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FOOD VALUES: HOW FOODS MEET BODY NEEDS.

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CONTENTS.

WHAT THE CHARTS SHOW.

The purpose of this bulletin is to bring out certain important and well-established facts by a new and graphic method. Up to this time the composition of foods has been presented to the housekeeper and the student chiefly by means of figures and in terms of percentages. This bulletin presents such facts not only in the older way but also by diagrams which should appeal quickly to the eye and be of assistance to the memory.

In estimating to what extent a certain food supplies the various substances required by the body or whether or not a diet meets the needs of the person who uses it, two sets of facts are needed—the kinds and amounts of substances required by the body, and the amounts of these substances supplied by different food materials. The more clearly these facts can be shown, the easier it is to plan satisfactory meals.

Through scientific research, the food needs of persons of different age, sex, and occupation are so well established that general statements can be made as to the number of calories of energy and the amount of protein, fat, and carbohydrates that should be provided for each. In this way have been gathered data about how much of these main nutrients and how much energy are furnished by the common food materials, and simple statements of these facts are

fairly common.[1] There are, however, other essentials in the diet which can not be explained so easily. For example, it has been difficult to make helpful statements about the mineral matters, the more important of which are iron, calcium, and phosphorus. It is fairly well known how much of these are needed by the body and how much are found in different food materials, but in both cases the quantities are so small (only a few grams or even milligrams per man per day or per pound of material) that it is impracticable to measure them by pounds or ounces as we do the food materials that supply them.

In general, the plan here followed is to make a graphic comparison between a pound of some of the common foods and the daily needs of a man who does moderately active muscular work. No one would think, of course, of trying to live on one food alone, but the comparison made by the charts is helpful in combining food materials so as to make a complete ration, for it shows not only what a given food supplies but also what it lacks. The milk diagram (p. 20) is a good illustration. A glance at it shows that a pound (pint) of milk would supply 9 per cent of the energy or fuel, 15 per cent of the protein, 80 per cent of the calcium, 32 per cent of the phosphorus, but only 7 per cent of the iron needed daily by a man who does moderately active muscular work. Or, to put it another way, if a pint of milk is used in the daily dietary of this man, the remaining foods must supply 91 per cent of the fuel needed, 85 per cent of the protein, 20 per cent of the calcium, 68 per cent of the phosphorus, and 93 per cent of the iron. To speak in particular only of the calcium and the iron, which offer a striking contrast, the remaining 20 per cent of the calcium would almost inevitably be supplied by the other foods even if they were selected at random, while it might require some thought to supply the other 93 per cent of the iron.

In making these comparisons it is assumed that the food supply of a man who does moderately active muscular work should furnish 3,500 calories of energy, or body fuel, 100 grams (3½ ounces) of protein, 0.68 gram of calcium, commonly called lime, 1.32 grams of phosphorus, and 15 milligrams of iron. This amount of food makes provision for waste, of which a certain amount is unavoidable. It is generally agreed that a properly nourished man doing moderately active muscular work eats daily food that supplies about 3,000 calories, and that to be sure of supplying this amount the foods provided for him should furnish about 3,500 calories. The allowance of 100 grams of protein provides a generous margin of safety above the actual protein requirement, and the allowances for calcium,

[1] U. S. Dept. Agr., Farmers' Bul. 142, Principles of Nutrition and Nutritive Value of Food; Farmers' Bul. 808, How to Select Foods. I. What the Body Needs.

phosphorus, and iron are slightly higher than what is considered a minimum requirement to cover possible waste and lack of utilization.

The needs of a man at moderately active muscular work are almost universally adopted as the unit for measuring food needs, and for this reason they are used in this publication. For some persons, it may be more to the point to know what percentage a given food supplies of the nutrients needed by the average adult, by the average family, or by some other individual or group. To change the percentages so that they will apply to the needs of the average adult, the man doing little or no muscular work, or the woman doing moderately active muscular work, they need only to be increased one-fourth. This must not be taken to mean that the man doing little or no work needs one-fourth more food than the man doing active work, but that he derives a higher proportion of the food needs of his body from a pound of a given food. For the woman doing little or no muscular work, they should be increased one-half. For the average family, which is supposed to consist of a man and a woman, both doing moderately active muscular work, and three young children, they should be only three-tenths as great. For example, a pound of oatmeal, which supplies 52 per cent of the fuel needed daily by a man at moderately active work, will supply 65 ($1\frac{1}{4}\times52$) per cent of the fuel needed by the average adult, 78 ($1\frac{1}{2}\times52$) per cent of the fuel needed by a woman who does little or no muscular work, and about 16 ($\frac{3}{10}\times52$) per cent of the fuel needed by the average family. More detailed information on working out the energy requirements of various individuals and families is given in other publications of this department.[1]

The charts will be found useful in various ways. The heavy lines, even without the figures that accompany them, show for what constituents the various foods are specially valuable. For example, the comparatively long lines representing iron in spinach, calcium in cheese, fuel in butter, phosphorus in peanuts, and protein in such foods as milk, eggs, and meat, show at a glance the nutrients in which these foods are rich.

The lines and figures also furnish an easy means of comparing one food with another. The energy lines on the sweet and Irish potato charts, for instance, show that the former has a higher fuel value. The protein lines on the oatmeal and rice charts show that as a source of protein, oatmeal excels rice. The calcium lines on the string bean and tomato charts show that the former is richer than the latter in lime. The phosphorus lines in corn and spinach show that corn is richer in this particular element. The iron line in lettuce as com-

[1] U. S. Dept. Agr., Farmers' Bul. 142, Principles of Nutrition and Nutritive Value of Food; Farmers' Bul. 1228, A Week's Food for an Average Family.

pared with that in turnips shows that lettuce is a better source of iron. By comparing the lines in the different charts in this way, a person can see what the various foods can be depended on to supply.

Not aways, however, is the body able to utilize equally well the nutritive elements present in different kinds of food. As will be discussed later, care must be used to select foods not only from a quantitative standpoint, but also with reference to digestibility, cost, dietary suitability, and the relative values of the types of protein, fat, carbohydrate, calcium, phosphorus, and iron which they may contain.[1]

FOOD VALUES NOT SHOWN ON THE CHARTS.

In publishing these charts, which deal with food factors that can be measured by weight, there is no intention of undervaluing those other factors that can not be so measured, namely, the vitamines. Though the quantities of vitamines in different food materials have not yet been determined and the comparative vitamine values can not yet be satisfactorily expressed by lines or figures, general statements can be made in many cases and are given in connection with the charts.

Scientists now recognize at least three vitamines which, until more satisfactory names are agreed upon, may be called A, B, and C. Vitamine A is believed to be necessary for normal growth and development. It is sometimes known as fat-soluble A, because it is found associated with fat, and sometimes as the antirachitic vitamine, because when it is absent from the diet rachitis, or rickets, is likely to occur. It is found in milk, egg yolk, green-leaf vegetables, fats surrounding the vital organs of animals, and to a less extent in meat, and perhaps in certain fruits. Vitamine B is also believed to be necessary for general well-being. It is sometimes called water-soluble B, and sometimes the antineuritic vitamine, because lack of it may bring on polyneuritis, or beriberi. It is present in nearly all food materials except those that have been artifically purified, such as white sugar, white flour, and cornstarch, and most table oils. Vitamine C is sometimes known as water-soluble C, or as the antiscorbutic vitamine, because lack of it may be a cause of scurvy, or scorbute. It is found especially in certain fruits and vegetables, among them tomatoes, carrots, oranges, lemons, and grapefruit. It also occurs in fresh milk and probably in meat. Its efficacy in some foods seems to be easily destroyed by heat and sometimes by drying or even by ordinary storage, so that raw, fresh foods are in general the more reliable sources of it.

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[1] The charts are based on average analyses published in Chemistry of Food and Nutrition, by H. C. Sherman, New York, 1918, and on additional data determined by Lucy H. Gillett at Columbia University.

ARRANGEMENT OF THE CHARTS.

The charts of the foods that resemble each other in certain important particulars are arranged in the five following groups: Vegetables and fruits; milk, eggs, cheese, and flesh foods; cereals and cereal preparations; sugar and sugary foods; and fats and fat foods.

Group I. VEGETABLES AND FRUITS.

(Charts 1–18, pp. 11–20.)

Vegetables and fruits are characterized by large percentages of mineral substances as compared with fuel and protein, and are important as furnishing bulk in the diet. Fruits that have been preserved by the addition of a large amount of sugar, whether in the form of rich preserves, jellies, jams, or marmalades, are not included in this group but with the sweets, for in such foods the mineral value is subordinated to the fuel value. The vegetables and fruits differ greatly among themselves in respect to the vitamines they supply, but the exact quantities supplied by each are not known. They also vary considerably with reference to the amount of water and inedible material in the pound as purchased and consequently in the amount of energy supplied.

The charts of vegetables and fruits are notable for the length of the lines representing mineral constituents as compared with those representing energy and protein. These lines show the basis for the familiar statement that vegetables and fruits are a good source of mineral substances in the diet. The reason for this is not that they contain more mineral substances per pound than other foods. In fact, as the charts show, they contain less in many cases. It is rather that these foods can be eaten in large amounts without danger of overloading the diet with protein and fuel. As an example of this, Irish potatoes (chart 1) may be compared with another starchy food, such as rice (chart 35). It takes only about $3\frac{1}{3}$ pounds, or 10 medium-sized, potatoes to furnish all the iron needed per man per day, and this amount of potatoes would supply only about 30 per cent of the needed fuel, leaving 70 per cent to be furnished by other common foods of the diet. Of rice, on the other hand, it would take nearly 4 pounds to supply the required amount of iron, and this quantity when boiled would measure at least 6 quarts and would alone furnish about twice the needed fuel.

A pound of the least watery kind in the fresh vegetable group, namely, sweet potatoes, as shown on page 12 (chart 2), would furnish about 13 per cent of the needed energy, and a pound of the one with the most water and inedible material, namely, muskmelon (chart 15), would furnish 3 per cent. Of the foods in Group II, on the other

hand, none supply less than 5 per cent, and several supply more than 50 per cent of the needed energy.

On the average, the fresh vegetables and fruits furnish per pound less than 6 per cent of the energy and protein needed, and 18, 13, and 23 per cent, respectively, of the calcium, phosphorus, and lime. In short, these foods are convenient for increasing mineral substances in the diet without increasing fuel beyond the desirable amount.

Dried beans, prunes, and raisins, all of which are, of course, far less watery than the fresh fruits, are shown in charts 16, 17, and 18, respectively. It should be noted, however, that as in the case of fresh vegetables and fruits, the lines representing calcium, phosphorus, and iron are long as compared with those representing fuel and protein. The dried vegetables and fruits, like the fresh vegetables and fruits, are important for supplying mineral substances. Dried beans are so rich in protein that they are often considered a meat substitute, but they differ from meat in some important particulars (see Group II).

The vegetables and fruits, particularly if uncooked, are almost without exception, important sources of vitamines in the diet. Practically all of them furnish vitamine B, which in fact is seldom lacking in the ordinary mixed diet; only in very one-sided diets consisting chiefly of polished rice or other refined cereals is it absent. The leaf vegetables, such as lettuce and spinach, supply vitamine A. Vitamine C, which is believed to prevent scurvy, is probably supplied by oranges and tomatoes better than by the other foods here shown. Potatoes, carrots, cabbage, and rutabagas are also sources of vitamine C.

The points to remember about foods in this group are:

(1) Vegetables and fruits are useful in supplying mineral substances and bulk in the diet without unduly increasing protein and fuel.
(2) All fruits and vegetables, even dried legumes which contain comparatively high proportions of protein, need to be supplemented by milk, eggs, cheese, and flesh foods.
(3) Practically all vegetables and fruits are rich sources of one or more vitamines. The green-leaf vegetables are believed to be especially valuable sources of vitamine A, and oranges, lemons, and tomatoes of vitamine C.

Group II. MILK, EGGS, CHEESE, AND FLESH FOODS.

(Charts 19–30, pp. 21–26.)

Group II includes milk, eggs, cheeses of various kinds, meats except the very fattest, poultry, game, fish, sea foods, and also two of the legumes, namely, soy beans and peanuts, or, in general, all foods that contain efficient protein in amounts sufficient to supply at least one-sixth of their total fuel. These foods differ greatly among themselves in fatness and therefore in fuel value, in the amounts and kinds of minerals they contain, and also in their importance for supplying vitamines.

The foods of this group are characterized by comparatively large amounts of protein, as shown by the length of the second line on the charts. In this respect they resemble somewhat the cereals (Group III), except that in the cereals the other especially abundant nutrient is starch, whereas in the foods in Group II it is fat. The protein of the foods in Group II also differs from that of the cereals in being more adequate, or efficient, that is, more like body protein. Almost all the foods of this group are of animal origin. Peanuts and soy beans, of which the former only is shown here, are among the few exceptions. These foods differ from the other legumes, that is, dried beans, peas, and lentils, in containing efficient, or adequate, protein.

A given weight of fat yields the body over twice as much fuel as the same weight of protein, starch, or sugar, and the foods in Group II that show exceptionally long lines representing energy are those in which fat is especially abundant. Examples are beef and mutton (charts 24 and 25), cheese made from whole milk (chart 22), and peanuts (chart 30). Such long lines for energy suggest the wisdom of serving vegetables that have low fuel values with meats, of combining cheese with starchy foods such as macaroni, crackers, or rice rather than with such foods as butter or cream, and of making allowance for the fat of peanuts in combining them with other foods.

The comparatively short lines representing energy in the egg, cottage cheese, skimmed milk, and fresh codfish charts (charts 23, 21, 20, 27, respectively) are due to the small amount of fat they contain. The common custom of cooking eggs with butter, as in scrambling, or of serving them with bacon, or of serving codfish with sauces containing butter, egg yolks, or milk, compensates for the low proportion of fat and energy in these materials.

In comparing the various charts in this group, the small amount of iron in milk, cottage cheese, and fish and the rather large amount in eggs, beef, and mutton will be noted. Meats, though rich in iron, contain far less calcium, however, than milk and its products. These differences justify the use of eggs with milk as in custards, with cheese as in the baked dish known as cheese fondu, and with fish either in the form of slices of hard-boiled eggs or as an ingredient of a sauce. Since it is generally believed that the amount of calcium in the average diet runs very close to the lower limit of safety, the wisdom of using more milk and milk products than many people do is indicated.

Among the foods of this group, milk and egg yolks are most valuable in supplying vitamines A and B. Fresh raw milk is believed to provide the third, or antiscorbutic, vitamine, but its value in this

respect is low as compared with the juice of oranges, lemons, grapefruit, or tomatoes.

The points to remember about foods in this group are:

(1) Milk, eggs, cheese, flesh foods, and the others of this group are the most important protein foods in the diet.
(2) These are the foods that must be depended on for efficient protein, or, in other words, for the protein that can be used to special advantage by the body.
(3) Milk is one of the best foods for young and old, and can not be satisfactorily replaced by any other food in the diet of growing children.
(4) Some of these foods are rich in mineral substances, for example, meats and egg yolks in iron, milk in calcium, and peanuts in phosphorus.
(5) Many of these protein foods, especially milk and egg yolks, are valuable sources of vitamines A and B.

Group III. CEREALS AND CEREAL PREPARATIONS.

(Charts 31–38, pp. 26–30.)

Cereals and their products contain comparatively large amounts of protein, usually associated with several times its weight of starch and, if the outer coatings of the grains are included, with vitamines and considerable amounts of mineral substances, particularly phosphorus. The protein, however, is not so efficient as that of the foods in Group II.

In all the charts representing cereals, the first and second lines are very nearly the same length. This indicates that in eating a given amount of cereal a person obtains about the same percentage of his needed energy as of his needed protein. A large slice of bread (1½ ounces), for example, supplies about 3 per cent of the fuel needed per man per day, and also about 3 per cent of the protein. Most people use more cereal foods than any other one kind. They generally use with the cereal foods some others, such as meat, eggs, or milk, which increase the protein, and still others, such as butter or sweets, which add to the energy value of the diet. Thus, in the ordinary mixed diet, the protein and the energy will probably bear the same proportion to each other that they do in the cereals.

The charts representing cereal foods differ far less one from another, particularly in the lines representing energy and protein, than those of any other group. As a matter of fact, the cereals themselves, which include wheat, oats, corn, rice, rye, and barley, differ very little in food value. The foods such as flour, meal, and breakfast foods that are made from cereals also differ very little, provided the same method of preparation is followed. For example, a whole-grain meal or breakfast food would have much the same composition whether it were made of corn, rice, wheat, or rye. On the other hand, a refined preparation of one cereal differs greatly, particularly in mineral substances, from a whole-grain preparation,

whether of that same cereal or some other. For example, white wheat flour is very different in composition from cracked wheat or brown rice.

It is necessary only to glance at the lines representing mineral substances in oatmeal and graham flour (charts 31 and 33), which contain nearly the entire grain, as compared with those in white flour (chart 32) from which the outer layers have been removed, to understand the theory that persons who can get few vegetables and fruits, which are rich in mineral substances, should use whole-grain rather than refined cereal foods.

The vitamine B is the chief one of the three vitamines provided by the cereal grains. It is found chiefly in the part of the grain near the germ; and when cereals, especially refined products, form the main part of the diet, care must be taken to provide vitamines from other sources, such as dairy products, vegetables, and fruits.

The points to remember about foods in this group are:

(1) Cereals are the staple of the diet the world over because they are available almost everywhere, are easy to store and transport, and are relatively cheap.
(2) Cereal foods provide protein and energy in about the proportions needed by the body. Their protein is, however, of such kind that it needs to be supplemented by that of milk, eggs, cheese, and flesh foods.
(3) When made from the whole grains, cereal foods also supply some mineral substances and vitamines.
(4) A diet containing large proportions of refined cereal foods must be supplemented by plenty of dairy products, vegetables, and fruits.
(5) The various kinds of cereals used in the diet differ little in fuel value; rice, wheat flour, and cornmeal, for example, all yield about 1,600 calories to the pound.

Group IV. SUGAR AND SUGARY FOODS.

(Charts 39–42, pp. 30–32.)

Group IV includes sugar, sirup, molasses, honey, preserves, jellies, jams, marmalades, and candy, or, in general, all foods that furnish sugar chiefly.

The charts of this group show that sugar and foods consisting chiefly of sugar are mainly useful in supplying energy. Refined white sugar (granulated, lump, powdered, confectioners') is, in fact, all sugar. Brown and maple sugars, molasses, and maple sirup would show some protein and mineral matters, because they have some of the other ingredients of the juice or sap left in them. Dried prunes and raisins (charts 17 and 18) contain so much sugar that they are often grouped with the sugary foods. In addition to their energy, they contain mineral matters and some protein, as is natural considering that they are practically like fresh fruits except that most of the water has been removed. Jelly and preserved fruit

(charts 41 and 42) show some mineral matters and protein, but have relatively longer lines for energy because of the sugar used in preparing them. How much the efficacy of the vitamines survives drying and preserving is a question that has not yet been completely answered.

The group of sugary foods has another very important use—that of giving flavor to the diet, but this can not be expressed by lines on the diagrams.

The points to remember about foods of this group are:

(1) Sugar and sugary foods are valuable for fuel and for flavor.
(2) A few sweet foods, such as maple sirup, jelly, and preserved fruits, also contain small amounts of protein and mineral substances.
(3) Sweets in proper amounts are an important part of the diet, provided they are served at such times as not to take away the appetite for other foods.

Group V. FATS AND FAT FOODS.

(Charts 43–48, pp. 32–35.)

In Group V are classed butter and other table fats; lard, suet, and other cooking fats; oil; bacon, salt pork, and pork sausage; chocolate; cream; fat nuts, which include all the common nuts but chestnuts; and in general, all foods in which fat supplies at least five-sixths of the total fuel, leaving only one-sixth to be supplied by protein, starch, or sugar. They differ greatly among themselves in respect to the minerals and vitamines they supply.

The length of the first line in the charts of this group, when compared with the first lines of the other charts, shows that, pound for pound, fats contribute more to the energy value of the diet than any other kind of food. The purified fats, such as lard (chart 43), show no lines except for energy. On the other hand, salt pork and chocolate (charts 46 and 47) show considerable protein; cream (chart 45) and chocolate, calcium; and all three, but particularly chocolate, show phosphorus. Chocolate also is a rich source of iron.

In comparing these foods with one another, it should be remembered that butter and cream are important for the vitamines that they furnish, especially vitamine A, and that these factors of the diet are almost if not entirely wanting in lard, table oils, and other artificially purified fats.

The points to remember about foods in this group are:

(1) Fats and fat foods as a class have higher fuel value than those of any other group.
(2) Fats add flavor and richness to the diet, but, since they are such concentrated fuel foods, are often used in excess of the amount needed.
(3) Milk fat is a particularly rich source of vitamine A. Butter and cream are therefore far more important than most other fats in the diet of growing children.
(4) Some of these fat foods, for example, chocolate and nuts, contain generous proportions of protein and mineral substances.

MISCELLANEOUS DISHES.

(Charts 49, 50, pp. 35, 36.)

Many of the "made dishes" that are prepared in the home or purchased in shops or restaurants contain materials from several of the five food groups. In estimating the food value of a meal, it is often convenient to consider these in the form in which they are eaten rather than by the separate items out of which they are made. This is done in the charts for cake and apple pie.

In chart 49 is represented a pound of rich cup cake, or somewhat over three-fourths of a cake made from the following ingredients: One-third of a cup of butter, 1 cup of sugar, ½ cup of milk, 2 eggs, and 1⅝ cups of flour. The cake as compared with apple pie (chart 50) is characterized by large amounts of protein and mineral substances due to the milk and eggs used in it. In this respect a chart representing lemon or custard pie would more nearly resemble the chart for cake.

NOTE.—In most of the following charts a line of a given length represents the same percentage value. In numbers 8, 16, 21, 22, 29, 30, 31, 33, 43, 47, and 48, however, one or more of the lines represent over 100 per cent of the daily requirement of the energy or nutrient specified, and in order to make room for this the scale has been somewhat reduced. For example, on p. 15, in chart 9, the base line represents 100 per cent, while in chart 8 represents 110 per cent.

Group I. VEGETABLES AND FRUITS.

Chart 1. ONE POUND OF IRISH POTATOES.

(3 medium-sized.)

A pound of Irish potatoes supplies about 315 calories of energy, 8 grams (about ¼ ounce) of protein, 0.05 gram of calcium, 0.2 gram of phosphorus, and 4.5 milligrams of iron. It would furnish, therefore, 9 per cent of the energy a man needs daily, 8 per cent of the protein, 7 per cent of the calcium, 16 per cent of the phosphorus, and 30 per cent of the iron. This is shown in the following chart:

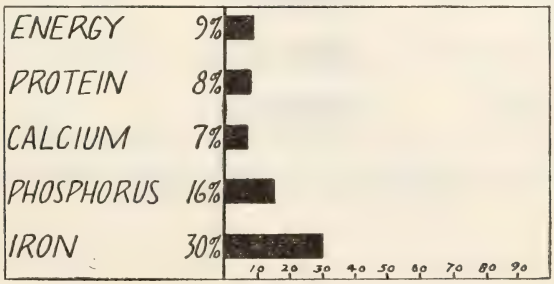

CHART 1.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of Irish potatoes.

Chart 2. One Pound of Sweet Potatoes.

(2 large.)

A pound of sweet potatoes supplies about 445 calories of energy, 6 grams (about $\frac{1}{5}$ ounce) of protein, 0.07 gram of calcium, 0.15 gram of phosphorus, and 0.8 milligram of iron. It would furnish, therefore, 13 per cent of the energy a man needs daily, 6 per cent of the protein, 10 per cent of the calcium, 12 per cent of the phosphorus, and 12 per cent of the iron. This is shown in the following chart:

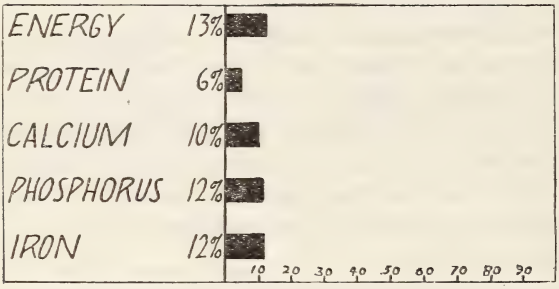

Chart 2.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of sweet potatoes.

Chart 3. One Pound of Onions.

(4 or 5 medium-sized.)

One pound of onions supplies about 210 calories of energy, 6 grams (about $\frac{1}{5}$ ounce) of protein, 0.14 gram of calcium, 0.18 gram of phosphorus, and 2.2 milligrams of iron. It would furnish, therefore, 6 per cent of the energy a man needs daily, 6 per cent of the protein, 21 per cent of the calcium, 14 per cent of the phosphorus, and 15 per cent of the iron. This is shown in the following chart:

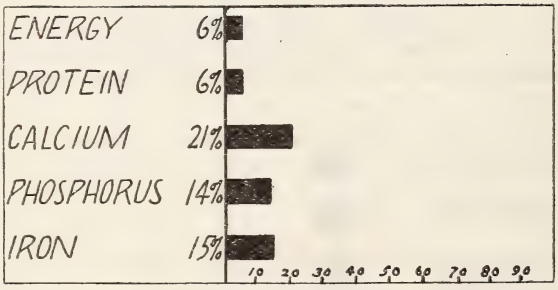

Chart 3.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of onions.

Chart 4. One Pound of Turnips.

(3 or 4 medium-sized.)

A pound of turnips supplies about 140 calories of energy, 4 grams (about $\frac{1}{7}$ ounce) of protein, 0.2 gram of calcium, 0.14 gram of phosphorus, and 1.8 milligrams of iron. It would furnish, therefore, 4 per cent of the energy a man needs daily, 4 per cent of the protein, 30 per cent of the calcium, 11 per cent of the phosphorus, and 12 per cent of the iron. This is shown in the following chart:

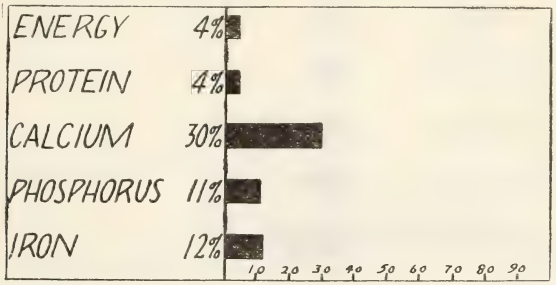

Chart 4.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of turnips.

Chart 5. One Pound of Asparagus.

(About 30 medium-sized stalks.)

One pound of asparagus supplies about 105 calories of energy, 8 grams (about $\frac{1}{4}$ ounce) of protein, 0.12 gram of calcium, 0.2 gram of phosphorus, and 4.5 milligrams of iron. It would furnish, therefore, 3 per cent of the energy a man needs daily, 8 per cent of the protein, 17 per cent of the calcium, 13 per cent of the phosphorus, and 30 per cent of the iron. This is shown in the following chart:

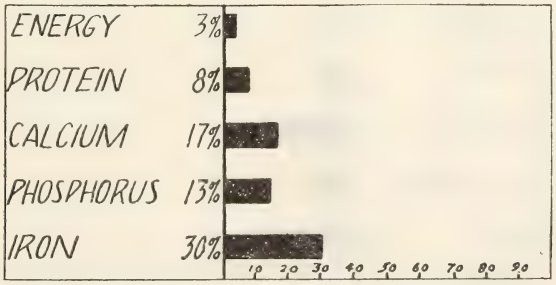

Chart 5.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of asparagus.

Chart 6. One Pound of Lettuce.

(2 large heads.)

One pound of lettuce supplies about 70 calories of energy, 5 grams (about $\frac{1}{6}$ ounce) of protein, 0.16 gram of calcium, 0.15 gram of phosphorus, and 2.7 milligrams of iron. It would furnish, therefore, 2 per cent of the energy a man needs daily, 5 per cent of the protein, 25 per cent of the calcium, 12 per cent of the phosphorous, and 18 per cent of the iron. This is shown in the following chart:

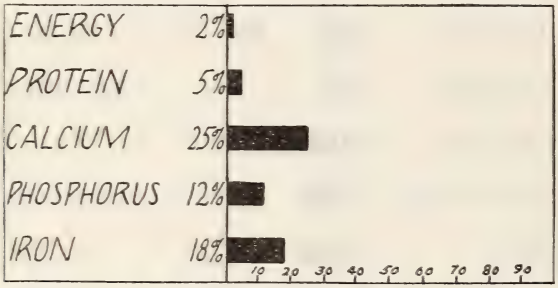

Chart 6.—Proportions of energy, protein, calcium, phosphorus and iron needed per man per day furnished by 1 pound of lettuce.

Chart 7. One Pound of Cabbage.

(About $\frac{1}{3}$ of an average head.)

One pound of cabbage supplies about 105 calories of energy, 6 grams (about $\frac{1}{5}$ ounce) of protein, 0.17 gram of calcium, 0.11 gram of phosphorus, and 4 milligrams of iron. It would furnish, therefore, 3 per cent of the energy a man needs daily, 6 per cent of the protein, 25 per cent of the calcium, 9 per cent of the phosphorus, and 27 per cent of the iron. This is shown in the following chart:

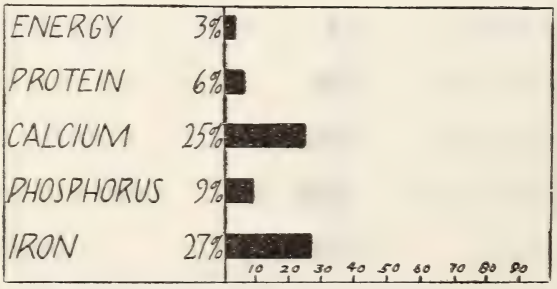

Chart 7.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of cabbage.

Chart 8. One Pound of Spinach.

(½ peck.)

One pound of spinach supplies about 105 calories of energy, 10 grams (about ⅓ ounce) of protein, 0.3 gram of calcium, 0.3 gram of phosphorus, and 16 milligrams of iron. It would furnish, therefore, 3 per cent of the energy a man needs daily, 10 per cent of the protein, 45 per cent of the calcium, 23 per cent of phosphorus, and 109 per cent (more than all) of the iron. This is shown in the following chart:

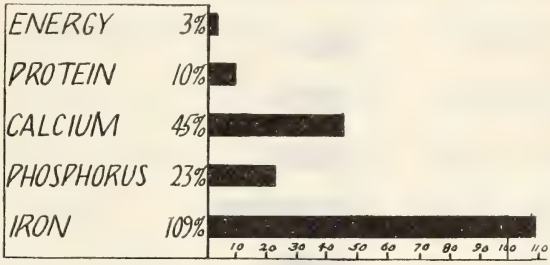

Chart 8.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of spinach.

Chart 9. One Pound of String Beans.

(About 1 quart.)

One pound of string beans supplies about 175 calories of energy, 6 grams (about ⅙ ounce) of protein, 0.19 gram of calcium, 0.21 gram of phosphorus, and 4 milligrams of iron. It would furnish, therefore, 5 per cent of the energy a man needs daily, 6 per cent of the protein, 29 per cent of the calcium, 16 per cent of the phosphorus, and 27 per cent of the iron. This is shown in the following chart:

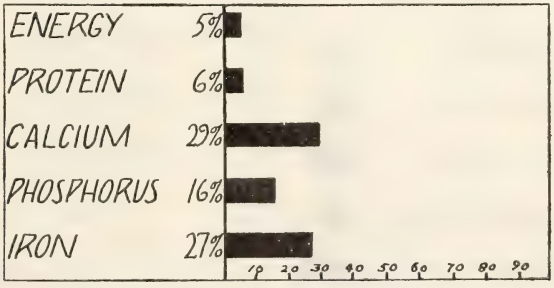

Chart 9.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of string beans.

Chart 10. One Pound of Green Corn, Canned.

(1¾ cups.)

One pound of green corn, canned, supplies about 455 calories of energy, 13 grams (a little less than ½ ounce) of protein, 0.14 gram of calcium, 0.5 gram of phosphorus, and 3 milligrams of iron. A pound of cooked fresh corn cut from the cob would supply practically the same quantities. Either would furnish, therefore, 13 per cent of the energy a man needs daily, 13 per cent of the protein, 21 per cent of the calcium, 38 per cent of the phosphorus, and 21 per cent of the iron. This is shown in the following chart:

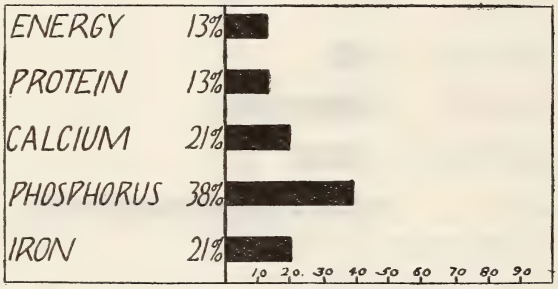

Chart 10.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of green corn, canned.

Chart 11. One Pound of Tomatoes, Canned.

(1¾ cups.)

One pound of tomatoes, canned, supplies about 105 calories of energy, 5 grams (about ⅙ ounce) of protein, 0.06 gram of calcium, 0.1 gram of phosphorus, and 1.8 milligrams of iron. It would furnish, therefore, 3 per cent of the energy a man needs daily, 5 per cent of the protein, 9 per cent of the calcium, 8 per cent of the phosphorus, and 12 per cent of the iron. This is shown in the following chart:

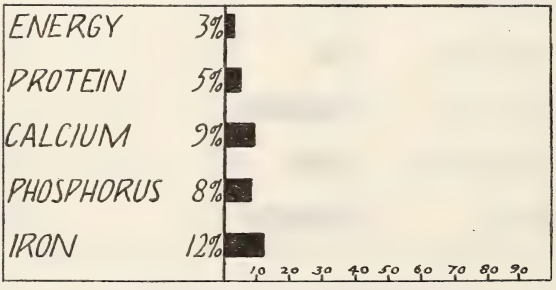

Chart 11.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of tomatoes, canned.

Chart 12. One Pound of Oranges.

(2 medium-sized.)

One pound of oranges supplies about 175 calories of energy, 3 grams (about $\frac{1}{9}$ ounce) of protein, 0.15 gram of calcium, 0.07 gram of phosphorus, and 0.9 milligram of iron. It would furnish, therefore, 5 per cent of the energy a man needs daily, 3 per cent of the protein, 22 per cent of the calcium, 5 per cent of the phosphorus, and 6 per cent of the iron. This is shown in the followinig chart:

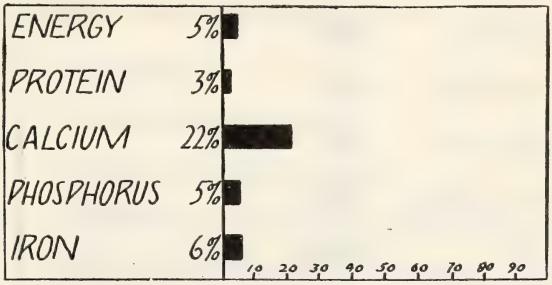

Chart 12.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of oranges.

Chart 13. One Pound of Apples.

(2 large.)

One pound of apples supplies about 210 calories of energy, 1 gram (an almost negligible amount) of protein, 0.02 gram of calcium, 0.04 gram of phosphorus, and 0.9 milligram of iron. It would furnish, therefore, 6 per cent of the energy a man needs daily, 1 per cent of the protein, 3 per cent of the calcium, 3 per cent of the phosphorus, and 6 per cent of the iron. This is shown in the following chart:

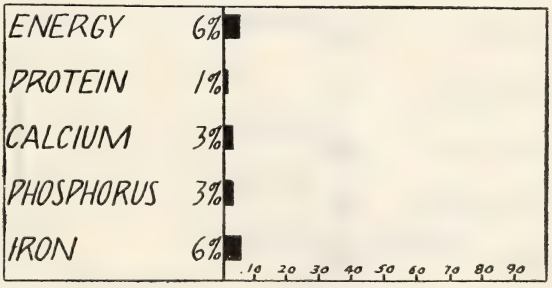

Chart 13.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of apples.

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Chart 14. One Pound of Bananas.

(3 large.)

One pound of bananas supplies about 280 calories of energy, 4 grams (about ⅛ ounce) protein, 0.02 gram of calcium, 0.09 gram of phosphorus, and 1.8 milligrams of iron. It would furnish, therefore, 8 per cent of the energy a man needs daily, 4 per cent of the protein, 4 per cent of the calcium, 7 per cent of the phosphorus, and 12 per cent of the iron. This is shown in the following chart:

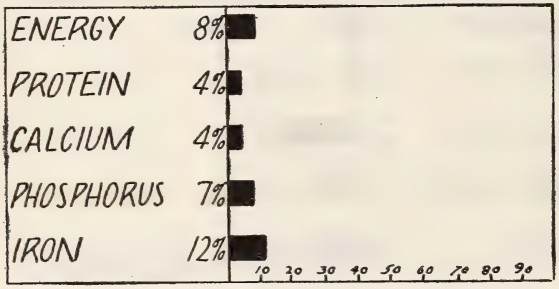

Chart 14.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of bananas.

Chart 15. One Pound of Muskmelon.

(1 medium-sized.)

One pound of muskmelon supplies about 105 calories of energy, 1 gram (an almost negligible amount) of protein, 0.04 gram of calcium, 0.03 gram of phosphorus, and 0.9 milligram of iron. It would furnish, therefore, 3 per cent of the energy a man needs daily, 1 per cent of the protein, 6 per cent of the calcium, 3 per cent of the phosphorus, and 6 per cent of the iron. This is shown in the following chart:

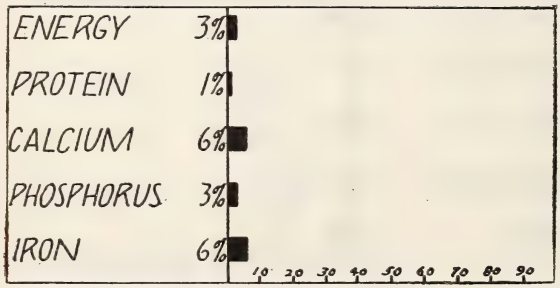

Chart 15.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of muskmelon.

Chart 16. One Pound of Dried Beans.

(2¼ cups.)

One pound of dried beans supplies about 1,575 calories of energy, 102 grams (about 3⅝ ounces) of protein, 0.7 gram of calcium, 2 grams of phosphorus, and 32 milligrams of iron. It would furnish, therefore, 45 per cent of the energy a man needs daily, 102 per cent of the protein, 107 per cent of the calcium, 162 per cent of the phosphorus, and 212 per cent of the iron. This is shown in the following chart:

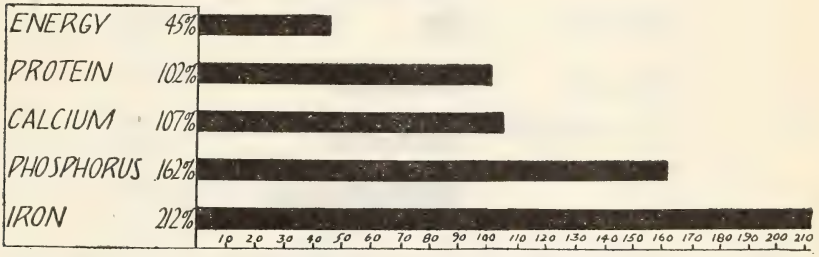

Chart 16.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of dried beans.

Chart 17. One Pound of Prunes.

A pound of prunes supplies about 1,155 calories of energy, 8 grams (about ¼ ounce) of protein, 0.2 gram of calcium, 0.4 gram of phosphorus, and 12 milligrams of iron. It would furnish, therefore, 33 per cent of the energy a man needs daily, 8 per cent of the protein, 31 per cent of the calcium, 31 per cent of the phosphorus, and 79 per cent of the iron. This is shown in the following chart:

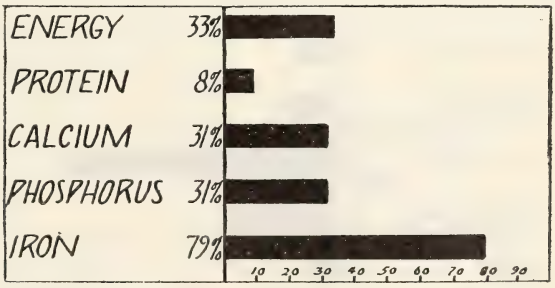

Chart 17.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of prunes.

Chart 18. One Pound of Raisins.

A pound of raisins supplies about 1,400 calories of energy, 10 grams (about $\frac{1}{3}$ ounce) of protein, 0.3 gram of calcium, 0.5 gram phosphorus, and 9 milligrams of iron. It would furnish, therefore, 40 per cent of the energy a man needs daily, 10 per cent of the protein, 39 per cent of the calcium, 41 per cent of the phosphorus, and 57 per cent of the iron. This is shown in the following chart:

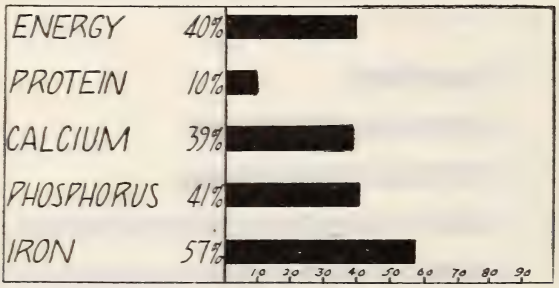

Chart 18.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of raisins.

Group II. MILK, EGGS, CHEESE, AND FLESH FOODS.

Chart 19. One Pound of Whole Milk.

(2 cups.)

One pound of whole milk supplies about 315 calories of energy, 15 grams (more than $\frac{1}{2}$ ounce) of protein, 0.54 gram of calcium, 0.42 gram of phosphorus, and 1 milligram of iron. It would furnish, therefore, 9 per cent of the energy a man needs daily, 15 per cent of the protein, 80 per cent of the calcium, 32 per cent of the phosphorus, and 7 per cent of the iron. This is shown in the following chart:

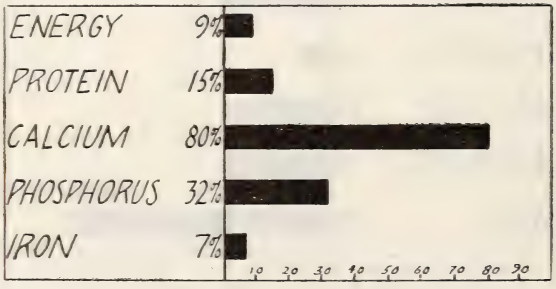

Chart 19.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of whole milk.

Chart 20. One Pound of Skimmed Milk.

(2 cups.)

One pound of skimmed milk supplies about 175 calories of energy, 15 grams (more than ½ ounce) of protein, 0.55 gram of calcium, 0.43 gram of phosphorus, and 1 milligram of iron. It would furnish, therefore, 5 per cent, of the energy a man needs daily, 15 per cent of the protein, 81 per cent of the calcium, 33 per cent of the phosphorus, and 8 per cent of the iron. This is shown in the following chart:

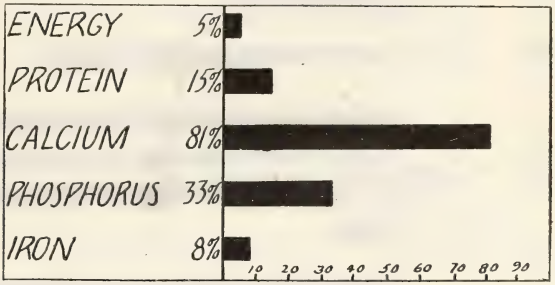

Chart 20.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of skimmed milk.

Chart 21. One Pound of Cottage Cheese.

(1½ cups packed solidly.)

One pound of cottage cheese supplies about 490 calories of energy, 95 grams (about 3½ ounces) of protein, 0.45 gram of calcium, 1.5 grams of phosphorus, and practically no iron. It would furnish, therefore, 14 per cent of the energy a man needs daily, 95 per cent of the protein, 67 per cent of the calcium, 112 per cent (more than all) of the phosphorus, and none of the iron. This is shown in the following chart:

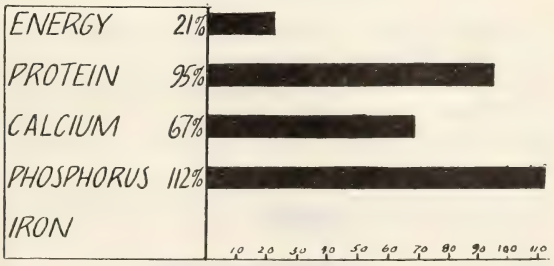

Chart 21.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of cottage cheese.

Chart 22. One Pound of American Cheese.

One pound of American cheese supplies about 1,995 calories of energy, 131 grams (about 4½ ounces) of protein, 4.2 grams of calcium, 3.1 grams of phosphorus, and nearly 6 milligrams of iron. It would furnish, therefore, 57 per cent of the energy a man needs daily, 131 per cent of the protein, 621 per cent of the calcium, 235 per cent of the phosphorus, and 39 per cent of the iron. This is shown in the following chart:

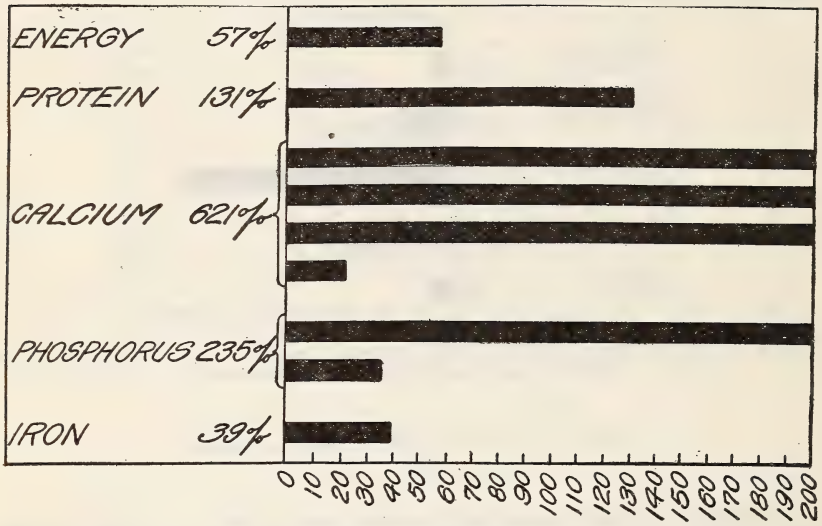

Chart 22.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of American cheese.

Chart 23. One Pound of Eggs.

(8 to 10 medium-sized.)

One pound of eggs supplies about 595 calories of energy, 54 grams (about 2 ounces) of protein, 0.3 gram of calcium, 0.7 gram of phosphorus, and 12 milligrams of iron. It would furnish, therefore, 17 per cent of the energy a man needs daily, 54 per cent of the protein, 39 per cent of the calcium, 55 per cent of the phosphorus, and 82 per cent of the iron. This is shown in the following chart:

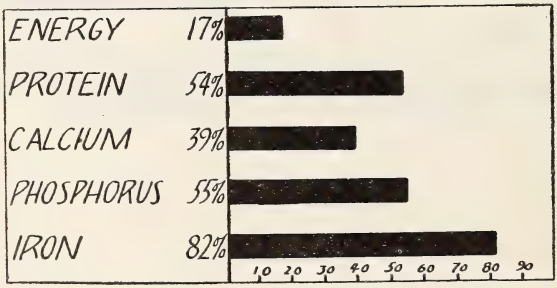

Chart 23.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of eggs.

Chart 24. One Pound of Beef.

One pound of medium fat beef, as purchased, supplies about 1,015 calories of energy, 67 grams (about 2½ ounces) of protein, 0.04 gram of calcium, 0.7 gram of phosphorus, and 11 milligrams of iron. It would furnish, therefore, 29 per cent of the energy a man needs daily, 67 per cent of the protein, 6 per cent of the calcium, 55 per cent of the phosphorus, and 74 per cent of the iron. This is shown in the following chart:

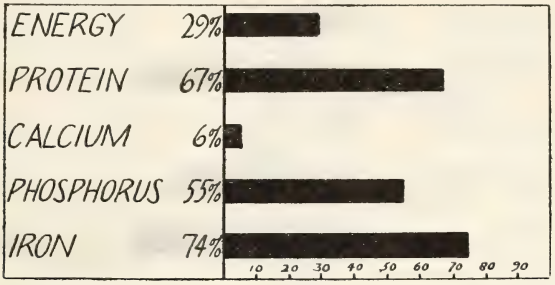

Chart 24.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of beef.

Chart 25. One Pound of Mutton.

One pound of average mutton, as purchased, supplies about 1,225 calories of energy, 59 grams (a little over 2 ounces) of protein, 0.03 gram of calcium, 0.6 gram of phosphorus, and 8.8 milligrams of iron. It would furnish, therefore, 35 per cent of the energy a man needs daily, 59 per cent of the protein, 5 per cent of the calcium, 48 per cent of the phosphorus, and 59 per cent of the iron. This is shown in the following chart:

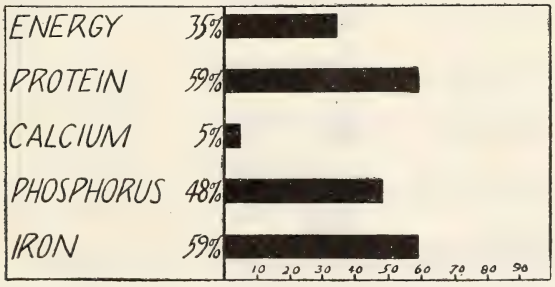

Chart 25.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of mutton.

Chart 26. One Pound of Fowl.

One pound of fowl, as purchased, supplies about 735 calories of energy, 62 grams (about 2¼ ounces) of protein, 0.03 gram of calcium, 0.67 gram of phosphorus, and 9 milligrams of iron. It would furnish, therefore, 21 per cent of the energy a man needs daily, 62 per cent of the protein, 5 per cent of the calcium, 51 per cent of the phosphorus, and 62 per cent of the iron. This is shown in the following chart:

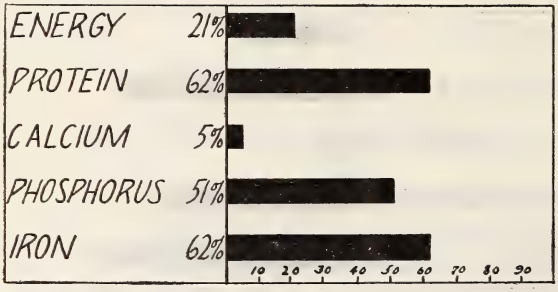

Chart 26.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of fowl.

Chart 27. One Pound of Fresh Codfish.

One pound of fresh codfish, as purchased, supplies about 175 calories of energy, 38 grams (about 1⅓ ounces) of protein, 0.04 gram of calcium, 0.4 gram of phosphorus, and 2 milligrams of iron. It would furnish, therefore, 5 per cent of the energy a man needs daily, 38 per cent of the protein, 6 per cent of the calcium, 33 per cent of the phosphorus, and 14 per cent of the iron. This is shown in the following chart:

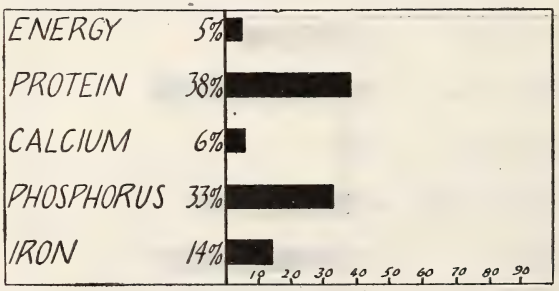

Chart 27.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of fresh codfish.

Chart 28. One Pound of Fresh Salmon.

One pound of fresh salmon, as purchased, supplies about 630 calories of energy, 69 grams (about 2½ ounces) of protein, 0.07 gram of calcium, 0.8 gram of phosphorus, and 4 milligrams of iron. It would furnish, therefore, 18 per cent of the energy a man needs daily, 69 per cent of the protein, 11 per cent of the calcium, 60 per cent of the phosphorus, and 25 per cent of the iron. This is shown in the following chart:

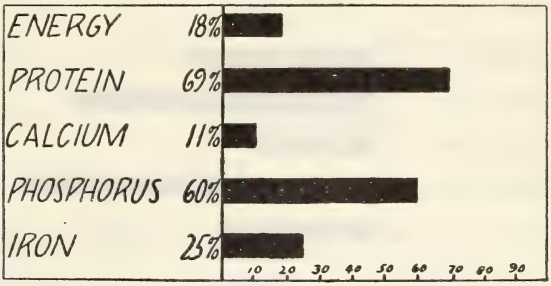

Chart 28.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of fresh salmon.

Chart 29. One Pound of Oysters.

(About 1 pint.)

A pound of oysters supplies about 245 calories of energy, 28 grams (about 1 ounce) of protein, 0.2 gram of calcium, 0.7 gram of phosphorus, and 20 milligrams of iron. It would furnish, therefore, 7 per cent of the energy a man needs daily, 28 per cent of the protein, 35 per cent of the calcium, 53 per cent of the phosphorus, and 136 per cent (more than all) of the iron. This is shown in the following chart:

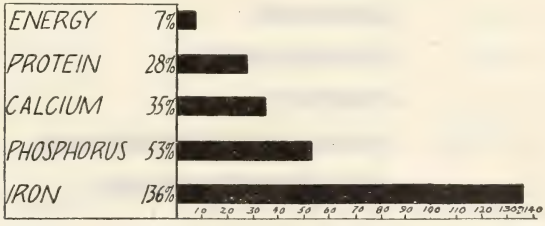

Chart 29.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of oysters.

Chart 30. One Pound of Shelled Peanuts.

(2¼ cups.)

One pound of shelled peanuts supplies about 2,485 calories of energy, 117 grams (about 4⅛ ounces) of protein, 0.3 gram of calcium, 1.8 grams of phosphorus, and 9 milligrams of iron. It would furnish, therefore, 71 per cent of the energy a man needs daily, 117 per cent of the protein, 47 per cent of the calcium, 137 per cent of the phosphorus, and 60 per cent of the iron. This is shown in the following chart:

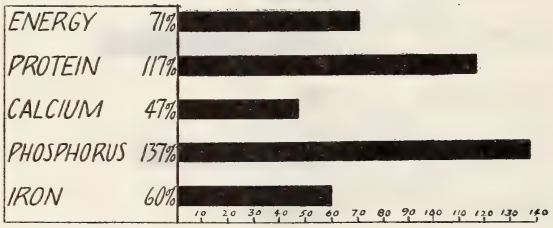

Chart 30.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of shelled peanuts.

Group III. CEREALS AND CEREAL PREPARATIONS.

Chart 31. One Pound of Oatmeal.

(2⅔ cups.)

One pound of oatmeal supplies about 1,820 calories of energy, 73 grams (more than 2½ ounces) of protein, 0.3 gram of calcium, 1.8 grams of phosphorus, and 17 milligrams of iron. It would furnish, therefore, 52 per cent of the energy a man needs daily, 73 per cent of the protein, 46 per cent of the calcium, 135 per cent of the phosphorus, and 115 per cent of the iron. This is shown in the following chart:

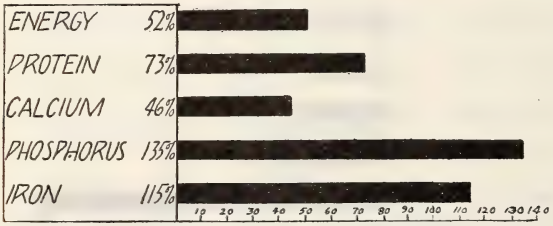

Chart 31.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of oatmeal.

Chart 32. One Pound of Wheat Flour.

(4 cups.)

One pound of wheat flour supplies about 1,610 calories of energy, 52 grams (nearly 2 ounces) of protein, 0.06 gram of calcium, 0.3 gram of phosphorus, and 3 milligrams of iron. It would furnish, therefore, 46 per cent of the energy a man needs daily, 52 per cent of the protein, 9 per cent of the calcium, 21 per cent of the phosphorus, and 21 per cent of the iron. This is shown in the following chart:

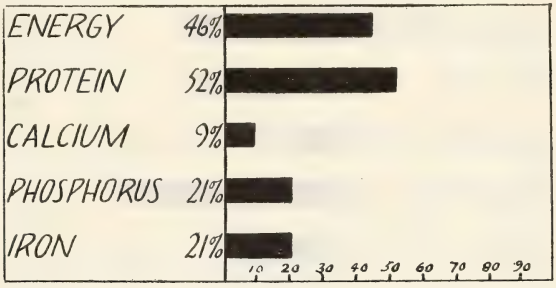

Chart 32.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of wheat flour.

Chart 33. One Pound of Graham Flour.

(4½ cups.)

One pound of graham flour supplies about 1,610 calories of energy, 60 grams (about 2 ounces) of protein, 0.17 gram of calcium, 1.6 grams of phosphorus, and 16.8 milligrams of iron. It would furnish, therefore, 46 per cent of the energy a man needs daily, 60 per cent of the protein, 26 per cent of the calcium, 125 per cent of the phosphorus, and 112 per cent of the iron. This is shown in the following chart:

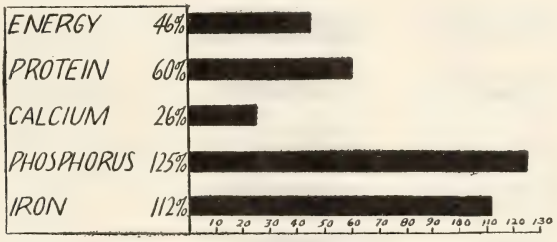

Chart 33.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of graham flour.

Chart 34. One Pound of Corn Meal.

(2⅝ cups.)

One pound of corn meal supplies about 1,575 calories of energy, 42 grams (about 1½ ounces) of protein, 0.08 gram of calcium, 0.9 gram of phosphorus, and 4 milligrams of iron. It would furnish, therefore, 46 per cent of the energy a man needs daily, 42 per cent of the protein, 12 per cent of the calcium, 65 per cent of the phosphorus, and 27 per cent of the iron. This is shown in the following chart:

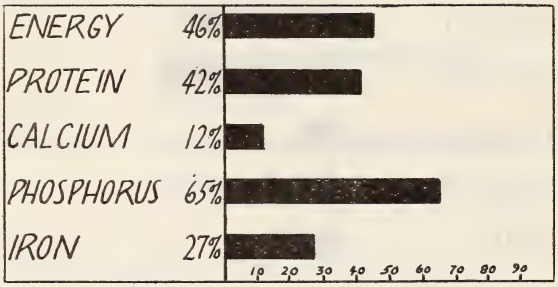

Chart 34.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of corn meal.

Chart 35. One Pound of Rice.

(1⅞ cups.)

One pound of rice supplies about 1,610 calories of energy, 36 grams (about 1¼ ounces) of protein, 0.04 gram of calcium, 0.4 gram of phosphorus, and 4 milligrams of iron. It would furnish, therefore, 45 per cent of the energy a man needs daily, 36 per cent of the protein, 6 per cent of the calcium, 33 per cent of the phosphorus, and 27 per cent of the iron. This is shown in the following chart:

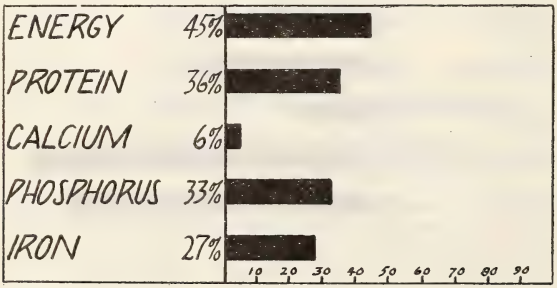

Chart 35.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of rice.

Chart 36. One Pound of Macaroni.

One pound of macaroni, as purchased, supplies about 1,610 calories of energy, 61 grams (over 2 ounces) of protein, 0.1 gram of calcium, 0.6 gram of phosphorus, and 5.4 milligrams of iron. It would furnish, therefore, 46 per cent of the energy a man needs daily, 61 per cent of the protein, 15 per cent of the calcium, 49 per cent of the phosphorus, and 36 per cent of iron. This is shown in the following chart:

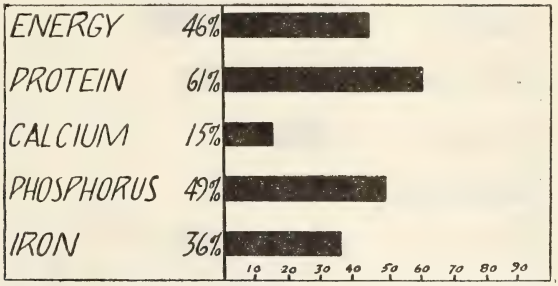

Chart 36.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of macaroni.

Chart 37. One Pound of Wheat Bread.

(1¼ of an ordinary baker's loaf.)

One pound of wheat bread supplies about 1,190 calories of energy, 42 grams (about 1½ ounces) of protein, 0.1 gram of calcium, 0.4 gram of phosphorus, and 4 milligrams of iron. It would furnish, therefore, 34 per cent of the energy a man needs daily, 42 per cent of the protein, 18 per cent of the calcium, 32 per cent of the phosphorus, and 27 per cent of the iron. This is shown in the following chart:

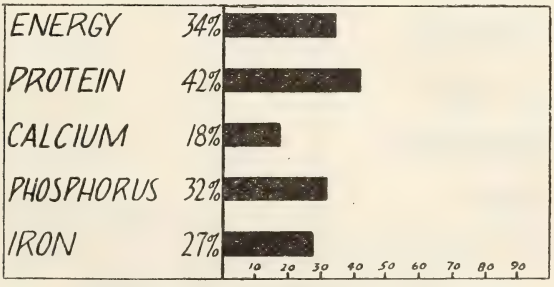

Chart 37.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of wheat bread.

Chart 38. One Pound of "Soda" Crackers.

One pound of "soda" crackers supplies about 1,890 calories of energy, 44 grams (about 1½ ounces) of protein, 0.1 gram of calcium, 0.4 gram of phosphorus, and 6.7 milligrams of iron. It would furnish, therefore, 54 per cent of the energy a man needs daily, 44 per cent of the protein, 15 per cent of the calcium, 35 per cent of the phosphorus, and 45 per cent of the iron. This is shown in the following chart:

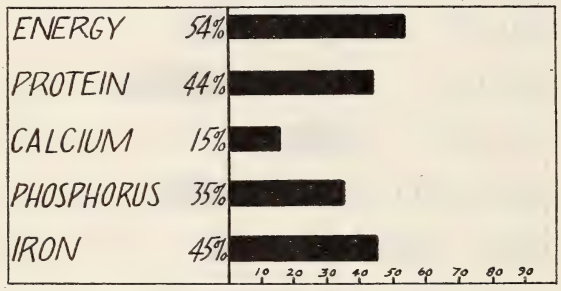

Chart 38.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of soda crackers.

Group IV. SUGAR AND SUGARY FOODS.

Chart 39. One Pound of Sugar.

(2 cups.)

One pound of sugar supplies about 1,820 calories of energy and contains none of the other substances included in these comparisons. It would therefore furnish 52 per cent of the energy a man needs daily. This is shown in the following chart:

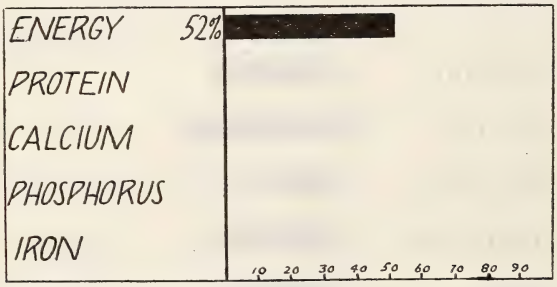

Chart 39.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of sugar.

Chart 40. One Pound of Honey.

(1½ cups.)

A pound of honey supplies about 1,470 calories of energy, 2 grams (about $\frac{1}{14}$ ounce) of protein, 0.02 grain of calcium, 0.09 gram of phosphorus, and 3 milligrams of iron. It would furnish, therefore, 42 per cent of the energy a man needs daily, 2 per cent of the protein, 3 per cent of the calcium, 7 per cent of the phosphorus, and 21 per cent of the iron. This is shown in the following chart:

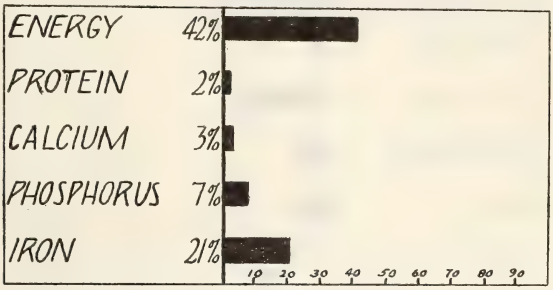

Chart 40.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of honey.

Chart 41. One Pound of Currant Jelly.

A pound of currant jelly supplies about 1,190 calories of energy, 1 gram (a negligible amount) of protein, 0.06 gram of calcium, 0.04 gram of phosphorus, and 1 milligram of iron. It would furnish, therefore, 34 per cent of the energy a man needs daily, 1 per cent of the protein, 9 per cent of the calcium, 3 per cent of the phosphorus, and 9 per cent of the iron. This is shown in the following chart:

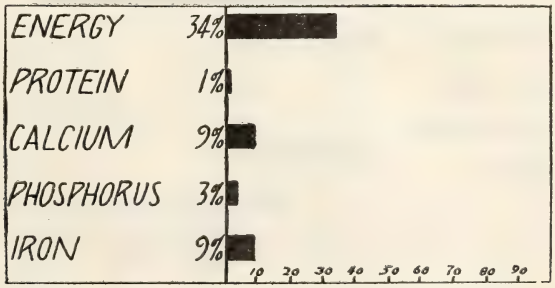

Chart 41.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of currant jelly.

Chart 42. One Pound of Preserved Blackberries.

A pound of preserved blackberries supplies about 1,120 calories of energy, 4 grams (about $\frac{1}{7}$ ounce) of protein, 0.16 gram of calcium, 0.1 gram of phosphorus and 1 milligram of iron. It would furnish, therefore, 32 per cent of the energy a man needs daily, 4 per cent of the protein, 24 per cent of the calcium, 8 per cent of the phosphorus, and 9 per cent of the iron. This is shown in the following chart:

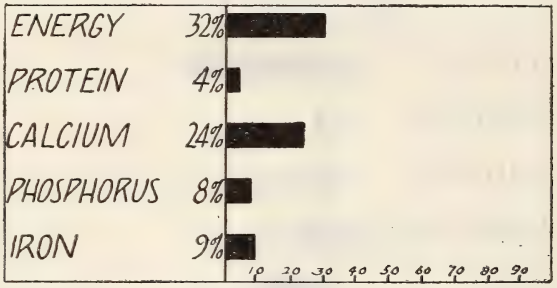

Chart 42.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of preserved blackberries.

Group V. FATS AND FAT FOODS.

Chart 43. One Pound of Lard.

(2 cups.)

One pound of lard supplies about 4,100 calories of energy, and, if thoroughly refined, no other nutrients. It would furnish, therefore, 117 per cent, or considerably more than all the energy a man needs daily. This is shown in the following chart:

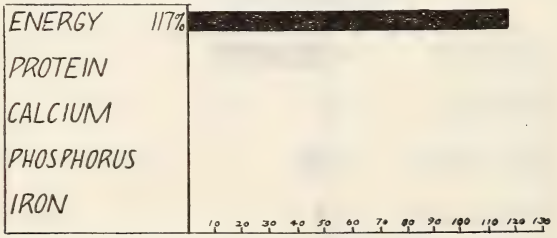

Chart 43.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of lard.

Chart 44. One Pound of Butter.

One pound of butter supplies about 3,360 calories of energy, 5 grams (about $\frac{1}{6}$ ounce) of protein, 0.07 gram of calcium, 0.08 gram of phosphorus, and 1.8 milligrams of iron. It would furnish, therefore, 96 per cent of the energy a man needs daily, 5 per cent of the protein, 10 per cent of the calcium, 6 per cent of the phosphorus, and 6 per cent of the iron. This is shown in the following chart:

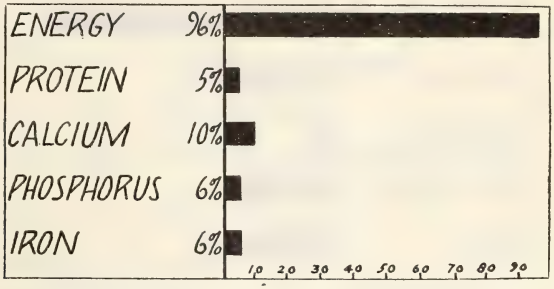

Chart 44.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of butter.

Chart 45. One Pound of Double Cream.

(About 2 cups.)

One pound of double cream supplies about 1,700 calories of energy, 9 grams (about $\frac{1}{3}$ ounce) of protein, 0.33 gram of calcium, 0.26 gram of phosphorus, and 0.5 milligram of iron. It would furnish, therefore, 49 per cent of the energy a man needs daily, 9 per cent of the protein, 49 per cent of the calcium, 20 per cent of the phosphorus, and 3 per cent of the iron. This is shown in the following chart:

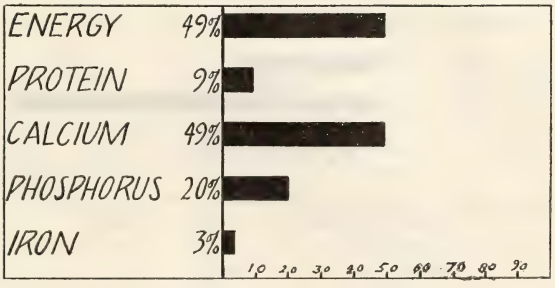

Chart 45.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of double cream.

Chart 46. One Pound of Fat Salt Pork.

A pound of salt pork supplies about 2,835 calories of energy, 34 grams (about 1⅛ ounces) of protein, 0.02 gram of calcium, 0.36 gram of phosphorus, and 5 milligrams of iron. It would furnish, therefore, 81 per cent of the energy a man needs daily, 34 per cent of the protein, 3 per cent of the calcium, 28 per cent of the phosphorus, and 34 per cent of the iron. This is shown in the following chart:

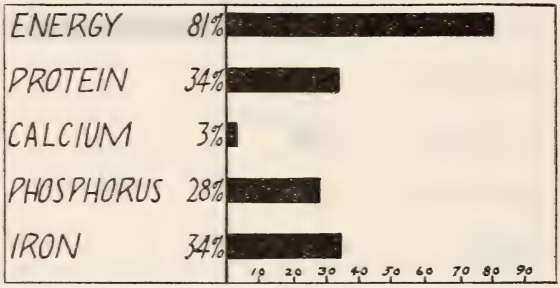

Chart 46.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of fat salt pork.

Chart 47. One Pound of Chocolate.

A pound of chocolate supplies about 2,765 calories of energy, 59 grams (about 2 ounces) of protein, 0.04 gram of calcium, 2 grams of phosphorus, and 12 milligrams of iron. It would furnish, therefore, 79 per cent of the energy a man needs daily, 59 per cent of the protein, 61 per cent of the calcium, 156 per cent (more than all) of the phosphorus, and 82 per cent of the iron. This is shown in the following chart:

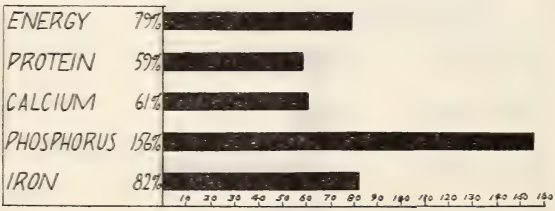

Chart 47.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of chocolate.

Chart 48. One Pound of Shelled Walnuts.

One pound of shelled walnuts supplies about 3,185 calories of energy, 83 grams (nearly 3 ounces) of protein, 0.4 gram of calcium, 1.6 grams of phosphorus, and 9.6 milligrams of iron. It would furnish, therefore, 91 per cent of the energy a man needs daily, 83 per cent of the protein, 59 per cent of the calcium, 123 per cent (more than all) of the phosphorus, and 64 per cent of the iron. This is shown in the following chart:

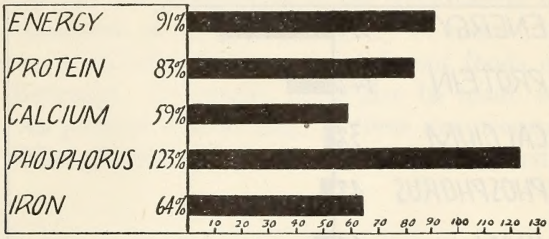

Chart 48.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of shelled walnuts.

Chart 49. One Pound of "Butter" Cake.

One pound of cake (representing seven-eighths of the following recipe: ⅓ cup butter, 1 cup sugar, ½ cup milk, 2 eggs, and 1⅝ cups flour) supplies about 1,750 calories of energy, 29 grams (about 1 ounce) of protein, 0.2 gram of calcium, 0.3 gram of phosphorus, and 3 milligrams of iron. It would furnish, therefore, 50 per cent of the energy a man needs daily, 29 per cent of the protein, 31 per cent of the calcium, 23 per cent of the phosphorus, and 21 per cent of the iron. This is shown in the following chart:

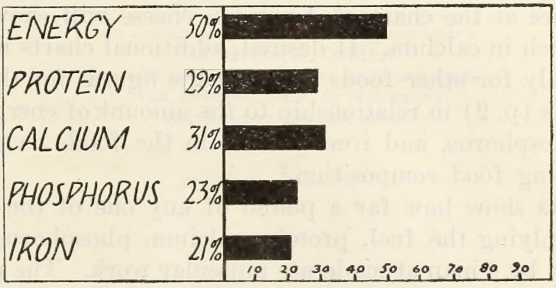

Chart 49.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of cake.

Chart 50. One Pound of Apple Pie.

One pound of apple pie supplies about 2,225 calories of energy, 14 grams (about ½ ounce) of protein, 0.01 gram of calcium, 0.05 gram of phosphorus, and 0.9 milligram of iron. It would furnish, therefore, 35 per cent of the energy a man needs daily, 14 per cent of the protein, 3 per cent of the calcium, 4 per cent of the phosphorus, and 6 per cent of the iron. This is shown in the following chart:

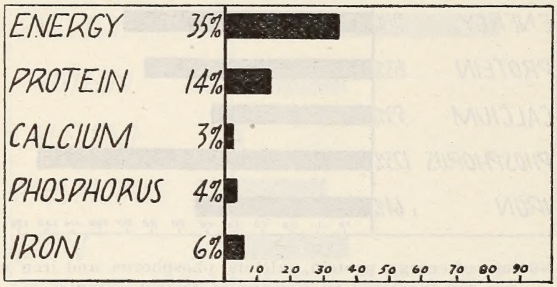

Chart 50.—Proportions of energy, protein, calcium, phosphorus, and iron needed per man per day furnished by 1 pound of apple pie.

USES OF THE CHARTS.

The housekeeper or the student of foods can quickly see from the charts in just what proportions the five important constituents—fuel, protein, calcium, phosphorus, and iron—are supplied in 50 common foods. The charts are so simply arranged that a cursory reading will show these special characteristics of the various foods. For example, even a glance at the chart of American cheese will show that it is extremely rich in calcium. If desired, additional charts may be constructed easily for other foods by using the figures for the nutritive requirements (p. 2) in relationship to the amount of energy, protein, calcium, phosphorus, and iron present in the foods as reported in tables showing food composition.[3]

The charts show how far a pound of any one of the foods goes toward supplying the fuel, protein, calcium, phosphorus, and iron needed daily by a man at moderate muscular work. The percentages of these constituents supplied by fractions of a pound can easily be calculated. Changes may also be made to indicate the relationship of a certain quantity of food to the requirements of a family or to a period of time longer than a day.

How much of several different foods will be needed to supply the daily requirement of iron or any other element, can be found by adding the percentages representing this element.

[3] U. S. Dept. Agr., Office Expt. Sta. Bul. No. 28, Chemical Composition of American Food Materials.

Another use for the charts is in showing what foods can be combined to make a complete ration. For a complete ration the sum of the energy from all the foods included should equal 100 per cent, and similarly with protein, calcium, phosphorus, and iron. Although there is no disadvantage and probably considerable advantage if the totals for calcium, phosphorus, and iron are higher than those for energy and protein. The completeness of a ration can be tested by adding together the percentages of the constituents shown on the charts. In classroom or lecture use it may be more effective to fill in the lines on a skeleton chart as the different foods making up a ration are discussed. Allowance must also be made for bulk and vitamines. As pointed out on page 4, these are necessary elements of the diet although they can not be definitely measured.

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