch grains and prevents their digestion is disintegrated so that the digestive juices can act. In general, the more crude fiber a cereal contains, the longer it should be cooked. Reference to the table (p. 195) shows that oats require more cooking than rice; whole or partially crushed grains than finely ground ones. There is danger in undercooked cereals, not only of loss of valuable nutriment through failure of digestion, but in irritation of the alimentary tract. This should be especially remembered in preparing partially cooked breakfast foods.

When cereals are cooked in water some of it is absorbed and soluble substances in the food pass into the remaining water. If this is thrown away, as when rice is boiled in a large quantity of water and subsequently drained dry, a considerable part of the nutriment is lost. Rice water frequently contains enough dissolved starch to form a jelly on cooling. For this reason steaming is a preferable method. Practical application of the fact that certain nutrients in cereals are soluble is made in the preparation of all kinds of cereal waters and starchy jellies. (See Recipes, pp. 311-203.)

Gruels are thin porridges made from flour or other finely ground grain products, with either water or milk. They are cooked for a long time until the starch grains are thoroughly ruptured and the starch passes into a condition of "colloidal" or semi-solution. It is then much more easily acted on by the digestive juices. The time of cooking should therefore be conscientiously kept by the clock.

By passing the material through a cheese-cloth or sieve the coarser, undissolved portions are removed and the smooth product does not irritate weakened digestive organs; hence this method is desirable for invalids and young children.

In cooking all cereal products, the following points should be observed:

1. Use a double boiler.
2. Observe the correct proportions of cereal, water and salt.
3. Cook at boiling temperature (212° F.).
4. Watch the time by the clock and always cook the full time prescribed, preferably longer.
5. Serve attractively.

Improper cooking and poor serving are largely responsible for unpopularity of cereal foods.

Digestibility.—The digestibility of cereals is greatly influenced by the mode of preparation and the thoroughness with which they are masticated. For the normal healthy person cereal foods are very wholesome and, in general, easily digested.

Nutritive Value.—Cereals supply actual digestible nutriments to the body more cheaply than any other class of foods except the dried legumes. All animal foods, especially meats, are more expensive than cereals, even as sources of protein. For a discussion of the biological value of cereal proteins, see page 16. A glance at the composition of cereals shows that they are chiefly fuel foods, because of their high carbohydrate content. Their cost varies with the cost of labor and fuel in preparing the food. The comparatively expensive ready-to-eat breakfast foods do not furnish any extra nourishment. Their only advantages are pleasant flavor, variety and ease of serving. Cereal products yield on the average between 1600 and 1800 calories per pound. Thus:

1 lb. white flour furnishes	1603 Calories
1 lb. entire wheat flour furnishes	1633 Calories
1 lb. cornstarch furnishes	1632 Calories
1 lb. hominy furnishes	1608 Calories
1 lb. granulated corn meal furnishes	1613 Calories
1 lb. tapioca furnishes	1608 Calories
1 lb. rolled oats furnishes	1803 Calories
1 lb. rice furnishes	1591 Calories

Care of Cereals.—Cereals must be kept in a cool, dry place; warmth will favor the development of the maggot eggs and moisture when absorbed makes them musty.

Gruels

Gruels made of whole grains require long cooking and should be strained for infants under one year of age. Whole grains such as pearl barley or oat flakes are used in the proportion of two to four tablespoons to one pint of water, depending upon the consistency desired. The flour of grain is used in the same proportions.

The calories for gruels in following recipes are approximate, as there is no way of calculating how many calories are lost when gruel is strained.

ARROWROOT GRUEL, 206 CALORIES[1]

2 teaspoons arrowroot.	1 cup boiling water or milk.
2 tablespoons cold water.	Salt.

Blend the arrowroot and cold water to a smooth paste. Add to the boiling water or milk, stirring constantly. Cook in double boiler.

Arrowroot is the purest form of starch and beneficial in case of diarrhœa if not given too hot.

Note: Sugar, lemon juice, wine or brandy may be added as desired.

BARLEY GRUEL (FOR INFANTS), 114 CALORIES

2 tablespoons barley flour.	1¾ cup boiling water.
¼ cup cold water.	Pinch of salt.

Blend flour and cold water to make a smooth paste, then stir it into the briskly boiling salted water, stirring constantly. After the mixture has boiled, place it in a double boiler and cook at least twenty minutes to one-half hour. Strain and dilute with hot water to bring the whole up to one pint or to the desired consistency of thin paste or jelly.

Note: For the adult milk may be substituted for water in this recipe—Calories, 395. Sugar may be added if desired.

RICE—WHEAT OR OAT GRUEL (FOR INFANTS)

These are made from rice, wheat or oat flour exactly as barley water, as above described. They may also be made from the grain, using the same proportions with longer cooking. See "Pearl Barley Water," page 312, for directions in cooking.

[1] Calculated with milk.

BARLEY GRUEL (WITH BROTH), 189 CALORIES

(Two Servings.)

2 cups beef broth.
2 tablespoons barley flour.
2 tablespoons cold water.
¼ teaspoon salt.

Mix barley flour and salt with the cold water to form a smooth paste. Add gradually to the boiling stock and boil one-half hour. Strain and serve very hot.

CRACKER GRUEL, 243 CALORIES

(Individual Rule.)

2 tablespoons sifted cracker crumbs.
⅛ teaspoon salt.
1 cup scalded milk.

Pour hot milk gradually over cracker crumbs, stirring constantly. Cook in double boiler five minutes or two minutes over direct heat.

Note: Before preparing crumbs, crackers may be baked in a slow oven until a delicate brown, or graham crackers may be used. A convenient way to prepare the crumbs is to put them several times through a meat chopper and then sift.

FLOUR GRUEL OR THICKENED MILK, 214 CALORIES

(Individual Rule.)

¾ cup scalded milk.
¼ cup cold milk.
½ tablespoon flour.
Speck salt.
1 dozen raisins.

Scald the milk. Mix the flour with the cold milk to make a smooth mixture and stir into the scalded milk. Cook in a double boiler one-half hour or on back of stove in a saucepan.

Stone and quarter the raisins, then add water enough to cover; cook slowly until water has all boiled away. Add to gruel just before serving. Add salt. Strain and serve, or it may be served with the raisins in it.

Note: This gruel may be made without the raisins. Never use raisins in bowel troubles.

FARINA GRUEL, 102 CALORIES

(Individual Rule.)

½ tablespoon farina.
¼ cup cold water.
½ cup boiling water.
½ cup scalded milk.
Salt.

Mix the farina with the cold water, add to the boiling water and boil thirty minutes. Add the scalded milk. Taste and season properly. A little sugar may be added if desired, or an egg may be beaten and the gruel poured into it.

CORN MEAL GRUEL, 48 CALORIES[1]

1 tablespoon corn meal.
½ tablespoon flour.
¼ teaspoon salt.
2 tablespoons cold water.
1½ cups boiling water.
Milk.

Blend the meal, flour and salt with the cold water to make a smooth paste and stir into the boiling water. Cook in a double boiler one and one-half hours. Dilute with hot water, milk or cream to the desired consistency of thin paste or jelly. This may be strained.

Note: Hot milk may be substituted for the boiling water.

OATMEAL GRUEL, 156 CALORIES[1]

¼ cup granulated oatmeal.
½ teaspoon salt.
1½ cup boiling water.
Milk or cream.

Add oatmeal and salt to the boiling water and cook four to five hours in a double boiler, adding more water if necessary. Strain and dilute with hot milk to make it of the right consistency. Reheat and serve.

Note: Sugar and a little port wine may be added if allowed and desired. Hot milk may be substituted for the boiling water.

OATMEAL GRUEL, NO. II, 71 CALORIES[1]

¼ cup rolled oats.
1⅓ cup boiling water.
¼ teaspoon salt.
Milk or cream.

[1] Without milk or cream.

Mix the oats, water and salt in top of double boiler. Cook over direct heat five minutes and then over hot water one hour. Strain, bring to the boiling point and add milk or cream as desired.

EGG AND SHERRY GRUEL, 336 CALORIES

(Individual Rule.)

1 egg.
1 wineglass sherry (2 oz.).
1 teaspoon lemon juice.
1 tablespoon sugar.
Grating of nutmeg.
1 cup smooth hot gruel.

Beat the egg; add wine, lemon, nutmeg and pour on the hot gruel.

CAUDLE, 385 CALORIES[1]

¼ cup Scotch oatmeal.
2 quarts water.
Salt to taste.
½ cup raisins.
Juice ½ lemon.
Sugar, cinnamon, brandy, *or* wine.

Boil oatmeal, water and salt four or five hours. Strain; if too thick add a little hot water and whip it with a wooden spoon. Remove seeds from raisins, cook a short time in hot water and add raisins and water to above. Add lemon juice and sugar, cinnamon, brandy or wine to taste.

FLOUR BALL OR BOILED OR BROWNED FLOUR GRUEL (FOR TEETHING CHILDREN)

Tie one cup of wheat flour in a thick cloth and boil it in one quart of water for three hours; remove the cloth and expose the flour to the air or heat until it is hard. Grate from it when wanted. Put one tablespoonful into half a pint of new milk and stir over the fire until it comes to a boil; add a pinch of salt and a tablespoon of cold water and serve. This gruel is excellent for children afflicted with summer complaint. Or brown a tablespoon of flour in the oven or on top of the stove in a baking tin; feed a few pinches at a time to a child and it will often check diarrhœa.

[1] Without sugar or liquor.

DIABETIC—SOY BEAN GRUEL, 30 CALORIES

1 level tablespoon soy flour   4 cups boiling water

Pour water gradually on the flour and cook fifteen minutes. Season with salt. As this flour contains no starch it settles on standing. This may be overcome by adding one to two heaping teaspoons of barley, oat or wheat gruel flour before cooking. This adds 0.6 to 1.2 per cent starch to the gruel, also slightly increases the percentage of protein. One to four tablespoons soy flour may be used to one quart of water.

Starchy Jellies

BARLEY JELLY, 162 CALORIES

(Three Servings.)

3 tablespoons pearl barley.   1/8 teaspoon salt.
1 quart cold water.

Soak barley over night, drain and add the quart of fresh water, add salt, and cook in double boiler steadily for four hours down to one pint, adding water from time to time; strain through muslin. When cold this makes a thick jelly. Two tablespoons dissolved in eight ounces of warmed and sweetened milk may be given at single feeding for infants.

Note: Oatmeal, wheaten grits and rice grains may be used in same way.

Barley Jelly may be made using one tablespoon barley *flour,* blended with two tablespoons cold water, one cup boiling water and a pinch of salt. Cook twenty minutes, strain—Calories, 53. One-half cup of milk may be added if desired—Calories, 142.

RICE JELLY, 205 CALORIES

(Three Servings.)

1½ tablespoons rice.   2/3 cup milk.
1 cup cold water.   1 white of egg.
Speck salt.

Wash the rice and soak in cold water two hours, drain off the water and add the milk, cook in double boiler one and one-half hours. Strain through a fine sieve. Pour into molds, chill and serve with fruit juice or cream and sugar.

TAPIOCA JELLY, 196 CALORIES

(Three Servings.)

4 tablespoons pearl tapioca.
1 cup cold water.
⅔ cup boiling water.
Speck salt.

Soak tapioca in cold water three hours; add boiling water and salt; cook in double boiler two and one-fourth hours. Serve hot, plain with cream, wine and powdered sugar, or flavor while hot with lemon juice, and chill.

CORNSTARCH JELLIES

See "Cornstarch Pudding" for recipe. Page 263.

Breakfast Foods

Fruits served with breakfast foods make them more appetizing.

Follow directions on package for preparing patent or prepared cereals, allowing double the given time for cooking.

HASTY PUDDING OR CORNMEAL MUSH, 140 CALORIES[1]

(Individual Rule.)

¼ cup cornmeal.
½ tablespoon flour.
¼ teaspoon salt.
¼ cup cold milk or water.
½ cup boiling water.

Mix the meal, flour and salt with the cold milk or water; when smooth, stir into the boiling water. Cook in a double boiler one hour or more, or over direct heat one-half hour. Serve with cream and sugar, or turn into tins to cool if wanted for sautéing. Cut into slices, dip in flour and sauté in drippings or butter.

[1] Calculated without milk or cream.

HOMINY AND DATES, 241 CALORIES

¼ cup fine hominy.
1⅓ cups boiling water.
¼ teaspoon salt.
6 Dromedary Dates.

Put the hominy, water and salt in top of double boiler and cook two hours. Add more boiling water if mush seems stiff and thick. Stone and chop the dates and add to the mush about three minutes before serving. Dates are delicious served with rice or combined with any cereal.

OATMEAL MUSH FOR CHILDREN AND INVALIDS, 623 CALORIES

(Four Servings.)

1 cup granulated oatmeal.
1 teaspoon salt.
1 scant quart boiling water.

Put the oatmeal and salt in a double boiler, pour on the boiling water and cook three or four hours. Remove the cover just before serving and stir with a fork to let the steam escape. If the water in the lower boiler be strongly salted, the oatmeal will cook more quickly. Serve with sugar or salt and cream or milk.

Note: Baked sour apples, apple sauce and apple jelly are delicious eaten with oatmeal. They should be served with the mush and sugar and cream poured over the whole. They give the acid flavor which so many crave in the morning. Coarse oatmeal is not advisable in any form of water brash, acidity or bowel irritations. It often causes eruptions on the skin in warm weather.

BOILED RICE

See "Rice Puddings" for recipe. Page 266.

STEAMED RICE

See "Rice Puddings" for recipe. Page 267.

DIABETIC—SOY BEAN BREAKFAST FOOD, 480 CALORIES[1]

1 cup soy flour.
Milk or water.
Salt.
1 gram saccharin dissolved in water.

[1] Calculated without milk or cream.

Moisten the flour with milk or water to make a smooth paste, add a pinch of salt and one gram saccharin, which should be dissolved before adding. Boil one and one-half hours in a double boiler and serve with rich cream.

Starchy Sauces

BASIC RECIPES FOR SAUCES

Proportion:

a. Liquid...1 cup;	fat...1 tablespoon;	flour..1 tablespoon.
b. Liquid...1 cup;	fat...2 tablespoons;	flour..2 tablespoons.
c. Liquid...1 cup;	fat...3 tablespoons;	flour..3 tablespoons.

The liquid may be milk, soup stock or strained tomato. Salt, pepper, etc., to taste. Average amount of salt, ¼ teaspoon to one cup. Sauce of the first grade is suitable to combine with dry materials; of the second, to use with the average fish, meat or vegetables; of the third, for the basis of croquettes or souffles.

The shape of the dish influences the thickness of the sauce. If it is made in a shallow pan the evaporation will be greater.

Methods of Blending Sauces

1. Melt fat in saucepan; add flour mixed with seasonings and stir until it bubbles and the starch is thoroughly cooked; remove from the fire, add hot liquid about 1/3 at a time, stirring until well mixed, then beating until smooth and glossy. Boil about one minute.
2. Melt fat and add flour as above. Remove from fire, then add all cold liquid at once. Return to the fire, stir steadily until mixture boils.
3. Cream fat and flour. Add hot liquid, a little at a time. Cook until starch is thoroughly cooked about five minutes.
4. Heat milk in double boiler. Stir flour to smooth paste with a little cold milk; add some of the hot liquid, then mix with the remainder, stir until blended and cook thoroughly 20 to 30 minutes just before serving. Add fat, bit by bit, and seasoning.

DUTCH SAUCE

Add one cup white or milk sauce, to two beaten egg yolks and cook in double boiler like custard. Flavor with 1 tablespoon lemon juice.

WHITE SAUCE

White sauce may be varied by different flavors and garnishes, such as capers, celery, mushrooms, lobsters, oysters, etc.

TOMATO SAUCE

Tomato for sauce may be seasoned with onion, herbs and spices, by cooking them with it for a short time before straining.

Macaroni

BOILED MACARONI, 98 CALORIES[1]

(Individual Rule.)

¼ cup macaroni.	1 teaspoon salt.
3 cups boiling water.	Cream or milk.

Break macaroni into one-inch pieces, put into a strainer and rinse with cold water. Cook in boiling salted water twenty minutes, or until tender. Strain, pour a little cold water over it to prevent pieces from adhering; add cream, reheat and season with salt, or serve with White or Tomato Sauce and grated cheese.

WHITE SAUCE, 149 CALORIES

(Individual Rule.)

½ cup milk.	½ tablespoon flour.
½ tablespoon butter.	¼ teaspoon salt.

Scald the milk. Melt the butter, remove from stove and add the flour and mix thoroughly, then gradually pour on the hot milk, stirring constantly while blending. Cook thor-

[1] Without milk or cream.

oughly until there is no taste of raw starch and season with salt.

TOMATO SAUCE, 81 CALORIES

(Individual Rule.)

⅓ cup strained tomato juice.	½ tablespoon flour.
½ tablespoon butter.	Salt and pepper to taste.

Scald the tomatoes. Melt the butter and remove from stove, add the flour and mix thoroughly, then gradually pour on the hot tomato, stirring constantly while blending; cook thoroughly until there is no taste of raw starch and season with salt and pepper.

BAKED MACARONI

1 tablespoon grated fresh cheese=62 Calories.

Fill a buttered baking-dish with alternate layers of macaroni, white sauce and cheese; then cover with buttered cracker crumbs and bake until crumbs are a golden brown. Tomato sauce may be substituted for white sauce if desired.

DIABETIC—NOODLES, 597 CALORIES

(Individual Rule.)

1 egg, well beaten.	5 ounces Hoyt's gluten flour.
1 tablespoon milk.	

Beat egg, add milk and gradually add the gluten flour. Roll out and cut in thin strips. Serve with any soup.

DIABETIC—BOILED NOODLES OR NOODLES AU GRATIN

1 tablespoon grated fresh cheese=62 Calories.

Put the noodles into cold, salted water; cook at least forty-five minutes after it comes to boil, or boil until it is tender. Season with pepper and butter. Serve with white sauce or place the noodles in a baking-dish in alternate layers with grated cheese, having the top layer of cheese; season with pepper and butter. Pour over the mixture the water in which the noodles were cooked; or, if preferred, cream or stewed tomatoes may be used to moisten.

BUTTERED CRACKER CRUMBS, 197 CALORIES

1 tablespoon butter. ¼ cup cracker crumbs.

Melt butter and add cracker crumbs that have been rolled fine. To be used for the top of any scalloped dish. Cracker crumbs or bread crumbs may be used and bits of butter dotted over top.

Bread

From the most remote times, bread has been an important part of the diet of mankind. It is to-day probably more generally and extensively used than any other one food-stuff, with the possible exception of milk. It is therefore extremely important to know what constitutes good bread and what are its nutritive properties.

Composition.—The ingredients of bread are very simple—flour, water, yeast and salt. Any cereal, cleaned, crushed and sifted to a powder, may serve as the flour, but wheat flour makes the most satisfactory bread, because its proteins in the form of gluten have more elasticity than those of other cereals.

"Bread contains from 34 to 40 per cent. of water and the remainder, about 60 per cent. at least, is nutritive material. It contains a large amount of carbohydrates, a moderate amount of protein, a small amount of mineral matter, and almost no fat. Bread could not serve as the sole article of diet, because in order to supply enough fuel, protein, and ash constituents one would have to eat an impossibly large amount, and the diet would still be deficient in vitamines. The addition of other foods to increase the protein and ash content of the diet decreases the bulk necessary. Most methods of increasing the protein contents of bread have a tendency to increase the cost, but skimmed milk can be used in place of water in the mixing with little added expense and it will add about 2 per cent. increase as to protein."[1]

[1] From Farmer's Bulletin No. 389, U. S. Dept. of Agriculture, Washington, D. C. For further information, read, "Bread and Bread-Making," Farmer's Bulletin No. 389.

Digestibility and Nutritive Value.—"The nutritive value of bread depends not only on its chemical composition but also on its digestibility and digestibility in its turn seems to depend largely on the lightness of the loaf. It is the gluten in a dough which gives it the power of stretching and rising as the gas from the yeast expands within it and hence of making a light loaf. Rye has less gluten protein than wheat, while barley, oats and maize have none, so that they do not make a light, porous loaf like wheat. It is possible that of the various kinds of wheat flour those containing a large part of the bran—entire wheat and graham flours—furnish the body with more mineral matter than fine white flour, but it is not certain that the extra amount of mineral matter furnished is of the same value as that from the interior of the grain. They do not yield more digestible protein than the white flours, as was for a time supposed. It seems safe to say that, as far as is known, for a given amount of money, white flour yields the most caloric nourishment with the various food ingredients in good proportion. It should be remembered, however, that all kinds of bread are wholesome if of good quality and the use of several kinds is an easy means of securing variety in the diet."[1]

As compared with most meats and vegetables, bread has practically no waste and is very completely digested. Few foods yield so much energy for so little money. A diet of bread and milk can be perfectly balanced and will be tired of less easily than any other equally simple diet.

All bread-stuffs should be eaten slowly and thoroughly masticated, in order that time may be given for the saliva to act upon the starch, for if the stomach is hampered with quantities of unchanged starch it cannot perform its work without effort. Fermentation results or the intestines have more than their share of work to do and rebel. If these foods were eaten slowly much of the resultant dyspepsia would be avoided.

[1] From Farmer's Bulletin No. 389, U. S. Dept. of Agriculture, Washington, D. C.

Gluten Bread.—Gluten flour is prepared by washing the starch wholly or in part from wheat flour. The grayish, tough, elastic, sticky mass left after this process is largely gluten. The washed gluten dried and ground is called gluten flour. It contains considerable starch, so that it is necessary for the physician to know the exact composition of the brand employed in order to insure good results.

Bran Bread.—Bran is now extensively used in the diet of diabetic patients. If cooked with bacon fat, butter or eggs the flavor is much improved. Bran often contains a considerable quantity of starch. This may be washed out by putting bran in cheese-cloth and washing under cold water tap until water is clear, or by boiling. See page 217.

Cellu (cellulose) flour is a non-nutritive flour. It is prepared from specially purified vegetable fiber. It serves as a basis for bulk in filling out restricted diets, such as in the Allen treatment of diabetes. By admixture with India gum, washed bran, mineral oil and flavors, non-nutritive food substitutes can be prepared.

Soy Bean Bread.—Soy bean or soy bean flour contains a small amount of sugar, but few foods so valuable to the diabetic contain so little, and the flour is used to great advantage in diabetes. The average composition is water 10%, protein 35%, fat 18%, sugar 8 or 9%, while the remainder is made up of fiber and non-nitrogenous extract. One ounce contains 13 grams of protein and 120 calories.

Bread-Making.—The two practical methods of making bread are with yeast (fermented bread) and with cream of tartar and bicarbonate of soda (unfermented bread).

Fermented Bread.—The raising or leavening of bread is usually brought about by allowing yeast to develop in it. Yeast is an exceedingly minute form of plant life, which grows when given flour, moisture and warmth and by this growth produces carbon dioxide and alcohol.

The carbon dioxide, in its effort to escape, puffs up the flour dough, but owing to the viscous nature of the gluten (the elastic, strength-giving substances of flour) it is caught and retained.

Each little bubble of gas occupies a certain space, and when the bread is baked the walls around these spaces harden, the result being a porous loaf. The alcohol escapes into the oven in the baking.

Baking bread requires a hot oven.

The bread should continue to rise for about fifteen minutes after being placed in the oven, then the rising should cease and the loaf begin to brown.

We bake bread to kill the yeast plant, to render the starch more digestible, to expel the alcohol and carbon dioxide and to form a well-flavored crust.

The making of good bread requires care and intelligence on the part of the cook. Use a good brand of flour, fresh yeast, remembering that yeast is a plant and must be put at a proper temperature to grow. Watch each process carefully.

"Lightness and sweetness of bread depends as much on the way in which it is made as on the materials used. The greatest care should be used in preparing and baking the dough and in cooking and keeping the finished bread."

Unfermented Bread.—Carbon dioxide lightens bread by causing cream of tartar and bicarbonate of soda to unite chemically.

To one part soda use two parts cream of tartar. When given moisture and heat carbon dioxide is obtained.

Baking powder is a combination of the following ingredients:

Bicarbonate of soda	84 grammes
Cream of tartar	188 grammes
Starch	5 to 20 per cent.

General Rules for Flour Mixtures.—Use wheat flour unless otherwise stated.

If pastry flour is substituted for wheat flour, increase the quantity 2 tablespoons to 1 cup flour.

Sift the flour before measuring.

Sift again with the dry ingredients.

The pans should be ready and the oven should be heated before the ingredients are put together. The mixture should be put into the oven as soon as prepared.

For the Diabetic, Bread and Sugar Substitutes

Bread Substitutes.—When for any reason persons are curtailed in the use of starch in a diet, as in diabetes, they find it a great privation to do without bread and an acceptable substitute may be used. However, a diabetic bread should never be prescribed without a knowledge of its content of carbohydrates, protein and fat.

Sugar Substitutes.—Sweetina, or saccharin tablets, may be used to sweeten bread substitutes or for any food needing sweetening for the diabetic. To one bottle of "sweetina" add one pint winter. One teaspoon of this is equal to one pint of sugar. Dissolve one-half grain "saccharin" in one teaspoon water or one "saccharin tablet" in two tablespoons of water.

Energy Value of Bread

1 small slice (1 oz.) white bread	73 Calories
1 large slice (1⅖ oz.) white bread	100 Calories
1 small slice (1 oz.) entire wheat bread	74 Calories
1 small slice (1 oz.) gluten bread	70 Calories
1 small slice (1 oz.) Boston brown bread	64 Calories
1 large slice (1⅘ oz.) Boston brown bread	115 Calories

WHITE FLOUR BREAD

1 slice (1⅖ oz.)=100 Calories.

1 pint hot milk (or water).
1 pint cold milk (or water).
1 tablespoon sugar.
2 tablespoons butter *or* lard.
1 tablespoon salt.
1 Fleischmann's yeast cake.
Flour (about 3 quarts).

Put the scalded milk into mixing bowl; add the butter; when melted add the sugar, salt and cold milk. Save one-half cup of this liquid and when lukewarm soften the yeast in it and stand where it will keep warm. To above mixture add warmed sifted flour (sift twice before using) to make a thin batter, add softened yeast and more flour until stiff enough to knead. Knead until light and spongy. Care should be taken not to add more flour than is absolutely necessary. Butter a large stone crock or bowl, place bread in it and cover. Let rise three and one-half hours at about 75 degrees Fahrenheit (in a medium warm room). Then remove from jar and knead about twenty minutes until smooth and velvety, put into pans, cover carefully and let rise one hour or until double its bulk.

Bake in a hot oven from forty-five minutes to one hour, depending upon size of loaves.

If hard crust is desired, remove from pans and cool in a draft of air. For soft crust, roll bread in a clean cloth while still hot.

This quantity will make three good sized loaves; one-half the amount may be used for one large loaf.

ENTIRE WHEAT BREAD

1 slice (1 oz.)=74 Calories.

2 cups scalded milk.
2 cups boiling water.
3 tablespoons butter.
3 tablespoons salt.
5 tablespoons molasses.
2 yeast cakes dissolved in ½ cup lukewarm water.
2 cups white flour.
Entire wheat flour enough to knead.

Make as for wheat flour bread and add molasses after the first rising.

One-half of recipe may be used.

WHOLE WHEAT OR GRAHAM BREAD

Make the same as wheat flour bread adding two tablespoons of sugar or molasses. Make a batter with white flour, using three or four cups, then use whole wheat or graham flour. Let rise longer than for white bread and put immediately into pans without second kneading.

Note: Sweetening may be omitted if desired.

DIABETIC—GLUTEN BREAD

1 slice (1 oz.)=70 Calories.

½ yeast cake.
2 cups lukewarm water.
3½ cups Hoyt's gluten flour.
½ teaspoon salt.

Soften the yeast in a small portion of the water and add to the ingredients. Mix to a stiff dough and knead thoroughly, using more gluten if necessary to keep it from sticking to the board. Shape into a loaf, place in a buttered pan for about two and one-half hours to rise until the dough is about twice its bulk. Then bake for forty-five minutes. If desired the dough may be given a second mixing after the first rising, letting it rise again before baking.

Note: Gluten bread may be made the same as ordinary wheat flour bread with the exception of shortening, which is not required.

Avoid having the water too warm or the bread will be sticky; the chill taken off is all that is necessary.

If desired one cup of nut meats cut in small pieces may be added to dough just before putting into pans.

BRAN BREAD

Follow rule for Gluten Bread, using one part of bran to four parts of Gluten Flour with one cup of moisture. If the bran is increased the moisture must be lessened.

BOSTON BROWN BREAD, 2074 CALORIES

1 large slice (1⅘ oz.) = 115 Calories.

1 cup granulated Indian meal.
1 cup rye flour.
1 cup graham flour.
1 teaspoon salt.
2 cups sour milk.
2 teaspoons soda.
¾ cup molasses.

Mix dry ingredients (except soda) together; dissolve soda in sour milk after which add molasses. Pour into buttered tins and steam three or four hours.

BAKING POWDER BISCUIT, 630 CALORIES[1]

1 cup flour.
1½ level teaspoons Rumford baking powder.
¼ teaspoon salt.
1 tablespoon butter or lard.
½ cup (scant) milk or water.

Sift dry ingredients twice, rub in the butter with tips of fingers; using knife, gradually stir in the liquid; mix as

[1] With milk.

soft as can be handled; put dough on a well-floured board, pat lightly to one inch thickness, cut with biscuit cutter, put on a shallow buttered tin, heated, and bake in a hot oven. Put a little milk on top of each biscuit before baking to make them brown well.

Note: Dough may be lightly kneaded as for bread and then cut.

WHITE GEMS, 1511 CALORIES

2 cups flour.
1 teaspoon salt.
3 level teaspoons Rumford baking powder.
2 tablespoons butter.
2 tablespoons sugar.
2 eggs.
1 cup milk.

Sift dry ingredients into mixing bowl, add the well-beaten eggs and the milk gradually, then the butter melted and beat all well together. Have gem pans well greased and heated; fill two-thirds full and bake in a very hot oven fifteen or twenty minutes. Put a little melted butter on each gem before putting it into the oven. They are sufficiently cooked if when tested with a fine washed knitting needle it comes out dry.

CORNMEAL GEMS, 1320 CALORIES

1 cup flour.
½ cup cornmeal.
⅓ cup sugar.
3 level teaspoons Rumford baking powder.
½ teaspoon salt.
1 egg.
1 cup milk.
1 tablespoon melted butter.

Sift dry ingredients into mixing bowl, add the milk and well-beaten egg and the melted butter. Put into well-greased hot gems and cook in a quick oven.

BRAN MUFFINS, 791 CALORIES

½ cup flour.
½ teaspoon soda.
¼ teaspoon salt.
1 cup bran.
½ cup sweet milk.
2½ tablespoons molasses.
1 egg.

Sift flour, soda and salt into mixing bowl and add the bran, milk, molasses and well-beaten egg. Bake in gem pans in quick oven.

DIABETIC—BRAN CAKES, 832 CALORIES[1]

Bran, 2 cups.	Egg-white (1), 33 grams.
Melted butter, 30 grams.	Salt, 1 teaspoonful.
Eggs (whole) 2.	Water.

Tie bran in cheese-cloth and wash thoroughly by fastening on the water tap, until the water comes away clear. The bran should be frequently kneaded so that all parts come in contact with the water. Wring dry. Mix bran, well-beaten whole eggs, butter and salt. Beat the egg white very stiff and fold in at the last. Shape with knife and tablespoon into three dozen small cakes. If desired one-half a gram of cinnamon or other flavoring may be added. Each cake contains: protein, 0.5 grams; fat, 1.0 grams; calories, 11.

DIABETIC—WASHED BRAN[2]

Boil the bran with abundant water three times in succession, straining off the water through a cloth each time. After the final straining, the wet bran is ready for use in the bran muffins, cakes, etc.

DIABETIC—BRAN BISCUIT[2]

India Gum or gum arabic	25	grams
Bran	360	"
Water	75	"

Weigh bran. Wash or boil out starch, as described above. Mix gum and water to make a thick paste. Mix with washed bran, kneading the bran and gum together thoroughly. Spread in thin layer on baking pans and press smoothly and firmly. Cut the bran into desired size before cooking. Bake in a moderate oven until biscuits are dry and crisp. Caraway seeds may be added before baking if desired. This recipe is on the whole better than that with agar.

[1] Dr. Elliott P. Joslin, "The Treatment of Diabetes Mellitus." Lea & Febiger. Philadelphia, Pa., 1916.
[2] Dr. Frederick M. Allen, Director, The Psychiatric Institute, Morristown, New Jersey.

DIABETIC—BRAN AND CELLUFLOUR MUFFINS[1]

Bran (washed)	50 grams
Celluflour	80 grams
Baking powder	10 grams
India gum or gum arabic	10 grams
Hot water	150 c.c.
Saccharin	1 grain
Mineral oil (or petrolatum jelly)	60 grams

Mix dry ingredients, add oil and saccharin dissolved in hot water, mix thoroughly. Mold in muffin tins and bake in a slow oven, increasing the heat to brown the muffins.

DIABETIC—SOY BEAN MUFFINS, 1290 CALORIES

1¼ cups soy flour.
½ cup wheat flour.
½ teaspoon salt.
2 eggs.
1 cup milk.
3 teaspoons (level) baking powder.
1½ tablespoons melted butter.

Sift dry ingredients into mixing bowl, add the milk and well-beaten eggs and the melted butter. Put into well-greased hot gem pans and cook in a hot oven about fifteen minutes. The carbohydrates produced by the above will be 280. Soy bean cake may be made the same as above adding chopped nuts, spices or chocolate, etc., for flavor.

BUTTER BALLS

1 teaspoon butter = 33 Calories.

Cut butter in small pieces size of balls desired and put into ice-water. Soak the butter paddles in boiling water ten minutes, then chill in ice-water. Hold a paddle firmly in the left hand and roll each piece of butter with the right paddle until round. If butter sticks it must be chilled longer, or paddles must be rubbed with salt and reheated.

One pound of butter will make about thirty balls.

Toast

In ordinary wheat bread, starch is the principal constituent. Starch when subjected to a high degree of heat is changed into an easily digested substance called dextrin.

[1] Dr. Frederick M. Allen, Director, The Psychiatric Institute, Morristown, New Jersey.

In the ordinary cooking of a loaf of bread the starch in the outer layer is changed into dextrin, which gives the crust its sweet flavor. Slices of bread toasted undergo a similar change on the surface of the bread; the interior is not affected.

Bread is toasted not merely to brown it but to take out all the moisture possible, so that it may be more thoroughly moistened with the saliva and thus more easily digested; also to give it a better flavor. The correct way to make toast is to use stale bread cut in uniform slices and dried thoroughly before browning.

Toast prepared in this way, even if moistened with milk or water, may be easily and thoroughly acted upon by the digestive fluids.

Proportions for Cream or White Sauces to Serve with Toast.—Liquid, 1 cup; fat, 1 tablespoon; flour, 1 tablespoon. Average amount of salt, ¼ teaspoonful. The shape of the dish in which the sauce is made influences the thickness of the sauce. If it is made in a shallow pan or in small quantity the evaporation will be greater and thus slightly more liquid or slightly less flour will be necessary.

Energy Value of Bread

1 small slice (1 oz.) white bread	73 Calories
1 large slice (1⅖ oz.) white bread	100 Calories
1 small slice (1 oz.) entire wheat bread	74 Calories
1 small slice (1 oz.) gluten bread	70 Calories
1 small slice (1 oz.) Boston brown bread	64 Calories
1 large slice (1⅘ oz.) Boston brown bread	115 Calories

See Table, page 58, for energy value of other ingredients.

DRIED BREAD (FOR CHILDREN)

Cut thin slices of either stale or fresh bread (whole wheat preferred) and place on top of the stove or in the oven with the door open and dry quickly until it is crisp, but not burned. In many respects preferable to crackers for little children.

SIPPETS

Cut thin slices of bread and from them make oblongs an inch wide by four inches long. Toast carefully so that they will not break and pile on a small bread-plate with doily if they are to be served dry.

CROÛTONS

See chapter, "Soup Accompaniments," for recipe. Page 191.

DIABETIC—GLUTEN CRISP

Cut gluten bread into thin slices and dry in slow oven until the moistening is thoroughly evaporated, or cut into cubes and brown slightly. Serve in soups or in milk.

WATER TOAST

Toast the bread. Dip quickly in boiling salted water, allowing one-half teaspoon salt to one cup water. Spread with butter and serve on hot plate.

TOASTED CRACKERS

1 saltine = 15 Calories.

Toast oblong crackers daintily and butter. Serve on plate with doily, piled log-cabin fashion.

MILK TOAST, 469 CALORIES

Put a cup of rich milk into a saucepan and place it on the stove. While it is heating, toast three slices of bread to a delicate brown. Put them into a covered dish and when the milk is scalding hot season it with a saltspoon of salt and pour it over the toast.

Note: A little butter may be spread on each slice before the milk is added, but it is a more delicate dish without it.

CREAM TOAST NO. I, 299 CALORIES

(Individual Rule.)

½ tablespoon butter.
½ tablespoon flour.
⅛ teaspoon salt.
½ cup milk.
1½ thick slices bread.

Scald the milk. Melt butter, add flour, remove from fire and add the milk gradually. Stir over heat constantly until smooth, cooking five minutes after blending, or until the starch is thoroughly cooked.

Toast.—Remove crust if desired, cut into oblong pieces and toast. Serve on small platter with cream sauce poured over it and garnish with toast points.

Note: If you wish the toast very soft it may be dipped very quickly in boiling salt water before adding the cream sauce.

CREAM TOAST NO. II, 299 CALORIES

½ tablespoon butter.	1 tablespoon cold water.
½ tablespoon flour.	½ cup milk.
⅛ teaspoon salt.	1½ thick slices toast.

Scald milk. Mix flour and salt and add the cold water gradually, making a smooth, thin paste. Add to scalded milk; cook in double boiler twenty minutes, stirring constantly until it thickens. Add butter. Pour over toast and serve hot, on hot platter.

CELERY TOAST

Clean celery and cut into one-inch pieces; cover with boiling water and cook until tender; drain off water.

Prepare Cream Sauce in Cream Toast No. 1; add cooked celery and pour on small slices of buttered toast. Garnish with toast points.

CLAM BROTH ON TOAST

Follow directions as for Milk or Cream Toast, adding Clam Broth, to taste, to the sauce and pour over toast. Serve hot.

DIABETIC—FRENCH TOAST, 457 CALORIES

1 egg.	Salt.
3 tablespoons milk.	5 slices gluten bread.

Beat the egg, add milk or cream and salt; dip into this mixture slices of the bread, or muffins if preferred. Sauté and brown in a little butter.

Sandwiches

TO PREPARE SANDWICHES

Use white, entire wheat, graham, gluten or Boston brown bread. Bread may be buttered before cutting from loaf. Spread with soft, plain butter, cut into very thin slices, cover with another slice, press together, cut into fancy shapes, or roll. Wrap in waxed paper or cover with a dry napkin, over which place a slightly moistened one until ready to serve.

Bread may be baked purposely for sandwiches by filling one-half pound baking powder boxes half full of dough, allowing to rise and bake. Serve sandwiches on a dainty doily on a small plate.

Energy Value of Bread

1 small slice (1 oz.) white bread	73 Calories
1 large slice (1⅖ oz.) white bread	100 Calories
1 slice (1 oz.) entire wheat bread	74 Calories
1 slice (1 oz.) gluten bread	70 Calories
1 small slice (1 oz.) Boston brown bread	64 Calories
1 large slice (1⅘ oz.) Boston brown bread	115 Calories

See Table, page 58, for energy value of other ingredients.

BREAD AND BUTTER SANDWICHES

Butter bread slightly, cut very thin and put slices together. Cut into fancy shapes.

BOSTON BROWN BREAD SANDWICHES

Steam Boston brown bread in one-half pound baking powder cans. Butter and cut into thin slices and add a thin round of white bread. The combination of the two makes a pleasing variety.

CHEESE SANDWICHES

Chop stuffed olives fine and add equal quantity of cream cheese and spread on bread and butter sandwiches. A lettuce leaf may be added if desired.

CHICKEN SANDWICHES

Chop cold boiled chicken, add mayonnaise dressing and spread on bread and butter sandwiches.

Or, instead of mayonnaise, moisten with strong chicken broth and season with salt and pepper. Minced celery may be added.

EGG SANDWICHES

See "Eggs" for recipe. Page 164.

FRUIT SANDWICHES

Spread bread and butter sandwiches with stewed dates, figs or prunes, seasoned with a little lemon juice, or chop dates, raisins and nuts very fine and moisten with "Cream Dressing." See page 242.

LETTUCE OR NUT SANDWICHES

Spread bread and butter sandwiches with a little mayonnaise dressing, lay in fresh, crisp lettuce leaves washed and dried thoroughly and cut even. For nut sandwiches add chopped nuts to the mayonnaise.

RAW BEEF SANDWICHES

See "Beef Preparations" for recipe. Page 125.

DATE SANDWICHES

Combine chopped Dromedary Dates with chopped pecan nut meats or cottage cheese and spread on slices of wheat bread, which have been spread with thick, sweet cream or soft butter.

Crackers—Wafers—Griddle Cakes

BRAN CRACKERS, 1395 CALORIES[1]

1½ cups wheat bran.
1½ cups sifted flour.
1 teaspoon cream of tartar.
½ teaspoon soda.
½ teaspoon salt.
4 tablespoons butter.
Milk.

Blend all ingredients, using enough cold milk to make a stiff dough. Roll to one-eighth inch thickness and cut with a small biscuit cutter. Great care is needed in baking that they do not burn and at the same time that they are thoroughly cooked.

They keep well a long time if put in a tin box.

They should be eaten at each meal if needed as purgative medicine.

WHEATSWORTH WHOLE WHEAT CRACKERS

Wheatsworth crackers are made with genuine whole wheat flour containing all the bran. They are appetizing and are used by many as a complete substitute for bread.

For breakfast and luncheon wheatsworth crackers broken up in a bowl of milk or cream make a nourishing meal for children and adults. They are delicious spread with butter, cheese, jam, etc.

DELICIOUS CRACKERS

White of one egg.
Pinch of salt.
¾ cup stoned Dromedary Dates, chopped.

Beat slightly the white of egg with salt. Add the chopped dates, spread on unsweetened crackers, pressing down firmly, and put in moderate oven for three minutes. This is a delicious cracker, particularly suitable for small children.

DIABETIC—GLUTEN WAFERS, 944 CALORIES

½ cup thick cream.
¼ teaspoon salt.
1 cup Hoyt's gluten flour.

[1] Without milk.

Add salt to the cream and add the gluten gradually to make a stiff dough. Toss on a floured board, roll as thin as possible and cut into strips with sharp knife or shape with a cutter. Bake on a buttered sheet in a slow oven until delicately browned.

DIABETIC—GRIDDLE CAKES[1]

1 egg.
Cellu flour.
Mineral oil or butter.

Beat egg until light and creamy; add salt, 50 c.c. water and cellu flour to make a thick batter. Fry on a hot griddle greased with mineral oil or butter. Serve with substitute maple syrup.

DIABETIC—MAPLE SYRUP[1]

Agar-agar	4 grams
Water	1 cup
Mapleine extract	¼ teaspoon
Saccharin	¼ grain

Dissolve agar-agar in one cup of hot water, cook until the mixture is clear; add mapleine, remove from the fire and add saccharin. Serve hot.

Cake

The two methods of making cake light are by means of air and of gas. Air is introduced by beating, or by the addition of beaten eggs, as in sponge cake. When the lightness is entirely dependent upon air, the whites and yolks of eggs should be beaten separately.

Gas may be generated from within by combining an acid or acid salt with a carbonate and adding moisture; as cream of tartar and bicarbonate of soda; or sour milk and soda; or molasses and soda. The combination of both air and gas is used to raise butter cakes.

General Directions for Cake Making.—Before blending

[1] Dr. Frederick M. Allen, Director, The Psychiatric Institute, Morristown, New Jersey.

the cake, see that the oven is at right temperature for baking and the pans greased with a little beef fat and dredged with flour. The pan may be lined with paper to prevent cake burning on bottom when cake requires long baking or when the oven bakes too quickly on the bottom. Have all material at hand and measured. Sift flour before measuring; sift again with dry ingredients. If pastry flour is substituted for wheat flour, increase the quantity 2 tablespoons to each cup of flour. Use a round bottom bowl and a wooden spoon for mixing; beat rather than stir the mixture and fold in ingredients. Put mixture into cake pans, slightly higher on the sides than in the center, as cake rises more quickly in the center. The mixture should be put into the oven as soon as prepared. Layer cake takes a hotter oven than loaf cake. If cake is baked properly it will rise but not brown during first quarter o₁ the time required for baking; become slightly browned the second quarter; well browned during the third, and shrink from the pan during the fourth.

If the oven is too hot, a crust will form over the top before the cake has risen sufficiently and the cake will break open on the top. If the oven is too cool the cake will rise too much and will be of coarse texture.

Place pans in oven and do not move them before the third quarter of the baking. If the top of the cake should brown too quickly cover with a piece of light weight paper, slightly buttered on the side next to the cake.

Cake is sufficiently baked if upon testing, a fine knitting needle or broom straw comes out dry, or when the cake feels firm and shrinks slightly from the edge of the pan. In looking at cake open the oven door slightly and only for a moment. Care must be taken not to jar the door in closing.

SPONGE CAKE, 1375 CALORIES

4 eggs.
1 cup powdered sugar.
¾ cup bread flour.
½ teaspoon salt.
1½ level teaspoons Rumford's baking powder.
Rind and juice of ½ lemon.

Beat eggs separately, very light. To the yolks add the sugar and lemon, carefully sift in the flour blended with the baking powder and beat about five minutes, then fold in the whites. Bake in a well-greased and floured angel cake tin in a moderate oven.

COLD WATER SPONGE CAKE, 1587 CALORIES

2 eggs.
1 cup sugar.
6 tablespoons cold water.
1⅓ cups bread flour.
2 level teaspoons Rumford baking powder.
1 tablespoon lemon juice.

Beat the yolks and whites separately. To the yolks add the sugar and beat well; add lemon juice and cold water; sift flour and baking powder together three times and add gradually, beating thoroughly.

Fold in the well-beaten whites. Bake in well-greased and floured gem tins, or shallow pan in a moderate oven.

PLAIN CAKE, 2217 CALORIES

2 eggs.
½ cup milk.
1 cup sugar.
1½ cups bread flour blended with 2 tablespoons cornstarch.
4 tablespoons butter.
2 level teaspoons Rumford baking powder.
1 teaspoon flavoring or spices.

Line the pan with buttered paper; separate eggs. Cream the butter, add the sugar gradually, then the well-beaten yolks and flavoring. Add alternately the milk and the flour and baking powder sifted together. Beat well and fold in the stiffly-beaten white. Put at once into a well-lined and greased pan and bake in a hot oven about thirty minutes.

The cake may be varied by adding one-fourth cup currants, or a few raisins and a little citron, or mixed spices, or a little melted chocolate. Before adding fruit to cake it should be slightly floured.

BOILED FROSTING, 857 CALORIES

1 cup sugar.
¼ teaspoon cream of tartar.
⅓ cup cold water.
White 1 egg.
¼ teaspoon flavoring.

Boil the sugar, cream of tartar and cold water without stirring until it threads from spoon and pour gradually over the well-beaten white of egg. Add any flavoring to taste. Beat until thick and spread quickly. A little chocolate may be added for variety, or chopped nuts, cocoanut, etc.

MARGUERITE WAFERS

Take "Long Branch" or saltine wafer crackers and spread with plain-boiled frosting, or add nuts, chocolate, cocoanut, etc. Put into oven a moment to dry, but not brown. Dainty to serve with Ice Cream, Ices and Sherbet.

GINGER BREAD, 2351 CALORIES

1 egg.
1 cup molasses.
7 tablespoons *melted* butter.
1 teaspoon soda.
½ cup boiling water.
1 teaspoon ginger.
1½ cups bread flour *or*
2 cups pastry flour.

Beat egg in mixing bowl; add molasses, melted butter, and gradually one cup of flour. To the remaining flour add the soda and ginger, sift and add to mixture; beat well and add the boiling water. Bake in well-greased and floured gem tins, or shallow pan, in a hot oven about twenty minutes.

DIABETIC—GLUTEN NUT CAKE

1 tablespoon butter.
Yolks 2 eggs.
Whites 2 eggs.
⅔ cup sour milk.
1 teaspoon soda.
½ teaspoon sweetina.[1]
Salt and spices.
1 cup nut meats.
Hoyt's gluten flour.

Cream the butter, add the well-beaten yolks and sweetina syrup, then the sour milk in which the soda has been blended. Add gluten flour gradually to make a stiff batter.

DIABETIC—OATMEAL COOKIES, 766 CALORIES[2]

1½ cups dry rolled oatmeal.
1 egg.
1 tablespoon butter.
1 teaspoon salt.
1 cup buttermilk with ¼ teaspoon soda *or*
1 cup sweet milk and 1 teaspoon baking powder.

[1] Note sugar substitutes, page 213.
[2] Calculated with sweet milk.

Melt the butter and add to the dry oatmeal. Add the well-beaten egg and the milk last, with soda or baking powder. Drop by spoonfuls on pan and bake in hot oven.

QUESTIONS FOR STUDY

1. Give two methods of making cake light.
2. Outline the general points to be observed in making cake.

Vegetables—Vegetable Sauces

LEGUMES—ROOTS AND TUBERS—GREEN VEGETABLES

Vegetables include nearly all kinds of plant food except fruits, grains and nuts.

Classification.—Vegetables are classified as:

1. Legumes—peas, beans and lentils.
2. Roots and Tubers—potatoes, beets, turnips, etc.
3. Stems and Leaves (green vegetables)—lettuce, spinach, celery, etc.

Composition.—All vegetables with the exception of legumes have a high percentage of water and a relatively small proportion of proteins. The chief organic constituents are starch and sugar. The fats and proteins are usually small in amount. As a class, vegetables are rich in mineral matter.

Digestibility.—As the gastric ferments play no part in carbohydrate digestion, vegetables are digested mainly in the intestines. The presence of cellulose prevents the rapid digestion of the nutrients, hence it may be stated as a general rule that vegetable food is less completely digested and absorbed than animal food. It would seem desirable to restrict this type of food for persons of very weak digestive powers.

Legumes. Of this class of foodstuffs, peas, beans, lentils and peanuts are the most important.

Composition.—Fresh legumes, such as peas and beans, contain from 2 per cent. to 9 per cent. of protein, a trace of fat and from 7 per cent. to 30 per cent. of carbohydrate.

Dried legumes, such as dried peas and beans, on account of the lessened amount of water, contain from 18 per cent. to 35 per cent. of protein, over 1 per cent. fat, and as high as 65 per cent. carbohydrate. They form one of the chief sources of protein in a strictly vegetarian diet. They also furnish considerable amounts of iron, phosphorus and calcium. Digestibility depends largely upon the method of cooking and the amount eaten.

Roots and Tubers. Roots and tubers contain the reserve material stored up by the plant and some of them, as potatoes, are among the most important foodstuffs. Their nutritive value is due largely to starch and sugar. On account of the small proportion of protein and fat, and the large proportion of water they are inferior in nutritive value to both legumes and cereals. The mineral matter, chiefly sodium, potassium, iron, phosphorus and sulphur, is an important constituent of these as of other vegetable foods.

The potato is one of the most important of the "starchy" vegetables. It is a tuber or thickened underground stem.

The composition of the potato E. P. is as follows:

Water	78.3	per cent.
Carbohydrate	18.4	per cent.
Protein	2.2	per cent.
Fat	0.1	per cent.
Calcium	0.014	per cent.
Phosphorus	0.058	per cent.
Iron	0.0013	per cent.
Magnesium	0.028	per cent.
Potassium	0.429	per cent.
Sodium	0.021	per cent.
Chlorine	0.038	per cent.

When pared before cooking, there may be a considerable loss of nutritive material, especially of mineral matter. By cooking in the skin, this loss is largely prevented. To be easily digestible, a potato must be mealy so as to be readily acted on by digestive juices. This is best accomplished by baking in an oven at 380° to 400° F. When a patient begins to take solids the vegetable usually prescribed first is a baked potato.

Beets, carrots, parsnips, salsify, turnips and onions are the most common of the class of succulent roots. The percentage of cellulose is greater than in the starchy class of vegetables.

The characteristic flavors and odors are due to the presence of volatile organic compounds.

Radishes contain a large amount of cellulose and should not be eaten by invalids. They are used chiefly as a relish.

Green Vegetables.—Almost all of this class of vegetables have a fuel value of less than 200 calories per pound; they are useful chiefly for their mineral salts and vitamine contents and for the roughage, variety and flavor they give to the diet.

Asparagus is easily digested, even by invalids. It has a diuretic action and imparts a characteristic odor to the urine for some hours. Because of its tendency to form uric acid it must be omitted from the diet of persons suffering from rheumatism, gout or arthritis.

Cabbage contains considerable sulphur and therefore frequently causes flatulence, especially if overcooked.

Cauliflower belongs to the cabbage family, but is more easily digested.

Celery is more easily digested cooked than raw.

Spinach is especially valuable for its large amount of iron and vitamines.

General Rules for Cooking Vegetables.—Wash thoroughly; pare, peel, or scrape, according to the kind. Let them stand in cold water until ready to cook, to keep them crisp, to freshen them when wilted, or to prevent them from turning dark.

Cook in enough freshly boiling salted water to cover and keep the water boiling slowly as tender vegetables are easily broken. Allow one teaspoon of salt to one quart of water. Salt may be added when vegetables are put in, except in the case of delicate green vegetables, as peas, spinach, etc., when it should not be added until nearly done. To preserve the color, cook green vegetables uncovered.

Vegetables should be cooked only until tender, drained immediately and served promptly. Overcooking injures their flavor and makes them tough. Time for cooking vegetables varies with the size, age and freshness.

Time-Table for Cooking Vegetables in Water

Potatoes	25-30m.	Cabbage	45-60m.	String Beans	1-3 hrs.
Carrots	35-45m.	Cauliflower	20-30m.	Lima Beans	1 hr. or more
Turnips	45m.	Asparagus	20-30m.	Green corn	12-20m.
Beets (young)	45m.	Spinach	30-45m.	Rice	20-45m.
Beets (old)	3-4 hrs.	Celery	20-30m.	Macaroni	45-60m.
Tomatoes	1-3 hrs.	Parsnips	30-45m.		
Onions	45-60m.	Green Peas	30-45m.		

For the Diabetic. Selection of vegetables should be made from the 5 per cent. group (p. 384) until otherwise ordered by the physician. These should be boiled in three separate waters to reduce carbohydrate content. In the beginning, after starvation, salt only is added but when diet permits cream or butter also is added.

Five per cent., *thrice cooked* (boiled) vegetables are considered, by some authorities, to be practically carbohydrate free. Others say that vegetables *thrice cooked* lose one-half to two-thirds of their carbohydrate content. Proteins and fats remain approximately the same.

Thrice-Cooked Vegetables.[1]—The vegetables are cleaned, cut up fine, soaked in cold water and strained. They are then tied loosely in a large square of double cheesecloth—large enough so that the corners of the cloth, after it has been tied with a string, make conveniently long ends and also large enough to allow the vegetables to swell without sticking together. They are then transferred to fresh, cold water, placed on the fire and allowed to reach 150° F. This water is poured off and replaced by water of the same temperature, which is brought to the boiling point and then again poured off and so on until the requisite number of changes have been made. The pots for the vegetables should be of sufficient size to hold a large quantity of water and, in a hospital, vegetables enough for the daily supply of six pa-

[1] Dr. Elliott P. Joslin, "The Treatment of Diabetes Mellitus."

tients. Vegetables thus cooked will keep in cold storage two or more days and may be reheated in a steamer.

If the vegetables are cooked with the cover off the pot they will be lighter in color and the flavor not so strong.

Energy Value of Vegetables

See Tables, pages 58 to 76. Vegetables are listed under their various names.

BOILED POTATOES

Select potatoes of uniform size. Wash, pare and put into cold water to keep from discoloring. Put them into saucepan, cover with boiling water, boil and when partly cooked, add one tablespoon salt to every six potatoes. Cook until soft, about twenty-five to thirty minutes, drain very dry and shake the pan, without a cover, gently over the stove till the potatoes are mealy, or cover with a folded cloth to absorb the moisture. Do not serve in covered dish.

RICED POTATOES

Add salt and pepper to boiled potatoes and rub them through a heated potato-ricer or squash-strainer into the hot dish they are to be served in. Serve immediately, or pour a little milk over the top and brown in the oven.

MASHED POTATOES

For mashed potatoes the uneven sizes may be used; the larger ones should be cut, so all will be of uniform size. Prepare as for boiled potatoes. When cooked and dried, add salt, butter, pepper and cream in following proportion:

1 pint potatoes.
½ teaspoon salt.
1 tablespoon butter
⅛ teaspoon white pepper.
2 teaspoons hot cream.

Add the salt, pepper and butter to the potatoes and mash, leaving them in saucepan on stove so as to keep them hot. Use open-wire masher or fork and beat quickly, so they may be light and dry, not "gummy." Put in the cream last, beat for a moment and serve immediately.

POTATO CAKES

From cold mashed potatoes make slightly flattened balls. Put them in a floured tin, brush each over with milk and bake in a hot oven five minutes, or till a delicate brown.

Note: These cakes may be sautéed in a little beef fat or butter if desired.

SURPRISE BALLS

Roll the potatoes into balls as above and with a teaspoon press a hollow in the top. Chop fine some cold, lean meat, season it with salt, pepper and gravy and put one teaspoon of the meat into the hollow of the potato ball. Put a little milk or melted butter on top and brown in oven or sauté.

BAKED POTATOES

Select potatoes of uniform size, not very large, wash thoroughly, and cut off a small piece at each end in order that the steam may escape. Bake in *hot* oven from forty-five to fifty minutes. When baked break open slightly, that steam may escape, and serve on folded napkin.

POTATOES BAKED IN THE HALF SHELL

Cut off top of baked potato and scoop out inside. Mash and season well as for mashed potatoes and add the well-beaten white of egg. Fill the skins with the mixture, heaping it lightly on top, brush over with milk or slightly beaten white of egg and brown slightly. Potatoes may be sprinkled with grated cheese before putting into oven.

POTATOES AU GRATIN

Cut cold boiled potatoes into cubes and put into a buttered baking dish. Cover with white sauce, put buttered cracker or bread crumbs on top and bake until golden brown.

Note: A little grated cheese added to the white sauce just before pouring over the potatoes adds a pleasant flavor.

CREAMED POTATOES

1 cup cold sliced or cubed potatoes.
¼ cup milk.
2 teaspoons butter.
¼ teaspoon salt.
½ teaspoon finely chopped parsley.
Speck white pepper.

Heat the milk, add the potatoes and cook until they have nearly absorbed the milk. Add butter and seasoning, cook five minutes longer, add parsley and serve hot.

POTATO BALLS

From large potatoes cut balls with a French potato cutter and put them into cold water. Cook for twelve minutes or more in enough boiling water to cover. Salt at end of six minutes. Drain and let them stand a few minutes to dry. Serve as a vegetable, with cream sauce, or with parsley butter, or use as a garnish for broiled fish. Test potatoes with a needle to see when tender.

Note: Make mashed potatoes from frames left after cutting out the balls.

ASPARAGUS

Boiled Asparagus.—Prepare asparagus by cutting off lower part of stalk at the point at which they will snap. Wash, remove scales and tie together or cut into one inch pieces. Cook in boiling salted water until soft, twenty to thirty-five minutes. As the tips are more tender keep them out of water the first ten minutes of the cooking. Drain, place in hot serving dish, spread with one-half teaspoon butter and sprinkle with salt.

Asparagus on Toast.—Serve boiled asparagus on buttered toast, moistened with a little of the liquid the asparagus is cooked in.

Creamed Asparagus, Plain or on Toast.—Pour Cream Sauce No. 1 over boiled asparagus and serve hot, or serve boiled asparagus on toast and pour Cream Sauce No. 1 over it.

CARROTS

1 small carrot (2 ozs.)=20 Calories.

Boiled Carrots.—Wash thoroughly and scrape off the very thin skin. Cut each carrot into slices from one-fourth to one-fifth inch thick, cut into cubes and cook in boiling salted water until soft, forty-five to sixty minutes. They may be served plain with a little melted butter, salt and pepper, or they may be mashed and seasoned as above.

Creamed Carrots.—Pour Creamed Sauce No. 1 over boiled cubed carrots, reheat and serve.

CAULIFLOWER

1 serving (4 ozs.)=35 Calories.

Boiled Cauliflower.—Cut off stalk and remove leaves of cauliflower. Soak thirty minutes in cold water to cover, head down. Cook, head up, twenty to thirty minutes, or until soft, in boiling salted water. Drain and separate flowerets.

Creamed Cauliflower.—Pour Cream Sauce No. 1 over boiled cauliflower, reheat and serve.

CELERY

1 serving (2 ozs.)=11 Calories.

Scrape celery. Cut stalks into one-half inch pieces and cook uncovered in boiling salted water twenty to thirty minutes. Serve with Cream Sauce No. 1 poured over it. Sauce may be made using part milk and part water in which celery was cooked.

SPINACH—DANDELIONS—BEET GREENS

1 serving (4 ozs.)=27 Calories.

Remove roots, pick over carefully, discarding wilted leaves, and wash *thoroughly* in many waters until free from sand; cook in boiling salted water, allowing one-fourth as much water as greens. Cook twenty-five to thirty minutes. Drain and chop if desired, reheat, season with butter and salt; garnish with slices of hard-cooked egg. Serve with vinegar.

ONIONS

1 serving (4 ozs.)=56 Calories.

Boiled Onions.—Put onions into pan of cold water and peel under water. Put them into boiling water with one teaspoon salt and one-fourth teaspoon soda to one quart water. After cooking five minutes pour off the water and add fresh boiling salted water and after ten minutes change the water again. Boil until tender, forty-five to sixty minutes. Drain off the water and add a little milk, cook a few moments and add butter, salt and pepper.

Creamed Onions.—Pour Cream Sauce No. I. over boiled onions, reheat and serve.

Scalloped Onions.—Place onions in a baking dish and add Cream Sauce No. 1. Cover top with buttered cracker or bread crumbs and bake until crumbs are a golden brown.

PEAS (GREEN OR CANNED)

1 serving (4 ozs.)=114 Calories.

Green Peas.—Remove peas from pods, cover with cold water and let stand one-half hour. Skim off small peas that come to the top and drain remaining peas. Cook until soft, thirty to forty-five minutes, in a small quantity of water. There should be little or no water to drain from peas when they are cooked. A small quantity of sugar may be added if the natural sweetness of the peas has been lost. Season with butter and salt.

Canned Peas should be drained and thoroughly rinsed. Cover with boiling water, boil two minutes and drain again, then add a small quantity of boiling water and cook from five to ten minutes. Season with butter, salt and pepper.

Creamed Peas No. 1.—To one-third cup of cooked peas add one teaspoon of flour mixed with one-eighth teaspoon of sugar. Cook slightly and add one tablespoon of cream and salt and pepper to taste. Equal to 75 calories.

Creamed Peas No. II.—Pour Cream Sauce No. 1 over drained cooked peas, reheat and serve.

STRING BEANS

1 serving (4 ozs.)=44 Calories.

Remove strings from beans and cut or snap into one inch pieces. Wash and cook in boiling water until tender (one to three hours). Drain and season with butter and salt. Cook beans in as little water as possible. Select fresh beans that will snap easily.

STEWED TOMATOES

1 medium tomato	= 33 Calories
1 cup canned tomato	= 51 Calories

Canned or fresh tomatoes may be used. To prepare fresh tomatoes wash, pour boiling water over them and then peel and cut into pieces, put in saucepan and cook slowly twenty minutes, stirring occasionally. Add a few bread or cracker crumbs and season with butter, salt and pepper. Bread and cracker crumbs may be omitted. A little sugar may be added if tomatoes are very acid.

BAKED TOMATOES

1 medium tomato (5 oz.) = 33 Calories.

Wash, dry and remove a thin slice from stem end of tomato. Remove seeds and pulp and drain off most of the liquid; to the pulp add an equal quantity of cracker crumbs, season with salt and pepper and a little chopped onion, or a few drops of onion juice. Refill tomatoes with mixture and place in a buttered tin; sprinkle with buttered cracker crumbs, bake twenty to thirty minutes in a hot oven.

SCALLOPED TOMATOES

(Individual Rule.)

1 large ripe tomato.	Bread crumbs.
Salt, pepper.	2 teaspoons butter.

Place a layer of bread crumbs in a well-buttered individual baking dish; place on top of this one half of the tomato, from which the skin has been removed and then cut into small pieces; season well with salt, pepper and bits of butter. Add another layer of crumbs, then the remaining tomato and seasoning, lastly crumbs. Place bits of butter on top, put into slow oven and bake twenty to thirty minutes.

Vegetable Sauces

BASIC RECIPE FOR VEGETABLE SAUCES

1 cup liquid.	1 tablespoon flour.
1 tablespoon fat.	¼ teaspoon salt.

The two methods of blending are given in the two following recipes, Cream Sauce No. I and Cream Sauce No. II.

The shape of the dish in which the sauce is made influences the thickness of the sauce. If it is made in a shallow pan, or in small quantity, evaporation will be greater and thus slightly more liquid or slightly less flour will be necessary.

CREAM OR WHITE SAUCE NO. I, 149 CALORIES[1]

Use to pour over any vegetable.

(Individual Rule.)

½ cup milk or thin cream.	1/16 teaspoon salt.
½ tablespoon butter.	Speck white pepper.
½ tablespoon flour.	

Scald the milk. Melt the butter in a saucepan, remove from stove, add the flour, then the scalding milk gradually, put over heat and cook, stirring constantly, until smooth and there is no taste of raw starch.

This sauce may be used in many ways—with creamed oysters, sweetbreads, any cream dish or any scalloped dish. If a thick sauce is desired, use one tablespoon of flour in place of one-half.

CREAM SAUCE NO. II, 267 CALORIES[2]

(Individual Rule.)

½ cup milk or thin cream.	1 teaspoon butter.
½ tablespoon flour.	⅛ teaspoon salt.

[1] Calculated with milk.
[2] Calculated with cream.

Scald the cream. Wet the flour with a little cold milk to make a smooth mixture, and add to the hot cream. Cook well. Just before serving add the butter and salt, and pepper if desired.

If a thick sauce is desired, use one tablespoon of flour in place of one-half.

DIABETIC—CREAM SAUCE, 560 CALORIES

For Soup or Vegetables—Calories per oz., 0.65.

1 cup thin cream.
¾ cup water.
2 egg yolks.

Mix together. Cook in a double boiler until of a creamy consistancy, stirring constantly. When the mixture coats a silver spoon, remove from fire.

PARSLEY BUTTER

1 tablespoon butter.
1 teaspoon chopped parsley.
Juice ½ lemon.

Cream the butter, add lemon juice and chopped parsley. Omit lemon juice if desired.

Salads and Salad Dressings

The salad plants, such as lettuce, celery, watercress, endives, etc., contribute very little energy and protein to the diet but are especially rich in mineral matter, which is all preserved when they are served uncooked in the form of salad. They are also useful for their vitamine content and their laxative qualities.

Salads should not be eaten by dyspeptics or those having delicate bowels.

Salads should be prepared daintily, arranged attractively and always served cold. Lettuce and other salad plants should be fresh, crisp and dry. Wash thoroughly, on account of danger of germs from dust, soil, etc., chill in very cold water until crisp and dry by placing on a clean towel so that the water will drain from the leaves; or fold lightly in a towel and place on ice until serving time. Parsley is revived quickly by sprinkling with cold water and putting it into an air-tight fruit jar and keeping it in a cold place. Treated in this way it will keep fresh a long time.

Dressing should not be added to green vegetables until just before serving, as it tends to wilt them.

Meat to be used in salads should be free from skin and gristle and should be cut into small cubes, mixed with French dressing and allowed to stand some time before combining with the vegetables.

A dainty salad served with a crisp cracker or cheese wafer forms an acceptable luncheon for the convalescent. It may also be served with dinner.

For the Diabetic.— Selection of vegetables for salads should be made from the 5 per cent. group (p. 384) until otherwise ordered by the physician. These should be boiled in three separate waters[1] to reduce carbohydrate contents. In the beginning, after starvation, only salt is used, later a little lemon juice with a little salt and pepper is added. Grated onion, a small quantity of celery seed, or a tiny bit of chopped green pepper may be added for additional seasoning.

FRENCH DRESSING, 200 CALORIES

(Individual Rule, ⅓ of Recipe.)

1 tablespoon vinegar.	⅓ teaspoon salt.
2 tablespoons Nicelle olive oil.	⅛ teaspoon pepper.

Mix all ingredients thoroughly and pour over salad just before serving.

BOILED DRESSING, 463 CALORIES

(Individual Rule, ½ of Recipe.)

1 teaspoon salt.	1 egg.
½ teaspoon mustard.	½ cup milk.
Speck cayenne.	2 tablespoons butter.
2 tablespoons sugar.	¼ cup vinegar.

Mix all dry ingredients. Beat egg in double boiler, add dry ingredients, butter and milk; cook over hot water, stir-

[1] For cooking directions note thrice-cooked vegetables, page 232

ring constantly until thick like custard; add vinegar; cool and serve. One-half tablespoon flour added to the dry ingredients will make a slightly thicker and very smooth dressing.

Note: If it curdles beat over cold water until smooth.

MAYONNAISE DRESSING, 2963 CALORIES

(Individual Rule, ¼ of Recipe.)

1 teaspoon mustard.	Yolks 2 eggs.
2 teaspoons powdered sugar.	1½ cups Nicelle olive oil.
1 teaspoon salt.	2 tablespoons vinegar.
Speck cayenne.	2 tablespoons lemon juice.

Mix dry ingredients, add to yolks and mix thoroughly. Add a few drops of oil at a time until one-half cup is used, beating with egg-beater or wooden spoon. Then add alternately a few drops of vinegar and lemon juice and the remainder of the oil, using care not to lose the stiff consistency. It should be a thick dressing and not added to food until just before serving.

Note: Have all ingredients and utensils thoroughly chilled and place mixing bowl in a pan of crushed ice while blending.

If dressing curdles, take another egg yolk and add the curdled mixture to it slowly, beating constantly.

Another method of blending is to mix dry ingredients, add to yolks and mix thoroughly. Add the vinegar and lemon juice slowly, beating well with Dover egg beater. Add the oil slowly.

CREAM DRESSING, 1538 CALORIES

(For Fruit Salads.)

½ cup butter.	1 teaspoon mustard.
2 tablespoons flour.	1 tablespoon cider vinegar.
1 cup scalded milk.	1 teaspoon salt.
3 yolks of eggs.	½ cup vinegar.
3 whites of eggs.	¼ cup sugar.

(*a*) Melt butter in a saucepan, add flour and gradually pour on the scalding milk; cook thoroughly, stirring constantly. (*b*) Beat yolks in top of double boiler, add the mustard, dissolved in one tablespoon of vinegar, salt and vinegar. Pour (*a*) gradually on the egg mixture and cook over hot water until it thickens like soft custard, remove from fire, add the sugar and fold in the stiffly-beaten white of eggs. Pour into glass fruit jar, cool and cover and keep on ice. This dressing will keep a long time and is especially delicious to serve with fruit salads.

CHICKEN SALAD, 855 CALORIES

(Six Servings.)

2 cups of chicken.
1 cup cut celery.
2 tablespoons olive oil.
1 saltspoon salt.
⅛ teaspoon pepper.
1 tablespoon vinegar.
2 tablespoons mayonnaise.

Mayonnaise, olives, celery leaves or white lettuce for garnishing.

Cut the cold chicken into small dice; cut the cleaned celery into small uniform pieces. Mix these together and pour over the oil. Mix well, then sprinkle with salt and pepper to taste; add the vinegar, blend and put in colander to drain; set in a cold place for two or three hours. Just before serving add the mayonnaise, put on a bed of lettuce and garnish.

Note: Do not mince chicken.

FRUIT SALADS

Any combination of fruit desired may be used served with "Cream Dressing." An attractive combination is a banana peeled and cut in half crosswise. Cut one-half lengthwise, arrange on lettuce leaf, add a little cream dressing and garnish with malaga grapes, cut in half and seeded, and small pieces of English walnuts.

MARGUERITE SALAD

One hard-cooked egg cut crosswise. Remove yolk. Cut white in slices, petal fashion, arrange on lettuce leaf like a marguerite and fill the center with the yolk put through the potato-ricer or strainer. Garnish with parsley and serve with French, boiled or mayonnaise dressing.

MIXED SALAD

Equal proportions of green peas, cooked and drained, celery cut in thin slices and English walnuts cut into small pieces. Season with salt and pepper, add mayonnaise and serve on lettuce leaves. Garnish with ripe cherries on the stem with blanched hazel nuts put in place of stones.

SWEETBREAD SALAD

Mix equal parts of parboiled sweetbreads cut into one-half inch cubes and celery cut into thin slices. Season with salt and moisten with mayonnaise dressing. Arrange daintily on lettuce leaves.

ORANGE AND DATE SALAD, 1373 CALORIES

Separate one package Dromedary Dates, cover with boiling water and cook for two or three minutes. Drain and dry in an oven. Cool, stone and cut in halves lengthwise. Halve four large oranges and cut out the sections of pulp. Arrange crisp lettuce leaves on a platter, pile the orange in the centre and surround with the dates. Serve with French dressing.

WALDORF SALAD

Mix equal parts of apples, pared and cut into small cubes, celery sliced in thin circles and English walnuts cut into small pieces. Season with salt and moisten with mayonnaise. Serve on lettuce leaf, garnished with a spoonful of whipped cream and halves of English walnuts or pecans.

WATER LILY SALAD

One hard-cooked egg. Cut in halves crosswise in fence fashion; remove yolk, put through strainer and refill white. Serve on shredded lettuce leaves and garnish with parsley. Serve with French, boiled or mayonnaise dressing.

CHEESE WAFERS

Butter wafer crackers and sprinkle thickly with grated cheese. Put in oven and bake till cheese is melted and crackers are a delicate brown. Arrange on small plate with doily. Serve with salad.

Fruits[1]

Fruits are the seed-bearing portions of plants. Some products of this class, such as melons and tomatoes are sometimes called fruits and sometimes vegetables, while a few vegetable products which are not fruits in the strict sense, are included in this class of food products because they have a similar place in the diet.

Composition.—Fresh fruits contain a high percentage of water, varying from about 75 per cent. to over 95 per cent. It has been suggested that those containing 80 per cent. or more of water be classed as flavor fruits and those with less than 80 per cent. as food fruits. Bananas, grapes and fresh figs are the commonest examples of the latter class. When the water is removed by evaporation, as in drying, the percentage of moisture falls to 20 per cent. or less and the proportion of nutrients is correspondingly raised, so that dried fruits would fall into the class of food fruits. Preserved fruits have their nutritive value raised by the addition of sugar and usually by some loss of water in preparation.

As a class fruits contain little or no fat. The olive is a remarkable exception. The proportion of proteins is so low as to be practically negligible.

Carbohydrates are the chief nutrient present. In ripe fruits these are almost wholly in the form of sugars and other soluble carbohydrates, commonly called pectin bodies. Starch is often found in unripe fruits—notably in the ordinary banana. The principal sugars are sucrose or cane sugar, dextrose or grape sugar, and levulose or fruit sugar. A mixture of the last two is common and is called invert sugar.

Fruits contain characteristic organic acids, such as malic

[1]For further information, note, "Uses of Fruit as Food," Farmer's Bulletin No. 293, U. S. Dept. of Agriculture, Washington, D. C.

in apples, citric in lemons, etc. Fruits as a class are important sources of mineral matter. Some of them as dried fruits, and of these notably prunes, dates, raisins and figs, are fairly rich in iron as well as calcium and phosphorus.

The flavor is due partly to the sugars and acids and partly to characteristic "ethereal" substances present in small quantities. Chemists have isolated the ethers and oils which give the peculiar flavor to bananas, strawberries and other fruits.

Digestibility.—The digestibility of fruits varies with the kind of fruit eaten and its mode of preparation; stewed fruits are in general more easily digested than raw fruits. Personal idiosyncrasy also has much to do with digestibility in the case of this class of food materials. Oranges, lemons, grapes and peaches are very generally digested with ease. Oranges are much used in invalid dietaries, their juice being very effective in allaying thirst.

Nutritive Value.—Fresh fruits are important constituents of the diet of every individual, sick or well, because they supply mineral matter, vitamines, especially the antiscorbutic vitamine (see page 22), because of their laxative effect due to the cellulose and organic acids which they contain, and because when absorbed in the body they yield an alkaline residue, which neutralizes the acid residue formed when meat, eggs and other protein-rich foods are eaten. This "maintenance of neutrality" is one of the processes included in the regulatory function of food (see page 3). They are useful also for their refreshing, appetizing qualities.

Dried fruits are concentrated sources of energy and valuable for the mineral salts, especially iron, which they supply.

Precautions in the Use of Fruit.—Over-ripe or unripe fruit should not be eaten raw; besides inferior flavor there is danger of digestive disturbance.

Before serving, all fruit should be thoroughly washed to avoid germs. Digestive disturbances are more often caused by these germs than by the fruit itself. There is danger also of acquiring harmful intestinal parasites from raw fruits. In all doubtful cases, the food should be cooked.

STEWED PRUNES

3 prunes = 72 Calories.

Wash and look over the prunes, cover with clear cold water and allow to stand on the back of range over night. In the morning place the saucepan where they will cook slowly for four hours.

Note: No sugar is needed as prunes are 18 per cent. sugar and by this manner of cooking are made very sweet. This simmering process renders them rich and juicy, while boiling toughens the skin. A little lemon juice is a pleasant addition.

Prunes are a valuable nutrient and their use as a laxative is scarcely second to figs. To increase the laxative effect add one ounce of senna leaves to one pound of fruit, all prunes or part figs. The senna should be added the last hour of cooking.

PRUNE PULP[1] (FOR INFANTS)

Cook prunes as above described, with no seasoning. Remove *all skins* by pressing through a fine wire sieve. From one to four tablespoonfuls may be given at one time. Apricots, apples or peaches may be prepared in this way.

APRICOT AND PRUNE SAUCE, 191 CALORIES[2]

¼ cup prunes.	1 cup cold water.
¼ cup dried apricots.	Sugar to taste.

Wash fruit carefully; soak over night and cook slowly for two hours. If cooked properly the fruit will need very little sugar, as the sugar in the fruit is developed by this method of cooking.

[1] Dr. L. Emmett Holt, "The Care and Feeding of Children," D. Appleton and Company, New York City.
[2] Without sugar.

BAKED APPLES

Wipe and core apples. Put into a shallow dish with one tablespoon water to each apple. More may be added during cooking if necessary. Put into the center of each apple two teaspoons sugar, bake in a hot oven twenty or thirty minutes, or until soft; baste with the syrup every ten minutes. A little nutmeg may be added to the sugar, and a few drops of lemon juice to each apple. Care must be taken that apples do not break and lose their shape. 1 apple = 70 calories.

STEWED APPLE SAUCE, 87 CALORIES

Wash, pare, core and slice one apple; put into saucepan and add one teaspoon sugar and enough boiling water to partly cover. Cover saucepan and cook slowly, without stirring, until transparent and tender. Appetizing to serve with any breakfast food. Pears and peaches may be cooked in the same way.

APPLES CUBAN STYLE

Pare and core sound, tart apples. Steam until almost tender; remove to a buttered pan; fill cavities with cocoanut, stick apples full of blanched almonds, baste with syrup made of sugar, water and lemon juice. Finish cooking in a hot oven, basting often. When serving, fill the cavities with jelly or the jellied juice.

BAKED BANANA

1 medium banana=64 Calories.

When eaten raw this fruit is often indigestible, but baked it acts as a stimulant to the nerves, being at once received and rapidly assimilated by the stomach. Cut bananas in halves, put into shallow pan, sprinkle with sugar and a little lemon juice and bake until soft.

Note: The banana contains starch and should be thoroughly ripened before eating.

CRANBERRY SAUCE OR JELLY

1 cup cranberries. ½ cup water.
⅓ cup sugar.

Pick over and wash cranberries. Put into saucepan and add sugar and water, bring to the boiling point and boil fifteen minutes. Strain and cool.

For jelly use one-half cup sugar and one-quarter cup water and after straining put into molds.

BAKED LEMON OR ORANGE

Bake a lemon or a sour orange in a moderate oven for twenty minutes. When done, open at one end and take out the inside. Sweeten with sugar or molasses. This is excellent for hoarseness and pressure on the lungs.

ORANGE SUNFLOWER

Wash the orange. Put a three-tined fork into the stem end. Cut off each end down to pulp, leaving the stem end on fork, then pare off rind to pulp. Cut out each section and place on small plate in sunflower fashion using the pieces of pulp for petals; fill centre with granulated sugar. Serve cold.

Note: To cut nicely have a large, firm, cold orange and a sharp knife.

ORANGE NO. II

1 medium orange=73 Calories.

Select a large, firm orange; wash, cut and peel skin down in eight parts, leaving them connected to stem end of orange to form the petals, folding them under the pulp. Separate pulp in sections and put ice between petals before serving.

DATE SAUCE

Prepare apples as for stewing and partially cook. Add equal quantity of stoned Dromedary Dates and sugar to taste. Cook until dates are tender. Serve either hot or cold.

DATES FOR YOUNG CHILDREN

Wash the dates and lay in water for fifteen minutes, then remove and dry; take off the outer skin and remove the stone; put through meat chopper; add two teaspoons of orange juice to each cup of dates. This is good on toast or crackers and is very nourishing. It can be prepared and kept on hand summer and winter.

DATE BON BONS

1 date ....=20-25 Calories.
1 walnut meat ....= 6- 8 Calories.

Put salted almonds or fourths of English walnuts into the inside of dates that have been cut open and stones removed. Roll in powdered or granulated sugar and serve.

DATE AND FIG BON BONS

1 pound raisins.	1 pound dates.
1 pound figs.	Nuts if desired.

Stone fruit and put all through a meat chopper. Serve in small fancy covered dish or make into balls and roll in powdered sugar. These are delicious and beneficial for children and adults to partake of daily.

To increase the laxative effect add one ounce of senna leaves and give in doses of one to two teaspoonfuls night and morning.

STEWED FIGS, 938 CALORIES

½ pound figs.	1 cup cold water.
¼ cup white sugar.	Juice ½ lemon.

Wash figs. Dissolve sugar in the water; add figs and bring slowly to boiling point. Stew two and one-half hours; when tender, add lemon juice.

Note: Cut figs into small pieces; cook very slowly so as not to add more water.

STEAMED RHUBARB, 234 CALORIES[1]

1 cup rhubarb (4 oz.).	¼ to ½ cup sugar.

[1]Calculated with ¼ cup sugar; with ½ cup sugar = 444 calories.

Wash the rhubarb and cut it into inch pieces without removing the skin, as this gives a pretty pink color to the juice. Put it into an agate double boiler without water and steam one-half hour, or until soft. Do not stir, as it breaks the pieces. Sweeten to taste at once on taking from fire. If rhubarb cooks a minute too long—which means after it has gone to pieces—it will lose its delicious flavor.

Nuts[1]

Nuts enter but little into the invalid's dietary, but as attention is being paid to means of rendering them more digestible, a word concerning them is not out of place.

Composition.—Because of their high content of protein and fat, nuts are commonly used as substitutes for meat and deservedly so. They are not as easily digested as meat because of the large amount of cellulose and fat present, but nut pastes and butters, in which the cellulose has been removed, can be used with safety.

Cooking of Nuts.—Nuts are more often eaten raw than cooked. The peanut, however, is not considered palatable when raw, and the chestnut is very indigestible unless the starch is cooked, when it becomes easily digestible. Almonds and walnuts are widely used in confectionery.

Nuts may be used as staple articles of diet, in salad, soups, desserts, etc.

To insure the best utilization of nuts they must be thoroughly prepared for digestion by grinding or mastication. Nut butters offer much less resistance to digestion than raw nuts hastily eaten. On account of the high fat content, these products must be fresh, or the fat is likely to decompose and become rancid and irritating.

Nut flours and meals are made into bread or porridge. Almond meal, which contains no starch and very little sugar, is often utilized as a bread for diabetics. The chestnut cannot be so used on account of its high content of starch. The

[1]For further information, note, "Nuts and Their Uses as Food," Farmer's Bulletin No. 332, U. S. Dept. of Agriculture, Washington, D. C.

peanut contains about 11 per cent. of carbohydrates and hence is undesirable for this purpose.

Digestibility.—Nuts have been considered very indigestible. This is due largely to improper mastication or other preparation for digestion and to the fact that they are a very concentrated food, and often eaten when not needed. While nut proteins, as nuts are ordinarily eaten, are not so easily nor completely digested as meat proteins there are experiments showing that on the whole they are as thoroughly digested as an ordinary mixed diet. No experiments have been reported on the ease or rapidity of nut digestion.

Nutritive Value.—Nuts are a concentrated food. This is clearly shown by the following figures:

1 lb. of Almonds, E. P.[1]	yield 2936 Calories.
1 lb. of Brazil nuts, E. P	yield 3162 Calories.
1 lb. of Filberts, E. P	yield 3185 Calories.
1 lb. of Hickory nuts, E. P	yield 3238 Calories.
1 lb. of Peanuts, E. P	yield 2487 Calories.
1 lb. of Walnuts, E. P	yield 3199 Calories.

The high fuel value is due to the absence of water and the large amount of fat present. Nuts can be most advantageously used along with bulky foods, such as fruits and vegetables, and those lacking in fat, such as bread. In a vegetarian diet they become a valuable source of protein.

Fungi and Algæ

These substances have little nutritive value. They may be considered as food adjuncts, rather than as foods proper.

Of fungi, mushrooms are the most commonly eaten. They are prized for their delicate flavor. Chemical analysis shows a high percentage of nitrogen, but although reported as protein it is largely in an indigestible form.

Algæ and lichens are much used as food in some parts of the world and high claims are sometimes made for their nutritive value, but digestive experiments show that, although they have a carbohydrate content similar to other

[1] Edible portion.

succulent vegetable foods, these carbohydrates are not attacked by the ordinary digestive enzymes of the alimentary tract.

The most important algæ, from the dietetic standpoint, is Irish moss. It is commonly used in making jellies or soothing beverages for invalids, but it has no nutritive value whatsoever.

The lichen most used as food is Iceland moss. It has frequently been recommended as a food for diabetics, but it is practically indigestible.

QUESTIONS FOR STUDY

1. Compare the digestibility of animal and vegetable foods.
2. Discuss the nutritive value of cereals, comparing whole grain and finely milled cereals.
3. State the principles involved in the cooking of cereals.
4. Name a class of vegetable foods which is rich in protein. Give examples of this class.
5. Compare vegetable and animal proteins as to digestibility and nutritive value.
6. Discuss the nutritive value of breads. Name two breads commonly prescribed for diabetics. Why does toasting bread make it more digestible?
7. What are thrice cooked vegetables?
8. Discuss the digestibility and nutritive value of legumes, roots and tubers and green vegetables. Give one reason why peas and beans should not be given in cases of digestive disturbances.
9. What is the most easily digested form of potatoes?
10. Compare the composition of vegetables, cereals and fruits.
11. Compare the nutritive value of fresh and dried fruits.
12. What advantage is there in cooking fruits?
13. Why is the inclusion of fruits and vegetables in the diet important?
14. What is an ideal diet?

CHAPTER X

NUTRITIOUS DESSERTS

Hot and Cold Desserts—Frozen Desserts

SOFT CUSTARDS, BAKED CUSTARDS, WHIPS AND SOUFFLES, JUNKET, CORNSTARCH PUDDINGS OR BLANC MANGE, RICE, TAPIOCA, CRACKER AND BREAD PUDDINGS, SAUCES, GELATIN DISHES.

Properly prepared, the dessert may constitute a very large part of the nourishment represented in a meal. Dishes containing eggs, milk, cream, starches, etc., in large proportion are necessarily of high nutritive value and become a useful means of administering these foods to patients who do not care for the flavor of plain milk, raw eggs, cereals, etc., or who are likely to become tired of them. For invalids, combinations of foods should always be simple, because the more complex the mixture of protein, fat and carbohydrate, the longer and more complicated is the process of digestion. Hence junket, which is simply coagulated milk flavored, is one of the most digestible of desserts. As a rule, sugar is less acceptable in sickness than in health, excess being apt to cause loss of appetite or nausea.

Dainty service is most important. Baked custards and junkets are usually best served in the original individual molds to avoid danger of breaking or of becoming watery. Sauces should never be poured over puddings till the moment of serving. Care must be taken to see that cold desserts are thoroughly chilled; a lukewarm custard is frequently nauseating and always unappetizing.

For the Diabetic.– In sweetening desserts, sugar must be replaced by sweetina or saccharin. It is many times sweeter than sugar but has no food value. Note, Sugar Substitutes, page 213.

Soft Custards

SOFT CUSTARD NO. I, 197 CALORIES

(Individual Rule.)

Yolk 1 egg.	Speck salt.
1 tablespoon sugar.	½ cup milk.

Scald milk in double boiler. Beat yolk, add salt and sugar and gradually pour on the scalded milk. Pour back into top of double boiler and stir constantly until it looks creamy or coats the spoon and the foam has disappeared; then remove immediately from hot water. Cool and add flavoring desired; vanilla, orange or lemon extract.

Note: If custard curdles, place saucepan over cold water and beat until smooth.

This custard is usually used for pudding sauces.

SOFT CUSTARD NO. II, 421 CALORIES

(Two Servings.)

1 cup milk.	⅛ teaspoon salt.
2 eggs.	¼ teaspoon vanilla or grating of nutmeg.
2 tablespoons sugar.	

Reserve one egg white for meringue. Blend according to Soft Custard No. I. This custard is usually used as a foundation for puddings.

SOFT CUSTARD WITH LACTOSE, 470 CALORIES[1]

8 ounces milk (1 cup).	Speck of salt.
1 egg.	2 to 3 drops of vanilla or caramel made of 3 tablespoons of granulated sugar.
2 ounces of milk sugar (about 4 tablespoons).	

Blend according to Soft Custard No. I. To make caramel, put the sugar in a pan directly over heat and burn until a very dark brown. Dissolve in hot water or milk.

[1] Dr. W. Coleman, *American Journal of Medical Sciences*, January, 1912.

MERINGUE, 113 CALORIES[1]

1 egg white.
Speck salt.
2 tablespoons powdered sugar.
Lemon or orange juice.

Beat the egg until stiff and dry; add the salt, sugar and lemon juice to taste. Beat very little after adding the sugar.

FLOATING ISLAND

Chill Soft Custard No. 11; pour into serving dish and put meringue on top.

ORANGE CUSTARD

Peel, slice and remove seeds of oranges, put into serving dish. Chill Soft Custard No. 11, pour over fruit and put meringue on top.

BANANA CUSTARD

Peel bananas and slice very thin with silver knife, put into serving dish and flavor with lemon juice. Chill Soft Custard No. 11, pour over fruit and put meringue on top.

ALMOND PUDDING

Line a glass dish with slices of stale cake and put in some salted almonds. Pour a little sherry wine on the cake. Chill Soft Custard No. 11 and pour over it. Put meringue on top, with some salted almonds in it.

Baked Custards

BAKED OR CUP CUSTARD, 321 CALORIES

(Individual Rule.)

1 cup milk.
1 egg.
1½ tablespoon sugar.
⅛ teaspoon salt.
Flavoring to taste—nutmeg, cinnamon, vanilla or lemon extract.

Scald the milk; beat egg, add sugar and salt and gradually pour on the scalded milk. Flavor to taste and pour into

[1] Without lemon and orange juice.

custard cups; place in deep pan and pour boiling water around until it almost reaches the top of cups. Bake in moderate oven about twenty minutes. If cinnamon is used for flavor, put one-half or inch square into the milk when scalding.

Note: To test when done, dip a pointed knife into water and plunge into the middle of the custard. If it looks set and the knife comes out clear, the custard is done; if milky, it is not cooked enough. If cooked too long the custard will curdle.

BAKED CUSTARD NO. II, 265 CALORIES

(Individual Rule.)

⅔ cup milk.	1/12 teaspoon salt.
1 egg.	Nutmeg.
1½ tablespoon sugar.	¼ teaspoon vanilla.

Blend according to Baked Custard No. 1.

The smaller quantity of milk makes a little firmer custard.

WHITE CUSTARD, 154 CALORIES

1 egg white.	¼ saltspoon salt.
1 tablespoon sugar.	½ cup rich milk.

Beat white of egg until very light; add sugar and salt and gradually pour on the milk. Flavor with vanilla, orange or lemon extract. Bake in cups set in pan of boiling water in a moderate oven about twenty minutes. When firm set on ice and serve cold. This may be taken by patient when the yolk of egg is prohibited.

CHOCOLATE CUSTARD, 258 CALORIES

(Individual Rule.)

2 teaspoons Walter Baker's chocolate.	2 egg yolks.
	2 teaspoons sugar.
½ cup milk.	Speck salt.

Grate chocolate and mix with two tablespoons milk; stir over the fire until smooth, add remaining milk, the well-beaten egg yolks, sugar and salt. Pour into custard cups set in pan of hot water, nearly to the top. Cook until custard is set. Serve hot or cold.

MALTED MILK CUSTARD, 121 CALORIES

(Individual Rule.)

1 tablespoon Horlick's Malted Milk.
1 egg yolk.
½ cup hot water.
Salt.

Mix the Malted Milk powder with enough of the hot water to make a smooth paste, add remainder of water and pour it gradually over the well-beaten yolk. Butter custard cup, pour in the mixture and let it stand in a pan of boiling water in a moderate oven until custard is set.

BAKED CARAMEL CUSTARD, 343 CALORIES

(Individual Rule.)

⅔ cup milk.
1 egg.
Speck salt.
3 tablespoons sugar.
A few drops of vanilla.

Scald the milk. Put two tablespoons sugar into a small saucepan, place over heat and stir constantly until the sugar is melted and a light brown color. Add milk and pour over the slightly-beaten egg. Add one tablespoon sugar and flavoring. Strain into buttered custard cups, place in a pan of hot water and bake until firm in a slow oven.

BAKED CUSTARD WITH LACTOSE,[1] 357 CALORIES

1⅓ ounces of milk sugar (about 2⅔ tablespoons).
6 ounces of milk (12 tablespoons).
1 egg.
Nutmeg or vanilla.
Speck of salt.

Beat the egg slightly. Warm the sugar and milk, stirring constantly, add to the egg, strain into a custard cup and flavor. Bake in a pan of water in a moderate oven until a knife when cut into it will come out clean—30 minutes to 1 hour.

[1] Dr. W. Coleman, *American Journal of Medical Sciences*, January, 1912.

DIABETIC—CUSTARD[1]

4 oz. mold—135 Calories *or* 1 oz. mold—35 Calories.

2 cups milk.
3 eggs.
¾ grain saccharin.

Beat the eggs, dissolve the saccharin in the milk, add to the egg. Pour the mixture into the mold. Place in a pan of lukewarm water and bake in a moderate oven. When a silver knife plunged into the center of the custard comes out clean, remove from the oven. This will fill four custard cups.

SPECIAL DIABETIC—CUSTARD[1]

4 oz. mold—335 Calories *or* 1 oz. mold—80 Calories.

2 ounces (4 tablespoons) milk.
1 egg.
2 ounces cream[2]
Few grains salt.
⅙ grain saccharin.

Beat egg, add cream, in which the saccharin has been dissolved, and the salt. Bake according to directions given above.

Whips and Soufflés

Dainty and nutritious ways to serve the uncooked and slightly cooked white of eggs.

FRUIT WHIP

(Two Servings.)

Any fruit, fresh, canned or dried, properly prepared, or jellies may be used.

2 to 4 tablespoons fruit pulp.
White 1 egg.
Lemon juice.
2 tablespoons powdered sugar *or* to taste.

Prepare the fruit pulp by scraping, grating or rubbing through a strainer. Beat the white of egg on platter until stiff. Add pulp, sugar and lemon juice to taste and beat until very stiff. Heap in center of serving dish and pour Soft Custard No. 1 around it.

[1] "St. Luke's Dietary," St. Luke's Hospital, New York City.
[2] Cream used in these formulas is 40% fat. Milk figured 20 Cal. per ounce.

Note: The apple is a favorite fruit for these whips. The juice of fresh fruits in season used with the raw white of egg makes an appetizing as well as a very nutritious lunch for the sick.

STRAWBERRY WHIP, 342 CALORIES

(Four Servings.)

1 cup fresh strawberries.
Whites 2 eggs.
⅓ cup powdered sugar.

Wash and hull the strawberries and mash slightly. Beat whites of eggs until stiff, add sugar and berries; beat until very stiff, using a broad bowl and a wire egg-beater, beating with a long, steady stroke. Pile lightly in a glass dish and serve with white or sponge cake.

GRAPE WHIP, 1321 CALORIES

(Six Servings.)

¾ cup grape juice.
White 1 egg.
5 tablespoons sugar.
1 cup double cream.

Beat the white of egg until foamy, add the grape juice mixed with the sugar and, lastly, the cream, then beat with a whip churn. Take off the froth as it rises and drain on a sieve. Pour the unwhipped mixture into small, high glasses and pile the whip on top. Serve cold.

OMELET SOUFFLE, 249 CALORIES[1]

(Individual Rule.)

Yolk 1 egg.
3 tablespoons powdered sugar.
2 tablespoons lemon juice.
Speck salt.
Whites 2 eggs.
Strawberry or fruit jam.

To the well-beaten yolk add the sugar, salt, lemon juice and rind. Beat the whites to the stiffest possible froth, then cut and fold into the yolk. Have ready a small baking dish, buttered and spread with a layer of the fruit; pour the omelet over it and bake in a moderate oven fifteen or twenty minutes. Test as for baked custard. Serve at once.

Note: Do not use lemon rind if it will interfere medicinally.

[1] Without jam.

CUSTARD SOUFFLÉ, 294 CALORIES

(Individual Rule.)

¾ tablespoon butter.
1¼ tablespoons flour.
¼ cup scalded milk.
Yolk 1 egg.
1¼ tablespoons sugar.
White 1 egg.

Melt butter, add flour and gradually the scalded milk. Cook thoroughly, pour over the well-beaten yolk, add sugar and cool. Fold the well-beaten white into the mixture. Turn into buttered custard cups and bake about fifteen minutes, until firm—determined by pressing with the finger. Take from oven and serve at once, or it will fall. Serve with Foamy Sauce.

LEMON SOUFFLÉ, 291 CALORIES

(Individual Rule.)

Yolk 1 egg.
Juice ¼ lemon.
¼ cup sugar.
White 1 egg.

Beat yolk thoroughly, add sugar slowly, beating constantly; add lemon juice. Fold in the white, beaten until dry. Pour into buttered custard cups, set in pan of hot water and bake twenty minutes or until firm, testing by pressing with finger. Serve plain or with Foamy Sauce.

PEACH MERINGUE

(Individual Rule.)

1 cup yellow peaches.
Sugar to taste.
Yolk 1 egg.
Bread crumbs.
White 1 egg.
1 tablespoon powdered sugar.

Stew peaches in a very little water, sweeten to taste and stir in the well-beaten yolk. Butter a pudding dish and cover bottom with fine bread crumbs, put in the peaches and bake fifteen minutes. Cover with meringue made of white of egg and the powdered sugar; brown slightly in the oven. Serve cold.

Junket

Junket is a healthful and dainty dessert made simply of pure milk, containing enough of the active principle of rennet found in the Junket Tablet to coagulate the milk. It is nutritious and has the added advantage of being easily digested.

Milk or cream that has been boiled, sterilized, condensed or evaporated cannot be used in making junket, and care must be taken not to heat the milk more than lukewarm, as hot milk prevents the action of the tablet.

For diabetic patients saccharin may be used as a substitute for sugar in these recipes.

PLAIN JUNKET, 280 CALORIES

(Individual Rule.)

1 cup milk.
2 tablespoons sugar.
½ teaspoon brandy *or* wine.
¼ Junket Tablet *or* 1 teaspoon essence of pepsin *or* liquid rennet.
1 teaspoon cold water.

Heat the milk until lukewarm, add sugar and flavoring; when sugar is dissolved add the tablet dissolved in the cold water. Pour mixture immediately into sherbet cups or champagne glasses, partly fill. Stand in warm room undisturbed until firm like jelly, then put on ice to cool. Serve with whipped cream heaped on top, with one-half teaspoon bright jelly for garnish.

Note: For variety, whole strawberries or raspberries may be served with junket, or chopped English walnuts with the whipped cream. For garnish, candied cherries may be used.

If desired, the brandy and sugar may be omitted, serving it plain, with sugar and a grating of nutmeg.

CUSTARD JUNKET, 494 CALORIES

(Two Servings.)

½ cup hot milk.
1 egg.
2 tablespoons sugar.
¾ cup lukewarm milk.
2 tablespoons sugar.
¼ teaspoon vanilla.
¼ Junket Tablet.
2 teaspoons cold water.

Beat the egg, add two tablespoons sugar; gradually pour on the hot milk. Cook in top of double boiler, stirring constantly until it thickens; take at once from the fire and cool.

Mix two tablespoons sugar with the lukewarm milk, add to the *cooled* custard and blend thoroughly. When lukewarm add vanilla and the tablet dissolved in cold water; finish as for Plain Junket.

COCOA JUNKET, 232 CALORIES

(Individual Rule.)

1 tablespoon cocoa.
2 teaspoons sugar.
2 tablespoons boiling water.
1 cup milk.
¼ Junket Tablet.
1 teaspoon cold water.
3 drops vanilla.

Mix the cocoa, sugar and boiling water, cook over heat and rub to a smooth paste; gradually add the fresh cool milk. Heat until lukewarm (not more), add vanilla and then tablet dissolved in the cold water. Finish as for Plain Junket and serve with sweetened cream or a Soft Custard.

PLAIN AND COCOA JUNKET WITH LACTOSE, 219 CALORIES[1]

1 teaspoonful of cocoa.
25 grams of milk sugar (scant 2 tablespoons)
5 ounces of milk (10 tablespoons).
¼ Junket Tablet dissolved in 1 ounce of cold water.

Mix the cocoa and sugar, add the milk and heat lukewarm, stirring constantly; add the dissolved junket, stir thoroughly and leave in a cool place to set. For Plain Junket omit cocoa.

Cornstarch Pudding or Blanc Mange

Starch of various kinds is used in milk puddings. For children, invalids and dyspeptics such puddings are admirable. They must be thoroughly cooked, that the action of the heat may affect the starch. The combination of starch and milk gives a wholesome nutritive food and the addition of eggs increases the food value:

[1] Dr. W. Coleman, *American Journal of Medical Sciences*, January, 1912.

CORNSTARCH PUDDING, 321 CALORIES

(Individual Rule.)

1 cup milk.
1½ tablespoons cornstarch.
1½ tablespoons sugar.
Speck salt.
White 1 egg.
Vanilla.

Scald the milk in double boiler. Mix cornstarch, sugar and salt thoroughly; add the scalded milk slowly, stirring constantly. Return to top of boiler and cook twenty minutes, stirring constantly for the first five or six minutes, then occasionally. Remove from fire and while very hot fold in the well-beaten white of egg lightly, but thoroughly. When partially cooled add flavoring to taste; put into wet cups or molds, cool and then stand for several hours on ice. Remove from molds. Serve with a soft custard, mashed fresh berries, or whipped cream. Vary the pudding by adding a little melted Walter Baker's chocolate.

PINEAPPLE CREAM, 377 CALORIES

(Individual Rule.)

1 cup milk.
1½ tablespoons cornstarch.
1½ tablespoons sugar.
Speck salt.
White 1 egg.
2 tablespoons grated pineapple.

Follow directions for Cornstarch Pudding, adding the pineapple instead of vanilla. Pour into individual molds and serve cold with cream.

CORNSTARCH FRUIT JELLY

(Two Servings.)

1 cup raspberry juice.
Sugar.
2 tablespoons cornstarch.

Sweeten the juice to taste and heat to boiling point. Make a smooth paste of the cornstarch and a little cold water, add slowly to the juice and cook thirty minutes in top of double boiler, stirring constantly at first. Pour into cold, wet molds. Serve cold with whipped cream and fresh, whole berries.

MALTED MILK BLANC MANGE, 284 CALORIES

(Two Servings.)

2 tablespoons Horlick's Malted Milk.
2 tablespoons powdered arrowroot.
Speck salt.
1 tablespoon sugar.
1½ cups boiling water.
¼ teaspoon vanilla.

Mix the arrowroot and malted milk powder with a little cold water into a smooth paste. Add the boiling water slowly, cook in double boiler about twenty minutes, or until arrowroot is thoroughly cooked, add vanilla and pour into cold, wet molds. Chill and serve with Soft Custard or whipped cream.

Note: One teaspoon powdered coffee may be added to above before cooking, for Coffee Blanc Mange.

NUTRITIOUS WHEAT PUDDING, 256 CALORIES

(Individual Rule.)

1 cup milk.
2½ tablespoons flour.
Speck salt.
White 1 egg.
¼ teaspoon vanilla.

Blend flour with a little of the cold milk. Scald remainder of milk and add flour mixture; cook thoroughly; add salt and flavoring and fold in the white of egg beaten slightly. Put into cold, wet mold, cool and set in ice box to harden. Serve with Soft Custard or whipped cream, or sprinkle with powdered sugar and pour over it one-fourth cup of fresh fruit juice or crushed fruit.

DIABETIC—GLUTEN PUDDING, 869 CALORIES

(Six Servings.)

3 tablespoons gluten flour.
1 pint hot milk.
1 pint cold milk.
1 egg.
1 teaspoon butter.
¼ teaspoon salt.
Cinnamon.
Saccharin.

Blend gluten flour with a little of the cold milk, add gradually to one pint hot milk. Cook thoroughly. Beat egg, add cold milk, the cooked mixture and salt, cinnamon and saccharin to taste. Bake thirty minutes. A little fruit improves the flavor. Serve with whipped cream.

IRISH MOSS JELLY, 677 CALORIES

(Three Servings.)

½ cup Irish moss.
2 cups boiling water.
4 figs.
Juice 1 lemon or orange.
⅓ cup sugar.

Soak, pick over and wash the moss. Put it into the boiling water, add the figs cut into strips and *simmer* about twenty minutes, or until it is very thick when dropped on a cold plate. Add lemon juice and sugar. Strain into a cold, wet mold.

IRISH MOSS BLANC MANGE, 296 CALORIES

(Four Servings.)

¼ cup Irish moss.
1½ cups cold water.
1¾ cups milk.
1/16 teaspoon salt.
⅓ teaspoon vanilla.

Soak the moss in cold water about fifteen minutes. Remove from water, pick over and put into double boiler with the milk. Cook about twenty minutes, or until it thickens when dropped on a cold plate. Add salt, strain and flavor. Strain again and turn into small, cold, wet molds. Chill and serve with cream and sugar or sliced fruit.

Rice Puddings

BOILED RICE, 100 CALORIES

(Individual Rule.)

2 tablespoons rice.
2 cups boiling water.
½ teaspoon salt.

Wash rice thoroughly and add gradually to the boiling salted water, taking care that the water does not stop boiling. Boil uncovered twenty minutes, or until grains are soft. Turn into a strainer, pour over it one cup of hot water, drain and put into oven a few moments to dry, with oven door open. Serve as a cereal with sugar or cream or as a pudding with cooked dates and whipped cream, or plain with Soft Custard.

Note: Keep rice well covered with water while cooking.

Dates: Cut into small pieces, add a little water to partly cover and cook until soft. Simmer and do not stir.

STEAMED RICE, 267 CALORIES

(Individual Rule.)

⅓ cup rice.
1 cup boiling water.
½ teaspoon salt.

Pick over the rice, wash in three or four waters; put it with the boiling water and salt in upper part of double boiler. Do not stir while cooking. Steam one hour, or until the grains are tender. Serve as a cereal with sugar or cream, as a pudding with Soft Custard, or with sugar and cream.

Note: A few dates cut in narrow strips may be added just before serving if desired. Part milk may be used in the cooking.

PEACHES AND RICE

Serve boiled or steamed rice with sections of fresh, juicy peaches, or with fresh berries. Serve with sugar and cream.

DATES AND RICE, 802 CALORIES

1 tablespoon sugar.
1 cup Dromedary Dates.
¼ cup boiling water.
1 cup boiled or steamed rice.

Put dates, sugar and boiling water into sauce pan and simmer three minutes. Make border around serving dish with the boiled or steam rice and fill center with the date mixture. Serve with cream.

SOUTHERN SNOWBALLS, 369 CALORIES

(Individual Rule.)

¼ cup rice.
1 cup milk.
¼ teaspoon salt.

Pick over rice, wash in several waters and put into top of double boiler with milk and salt. Cook until milk is absorbed and rice is tender. Do not stir while cooking. Dip egg cups in cold water and pack with rice carefully but tightly, turn out on serving dish, sprinkle with powdered sugar, put a candied cherry or a strawberry on top, and serve with whipped cream.

PLAIN RICE PUDDING, 634 CALORIES

(Individual Rule.)

1 cup steamed rice.
1 cup scalded milk.
½ tablespoon butter.
1 egg.
2 tablespoons sugar.
⅛ teaspoon salt.
¼ cup stoned raisins.

Scald milk and add butter. Beat egg, add sugar and salt and pour on the scalded milk slowly. Put into pudding dish with rice and raisins. Bake in a moderate oven until custard is set. Serve with hard sauce.

Note: Do not use raisins in case of bowel trouble.

RICE MERINGUE, 504 CALORIES

(Two Servings.)

¼ cup cold cooked rice.
1 cup scalded milk.
2½ tablespoons sugar.
½ saltspoon salt.
Egg yolk.
Vanilla.
1 egg white.
2 tablespoons powdered sugar.

Blend rice and milk and soak until soft. Beat the yolk, add sugar and salt and gradually the hot milk and rice. Cook until it thickens like soft custard. Flavor to taste and pour into pudding dish or custard cups. Make a meringue of the white of egg and powdered sugar, cover the pudding and brown slightly in the oven.

CREAM OF RICE PUDDING, 642 CALORIES

(Three Servings.)

¼ cup rice (well washed).
2 tablespoons sugar.
Grated rind of ⅓ lemon.
¼ teaspoon salt.
1 pint milk.

Mix all ingredients in a small baking dish. Bake two hours, slowly at first until rice is softened and thickened in the milk. Cut the crust several times, stirring to the bottom gently. The crust will then dissolve in the pudding, giving it a creamy color. Then let it brown slightly.

Tapioca Puddings

TAPICOCA CREAM, 395 CALORIES

(Two Servings.)

1½ tablespoons Minute Tapioca.
1½ tablespoons sugar.
⅛ teaspoon salt.
1 cup scalded milk.
1 egg.
Flavoring.

Scald milk in double boiler. Mix tapioca, sugar and salt; add slowly to the scalded milk, return to double boiler and cook fifteen minutes. Add the yolk and white of the egg, beaten separately. Remove from fire and add flavoring desired. Serve plain or with any fresh fruit in season.

PLAIN TAPIOCA, 405 CALORIES

(Three Servings.)

1½ tablespoons Minute Tapioca.
1 tablespoon sugar.
Salt.
1 cup scalded milk.
¼ cup raisins.
Nutmeg.

Scald milk in double boiler and gradually add the tapioca and sugar. Cook fifteen minutes. Add salt, nutmeg to taste and seeded raisins. Serve with cream and sugar.

Note: Raisins should never be used in bowel trouble.

PINEAPPLE TAPIOCA, 850 CALORIES

(Three Servings.)

¼ cup Minute Tapioca.
¼ cup sugar.
Speck salt.
1½ cups boiling water.
1 cup canned grated pineapple.

Mix tapioca, sugar and salt, pour the boiling water on slowly and cook in double boiler until clear, about fifteen minutes. Pour over the grated pineapple and decorate the top of the pudding with current jelly.

APPLE TAPIOCA, 458 CALORIES[1]

(Three Servings.)

¼ cup Minute Tapioca.
1 tablespoon sugar.
Speck salt.
1 pint boiling water.
3 tart apples.
Sugar, nutmeg.

[1] Without extra sugar.

Mix tapioca, sugar and salt, pour the boiling water on slowly, and cook in double boiler fifteen minutes. Pour this over the apples, which have been pared and cored and the holes filled with sugar and a little nutmeg. Cover the dish and bake one-half hour. Serve with cream and sugar.

RASPBERRY TAPIOCA, 206 CALORIES

(Three Servings.)

1½ tablespoons Minute Tapioca.
1½ tablespoons sugar.
1 cup boiling water.
½ cup raspberry juice.
Juice ½ lemon.
Speck salt.

Mix tapioca, sugar and salt, pour the boiling water on slowly and cook in double boiler fifteen minutes. Add raspberry and lemon juice. When it begins to jelly, beat smooth with a spoon. Serve plain or with whipped cream.

DATE TAPIOCA, 525 CALORIES

(Three Servings.)

1½ tablespoons Minute Tapioca.
1 tablespoon sugar.
⅛ teaspoon salt.
1 cup scalded milk.
1 egg.
¼ cup chopped dates.

Mix tapioca, sugar and salt; gradually add the hot milk and cook in double boiler fifteen minutes. Add the beaten egg yolk and cook three minutes longer. Stir in the dates. Make a meringue of the white of egg, heap it on top and brown delicately in the oven.

CHOCOLATE OR COCOA BLANC MANGE, 856 CALORIES[1]

(Three Servings.)

¼ cup Minute Tapioca.
¼ cup sugar.
¼ teaspoon salt.
1½ cups hot chocolate or cocoa
¼ teaspoon vanilla.

Mix tapioca, sugar and salt; gradually pour on the hot cocoa and cook in double boiler about twenty minutes. Remove from heat, add vanilla and pour into cold, wet molds. Serve cold, plain or with whipped cream or soft custard.

[1]Calculated with chocolate, recipe, page 323.

Bread Puddings

The principle of employing farinaceous matter which has already been subjected to heat, so that a considerable conversion of starch has occurred before the human salivary diastase comes into play, is put into practice in the form of bread puddings.

PLAIN BREAD PUDDING, 909 CALORIES
(Two Servings.)

1 cup stale bread.
1 cup milk.
1 tablespoon butter.
1 egg.
2 tablespoons sugar.
⅛ teaspoon salt.
¼ cup seeded raisins.

Scald milk and add butter. Beat the egg and add sugar and salt; pour the scalded milk on gradually. Cut the bread into one-half inch cubes and add with the raisins. Pour into well-buttered pudding dish, put bits of butter on top and bake in a moderate oven until the custard is set. Serve with hard sauce or cream and sugar.

Note: Do not serve raisins in bowel trouble.

ORANGE BREAD PUDDING, 955 CALORIES
(Two Servings.)

¾ cup stale bread.
½ cup milk.
2 eggs.
2 oranges.
6 tablespoons sugar.

Soak bread in the milk until soft and beat lightly with fork; add the grated rind of one orange and the juice of both; sweeten. Beat the whites very light and add to above mixture. Pour into custard cups and cook as for baked custard—about fifteen or twenty minutes. Serve plain or with hard sauce.

Note: Omit orange rind if it will interfere medicinally.

LEMON BREAD PUDDING, 527 CALORIES
(Two Servings.)

½ cup milk.
½ cup soft bread crumbs.
Yolk 1 egg.
Speck salt.
3 tablespoons sugar.
½ tablespoon butter.
Grated rind ¼ lemon.

Scald milk and add butter. Beat the egg yolk, add sugar and salt and pour the scalded milk on gradually. Add the bread crumbs and grated lemon rind; pour into a buttered pudding dish and bake in a moderate oven about fifteen minutes, or until set like baked custard.

Make a meringue by beating the white of egg very stiff, adding two tablespoons powdered sugar and juice of one-fourth lemon. Cover the pudding with this and set in the oven till a dainty brown.

Note: Do not use lemon rind if it will interfere medicinally. For the crumbs, rub soft bread through a coarse strainer or colander.

JELLY BREAD PUDDING

Prepare the same as for Lemon Bread Pudding, omitting the lemon rind and juice. Spread any tart jelly over pudding when baked and add meringue.

CHOCOLATE BREAD PUDDING, 636 CALORIES

(Two Servings.)

½ cup stale bread crumbs.
1 cup milk.
½ square Walter Baker's unsweetened chocolate.
2½ tablespoons sugar.
1 egg.
Speck salt.
¼ teaspoon vanilla.

Soak bread crumbs in milk. Melt chocolate over hot water and add to it the sugar and salt. To the chocolate mixture, add the soaked crumbs, the beaten egg and vanilla. Put into buttered custard cups and bake in a moderate oven about twenty minutes, or until custard is set. Serve hot, plain or with hard sauce.

LACTOSE BREAD PUDDING, 526 CALORIES[1]

1½ ounces of milk sugar (about 3 tablespoons).
6 ounces of milk (12 tablespoons).
1 egg.
1 slice of bread (⅜ inch thick)
⅖ ounce of butter (1 level tablespoon).

Spread the bread with butter and cut into squares. Beat

[1] Dr. W. Coleman, *American Journal of Medical Sciences,* January, 1912.

the egg slightly; heat the milk and sugar, stirring constantly; mix with the egg and pour over the bread. Grate nutmeg over the top and bake the same as the custard.

BROWN BETTY, 270 CALORIES[1]

(Individual Rule.)

Bread crumbs.
1 large sour apple.
2 teaspoons butter.
Sugar.
Cinnamon.

In a well-buttered individual baking dish place a layer of bread crumbs; into this put one-half apple cooked as for apple sauce or raw, cut in thin slices or chopped; season with sugar, speck of cinnamon and bits of butter. Add another layer of crumbs, then the remaining half of apple and seasoning, lastly crumbs. Place bits of butter on top, put in slow oven and bake.

Cracker Puddings

CRACKER PUDDING, 393 CALORIES

(Two Servings.)

1½ soda crackers.
1 cup milk.
⅛ teaspoon salt.
Yolk 1 egg.
2 tablespoons sugar.

Roll the crackers and soak in the milk. Beat yolks and sugar well together and add to pudding with salt. Bake one-half hour. Make a meringue with the whites of the eggs, pile lightly on top and put into oven till golden brown. Serve hot.

Pudding Sauces

HARD SAUCE, 770 CALORIES

(Four Servings.)

3 tablespoons butter.
9 tablespoons powdered sugar.
Nutmeg.
½ white of egg.
½ tablespoon cream.

Cream butter; add sugar gradually. When light and creamy add the unbeaten white of egg and the cream, a drop

[1]Calculated with 2 teaspoons sugar and 1 large slice of bread.

or two at a time. Season highly. Heap on serving dish and cool.

FOAMY SAUCE, 841 CALORIES[1]

(Three Servings.)

¼ cup butter.
½ cup powdered sugar.
½ egg
1 tablespoon wine.

Cream butter; add sugar gradually, the well-beaten egg and the wine. Heat over hot water, beating constantly. Serve immediately.

VANILLA SAUCE, 466 CALORIES

2 tablespoons butter.
2 tablespoons flour.
1 cup boiling water.
¼ cup sugar.
1 teaspoon vanilla.

Mix butter and flour and stir until smooth, add the boiling water and sugar. Cook thoroughly. Add flavoring and serve. Cornstarch may be substituted for the flour.

GOLD SAUCE, 856 CALORIES

Yolks 2 eggs.
1 cup powdered sugar.
Lemon juice or vanilla.

Beat yolks very light and add powdered sugar gradually, beating constantly. Add seasoning and serve.

TO WHIP CREAM

½ cup thick cream (40%)=432 Calories.

Do not have cream too thick; season with sugar and any flavoring desired; put into bowl and set bowl in another utensil containing a little cold water and ice. Beat cream with Dover egg-beater until stiff enough to keep its form. Set on ice to keep cold.

Note: Do not beat too long or it may turn to butter. To one-half cup thick cream add three tablespoons milk.

[1] Calculated without wine.

WHIPPED CREAM NO. II

1 average egg white = 17 Calories.

Follow the above recipe, and add the white of one egg beaten stiff, folding it into the stiffly-beaten cream.

FRUIT SAUCE

(Two Servings.)

6 tablespoons fruit juice. ½ teaspoon arrowroot or cornstarch.

Blend starch with a little cold water and pour into the hot fruit juice. Boil two or three minutes. Sweeten if desired.

ORANGE SAUCE

See chapter "Gelatin" for recipe. Page 282.

Gelatin[1]

Source.—Gelatin is a protein derived from "collagen," the chief constituent of connective tissue with its various modifications, as tendons, the "chondrigen" of cartilage, or the "ossein" of bone. "By proper treatment, any form of connective tissue can be made to yield gelatin. The best commercial gelatin is made from 'ossein' of bone—just like home-made soup stock. Isinglass, obtained from the swimming bladder of the sturgeon and other fish, is the purest form of gelatin; the gelatin obtained from calves' feet is also of high quality."[2]

General Principles in Cooking.—Gelatin is insoluble in cold water, but when allowed to stand in it will swell from absorption of water. "Gelatin is very soluble in boiling water, and on cooling sets into a jelly. This jellying will occur in a solution containing as little as 1 per cent. of gelatin."[2] Gelatin is decomposed by boiling and consequently if allowed to boil will not solidify on cooling.

[1] Gelatin is classed with the Nutritious Desserts for convenience, rather than under Animal Foods where it rightly belongs.

[2] State of Connecticut. Report of The Connecticut Agricultural Experiment Station. Food and Drug Products, 1909. Being Part II of the Biennial Report of 1909-1910.

General Rules for Blending.—Soak gelatin in cold water until it is softened. Add the boiling water to the softened gelatin to dissolve it. If gelatin must be softened quickly, pour the cold water over the gelatin and heat over boiling water until it is dissolved.

Gelatin should be covered with a cloth while soaking.

Add sugar to the mixture while hot and stir until the sugar is dissolved.

Add the fruit juice, etc.

Jellies should be strained through a fine wire strainer or through cheese cloth.

The cloth through which jellies are strained should be wet.

If jellies are to be molded, the molds should be wet with cold water.

Jellies should be placed near the ice to harden, but may be hardened quickly by surrounding with ice water.

One level tablespoon of granulated gelatin will stiffen about one pint of liquid.

Digestibility.—Gelatin is very easily digested in the stomach, and readily absorbed from the small intestines.

Nutritive Value.—Although gelatin is a true protein it cannot alone support life because of the absence of the amino acid, tryptophan. (See page 16.)

In convalescence, acid jellies (orange, lemon, etc.,) are of service as a pleasant supplement to the ordinary diet, but the actual nutriment which they supply is small.

Extra nutriment can be added to gelatin by combining it with eggs and milk, as in Snow Pudding, Charlottes of various kinds, Spanish Cream, etc., all of which are attractive forms of invalid diet.

Meat Jellies are a condensed form of broth, and are prepared by taking any meat containing a large proportion of connective tissues and cooking long and slowly. (Note broths, page 126, for directions and recipes.) Home-made jellies, properly prepared, have a pleasing flavor and are an agreeable addition to diet of an invalid, although their nutritive value is low.

For the Diabetic.—In sweetening gelatin, sugar must be replaced by sweetina or saccharin. It is many times sweeter than sugar but it has no food value. Note Sugar Substitutes, page 213.

WINE JELLY NO. I, 152 CALORIES

(Individual Rule.)

1 teaspoon granulated gelatin.
1 tablespoon cold water.
¼ cup boiling water.
2 tablespoons sugar.
2 tablespoons sherry wine.
1 tablespoon orange juice.
1 teaspoon lemon juice.

Soak gelatin in the cold water 5 minutes; add the boiling water and dissolve. Add sugar, wine, orange and lemon juice. When sugar is dissolved, strain through a cheesecloth into cold, wet molds; or chill in shallow soup plate and when firm cut into one-half inch cubes and serve in sherbet or champagne glasses or half orange shell with a little whipped cream on top.

WINE JELLY NO. II, 1530 CALORIES

(Six Servings.)

2 tablespoons granulated gelatin
½ cup cold water.
1½ cups sugar.
2 cups boiling water.
1 cup sherry wine.
Speck salt.

Cover gelatin with the cold water and let it stand about one-half hour. Add the boiling water, sugar and salt. Stir till gelatin is dissolved and add the wine. Strain through cloth and strainer into cold, wet molds and set in cold place to harden. Serve plain or with whipped cream.

ORANGE JELLY NO. I, 1023 CALORIES

(Six Servings.)

2 tablespoons granulated gelatin.
½ cup cold water.
2 cups boiling water.
1 cup sugar.
1 cup orange juice.
Juice 1 lemon.

Soak the gelatin in the cold water one-half hour; add the boiling water and dissolve. Add sugar and fruit juice, strain through a cloth and strainer into cold, wet molds and set away to harden. Serve plain or with whipped cream.

ORANGE JELLY NO. II, 136 CALORIES

(Individual Rule.)

1 teaspoon granulated gelatin.	3 tablespoons orange juice.
1 tablespoon cold water.	2 teaspoons lemon juice.
3 tablespoons boiling water.	2 tablespoons sugar.

Make same as preceding, soaking gelatin five minutes.

Cut orange in half, crosswise, remove pulp with spoon and strain through cheese-cloth. Fill halves with jelly; when it is hardened cut with sharp knife into thirds, thus leaving the rim filled with jelly. Serve three pieces on small plate with whipped cream in center.

ORANGE BASKETS

Wash oranges. Remove two sections from the upper half of an orange, leaving a band of peel for a handle. Dig out the pulp and scrape clean. Fill with lemon or orange jelly, cut into cubes. An attractive form to serve to children.

Note: If these shells are wrapped in a damp cloth they will retain their shape for hours.

LEMON JELLY, 125 CALORIES

(Individual Rule.)

1 teaspoon granulated gelatin.	1 tablespoon lemon juice.
1 tablespoon cold water.	2 tablespoons sugar.
¼ cup boiling water.	

Soak gelatin in the cold water 5 minutes; add the boiling water, sugar and fruit juice. When the sugar is dissolved, pour into cold, wet molds and put on ice to harden.

JELLIED PRUNES, 1352 CALORIES

(Six Servings.)

2 tablespoons granulated gelatin.	1 cup sugar.
⅓ lb. prunes.	¼ cup lemon juice.
2½ cups cold water.	

Pick over, wash and soak prunes for several hours in two cups cold water and cook in same water until soft; remove prunes, stone and cut in quarters. To prune water add enough boiling water to make two cups. Soak gelatin in half cup cold water, dissolve in hot liquid, add sugar and lemon juice, then strain, add prunes, mold and chill. Stir twice while cooling to prevent prunes from settling. Serve with sugar and cream.

GRAPE JELLY, 588 CALORIES

(Individual Rule.)

1 tablespoon granulated gelatin.
¼ cup cold water.
1 cup boiling water.
½ cup sugar.
Juice 1 lemon.
½ cup grape juice.

Soak gelatin in the cold water; add boiling water and dissolve. Add sugar, lemon juice and grape juice; strain, pour into cold, wet molds and cool.

This recipe may be served in another and very inviting form; when the gelatin is firm, force it through a potato ricer. Keep on ice until ready to serve.

PEACH JELLY, 116 CALORIES

(Individual Rule.)

1 teaspoon granulated gelatin.
1 teaspoon cold water.
1 tablespoon boiling water.
3 tablespoons peach juice.
1 teaspoon lemon juice.
1 tablespoon sherry wine.
1½ tablespoons sugar.

Soak gelatin in the cold water 5 minutes; add boiling water and dissolve. Add fruit juice, wine and sugar, strain and pour into a cold, wet mold.

COFFEE JELLY, 513 CALORIES

(Individual Rule.)

1 teaspoon granulated gelatin.
1 tablespoon cold water.
2 tablespoons strong hot coffee.
2 tablespoons sugar.
7 tablespoons thick cream.

Soak gelatin in the cold water 5 minutes. Add the hot coffee and dissolve; add sugar and strain. Set bowl into chopped ice, or ice water to cool, stirring occasionally until it thickens. Then add the cream, and pour into cold, wet molds to chill.

CREAM JELLY, 332 CALORIES

(Individual Rule.)

1 teaspoon granulated gelatin.
1 tablespoon cold water.
3 tablespoons scalded milk.
4 tablespoons thick cream.
1 tablespoon sugar.
Speck salt.
Vanilla to taste.

Soak gelatin in the cold water 5 minutes; add the scalded milk and dissolve. Add the sugar, salt, cream and vanilla. Stir occasionally until the mixture thickens; pour into cold, wet after-dinner coffee cups, or egg cups, and chill. Serve with Soft Custard, or cream and sugar.

PEPTONIZED MILK JELLY, 567 CALORIES[1]

(Three Servings.)

1 cup cold water.
2 tablespoons granulated gelatin.
1 pint "specially peptonized milk," hot.
Sugar to taste.
Rinds and juice of one fresh lemon and orange.
2 or 3 tablespoons best St. Croix rum, or brandy, etc.[2]

Soak the gelatin in a cup of cold water, pour the hot milk over it and add the sugar; stir until dissolved, then throw in the lemon and orange rinds.

Squeeze the juice of the lemon and orange into a glass and strain; stir in the rum or brandy, etc., then mix with the milk and gelatin; strain.

When the mixture has cooled to a syrup so as to be almost ready to set, pour into molds or glasses wet in cold water and put on ice or in cold water or in a cold place to harden; if it is too warm when poured into the molds, it is likely to separate in setting.

[1] Without sugar.
[2] Calculated with 2 tablespoons rum.

DATE JELLY

½ lb. Dromedary Dates.
½ pint strawberry gelatin jelly.
½ pint orange gelatin jelly.

Pit dates and fill with walnuts chopped fine. Pour half the strawberry mixture into a mold and when it begins to harden, cover with layer of dates and half the orange mixture. When this hardens repeat the process until all the ingredients are used. Keep on ice until perfectly firm. Serve with cream.

SNOW PUDDING, 943 CALORIES

(Six Servings.)

½ envelope Knox Sparkling granulated gelatin.
¼ cup cold water.
1 cup boiling water.
1 cup sugar.
¼ cup lemon juice.
Whites 3 eggs.
1 teaspoon lemon extract.

Soften gelatin in cold water, add boiling water and dissolve. Add sugar, fruit juice and extract and stir until sugar is dissolved. Set bowl into chopped ice or ice water to cool, stirring occasionally; when jelly is quite thick fold in the stiffly-beaten whites of eggs and put into cold, wet molds. Put on ice to harden. When firm, remove from molds and serve with Soft Custard No. 1.

SNOW PUDDING, 202 CALORIES

(Individual Rule.)

2 teaspoons granulated gelatin.
3 tablespoons cold water.
⅓ cup boiling water.
1½ tablespoons lemon juice.
3 tablespoons sugar.
White 1 egg.

Blend the same as the preceding recipe.

SPANISH CREAM, 1105 CALORIES

1 tablespoon granulated gelatin.
¼ cup cold milk or water.
2½ cups hot milk.
Yolk 3 eggs.
½ cup sugar.
⅛ teaspoon salt.
1 teaspoon vanilla *or*
2 teaspoons sherry.[1]
Whites 3 eggs beaten very light.

Soften gelatin in cold milk or water. Beat yolks in top

[1] Calculated without sherry.

of double boiler and add the sugar and gradually the hot milk. Place boiler over hot water and stir until custard thickens; remove boiler immediately from hot water and add the softened gelatin, salt and flavoring, stirring till the gelatin dissolves. Fold in the stiffly beaten whites and pour into cold, wet molds, large or individual, to harden. Serve with Soft Custard No. 1, or with Whipped Cream.

SPANISH CREAM, 304 CALORIES

(Individual Rule.)

1 teaspoon granulated gelatin.	2 tablespoons sugar.
1 tablespoon cold water.	Speck salt.
3 tablespoons boiling water.	White 1 egg.
⅔ cup milk.	¼ teaspoon vanilla.
Yolk 1 egg.	

Blend the same as the preceding and serve with Orange Sauce.

ORANGE SAUCE, 132 CALORIES

(Three Servings.)

Beat white of one egg very light, add two tablespoons sugar gradually, beating constantly, then add one and one-half tablespoons orange juice and one teaspoon lemon juice.

BAVARIAN CREAM, 252 CALORIES

(Individual Rule.)

1 teaspoon granulated gelatin.	½ tablespoon sugar.
1 tablespoon cold water.	¼ teaspoon vanilla.
¼ cup milk.	¼ cup whipped cream (2 tablespoons thick cream).
Yolk 1 egg.	

Soak gelatin in cold water 5 minutes. Heat the milk and pour into the beaten yolk of egg and add this mixture to gelatin; stir until gelatin is dissolved and flavor. Set in ice water to cool, beating almost constantly. When it begins to stiffen, fold in the whipped cream. Pour into molds. Serve with whipped cream.

Note: Chocolate may be added by omitting flavoring, adding chocolate to hot milk and dissolving before adding to the yolk.

A CONVALESCENT'S TREAT—CHOCOLATE SPONGE, 848 CALORIES[1]

(Six Servings)

½ envelope Knox Sparkling granulated gelatin.
¼ cup cold water.
¼ cupful boiling water.
2 squares chocolate *or*
6 tablespoons cocoa.
⅓ cupful of sugar.
3 eggs.
Few grains of salt.
1 teaspoonful vanilla.

Soak gelatin in cold water until soft, then dissolve in boiling water. Add cocoa *or* melted chocolate. Beat egg whites until stiff and add well-beaten egg yolks, one at a time, to the whites. Add sugar, then the dissolved gelatin, which has been beaten well. Beat and add flavoring. Pour into wet mold, chill and serve with whipped cream or whipped evaporated milk. This recipe is quickly prepared.

GRAPE FLUFF, 969 CALORIES

(Six Servings.)

1 tablespoon granulated gelatin.
¼ cup cold water.
¾ cup sugar.
1 cup grape juice.
Juice 1 lemon.
Whites 3 eggs.

Soften the gelatin in cold water and dissolve by standing the dish in hot water. Dissolve the sugar in the fruit juice and strain the gelatin into it. Set in ice and water and stir occasionally until the mixture begins to thicken, then gradually add the well-beaten whites of eggs and beat until the whole is very light and stiff enough to hold its shape. Pile lightly in glass serving dish, or mold and serve with Whipped Cream or Soft Custard.

ORANGE CHARLOTTE, 358 CALORIES

(Individual Rule.)

2 teaspoons granulated gelatin.
1 tablespoon cold water.
⅓ cup boiling water.
⅓ cup sugar.
3 tablespoons orange juice.
1 tablespoon lemon juice.
Whites 2 eggs.

Blend as for Orange Gelatin and set the bowl into chopped ice or ice-water to cool; stir occasionally. When jelly is quite thick, fold in the stiffly-beaten whites of eggs. Mix well and pour into cold, wet molds. Put on ice to harden. When firm, remove by dipping mold quickly in warm water; loosen with knife, allowing air to enter. Serve with Soft Custard No. 1.

Note: Line molds with lady fingers or slices of sponge cake and pour in the charlotte.

STRAWBERRY MOUSSE, 2172 CALORIES[1]

1 tablespoon granulated gelatin.	1 pint thick cream.
¼ cup cold water.	½ cup powdered sugar.
¼ cup boiling water.	1 cup strawberry juice.

Soften the gelatin in the cold water; add the boiling water and dissolve. Whip the cream until stiff and add the powdered sugar. Add the strawberry juice to the gelatin, fold the cream in carefully, turn into a wet mold and pack in salt and ice for two hours.

THE MADE-IN-A-MINUTE DESSERT, 395 CALORIES[2]

Dissolve one package of Jell-O in one pint of boiling water. Pour into a mold and put in a cold place to harden. When set, turn out on a plate and serve with whipped cream. Wine Jelly can be made by using one-fourth cup of good wine with the Lemon Jell-O and that much less water.

PINEAPPLE JELL-O WHIP, 839 CALORIES

Drain the juice from one cup of canned pineapple. Add enough water to make a pint, heat to boiling point and dissolve in this liquid one package of Lemon Jell-O. When cool but still liquid, set the dish in ice water and whip to the consistency of whipped cream. Chop or grate the pineapple and fold into the whipped Jell-O, turn into mold to harden or pile up in sherbet glasses. Fresh or canned berries may be used in place of pineapple.

[1] Calculated without fruit.
[2] Calculated without cream.

LACTOSE JELLY,[1] 174 CALORIES

½ teaspoon granulated gelatin.	1½ teaspoons cane-sugar.
2 teaspoons cold water.	1 teaspoon sherry.
3 tablespoons orange juice.	3 tablespoons lactose.
1 teaspoon lemon juice.	3 tablespons boiling water.

Boil lactose in water until clear. Pour over soaked gelatin to dissolve and add other ingredients. Strain through cheese-cloth and chill.

May also be flavored with grape or raspberry juice.

DIABETIC—AGAR-AGAR JELLY[2]

7 grams agar-agar.	2½ grains saccharin.
1.000 c.c. water.	Flavoring as desired.

Mix agar-agar and cold water; cook over a moderate fire until it boils. Allow to simmer two or three hours until mixture is clear; add sufficient hot water to make one quart of liquid. Remove from fire; add saccharin and flavor as desired. The following flavors are suggested:

Coffee, cinnamon, cocoa (cocoa shells), lemon extract, orange extract, strawberry extract, mapleine extract, peppermint. Burnett's coloring paste may be added to the jellies.

DIABETIC—WINE JELLY[3]

4 ounce mold—35 Calories.

2 teaspoons granulated gelatin.	1 tablespoon brandy.
1 teaspoon lemon juice.	4 tablespoons cold water.
4 tablespoons sherry wine.	1½ cups boiling water.

Soak gelatin in cold water, add boiling water, sherry wine, brandy, lemon juice and saccharin. Stir until the gelatin is thoroughly dissolved. Pour into small molds, and stand in a cold place until firm.

DIABETIC—LEMON JELLY[3]

4 ounce mold—20 Calories.

1 tablespoon granulated gelatin.	1 gr. saccharin.
	½ cup lemon juice.
¼ cup cold water.	3 cups boiling water.

[1] Dr. H. Carter, "Presbyterian Diet Lists," New York; W. B. Saunders, Phila., Pa.
[2] Dr. Frederick M. Allen, Director Psychiatric Institute, Morristown, N. J.
[3] "St. Luke's Dietary," St. Luke's Hospital, New York City.

Soak gelatin in cold water, add boiling water, lemon juice and saccharin. Stir until the gelatin is thoroughly dissolved. Pour into small molds and stand in a cold place until firm.

MEAT JELLIES

See "Meat Jellies" for recipe. Page 129-130.

STARCHY JELLIES

See "Starchy Jellies" for recipe. Page 203.

Frozen Dessert

ICE CREAM—SHERBET—ICES

Frozen dishes not only constitute an acceptable form of serving nutriment, but are often a means of furnishing additional liquid and relieving thirst. Ices and sherbets made with fruits and water have a dietetic value similar to acid beverages. Frozen cream, milk, junkets, custards, etc., have the same nutritive value as the same foods served without freezing.

In giving all very cold dishes, care must be taken not to interfere with the digestion of other foods. Chilling the mouth hinders the formation and activity of saliva; chilling the stomach retards gastric digestion. The latter effect can be avoided by eating ice-cold food very slowly, so that it is partially warmed before reaching the stomach. Frozen foods should not be given when ptyalin digestion is especially important.

General Rules for Freezing.—Ice (or snow) and salt are required for the process of freezing. The salt melts the ice and in melting absorbs heat from the mixture, thus causing it to freeze. The finer the ice, the more quickly the freezing will be accomplished. In packing a freezer allow three level measures of ice to one of salt. This proportion is found best for fine-grained mixture. The can should not be filled more than three-fourths full, as the liquid expands in freezing and if overcrowded the cream will become coarse-grained and the cover may be pushed up allowing the salt water to get in.

Freezing in Small Amounts.—Put mixture to be frozen into a water-tight baking powder can, or a small tin pail with cover, and stand in large pail or bowl. Pack the ice and salt alternately under and around it, using one part salt to three parts ice. Remove cover and beat mixture with Dover egg-beater until foamy, replace cover and turn can or pail back and forth; remove cover occasionally, scrape the frozen mixture from side of can and beat thoroughly with fork. The mixture will freeze in twenty minutes. When frozen, place a narrow strip of cloth, dipped in melted beef fat or lard, around the outside of cover to keep out the salt water. Repack in ice, or ice and salt, and cover well until wanted.

Serve frozen dishes in sherbet, champagne, or high glasses; pass on small plate covered with doily and at the side of the plate a small cake, wafer or a few orange straws may be added. A rose will add attractiveness.

For the Diabetic. Sugar must be replaced by sweetina or saccharin. It is many times sweeter than sugar but has no food value. Note Sugar Substitutes, page 213.

Ice Cream

VANILLA ICE CREAM, 298 CALORIES[1]

½ cup thin cream *or* ¼ cup heavy cream and ¼ cup milk.
1½ tablespoons sugar.
½ teaspoon vanilla.
Speck salt.

Blend all the ingredients; when sugar is dissolved, freeze in a small pail according to general directions.

VANILLA ICE CREAM WITH LACTOSE,[2] 491 CALORIES

4 ounces cream (¼ pint *or* ½ cup).
2 ounces milk (4 tablespoons).
2 ounces milk sugar—about 4 level tablespoons.
Speck salt.
Few drops of vanilla.

[1] Calculated with thin cream.
[2] Dr. W. Coleman, *American Journal of Medical Sciences*, January, 1916.

Mix cream, milk and sugar and heat, stirring constantly, until the sugar is dissolved. Then flavor, cool and freeze.

CHOCOLATE ICE CREAM, 341 CALORIES[1]

(Individual Rule.)

½ cup thin cream *or* ¼ cup heavy cream and ¼ cup milk.
¼ square Walter Baker's chocolate.
1½ tablespoons sugar.
1 tablespoon boiling water.
¼ teaspoon vanilla.
Speck salt.

Melt the chocolate over hot water, add the boiling water, sugar and hot cream. Cool, add vanilla and salt and freeze in small pail according to general directions.

Note: To make a large quantity, double recipe as many times as desired.

COFFEE ICE CREAM, 340 CALORIES[1]

(Individual Rule.)

½ cup thin cream *or* ¼ cup heavy cream and ¼ cup milk
1 tablespoon ground coffee.
1½ tablespoons sugar.
Speck salt.
¼ cup milk.

Mix coffee and milk, put into double boiler and cook 5 minutes. Strain through cheese-cloth and strainer; add sugar, salt and cream. Cool and freeze in small pail according to general directions.

GRAPE JUICE ICE CREAM, 490 CALORIES

(Individual Rule.)

½ cup thin cream.
¼ cup grape juice.
¼ cup sugar.

Scald one-half cup of the cream and add the sugar. Cool, add remainder of cream and the grape juice and freeze according to general directions.

STRAWBERRY ICE CREAM, 340 CALORIES

(Individual Rule.)

½ cup thin cream *or*
¼ cup thick cream and ¼ cup milk.
¼ cup strawberries.
2 tablespoons sugar.
Speck salt.

Mash the strawberries with the sugar and allow them to

[1] Calculated with thin cream.

stand five minutes. Add the cream and milk and freeze in small pail according to general directions.

Note: The berries may be mashed and strained through cheese-cloth.

RASPBERRY ICE CREAM, 347 CALORIES

(Individual Rule.)

½ cup thin cream *or* ¼ cup heavy cream and ¼ cup milk.
¼ cup raspberries.
2 tablespoons sugar.
Speck salt.

Mash the raspberries and strain through cheese-cloth. Add cream, milk and sugar. Freeze in small pail according to general directions.

PEACH ICE CREAM, 424 CALORIES

(Individual Rule.)

½ cup thin cream *or* ¼ cup heavy cream and ¼ cup milk
¼ cup peaches.
2 tablespoons sugar.

Mix peaches and sugar and press through a potato-ricer or sieve. Scald cream and milk. Cool and add peaches and sugar. Freeze in small pail according to general directions.

CARAMEL ICE CREAM, 324 CALORIES

(Individual Rule.)

½ cup thin cream *or* ¼ cup thick cream and ¼ cup milk.
2 tablespoons sugar.
1¼ tablespoons boiling water.
⅓ teaspoon vanilla.
Speck salt.

Place the sugar in saucepan and stir constantly until melted. Add water and boil until reduced to one and one-half tablespoons. Add cream very slowly, vanilla, salt, and freeze.

CARAMEL ICE CREAM NO. II, 3982 CALORIES

(Ten Servings.)

1 pint milk.
1 cup sugar.
2 tablespoons flour.
1 scant cup sugar for caramel.
2 eggs.
Speck salt.
1 quart thin cream.

Scald the milk; mix one cup sugar, flour and salt, add the eggs and beat all together until perfectly smooth and light. Add the scalded milk gradually, beating until very smooth. Cook in double boiler twenty minutes.

While cooking, prepare caramel. Put the second cup of sugar into sauté pan and cook until melted and a delicate brown; add the custard gradually, stirring constantly; strain and cool. Add the cream, which has been scalded and cooled, and freeze in large freezer.

Note: This may be used for vanilla ice-cream by omitting the caramel and using one tablespoon vanilla and enough of the second cup of sugar to sweeten.

MALTED MILK ICE CREAM, 3907 CALORIES

(Ten Servings.)

½ pound Horlick's Malted Milk.
1 cup granulated sugar.
1 quart water.
White 1 egg.
1 pint thick cream.
2 ounces chocolate.
1 tablespoon vanilla.

Mix the Malted Milk powder, sugar and boiling water, stirring until smooth. Add cream and scraped chocolate and cook until chocolate is melted. Add vanilla, cool and freeze. When partly frozen add the well-beaten white of egg and finish freezing.

Note: If strawberry or other flavor is desired it may be used in place of vanilla.

JUNKET ICE CREAM, 2379 CALORIES

1 cup thick cream.
1 quart rich milk.
1 cup sugar.
½ tablespoon vanilla.
1 junket tablet dissolved in
1 tablespoon cold water.

Heat the milk and sugar to lukewarm. Add the dissolved junket and the vanilla. Allow to jelly in warm place and then freeze.

FROZEN CUSTARD, 347 CALORIES

(Two Servings.)

1 cup hot milk.
1 egg.
Speck salt.
2 tablespoons sugar.
¼ teaspoon vanilla.

Beat the egg, add the sugar and salt and gradually the scalded milk. Cool, add flavoring and freeze.

HOT COCOA SAUCE FOR ICE CREAM, 965 CALORIES

(Six Servings.)

1½ cups water.
1 cup sugar.
1 tablespoon arrowroot.
Speck salt.
2 tablespoons Walter Baker's cocoa.
1 teaspoon vanilla.

Boil the water and sugar together for two minutes; add the arrowroot mixed with a little cold water, stir for a moment, then boil until clear. Add the cocoa, which has been mixed with a little hot water, and the salt and boil three minutes longer. Remove from the fire and add the vanilla.

DIABETIC—ICE CREAM[1]

65 Calories per Ounce.

1 cup cream.
½ cup water.
2 eggs.
½ grain saccharin.

Beat the eggs, add the cream, water and saccharin, which has been dissolved in a small amount of liquid. The mixture is frozen as any ice cream.

Sherbet

LEMON MILK SHERBET, 245 CALORIES

(Individual Rule.)

½ cup milk.
3 tablespoons sugar.
Juice of ¼ lemon.
1 drop lemon extract.

Blend all the ingredients and freeze in small pail according to general directions.

[1] "St. Luke's Dietary," St. Luke's Hospital, New York City.

LEMON MILK SHERBET, NO. II, 1969 CALORIES

(Six Servings.)

1 quart milk.
1½ cups sugar.
Juice 2 lemons.
½ teaspoon lemon extract.

To the lemon juice add the sugar, milk and extract. Freeze immediately in large freezer.

STRAWBERRY SHERBET, 358 CALORIES

(Individual Rule.)

½ cup milk.
1 cup strawberries.
¼ cup sugar.

Mash the berries and strain. To the juice add sugar and milk. Freeze in small pail according to general directions.

STRAWBERRY SHERBET NO. II, 2859 CALORIES

(Six Servings.)

1 quart milk.
2 quarts strawberries.
2 cups sugar.

Mash the berries and strain. Add sugar and milk. Freeze in large freezer.

CLAM SHERBET, 129 CALORIES

(Individual Rule.)

¾ cup milk.
¼ cup clam broth.
Speck paprika.

Blend and freeze according to general rule. Serve in small, dainty glasses with a teaspoon of unsweetened whipped cream on top. The milk and clam taken in this way are often more acceptable to the patient than when served in liquid form.

Note: The paprika may be omitted if condiments are not desirable.

MALTED MILK SHERBET, 2179 CALORIES

(Six Servings.)

½ pound Horlick's Malted Milk.
1 cup granulated sugar.
3 pints water.
1 tablespoon vanilla.
2 ounces chocolate.
White 1 egg.

Make a smooth paste of the malted milk powder and a little of the water, then add the rest of the water gradually, the sugar, the vanilla and the chocolate grated. Freeze. When partly frozen, add the well-beaten white of egg and finish freezing.

GRAPE SHERBET, 3274 CALORIES

(Ten Servings.)

3 cups grape juice.
1 quart water.
3 cups sugar.
Whites 2 eggs.

Blend the grape juice, water and sugar. Freeze partially. Beat the whites of eggs lightly, add two tablespoons powdered sugar; add to sherbet and continue freezing until hard. Remove dasher and allow it to stand for one hour to ripen. Pack carefully.

GRAPE AMBROSIA, 5258 CALORIES

(Twelve Servings.)

1 quart milk.
2 quarts water.
3½ cups sugar.
Whites 4 eggs.
1 pint grape juice.
1 can grated pineapple.
Juice 3 lemons.

Mix together milk, water, sugar and fruit and freeze partially. Add the well-beaten whites of eggs and continue freezing until hard.

Ices

ORANGE ICE, 326 CALORIES

(Individual Rule.)

½ cup water.
Juice 1½ oranges.
1 tablespoon lemon juice.
¼ cup sugar.

Mix together all the ingredients and freeze in small pail, according to general directions.

ORANGE ICE NO. II, 1023 CALORIES

(Four Servings.)

2 tablespoons granulated gelatin.
½ cup cold water.
1½ cups boiling water.
1 cup sugar.
1 cup orange juice.
Juice 1 lemon.

Soak gelatin in the cold water twenty minutes; add boiling water; when gelatin is dissolved add the sugar, orange and lemon juice. Cool, strain and freeze in large freezer.

ORANGE ICE NO. III, 1922 CALORIES

(Four Servings.)

1 pint orange juice.
Juice 2 lemons.
1 pint sugar.
Grated rind 1 orange.
1 quart water.

Boil the water and sugar twenty minutes; add fruit juice and rind of orange. Cool, strain and freeze in large freezer.

Note: Do not use orange rind if it will interfere medicinally.

LEMON ICE, 225 CALORIES

(Individual Rule.)

½ cup water.
Juice 1 lemon.
4 tablespoons sugar.

Mix all the ingredients and freeze in small pail according to general directions.

FRUIT ICE, 519 CALORIES

(Individual Rule.)

½ banana.
⅓ cup strawberries.
Juice ½ orange.
Juice ½ lemon.
½ cup cold water.
½ cup sugar.

Put the fruit into a coarse strainer or a potato-ricer and rub it through into a large bowl. Pour the cold water through the strainer. Add the sugar, stir well and freeze according to general directions.

PINEAPPLE ICE, 258 CALORIES

(Individual Rule.)

⅓ cup grated pineapple.
1 tablespoon lemon juice.
½ cup water.
2 tablespoons sugar.

Boil the water and sugar together about three minutes; add pineapple and lemon juice. Cool, strain and freeze according to general directions.

GRAPE FRAPPÉ, 2177 CALLORIES
(Six Servings.)

1 pint grape juice.
Juice 1 lemon.
1 pint water.
2 cups sugar.

Boil the water and sugar together for five minutes; cool and add the grape and lemon juice. Freeze to the consistency of a mush. Serve in tall glasses with sweetened whipped cream piled high on top.

CLAM FRAPPÉ
(Individual Rule.)

¾ cup cold water.
¼ cup clam broth.
Speck paprika.

Blend and freeze according to general directions, to the consistency of a soft water ice. Serve in small punch glasses or champagne glasses, with a teaspoon of unsweetened whipped cream on top. Delicious to serve for dinner in place of shellfish.

SCALPICON OF FRUIT

A delicious scalpicon is made by cutting all kinds of fresh fruits into small pieces and flavoring with wine or lemon juice and sugar. Put into serving dish with orange or lemon ice on top. Serve individually in champagne glasses on a small plate with doily, with a single rose or other flower to correspond with color of ice.

ORANGE STRAWS

Peel the orange or lemon lengthwise; cut into long, narrow strips, about one-fourth of an inch wide. Put into saucepan and cover with cold water, bring to the boiling point and pour off the water; repeat this process five or six times, or until the bitter taste of peel is extracted. Drain thoroughly and cover with granulated sugar. Cook until syrup is thick and hardens in cold water. Then roll straws in granulated sugar and cool. Serve with orange ice, etc., or as a bon-bon.

QUESTIONS FOR STUDY

1. Name five easily digested desserts made with milk and eggs.
2. What is a good proportion of liquid to egg for soft custard? For baked custard?
3. What is gained by using lactose in desserts?
4. What do you understand by the term "diabetic custard"?
5. How would you serve a custard with chocolate sauce?
6. What is junket? How is it made?
7. What variations of plain custard can you suggest?
8. On what principle is the cooking of starchy desserts based?
9. What is gelatin? Discuss its food value and use in the diet.
10. Discuss the value of frozen desserts. What caution must be observed in serving them?
11. What principle is involved in freezing mixtures?
12. How would you freeze a small amount of material?

CHAPTER XI

BEVERAGES

ACID—ALBUMINOUS—STARCHY—MISCELLANEOUS BEVERAGES, INCLUDING TEA, COFFEE, CHOCOLATE, COCOA, AND SPECIAL NON-NUTRITIVE BEVERAGES.

Beverages serve primarily to relieve thirst. The universal beverage is water.[1] Other beverages answer the same purpose, because their chief constituent is water. They are also taken for their temperature, cold or hot, for their flavor, which helps to arouse or appease the appetite, or for their stimulating properties. Usually they have little or no energy value, but when made with milk, eggs, cocoa, chocolate or other highly nutritive materials, they become a valuable means of administering food in a liquid form.

Acid Beverages

Beverages made from fruit juices are cooling and refreshing and hence especially grateful to fever patients. They are valuable for the organic acids, mineral matter, sugar and vitamines which they contain. Some of them, as lemonade and orangeade, have an added value in their diuretic and diaphoretic action. The antiscorbutic property of fruits is discussed on page 22. The organic acids are useful in constipation, as they stimulate peristaltic action. These acids vary with the kind of fruit; thus, apples contain *malic* acid, lemons, *citric* acid, grapes, *tartaric* acid, etc. In the body these are changed to carbonates, which preserve the alkalinity of the blood. Ripe pineapple juice contains a ferment capable of digesting proteins.

[1]See Water, page 19.

Wash lemons and oranges and in using the juice remove the seeds, as they give a bitter taste. When the rind of lemon or orange is undesirable medicinally it should not be used.

Serve acid beverages daintily in glasses or sherbet cups (three-fourths filled), on small tray or plate, covered with doily, and add a few wafer crackers, or a single flower.

Whenever cold water is to be used instead of very hot or boiling water in preparing drinks, it is preferable to use "sugar syrup" for sweetening in place of sugar, which requires time for solution.

As the acidity of fruit varies considerably with the kind, this fact must be borne in mind while preparing the following recipes, otherwise too much sugar may be added.

For the Diabetic—In sweetening acid beverages, sugar must be replaced by sweetina or saccharin. It is many times sweeter than sugar but it has no food value. Note Sugar Substitutes, page 213.

SUGAR SYRUP, 420 CALORIES

FOR SWEETENING ACID BEVERAGES

½ cup of sugar.
½ cup of boiling water.

Mix the sugar and water and stir until the sugar is dissolved. Boil slowly, without stirring, for fifteen minutes; cool slightly and bottle.

Sugar syrup may be used for sweetening acid beverages when cold water is used in place of boiling water.

LEMONADE NO. I, 69 CALORIES

Juice 1 lemon *or*
3 tablespoons lemon juice.
1 tablespoon sugar *or* sugar syrup to taste.
1 cup cold water.

Dissolve the sugar in lemon juice; add cold water and a little ice if desired.

LEMONADE NO. II, 121 CALORIES

1 lemon.
¾ cup boiling water.
2 tablespoons sugar.
½ thin slice lemon.

Wash and wipe lemon; cut a very thin slice from middle.

Squeeze juice into bowl, keeping back the seeds, add the sugar and boiling water; cover, and put on ice to cool. Strain and pour into a glass or sherbet cup.

Cut half the slice of lemon into two pieces, and use as garnish in glass, or a few berries or slice of orange may be used.

Note: The quantity of sugar used depends upon the acidity of fruit. For *fruit lemonade* add fresh fruit of all kinds to strong lemonade, using boiling water for the beverage; cool, and chill on ice.

LACTOSE LEMONADE,[1] 465 CALORIES

4 ounces of milk sugar (about 8 tablespoons)
7 ounces of cold water (14 tablespoons)
2 tablespoons of lemon juice (or to taste)

Boil the sugar and water for two minutes, add lemon juice to taste, strain, and cool. If not sweet enough add 1 or 2 tablespoons cane sugar.

SODA OR EFFERVESCENT LEMONADE, 121 CALORIES[2]

Juice of 1 lemon.
1 or 2 tablespoons sugar.
¾ cup of cold water.
¼ teaspoon soda, free from lumps.

Prepare the lemonade to taste, cool, add the soda, stir thoroughly and drink while effervescing.

Note: Put glass on plate before soda is added. Water and soda may be omitted and carbonated water substituted.

IRISH MOSS LEMONADE, .23 CALORIES[3]

¼ cup Irish moss.
2 cups cold water.
4 tablespoons lemon juice.
Sugar.

Pick over and wash the moss and soak 15 minutes. Drain and add the cold water; cook in top of double boiler about 20 minutes or until syrupy. If it becomes too thick,

[1] Dr. W. Coleman, *American Journal of Medical Sciences*, January, 1912.
[2] Calculated with two tablespoons sugar.
[3] Without sugar.

add hot water. Strain, add the lemon juice and sugar to taste. Reheat and serve hot.

Excellent for sore throat and cold on the lungs, or any inflammation of the mucuous membrane.

EGG LEMONADE

See "Albuminous Beverages" for recipe. Page 310.

ORANGEADE, 177 CALORIES

1 sour orange.	2 tablespoons sugar.
½ cup boiling water.	½ slice orange.

Prepare as for lemonade No. II. If orange is not very acid, add a little lemon juice or use less sugar.

ORANGEADE NO. II, 73 CALORIES

Put two tablespoons of crushed ice in dainty glasses and pour the juice of one orange over it. Sweeten if desired.

FRUITADE, 156 CALORIES

¼ cup grated pineapple.	1 cup boiling water.
Juice ½ lemon.	Sugar.
Juice ½ orange.	

Prepare fruit. Add the boiling water and one tablespoon sugar; allow to stand until cool. Add more water or sugar if necessary. Strain and serve *cold*.

LEMON WHEY

1 cup hot milk.	2 tablespoons lemon juice.
2 teaspoons sugar.	

Heat the milk in a small saucepan over hot water, or in a double-boiler. Add the lemon juice. Cook without stirring until the whey separates. Strain through double cheese-cloth, and add the sugar. Serve hot or cold. Garnish with small pieces or slice of lemon.

WINE WHEY

1 cup sweet milk.	¼ cup sherry wine.

Heat the milk to boiling point, add the wine, and cook without stirring until the milk separates. Strain through a double cheese-cloth, and serve hot or cold.

ACID PHOSPHATE

Horsford's Acid Phosphate is a solution of the phosphates of lime, magnesia, potash and iron with phosphoric acid, in such form as to be readily assimilated by the system. It is thus a true nerve and tissue food.

1 teaspoon Horsford's Acid Phosphate.
1 cup hot or cold water.
Sugar.

Mix the Acid Phosphate with the water and sweeten with sugar if desired.

If the above should seem too strong or be found too stimulating, use one-half teaspoon of the Acid Phosphate.

Note: Horsford's Acid Phosphate may be substituted for lemon juice in any of the acid drinks.

ACID PHOSPHATE WHEY

1 cup hot milk.
2 teaspoons sugar.
1 teaspoon Horsford's Acid Phosphate.

Heat the milk in a small saucepan over hot water or in a double boiler. Add the Acid Phosphate. Cook without stirring until the whey separates. Strain through cheese-cloth and add the sugar. If more acid is desired, add two or three drops of Horsford's Acid Phosphate. Serve hot or cold.

CREAM OF TARTAR DRINK

1 or 1½ teaspoons cream of tartar.
1 pint boiling water.
Lemon.
Sugar.

Dissolve the cream of tartar in the boiling water and flavor with lemon and sugar. When cold strain. Take as a refrigerant drink and diuretic.

IMPERIAL DRINK[1]

Potassium bitartrate	(6.0) ʒ iss
Sugar	(16.0) ℥ ss
Lemon peel, cut or grated	(16.0) ℥ ss
Boiling water	(1000.0) O ij

MALTED MILK AND CURRANT JELLY, 85 CALORIES

1 tablespoon Horlick's Malted Milk.
¼ cup boiling water.
1 tablespoon currant jelly.
¾ cup cold water.
Cracked ice.

Mix the malted milk powder with a little of the boiling water to make a smooth paste, add the jelly and the rest of the water and stir till the jelly is dissolved. Add the cold water and ice, strain and serve daintily in glass or sherbet cup, partly filled, on small plate with doily.

MALTED MILK WITH WINE, 84 CALORIES

1 tablespoon Horlick's Malted Milk.
1 cup hot water.
1 teaspoon port or sherry wine.
1 teaspoon sugar.

Mix the malted milk powder with enough of the hot water to make a smooth paste, then add gradually the rest of the hot water, the wine, and sugar if desired.

JELLY AND ICE

With a large needle or pin or an ice-scraper chip half a cup of ice into bits as large as a pea. Mix with it about the same quantity of lemon, currant, blackberry or barberry jelly. Very refreshing in fevers. Be sure ice is perfectly pure.

GRAPE WATER, 135 CALORIES[2]

4 tablespoons grape jelly.
½ cup boiling water.
½ cup cold water.
Lemon juice and sugar.

Dissolve the jelly in the boiling water, then add the cold water. Season to taste and serve *ice cold.*

[1] "St. Luke's Dietary," St. Luke's Hospital, New York City.
[2] Without lemon juice or sugar.

CURRANT WATER, 100-125 CALORIES[1]

¼ cup currant juice *or*
4 tablespoons currant jelly.
½ cup boiling water.
½ cup cold water.
Lemon juice and sugar.

Dissolve the jelly in the boiling water (put over heat a few moments if it does not dissolve quickly). When dissolved add the cold water, sweeten to taste and add a little lemon juice if desired. Serve cold.

APPLE WATER

1 sour apple.
1 cup boiling water.
Lemon juice.
Sugar.

Wipe a rosy-cheeked sour apple and without paring it cut it into small pieces. Add the boiling water and one tablespoon sugar. Cover and let stand till cold, then strain and add lemon juice and sugar to taste. Serve cold.

Note: Dried apple may be substituted, or two baked apples.

RHUBARB WATER

1 stalk rhubarb.
1 cup boiling water.
Lemon juice.
Sugar.

Wash and wipe the rhubarb and cut into thin slices, leaving the skin on. Add the boiling water and one tablespoon sugar. Cover and let stand till cold. Strain, add lemon juice and sugar to taste and serve cold.

TAMARIND MALTED MILK, 122 CALORIES

2 tablespoons Horlick's Malted Milk.
1 tablespoon tamarinds.
¼ cup hot water.
½ cup cold water.
Cracked ice.

Make a smooth paste of the malted milk powder and hot water, add preserved tamarinds and the cold water. Strain and chill, or add pure cracked ice.

GRAPE JUICE—GRAPE LEMONADE

(1½ cups grape juice=120 Calories)

Partially fill a small glass with crushed ice, add grape juice and serve.

Many prefer grape juice diluted. Any good plain or charged water is acceptable, using at least half grape juice and serve cold. Grape juice with an equal quantity of water may be served hot (do not boil) with sugar and lemon juice to taste.

For grape lemonade add one-fourth cup of grape juice to one cup of rather sweet lemonade.

GRAPE PUNCH, 1444 CALORIES

Juice of three lemons and one orange, one pint of grape juice, one quart water and one cup sugar. Serve cold.

TEA PUNCH

Few beverages find readier favor during the hot weather than tea punch. To make it, pour boiling lemonade, sweetened to taste, over the tea leaves, and allow the liquid to stand until cold. Then strain and serve in tall glasses, with shaved ice and slices of lemon.

FRUIT PUNCH, 2713 CALORIES

(3 Quarts.)

2 large teaspoons tea.	3 oranges.
2 quarts boiling water.	1 pineapple.
1 pound lump sugar.	5 bananas.
8 lemons.	1 pint strawberries.

Steep the tea in the boiling water for five minutes, strain and add the sugar, stirring until thoroughly dissolved. Grate the rind of the lemons and extract all the juice. Cut the oranges into slices, shred the pineapple, slice the bananas very thin and hull the strawberries. When the tea is cold add all the fruit and let stand in the refrigerator for several hours. Place a cube of ice in the punch-bowl, pour the mixture around it, and when well chilled serve in punch glasses. If desired, one cup of Maraschino cherries may be added.

To get the best results from the pineapple, pare and remove the eyes, tear apart with a silver knife and fork, reject the core, sprinkle with sugar and let stand on ice for twelve hours.

While fresh fruits are always preferable, canned berries and pineapples may be substituted.

TUTTI-FRUTTI PUNCH, 2984 CALORIES

(3 Quarts.)

2 quarts water.
1 pound sugar.
2 lemons
4 oranges.
2 dozen Malaga grapes.
2 tangerine oranges.
4 slices pineapple.
1 banana.
1 pint Maraschino cherries.

Boil the water and sugar together for five minutes. Add the grated rind of two lemons and four oranges, and continue boiling for ten minutes longer. Strain the syrup through cheese-cloth and add one quart of cold water. Extract the juice from the lemons and oranges, strain and mix with two dozen Malaga grapes cut in half and seeded, the tangerine oranges sliced, the pineapple shredded, the banana cut in slices and one pint bottle of Maraschino cherries with their liquor. Add the fruit to the syrup, chill and serve same as Fruit Punch.

Albuminous Beverages

Albuminous or albuminized beverages are combinations of egg with water, milk, fruit juices and other fluids.

The yolk of egg contains about thirty per cent. of fat and has a much higher fuel value than the white (see table on following page). In cases where the patient's ability to digest fat is disturbed, egg yolk should be given with caution. The combination of egg, milk and sugar with alcohol which constitutes egg-nog may produce nausea and vomiting in a feeble stomach, especially in fever. Egg-nog is very nutritious and is extensively prescribed in certain non-febrile diseases, especially for forced feeding in phthisis and melancholia.

Albuminous drinks are most easily prepared cold. When a hot liquid is used it must be poured very slowly into the well-beaten egg, stirring constantly, so that lumps of coagulated albumin do not form.

For the Diabetic—In sweetening albuminous beverages sugar must be replaced by sweetina or saccharin. It is many times sweeter than sugar but it has no food value. Note Sugar Substitutes, page 213.

Energy Value of an Egg[1]

	Calories
1 egg (with shell) average size	74
1 egg (without shell) average size	74
1 white of egg average size	17
1 yolk of egg average size	60

PLAIN ALBUMIN, 17 CALORIES[1]

White 1 egg. Salt.

Beat the white slightly, allow it to stand in a cold place until the liquid separates from the foam. Remove the foam and serve the liquid albumin. Salt the mixture if desired.

Note: Mix white of one egg (unbeaten) with equal quantity of cold water, a large pinch of salt and ten drops, or more, of whiskey. Serve by teaspoonful or tablespoonful alternately with a "heart stimulant" when other food cannot be taken. A patient can live on this mixture for several days without other food.

ALBUMIN WATER (FOR INFANTS), 31 CALORIES

The white of one fresh egg, half a pint of cold water, pinch of salt, teaspoonful of brandy. This should be shaken thoroughly and fed cold either with a spoon or from a bottle. It is useful in cases of vomiting and can sometimes be retained by a very irritable stomach.—(Holt.)

ALBUMIN WATER (FOR INFANTS), 17 CALORIES

The white of one fresh egg is dissolved in eight ounces or a pint of water which has been boiled and cooled. Albumin water is utilized chiefly in cases of acute stomach

[1] Range from 60 to 100 calories according to size of egg.

and intestinal disorders in which some easily assimilated food is needed.—(Koplik.)

ALBUMINIZED WATER, 36 CALORIES

White 1 egg.
½ cup cold water, (boiled and chilled).
1 teaspoon sugar.
1 teaspoon lemon juice.

Place all ingredients in a lemonade shaker or a glass fruit jar with air tight cover and rubber ring. Shake until thoroughly blended. Strain and serve cold in a dainty glass. A few grains of salt may be added if desired. If set on ice to cool shake before serving.

ALBUMINIZED MILK, 102 CALORIES

White 1 egg.
½ cup milk.
⅛ cup lime water *or*
Speck salt.

Blend as for "Albuminized Water." May omit lime water and serve plain seasoned with salt.

ALBUMINIZED CLAM WATER, 17 CALORIES

White 1 egg.
¾ cup cold water.
Clam broth to taste.

Place all ingredients in a lemonade shaker or a glass fruit jar with air tight cover and rubber ring. Shake until thoroughly blended. Strain and serve cold in a dainty glass.

Milk may be substituted for water. This drink will often be retained when other nourishment is rejected.

ALBUMINIZED ORANGE JUICE, 142 CALORIES[1]

White 1 egg.
Juice 1 orange.
1 tablespoon sugar.
Lemon juice if desired.

Place all ingredients in a lemonade shaker or a glass fruit jar with air tight cover and rubber ring. Shake until thoroughly blended. Strain and serve cold in a dainty glass.

[1] Without lemon juice.

ALBUMINIZED SHERRY,[1] 27 CALORIES

White 1 egg.
¾ tablespoon sherry.
Sugar.

Beat the white very stiff. Continue to beat while adding the wine and sugar slowly. Serve cold in a dainty glass.

Two tablespoons of grape juice may be substituted for the wine.

EGG BROTH, 323 CALORIES

Yolk 1 egg.
1 tablespoon sugar.
Speck salt.
1 cup hot milk.
1 tablespoon brandy.

Beat egg, add sugar and salt. Pour the hot milk on carefully and flavor. Wine may be substituted for brandy or stimulants may be omitted.

Note: Dried and rolled bread crumbs may be added if desired. The whole egg may be used. Hot water, broth or coffee, may be substituted for the milk; nutmeg may be substituted for the stimulant.

EGG-NOG NO. I, 240 CALORIES[2]

1 egg.
Speck salt.
¾ tablespoon sugar.
¾ cup milk.
1½ tablespoon wine *or*
1 tablespoon brandy (or less).

Beat the egg, add the sugar and salt; blend thoroughly, add the milk and liquor. Serve immediately.

Note: Have eggs and milk chilled before blending. A grating of nutmeg may be substituted for the stimulant. A lemonade shaker may be used for the blending.

EGG-NOG NO. II, 240 CALORIES[2]

1 egg.
¾ tablespoon sugar.
Speck salt.
¾ cup milk.
1 tablespoon brandy (or less).

Separate egg. Beat yolk, add sugar and salt and beat until

[1] Without sugar.
[2] Without liquor.

creamy. Add the milk and brandy. Beat the white till foamy (not stiff and dry) and fold it in lightly. Serve immediately.

JUNKET EGG-NOG, 295 CALORIES[1]

1 egg.
1 cup milk.
1 tablespoon sugar.
2 teaspoons rum, brandy or wine.
½ Junket Tablet.

Beat white and yolk of egg separately, very light; blend the two. Add the sugar dissolved in the rum. Heat the milk lukewarm, stir into the egg mixture and add quickly the tablet dissolved in cold water. Pour into small warm glasses and sprinkle grated nutmeg over the top. Stand in warm room undisturbed until firm and then put on ice to cool. This can be retained by the most delicate stomach.

BEEF EGG-NOG, 187 CALORIES

1 egg.
Speck salt.
1 tablespoon sugar.
½ cup hot beef broth.
1 tablespoon brandy.

Beat the egg slightly; add the salt and sugar; add the hot broth gradually; add brandy and strain. Sugar and brandy may be omitted if preferred.

COFFEE EGG-NOG, 185 CALORIES[2]

1 egg.
1½ teaspoon sugar.
½ scant cup milk or cream.
½ scant cup strong coffee.

Chill ingredients and blend as for Egg-nog No. 11.

EGG AND RUM, 319 CALORIES

Famous in the Treatment of Phthisis

1 cup fresh milk.
Yolk 1 egg.
1 tablespoon sugar.
Speck salt.
Few grains nutmeg.
1 tablespoon rum.

Beat yolk, add sugar, salt and nutmeg; add milk and rum.
Note: For consumptives, taken at about 6 A. M., this often

[1] Without liquor.
[2] Calculated with milk.

prevents the exhausting sweats which accompany the morning doze. Also may be given to a patient before dressing to prevent exhaustion.

EGG AND BRANDY, 390 CALORIES[1]

3 eggs.
4 tablespoons cold water.
Nutmeg.
4 tablespoons brandy.
Sugar.

Beat the eggs, add cold water, brandy and sweeten to taste. A little nutmeg may be added. Give a tablespoonful at a time.

EGG AND WINE, 125 CALORIES[1]

1 egg.
½ cup cold water.
Sugar.
1 wineglass sherry.
Nutmeg.

Beat the egg. Heat the water and wine together, but do not boil; pour over the egg, stirring constantly; flavor with sugar and nutmeg.

EGG LEMONADE, 189 CALORIES

1 egg.
2 tablespoons sugar.
2 tablespoons lemon juice.
1 cup cold water.

Beat the egg thoroughly, add the sugar and lemon juice; pour in the water gradually, stirring until smooth and well mixed. Strain and serve. Two tablespoons of sherry or port may be added if desired.

MALTED MILK AND EGG, 135 CALORIES

1 tablespoon Horlick's Malted Milk.
1 tablespoon crushed fruit.
1 egg.
20 drops acid phosphate.
1 tablespoon crushed ice.
¾ cup ice water.

Mix the malted milk powder, crushed fruit and egg and beat five minutes. Add the phosphate and crushed ice, blend-

[1]Without sugar.

ing thoroughly. Strain and add ice water or cold carbonated water, and a grating of nutmeg to flavor.

STOKES' MIXTURE

"2 egg yolks, 50 c.c. of brandy, 120 c.c. of aqua aurantii florum (sugar or syrup enough to sweeten), has considerable nutritive as well as stimulative value and is eligible for use when such a combination is indicated."

GRAPE YOLK, 156 CALORIES

1 egg.
1 tablespoon sugar.
Speck salt.
2 tablespoons grape juice.

Separate egg. Beat yolk, add sugar and stand aside while the white is thoroughly whipped. Add the grape juice to the yolk and pour this over the whipped white, blending carefully. Serve cold. Have all ingredients chilled before blending.

MULLED WINE, 282 CALORIES[1]

1 ounce stick cinnamon.
A slight grating nutmeg.
½ cup boiling water.
1 egg.
½ cup sherry, port, or claret wine.
2 tablespoons sugar.

Put the spices into top of a double boiler with the water. Cover and cook over hot water ten minutes. Add wine to the spiced water and bring to the boiling point. Beat the egg to a stiff froth, add sugar and pour on the mulled wine and beat well. Serve at once.

Starchy Beverages

Starchy drinks consist of cereals or cereal products, usually in the proportion of one tablespoon of the *whole grain* to one pint of water *or* one tablespoon of the *flour of grain* to one pint of water, cooked thoroughly and strained before serving.

[1] With sherry.

Arrowroot, cornstarch, tapioca, rice and rice flour are nearly pure starch. Oats, barley and wheat in forms which include the whole grains contain besides starch some protein and fat, as well as valuable mineral matter, especially phosphorus, iron, and calcium salts.[1] In starchy drinks these ingredients are necessarily present in small amounts, hence they have little food value[2] unless milk or other highly nutritive material is added. Such drinks are of value when only a small quantity of nutriment can be taken.

Principles of Cooking.—As the chief ingredient is starch, long cooking is necessary in water at a high temperature (212°). This softens the cellulose and breaks open the starch grains, so that they can be very readily digested. Time of cooking should be conscientiously kept by the clock.

Digestion.—The action of ptyalin is very rapid and if these drinks are sipped slowly, so as to be thoroughly mixed with saliva, a considerable portion of starch may be changed to sugar before reaching the intestines.

BARLEY WATER[3] (FOR INFANTS), 57 CALORIES

1 tablespoon barley flour.
¼ cup cold water.
1¾ cups boiling water.
Pinch of salt.

Blend flour and cold water to make a smooth paste, then pour it into the briskly boiling salted water, stirring constantly. After the mixture has boiled, place it in a double boiler and cook at least twenty minutes to one-half hour and then strain through a fine wire strainer or muslin. Enough water should then be added to bring the whole up to one pint.

Note: Some authorities say not to salt barley water for the baby under six months of age.

PEARL BARLEY WATER[3] (FOR INFANTS), 54 CALORIES

1 tablespoon pearl barley.
1 pint cold water.
Pinch of salt.

[1] See Mineral Matter, p. 17.
[2] Calculations for starchy beverages in following recipes are approximate as there is no way of calculating exactly. The question here is how many calories are left in water after straining.
[3] Modified from Dr. L. Emmett Holt, "The Care and Feeding of Children," D. Appleton, New York City.

Wash barley, add the cold water and let soak five hours or over night. Add a pinch of salt and boil quickly over direct heat for four hours, adding water from time to time to keep the quantity up to one pint. Then strain through muslin.

Note: Some authorities say not to salt barley water for the baby under six months of age. Barley water is an astringent or demulcent drink used to reduce laxative condition. For the adult, cream or milk and salt may be added or lemon juice and sugar.

RICE, WHEAT OR OAT WATER

These are made from rice, wheat, or oat *flour* exactly as barley water as above described. They are also made from the *grain,* using the same proportions and directions for Pearl Barley Water.

RICE WATER, 160 CALORIES

3 tablespoons rice.	1 tablespoon seeded raisins.
1 pint boiling water.	Sugar or salt.

Wash rice, put in sauce pan with water and raisins; boil gently for one hour. Strain, reheat and dilute with boiling water or hot milk to desired consistency. Season with salt or sugar and serve hot or cold. Do not use raisins in bowel trouble.

Note: Omit raisins if desired and serve plain or if allowed cinnamon may be cooked with the rice. This will assist in reducing a laxative condition. For variety or extra nutriment milk may be substituted for the water.

TOAST WATER, 352 CALORIES

1 cup stale bread toasted.	Salt.
1 cup boiling water.	

Slice bread thin and cut into inch squares. Dry thoroughly in oven until crisp and a delicate brown. Measure and break into crumbs; add the water and let it stand one hour. Rub through a fine strainer, season and serve hot or cold. The nourishment of the bread is easily absorbed in this way and is valuable in cases of fever or extreme nausea.

Note: Milk or cream and sugar may be added.

CRUST COFFEE

Take some pieces and crusts of brown bread and dry them in a slow oven until thoroughly hard and crisp. Place in a mortar and pound or roll. Pour boiling water over and let soak for about fifteen minutes. This when strained carefully is very acceptable to invalids who are tired of the ordinary drinks, such as lemonade, etc.

CRACKER PANADA, 100 CALORIES[1]

4 hard crackers.
1 quart water.
Sugar.

Break crackers into pieces and bake quite brown; add water and boil fifteen minutes. Allow to stand three or four minutes; strain off the liquid through a fine wire sieve; season with salt and a little sugar. This is a nourishing beverage for infants who are teething and with the addition of a little wine and nutmeg is often prescribed for invalids recovering from a fever.

BREAD PANADA, 105 CALORIES

1½ cups water.
1 tablespoon sugar.
2 tablespoons stale white bread crumbs.
¼ cup white wine.
1 tablespoon lemon juice.
Nutmeg.

Put water and sugar on to cook. Just before it commences to boil add the bread crumbs; stir well and let it boil three or four minutes. Add the wine, lemon and a grating of nutmeg; let it boil up once, remove from fire and keep closely covered until wanted for use.

[1] Without sugar.

Miscellaneous Beverages

TEA—COFFEE—CHOCOLATE—COCOA AND SPECIAL NON-NUTRITIVE BEVERAGES

Tea

Source.—The tea of commerce is prepared from the leaves of a shrub cultivated for this purpose in China, Japan, India, Ceylon and other portions of Southern and Eastern Asia.

Classes of Tea.—There are two great classes of tea, the green and the black. The difference lies in the mode of preparation. Green teas are quickly dried and fired; black teas are allowed to ferment a few hours before drying and firing.

Active Principles of Tea.—The principal constituents of tea are caffein, tannic acid and a volatile oil.

Its flavor is due to the volatile oil; its stimulating properties to the caffein. Tannic acid is a soluble, bitter substance which has a retarding effect on digestion.

When tea leaves are placed in boiling water caffein is extracted very rapidly. Tannic acid is less soluble and it is therefore possible to make tea with little of this principle by letting the water stand on the leaves only a short time. In practice, the freshly boiled water is poured on the leaves which should then stand from three to five minutes. Tea should never be boiled.

The water should be soft, as lime in hard water tends to make tannin dissolve more freely. Green or mixed tea is more powerful than black tea.

Effects of Tea.—Tea is mildly stimulating and hence refreshing, as it removes the sense of bodily fatigue, but the tannic acid retards the digestive action of the saliva and gastric juice and tends to produce constipation. Tea is therefore not suitable for persons suffering from gastric disorders. The caffein is over-stimulating to the nervous system of many persons, causing restlessness, sleeplessness and muscular tremors. It should not be given to children nor to adults with a tendency to nervousness. If you wish to avoid the retarding effect of tea on salivary digestion, direct the patient not to sip the beverage with the meal but to eat first and drink afterward; in this way time is given for the saliva to perform its intended functions.

For the Diabetic—In sweetening beverages sugar must be replaced by sweetina or saccharin. It is many times sweeter than sugar but it has no food value. Note Sugar Substitutes, page 213. Coffee may be poured into a lightly beaten egg or yolk, or one teaspoon butter, or heavy cream.

Coffee

Source.—This beverage is prepared from the seeds of the coffee tree; *caffea arabica,* which grows in many warm countries though originally found in Arabia. The coffee berry is about the color and size of a ripe cherry and contains two seeds placed face to face.

Active Principles of Coffee.—The active principles of coffee are essentially the same as those in tea. By the roasting process a *volatile oil* is liberated (called caffeol) to which the aroma is due. The *caffein* is chemically the same as in tea and according to Hutchison (p. 310) a cup of black coffee contains about as large a quantity of caffein and tannic acid as a cup of tea.

Effects of Coffee.—Compared with tea, coffee has only a slight retarding influence on salivary digestion, but an equally detrimental effect on gastric digestion.

As a stimulant it affects more directly the central nervous system; the heart action is considerably increased in rate as well as strength. Indirectly, this results in an increased activity of the kidneys. The respiration is deepened and the cerebral centers excited. For this reason it often proves useful in cases of opium and alcoholic poisoning. In some persons these effects are very mild; in others, they are severe, producing nervousness and insomnia, and coffee should then be withheld. It removes the sensation of fatigue for which reason it is used by many nurses when on night duty. It should never be given to children.

Frequently after operation freshly made black coffee or tea without milk or sugar will be retained and in some cases will check vomiting. Give the patient one-half teaspoonful at frequent intervals.

Tea and coffee in themselves have no nutritive value; they are useful only as stimulants and as carriers of water.

Many preparations have been put upon the market as coffee substitutes but they lack the aromatic oil and caffein for which it is really prized. They make pleasing hot beverages, however, and when served with sugar and cream have a food value.

Chocolate and Cocoa

Source.—Cocoa and chocolate are commercially prepared from the seeds of the cacao tree, *Theobroma cacao*. The seeds (or beans) are contained in a pulpy fruit 7 to 12 inches long, 3 to 5 inches in diameter, and in shape intermediate between a melon and a cucumber. The fruit is gathered and allowed to remain in a heap for a few days to ferment, when the pulp becomes loosened. During this process the seeds lose some of their bitterness upon which the flavor of the bean largely depends. They are then dried in the sun, cleaned, sorted and carefully roasted. After this the thin outer husks are removed and sold under the name of cocoa shells. The broken roasted beans constitute cocoa nibs.

Chocolate is prepared by grinding the nibs between hot rollers to a great degree of fineness. The presence of 50 per cent. fat causes the mass to form a paste. This is molded and cooled with or without the addition of sugar and flavoring.

Cocoa consists of chocolate deprived of a part of the fat. Sugar or starch or both are sometimes added.

Resemblance to Tea and Coffee.—Chocolate and cocoa contain a volatile oil set free by the fermenting process and further modified by roasting, to which the characteristic flavor is due. They also contain tannic acid but in smaller amount than tea or coffee. The stimulating principle of chocolate and cocoa is an alkaloid closely allied to caffein, called theobromin. It is less apt to induce nervous symptoms than either tea or coffee but in many persons its stimulating power is distinctly felt.

Nutritive Value.—Unlike tea and coffee, chocolate and cocoa have a high food value as shown by the following analysis:

	Protein	Fat	Carbohydrates	Mineral Matter	Water	Calories per lb.
Chocolate	12.5%	47.1%	26.8%	3.3%	10.3%	2720
Breakfast Cocoa	12.6%	28.9%	37.7%	7.2%	4.6%	2320

By reason of the high percentage of fat, chocolate is likely to cause indigestion when used to excess or when taken in addition to an otherwise heavy meal. Cocoa, being less rich in fat, is free from this objection.

The use of cocoa often makes milk acceptable when it would otherwise be refused. Hence this beverage is useful in convalescence if there are no digestive disturbances. When made weak it can also be given to children in moderation.

Principles of Cooking.—Chocolate and cocoa both contain considerable starch and hence should be boiled to be digestible. The cooked starch also serves to thicken the beverage somewhat and to make it smoother and more homogeneous. On account of the volatile oil to which the flavor is due the cooking should be continued only long enough to alter the starch, otherwise the oil is lost.

TEA

(Individual Rule.)

1 teaspoon tea. 1 cup boiling water.

Scald the teapot, which should be of silver, crockery or granite ware, not tin. Put in the tea, add the freshly boiling water and let it infuse three to five minutes. By no means allow it to boil, for boiling dissipates the aroma and extracts the tannin. Strain into hot cup and serve with cream or milk and lump sugar, or with sugar and a slice of lemon.

RUSSIAN TEA

Heat cup, fill three-fourths full of boiling water and dip in it one teaspoon tea (put in tea-ball or fine small strainer), until strong enough. Serve hot with sugar and a slice of lemon.

Note: Lemon is a good substitute for milk. The lemon prevents the headache and sleeplessness which the milk in tea causes some persons.

COFFEE MADE IN THE PERCOLATOR

Breakfast Coffee

2 tablespoons coffee.
1 cup cold water.

After-Dinner Coffee

Increase quantity of coffee to suit the taste.

For method of cooking, follow directions that come with percolator. There are several makes of percolators on the market and directions vary.

Coffee made in a perculator has a delicious aroma, a fine flavor and an absence of the bitter taste caused by boiling.

Buy coffee in the berry and grind it fresh every day, for ground coffee soon loses its aroma.

BOILED COFFEE

(To make seven cups of coffee.)

1 cup coffee.
½ egg and shell.
6 cups boiling water.
1 cup cold water.

Scald coffee pot. Wash egg, beat slightly and add crushed shell, coffee and one-half cup cold water. Put into scalded coffee pot, add boiling water and let boil up three times, stirring down after each time (or boil five minutes) and pour out a little coffee to free spout from grounds; then add one-half cup cold water. Let it stand 20 minutes where it will keep hot but not boil. If there is no cap to the spout of coffee pot, plug it to prevent escape of aroma. Serve in hot coffee cups with cream and sugar, or hot milk may be used in place of cream.

Note: A favorite blend of coffee is three parts Java and one part Mocha.

BOILED COFFEE

(Individual Rule.)

2 tablespoons coffee.
1 tablespoon cold water.
1 egg shell *or* 1 teaspoon egg white.
1 cup boiling water.

Follow general directions for blending as in preceding recipe. Boil three minutes and add one teaspoon cold water. Keep hot 15 minutes. The size of coffee pot should be in accordance with the quantity to be made.

FILTERED COFFEE

(Individual Rule.)

2 tablespoons finely ground coffee,
¾ cup boiling water.

Place a piece of filter paper over a strainer and put the coffee in it. Hold the strainer over a hot coffee cup and pour the boiling water slowly over the coffee.

COFFEE WITH LACTOSE, 280 CALORIES[1]

1½ ounces of milk sugar................(about 3 tablespoons)
4 to 5 ounces of strong coffee ....(8 to 10 tablespoons)
2 ounces of cream (18%) ....(4 tablespoons)

By previously dissolving the milk sugar in water, 72 grams of it may be put into a cup of coffee.

MALTED MILK COFFEE, 61 CALORIES[2]

(Individual Rule.)

1 tablespoon Horlick's Malted Milk.
Sugar.
1 tablespoon ground coffee.
¾ cup boiling water.

Mix the malted milk powder, coffee and water, stirring well. Boil three minutes. Add sugar if desired.

[1] Dr. W. Coleman, *American Journal of Medical Sciences*, *January*, 1912.
[2] Without sugar.

Or one to four teaspoons of malted milk powder may be put in a cup and ordinary coffee poured directly upon it, stirring constantly.

DIABETIC—CRACKED COCOA[1]

1 cup cracked cocoa.	1 quart water.

Add cracked cocoa to one quart of water. Let simmer all day, adding water from time to time keeping the quantity up to one quart.

COCOA WITH LACTOSE AND MILK,[2] 433 CALORIES

2 teaspoons of cocoa.	4 ounces of milk.
2 ounces of milk sugar.	2 ounces of cream (18%).

Mix the sugar and cocoa; cook in the milk until dissolved. Serve with cream.

COCOA WITH LACTOSE AND WATER,[2] 410 CALORIES

2 teaspoons of cocoa.	½ cup water.
2 ounces of milk sugar.	3 ounces of cream (18%).

Mix cocoa and sugar, add the water and boil. Then add the cream, or use less cream and serve with whipped cream.

BREAKFAST COCOA, 820 CALORIES

3 tablespoons Walter Baker's cocoa.	1 cup boiling water.
4 tablespoons sugar.	3 cups scalded milk.

Scald milk in double boiler. Put the cocoa and sugar in a saucepan and slowly pour on the hot water, stirring all the time. Boil five minutes, add the scalded milk, beat until foamy with Dover egg beater to prevent formation of skin. Serve in heated cups. One-half cup of cream is a great addition to cocoa.

[1] Dr. Frederick M. Allen, Director, The Psychiatric Institute, Morristown, New Jersey.
[2] Dr. W. Coleman, *American Journal of Medical Sciences*, January, 1912.

BREAKFAST COCOA, 162 CALORIES

(Individual Rule.)

2 teaspoons Walter Baker's cocoa.
1 teaspoon sugar.
¼ cup boiling water.
¾ cup scalded milk.

Follow general directions for blending and cooking as in preceding recipe. Boil three minutes.

Note: Cocoa may be served hot or ice cold, with or without whipped cream. It may be served hot, poured over the beaten white or yolk of egg. One-third teaspoon of brandy may be added if ordered by the physician.

MALTED MILK COCOA, 70 CALORIES[1]

(Individual Rule.)

1 tablespoon Horlick's Malted Milk.
1 teaspoon cocoa.
¾ cup boiling water.
Sugar.

Mix the malted milk powder, cocoa and water, stirring well. Boil three minutes. Add sugar if desired and serve hot.

PLAIN CHOCOLATE, 1196 CALORIES

(Eight Cups.)

1 quart milk.
2 ounces Walter Baker's chocolate.
2 tablespoons boiling water.
½ tablespoon cornstarch.
3 tablespoons sugar.
Speck salt.

Mix the cornstarch with one-fourth cup of the milk. Put remainder of milk in double boiler to heat. When the milk is scalded, stir in the cornstarch and cook ten minutes. Scrape the chocolate and put it in a small saucepan; add sugar and water and place the saucepan over hot water. Stir constantly until the mixture is smooth and glossy. Add the hot milk and beat the mixture with egg beater until frothy; or it may be poured back and forth from the boiler to a pitcher, holding high the vessel from which it is poured. This will give a thick froth. Serve at once.

[1]Without Sugar.

Note: If you prefer not to thicken the chocolate, omit the cornstarch.

Whipped cream may be served with chocolate, or it may be poured over the beaten yolk of egg.

If desired flavor with one-half teaspoon vanilla.

PLAIN CHOCOLATE, 300 CALORIES

(Individual Rule.)

1 cup milk.
½ ounce chocolate.
⅛ tablespoon cornstarch.
¾ tablespoon sugar.

Follow directions for blending and cooking as in preceding recipe.

CHOCOLATE, VIENNA STYLE, 1419 CALORIES

(Eight Cups.)

1 quart milk.
4 ounces Walter Baker's vanilla chocolate.
3 tablespoons boiling water.
1 tablespoon sugar.

Scald milk in double boiler. Scrape chocolate and put sugar and water into a small saucepan; heat over hot water, stirring till smooth and glossy. Stir this mixture into the hot milk and beat well with an egg beater. Serve at once, putting a tablespoon of whipped cream in each cup and filling with the chocolate.

The plain chocolate may be used instead of the vanilla but in that case use one teaspoon vanilla and three generous tablespoons sugar.

Special Non-Nutritive Beverages

FLAXSEED TEA

1 tablespoon whole flaxseed.
2 cups cold water.
Lemon juice to taste.
Sugar.

Wash flaxseed thoroughly, put it with the cold water in a saucepan, simmer one hour, add lemon juice and sugar to taste and strain.

Note: If too thick, add hot water.

Valuable in case of inflammation of the mucous membrane.

FLAXSEED AND LICORICE TEA

1 ounce flaxseed.
2 drachms licorice root.
1 pint boiling water.

Pour the boiling water over whole flaxseed and bruised licorice-root, cover and cook very slowly for four hours. Strain.

CINNAMON WATER

1 ounce stick cinnamon.
1 pint boiling water.

Boil together fifteen minutes. Strain. Serve hot or cold.

Note: Good in bowel trouble. The pure cinnamon is quite different from the coarse bark usually sold for cinnamon, which is really only cassia.

LIME WATER

1 tablespoon of slaked lime.
1 quart boiled or distilled water.

Put the lime and water into a corked bottle and shake thoroughly two or three times during the first hour. The lime should then be allowed to settle and after twenty-four hours the upper clear fluid carefully poured or siphoned off into a glass-stoppered bottle. Keep tightly corked, as it absorbs carbon dioxide from the air. Keep in a cool place.

BRAN TEA

¼ cup wheat bran.
2 cups cold water.
Egg shell.
Molasses.
Lemon juice.

Boil the water and bran twenty minutes and settle it with an egg shell or a little cold water. Sweeten with molasses. Lemon juice may be used if desired.

SLIPPERY ELM TEA

2 teaspoons slippery elm powder *or* piece of the bark.
1 cup boiling water.
Sugar.
Lemon juice.

Pour the water upon the slippery-elm powder or bark. When cool, strain and flavor with lemon juice and sugar.

This is soothing in case of inflammation of the mucous membrane.

HERB TEA

Pour one cup of boiling water over two tablespoons of herbs. Cover the bowl, set it over the tea-kettle and steep ten minutes. Sweeten if desired.

GINGER TEA

Mix one tablespoon of molasses with one-half teaspoon of ginger; pour on gradually one-half cup boiling water, and boil one minute. Add one-half cup milk and when thoroughly heated, serve.

QUESTIONS FOR STUDY

1. Discuss fully the uses of beverages in the diet.
2. Why is it important that the ice used in preparing cold drinks should be pure?
3. Why is a sugar syrup preferable to sugar in sweetening cold beverages?
4. Give a recipe for lemonade.
5. What fruit juices may be used in place of or combined with lemon juice?
6. Discuss the digestibility of raw eggs. How does this affect the nutritive value of albuminous beverages?
7. What is the energy value of one tablespoon of malted milk powder?
8. What principle is involved in the preparation of starchy beverages?
9. Give a recipe for barley water; oatmeal water.
10. What are the active principles of tea and coffee To what are their stimulating properties due?
11. Discuss the nutritive value of chocolate and cocoa.
12. What is the chief difference between chocolate and cocoa? What active principles do they contain?
13. Give a recipe for tea, coffee, cocoa.
14. Give a method for making lime water.

PART III

DIETO-THERAPY

FEEDING THE SICK—HOSPITAL DIETS—DIET IN DISEASE—DIET IN SPECIAL CONDITIONS

CHAPTER XII

FEEDING THE SICK

In the treatment of disease there are few questions which must be considered so often in the daily routine of practice as those which concern the proper support and nourishment of the patient.

A good nurse will never exceed or depart from the physician's instructions, but there are occasions when her possession of accurate, even if limited, knowledge on the subject of chemical and physiological action of food will enable a physician to give more definite directions, greatly assisting him in the performance of his duties and adding to the comfort and well-being of the patient.

Physician's Directions.—The nurse should recieve definite *written* directions regarding quantity, form and preparation of food and time of serving. A detailed food record should be kept, covering these details, in pneumonia, typhoid and all acute serious conditions, and the quantity of fluid and medicine taken should be noted. After the physician has received from the nurse a report on the condition of the patient's digestion and a statement of his preference for particular foods, further specific directions may be given, allowing, for the sake of humoring the patient, the substitution of one form of food or drink for another.

The careful serving of suitable and easily digested food is essential, for it is from this supply of nutritive material that the patient derives the requisite energy for the involuntary action of the heart and lungs. Then, too, the medicine will produce its proper effect. In the matter of feeding, the nurse has scope for her power of co-operation and her opportunity to benefit the patient is immeasurable.

Methods of Feeding.—There are several methods of feeding which have been adopted to meet the needs of the individual under various conditions:

1. The natural method of feeding by *mouth.*
2. The artificial method of feeding, by *inunction,* by *gavage* or *forced feeding,* and *rectal feeding.*

Methods of Making Food Easy to Digest

Selection and Preparation of Food for the Sick.—There are certain points for the nurse to remember in regard to the selection and preparation of food to make it easier to digest.

a. Food can be made more available to the digestive juices and therefore more easily digested;

1. By giving it in solution, e.g., milk, soups, raw or soft-cooked eggs, fruit juices, cereal gruels.
2. By scraping or chopping, e.g., meat, vegetables.
3. By straining, e.g., cereals, vegetables, etc.
4. By mashing, e.g., vegetables.
5. By using the finely milled rather than the coarse cereals.
6. By proper cooking, i.e., the proteins should be softened, the fats not decomposed by high temperature and cellulose should be softened.

b. Certain substances are irritating to the digestive tract and should therefore be avoided;

1. Decomposed fat or rancid fat.
2. Burned food.
3. Condiments and spices, except in very small amounts.
4. Sugar in concentration (e.g., very sweet desserts, jams, jellies, preserves, candies, etc.).
5. Strong flavored foods, such as onions, cabbage, cauliflower, turnips. These should be used with caution.

c. Digestion is also furthered by the avoidance of large amounts of protein and fat, which are less rapidly digested than carbohydrates (see pages 28 and 32) and of cellulose, which delays the passage of food from the stomach (page 32); by giving small amounts of food at a time, warm rather than cold, dilute rather than concentrated; and by serving meals at regular hours. All food should be thoroughly chewed and insalivated.

Methods of Serving Food Easy to Digest.—See fluid diets, page 340; soft diets, page 344; milk diet, page 344; convalescent diets, page 348.

Feeding in Acute Diseases.—The patient's condition is often an all-important consideration. In an acute disease, accompanied by fever, the body loses weight, urea is increased and carbon dioxide and water are excreted in larger amounts than in health. All of this loss is not dangerous if permitted to go on for a few days only, and if the amounts do not exceed certain limits. But in replacing these losses we meet this difficulty, namely, the patient's lowered ability to assimilate food.

It is the administration of unsuitable food that must be guarded against as well as the giving of nourishment in quantities and at times unsuited to the digestive powers of the patient. One should not give what cannot be digested, nor more than can be assimilated. So the attendant must have a constant watch over the condition of the patient's power of digestion, (not only as to what is put into the alimentary tract, but also as to what goes out, such as curds of undigested milk, etc.). It is necessary for her to know how to choose such variety in the diet as to include both what is palatable and what will afford a proper amount of nourishment.

Details of Feeding

The Room.—The room in which the food is to be served to the patient should be clean and orderly and free from the noise and smell of cooking.

Bathing and Cleansing the Mouth.—When possible, it is well to bathe the patient's face and hands before offering a meal. A tongue scraper made of a whalebone bent to a loop may be used before serving the food, thus uncovering the taste nerves and improving the appetite.

In any febrile condition the mouth is apt to acquire a disagreeable taste, so prominent in certain cases as to render it difficult for the patient to eat. This can be to a great extent eliminated by the use of aseptic mouth washes. When the patient is not strong enough to rinse the mouth before and after eating, the nurse must use a swab for the purpose.

Time and Position for Feeding.—When the patient is first allowed to sit up for half an hour, it is well to utilize this time for giving the principal meal of the day. In whatever position the patient may be during feeding, he should be made as comfortable as possible and never cramped by the food tray. Patients who become exhausted in the morning before they are able to take any solid food may, if ordered by the physician, be given a spoonful of some liquid nourishment every hour or two from early morning till the time for taking solid food, which would then probably be at about noon.

The Appetite.—If great pains are taken in the preparation of food, the invalid's appetite may be tempted. Then, too, the nurse should learn the reason for the apparent lack of desire for food. This may lead to a change in the kind, flavor or appearance of the food, or to making the patient's surroundings more cheerful, or to keeping from the patient all questions as to what he will eat as well as the sight or sound of others eating or even tasting of food in his presence. Personal idiosyncrasies should be considered, for some foods easy of digestion, if repugnant to the patient, may prove nauseating and be rejected or disturb digestion.

The Food and Drink Served.—For those acutely ill only a small quantity of food should be given at one time. A tablespoonful of nourishment every half hour may suffice.

Many foods properly cooked, which if served promptly would be delicious, are spoiled by standing. The rule of serving food at stated intervals should be observed for the conscious as well as the unconscious or semi-unconscious patient.

With an adequate supply of the best quality of pure fresh food and a physician's regulation as to the amount for each feeding, the nurse's task is not difficult. If the doctor makes no rule in the matter, the nurse must see to it that the patient eats enough without overindulging. If disease is wasting the body, extra food is needed. During convalescence additional food may be served to enable the patient to regain lost weight.

Only the easily digestible parts of foods should be presented to a patient, as tender meats, young vegetables, etc. Avoid all well-known indigestible foods.

The seasoning of food should be carefully done, using only the simplest condiments, salt, pepper, celery salt, in minimum amounts.

Thirst must, of course, be alleviated, giving water regularly and freely. In some cases, as in peptic ulcer, only a meager amount of "fluids" may be administered with safety. In typhoid fever it is wise to find out the beverages particularly liked by the patient and whenever possible to make use of them.

The Temperature of food served has a marked influence upon digestion. Foods to be served "hot" should not be lukewarm. Cold food should be neither lukewarm nor ice cold, for food at extreme temperatures often interferes with digestion and absorption.

Sleep and Feeding.—Food should be administered in serious cases, even though it be necessary to awaken the patient to receive it. If a patient should be unable, however, to fall asleep readily after the feeding, sleep would very likely be more beneficial than food.

Feeding the Helpless Patient.—If the patient is very weak, the feeding process may be made less wearisome by placing the hand beneath the pillow and raising both together gently. In feeding fluids, always serve in a small tumbler, not more than two-thirds filled; see that swallows are not taken during inspiration, and that each mouthful is swallowed before another is offered. In case the head cannot be raised, food may be given by means of a glass tube or a feeding cup.

Feeding the Unconscious Patient.—Unconscious patients demand specially careful feeding. They should be given only liquid nourishment and fed with a spoon, or through a catheter. If the jaws are set, a medicine dropper may be utilized. Not over a teaspoonful should be given at once, and the nurse must be sure it is swallowed before she gives more. In the case of comatose children or young infants, the nourishment may be poured into the nostril in place of the mouth. Feeding with the stomach tube is sometimes resorted to when nasal feeding is not feasible.

The foods best adapted to this use are some of the milk, cream, and lactose mixtures recommended for typhoid fever patients, to which raw eggs, beaten up, or thin cereal may be added. The intervals between feeding should be as long as possible, preferably not oftener than three times in the twenty-fours hours. The caloric needs of the individual must be considered in arranging for the exact quantity to be used in the twenty-four hours.[1]

Use of Alcohol in the Sick Room.—The nurse may be required to exercise her own judgment at times in the emergency use of alcoholics in the sick room. Consumptives often show remarkable tolerance of alcohol and receive a noticeable stimulating effect from it.

Severe acute or sub-acute conditions which might require an alcoholic stimulant rather than any other for the sake of its emergency effect in averting unforeseen cardiac failure, comprise pyemia, septicemia and diphtheria.

Alcohol should perhaps never be given even in emergencies to subjects with neurosis or insanity or to victims of severe disease of the gastro-intestinal organs.

[1] Carter, Howe & Mason, "Nutrition & Clinical Dietetics." Lea & Febiger, Philadelphia, Pa.

Artificial Methods of Feeding

Inunction

Feeding by Inunction.—This method consists of rubbing the body with certain oils, such as olive oil, cocoanut oil, cocoa butter, etc. It has been shown to be of little value from the standpoint of nutrition, but is occasionally resorted to with very much emaciated and underfed infants, as it improves the circulation and gives a better body tone.

Gavage or Forced Feeding

Forced Feeding.—Forced feeding, i.e., introducing various liquid foods, as milk, eggs, meat-juice or extracts into the stomach by way of the nose or directly through the mouth by means of a stomach tube, is seldom required of the nurse, being done usually by the physician. This method is employed when the unconscious patient experiences difficulty in swallowing, in gastric irritability, when a patient is unable to take sufficient food, owing to loss of appetite and disgust for food, and also in case of a refractory patient who refuses to eat.

Technique of Nasal Feeding.—In nasal feeding a nasal tube is employed or, in the case of an infant, a catheter. Have either well oiled and pass gently through the nose into the œsophagus and then into the stomach. Before pouring in the food wait a moment to see that the tube has not entered the larynx.

Technique of Gavage.—The jaws must be kept open. In children without teeth, the finger may be employed; in grown persons a mouth gag or a roller bandage may be held between the teeth. The tube should be *moistened,* passed into the pharynx and thence *rapidly* into the stomach. If these two precautions are not observed, contraction of the muscles may occur, preventing the tube from entering the œsophagus. In passing the tube into the œsophagus, hold it well back from the end. When the tube is satisfactorily introduced, place a funnel in the free end and pour liquid nourishment slowly down the side of the funnel until the tube is filled and the air in tube is expelled. This care prevents the air in tube from entering the stomach. In removing the tube, withdraw it rapidly in order not to excite vomiting. In some cases the physician orders the stomach washed out before introducing the food. When it is necessary to take special precautions to prevent regurgitation of the food, the ribs may be tickled to prevent contraction of the diaphragm.

Technique of Duodenal Feeding.[1]—The object of duodenal feeding is to supply nourishment to the patient in such a manner that the stomach is kept empty. This can be done by introducing a small tube into the stomach, whence it passes of itself into the duodenum, and is left there.

Rectal Feeding

Rectal Feeding.—This form of alimentation is necessary when the stomach cannot retain food. It is based on the fact that the rectal mucous membrane, while it possesses no digestive faculty, is able to absorb certain classes of nutriment, notably sugars (of which dextrose is the most satisfactory), proteoses, peptones and amino acids, especially the latter substances. There is great difference of opinion regarding the utilization of fats given by rectum, but it is doubtful if fats are absorbed except possibly in amounts too small to be of any nutritive value.

The rectum may be intolerant of almost any form of enema; even if retained for some time, it may be rejected without apparent change. Under the most favorable circumstances, at least three-fourths of the quantity injected will come away with the regular evacuation of the bowels. The amount of energy actually supplied must be far below the theoretical demands of the body. Some of the most available substances, such as dextrose, are naturally irritating to the rectum, but provided they are not given in too concentrated solutions, they are usually well borne.

It is possible to keep a patient alive for weeks and even

[1] For further information note Dr. Max Einhorn's "Lectures on Dietetics," published by Paul B. Hoeber, New York.

months by rectal feeding, but in many cases this resource for one reason or another fails outright to do what is expected of it. Hence we cannot be too careful as to technique and choice of material used. Of natural substances, milk and eggs have been very freely used. The albumin and sugar in the milk and the albumin in the eggs are probably utilized to some extent, but we cannot be sure of the absorption of the fatty matter of the milk and eggs. Both these substances are relatively non-irritating. Peptonized milk answers well in some cases. It is best to carry on the peptonization for a long period, until the end products of digestion (amino acids) form, peptones themselves being sometimes irritating and amino acids better absorbed.

Technique of Rectal Feeding:[1]

1. During the period of rectal alimentation it is best to have the patient in bed with the foot of the bed raised on shock-blocks. The patient should remain in this position for at least an hour after the feeding.

2. Every morning the patient should be given a cleansing enema consisting of a quart of water and one teaspoonful of salt in order to empty the bowels thoroughly.

3. One hour later the first feeding enema is employed. The latter is injected into the rectum slowly and quite high by means of a soft rubber rectal tube and an irrigator funnel or syringe. Everything used for the enema should be of the temperature of the body.

4. The food used must be sterilized, the peptonized milk in particular must be brought to a boil after peptonization is complete.

5. Should the rectum become irritated by using solutions which are too strong the strength must be reduced and the rectum given a rest of a few hours after the saline cleansing.

6. It may be necessary to add 5 to 10 drops of deodorized tincture of opium if the rectum irritability cannot be otherwise controlled.

[1] Modified from Dr. Max Einhorn's directions and Drs. Carter, Howe & Mason's "Nutrition & Clinical Dietetics," Lea & Febiger, Phila., Pa.

7. It is often advantageous to give the dextrose solution by the Murphy drip. This is done by putting the solution at 105° F. in an irrigator and keeping it warm by means of cloths wrapped about the apparatus, or by placing a lighted electric bulb in the fluid to keep up its temperature. The fluid flow is then regulated by a stop-cock or merely by pinching the rubber tube by an artery clamp so that the fluid will drip from 60 to 90 drops per minute. This can often be continued for hours, depending on the rectal toleration. (Inasmuch as the anal tube for the drip injection must lodge in the rectum a long time, Dr. Einhorn employs for this purpose a specially thin rubber which is non-collapsible and has a circumference of 8-10 mm. 8-10F). At the end of the tube is attached a small hard rubber or metal capsule provided with numerous openings. The thin tube does not annoy patient and the capsule with the many openings facilitates the flow of the fluid.

NUTRIENT ENEMAS[1]

I. *Peptone Enema:*

30-60 gm. (1-2 oz.) of a peptone preparation (Witte's, Kemmerich's or Rudisch's peptone, Somatose, Senose, Plasmon, Sanatogen, etc.). Mixed with 200-250 c.c. of water (7-8 oz.) and thoroughly stirred.
The various malt extracts (like Valentine's Beef Juice, Bovinine, Mosquera, Beef Jelly, etc.) can be used in similar proportions with advantages.

II. *Milk Enema:*

200-250 c.c. (7-8 oz.) of milk alone as with the addition of 0.5 gm. (gr. VII ss) of bicarbonate of soda.

III. *Egg-Milk Enema:*

200 c.c. (7 oz.) of milk, 2 raw eggs.
1 tablespoonful of grape sugar.
1 teaspoonful of common table salt mixed and well beaten.
Pancreatin 0.3 gm. (gr. V) may be added advantageously though this is not essential.

IV. *Milk-Starch Enema:*

250 c.c. (8 oz.) of milk and 60 gm. (2 oz.) of starch added.

[1]Arranged by Dr. Max Einhorn, for "Pattee's Practical Dietetics," 1922.

V. *Leube's Meat—Pancreas Enema:*

50 gm. (1½ oz.) fresh pancreas.
150 gm. (5 oz.) meat.
30 gm. (1 oz.) fat.
Chop finely and mix with
150 gm. (5 oz.) of water.

IV. *Sugar Enema:*

30-50 gm. (1-1½ oz.) glucose mixed with
300-500 c.c. (10-17 oz.) of water, saline or milk.

SUGGESTED 24 HOUR SCHEDULE FOR RECTAL FEEDING

7 A. M.	Cleansing enema.
8 A. M.	Egg-Milk enema.
12 Noon	Drip enema of a 5-10% glucose solution of 500 c.c. (17 oz.) or more.
2 P. M.	Egg-Milk enema.
6 P. M.	Egg-Milk enema.
9 P. M.	Drip enema of a 5-10% glucose solution of 500 c.c. (17 oz.) or more.

In case the bowel injections cause diarrhœa, 5 drops of Tr. Opii. Simplex are added to each nutrient enema, and instead of the glucose drip, plain saline should be tentatively given.

QUESTIONS FOR STUDY

FEEDING THE SICK

1. What is the duty of the nurse in regard to the physician's directions concerning diet?
2. Why is a knowledge of dietetics essential for the nurse?
3. What conditions present in acute disease accompanied by fever require adjustment of the diet?
4. What are the advantages of a liquid diet in feeding the sick? What must be guarded against?
5. What may be done to stimulate a patient's appetite?
6. Why is it important to cleanse the patient's mouth before and after eating? How should this be done?
7. Would you wake a patient to feed him?
8. How would you feed a helpless patient?
9. How would you feed an unconscious patient?
10. When is forced feeding necessary? What methods are used?
11. Outline the procedure to be followed in the use of the stomach tube. What precautions must be taken?
12. When is rectal feeding used?
13. How far is it possible to nourish the patient in this way?
14. Describe the method of procedure to be followed in rectal feeding.
15. List the foods generally used.
16. How often and in what quantities can nutrient enemas be given?

CHAPTER XIII

HOSPITAL DIETS

Since diet is of paramount importance in the treatment of many diseases, the ability to arrange and administer these diets to the satisfaction of physician and patient becomes a more and more essential part of the nurse's education. It is not an easy task, for it may require not only an accurate knowledge of the foods suitable for the condition and skill in preparation, but often much patience, much tact and much ingenuity to meet the requirements and the moods of the patient.

In order to do her very best work the nurse must know the different types of diets, the foods that are included in these, why they are included and why others are excluded. She should be able, if necessary, to calculate the quantity of food required and to apportion this throughout the day either in the regular three meals or in smaller amounts at more frequent intervals. "Individuality is expressed in the diet of every human being and this is often greatly emphasized in times of sickness. The difficulties of tempting the palate fall to the nurse and if need be she must employ all her skill and intuitiveness to carry out the doctor's orders, while at the same time pleasing her patient."[1]

Types of Diets

Fluid Diet

Fluid Diet.—Consisting only of liquid foods is of exceedingly low caloric value and represents what may be well to give during the first day or two of any acute illness, when

[1]Carter, Howe and Mason, "Nutrition and Clinical Dietetics," Lea & Febiger, Philadelphia, Pa.

one wishes to rest the organism without withholding food altogether.

Kinds of Food to Use.—Acid, starchy and miscellaneous beverages (note various chapters for recipes). Raw eggs in combination with water, milk, fruit juices, cocoa, or other fluids (note chapter on Albuminous Beverages). Milk, either plain or modified in different ways, as given in recipes under chapter on Milk; thus milk may be flavored with cocoa, chocolate, coffee or meat broth, diluted with lime water, or carbonated water or combined with starchy drinks or strained gruels. Broths of various kinds; beef juice, beef tea, beef extract. Soups, both clear and creamy. Wine, whey, sherry or brandy and milk to be given only when ordered by physician.

Schedule for Feeding.—Feedings are given every two hours from 6 A. M. to 8 P. M. with two night feedings if patient is awake.[1]

TYPICAL FLUID DIET MENUS

Dr. Max Einhorn[2]

NON-NUTRITIVE FLUID DIET

8 A. M.	Tea or Coffee 1 or 2 cups	250-500 c.c.
12 M.	Bouillon 1 or 2 cups	250-500 c.c.
4 P. M.	Tea or Coffee 1 or 2 cups	250-500 c.c.
8 P. M.	Bouillon 1 or 2 cups	250-500 c.c.

2 quarts of plain water, White Rock or Vichy should be consumed in addition in every 24 hours.

LOW RATION FLUID DIET, 100-200 CALORIES

This consists practically of plain broths, clear soups, thin gruels, diluted fruit juices slightly sweetened, along with non-nutritious drinks, such as plain tea and coffee. These food articles are in reality not given for their very slight nutritive value, but because they are palatable and at the same time

[1] "St. Luke's Dietary," St. Luke's Hospital, New York City.

[2] Dr. Max Einhorn, Professor of Medicine, New York Post Graduate School and Hospital, Physician to the Lenox-Hill Hospital, New York; Post Graduate Hospital, New York; White Plains Hospital, White Plains; Hackensack Hospital, Hackensack, New Jersey.

enable the stomach to rest for a day or two. Thus the patient receives a liberal daily supply of water (two or three pints) in a bland and agreeable form.

LOW RATION FLUID DIET, 126 CALORIES

			Calories
8 A. M.	Tea or Coffee 1 or 2 cups	250-500 c.c.	
	with one teaspoonful of sugar		16
12 M.	Thin Barley Gruel 10 ounces	300 c.c.	
	1 tablespoonful Crushed Barley		50
4 P. M.	Bouillon 1 or 2 cups	250-500 c.c.	
8 P. M.	Lemonade 1 or 2 cups	250-500 c.c.	
	with one tablespoonful sugar		60
	Total		126

2 quarts of plain water, White Rock or Vichy should be consumed in addition in every 24 hours.

HALF RATION FLUID DIET, 800-900 CALORIES

This is intended for very brief use—a few days at most—to rest the digestive organs and prepare the patient for the full fluid regimen. The balance of the daily requirement must be borrowed from the patient's own tissues. This diet may be obtained from the following articles:

Milk	1½	pints (about)	400 Calories
Meat Broth	1½	pints (about)	110 "
Cereal Flour for Gruel	1	tablespoon (about)	40 "
Sugar	4	tablespoons	240 "
Egg White	2		27 "
Lemon Juice	4	tablespoons	22 "
Coffee, tea, Vichy water (no fuel value)			
		Total	839 "

In arranging these food articles in a daily menu, individual feedings should be small and succeed one another every two hours in eight or nine feedings daily.

HALF RATION FLUID DIET, 924 CALORIES

			Calories
8 A. M.	Milk	10 ounces 300 c.c.	202
10 A. M.	Milk and strained barley water, equal parts	10 ounces 300 c.c.	160

			Calories
12 M.	Bouillon with the white of two eggs	10 ounces 300 c.c.	30
2 P. M.	Lemonade with 2 tablespoonfuls sugar	10 ounces 300 c.c.	120
4 P. M.	Milk	10 ounces 300 c.c.	202
6 P. M.	Bouillon with the whites of 2 eggs	10 ounces 300 c.c	30
8 P. M.	Whey	10 ounces 300 c.c.	60
10 P. M.	Lemonade, with 2 tablespoonfuls sugar	10 ounces 300 c.c.	120
	Total		924

I quart of water should be taken in addition in 24 hours.

FULL RATION FLUID DIET, 2072 CALORIES

The full fluid diet gives the full requirement for an adult in bed and may, if necessary, be used over long periods. It also serves as a preparation for semi-solid and convalescent diets. The calories may be derived as follows:

Milk	2½	pints	844	Calories
Extra Cream (thick)	3½	ounces	584	"
Sugar	3	tablespoons	180	"
Malted Milk	3	tablespoons	180	"
Egg	2		120	"
Egg White	1		14	"
Cereal Flour Gruel	1	tablespoon cereal flour	40	"
Grape Juice	2	ounces	60	"
Orange Juice	4	ounces	50	"
		Total	2072	"

A daily menu with eight or nine feedings two hours apart, may be arranged from the above materials.

FULL RATION FLUID DIET, 2070 CALORIES

		Calories
8 A. M.	Milk, 200 c.c. (6⅔ oz.), with Coffee 100 c.c. (3⅓ oz.), and Sugar 2 teaspoonfuls	160
10 A. M.	Bouillon and 1 Egg	82
12 M.	Milk 200 c.c. (6⅔ oz.), Cream 50 c.c. (1⅔ oz.), and Cereal 50 c.c. (1⅔ oz.)	426
2 P. M.	Milk 200 c.c. (6⅔ oz.), with Coffee 100 c.c. (3⅓ oz.) and Sugar 2 teaspoonfuls	160

		Calories
4 P. M.	Milk 250 c.c. (8½ oz.), Cream 50 c.c. (1⅔ oz.)...	296
6 P. M.	Milk 200 c.c. (6⅔ oz.), Tea 50 c.c. (1⅔ oz.), Cream 50 c.c. (1⅔ oz.), and Sugar 2 teaspoonfuls	328
8 P. M.	Milk 200 c.c. (6⅔ oz.), Cream 50 c.c. (1⅔ oz.), Cereal 50 c.c. (1⅔ oz.)........	426
10 P. M.	Milk 300 c.c. (10 oz.)........	192
	Total	2070

TYPHOID FLUID DIET

See Dr. Coleman's "High Calory Diet," page 365.
See Dr. Kinnicutt's "Mixed Fluid Diet" No. I, page 373.
See Dr. Kinnicutt's "Mixed Fluid Diet" No. II, page 373.

Milk Diet

Milk diet may consist of whole milk, modified milk, butter milk, malted milk or fermented milk.

Milk may be modified to suit various abnormal conditions such as typhoid fever (see page 365) or gastric disturbances (see page 450). An exclusive whole milk diet has this great disadvantage, that in order to satisfy the caloric requirement of the average man three or four quarts per day would be needed and such volume is highly undesirable. For this reason an exclusive whole milk diet is advantageous only for limited periods. It is often used in acute or chronic renal conditions.

Soft or Light Diet

Soft or Light Diet.—This differs from a full liquid diet in including a number of semi-solid dishes and having generally a larger caloric value (2000-2200 calories). It must be simple, well cooked, attractively served and easy of digestion. It is a step in advance of a liquid diet but contains less variety and less solid food than the convalescent diet. It does not include meat, fish or green vegetables. During the time of giving this diet the patient's appetite may usually be depended upon to regulate quantity.

Kinds of Food to Use.—All fluid foods. Milk and water gruels. Water, milk or creamy toast. Toast softened with broth. Starch and meat jellies. Custards in various forms. Whips and soufflés, junkets, cornstarch puddings or blanc-mange, gelatin jellies. Ice cream, sherbets, ices. Plain cream and butter.

TYPICAL SOFT DIET MENUS[1]

LOW SOFT DIET[2]

For 2000 Calories a Day: Approximate value—protein, 79.870 gm.; fat, 95.683 gm.; carbohydrate, 215.22 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	CALORIES
7.30 A. M.	Milk, flavored with tea	1 cup	8.0	160.0
9:30 A. M.	Grape juice	½ cup	4.0	113.6
	Farina	1 cup	8.0	113.0
	Top milk	½ cup	4.0	233.9
	Toast	1 slice	.69	50.0
	Butter	¼ tbsp.	.12	25.0
12:00 Noon.	Beef broth	¾ cup	6.0	24.0
	Egg White	1	.84	12.09
	Toast	1 slice	.69	50.0
	Butter	¼ tbsp.	.12	25.0
2:30 P. M.	Creamed chicken	½ cup	4.8	290.0
	on toast	1 slice	.69	50.0
	Lemon Jelley	⅔ cup	4.0	142.0
	Whipped Cream..	1 tbsp.	.47	50.0
5:00 P. M.	Milk, flavored with tea	1 cup	8.0	160.0
	Toast	1 slice	.69	50.0
7:30 P. M.	Bouillon	½ cup	4.0	12.0
	Egg omelet	1 egg	1.86	75.0
	Cocoa	½ cup	4.6	160.0
10:00 P. M.	Malted Milk	1 cup	8.5	201.0
	Toast	slice	.69	50.0
				2046.59

[1] See Dr. Coleman's Soft Diets in "Fever Diets," page 365.

[2] Mary Swartz Rose, Ph.D., "Feeding the Family," The Macmillan Co., 1921.

MEDIUM SOFT DIET

For 2250 Calories a Day: Approximate value—protein, 73.488 gm.; fat, 90.97 gm.; carbohydrate, 293.62 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	CALORIES
7:00 A. M.	Milk	1 cup	8.0	160.0
9:30 A. M.	Orange juice	½ cup	4.7	50
	Wheatena	1 cup	6.0	150
	Cream—18%	¼ cup	1.8	100
	Toast	1 slice	.69	50
	Butter	½ tbsp.	.23	50
12:00 Noon.	Cream of Celery.. Soup	1 cup	10.85	229.7
	Crackers	3	.85	100.0
2:30 P. M.	Egg Soufflé	¾ cup	6.71	350.0
	Apple Sauce	½ cup	4.6	135
5:00 P. M.	Cocoa	1 cup	8.46	218
	Graham Crackers.	3	1.26	150
7:30 P. M.	Beef Bouillon....	1 cup	8.0	24
	Creamy rice pudding	¾ cup	7.0	323
10:00 P. M.	Gruel (Barley)..	1 cup	9.0	100
	Toast	1 slice	.69	50
				2239.7

FULL SOFT DIET

For 2500 Calories a Day: Approximate value—protein, 93.71 gm.; fat, 146.18 gm.; carbohydrate, 230.17 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	CALORIES
7:00 A. M.	Milk	1 cup	8	160
9:30 A. M.	Pineapple juice...	½ cup	4	74.8
	Oatmeal	1 cup	7.9	100
	Cream (40%) ...	¼ cup	2.7	300.0
	Toast	1 slice	.69	50
	Butter	½ tbsp.	.23	50
12:00 Noon.	Milk	1 cup	8.0	160
	Graham Crackers.	3	1.26	150
2:30 P. M.	Pea Purée	1 cup	8.0	152
	Chicken Soufflé ..	¾ cup	5.4	401.25
	Toast	1 slice	.69	50
	Butter	½ tbsp.	.23	50
5:00 P. M.	Chocolate Malted Milk	1 cup	9.5	285
7:30 P. M.	Eggs à la Goldenrod	1 egg	....	75
	Toast	1 slice	.69	50
	Cream Sauce	½ cup	....	161
	Orange Gelatin ..	⅔ cup	4.8	65
10:00 P. M.	Egg Nog (warm)	1 cup	8.5	230
				2579.05

Lacto-Farinaceous Diet[1]

Kinds of Food to Use.—Milk, kumyss, zoolak, tea as served, coffee as served, graham bread, white bread, French rolls, toast, milk toast, cream toast, baked potatoes, plain crackers, spaghetti, cornstarch pudding, rice, cornmeal, oatmeal, arrowroot, barley, farina, hominy, cream of wheat, sago, junket, ice cream without eggs.

This diet is often useful in case of both acute and chronic nephritis.

[1] "St. Luke's Dietary," St. Luke's Hospital, New York City.

For 2047 Calories a Day:

SCHEDULE OF FEEDING		MEASURE		GRAMS	CALORIES
7:00 A. M.	Milk	1	cup	241	170
8:00 A. M.	Farina	½	cup	113	67
	Milk on cereal...	½	cup	80	42
	Toast	2	slices	37	100
	Coffee	....		...	...
	Cream	2	tbsp.	19	69
10:00 A. M.	Junket	1	cup	241	190
	Graham crackers.	2		23	100
12:00 Noon.	Baked Potato ...	1		85	100
	Hot milk	2	tbsp.	30	21
	Lettuce Sandwich-				
	Bread	2	slices	37	100
	Lettuce Heart.	2	small leaves	20	6
	Mayonnaise	1	tbsp.	15	100
	Rice Pudding ...	½	cup	62	200
	Milk	1	cup	241	170
3:00 P. M.	Kumyss	1	cup	243	82
	Soda crackers ...	1		12	50
6:00 P. M.	Milk toast				
	Graham bread ...	3	slices	60	150
	Milk	1	cup	241	170
	Vanilla Ice Cream	4	tbsp.	72	160
					2047

Convalescent Diet

A simple mixed diet is suitable for convalescence. Foods recognized as difficult of digestion should be avoided and emphasis laid on milk, eggs, toast, well-cooked cereals and other foods used in Soft Diet. Mild fruits and well-cooked vegetables may be added cautiously and tender meat about once a day. The fuel value should be liberal, probably 2200 to 2500 calories per day, with 80 to 100 grams protein, 300 grams carbohydrate and 80 to 90 grams fat.

As the name indicates such a diet is given when a patient is recovering from illness and is preliminary to a regular normal diet.

TYPICAL CONVALESCENT DIET[1]

LIGHT CONVALESCENT DIET

For 2000 Calories a Day: Approximate value—protein, 70 gm.; fat, 80 gm.; carbohydrate, 251 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	CALORIES
Breakfast:	½ orange	½ med.	4.7	50
	Shredded wheat..	1 biscuit	1.0	100
	Milk	½ cup	4.0	80
	Toast	1 slice	0.7	50
	Butter	½ tbsp.	0.3	50
	Coffee	1 cup	8.0	...
	Cream, thin	2 tbsp.	1.0	56
	Sugar	2 tsp.	.3	35
10:30 A. M.	Milk	⅝ cup	5.1	100
Luncheon: 12:30 P. M.	Cream of potato soup	⅝ cup	6.1	150
	Minced chicken ..	⅜ cup	1.6	100
	Rice	⅜ cup	3.0	50
	Buttered carrots..	¾ cup	7.0	75
	Whole wheat bread	1 slice	1.4	100
	Butter	½ tbsp.	0.3	50
	Vanilla ice cream	⅜ cup	3.0	150
3:30 P. M.	Orangeade	1 cup	8.0	62
	½ cup juice			
	½ cup water			
	1 tsp. sugar			
6:30 P. M.	Lamb chop	1 large	2.4	150
	Creamed peas	½ cup	4.0	100
	Bread	1 slice	0.7	50
	Butter	½ tbsp.	0.3	50
	Chocolate .... Blanc-mange	⅜ cup	2.8	150
	Whipped cream ..	1 tbsp.	0.5	50
	Tea	1 cup	8.0	...
	Sugar	2 tsp.	0.4	35
9:30 P. M.	Iced cocoa	1 cup	9.0	161
				2004

[1] See Dr. Coleman's High Calory Diet in "Fever Diets," page 365.

MEDIUM CONVALESCENT DIET

For 2601 Calories a Day: Approximate value—protein, 90 gm.; fat, 125 gm.; carbohydrate, 255 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	CAL-ORIES
Breakfast:	Oatmeal	1 cup	7.9	100
	Milk	½ cup	4.0	80
	Toast	2 slices	1.4	100
	Butter	1 tbsp.	0.5	100
	Coffee	1 cup	8.0	...
	Cream, thin	2 tbsp.	1.0	56
	Sugar	2 tsp.	0.4	35
10:30 A. M.	Egg Nog	1 cup	8.5	230
	Crackers	4	0.9	100
Luncheon: 12:30 P. M.	Cream of green pea soup, strained..	1 cup	7.8	150
	White bread	2 slices	1.5	100
	Butter	1 tbsp.	0.5	100
	Sirloin steak, broiled (lean)..	Slice 3½"x1½"x¾"	3.0	150
	Baked potato	1 med.	3.0	100
	Spinach	½ cup	4.0	20
	Apple tapioca ...	⅜ cup	5.4	150
3:30 P. M.	Orangeade ½ cup juice ½ cup water 1 tsp. sugar	1 cup	8.0	65
	Crackers	4	0.9	100
6:30 P. M.	Broiled halibut steak	Slice 4½"x2¼"x1"	3.0	100
	Tomato Sauce ...	4 tbsp.	2.0	80
	Toast	2 slices	1.5	100
	Butter	1 tbsp.	0.5	100
	Tea	1 cup	8.0	...
	Sugar	2 tsp.	0.4	35
	Rice pudding	⅜ cup	3.3	150
	Thin cream	¼ cup	1.8	100
9:30 P. M.	Milk	⅝ cup	5.0	100
	Crackers	4	0.9	100
				2601

FULL CONVALESCENT DIET

For 3000 Calories a Day: Approximate value—protein, 103 gm.; fat, 140 gm.; carbohydrate, 326 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	CALORIES
Breakfast:	Farina	3/8 cup	6.0	100
	Milk	3/8 cup	3.0	80
	Toast	2 slices	1.4	100
	Butter	1 tbsp.	0.5	100
	Egg, coddled	1 egg	2.5	70
	Coffee	1 cup	8.0	...
	Cream, thin	2 tbsp.	1.0	55
	Sugar	2 tsp.	0.3	35
10:30 A. M.	Orangeade	1 cup	8.0	85
	½ cup juice			
	½ cup water			
	2 tsp. sugar			
	Crackers	4	0.9	100
Luncheon: 12:30 P. M.	Cream of corn soup	¾ cup	5.9	150
	Whole wheat bread	2 slices	2.8	200
	Butter	1 tbsp.	0.5	100
	Baked ham, lean	Slice 4¾"x6"x1/8"	2.0	150
	Mashed potato ...	¾ cup	4.6	150
	Cauliflower	1¼ cup	8.0	75
	Norwegian prune pudding	5/8 cup	4.0	150
	Custard sauce ...	⅓ cup	2.2	100
3:30 P. M.	Iced cocoa	1 cup	9.0	161
	Crackers	4	0.9	100
6.30 P. M.	Creamed salmon.	¾ cup	2.7	300
	White sauce	3/8 cup	3.6	
	Toast	2 slices	1.4	100
	Butter	1 tbsp.	0.5	100
	Tea	1 cup	8.0	...
	Sugar	2 tsp.	0.3	35
	Tapicoa custard..	⅗ cup	4.2	150
9:30 P. M.	Egg Nog	1 cup	8.5	230
				2976

House Diet

A Normal or House Diet, meaning the diet usual for normal people. It is used for patients who are more or less confined by incapacities other than illness, e. g., a broken leg, etc. Its protein content and its caloric value should be sufficient for the individual's needs. As the patient is usually somewhat inactive a daily dietary furnishing from 70 to 90 grams of protein and 1800 to 2200 calories would meet the average requirement. The choice of foods may be rather wide, less expensive foods being used where cost must be kept at a low level. Laxative foods should be incorporated in the diet. Very rich foods or those liable to cause digestive disturbances should of course be avoided.

HOUSE DIET FOR WARDS,[1] NO. I

SAMPLES OF HOUSE DIET: BREAD AND BUTTER AND EITHER MILK, TEA OR COFFEE SERVED WITH HOUSE DIET AT EACH MEAL.

Breakfast	Dinner	Supper
Oatmeal Creamed Beef or Kippered Herring Toast	Vegetable Soup Roast Beef, Gravy Boiled Potatoes Buttered Onions Tapicoa Cream	Meat Cakes Apricot Sauce Toast
Oatmeal Creamed Ham Toast French Rolls	Vegetable Soup Escalloped Fish Steamed Potatoes Peas Cornstarch Pudding	Cornmeal Mush Cold Roast Beef Prunes Toast
Hominy Scrambled Eggs Toast	Split Pea Soup Pot Roast Boiled Potatoes Vegetables in Season Apple and Rice Pudding	Fish Chowder Crackers Peach Sauce Toast
Oatmeal Bacon Toast French Rolls	Vegetable Soup Steamed Fish White Sauce Riced Potatoes Creamed Carrots Sago Pudding	Ham Omelet. or Macaroni and Cheese, or Creamed Rice, or Meat Loaf Apple Sauce Cake Toast

[1] "St. Luke's Dietary," St. Luke's Hospital, New York City.

Breakfast	Dinner	Supper
Hominy Meat Hash Toast	Vermicelli Soup Beef Stew with Vegetables Steamed Potatoes Lemon Jelly	Baked Beans and Pork Brown Bread Apricot Sauce Toast
Oatmeal Corned Beef Hash Toast	Vegetable Soup Roast Beef, Gravy Boiled Potatoes Vegetable in Season Bread Pudding Caramel Sauce	Cold Roast Beef Creamed Rice Prunes Toast Cake
Hominy Fish Balls Toast	Clear Soup Boiled Mutton Steamed Potatoes Squash Apple or Rice Pudding or Jellied Prunes	Cold Roast Beef Creamed Potatoes Peach Sauce Toast

Diets are occasionally changed according to Market and House conditions.

HOUSE DIET FOR WARDS, NO. II

Breakfast	Dinner	Supper
Oatmeal Creamed Ham Toast	Black Bean Soup Pot Roast Riced Potatoes Sliced Beets Ice Cream	Cold Roast Beef Macaroni and Cheese Stewed Apricots Toast
Hominy Scrambled Eggs Toast	Vegetable Soup Escalloped Fish Mashed Potatoes Vegetables in Season Tapioca Pudding	Fish Chowder Crackers Prunes Toast
Oatmeal Kippered Herring or Creamed Beef Toast	Split Pea Soup Beef Stew with Vegetables Steamed Potatoes Baked Rice Pudding	Minced Meat Potato Salad Apple Sauce Toast
Hominy Codfish Balls French Rolls Toast	Vegetable Soup Steamed Fish Egg Sauce Mashed Potatoes Carrots and Peas Chocolate Cornstarch Pudding	Salmon Loaf Escalloped Potatoes, or Creamed Potatoes Peach Sauce Spice Cake Toast

Breakfast	Dinner	Supper
Oatmeal Meat Cakes Creamed Potatoes Toast	Vegetable Soup Boiled Corn Beef Steamed Potatoes Boiled Cabbage Creamy Rice Pudding	Baked Beans and Pork Brown Bread Apricot Sauce Toast
Hominy Corn Beef Hash Toast	Clear Soup Fricassee of Chicken Riced Potatoes String Beans Lemon Jelly or Custard	Cold Meat Corn Meal Mush Apple Sauce Ribbon Cake Toast
Oatmeal Liver and Bacon Muffins Toast	Vegetable Soup Roast Beef Boiled Potatoes Vegetables in Season Sago Pudding	Cold Roast Beef Boiled Rice Stewed Apricots Toast

HOUSE DIET FOR WARDS, NO. III

Breakfast	Dinner	Supper
Hominy Creamed Eggs Toast	Vegetable Soup Pot Roast, Gravy Steamed Potatoes Vegetables in Season Tapioca Pudding	Hungarian Goulash Stewed Prunes Toast
Oatmeal Meat Hash Toast	Vegetable Soup Escalloped Fish Riced Potatoes Boiled Onions Bread Pudding	Cold Roast Beef Spaghetti a la Italienne Apricot Sauce Toast
Hominy Liver and Bacon Muffins Toast	Vegetable Soup Roast Mutton Riced Potatoes Creamed Carrots Cornstarch Pudding	Cold Roast Beef Lyonnaise Potatoes Peach Sauce Toast
Oatmeal Boiled Eggs Toast	Mutton Broth Baked Fish, Sauce Boiled Potatoes Parsnips Apple Tapioca, or Soft Custard	Fish Hash Cookies Baked Apples, or Stewed Pears Toast

Breakfast	Dinner	Supper
Oatmeal Kippered Herring, or Creamed Beef Toast	Beef Broth Meat Stew Boiled Potatoes Vegetable in Season Sago Pudding	Corn Meal Mush Cold Meat Scrambled Eggs Stewed Prunes Toast
Oatmeal Corned Beef Hash Toast	Onion Soup Pot Roast, Gravy Riced Potatoes String Beans Indian Meal Pudding	Cold Meat Plain Cake Apple Sauce Toast
Hominy Scrambled Eggs Toast	Vegetable Soup Boiled Corned Beef Boiled Potatoes Creamed Cabbage Rice Pudding	Baked Beans and Pork Apricot Sauce Toast

Diets to Meet Special Mechanical or Chemical Body Needs[1]

Of these one may designate:

1. **High Calory Diet.**—Such a diet is of higher caloric value than the individual to whom it is given would normally require. It is given to meet a need for energy caused by the more rapid metabolism which accompanies certain diseases, especially fevers. The diets are usually liquid and soft diets with the caloric value increased by the addition of carbohydrates and fats, mostly in form of milk, sugar and cream. For details see "The Fever Diet," pages 358, 365, 424, 555.

2. **High Protein Diet** contains a higher protein content than is needed under normal conditions. It is often used during convalescence when there has been much loss of body protein during illness as in some fevers. It is used during illness when loss of protein accompanies disease as in tuberculosis, cancer, etc. A diet rich in non-stimulating protein is given in cases of excessive gastric acidity.[1] See pages 414, 424, 441, 444, 450.

3. **Low Protein Diet,** as the name signifies, is one which

[1] In addition to pages given below, see index for other examples and various combinations of these diets.

[2] Carter, Howe and Mason, "Nutrition and Clinical Dietetics," Lea & Febiger, Philadelphia, Pa. 2nd Edition.

is made up of foods which furnish only small amounts of protein. This diet consists largely of carbohydrates and is used in cases of chronic nephritis and intestinal disorders when putrefaction is present. See pages 437, 485, 541, 544, 555.

4. **High Carbohydrate Diet** in which the protein is kept rather low but the percentage of carbohydrates is above normal. Such a diet is used in cases of intestinal putrefaction, or for fattening purposes. See pages 414, 437, 485.

5. **Low Carbohydrate Diet** in which starches and sugars are restricted. This is used in cases where carbohydrates are poorly metabolized, as diabetes mellitus and in case of obesity. See pages 381, 393, 408.

6. **High Fat Diet.**—Such a diet is usually of high caloric value and is used for fattening or when energy requirement is increased. A high fat content is also helpful in cases of constipation. See pages 414, 444.

7. **Low Fat Diet** in which little fat is present. This excludes fat meats, butter, cream, oil dressings and pastries and is used in obesity or any form of acidosis. See pages 408, 495.

8. **Purin-Poor Diets.**—Such diets exclude purin-bearing foods as meats, fish and glandular tissues and sometimes tea and coffee. If meat or fish is given it should be boiled rather than roasted or broiled. This diet is used in cases of gout, chronic nephritis and sometimes cancer. See page 398.

9. **Salt-Poor Diet.**—It is impossible to arrange a diet that is absolutely "salt free", but a salt-poor diet consists of foods containing a very small percentage of sodium chloride and no salt is added in their preparation. Bread and butter with no added salt are used. This diet is beneficial in the treatment of edema in various forms, especially that resulting from renal disorders. See pages 437, 510, 514. A modified salt-poor diet is recommended in cases of gastric hyperacidity.

10. **Alkaline Diets.**—These diets are rich in basic salts, and consist largely of green vegetables and fruits. They are

useful in conditions of acidosis, as in case of chronic nephritis and diabetes mellitus. See pages 384, 393, 510, 514.

11. **Diets Rich in Mineral Salts,** as iron and calcium. These are made up of milk, eggs, vegetables and fruits, whole grains, dried fruits and nuts. Milk is especially rich in calcium. The iron content of milk is small but it is in a particularly available form so that it forms an important part of such diets. Iron-rich diets are used in the treatment of various forms of anemia. Calcium-rich diets are used in tuberculosis. Calcium and iron are both of special importance in the feeding of children. See page 548.

12. **Roughage Diet,** includes generous amounts of fresh and dried fruits, green vegetables, salad plants, fats, as butter and salad oils, whole grains for bread and breakfast cereals, molasses and plenty of water. Protein is kept low. The diet is recommended to counteract constipation. See page 480.

13. **Non-roughage Diet** consists of foods almost free from indigestible material. It must be non-irritating, non-stimulating and easily digested so that there will be little residue. Such a diet may be given in cases of chronic diarrhea or as an intestinal test diet. See page 473.

QUESTIONS FOR STUDY

HOSPITAL DIET

1. Describe fluid, soft and convalescent diets. Under what conditions are they given?
2. Discuss the advantages and disadvantages of an exclusive milk diet.
3. What foods make up a lacto-farinaceous diet? When could such a diet be given?
4. What conditions call for high calorie diet?
5. How may the caloric value of a diet be increased without increasing protein?
6. What conditions call for low protein in diet?
7. When would a low carbohydrate diet be given?
8. Under what conditions should pruins be excluded or restricted?
9. What is meant by a salt-poor diet?
10. When should salt-poor diets be given?
11. What are the benefits from a roughage diet?
12. What foods should be included in such a diet?

CHAPTER XIV

DIET IN DISEASE

One of the most striking features of the modern treatment of disease is the careful attention that is quite generally given to the proper selection of food. In the treatment of disorders of metabolism such as diabetes, gout and obesity, in many febrile diseases and in diseases affecting the digestive organs and kidneys, diet is given the major place.

While a nurse may seldom be called upon to assume complete responsibility in the choosing of food, a knowledge of the type of diet suitable in different diseases will help her to follow a physician's directions more intelligently, to adapt prescribed diets to individual tastes and to avoid the use of foods that might prove distinctly harmful.

THE FEVER DIET[1]

The dietetic treatment of those diseases which are characterised by fever has undergone revolutionary changes within the last few years. For more than two thousand years patients with fever were practically starved and often deprived of water. About 1830 Graves recommended a diet furnishing some 300 calories. The elder Flint popularized the milk diet, containing from 1000 to 1200 calories, about 1870. From the 90's on the so-called liberal diets were advocated in Russia, England and America. These diets, however, contained too much protein and too little fuel.

In 1907 Coleman and Shaffer began a study of the metabolism in typhoid fever, which served as the foundation for the more extended studies of Coleman and DuBois.

[1] Through the kindness of Dr. Warren Coleman, "The Fever Diet" was rewritten under his supervision from his work appearing in "Nelson Loose-Leaf Living Medicine," published by Thomas Nelson & Sons, New York, N. Y.

While these investigations were confined to typhoid fever, the facts which were discovered are believed to be generally applicable to many other febrile diseases.

Metabolism in Fever.—All the processes of metabolism are increased in fevers—the fires of the body burn under forced draught—and to meet this condition a patient with fever requires more, rather than less food.

The investigations of Coleman and DuBois have brought out the fact that the fuel of choice for the production of increased energy is carbohydrate and that the fever diet should contain preferably a predominant amount of this foodstuff. But fat also is useful and when carbohydrate cannot be given freely may be increased to large amounts.

When a patient with fever does not receive sufficient food, the food reserves of the body are consumed to supply the deficit. If the fever is high, the carbohydrate reserve is quickly exhausted—probably within a few hours. Thereafter, the fat and the muscles are called upon to meet the extra demands. The extent to which the muscles become involved is indicated by the increase of the nitrogen output in the urine. Formerly it was not thought possible, through diet, to protect the tissues of the body completely during fever, but the studies of Shaffer and Coleman have proved that the patient can be brought into complete equilibrium.

The Total Food Required.—"Broadly speaking the diet should be arranged with the view of keeping the patient in complete metabolic equilibrium, that is, equilibrium of energy and equilibrium of substance. If the diet should fail in either of these respects it cannot be considered adequate. Patients may survive an inadequate diet as many patients have survived various degrees of starvation, but there is no physiological basis upon which such a diet may be defended."[1]

The increase in metabolism which is characteristic of probably all fevers varies in extent, but for practical purposes it

[1] Dr. Warren Coleman, "Nelson Loose-Leaf Living Medicine," Thomas Nelson & Sons, New York, N. Y.

may be said that the higher the temperature, the more active the metabolism. This means that, contrary to the popular conception, the higher the fever, the greater is the need for food. (It should not be forgotten, however, that special conditions may exist or arise such as nausea and vomiting, intestinal hemorrhage in typhoid fever or marked abdominal distension in pneumonia, which make it unwise to attempt to give the patient all the food he requires.) With temperatures under 103° F. the average increase in metabolism will probably not exceed 30% to 40%; with higher temperatures the increase may amount to 50% or more.

While it might be thought that a diet which furnished 50% more energy than a patient requires when he is well would cover his needs during fever, according to Shaffer and Coleman some typhoid patients continue to lose nitrogen (for the most part from the muscles) until the energy value of the diet reaches 100% over the normal; in other words, some patients require twice as much food during a fever as when they are well.

Expressed in terms of energy, adult fever patients require from 3000 to 5000 or even 6000 calories a day.

The Carbohydrate and Fat Needs.—Since the greater part of the energy produced in the body in fever, as well as in health, is derived from carbohydrate and fat, these foodstuffs should predominate in the diet.

Ordinarily the carbohydrate should furnish from one-half to two-thirds—preferably the latter—of the energy of the diet, but when a patient cannot take so much carbohydrate the fat should be proportionately increased.

An average daily carbohydrate allowance would be from 400-500 gm.; it should not be allowed to fall below 50 gm.; on the other hand it may be raised to 800 gm.

An average daily fat allowance would be 100-150 gm.; it may be increased in exceptional instances up to 300 gm.

The Protein Need.—The amount of protein needed in fevers is only slightly greater than in health. Stating this fact differently, the protein of the diet cannot be reduced as low in fever as in health without loss of body protein.

The daily amount of protein in the fever diet should not be allowed to fall below 60 gm. nor does any benefit come from increasing it beyond 90 gm. Stated generally, a diet which furnishes sufficient energy will almost certainly contain enough protein.

Method of Calculating Food Requirements.—The food requirement of a patient may be calculated from the body weight or from his surface area. That is, we may calculate the daily calory requirement per kilogram of body weight or the hourly calory requirement per square meter of surface. DuBois, who has published a "height-weight" chart for estimating surface area, advises this latter method as the more accurate.

Starting with the basal calory requirement, which for the average man is 26 calories per kilogram of body weight per day or 40 calories per square meter of body surface per hour, and allowing a 50% increase to cover the extra heat production during fever, the calory requirement will be about 40 calories per kilogram per day, or 60 calories per square meter of body surface per hour. Since it requires an extra supply of energy amounting to from 50% to 100% of the total heat production to protect the body protein the patient's requirement would be from 60 to 80 calories per kilogram of body weight per day or from 90 to 120 calories per square meter of surface per hour.

For an adult this may mean a diet furnishing as high as 3000 calories per day, or in some cases of typhoid fever 4500 or even 6000 calories daily.

Administration of Diet.—While the patient's food requirements may be as stated above, it does not follow that a diet so arranged can always be given. The individual's ability to utilize it must always be considered. "It is the patient, not the disease, which must be fed."[1] Careful atten-

[1] Dr. Warren Coleman, "Nelson Loose-Leaf Living Medicine," Thomas Nelson & Sons, New York, N. Y.

tion should be given to a patient's preferences for food and to his peculiar dislikes. These will probably be more pronounced in sickness than in health. If the appetite is sluggish willingness to eat may often be stimulated by talks with the patient about the effect his food intake will have on his recovery. The nurse may be able to do much in this way.

Unless the patient really wants to eat, which is unusual, it is better to give comparatively small amounts during the first few days. Whether it should be liquid or not depends on the patient's attitude of mind. If he is able to masticate it thoroughly there is no objection to carefully selected solid food. The amount and variety of food should be increased as the patient's appetite and his ability to digest it may indicate.

Cleansing the mouth is of importance in any febrile condition as the mouth is apt to acquire a disagreeable taste and should be cleansed before serving food. See "Details of Feeding," page 331.

Kinds of Food to Use.—A high calory diet may be built up of such foods as milk, eggs, bread, cereals, potatoes, rice, apples and oranges, reinforced by concentrated fuel foods such as butter, cream, sugar and milk sugar. Milk sugar is especially adapted for this purpose, as on account of its lack of sweetness it can be added in considerable amounts to beverages, etc., without appreciably affecting their taste.

Milk is always a staple article of diet for fever patients. It can be modified in many ways to increase its digestibility, such as diluting it with water, lime water, cereal water or effervescing water, by peptonizing it or by ferments such as are used in making Zoolak, Kumyss and Kefir. The flavor of milk may be disguised by the use of tea, coffee or cocoa. Milk is always the more readily digested if taken with crackers or toast.

Well cooked cereals and gruels play an important part in these diets. They are nutritious in themselves and they are a means of acceptably adding cream and sugar.

Eggs may be used, either mixed raw with milk and other liquids, in soups and beverages, or served soft-cooked or in custards. The number of eggs should rarely exceed six a day.

Broths and clear soups are valuable for variety and for stimulation of the gastric digestion. If thickened with some farinaceous substance such as tapioca, sago or fine dry bread or cracker crumbs, they are of material nutritive value.

Plenty of water is recommended and acid drinks, not only because they are refreshing, relieve thirst, and aid in elimination of waste, but also because they may be made the vehicle for albumin and lactose. Although some authorities recommend as high as 1½ to 2½ quarts daily, Dr. Coleman does not believe in the popular plan of forcing water. Enough should be given however to keep the urine around 3 to 4 pints.

Cautions.—If the disease is complicated by digestive disturbances, or if the digestion becomes disordered, the diet must be rearranged as to quantity and kind to overcome the difficulty.

The disturbances most often occurring with this diet are nausea, vomiting, tympanites and diarrhea. The mixtures of milk, cream, lactose and egg may be too rich and the development of such digestive troubles depends upon the patient's tolerance for these foods, as to whether or not he can take care of the quantities given.

Large amounts of milk sugar sometimes cause vomiting. If this occurs the diet should be made very simple, possibly all food withheld for a few hours, and the diet continued with small amounts.

Unless tympanites causes discomfort it may be ignored, but should it become distressing the diet should be altered. Eggs may be the disturbing element, sometimes the cream, but more often it is lactose.

Diarrhea is most likely to be due to excess of cream. It can usually be controlled by changing the diet. Reducing the cream should be tried first and if this is not effective the amount of lactose may be lessened and cream increased. Many cases have been controlled in this way.

Diet in Convalescence.—With the more liberal diet now used during the febrile period the diet during convalescence does not differ so much as formerly. The same type of food is used with the gradual addition of more solid food as the patient seems able to care for it. Meat is not advised until late in convalescence.

Diet in Typhoid Fever

By means of numerous studies of metabolism made upon typhoid patients in the calorimeter it has been established beyond doubt that the high calory diet is an essential part of the treatment of this disease. With a diet sufficiently high in fats and carbohydrates to cover the energy requirements, the patient is able to maintain almost normal weight and is better able to withstand relapse if it should occur. It may be added that this diet does not make relapse more liable. The period of convalescence is greatly shortened and the patient escapes the intense hunger that used to follow the starvation treatment.

HIGH CALORY-FOOD LIST[1]

NAME	AMOUNT	CALORIES
Apple sauce[2]	1 ounce	30
Apple, pared and cored	1 medium	about 75
Bread, average slice	30 grams	80
Butter, 1 pat	13 grams	about 100
Cocoa, 1 rounding teaspoon	5 grams	25
Crackers, soda (1 cracker)	9 grams	36
Crackers, Uneeda (1 cracker)	6 grams	25
Cream (20 per cent[3])	1 ounce (30 c.c.)	60
Egg	1 average size	75

[1] Dr. Warren Coleman, "Nelson Loose-Leaf Living Medicine," Thomas Nelson & Sons, New York, N. Y.

[2] Cooked without sugar.

[3] Approximately the same as the top 2 ounces from a quart bottle of milk that has stood at least six hours. This is not heavy cream. To add lactose to milk boil 15 grams (½ ounce) of lactose in 30 c.c. (1 ounce) of water; cool and add to milk.

NAME	AMOUNT	CALORIES
Egg white	white of 1 egg	15
Egg yolk	yolk of 1 egg	60
Farina (cooked)	1 heaping tbsp.	25-30
Lactose (milk-sugar)	1 heaping tsp.	40
Lactose (milk-sugar)	1 measured ounce, 18 grams	72
Lemon juice	1 ounce	12
Milk (whole)	1 ounce	20
Orange	1 large	100
Orange juice	1 ounce	15
Oatmeal (rolled oats, cooked)	1 heaping tbsp.	36
Potato	1 medium	100
Rice (boiled)	1 heaping tbsp.	about 60
Sugar, cane	1 heaping tsp.	40
Sugar, cane	1 level tbsp.	56
Toast	average slice	80

Food Combinations and Menus[1]

HIGH CALORY DIET

Dr. Warren Coleman

The following food combinations and menus will be found of assistance in administering the high calory diet:

For 1000 Calories a Day:	CALORIES
Milk, 1 quart (1000 c.c.)	700
Cream, 1⅔ ounces (50 c.c.)	100
Lactose, 1⅔ ounces (50 grams)	200
This furnishes eight feedings, each containing:	
Milk, 4 ounces	80
Cream, 2 drams	15
Lactose, 6 grams	24
Or,	
Eggs, 2	150
Lactose, 30 grams (1 ounce)	120
Sugar, 25 grams (⅘ ounce)	100
Milk, 800 c.c. (26⅔ ounces)	560
Cream, 30 c.c. (1 ounce)	60
Lemon juice, 30 c.c. (1 ounce)	12
Coffee, 150 c.c. (5 ounces)	00
Tea, 150 c.c. (5 ounces)	00

[1] Dr. Warren Coleman. "Nelson Loose-Leaf Living Medicine," Thomas Nelson & Sons, New York, N. Y.

[1] Some of these combinations appeared in the Am. J. M. Sc. 143-77, 1912; the others have been arranged by Miss Estelle Magill, Head Nurse of the Russell Sage Institute of Pathology.

	CALORIES
This furnishes seven feedings:	
One feeding containing:[1]	
Coffee, 150 c.c. (5 ounces)	00
Egg, 1	75
Lactose, 30 grams (1 ounce)	120
Sugar, 5 grams	20
One feeding containing:	
Tea, 150 c.c. (5 ounces)	00
Cream, 30 c.c. (1 ounce)	60
Sugar, 5 grams	20
Four feedings, each containing:	
Milk, 200 c.c. (6⅔ ounces)	140
One feeding containing:[2]	
Egg, 1	75
Sugar, 15 grams (½ ounce)	60
Lemon juice, 30 c.c. (1 ounce)	12
Water, 4 or 5 ounces	00
For 1500 Calories a Day:	
Milk, 1½ quarts (1500 c.c.)	1000
Cream, 1⅔ ounces	100
Lactose, 3⅓ ounces (100 grams)	400
This furnishes six feedings, each containing:	
Milk, 8 ounces	160
Cream, 2 drams	15
Lactose, 16 grams	64
Or,	
Eggs, 2	150
Lactose, 110 grams (3⅔ ounces)	440
Sugar, 25 grams (⅘ ounce)	100
Milk, 800 c.c. (26⅔ ounces)	560
Cream, 120 c.c. (4 ounces)	240
Lemon juice, 30 c.c. (1 ounce)	12
Coffee, 150 c.c. (5 ounces)	00
Tea, 150 c.c. (5 ounces)	00
This furnishes one feeding containing:	
Coffee, 150 c.c. (5 ounces)	00
Egg, 1	75
Lactose,[3] 40 grams (1⅓ ounces)	160
Sugar, 5 grams (⅙ ounce)	20
One feeding containing:	
Tea, 150 c.c. (5 ounces)	00
Cream, 50 c.c. (1⅔ ounces)	100

[1] Beat the egg lightly in a cup, dissolve lactose thoroughly in very hot coffee; pour over beaten egg, stirring constantly, strain, add sugar and serve. This may be served hot or iced.

[2] Dissolve sugar in water; add lemon juice and pour over beaten egg; add cracked ice, strain and serve. Or, dissolve sugar in water and put with other ingredients into a shaker; shake up thoroughly, strain and serve.

[3] Lactose to be thoroughly dissolved in very hot tea before adding cream.

	CALORIES
Lactose,[1] 30 grams (1 ounce)	120
Sugar, 5 grams	20
Four feedings, each containing:	
Milk, 200 c.c. (6⅔ ounces)	140
Cream, 17 c.c., large tablespoonful	34
One feeding containing:	
Egg, 1	75
Lactose,[2] 40 grams (1⅓ ounces)	60
Sugar, 15 grams (½ ounce)	60
Lemon juice, 30 c.c. (1 ounce)	12
Water, 4 or 5 ounces	00
For 2000 Calories a Day:	
Milk, 1½ quarts	1000
Cream, 8 ounces (240 c.c.)	500
Lactose, 4 ounces (120 grams)	500
This furnishes seven feedings, each containing:	
Milk, 7 ounces	140
Cream, 1 ounce	60
Lactose, 18 grams	72
Or,	
Eggs, 2	150
Lactose, 125 grams (4 ounces)	500
Sugar, 15 grams (½ ounce)	60
Milk, 1000 c.c. (32 ounces)	700
Cream, 240 c.c. (8 ounces)	480
Cocoa, 5 grams	25
Orange juice, 60 c.c. (2 ounces)	30
Lemon juice, negligible	00
Coffee, 150 c.c. (5 ounces)	00
This furnishes one feeding containing:	
Coffee, 150 c.c. (5 ounces)	00
Egg, 1	75
Lactose, 50 grams (1⅔ ounces)	200
Sugar, 5 grams	20
One feeding containing:	
Cocoa, 5 grams	25
Milk, 120 c.c. (4 ounces)	80
Cream, 60 c.c. (2 ounces)	120
Lactose, 50 grams	200
One feeding containing:	
Egg, 1	75
Lactose, 40 grams (1⅓ ounces)	160
Sugar, 10 grams	40
Orange juice, 120 c.c. (4 ounces)	60
Lemon juice, 1 to 2 teaspoonfuls	00

[1] Lactose to be thoroughly dissolved in very hot tea before adding cream.
[2] Boil lactose and sugar in water for two minutes and cool before adding lemon juice.

	CALORIES
Four feedings containing:	
Milk, 210 c.c. (7 ounces)	140
Cream, 45 c.c. (1½ ounces)	90
For 2500 Calories a Day:	
Milk, 1½ quarts	1000
Cream, 8 ounces	500
Lactose, 8 ounces (240 grams)	1000
This furnishes seven feedings, each containing:	
Milk, 7 ounces	140
Cream, 1 ounce	60
Lactose, 36 grams	144
Or,	
Milk, 1000 c.c.	700
Cream, 240 c.c. (8 ounces)	480
Eggs, 3	225
Lactose, 165 grams (5½ ounces)	660
Sugar, 40 grams	160
Bread, 1 slice, 30 grams	80
Uneeda biscuit, 1	25
Butter, 10 grams (⅓ ounce)	80
Orange juice, 120 c.c. (4 ounces)	60
Lemon juice (1½ ounces)	20
This furnishes one feeding containing:	
Coffee, 150 c.c. (5 ounces)	00
Egg, 1	75
Lactose, 40 grams (1⅓ ounces)	160
Sugar, 5 grams	20
Toast, 1 slice	80
Butter, 10 grams	80
One feeding containing:	
Egg, 1	75
Lactose, 50 grams (1⅔ ounces)	200
Orange juice, 120 c.c. (4 ounces)	60
Sugar, 10 grams	40
Lemon juice to taste.	
Water.	
One feeding containing:	
Egg, 1	75
Milk, 200 c.c. (6⅔ ounces)	140
Cream, 40 c.c. (1⅓ ounces)	80
Lactose, 25 grams (⅚ ounce)	100
Sugar, 5 grams	20
Flavor with vanilla or nutmeg.	
One feeding containing:	
Lactose, 60 grams (2 ounces)	240
Sugar, 20 grams (⅔ ounce)	60
Lemon juice, 30 or 40 c.c. (1⅓ ounces)	15
Four feedings, each containing:	
Milk, 200 c.c. (6⅔ ounces)	140

	CALORIES
Cream, 50 c.c. (1⅔ ounces)	100
For 3000 Calories a Day:	
Milk, 1½ quarts	1000
Cream, 1 pint (480 c.c.)	1000
Lactose, 8 ounces	1000
This furnishes eight feedings, each containing:	
Milk, 6 ounces	120
Cream, 2 ounces	120
Lactose, 1 ounce	120
Or,	
Breakfast:	
Farina	100
Toast, 1 slice (30 grams before toasting)	80
Cream, 100 c.c. (3⅓ ounces)	200
Butter, 8 grams	60
Lactose, 40 grams (1⅓ ounces)	160
Sugar, 20 grams	80
Coffee, 1 large cup or two small cups (300 c.c.)	00
10 *to* 10:30 *A. M.:*	
Milk, 200 c.c. (6⅔ ounces)	140
Cream, 50 c.c. (1⅔ ounces)	100
Dinner:[1]	
Eggs, 2	150
Potato, 1 medium, about	100
Bread, 1 slice, or roll, 1, about	80
Butter, 30 grams (1 ounce)	230
Apple, 1 medium (pared and cored)	75
Sugar, 15 grams (½ ounce)	60
3 *to* 4 *P. M.:*	
Tea, 150-200 c.c.	00
Lactose, 50 grams	200
Sugar, 5 grams	20
Cream, 50 c.c. (1⅔ ounces)	100
Crackers, 3 Uneeda, or 2 soda, toasted	75
Butter, 8 grams	62
Supper:	
Rice, 25 grams, or farina, cooked with	100
Milk, 100 c.c. (3⅓ ounces)	70
Toast, 30 grams (1 slice)	80
Butter, 8 grams	62
Sugar, 5 grams (for cereal)	20
Cream, 60 c.c. (2 ounces)	120
Orange, 1 slice	100
Sugar, 5 grams (with orange)	20

[1] Potato baked, served with butter. Apple baked with 15 grams sugar and about 8 grams butter. Some patients will eat more butter if unsalted butter is used in the diet.

8 to 9 P. M.:	CALORIES
Cocoa, 5 grams	25
Sugar, 10 grams	40
Milk, 150 c.c. (5 ounces)	105
Cream, 30 c.c. (1 ounce)	60
Lactose, 25 grams	100

For 3900 Calories a Day:

Milk, 1½ quarts	1000
Cream, 1 pint	1000
Lactose, 16 ounces (480 grams)	1900

This furnishes eight feedings, each containing:

Milk, 6 ounces	120
Cream, 2 ounces	120
Lactose, 2 ounces	240

For 3910 Calories a Day:[1] Approximate values—protein, 90 gm.; fat, 250 gm.; carbohydrate, 318 gm

Schedule of Feeding: 9 A. M., 1, 3, 7, 10 P. M. and 1 and 4 A. M.

Milk, 6 ounces; total, 1260 c.c.	860
Cream, 2 ounces; total, 420 c.c.	840
Lactose, 10 gm.; total, 70 gm.	280
Total Calories 1980	

At 11 A. M.:	
Egg, 1	80
Mashed potato (20 gm.)	20
Custard (4 ounces)	250
Toast or bread (1 slice)	80
Butter (20 gm.)	150
Coffee	00
Cream (2 oz.)	120
Lactose (20 gm.)	80
Total Calories 780	

At 5 P. M.:	
Egg, 1	80
Cereal, 3 tablespoonsfuls	150
Cream, 2 ounces	120
Apple sauce, 1 ounce	30
Tea	00
Cream, 3 ounces	180
Lactose, 20 gm.	80
Total Calories 640	

At 7 A. M.:	
Egg, 1	80
Toast, 1 slice	80
Butter, 20 gm.	150

[1] Dr. Coleman, "American Journal of Medical Sciences," 1912, page 77.

	CALORIES
Coffee	00
Cream, 2 ounces	120
Lactose, 20 gm.	80
Total Calories 510	

Milk-sugar lemonade may be substituted for the milk mixture at 3 o'clock.

For 5589 Calories a Day: Approximate values—protein 122 gm.; fat, 293 gm.; carbohydrates, 515 gm.

Milk, 5 ounces, at 9 and 11 A. M., 1 P. M.; 1200 c.c.	820
Cream, 2 ounces at 3, 7 and 10 P. M.; 480 c.c.	1440
Lactose, 15 gm., at 1 and 4 A. M.; 120 c.c.	480
Total Calories 2740	

At 11 *A. M.:*

Eggs, 2	160
Toast, 2 slices	160
Butter, 20 gm.	150
Mashed potato, 70 gm.	70
Custard, 8 ounces	500
Total Calories 1040	

At 5 *P. M.:*

Egg, 1	80
Toast, 2 slices	160
Butter, 20 gm.	150
Cereal, 6 tablespoonfuls	290
Cream, 4 ounces	240
Apple sauce, 1 ounce	30
Cream, 2 ounces	120
Lactose, 20 gm.	80
Total Calories 1150	

At 7 A. M.:

Egg, 1	80
Toast, 2 slices	160
Butter, 20 gm.	150
Coffee	00
Cream, 3 ounces	180
Lactose, 20 gm.	80
Total Calories 650	

For 5570 Calories a Day: Approximate values—protein 106 to 115 gm.; fats, 212 gm.; carbohydrates, 450 to 570 gm.

Milk, 5 ounces, at 9 and 11 A. M., 1 P. M.; 1050 c.c.	700
Cream, 3 ounces, at 7 and 10 P. M.; 630 c.c.	1260
Lactose, 15 gm., at 1 and 4 A. M.; 105 gm.	420
Total Calories 3010	

At 11 *A. M.:*

Eggs, 2	160
Potato (mashed), 80 gm.	80

	CALORIES
Custard, 8 ounces	500
Creamed chicken, 1 ounce	50
Toast, 2 slices	150
Total Calories .950	

At 5 P. M.:

Toast, 2 slices	160
Cereal, 2 tablespoonfuls	290
Cream, 2 ounces	120
Lactose, 20 gm.	80
Total Calories .650	

Use chicken only after convalescence is established.

At 3 P. M.:

Lemonade (lactose, 120 gm.)

At 7 P. M.:

Egg, 1	80
Cereal, 5 tablespoonfuls	250
Cream, 2 ounces	120
Toast, 2 slices	160
Butter, 20 gm.	150
Coffee	00
Cream, 2 ounces	120
Lactose, 20 gm.	90
Total Calories .960	

Other Typhoid Diets

CARTER'S TYPHOID DIET WITHOUT MILK[1]

For 2600 Calories a Day: Approximate values—protein 72 gm. (2⅓ oz.); fat, 126 gm. (4 oz.); carbohydrates, 346. (12 oz.)

6:30 A. M. Cup of hot coffee, sugar 8 gm. (ʒ ii), two slices zwieback or toast (softened), butter.

8:30 A. M. One portion of oatmeal or Robinson's prepared barley. Six buttered crackers or saltines.

10:30 A. M. Soup, various kinds, 180 c.c. (6 oz.). One soft egg.

12:30 P. M. One medium sized baked potato mashed and prepared with butter and salt. Cup of hot, weak tea with sugar, 8 gm. (ʒ ii).

2:30 P. M. Two tablespoons of pudding—tapioca or bread. Six saltines and butter. One soft egg.

4:30 P. M. Rice, farina or cream of wheat, 60 gm. (2 oz.), with butter, 30 gm. (1 oz.) and sugar, 15 gm. (½ oz.).

6:30 P. M. Three slices buttered toast. One soft egg.

8:30 P. M. Soup, 180 c.c. (6 oz.).

[1] Dr. H. S. Carter, "Diet Lists of the Presbyterian Hospital," New York. W. B. Saunders Co., Philadelphia, Pa.

KINNICUTT'S TYPHOID MIXED FLUID DIET[1] NO. I

For 1900 Calories a Day: Approximate values—protein, 98 gm. (3⅓ oz.), fat, 52 gm. (1⅔ oz.); carbohydrates, 150 gm. (5 oz.)

8 A. M.	Milk and coffee, each 120 c.c. (4 oz.).
10 A. M.	Milk, hot or cold, 240 c.c. (8 oz.).
12 Noon	Oatmeal gruel, 120 c.c. (4 oz.), with milk, 60 c.c. (2 oz.).
2 P. M.	Milk, 240 c.c. (8 oz.).
4 P. M.	Oatmeal gruel, 120 c.c. (4 oz.), with milk, 60 c.c. (2 oz.).
6 P. M.	Custard with lactose (full cup).
8 P. M.	Hot milk, 240 c.c. (8 oz.).
10 P. M.	Whey, 180 c.c. (6 oz.), with one whole egg and sherry.
12 P. M.	Oatmeal gruel, 120 c.c. (4 oz.), milk, 60 c.c. (2 oz.).
2 A M.	Milk, 240 c.c. (8 oz.).
4 A. M.	Broth, 240 c.c. (8 oz.), with one whole egg.
6 A. M.	Milk, 240 c.c. (8 oz.).

KINNICUTT'S TYPHOID MIXED FLUID DIET[1] NO. II

(LOWER PROTEIN)

For 2300 Calories a Day: Approximate values—protein, 71 gm. (2⅓ oz.); fat, 81 gm. (2⅔ oz.); carbohydrates, 160 gm. (5⅓ oz.)

8 A. M.	Milk and coffee, each 120 c.c. (4 oz.).
10 A. M.	Milk, hot or cold, 240 c.c. (8 oz.).
12 Noon	Oatmeal gruel, 120 c.c. (4 oz.), with milk, 60 c.c. (2 oz.).
2 P. M.	Junket with cane- and milk-sugar.
4 P. M.	Oatmeal gruel, 120 c.c. (4 oz.), with milk, 60 c.c. (2 oz.).
6 P. M.	Junket with cane- and milk-sugar.
8 P. M.	Hot milk, 240 c.c. (8 oz.).
10 P. M.	Whey, 180 c.c., with one whole egg and sherry.
12 P. M.	Oatmeal gruel, 120 c.c. (4 oz.), with milk, 60 c.c. (2 oz.)
2 A. M.	Junket with cane- and milk-sugar.
4 A. M.	Milk, 240 c.c. (8 oz.).
6 A. M.	Milk, 240 c.c. (8 oz.).

15 gm. (½ oz.) of lactose added to the four milk feedings.

These typhoid fluid diets may be further augmented by the addition of the following articles:

Lactose or cane-sugar, 30 gm. (1 oz.), 120 calories.
Pea soup, 180 c.c. (1 cup, 6 oz.), 192 calories (7.5 gm. protein).
Bean soup, 180 c.c. (1 cup, 6 oz.), 242 calories (12 gm. protein).
Soda cracker (one), 30 calories (.5 gm. protein).

Cream	100 c.c. (3⅓ oz.).	500 calories.
Sugar or lactose	60 gm. (2 oz.).	
Gruel	150 c.c. (5 oz.).	

[1] Dr. F. P. Kinnicutt, "Diet Lists of the Presbyterian Hospital," New York. W. B. Saunders Co., Philadelphia, Pa.

Kinds of Food to Use in a Mixed Typhoid Diet[1].—When the typhoid patient is not limited to a fluid diet, foods may be chosen from the following:

1. Milk in various forms.
2. Broths—beef, veal, chicken, mutton.
3. Soups—potato, pea, bean, carefully strained and thickened with flour, milk, cream and egg.
4. Gruels—always strained.
5. Eggs, raw or soft-cooked.
6. Cream and butter.
7. Custards, ice cream and sherbets, blanc manges, and gelatin jellies. Milk sugar used for sweetening will increase the fuel value.
8. Toast.
9. Breakfast cereals, thoroughly cooked and strained.
10. Rice, baked and mashed potatoes.
11. Apple sauce, orange juice and grape juice.

DIET IN OTHER FEBRILE DISEASES

Scarlet Fever

Food Needs.—As in other fever conditions a rather high calory diet should be given, but because of danger of serious kidney complications the proteins should be kept low. Eggs are excluded at first and no meat should be given until danger of complications is past.

Kinds of Food to Use.—The diets recommended for typhoid, including milk gruels and milk toast but without eggs, are quite suitable.

Should indication of nephritis appear diets recommended for that condition should be adopted.

Whooping Cough

Food Needs.—The danger in whooping cough is from undernourishment. Paroxysms of coughing often give rise

[1] Mary Swartz Rose, Ph.D., "Feeding the Family," The Macmillan Co., New York, 1921.

to vomiting and these frequently follow so closely the taking of food that it has no chance to become assimilated. In such cases it is better to give food in smaller quantities and often, possibly every two hours, rather than to depend on the regular three meals a day.

Kinds of Food to Use.—The diet should be made up of foods that can be quickly digested and assimilated. Anything that is at all irritating or liable to excite coughing, such as dry toast or the bran of coarse breads and cereals, should be avoided. The liquid and soft high calory diets recommended for typhoid fever would be suitable to use.

Measles

Food Needs are about the same as with any infectious disease accompanied by fever. There is nothing to be especially avoided and the calory value should be kept up.

Kinds of Food to Use.—Soft and semi-fluid food should be used—gruels, soft-cooked eggs and gelatin dishes.

Cautions.—Because of the nature of the disease, which is characterized by eruptions not only on the surface of the body but on the mucous linings of the intestines, care should be taken to avoid food that would be in any way irritating to these surfaces. After the eruption disappears the diet may be returned rapidly to normal.

Influenza[1] (Grippe)

The fever is the determining factor in this disease and the patient may have any simple foods that his appetite calls for, following for the most part the suggestions for feeding in fevers in which there are no special dietary indications. Since the manifestations of grippe are so varied, the diet may often be judiciously regulated in view of the particular organs affected, i.e., if the bronchial tree is principally involved the feedings should be regulated as in bronchitis; if the gastro-intestinal form is present, due regard must be had

[1] Carter, Howe and Mason, "Nutrition and Clinical Dietetics," Lea & Febiger, Philadelphia, Pa.

to giving foods which are non-irritating to the stomach and intestine; when there is vomiting, particular care is necessary. In these circumstances, after a few hours of absolute gastric rest one may give small amounts of buttermilk, either plain or diluted with Vichy.

Delafield's mixture[1] is often well borne when the patients can take nothing else. This consists of equal parts of milk, cream and Vichy, with sodium bicarbonate 20 grains, cerium oxalate 10 grains, to each 4 ounces of the mixture. This should be given iced and in dram doses, at first every twenty to thirty minutes, gradually increasing the amount and lengthening the period. Sometimes iced malted milk will be retained or egg white with orange juice and powdered ice. Afterward the patient can take a moral liberal diet of soft solids, then increasing rapidly to full diet.

Throat Affections

Food Needs.—Diets in such affections as tonsilitis, quinsy and diphtheria with attending fever, do not differ essentially from those used in other fever conditions. The energy requirement should be fully met, as a well-nourished body may more easily combat anemia or bronchial and pulmonary complications which sometimes follow these diseases.

Kinds of Food to Use.—The inflammation of the throat makes the act of swallowing painful and food that is least irritating should be given, such as liquids and semi-solids. The latter are sometimes less painful to swallow than liquids. If a diet of high calory value is used it is possible to lessen the total volume. Diets recommended for typhoid fever may be used to advantage with these diseases.

Acute Rheumatic Fever[2]

"During the past few years there has been a complete change in the conception of the etiology of this disease. The humoral theory or, to put it in modern language, the theory

[1] See page 181.

[2] Carter, Howe and Mason, "Nutrition and Clinical Dietetics," Lea & Febiger, Philadelphia, Pa. 2nd Edition, 1921.

of a disturbed body metabolism, as the cause of this disease, has been entirely superseded by the proved infectious origin of much of this form of articular inflammation. Much experimental work has been done to prove this latter and numerous observers have been able, by inoculation of animals with cultures from the throats of rheumatic patients, to produce attacks of joint inflammation which closely resemble the conditions found in this disease. The offending organism said to be responsible for this, and obtained from the tonsils, abscesses at the roots of teeth or, in fact, from any focus of pus infection, is a form of streptococcus. Whether there is a distinct strain of this bacterium which causes only rheumatic lesions is exceedingly doubtful. It is much more likely that it is one of the ordinary groups of streptococci, which, for some as yet unknown reason, has a predilection for the serous membranes of the body, particularly those of the joints and heart. The humoral theory of this disease therefore has been almost completely given up for a bacterial conception. It is still true that marked metabolic changes accompany the condition, as shown by the excessive acid perspiration and excessive urinary acidity, greater than that which is found in any other disease except possibly in a marked diabetic acidosis. It is not at all unlikely that the metabolic changes which often precede a rheumatic manifestation may have much to do with lowered resistance to the streptococci as is the case in rheumatism."

Food Needs.—So far as the infection is concerned the food requirements would be practically the same as in general fever conditions but the hyperacidity of the excretions, especially the sweat and urine, must be considered and call for a more restricted diet.

Kinds of Food to Use.—"For the first few days of acute fever after a thorough intestinal purge, the diet should consist mainly of milk products and gruels, such as plain milk, milk cream and Vichy, junket, Vichy and buttermilk, barley, rice and farina gruels. Water in large amounts is grateful, either plain as Vichy, or as orange and lemonade made with very little sugar. Feedings should be given every two or three hours."

Later when the acute stage of illness has passed, other cereals, stale bread and butter, may be added as the patient desires more food. Oranges and scraped or baked apple may be used, also baked potato, then green vegetables. Of protein foods other than milk, egg is first given. After ten days or two weeks of normal temperature chicken and white meated fish, as bass, cod and halibut may be given.

Foods to Avoid.—Exclude meat and meat soups from the diet. Because of their purin content they tend to increase the uric acid in the blood. Sugar should be used very sparingly, if at all, since it may produce acid fermentation in the digestive tract. Tea and coffee may be given very moderately and well diluted with milk or water. Avoid all preserves, cakes, rich, sweet food and highly acid fruits. Strawberries, tomatoes and rhubarb are to be avoided. Their ill effect is often observed, although not scientifically accounted for.

QUESTIONS FOR STUDY

THE FEVER DIET

1. What is the cause of loss of weight in fevers?
2. How may this be avoided?
3. How many calories should the diet in the average fever case furnish?
4. How is the protein requirement in fever compared with that in health?
5. What type of food should predominate in the fever diet?
6. How is the food requirement determined?
7. What difficulties may arise in the use of these diets and how may they be overcome?
8. What are the advantages of a high calory diet in typhoid fever?
9. Give a list of food that may be used in typhoid fever.
10. Outline a day's dietary furnishing about 3000 calories.

OTHER FEBRILE DISEASES

11. State food restrictions in scarlet fever. Why?
12. What foods may be given?
13. What should be the diet for the whooping cough patient?
14. What care is needed in arranging diet for measles cases?
15. Discuss diet in influenza.
16. Discuss diet in rheumatic fever.
17. What foods should be avoided?

CHAPTER XV

DIET IN DISTURBANCES OF METABOLISM AND ACIDOSIS

Diabetes Mellitus

Metabolism in Diabetes.—The underlying cause of diabetes mellitus is generally considered to be a derangement of one of the functions of the pancreas. This gland produces two secretions, the external secretion, discharged into the small intestine and known as the pancreatic juice (see page 30) containing enzymes for the digestion of protein, carbohydrate and fat, and an internal secretion thought to be a product of certain cells (the Islands of Langerhans) within the pancreas, which is discharged into the blood and regulates the body's power to utilize carbohydrate. When this ability to oxidize carbohydrate is affected sugar accumulates in the blood (hyperglycemia) and escapes into the urine. The outstanding symptom of diabetes mellitus is the appearance of sugar in the urine.

Protein as well as carbohydrate may contribute to the formation of sugar in the blood, and in severe cases protein and fat. Fat, and to a lesser extent protein, because of being incompletely burned, may give rise to acids in the blood which produce the condition known as acidosis. This occurs in severe cases and in all cases when the quantity of calories furnished by carbohydrate in the diet is under about ten per cent. of the total calories oxidized by the individual.

Method of Treatment.—In the older method of treatment of diabetes the carbohydrate was reduced and the amount of fat and protein in the diet increased in an attempt to make up the deficit in calories. Acidosis frequently resulted.

The modern method involves the restriction of the quantity and variety of food to such an extent as will remove sugar from the urine. This is done either by complete fasting, by the withdrawal of fat from the diet and the subsequent reduction of carbohydrate and protein to a point at which the urine is sugar-free, or by a reduction of the total calories of the diet to about one-half that required, making this up from about 12 grams of protein and the same quantity of carbohydrate with the remainder from fat. Of the three methods the first has been advocated by Allen, the second by Joslin and the third by Newburgh and Marsh. Recently Joslin has suggested a simple plan by which the diabetic patient can be made sugar-free and thereafter the diet built up to a maintenance level. The plan combines many of the advantages without the extremes of other methods and is described on the following page.

DIABETIC DIETS—Dr. E. P. Joslin

DIETS WITH WHICH TO BECOME SUGAR-FREE	DIET IN GRAMS				TEST DIETS														NAME OF DIET
	Carbo-hydrate	Protein	Fat	Calories	5% Vegetable	Orange	Oatmeal	Shredded Wheat	Uneeda	Potato	Bread	Egg	Cream 20% fat	Bacon	Butter	Meat	Fish	Skimmed Milk	
T. D.1	189	89	15	1247	300	300	....	1	....	240	90	....	....	....	....	90	120	480	1
T. D.2	102	58	0	640	300	300	....	1	....	120	...	....	....	....	....	....	180	300	2
T. D.3	64	33	0	388	300	300	....	....	....	160	....	....	....	....	....	....	90	240	3
T. D.4	36	27	0	252	300	200	....	....	....	....	....	....	....	....	....	....	90	120	4
T. D.5	15	5	0	80	300	50	....	....	....	....	....	....	....	....	....	....	....	....	5
MAINTENANCE DIETS					CARBOHYDRATE (C)							PROTEIN AND FAT (PF).							
C1+PF1	10	11	6	138	300	....	....	....	....	....	....	1	....	....	....	....	....	....	1
C2+PF2	22	13	18	302	300	100	....	....	...	....	....	1	60	....	....	....	....	....	2
C3+PF3	32	24	24	440	600	100	....	....	....	....	....	2	60	....	....	....	....	....	3
C4+PF4	42	29	39	635	600	200	....	....	....	....	....	2	60	30	....	....	....	....	4
C5+PF5	52	32	53	813	600	200	15	....	....	....	....	2	60	30	15	....	....	....	5
C6+PF6	63	43	65	1009	600	200	30	....	....	....	....	2	90	30	15	30	....	....	6
C7+PF7	73	51	70	1126	600	300	30	....	....	....	....	2	90	30	15	60	....	....	7
C8+PF8	83	59	87	1351	600	300	30	....	2	....	....	2	90	30	30	90	....	....	8
C9+PF9	96	62	93	1469	600	300	30	½	2	....	....	2	120	30	30	90	....	....	9
C10+PF10	107	63	93	1517	600	300	30	1	2	....	....	2	120	30	30	90	....	....	10
C11+PF11	131	75	98	1706	600	300	30	1	2	120	....	2	120	30	30	120	....	....	11
C12+PF12	155	79	98	1818	600	300	30	1	2	240	....	2	120	30	30	120	....	....	12

FOOD	WEIGHT IN GRAMS	APPROXIMATE EQUIVALENT
Orange	300	One and one-half (large size)
5 per cent vegetables	300	Three moderate portions
Skimmed milk	480	One pint (16 ounces)
Fish	120	Two small porttions
Potato	240	Two medium-sized potatoes
Meat	90	One moderate portion

FOOD	WEIGHT IN GRAMS	APPROXIMATE EQUIVALENT
Bread	90	Three small slices
Oatmeal (dry wgt.)	30	One large saucerful
Cream	60	Four tablespoonfuls
Bacon	30	Four crisp strips
Butter	30	Three medium portions

Patients are put first on the test diets, changing from Test Diet 1 to Test Diet 2 at the end of twenty-four to seventy-two hours, similarly from Test Diet 2 to 3, 3 to 4, 4 to 5.

The Test Diets are designed for the period during which the patient becomes gradually sugar-free. On successive days advances may be made from Test Diet 1 to Test Diet 5, and if on the fifth day the patient is not sugar free, fasting may be employed for one or more days.

The Maintenance Diets are for use as soon as the urine of the patient is free from sugar. If this occurs as a result of Test Diet 5 the patient begins with Maintenance Diet C1 PF1. The actual articles of food representing the carbohydrate in the diet for the first day are given under the heading of carbohydrate, for convenience described C1, 2, 3, etc. The articles referred to under protein and fat are under that heading, which for the same reason is described as PF1, 2, 3, etc. Certain cases of diabetes can proceed steadily day by day from C1 PF1 to C12 PF12, without showing sugar. If sugar does appear in the urine, drop back two days in the carbohydrate group, wait till sugar-free, then advance in the protein and fat group until sufficient calories are obtained. Thus, if sugar shows on C7 PF7 the diet prescribed would be that included in C5 PF7 and thereafter progression could be made in the PF group until twenty-five to thirty calories per kilogram body weight were furnished the patient.

Occasionally the patient becomes sugar-free on Test Diet 2, 3, or 4. It is then unnecessary to begin with Maintenance Diet C1 PF1, but instead with a maintenance diet which contains a value for carbohydrate similar to that of the test diet upon which the patient became sugar free.

If the protein and fat are too high for the individual on a given day it is easy to advance the carbohydrate and decrease to an earlier day on protein and fat.

The plan is arbitrary and the majority of cases will demand some modification. It is arranged to enable patient or nurse to see in advance the general plan of treatment.

When the patient's tolerance for carbohydrate, protein and fat have been determined, his diet must be planned to keep within the limits set. This requires a knowledge of the composition of foods, the methods of calculating food values, and access to such tables as are given on the following page in which fruits and vegetables are grouped according to the percentage of carbohydrate which they contain.

FOODS ARRANGED APPROXIMATELY TO PERCENTAGE OF CARBOHYDRATES—Dr. E. P. Joslin

WATER, CLEAR BROTHS, COFFEE, TEA, COCOA SHELLS AND CRACKED COCOA MAY BE TAKEN WITHOUT ALLOWANCE FOR FOOD CONTENT

FOODS ARRANGED APPROXIMATELY ACCORDING TO CONTENT OF CARBOHYDRATES.

	5%		10%	15%	20%
	* Reckon average carbohydrate in 5% veg. as 3%—of 10% veg. as 6%				
	1%–3%	3%–5% *	10% *	15%	20%
VEGETABLES (fresh or canned)	Lettuce Cucumbers Spinach Asparagus Rhubarb Endive Marrow Sorrel Sauerkraut Beet Greens Dandelion Greens Swiss Chard Celery Mushrooms	Tomatoes Brussels Sprouts Water Cress Sea Kale Okra Cauliflower Egg Plant Cabbage Radishes Leeks String Beans canned Broccoli Artichokes canned	String Beans Pumpkin Turnip Kohl-Rabi Squash Beets Carrots Onions Green Peas canned	Green Peas Artichokes Parsnips Canned Lima Beans	Potatoes Shell Beans Baked Beans Green Corn Boiled Rice Boiled Macaroni
FRUITS	Ripe Olives (20% fat) Grape Fruit		Watermellon Strawberries Lemons Cranberries Peaches Pineapple Blackberries Gooseberries Oranges	Raspberries Currants Apricots Pears Apples Huckleberries Blueberries Cherries	Plums Bananas Prunes

1 gram protein, 4 calories.
1 " carbohydrate, 4 "
1 " fat, 9 "
6.25 " protein contain 1g. nitrogen.

1 kilogram=2.2 pounds
30 grams g or cubic centimeters c.c.=1 ounce.
A patient "at rest" requires 25 calories per kilogram.

(30 grams 1 oz.) CONTAIN APPROXIMATELY	CARBOHYDRATES G.	PROTEIN G.	FAT G.	CALORIES
Oatmeal, dry wgt.	20	5	2	118
Shredded Wheat	23	3	0	104
Cream, 40%	1	1	12	116
" 20%	1	1	6	62
Milk	1.5	1	1	19
Brazil Nuts	2	5	20	208
Oysters, six	4	6	1	49
Meat (uncooked, lean)	0	6	3	51
" (cooked, lean)	0	8	5	77
Chicken (cooked, lean)	0	8	3	59
Bacon	0	5	15	155
Cheese	0	8	11	131
Egg (one)	0	6	6	78
Vegetables, 5% group	1	0.5	0	6
Vegetables, 10% group	2	0.5	0	10
Potato	6	1	0	28
Bread	18	3	0	84
Butter	0	0	25	225
Oil	0	0	30	270
Fish, cod, haddock (cooked)	0	6	0	24
Broth	0	0.7	0	3
Fruit, 10%	3	0	0	12

Under certain conditions it is desirable to employ more detailed values than those given in the preceding tables. In such case the following tables will prove serviceable.

CARBOHYDRATE CONTENT FOOD LIST[1]

(FROM LOWEST TO HIGHEST)

Dr. Frederick M. Allen

Edible Portion	Protein %	Fat %	Carbohydrate %
Meats			
Bacon	33.0	67.2	
Bacon, crisp	33.0	10.0	
Beef, Sirloin, very lean	20.5	6.4	
Beef, Round, very lean	20.8	8.0	
Chicken, Broiler	15.0	3.0	
Ham, very lean	20.2	20.8	
Pork, Tenderloin	19.5	14.4	
Pork, Loin	19.7	19.0	
Lamb, Leg.	19.1	12.4	
Veal, Leg	21.0	3.6	
Fresh Fish			
Sea Bass	18.8	0.5	
Blue Fish	19.0	1.2	
Cod, fresh	15.8	0.4	
Flounder	13.9	0.6	
Halibut	18.3	5.2	
Salmon	20.6	12.8	
Shad Roe	20.9	3.8	2.6
Shad, whole	18.6	9.5	
Vegetables			
Cucumbers, fresh	0.8	0.2	3.0
Asparagus, fresh	1.8	0.2	3.3
Asparagus, canned	1.5	0.1	2.8
Celery, fresh	1.4	0.1	3.0
Spinach, fresh	2.1	0.5	3.1
Lettuce, fresh	1.3	0.4	3.0
Brussels Sprouts, canned	1.5	0.1	3.4

[1] "It must be recognized that all foods vary in composition. For this reason no table can be exact and we no longer use decimals in our calculations, merely taking the percentages in the form of the nearest whole numbers. Cooked foods are particularly uncertain because of differences in cooking. The value of crisp bacon, for example, varies with the kind of bacon, the thoroughness of frying and removing fat, etc., but the figure given is a fair approximation according to analyses. In general, it is safest for patients to count foods at their highest values, rather than at the lowest."—Dr. Frederick M. Allen, The Physiatric Institute, Morristown, N. J.

Edible Portion	Protein %	Fat %	Carbohydrate %
Vegetables (Continued)			
Rhubarb, fresh	0.6	0.7	3.6
Beans, String, canned	1.1	0.1	3.9
Tomatoes, fresh	0.8	0.4	3.9
Tomatoes, canned	1.2	0.2	4.0
Brussels Sprouts, fresh	4.7	1.1	4.3
Sauerkraut	1.5	0.8	4.4
Artichokes, canned	0.8		5.0
Leeks	1.2	0.5	5.8
Eggplant, fresh	1.2	0.3	5.1
Pumpkin, fresh	1.0	0.1	5.2
Cucumber pickles	0.5	0.5	5.4
Kohl-rabi, fresh	2.0	0.1	5.5
Cabbage, fresh	2.1	0.4	5.8
Cauliflower, fresh	1.6	0.8	6.0
Radishes, fresh	1.4	0.1	6.6
Turnips, fresh	1.4	0.2	8.7
Carrots, fresh	1.1	0.4	9.2
Beans, String, fresh	2.2	0.4	7.0
Beets, fresh	1.6	0.1	9.6
Peas, Green, canned	3.6	0.2	9.8
Onions, fresh	1.7	0.4	9.9
Squash, fresh	1.6	0.6	9.0
Lima Beans, canned	4.0	0.3	14.6
Corn, Green, fresh	3.0	1.1	20.0
Peas, Green, fresh	7.0	0.5	17.0
Parsnip, fresh	1.7	0.6	14.0
Artichoke, fresh	2.6	0.2	16.7
Potatoes, fresh	2.1	0.1	18.0
Lima Beans, fresh	7.1	0.7	22.0
Bread	9.5	1.2	52.8
Fruits			
Grapefruit			5.0
Watermelon	0.3	0.1	6.5
Strawberries	1.0	0.1	6.8
Blackberries	0.9	0.2	11.0
Muskmelon	0.6		9.3
Peaches	0.7	0.1	9.4
Pineapple	0.4	0.3	9.7
Orange	0.8	0.6	9.7
Lemon Juice			9.8
Cranberries	0.5	0.7	10.1
Raspberries	1.0		12.6
Grapes	1.0	2.0	19.0
Apricots	1.1		13.4

Edible Portion	Protein %	Fat %	Carbohydrate %
Fruits (Continued)			
Pears	0.6	0.8	14.2
Apples, Sweet	0.5	0.5	20.0
Apples, Sour	0.5		14.0
Dairy Products			
Eggs, 1	7.5	5.5	
Eggs, 100 gms.	13.4	10.6	
Butter		85.0	
Whole Milk	3.3	4.0	5.0
Buttermilk	3.0	0.5	4.8
Whiting's Milk (Sugar of Milk)	5.97	7.36	
Cream, Average	3.0	20.0	5.0
Cheese			
Dutch	37.1	17.7	
Cheddar	28.2	32.0	
Cheshire	26.9	31.6	
Cream	25.9	31.7	
American, pale	28.8	36.2	
American, red	29.6	38.3	
Limburger	23.0	29.4	0.4
Boudon	15.4	21.7	0.7
Swiss	27.6	34.9	1.3
Brie	15.9	21.0	1.4
Neufchatel	18.7	27.4	1.5
Roquefort	22.6	29.5	.8

FIVE PER CENT. VEGETABLES (FRESH OR CANNED)

When cooked 5% vegetables yield for each 10 gm. approximately, protein, 0.1 gm., carbohydrate, 0.3 gm., calories, 1.6.

Asparagus	Pickles, sour or dill
Brussels Sprouts	Pumpkin
Cabbage	Radishes
Cauliflower	Rhubarb
Celery	Sauerkraut
Cucumbers	Sorrel
Eggplant	Spinach
Endive	String beans
Greens from beets	Swiss chard
Kohlrabi	Tomatoes
Leeks	Watercress
Lettuce	Wax beans

CALORIC EQUIVALENTS IN FISH AND MEAT

	GM.	PRO. GM.	FAT GM.	CAL-ORIES
Fish:				
*Bass, black	19	3.9	0.3	19
*Bass, sea	23	4.6	0.1	20
*Blue fish	13	3.6	0.6	20
Butterfish	11	2.0	1.2	19
*Codfish, fresh	19	4.1	0.1	18
*Codfish, salt	17	4.6	0.1	20
*Flounder	30	4.3	0.2	20
*Haddock	19	4.2	0.1	18
*Halibut	15	3.1	0.6	18
Herring, smoked	6	2.2	1.0	18
Mackerel, fresh	14	2.4	1.0	19
Mackerel, salt	6	1.0	1.6	19
*Perch	17	3.3	0.7	20
*Pike	24	4.5	0.1	19
*Porgy	16	3.0	0.8	20
Salmon, fresh	11	2.2	1.1	19
Salmon, canned	10	2.2	1.2	20
Sardines, canned	7	1.6	1.4	20
Shad	12	2.3	1.1	20
*Shad roe	15	3.1	0.6	18
*Smelts	22	3.5	0.4	18
*Trout	17	3.6	0.4	18
*Weakfish	20	3.6	0.5	19
*White fish	12	2.7	0.8	19
Meats:				
Bacon	7	0.9	1.6	19
Beef brains	16	1.4	1.5	19
Beef, corned	6	0.9	1.6	19
*Beef, dried	9	3.5	0.5	19
Beef, roast	5	1.1	1.4	18
*Beef, roast, very lean	17	4.0	0.3	19
*Beefsteak, round, lean	10	2.8	0.8	19
Beefsteak, sirloin, lean	10	2.4	1.	19
Beefsteak, tenderloin	7	1.7	1.4	20
Beef tongue	12	2.3	1.1	20
Capon	9	2.4	1.0	19
*Chicken	11	3.5	0.5	19
Duck	6	1.0	1.6	19
Ham, fresh	5	0.8	1.7	19
Ham, smoked	4	0.7	1.6	13
Ham, smoked, boiled	7	1.4	1.6	20
Ham, smoked, fried	5	1.1	1.7	20
*Guinea hen	12	2.8	0.8	19
*Kidney	17	2.8	0.8	19

*May be used in "Lowest Fat" Diets.

	GM.	PRO. GM.	FAT GM.	CAL-ORIES
Lamb chop	5	1.1	1.5	19
Lamb roast	10	2.0	1.3	20
*Mutton chop, lean............	14	3.2	0.6	19
*Mutton, boiled, lean	11	3.4	0.5	19
Mutton, roast	6	1.5	1.4	19
Pork chop, lean	12	3.1	0.7	19
Pork, roast	9	2.6	0.9	19
Squab	7	1.3	1.6	20
*Sweetbreads	11	4.4	0.1	19
Turkey, roast	7	2.0	1.3	20
*Veal, roast or chop, lean	14	4.0	0.2	18

As an example of how to apportion the test diets throughout the day, the following arrangement of Test Diet 1, page 381, is given.

TEST DIET I

		C.	P.	F.	Cal.
Breakfast:					
Orange	100 grams	10			40
Shredded Wheat	1	23	3		104
Bread	30 grams	18	3		84
Skimmed Milk..........	180 grams	18	6		60
Boiled Fish	90 grams		18		72
		60	30		360
Noon					
Orange	100 grams	10			40
5% Vegetables	150 grams	5	3		32
Potato	120 grams	24	4		112
Bread	30 grams	18	3		84
Skimmed Milk...........	150 grams	8	5		52
Meat	60 grams		16	10	154
		65	31	10	474
Night:					
Orange	100 grams	10			40
5% Vegetables	150 grams	5	3		32
Potato	120 grams	24	4		112
Bread	30 grams	18	3		84
Skimmed Milk...........	150 grams	8	5		52
Meat	30 grams		8	5	77
Fish	30 grams		6		24
		65	29	5	421

*May be used in "Lowest Fat" Diets.

For the sake of convenience in prescribing and calculating diets the following general plan should be employed.

Name Date

FOOD	BREAK-FAST	DINNER	SUPPER	TOTAL GRAMS	CAR-BOHY-DRATE	PRO-TEIN	FAT
5% veg.	......	......	......	......	......	......	......
10% veg.	......	......	......	......	......	......	......
Eggs	......	......	......	......	......	......	......
Meat Cooked	......	......	......	......	......	......	......
Chicken	......	......	......	......	......	......	......
Fish	......	......	......	......	......	......	......
Bacon	......	......	......	......	......	......	......
Butter	......	......	......	......	......	......	......
Cream, 20%	......	......	......	......	......	......	......
Oatmeal	......	......	......	......	......	......	......
....	......	......	......	......	......	......	......
Total Grams					......	......	......
Multiply for Calories					4	4	9
					......	......	......
Total Calories = ...					......	......	......

A compact record comparing urinary findings with dietary prescriptions for corresponding twenty-four hours should be kept in every case. For this purpose the chart given on the following page is useful.

Often, on account of the severity of the case, it is necessary to keep more detailed records of the condition of the urine, blood and alveolar air with corresponding record of diet and patient weight. When this is the case, the chart given on the following page will be found useful.

Date	URINE				BLOOD		DIET IN GRAMS				WGT	DIETARY DESCRIPTIONS IN GRAMS
	Vol. C.C.	Di-acetic Acid	SUGAR Per Cent.	SUGAR Total G.			Carb.	Prot.	Fat.	Cal.		

No. Name

Date	Vol. c.c.	Sp. Gr.	Reac.	Alb.	Ace-tone	Di-acetic Acid	Sodium Chlor-ide	Ni-tro-gen G.	Am-monia Total G.	SUGAR IN URINE		
										Reduc-tion %	Polar-ization %	Total G.

Present Weight in Kilograms

DIET IN GRAMS				Carbo-hy drate Balance G.	Naked Weight Lbs.	Non Protein Nitro-gen	Bloor's Blood Fat %	Blood Sugar %	Blood CO mm Hg	Alveo-lar air CO_2 mm Hg	REMARKS
Carbo-hydrate	Pro-tein	Fat	Cal-ories								

Cautions.[1]—Patients should eat too little rather than too much. With a return to normal weight sugar may appear.

All food should be eaten slowly and the coarser the food the more thoroughly it should be masticated.

If in doubt about a food, let it alone until you have found out whether it is allowed. Do not yield to the temptation to break the diet, for if this is done the plan of treatment is upset, a week's time may be lost and several pounds of weight sacrificed.

So-called diabetic foods often contain considerable quantities of carbohydrate and usually so much protein and fat that they should not be taken by the patient without due allowance for the same. They should not be taken under any circumstances unless their composition is known.

The carbohydrate in the diet should be divided between the three meals. Even if the 10 per cent., 15 per cent. and 20 per cent. vegetables are allowed, vegetables from the 5 per cent. group should be taken as well. Usually it is allowable to substitute for a given quantity of 5 per cent. vegetables one-half as much from the 10 per cent. group, one-quarter as much from the 15 per cent. or one-sixth as much from the 20 per cent.

[1] Dr. E. P. Joslin, "Diabetic Manual," Lea & Febiger, Philadelphia, Pa., 1919.

Other Diabetic Diets

RÉGIME FOR SURGICAL DIABETIC PATIENTS

In use in the Peter Bent Brigham Hospital, August, 1921.

PRE-OPERATIVE	PROTEIN	FAT	CARBO-HYDRATES	CALORIES
1st day	100	—	100	800
2nd day	50	—	50	400
3rd day	0	—	25	100
4th day	0	—	10	40
5th day	0	—	0	
If patient is not sugar-free after starvation for three days, give the following diet	15	—	0	60
	20	—	0	80
	0	0	0	
Sugar-Free "Building Diet."				
1st day	10	—	0	
2nd day	20	—	0	80
3rd day	35	—	5	160
4th day	50	—	10	240
5th day	50 [1]	— [2]	15 [3]	260 [4]

[1]Increase gradually to 1 gm. per kilo of body weight.
[2]Add fat gradually to increase calories.
[3]Increase slowly so as to get 3 gms. per kilo body weight.
[4]Increase to 25-30 calories per kilo body weight.

Post-operative diet will have to be regulated in many cases as the severity of acidosis is determined. A higher carbohydrate diet of longer duration than charted should be followed.

POST-OPERATIVE	—	—	60	240

This should be given in the form of Orange Juice and Oatmeal Gruel every three hours. This until no acid.

Put patient on following diet and will probably become sugar-free in the course of a few days.

1st day	10	—	10	80
2nd day	20	—	10	120
3rd day	35	—	15	200

If sugar-free, increase diet as directed before in "Building Diet."

This chart is for a general outline. Many cases will have to be treated individually.

Building Diet.[1]—When the urine has been sugar-free for one day, add 10 grams of protein, next day give 20 grams of protein in the form of meat and thereafter add daily 15 grams of protein in the form of meat until the patient is receiving 1 gram of protein per kilo of weight. In very severe cases, go more slowly and add protein in the form of meat later.

When the urine has been sugar-free for two days, increase the above diet by addition of 5 grams of carbohydrate and continue to add 5 grams daily up to 20 grams and then add 5 grams every other day up to 3 grams of carbohydrates per kilo of body weight.

Next, gradually add fat as such to raise the diet to adequate caloric value.

The reappearance of sugar in the urine at any time indicates a reduction in diet. The appearance of diacetic acid and acetone in the urine indicates caution in the use of fat.

The aim of dieting should be to attain about 75 grams of protein and as much carbohydrate as the patient will tolerate and remain daily sugar-free, and fat to give a fair caloric intake.

DIABETES MELLITUS IN ITS MILD FORM

Diabetes mellitus in its mild form can frequently be controlled by no further restriction in the diet than that the patient be limited to the foods found in the tables presented on page 384. With very rare exceptions the way for even these mild diabetics to begin is by getting the urine sugar-free and then gradually adding to the diet as suggested on page 381 under Maintenance Diets.

Gout

Metabolism.—In gout the body's ability to metabolize purins is impaired and with this there is frequently a difficulty in uric acid excretion. The result is an accumulation

[1] In use in the Peter Bent Brigham Hospital, Boston, Mass., August, 1921.

of uric acid in the blood. Uric acid is formed in the body in two ways: (1) from the metabolism of nucleic acid derived from the nucleo-proteins of the food or body tissues, and, (2) from foods containing free purins. There is always a small amount of uric acid in normal blood and urine, but in gouty conditions the blood contents of uric acid is increased.

Food Needs.—The aim in feeding gout is to give a diet which will not increase the uric acid in the blood, that is, one which contains little or no nucleo-protein or free purins, and which will meet the body's needs for protein, at the same time keeping the quantity of protein low. Carter, Howe and Mason suggest a diet for man containing not over 50 to 70 grams of protein per 70 kilogram per day. The caloric value of the diet is regulated by the condition of the patient; if he is much overweight, as he frequently is, the amount of food must be correspondingly reduced; if he is under-nourished the energy value of the diet should be such as to correct this condition.

Foods to Avoid.—Foods rich in purins should be rigidly excluded from the diet. These include:

Meat ....Glandular organs such as liver, kidney and sweetbreads, which contain considerable amounts of nucleoprotein. Beef, veal, mutton, pork, chicken, turkey, goose and other kinds of game.
Boiling meat, especially if boiled in two waters, removes a great part of the purins and such small amounts as remain are occasionally permitted.

Soups ....Made from meat stocks.

Fish ....Of all kinds, except cod.

Vegetables ....Asparagus, spinach, peas and beans.

Beverages .....Coffee, tea and cocoa, except in small amounts. Alcoholic beverages.

Rich gravies and sauces, pastries, concentrated sweets, spices and other condiments. Salt may be used in moderation but an excess should be avoided.

Kinds of Food to Use:

a. Purin-Free Foods.
 Milk, cream, butter and cheese.
 Eggs.

White bread and flour.
Cereals (hominy, rice, farina and wheat).
Cornstarch, tapioca.
Sugar and syrup.
Jam and marmalade.
Potatoes and other root vegetables.
Green vegetables with the exception of those listed above.
Nuts, gelatin and friuts.

b. Low-Purin Foods.[1] Used only when physician prescribes; fluid intake also to be regulated under his supervision.

Breakfast:

Fruit ....Fresh, cooked or preserved.
Cereal ......Any kind with sugar and milk or cream.
Bread ......White bread, toast, biscuits, muffins with butter.
Eggs ....In any form except fried.
Milk ....Seasoned with a very little cocoa, tea or coffee.

Lunch and Dinner:

Soup ....Cream soup, using any of the low-purin content vegetables. (See Purin-Content Food List, page 397)
Fish or Meat. Any of the following once a day: Boiled fish, boiled chicken, boiled mutton, boiled beef, pot roast, boiled ham.
Vegetables ..Brussels sprouts, cabbage, cauliflower, corn, eggplant, lettuce, okra, white or sweet potatoes, spinach, macaroni, noodles, rice.
Bread ......White bread, toast, crackers with butter.
Desserts ....All fruit cooked or fresh, ice cream, pudding, cake, pie and all desserts not flavored with chocolate, coffee or cheese.

Beverages .....Milk, water, all carbonated waters, cider, grape juice.

Desirable limits for calories and proteins for a Low-Purin Diet:

Women, 1800 calories a day: Approximate values to be given—Protein, 50 gm. (2 oz.); carbohydrates, 300 gm. (10 oz.); fat, 50 gm. (1 2/3 oz.).

Men, 2200 calories a day: Approximate values to be given—Protein, 60 gm. (2 oz.); carbohydrates, 350 gm. (11 2/3 oz.); fat, 60 gm.

[1] Modified from Dr. Carter's "Presbyterian Diet Lists," W. B. Saunders Co., Philadelphia, Pa.

PURIN-CONTENT FOOD LIST[1]

	Grams Per Kilo
Fish:	
Codfish*	1.0
Halibut	1.0
Salmon	1.1
Meat:	
Beef Liver*	2.6
Beef Sirloin*	1.5
Beef Sweetbread*	10.6
Chicken*	1.3
Ham	1.1
Mutton	1.0
Pork (Loin)	1.2
Turkey	1.3
Veal	1.1
Meat Soups: (purin-content large).	
Vegetables:	
Asparagus	0.2
Beans (Haricot)	0.6
Cabbage	0.0
Cauliflower	0.0
Lentils	0.4
Lettuce	0.0
Onions	0.09
Peas	0.4
Spinach*	0.6
Potatoes	0.03
Cereals and Cereal Products:	
Arrowroot Flour*	0.03
Hominy*	.01
Oatmeal*	.08
Pea Flour*	.04
Rice*	.00
Rye Bread (German)*	.04
Rye Flour*	.05
Tapioca	.00
White Bread	.00
White Flour	.00
Special Foods:	
Butter	.00
Cheese (fat)	.00
Eggs*	.00
Milk	.00

[1] "St. Luke's Dietary," St. Luke's Hospital, New York City.
*Articles designated by * analyzed by Karl M. Vogel; the other by Walker Hall.

	Grams Per Kilo
Beverages:	
Beer, Ale, Porter	.01 to .02
Claret, Sherry, Port	.00
Chocolate	1.4
Cocoa	2.
Coffee	1.7
Tea	2.4

Food Combinations and Menus

(PURIN-POOR DIETS)

FOLIN'S PURIN-FREE LIQUID DIET

For 2830 Calories a Day: Approximate values—protein, 139 gm. (4⅔ oz.); fat, 146 gm.; (4⅚ oz.); carbohydrates, 225 gm. (7½ oz.).

Whole milk	500 c.c.	(16 oz.)
Cream (18 to 22 per cent. fat)	300 c.c.	(10 oz.)
10 eggs (whites and yolks)	450 gm.	(15 oz.)
Horlick's malted milk	200 gm.	(6⅔ oz.)
Sugar	20 gm.	(⅔ oz.)
Sodium chloride	6 gm.	(⅕ oz.)
Water, q. s. ad	2000 c.c.	(64 oz.)
Extra water	900 c.c.	(30 oz.)

Schedule of Feeding:

7:00 A. M. Malted milk, 40 gm., 2 eggs, cream, 50 c.c., sugar, 4 gm., water, 400 c.c.

9:00 A. M. Milk, 250 c.c., cream, 50 c.c.

11:00 A. M. Malted milk, 40 gm., 2 eggs, cream, 50 c.c., sugar, 4 gm., water, 400 c.c.

1:30 A. M. Milk, 250 c.c., cream, 50 c.c.

3:30 P. M. Malted milk, 40 gm., 2 eggs, cream, 50 c.c., sugar, 4 gm., water, 400 c.c.

6:00 P. M. Malted milk, 40 gm., 2 eggs, cream, 50 c.c., sugar, 4 gm., water, 400 c.c.

8:00 P. M. Malted milk, 40 gm., 2 eggs, sugar, 4 gm., water, 400 c.c. During the day—water, 900 c.c., sodium chloride, 6 gm.

PURIN-FREE SOFT DIET

For 2300 Calories a Day: Approximate values—protein, 80. gm. (2⅔ oz.); fat, 120 gm. (4¼ oz.); carbohydrates, 225 gm. (8 oz.)

		MEASURE	OUNCE	CALORIES
6:00 A. M.	Milk	⅝ cup	5.1	100
Breakfast:				
8:00 A. M.	Cream of wheat (uncooked)	3 tbsp.	1.0	100
	Milk	½ cup	4.0	80
	Poached egg	1	2.5	70
	Toast	2 slices	1.3	100
	Butter	1 tbsp.	0.5	100
	Milk	⅝ cup	5.1	100
Dinner:				
12:00 Noon:	Cream of Potato Soup	⅞ cup	8.4	200
	Crackers	4	0.9	100
	Coddled Egg	1	2.5	70
	Lettuce	¼ lg. hd.	3.7	20
	Mayonnaise	1 tbsp.	0.5	100
	Bread	2 slices	1.3	100
	Butter	1 tbsp.	0.5	100
	Tapioca Pudding	⅗ cup	2.8	150
3:30 P. M.	Milk	⅝ cup	2.5	100
Supper:				
5:30 P. M.	Baked Potato	1 med.	3.0	100
	Cheese	1½ in. cube	1.2	150
	Cauliflower	½ sm. hd.	5.8	
	Cream Sauce	¼ cup	2.4	150
	Bread	2 slices	1.3	100
	Butter	1 tbsp.	0.5	100
	Baked Apple	½ large	2.3	100
	Cream, thin	⅛ cup	1.8	50
8:00 P. M.	Malted Milk (using 2 tablespoons)	1 cup	8.0	65
				2305

PURIN-FREE DIET. FIXED PROTEIN[1]

St. Luke's Hospital

For 2751 Calories a Day: Approximate values—Protein, 79.6 gm.; Nitrogen, 12.7 gm.

	PROTEIN GM.	CALORIES
Breakfast:		
1 orange	1.6	73
2 soft-boiled eggs	12.2	168
2 slices bread (60 gm.)	3.3	161
15 gm. butter	0.1	114
1 glass milk (250 c.c.)	8.	168
30 gm. sugar		126
Dinner:		
50 gm. steamed rice	2.	122
2 hard-boiled eggs	12.2	168
2 slices bread	3.3	161
15 gm. butter	0.1	114
1 glass milk (250 c.c.)	8.	168
50 gm. cream	2.	122
30 gm. sugar		126
Supper:		
2 soft-boiled eggs	12.2	168
1 sliced banana	0.5	40
50 gm. cream	2.	122
1 baked apple	0.3	52
50 gm. stewed tomatoes	0.4	9
2 slices bread	3.3	161
15 gm. butter	0.1	114
1 glass milk (250 c.c.)	8.	168
30 gm. sugar		126

PURIN-FREE DIET. FIXED NITROGEN, CALCIUM AND MAGNESIUM[1]

St. Luke's Hospital

For 1900 Calories in 24 Hours: Approximate values— N, 9.138 gm.. CaO, 1.214 gm.; MgO, 0.175 gm.

Milk	500 gm.
Eggs	300 gm.
Cream	300 gm.
Rice, uncooked	100 gm.

Schedule of Feeding:

6:00 A. M. Milk .... 180 gm.

[1] "St. Luke's Dietary," St. Luke's Hospital, New York City.

8:00 A. M.	Steamed rice (uncooked)	30 gm.
	Cream	60 gm.
	2 soft boiled eggs	100 gm.
12 NOON.	Steamed rice (uncooked)	35 gm.
	Cream	90 gm.
	2 poached eggs	100 gm.
3:00 P. M.	Milk	180 gm.
	Cream	30 gm.
5:30 P. M.	Steam rice (uncooked)	35 gm.
	Cream	60 gm.
	2 soft boiled eggs	100 gm.
8:00 P. M.	Milk	140 gm.
	Cream	60 gm.

LOW-PURIN DIET, NO. I

For 1800 Calories a Day: Approximate values—protein, 46.94 gm.; fat, 82.35 gm.; carbohydrate, 185.46 gm.

SCHEDULE OF FEEDING	MEASURE	OUNCE	PROTEIN GM.	CALORIES
Breakfast:				
Orange	1	9.45	1.61	100
Farina	¾ cup	6.00	3.00	100
White Bread (toast)	2 slices	1.38	3.60	100
Butter	1 tbsp.	.46	.13	100
Cream (thin)	¼ cup	1.80	1.25	100
Sugar	1 tbsp.	.44	...	50
Milk	1 glass	5.10	4.76	100
Dinner:				
Cream of Celery Soup	½ cup	3.60	2.75	100
Poached Egg	1	1.78	5.79	75
Baked Potato	1	5.27	2.69	100
Roll	1	1.30	4.00	100
Butter	1½ tbsp.	.69	.20	150
Cream Pie with Meringue	Section 3⅘" at circum.	2.40	3.75	150
Supper:				
Cream Toast	1½ slice toast ⅖ c. sauce	4.40	6.50	200
Baked Apple and Whipped Cream	1 large apple	4.40	.25	200
Lady Fingers	3	.75	1.87	75
				1800

LOW-PURIN DIET, NO. II

For 2208 Calories a Day: Approximate values—protein, 55.23 gm.; fat, 91.72 gm.; carbohydrate, 287.86 gm.

SCHEDULE OF FEEDING	MEASURE	OUNCE	PROTEIN GM.	CALORIES
Breakfast:				
Prunes	3 prunes and 3 tbsp. juice	4.20	.75	150
Hominy Grits	⅘ cup	6.80	2.25	100
White Bread (toast)	2 slices	1.38	3.60	100
Butter	1 tbsp.	.46	.13	100
Cream (thin)	¼ cup	1.80	1.25	100
Sugar	1 tbsp.	.44	...	50
Milk	⅝ cup	5.10	4.76	100
Dinner:				
Eggs à la Goldenrod	1 serving i.e. 1 egg, etc.	6.00	12.00	300
Baked Sweet Potato	1 medium	6.00	1.50	200
Creamed Cauliflower	1 serving	4.38	2.37	83
Roll	1	1.30	4.00	100
Butter	1½ tbsp.	.69	.20	150
Rice Pudding	½ cup	3.10	4.25	100
Supper:				
Macaroni and Cheese	¾ cup	3.15	6.37	150
Lettuce Salad	1 sm. serving	.60	.12	50
Popovers	1	2.00	4.50	100
Butter	½ tbsp.	.23	.06	50
Sliced Bananas with	½	2.75	.62	50
Boiled Custard	⅓ cup	2.20	4.25	100
Molasses Cookies	2 cookies 2" diam.	.52	2.25	75
				2208

A DAY'S DIETARY SUGGESTED FOR CHRONIC GOUT[1]

Mary Swartz Rose

SCHEDULE OF FEEDING		MEASURE	WEIGHT OUNCE	PROTEIN CALORIES	TOTAL CALORIES
7 A. M.	Hot water	1 cup	...	...	...
8 A. M.	Orange	1 large	9.5	7	100
	Rice	⅜ cup	2.0	5	50
	Cream, thick	1 tbsp. (scant)	0.5	1	50
	Sugar	1 tbsp. (scant)	0.5	...	50
	Hot milk	1¼ cups	10.2	38	200
	Bread	4 slices	1.3	28	200
	Butter	1 tbsp.	0.5	1	100
	Peaches	1½ medium	5.3	3	50
					800
1 P. M.	Soft-cooked eggs	2 eggs	3.4	54	150
	Baked potato	2 medium	6.0	22	200
	Celery		4.8	6	25
	Bread	4 slices	2.6	28	200
	Butter	1 tbsp.	0.5	1	100
	Peaches	1½ medium	5.3	3	50
	Tea, very weak and unsweetened	....	...	...	....
					725
6 P. M.	Milk	1¼ cups	10.2	38	200
	Bread	6 slices	3.9	42	300
	Baked apple with whipped cream	1 sm. apple	2.4	1	100
	Sugar	1 tbsp. (scant)	0.5	...	50
	Butter	1 tbsp.	0.5	1	100
					750
	Total for day..........			279	2275

[1] Mary Swartz Rose, Ph.D., "Feeding the Family." The Macmillan Co., New York, 1921.

Obesity

The underlying causes of obesity are: (1) overeating; (2) lack of exercise; (3) hereditary constitutional diseases, such as hypothyroidism or hypopituitarism.

Dr. Joslin calls attention to a startling relationship between obesity and diabetes. In a paper published in the Journal of the American Medical Association in 1921,[1] he states that diabetes rarely develops in individuals above the age of twenty who are habitually underweight. In 1000 cases studied it was found that diabetes occurred 79 times as frequently when the individuals were 21% or more above as when they were 21% or more below normal weight.

As a safeguard against disease as well as for the sake of comfort and appearance it is therefore desirable that body weight should not be permitted to become excessive.

The standard of what constitutes normal weight for any individual is based upon two factors, age and height. The tables cited on the following page are calculated from statistics gathered from heights and weights of average healthy men and women of various ages. In general an individual is considered to be "overweight" if he is more than 10 to 15 per cent. above the average normal weight for his age and height.

[1] Dr. E. P. Joslin, "The Prevention of Diabetes Mellitus," Journal of the American Medical Association, Vol. 76, page 79.

TABLE OF WEIGHT AND HEIGHT FOR MEN AT DIFFERENT AGES[1]

Height		19 yrs.	20	21-22	23-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59
5 ft.		107	110	114	118	122	126	128	131	133	134	135
	1 in.	112	115	118	121	124	128	130	133	135	136	137
	2 "	117	120	122	124	126	130	132	135	137	138	139
	3 "	121	124	126	128	129	133	135	138	140	141	142
	4 "	124	127	129	131	133	136	138	141	143	144	145
	5 "	128	130	132	134	137	140	142	145	147	148	149
	6 "	132	133	136	138	141	144	146	149	151	152	153
	7 "	136	137	140	142	145	148	150	153	155	156	158
	8 "	140	141	143	146	149	152	155	158	160	161	163
	9 "	144	145	147	150	153	156	160	163	165	166	168
	10 "	148	149	151	154	157	161	165	168	170	171	173
	11 "	153	154	156	159	162	166	170	174	176	177	178
6 ft.		158	160	162	165	167	172	176	180	182	183	184
	1 "	163	165	167	170	173	178	182	186	188	190	191
	2 "	168	170	173	176	179	184	189	193	195	197	198
	3 "	173	175	178	181	184	190	195	200	202	204	205
	4 "	178	180	183	186	189	196	201	206	209	211	212
	5 "	183	185	188	191	194	201	207	212	215	217	219

In ascertaining height—measure in shoes; stand erect, and press measuring rod down against scalp. Weigh yourself in indoor clothing and shoes. Subtract one inch for height, if measured in shoes.

TABLE OF WEIGHT AND HEIGHT FOR WOMEN AT DIFFERENT AGES[1]

Height		19 yrs.	20	21-22	23-24	25-29	30-34	35-39	40-44	45-49	50-54
4 ft.	10 in.	98	102	106	110	113	116	119	123	126	129
	11 "	103	107	109	112	115	118	121	125	128	131
5 ft.		109	112	113	115	117	120	123	127	130	133
	1 "	113	115	116	118	119	122	125	129	132	135
	2 "	116	118	119	120	121	124	127	132	135	138
	3 "	120	121	122	123	124	127	130	135	138	141
	4 "	123	124	125	126	128	131	134	138	141	144
	5 "	126	127	128	129	131	134	138	142	145	148
	6 "	129	130	131	133	135	138	142	146	149	152
	7 "	131	133	135	137	139	142	146	150	153	156
	8 "	135	137	139	141	143	146	150	154	157	161
	9 "	138	140	142	145	147	150	154	158	161	165
	10 "	141	143	145	148	151	154	157	161	164	169
	11 "	145	147	149	151	154	157	160	164	168	173
6 ft.		150	152	154	156	158	161	163	167	171	176

[1] Private communication, printed by permission of Thomas D. Wood, M.D., Professor of Physical Education, Columbia University.

In ascertaining height—measure yourself in shoes; stand erect, and press measuring rod down against the scalp. Weigh yourself in indoor clothing and shoes. If shoes have sensible heels, subtract one inch for height; if heels are "high," subtract two inches.

In the treatment of obesity two methods are employed: (1) reduction of the amount of food consumed; (2) increased muscular work or exercise. The greatest success is attained when both methods are used.

Among the popular reduction cures are those which follow:

Reduction Cure[1]

Dr. von Noorden

Among all the methods to be found none appeals more strongly to the intelligence than the reduction cure recommended by von Noorden, as it places the emphasis on the regulation of food intake as affecting: first, slight obesity; second, moderate obesity and third, marked obesity.

Method of Calculating Food Requirements.—The assumption is made that a patient weighing 70 kilos (154 pounds) requires for ordinary activities 37 calories per kilo or 2590 calories in all as his "maintenance" diet; if this patient weighs 100 kg. (220 lbs.) this is 30 kg. over what he should weigh for his height, and while the 2590 calories are enough to maintain him at 70 kg. (154 lbs.), it would require 1110 extra calories to feed these 30 kg. extra. The ideal weight for his height being 70 kg., his maintenance diet is therefore 2590 calories, so that in calculating the calories necessary for any individual, account must be taken of the maintenance diet for that particular person, from which must be taken one-fifth, two-fifths, or three-fifths of the maintenance allowance, *e. g.:*

1st. Degree of reduction diet, four-fifths of the demand, 2000 calories.

2d. Degree of reduction diet, three-fifths of the demand, 1500 calories.

[1] Carter, Howe and Mason, "Nutrition and Clinical Dietetics," Lea & Febiger, Philadelphia, Pa.

3d. Degree of reduction diet, three-fifths to two-fifths of the demand, 1500 calories down to 1000.[1]

It is easy to arrange Diets I. and II. for all that is needed in Diet I. is to omit all visible fat, such as oil, butter, fat meat, etc., to have vegetable and farinaceous dishes made with little fat and to prohibit the use of alcohol.

In Diet II. dishes made from flour, stewed fruits, milk and soups containing flour must be forbidden as well. The results of these diets are slow, but if lived up to, the reduction will come gradually.

In Diet III. the foods should be chosen from this list: "Coffee, tea without milk or sugar; meat broth (fat skimmed off) with vegetables; lean meat or fish (total weight 250 to 350 gm.—8 to 10 oz.—weighed cooked); lean cheese; abundant green vegetables and salads, prepared with as little fat or oil as possible; vinegar, lemon, pickles, tomatoes, celery, radishes (abundant raw fruit with small percentage of sugar, as apples, peaches, strawberries, raspberries, currants, blueberries, sour cherries, grapefruit, early oranges, etc.); coarse bread (bran or graham bread) in quantities of from 40 to 70 gm. (1 1/3 to 2 1/3 oz.) per day only; potatoes prepared without fat, in quantities of from 80 to 150 gm. (2 2/3 to 5 oz.); mineral waters *ad libitum;* wine for weak persons up to 200 c.c., but preferably omitted altogether; eggs, one or two; skimmed milk; buttermilk."[2]

The diet must be calculated in calories necessary for the individual, and von Noorden advises against this third degree of reduction except under direct supervision of the physician, best in a sanatorium.

Fat and Carbohydrate Restriction.—The fats must be restricted to 30 gm. (1 oz.) per day, but considerable carbohydrate in fruit, potatoes, bread and buttermilk is allowed. von Noorden says that it is not necessary to go below 100 gm. (3 1/3 oz.) of carbohydrate in a day's ration and he usually permits 120 gm. (4 oz.). This fairly generous sup-

[1] Disorders of Metabolism and Nutrition, von Noorden, Obesity, page 31.
[2] Von Noordon, ibid.

ply of carbohydrate contributes to the sparing of the body albumin better than 53 gm. of fat, although the latter has the same caloric value.

Hunger should not be allowed, for it will result in the failure of the cure or else a rapid return to overeating as soon as the cure is over. This may be accomplished by feeding foods of considerable bulk but of low food value.

Protein Allowance.—The diet allows a fair amount of protein, 120 to 180 gm. (4 to 6 oz.) which is necessary to spare the body albumin. On the basis of what has been said von Noorden builds his minimal and maximal diets as follows:

	Minimal.	Maximal.
Protein	120 gm. (4 oz.) 492 cal.	180 gm. (6 oz.) 738 cal.
Fat	30 gm. (1 oz.) 280 cal.	30 gm. (1 oz.) 280 cal.
Carbohydrate	100 gm. (3⅓ oz.) 410 cal.	120 gm. (4 oz.) 492 cal.
	1182 cal.	1510 cal.

Food Combinations and Menus

(LOW CARBOHYDRATE—LOW FAT DIETS)

VON NOORDEN'S OBESITY DIET[1]

Breakfast:	Lean meat, 80 gm. (2⅔ oz.); bread, 25 gm. (1 oz.); tea, one cup with milk, no sugar.
Midforenoon:	One egg.
Luncheon:	Soup, 1 small portion; lean meat, 160 gms. (5⅓ oz.); potatoes, 100 gms. (3⅓ oz.); fruit, 100 gms. (3⅓ oz.).
Afternoon:	
3:00 P. M.	Cup of black coffee.
4:00 P. M.	Fruit, 200 gm. (6⅔ oz.).
6:00 P. M.	Milk, 250 c.c. (8 oz.).
Dinner:	Meat, 125 gm. (3⅙ oz.); bread (graham), 30 gm. (1 oz.); fruit, small portion as sauce without sugar; salad, vegetable or fruit, radishes, pickles.

BANTING'S OBESITY DIET[2] (VERY SEVERE)

Breakfast:	
8:00 A. M.	150 to 180 gm. (5 to 6 oz.) meat or broiled fish (not a fat variety of either); a small biscuit or 30 gm.

[1] Osler's Practice.

[2] Carter, Howe and Mason, "Nutrition and Clinical Dietetics," Lea & Febiger, Philadelphia, Pa.

	(1 oz.) dry toast; a large cup of tea or coffee without cream, milk or sugar.
Dinner: 1:00 P. M.	Meat or fish as at breakfast, or any kind of game or poultry, same amount; any vegetables except those that grow underground, such as potatoes, parsnips, carrots or beets; dry toast, 30 gm. (1 oz); cooked fruit without sugar; good claret, 300 c.c. (10 oz.), Madeira or sherry.
Tea: 5:00 P. M.	Cooked fruit, 60 to 90 gm. (2 to 3 oz.); one or two pieces of zwieback; tea, 270 c.c. (9 oz.) without milk, cream or sugar.
Supper: 8:00 P. M.	Meat or fish, as at dinner, 90 to 120 c.c. (3 to 4 oz.); claret or sherry, water, 210 c.c. (7 oz.). Fluids restricted to 1050 c.c. (35 oz.) per day.

EBSTEIN'S OBESITY DIET[1]

The proteins are diminished, carbohydrates greatly restricted, fat freely permitted. The following is an example of Ebstein's diet:

Breakfast:	White bread, well toasted, 2 ounces (60 gm.), and well covered with butter. Tea, without milk or sugar, 8 or 9 ounces (240 to 270 c.c.).
Dinner:	Soup made with beef marrow. Fat meat, with fat sauce, 4 to 5 ounces (120 to 150 gm.). A moderate quantity of asparagus, spinach, cabbage, peas, or beans. After the meal, tea without milk or sugar, 8 or 9 ounces (240 to 270 c.c.).
Supper:	An egg, a little roast, with fat. About an ounce (30 gm.) of bread, well covered with butter. Tea without milk or sugar, 8 or 9 ounces (240 to 270 c.c.).

OERTEL'S OBESITY DIET[1]

Contains less fat, more proteins and carbohydrates than Ebstein. The free water permitted is only one pint daily. This method is especially adapted for obesity cases with feeble hearts. An example of Oertel's diet follows:

Morning:	A cup of coffee, or tea, with a little milk, about 6 ounces (180 c.c.) altogether; bread, 3 ounces (90 gm.).
Noon:	Three to 4 ounces (90 to 120 c.c.) of soup; 7 to 8 ounces (210 gm. to 240 gm.) of roast beef, veal, game, or poultry; salad or a light vegetable; a little fish, 1

[1] "St. Luke's Dietary," St. Luke's Hospital, New York City.

ounce (30 gm.) of bread or farinaceous pudding; 3 to 6 ounces (90 to 180 gm.) of fruit for dessert. No liquids at this meal, as a rule, but in hot weather 6 ounces (180 c.c.) of water may be taken.

Afternoon: Six ounces (180 c.c.) of coffee or tea, with as much water. An ounce (30 gm.) of bread as an indulgence.

Evening: One or two soft-boiled eggs; 1 ounce (30 gm.) of bread; perhaps a small slice of cheese; a little salad, fruit; 8 to 10 ounces (240 to 300 c.c.) of water.

OBESITY DIET[1]

Massachusetts General Hospital

Breakfast: Cup of black coffee (with milk but no cream or sugar), raw fruit (1 orange, apple, pear, or ½ grapefruit), eggs (one or two, boiled or poached), toast (one or two small slices, *i.e.*, 10-20 grams, usually without butter).

11:30 A. M. Cup bouillon (250 c.c.), skimmed milk or buttermilk, or fruit.

Luncheon: Clear soup, 120 c.c., moderately lean meat or fish, 100 grams (or eggs), two varieties green vegetables, 50-100 grams each, as spinach, lettuce, cabbage, cauliflower, onions, lentils, beets, carrots, string beans, celery or squash.

5:00 P. M. Raw oysters, moderately lean meat or fish, 100-150 grams, two varieties green vegetables, 50-100 grams each (as in luncheon), salad (fruit or vegetable) with small quantity of French dressing), raw or unsweetened cooked fruit, orange, grapefruit, apple, pear, grapes, demi-tasse black coffee.

The above menu represents, according to choice, a maximum and minimum value, as follows:

	Protein	Fat	Carbohydrates	Calories
Minimum	60	50	70	1000
Maximum	100	70	165	1738

Water in Obesity.—Water does not increase weight unless there is retention of chlorides. Hence, as von Noorden states, the restriction of water is not important except in four conditions: (1) in cases with weak circulation; (2) at the beginning of an obesity cure for the sake of the mental

[1] Diet used at the Massachusetts General Hospital, Boston, Mass.

effect on the patient, for by restriction of fluids loss of weight is apparently greater; (3) when reduction of water causes less appetite for fat producing foods, *e. g.,* water after sweets; (4) when the sweat excretion is excessive. It is also true that when water is permitted with meals the appetite is increased and there is a tendency for the individual to eat more food.

Kinds of Food to Use:

Meat and Fish.....	All lean meats and fish, except as noted below, but without rich dressing or sauce.
Soups	Thin soups in moderation.
Eggs	In any form except scrambled, fried and omelette.
Fruits	All fresh varieties except bananas, and berries, without cream and sugar; if cooked, use saccharin.
Vegetables	String beans, water-cress, lettuce, radish, cucumber, asparagus, green peas, Brussels sprouts, cabbage, cauliflower, okra, onions, celery, watermelon, tomato, artichoke, spinach, white potato in moderation, mushrooms, squash, beets, turnips, carrots, parsnips, oyster plant.
Beverages	Tea, coffee, skimmed milk, lemonade (with saccharin), ginger ale.
Desserts	Made of gelatin, or Irish moss, if with but little sugar; use saccharin or sweetena in place of sugar.

Foods to be Avoided or Greatly Restricted:

Starches	Bread, crackers, cereals, maccaroni, vermicelli, spaghetti, sago, tapioca, corn, cornstarch, sweet potatoes, shelled beans, dried peas or beans and nuts.
Sweets	Sugar, candy, dried fruits, syrups, fruit preserves, honey, marmalade and sugar sauces.
Meats	Pork, bacon, goose, sausage, croquettes.
Fish	Shad, fresh salmon, eels, sardines, mackerel, bluefish, fried fish.
Fats	Butter, cream, olive oil, bacon, lard, fat meats and fish.
Desserts	Ices, rice puddings, cake and gingerbread.

Emaciation

In the feeding of an individual who is much below normal weight, the aim should be to give enough more food than is necessary to meet the patient's energy requirement, to permit of the storage of extra energy in the form of body fat. If muscle tissue as well as fat has been wasted away the diet must include liberal amounts of protein to rebuild the body substance.

The foodstuffs which are capable of forming body fat are fat, carbohydrate and protein. The most concentrated source of body fat is fat, which furnishes 9 calories per gram or 255 calories per ounce of fat. Carbohydrate and protein yield 4 calories per gram or 113 calories per ounce. It is unwise, however, in many cases to attempt to feed large quantities of fat in fattening diets because of the danger of upsetting the digestion or of loss of appetite. Carbohydrates are a readily available, easily digested source of calories. Protein, after the nitrogen has been split off (see page 43), can be burned to yield energy or to be stored as body fat.

In the effort to give a large number of calories, however, one must never forget that good nutrition is impossible unless the diet provides all the materials required by the body. The protein needs will usually be met by a high calory diet, but care must be taken that the requirements of the body for calcium, phosphorus and iron are met and the vitamines must be liberally supplied if the body is to use the extra calories to best advantage.

Methods of Calculating the Food Requirement.—The estimation of the food requirement of an individual who is under weight should be based upon two factors: his physical activity and the degree of emaciation. If the patient is to gain in weight, enough food must be consumed to provide the energy he requires for his muscular activity and to allow the storage of extra fuel as body fat.

The principle on which a diet for emaciation is planned is that of the High Calory Feeding[1] which is used in typhoid fever, with this difference, that the exclusion of coarse foods is usually not necessary.

[1]Dr. Coleman's "High Calory Diet," note page 365.

Suggestions For Diet:

1. A well-balanced diet will include, in addition to the foods listed below under 2, a liberal supply of milk, vegetables, especially the leaf vegetables, and fruits.
2. Extra calories may be supplied by
   a. Foods rich in fat; butter, cream, olive oil, egg yolk, nuts, peanut butter, bacon, etc.
   b. Foods rich in carbohydrates; cereals of all kinds, breads, macaroni, spaghetti, tapioca, cornstarch, cane sugar, lactose, syrups, etc.
   c. Foods rich in protein; milk, cheese, eggs, meat, fish, and poultry, etc.

Food Combinations and Menus

(HIGH FAT-CARBOHYDRATE-PROTEIN DIET)

FATTENING DIET FOR THIN WOMEN[1] NO. I

Calories, 3000-3050—Ordinary Requirement, 2200 Calories: protein, 69.64 gm.; fat, 182.19 gm.; carbohydrate, 285.90 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCE	PROTEIN GM.	CALORIES
Breakfast:					
	Prunes	4 medium (dry)	1.40	.75	100
	Grapenuts	3 tbsp.	1.00	3.00	100
	Egg	1	2.40	6.25	70
	Toast	2 slices	1.00	3.50	100
	Butter	1 tbsp.	.50	.13	100
	Cream, thin	¾ cup	5.40	3.75	300
	Sugar	1 tbsp	.50	...	50
10:30 A. M.	Cocoa	⅘ cup	7.60	8.00	250
Lunch or Supper:					
	Corn Chowder	⅗ cup	4.40	4.50	150
	Fruit Salad	1 serving	3.00	1.50	200
	Roll	1	1.30	3.00	100
	Butter	1½ tbsp.	.70	.26	150
	Chocolate Blanc Mange	½ cup	3.80	4.50	200
	and Whipped Cream	2 tbsp.	.90	.50	100
4:00 P. M.	Egg in Orange Juice	1 egg, 3 tbsp. orange juice, 2 tsp. sugar	4.20	6.25	130
Dinner:					
	Broiled Steak	piece 3"x1½" x¾"	3.00	17.50	150
	Scalloped Potatoes	1 cup	5.20	3.25	150
	Buttered Beets	⅓ cup	2.00	.75	50
	Lettuce and Tomato Salad	1 serving	5.40	1.50	200
	Salted Almonds	12 nuts	.50	3.25	100
	Boiled Custard	½ cup	3.30	5.00	150
	Macaroons	2	.80	1.50	100
				69.64	3050

[1] Mary Swartz Rose, Ph.D. "Feeding the Family," The Macmillan Co., 1921.

FATTENING DIET FOR THIN WOMEN, NO. II

Calories, 3022: protein, 86.75 gm.; fat, 158.32 gm.; carbohydrate, 355.64 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCE	PROTEIN GM.	CALORIES
Breakfast:					
7:30 A. M.	Baked Apple	1 medium	2.30	.25	100
	Oatmeal	½ cup	3.90	4.12	50
	Bacon	4 sm. slices	.50	3.25	100
	Toast	2 slices	1.00	3.50	100
	Butter	1 tbsp.	.50	.13	100
	Sugar	1 tbsp.	.50		50
	Cream (thin)	¾ cup	5.40	3.75	300
	Coffee				
10:30 A. M.	Cocoa	⅘ cup	7.60	8.00	250
Lunch or Supper:					
	Creamed Eggs on Toast	1 serving, i.e. 1 egg, etc.	6.00	13.50	300
	Spinach	½ cup	4.25	1.87	22
	Brown Bread	2 slices	1.00	3.50	100
	Butter	1 tbsp.	.50	.13	100
	Pineapple with	1 slice	2.30	.25	100
	Whipped Cream	2 tbsp.	.90	.50	100
	and Almonds	7 nuts	.25	1.87	50
	Lady Fingers	3	1.00	2.50	100
4:30 P. M.	Grapejuice Egg-nog	1 cup	5.40	5.25	150
Dinner:					
	Cream of Tomato Soup	⅗ cup	4.20	4.00	100
	Halibut Steak	piece 3"x2¼" x1"	3.00	15.25	100
	Boiled Potato	1 medium	4.00	2.75	100
	Creamed Peas	½ cup	2.70	4.50	100
	Roll	1	1.30	4.00	100
	Butter	1 tbsp	.50	.13	100
	Cabbage Salad	½ cup	1.40	1.50	50
	Raisin and Cranberry Pie	sector 3" at circumference	3.00	2.25	300
				86.75	3022

FATTENING DIET FOR THIN MEN

Total Calories, 3450—Ordinary Requirement, 2400 Calories: protein, 96 gm.; fat, 175.28 gm.; carbohydrate, 385.28 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCE	PROTEIN GM.	CALORIES
Breakfast:					
7:30 A. M.	Banana, served with	1 banana	5.50	1.24	100
	Shredded Wheat...	1	.90	3.25	100
	Scrambled Eggs ...	½ cup	4.20	10.00	200
	Popovers	2	4.00	9.00	200
	Butter	1 tbsp.	.50	.13	100
	Sugar	1 tbsp.	.50	...	50
	Cream (thin)	¾ cup	5.40	3.75	300
	Coffee				
Lunch or Supper:					
	Macaroni and cheese	1 cup	4.00	8.50	200
	Lettuce with French Dressing...	1 serving	1.80	.37	150
	Whole Wheat Bread	3 slices ½ inch thick	2.10	5.40	150
	Butter	1½ tbsp.	.75	.20	150
	Prune Soufflé......	⅘ cup	3.60	5.00	200
	Chocolate (all milk)	⅔ cup	6.20	6.20	200
Dinner:					
	Cream of Celery Soup	1 cup	7.20	5.50	200
	Lamb Chop, loin...	1 (2 inches thick)	2.20	20.00	200
	Baked Sweet Potato	1 medium	6.00	3.00	200
	Canned Corn	⅓ cup	3.60	2.75	100
	Rolls	2	2.60	8.00	200
	Butter	1½ tbsp.	.75	.20	150
	Lemon Milk Sherbet	½ cup	3.80	2.00	200
	Plain Cookies	2 (2¼ inch diameter)	.90	1.50	100
				95.99	3450

Acidosis

The condition of acidosis results mostly from a faulty metabolism of fats. Instead of their being completely oxidized to CO_2 and water, there is an incomplete oxidation with the formation of acetone bodies, which appear in the blood and the urine. The natural alkaline reserves of the body are much depleted by the unusual demand upon them to neutralize this unusual acid production.

The oxidation of fatty acids seems in some way dependent upon carbohydrate in the diet and the condition of acidosis may arise as in diabetic mellitus from restriction of carbohydrate food.

Dietetic Treatment.—Reduction of fat in the diet is the obvious treatment and with this the use of foods in which the base forming elements predominate. These include all vegetables, fruits and milk, while the foods in which acid forming elements predominate include meats, eggs and grains. The latter class of foods should be restricted.

QUESTIONS FOR STUDY

DIABETES MELLITUS

1. How can you explain the cause of diabetes?
2. What is the outstanding symptom of the disease?
3. Outline the modern method of treatment.
4. Why should care be given to the balance between the amounts of fats and carbohydrates given?
5. Give in detail Dr. Joslin's method of treatment in preparation for and during the fasting period.
6. What is meant by carbohydrate tolerance? How is it established?
7. How are proteins and fats introduced into the diet?
8. What is the treatment if sugar appears at any time in the urine?
9. What is meant by 5% vegetables?
10. What advice would you give a patient regarding commercial diabetic foods?

GOUT

11. What derangement of metabolism characterizes gout?
12. What is the general principle of feeding in this disease?
13. Give a list of foods rich in purins.
14. Give a list of purin-free foods.
15. Arrange a day's menu of purin-free foods where soft diet should be given.

OBESITY

16. State some of the causes of overweight.
17. Give some good reasons why the condition should be avoided or treated.
18. How can you ascertain if you are overweight?
19. How may the condition be treated?
20. What is von Noorden's principle of treatment as to carbohydrate, fat and protein allowance?
21. Outline a day's menu according to von Noorden.
22. Give names of other popular diets.
23. What effect does water have upon reduction? When should it be restricted?
24. Give a list of foods that may be used in obesity diets.
25. Give list of foods to avoid.

EMACIATION

26. Explain the principle involved in a diet to increase weight.
27. From what may body fat be formed?
28. What conditions should be observed in the selection of foods in this diet?
29. Aside from the caloric value of foods, what care should be given to their selection?
30. How would you calculate the food requirement in such cases?
31. Give a list of foods you would supply liberally in the diet.

ACIDOSIS

32. Discuss the cause of acidosis.
33. How may it be relieved by dietetic treatment?

CHAPTER XVI

DIET IN DEFICIENCY DISEASES

Pellagra

While pellagra is classed among the "deficiency diseases" the specified food element to be taken in the dietary of pellagra sufferers has not been as definitely determined as in some other such diseases. The vitamines, the protein supply and mineral constituents of the diet are all under question. The disease yields to treatment, however, when the diet is of adequate caloric value, with rather high protein and furnishing a liberal supply of mineral salts and vitamines A & B. The protein allowance should be 100 to 125 grams daily, obtained mostly from meat and the legumes. Milk, fruit and green vegetables, plentifully used, will yield sufficient amounts of the vitamines and mineral salts.

If diarrhea is persistent but little cellulose should be given and vegetables should be in form of purée.

Scurvy

Dietetic Treatment.—Scurvy is undoubtedly due to a diet lacking in that vitamine known as vitamine C. It is present in appreciable quantities in milk and in most uncooked vegetables and fruits, being especially abundant in cabbage, beets, lettuce, onions, potatoes, spinach, turnips, lemons, oranges and grapefruit. Cooking impairs the value of this antiscorbutic property in all foods and destroys it entirely in many. Heat has less destructive effect on those foods whose vitamine content is very low. In the adult diet, the disease can always be avoided by including raw fruits and vegetables, and the introduction of such foods into the diet of a patient suffering from the disease quickly effects a cure. Treatment of Infantile Scurvy is given in the chapter on Infant Feeding, page 592.

QUESTIONS FOR STUDY

PELLAGRA

1. Discuss cause and treatment of pellagra.

SCURVY

2. What is the cause of scurvy?
3. How may it be prevented or cured?

CHAPTER XVII

DIET IN DISEASES OF THE LUNGS[1]

Tuberculosis

Loomis Sanatorium

Diet in Tuberculosis, Pulmonary or General.—"In none of the infectious diseases is a proper dietary of so great importance as in tuberculosis. One has only to think of its older name, consumption, to realize the truth of this statement. Whether the disease is seen in its acute or chronic form, pulmonary or other distribution, the necessity for a definite feeding plan is paramount. There can be no possible doubt that food, good food, properly chosen, properly prepared and eaten in cheerful surroundings, is our sheet anchor in this disease."[2]

The old method of stuffing the patients with food whether they wanted it or not and requiring them to consume large quantities of milk and eggs, has passed into disuse in most modern sanatoria as it has proved to be of no real benefit and was an important contributing cause of the gastric atony which so often developed under this treatment. Neither is great gain in weight above the normal for the individual now considered of advantage.

Food Needs.—The tuberculosis patient should be given a diet of sufficient nutritive value to maintain a weight slightly above normal. It is not desirable that this should exceed five or ten pounds. If the patient has lost weight by reason of the disease or any of its complications, the diet should be regulated accordingly. The total caloric value required

[1] Arranged under the supervision of the Loomis Sanatorium, Loomis, N. Y., for Pattee's Practical Dietetics, 1922.

[2] Carter, Howe and Mason, "Nutrition and Clinical Dietetics," Lea & Febiger, Philadelphia, Pa.

will depend much upon whether the patient continues at work or is put on exercise or whether the usual physical activities are given up during the treatment. The working patient would, of course, require more food than the one at rest.

Protein Requirement.—Opinions differ as to the amount of protein it is best to give. The diets most commonly recommended for the tuberculous have a higher protein content than the normal requirement. However, as McCann has recently emphasized, high protein diets greatly increase metabolism and the demands upon the cardio-respiratory mechanism and also produce undesirable effects on the digestive and excretory systems. Better results were obtained at the Loomis Sanatorium with a 130-gram protein allowance in a 3200 calory diet, than when 150 grams of protein were given, and it has been shown that satisfactory nutrition may be maintained on less than 100 grams if the fats and carbohydrates are properly adjusted.

Suggested Dietary Standards.—For the resting patient from 2500 to 3000 calories with 80 to 100 grams protein. Standards: 1 to 7 inclusive, page 332-333, Carter, Howe and Mason. McCann suggests 60 to 90 grams of protein, with fat up to the limits of digestive capacity, and sufficient carbohydrates to bring the total caloric value up to 2500 or 3000 calories. The carbohydrates, according to McCann, should furnish at least 1/5 of the total calories in order to prevent acidosis from fat metabolism, but should not be consumed in excess because of their effect in unduly increasing pulmonary work.

While the proper diet is an important factor in the treatment of tuberculosis, the influence of good hygienic conditions, and especially of properly regulated rest and exercise, must also be emphasized. Plenty of fresh air is an essential but provision should be made to keep patients comfortable when out of doors. The main object in treatment is to build up in the body such strong defenses against the activity of the tubercle bacillus that its rapid growth is arrested and its results minimized.

Administration of Diet.—If there are no serious gastric disturbances and the patient's appetite is good it is considered best to give only three meals a day. Sufficient amounts must be taken to satisfy the individual requirement and if this cannot be done in three meals these may be supplemented with an extra diet of sandwich or milk. If a patient is able to take only small amounts at a time more frequent feeding must be resorted to, every four hours or possibly every two hours. The latter is not advised unless absolutely necessary. It is often better to wait and rest the gastro-intestinal tract during periods of acute disturbance, when there may be nausea, intestinal gas and abdominal discomfort.

Kinds of Food to Use.—Milk and eggs are still considered valuable in the diet of the tuberculous but not in the quantities used some years ago, being added with due regard for their real nutritive value and with consideration of the gastro-intestinal tract. An excessive consumption of food not only increases metabolism but respiratory work as well and is especially contra-indicated during febrile periods. Various modifications of milk may be resorted to when the appetite is poor or when there is an irritable condition of the stomach and intestines. In such cases buttermilk, or some of the fermented milks such as Kumyss, Kefer or Zoolak, may often be used with good results. Egg forms an important source of protein and fat and when included in the diet it must be so considered. Slightly cooked eggs are advised rather than raw because more easily digested. Fatty foods are of very great value. The necessary increase in caloric value is made from fats rather than carbohydrates because these are less liable to cause digestive disturbances from fermentation. Animal fats such as those from meat, butter, eggs and cream, are given preference over vegetable fats. Carter, Howe and Mason put the fat from cod livers at the head of the list, saying that it furnishes something, possibly iodine, possibly some vitamine, that does more for the patient than other fats do.

Food Combinations and Menus[1]

(HIGH CALORY—MEDIUM PROTEIN DIET)

SUGGESTIONS FOR A BALANCED TUBERCULOSIS DIET[1]

Breakfast:

Fruit—fresh, canned or stewed. Stewed dried fruit is of the highest food value.

Figs, dates, currants, grapes, prunes, raisins and apricots are of the highest value.

Cereals—all kinds; cooked ones are the best.

Meat, fish, and eggs; choose one kind or small portion of two.

Bacon Eggs Potato	Fish Eggs	Meat	Alone

Use bread, rolls, or toast; eat at least one order of it. Plenty of cream on cereal. Glass of milk, more if breakfast has been light.

Dinner:

Soup.

Fish and meat, small servings. Meat, full order if taken alone.

Potatoes, mashed or boiled.

Vegetables, use two kinds.

Salad, dessert, crackers and cheese.

Vegetables of the highest vegetable protein are in order given; dried beans (baked beans, lima, and red kidney), peas, cabbage, creamed spinach, succotash, sweet potatoes, cauliflower, corn, beets, plain spinach, asparagus, tomatoes, stewed onions.

Crackers and bread and butter. Large order of cheese if meat and fish has not been desirable.

Milk and coffee.

Supper:

Either rice or farina, cornmeal mush, milk toast, crackers and milk or cream soup.

Choose between hot and cold meat, eggs or salads.

Potatoes, baked, boiled, creamed, fried or scalloped.

Dessert.

Use plenty of bread, toast, or the rolls and butter.

Glass of milk if light supper is eaten. Drink plenty of milk.

Milk should be used as a food.

Milk and raw eggs make excellent diet between meals.

[1] Arranged by the Loomis Sanatorium, Loomis, New York, for Pattee's Practical Dietetics, 1922.

REGULAR TWO HOUR DIET FOR ONE WEEK[1]

AVERAGE CALORIES PER DAY, 1867

For 1870 Calories a Day: Approximate values—protein, 83.6 gm.; fat, 97 gm.; carbohydrate, 127.8 gm.

Sunday:

6 A. M.	Milk 190 gm., 1 raw egg.
8 A. M.	Fruit 90 gm.
10 A. M.	Broth 100 gm., toast 14 gm., beef juice 96 gm.
12 Noon	Soup 120 gm., chicken 30 gm., potato 40 gm., ice cream 100 gm.
2 P. M.	Cocoa 120 gm., bread 20 gm., butter 15 gm.
4 P. M.	Beef juice 96 gm., milk 190 gm.
6 P. M.	Bouillon 120 gm., fruit 70 gm., sandwich of scraped beef 37 gm., bread 12 gm., butter 8 gm.

For 1817 Calories a Day: Approximate values—protein, 74.7 gm.; fat, 96.4 gm.; carbohydrate, 125.2 gm.

Monday:

6 A. M.	Milk 190 gm., 1 raw egg.
8 A. M.	Fruit 90 gm., cereal 180 gm., cream 75 gm., coffee 120 gm., bread 20 gm., butter 15 gm.
10 A. M.	Cocoa 120 gm., toast 14 gm., beef juice 96 gm.
12 Noon	Thick soup 120 gm., chop 40 gm., potato 40 gm., bread 20 gm., butter 15 gm.
2 P. M.	Beef juice 86 gm., 1 raw egg.
4 P. M.	Milk 190 gm., 1 raw egg.
6 P. M.	Beef broth 120 gm., toast 14 gm., lettuce salad 25 gm.
8 & 10	Milk 190 gm. each.

For 1870 Calories a Day: Approximate values—protein, 79 gm.; fat, 105 gm.; carbohydrate, 199 gm.

Tuesday:

6 A. M.	Milk 190 gm., 1 raw egg.
8 A. M.	Fruit 90 gm., bacon 30 gm., coffee 120 gm., toast 14 gm.
10 A. M.	Shredded wheat 28 gm., cream 75 gm., sugar 16 gm., 1 raw egg.

[1] Arranged by the Loomis Sanatorium, Loomis, New York, for Pattee's Practical Dietetics, 1922.

12 Noon	Chicken broth 120 gm., rice 30 gm., beef sandwich as above.
2 P. M.	Egg orangeade (1 egg albumin and orange juice), beef juice 96 gm.
4 P. M.	Milk 190 gm., beef juice 96 gm.
6 P. M.	Steak 75 gm., potato 40 gm., bread 20 gm., butter 15 gm., baked apple 90 gm.
8 & 10	Milk 190 gm. each.

For 1961 Calories a Day: Approximate values—protein, 70 gm.; fat, 110 gm.; carbohydrate, 117 gm.:

Wednesday:

6 A. M.	Milk 190 gm., 1 raw egg.
8 A. M.	Fruit 90 gm., cocoa 120 gm., toast 14 gm., 1 raw egg.
10 A. M.	Lettuce sandwich, milk 190 gm., 1 raw egg, beef juice 96 gm.
12 Noon	Thick soup 120 gm., fricasseed chicken 30 gm., potato 30 gm., celery 25 gm., ice cream 100 gm.
2 P. M.	Rice pudding 40 gm., bread 20 gm., butter 15 gm.
4 P. M.	Milk 190 gm., 1 raw egg.
6 P. M.	Scraped beef sandwich, orange and banana salad 70 gm., beef juice 96 gm.
8 & 10	Milk 190 gm. each.

For 1563 Calories a Day: Approximate values—protein, 70 gm.; fat, 75 gm.; carbohydrate, 180 gm.

Thursday:

6 A. M.	Milk 190 gm., 1 raw egg.
8 A. M.	Cream of wheat 80 gm., milk toast, coffee.
10 A. M.	Egg lemonade, beef juice 96 gm.
12 Noon	Soup 120 gm., scraped beef sandwich, onion or celery 25 gm.
2 P. M.	Beef broth 120 gm., bread 20 gm., butter.
4 P. M.	Milk 190 gm., 1 raw egg.
6 P. M.	Corn meal mush 90 gm., milk 140 gm., fruit 70 gm.
8 & 10	Milk 190 gm. each.

For 1810 Calories a Day: Approximate values—protein, 92.2 gm.; fat, 772 gm.; carbohydrate, 150 gm.

Friday:

6 A. M.	Milk 190 gm., 1 raw egg.
8 A. M.	Fish 70 gm., toast 14 gm., coffee 120 gm., beef juice 96 gm.
10 A. M.	Cocoa 120 gm., 1 raw egg.
12 Noon	Steak 75 gm., potato 40 gm., custard 90 gm., milk 190 gm.
2 P. M.	Gruel 80 gm.
4 P. M.	Milk 190 gm., beef juice 96 gm.
6 P. M.	Omelet (egg 48 gm., milk 50 gm.), toast 20 gm., apple sauce 100 gm.
8 & 10	Milk 190 gm.

For 2180 Calories a Day: Approximate values—protein, 86 gm.; fat, 123 gm.; carbohydrate, 141 gm.

Saturday:

6 A. M.	Milk 190 gm., 1 raw egg.
8 A. M.	Bacon 30 gm., toast 14 gm., coffee 120 gm.
10 A. M.	Grape nuts 60 gm., cream 75 gm., 1 raw egg.
12 Noon	Roast beef 57 gm., apple and nut salad 50 gm., bread 20 gm., butter 15 gm.
2 P. M.	Milk 140 gm., toast 28 gm., milk 190 gm.
4 P. M.	Beef juice 96 gm., 1 raw egg.
6 P. M.	Chop 40 gm., potato 30 gm., junket 40 gm., toast 14 gm., beef juice 96 gm.
8 & 10	Milk as above.

LIGHT DIET[1]

This rather restricted diet is used for patients with an irritable gastro-intestinal tract, some of whom probably have definite intestinal lesions.

The following foods are allowed:

Fluids .... Milk, tea, cocoa, plain broth or creamed soups.
Eggs .... Soft, boiled or poached.
Cereals and vegetables.. Cream of wheat, farina, rice, baked or mashed potato.

[1] Arranged by the Loomis Sanatorium, Loomis, N. Y., for Pattee's Practical Dietetics, 1922.

ANTI-CONSTIPATION DIET[1]

LIGHT DIET

No. 1

7:00 A. M.	1 glass of cold water or 40 gm. orange juice.
8:00 A. M.	300 gm. buttermilk, coffee and cream, 2 soft boiled eggs, 150 gm. graham bread, 40 gm butter.
10:00 A. M.	400 gm. cider
12:30 P. M.	200 gm. broth, 1 egg, 100 gm. steak, 100 gm. carrots, 100 gm. beans, 150 gm. graham bread, 200 gm. stewed apples.
4:00 P. M.	400 gm. buttermilk.
7:00 P. M.	100 gm. scraped beef, 150 gm. graham bread, 200 gm. stewed prunes, 300 gm. cider.
9:00 P. M.	40 gm. figs.

No. 2

Vegetables..Cauliflower, cabbage, asparagus, spinach, peas, salad, celery, tomato.

Cereals .....Oatmeal, cornmeal, pettijohn, shredded wheat.

Breads .....Whole wheat, brown, rye.

Fruits .....Apples, pears, figs, dates, prunes, honey, cider, oranges.

Meats .....Chicken, beef, lamb.

Avoid. Tea, cocoa, chocolate, rice, barley, farina, milk.

Foods Allowed on Light Diet:

Soups ......All kinds.

Toast ......Dry, buttered, milk or cream, zwieback and crackers.

Milk ....All forms.

Eggs ....Any form except fried.

Desserts ...Custards, snow pudding, jellies, junket, ice cream.

Fruit ......Oranges, grape fruit, grapes, baked apples.

All cereals. Oranges or lemonade with egg. Occasionally beef or scraped beef sandwich. Oysters, raw or stewed. Creamed sweetbreads.

ANTI-ACID DIET[1]

STRICT DIET

8 A. M.	Milk	200 gm.
	Soft boiled eggs	2 "

[1] Arranged by the Loomis Sanatorium, Loomis, N. Y., for Pattee's Practical Dietetics, 1922.

	Toast	60	gm.
	Butter	30	"
10 A. M.	Sherry wine	50	"
	Egg	1	"
Noon.	Chicken or broiled meat	100	"
	Spinach or asparagus	100	"
	Stewed apple or prunes	100	"
	Stale bread	60	"
	Butter	30	"
4 P. M.	Milk	150	c.c.
	Crackers	50	gm.
	Butter	30	"
7 P. M.	Milk	100	"
	Butter	25	"
	Zwieback	20	"
	Soft boiled eggs	1	"

LIBERAL DIET

8 A. M.	Broiled veal	70	"
	Stewed veal	100	"
	Beefsteak	70	"
	Fowl	70	"
	Eggs	1	"
	Toast	30	"
	or		
	Zwieback	20	"
	Sherry wine	2	oz.
	Butter	20	gm.
10 A. M.	Milk	500	c.c.
	Toast	40	gm.
	Butter	20	"
Noon.	French soup with yolk of egg		
	Broiled or boiled fowl	140	"
	Raw meat—Beefsteak	200	"
	Broiled or boiled fish		
	Asparagus heads	4	"
	Toast	20	"
	Omelet soufflé		
	Small cup black coffee		
	Butter	10	"
4 P. M.	Milk	250	c.c.
	Zwieback	60	gm.
	Butter	20	"
7 P. M.	Cold meat	70	"
	Meat jelly	100	"
	Toast	20	"
	Swiss or Dutch cheese	20	"

ANTI-CONSTIPATION FULL DIET[1]

Breakfast:

A. M.	Fruit	Any kind fresh or cooked.
	Cereal	Oatmeal, pettijohn, shredded wheat or corn-meal.
	Eggs	One or two cooked in any form.
	Bread	Graham, whole wheat or rye, or graham muffins. Bread may be toasted.
	Butter	Large amount.
	Coffee	With cream and sugar.
	Buttermilk	One glass if necessary to maintain weight.

Dinner:

1 P. M.	Soup	All kinds, except cream soups.
	Meat or fish	Small amount.
	Vegetables	Extra large amount—all kinds. Potatoes—small amount.
	Salads	Lettuce with fruit or vegetables, olive oil.
	Bread	As at breakfast.
	Butter	As at breakfast.
	Dessert	Raw or cooked fruit.
	Buttermilk.	

Supper:

6 P. M.	Soup or cereal	As at breakfast.
	Meat, fish or eggs	Small amount.
	Salads	As at dinner.
	Bread and butter	As at breakfast and dinner.
	Dessert	Fruit.
	Buttermilk	One glass if necessary.

Foods to Avoid:

Tea, cocoa, chocolate, rice, farina, cream of wheat, milk (as far as possible), excess of meat, fish or eggs, potatoes, puddings without fruit, white bread or cream soups.

Take in Abundance:

Fruit and fruit juices, green vegetables (two or three times the usual amount), salads (two a day), butter, olive oil, prunes, grapes, apples, pears, oranges, pineapples, dates, figs, peaches, apricots, etc., cider, grape and orange juice, whole wheat, rye or graham bread.

[1] Arranged by the Loomis Sanatorium, Loomis, N. Y., for Pattee's Practical Dietetics, 1922.

CONCENTRATED DIET[1]

For 2417.96 Calories a Day: Approximate values—protein, 109.8 gm.; fat, 104.9 gm.; carbohydate, 242 gm.

Beef Juice	288 gm.......90 oz.
Eggs	3 gm.
Cocoa	240 gm.
Toast	45 gm.
Rice (cooked)	160 gm.
Zwieback	20 gm.
Baked Potato	80 gm.
Hominy	80 gm.
Sugar	8 gm.
Cream	64 gm.
Skimmed Milk	360 gm.

Beef......Lamb......Poultry.

INEXPENSIVE MENUS FOR TUBERCULOSIS[1]

For 3041 Calories a Day: Approximate values—protein, 127 gm.; fat, 107 gm.; carbohydrate, 372 gm.

Bread for day	80 gm.
Butter " "	32 gm.
Milk " "	1430 gm.
Cream " "	160 gm.
Cocoa " "	250 gm.
Sugar " "	78 gm.

Schedule of Feeding:

Breakfast	Gm.	Dinner	Gm.	Supper	Gm.
Prunes	75	Bouillon, wafers	120	Creamed beef	89
Quaker oats, cream	25	Baked halibut	122	Baked potato	80
Bacon	10	Mashed potatoes	160	Dutch cheese	39
Corn muffins	20	Stewed tomatoes	150	Biscuit	43
Bread, butter		Lemon jelly, cream	95	Baked apples, cream	75
Coffee, cocoa, milk		Bread, butter		Bread, butter	
		Milk		Tea, cocoa	

For 3456 Calories a Day: Approximate values—protein, 145 gm.; fat, 123 gm.; carbohydrate, 419 gm.

Bread for day	120 gm.
Butter " "	28 gm.
Milk " "	1549 gm.
Cream " "	155 gm.
Cocoa " "	60 gm.

[1] Arranged by the Loomis Sanatorium, Loomis, N. Y., for Pattee's Practical Dietetics, 1922.

[2] Loomis Sanatorium—cf. King, "On the Construction of an Efficient and Economic Diet in Tuberculosis," Medical Record, Oct. 16, 1900. (Still in use, 1922).

Schedule of Feeding:

Breakfast	Gm.	Dinner	Gm.	Supper	Gm.
Orange		Fricasseed chicken	200	Boston baked beans, catsup	82
Pettijohn	24	Sliced tomatoes..	98	Marmalade	15
Sausage	63	Mashed potatoes.	126	Chocolate cake....	67
Corn bread	40	Boiled rice	37	Prunes	63
Bread, butter		Vanilla ice cream	120	Bread, butter.....	
Coffee, cocoa		Bread, butter....		Tea, cocoa, milk.	
Milk, cream		Milk			

Pneumonia[1]

Loomis Sanatorium

Because pneumonia is usually of short duration the amount of food given has not been considered so important as in some other diseases. However, when the illness is protracted and convalescence is delayed, it is most desirable that the body should not become too much weakened and proper dietary treatment must be considered.

Kinds of Food to Use.—During the acute febrile stage, i. e., in lobar pneumonia, prior to the crisis, the diet should consist chiefly of fluids, with gruel, custard and jelly added if desired and possibly lactose if well tolerated. The addition of cream has been suggested (Carter, Howe and Mason) but it is doubtful if many patients during this stage will tolerate either much cream or lactose. Plenty of water is allowed and fruit drinks like lemonade, orangeade or grapejuice are refreshing to the patient.

Administration of Diet.[2]—"Since sleep is of the utmost importance in pneumonia, a rest from feedings at night of from six to eight hours is advisable if the patients will sleep, but they are to be fed when awake not oftener than every two hours. With the onset of tympanites feedings must be stopped for a few hours so that the beneficial effects of stupes to the abdomen and a hypodermic of pituitary extract, etc., may be obtained. When feedings are resumed it is often

[1] Arranged under the supervision of the Loomis Sanatorium, Loomis, N. Y., for Pattee's Practical Dietetics, 1922.
[2] Carter, Howe and Mason, "Nutrition and Clinical Dietetics," Lea & Febiger, Philadelphia, Pa.

better to leave sugar and milk out of the diet unless the latter is fully peptonized (2 hours) or else given in some other form than raw milk. The use of other artificial digestants is often of service.

"In this connection it seems worth while calling attention to the use of a good Bulgarian bacillus culture given in a little sweetened water three times a day on an empty stomach. The apparent effect of this is often most happy in reducing the distention, as is also indicated in the discussion of typhoid fever."

A good diet for an average-sized person might be formulated as follows:[1]

For 1825 Calories a Day: Approximate values—protein, 90 gm.; carbohydrate, 220 gm.

8 A. M.	Milk and coffee, each 120 c.c. (4 oz.), 240 c.c. (8 oz.) sugar.
10 A. M.	Milk in any form, hot or cold, 240 c.c. (8 oz.)
12 M.	Gruel, 120 c.c. (6 oz.)
2 P. M.	Milk feeding, as at 10:00 A. M., 240 c.c. (8 oz.).
4 P. M.	Gruel, 120 c.c. (4 oz.), with milk, 180 c.c. (6 oz.).
6 P. M.	Custard with lactose (4 oz.) 1 cup.
8 P. M.	Milk feeding, as at 10.00 A. M., 240 c.c. (8 oz.).
10 P. M.	Whey, 180 c.c. (6 oz.) with one whole egg and sherry, 15 c.c. (½ oz.).
12 P. M.	Gruel, as at 12:00 o'clock noon.
2 A. M.	Milk as at 10:00 A. M.
4 A. M.	Whey, 180 c.c. (6 oz.), or hot milk 240 c.c. (8 oz.).
6 A. M.	Milk as at 10:00 A. M.

Diet in Convalescence.—The liquid or semi-solid diet should be continued until temperature falls and symptoms of toxemia are passed. There should then be a gradual return to normal feeding through the usual soft and convalescent diets. All through this period the diet should be very nourishing and easily digested. During this period, as appetite returns, the total calories may be increased by the addition of cream suggested (1 pint divided between meals).

[1]Carter, Howe and Mason, "Nutrition and Clinical Dietetics," Lea & Febiger, Philadelphia, Pa.

Acute Bronchitis

This may be the result of an initial respiratory infection, or it may appear as a complication of certain exanthemata or certain chronic diseases.

Kinds of Food to Use.—During the acute febrile stage the diet should be liquid or semi-solid, somewhat similar to that in pneumonia except that frequently more food can be taken. Instead of adding lactose, some butter may be given and cereals and creamed toast may be added. As soon as a patient wishes solid food it may be given, using only easily digested food. Should the disease accompany gout or nephritis as it does with some elderly people, the diet should be such as is recommended for those disorders.

Chronic Bronchitis

Chronic bronchitis is frequently a condition accompanying other diseases and the diet must be arranged according to the requirements of that disease.

If, however, there is no other disorder the diet should be made up of foods which are easily digested and which do not easily ferment, avoiding an excess of carbohydrate, as this has been shown considerably to increase the respiratory work. (Vide McCann, W.S.)

Fatty foods, as cream, butter, fat meats, etc.

Laxative foods, as fruits, green vegetables, simple salads.

Water, 6 to 8 glasses a day.

QUESTIONS FOR STUDY

TUBERCULOSIS

1. Discuss the food requirements for tuberculosis patients.
2. What should be the protein allowance?
3. What is considered the best distribution of fats and carbohydrates?
4. Discuss arrangement of meals.
5. State what foods are best adapted for this diet.

PNEUMONIA

6. Discuss the dietetic treatment of pneumonia.
7. How may tympanites be relieved?

BRONCHITIS

8. What reason is there for some restriction of carbohydrates in pulmonary and bronchial affections?

CHAPTER XVIII

DIET IN DISEASE OF THE CIRCULATION

High Blood Pressure

Dr. G. Oliver[1]

Reduction of Cardio-Vascular Stimulation.—The principal aim in our dietetic directions should be to select a diet which has the least stimulating effect on the circulatory organs. Hence we should reduce as much as possible not only the bulk of each meal but also the proportion of those constituents of the foodstuffs which more particularly stimulate the cardio-vascular apparatus, such as various salts, soluble extractives, active principles and other bodies (e. g. alcohol), which are directly absorbed without change, and may be regarded as exogenous hormones between the digestive tract and the circulatory apparatus, stimulating the heart on the one hand and the capillary circulation on the other.

In the normal state of the circulation the vaso-motor play of the peripheral parts is free and responds to the variations in the heart action; but this harmony becomes disturbed in cases of supernormal arterial pressure, in which the stress of any stimulation of the circulation falls more and more on the heart muscle, with increment of the arterial pressure Hence in such cases we should try to modify as much as possible the cardio-vascular stimulation produced by the ingestion of food.

The next important point is to correct digestive irregularities, (and examine the mouth for carious teeth and pyorrhoea, which commonly cause gastric disturbances and possibly by the absorption of toxins contribute to a rise in

[1] "Studies in Blood Pressure," by Dr. G. Oliver. H. K. Lewis & Co., Ltd., London, England.

blood pressure.—A.M.). We should encourage extra mastication and insalivation, especially of the amylaceous foodstuffs, which are generally so soft as not to seem to need any mastication at all and are consequently bolted, whereas it is more important to masticate and insalivate them thoroughly than the protein foods.

The supply of meats of all kinds should be reduced below the proportion ordinarily taken, some being satisfied merely to reduce or to disallow the red meats (beef and mutton), while they permit the taking of white and young meats (fish, poultry, veal, etc.,) in ordinary quantities. Though the practitioner is nearly always inclined to select what are called lighter meats, I cannot say that I have observed any difference of effect on the arterial pressure of the various forms of roast or fried meats—whether as beef, mutton, fish, poultry, etc. A more important difference in this respect seems to me connected with the way in which the meats are cooked—whether roasted and taken with the gravy, or boiled and served without the broth. I therefore make it a rule in these cases to substitute, as much as possible, boiled for the roasted or fried forms of fish, fowl, beef, mutton, etc., and to exclude from the dietary meat extractives, such as meat soups, gravies, etc. The proportion of green vegetables and fruits should be increased and carbohydrate foods may be taken in moderation. As a rule I think the cases do best on the reduction of an ordinary diet as a whole, with a diminution of the animal and an increase of the vegetable foodstuffs. The reduction of the ingesta to physiological needs and expenditure is particularly important in the management of cases of high arterial pressure; for some of these patients are inactive and, feeling weak and run down, crave for the stimulant effects of tonics, a full meat diet, an excess of salt and other condiments and alcoholic drinks.

Type of Diet.—Non-stimulating diet—low protein, high carbohydrate, low salt. In obese cases reduce quantity of fat and carbohydrates.

HIGH BLOOD PRESSURE DIET

(SALT-POOR DIET)

For 2425 Calories a Day: Approximate values—protein, 72 gm.; fat, 101 gm.; carbohydrates, 307 gm.

SCHEDULE OF FEEDING	MEASURE	GRAMS	PROTEIN	FAT	CARBO-HYDRATE
Breakfast:					
Grapefruit	½	150	...	....	7.5
Farina (Salt-Free)	6⅔ tbsp.	100	1.6	....	11.5
Eggs	2	...	15.0	11.0	....
Salt-Free Bread Toasted	2 thin slices	30	3.0	.3	16.5
Butter (Salt-Free)	1 tbsp.	15	...	12.7	....
Sugar	2 tbsp.	30	...	....	30.0
Cream (orange)	2½ tbsp.	50	1.5	10.0	2.5
Orange marmalade	2 tbsp.	30	.2	....	25.3
Coffee (Caffein-Free)					
Luncheon:					
Fresh Mackerel	1 serving	80	15.2	5.6	....
Lemon	1 slice	10	1	....	1.0
Spinach	½ cup	100	2.0	....	3.0
Baked Potato	1 large	130	3.7	.2	32.0
{ Fresh Tomato	1 small	150	1.5	....	6.0
{ Lettuce	2 leaves	30	.3	....	.9
Vinegar					
Bread (Salt-Free)	2 thin slices	30	3.0	.3	16.5
Butter (Salt-Free)	1⅓ tbsp.	20	...	17.0	....
Baked Apples	1½ apple	200	2.0	....	40.0
Cream	1½ tbsp.	30	.9	6.0	1.5
Sugar	1⅓ tbsp.	20	...	....	20.0
Coffee (Caffein-Free)					
Dinner:					
Broiled chicken with bone	1 serving	150	19.7	1.5	....
Sweet Potato (baked)	1 medium	150	3.0	1.5	41.0
String Beans	¾ cup	100	2.0	....	7.0
Celery hearts	½ heart	50	.5	....	1.5
Salad { Lettuce	2 leaves	20	.2	....	.6
Salad { Orange	3 sections	30	.3	....	3.0
Salad { Grapefruit	1½ sections	40	...	....	2.0
Salad { Banana	6 slices	20	.2	....	4.4
Salad { Grapes		20	.2	....	3.8
Mayonnaise dressing	1 tbsp.	21	.3	19.9	....
Bread (Salt-Free)	2 thin slices	30	3.0	.3	16.5
Sugar	⅔ tbsp.	12	...	....	12.0
Butter (Salt-Free)	⅘ tbsp.	13	...	10.9	....
Cream	1 tbsp.	20	.6	4.0	1.0
Coffee (Caffein-Free)					
			72.0	101.0	307.0

Soper's High Blood Pressure Treatment[1]

As a working rule the following diet was given and the patient instructed to follow it for a week.

DIET LIST

1. Always bring this list with you when returning to this office.
2. Do not under any circumstances eat or drink anything else.
3. Eat slowly and chew the food well.
4. One glass cold water upon arising.

Breakfast: Oranges or grape fruit.
Cereals with cream.
Eggs—soft boiled, poached, omelet.
Toast and Butter.
One cup hot water flavored with cream.

11 A. M. One glass of cold water.

Lunch: Orange or grape fruit.
Creamed vegetable soups (no meat stock).
Stewed white onions, oyster plant, carrots, celery, spinach, asparagus, string beans, well-mashed squash, well-mashed turnips, cauliflower, artichokes, baked or broiled egg plant, okra, corn.
Raw celery, onions, tomatoes, olives.
Lettuce, tomato and fruit salad, with French or mayonnaise dressing.
Custards, gelatines, cornstarch, tapioca.
Stewed fruits.
Whole wheat bread and butter.
Raw fruits.
One glass cool water.

4-5 P. M. One glass cool water.

Dinner: Creamed vegetable soups (no meat stock).
Roast beef, roast lamb, roast chicken, or roast turkey, without dressing.
Broiled lamb chops, broiled steak.
Baked fresh fish.
(Portion of meat to correspond in size to the lean part of one lamb chop.)
Potatoes well-mashed, or rice well-cooked.
Other vegetables same as at lunch.
Whole wheat bread and butter.
Stewed fruits.
Raw fruits.
One glass cool water.

At bedtime: One glass cool water.

Avoid: Avoid all condiments, such as mustard, horse radish, catsup, etc. Use very little sugar, very little salt, no pepper. All vegetables should be very well cooked without the addition of meat, fat, or salt.

[1] Dr. Horace W. Soper, "The Dietetic Treatment of Arterial Hypertension," Interstate Medical Journal Co., St. Louis, Mo.

Upon the patient's return to the office the approximate amount of food eaten, together with the protein, was calculated by Arnold's method. Additions and subtractions were made as appeared to be indicated, taking into consideration the general condition of nutrition, the digestive processes, as well as the subjective symptoms.

In many cases meat was withdrawn, then added from time to time, and the results noted. Two thousand calories and 50 to 60 grams of protein represented the average daily quantity consumed. However, some patients consume more than 100 grams, one in particular reaching the high figure of 150 grams. In many cases considerably less protein was used to produce the initial fall in blood-pressure.

General hygienic measures, such as physical exercise, periods of rest, abstinence from alcohol, coffee, tea and cocoa and reduction in tobacco when used to excess, were insisted upon in all the cases.

Water.—The daily quantity of water to be consumed is another important feature. Eustis and others recommend copious water drinking with the idea of flushing out the tissue poisons. Von Hecht on the other hand severely restricts the fluid intake. My experience is that water should be used regularly and in sufficient quantities to produce proper elimination—approximately two quarts daily.

Low Blood Pressure

Dr. G. Oliver[1]

Diet.—The value of meat and meat extractives in the treatment of an asthenic condition of the circulation has of late years been thrown somewhat into the background by our dread of uric acid and the other purin bodies which are associated with goutiness and indeed our dietetic directions generally have thus to a considerable extent become vitiated and lopsided. In low-pressure cases roast meats and gravies should predominate in the diet and when meats are not ad-

[1]"Studies in Blood Pressure," by Dr. G. Oliver. H. K. Lewis & Co., Ltd., London, England.

missible in the crude form, as when there is a rise of temperature, extractives of them, which are valuable cardiac stimulants and restoratives, should be give frequently in small quantities. In many cases of acute illness, such as diphtheria, pneumonia and influenza, in which the heart is apt to fail, watery extracts of muscle when given in judicious intervals often afford timely aid in tiding the heart over a critical period, acting like other stimulant remedies quickly and decisively and enforcing the sustaining effects of food (milk, etc.,) which requires time for its absorption and assimilation. They should not be given, as they were some years ago, as substitutes for food. Alcohol, especially in the form of brandy egg-flip, acts in a similar way when administered with food. Sodium chloride (salt) is another stimulant of the circulation which is apt to be overlooked. It should never be omitted from the liquid foods, such as milk, and I would suggest that it should be given along with calcium and potassium chloride in the proportions present in Ringer's circulating fluid,[1] which may form the menstruum of the drinks—lemon, barley or toast water.

The due apportionment of rest and the regulation of exercise are most important in the treatment of low-pressure patents. In acute cases absolute recumbency is of course necessary. In chronic cases and during convalescence from febrile ailments the prescription of exercise frequently requires to be well guarded in order to prevent recurrence of atonia and consequent delay in recovery, and in such cases recumbency should be enjoined during the hypotonic periods following the meals and exercise, when undue draining of blood into the splanchnic veins takes place. In low-pressure cases abdominal massage and faradism of the abdomen are useful.

Type of Diet.—Stimulating diet—rich in meat extractives and sodium chloride.

[1]Aseptules containing the chlorides of sodium (6 parts), potassium (3 parts), and calcium (1 part) are supplied by Messrs. Oppenheimer, Son & Co. for the ready preparation of Ringer's solution—one aseptule being dissolved in 20 oz. of freshly boiled water.

LOW BLOOD PRESSURE DIET

For 2372 Calories a Day: Approximate values—protein, 95 gm.; fat, 128 gm.; carbohyrate, 210 gm.

SCHEDULE OF FEEDING	MEASURE	GRAMS	PROTEIN	FAT	CARBO-HYDRATE
Breakfast:					
Orange	⅓	100	1.0	....	10.0
Oatmeal	½ cup	100	2.8	.5	11.5
Eggs	2	...	15.0	11.0	....
Bacon med. fat weighed raw	4 or 5 large slices	30	3.0	20.1	....
Bread (toasted)	1 med. slice	20	2.0	.2	11.0
Butter	⅔ tbsp.	10	...	8.5	....
Cream	2½ tbsp.	50	1.5	10.0	2.5
Sugar	2 tbsp.	30	...	....	30.0
Coffee					
Luncheon:					
Cold Pickled Tongue		80	17.0	7.2	....
Baked Potato	1 large	130	3.0	....	27.0
Salad: Lettuce	3 leaves	50	.5	....	1.5
Salad: Oil	1 tbsp.	5	...	5.0	....
Salad: Vinegar					
String Beans	¾ cup	100	2.0	....	7.0
Bread	1 med. slice	20	2.0	.2	11.0
Butter	1⅓ tbsp.	20	...	17.0	....
Grapefruit		146	...	....	7.3
Sugar	2 tbsp	29	...	....	29.0
Cream	1 tbsp.	20	.6	4.0	1.0
Coffee or tea					
Dinner:					
Broth	⅝ cup	150	3.0	....	...
Steak (lean sirloin)	Small serving	100	24.0	10.0	....
Spinach	½ cup	100	2.0	....	3.0
Beets (cooked)	⅔ cup sliced	100	2.0	....	7.0
Celery hearts	1 heart	50	.5	....	1.5
Bread	1 med. slice	20	2.0	.2	11.0
Butter	1 tbsp.	15	...	12.7	....
American Cheese	1 small slice	20	5.3	7.2	....
Cream	1 tbsp.	20	.6	4.0	1.0
Ice Cream	5 tbsp.	100	5.2	10.2	17.7
Sugar	1⅓ tbsp.	20	...	....	20.0
Coffee or tea					
			95.0	128.0	210.0

QUESTIONS FOR STUDY

BLOOD PRESSURE

1. What type of foods should be restricted or eliminated from diet of high blood pressure patients?
2. Give reason for this restriction.
3. Does the method of cooking enter into the question?
4. Is the disorder affected by other physiological conditions?
5. What type of diet should be given?
6. Compare with this the diet in low blood pressure cases.

CHAPTER XIX

DIET IN DISEASES OF THE STOMACH[1]

Dr. Max Einhorn

Two principles of feeding are used in the dietetic treatment of gastric disorders. One is to spare the organ by giving little or no food for a time, a treatment used mostly in acute cases the other is by corrective feeding, that is, giving foods of such composition that the disordered stomach can care for them and by gradual additions be strengthened to digest again a normal diet. The second method follows the period of rest in acute attacks and is generally used in chronic cases. Einhorn points out the necessity, especially in chronic cases, of taking sufficient amounts of food to prevent loss of weight, even though stomach digestion is poor. Intestinal digestion so supplements stomach digestion that with careful selection of food the body may be well nourished.

Indigestion is an indefinite term applied to any discomfort arising from a disordered digestive tract. The seat of the trouble may be in the stomach or the discomfort may be a symptom of a derangement of the intestines or some of the digestive glands. The cause should always be investigated as it may be due to some avoidable reason, such as rapid eating, poor mastication, individual reaction to certain kinds of food, or to the wrong mental attitude while eating. Anger, worry and fear undoubtedly inhibit the action of the secretory glands of the stomach. Again it may be a warning of serious gastric trouble.

[1] Through the kindness of Dr. Max Einhorn, "Diet in Diseases of the Stomach" was rewritten under his supervision from his book, "Diseases of the Stomach," published by William Wood Co., New York City, 1920.

Gastric Hyperacidity

Type of Diet.—Non-stimulating—high protein and fat diet.

The underlying cause of the excessive acidity must be the guide in selecting the diet. If it is due to gastric ulcer the treatment for that disorder should be followed. If from other causes there are two rules which are safe to follow:

1. Avoid foods which may excite or stimulate the glands of the stomach, such as acids, spices and condiments and foods extremely hot or cold.
2. Give the diet having a high protein content because it will readily combine with the free acid present in the stomach, also plenty of fats (cream, butter), as the latter have a tendency to diminish gastric secretion.

EINHORN'S DIET IN HYPERACIDITY

For 2539 Calories a Day:

			Calories.
7:30 A. M.	2 Eggs		160
	Wheat bread	50 gm.	128
	Butter	20 gm.	163
	Milk	250 gm.	169
10:30 A. M.	Zoolak or Milk	200 gm.	135
	Crackers or Bread	30 gm.	77
	Butter	10 gm.	81
1:00 P. M.	Broiled Meat	100 gm.	210
	Mashed Potatoes	50 gm.	63
	Bread	30 gm.	77
	Butter	10 gm.	81
	Weak tea or Vichy Water	200 gm.	
3:30 P. M.	The same as at 10:30 A. M		293
6:30 P. M.	Soup (with Barley or Vermicelli)	200 gm.	100
	Bread (30 gm.) and Butter	10 gm.	158
	Meat (broiled or boiled)	100 gm.	210
	Potatoes baked	50 gm.	60
	Green vegetables (spinach, green peas)	50 gm.	80
	Coffee (half milk)	100 gm.	34
10:00 P. M.	Oysters and Crackers, or Cold Meat Sandwich; 1 glass Beer		260
			2539

Kind of Food to Use[1]:

Soups ....Cream of purée (except tomato).

Fish ....Raw oysters, fresh cod, halibut, bass, boiled with cream sauce or broiled.

Meat ....Beef well done (without gristle, fat or gravy), chicken, turkey, guinea hen, lamb (without fat), once daily.

Vegetables ...All soft-boiled green vegetables, except cabbage, cauliflower, brussels sprouts, or turnips. Baked white potato may be used moderately. Rice or macaroni.

Cheese ......Any mild variety, but better without this at first.

Desserts .....Cream and egg desserts of all sorts, *e. g.*, blancmange, Bavarian cream, floating island, cup custard, junket, soft rice or bread puddings. Gelatin desserts made with little flavoring. Very little sugar used in all desserts. Fruit, none, except when constipation is a marked feature, then stewed soft fruits may be taken in good amount, but must be cooked with very little sugar and are best taken with or after a meal, never before. Cream may usually be used freely.

Bread ....Toast, stale bread, roll. (Fresh butter or salt butter freshened by working it over in fresh water.)

Drinks ......Weak tea, cocoa, water and milk.

Cereals ......Fine-grained varieties, well cooked.

Eggs ....In all forms except fried.

Foods to Avoid:

All sour, spiced or peppery foods, condiments, salt foods, chow-chow, etc. Sweets, fried foods.

Very hot or very cold food or drinks.

Rough, hard substances, such as seeds, skins of fruit or vegetables, corn, uncooked vegetables.

Coffee, wines, liquors, beer.

Hot breads, pies, cakes, syrups, etc.

Gastric Subacidity

Type of Diet.—Low Protein.

Protein foods should be limited and only those most easily digested included, such as eggs, milk and meats which are free from gristle or connective tissue. Carbohydrates may be largely given, especially in the form of starch, as in the absence of acid salivary digestion continues in the stomach longer than normally. Sugar should be given sparingly because of its tendency to ferment.

[1]Dr. H. S. Carter, "Presbyterian Diet Lists." W. B. Saunders Co., Philadelphia, Pa.

Clear soups are recommended because of their stimulating effect on the gastric glands.

Particular care should be taken to have all foods and drinks sterile since the natural germicidal effect of the acid of the stomach is largely missing.

Chronic Gastritis[1]

Dietetic Treatment.—The causes giving rise to chronic gastritis are much the same as for the acute form. Repeated attacks of acute gastritis may result in a chronic condition, or the condition may follow infectious diseases.

The regulation of the diet is of prime importance in the treatment. The dietary to be selected will depend on the severity of the symptoms.

At the beginning, therefore, a light diet will be called for. The patient should partake of four meals daily. The articles of food should be given largely in liquid and semi-liquid forms; that is, milk, kumyss, matzoon, barley, oatmeal, and rice soup prepared in milk; chicken soup with an egg beaten up in it; soft-cooked eggs, mashed potatoes, scraped meat, raw, or broiled, toasted bread, and also French white bread (not too fresh); butter; tea and cocoa.

The quantity of nourishment for each meal should be neither excessively large nor too small.

My own bill of fare for the first week of the treatment is as follows:

		CALORIES
8:00 A. M.	Two eggs	160
	Two ounces of French white bread	156
	One-half ounce of butter	107
	One cup of tea (100 gm. of tea, 150 gm. milk)	101
	Sugar 10 gm. (ʒ iiss.)	40
10:30 A. M.	Kumyss or matzoon or milk, 250 gm. (℥ viii. ⅓)	168
	Crackers, 30 gm. (one ounce)	107
	Butter, 20 gm. (ʒ v.)	163
12:30 P. M.	Two ounces of tenderloin steak, or of white meat of chicken	76

[1] Max Einhorn, M.D.: "Diseases of the Stomach." 6th Edition. New York. William Wood & Co., 1920.

		CALORIES
	Mashed potatoes, or thick rice, 100 gm. (℥ iii. ⅓)	127
	White bread, two ounces	153
	Butter, one-half ounce	107
	One cup of cocoa, 200 gm. (℥ vi. ⅔)	101
3:30 P. M.	The same as 10:30 A. M.	438
6:30 P. M.	Farina, hominy, or rice boiled in milk, one plateful, 250 gm. (℥ viii. ⅓)	440
	Two scrambled eggs	160
	Bread, two ounces	156
	Butter, one-half ounce	107
		2863

After the patient has been kept on this diet for a week or two, the diet must be gradually changed to one suitable for the lighter forms of chronic gastritis. Here the following rule will apply: The diet should correspond as nearly as possible to the common mode of living. In this way the distribution of the meals should be arranged according to the customs prevailing in those places in which the patient lives.

All food derived from the vegetable kingdom should be given in large portions, while the quantity of meat should be somewhat limited.

In order to permit the patient to have a greater variety in his food, it is best not to point out a few articles he should eat, but to mention only those he should avoid. Forbid meat with very tough fibers, meat from too old animals or too fresh meat (right after slaughtering), meat that contains too much fat, like pork; forbid sausages, lobster, salmon, chicken salad, mayonnaise, cucumbers, pickles, cabbage and strong alcoholic drinks like liquors.

It must be impressed upon the patient to masticate the food thoroughly, to eat slowly, not to think of business during meals, and to stop eating before the sensation of satiety appears. The latter advice is only necessary in persons who are accustomed to high living.

Chronic gastric catarrh is frequently combined with constipation. The diet can be arranged as to facilitate movement of the bowels. All foods which contain a large percentage of cellulose (undigested matter) increase the quantity of feces, thereby effecting a stronger peristalsis of the larger bowel.

All kinds of green vegetables (spinach, asparagus, green peas) and rye bread are therefore very suitable. Many organic acids possess the property of increasing intestinal peristalsis. Almost all kinds of fruits contain a certain quantity of these organic acids, and act like mild aperients. The use of cooked pears, stewed or baked apples, stewed prunes, is in many instances effective. Ewald recommends a mixture of two parts of prunes to one part of dried figs. The taste is agreeable, and the cathartic action mild. The custom of eating an orange in the morning for its laxative effect is well known. To these dietary remedies we may also add the use of a glassful of either very cold or warm water, or a glass of milk on arising, in the fasting condition.

There are many persons in whom one of these latter means produces a good movement of the bowels.

Acute Gastritis

Dietetic Treatment.—Attacks of acute gastritis very often follow errors in diet, either over-feeding or the use of unusual quantities of very hot or very cold food, or very highly seasoned foods. Poor mastication, either from too rapid eating or because of defective teeth, is also a contributing cause. In such acute attacks the treatment calls for complete rest for one or possible two days that the stomach may rid itself of all offending substances and recover from its irritated condition, then by beginning with very simple foods and gradually increasing the amounts and variety it is brought back to its normal functioning.

Diet in Acute Gastritis.[1]—During the first or second day of illness it is best not to give the patient anything substantial to eat. Strained barley or rice water, or weak tea may be taken. On the third day, as soon as the appetite reappears,

[1] Dr. Max Einhorn, "Diseases of the Stomach," 6th Edition. William Wood & Co., New York City, 1920.

the patient is permitted to partake of water soup (bread and hot water) oatmeal or barley gruel, rice soup, and perhaps one soft-cooked egg. Later on French bread, butter and oysters may be added to the dietary.

If the improvement is steadily progressing the fourth day begin with meat once a day, and thus slowly return to the usual bill of fare.

Ulcer of the Stomach[1]

The diet consists of liquids—milk, milk with strained barley, or oatmeal, or rice water; plain water, weak tea and peptone (one teaspoon to a cup of water). Debove and Rémond have suggested the addition of lactose and of meat powder to the milk, in order to make the diet richer in nourishing substances.

As a rule, we employ the above-named additions, which fulfill the same purposes, besides varying the monotonous bill of fare.

First Week. During the first week we give the patient half a cup (about 100-150 c.c.) of either, every hour. Everything the patient takes must be neither cold nor very warm, and should be taken slowly (sipping, or with a spoon).

Second Week. During the second week we order the same kind of food, with this difference, that he is nourished every two hours, and gets a cupful or a cupful and a half (200 to 300 c.c.) at a time.

Occasionally we now allow the patient one raw egg beaten up in the milk, once or twice a day. In the beginning of the third week we feed the patient every three hours; he is allowed barley, farina, and rice (well cooked) in milk, soft-cooked eggs, crackers softened in milk, in addition to his previous foods; on the third day of the third week we begin to give the patient meat, first raw, well scraped, then broiled.

Thereafter we go over to the ordinary daily diet, excluding heavy salads, pastry, raw fruit and the like.

[1] Dr. Max Einhorn, "Diseases of the Stomach," 6th Edition. William Wood & Co., New York City, 1920.

In the following table I give an outline of diet which I ordinarily prescribe in this affection:

EINHORN'S GASTRIC ULCER DIET

First Three Days

For 1402 Calories a Day:

		CALORIES
7:00 A. M.	Milk, 150 c.c. (five ounces)	101
8:00 A. M.	Milk, 150 c.c. (five ounces)	101
9:00 A. M.	Milk, 150 c.c. (five ounces)	101
10:00 A. M.	Milk and strained barley water (āā, 150 c.c.)	80
11:00 A. M.	Milk, 150 c.c.	101
12:00 M.	Milk, 150 c.c.	101
1:00 P. M.	Bouillon either alone or with the addition of one to two teaspoonfuls of a peptone preparation, 150 c.c.	30
2:00 P. M.	Milk	101
3:00 P. M.	Milk	101
4:00 P. M.	Milk	101
5:00 P. M.	Milk with strained barley or oatmeal	80
6, 7, 8, 9 P. M.	Milk, 150 c.c.	404

Fourth to the Tenth Day

For 1410 Calories a Day:

7:00 A. M.	Milk, 300 c.c. (ten ounces)	202
9:00 A. M.	Milk, 300 c.c. (ten ounces)	202
11:00 A. M.	Milk with barley, rice, or oatmeal water, 300 c.c.	160
1:00 P. M.	One cup of bouillon, 200 c.c., and one egg beaten up in it	80
3:00 P. M.	Milk, 300 c.c.	202
5:00 P. M.	Milk, 300 c.c.	202
7:00 P. M.	Milk with barley water, 300 c.c.	160
9:00 P. M.	Milk, 300 c.c.	202

Eleventh to the Fourteenth Day

For 1790 Calories a Day:

7:00 A. M.	Milk, 300 c.c.	202
9:00 A. M.	Milk, 300 c.c.	202
	and two crackers softened (one ounce)	100
11:00 A. M.	Milk with barley water, 300 c.c.	160
1:00 P. M.	One cup of bouillon, 200 c.c., one egg, and two crackers	180
3:00 P. M.	Milk, 300 c.c., and one egg	282
5:00 P. M.	Milk, 300 c.c.	202
	and two crackers	100
7:00 P. M.	Milk, with barley water	160
9:00 P. M.	Milk, 300 c.c.	202

Fourteenth to the Seventeenth Day

For 2134 Calories a Day:		CALORIES
7:00 A. M.	Milk, 300 c.c.	202
9:00 A. M.	Milk, 300 c.c.	202
	and two crackers (one ounce)	100
11:00 A. M.	Milk with barley, 300 c.c.	342
1:00 P. M.	Scraped meat, 50 gm	60
	two crackers, one cup of bouillon, 200 c.c.	100
3:00 P. M.	Milk, 300 c.c.	202
5:00 P. M.	Milk, 300 c.c.	202
	one egg (soft boiled)	80
	two crackers	100
7:00 P. M.	Milk with farina, 300 c.c.	342
9:00 P. M.	Milk, 300 c.c.	202

Seventeenth to Twenty-Fourth Day

For 2820 Calories a Day:		
7:00 A. M.	Two eggs (soft boiled)	160
	Butter, 10 gm	81
	Toasted bread, 50 gm	130
	Milk, 300 c.c.	202
10:00 A. M.	Milk, 300 c.c.	202
	Crackers, 50 gm	166
	Butter, 20 gm	162
1:00 P. M.	Lamb chops (broiled), 50 c.c.	60
	Mashed potatoes, 50 gm	44
	Toasted bread, 50 gm	130
	Butter, 10 gm.; one cup of bouillon, 200 c.c.	81
4:00 P. M.	The same as at 10 A. M	530
6:30 P. M.	Milk with farina, 300 c.c.	342
	Crackers, 50 gm	166
	Butter, 20 gm	162
9:00 P. M.	Milk, 300 c.c.	202

In cases of ulcer of the stomach presenting a more severe type—violent pains, frequent vomiting, inability to take food on account of the pains—or after hæmatemesis, I usually have the patient abstain from any food whatever, given by the mouth, for a period of five days. The patient is then fed by the rectum. This is done in the following way: early each morning the patient receives a large enema of about a quart of lukewarm water, in which a teaspoonful of common table-salt has been dissolved as a cleansing enema. About an hour after the patient has emptied the injected water the first nourishing enema is given; this may consist either of a glassful of milk (about 200 c.c.), in which a raw egg has been well beaten and a pinch of salt added, or of a cupful of water in which a tablespoon of a good peptone preparation has been dissolved. The temperature of either must be about 100° F. Such a nourishing enema is given three or four times a day, being slowly injected by means of a fountain syringe and a soft-rubber rectal tube. One or two quarts of saline or of a 6% glucose solution is given besides, by the Murphy drip. The patient may frequently wash his mouth with cold water and is allowed from time to time to keep a small piece of chopped ice in his mouth and to swallow the melted water, also to take a little gelatin. The five days being over, the mode of diet is the same as described above for the ordinary form of ulcer.

Other Ulcer Diets

LENHARTZ'S GASTRIC DIET FOR ACUTE ULCER

The "Lenhartz diet" begins with 100 c.c. milk and one egg daily, in teaspoonful doses, gradually increasing until at the end of four weeks a liberal mixed diet is allowed, always avoiding coarse vegetables and irritating substances.

The gradual increase of food appears in the accompanying scale.

Preparation of Food for Serving:

1. Take total of eggs per day (as size of eggs differ) beat and measure into seven feedings. Put into medicine glasses and keep on ice until ready for use.
2. Measure daily requirements of milk and keep in bowl of cracked ice.
3. Spoon used in serving should be kept in a bowl of ice.
4. Salt eggs very slightly first and second day or salt may be omitted. The third day sugar is used.
5. All feedings should be given *very* slowly.
6. On the tenth day some of the milk, eggs and sugar are made into custard. The beef is scraped and weighed after cooking. Occasionally lime water must be added to the milk. If large curds form, the milk is diluted with barley water. Great care is exercised in the transition stages from liquids to semi-solids and finally to full diet.

Schedule for Feeding:

First Day:

7 A. M.	Egg.
8 A. M.	Milk, 20 c. c. (⅔ oz.).
9 A. M.	Egg.
10 A. M.	Milk, 20 c. c. (⅔ oz.).
11 A. M.	Egg.
12 M.	Milk, 15 c. c. (½ oz.).
1 P. M.	Egg.
2 P. M.	Milk, 15 c. c. (½ oz.).
3 P. M.	Egg.
4 P. M.	Milk, 15 c. c. (½ oz.).
5 P. M.	Egg.
6 P. M.	Milk, 15 c. c. (½ oz.).
7 P. M.	Egg.

Thus the total for the first day is—eggs (raw), 2; milk, 100 c. c. (3⅓ oz.); calories, 280. Note Recapitulation of Lenhartz Diet.

Second Day:

7 A. M.	Egg.
8 A. M.	Milk, 35 c. c. (1 oz.).
9 A. M.	Egg.
10 A. M.	Milk, 35 c. c. (1 oz.).
11 A. M.	Egg.
12 M.	Milk, 35 c. c. (1 oz.).
1 P. M.	Egg.
2 P. M.	Milk, 35 c. c. (1 oz.).
3 P. M.	Egg.
4 P. M.	Milk, 30 c. c. (1 oz.).
5 P. M.	Egg.
6 P. M.	Milk, 30 c. c. (1 oz.).

Thus the total for the second day is—eggs (raw), 3; milk, 200 c. c. (6⅔ oz.); calories, 470. Note Recapitulation of Lenhartz Diet.

Third Day:

7 A. M.	Egg; sugar, 2 gm. (½ dr.).
8 A. M.	Milk, 50 c. c. (1⅔ oz.).
9 A. M.	Egg; sugar, 3 gm. (¾ dr.)
10 A. M.	Milk, 50 c. c. (1⅔ oz.).
11 A. M.	Egg; sugar, 3 gm. (¾ dr.).
12 M.	Milk, 50 c. c. (1⅔ oz.).
1 P. M.	Egg; sugar, 3 gm. (¾ dr.).
2 P. M.	Milk, 50 c. c. (1⅔ oz.).
3 P. M.	Egg; sugar, 3 gm. (¾ dr.).
4 P. M.	Milk, 50 c. c. (1⅔ oz.).
5 P. M.	Egg; sugar, 3 gm. (¾ dr.).
6 P. M.	Milk, 50 c. c. (1⅔ oz.).
7 P. M.	Egg; sugar, 3 gm. (¾ dr.).

Thus the total for the third day is—eggs (raw), 4; milk, 300 c. c. (10 oz.); sugar, 20 gm. (5 dr.); calories, 637. Note Recapitulation of Lenhartz Diet.

The preceeding outlines will be sufficient to show the intervals of feeding and arrangement of the foods. Then the directions can be followed for the daily allowance noted under the recapitulation as given on the following page.

RECAPITULATION OF LENHARTZ'S DIET

Day Calories	Eggs	Milk c.c.	Milk oz.	Sugar	Scraped beef	Boiled rice gm.	Boiled rice oz.	Zwieback	Butter gm.	Butter oz.	Chicken gm.	Chicken oz
1... 280	Raw 2	100	(3⅓)									
2... 470	Raw 3	200	(6⅔)									
3... 637	Raw 4	300	(10)	20 gm. (5 dr.)								
4... 777	Raw 5	400	(13⅓)	20 gm. (5 dr.)								
5... 966	Raw 6	500	(16⅔)	30 gm. (1 oz.)								
6...1135	Raw 7	600	(20)	30 gm. (1 oz.)	36 gm. (9 dr.)							
7...1580	Raw 4, soft 4	700	(23⅓)	40 gm. (1⅓ oz.)	70 gm. (2⅓ oz.)	100	(3⅓)					
8...1720	Raw 4, soft 4	800	(26⅔)	40 gm. (1⅓ oz.)	70 gm. (2⅓ oz.)	100	(3⅓)	20 gm. (⅔ oz.)				
9...2138	Raw 4, soft 4	900	(30)	40 gm. (1⅓ oz.)	70 gm. (2⅓ oz.)	200	(6⅔)	40 gm. (1⅓ oz.) or toast, 20 gm. (⅔ oz.)				
10...2478	Raw 4, soft 4	1000	(33⅓)	40 gm. (1⅓ oz.)	70 gm. (2⅓ oz.)	200	(6⅔)	40 gm. (1⅓ oz.) or toast, 20 gm. (⅔ oz.)	20	(⅔)	50	(1⅔)
11...2941	Raw 4, soft 4	1000	(33⅓)	40 gm. (1⅓ oz.)	70 gm. (2⅓ oz.)	300	(10)	60 gm. (2 oz.)	40	(1⅓)	50	(1⅔)
12...2941	Raw 4, soft 4	1000	(33⅓)	40 gm. (1⅓ oz.)	70 gm. (2⅓ oz.)	300	(10)	80 gm. (2⅔ oz.)	40	(1⅓)	50	(1⅔)
13...3007	Raw 4, soft 4	1000	(33⅓)	40 gm. 1⅓ oz.)	70 gm. (2⅓ oz.)	300	(10)	80 gm. (2⅔ oz.)	40	(1⅓)	50	(1⅔)
14...Same as thirteenth day.												

LENHARTZ'S DIET AFTER GASTRIC HEMORRHAGE[1]

	Days after Gastric Hemorrhage														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Eggs, beaten up, uncooked	2	3	4	5	6	7	8 four raw, four cooked	8	8	8	8	8	8	8	8
Cold milk taken with teaspoon, c.c.	200	300	400	500	600	700	800	900	1000	1000	1000	1000	1000	1000	1000
Sugar, gm........			20	20	30	30	40	40	50	50	50	50	50	50	50
Scraped meat, gm.						35	35	35	35	35	35	35	35	35	35
Milk and rice, gm.							100	200	200	200	300	300	300	300	300
Zwieback, gm.....								20	40	40	60	60	80	100	100
Ham, gm.........										50	50	50	50	50	50
Butter, gm.......										20	40	40	40	40	40
Calories	280	420	637	717	955	1135	1338	1721	2138	2478	2941	2941	3007	3073	3073

[1] Diet used at the University Hospital, Philadelphia, Pa.

VON LEUBE'S GASTRIC ULCER DIET[1]

Von Leube, modified by Lockwood

The principle underlying this diet is that of affording the stomach the greatest possible rest.

1st day. Neither food nor water, the mouth being kept moist by washes. If possible, this starvation period lasts three days, the Murphy drip being used if thirst is excessive.

2nd day. Vichy water, 2 to 4 ounces every two hours.

3rd day. Alternate Vichy with albumin water so that liquids are taken every hour.

4th day. Peptonized milk, 2 ounces; Vichy, 2 to 3 ounces on alternate hours, increasing daily till 8 ounces of each are taken.

10th day. Begin to add in the following order: milk toast, junket, fine cereal.

21st day. Begin to add in order: spaghetti and macaroni, creamed mashed potatoes, creamed fresh fish, thick purées of vegetables that have been put through a sieve, or thick soups without meat stock, as well as farinaceous desserts, such as farina, tapioca, cornstarch, blanc mange, pudding and custard.

During the fourth week a convalescent gastric diet is given.

SIPPY'S TREATMENT OF PEPTIC ULCER[2]

In uncomplicated cases of peptic ulcer with rare individual exceptions, the writer has found the following management most serviceable. The patient should be put to bed, where it is usually advisable for him to remain for approximately three weeks. He may then be allowed to sit up a portion of each day and take short walks. In the absence of serious complications the patient is usually able to do some or all of his work at the end of four or five weeks.[3]

Schedule of Feeding and Treatment:

For 3 days:

1. 6:00 A. M. 1 dram (4 gm.) of subnitrate of bismuth is given in a little water.
2. 7:00 A. M. to 7:00 P. M.
   Give every hour—Milk, 1½ oz., and cream (40%), 1½ oz. Total, 3 oz. each feeding.

[1] "St. Luke's Dietary," St. Luke's Hospital, New York City.
[2] Modified from "Nelson's Loose-Leaf Medicine," Vol. V. "Dr. Carter's Presbyterian Diet List," "Massachusetts General Hospital Diet List."
[3] Sippy's treatment, "Nelson's Loose-Leaf Medicine," Vol. V.

3. 7:30 A. M. to 7:30 P. M.

   Give alternately every hour the following powders:

   a. 10 grains (0.6 gm.) each of calcined magnesia and soda bicarbonate or
   b. 10 grains (0.6 gm.) bismuth and 20 to 30 grains (1.3 to 2 gm.) soda bicarbonate.

   The magnesia is used as often as possible, as it has the highest neutralizing power for free hydrochloric acid.

4. Although acidity is best controlled by hourly feedings, some cases do well on a two-, three- or four-hourly schedule.

5. If diarrhea develops, use less of the magnesia powder and more of the bismuth.

After 2 or 3 days:

Add soft boiled eggs and fine cereals (giving eggs and cereal at alternate hours) so that at the end of ten days the patient is getting 3 ounces of milk and cream every hour from 7 A. M. to 7 P. M. with the addition of 3 soft boiled eggs and 9 ounces of cereal (measured after cooking) about 3 ounces to a feeding. Each feeding per hour should not exceed 6 ounces.

After 10 days:

Add to the diet cream soups, vegetable purées, or soft food, such as jellies, custards and cream. Farina, cream of wheat and rice cooked to a pulp are best.

During the 3rd week:

Add to the diet soft toast, crackers, purées of potato, and other cream soups.

In the 4th week:

The milk and cream may be increased to 2½ ounces (75 c.c.) at each feeding, the periods between feedings lengthened to two hours, or after three weeks to three hours.

The bismuth is continued from 6 to 8 weeks and the alkaline powders for several months between feedings. For a year or more only soft non-irritating foods should be taken.

"To insure the success of this treatment absolutely accurate control of the acidity must be maintained throughout the twenty-four hours. This is accomplished by testing the gastric contents frequently early in the treatment by the stomach tube or duodenal tube as follows:

"The first day or two the tube is passed occasionally to determine the presence of free HCL; if present in the stomach contents, the alkali powders must be increased as the treatment aims to keep the free HCL absolutely neutralized. After the first few days this need only be done two or three times a week. It is necessary to be sure that the stomach does not contain free acid during the night, and it is necessary to give two or three alkali powders between 7 and 10 P. M. to make sure of this. At 10 o'clock the tube should be passed and any hyperacid secretion removed. If necessary, the tube should be passed for the first few days two or three times through the night. After the first few days this is rarely necessary, the last emptying being done at 10 P. M."[1]

BASTEDO'S GASTRIC ULCER DIET[2]

In the first two weeks, if stomach permits, feed every hour (high calory), otherwise, every 2 hours (low calory). Allow water as desired in amounts up to 4 oz. at a time. If eggs are not acceptable substitute 1½ ounces of cream for each egg.

1st day. Peptonized milk, 3 oz. every 1 or 2 hours from 7 A. M. to 9 P. M. and once in night if patient is awake. Serve hot or cold, but not ice cold.

2nd day. The same, but 4 oz. every 1 or 2 hours.

3rd day. One egg in each quart—4 oz. every 1 or 2 hours.

4th day. The same; 5 oz. every 1 or 2 hours.

5th day. Two eggs in each quart; 5 oz. every 1 or 2 hours.

6th day. Three eggs in each quart; 5 oz. every 1 or 2 hours.

7th day. The same; 6 oz. every 1 or 2 hours.

8th day. Plain milk, 3 eggs in each quart; 6 oz. every 1 or 2 hours.

9th day. The same, but for second feeding give saucer (5 oz.) of oatmeal gruel or white cereal (arrowroot, cream of wheat, farina, hominy, rice) with cream (or milk) and sugar.

10th day. The same, but for one evening feeding a saucer of junket, custard or farina with cream (or milk) and sugar.

11th day. The same, but at one o'clock, milk toast made with one full slice of toast, 4 oz. of hot milk and 1 oz. of cream.

[1] Dr. H. S. Carter, "Diet Lists of the Presbyterian Hospital," New York City. W. B. Saunders Co., Philadelphia, Pa.

[2] Dr. W. A. Bastedo, St. Luke's Dietary," St. Luke's Hospital, New York City.

12th day. The same, but with two slices of toast with hot milk and cream. Give next feeding two hours later.

13th day. The same, but for evening meal, one coddled egg, one slice of toast and butter, and junket, custard or farina with cream (or milk). One glass of milk or water to drink.

14th to 18th day:

7 A. M. Cereal as above, one poached or coddled egg, one slice of toast and butter, one glass of milk.

9 A. M. One glass of milk and egg, or equal parts of milk and cream.

1 A. M. Same.

1 P. M. Minced chicken, creamed brain or sweetbread, or scraped cooked beef, one small baked potato with butter, one slice of bread and butter, milk or water to drink.

3 P. M. One glass of milk, or milk and egg, or equal parts of milk and cream.

5 P. M. Same.

7 P. M. One soft poached egg on toast or soft boiled egg with toast, and custard, farina, blanc-mange, junket, plain rice pudding or boiled rice, with cream (or milk) and sugar.

9 P. M. One glass of milk, or milk and egg with two plain crackers.

19th to 28th day (or to end of fifth or sixth week):

Breakfast:

Cereal as above, two eggs, toast, a glass of milk or cup of cocoa made with milk.

11 A. M. A glass of milk and egg, or milk and cream.

Dinner:

1. Thickened, strained soup or purée (not made from meat stock) or potato, beans, peas, asparagus, corn, celery.
2. Chicken, lamb chop, beefsteak, creamed sweetbread, brain or tripe.
3. Baked potato, creamed macaroni or spaghetti, rice, strained squash or carrots, asparagus tips.
4. Bread, toast or zwieback with butter.
5. Lettuce with olive oil and salt.
6. Milk or water to drink.

4 P. M. A glass of milk and egg, or milk and cream.

Supper:

One egg, toast or bread with butter, and a dessert (custard, jelly, farina, cornstarch, junket, vanilla ice cream, milk and cereal puddings, tapioca).

9. P. M. A glass of milk, or milk and cream, with crackers.

Fifth week and thereafter—Hyperacidity Diet.

EINHORN'S DUODENAL FEEDING IN ULCER OF STOMACH[1]

Einhorn gives feeding by means of a duodenal pump or tube as "another and more efficient way of giving the stomach perfect rest". The pump is inserted into the digestive tract as far as the duodenum and nourishment injected through it. The instrument is left in place from ten to fourteen days.

"The feeding is best done at intervals of two hours. After the feeding water and then air is forced through and the stop cock closed. We can introduce at one feeding between 240 and 300 c.c. of food slowly. All fluids must of course be at body temperature. Usually the following material was used every two hours from seven in the morning until nine in the evening:

Milk, 240 c.c.
Raw egg, 1
Sugar of milk, 15 gm.

The mixture is well beaten up and injected at blood temperature. The patient may be given besides, a quart of physiological salt solution by rectum, according to the Murphy drip method, or receive water directly into the duodenum very slowly drop by drop."[1]

The diet given below is recommended by Einhorn and is administered in same way, when milk is not well tolerated by the patient.

EINHORN'S DUODENAL FEEDING DIET[1]

Daily Allowance:			Calories
Oatmeal gruel	300 c.c.	12 oz.	1476
Eggs	7		490
Pea soup	720 c.c.	24 oz.	384
Lactose	90 gm.	3 oz.	369
Bouillon	560 c.c.	12 oz.	39
Butter	90 gm.	3 oz.	715
Barley gruel or barley water	180 c.c.	6 oz.	57
Total calories			3530

[1] Dr. Max Einhorn, "Lectures on Dietetics," New York, 1914, page 135.

Schedule of Feeding:

7:30 A. M.	Oatmeal gruel..........	180 c.c.	6 oz.
	One egg		
	Butter	15 gm.	½ oz.
	Lactose	15 gm.	½ oz.
9:30 A. M.	Pea soup	180 c.c.	6 oz.
	One egg		
	Butter	15 gm.	½ oz.
	Lactose	15 gm.	½ oz.
11:30 A. M.	Same as 9:30 A.M.		
1:30 P. M.	Bouillon	180 c.c.	6 oz.
	One egg		
3.30 P. M.	Oatmeal gruel..........	180 c.c.	6 oz.
	Butter	15 gm.	½ oz.
	Lactose	15 gm.	½ oz.
5:30 P. M.	Same as 9:30 A.M.		
7:30 P. M.	Barley gruel...........	180 c.c.	6 oz.
	One egg		
	Butter	15 gm.	½ oz.
9:30 P. M.	Bouillon	180 c.c.	6 oz.
	One egg		

AMBULATORY CASES OF PEPTIC ULCER[1]

Dietetic Treatment.—For cases of peptic ulcer which cannot take the regular course of rest and treatment in bed the following diet is recommended as one which will furnish sufficient nourishment and combine well with the usual excess of free hydrochloric acid of the gastric juice and which can be obtained anywhere.

Daily Allowance:

Milk, 56 oz.
Cream, 13 oz.
Eggs, 6.

Approximate Content: Protein, 105 gr., Calories, 2400.

Schedule of Feeding:

8 A.M., 1 and 7 P.M.	2 glasses milk ⅕ cream.
	2 soft cooked eggs without salt.
11 A.M., 4 P.M.	1½ glasses milk.

[1] Dr. H. S. Carter. "Diet Lists of the Presbyterian Hospital," New York City. W. B. Saunders Co., Philadelphia, Pa.

Before breakfast 4 gm. of bismuth subnitrate is given in an ounce of water. One-half hour after the three principal meals 2 to 4 grams of the following powder: Equal parts of bismuth, soda bicarbonate and calcined magnesia is given in four ounces (120 c.c.) water. The magnesia may be reduced and an equal amount of soda added if the bowels are made too active by the magnesia. One-half hour after the 11 A.M. and 4 P.M. feedings one teaspoon of soda is given in ½ glass water. At night after the seven o'clock feeding the magnesia mixture is given at 7:45 and a teaspoon of soda at 8:45 P.M. and 9:45 P.M. each in ½ glass water. If possible it is well for the patient to empty his stomach by tube at 10:30.

Continue this treatment for two weeks or longer in severe cases, then add well cooked cereals, custards, gruels, cream soups, soft toast.

Good results have been obtained from this diet, although it is not advised if patient can take the regular treatment.

CARTER'S GASTRIC TOLERANCE DIET[1]

USED IN GASES OF PERSISTENT VOMITING

Chloroform water (strictly fresh)	1 dram	4 c.c.
Peptonized milk (5 min. later)	½ oz.	15 c.c.
Repeat once every hour for four doses.		
If not vomiting advance to		
Chloroform water	1 dram	4 c.c.
Peptonized milk (5 min. later)	1 oz.	30 c.c.
Repeat once every hour for four doses.		
If not vomiting advance to		
Peptonized milk alone	1 oz.	30 c.c.
Repeat once every hour for four doses.		
If still not vomiting advance to		
Peptonized milk	2 oz.	60 c.c.
Repeat once every hour for four doses.		

Advance then at discretion of doctor or nurse to more peptonized milk, full fluid or soft diet.

GASTRIC TEST MEALS

Ewald: On early morning fasting stomach give:
White bread (one roll) .... 40 gm. (1⅓ oz.)

[1]Dr. H. S. Carter, "Diet Lists of the Presbyterian Hospital," New York City. W. B. Saunders Co., Philadelphia, Pa

	Clear tea or water	400 c.c.	(6 oz.)
	No butter, no sugar or milk.		
	Express 1 hour later.		
Leube:	Clear beef soup	400 c.c.	(13⅓ oz.)
	Beefsteak	200 gm.	(6⅔ oz.)
	Bread	50 gm.	(1⅔ oz.)
	Water	200 c.c.	(6⅔ oz.)
	Express 3 to 4 hours later.		
Riegel:	1 bowl mutton broth	200 c.c.	(6⅔ oz.)
	Beefsteak	200 gm.	(6⅔ oz.)
	Mashed potato	50 gm.	(1⅔ oz.)
	1 roll or piece of bread.		
	1 glass water.		
	Express 3 to 4 hours later.		

SERIAL TEST MEAL

"The Ewald meal may be used or one pint of gruel made of strained oatmeal or other cereal just thin enough to be aspirated through the small tube ordinarily used. A sample of gastric contents is aspirated and tested chemically at ½, 1, 1½, 2 and 2½ hours after taking meal."[1]

Purpose of Tests.—These test meals are given in order to ascertain the chemical and mechanical reaction of the stomach to the food. The patient is asked to eat the ordinary evening meal on the day previous to the test including in it something like spinach, prunes or raisins. These can be recognized the following morning if there is any retention of food. Before giving the tests the stomach contents are expressed through tube and examined. The acid reaction of the stomach is best obtained by the meals including meat. Also the Ewald or Riegel diets are better to test the motor efficiency of the stomach.

GASTRIC TEST MEALS

St. Luke's Hospital, New York City

Breakfast:	60 grams bread or bread roll with 350 c.c. water.
	Extract one hour after beginning of meal.
Dinner:	1 baked or boiled potato.
	1 helping of peas or corn.

[1] Dr. H. S. Carter, "Diet Lists of the Presbyterian Hospital," New York City. W. B. Saunders Co., Philadelphia, Pa

1 slice of bread and butter.
1 lamb chop.
3 stewed prunes.
Water ad lib.
Extract 6 hours after meals. If no return, lavage.

JANEWAY'S CONVALESCENT GASTRIC DIET NO. I[1]

Breakfast:	Boiled milk with cocoa or coffee. Any cereal, strained, with cream. Soft toast, buttered.
11 A.M.	Glass of milk.
Dinner:	Purée of potatoes, peas, or beans with toast soaked in it, or boiled rice, with milk or cream. Junket or custard, or jelly or tapioca pudding.
4 P.M.	Glass of milk with beaten egg in it.
Supper:	2 soft-boiled eggs. Soft toast. Glass of milk.
9:30 P.M.	Glass of milk, with beaten egg in it.

JANEWAY'S CONVALESCENT GASTRIC DIET NO. II[1]

Breakfast:	Boiled milk, with a little coffee or cocoa. Any cereal, strained, with cream. Dry toast, buttered. One egg.
11 A.M.	Glass of malted milk.
Lunch:	2 soft-boiled or scrambled eggs, or fresh boiled fish in place of eggs. A little broiled bacon (eating the fat and not the lean). Toast and milk.
Dinner:	Purée of potatoes, rice, barley, peas, asparagus, celery, or beans. Buttered toast. Rare beafsteak broiled, or lamb chop broiled, roast beef or lamb. Roast or broiled chicken or minced chicken, with well-cooked rice or a well-baked potato with butter. Junket or custard, jelly or tapioca pudding.
10:30 P.M.	Glass of milk with lime-water.

[1] Dr. T. C. Janeway, "Diet Lists of the Presbyterian Hospital," New York City. W. B. Saunders Co., Philadelphia, Pa.

QUESTIONS FOR STUDY

STOMACH.

1. Enumerate some of the causes of "indigestion."
2. What type of diet should be given when there is an over-acid condition of the stomach? Why?
3. What foods should be avoided?
4. Outline a day's dietary for this condition.
5. What type of diet should be given in a condition of subacidity?
6. Outline the principle of the diet in chronic gastritis. What type of food should be given and how should meals be arranged? What foods should be avoided?
7. What accompanying condition should be watched for?
8. What are some contributing causes of acute gastritis?
9. Outline the dietetic treatment of this disorder.
10. Give the general procedure in the treatment of gastric ulcer.
11. When should feeding by rectum be resorted to and how is this done?
12. How may thirst be allayed?
13. What is the principle of the Lenhartz diet?
14. What is the especial value of Von Leube's diet for gastric ulcer?
15. What is the underlying principle of Sippy's treatment for peptic ulcer?
16. Outline the duodenal feeding in peptic ulcer as administered by Einhorn.
17. What is the purpose of gastric test meal?

CHAPTER XX

DIET IN INTESTINAL DISEASES AND FOOD POISONING[1]

Intestinal disorders while due to a variety of causes may in many cases be controlled by dietary treatment whether the disturbance is due to incomplete digestive processes or to bacterial invasion of the intestine. A properly regulated diet may successfully combat either cause. Either constipation or some degree of diarrhea usually accompanies these disorders, and when present determines in large measure the *type of diet* to be selected. The *roughage* diet consisting principally of coarse foods, fruits and vegetables, should be used when constipation is to be counteracted, while any degree of diarrhea would call for a *non-roughage* diet consisting of all easily digested, non-irritating foods, which leave little or no residue. The introduction of counteracting bacteria by means of diet is also a successful means of treatment.

Acute Enteritis

Enteritis is usually accompanied by more or less severe diarrhea and is due to a variety of causes, among which may be indulgence in distinctly irritating foods, unsanitary conditions or the introduction of certain poisonous substances into the intestine. Complete abstinence from food for one or two days is usually recommended. When acute symptoms have passed, soup and gruels made of barley, rice or oatmeal may be given. These may often be made with milk. Toasted bread, crackers and soft-cooked egg may be added gradually and if symptoms do not return, a little easily di-

[1] Arranged under the supervision of Dr. B. Franklin Stahl, Clinical Professor of Medicine, Women's Medical College of Pennsylvania. Visiting Physician to the St. Agnes and the Philadelphia General Hospital, Philadelphia, Pa.

gested meat, as scraped beef balls or lamb chop, with bread and butter. When diarrhea has entirely disappeared baked or mashed potato may be given. Other vegetables should be added very carefully and at first in very small portions. Fruits, because of their natural laxative quality, should be avoided for a still longer time.

Chronic Enteritis

This disorder may be characterized by constipation, diarrhea, or alternating attacks of each. The dietetic treatment depends upon the nature of the case. The meals should be given regularly and good results are often obtained by giving food frequently and in small portions. Speedy cures are seldom effected and the treatment requires much patience. The test diet may be used to determine if possible if there is any particular fault in digestion. The following Schmidt's Intestinal Test Diet is frequently used:

SCHMIDT'S INTESTINAL TEST DIET

For 2234 Calories a Day: Approximate value—protein, 102 gm. (3⅓ oz.); fat, 111 gm. (4 oz.); carbohydrate, 191 gm. (6⅓ oz.).

Total allowance per day:

Milk	1.5	liters	(1½ qt.)
Zwieback	100	gm.	(3⅓ oz.)
Eggs	2		
Butter	50	gm.	(1⅔ oz.)
Beef	125	gm.	(4 oz.)
Potatoes	190	gm.	(6⅓ oz.)
Oatmeal (gruel)	80	gm.	(2⅔ oz.)

Schedule of Feeding:

Breakfast:

Milk, 0.5 liter (16 oz.) or if milk does not agree, 0.5 liter (16 oz.) cocoa, prepared from 20 gm. (⅔ oz.) cocoa powder, 10 gm. (⅓ oz.) sugar, 400 c.c. (13 oz.) water, and 100 c.c. (3⅔ oz.) milk.

10:30 A.M.:

Oatmeal gruel, 0.5 liter (16 oz.), made from 40 gm. (1⅓ oz.) oatmeal, 10 gm. (⅓ oz.) butter, 200 c.c. (6½ oz.) milk, 300 c.c. (10 oz.) water, 1 egg, strained.

Lunch:

Chopped beef (raw weight), 125 gm. (4 oz.), broiled rare so that the interior will still remain raw, served with 20 gm. (⅔ oz.) of butter. Potato broth, 250 gm. (8 oz.), made of 190 gm. (6⅓ oz.) mashed potatoes, 100 c.c. (3⅓ oz.) milk, and 10 gm. (⅓ oz.) butter.

3:30 P.M.:

Same as breakfast.

Supper:

Same as 10:30.

Quantity of food may be cut down to 2088 calories for patients (especially women) who cannot take the above amount.

INTESTINAL TEST DIET,[1] NO. II

St. Luke's Hospital, New York City

Two to three days. Before beginning diet give capsule containing 0.5 g. carmine and save for examination stools voided after the red color has appeared.

For Approximately 2300 Calories a Day:

Breakfast:

Large helping oatmeal with milk and sugar
One poached or boiled egg.
Two slices toast with butter.
One glass milk, or one cup of cocoa made with milk and one teaspoonful of sugar.

Dinner:

One cup clear soup or broth.
¼ lb. beefsteak (underdone), or two lamb chops.
One large helping (6 oz.) mashed or baked potato with butter.
One slice white bread and butter.
One glass milk.
One saucer junket, custard, jelly or farina.

Supper:

One glass milk.
Two soft boiled eggs or plain omelet.
Two slices toast with butter.

Bedtime:

One glass milk with one Uneeda cracker or two Educator crackers.

[1] "St. Luke's Dietary," St. Luke's Hospital, New York City.

When the efficiency of the digestive enzymes has been tested it is then possible to arrange a diet to suit the individual case. Examination of the stools to discover any undigested material should be carefully made as this may lead to changes in the kind of food given. As these cases may extend over many months the diet should be adjusted to supply the body need in calories, nitrogen and mineral constituents. It is desirable to increase rather than decrease weight.

Kind of Food to Use.—In cases of diarrhea a non-roughage diet should be strictly adhered to, avoiding all foods that would be irritating to the intestines or that would stimulate peristalsis. In cases attended with constipation a more liberal diet may be used including fruits, green vegetables and fats, but still avoiding very coarse foods and those known to cause digestive disturbances such as sausage, lobster, cabbage and cucumber.

Diarrhea

Type of Diet.—Non-Roughage. Dietetic treatment will depend somewhat upon the type of the disorder, as the trouble may result from gastric indigestion, from inefficiency of the pancreatic enzymes, from some peculiarity of nerve condition or from the toxic effect of a food substance.

Diarrhea often results from a lack of acid in the gastric juice, although occasionally an over-acid condition may cause the same trouble, and it sometimes occurs when the pancreatic lipase is inadequate for complete fat digestion. If the cause can be ascertained dietetic treatment in these cases would naturally be a restriction or regulation of food to suit the individual need.

Kind of Foods to Use.—Acute conditions, whatever may be the cause, call for a day or two without food followed by a day or two of liquid diet with cereal gruels and tea with dry toast. Boiled milk may sometimes be given although milk is usually excluded. The diet for several days after acute symptoms have passed should include only non-irritating foods.

If the condition becomes chronic a carefully chosen diet should be continued as long as the condition lasts.

The foods selected should conform to the four following rules:[1]

1. Non-stimulating and non-irritating.
2. Easily digested, leaving little residue.
3. Not likely to ferment.
4. As astrigent as possible.

Diet in Chronic Diarrhea:

Kinds of Food to Use:

Shell Fish.....Soft part of raw oysters.
Soups.........Clear soups.
Fish ....Any soft, white-fleshed, non-oily variety.
Meat ....Beef, lamb without gristle, chicken, guinea hen.
Cereals ....Farina, cream of wheat, grapenuts, flaked rice, puffed wheat or rice, well-boiled rice.
Gruels ....Vermicelli.
Bread ....Stale bread, toast, zwieback, toasted crackers.
Cheese ....Ripe American, Canadian, cream or cottage, pineapple.
Desserts ......Gelatin desserts made with little sugar, farina pudding, blanc-mange or almost any cereal pudding, simple cake at times, such as sponge cake.
Drinks ....Water, tea, black coffee, cocoa, claret, dry sherry, Burgundy, whiskey and water or brandy and water.

Foods to Avoid:

Fish ....Tough or oily fish, clams, etc.
Meat ....Pork, veal, ham, duck, goose.
Vegetables ....Green vegetables, salads.
Bread ....Hot breads.
Fruits ....Fresh or stewed fruits.
Desserts ......Pies and sweets of all kinds.
Miscellaneous.. Condiments, pickles, olives.
Liquids ....Sweet wines. Milk is usually avoided. If prescribed, should be boiled or skimmed.

[1]Dr. H. S. Carter, "Diet Lists of the Presbyterian Hospital," New York City. W. B. Saunders Co., Philadelphia, Pa.

Foods Allowable in Certain Cases:

Malted milk may often be used on cereals rather than fresh milk.
Kumyss, zoolak.
Fresh milk, boiled.
Turkey.
Bacon (crisp).
Baked white potatoes.
Eggs ....Boiled, baked, poached, omelet, scrambled.
Vegetables ....Baked Hubbard squash, well-stewed celery, creamed spinach, small boiled onions. Boiled peas or lima beans put through a strainer.

Food Combinations and Menus

(NON-ROUGHAGE DIETS)

CHRONIC DIARRHEA DIET

FIRST DAY

For 1800 Calories a Day: Approximate value—protein, 60 gm.; fat, 75 gm.; carbohydrate, 222 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	CALORIES
Breakfast:	Cream of Wheat	¾ cup	6.0	100
7:30 A. M.	Butter	1 tbsp.	0.5	100
	Toast	2 slices	2.6	100
9:30 A. M.	Cocoa (with water) .... 2 tsp. sugar	1 cup	8.0	55
	Toast	1 slice	1.3	50
	Butter	½ tbsp.	0.3	50
Luncheon:	Broth with			
12:30 P. M.	Macaroni	1 cup	10.0	75
	Toasted Crackers	4	0.9	100
	Scraped beef ...	3 tbsp.	1.7	75
	Stale white bread	2 slices	2.6	100
	Butter	1 tbsp.	0.5	100
	Lemon Jelly ...	½ cup	3.8	100
	Custard Sauce ..	⅓ cup	2.2	100
3:30 P. M.	Buttermilk	¾ cup	6.3	70
Dinner:	Baked halibut ..	1 piece 3″x2¼″x¾″	2.3	75
6:30 P. M.	Carrots (mashed)	¾ cup	5.0	50
	French roll (stale)	1	1.3	100
	Butter	½ tbsp.	0.3	50
	Rice Pudding ...	⅝ cup	0.5	115
	Vanilla Sauce (cornstarch) .	2 tbsp.	1.5	100
9:30 P. M.	Tea (very weak)	1 cup	8.0	...
	Sugar	2 tsp.	0.3	35
	Toast	2 slices	2.6	50
	Butter	½ tbsp.	0.3	50
				1800

CHRONIC DIARRHEA DIET

SECOND DAY

For 2000 Calories a Day: Approximate value—protein, 67 gm.; fat, 75 gm.; carbohydrate, 265 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	CAL. ORIES
Breakfast:	Hominy grits......	⅘ cup	6.8	100
7:30 A. M.	Butter	1 tbsp.	0.5	100
	Toast	2 slices	2.6	100
	Lamb chop (tender eye)	1 chop 2″x2″x½″	1.6	100
9:30 A. M.	Tea	1 cup	8.0	...
	Sugar	2 tsp.	0.3	35
	Zwieback	3 pieces	0.8	100
	Butter	½ tbsp.	0.3	50
Luncheon:	Lentil Soup	1 cup	9.0	100
12:30 P. M.	Toasted crackers	2	0.5	50
	Chicken (minced) and	¼ cup	0.9	100
	Rice	⅝ cup	3.4	85
	French roll (stale)	1	1.3	100
	Butter	½ tbsp.	0.3	50
	Snow Pudding ...	⅔ cup	2.2	100
3:30 P. M.	Kuymss	¾ cup	6.8	100
Dinner:	Poached egg	1 egg	2.5	70
6:30 P. M.	Purée of lima bean	½ cup	2.9	100
	White bread (stale)	1 slice	1.3	50
	Butter	½ tbsp.	0.3	50
	Tapioca-cornmeal pudding	3 tbsp.	2.7	150
	Lemon sauce	2 tbsp.	1.5	100
9:30 P. M.	Hot malted milk (made with water)	1 cup	8.0	65
	Toast	2 slices	2.6	100
	Butter	½ tbsp.	0.3	50
				2005

CHRONIC DIARRHEA DIET

THIRD DAY, NO. I

For 1650 Calories a Day: Approximate value—protein, 63 gm.; fat, 69 gm.; carbohydrate, 195 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	CALORIES
Breakfast:	Farina	¾ cup	6.0	100
7:30 A. M.	Butter	1 tbsp.	0.5	100
	Toast	2 slices	2.6	100
	Poached egg	1 egg	2.5	70
10:30 A. M.	Cocoa (with water)	1 cup	8.0	55
	Toast	1 slice	1.3	50
	Butter	½ tbsp.	0.25	50
Luncheon:	Broth with rice ...	1 cup	6.0	75
12:30 P. M.	Toasted Crackers	2	0.5	50
	Baked Cod	1 piece 3"x2½"x1"	4.8	100
	Baked Hubbard Squash	½ cup	4.0	55
	White bread (stale)	2 slices	2.6	100
	Butter	½ tbsp.	0.25	50
	Coffee Jelly	¾ cup	4.5	50
	Custard Sauce ...	⅙ cup	1.1	50
3:30 P. M.	Tea	1 cup	8.0	...
	Sugar	2 tsp.	0.3	35
	Zwieback	1½ pieces	1.3	50
	Butter	½ tbsp.	0.3	50
Dinner:	Minced chicken....	¼ cup	0.9	100
6:30 P. M.	Chopped spinach ..	½ cup	4.3	20
	Toast	2 slices	2.6	100
	Butter	1 tbsp.	0.5	100
	Tapioca Pudding ..	⅖ cup	2.8	100
9:30 P. M.	Hot peppermint tea	1 cup	8.0	...
	Sugar	2 tsp.	0.3	35
				1645

CHRONIC DIARRHEA DIET

THIRD DAY, NO. II

For 2195 Calories a Day: Approximate value—protein, 75 gm.; fat, 100 gm.; carbohydrate, 250 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	CALORIES
Breakfast:	Farina	⅔ cup	6.0	100
7:30 A. M.	Butter	1 tbsp.	0.5	100
	Toast	2 slices	2.6	100
	Poached egg	1 egg	2.5	70
10:30 A. M.	Cocoa (with water)	1 cup	8.0	55
	Toast	2 slices	2.6	100
	Butter	1 tbsp.	0.5	100
Luncheon:	Broth with rice	1 cup	6.0	75
12:30 P. M.	Toasted Crackers	4	0.9	100
	Cod (baked)	1 piece 3"x2½"x1"	4.8	100
	Baked Hubbard Squash	½ cup	4.0	55
	White Bread (stale)	2 slices	2.6	100
	Butter	1 tbsp.	0.5	100
	Coffee Jelly	¾ cup	4.5	50
	Custard Sauce	⅓ cup	2.2	100
3:30 P. M.	Tea	1 cup	8.0	
	Sugar	2 tsp.	0.3	35
	Zwieback	3 pieces	2.6	100
	Butter	½ tbsp.	0.3	50
Dinner:	Minced chicken	⅜ cup	1.4	150
6:30 P. M.	Chopped spinach	½ cup	4.3	20
	Toast	2 slices	2.6	100
	Butter	1 tbsp.	0.5	100
	Tapioca Pudding	⅖ cup	2.8	100
9:30 P. M.	Hot peppermint tea	1 cup	8.0	...
	Sugar	2 tsp.	0.3	35
	Toast	2 slices	2.6	100
	Butter	1 tbsp.	0.5	100
				2195

Acute Colitis or Acute Dysentery

Dietetic Treatment.—After suitable catharsis, food should be withheld for at least twenty-four hours. The first feeding should be liquid, consisting of whey, clear soup, or albumin water, after which cereal gruels may be added. A farinaceous diet consisting of macaroni, boiled rice and well-cooked cereals, dry toast with occasionally soft-cooked egg and a little scraped beef, should be continued until all symptoms disappear. Should the condition become chronic long adherence to a non-irritating diet must be the treatment. The food must be easily digested and such as will leave little residue in the intestine. The type of food recommended for chronic diarrhea should be used here. Some vegetables such as peas, beans or Hubbard squash may sometimes be added but should be in form of a purée. Green vegetables are usually best avoided. Patients differ in their ability to take milk. It proves a distinct laxative with some, while with others it has an opposite effect. Boiled milk or kumyss may often be used rather than raw milk. Care should be taken in chronic conditions that the diet furnish sufficient nourishment, as there is always danger of malnutrition.

Appendicitis

Dietetic Treatment.—Complete abstinence from food during the first few days of illness is recommended. If any food is given it should be liquid and in very small portions. Strained barley, oatmeal or rice water may be used, also thickened soup and very weak tea. In very severe cases or where there is perforation even water is not allowed. Some give an occasional teaspoonful of cool water if thirst is extreme. Nourishment may be given in an enema.

An egg beaten up in milk or bouillon may be given after first severe symptoms have passed and nothing else allowed until fever and pain have disappeared. Then soft-cooked eggs, small portions of tender, easily digested meats and later, mashed potatoes, bread and butter and light vegetables may be added. Return to normal diet should be very gradual.

Chronic Appendicitis is often accompanied by constipation and can be benefited by using an anti-constipation diet.[1] If constipation is not present the diet should be made up of very easily digested foods, avoiding those which are liable to fermentation, such as onions, cauliflower, cabbage, fresh breads and pies. Thorough mastication of all food is advised.

Constipation

Constipation is commonly due to one or more of the following conditions:

1. Faulty diet.
2. Irregular habits of eating.
3. Irregular habits of defecation.
4. Lack of exercise.
5. Chronic constitutional diseases producing a congestion of the abdominal organs.
6. Mechanical obstructions in the intestines.

The method of treatment naturally depends upon the conditions involved—for example, mechanical obstructions may demand surgical relief.

The chief dietary causes of constipation are irregular habits of eating, a lack of laxative elements in the diet and insufficient water intake.

Normal intestinal movements may be stimulated:

1. Mechanically, by the presence in the intestine of more or less cellulose or other material not attacked by the digestive enzymes, or
2. Chemically, by organic acids, such as those found in fruits and fruit juices.

Fluid and soft-solid diets are typical of diets lacking in roughage and if constipation is to be avoided other laxative elements must be included.

The taking of food or water into the empty stomach is a

[1]See anti-constipation diet, page 428.

definite stimulus to peristalsis of the large intestine. The impulse to evacuate the bowels therefore is usually strongest after a meal and particularly after breakfast. Irregular hours or the omission of breakfast is often a contributing factor in constipation. The drinking of a glass or two of water on arising in the morning when the stomach is empty stimulates the intestinal movement.

Kinds of Food to Use in Diets to Correct Constipation:

Vegetables ....All kinds, especially those containing large amounts of cellulose, such as lettuce, chard, endive, romaine, cabbage, celery, spinach, onions, turnips, parsnips, squash, peas, beans, asparagus, tomatoes, cauliflower, etc.

Fruits ....All kinds, including apples, apricots, peaches, plums, pears, grapes, prunes, dates, raisins, figs and currants. Oranges, grapefruit and rhubarb are useful for both their cellulose and their organic acids.

Cereals ....Whole grain cereals, such as rolled oats, pettijohn and shredded wheat, graham and whole wheat bread.

Bran ....Bran is useful as a means of adding cellulose, although its long continued use is not recommended. One to two tablespoons of bran as needed may be eaten during each meal, moistened with kumyss, milk, tea, coffee or cocoa.

Agar ....Agar is a form of seaweed. It is not digested in the human body and therefore serves as roughage. It is sometimes eaten in the form of flakes mixed with cereals and often served as agar jelly or in biscuits, wafers and muffins. Agar jelly can be used when bran would be too harsh a stimulant.

Honey and molasses are laxative by virtue of the fact that they contain mineral salts. They ferment and help to break the fecal mass in addition to possessing a slight stimulating action on the intestinal muscles.

Mineral oils are sometimes valuable aids in combatting constipation because, not being digested or absorbed, they act as lubricants, softening the feces and making evacuation less difficult. They have no stimulating effect on the intestines. They do not agree with all persons and hence must be prescribed with caution.

Food Combinations and Menus[1]

(ROUGHAGE DIETS)

CONSTIPATION DIET NO. I

For 2023 Calories a Day: Approximate value—protein, 62.19 gm.; fat, 119.40 gm.; carbohydrate, 235.27 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	PROTEIN GM.	CALORIES
On rising	Water	2 glasses	...	....	....
Breakfast:					
7:30 A. M.	Orange	1	9.50	1.61	100
	Oatmeal	½ cup	2.00	2.10	50
	Whole Wheat Bread Toast	2 slices	1.50	3.60	100
	Egg	1	2.00	7.00	75
	Butter	1 tbsp.	.50	.13	100
	Sugar	2 tbsp.	1.00	....	100
	Cream	¼ cup	1.80	.59	100
	Coffee		...	....	....
Dinner:					
12:30 A. M.	Tomato Soup	½ cup	3.75	1.00	50
	Roast Beef	2 slices 5"x2¼"x¼"	5.20	23.00	200
	Baked Potato	1 medium	4.00	2.02	75
	String Beans	½ cup	2.00	1.30	23
	Bran Bread	1 slice	.75	1.80	50
	Butter	1 tbsp.	.50	.13	100
	Lettuce and French Dressing	1 serving	1.20	.25	100
	Lemon Jelly	⅜ cup	3.00	1.69	75
	Whipped Cream	½ tbsp.	.25	.15	25
Supper:					
6:30 P. M.	Baked Beans	⅔ cup	5.40	10.50	200
	Graham Bread	2 slices	1.50	3.60	100
	Butter	1 tbsp.	.50	.13	100
	Baked Apple and Cream	1 large apple	4.8	.75	200
Before Retiring:	Prunes	4 medium	1.4	.75	100
					2023

[1] For other constipation diets note "constipation diets" and "anti-constipation diets," page 428.

CONSTIPATION DIET NO. II

For 2217 Calories a Day: Approximate value—protein, 66.38 gm.; fat, 81.56 gm.; carbohydrate, 312.31 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	PROTEIN GM.	CALORIES
On rising	Water	2 glasses			
Breakfast: 7.30 A. M.	Grapefruit	½	7.50	.86	50
	Shredded Wheat	1	.97	3.51	100
	Bacon	2 small slices	.57	3.25	100
	Whole Wheat Bread Toast	2 slices	1.50	3.60	100
	Butter	1 tbsp.	.50	.13	100
	Sugar	2 tbsp.	1.00	....	100
	Cream	¼ cup	1.80	.59	100
Dinner: 12:30 P. M.	Split Pea Soup	⅗ cup	6.00	6.50	100
	Halibut Steak	1½ piece 3″x2¼″x1″	4.50	30.50	150
	Baked Potato	1 medium	4.00	2.02	75
	Fresh Tomatoes	1 large	7.75	2.00	50
	Bran Bread	1 slice	.75	1.80	50
	Butter	1 tbsp.	.50	.13	100
	Cabbage Salad	½ cup	1.40	.75	50
	Rhubarb Pie	Section 3⅕″ at circum.	3.40	2.50	200
Supper: 6:30 P. M.	Asparagus on Toast	8 stalks & ¼ cup white sauce	6.90	5.00	150
	Steamed Rice	1 cup	5.33	2.50	127
	Graham Bread	2 slices	1.50	3.60	100
	Butter	1 tbsp.	.50	.13	100
	Milk	1 glass	5.10	4.76	100
	Sliced Orange	1	9.50	1.61	100
	and Sugar	¼ tbsp.	.25	....	25
Before Retiring:	Apple	1 large	7.49	.64	100
					2217

CONSTIPATION DIET NO. III

For 2407 Calories a Day: Approximate values—protein, 62.96 gm.; fat, 127.39 gm.; carbohydrate, 389.00 gm.

Schedule of Feeding		Measure	Ounces	Protein Gm.	Calories
On rising	Water	2 glasses			
Breakfast: 7:30 A. M.	Stewed Prunes ..	4 prunes and juice	5.60	1.00	200
	Wheat—flaked, cooked	⅔ cup	6.00	3.25	100
	Whole Wheat Bread Toast	2 slices	1.50	3.60	100
	Butter	1 tbsp.	.50	.13	100
	Egg	1	2.00	7.00	75
	Sugar	2 tbsp.	1.00	...	100
	Cream	¼ cup	1.80	.59	100
Dinner: 12:30 P. M.	Cream of Pea Soup	1 cup	9.00	4.25	100
	Roast Lamb	1½ slice 3½"x4½"x⅓"	2.80	15.37	150
	Baked Sweet Potato	1 medium	6.00	3.00	200
	Spinach	¾ cup	6.40	2.72	32
	Bran Bread	1 slice	.75	1.80	50
	Butter	1 tbsp.	.50	.13	100
	Fruit Salad (grapes, oranges, bananas, walnuts, lettuce and mayonnaise dressing)	½ cup	3.80	2.25	100
	Date Pudding	slice 3" diam. ½" thick	1.10	1.75	100
	Lemon Sauce	1 tbsp.	.75	...	50
Supper: 6:30 P. M.	Tomatoes stuffed with chopped onions, ham and bread crumbs ...	2 tomatoes holding ½ cup	8.00	6.50	200
	Brown Bread	2 slices	1.50	3.60	100
	Butter	1 tbsp.	.50	.13	100
	Milk	1 glass	5.10	4.76	100
	Stewed Apricots ...	½ cup	5.40	2.00	200
Before Retiring	Figs	1 large	.50	.61	50
					2407

FULL ROUGHAGE DIETS

Breakfast	Luncheon	Dinner
Stewed prunes Oatmeal, cream Bran muffins, honey Eggs Coffee	Creamed chipped beef Baked potatoes (skins eaten) Vegetable salad Canned pears Wafers	Roast beef Mashed potatoes Boiled onions Lettuce salad Sherbet, cake
Oranges Wheatena with bran Graham toast, marmalade Bacon Coffee	Cream of pea soup, crackers Fruit salad Date muffins Tea	Steak Baked potatoes (skins eaten) Escalloped cabbage Sliced tomatoes Date pudding
Grapefruit Shredded wheat Rolls Eggs Coffee	Baked beans Brown bread Cabbage slaw Canned peaches	Baked ham Mashed potatoes Spinach Baked apples (skins eaten) cream Oatmeal cookies

Intestinal Auto-Intoxication

Intestinal Auto-Intoxication.—Intestinal auto-intoxication or putrefaction is the result of bacterial action on protein, chiefly on the proteins of meat and fish. The products formed, among which are indol, phenol, cresol and skatol, are believed to be toxic if absorbed into the blood.

The cure for this condition is largely a matter of diet. General rules for the diet in cases of intestinal auto-intoxication are as follows:

1. Exclude all animal protein except milk in its various forms. Eggs are sometimes allowed in small amounts.
2. Limit the total amount of protein in the diet to 40-60 grams.
3. Use liberal amounts of fruits and vegetables, of cereals and other starchy foods and of lactose.
4. When constipation accompanies intestinal auto-intoxication, as it often does, the laxative elements in the diet must be emphasized.

The object of such a diet is to bring about a change in the intestinal flora, so that fermentative rather than putrefactive bacteria will predominate. This may be accomplished (1) by cutting to a minimum the protein of the diet, and (2) by favoring the growth of fermentative organisms by means of feeding carbohydrate foods liberally.

Recent work of Rettger and Cheplin would indicate that lactose is particularly valuable in effecting such a change if fed in large amounts (300 gms. daily). When a culture of Bacillus Acidophilus is given in combination with the lactose, 150 gms. daily are sufficient to bring about a speedy transformation of the intestinal flora.

Kinds of Food to Use:[1]

Milk.......... Whole, skimmed, zoolack, kumyss, buttermilk, kefir, clabbered milk, cream or pot cheese.
Fruits......... Raw or cooked.
Vegetables..... Thoroughly cooked and soft.
All farinaceous foods such as rice, noodles, macaroni, puddings.
Purée of vegetables and bread.
Yolk of eggs.
Fresh butter and cream.
Sauerkraut is a valuable anti-putrefactive food.

Foods to Avoid:[1]

Bouillon, meat soups, meat juices and jellies, meat extract.
White of egg or dishes made therefrom.
Milk, unless mixed with farinaceous food.
High or tainted meats or those which decompose rapidly, game, rare or raw meats, fish, shell fish.
Meat fats of all kinds.

In severe auto-intoxication absolutely no meat should be taken and when it is begun later, only in small progressive quantities, not forgetting that it should be taken with five times its bulk of farinaceous food.

[1]Carter, Howe and Mason, "Nutrition and Clinical Dietetics," Lea & Febiger, Philadelphia, Pa.

Food Combinations and Menus

(HIGH CARBOHYDRATE-LOW PROTEIN DIET)

INTESTINAL AUTO-INTOXICATION DIET[1] NO. I

(IN SEVERE CASES)

7:30 A. M. Cereal prepared with water or milk, rolls and fresh butter.

10:00 A. M. Some form of gruel made with milk or water.

12:30 P. M. One or two yolks of eggs, raw or boiled, maccaroni, rice, farina with salt and fresh butter. Farinaceous pudding. Rolls and butter.

3:30 P. M. The same as 10:00 A. M.

7:00 P. M. Same variety as at 12:30 P. M.

10:00 P. M. Infusion of chamomile, peppermint, fennel, or anise.

Continue this diet for eight or ten days then add potatoes, purée or baked, Whortleberry juice or jelly. No fluids with meals. Later tea, coffee, cocoa, vegetables and fruits may be added in the order named with a little meat, first at one and then at two meals, watching the effect.

INTESTINAL AUTO-INTOXICATION DIET[1] NO. II

ASSOCIATED WITH CHRONIC CONSTIPATION OR INTESTINAL STASIS

Early A. M.:
One-third or one-half of grape juice with equal amount of water.

Breakfast:
Glass of milk or buttermilk with cereal and cream. Later on tea and coffee may be included.

10 A. M.:
One-half glass of buttermilk and slice of bread.

Dinner or Supper:
Cream vegetable soup made without stock or thickened with flour. Yolks of two or three eggs poached or scrambled; macaroni, cream cheese, potatoes, rice, baked farina, green vegetables, that grow above ground. Glass of milk or buttermilk. Bread and fresh butter. Farinaceous pudding with fruit sauce or stewed figs, prunes, apricots, pears, cherries or peaches.

4 P. M.:
Cream cheese and crackers.

[1]Carter, Howe and Mason, "Nutrition and Clinical Dietetics," Lea & Febiger, Philadelphia, Pa.

At Bedtime:

One-half to one glass of buttermilk with two or three toasted crackers and several dates or figs.

This diet should be continued until there are no subjective symptoms or abnormal urinary findings. Small amounts of meat and other foods may then be gradually added, slowly returning to a normal dietary. The protein should, however, be kept at a low level for a long time.

INTESTINAL AUTO-INTOXICATION DIET NO. III

For 2012 Calories a Day: Approximate values—protein, 48.19 gm.; fat, 87.31 gm.; carbohydrate, 258.35 gm.

SCHEDULE OF FEEDING		MEASURE		OUNCES	PROTEIN GM.	CALORIES
Breakfast:						
7:30 A. M.	Orange	½		4.72	.80	50
	Rolled Oats	½	cup	2.00	2.10	50
	Bread	2	slices	1.50	3.60	100
	Butter (fresh)	1	tbsp.	.50	.13	100
	Sugar	½	tbsp.	.50	....	50
	Cream (thin)	¼	cup	1.80	1.25	100
10:00 A. M.	Milk	1	small glass	5.50	5.00	108
	Graham Cracker	1		.40	1.12	50
Dinner:						
12:30 P. M.	Cream of Green Pea Soup	⅔	cup	5.20	4.00	100
	Yolks of eggs poached	2	eggs	1.00	4.25	100
	Baked Potato	1		5.27	2.69	100
	Creamed Cauliflower	1	serving	4.38	2.37	83
	Bread	2	slices	1.50	3.60	100
	Butter (Fresh)	1½	tbsp.	.75	.21	150
	Rice and Raisin Pudding	⅗	cup	2.20	3.00	150
	Cream (thin)	⅛	cup	.90	.62	50
4:00 P. M.	Buttermilk	1	small glass	5.50	4.58	55
	Zwieback	1	piece 3¼"x½"x1¼"	.26	.75	33
Supper:	Macaroni	½	cup	4.60	1.37	50
6:30 P. M.	String beans	¾	cup	2.83	1.83	33
	Bread	2	slices	1.50	3.60	100
	Butter (fresh)	1½	tbsp.	.75	....	150
	Pears (canned)	3	halves & juice	4.70	....	100
Before Retiring:	Fig	1		.50	.61	50
					48.19	2012

INTESTINAL AUTO-INTOXICATION DIET NO. IV

For 2404 Calories a Day: Approximate values—protein, 57.46 gm.; fat, 100.83 gm.; carbohyrate, 319.43 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	PROTEIN GM.	CALORIES
Breakfast:					
7:30 A. M.	Baked Apple	1 (medium)	3.45	.18	150
	Hominy grits	⅗ cup	1.22	1.69	75
	Bread	2 slices	1.50	3.60	100
	Butter (fresh)	1 tbsp.	.50	.13	100
	Sugar	1 tbsp.	.50	....	50
	Cream (thin)	½ cup	3.60	2.50	200
10:00 A. M.	Milk	1 small glass	5.50	5.00	108
	Soda crackers	2	.45	1.25	50
Dinner:					
12:30 P. M.	Lentil Soup	½ cup	4.50	2.12	50
	Baked Potato	1	5.27	2.69	100
	Creamed Peas	½ cup	2.70	4.50	100
	Lettuce and Cream Cheese ...	1 sm. serving piece 2"x1"x⅜"	.50 .90	.17 6.25	03 100
	Bread	2 slices	1.50	3.60	100
	Butter (fresh)	1½ tbsp.	.75	.21	150
	Boiled custard on	⅓ cup	2.20	3.25	100
	Banana (very ripe)	½	2.75	.62	50
4:00 P. M.	Buttermilk	1 small glass	5.50	4.58	55
	Zwieback	piece 3¼"x½"x 1¼"	.26	.75	33
Supper:					
6:30 P. M.	Cream Toast	1⅕ slice, etc	4.40	4.50	200
	Bread	2 slices	1.50	3.60	100
	Butter (fresh)	1¼ tbsp.	.62	.19	125
	Stewed Peaches ...	¾ cup	5.20	.75	150
Before Retiring:	Buttermilk	1 small glass	5.50	4.58	55
	Prunes	4	1.40	.75	100
				57.46	2404

INTESTINAL AUTO-INTOXICATION DIET NO. V

For 2812 Calories a Day: Approximate values—protein, 67.69 gm.; fat, 117.68 gm.; carbohydrate, 377.77 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	PROTEIN GM.	CALORIES
Breakfast:					
7:30 A. M.	Prunes stewed	4 and juice	5.60	1.25	200
	Farina	¾ cup	6.00	3.00	100
	Bread	2 slices	1.50	3.60	100
	Butter (fresh)	1 tbsp.	.50	.13	100
	Sugar	1 tbsp.	.50	...	50
	Cream (thin)	¼ cup	1.80	1.25	100
10:00 A. M.	Milk	1 glass	7.65	7.14	150
	Graham Crackers ..	2	.40	2.25	100
Dinner:					
12:30 P. M.	Cream of Celery Soup	¾ cup	5.40	4.12	150
	Yolks of eggs poached	2	1.00	4.25	100
	Baked Potato	1	5.27	2.69	100
	Lima Beans buttered	⅜ cup	2.55	6.00	150
	Bread	2 slices	1.50	3.60	100
	Butter (fresh)	1 tbsp.	.50	.13	100
	Tapioca-cornmeal Pudding	4 tbsp.	3.60	5.50	200
	Cream (thin)	⅛ cup	.90	.62	50
4:00 P. M.	Buttermilk	1 glass	5.50	4.58	55
	Soda crackers	3	.67	1.88	75
Supper:					
6:30 P. M.	Boiled Rice	⅜ cup	2.00	1.12	50
	Asparagus on Toast	5 stalks and sauce	7.70	5.75	169
	Bread	2 slices	1.50	3.60	100
	Butter	2 tbsp.	1.00	.26	200
	Stewed Apricots ...	½ cup	5.40	2.00	200
Before Retiring:	Fig	2	1.00	1.22	100
	Zwieback	1 piece 3¼"x½"x1¼"	.26	.75	33
				67.69	2812

Food Poisoning

Food poisoning may be caused in two ways.

1. By use of food which naturally contains poison, such as some varieties of mushrooms.
2. By use of food which has become infected by bacteria or which contains poison products resulting from bacterial action.

Milk, meat, fish, vegetables and canned goods are all subject to this infection and the putrefactive changes that give rise to poisonous products. Much may be done to prevent this trouble by very careful selection, handling and cooking of food. The dietetic treatment in cases of poisoning would be the same as for any acute affection of the gastro-intestinal canal. All of the offending substances should of course be removed. This may necessitate stomach lavage, the use of powerful cathartics and high enemas.

Type of Diet.—Low-calory fluid diet.

The patient should be given a very simple fluid diet at first, gradually increasing it to soft and then to normal diet as ability to retain and digest food permits.

Dietary Precautions:[1]

1. Fresh food only should be bought from a reliable dealer unless the buyer is able to decide for himself just what is fresh.
2. Meat that tastes "queer," oysters that are spoiled and meat that is bitter, strong or rancid should be ejected from the mouth, no matter in whose society. It can be gracefully done.
3. Cooking thoroughly, broiling, roasting or boiling kills most of the bacteria but is usually ineffectual in removing the products of decomposition or in making them ineffective. Ordinary boiling does not kill all kinds of bacteria; most are readily killed but some resist even prolonged boiling. Bacillus botulinus is

[1]Carter, Howe and Mason, "Nutrition and Clinical Dietetics," Lea & Febiger, Philadelphia, Pa., 1921.

easily decomposed by heat, while bacillus paratyphi produces a poison which cannot be eliminated even by boiling for a long time.

4. Not less than a 15 per cent. solution of salt should be used as brine for salting, and smoking food must be done very thoroughly, or in either case the bacteria will not be destroyed.
5. Fish if frozen while fresh will keep almost indefinitely without loss of essential good qualities, palatability or change in sanitary characteristics. But if the fish is frozen after becoming infected the poisonous effects will be as apparent when it is thawed for cooking as if it had not been frozen.
6. Food should be eaten as soon as convenient after cooking and should not be kept for long intervals. If necessary to keep food over, particularly in hot weather, it should be cooked again just before eating.
7. Canned goods should never be used if the can is seen to have a convex top, this is always due to imperfect sterilization with resulting fermentation and putrefaction, the bulging being caused by the gas under pressure. These cans are called "swells" or "blows."
8. All canned goods should be thoroughly cooked through before serving, to kill any possible organisms, and if the entire contents are not used at one meal the remainder should be kept in stone or enamel ware on ice and not in the can.

If by chance it becomes necessary to prescribe a diet for a patient suffering from food-poisoning one should follow the rules laid down for the diet of the concomitant condition which it causes, e. g., diet for acute gastritis, gastro-enteritis, or enterocolitis according to which part of the intestinal canal is affected. It is needless to say that if any food is remaining in the stomach or intestine, patients must have gastric lavage, quick and effectual catharsis and high colonic irrigations.

QUESTIONS FOR STUDY

ENTERITIS

1. What may be the cause of acute enteritis?
2. What type of diet should be used? Why?
3. How may the dietetic treatment of chronic enteritis differ from that in acute cases?
4. What may cause the disorder?
5. What determines the type of diet to be used?
6. What care should be given to the nutrition value of the diet?

DIARRHEA

7. What are some causes of diarrhea?
8. How is it possible to control diarrhea by diet?
9. What is the usual treatment in acute cases?
10. What rules govern the selection of foods for the later treatment of acute cases and for all chronic cases?
11. Give a list of foods and beverages that may be used.
12. Is milk useful in these diets?

CONSTIPATION

13. What are common causes of constipation?
14. What is the principle underlying the dietetic treatment of constipation?
15. Construct a menu that would be suitable for this trouble.
16. How are agar, honey and molasses effective in counteracting constipation?
17. Why are mineral oils given?

AUTO-INTOXICATION

18. How may intestinal auto-intoxication be counteracted by diet?
19. Why is lactose valuable in this treatment?

FOOD POISONING

20. What are some causes of food poisoning?
21. Discuss the treatment of such cases.
22. Cite precautions which may avoid such trouble.

CHAPTER XXI

DIET IN DISEASES OF THE LIVER

Some abuse of the organ is usually responsible for a diseased condition. The liver functions in the metabolism of all foodstuffs and excessive amounts of any of them may disturb the normal working of the organ.

The use of alcohol is probably responsible for more liver disorders than any other one article of diet but close second to this come condiments and all rich, highly spiced foods. All these should be entirely eliminated from the diet when the liver ceases to function properly.

The following general dietary regulations apply in all cases of hepatic disease. Food should be given in small amounts, at frequent, regular intervals. It should be well masticated and taken slowly. Rest before and after meals is advisable.

Jaundice

Jaundice is caused by a narrowing or complete occlusion of the bile ducts, due to catarrh, gallstones or to some malignant growth such as cancer or tumor. The obstruction of the duct interferes with the flow of bile and affects the digestion and absorption of fats, so that in this condition they are poorly tolerated.

In jaundice the liver loses its power to store glycogen and in consequence carbohydrate foods must be somewhat restricted.

In acute catarrhal jaundice the stomach is apt to be very irritable. Accordingly, all foods should be fluid and should be given regularly in small amounts at frequent intervals.

Because of the disturbed liver function fats should be practically excluded and the carbohydrates somewhat restricted, as stated above. For this reason we must supply protein liberally. The milk proteins are the best to use and skimmed milk, diluted with lime water or other alkaline water should make up the most of the diet. Cereals, such as rice, farina and other wheat products may be used. Such a diet is outlined below.

DIET IN ACUTE CATARRHAL JAUNDICE[1]

For 544.2 Calories a Day: Approximate value—protein, 43.3 gm.; fat, 5.09 gm.; carbohydrate, 81.3 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	PROTEIN GM.	CALORIES
7 A. M.	Mineral Water	1¼ cups	10.0	....	....
8 A. M.	Skimmed milk........	1¼ cups	10.0	9.6	104.0
	with egg white	1 cup	0.69	1.8	14.4
10 A. M.	Buttermilk	1¼ cups	10.0	1.4	101.0
1 P. M.	Beef tea	1¼ cups	10.0	6.2	29.8
	Roll	1	1.26	3.22	100.0
4 P. M.	Tea	1 cup	8.0	.....	.....
	Sugar	1 tsp.	0.14	....	16.0
	Toast	½ slice	0.35	0.96	25.0
6 P. M.	Skimmed milk........	1¼ cups	10.0	9.6	104.0
10 P. M.	Mineral Water	1¼ cups	10.0	.....	.....
				43.3	544.2

After the acute stage is past, the diet may be increased, until by the end of the second week the patient is taking a diet of milk, highly milled cereals, mild vegetables and cooked fruits, tender lean meats and non-oily fish. Sugar and fats should be used with caution, and fried foods and rich desserts should be avoided altogether. Meals should still be small and given at frequent intervals.

During convalescence the patient should avoid over-eating. Carelessness in the diet at this time may delay recovery or cause the condition to become chronic.

[1] Watson, "Foods and Feeding."

CONVALESCENT DIET IN JAUNDICE, NO. I

(LOW FAT DIET)

For 2401 Calories a Day: Approximate value—protein, 118.14 gm.; fat, 43.12 gm.; carbohydrate, 312.67 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	PROTEIN GM.	CALORIES
Breakfast:					
7 A. M.	Pears (canned)	3 halves and juice	4.70	.50	100
	Hominy Grits	⅘ cup	6.80	2.25	100
	Milk (skimmed)	1⅛ cup	9.60	9.25	100
	Bread (toast)	1 slice	.75	1.80	50
10 A. M.	Split Pea Soup	⅗ cup	6.00	6.50	100
	Soda Crackers	2	.45	1.25	50
Dinner:					
1 P. M.	Cod	1 serving	4.90	26.25	100
	Potatoes, mashed	½ cup	3.10	1.75	100
	Creamed spinach	⅗ cup	4.10	3.75	100
	Roll	1	1.30	4.00	100
	Cup Custard	⅔ cup	6.60	8.50	200
4 P. M.	Milk (skimmed)	1 large glass	9.60	9.25	100
	Egg white	1	.98	3.50	14
	Graham Cracker	1	.20	1.12	50
Supper:					
6 P. M.	Cream of Asparagus Soup	1 cup	8.00	8.50	200
	Toast	2 slices	1.50	3.60	100
	Potatoes creamed	⅖ cup	2.70	2.25	100
	Prune Soufflé	⅘ cup	3.60	5.00	200
Before Retiring:	Milk (skimmed)	1 large glass	9.60	9.25	100
	Graham Cracker	1	.20	1.12	50
					2014

CONVALESCENT DIET IN JAUNDICE, NO. II
(LOW FAT DIET)

For 2203 Calories a Day: Approximate value—protein, 101.63 gm.; fat, 55.37 gm.; carbohydrate, 331.28 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	PROTEIN GM.	CALORIES
Breakfast:					
7 A. M.	Banana	1	3.50	1.24	100
	Farina	¾ cup	6.00	3.00	100
	Bread (toast)	2 slices	1.50	3.60	100
	Milk (skimmed)	1⅛ cup	9.60	9.25	100
10 A. M.	Cream of Pea Soup	1 cup	7.80	6.00	150
	Soda Crackers	3	.60	1.87	75
Dinner:					
1 P. M.	Chicken (roast)	slice 4″x2½″x¼″	1.70	12.75	100
	Potato, mashed	½ cup	3.10	1.75	100
	Creamed Peas	½ cup	2.70	4.50	100
	Roll	1	1.30	4.00	100
	Rice Pudding	⅗ cup	2.25	4.00	150
	Milk (skimmed)	½ large cup	4.80	4.62	50
4 P. M.	Milk (skimmed)	1 large glass	9.60	9.25	100
	Egg white	2	1.96	7.00	28
	Graham Cracker	1	.20	1.12	50
Supper:					
6 P. M.	Creamed Toast	1½ slice	4.40	6.50	200
	Peaches with	2 lge. halves	7.50	1.50	100
	Boiled Custard	⅔ cup	4.40	6.50	200
	Plain Sponge cake	piece 2″x2¾″x⅞″	.90	1.75	100
Before Retiring:	Milk (skimmed)	1 large glass	9.60	9.25	100
	Graham Crackers	2	.40	2.24	100
					2203

Cirrhosis of the Liver

In cirrhosis of the liver there is destruction, to a greater or less extent, of the parenchymatous cells. This disease is very commonly the result of over-indulgence, either in alcohol or food, which causes chronic irritation of the liver. There are, however, other causes such as syphilis, metallic poisoning and chronic malarial poisoning.

The dietetic treatment will aim to relieve irritation of the liver and putrefaction in the intestines. Protein metabolism is interfered with in this condition and the kind and amount of protein given must be watched.

When the disease has been diagnosed the patient is usually put upon a milk diet. Osler recommends the use of milk alone, diluted with lime water or other alkaline water, giveing 2 to 3 quarts a day for from 4 to 6 weeks. Skimmed milk may be used where whole milk is not well tolerated. If ascites is present, the Karell milk cure,[1] with its smaller volume, is advised.

After several weeks of the milk diet cases without ascites may be given a more liberal diet, though Osler recommends a periodic return to the milk diet. This more liberal diet will consist of milk, eggs, cereals, green vegetables, potatoes and fruits. Fats and sugar, with their tendency to undesirable fermentations, should be used most cautiously and all irritating foods must of course be eliminated. Meats and meat broths are also prohibited, because of the disturbed protein metabolism.

Where ascites is present a dry diet is usually prescribed, such as the Balfour dry diet given on the following page.

[2]See page 515.

BALFOUR'S DRY DIET

For 955 Calories a Day: Approximate value—protein, 41 gm.; fat, 20.25 gm.; carbohydrates, 130.17 gm.

SCHEDULE OF FEEDING	MEASURE	OUNCES	PROTEIN GM.	CALORIES
Breakfast:				
Dry Toast	2 large slices	1.50	4.92	137
Tea	1 tea cup	4.00	...	...
Cream	2 tsp.	.44	.16	46
Sugar	1 tsp.	.14	...	17
Dinner:				
Lamb Chops	2 (lean)	3.20	20.00	200
Cocoa	1 tea cup	4.00	3.00	80
Dry Toast	3 large slices	2.25	6.38	206
Supper:				
Dry Toast	3 large slices	2.25	6.38	206
Tea	1 tea cup	4.00	...	...
Cream	2 tsp.	.44	.16	46
Sugar	1 tsp.	.14	...	17
				955

Gall-Stones

By gall-stones we mean stones precipitated in the gall bladder or gall ducts. They vary in size from that of grains of sand to that of a walnut. They are concretions of insoluble lime salts in combination with bile pigments—particularly bilirubin. A foundation for these deposits is often a chalisteral stone with epithelia débris and bacteria at its center.

This bacterial infection of the gall bladder results mostly from catarrhal condition of stomach and intestine. The stones are precipitated from the bile when there is stagnation resulting from catarrh or inflammatory stricture of the duct.

Stones once formed are not influenced by diet so far as we know but dietary measures are important in preventing their formation in the first place or in preventing their recurrence after operation. For the prevention of gall-stones the rate of bile flow should be normal and it is important to avoid constipation and intestinal putrefaction which may set up inflammatory processes.

The same general rules for diet will hold here as in other hepatic disturbances. Avoid irritating foods, such as alcohol, condiments and spices, rich, greasy foods and concentrated sweets. Do not overtax the liver by fat or carbohydrate beyond its tolerance. Give small, frequent meals. Use milk, fruits and vegetables liberally to keep the bowels open.

PROPHYLACTIC OR POSTOPERATIVE DIET
FOR GALL-STONES

For 1991.5 Calories a Day: Approximate values—protein, 59.1 gm.; fat, 75.28 gm.; carbohydrates, 271.8 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	PROTEIN GM.	CALORIES
Breakfast:					
7 A. M.	Pears (canned)	3 halves and juice	4.00	.50	100
	Wheat, flaked, cooked	⅔ cup	6.00	3.25	100
	Bread (toast)	2 slices	1.50	3.60	100
	Butter (fresh)	½ tbsp.	.25	.07	50
	Cream (thin)	¼ cup	2.00	.59	100
	Sugar	1 teaspoon	.14	...	17
	Coffee		...	...	....
10 A. M.	Puffed rice	⅔ cup	.50	1.12	50
	Milk	⅝ cup	5.10	4.76	100
	Cream	⅛ cup	1.00	.29	50
Dinner:					
1 P. M.	Creamed codfish	½ cup	2.50	8.00	100
	Baked potato	1	5.27	2.69	100
	Spinach	½ cup	4.25	1.87	22
	Roll	2	2.60	8.00	200
	Butter (fresh)	½ tbsp.	.25	.07	50
	Spanish cream	⅔ cup	1.66	3.00	66
4 P. M.	Milk	1 large glass	7.55	7.14	150
	Graham crackers	2	.40	2.25	100
Supper:					
6 P. M.	Cream of celery soup	1 cup	7.20	5.50	200
	Soda Biscuit	2	.45	1.25	50
	Bread	2 slices	1.50	3.60	100
	Butter (fresh)	½ tbsp.	.25	.07	50
	Peaches, canned	2 halves and juice	7.50	1.50	100
					1991.5

PROPHYLACTIC OR POSTOPERATIVE DIET FOR GALL-STONES

For 2086 Calories a Day: Approximate values—protein, 80.13 gm.; fat, 79.0 gm.; carbohydrate, 266.0 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	PROTEIN GM.	CALORIES
Breakfast:					
7 A. M.	Apricots (stewed) ...	¼ cup	2.90	1.00	100
	Farina	¾ cup	6.00	3.00	100
	Bread (toast)	1 slice	0.75	1.80	50
	Butter (fresh)	½ tbsp.	0.25	0.07	50
	Cream (thin)	¼ cup	2.06	0.59	100
	Sugar	1 teaspoon	0.14	...	17
	Coffee		...	...	...
10 A. M.	Shredded wheat	1	.90	3.25	100
	Milk	⅝ cup	5.10	4.76	100
Dinner:					
1 P. M.	Hamburg steak	2 cakes 2½" diameter ⅞" thick	4.00	26.50	200
	Baked potato	1	5.27	2.69	100
	Creamed peas	½ cup	2.70	4.50	100
	Roll	1	1.30	4.00	100
	Butter (fresh)	½ tbsp.	0.25	0.07	50
	Boiled custard on.....	⅓ cup	2.20	3.25	100
	Banana	½ cup	2.75	0.62	50
4 P. M.	Milk	1 large glass	7.55	7.14	150
	Graham crackers	2	.40	2.25	100
Supper:					
6 P. M.	Creamed eggs on toast	1 serving (1 egg, etc.)	6.00	13.50	300
	Bread	1 slice	0.75	1.80	50
	Butter (fresh)	½ tbsp.	0.25	0.07	50
	Apple sauce	½ cup	4.66	0.33	133
					2086

PROPHYLACTIC OR POSTOPERATIVE DIET
FOR GALL-STONES

For 2186 Calories a Day: Approximate values—protein, 66.75 gm.; fat, 75.57 gm.; carbohydrate, 333.8 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	PROTEIN GM.	CALORIES
Breakfast:					
7 A. M.	Banana	1	3.50	1.24	100
	Farina	¾ cup	6.00	3.00	100
	Bread (toast)	2 slices	1.50	3.60	100
	Butter (fresh)	½ tbsp.	.52	.07	50
	Cream (thin)	¼ cup	2.00	.59	100
	Sugar	1 teaspoon	.14	...	17
	Coffee	...	...	...	...
10 P. M.	Rice, boiled	½ cup	1.01	2.28	100
	Milk	⅝ cup	5.10	4.76	100
	Cream	⅛ cup	1.00	.29	50
Dinner:					
1 P. M.	Sirloin steak	small serving	3.17	18.10	160
	Potatoes, mashed	¾ cup	4.60	2.63	150
	String beans	½ cup	2.00	1.30	23
	Roll	1	1.30	4.00	100
	Butter (fresh)	½ tbsp.	.25	.07	50
	Tapioca cream	⅗ cup	4.20	4.50	150
4 P. M.	Milk	1 large glass	7.55	7.14	150
	Graham crackers	2	.40	2.25	100
Supper:					
6 P. M.	Asparagus on toast	8 stalks on toast	6.90	5.00	150
	Bread	2 slices	1.50	3.60	100
	Butter (fresh)	½ tbsp.	.25	.07	50
	Prunes (stewed)	6 and juice	8.40	1.87	300
					2186

QUESTIONS FOR STUDY

LIVER

1. State probable causes of liver disturbances.
2. Give dietary rules which should govern the treatment of all cases.
3. What causes jaundice and does its occurrence effect body processes?
4. What food restriction is advised?
5. What foods may be given?
6. What is the diet recommended for cirrhosis of the liver?
7. When is a dry diet advised?
8. What is meant by a dry diet?
9. Can gall-stones be benefited by dietary treatment?
10. Give type of diet.

CHAPTER XXII

DIET IN DISEASES OF THE GENITO-URINARY ORGANS[1]

Nephritis

Dietetic Treatment.—Nephritis, either acute or chronic, is characterized by a disturbance of the excretory powers of the kidneys. Under normal conditions water, the nitrogenous products of protein metabolism, and certain inorganic salts, especially sodium chloride, are perfectly eliminated. In the diseased condition one or all of these products are partially retained. The dietetic treatment of nephritis aims to minimize the work of the kidneys by restricting the products they have difficulty in eliminating.

Acute Nephritis.

Type of Diet.—The diet in acute cases must always be very limited. Sometimes no food is allowed for a period of twenty-four hours. Water may be given in generous amounts if it is properly eliminated. Practically all authorities recommend a milk diet and diets of low nitrogen content, the Karell diet[2] being very generally used. The lacto-farinaceous diet and lacto-vegetarian diets are used when other foods may be added.

The exact type of diet must be determined for individual cases and depends upon extent of water, salt and nitrogen retention. Salt and water retention are usually found together. The Karell diet[2] may be used or if the case does not

[1]Through the kindness of Dr. Herbert S. Carter, "Diet in Diseases of the Genito-Urinary System" was rewritten under his supervision largely from his books, "Presbyterian Diet Lists," published by W. B. Saunders Co., Philadelphia, Pa., and from, "Nutrition and Clinical Dietetics," published by Lea & Febiger, Philadelphia, Pa.

[2]The Karell Diet, see page 515.

demand an exclusive milk diet one of the salt-poor diets[1] is recommended. Where there is evidence of renal acidosis a lacto-vegetarian diet is of benefit because the base-forming elements of the vegetables and fruits tend to counteract the excessive acid content of the urine. All irritating foods should be avoided, such as meat extractives, meat soups and vegetables containing irritating oils, such as celery, garlic and onion. Alcohol in all forms is forbidden.

Albuminuria.

Dietetic Treatment[2].—When the albumin in the urine is a symptom of actual renal irritation, chemical or bacterial, it is necessary to treat the causal conditions by removal of poisonous materials from the food and to furnish such a dietary that no unnecessary strain shall be put upon the renal epithelium. For this purpose a lacto-farinaceous diet is best, milk alone being used for the more serious cases, and farinaceous additions being made for milder grades. When the albuminuria is a part of a general acute or chronic infection the diet must conform largely to the particular infection at fault, but in general the lacto-farinaceous diet fills the requirements perfectly and must be kept up as long as signs of renal irritation persist.

Chronic Nephritis

Dietetic Treatment:[2]

1. As most cases of chronic nephritis have distinct limitations in regard to their powers of excreting nitrogen, salts and water, it is necessary for their most intelligent dietary treatment that these limitations be determined, at least approximately.
2. Since in these cases diet is a matter of months or years, it is necessary to make sure that any diet chosen is palatable, supplies the full requirement of protein, fat, carbohydrate, salts, vitamines and calories adjusted to

[1] Salt-Poor Diets, see page 510.
[2] Carter, Howe and Mason, "Nutrition and Clinical Dietetics," Lea & Febiger, Philadelphia, Pa., 2nd Edition.

the requirements of the particular case and avoiding undue increase in weight.

3. In long standing cases it is not necessary to exclude meat absolutely, except possibly in cases of high arterial tension. Most authorities agree with Hare that the removal of red meat from the diet for a long period is harmful.[1] Since it is the extractives which seem to contain the pressor substances, meat soups are much better excluded from the diet and boiled meat is more to be desired than meat broiled or roasted, as boiling removes a large proportion of the extraction. Boiling in two waters is better still.
4. As far as possible the diet must be kept laxative, as many cases of chronic nephritis are made distinctly worse where there is constipation.
5. Von Noorden recommends the giving once a week of an extra one or two liters of water for its flushing effect. On these days the food is best limited to not over half the allowance. Of course when the patient is not excreting the ordinary daily allowance of water it would be of doubtful utility to give this extra amount, although Fischer insists that a kidney that is not secreting water in normal amounts needs more water, provided it contains the necessary salts and alkali.
6. The use of vegetables and fruits in large amounts as already explained is of the greatest value in furnishing alkaline basic salts.

Diet for Nitrogen Retention—Chronic Uremia[2].— A diet with low nitrogen content is indicated. Miller's cream or milk and cream diet[3] is used to advantage. The calory value is low but sufficient for temporary use. Extra water is often given with this diet. Additions to diet are made later in the form of cereals and then vegetables.

[1] Therapeutic Gazette—1914.
[2] Miller-Forchheimer's Therapeutic—Vol. IV.
[3] Miller's Diet, see page 515.

Diet for Water Retention—Edema and Salt Retention.— These conditions are usually found together. The Karell diet[1] is here used to advantage, its content of salt as well as its liquid being limited. When an exclusive milk diet is not necessary one of the salt-poor diets[2] may be used, beginning with those of lower protein content and working up to a more normal diet as indications of excretion permit.

Kinds of Food Used:

Soup	Cream soups and green vegetable purée, without meat stock.
Fish	Oysters, fresh fish, boiled or broiled.
Cereals	All kinds. The wheat preparations and rice preferred to oatmeal.
Bread	Stale bread or toast, milk or cream toast, zwieback.
Vegetables	White potatoes baked, mashed or creamed, sweet potatoes, carrots, green vegetables, such as spinach, asparagus, string beans, cabbage, lettuce, water cress.
Egg	Not more than 1 or 2 a day.
Fats	Butter, oil, mild cheese, cream.
Desserts	Rice, tapioca, cornstarch and bread and milk puddings.
Fruits	All kinds, fresh or cooked.
Beverages	Milk, malted milk, buttermilk, cocoa, Vichy, sweet cider, unfermented fruit juices. Tea and coffee in moderation as conditions may indicate.
Meats	Meats may be used very sparingly in the diet and are best included only at the physician's discretion.

Foods to Avoid:

Fried foods, made dishes such as hash, croquettes, gravies, cake and pastry, condiments and spices, all alcohol.

Chronic Interstitial Nephritis

Nitrogen retention is more commonly associated with this type of nephritis than are water and salt retention and it is nearly always accompanied by high blood pressure.

Dietetic Treatment.—It is perhaps as important to restrict the total amount of food taken as to eliminate particular kinds of food. Over-eating should be carefully avoided.

[1] Karell Diet, see page 515.
[2] Salt-Poor Diet, see page 510.

The faulty nitrogen elimination points to a restriction of protein food. As the disorder may be of long standing the elimnation of all animal protein is not advised. Meats, fowl and fish—preference being given to the last two—may be included in the diet once a day. Otherwise the diet should conform to the requirements for chronic nephritis. Should there be symptoms of uremia the animal protein should be further restricted. Plentiful use of water is recommended.

Type of Diet.—Low protein diet.

Kidney Stones

Dietetic Treatment.—Kidney stones may be of three general types; those made of uric acid, of calcium oxalate or of phosphates. The diet must be determined by the type.

For uric acid stone the diet advised for gout would be suitable. For the calcium oxalate stone, foods containing lime and oxalic acid should be avoided. Milk, eggs and fresh vegetables for the former; pepper, sorrel, rhubarb, spinach, beet roots, dried figs, tea and cocoa for the latter. Meats, cereals, bread, rice, potatoes, apples may be used. The phosphate stones are probably not remedied much by diet. It is a condition associated more closely with nervous disturbances. Plentiful use of water is beneficial and restriction of foods rich in lime, such as milk, eggs and fruit, has sometimes had good effect.

High Blood Pressure

This is very often associated with chronic nephritis and with chronic interstitial nephritis. It may be the result of infection in tonsils or teeth or it may be associated with arterial or cardiac diseases. The underlying cause should be determined and the diet adapted to the need. Since the majority of patients suffering from high blood pressure have some symptoms of nephritis the diet recommended for chronic nephritis will be found most valuable.

SALT-CONTENT-FOOD LIST[1]

ACCORDING TO LEVA

	% Sodium Chloride in Raw Material.
MEATS	
Mutton	0.17
Veal	0.13
Calf's brain	0.20
Calf's kidney	0.32
Calf's liver	0.14
Beef (lean)	0.11
Pork (lean)	0.10
FISH	
Trout	0.12
Halibut	0.30
Herring	0.27
Cod	0.16
Carp	0.086
Salmon	0.061
Sole	0.41
Mackerel	0.28
Haddock	0.39
POULTRY	
Duck	0.14
Goose	0.20
Chicken	0.14
Pigeon	0.15
Turkey	0.17
Venison	0.11
Oyster (washed)	0.52
Oyster (with sea water)	1.14
SMOKED AND SALTED FOODS	
Ham (raw)	4.15—5.86
Ham (boiled)	1.85—5.35
Salmon (smoked)	7.50
Bacon (smoked, German)	1.01
Bacon (smoked, American)	11.61
Corned beef, German	2.04
Corned beef, American	11.52
Cod (salt)*	23.00
Cod (salt, boneless)*	19.00
Herring (smoked)*	11.70
Mackerel (salt, dressed)	10.40
Salmon (smoked, salted)	10.87
Sardines (French, in oil)	1.34
Cod-liver oil	0.17
Gelatin (dry)	0.75
Beef marrow	0.11
Sausages, Frankfurter	2.20
Sausages, various kinds	2.90—8.10
Anchovy paste (Cross & Blackwell)	40.1

	% Sodium Chloride in Raw Material.
MEAT EXTRACTS	
Liebig's	2.60
Kemmerich	1.40
Various bouillon capsules, extracts, etc.	9.40—22.0
PREPARED FOODS	
Plasmon	0.21
Roborat	0.0051
Sanatogen	0.42
Somatose	0.66
Bovril's preparations.	0.36—14.1
Valentine's Meat Juice	0.08—1.20
Egg (white and yolk)	0.21
Egg (white alone)	0.20
Egg (yolk alone)	0.039
Caviar	3.00
Milk (whole)[1]	0.18
Cream	0.13
Buttermilk	0.16
Whey	0.11—0.15
Condensed milk	0.40
Butter (unsalted)	0.02—0.21
Butter (salted)	1.00—3.00
Peanut butter*	4.10
Oleomargarine	2.15
Palmin	0.0016
Fructin	0.10
CHEESE	
Parmesan	1.93
Swiss	2.00
American, pale*	0.82
Pineapple cheese	2.13
Edam	3.30
English cream cheese	0.70—1.15
INFANT'S FOODS	
Nestle's Food	0.29
Rademan's	0.03
Robinson's Patent Groats	Trace
BREAD, ETC.	
Graham bread	0.61
Pumpernickel	0.46
White bread	0.18—0.70
Ordinary white bread (not salt-free)	0.701
Rye bread	0.18—0.59
Zwieback	0.38
Macaroni	0.067

[1] Dr. Coleman in Forchheimer's "Therapeutics of Internal Diseases," Vol. 1, p. 642.

*Analyses marked thus * from Atwater and Bryant; [1] from Carter.

	% Sodium Chloride in Raw Material.
CEREALS, ETC.	
Barley	0.037
Oats	0.046
Rye	0.014
Wheat	0.013
Rice	0.039
Corn (maize)	0.019
Wheat flour	0.002—0.008
Oatmeal (American)	0.29
Oatmeal (German)	0.28
Quaker oats	0.082
Sago	0.19
VEGETABLES	
Potatoes	0.016—0.078
Beets	0.058
Beans	0.09
Peas	0.058
Lettuce	0.12
Lentils	0.13—0.19
Lentils (dried)	0.155
Artichokes	0.036
Cauliflower	0.05—0.15
Cucumber (fresh)	0.06—0.08
Horse-radish	0.02—0.06
Radish	0.075
Celery, stalks	0.25—0.49
Celery, roots	0.089
Asparagus	0.04—0.06
Spinach	0.084—0.21
Tomatoes	0.094
Cabbage	0.11—0.44
Onions	0.016—0.09
CANNED VEGETABLES	
Green corn*	0.40
Green peas*	0.70
Tomatoes*	0.10
Mushrooms	0.04—0.06
FRUITS	
Pineapple	0.071
Orange	0.0057—0.0550
Apricot	0.0047
Lemon	0.0045
Strawberry	0.0100—0.020
Chestnuts	0.0045—0.010
Cherry	0.013
Cocoanut juice	0.035
Olives	0.008—0.210
Plum	0.0046
Gooseberry	0.021
Watermelon juice	0.011
Grape	0.024
Almonds, dry	0.010
Walnuts, dry	0.019
Cane sugar	0.110
Lump sugar	0.049
Chocolate (Lindt)	0.073

	% Sodium Chloride in Raw Material.
SPICES	
Capers (preserved in salt)	2.10
Capers (preserved in vinegar)	0.20
Pepper, black	0.51
Pepper, white	0.019
Mustard	2.66
Vanilla	0.055
Cinnamon	0.061
Cocoa beans	0.05—0.095
Coffee (roasted)	0.045
Tea	0.15
DRINKS	
Ground water	0.0012—0.0060
Spring water	0.00055—0.0046
Ale	0.0017
Beer (German)	0.016
Beer (English)	0.10
Champagne (Moët & Chandon)	0.0045
Apollinaris	0.043
Fachinger	0.039
Giesshübel (Mattoni)	0.0021
Vichy	0.053
FOODS PREPARED FOR TABLE	
Beef broth [1]	0.735
Bouillon	0.5—1.0
Thick soups	0.54
Oatmeal gruel [1]	0.075
Roast beef	0.98
Roast pork	1.54
Lamb Chops (Coleman)	0.97
Chicken [1]	0.01
Roast chicken	0.39
Chicken broth [1]	0.35
Sauces	0.7—1.5
Scrambled eggs (salted)	1.10
Spinach	0.91
Carrots [1]	0.029
Carrots	0.46
Cauliflower	0.49
Green salad	0.41
Apple sauce	0.031
Apple sauce [1]	0.0005
Stewed pears	0.019
Tapioca pudding (unsalted)	0.026
Macaroni (à la Napolitaine)	1.04
Pea soup [1]	0.499
Rice with apples	0.18
Potatoes (boiled)[1]	0.058

*Analyses marked thus * from Atwater and Bryant; [1] from Carter.

Food Combinations and Menus

(SALT-POOR DIETS)

CARTER'S SALT-POOR DIETS[1]

The cereals, butter, bread, etc., used in these diets, are all prepared without salt.

Diet No. 1 may be used at once in very severe cases. In milder cases No. 2, No. 3, No. 4 or No. 5 may be used or they may be used in series as the individual case shows improvement. The length of time each should be used is a matter for judgment on the physician's part. Later, ordinary mixed diet may be used without the use of a salt shaker after which definite amounts of salt may be allowed.

DIET, NO. I

For 1350 Calories a Day: Approximate values—protein, 36 gm. (1 1/6 oz.); fat, 65 gm. (2/6 oz.); carbohydrate, 160 gm. (5⅓ oz.); chlorides, 1 gm.

(LOW IN PROTEIN)

Breakfast:	Gm.	Oz.
Farina	60	2
Bread	30	1
Butter (unsalted)	30	1
Sugar	10	⅓
Egg (1)	40	1⅓
Coffee	175	5⅔
Prunes, stewed	60	2
Total	405	13⅓

Dinner:	Gm.	Oz.
Rice	60	2
Farina	100	3⅓
Bread	30	1
Butter (unsalted)	20	⅔
Sugar	10	⅓
Tea	175	5⅔
Total	395	13

Supper:	Gm.	Oz.
Toast	15	½
Egg (1)	40	1⅓
Bread	30	1

[1]Carter Howe and Mason, "Nutrition and Clinical Dietetics," Lea & Febiger, Philadelphia, Pa.

Supper:	Gm.	Oz.
Butter (unsalted)	15	½
Sugar	10	⅓
Custard	100	3⅓
Baked apple	60	2
Tea	175	5⅔
Total	445	14⅔

DIET, NO. II

For 2150 Calories a Day: Approximate values—protein, 51 gm. (1⅔ oz.); fat, 100 gm. (3⅓ oz.); carbohydrate, 250 gm. (8⅓ oz.); chlorides, 1.4 gm.

Breakfast:	Gm.	Oz.
Egg (1)	40	1⅓
Farina	60	2
Bread	65	2⅙
Butter (unsalted)	30	1
Coffee	175	5⅔
Prunes *or* baked apple	60	2
Total	430	14

Dinner:	Gm.	Oz.
Egg (1)	40	1⅓
Bread	60	2
Butter (unsalted)	35	1⅙
Farina	100	3⅓
Sugar	10	⅓
Rice	60	2
Tea	175	5⅔
Total	480	15½

Supper:	Gm.	Oz.
Toast	15	½
Egg (1)	40	1⅓
Butter (unsalted)	30	1
Bread	60	2
Custard	100	3⅓
Baked apple	60	2
Prunes	60	2
Tea	175	5⅔
Total	540	17½

DIET, NO. III

For 2000 Calories a Day: Approximate values—protein, 37 gm. (1⅙ oz.) (5.9 gm. nitrogen); chlorides about 1 gm. (15 grains)

Breakfast:	Gm.	Oz.
Bread	30	1
Egg (1)	40	1⅓
Wheat or corn cereal	60	2
Orange juice	200c.c.	6⅔
Sugar	25	⅚
Butter	20	⅔
Cream	50	1⅔

Luncheon:	Gm.	Oz.
Potato or young carrots	50	1⅔
Bread	30	1
Rice	80	2⅔
Tomato	100	3⅓
Butter	20	⅔
Raisins	15	½
Sugar	10	⅓
Ice cream	100	3⅓

Supper:	Gm.	Oz.
Bread	40	1⅓
Butter	30	1
Wheat *or* corn cereal	60	2
Cream	50	1⅔
Raisins	10	⅓
Sugar	35	1
Potato *or* young carrots	50	1⅔
Egg (1)	40	1⅓

DIET, NO. IV

For 2600 Calories a Day: Approximate values—protein, 35 gm. (1⅙ oz.) (5.6 gm. nitrogen); chlorides about 1 gm. (15 grains)

Breakfast:	Gm.	Oz
Bread	60	2
Orange juice	200	6⅔
Butter	40	1⅓
Cream	30	1
Farina	50	1⅔
Sugar	30	1
Coffee *or* tea	180c.c.	6

Luncheon:	Gm.	Oz.
Bread	40	1⅓
Butter	20	⅔
Egg (1)	40	1⅓

Luncheon:	Gm.	Oz.
Potato or carrots	125	4
Cream cheese	20	⅔
Sugar	30	1
Rice	50	1⅔
Cream	30	1

Supper:	Gm.	Oz.
Bread	50	1⅔
Butter	35	1
Farina	50	1⅔
Cream	40	1⅓
Cream cheese	30	1
Olive oil	15	½
Lactose	8	¼
Sugar	30	1
Potato *or* carrots	75	2½

May have in addition moderate amount of tomatoes, lettuce, cabbage, cauliflower, spinach (fresh), beets, carrots, squash, oranges, grape-fruit, peaches, grapes, apricots, pears, melons, jams.

DIET, NO. V

For 3000 Calories a Day: Approximate values—protein, 69 gm. (2⅓ oz.); nitrogen, 11 gm. (⅓ oz.); chlorides, 1-1.5 (15-23 grains)

(HIGHER PROTEIN)

Breakfast:	Gm.	Oz.
Bread	60	2
Orange juice	200	6⅔
Butter	30	1
Eggs (2)	80	2⅔
Wheat *or* corn meal	90	3
Fresh fruit	50	1⅔
Cream	40	1⅓
Sugar	50	1⅔
Tea *or* coffee	150	5

Luncheon:	Gm.	Oz.
Bread	40	1⅓
Butter	10	⅓
Potato *or* carrots	80	2⅓
Meat—choice of:		
Lamb chop *or*	100	3⅓
Steak *or*	100	3⅓
Chicken	125	4
Fish	70	2⅓
Rice	80	2⅔
Cream	20	⅔
Vegetables from list.		

Supper:	Gm.	Oz.
Bread	50	1⅔
Butter	30	1
Cream	40	1⅓
Lactose	8	⅓
Cereal	30	1
Stewed fruit	100	3⅓
Olive oil	20	⅔
Eggs (2)	80	2⅔
Sugar	30	1
Tea	150	5

The same list of accessory fruits and vegetables that was given with Diet No. 4 is available here.

Other Nephritic Diets

WIDAL'S STRICT SALT-POOR DIET

For 2500 Calories a Day: Approximate content—protein, 90 gm.; 1 to 2 gm. NaCl.

Salt-free bread	200 gm.
Meat (beef, chicken or mutton)	200 gm.
Vegetables (beans or rice), salt-free	250 gm.
Butter, salt-free	50 gm.
Sugar	40 gm.

Schedule of Feeding:

8 A. M. Chicken and rice (chicken, 50 gm.; rice, 75 gm.), bread, 40 gm.; butter, 10 gm.

12 M. Roast lamb, 75 gm.; beans, 100 gm.; bread, 80 gm.; butter, 20 gm.

5 P. M. Steak, 75 gm.; bread, 80 gm., butter, 20 gm., rice, 75 gm.; sugar, 40 gm.

HALPIN'S SALT-POOR NEPHRITIC DIET

For 2700 Calories a Day: Approximate content—protein, 119 gm.; salt, 5 to 6 gm.

Milk	1500 to 2000 c.c.
White salt-free bread	400 to 500 gm.
Salt-free butter	40 gm.
Eggs	4 to 6

Schedule of Feeding:

6 A. M. Eggnog (1 egg, 200 c.c. milk).

8 A. M. Hot milk (200 c.c.), toast (bread, 100 gm.), poached egg (1 egg).

10 A. M. Milk, 200 c.c.; bread, 50 gm.

1 P. M. Milk, 200 c.c.; bread, 100 gm.; 1 egg (coddled).

4 P. M. Milk Toast (200 c.c. milk, 50 gm. bread).
7 P. M. Omelet (1 egg), bread, 100 gm.; milk, 200 c.c.; custard (1 egg, 200 c.c. milk).

KARELL'S SALT-POOR MILK DIET

Schedule of Feeding:

For first five to seven days—

8 A. M.-12 M.—4-8 P. M. Milk, 200 c.c. (6½ oz.)

No other fluids allowed.
Approximate content—NaCl, 1.2 gm., Calories, 520.

Eighth Day—

Milk as above.

10 A. M. 1 soft cooked egg.

6 P. M. 2 pieces dry toast.
Approximate content, NaCl, 1.75 gm., Calories, 770.

Ninth Day—

Milk as above.

10 A. M. 1 soft cooked egg, 2 pieces dry toast.

6 P. M. 1 soft cooked egg and 2 pieces dry toast.
Approximate content, NaCl, 2.2 gm., Calories, 1020.

Tenth, eleventh and twelfth days—

Milk as above.

12 Noon. Chopped meat (if allowed), rice boiled in milk, vegetables.

6 P. M. 1 soft cooked egg.

No salt is used throughout diet. Salt-free toast and butter used. Small amount of cracked ice allowed with diet. All meat may often be omitted advantageously.

MILLER'S DIET FOR NITROGEN RETENTION

Daily Allowance:	*Approximate Content:*
1 pint cream	Protein, 12.5 gm., Calories, 1000
or	
1 pint cream with 1 pint milk.......	Protein, 29 gm., Calories, 1350

PETER BENT BRIGHAM HOSPITAL NEPHRITIC DIET[1]

There are available the following diets:

1. Standard Nephritic Diet: Protein, 75 gms., NaCl, 4 gms.; fat and carbohydrates to make up to 2000 calories. Tea or cof-

[1]In use at Peter Brent Brigham Hospital, Boston, Mass., August, 1921.

fee, 150 to 300 c.c., is to be served in the morning; milk, 400 c.c., during the day and water and other beverages to make up a total of 1500 c.c.

2. Low Protein Nephritic Diet: Protein, 25 gms., NaCl, 4 gms.; fat and carbohydrates to make up to 2000 to 2200 calories; tea or coffee, 150 to 300 c.c., and water and other beverages to make up a total of 1500 c.c.
3. Salt-Poor Standard Nephritic Diet: Same is Standard Nephritic except that NaCl is 2 gms. or less.
4. Salt-Poor Low Protein Diet: Same as Low Protein Nephritic Diet except that NaCl is 2 gms. or less.

Approximate Standard Nephritic Diet, etc., means that any of the above diets may be ordered as "approximate" for patients not under special tests. When so ordered they will be made up in the kitchen in form approximating the formulae for the special diets but will not be weighed out with the accuracy of the special diets and slips with food weights will not be sent to the wards.

STANDARD NEPHRITIS[1] 75-80 GMS. PROTEIN

Breakfast 7:30 *A. M.*	*Dinner* 12	*Supper* 5:30
Fruit .....100 gm.	Meat ...... 75 gm.	Meat ...... 50 gm.
Cereal .....150 gm.	Vegetables 100 gm.	Vegetables 100 gm.
Egg .... 50 gm.	Bread ..... 20 gm.	Fruit ......100 gm.
Bread ..... 20 gm.	Butter ....100 gm.	Bread ..... 20 gm.
Butter	Potato	Sugar
Sugar	Sugar	NaCl ...... 1 gm.
Cream	Dessert	
Milk	NaCl	
10 A. M. Milk 200 c.c.		

Totals for Day	*Protein	*Calories
Bread ..... 60 gm.	38.04	1445.07
Butter .....100 gm.		
Sugar ..... 40 gm.		
Cream .... 60 gm.		
Milk ......450 gm.		
Eggs (2)..100 gm.		

*These are the figures for the unchanging amounts of food in the diet—bread, butter, sugar, cream, milk, potato and eggs. They do not include fruit, cereal, meat and varying vegetables.

Butter is divided into three parts, one for each meal.

[1]In use at Peter Brent Brigham Hospital, Boston, Mass., August, 1921.

Sugar may be used on cereal, fruit or in dessert. *Cream and Milk* may be used for cereal, fruit, in dessert or given as a drink. *Eggs,* one for breakfast and one in noon dessert. *Meat,* usually steak or chop, given at noon and cold chicken, beef or lamb given at night. *Salt* contained in food of Standard Nephritic Diet averages about 2 gms. Two gms. additional salt is sent daily. If the diet is ordered salt-poor, no additional salt is given. The majority of standard nephritic diets are ordered salt-poor. *Weak tea or coffee* may be given with this diet. Fresh butter and salt-poor bread are used. *Dessert at noon* is made of cream, milk, sugar and one egg. In addition, gelatin, cocoa, cocoanut, cornstarch, rice or fruit, etc., are sometimes used in dessert.

Suggestions for Dessert: Lemon jelly with soft custard, ice cream, custards, cornstarch pudding, rice pudding.

SAMPLE MENU

7:30 A. M.	*12 Noon*	*5 P. M.*
Orange ....100 gm.	Steak ......75 gm.	Chicken ... 50 gm.
Cr. Wheat 150 gm.	Potato ....100 gm.	Tomatoes ..100 gm.
Toast ..... 20 gm.	Peas ......100 gm.	Toast ..... 20 gm.
Butter ..... 10 gm.	Bread ..... 20 gm.	Baked Apple 100 gm.
Cream .... 30 c.c.	Butter ..... 25 gm.	Sugar ..... 10 gm.
Milk .... 70 c.c.	Choc. Blanc-Mange	Cream .... 30 c.c.
Egg ...... 50 gm.	Milk ......150 c.c.	Milk ...... 30 c.c.
	Sugar ..... 10 gm.	Butter .... 10 gm.
	Egg (1) .. 50 gm.	
	Cornstarch 4 gm.	
	Cocoa ..... 5 gm.	

Calculations	*Protein*	*Calories*
Orange 100	.8	51.4
Cr. of Wheat...150	2.475	81.433
Peas 100	3.6	55.4
Tomatoes 100	1.2	22.6
Steak 75	17.625	199.2
Chicken 50	10.95	77.1
Apple 100	.4	62.9
Cornstarch 4	.56	8.64
Cocoa 4	.516	24.44
	38.126	583.116
	38.04	1445.07
	76.16	2028.185

LOW PROTEIN[1] 25-30 GMS. PROTEIN

Breakfast 7:30 *A. M.*	*Dinner*	*Supper*
Fruit ......100 gm.	Potato .....100 gm.	Vegetable ..100 gm.
Cereal ....150 gm.	Vegetable ..100 gm.	Bread ..... 30 gm.
Bread ..... 30 gm.	Bread ..... 30 gm.	Butter
Sugar	Butter	Fruit ......100 gm.
Butter	Sugar	Sugar
	Dessert	NaCl ...... 1 gm.
	NaCl ...... 1 gm.	
Totals for Day	**Amount Protein*	**Calories*
Bread ...... 90 gm.	without egg 15.78 gm.	1812.31
Butter ..... 60 gm.	with egg white in dessert 18.855 gm.	1825.0
Sugar ..... 65 gm.	with egg yolk in dessert 19.705	1902.935
Cream .....200 gm.		
Potato .....100 gm.		
NaCl ...... 2 gm.		

*These are the figures for the unchanging amounts of food in the diet—bread, butter, sugar, cream and potato. They do not include fruit, cereal and varying vegetables. *Butter* is divided into 3 parts, one for each meal. *Sugar* may be used on cereal, fruit, in dessert or lemonade. *Salt* contained in food of Low Protein Diet averages about 2 gms. Two gms. additional salt is sent daily. If the diet is ordered salt-poor, no additional salt is sent. The majority of Low Protein diets are ordered salt-poor. Dessert at noon is made up of cream and sugar, with or without egg white or egg yolk. In addition gelatin, cocoa, cocoanut, cornstarch, rice or fruit are sometimes used in dessert.

Suggestions for Dessert.—Lemon jelly with whipped cream, fruit whips, ice cream, mousse, cornstarch puddings, custards and rice pudding. Weak tea or coffee may be served. Fresh butter and salt-poor bread are used.

SAMPLE MENU

7:30 *A. M.*	12 *Noon*	5 *P. M.*
Orange ...100 gm.	Potato .....100 gm.	Tomatoes ..100 gm.
Cr. Wheat 150 gm.	Peas ......100 gm.	Toast ...... 30 gm.
Toast ..... 30 gm.	Bread ..... 30 gm.	Butter ..... 20 gm.
Butter ..... 20 gm.	Butter .... 40 gm.	Baked Apple 100 gm.

[1]In use at Peter Bent Brigham Hospital, Boston, Mass., August, 1921.

7:30 *A. M.*	12 *Noon*	5 *P. M.*
Cream .... 50 gm.	Choc. Blanc-Mange	Sugar ..... 10 gm.
Sugar .... 45 gm.	Cream .....100 c.c.	Cream ..... 50 c.c.
Any sugar not used for breakfast may be used in lemonade during the day.	Cocoa ..... 4 gm.	
	Cornstarch 4 gm.	
	Sugar .... 10 gm.	

Calculations	*Protein*	*Calories*
Orange ....100 gm.	.8	51.4
Cr. Wheat 150 gm.	2.475	81.435
Peas ......100 gm.	3.6	55.4
Cocoa ..... 4 gm.	.516	24.44
Cornstarch 4 gm.	1.2	8.64
Tomatoes ..100 gm.	.4	22.5
Apple .....100 gm.		62.9
	9.551	306.815
	15.78	1812.810
	25.331	2119.125

TWO HOUR RENAL TEST[1]

Patients on Two Hour Renal Test Must Be Kept in Bed

BREAKFAST	DINNER	SUPPER
7. A. M.	12 Noon	5 P. M.
Orange ..... 50 gm.	Chicken Broth .... 250 c.c.	Tomatoes ... 75 gm.
Oatmeal .... 150 gm.	Rice .... 5 gm.	Butter ...... 10 gm.
1 egg ...... 50 gm.	Steak .... 75 gm.	Lettuce ..... 20 gm.
Toast ...... 20 gm.	Potato ..... 100 gm.	Celery ...... 50 gm.
Butter ..... 5 gm.	Butter ...... 10 gm.	Olive Oil.... 20 c.c.
Sugar ...... 10 gm.	Peas .... 100 gm.	Bread ...... 20 gm.
Cream ...... 20 c.c.	Butter ...... 10 gm.	Butter ...... 5 gm.
Milk ...... 25 c.c.	Milk ...... 100 gm.	Apple ...... 100 gm.
Sugar ...... 5 gm.	Flour ...... 2 gm.	Sugar ..... 10 gm.
Tea *or* coffee 150 c.c.	Bread ...... 20 gm.	Cream ..... 20 c.c.
	Butter ...... 5 gm.	Water with meal ..... 350 c.c.
	Ice Cream, NaCl } 3.5 gm.	
	Tea .... 150 c.c.	
	Sugar ...... 10 gm.	
	Milk .... 25 c.c.	
	Water with meal ...... 500 c.c.	

TOTAL FLUID INTAKE 1490 C.C. APPROXIMATELY

[1] In use at Peter Bent Brigham Hospital, Boston, Mass, August, 1921.

LIGHT NEPHRITIC DIET

Breakfast:

Fruit juice, strained cereal, cocoa, toast and butter.

Dinner:

Cream soup, tapioca or cornstarch pudding or junket.

Supper:

Strained cereal with cream, strained stewed fruit, cocoa, toast and butter.

SOFT NEPHRITIC DIET

Breakfast:

Cooked fruit or fruit juice, cereal with cream, cocoa, toast and butter.

Dinner:

Cream soup, mashed or baked potato, well-cooked green vegetables, junket or starchy pudding, cocoa, toast and butter.

Supper:

Cereal and cream, baked or creamed potato, cooked fruit, cocoa, toast and butter.

FULL NEPHRITIC DIET

Meat, fish or fowl once daily.

Breakfast:

Fruit, raw or cooked, or fruit juices, cereal with cream, cocoa, toast and butter.

Dinner:

Cream soup, meat, fish or fowl, potatoes or sweet potatoes, baked, boiled or mashed. Green vegetables—any of those allowed. Salad plain or with fruit or vegetables. Salad dressing made with lemon instead of vinegar. Dessert—farinaceous puddings or fruits, cocoa, bread and butter.

Supper:

Cereal with cream, white or sweet potato, baked or creamed, green vegetable, vegetable or fruit salad, stewed fruit, cocoa, bread and butter.

Suggestions to Nurse.—With the above rather wide choice of food it is possible to arrange daily menus with considerable variety. A different fruit or a different form of serving it may be chosen each day. Cereals may be rotated and care-full choice of green vegetables will insure a diet that need not be monotonous.

Kidney Dietary Tests

In order to adjust the diet as nearly as possible to the needs of a particular case it is necessary to determine the extent of the kidney's inability to eliminate water, salt and nitrogen, and certain diet tests are made for this purpose. The water excretion can be ascertained by measuring the actual intake and output in twenty-four hours. Schlayer's Nephritic Test Day as modified by Mosenthal is also used to determine sodium chloride, nitrogen and water.

DIRECTIONS FOR SCHLAYER'S NEPHRITIC TEST DAY[1]

(MOSENTHAL)

Needed in the Ward:

7 wide-necked bottles, each labeled.
1 bottle to hold 1000 c.c. for night specimen.
6 bottles to hold 500 c.c. each, for two-hour specimens during day.
Salt in capsules; each capsule to contain 2.3 grams sodium chloride.

Preceding day's diet should be soft salt-poor with fluids limited to 1500c.c.

Test Day.

1. All food is to be *salt-free,* from the diet kitchen.
2. Salt for each meal will be furnished in weighed amounts, one capsule containing 2.3 grams sodium chloride with each meal.
3. *All food or fluid not taken must be weighed or measured after meals and charted.*
4. *Allow no food or fluid of any kind except at meal times as directed.*
5. Note any mishap or irregularities that occur in giving the diet or in collection of specimens.

Meals to be given at the following hours:

Breakfast, 7:45 A. M.
Dinner, 1:45 A. M.
Supper, 4:45 P. M.

No fluids between meals or during the night.

Collection of urine during the day every two hours, and from 7:45 P. M. to 7:45 A. M.

[1] Dr. Herbert S. Carter, "Presbyterian Diet Lists," New York City.

Empty bladder at the following times:

No. of specimen............... 7:45 A. M. discard.
1. .... 9:45 A. M. save in separate bottle
2. ....11:45 A. M. save in separate bottle
3. .... 1:45 P. M. save in separate bottle
4. .... 3:45 P. M. save in separate bottle
5. .... 5:45 P. M. save in separate bottle
6. .... 7:45 P. M. save in separate bottle
7. .... 7:45 P. M. to 7:45 A. M.

Label each bottle with period of collection, number of specimen and name of patient and send to laboratory.

Schedule of Feeding:

Breakfast:
7:45 A. M........(Chart food or fluid not taken.) Boiled oatmeal, 100 grams (3⅓ oz.); sugar, one-half teaspoonful; milk, 30 c.c. (1 oz.); two slices of bread, 30 grams each, (1 oz.); butter, 20 grams (⅔ oz.); coffee, 160 c.c. (5⅓ oz.); milk, 40 c.c. (1⅓ oz.); sugar one teaspoonful; milk, 200 c.c. (6⅔ oz.); water, 200 c.c. (6⅔ oz.).

Dinner:
11:45 A. M.......Meat soup, 180 c.c. (6 oz.); beefsteak, 100 grams (3⅓ oz.); potatoes, baked, mashed or boiled, 130 grams (4⅓ oz.); green vegetables as desired; two slices bread, 30 grams each, (1 oz.); butter, 20 grams (⅔ oz.); tea, 180 c.c. (6 oz.); milk, 20 c.c. (⅔ oz.); sugar, one teaspoonful; water, 250 c.c. (8⅓ oz.); tapioca or rice pudding, 110 grams (3⅔ oz.).

Supper:
4:45 P. M........Two eggs (cooked in any style); two slices of bread, 30 grams each, (1 oz.); butter, 20 grams (⅔ oz.); tea, 180 c.c. (6 oz.); milk, 20 c.c. (⅔ oz.); sugar, one teaspoonful; fruit, stewed or fresh, one portion.

One capsule of salt with each meal, 3 x 2.3 grams.

QUESTIONS FOR STUDY

NEPHRITIS

1. What metabolic disturbances are usual in cases of nephritis?
2. How may this trouble be treated by diet?
3. What is the usual treatment in acute cases?
4. What type of diet is recommended in albuminuria?
5. Outline the dietetic treatment of chronic nephritis.
6. Advise diets for nitrogen retention; for water and salt retenion.
7. What selection of food should there be for kidney stones? Speak of the various types.

8. Can high blood pressure be treated effectively by diet? If so, how?
9. What is meant by a salt-poor diet? Why is it given?
10. Why are proteins restricted in nephritic diets?
11. Why is boiling of meats recommended instead of broiling or roasting?
12. In arranging meals for such cases, what must be the aim of the nurse?

CHAPTER XXIII

DIET IN DISEASES OF THE NERVOUS SYSTEM[1]

Dietetic Treatment.—Many types of nervous disorders respond very gratifying to dietetic treatment. The organic nervous diseases such as neuritis and epilepsy are often helped by a low protein diet while functional disorders like neurasthenia respond to a rest cure with diet made up largely of milk.

Neuritis

Neuritis may be associated with alcoholism, gouty condition or malnutrition, each condition calling for special treatment. In the first, of course, the use of alcohol should be stopped, in the gouty condition a purin-free diet, such as is recommended for gout,[2] should be used. When neuritis accompanies an under-nourished condition a well-balanced diet that will cover the patient's nutritive requirement should be arranged and in all these cases careful regulation of the intestinal function is of utmost importance.

Neurasthenia

The causes of this trouble are varied. "The great essentials to the treatment of these cases are rest, diet, diversion and required exercise."[3]

The treatment calls for a very nourishing diet. The Keating Diet is used with success in mild cases. It is given as follows:

[1] Arranged under the supervision of Dr. B. Franklin Stahl, Clinical Professor of Medicine, Women's Medical College of Pennsylvania. Visiting Physician to the St. Agnes and the Philadelphia General Hospital, Philadelphia, Pa.
[2] See page 398.
[3] Carter, Howe and Mason, "Nutrition and Clinical Dietetics," Lea & Febiger, Philadelphia, Pa.

The Keating Treatment

6 A. M.	240 c.c. (8 oz.) strong beef tea, hot.
8 A. M.	Half glass of iron water. *Breakfast* of fruit, steak, coffee 240 c.c. (8 oz.). Milk with extract of malt, citrate of iron and 6 grains quinine.
10 A. M.	Electricity.
12 Noon	Milk, 240 c.c. (8 oz.) with malt.
2 P. M.	*Dinner* with half glass of iron water followed by a glass of milk with malt.
6 P. M.	Third dose of iron water with light *Supper* of fruits, bread and butter and cream. Glass of milk and malt.
10 P. M.	Beef soup, 120 c.c. (4 oz.) preceded by massage with cocoa oil for one hour.

KEATING DIET, NO. I

For 1778 Calories a Day: Approximate values—protein, 144.2 gm.; fat, 96.9 gm.; carbohydrate, 133.8 gm.

SCHEDULE OF FEEDING	MEASURE	OZ.	GM.	CAL.
6 A. M.:				
Strong Beef Tea.........	1 cup	6.4	150.0	....
Breakfast: 8 A. M.				
Stewed Peaches	1 peach med.	5.0	128.0	60.0
Pan broiled steak........	med. serving	2.0	75.0	140.0
Coffee	1½ cup; 240 c.c.	8.0	226.0	....
Milk	⅞ cup milk; 1 tbsp. extract of malt	11.4	325.0	221.0
Iron water	½ glass	...	....	....
Electricity: 10 A. M.				
Noon:				
Milk with extract of malt	⅞ cup milk; 1 tbsp. extract of malt	11.4	325.0	221.0
Dinner: 2 P. M.				
Clear Soup (Broth).....	1 cup	...	150.0	....
Roast Beef	av. serving	6.0	100.0	156.0
Swiss chard	av. serving	4.0	100.0	20.0
Asparagus	av. serving	4.0	100.0	20.0
Salad { Lettuce; Grapefruit	av. serving	2.6	75.0	13.0
Coffee jelly sweetened with saccharin	gel. 4 gm.; coffee liquid 2 tbsp.	...	3.3	13.0
Coffee	1½ cup; 240 c.c.	8.0	226.0	....
Milk with extract of malt	⅞ cup milk; 1 tbsp. extract of malt	11.4	325.0	221.0
Iron water	½ glass	...	....	....
Supper: 6 P. M.				
Orange and grapes[1]......	med. serving; 1 orange; 8 grapes	2.0	50.0	53.0

[1] Sweeten with saccharin.

KEATING DIET, NO. I—CONTINUED

SCHEDULE OF FEEDING	MEASURE	OZ.	GM.	CAL.
Bread	1 slice 3" x 3½" x ½"	.7	20.0	50.0
Butter	2 sq. 1½" x 1½" x ¼"	.7	20.0	153.0
Cream (40%)	5 tbsp.	2.0	50.0	192.0
Tea (weak)	1 cup	...	....	....
Milk with extract of malt	⅞ cup milk 1 tbsp. extract of malt	11.4	325.0	221.0
Iron water	½ glass	...	....	....
10 P. M.:				
Beef Soup	¾ cup 120 c.c.	4.0	113.0	24.0
				1778.0

KEATING DIET, NO. II

For 2017 Calories a Day: Approximate values—protein, 144.9 gm.; fat, 113.3 gm.; carbohydrate, 142.9 gm.

SCHEDULE OF FEEDING	MEASURE	OZ.	GM.	CAL.
6 A. M.:				
Strong Beef Tea.........	1 cup	6.0	150.0	....
Breakfast: 8 A. M.				
Orange E. P.[1]...........	1 med.	2.0	60.0	28.0
Broiled Steak	med. serving	2.0	75.0	140.0
Coffee	1½ cup 240 c.c.	8.0	226.0	....
Milk { Extract of malt... Citrate of iron.... 6 gr. quinine......	⅞ cup milk 1 tbsp. extract of malt	11.4	325.0	221.0
Iron Water	½ glass	...	....	....
Electricity: 10 A. M.				
Noon:				
Milk with extract of malt	⅞ cup milk 1 tbsp. extract of malt	11.4	325.0	221.0

[1] Edible portion.

KEATING DIET, NO. II—CONTINUED

SCHEDULE OF FEEDING	MEASURE	OZ.	GM.	CAL.
Dinner: 2 P. M.				
Broth	1 cup	6.0	150.0	....
Roast Chicken	av. serving	5.0	150.0	246.0
Peas	¼ cup	3.0	85.0	72.0
Beets	2 med. beets	2.0	60.0	20.0
Salad { Lettuce	med. serving	2.0	50.0	12.0
Salad { Cottage Cheese ..	2 small balls	2.0	40.0	43.0
Bavarian Cream[1] Chocolate and nuts....	gel., 1 tsp.	.1	4.0	13.0
	cocoa, 1 tsp.	.1	2.0	47.0
	cream, 1 tbsp.	.4	10.0	39.0
	nuts, 5 pecans	.1	7.0	53.0
Milk with extract of malt	⅞ cup milk 1 tbsp. extract of malt	11.4	325.0	221.0
Coffee	1½ cup 240 c.c.	8.0	226.0	....
Iron water	½ glass	...	....	....
Supper: 6 P. M.				
Baked Apple and Cream[2].	1 med.	2.0	70.0	60.0
Cream (40%)	5 tbsp. (for tea and apple)	3.0	50.0	192.0
Bread	1 slice 3" x 3½" x ½"	.7	20.0	50.0
Butter	2 sq. 1½" x 1½" x ¼"	.7	20.0	153.0
Tea (weak)	1 cup	...	....	....
Milk with extract of malt	⅞ cup milk 1 tbsp. extract of malt	11.4	325.0	221.0
Iron water	½ glass	...	....	....
10 P. M.:				
Beef Soup	¾ cup 120 c.c.	4.0	113.0	24.0
				2037.0

[1]Sweeten with saccharin.

KEATING DIET, NO. III

For 2280 Calories a Day: Approximate values—protein, **117.1** gm.; fat, 142.4 gm.; carbohydrates, 124.8 gm.

SCHEDULE OF FEEDING	MEASURE	OZ.	GM.	CAL.
6 A. M.:				
Strong Beef Tea.........	1 cup	6.0	150.0	....
Breakfast: 8 A. M.				
Grapefruit E. P.[1]	½ med.	4.0	100.0	20.0
Hamburger Steak	2 balls	4.0	113.0	496.0
Coffee	1½ cup 240 c.c.	8.0	226.0	....
Milk: Extract of malt... Citrate of iron.... 6 grains of quinine	⅞ cup milk 1 tbsp. extract of malt	11.4	325.0	221.0
Iron water	½ glass	...	....	....
Electricity: 10 A. M.				
Noon:				
Milk with extract of malt	⅞ cup milk 1 tbsp. extract of malt	11.4	325.0	221.0
Dinner: 2 P. M.				
Broth	1 cup	6.0	150.0	....
Roast Lamb..............	av. serving	4.0	100.0	197.0
Spinach	av. serving	4.0	100.0	20.0
Asparagus	av. serving	4.0	100.0	20.0
Salad: Lettuce	av. serving	2.0	50.0	12.0
Salad: Celery	av. serving	2.0	50.0	12.0
Cream Custard[2]..........	1 egg	...	....	156.0
	10 gm. cream	...	....	....
Coffee	1½ cup	8.0	226.0	....
	240 c.c.	...	....	....
Milk with extract of malt	⅞ cup milk 1 tbsp. extract of malt	11.4	325.0	221.0
Iron water	½ glass	...	....	....
Supper: 6 P. M.				
Stewed prunes and cream[2]	6 prunes and 2 tbsp. juice	2.0	50.0	44.0
Cream (40%)[2]	2 tbsp. whip 2 tbsp. for tea	...	50.0	192.0

[1] Edible portion.
[2] Sweeten with saccharin.

KEATING DIET, NO. III—CONTINUED

SCHEDULE OF FEEDING	MEASURE	OZ.	GM.	CAL.
Bread	1 slice 3" x 3½" x ½"	.7	20.0	50.0
Tea (weak)	1 cup	...	....	....
Butter	2 sq. 1½" x 1½" x ¼"	.7	20.0	153.0
Milk with extract of malt	⅞ cup milk 1 tbsp. extract of malt	11.4	325.0	221.0
10 P. M.:				
Beef Soup	120 c.c.	.4	113.0	24.0
				2280.0

The Weir-Mitchell Treatment

The Weir-Mitchell Diet is recommended for more severe cases. This consists of absolute seclusion of the patient, preferably away from home, with a nurse entirely unknown to the patient, chosen by the physician for her qualities with special reference to the individual case. The nurse should be changed if she is a misfit with the patient. The patient is kept in bed during the treatment, which is from four to eight or more weeks. Massage and electricity are given daily in hour or hour and a half periods and feedings which are based on the following routine:

Milk is the food of first importance with Mitchell, for he finds that on an exclusive milk diet for a few days the patients lose their various digestive symptoms. When neurasthenia is combined with obesity the Karell cure[1] for a fortnight or less is the best method of procedure, particularly in cases of extreme fatness accompanied by anemia. Skimmed milk given every two hours with or without lime water is especially recommended as being most favorable to dyspeptics. The milk should be sipped slowly and if disagreeable or nauseating may be flavored with tea, coffee,

[1] See Karell Cure, page 515.

caramel or salt. If the milk causes acidity the use of alkalies is indicated. At first 4 ounces are given every two hours and as the amount is increased the periods may be lengthened to three hours with a total of three quarts of milk daily.

For the first few days the patients lose weight but after that remain stationary or even gain. Patients on this diet are usually sleepy after a few days. Constipation and coated tongue are usual and must be dealt with. Mitchell says that on a skimmed milk diet uric acid disappears almost entirely from the urine but reappears as soon as a mixed diet is begun. The addition of various farinaceous and milk preparations to the milk diet such as malted milk and Nestlé's Food are often useful. Ordinarily after 4 to 7 days a light breakfast is allowed, in another couple of days a chop is given as a midday dinner and again, in a day or two, bread and butter three times a day. After ten days it is usually possible to allow three full meals, together with three or four pints of milk given at or after meals instead of water. After ten days Mitchell also orders 2 to 4 oz. of a good fluid extract of malt before each meal. The foods actually used are selected largely according to the patient's wishes but butter in considerable amounts is urged and a cup of coffee or cocoa is allowed the first thing in the morning.

At the end of the first week a raw meat soup is added, made as follows:

One pound of rare beef chopped fine and put in a bottle with 1 pint of water and five drops of strong hydrochloric acid. This is allowed to stand over night on ice and in the morning the bottle is placed in water at 110° F. and kept for two hours at this temperature. It is then strained through a cloth under pressure and the resulting fluid given in divided doses three times during the day. A little more pleasant taste is obtained by first roasting the meat slightly on one side. When the patients are on full feedings, iron is given, also cod liver oil, either by mouth or rectum, in case there has been much loss of flesh. Under this regimen the increase of weight and well being is often extraordinary, but much depends upon the physician's attention to details and his ability to carry the patient along psychologically. In other words, the same treatment will succeed in the hands of one man and not of another. One criticism that has been offered is that while the patients do gain they lose the additional fat very shortly after they are allowed up. This is not the case if the massage has been kept up vigorously and steadily, for this in conjunction with the electricity prevents the patients from getting "soft," the added weight being firm and sound.

WEIR-MITCHELL DIET

7:00 A. M.	Cocoa. Cold sponge with rough rub.
8:00 A. M.	*Breakfast* with milk. Rest an hour afterward.
10:00 A. M.	Milk, 240 c.c. (8 oz.) peptonized. Massage.
12:00 Noon.	Milk as soup. Reading aloud by nurse.
1:30 P. M.	*Dinner*. Rest one hour afterward.
3:30 P. M.	Peptonized milk, 240 c.c. (8 oz.).
4:00 P. M.	Electricity.
6:00 P. M.	*Supper* with milk.
8:00 P. M.	Reading aloud by nurse for half an hour.
9:00 P. M.	Light rub by nurse with drip sheet.
10:00 P. M.	Peptonized milk, 240 c.c. (8 oz.) with biscuit.

During the night a glass of milk is needed.
With dinner and supper give malt extract 240 c.c. (8 oz.).
After each meal some tonic mixture with iron if anemia is present.

WEIR-MITCHELL DIET, NO. I

For 1943.3 Calories a Day: Approximate values—protein, 93.2 gm.; fat, 116.4 gm.; carbohydrate, 165.5 gm.

SCHEDULE OF FEEDING		MEASURE	OZ.	GM.	CAL.
7 A. M.	Cocoa	1 tsp. cocoa, 1 cup milk	6.0	150.0	114.1
Breakfast:					
8 A. M.	Grapefruit	med. serving	4.0	100.0	20.0
	Poached Egg	1	2.0	56.0	79.5
	Toast	1 slice	.7	19.8	32.1
	Butter	1 tbsp.	.5	14.0	107.1
	Milk (hot) flavored with coffee	1 cup	6.0	150.0	92.0
10 A. M.	Peptonized Milk	1 cup	6.0	150.0	92.0
Noon	Milk as Soup	1 cup	6.0	150.0	92.0
Dinner:					
2 P. M.	Broth	1 cup	6.0	150.0	....
	Broiled Chicken	med. serving	5.0	130.0	147.1
	Asparagus	med. serving	4.0	100.0	20.0
	Peas	¼ cup	3.0	85.0	72.0
	Egg white colored pink beaten and flavored with strawberry[1]	med. serving	.7	20.0	10.4
	Milk with extract of malt	1½ cup	17.1	492.0	331.5
3:30 P. M.	Peptonized Milk	1 cup	6.0	150.0	92.0
Electricity 4 P. M.					
Supper:					
6 P. M.	Baked Apple[1]	1 med.	2.0	70.0	60.0
	Cream	2½ tbsp.	1.5	25.0	96.0
	Salad { Lettuce, 30 gm.	small serving	1.0	38.0	4.8
	Salad { Beets, 30 gm.	1 beet	1.0	30.0	10.0
	Bread	1 slice	.7	19.8	32.1
	Butter	1 tbsp.	.5	14.0	107.1
	Milk with extract of malt	1½ cup	17.1	492.0	331.5
Reading 8 P. M.					
Rub 9 P. M.					
10 P. M.	Biscuit	1	.7	20.0	49.0
	Peptonized Milk	1 cup	6.0	150.0	92.0
					1943.3

[1] Sweeten with saccharin.

WEIR-MITCHELL DIET, NO. II

For 2026.8 Calories a Day: Approximate values—protein, 107.3 gm.; fat, 101.8 gm.; carbohydrate, 166.9 gm.

SCHEDULE OF FEEDING		MEASURE	OZ.	GM.	CAL.
7:00 A. M.	Cocoa	1 tsp. cocoa 1 cup milk	6.0	150.0	114.1
Breakfast:					
8:00 A. M.	Prunes	med. serving	2.0	50.0	44.0
	Bacon (cooked) ..	3 pieces	.5	15.0	93.0
	Eggwhite Omelette.	4 tbsp.	0.7	20.0	10.4
	Bread	1 slice	.7	19.8	32.1
	Milk (hot)	1 cup	6.0	150.0	92.0
10:00 A. M.	Peptonized Milk ...	1 cup	6.0	150.0	92.0
Noon	Milk as soup	1 cup	6.0	150.0	92.0
Dinner:					
2:00 P. M.	Broth	1 cup	6.0	150.0	....
	Baked Halibut	med. serving	4.0	100.0	121.0
	Cauliflower	med. serving	4.0	100.0	32.0
	Lettuce	1 leaf	.5	20.0	4.0
	Tomato Aspic	2 tbsp. agar 2 gm.			
	[1]Gel., 4 gm. ..... Tomato, 46 gm..	med. serving	2.0	50.0	58.4
	Milk with extract of malt	1½ cup	17.1	492.0	331.5
	Butter	1 tbsp.	.5	14.0	107.1
3:30 P. M.	Peptonized Milk ...	1 cup	6.0	150.0	92.0
Electricity 4:00 P. M.					
Supper:					
6:00 P. M.	Baked Egg	1 egg	2.0	56.6	79.5
	Spinach	med. serving	4.0	100.0	20.0
	Bread	1 slice	.7	19.8	32.1
	Butter	1 tbsp.	.5	20.0	107.1
	Milk with extract of malt	1½ cup	17.1	492.0	331.5
Reading 8:00 P. M.					
Rub 9:00 P. M.					
10:00 P. M.	Peptonized Milk ...	1 cup	6.0	150.0	92.0
	Biscuit	1	.7	20.0	49.0
					2026.8

[1]Sweeten with saccharin.

WEIR-MITCHELL DIET, NO. III

For 2054 Calories a Day: Approximate values—protein, 98.1 gm.; fat, 126.1 gm.; carbohydrate, 146.0 gm.

SCHEDULE OF FEEDING		MEASURE	OZ.	GM.	CAL.
7 A. M.	Cocoa	1 tsp. cocoa 1 cup milk	6.0	150.0	114.1
Breakfast:	Orange E. P.	1 med.	2.0	60.0	28.1
8 A. M.	Omelette	1 egg egg white, 19 gm.	3.0	60.0	89.9
	Milk (hot)	1 cup	6.0	150.0	92.0
10 A. M.	Peptonized Milk	1 cup	6.0	150.0	92.0
Noon:	Milk as Soup	1 cup	6.0	150.0	92.0
Dinner: 2 P. M.	Broth	1 cup	6.0	150.0	....
	Lamb Chop Broil	1 med. chop	3.0	85.0	275.0
	Spinach	med. serving	4.0	100.0	20.0
	Butter	1 tbsp.	.5	14.0	107.1
	Egg Custard[1]	1 egg	2.0	56.0	79.5
	Milk with extract of malt	1½ cup	17.1	492.0	331.5
3:30 P. M.	Peptonized Milk	1 cup	6.0	150.0	92.0
Electricity 4 P. M.					
Supper: 6 P. M.	Stewed Celery	med. serving	4.0	100.0	16.0
	Bread	1 slice	.7	19.8	32.1
	Butter	1 tbsp.	.5	14.0	107.1
	Salad { Lettuce, 30 gm.. Grapefruit, 45 gm.	med. serving	2.6	7.5	13.0
	Milk with extract of malt	1½ cup	17.1	492.0	331.5
Reading 8 P. M.					
Rub 9 P. M.					
10 P. M.	Peptonized Milk	1 cup	.6	150.0	92.0
	Biscuit	1	.7	20.0	49.0
					2053.9

[1] Sweeten with saccharin.

Epilepsy

Most authorities agree that a restriction of meat proteins is of importance in the diet of epileptic patients. This tends to reduce intestinal putrefaction. Some advise a salt-poor diet. Concklin of Battle Creek, Michigan, has tried a starvation treatment with some success. The patient is put to bed and kept without food for 10 to 14 days, water only being allowed. After this period there is a very gradual working back to a normal diet.

Insomnia

Make the entire day's dietary of the simplest food. Avoid anything that would be likely to cause indigestion. Let the midday meal be the heaviest. It often induces sleep to sip a glass of hot milk at bed-time. Malted milk may be used if preferred. If one is in the habit of waking in the night and lying awake have a glass of milk or cocoa, crackers or a sandwich convenient. If this is taken immediately on waking sleep will often come almost at once.

QUESTIONS FOR STUDY

NERVOUS DISORDERS

1. Can neuritis be benefited by diet? How?
2. What are the essentials in treatment of neurasthenia?
3. What diet systems are used? Describe each.
4. How may epilepsy be benefited by dietetic treatment? Insomnia?

CHAPTER XXIV

DIET IN DISEASES OF THE SKIN[1]

The Influence of Diet in Skin Affections.[2]—There is no doubt whatever that the majority of cutaneous disorders are greatly influenced by diet and depend upon the state of the alimentary canal for their development and maintenance. It must be borne in mind that we can only lay down certain general principles in this connection since different people differ so extraordinarily in their susceptibilities. One individual cannot take eggs in any shape or form without feeling ill, another develops a rash after eating strawberries, a third suffers from severe cutaneous irritation after drinking coffee.

Apart from these instances of idiosyncrasy, which are comparatively rare, it is well known that certain articles of food aggravate most acute diseases of the skin. Too much salt is bad in eczema and an excess of sugar is likewise harmful. Similarly, highly seasoned dishes, spices and sauces must be avoided.

We might classify articles of food into three main groups:

1. Those that may produce skin-rashes in sensitive individuals with apparently healthy skin, such as crab, lobster, mussels, eels, pork, strawberries, rhubarb, honey, alcoholic liquors, mushrooms, cucumbers, parsley, oatmeal and pickles. All these are forbidden in all skin diseases except those due to parasites, in which the patient is perfectly well in other ways.
2. Those which it is safer to avoid when in doubt as to

[1] Arranged under the supervision of Dr. B. Franklin Stahl, Clinical Professor of Medicine, Women's Medical College of Pennsylvania. Visiting Physician to the St. Agnes and Philadelphia General Hospital, Philadelphia, Pa.

[2] G. Norman Meachen, M.D. "Skin Diseases: Their Nursing and General Management," London, The Scientic Press, Limited.

what to give in a skin case, such as salt meat, pastry, sweet puddings, coffee and cocoa.

3. Those which must not be given to a skin patient because of some associated constitutional disorder which is keeping up the skin trouble. Thus, gouty cases must not have much meat, cheese or any highly seasoned dish; dyspeptic patients must not take strong tea, excess of potatoes, farinaceous food or anything that is likely to set up gastric fermentation; diabetics are forbidden sugar, much milk and all sweetened dishes and wines. Saccharin, however, may be used instead of sugar for sweetening purposes.

Except in the case of diabetics, in which a strict diet is one of the essential points in treatment, a rigid adherence to a prescribed diet-table is not always absolutely necessary. Indeed, the deprivation of an accustomed article of food may do as much harm as its continuance in nervous, fretful individuals. The risk that is run by partaking of a prohibited dish should be fully and simply stated to the patient and if he persists in gratifying his palate at the expense of his skin he alone is responsible. Only those, however, who have been subjected to great restriction in the matter of diet, especially when they are not feeling bodily ill, can understand the painful longing which is experienced sooner or later for "one bite" of a forbidden fruit which it is felt could not do any possible harm. The gratification of such a wish expressed by a skin patient should not be instantly refused by the nurse without a word of explanation and a silent resolve to ask the doctor about it at his next visit.

The General Condition and Habits of Life[1] of the patient should always be taken into consideration in the matter of diet. An ill-nourished child with scrofulous tendencies requires plenty of milk, eggs and butter, whereas a plethoric individual who leads a "fast" life will do better on a simple diet which does not contain any foodstuff to excess.

[1] G. Norman Meachen, M.D., "Skin Diseases: Their Nursing and General Management," London, The Scientific Press, Limited.

With regard to *Malt-Liquors and Alcoholic Stimulants* generally, it may be stated at once that, as a general rule, they are quite unnecessary in skin diseases and further, that their habitual use even in a moderate degree is frequently responsible for the appearance and continuation of a cutaneous eruption.

Eczema

This disease of the skin lends itself very favorably to dietetic treatment as its cause may often be traced to one's eating habits. It may result from too much, too little, or too rich food while certain proteins may cause reactions in individual cases, particularly in infants, resulting in skin eruption. The treatment of course must be guided by the cause.

Acute Eczema calls for a very simple diet. An exclusive milk diet is sometimes used for a time, or milk with cereals, bread and butter and green vegetables. The Bulkley rice diet is used with success. Its use is based on the theory that the acute form of eczema may be due to a retention of nitrogen waste products and this diet, very low in protein, permits the complete elimination of all these products.

BULKLEY RICE—BREAD—BUTTER AND WATER DIET[1]

The patient lives exclusively on rice. The rice should be thoroughly cooked in water, not milk. It is generally better to dry it out somewhat by leaving it uncovered on the fire for a few minutes.

The rice should be freshly prepared with abundance of butter and salt. It should be eaten slowly with a fork and perfectly masticated. The bread and butter also should be well chewed to secure the full action of the saliva.

Water, hot or cold, not iced, may be taken freely but should not be used to wash down the food.

This diet should be continued for five days, when an ordinary mixed diet may be gradually resumed.

Chronic Eczema usually results from a diet injudicious in amount or kind—too much, too little or too rich.

An adequate amount of easily digested food should be taken and such articles as spices, condiments, rich pastries and desserts, fried foods, pork and alcohol should be avoided.

[1] Bulkley, "Diet and Hygiene in Diseases of the Skin."

Eczema in nursing infants is not uncommon. It usually results from too much food or a reaction against the fat or protein of the milk. Less food for the over-nourished may bring about a cure. A careful regulation of the mother's diet may also be beneficial. When there is indigestion from fat or protein, artificial feeding, for a time at least, may be necessary, as in that way one or the other or both may be restricted.

Skin Tests.—Eczema may be due to certain proteins to which the individual is especially susceptible. Tests are made to observe the skin reaction in different proteins and the offending ones or those giving positive skin reactions are eliminated from the diet.

Acne Rosacea.—Characterized by an abnormal flushing of the face and is very often associated with excessive acidity of the stomach. It is frequently seen also in those who make liberal use of alcohol. Intestinal putrefaction may be a contributing cause of the disorder. The diet should exclude alcohol, hot drinks and soups and all the rich foods listed as those to be avoided. As in cases of eczema, plenty of fresh air, exercise and water drinking is recommended.

Acne Vulgaris while differing in its cause, calls for practically the same dietetic treatment for from four to six weeks, from 2 to 3 quarts of milk being given in a day. It may be diluted with soda water, White Rock or Vichy.

Psoriasis

Type of Diet.—Low protein diet.

Dietetic Treatment.—This disease is marked by nitrogen retention and patients benefit by restriction of protein. A diet containing not more than 45 or 50 grams is recommended. The following diets have been used to advantage:

LOW PROTEIN DIET IN PSORIASIS NO. I

For 1929 Calories a Day: Approximate values—Total nitrogen in food, 8.83 gm. = 55 gm. protein; fat, 77.9 gm.; carbohydrate, 252 gm.

SCHEDULE OF FEEDING	MEASURE	GRAMS	PROTEIN	FAT	CARBO-HYDRATE
Breakfast:					
Watermelon		100	1.0		7.0
Oatmeal	½ cup	100	2.8	.5	11.5
Egg	1	...	7.5	5.5	...
Bread (toasted)	2 thin slices	30	3.0	.3	16.5
Butter	1 tbsp.	16	...	13.3	...
Cream (average)	2½ tbsp.	50	1.5	10.0	2.5
Sugar	2⅔ tsp.	40	...	...	40.0
Coffee		...	...	...	...
Luncheon:					
Baked Salmon	1 serving	55	10.0	7.1	...
White Potato	1 very large	150	3.0	...	27.0
Spinach	½ cup	100	2.0	...	3.0
Celery hearts	1 heart	50	.5	...	1.5
Bread	1 thin slice	15	1.5	.2	8.2
Butter	scant ½ tbsp.	16	...	13.6	...
Sugar	2 tsp.	30	...	...	30.0
Prune Soufflé		...	...	...	...
½ cup prunes	⅗ cup	85	3.3	.6	18.9
1 egg white		...	...	...	...
Cream	1½ tbsp.	30	.9	6.0	1.5
Coffee or tea		...	...	...	...
Dinner:					
Roast Veal..............	1 serving	49	10.3	1.9	...
Beets (cooked)	⅔ cup sliced	100	2.0	...	7.0
String Beans	¾ cup	100	2.0	...	7.0
Lettuce	4 leaves	50	.5	...	1.5
Vinegar		...	...	...	...
Bread	1 thin slice	15	1.5	.2	8.2
Butter	⅔ tbsp.	10	...	8.5	...
Sugar	2 tsp.	30	...	...	30.0
Apple Tapioca	3 tbsp.	100	.2	.2	28.2
Cream	2½ tbsp.	50	1.5	10.0	2.5
Coffee or tea		...	...	...	...
			55.0	77.9	252.0

LOW PROTEIN DIET IN PSORIASIS NO. II

For 2057 Calories a Day: Approximate values—Total nitrogen in food, 7.31 gm. = 45 gm. protein; fat, 93.8 gm.; carbohydrate, 254 gm.

SCHEDULE OF FEEDING	MEASURE	GRAMS	PROTEIN	FAT	CARBO-HYDRATE
Breakfast:					
Farina	6⅔ tbsp.	100	1.6	...	11.5
Halibut	very small serving	50	9.0	1.5	...
Orange (edible portion) ..	2 oranges	200	2.0	...	20.0
Bread	1 thin slice	15	1.5	.2	8.2
Butter	1⅓ tbsp.	20	...	17.0	...
Sugar	2½ tsp.	38	...	...	38.0
Cream	1½ tbsp.	30	.9	6.0	1.5
Coffee					
Luncheon:					
Salad { Hard-cooked egg	1	...	7.5	5.5	...
Salad { Lettuce	2 or 3 leaves	30	.3	...	.9
Salad { Fresh tomato	1 small	100	1.0	...	4.0
Oil	⅓ tbsp.	5	...	5.0	...
Asparagus	4 stalks	100	2.0	...	3.0
Butter	1½ tbsp.	22	...	18.4	...
Dessert { Grapefruit	4 sections	100	...	...	5.0
Dessert { Orange.........	½ orange	50	.5	...	5.0
Dessert { Grapes.........		50	.5	.6	9.5
Dessert { Sugar..........	2 tsp.	30	...	...	30.0
Cream	1½ tbsp.	30	.9	6.0	1.5
Bread	1 thin slice	15	1.5	.2	8.2
Sugar	1⅓ tsp.	20	...	...	20.0
Coffee or tea					
Dinner:					
Lamb chop (broiled with bone)	1 small	52	9.4	14.5	...
Baked white potato	1 very large	150	3.0	...	27.0
Stewed celery	⅔ cup	100	1.0	...	3.0
Bread	1 thin slice	15	1.5	.2	8.2
Butter	1 tbsp.	15	...	12.7	...
Stewed strawberries	⅜ cup	100	...	...	24.0
Sugar	2 tsp.	30	...	...	30.0
Cream	1½ tbsp.	30	.9	6.0	1.5
Coffee or tea					
			45.0	93.8	254.0

LOW PROTEIN DIET IN PSORIASIS NO. III

For 2065 Calories a Day: Approximate values—Total nitrogen in food, 7.63 gm. = 47 gm. protein; fat, 91.4 gm.; carbohydrate, 265 gm.

SCHEDULE OF FEEDING	MEASURE	GRAMS	PROTEIN	FAT	CARBO-HYDRATE
Breakfast:					
Grapefruit		200	...	...	10.0
Egg	1	...	7.5	5.5	...
Bread (toasted)	1 thin slice	15	1.5	.2	8.2
Butter	1⅔ tbsp.	25	...	21.2	...
Sugar	2 tsp.	·30	...	...	30.0
Cream	3½ tbsp.	50	1.5	10.0	2.5
Coffee		...	...	...	...
Luncheon:					
Flounder	small serving	65	9.1	.7	...
Cauliflower	large serving	100	2.0	...	6.0
{ Lettuce	2 leaves	30	.3	...	.9
{ Tomato	1 small	150	1.5	...	6.0
Vinegar		...	...	...	...
Oil	⅓ tbsp.	5	...	5.0	...
Bread	1 thin slice	15	1.5	.2	8.2
Butter	1⅔ tbsp.	25	...	21.2	...
Sugar	⅔ tsp.	10	...	...	10 0
Cream	1 tbsp.	20	.6	4.0	1.0
Orange Ice	⅝ cup	100	.9	...	74.6
Coffee or tea		...	...	...	...
Dinner:					
Broiled Chicken	1 serving	102	13.3	1.0	...
Baked Sweet Potato	1 small	129	2.5	1.2	35.3
Lettuce	1 large leaf	20	.2	...	.6
Cucumber	few slices	50	.5	...	1.5
Vinegar		...	...	...	...
Bread	1 thin slice	15	1.5	.2	8.2
Butter	1⅓ tbsp.	20	...	17.0	...
Baked Apple	1½ apple	200	2.0	...	40.0
Cream	2 tbsp.	20	.6	4.0	1.0
Sugar	1⅓ tsp.	20	...	...	20.0
Coffee or tea		...	...	...	...
			47.0	91.4	264.0

Urticaria

Dietetic Treatment.—Many attacks of urticaria, hives and nettlerash may be traced to certain articles of diet. Shellfish, particularly if not fresh, may be the cause. Strawberries with some individuals produce a rash of this type. Obviously if the offending article be discovered it should be eliminated from the diet. One of the essentials of the treatment is to keep the bowels clear. It may be best to use a milk diet, diluted if necessary with lime water or Vichy, until the urticaria has disappeared.

Furunculosis—Boils

Dietetic Treatment.—A full nourishing diet of simple, well-prepared food. As in other skin affections avoid the use of all rich foods. The trouble may result from special food which disagrees with the individual, it may be due to a general undernourished condition, or it may be caused by an infecting organism from without.

Food Combinations and Menus

DIET IN SKIN DISEASES[1]

(LOW PROTEIN DIET)

FIRST DAY

Breakfast: 4 ounces rice, 3 ounces corn bread, 1¼ ounces butter, ½ ounce sugar, hot water.
Dinner: 5 ounces vegetable soup, 3 ounces baked potatoes, 3 ounces stewed celery, 1 ounce graham bread, 1¼ ounces butter, 1 fresh apple.
Supper: 4 ounces rolled oats, 2 ounces white bread, 1¼ ounces butter, 4 ounces stewed prunes, ¼ ounce sugar, very weak tea.

SECOND DAY

Breakfast: Orange, 4 ounces hominy, 2 ounces graham toast, 1¼ ounces butter, ½ ounce sugar, Postum.
Dinner: 5 ounces pea soup, 3 ounces macaroni, 3 ounces string beans, 3 ounces carrot, 2 ounces bread, 1¼ ounces butter.
Supper: 4 ounces cream of wheat, 2 ounces graham toast, 1¼ ounces baked apple, 2 ounces crackers, 1¼ ounces butter, ¼ ounce sugar, very weak tea.

[1]Diet used at the New York Skin and Cancer Hospital, New York, 1922.

THIRD DAY

Breakfast: Banana, 4 ounces Pettijohn, 2 ounces white bread, 1¼ ounces butter, ½ ounce sugar, hot water.
Dinner: 5 ounces corn soup, 3 ounces baked potato, 3 ounces spinach, 3 ounces boiled onion, 2 ounces bread, 1¼ ounces butter, raisins.
Supper: 4 ounces farina, 4 ounces stewed figs, 2 ounces graham cracker, 1½ ounces butter, ¼ ounce sugar, very weak tea.

FOURTH DAY

Breakfast: Raw apple, 4 ounces cornmeal mush, 2 ounces graham bread, 1¼ ounces butter, ½ ounce sugar, Postum.
Dinner: 5 ounces vegetable soup, 4 ounces baked beans, 3 ounces cauliflower, 3 ounces asparagus, 2 ounces bread, ¼ ounce butter, orange.
Supper: 4 ounces rice, 4 ounces stewed prunes, 2 ounces graham cracker, 1¼ ounces butter, ¼ ounce sugar, very weak tea.

FIFTH DAY

Breakfast: Orange, 4 ounces cracked wheat, 3 ounces corn muffins, 1¼ ounces butter, ½ ounce sugar, hot water.
Dinner: 5 ounces sago soup, 4 ounces spaghetti, 3 ounces lima beans, 3 ounces boiled onions, 1¼ ounces butter, dates.
Supper: 4 ounces cream of wheat, sliced orange, 2 ounces oatmeal crackers, 1¼ ounces butter, ¼ ounce sugar, very weak tea.

SIXTH DAY

Breakfast: 4 ounces samp, 2 ounces graham toast, 1¼ ounces butter, ½ ounce sugar, Postum.
Dinner: 5 ounces celery soup, 4 ounces baked potatoes, 3 ounces carrots, 3 ounces spinach, 1¼ ounces butter, 2 ounces bread.
Supper: 4 ounces wheatena, 4 ounces stewed figs, 2 ounces Uneeda Biscuit, 1¼ ounces butter, ¼ ounce sugar, very weak tea.

QUESTIONS FOR STUDY

SKIN DISEASES

1. Discuss the influence of diet upon skin diseases.
2. Should alcohol be permitted in the diet?
3. Give the general principle of the Bulkley rice diet. For what condition is it used?
4. When eczema occurs in nursing infants, what may be the cause and how should it be treated?
5. Discuss the dietetic treatment of acne, of psoriasis, urticaria and furunculosis.

CHAPTER XXV

DIET IN DISEASES OF THE BLOOD[1]

Anemia

The anemias are usually divided into two general classes, primary and secondary anemias. By secondary anemias we mean an anemia associated with or following some other disease of known origin. Chlorosis and pernicious anemia are classed as primary. In such cases there is some abnormality of the blood or the blood-forming organs, the causes for which are not well understood.

Chlorisis.—In the treatment of chlorosis rest plays an important part. In severe cases rest in bed is essential. Medicinal iron is usually given and seems to have a favorable effect on the return of the blood picture to normal.

The dietetic treatment of chlorosis should be based on the conditions present. The percentage of iron in the blood is below normal, resulting from a deficient supply of this element in food. Gastro-intestinal disturbances are common. Constipation usually accompanies chlorosis and intestinal putrefaction should be guarded against.

The diet then should contain iron-rich foods[2]—vegetables, especially spinach, chard, beans and potatoes, egg yolk, lean meat and fruits, such as oranges, apples, etc.; it should be laxative (see diets for constipation) and it should be easily digested. Clinical experience seems to show that a liberal supply of protein is desirable in the diet.

When digestion is seriously disturbed it may be necessary

[1] Arranged under the supervision of Dr. B. Franklin Stahl, Clinical Professor of Medicine, Women's Medical College of Pennsylvania. Visiting Physician to the St. Agnes and the Philadelphia General Hospital, Philadelphia, Pa.

[2] See page 26.

to put the patient on a diet consisting mainly of milk and eggs until the condition is improved.

When digestive conditions permit the diet should be normal and well-balanced with emphasis on the iron content and the laxative elements.

Pernicious Anemia.—Very little can be said concerning the diet in pernicious anemia as our knowledge of the underlying causes of the condition is too limited. There is often a decrease in the secretion of acid in the stomach and hydrochloric acid and pepsin are sometimes supplied medicinally.

The diet should be such as will keep the nutrition of the patient at the best level possible. This means a simple, nourishing diet in which the protein is kept fairly low and carbohydrates predominate. It is desirable to give iron-containing foods a prominent place in the diet but because of the deficient gastric secretion meat should be used in moderation and vegetables and fruits should supply the larger portion of the iron needed. Many authorities recommend the feeding of bone marrow.

Secondary Anemia.—The treatment of this condition aims at the removal of the underlying cause and the use as far as possible of the foods recommended for chlorosis.

Food Combinations and Menus

(DIETS RICH IN MINERAL SALTS, AS IRON AND CALCIUM[1])

SUTHERLAND'S SEMI-FLUID ANEMIA DIET (CHLOROSIS) NO. I

For 1844 Calories a Day: Approximate value—protein, 88.52 gm.; fat, 96.4 gm.; carbohydrate, 155.6 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	CALORIES
4:00 A. M.	Milk	1¼ cups	10	196
8:00 A. M.	Milk	1⅞ cups	15.	294
	Bread	1″ slice	1.38	100
11.00 A. M.	Egg Flip	1¼ cups milk 1 egg	10	266
1:00 P. M.	Milk Pudding	1⅞ cups milk ½ tbsp. flour	15 ¼	319
3:00 P. M.	Malted Milk	2 tbsp. 1¼ cups milk	10	262
5:30 P. M.	Milk Pudding	1¼ cups milk ¼ tbsp. flour	10	211
8:00 P. M.	Milk	1¼ cups	10	196
				1844

[1] For list of foods, see pages 25 and 26.

SUTHERLAND'S LIGHT ANEMIA DIET (CHLOROSIS) NO. II

For 2667 Calories a Day: Approximate value—protein, 115.29 gm.; fat, 150.94 gm.; carbohydrate, 211.9 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	CALORIES
4:00 A. M.	Milk	1¼ cups	10	196.0
8:00 A. M.	Milk (flavored with tea)	1¼ cups	10	196.0
	Bread	3 slices ½" thick	2	146.8
	Butter	½ tbsp.	¼	54.0
	White fish	1 slice 4"x2½"x1"	4	137.6
	White sauce	¼ cup	2	72.5
11:00 A. M.	Malted Milk	2 tbsp. 1¼ cups	10	262.0
1:00 P. M.	Chicken Soup	¾ cup broth	6	
	Rice		3	50.9
	Bread	2 thin slices	1	73.4
	Potatoes	½ med.	2	47.2
	Spinach	2 tbsp. cooked	1	6.8
	Milk Pudding	1¼ cups milk	10	
		flour	0.15	211.0
5:30 P. M.	Milk (flavored with tea)	1¼ cups	10	196.0
	Bread	3 slices ½" thick	2	146.8
	Butter	½ tbsp.	¼	54.0
	Egg	1	1.87	70.0
8:00 P. M.	Milk	1¼ cups	10	196.0
	Cream (daily) ...	1¼ cups	10	550.0
				2667.0

SUTHERLAND'S FULL ANEMIA DIET (CHLOROSIS) NO. III

For 3210 Calories a Day: Approximate value—protein, 160.58 gm.; fat, 154.7 gm.; carbohydrate, 293.9 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	CALORIES
4:00 A. M.	Milk	1¼ cups	10	196.0
8:00 A. M.	Milk (flavored with tea)	1¼ cups	10	196.0
	Bread	3 slices 1" thick	4	293.6
	Butter	½ tbsp.	¼	54.0
	Egg	1	1.87	70.0
11:00 A. M.	Malted Milk....	2 tbsp.		
	With milk	1¼ cups	10	262.0
1:00 P. M.	Soup	1¼ cups	10	50.8
	Meat (boiled or roasted)	...	6	255.2
	Bread	3 slices ½" thick	2	146.8
	Potato	½ med.	2	47.2
	Milk Pudding ...	1¼ cups milk	10	
		flour	0.15	211.0
5:00 P. M.	Milk (flavored with tea)	1¼ cups	10	196.0
	Bread	3 slices 1" thick	4	293.6
	Butter	½ tbsp.	¼	54.0
	White fish	1 slice 4"x2½"x1"	4	137.6
8:00 P. M.	Milk	1¼ cups	10	196.0
	Cream (daily)....	1¼ cups	10	550.0
				3209.8

VON NOORDEN'S DIET IN ANEMIA

For 2054 Calories a Day: Approximate value—protein, 90.47 gm.; fat, 83.09 gm.; carbohydrate, 225.02 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	PROTEIN GM.	CALORIES
Breakfast:					
	Sirloin Steak minced on toast	Small serving	3.00	18.10	160
	Toast (bread)	2 slices	1.50	3.50	100
	Tea		...	....	....
	Cream (thin)	1 tsp.	.22	.08	23
	Sugar	½ tsp.	.07	....	8.3
10 A. M.	Eggs poached	2	4.80	12.50	140
	Toast (bread)	1 slice	.75	1.80	50
	Butter	½ tbsp.	.23	.06	50
	Milk and	1 glass	5.10	4.76	100
	Sherry	½ tbsp.	.50	....	13
Luncheon:					
	Sirloin Steak	Small serving	3.00	18.10	160
	Potato, baked	1	5.27	2.69	100
	Asparagus on toast	1 serving, i.e. (about 5 stalks)	6.80	4.87	150
	Bread	1 slice	.75	1.80	50
	Butter	1 tbsp.	.46	.13	100
	Prune Soufflé	⅗ cup	2.70	4.75	150
4 P. M.	Sliced Orange	1	9.50	1.61	100
	Zwieback	3 pieces 3¼"x½"x1¼"	.80	2.26	100
Supper:	Cream Toast	1⅕ slice and sauce	4.40	6.50	200
	Bread	1 slice	.75	1.80	50
	Butter	½ tbsp.	.23	.06	50
	Apple Sauce	⅜ cup	3.50	....	100
Bedtime:	Milk	1 glass	5.10	4.76	100
					2054.3

ANEMIC DIET

Boston City Hospital

For 2036.8 Calories a Day: Approximate value—protein, 83.42 gm.; fat, 85.35 gm.; carbohydrate, 236.71 gm.

SCHEDULE OF FEEDING		MEASURE	OUNCES	PROTEIN GM.	CALORIES
Breakfast:					
	Shredded Wheat	1	.90	3.25	100
	Egg	1	2.40	6.25	70
	Bread	1 slice	.75	1.80	50
	Butter	1 pat	.46	.13	100
	Milk	½ cup	4.00	3.76	78.4
	Coffee				
	Cream	1 tsp.	.22	.08	23
	Sugar	½ tsp.	.07	.08	8.3
Dinner:					
	Sirloin Steak (lean)	Small serving	3.174 (90 gm.)	18.10	160
	Potato (baked)	1	5.27	2.69	100
	String beans	½ cup	2.00	1.30	23
	Lettuce and Tomato Salad	Very small serving	2.70	.75	100
	Bread	1 slice	.75	1.80	50
	Butter	1 pat	.46	.13	100
	Milk	¼ cup	2.00	1.88	39.2
	Rice Pudding	⅗ cup	2.25	4.00	150
Supper:					
	Corn flakes	8 tbsp.	.60	1.20	60
	Banana	1	5.50	3.24	100
	Milk	½ cup	4.00	3.76	78.4
	Hamburg Steak	Cake 2½" diam. and ⅞" thick	2.00	13.25	100
	Spinach	½ cup	4.25	1.87	21.5
	Bread	1 slice	.75	1.80	50
	Butter	1 pat	.46	.13	100
	Cocoa	1 large cup	10.00	7.00	200
	Angel Cake	1 serving	1.70	5.25	175
					2036.8

ANEMIC TEST DIET

Boston City Hospital

For 1834 Calories a Day: Approximate value—protein, 59.10 gm.; fat, 80.12 gm.; carbohydrate, 224.48 gm.

SCHEDULE OF FEEDING	MEASURE	OUNCES	PROTEIN GM.	CALORIES
Breakfast:				
Orange	1	9.50	1.61	100
Shredded Wheat	¾ biscuit	.67	2.43	75
Egg	1	2.40	6.25	70
Bread	1 slice	.75	1.80	50
Butter	½ tbsp.	.23	.06	50
Cream (thin)	¼ pint	3.60 i.e. 120 cc.	2.25	200
Dinner:				
Sirloin Steak (lean)	very small serving	1.59 i.e. 45 gm.	9.05	80
Potato, baked	1	5.27	2.69	100
Spinach	¾ cup	6.37	2.80	32
Bread	1 slice	.75	1.80	50
Butter	½ tbsp.	.23	.06	50
Prune Soufflé	⅗ cup	2.70	4.75	150
Cream	¼ cup	1.80 i.e. 60 cc.	1.12	100
Lemonade	1 glass	8.00	...	72
Supper:				
Rice, steamed	⅜ cup	2.00	1.12	50
Bread	1 slice	.75	1.80	50
Butter	½ tbsp.	.23	.06	50
Apple Sauce	⅜ cup	3.50	.25	100
Cream	¼ pint	3.60	2.25	200
Gingerbread	1 serving	1.60	2.37	150
Buttermilk	1 glass	5.50	4.58	55
				1834

QUESTIONS FOR STUDY

Anemia

1. What are some of the commonly known anemic conditions?
2. What is the main point to consider in arranging the diet for an anemic patient?
3. How may this be met by food?
4. What complications may influence the selection of food?
5. Can pernicious anemia be benefited by diet?
6. What foods would you select?
7. Give points on administration of diet for chlorosis.

CHAPTER XXVI

DIET IN DISEASES OF THE ENDOCRINE SYSTEM[1]

Goitre

Cases of exophthalmic goitre may be toxic or neurogenic in their origin. In the former, gastro-intestinal disorders are very often considered the cause and diet, of course, can play a very efficient part in this treatment. Proper diet may also help very materially in the treatment of the second type.

Food Needs.—Under-nourishment characterizes almost all cases. The excessive thyroid secretion stimulates metabolism so that food requirement in other cases is increased much the same as in fever patients. The caloric value of the diet may be increased advantageously from 25% to 50%.

Type of Diet.—High calory. Low protein. Proteins appear to have a stimulating effect upon the thyroid secretion as do also foods containing iodine. The protein contents of the diet should be kept low, not over 70 gms. to 75 gms. per day, and iodine-bearing foods should be excluded. Foods which tend to induce intestinal putrefaction, such as meat protein and shell fish, should be restricted or avoided. Stimulating foods and drinks should also be avoided.

Kinds of Food to Use:

Beverages	Milk.
Eggs	One or two eggs a day.
Fish	Non-oily except codfish.
Chicken	Fowl occasionally.
Cheese	Cheese occasionally.
Vegetables	Potatoes, corn, string beans, celery, onions, pumpkin, white beans.

[1] Arranged under the supervision of Dr. B. Franklin Stahl, Clinical Professor of Medicine, Women's Medical College of Pennsylvania, Visiting Physician to the St. Agnes and Philadelphia General Hospital, Philadelphia, Pa.

Starchy Foods.. Bread and most of the farinaceous foods except oatmeal.
Sugar .... Sugar may be given rather plentifully unless glycosuria appears.
Fruits .... Cooked fruits except raspberries and strawberries.

Foods to Avoid:

Cereals .... Oatmeal.
Fish .... Oily or dark flesh fish and codfish.
Meat .... Meats are excluded.
Vegetables .... Asparagus, beets, beans, spinach, carrots, peas, tomatoes, turnips.
Fruits .... Raspberries and strawberries.
Beverages ..... Coffee, tea.

DIET FOR GOITRE, NO. I

For 2775 Calories a Day: Approximate value—protein, 84 gm.

SCHEDULE OF FEEDING		MEASURE	GM.	CALORIES
Breakfast:				
	Orange	1 large	270	100
	Farina	½ cup	115	66
	Egg	1	...	70
	Toast	2 slices	76	100
	Butter	1 tbsp.	15	109
	Cream 18%	6 tbsp.	180	108
	Sugar	1 tbsp.	15	52
Lunch:				
10 A. M.	Lactose lemonade..	⅔ cup	148	200
	Sandwich			
	Bread	1 slice	38	50
	Butter	¼ tbsp.	4	25
Dinner:		½ cup	102	100
	Cream of celery soup with heavy cream	2 tbsp	38	138
	Halibut steak	1 serving	170	200
	Baked potato	1 large	127	150
	Butter and stringbeans	½ cup	64	55
	Bread	2 slices	76	100
	Butter	2 tbsp.	60	218

DIET FOR GOITRE, NO. I—CONTINUED

SCHEDULE OF FEEDING		MEASURE	GM.	CALORIES
	Dressed lettuce ...	3 leaves	30	6
	French dressing ...	1½ tbsp.	14	100
	Lemon ice	½ cup	85	100
Lunch:				
3 P. M.	Buttermilk	1 cup	240	88
	Saltines	3	11	50
Supper:				
	Omelet	1 egg	25	103
	Creamed potatoes..	½ cup	39	125
	Bread	2 slices	76	100
	Butter	1 tbsp.	15	109
	Stewed peaches ...	2 halves with juice	212	92
	Cookies	2	255	61
				2775

DIET FOR GOITRE, NO. II

For 3039 Calories a Day: Approximate value—protein, 75 gm.

SCHEDULE OF FEEDING		MEASURE	GM.	CALORIES
Breakfast:				
	Baked apple	1 large	130	200
	Steamed rice	¾ cup	113	100
	Bacon	3 slices	10	75
	Egg	1	...	70
	Muffins	2	85	150
	Butter	1½ tbsp.	22	163
	Cream (thin)	½ cup	113	220
Lunch:				
10 A. M.	Orangeade			
	Orange juice	½ cup	113	52
	Water	⅓ cup	...	...
	Lemon juice	3 tbsp.	42	17
	Gran. sugar	1 tbsp.	15	52
	Lactose	2 tbsp.	20	80
	Saltines	3	11	50

DIET FOR GOITRE, NO. II—CONTINUED

SCHEDULE OF FEEDING		MEASURE	GM.	CALORIES
Dinner:				
	Cream of corn soup with	½ cup	111	100
	Cream (heavy) ...	2 tbsp.	38	138
	Breast of chicken..	1 serving	71	150
	Mashed potatoes ...	½ cup	88	100
	Creamed onions ...	⅓ cup	71	100
	Lettuce	3 leaves	30	6
	French dressing ...	1½ tbsp.	14	100
	Bread	2 slices	76	100
	Butter	1 tbsp.	15	125
	Tapioca cream ...	½ cup	80	125
Lunch:				
3 P. M.	Buttermilk	1 cup	242	88
	Lactose	2 tbsp.	20	80
	Saltines	3	11	50
Supper:				
	Macaroni with cheese	½ cup	59	100
	Fruit salad—			
	Lettuce	3 leaves	30	6
	Orange	½	68	50
	Malaga grapes	10	56	50
	Pineapple	½ slice	27	40
	French dressing ...	1½ tbsp.	14	100
	Baking-powder-biscuit	3 small	57	93
	Butter	1 tbsp.	15	109
				3039

QUESTIONS FOR STUDY

Goitre

1. What may be origin of goitre?
2. Discuss food requirement in any case.
3. What type of diet should be used?
4. What type of foods should be avoided?
5. Name some specific foods to avoid.

CHAPTER XXVII

DIETETIC MANAGEMENT OF SURGICAL CASES[1]

Diet Preceding Operations.—For other than abdominal operations the only dietary precaution necessary is that for a few days previous to the operation all food should be very simple and nourishing, with rather large intake of fluids. If the patient is under-nourished effort should be made to improve this condition. No food should be given for twelve to fourteen hours before the operation and the intestinal canal should be thoroughly cleared.

Abdominal Operative Cases require more careful preparation. It is recommended that the patient rest in bed for a day, or better two days, before the operation and during this period receive only the very simplest diet, as soft-cooked eggs, soft cereal, toast and custard. Weak tea and coffee may be used and buttermilk or one of the fermented milks is recommended rather than whole milk. The amounts given should be adequate for caloric requirement.

Gastric Operations.—The rendering of the stomach as sterile as possible is an important preparation for such operations. This may be accomplished by careful cleansing of the month, and by giving sterile food and using sterilized utensils. If the stomach is normally acid most bacteria which might find entrance in spite of these precautions would be destroyed.

Operations involving other organs such as the kidneys, the liver or the gall bladder call for such dietary restrictions as are necessary in any disordered condition of these organs.

[1] Arranged under the supervision of Dr. B. Franklin Stahl, Clinical Professor of Medicine, Women's Medical College of Pennsylvania. Visiting Physician to the St. Agnes and Philadelphia General Hospital, Philadelphia, Pa.

Type of Diet.—A liquid or semi-liquid diet is given at first and easily digested solids are added as soon as the patient's condition permits. The food is usually given frequently and in small quantities. If it is given a teaspoonful at a time every few minutes until an ounce has been given it will often be retained when larger amounts would be vomited. When peristalisis has been established this method may be discontinued. After severe nausea an iced drink is sometimes better retained than a hot drink. A carbonated water, orange juice or buttermilk may be used. Mouth and throat operations naturally call for liquid or soft and non-irritating foods until the parts have healed so the passage of food will no longer be painful.

Food Needs.—A diet is recommended with a protein content slightly below the normal requirement. The normal requirement is about one gram of protein for each kilogram of body weight. The following dietary tables, recommended by Warren T. Vaughan, M.D., and Nellie H. VanDyke, B.S.,[1] and successfully used at the St. Elizabeth's Hospital, Richmond, Va., are arranged on such a basis.

Post Operative Diets

Unless the operation involves some part of the digestive canal, there are no especial dietetic rules. Usually no food is given during the first twenty-four hours after the operation. This permits recovery from the nausea and vomiting that so often result from the giving of an anesthetic. A rather abundant intake of fluids before operation is thought by some to lessen this tendency to nausea. The washing out of the stomach while the patient is still under the influence of the anesthetic is also recommended. If the condition of nausea and vomiting is not present there is no reason for withholding food.

Glucose to Prevent Acidosis Following Operation[2].—A solution of glucose given intravenously during an operation

[1] Warren T. Vaughan, M.D. and Nellie H. VanDyke, B.S., in Postoperative Dietotherapy, American Journal of The Medical Sciences, February, 1922.
[2] Farrar in "Surgery, Gynecology and Obstetrics," April, 1921.

at the rate of 0.8 gm. glucose for every kilogram of body weight each hour of the operation will lessen the acidosis incident to operation by promoting metabolism, prevent or diminish the vomiting and promote diuresis. The solution of gum acacia (6 per cent) in glucose (20 per cent) if given at a subtolerant rate the entire time of operation is an aid to the maintenance of blood pressure. Carbohydrate feeding before and after the operation, together with the use of sodium bicarbonate, will do much to prevent or lessen acidosis.

Food Combinations and Menus

POSTOPERATIVE DIETS[1]

Vaughan and VanDyke

DIET NO. I

SCHEDULE OF FEEDING	AMOUNT	PROTEIN GM.	FAT, GM.	CARBO-HYDRATE GM.	CALORIES
7 A. M.					
Hot milk	200 c.c.	6.6	8.0	10.0	138.40
9 A. M.					
Oatmeal gruel	100 c.c.	...	...	...	...
With milk	100 c.c.	4.5	4.4	11.3	102.80
Coffee with cream...	25 c.c.	...	...	...	...
With cane sugar...	8 gm.	0.55	10.0	8.75	127.2
11 A. M.					
Orange juice	50 c.c.	...	...	...	...
Lemon juice	25 c.c.	...	...	...	...
Lactose	50 gm.	...	...	...	...
Water	150 c.c.	0.4	0.1	58.25	235.5
1 P. M.					
Chicken broth	150 c.c.	5.4	0.5	2.25	35.10
Cocoa	5 gm.	...	...	...	...
With lactose	30 gm.	...	...	...	...
With cream	50 c.c.	...	...	...	...
With milk	100 c.c.	5.48	25.44	38.38	404.40
3 P. M.					
Buttermilk	200 c.c.	6.0	1.0	9.58	71.32
5 P. M.					
Grape juice	125 c.c.	...	...	...	...
With lactose	25 gm.	...	...	31.25	125.00
7 P. M.					
Cream of tomato soup	150 c.c.	10.65	42.64	41.05	590.56
Soft-cooked egg.....	50 gm.	5.95	4.65	...	65.55
9 P. M.					
Hot milk	150 c.c.	4.95	6.0	7.50	103.80
		50.48	102.93	212.06	1999.73

[1] "Postoperative Dietotherapy," Vaughan & VanDyke, American Journal of Medical Sciences, February, 1922.

TIME	FROM THE KITCHEN	AMOUNT	FROM THE FLOOR	AMOUNT
7 A.M.	....		Hot milk	1 glass
9 A.M.	Oatmeal gruel with milk.....	1 serving		
	Coffee with cream and sugar	1 cup		
11 A.M.	....	....	Orangeade with lactose	1 glass
1 P.M.	Chicken broth...	1 bowl		
3 P.M.	....	....	Buttermilk	1 glass
5 P.M.	Cream soup.....	1 bowl		
	Soft-cooked egg.	1 egg		
7 P.M.	....	....	Grape juice with lactose	1 glass
9 P.M.	....	....	Hot milk	1 cup

DIET NO. II

SCHEDULE OF FEEDING	AMOUNT	PROTEIN GM.	FAT, GM.	CARBO-HYDRATE GM.	CALORIES
7 A. M.					
Chicken broth	100 c.c.	3.6	0.1	1.5	21.30
9 A. M.					
Soft-cooked egg.....	50 gm.	5.95	4.65	...	65.65
Oatmeal gruel	100 c.c.	1.2	0.4	6.3	33.60
Coffee with cream and	25 c.c.				
sugar (cane)	8 gm.	0.55	10.0	8.75	127.20
11 A. M.					
Grape juice	150 c.c.	...	...	37.50	150.00
1 P. M.					
Cream of green pea soup	200 c.c.	15.56	56.88	88.04	806.32
Orange juice	50 c.c.				
With lemon juice...	25 c.c.				
With lactose	50 gm.				
With water	150 c.c.	0.4	0.4	58.25	235.80
3 P. M.					
Beef juice	100 c.c.	4.90	0.60	...	25.0
5 P. M.					
Malted milk	12 gm.				
With cocoa	5 gm.				
With lactose	25 gm.	4.13	4.30	4.01	191.26
Soft poached egg....	50 gm.	5.95	4.65	...	65.65
7 P. M.					
Boiled custard	100 gm.	6.27	6.32	31.35	207.36
9 P. M.					
Barley water	200 c.c.	15.56	56.88	58.04	806.35
		49.03	88.11	239.34	1946.47

TIME	FROM THE KITCHEN	AMOUNT	FROM THE FLOOR	AMOUNT
7 A.M.	....	....	Chicken broth	1 cup
9 A.M.	Oatmeal gruel...	1 serving		
	Soft-cooked egg.	1 egg		
	Coffee with sugar and cream.....	1 cup		
11 A.M.	....	....	Grape juice	1 glass
1 P.M.	Cream soup.....	1 bowl		
	Orangeade	1 glass		
3 P.M.	....	....	Beef juice	1 cup
5 P.M.	Chocolate malted milk	1 glass		
	Soft poached egg	1 egg		
7 P.M.	Boiled custard...	1 cup		
9 P.M.	....	....	Barley water	1 cup

DIET NO. III

SCHEDULE OF FEEDING	AMOUNT	PROTEIN GM.	FAT, GM.	CARBO-HYDRATE GM.	CALORIES
7 A. M.					
Orange juice	100 c.c.	0.8	0.2	28.07	117.28
Lemon juice	15 c.c.	...	...	...	...
Lactose	15 gm.	...	...	...	...
9 A. M.					
Cream toast	30 gm.	...	...	...	...
With milk	100 c.c.	...	...	...	...
With butter	1 oz.	...	...	...	...
With flour	1 oz.	7.78	12.49	7.45	173.33
Poached egg	50 gm.	5.95	4.65	...	65.65
11 A. M.					
Chicken broth	100 c.c.	...	...	...	...
With cracker	10 gm.	4.58	1.01	8.81	62.65
1 P. M.					
Cream of pea soup ..	200 c.c.	15.56	56.88	58.04	806.35
3 P. M.					
Oatmeal gruel with milk	100 c.c.	8.72	8.10	21.83	195.10
5 P. M.					
Poached egg on toast	20 gm.	7.87	13.39	10.54	194.15
Butter	10 c.c.	...	...	...	...
7 P. M.					
Baked custard	100 gm.	7.60	6.65	12.50	140.25
Malted milk	12 gm.	...	...	...	...
With cocoa	5 gm.	...	...	...	...
With lactose	25 gm.	10.39	11.56	48.07	237.88
		69.25	114.93	195.93	2092.81

TIME	FROM THE KITCHEN	AMOUNT	FROM THE FLOOR	AMOUNT
7 A.M.	....	....	Orangeade with lactose	1 glass
9 A.M.	Cream toast.....	1 serving		
	Poached egg.....	1 egg		
11 A.M.	....	....	Chicken broth with cracker..	1 glass
1 P.M.	Cream soup......	1 bowl		
3 P.M.	Oatmeal gruel with milk.....	1 serving		
5 P.M.	Poached egg on toast with butter	1 serving		
7 P.M.	Baked custard...	1 serving		
9 P.M.	....	....	Chocolate malted milk	1 glass

DIET NO. IV

SCHEDULE OF FEEDING	AMOUNT	PROTEIN GM.	FAT, GM.	CARBO-HYDRATE GM.	CALORIES
7 A. M.					
Baked apple	120 gm.	0.61	0.58	29.30	124.86
9 A. M.					
Wheat farina	100 c.c.				
With milk	100 c.c.				
With lactose	15 gm.	14.50	5.40	96.30	491.0
Toast with milk......	100 c.c.				
Toast	40 gm.	7.12	12.54	7.10	169.74
11 A. M.					
Plain junket	100 gm.	3.30	4.0	19.67	127.88
1 P. M.					
Creamed fish	50 gm.	17.48	18.83	26.24	344.35
With white sauce..	100 c.c.				
Purée of spinach....	100 gm.	2.10	4.10	2.60	55.70
3 P. M.					
Apricot soufflé		6.37	21.56	17.85	290.92
5 P. M.					
Chicken broth	100 c.c.				
With rice	50 gm.	5.0	0.60	1.50	31.40
Poached egg	50 gm.				
On toast	20 gm.				
With butter	10 c.c.	7.87	13.39	10.54	194.15
7 P. M.					
Stewed prunes	100 gm.	0.50	0.10	22.30	92.10
9 P. M.					
Barley gruel with milk	120 gm.	5.94	6.41	13.25	134.45
		70.59	87.51	246.65	2056.55

TIME	FROM THE KITCHEN	AMOUNT	FROM THE FLOOR	AMOUNT
7 A.M.	Baked apple.....	1 large		
9 A.M.	Wheat farina with sugar and milk	1 serving		
	Milk toast.......	1 serving		
11 A.M.	Plain junket.....	1 cup		
1 P.M.	Creamed fish.....	1 serving		
	Purée of spinach.	1 serving		
3 P.M.	Apricot soufflé...	1 serving		
5 P.M.	Chicken broth with rice.......	1 bowl		
7 P.M.	Stewed fruit.....	1 serving		
9 P.M.	Barley gruel with milk	1 serving		

Diet No. I, is usually the first administered and should be given as soon after operation as the patient's condition safely permits. It corresponds to the so-called liquid diet, although there are included in it such non-liquids as strained oatmeal gruel, and a soft-cooked egg.

Diet No. II, is used interchangeably with the former and is particularly useful in those cases with milk intolerance or with a tendency to abdominal distention.

Diet No. III, follows Diet No. I, or No. II, usually by about two days. When it is found that the patient tolerates the first diet well he may rapidly be changed to the third. In this the feedings are alternated, liquid and semi-solid. After an additional day or two, or as long as is necessary in each individual case, Diet No. IV, consisting of semi-solid food, is given.

The feedings in all four diets are administered every two hours. The directions to the nurse are simplified as shown in the accompanying tables, which indicate the amount to be given and whether it is to come from the kitchen or is to be made up by the nurse in the ward.

The advantages of these four groups of diets are as follows: (1) A graduated increase in feedings is provided for each case without complications; (2) the diets are composed of the proper proportions of protein, fat and carbohydrate; (3) the nourishing value is high; (4) all diets are sufficiently varied and are palatable.

In practical experience we have found the diets to be satisfactory. No striking advantage over the usual method of feeding is to be seen in the average postoperative case. It is particularly in those cases which develop untoward complications with prolonged convalescence that the comparative advantages become apparent. Nevertheless, we have observed that patients placed on these dietaries are much more content than others treated by the usual method.

We would particularly emphasize that in postoperative treatment the diet must be individualized. Every patient is a law unto himself. The patient's likes and dislikes should always be consulted and agreeable food substituted for that which is distasteful. This can easily be arranged in our diet. The dietaries above described will be relished by the majority of individuals but, when necessary, substitution should be freely employed provided care is taken not to change the relative proportion of protein, fat and carbohydrate and not to alter markedly the caloric value.

Gastric Operations.—For three days after the operation no food should be allowed. Very small amounts of water or Vichy, one to two ounces every hour may be given, and extra water may be furnished by means of Murphy Drip or by saline enema, four to six ounces every three hours. If thirst is not extreme, water by mouth may be withheld entirely during this time. After the three-day period, very careful feeding is advised. Sippy's Diet for Peptic Ulcer may be used to advantage and the following is Finney's Diet List for Gastro-Enterostomy[1]:

FINNEY'S DIET FOR GASTRO-ENTEROSTOMY

1st day.	First twelve hours, nothing by mouth, nutrient enema every four hours alternating with continuous salt solution by Murphy's method. Second twelve hours, water in 4 c.c. (1 dram) doses by mouth every two hours.
2nd day.	Increase water gradually up to 30 c.c. (1 oz.) every two hours.
3rd day.	Water, 30 c.c. (1 oz.) alternating with albumin, 4 c.c. (1 dram); gradually increase quantities of each until eighth day.
8th day.	Any liquid, 60 c.c. (2 oz.) every two hours.
9th day.	Any liquid, 90 c.c. (3 oz.) every two hours.
10th day.	Any liquid, 120 c.c. (4 oz.) every two hours. Discontinue rectal feeding.
11th day.	One soft-boiled egg in addition to any liquid.
12th day.	Two soft-boiled eggs in addition to any liquid.
13th day.	Soft diet.
14th day.	Soft diet.

[1] Carter, Howe and Mason, "Nutrition and Clinical Dietetics," Lea & Febiger, Philadelphia, Pa., 1921. 2nd Edition.

15th day. Very restricted light diet.

16th day. Restricted light diet.

17th day. Restricted light diet.

18th day. Any digestible solid food.

After the eighteenth day the following diet list may be gradually followed, and should be continued for at least four or five months:

Kinds of Foods to Use:

Soups..........	Any light soup.
Meats..........	Any easily digested meats, as brains, sweetbreads, beef, mutton, lamb, poultry (best minced and taken either broiled or boiled).
Fish	Mainly the white variety, mackerel, bass, as well as oysters (boiled or broiled).
Eggs	In any form except fried.
Vegetables	The easily digestible forms, best taken mashed or strained, as asparagus, spinach, peas, beans, potatoes, carrots, farinaceous food; any of the cereals; bread to be taken stale.
Desserts	Any of the light puddings.
Fruits	Mainly stewed.
Fatty Foods....	Cream, butter, and olive oil.
Drinks	Milk, buttermilk, cocoa, carbonated mineral water and plain water.

Food to Avoid.—Rich soups, pork, fried foods, veal, stews, hashes, corned meats, twice-cooked meat, potted meat, liver, kidney, duck, goose, sausage, crabs, sardines, lobster, preserved fish, salted or smoked fish, salmon, cauliflower, radishes, celery, cabbage, cucumbers, sweet potatoes, tomatoes, beets, corn, salad, bananas, melons, berries, pineapple, hot bread or cakes, nuts, candies, pies, pastry, preserves, cheese, strong tea or coffee, alcoholic stimulants.

QUESTIONS FOR STUDY

OPERATIONS

1. Discuss fully the dietary rules to be observed in preparation for operations of various types.
2. Speak in detail of postoperative diets.
3. What is the food requirement?
4. Discuss the diets and method of administration recommended by Vaughan and Van Dyke.
5. What special care is necessary in gastric operations?

CHAPTER XXVIII

DIET IN SPECIAL CONDITIONS

MOTHERHOOD

Diet in Pregnancy

It is necessary to adopt a specific diet for pregnancy only when complications arise, such as, for example, albuminuria or serious vomiting.

The diet should be one which is easy of digestion, avoiding all foods which cause distress or even discomfort because of indigestion. It should furnish all the essentials of an adequate diet (see page 23), bearing in mind that the energy requirement of the mother is not greatly increased even in the last stages of pregnancy, when an increase of 20% above her normal energy needs will cover the additional demands. A woman who ordinarily requires 2000 calories will then require 2400 calories.

It is especially important that the diet be laxative, since the mother must get rid of not only her own waste products but also those of the unborn child. Green vegetables, fruits, fresh and dried, and whole grain cereals, such as rolled oats, wheatena, etc., should be liberally used.

Kinds of Food to Use:

Milk	Valuable especially for its calcium, proteins of high nutritive value (see page 166), and vitamines.
Cereals	Especially those made from whole grains.
Green Vegetables.....	Spinach, lettuce and other salad greens, celery, cabbage, peas, beans, cauliflower, etc.
Fruits	All kinds, both fresh and dried, cooked or raw.

Meats and Fish......In moderate amounts once a day.
Eggs ....Except fried.
Fats ....Such as butter, cream, bacon and olive oil, in moderate amounts.

Vomiting in Pregnancy[1]

Well-nourished patients when serious vomiting first occurs should usually refrain from taking food of any kind for from ten or twelve or even twenty-four hours. Exceptions to this rule are sometimes found in that type of seasickness, and sometimes in the vomiting of pregnancy, in which, as soon almost as the stomach is emptied, there is a desire to replenish the loss.

In any case in which the gastric irritation is persistent, it is necessary to give fluid food, and only in small, oft-repeated doses, preferably in predigested form. The food is best given cold, as a rule, although some persons can relieve nausea by sipping very hot water.

A teaspoonful of prepared milk, or in extreme cases even a few drops, given with a medicine dropper once in ten or fifteen minutes, may be all that the stomach will at first tolerate.

Kinds of Food to Use.—The following is a list of foods which are commonly prescribed for the relief of nausea and vomiting, or for nourishment while those conditions exist: Cracked ice, milk, milk and lime water, kumyss, zoolak, beef extracts, strong black coffee, sour lemonade or lemonade and White Rock, clam broth, strong tea without cream or sugar.

Very severe and protracted cases of vomiting may require lavage or nutrient enema.

Diet for the Mother After Labor[2]

During the first eighteen hours after labor the mother should have liquids sufficient to quench the thirst, a cup of

[1] W. Gilman Thompson, M.D., "Practical Dietetics," D. Appleton Co., New York City.
[2] Carter, Howe and Mason, "Nutrition and Clinical Dietetics," Lea & Febiger, Philadelphia, Pa., 1921. 2nd Edition.

tea, water, White Rock or broth. After this, coffee, milk, toast, soft cereals, milk toast, and so back to normal diet. After the bowels have been moved on the second day the amount of food can be steadily increased, always giving plenty of water and small mid-morning and afternoon feedings.

Foods to Avoid.—Acid fruits, such as grapefruit, lemonade, sour oranges, strawberries, plums, tomatoes; vegetables which are apt to cause flatulence, such as onions, cabbage, turnips, beans; pork and veal; all fried foods.

Kinds of Food to Use:

Mild fruits.	Milk.
Cereals.	Eggs—except fried.
Soups and broths.	Fish.
Bread and toast.	Chicken.
Vegetables (all kinds except those noted above).	Lean beef or lamb.

Diet for a Nursing Mother

The diet for a nursing mother should be nutritious, easily digested and laxative. It must provide for her own body needs plus the additional demands occasioned by milk production. This means that it must supply an extra amount of protein, calcium, phosphorus, iron and vitamines, as well as extra fuel. If sufficient nourishment for both is not supplied, the needs of the child for protein, calcium, etc., will be met as far as possible at the expense of the mother's bones and tissues.

In order that this increased quantity of food should not tax the mother's digestion, it is essential that the diet should be comparatively easy of digestion. Acid fruits and vegetables if introduced gradually into the diet and used in moderation will not give the baby colic. Unless they upset the mother's digestion they will not affect the milk.

Just as during the period of pregnancy constipation must be carefully guarded against.

Kinds of Foods to Use.—In general the same foods which are valuable for the woman during pregnancy should be included in the diet of the nursing mother, avoiding such things as fried foods, rich puddings, cakes, pastries and fat meats, and including simple dishes such as cream soups, milk puddings, cereals, vegetables and fruits, fresh canned and dried, and meats and eggs in moderation.

The mother should avoid all fatigue, worry and emotional excitement of any kind, since these are certain to interfere seriously with the secretion of milk. She should have a moderate amount of outdoor exercise and at least eight hours of sleep every night, or, if her rest is broken then, she should try to make it up during the day when the baby sleeps.

QUESTIONS FOR STUDY

MOTHERHOOD

1. How should the diet be regulated during pregnancy?
2. What are the food requirements for the nursing mother?
3. Are there special restrictions for the diet of the nursing mother?

CHAPTER XXIX

INFANT FEEDING

Breast Feeding[1]

The first year of life is the year of greatest growth and development. The baby must adapt himself to entirely new conditions. All his organs must learn to function. The way a baby is fed during this period either helps him to live and to become strong and healthy, or makes his growth and development much more difficult. Breast feeding helps him more than any other one thing. Mother's milk is the one perfect infant food.

Statistics gathered from this country and many others show that breast-fed babies have a much greater chance for life than those bottle-fed, and also that infant illnesses, not only those of the digestive tract but other varieties as well, afflict bottle-fed infants much oftener and much more seriously than those who have had breast milk. Not only does breast milk protect the nursing baby from illness and increase materially his chance for life, but it practically insures his development in a normal, orderly fashion.

The majority of mothers can nurse their babies, at least in part if they will, provided they take proper care of themselves. Sufficient wholesome food, plenty of sleep, fresh air, a moderate amount of exercise, avoiding fatigue and overwork, and a serene, cheerful attitude of mind are necessary if she is to maintain a full normal milk supply. So intimate is the nervous connection of the mammary glands with the mind that the mental state of the mother is readily reflected in their functioning. Fear, anger, or worry may

[1] "Infant Care," U. S. Department of Labor, Children's Bureau, Care of Children Series No. 2, Bureau Publication No. 8, Revised 1922.

serve to check the secretion of the milk or to change its quality so much that, for the time being, it is unfiit for use, while on the other hand, a calm mind, joy, laughter and delight in life, coupled with the desire and intention to nurse the baby, will make it possible to do so.

Colostrum.[1]—The first secretion of the breasts is called colostrum and, while not a true milk, is adapted to the baby's needs in the first hours of his life. The baby should be put to the breast from six to twelve hours after birth, according to the condition of the mother and the strength of the baby. The object of this is not to give the baby food, but to obtain the cleansing action of the colostrum milk and stimulate the breast to secretion. It is supposed that nursing also favors the contraction of the uterus, but there is no proof that this is so.

Technique of Nursing.[1]—The baby should be held lying on its side with its head a little elevated. It must be everywhere supported, so that it is relaxed and comfortable. The breast above the nipple must be pressed away from its nose, so that it can breathe freely. The mother must be quiet and composed so that the baby is not disturbed and excited. Vomiting after nursing can sometimes be prevented by having the mother lie down beside the baby while she nurses it. In other instances it is advisable to hold the baby upright every few minutes during the nursing in order that it may get up the air which it swallows and which would otherwise cause vomiting.

The nipples should be washed before and after each nursing with sterile water or with a saturated solution of boracic acid and carefully dried. If a crack should appear, the greatest care should be taken to prevent infecting the breast, lest a painful breast abscess result. A doctor should always be consulted. The cracked nipple should be kept constantly clean by washing it with boiled water. A glass nipple shield should be used, care being taken that it is always

[1] Morse & Talbot, "Diseases of Nutrition and Infant Feeding," 2nd Ed. Macmillan Co., 1920.

perfectly clean and sterilized by boiling. The shield will not materially increase the difficulty of nursing for the baby and will safeguard the mother. If the breasts become engorged, they may be relieved by using a breast pump if necessary, or by gentle massage, but all manipulation only serves to stimulate the breast to greater activity and the less handling it can have the better. Usually the matter rights itself without difficulty as soon as the relation between the supply and demand is established. If the mother has received the proper care during pregnancy and the breasts and nipples have had due attention, which is part of a physician's duty, the nursing period will be shorn of much of its possible pain and trouble.

Intervals of Feeding.[1]—Most babies thrive better if the interval between feedings is fairly long. This interval may be six hours until the milk is established. From that time the baby may be fed at three-hour intervals until he is four months old, when four hours should be allowed to elapse between feedings. Many babies do well if fed only once in four hours from birth. However, if the breast supply is scanty, more frequent stimulation is sometimes necessary to the success of breast feeding.

Night feeding (after the 10 o'clock nursing) may be omitted when the child is four months old.

The following table shows nursing interval and the number of feedings in 24 hours when the three-hour interval is used:[1]

Period	Nursings in 24 hours.	Interval by day. *Hours.*	Night nursings (10 P. M. to 6 A. M.).
First and second day	4	6	1
Third day to 4 months.........	7	3	1
4 to 7 months	6	3	0
7 to 12 months	5	4	0

[1] Dr. L. Emmett Holt, "The Care and Feeding of Children," D. Appleton Co., New York City, 1922.

The baby should be nursed regularly, by the clock, from the very first and should have nothing between meals save water to drink. It takes from one and one-half to three hours for a baby's stomach to empty itself after a full meal of breast milk and considerably longer for the process of digestion to be completed in the intestines.

The baby should not ordinarily be allowed to remain at the breast over 20 minutes in any case, and the nipple should be withdrawn several times during the nursing, so that he will not take the food too rapidly with consequent regurgitation and indigestion. If the milk is plentiful the breasts should be nursed alternately but it may be necessary to give both breasts at one feeding in order to satisfy the baby. Do not let the baby go to sleep while nursing.

Supplementary Feeding.—It is sometimes found that the mother's milk is not sufficient in amount for the child and supplementary feedings of modified cow's milk must be given, adapted to the age of the infant. The amount of artificial food to be given depends on the amount of breast milk the infant is getting. This is determined by weighing the baby before and after each nursing in 24 hours.

Gains in Weight:

1. *Method of Weighing.* Undress the baby completely. Put a soft cloth in the pan of the scales and lay the baby on it, or wrap the baby in a blanket if the room is not warm. Weigh carefully and record the result. Remove the baby, weigh the blanket or cloth and subtract this amount from the first weight.

When weighing the baby before and after nursings to determine the amount of breast milk he is receiving do not undress him but weigh both times in exactly the same clothing. If the diaper becomes wet or soiled meantime, do not change it until after the weight has been taken.

2. *Average Gains.* The normal breast-fed infant gains 6 to 8 ounces per week for the first five months, and 4 to 6 ounces per week during the rest of the year. Smaller but

steady gains are not abnormal. A simple rule is that a baby should double its birth weight in the first five months and treble it by the end of the first year or soon after.

Gains from day to day are irregular. Weigh the baby once a week. Keep a weight record or preferably a weight chart. One weight is not significant but a weight curve is.

Artificial Feeding

The term "artificial feeding" refers by common parlance to the method of feeding which must be employed when an infant, for any reason, is denied breast milk, because any other method of feeding a young baby than at its mother's breast is truly artificial.

Wide experience has shown that fresh cow's milk is the best substitute for breast milk. This milk should be the purest and cleanest possible; it should be the product of a tuberculin-tested herd, one that is healthy, well fed, properly housed and cared for, and milked by clean milkers into sterilized utensils. The milk should be bottled and cooled at the dairy and delivered to the consumer in sealed bottles. The milk commonly sold from open cans, known as "loose" or "dipped" milk, should never be given to a baby.

Certified Milk[1].—In certain places it is possible to obtain what is known as "certified" milk, which is fresh, clean, pure, normal milk of uniform composition and highest quality obtained from healthy cows and produced and handled under the supervision of a medical milk commission, with special sanitary precautions. Although the amount of certified milk is as yet far too small, the demand for it is steadily increasing. As soon as mothers become convinced of the infinite advantage of having a supply of raw milk whose quality is guaranteed, they are quite ready to pay the additional cost.

Pasteurized Milk.—Milk is pasteurized by heating it to a temperature of 60° to 63° C. (140° to 145° F.) and

[1] For Methods and Standards for the Production of Certified Milk, see Sherman, "Food Products," Macmillan, 1916, page 533.

holding it at this temperature for 20 to 30 minutes. This serves to destroy any bacteria of diseases regarded as transmissible by milk. As a precaution against subsequent contamination it is desirable that the milk be pasteurized in the sealed bottles in which it is to be delivered to the consumer, or if the pasteurization is done at home, in the bottles in which it is to be kept. Unless Grade A or certified milk can be obtained it is safer to use pasteurized milk for infant feeding.

Differences Between Cow's Milk and Human Milk. The following table shows the average composition of cow's and human milk:

	Human	Cow's
Protein	1.5%	3.3%
Fat	4.0%	4.0%
Lactose	7.0%	5.0%
Mineral matter	0.2%	0.7%

Cow's milk contains approximately twice as much protein, about the same amount of fat, less carbohydrate (lactose) and a little more than three times as much mineral matter.

The difference between human and cow's milk is not only in the proportion but also in the form of the constituents. The fat is much more finely emulsified in human milk than in cow's milk. There is more casein (one of the milk proteins, see page 16) in cow's milk. Cow's milk forms larger and tougher curds in an infant's stomach than does human milk. Human milk is practically sterile as the baby takes it. Cow's milk, even under the best conditions, is far from sterile when the baby gets it.

Modification of Milk.—The aim in artificial feeding is to adapt cow's milk to the digestive tract of the baby and at the same time provide as far as possible an adequate supply of fuel, protein, mineral matter and vitamines.

There are a number of methods for modifying milk and authorities differ widely as to their use. A few of the fundamental points are given here but it should be understood that whenever possible a doctor should be consulted regarding the diet of an artificially fed infant. Each baby is an individual case in his capacity for and reaction to food and must be treated accordingly.

Whole Milk Formula.[1]—The simplest method of modification is by dilution of whole milk and addition of sugar or other carbohydrates to meet the energy requirement of the child.

A simple method of calculating a milk formula for an average healthy infant on the basis of caloric requirements is to start with the daily amount of protein of cow's milk needed. This by experience has been found to be furnished in approximately 1½ ounces of milk for each pound of body weight. An infant weighing 10 pounds will thus require 15 ounces of milk. If his caloric needs are calculated at 45 calories per pound of body weight they will be 450 calories. Of this there will be furnished in the milk (20 calories per ounce) 300 calories, leaving 150 calories to be made up by carbohydrates—sugar or starch. One ounce of sugar will add 120 calories, or 1¼ ounces, 150 calories. This will give the food values for a day. There is still to be determined the amount of diluent, which will depend upon the infant's daily need of fluid. This has been shown to be about 3 ounces for each pound of body weight in the early months, and 2 ounces for each pound in the later months, i.e., for a 10-pound infant it will be 30 ounces a day. There will need to be added, therefore, 15 ounces of water. The formula will then be:

15 ounces milk, giving 300 calories
1¼ ounces sugar, giving 150 calories
15 ounces water

[1] Dr. L. Emmett Holt, "Diseases of Infancy and Childhood," D. Appleton Co., New York City, 1922.

FORMULAS FROM WHOLE (4 PER CENT) MILK[1]

GIVING APPROXIMATE PERCENTAGE COMPOSITION AND CALORIC VALUE

	i	ii	iii	iv	v	vi	vii	viii	ix	x
Milk (ounces)	6	7	8	9	10	11	12	13	14	15
Water (ounces)	14	13	12	11	10	9	7	5	1	0
Gruel[2] (ounces)	....	....	....	....	....	....	1	2	5	5
Sugar[3] (even tablespoonfuls)	2½	2½	2½	2½	2½	2½	2	1½	1	1
Total	20	20	20	20	20	20	20	20	20	20
Fat, per cent	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80	3.00
Sugar, per cent	5.70	6.00	6.00	6.50	6.50	6.50	6.00	5.50	5.50	5.00
Starch, per cent	....	....	....	....	....	....	.40	.80	2.00	2.00
Protein, per cent	1.00	1.20	1.40	1.60	1.75	1.90	2.10	2.25	2.40	2.60
Calories, per ounce	11.5	12.5	13.5	14.5	15.5	16.5	17.0	18.0	20.0	21.0
Approx. age indication	2 da.	1 wk.	3 wk.	2 mo.	3 mo.	4 mo.	5 mo.	6 mo.	8 mo.	9-11 mo.

[1] Dr. L. Emmett Holt, "Diseases of Infancy and Children," D. Appleton Co., New York City, 1922.

[2] The gruel here indicated is made in the proportion of 1 oz. of flour by volume to 10 oz. of water.

[3] Milk sugar is here indicated; of cane sugar use two scant tablespoonfuls instead of two and a half, and one instead of one and a half, etc. Maltose may be used in the same amounts as milk sugar.

Top Milk Formula.[1]—It is sometimes desirable to use a somewhat higher fat than that given in whole milk formulas. This may be accomplished by using the upper half of a quart bottle of milk, i.e., a 7% top milk instead of whole milk. Before this top milk is removed the milk should stand in the bottle at least 4 hours, and the top milk should be carefully removed with a milk dipper and not poured off. The required number of ounces is measured from this. Such formulas are designed for infants who are able to take more fat than is contained in the formulas from whole milk.

With all young infants, even those having presumably normal digestion, it is desirable to begin with a weaker food than would be indicated by their caloric requirements, and gradually increase both the strength and quantity according to the child's digestion. With small or feeble infants still weaker formulas should be used and the increase made more slowly.

For a healthy child with normal digestion who has previously had no cow's milk one should begin with a lower formula than would usually be given to a healthy child of his size and age, but one may increase the strength and quantity of the food more rapidly than with a younger infant.

A stationary weight for a week or two, or even a loss of a few ounces, is of no importance, provided the change in diet can be effected without disturbing digestion, for as soon as a child becomes accustomed to cow's milk the strength can be increased and progress is assured. Nothing is easier than to disturb the digestion in the beginning by the use of too strong food.

Intervals of Feeding.[1]—The essential thing in feeding is the amount of food given in the 24 hours. Into how many portions this daily quantity shall be divided and at what

[1] Dr. L. Emmett Holt, "Diseases of Infancy and Childhood," D. Appleton Co., New York City, 1922.

intervals they shall be given is altogether a secondary consideration. Infants differ in their behavior to a schedule. Some do much better with relatively large feedings while others thrive best when smaller feedings are given and the interval is made somewhat shorter. No hard and fast rule is to be laid down for all children. Experience has shown that the average infant can digest his food better if the intervals are made longer than was formerly the practice. With longer intervals the quantity given at one time and the strength of the food may be correspondingly increased. There are few healthy infants who cannot readily be trained to the intervals given in the table below, in which the infant is placed upon three-hour feedings at the outset and upon four-hour feedings when three months old. Many do exceedingly well when placed upon four-hour feedings at the start.

SCHEDULE FOR HEALTHY INFANTS DURING THE FIRST YEAR[1]

Age	Interval Between Feedings	Night Feedings After 6 p.m.	Feedings in 24 Hours	Quantity for One Feeding	Quantity for 24 Hours
	Hrs.			Ounces	Ounces
2nd to 7th day	3	2	7	1 —2	7 —14
2nd, 3rd and 4th wks..	3	2	7	2½—4½	18 —32
2nd and 3rd mos......	3	2	7	3½—5	24 —35
4th and 5th mos........	4	1	5	6 —7	30 —35
6th, 7th and 8th mos....	4	1	5	6½—7½	32½—37½
9th and 10th mos.......	4	1	5	7 —8	35 —40
11th and 12th mos......	4	1	5	8 —9	40 —45

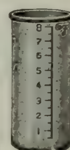
Technique of Milk Modification.—Everything that is to be used in the preparation of the baby's food, including the hands and clothing of the mother or nurse, must be clean. The best possible milk should be bought. Certified milk is safest but if there is any doubt as to the quality of the milk obtainable it should be pasteurized.

Articles Required for Preparing Milk Feedings include

[1] D. L. Emmett Holt, "Diseases of Infancy and Childhood," D. Appleton Co., New York City, 1922.

a glass graduate, a glass or agate funnel, a cream dipper, a pitcher for mixing food, nursing bottles, a tall cup in which the bottle may be surrounded by hot water and warmed, rubber nipples, bottle brushes, borax or boric acid and absorbent cotton.

The best style of bottle is that which can be most readily cleaned. The graduated cylindrical bottles with wide mouths are to be preferred, or better still is the Hygeia nursing bottle that has no neck and a breast-nipple so natural that the baby can be weaned without a struggle, or will take it in conjunction with the natural supply.



The best nipples are those of plain black rubber, which slip over the neck of the bottle and are not so thick as to prevent their being turned inside out for cleaning. The hole in the nipple should be large enough for the milk to drop rapidly when the bottle is inverted but not so large that it will run in a stream. New nipples should be boiled, but the daily boiling of nipples is unnecessary. It soon makes them so soft as to be useless. They should be rinsed in cold water immediately after using and washed daily in soap and water. When not in use nipples should be kept covered in a solution of borax or boric acid.

All the food needed for 24 hours should be prepared at one time. The bottles should be sealed[1] with sterile cotton and kept in the refrigerator until needed.

Directions for Feeding.—The food should be warmed to about 100° F. This is best done by placing the bottle in a tall pitcher or cup filled with hot water, *not* by pouring the food from the bottle into a sauce pan. The temperature of the food may be tested with a thermometer or by pouring

[1] To cork the Hygeia bottle, a sterilizer cap is used to cover the cell. The cap has a small opening, which is corked with non-absorbing cotton. These caps are on sale by druggists

a few drops upon the front of the wrist; it should feel warm but not hot. A bottle should not be warmed over for a second feeding. A child should not be more than twenty minutes in taking his food and should not sleep with the nipple of the bottle in his mouth. It is preferable to have a young infant held while taking his bottle. If this is not done the bottle should at least be held in such a position that the neck of the bottle is kept full. After feeding, the child should be held upright over the nurse's shoulder and patted on the back to allow him to bring up the gas, usually air, which he has swallowed. He is then placed in his crib and left alone. It is even more necessary than in breast feeding that rules as to frequency and regularity of meals be observed.

Drinking Water.—The baby needs plenty of cool, unsweetened water to drink. Drinking water for a baby should always be boiled, cooled, and given to the baby lukewarm, never ice cold. Never put sugar or anything else in it. Offer it to the baby between feedings. In summer especially a baby needs to drink frequently. Fretful babies, especially those who are cutting teeth, are often quieted by a cool drink.

Antiscorbutics.—Infants fed on pasteurized or boiled milk should always have orange juice or tomato juice as a preventive against scurvy.[1] The amount of juice to be given is determined by the age of the child; a three months old baby should receive about one tablespoonful daily.

Weaning

Weaning.—If the supply of breast milk continues to be adequate it is usually best to wean the baby between the tenth and twelfth months. The time to wean must be determined by the circumstances in the individual case, depending on the amount and quality of the milk, the drain on the mother and the time of year. If a baby is doing fairly well it is usually advisable to continue nursing through the summer months because breast-fed infants are much less

[1] See page 22.

liable to digestive disturbances than those that are artificially fed.

Weaning should proceed slowly, one bottle feeding being substituted for one breast feeding during the day for some time, then two bottles, and so on until all breast feeding has been done away with and the baby is entirely weaned.

If drinking water has been given by means of a nursing bottle during much of the first year the baby will take his food in the same way the more readily. A healthy infant weaned at 9 months should begin with the food for an infant of 4 or 5 months. If he digests this mixture well the strength can be increased until within two or three weeks he is taking the food full strength. Increase in the diet should be made with special caution at the beginning of summer or during the heat, when there is great danger of inducing diarrhea. *It is far better to keep the baby on rather a low diet, even without increasing his weight, than to upset the intestinal tract by overfeeding.* If, after trying a new food, vomiting occurs or the stools show that there is indigestion, it is always better to return to the weaker food until the disturbance has subsided.

Symptoms and Conditions Requiring Special Food Variations[1]

In a new case the most important guide in the first food prescription is a knowledge of the condition of the digestive organs. One should know, besides the age and weight, the nature and quantity of the food which has been taken, the appetite, the number and character of the stools, and also whether digestive symptoms are present, such as vomiting, flatulence, diarrhea, colic or constant discomfort. In any case the first prescription is somewhat in the nature of an experiment. Success will depend on how intelligently the symptoms have been judged.

Even with infants who are properly fed there are few

[1] Dr. L. Emmett Holt, "Diseases of Infancy and Childhood." D. Appleton Co., New York City, 1922.

whose digestion remains perfectly normal throughout the entire first year. Changes in the food are therefore necessary from time to time to meet special symptoms which may arise. Many of these are due to disturbances of a minor character, but if they are recognized early and proper changes promptly made, more serious and protracted derangements of digestion can usually be avoided. This is not always an easy matter, but there are some indications which are very clear and definite.

Hot Weather.—The depressing effects of very hot weather upon young infants should be appreciated. At such times less food can be digested and less is required. Owing to an increase in perspiration, the amount of water and consequently the volume of the food should seldom be reduced. The indications are best met by reducing the amount of milk in the formula and making up the deficiency by adding water, i. e., by simply diluting the food. An immediate change therefore should be made from any top-milk formula to one from whole milk or at times even to one from partially skimmed milk. Water should also be given freely between the feedings. As soon as the period of excessive heat has passed, the infant can gradually be brought back to the usual food.

Minor Illnesses.—In attacks of acute rhinitis, otitis, tonsillitis, bronchitis, etc., even though not especially severe, the food should be reduced. The reduction should depend upon the severity of the attack and the amount of fever. The child's apparent appetite is often only a demand for water. At least as much is needed as in normal conditions and usually more should be offered. The indications may be met in the same way as outlined in the preceding paragraph.

Vomiting.—The common causes of habitual vomiting referable to the food are: too much fat, too frequent feedings and too much food at one time; or too much sugar, especially if the sugar is either maltose or cane sugar. An infant who vomits often should not usually be fed at shorter intervals than four hours, even if only a few weeks old. If considerable quantities are ejected almost immediately after feeding, it is generally because too much food has been given. A diminution in the amount of food should bring about immediate improvement. When the fat is in excess, there is vomiting or frequent regurgitation of curdled milk, often long after feeding. Cream mixtures or top-milk mixtures should not be used. If this is not sufficient, the fat should be still further reduced by using less milk or by partially skimming the milk. A return to the former diet should be gradual and for some time neither maltose nor cane sugar should be given.

Other causes must be considered also. The child may be moved about too much or sometimes the clothing may be too tight. More often this frequent regurgitation of food soon after feeding is in consequence of swallowed air which the child has taken with his bottle. This is more likely to be the case when an infant is fed while lying upon the back and when taking his food very slowly owing to a very small hole in the nipple. He is unable to expel the gas in that position, but if lifted to the erect position or placed over the shoulder once or twice during the feeding or after it, he will often bring up a large amount of gas, after which the vomiting ceases.

Constipation.—The principal causes of constipation referable to the food are, too small an amount of carbohydrates, and too small an amount of total solids. Habit and general training are also important factors. Sterilization, and to a slight degree pasteurization, cause milk to be somewhat constipating. During the first few weeks, if the food is rather small in amount, there is often a species of constipation present which is simply the result of the low total solids in the food given. The bowels may move every day, sometimes even twice a day, but the stools are often small and rather dry. As the proportions of all the elements of the food are gradually increased this form of constipation passes away. Mothers and physicians often expect that the bottle-fed infant during his first one or two months will have the two or three large stools daily to which they have been accustomed with healthy breast-fed infants, but finding instead only one movement a day, and that small and sometimes dry, they resort to laxatives or enema, and by their use really cause much of the trouble they are seeking to remove. If milk mixtures are made up without the addition of carbohydrates, constipation frequently results. This is often due to the alteration in the reaction of the contents of the intestines brought about by putrefaction of the protein.

Milk sugar is somewhat laxative and if a smaller amount is being used the raising of the proportion of this ingredient as high as 7 per cent will often be all that is needed. Maltose preparations are also laxative in their effects and may be substituted wholly or in part for milk sugar. Their use will be more fully discussed later. They should not be given if there is vomiting. Cereal gruels, especially oatmeal, also have a favorable influence upon constipation.

Colic and Flatulence.—The habitual colic of early infancy may occur with any form of intestinal indigestion; its causes therefore are varied. Colic and flatulence are especially common in infants who suffer from constipation. Excessive flatulence may occur also when cereal gruels are added to the milk of young infants, particularly if the amount is large. If symptoms are severe a reduction in all the elements of the food may be necessary.

"Curds" in the Stools.—The undigested masses appearing in the stools of infants taking milk are usually spoken of as "curds." These may be small, soft and white, and may make up a large part of the loose stool. An excess of mucus is usually present. Such masses are composed almost entirely of fat. There are also seen, but much less frequently, larger, smooth, hard masses of a yellowish-brown color, but white on section. They are generally present in small numbers in a stool, the rest of which may be quite normal. These hard or "bean curds," so called from their resemblance to lima beans, are composed chiefly of protein, usually with an envelope of fat. They are undoubtedly formed in the stomach, where the casein coagulates into masses, some of which are so firm and hard that they pass the intestine without being digested. Curds of this description are not often seen unless the proportion of casein in the food is high and the milk is given raw.

Curds of the first variety, if numerous, call for a considerable reduction in the amount of fat. The large, smooth, hard curds, if numerous and persistent, may usually be made to disappear by boiling the milk. This causes the precipitation of the casein to occur in smaller masses, which are more readily attacked by the gastric and intestinal secretions.

Loose, Green, or Yellowish-green Stools of a Sour Odor.—These are usually due to too much sugar, especially lactose, sometimes also to an excess of fat. The number of stools is usually from two to five daily. In appearance the stools resemble thin scrambled eggs. Stools such as those described are often seen in nursing infants as well as in those artificially fed and the condition is not incompatible with steady and regular gain in weight. After it has persisted any length of time, mucus is regularly present.

Large, Dry, Light-colored Stools.—Such stools are seen only if infants are fed preponderately or entirely upon cow's milk. The bowels are constipated and the stools may not be passed oftener than once in forty-eight hours. They are relatively large, however, and are so dry that the diaper may be hardly soiled. In addition, they are putty-colored or grayish-green and are very foul with the odor of putrefaction. On analysis they are found to be alkaline in reaction and to contain a large proportion of calcium and magnesium soaps. For a time, infants with such stools may improve and gain in weight. After a time, however, they cease gaining and eventually lose weight while anemia of increasing severity appears and eventually a condition of marasmus may develop. To this condition the name *Milchnährschaden* has been given by Czerny, who believed that an excess of fat in the diet was responsible for it. It is probably due not so much to an excess of fat as to an insufficient amount of carbohydrates. In the absence of this latter, putrefaction of the protein goes on unchecked. This accounts for the character of the stools. It is the insufficient amount of carbohydrates that is chiefly responsible for the symptoms. Many infants may take diluted whole milk without additional carbohydrate and never show such symptoms, but some are rapidly and seriously affected by the absence of carbohydrates.

The condition is readily amenable to treatment. The indications are to diminish the milk if this has been in excess, and to add sugar alone or sugar and some cereal. The mere addition of milk sugar or cane sugar in the quantities usually given may be sufficient. At times, however, even when given in amounts up to the point of tolerance, no improvement is seen. It is then advantageous to give a preparation of maltose in the form of one of the malt soups, with wheat or barley flour in addition. The improvement is seen at once. The stools become acid in reaction, soft and brownish; the general condition shows a distinct amelioration and gain in weight again occurs.

No Gain in Weight without evident Symptoms of Indigestion.—This is sometimes due to too little or too weak food, the child usually manifesting signs of hunger. Occasionally it is due to the fact that the food has been too concentrated or that too much fat has been given. In the latter case it frequently happens that the appetite is much reduced, so that the infant takes perhaps less than half his usual allowance. Too frequent feeding and the practice of constantly coaxing the infant to take more food often produces the same aversion to food. It is much better to offer food only at four-hour intervals and take away the bottle as soon as the child shows that he does not want more.

TABLES FOR FEEDING OF INFANTS[1]

AGE	*OZ. OF TOP MILK	*OZ. OF BOTTOM MILK	OZ. BARLEY WATER	OZ. BARLEY JELLY	OZ. OF BOILED WATER	†SUGAR, LEVEL TEASPOONFULS	AMOUNT OF EACH FEEDING, OUNCES	INTERVALS BETW'N FEEDINGS, HOURS	NO. OF FEEDINGS IN 24 HOURS	‡COMPOSITION OF MIXTURES IN PERCENTAGES: FATS	SUGAR	PRO-TEINS	CALORIE VALUE OF MIXTURES
First Food	5/8	1	..	...	8 3/8	3	1	2	10	1.00	5.00	.50	88
End of 1st week	1 5/8	1 3/4	..	...	10 1/8	4	1 1/2	2 1/2	9	2.00	6.00	.75	173
End of 2d week	2 3/4	1 3/4	..	...	13 1/2	5	2	2 1/2	9	2.50	6.50	.75	263
End of 1st month	3 5/8	3	5	...	8 3/8	7	2 1/2	3	8	3.00	7.00	1.00	335
End of 2d month	4 1/4	4 1/2	5	...	7 1/4	7 1/2	3	3	7	3.50	7.00	1.25	395
End of 3d month	4 3/4	8 7/8	8	...	2 7/8	7	3 1/2	3	7	3.50	7.00	1.50	455
End of 4th month	5 1/2	10 1/2	10	...	2	7 1/2	4	3	7	3.50	7.00	1.75	527
End of 5th month	6 1/4	14 1/8	..	4	5 5/8	7 1/2	5	3	6	3.75	7.00	2.00	593
End of 6th month	7 1/4	18 7/8	..	5	4 7/8	8	6	3	6	3.75	7.00	2.25	722
End of 7th month	8 3/8	25 1/4	..	5	3 3/8	8	7	3 1/2	6	3.75	7.00	2.50	854
End of 8th month	9 3/8	30 1/8	..	5	3 1/2	9	8	3 1/2	6	3.75	7.00	2.50	976
End of 9th month	9 1/8	33	..	5	7/8	8	8	3 1/2	6	3.75	7.00	2.75	990
End of 10th month	9	36 3/4	..	2 1/4	....	6	8	3 1/2	6	3.75	6.50	3.00	977
End of 11th month	9 1/4	38 1/2	..	2 1/4	....	4	10	4	5	3.75	6.00	3.00	988
End of 12th month	Av. whole milk			...	....	...	10	4	5	3.70	4.75	3.20	923

*One quart of whole milk will yield approximately, after standing 8 hours or more, cream with 16% fats in the upper 6 ounces. This is generally known as top milk. The lower 16 ounces is known as bottom milk and contains approximately 1% of fats.

†MALT SUGAR usually preferred in constipation, marasmus, under weight, unable to take a sufficient amount of fat.

†LACTOSE (Sugar of Milk) usually preferred in healthy infants.

‡These percentages can be obtained approximately with average whole milk.

[1]Copyrighted, 1915, Brooks Barley Co., Boston, Mass.

Scurvy.[1]—Scurvy is a disease caused by a lack of certain elements in the food. The condition is rare in breast-fed babies or those fed on raw milk, but is found chiefly in artificially-fed babies who have lived for long periods on sterilized or proprietary foods. Scurvy may be prevented and cured by the feeding of fresh fruit and vegetable juices in addition to the milk.

Rickets.—Rickets is a disease characterized by malnutrition of the bones which frequently results in deformities. The disease is probably due to a diet deficiency but whether it is the lack of mineral substances, especially lime, or the A vitamine or both is still an open question. A diet which supplies both these food constituents proves beneficial. Cod liver oil has a remarkable curative effect.

QUESTIONS FOR STUDY

INFANT FEEDING

1. Give reasons why a baby should be breast-fed if possible.
2. What is colostrum milk?
3. What precautions should be taken both for child and mother in nursing? What care should be taken of the breasts?
4. How often should the baby be fed? How long should be the feeding interval?
5. What is the average rate of gain for the baby?
6. What kind of milk would you select for feeding a baby by bottle?
7. Describe pasteurization of milk.
8. Compare the composition of cow's milk and human milk.
9. Why is cow's milk modified when fed to infants?
10. How may a milk formula be calculated?
11. When is top milk used in infant feeding?
12. What precautions are necessary in the preparation of modified milk?
13. Give directions for feeding from the bottle.
14. What dietary precautions should be used when using pasteurized milk?
15. When should a baby be weaned?
16. How may constipation be counteracted?
17. What is the dietetic treatment for any form of indigestion?
18. How may scurvy be prevented?

[1] "Infant Care," U. S. Department of Labor, Children's Bureau, Care of Children's Series No. 2. Bureau Publication No. 8, Revised 1922.

CHAPTER XXX

THE FEEDING OF YOUNG CHILDREN

The baby is normally weaned sometime between the ninth and twelfth months, when he is given cow's milk diluted with water or cereal gruel to suit his digestive powers, strained fruit juice and a little egg yolk. The egg yolk is necessary to supply iron, in which milk is poor. A baby is born with a reserve store of iron in his body sufficient, together with the small amount in milk, to meet his needs through the greater part of the first year. As soon as his teeth come he should have toast, stale bread or zwieback to massage teeth and gums and to teach him to chew. By the time he is a year old he can usually take whole milk undiluted, strained cereal jelly, fruit juice, egg yolk and dry bread.

The Diet for a Child During the Second Year Should Include:

Milk ....One quart a day. This will supply a large part of his energy requirement of protein, calcium, phosphorous and vitamines and is easy to digest.

Cereals ....Cooked, strained and served with milk but no sugar. The finer varieties, such as cream of wheat, should be cooked from 4 to 6 hours; rolled oats and other coarse cereals should be cooked 12 hours. From ½ to 1 ounce can be given in a day, in one or two meals.

Fruit juice ...1 to 3 tablespoons, strained and given between meals.

Egg Yolk .....Not more than one a day. This may be very slightly beaten and given from a spoon, diluted with water or orange juice if desired. It is better not to give the whole egg because the protein in the diet is already sufficiently high if a quart of milk and cereal are used. White of egg furnishes practically no iron.

Bread ....Which must be stale, thoroughly toasted or zwieback.

Vegetables ....Such as spinach, peas, carrots, potatoes and asparagus tips, should be introduced in the latter part of the year. The liking for vegetables can best be brought about by first using each vegetable as a flavoring in milk. These should be cooked and put through a sieve, seasoned with a little salt and served either plain or thinned with milk. They are valuable for their mineral matter and vitamines and it is important that children be early taught to eat all kinds.

From this short list of foods the requirements of the child for energy, protein, mineral matter and vitamines can be met and no other foods should be given lest the sensitive digestive tract be overtaxed.

Throughout the growing period every child should have a quart of milk a day, if possible and never less than a pint. During the third and fourth years most of it will be drunk, but as the child grows older more of it can be used in simple recipes such as cream soups, white sauce for vegetables, cereal puddings (rice, cornmeal, bread, tapioca, farina) junket, blanc-mange, homemade ice creams, custards, milk toast, etc.

Cereals, preferably hot, should be a part of every child's breakfast, and a cereal of a different character can be used in the menu for the evening meal. If rolled oats is served at breakfast, a bowl of steamed rice or cream of wheat with raisins will make an attractive supper dish. Cereals are bland, easily digested and a fairly rich source of fuel, protein and mineral matter. Cooked in milk instead of water they make it possible to conceal the flavor of milk from a child who dislikes it. They need not be strained after a child is two years old and should be served without sugar.

Fruits should be given once or twice a day. The pulp as well as the juice of any cooked ripe, fresh fruit and of prunes, dates and other mild dried fruit, cooked slowly without sugar, may be used. By the time a child is six years old raw fruits may be given safely if perfectly ripe and free from skin and seeds. Raw bananas are not a good food for little children because the texture of the fruit makes thorough mastication difficult, but may be given in moderation if care is taken to see that they are *thoroughly ripe.*

The variety of vegetables should be increased to include all except those strong in flavor or coarse in texture, such as parsnips and turnips in particular, and all old vegetables in general. They should be cooked and mashed but need not be put through a sieve.

An egg should be provided daily if expense permits, soft cooked in any way or combined with milk in custard, tapioca cream, etc. If eggs cannot be given so often, oatmeal and other whole grain cereals, whole wheat and graham bread and green vegetables must be liberally used to insure an adequate supply of iron.

The bread for little children should always be dry or hard. Muffins, biscuits and other hot breads, and freshly baked bread are too difficult to digest and do not develop the habit of thorough mastication.

There is a difference of opinion as to when meat should be introduced into the diet of children. Dr. Mary Swartz Rose[1] of the Department of Nutrition in Columbia University says:

"With milk freely supplied and an average of one egg a day, there is no call for the introduction of meat into the diet until after a child is seven years old, and on the other hand there are several good reasons for withholding it during these early years. In the first place, meat is of all protein foods most liable to putrefaction in the intestine, and experiments indicate that the younger the child the more speedily these products of putrefaction develop when meat is fed. Since milk feeding will cause the signs of putrefaction to disappear and meat protein is no better for growth than milk protein, the advantage is decidedly with the milk rather than with the meat.

"Another reason for withholding meat is that it naturally tends to displace milk on account of its higher flavor. It

[1] Mary Swartz Rose, Ph.D., "Feeding the Family," Macmillan Co., New York City, 1921.

is also much poorer in ash constituents than milk, being deficient in calcium, of which milk is the most important source. A third reason is that the stimulating extractives in meat, which may be quite useful to a jaded adult, should not be used to whip up the sensitive growing organism, which when healthy is far better off without stimulants of any kind. The two chief advantages of meat are that it requires mastication and exercises the chewing apparatus and that it is a useful source of iron. But dry bread makes excellent chewing material, with none of the disadvantages of meat, while eggs and green vegetables will supply iron in forms believed to be more useful to the child, aside from the fact that the intestinal putrefaction of meat seriously interferes with the utilization of its iron."

Number of Meals.—During the second and third years four meals a day are necessary with the food about equally distributed between them. Children of four, five and six years should have three full meals with a light mid-morning lunch of milk or crackers and milk. When the child begins to go to school a mid-morning lunch is not always possible. When it can be provided it has been shown to be well worth while both from the standpoint of the child's health and of improved attention and ability in the schoolroom. For older children three meals a day are usually sufficient. If the child is hungry after school he may be given a glass of milk or a piece of bread and butter. Sweet cookies, chocolate, etc., should not be permitted, for they tempt him to eat for the sake of the taste alone and destroy his appetite for his evening meal.

Meals for little children should be served with the same strict attention to regularity that is given to the baby, for regularity is an exceedingly important factor in promoting good digestion.

The following models for children's meals are quoted from a pamphlet, "The Children's Food," by Mary S. Rose.[1]

[1] Mary Swartz Rose, Ph. D., "The Children's Food." Published by The Emergency Committee of the American Home Economics Association.

Diet for an Average Healthy Child[1]

CHILDREN ONE AND ONE-HALF TO TWO YEARS

6:00 A. M. 1 cup of warm milk.

8:30 A. M. 2 tablespoonfuls of prune pulp and juice.

9:30 A. M. 1 cup of warm milk.
½ cup well-cooked cereal (served with part of the milk).
1 small slice of toast.

1:30 P. M. 1 cup of warm milk.
1 teaspoonful of egg yolk (in a little of the milk).
1 slice of bread.
1 teaspoonful of sifted and salted spinach, carrots or peas.

5:30 P. M. 1 cup of warm milk.
½ cup well-cooked cereal (served with part of the milk).
1 small slice of toast.

10:30 P. M. 1 cup of warm milk. (This need not be given if the child sleeps through the night without it.)

If this food does not satisfy, give a little more milk, and bread, a teaspoonful of butter spread on the bread, or more cereal. Do not add other kinds of food.

CHILDREN TWO TO FOUR YEARS

7:00 A. M. Juice of one orange or mashed pulp of 1 baked banana or ¼ cup of apple-sauce (from fresh or dried apples).
Bowl of well-cooked oatmeal, with milk.
1 or 2 slices of lightly buttered toast.
1 cup of milk to drink.

10:30 A. M. 1 cup of milk with or without one slice of bread.

1:00 P. M. Bowl of soup made with milk and one or two tablespoons of vegetable pulp.
1 egg yolk on toast or with 1 small baked potato.
1 or 2 slices of bread lightly buttered.
1 small cup of rice or cornstarch pudding, served with milk.

5:30 P. M. Bowl of steamed rice, or other cereal with milk.
1 or 2 slices of lightly buttered toast or bread.
1 cup of milk to drink.

CHILDREN FOUR TO EIGHT YEARS

7:00 A. M. 4 or 5 stewed prunes or 1 baked banana or ½ cup stewed fruit (fresh or dried).

[1] Mary Swartz Rose, Ph.D., "The Children's Food." Published by The Emergency Committee of the American Home Economics Association.

Bowl of well-cooked cereal (oatmeal hominy, farina or cornmeal) with milk.
2 slices lightly buttered toast.
1 cup of milk to drink.

12:30 P. M. Bowl of split pea soup with crisp crackers.
1 baked potato or dish of creamed macaroni or boiled rice.
Small serving of some green vegetable or of stewed fruit when possible.
Cup of custard or bread pudding with milk.

5:30 P. M. Scrambled egg on toast or bowl of cereal with dates and milk.
Bread and butter.
2 small plain cookies.
Cup of milk to drink.

CHILDREN EIGHT TO TWELVE YEARS

7:00 A. M. ½ orange or 4 dates.
Oatmeal with milk.
Toast, lightly buttered.
Milk to drink (may be made into cocoa).

12:30 P. M. Creamed macaroni sprinkled with grated cheese or stewed navy beans with bread sticks, or split peas baked with bacon.
Bread and butter.
Stewed figs, raisins or fresh fruit in season.
Gingerbread.
Milk to drink.

6:00 P. M. Beef stew with potatoes and carrots.
Bread and butter.
Tapioca pudding with milk.
Milk to drink.

The following table gives the energy requirement of children per pound of body weight:

AGE IN YEARS	CALORIES PER POUND
Under 1	45
1-2	45-40
2-5	40-36
6-9	36-32
10-13	34-30
14-17	30-23

The Under-nourished Child.—The problem of the undernourished child is a very serious one. The number of children suffering from under-nutrition is so great, its effects so far reaching, that the question is everywhere today receiving the attention of physicians, nurses and others interested in the welfare of children.

The most conspicuous symptom of malnutrition is underweight. This may or may not be accompanied by other signs of a low nutritive condition. The under-nourished child is usually pale though his complexion may be sallow or muddy. He has blue ridges or circles under his eyes. His muscles are poorly developed, his flesh flabby, his carriage poor, his hair rough and lifeless. He may be listless and unresponsive or restless, irritable and nervous. There are all degrees of under-nutrition ranging from simple underweight to a severe case including several or all of the above symptoms. The under-nourished child is frequently further handicapped by bad tonsils, adenoids or a tubercular condition.

From the standpoint of weight, a child is considered to be under-nourished if he is 10% or more below the normal weight for his height and age. Some authorities regard 7% below normal weight as indicating a condition of malnutrition. For example, a boy of nine who is 50 inches tall should weight 60 pounds according to the tables of average weight and height for boys of that age. If he weighs 50 pounds he is 10 pounds or 16% underweight.

Standards for weight and height of children of different ages are given on the following page.

AVERAGE WEIGHT AND HEIGHT OF CHILDREN FROM BIRTH TO FIFTH YEAR[1]

AGE	BOYS		GIRLS	
	Height	Weight	Height	Weight
	Inches	*Pounds*	*Inches*	*Pounds*
Birth	20.6	7.6	20.5	7.16
3 mos.	23½	13	....	....
6 "	26½	18	25⅞	16¾
7 "	27¼	19⅛	26½	17⅜
8 "	27⅝	19¾	27	18¼
9 "	28⅛	20⅜	27⅝	19⅛
10 "	28½	20⅞	27⅞	19½
11 "	29	21⅜	28⅜	20⅛
12 "	29⅜	21⅞	28⅞	20¾
13 "	29⅞	22⅞	29⅜	21
14 "	30¼	23	29½	21⅝
15 "	30¾	23⅝	30⅛	21⅞
16 "	31⅛	24⅛	30½	22⅝
17 "	31⅜	24½	30¾	22⅞
18 "	31¾	24⅝	31⅛	23⅜
19 "	32¼	25½	31½	23¾
20 "	32⅝	25¾	32	24⅛
21 "	32⅞	25¾	32¼	24¾
22 "	33¼	26⅞	32⅝	25¼
23 "	33⅝	27	32⅞	25⅝
24 "	33¾	27⅛	33⅜	26⅜
25 "	34	27⅞	33¾	26⅞
26 "	34⅛	28¼	33⅞	27¼
27 "	34¾	29	33⅞	27¼
28 "	35⅛	29⅛	34⅝	27¾
29 "	35⅜	29¼	34¾	27¾
30 "	35⅜	29½	34⅞	28¼
31 "	35½	30½	35⅛	28¾
32 "	36	30⅝	35⅜	29
33 "	36⅛	30⅝	35⅝	29⅛
34 "	36½	31⅛	36½	30⅛
35 "	36¾	31⅞	36½	30¼
36 "	37⅛	32¼	36¾	30½
37 "	37⅜	32¼	36¾	30¾
38 "	37½	32⅜	37	31
39 "	37⅞	33⅛	37¼	31⅝
40 "	38½	33½	37½	32
41 "	38⅝	33⅝	37¾	32¼
42 "	38⅝	33¾	38	32½
43 "	38¾	33¾	38¼	32¾
44 "	38⅞	34¼	38½	33
45 "	39	34½	38½	33¼
46 "	39	34¾	38¾	33½
47 "	39¼	35¾	38⅞	33½
48 "	39½	35⅞	39	33¾
5 yrs.	41.6	41.1	41.3	39.7

[1] Reprinted by permission of the Children's Bureau, United States Department of Labor.

AVERAGE WEIGHT AND HEIGHT OF BOYS AT DIFFERENT AGES.*

Height Inches.	5 yrs.	6 yrs.	7 yrs.	8 yrs.	9 yrs.	10 yrs.	11 yrs.	12 yrs.	13 yrs.	14 yrs.	15 yrs.	16 yrs.	17 yrs.	18 yrs.
39	35	36	37											
40	37	38	39											
41	39	40	41											
42	41	42	43	44										
43	43	44	45	46										
44	45	46	46	47										
45	47	47	48	48	49									
46	48	49	50	50	51									
47		51	52	52	53	54								
48		53	54	55	55	56	57							
49		55	56	57	58	58	59							
50			58	59	60	60	61	62						
51			60	61	62	63	64	65						
52			62	63	64	65	67	68						
53				66	67	68	69	70	71					
54				69	70	71	72	73	74					
55					73	74	75	76	77	78				
56					77	78	79	80	81	82				
57						81	82	83	84	85	86			
58						84	85	86	87	88	90	91		
59						87	88	89	90	92	94	96	97	
60						91	92	93	94	97	99	101	102	
61							95	97	99	102	104	106	108	110
62							100	102	104	106	109	111	113	116
63							105	107	109	111	114	115	117	119
64								113	115	117	118	119	120	122
65									120	122	123	124	125	126
66									125	126	127	128	129	130
67									130	131	132	133	134	135
68									134	135	136	137	138	139
69									138	139	140	141	142	143
70										142	144	145	146	147
71										147	149	150	151	152
72										152	154	155	156	157
73										157	159	160	161	162
74										162	164	165	166	167
75											169	170	171	172
76											174	175	176	177

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AVERAGE WEIGHT AND HEIGHT OF GIRLS AT DIFFERENT AGES.*

Height Inches.	5 yrs.	6 yrs.	7 yrs.	8 yrs.	9 yrs.	10 yrs.	11 yrs.	12 yrs.	13 yrs.	14 yrs.	15 yrs.	16 yrs.	17 yrs.	18 yrs.
39	34	35	36											
40	36	37	38											
41	38	39	40											
42	40	41	42	43										
43	42	42	43	44										
44	44	45	45	46										
45	46	47	47	48	49									
46	48	48	49	50	51									
47		49	50	51	52	53								
48		51	52	53	54	55	56							
49		53	54	55	56	57	58							
50			56	57	58	59	60	61						
51			59	60	61	62	63	64						
52			62	63	64	65	66	67						
53				66	67	68	68	69	70					
54				68	69	70	71	72	73					
55					72	73	74	75	76	77				
56					76	77	78	79	80	81				
57						81	82	83	84	85	86			
58						85	86	87	88	89	90	91		
59						89	90	91	93	94	95	96	98	
60							94	95	97	99	100	102	104	106
61							99	101	102	104	106	108	109	111
62							104	106	107	109	111	113	114	115
63							109	111	112	113	115	117	118	119
64								115	117	118	119	120	121	122
65								117	119	120	122	123	124	125
66								119	121	122	124	126	127	128
67									124	126	127	128	129	130
68									126	128	130	132	133	134
69									129	131	133	135	136	137
70										134	136	138	139	140
71										138	140	142	143	144
72											145	147	148	149

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The School Lunch

In many cases the child must carry his noon meal to school. A box lunch must be planned with thought and carefully prepared if the child's good digestion and health are to be maintained. The choice of dishes is necessarily limited and monotony difficult to avoid, and yet with care some variety is possible. The following suggestions are offered for box lunches to be carried from home:

Sandwiches	White, graham, whole wheat, raisin, rye and brown bread or Wheatsworth crackers may be used.
Fillings may be:	
Peanut butter	Thinned with salad dressing or cream or honey.
Nuts	Ground or chopped finely and mixed with salad dressing. Finely chopped celery, dates or raisins may be added, or cottage or cream cheese.
Lettuce	Spread with a little salad dressing.
Lean meat	Beef, lamb, tongue, ham, chicken, sliced thin or chopped and moistened with salad dressing.
Fish	Salmon, tuna or sardines, moistened with salad dressing or lemon juice.
Eggs	Hard cooked and chopped and mixed with a little salad dressing.
Cheese	American or cottage or cream or pimento.
Jelly	Of various kinds or plain bread and butter sandwiches.
Fruit	Apples, bananas, oranges.
Prunes and dates	Plain or stuffed with cheese or nuts.
Cooked fruit	Baked apples, stewed prunes or other cooked fruit without too much juice can be carried in custard cups or waxed paper containers.
Cake	Plain or sponge cake. Better not rich cake with frosting.
Puddings	Rice, bread, cornstarch and other simple puddings packed in custard cups.
Milk	Milk may be carried in small bottles.
Sweet Chocolate	An occasional small cake.
Crackers	Wheatsworth or graham crackers and sweet crackers of various kinds.
Cookies	Plain, oatmeal and molasses.

SAMPLE MENUS FOR LUNCH BOXES

1. Plain bread and butter sandwiches or Wheatsworth crackers.
   Prunes stuffed with nuts and cottage cheese.
   Apple.
   Cup custard.
2. Peanut butter sandwiches.
   Lettuce sandwiches.
   Cup apple sauce.
   Oatmeal cookie.
3. Brown bread and cottage cheese sandwiches.
   Celery, with small package of salt.
   Dates.
   Orange.
4. Chopped meat sandwiches.
   Jelly sandwiches.
   Baked apple stuffed with nuts and raisins.
   Sponge cake.

Hot Dishes Served at School.—The child's lunch is greatly improved if it is supplemented by one or more hot dishes served at school. The following is a list of hot dishes intended to supplement the lunch brought from home. It will be noticed that nearly all of the recipes contain milk.

Suggestions for simple hot dishes which can be prepared with limited equipment and a small expenditure of time:

Cocoa.
Cream soups—corn, celery, tomato, bean, baked bean, potato, pea, spinach, etc.
Macaroni and cheese.
Macaroni and tomatoes.
Rice and cheese.
Rice and tomatoes.
Scrambled eggs.
Creamed eggs.
Eggs—goldenrod.
Boiled rice with raisins.
Cornstarch pudding.
Milk toast.

The following references will be found helpful in planning box lunches and menus for the school lunchroom:

"School Lunches." Caroline Hunt and Mabel Ward. Farmers' Bulletin 712. U. S. Department of Agriculture.

"Diet for the School Child." Department of the Interior. Bureau of Education. Health Education No. 2. Price 5 cents.

"The Lunch Hour at School." Department of the Interior. Bureau of Education. Health Education No. 7. Price 5 cents.

"The Rural Hot Lunch and the Nutrition of the Rural

Child." Mary G. McCormick. University of the State of New York Bulletin, Albany, No. 696.

"New York Bulletin," Albany, No. 696.

"The School Lunch." Mary Peck. University of Illinois. College of Agriculture, Urbana, Illinois. Extension circular No. 41.

Diet for the Adolescent

The period of adolescence is one of rapid development in many ways for both boys and girls. Boys especially are growing fast and as a rule are very active, hence their energy requirement is large, sometimes as high as 3500 calories or more than is required by many full-grown men. Girls need less fuel but have a special requirement for iron due to some loss from menstruation. The diet for both girls and boys should be simple and varied and should include liberal amounts of milk and vegetables, especially green vegetables and fruits. Rich meats, sauces, pastries and hot breads must be avoided.

Regularity of meals is still important and the taking of candy, sodas, etc., between meals should be discouraged. Children should never be allowed to omit breakfast. It is practically impossible to meet the high food requirements of childhood with less than three meals a day and when breakfast is omitted under-nutrition is a frequent and natural result.

The appetite of young girls at this time is often poor or capricious. They may develop a distate for cereals, milk and other plain foods. Much may be done to tempt the girl to eat the foods which should be a part of her diet by serving them in attractive forms. Salads are almost always acceptable and a great variety of vegetables and fruits may be used in this way. The flavor of milk may be changed by serving it as cocoa or flavored with cereal coffee, or in puddings of various kinds, ice creams and sherbets, cream sauce for vegetables or by cooking breakfast cereals in milk instead of water. The addition of chopped dates, raisins or prunes to cereals often makes them more acceptable to girls. Attention to color, garnishes and attractive ways of serving foods is necessary and a great deal may often be accomplished by interesting the girl herself in the importance of eating wisely for her own health.

QUESTIONS FOR STUDY

YOUNG CHILDREN

1. What foods should make up the diet of the child during the second year?
2. Why is milk so important a food throughout the period of growth?
3. Why are vegetables important?
4. When should meat be introduced into the child's diet?
5. Why should its use be restricted?
6. How often should children from 5 to 6 be fed?
7. Suggest the type of food to be included in child's school lunch.
8. What dietary rules apply to the period of adolescence?

CHAPTER XXXI

DIET FOR OLD AGE

Since there is a radical difference between a person merely old in years and one who is physiologically old no dietary can be constructed to suit the needs of all those of advanced years. As a man grows older his physical activity usually decreases and his energy requirement correspondingly lessens. Since protein is no longer needed for growth but only for repair of wornout tissues the amount required will be lessened. In true old age there is, in addition to this, a gradual slowing up of all the body processes, resulting in a further decrease in the amount of food needed as well as a decreased power to digest and assimilate large quanities of food. When the teeth are lost mastication is impossible and all foods used must be those which do not require chewing.

Food Needs for the Aged:

1. The amount of food required is less than for an average adult of the same size.
2. The amount of protein in the diet should be kept low. 1½ calories per pound of body weight is sufficient for the body needs. Overeating shoud be guarded against.
3. The meals must be simple, emphasizing ease of digestion in the selection and preparation of foods.
4. Four or five light meals are usually better than three meals a day.

Kinds of Food to Use:

Milk .... Served hot or cold, in weak cocoa or café au lait, ice cream, custards, cereal puddings, cream soups, etc.

Lean Meats and Fish. Unless there is difficulty in the elimination of uric acid, may be eaten once a day. Bacon is also allowable. Clear soups and broths are stimulating and refreshing and may be used unless meat is contra-indicated. If there is a tendency to intestinal putrefaction meat of all kinds must be excluded.

Eggs	In all ways except fried.
Cereals	Thoroughly cooked. If mastication is possible, crisp shredded wheat biscuits, cornflakes, etc., may be served.
Bread	Preferably toasted. Freshly baked bread and hot breads of all kinds should be excluded.
Vegetables	Of almost any kind unless they are found to disagree. Onions, turnips, cooked cabbage and beans are apt to cause flatulence and are therefore better excluded. Purées are an excellent way to serve vegetables.
Fruits	If ripe and thoroughly cooked. It may be necessary to strain them and to give only the juice and pulp of mild ripe fruits.

Number of Meals 4 to 5.—A suggested schedule for meals is as follows: Breakfast at 7:30 or 8:00 A. M., luncheon at 12:30 or 1:00 P. M., dinner at 6:00 P. M., a cup of hot milk or tea or broth on going to bed.

Sometimes a cup of coffee or tea early in the morning before arising is helpful. Tea, broth or other light nourishment in the afternoon often relieves fatigue and is a good preparation for the evening meal.

AVERAGE WEIGHT OF OLD MEN AND WOMEN[1]

AGE IN YEARS	MEN POUNDS	WOMEN POUNDS
60	144	125
70	139	125
80	135	113
90	127	109

QUESTIONS FOR STUDY

OLD AGE.

1. Outline dietary rules for feeding in old age.
2. How does the food requirement of the aged differ from that of the active adult?

[1] From Bulletin No. 223. Office of Experiment Station, U. S. Department of Agriculture (calculated to pounds).

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GENERAL INDEX

C.

Gordon & Dilworth
CALF'S FOOT JELLIES

This particular form of appetizing nourishment is prescribed by doctors, and used extensively in hospitals, as the most nourishing food for invalids, especially in cases where the stomach will not retain more solid foods.

Patients have thrived upon it, alone, for long periods, with an appreciable gain in strength.

Served with shaved or cracked ice, it will be found tempting to a poor appetite. At a temperature of 60 degrees, it becomes a delicate jelly which will dissolve quickly when placed on the tongue:

(In half-pint and pint glass
jars, and 9 oz. tumblers)

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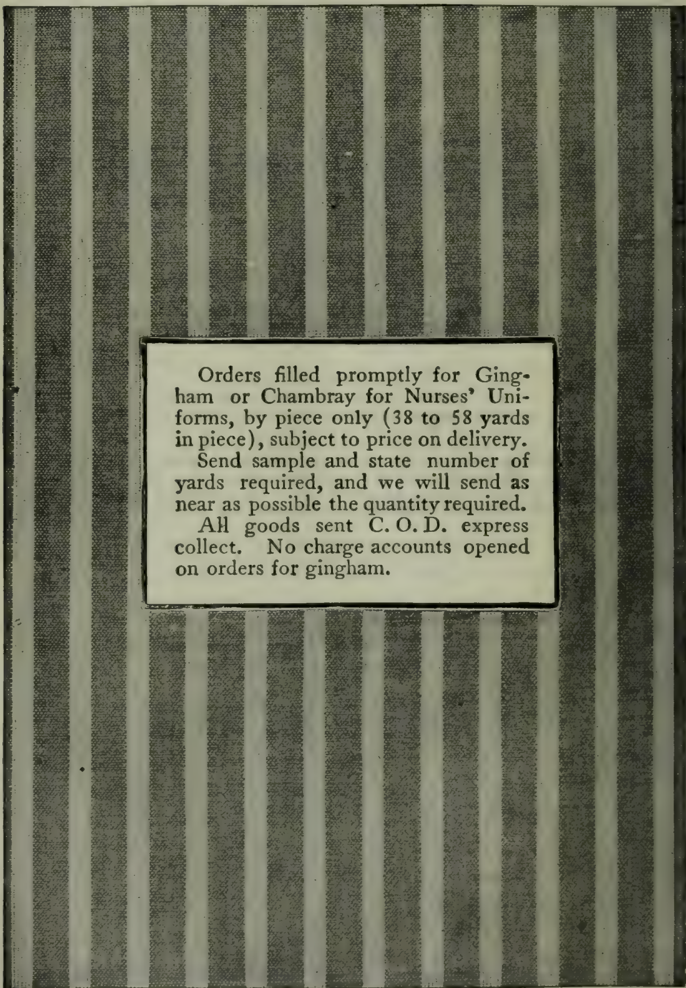

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