U. S. DEPARTMENT OF AGRICULTURE

FARMERS' BULLETIN No. 1383

FOOD VALUES AND BODY NEEDS SHOWN GRAPHICALLY

THIS BULLETIN brings out certain important and well-established facts about foods by a new and graphic method. Heretofore, 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.

FOOD VALUES AND BODY NEEDS SHOWN GRAPHICALLY.

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WHAT THE CHARTS SHOW.

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 mineral constituents, 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[2] 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 compari-

[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.

[2] Though the computations for these charts have been carefully checked, the quantities are so minute that there are some seeming discrepancies due to the necessary dropping of decimals.

son 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. 17) is a good illustration. A glance at it shows that a pound, or a pint, of whole 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 6 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 94 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 94 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 that 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, 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 rather that since he requires less he derives a higher proportion of it from a pound of a given food. For the woman doing little or no muscular work, percentages 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 another publication of this department.[3]

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 American cheese, fuel in butter, phosphorus in peanuts, and protein in such foods as meat and fish, 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 potato and white potato charts, for instance, show that sweet potatoes have 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 string beans are richer in lime. The phosphorus lines in corn and spinach show that corn is richer in this particular element. The iron line in lettuce as compared 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 always, 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.[4]

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. Among these are the vitamins. Though the quantities of vitamins in different food materials have not yet been determined, the relative value of foods as sources of vitamins may be shown somewhat roughly by the method given on p. 35. General statements about vitamins are also given in the discussions of the five groups of foods.

Scientists now recognize at least three vitamins which, until more satisfactory names are agreed upon, are called A, B, and C. Vitamin A, believed to be necessary for normal growth and development, is found in whole milk and is abundant in cream, butter, egg yolk, the liver and other glandular organs of animals, and green-leaf vegetables. Vitamin B, also believed to be necessary for growth and general well being, is present to some extent in nearly all food materials except those that have been highly refined, such as white sugar, white flour, polished rice, and cornstarch, and table oils. Vitamin C is found especially in certain fruits and vegetables, among them tomatoes, green-leaf vegetables, oranges, and lemons. It also occurs in

[3] U. S. Dept. Agr., Farmers' Bul. 1313, Good Proportions in the Diet.

[4] The charts in this bulletin are based on average analyses published in United States Department of Agriculture, Office of Experiment Stations, Bulletin 28, and on additional data compiled by the Office of Home Economics chiefly from the work of H. C. Sherman, of Columbia University; Lucy H. Gillett, of the New York Association for Improving the Condition of the Poor; and E. B. Forbes, of the Ohio Agricultural Experiment Station.

fresh, uncooked milk, especially from pasture-fed cows, and probably to some extent in fresh 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.

Cellulose, or roughage, is another important constituent of food not shown in these charts. Only a small proportion of it is digested and assimilated by the body, but it is valuable because it gives bulk to the food mass as it passes through the digestive tract and tends to prevent constipation. Most vegetables and fruits furnish cellulose. So also do the outer layers of the cereal grains which remain in the "whole grain" products, but have been removed from the more highly milled preparations.

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, efficient-protein foods, cereals and cereal preparations, sugar and sugary foods, and fats and fat foods.

GROUP I.—VEGETABLES AND FRUITS.

(Charts 1–17, pp. 9 to 17.)

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 such foods are more important as sources of fuel than of mineral matter and bulk. Vegetables and fruits differ considerably in the proportion of water and inedible material contained in a pound as purchased and consequently in their energy value. They also vary greatly as sources of vitamins, though from present knowledge, such comparisons can be made only in a general way.

As shown by the 13 kinds illustrated in these charts, fresh vegetables and fruits furnish per pound less than 6 per cent of the energy and protein needed, and 19, 11, and 23 per cent, respectively, of calcium, phosphorus, and iron. These figures show the basis for the familiar statement that vegetables and fruits are a good source of mineral substances, not because they contain more of these substances per pound than do other foods, but because they can be eaten in large quantities without overloading the diet with protein and fuel. A comparison of potatoes (chart 1) and another starchy food such as rice (chart 35) shows this clearly. About 3½ pounds, or 10 medium-sized, potatoes would furnish all the iron needed per man per day, and this quantity of potatoes would supply only about 30 per cent of the needed fuel, leaving 70 per cent to be furnished by other foods of the diet. Of polished 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.

Sweet potatoes and one of the succulent vegetables, such as asparagus or spinach, are good illustrations of difference in energy value

due at least in part to water content. A pound of sweet potatoes (chart 2) would furnish 13 per cent of the needed energy, but the same quantity of asparagus (chart 5) or spinach (chart 8) would furnish only 3 per cent. Also rinds, seeds, and inedible parts that must be discarded, help to lower the energy value of such a fresh food as muskmelon as purchased (chart 15).

Dried beans and raisins (charts 16 and 17), like the fresh vegetables and fruits, are important for supplying mineral substances. Dried beans are also rich in protein, but except in the case of soy beans, it is not of the efficient, or complete, kind found in meat and other flesh foods, milk, and eggs.

The vegetables and fruits, particularly if uncooked, are almost without exception important sources of one or more vitamins in the diet. Practically all of them furnish vitamin B to some extent. Of the vegetables and fruits shown here, lettuce and spinach also supply vitamin A, and oranges, tomatoes, potatoes, cabbage, and some kinds of turnips are sources of vitamin 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 most of the dried legumes, which contain comparatively high proportions of protein, need to be supplemented by such foods as meat, poultry, fish, eggs, milk, or cheese.

3. Practically all vegetables and fruits are rich sources of one or more vitamins. The green-leaf vegetables are believed to be especially valuable sources of vitamin A, and oranges, lemons, and tomatoes of vitamin C.

GROUP II.—EFFICIENT-PROTEIN FOODS.

(Charts 18–30, pp. 17 to 23.)

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 value. These foods differ greatly among themselves in fatness and water content and therefore in fuel value, in the amounts and kinds of minerals they contain, and also in their importance for supplying vitamins.

The protein in the foods of Group II, which with two exceptions are of animal origin, is termed efficient, or adequate, because it can be used to special advantage by the body. This is what gives them special dietetic value and distinguishes them from other foods also comparatively rich in protein, such as the cereals (Group III) and dried beans, peas, and other legumes, except peanuts and soy beans.

A given weight of fat yields the body over twice as much fuel as the same weight of protein, starch, or sugar. The foods in Group II with exceptionally long lines for energy are those in which fat is especially abundant; for example, beef, mutton, and pork loin (charts 23, 24, and 25, respectively), cheese made from whole milk (chart 21), and peanuts (chart 30). Such long lines for energy suggest the wisdom of serving vegetables that have low fuel values with these

rich foods and of making allowance for the fat of peanuts in combining them with other foods.

The comparatively short lines representing energy in the skimmed milk, cottage cheese, egg, and fresh codfish charts (charts 19, 20, 22, 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 or egg yolks, 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 some kinds of fish, and the rather large amount in eggs, beef, and mutton will be noted. Meats, though rich in iron, contain far less calcium than milk and its products. These differences justify the use of eggs with milk as in custards, with cheese as in rarebits, and in the baked dish known as cheese fondu, and with some kinds of 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, whole milk and egg yolks are the most valuable in supplying vitamin A. Milk, eggs, and certain meats also supply vitamin B. Fresh raw milk is believed to provide the third vitamin, but is a less certain source than are oranges, lemons, and tomatoes.

The points to remember about foods in this group are:

1. Meat and other flesh foods, milk, eggs, cheese, 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. Ordinarily, milk 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 are valuable sources of vitamins A and B.

GROUP III.—CEREALS AND CEREAL PREPARATIONS.

(Charts 31–38, pp. 24 to 27.)

Cereal products contain comparatively large amounts of protein associated with several times its weight of starch, and unless the outer coatings of the grains and the germ are removed, vitamins and considerable amounts of mineral substances, particularly phosphorus. The protein, however, is not so efficient as that of the foods in Group II.

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 and the products made from them, provided the same method of preparation is followed, differ very little in food value. 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 some respects 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. Still another reason for preferring the whole-grain products in such a case is that they are also a source of vitamin B and to some extent of vitamin A. The former is found chiefly in the part of the grain near the germ and hence is removed by refining.

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 meat, poultry, fish, eggs, milk, or cheese.
3. When made from the whole grains, cereal foods also supply some mineral substances and vitamins.
4. 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. 28 to 29.)

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, whether granulated, lump, powdered, or confectioners', is, in fact, all sugar. Brown and maple sugars, molasses, and maple sirup would show some protein and mineral constituents, because they have some of the other ingredients of the juice or sap left in them. Raisins (chart 17) contain so much sugar that they are often grouped with the sugary foods. In addition to their energy, they contain minerals 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.

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. 30 to 32.)

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, and sugar. They differ greatly among themselves in respect to the minerals and vitamins 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 contains iron. Because of their richness, however, these foods are seldom used in large enough quantities to contribute much to the mineral sources of the diet.

In comparing these foods with one another, it should be remembered that butter and cream are important for the vitamins that they furnish, especially vitamin 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 vitamin 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 some protein and mineral substances.

MISCELLANEOUS DISHES.

(Charts 49, 50, p. 33.)

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 plain butter cake, or about three-fourths of a cake made from the following ingredients: One-third of a cup of butter, 1 cup of sugar, one-half cup of milk, 2 eggs,

and one and five-eighths 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 custard pie would more nearly resemble the chart for cake.

DESCRIPTION OF THE CHARTS.

GROUP I.—VEGETABLES AND FRUITS.

CHART 1.—ONE POUND OF POTATOES.

One pound of potatoes supplies about 305 calories of energy, 8 grams (about one-fourth ounce) of protein, 0.05 gram of calcium, 0.21 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:

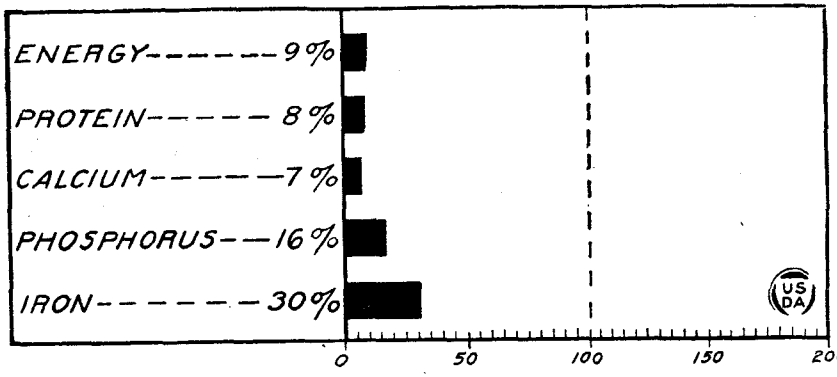

CHART 1.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of potatoes.

CHART 2.—ONE POUND OF SWEET POTATOES.

One pound of sweet potatoes supplies about 445 calories of energy, 6 grams (about one-fifth ounce) of protein, 0.07 gram of calcium, 0.16 gram of phosphorus, and 1.8 milligrams 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:

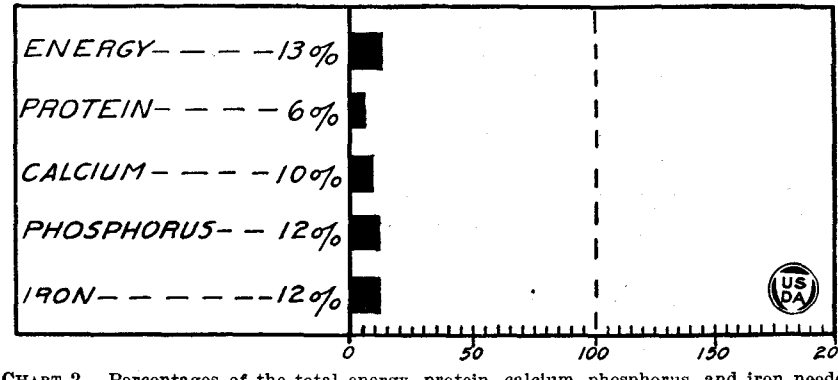

CHART 2.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of sweet potatoes.

CHART 3.—ONE POUND OF ONIONS.

One pound of onions supplies about 200 calories of energy, 6 grams (about one-fifth ounce) of protein, 0.14 gram of calcium, 0.19 gram of phosphorus, and 2.3 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:

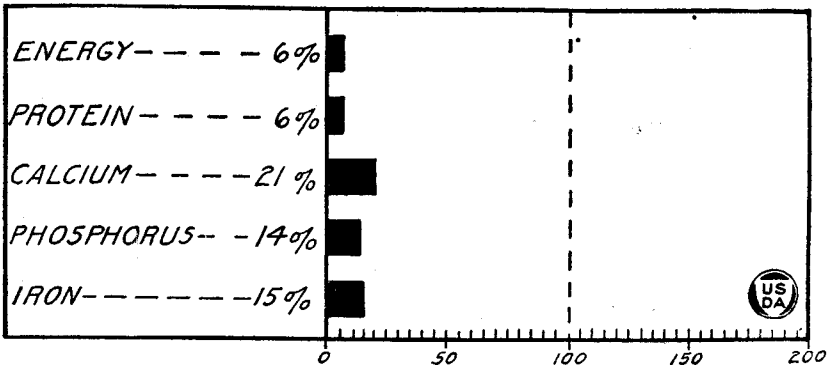

CHART 3.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of onions.

CHART 4.—ONE POUND OF TURNIPS.

One pound of turnips supplies about 125 calories of energy, 4 grams (about one-seventh ounce) of protein, 0.20 gram of calcium, 0.15 gram of phosphorus, and 1.4 milligrams of iron. It would furnish, therefore, 3 per cent of the energy a man needs daily, 4 per cent of the protein, 29 per cent of the calcium, 11 per cent of the phosphorus, and 9 per cent of the iron. This is shown in the following chart:

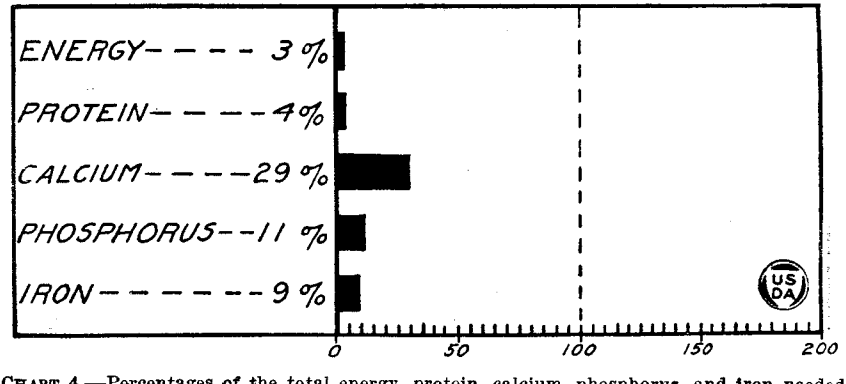

CHART 4.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of turnips.

CHART 5.—ONE POUND OF ASPARAGUS.

One pound of asparagus supplies about 100 calories of energy, 8 grams (about one-fourth ounce) of protein, 0.11 gram of calcium, 0.18 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, 16 per cent of the calcium, 14 per cent of the phosphorus, and 30 per cent of the iron. This is shown in the following chart:

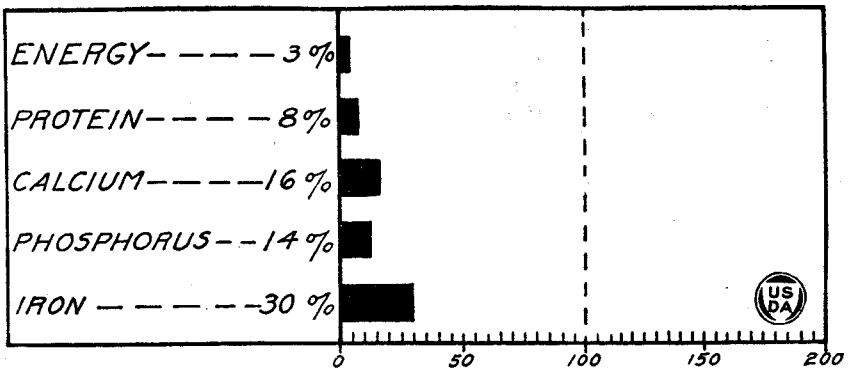

CHART 5.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of asparagus.

CHART 6.—ONE POUND OF LETTUCE.

One pound of lettuce supplies about 70 calories of energy, 5 grams (about one-sixth ounce) of protein, 0.17 gram of calcium, 0.16 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 phosphorus, and 18 per cent of the iron. This is shown in the following chart:

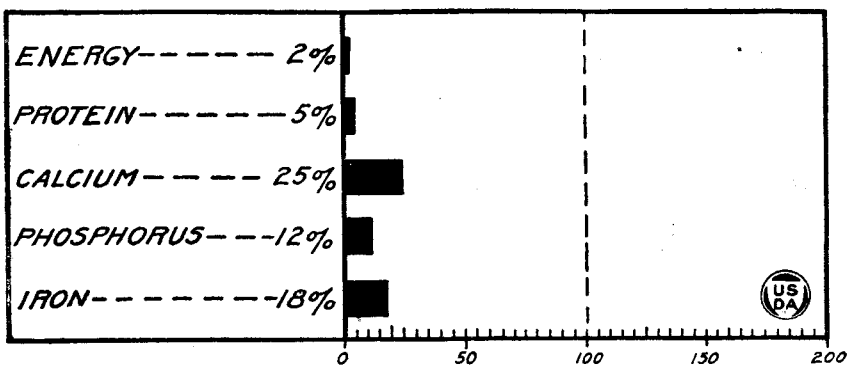

CHART 6.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of lettuce.

CHART 7.—ONE POUND OF CABBAGE.

One pound of cabbage supplies about 120 calories of energy, 6 grams (about one-fifth ounce) of protein, 0.17 gram of calcium, 0.11 gram of phosphorus, and 4.1 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, 8 per cent of the phosphorus, and 27 per cent of the iron. This is shown in the following chart:

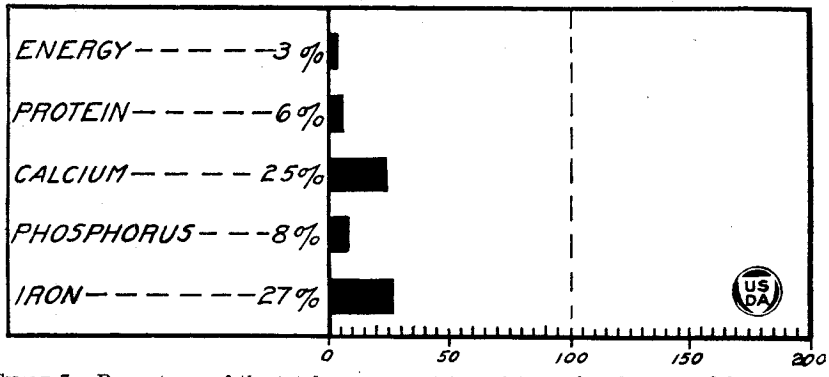

CHART 7.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of cabbage.

CHART 8.—ONE POUND OF SPINACH.

One pound of spinach supplies about 110 calories of energy, 10 grams (about one-third ounce) of protein, 0.30 gram of calcium, 0.31 gram of phosphorus, and 16.3 milligrams of iron. It would furnish, therefore, 3 per cent of the energy a man needs daily, 10 per cent of the protein, 44 per cent of the calcium, 23 per cent of the phosphorus, and 109 per cent of the iron. This is shown in the following chart:

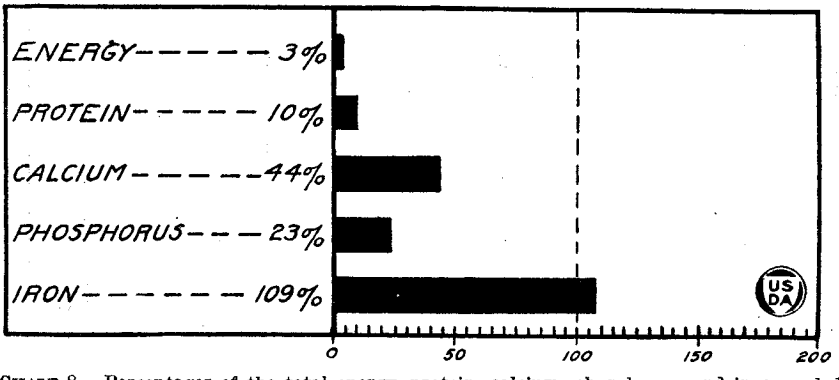

CHART 8.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of spinach.

CHART 9.—ONE POUND OF STRING BEANS.

One pound of string beans supplies about 175 calories of energy, 10 grams (about one-third ounce) of protein, 0.20 gram of calcium, 0.22 gram of phosphorus, and 4.1 milligrams of iron. It would furnish, therefore, 5 per cent of the energy a man needs daily, 10 per cent of the protein, 29 per cent of the calcium, 17 per cent of the phosphorus, and 27 per cent of the iron. This is shown in the following chart:

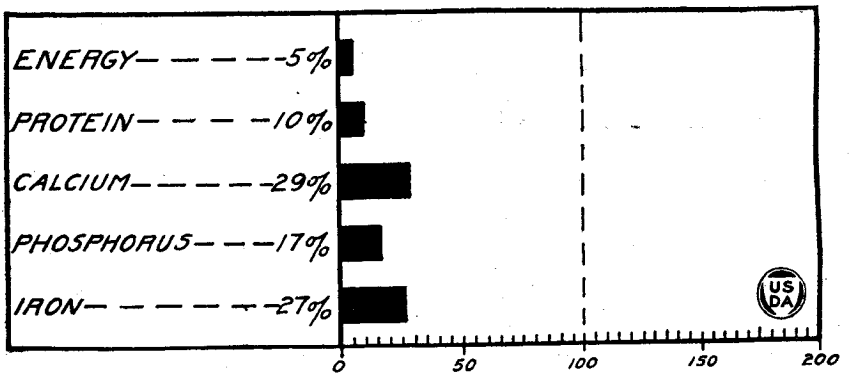

CHART 9.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of string beans.

CHART 10.—ONE POUND OF GREEN CORN, CANNED.

One pound of green corn, canned, supplies about 445 calories of energy, 13 grams (a little less than one-half ounce) of protein, 0.15 gram of calcium, 0.51 gram of phosphorus, and 3.2 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, 22 per cent of the calcium, 39 per cent of the phosphorus, and 21 per cent of the iron. This is shown in the following chart:

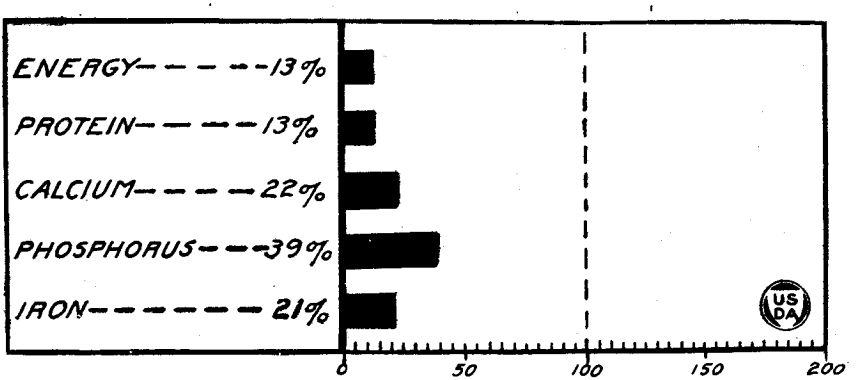

CHART 10.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of green corn, canned.

CHART 11.—ONE POUND OF TOMATOES, CANNED.

One pound of tomatoes, canned, supplies about 105 calories of energy, 5 grams (about one-sixth ounce) of protein, 0.06 gram of calcium, 0.11 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:

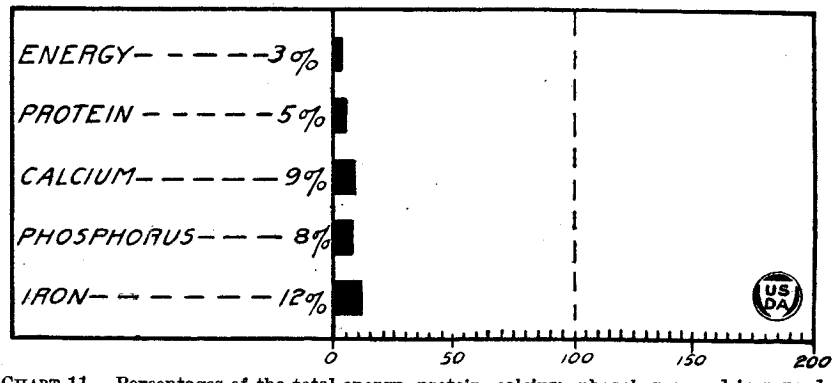

CHART 11.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of tomatoes, canned.

CHART 12.—ONE POUND OF ORANGES.

One pound of oranges supplies about 170 calories of energy, 3 grams (about one-ninth 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 following chart:

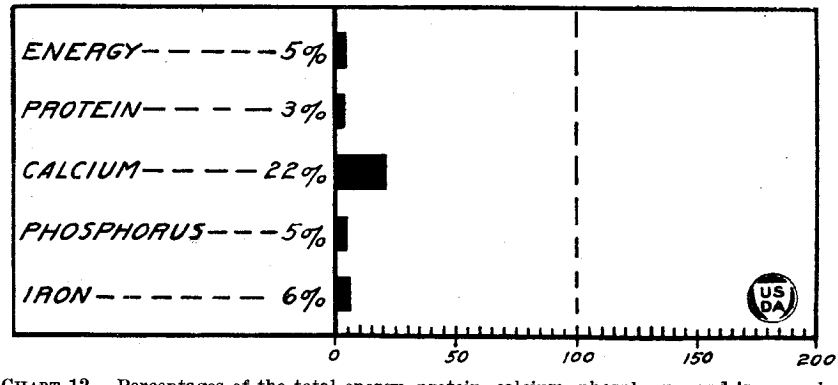

CHART 12.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of oranges.

CHART 13.—ONE POUND OF APPLES.

One pound of apples supplies about 215 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:

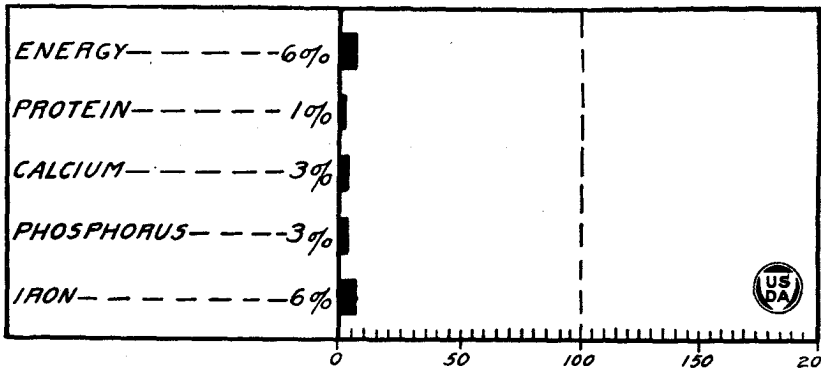

CHART 13.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of apples.

CHART 14.—ONE POUND OF BANANAS.

One pound of bananas supplies about 290 calories of energy, 4 grams (about one-seventh ounce) of protein, 0.03 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:

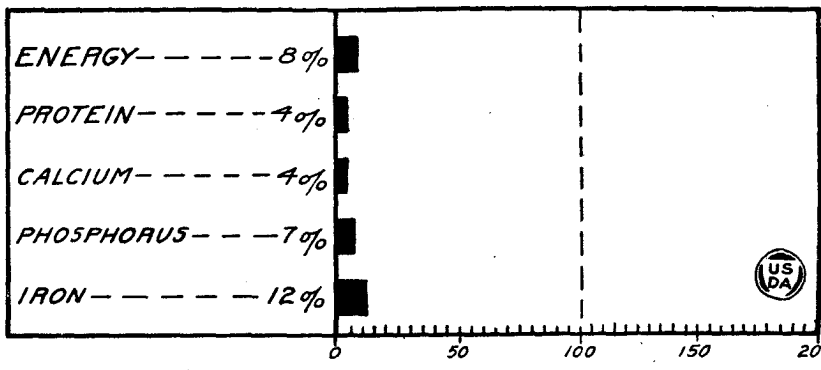

CHART 14.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of bananas.

CHART 15.—ONE POUND OF MUSKMELON.

One pound muskmelon supplies about 90 calories of energy, 1 gram (an almost negligible amount) of protein, 0.08 gram of calcium, 0.08 gram of phosphorus, and 1.4 milligrams of iron. It would furnish, therefore, 3 per cent of the energy a man needs daily, 1 per cent of the protein, 12 per cent of the calcium, 6 per cent of the phosphorus, and 9 per cent of the iron. This is shown in the following chart:

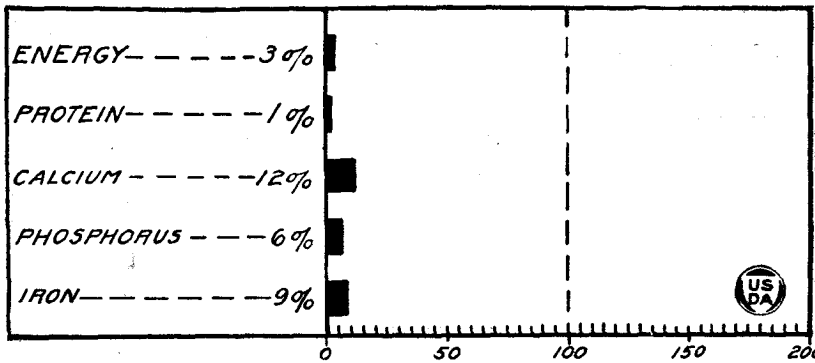

CHART 15.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of muskmelon.

CHART 16.—ONE POUND OF DRIED BEANS.

One pound of dried beans supplies about 1,565 calories of energy, 102 grams (about 3⅔ ounces) of protein, 0.73 gram of calcium, 2.14 grams of phosphorus, and 31.8 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:

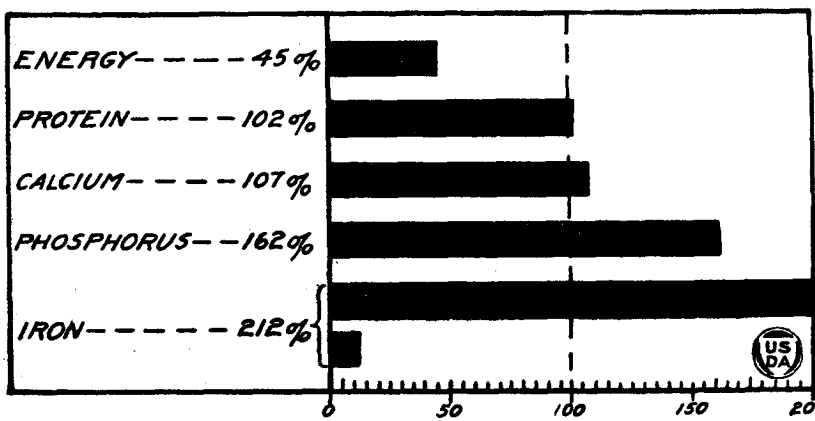

CHART 16.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of dried beans.

CHART 17.—ONE POUND OF RAISINS.

One pound of raisins supplies about 1,405 calories of energy, 10 grams (about one-third ounce) of protein, 0.29 gram of calcium, 0.60 gram of phosphorus, and 9.5 milligrams of iron. It would furnish, therefore, 40 per cent of the energy a man needs daily, 10 per cent of the protein, 43 per cent of the calcium, 45 per cent of the phosphorus, and 63 per cent of the iron. This is shown in the following chart:

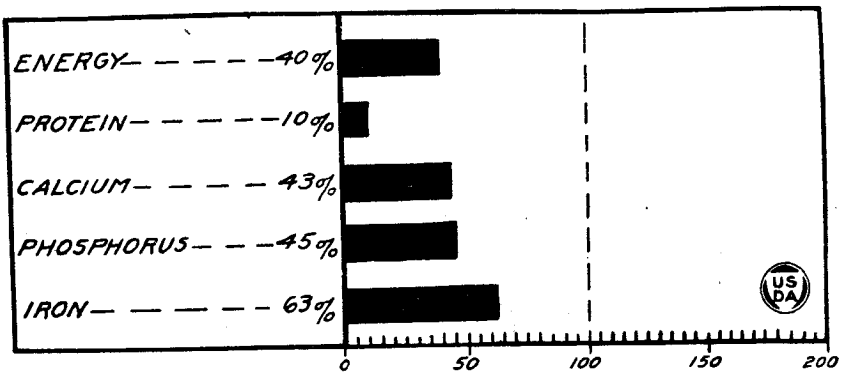

CHART 17.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of raisins.

GROUP II.—EFFICIENT-PROTEIN FOODS.

CHART 18.—ONE POUND OF WHOLE MILK.

One pound of whole milk supplies about 315 calories of energy, 15 grams (more than one-half ounce) of protein, 0.54 gram of calcium, 0.42 gram of phosphorus, and 0.9 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 6 per cent of the iron. This is shown in the following chart:

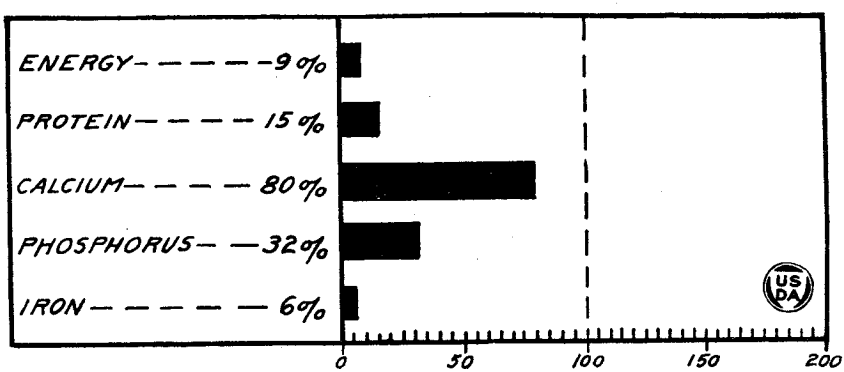

CHART 18.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of whole milk.

CHART 19.—ONE POUND OF SKIMMED MILK.

One pound of skimmed milk supplies about 165 calories of energy, 15 grams (more than one-half ounce) of protein, 0.55 gram of calcium, 0.44 gram of phosphorus, and 0.9 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 6 per cent of the iron. This is shown in the following chart:

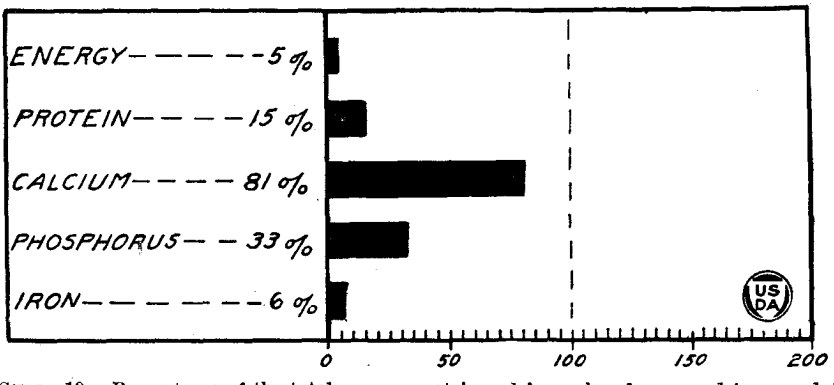

CHART 19.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of skimmed milk.

CHART 20.—ONE POUND OF COTTAGE CHEESE.

One pound of cottage cheese supplies about 500 calories of energy, 95 grams (about 3¼ ounces) of protein, 0.45 gram of calcium, 1.48 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, 66 per cent of the calcium, 112 per cent of the phosphorus, and none of the iron. This is shown in the following chart:

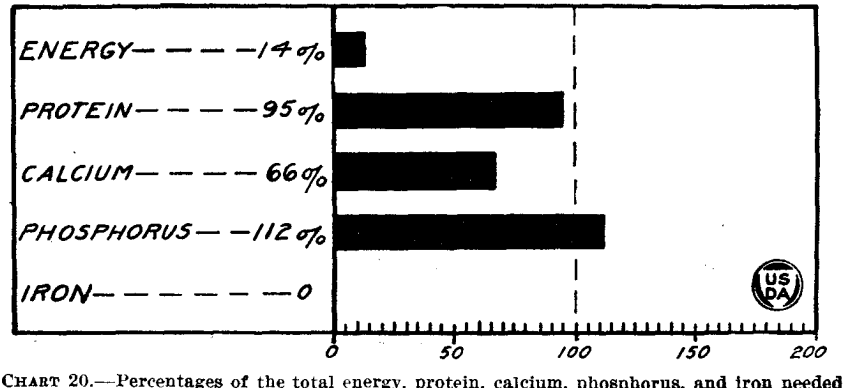

CHART 20.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of cottage cheese.

CHART 21.—ONE POUND OF AMERICAN CHEESE.

One pound of American cheese supplies about 1,995 calories of energy, 131 grams (about 4½ ounces) of protein, 3.84 grams of calcium, 2.76 grams of phosphorus, and 5.9 milligrams of iron. It would furnish, therefore, 57 per cent of the energy a man needs daily, 131 per cent of the protein, 565 per cent of the calcium, 209 per cent of the phosphorus, and 39 per cent of the iron. This is shown in the following chart:

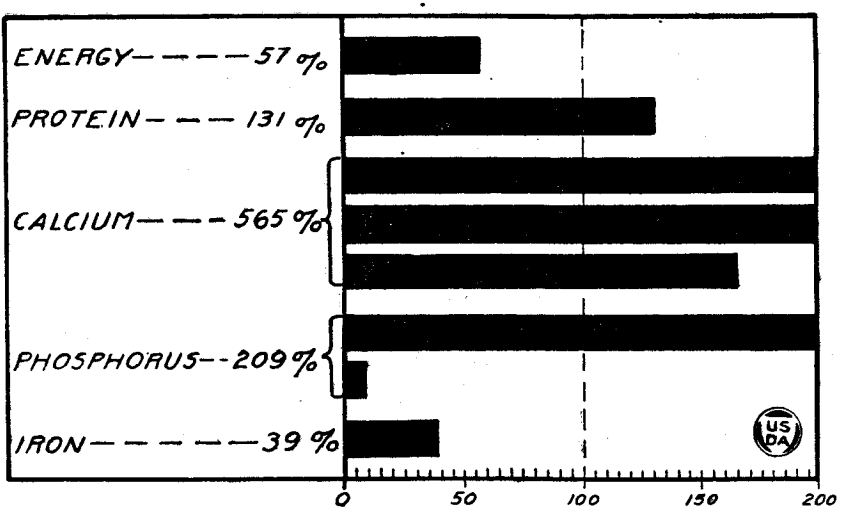

CHART 21.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of American cheese.

CHART 22.—ONE POUND OF EGGS.

One pound of eggs supplies about 595 calories of energy, 54 grams (about 2 ounces) of protein, 0.27 gram of calcium, 0.73 gram of phosphorus, and 12.2 milligrams of iron. It would furnish, therefore, 17 per cent of the energy a man needs daily, 54 per cent of the protein, 40 per cent of the calcium, 55 per cent of the phosphorus, and 81 per cent of the iron. This is shown in the following chart:

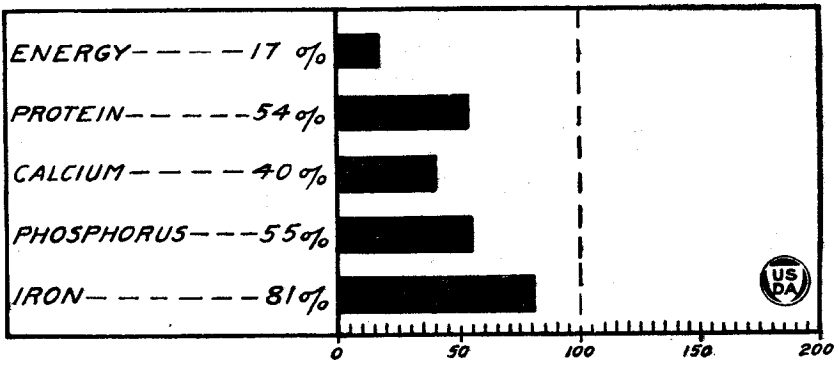

CHART 22.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of eggs.

CHART 23.—ONE POUND OF BEEF.

One pound of medium-fat beef, as purchased, supplies about 1,005 calories of energy, 67 grams (about 2⅓ ounces) of protein, 0.04 gram of calcium, 0.67 gram of phosphorus, and 10.1 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, 51 per cent of the phosphorus, and 67 per cent of the iron. This is shown in the following chart:

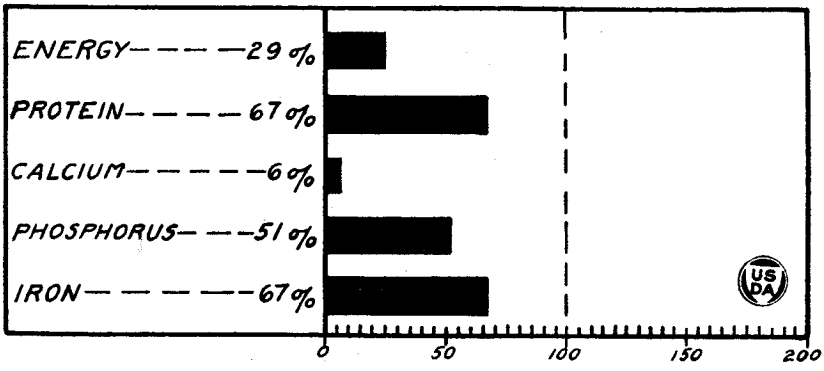

CHART 23.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of beef.

CHART 24.—ONE POUND OF MUTTON.

One pound of average mutton, as purchased, supplies about 1,215 calories of energy, 59 grams (a little over 2 ounces) of protein, 0.03 gram of calcium, 0.59 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, 4 per cent of the calcium, 45 per cent of the phosphorus, and 59 per cent of the iron. This is shown in the following chart:

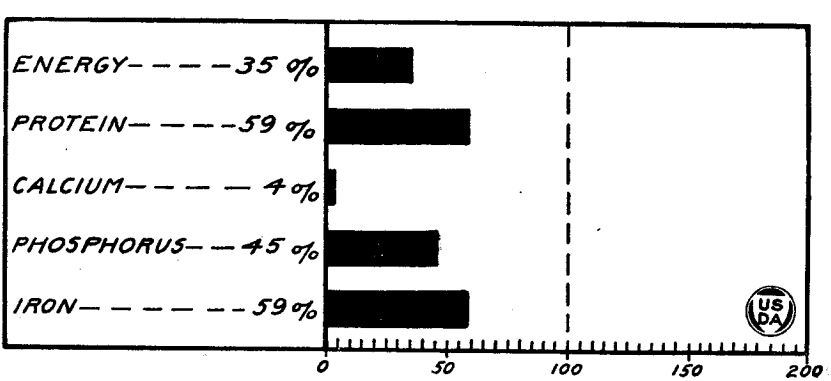

CHART 24.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of mutton.

CHART 25.—ONE POUND OF PORK LOIN.

One pound of medium-fat pork loin supplies about 1,230 calories of energy, 61 grams (over 2 ounces) of protein, 0.04 gram of calcium, 0.65 gram of phosphorus, and 9 milligrams of iron. It would furnish, therefore, 35 per cent of the energy a man needs daily, 61 per cent of the protein, 5 per cent of the calcium, 49 per cent of the phosphorus, and 60 per cent of the iron. This is shown in the following chart:

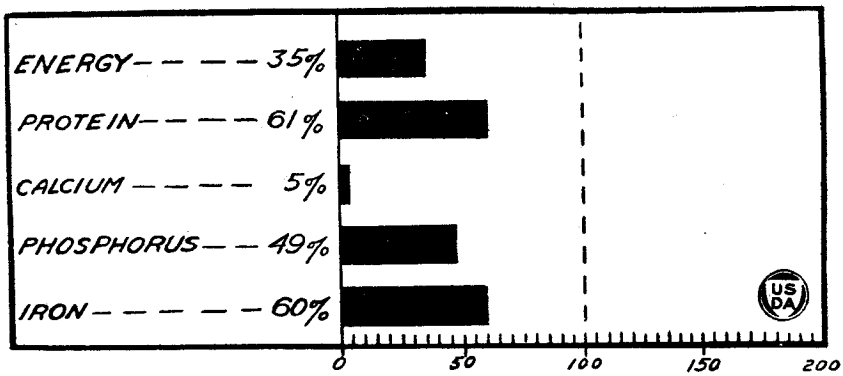

CHART 25.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of medium-fat pork loin.

CHART 26.—ONE POUND OF FOWL.

One pound of fowl, as purchased, supplies about 750 calories of energy, 62 grams (about 2⅛ ounces) of protein, 0.03 gram of calcium, 0.62 gram of phosphorus, and 9.3 milligrams of iron. It would furnish, therefore, 21 per cent of the energy a man needs daily, 62 per cent of the protein, 4 per cent of the calcium, 47 per cent of the phosphorus, and 62 per cent of the iron. This is shown in the following chart:

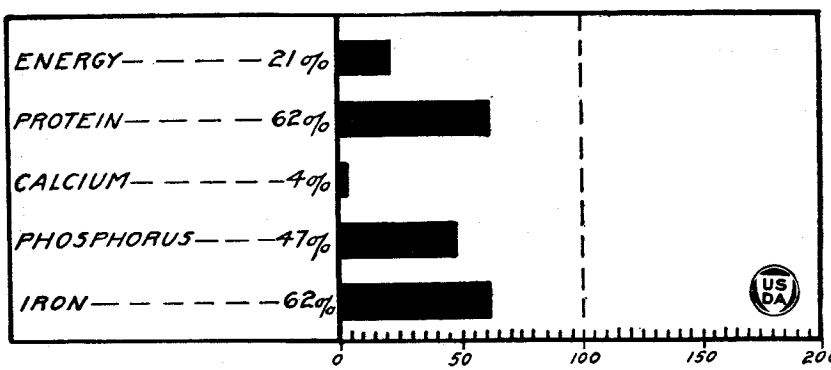

CHART 26.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of fowl.

CHART 27.—ONE POUND OF FRESH CODFISH.

One pound of fresh codfish, as purchased, supplies about 160 calories of energy, 38 grams (about 1½ ounces) of protein, 0.04 gram of calcium, 0.41 gram of phosphorus, and 1.5 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, 31 per cent of the phosphorus, and 10 per cent of the iron. This is shown in the following chart:

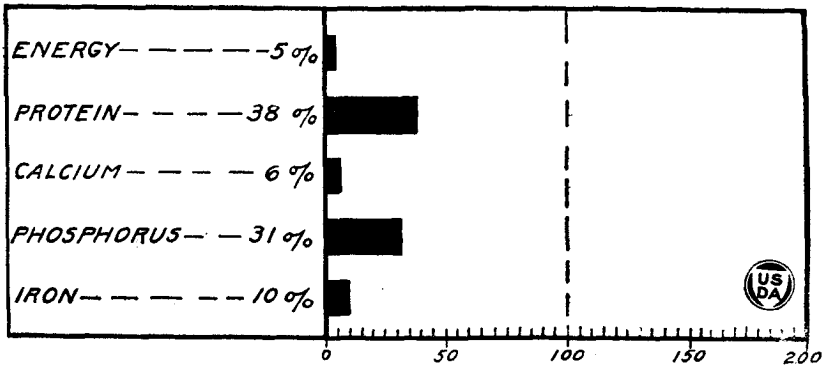

CHART 27.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of fresh codfish.

CHART 28.—ONE POUND OF FRESH SALMON.

One pound of fresh salmon, as purchased, supplies about 640 calories of energy, 69 grams (about 2½ ounces) of protein, 0.07 gram of calcium, 0.75 gram of phosphorus, and 2.8 milligrams of iron. It would furnish, therefore, 18 per cent of the energy a man needs daily, 69 per cent of the protein, 10 per cent of the calcium, 57 per cent of the phosphorus, and 19 per cent of the iron. This is shown in the following chart:

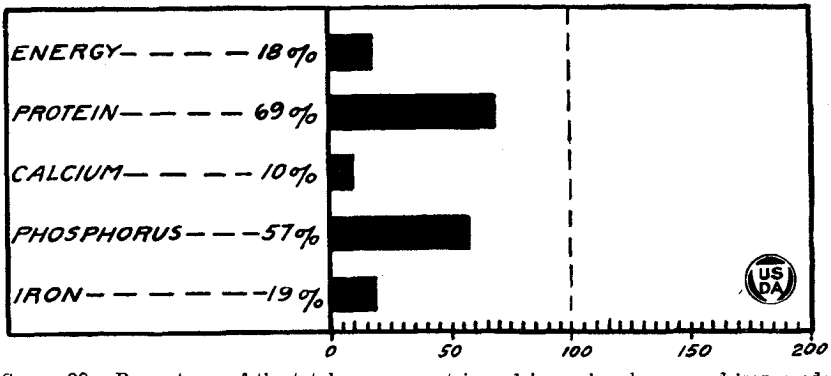

CHART 28.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of fresh salmon.

CHART 29.—ONE POUND OF OYSTERS.

One pound of oysters supplies about 230 calories of energy, 28 grams (about 1 ounce) of protein, 0.24 gram of calcium, 0.70 gram of phosphorus, and 20.4 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 of the iron. This is shown in the following chart:

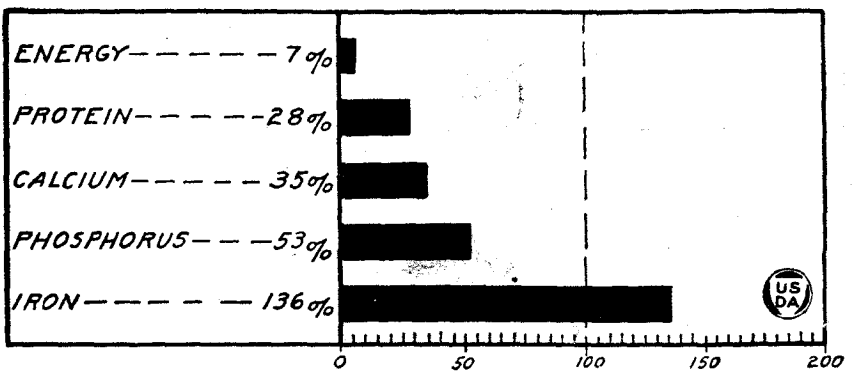

CHART 29.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of oysters.

CHART 30.—ONE POUND OF SHELLED PEANUTS.

One pound of shelled peanuts supplies about 2,485 calories of energy, 117 grams (about 4¼ ounces) of protein, 0.32 gram of calcium, 1.81 grams of phosphorus, and 9.1 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 61 per cent of the iron. This is shown in the following chart:

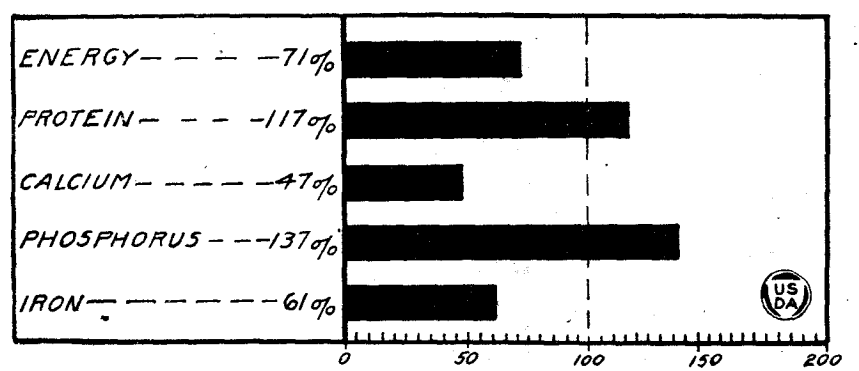

CHART 30.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of shelled peanuts.

GROUP III.—CEREALS AND CEREAL PREPARATIONS.

CHART 31.—ONE POUND OF OATMEAL.

One pound of oatmeal supplies about 1,810 calories of energy, 73 grams (more than 2½ ounces) of protein, 0.31 gram of calcium, 1.78 grams of phosphorus, and 17.2 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:

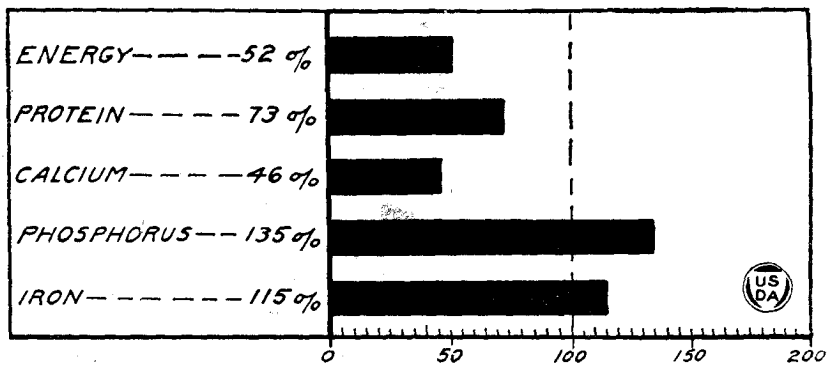

CHART 31.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of oatmeal.

CHART 32.—ONE POUND OF WHEAT FLOUR (PATENT ROLLER).

One pound of wheat flour (patent roller) supplies about 1,610 calories of energy, 52 grams (nearly 2 ounces) of protein, 0.06 gram of calcium, 0.28 gram of phosphorus, and 3.2 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:

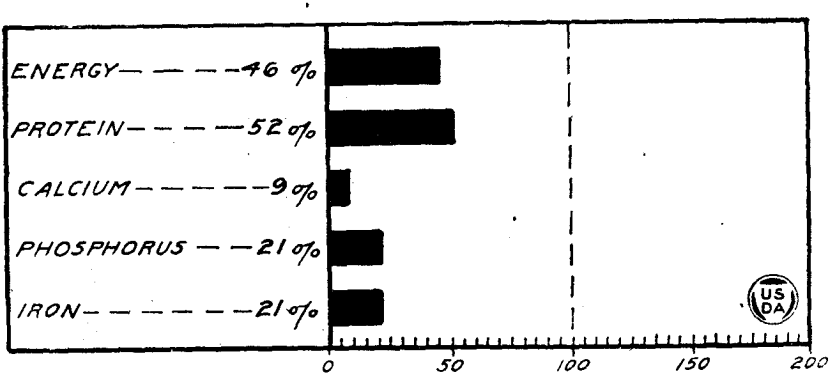

CHART 32.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of wheat flour (patent roller).

CHART 33.—ONE POUND OF GRAHAM FLOUR.

One pound of graham flour supplies about 1,625 calories of energy, 60 grams (about 2 ounces) of protein, 0.18 gram of calcium, 1.65 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:

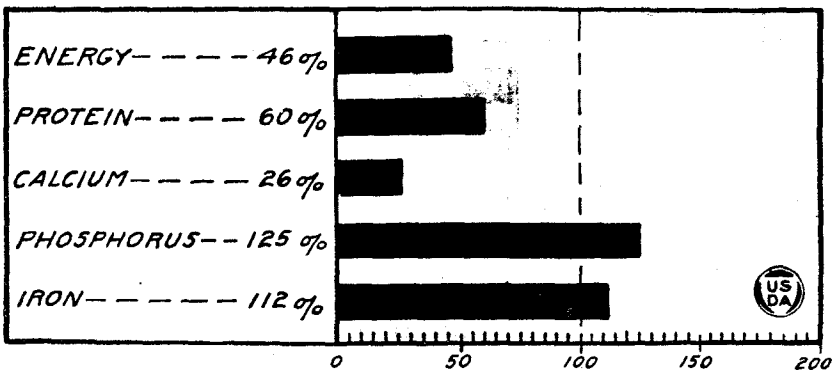

CHART 33.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of graham flour.

CHART 34.—ONE POUND OF CORN MEAL.

One pound of corn meal supplies about 1,615 calories of energy, 42 grams (about 1½ ounces) of protein, 0.08 gram of calcium, 0.86 gram of phosphorus, and 4.1 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:

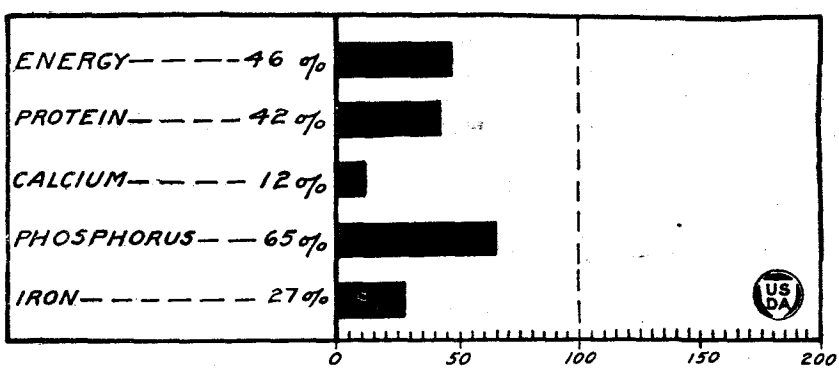

CHART 34.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of corn meal.

CHART 35.—ONE POUND OF RICE.

One pound of rice supplies about 1,590 calories of energy, 36 grams (about 1¼ ounces) of protein, 0.04 gram of calcium, 0.44 gram of phosphorus, and 4.1 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:

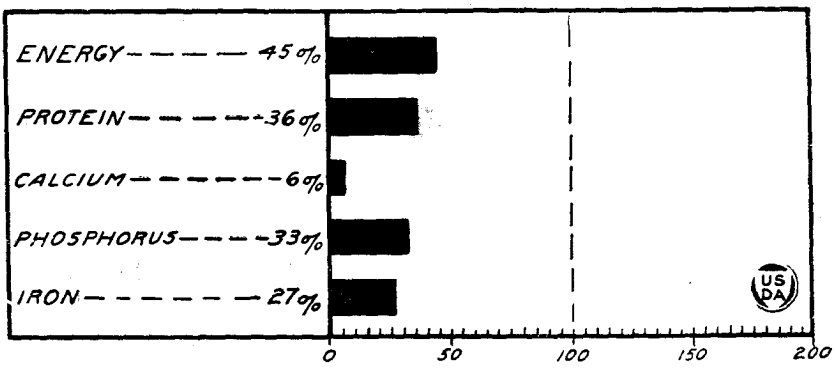

CHART 35.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of rice.

CHART 36.—ONE POUND OF MACARONI.

One pound of macaroni, as purchased, supplies about 1,625 calories of energy, 61 grams (over 2 ounces) of protein, 0.10 gram of calcium, 0.65 gram of phosphorus, and 5 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 33 per cent of iron. This is shown in the following chart:

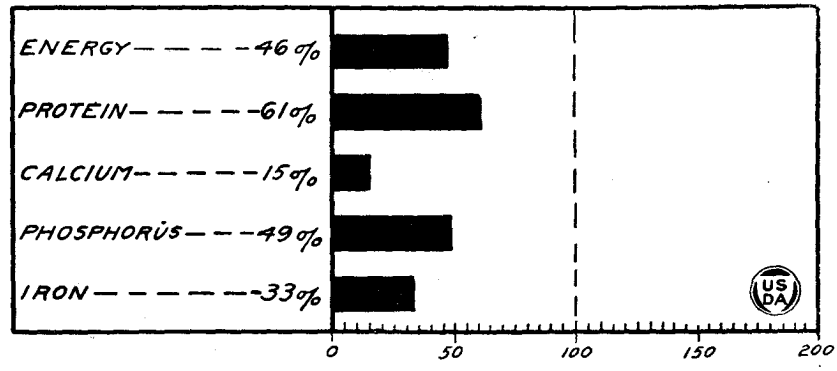

CHART 36.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of macaroni.

CHART 37.—ONE POUND OF WHEAT BREAD.

One pound of wheat bread supplies about 1,185 calories of energy, 42 grams (about 1½ ounces) of protein, 0.12 gram of calcium, 0.42 gram of phosphorus, and 4.1 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:

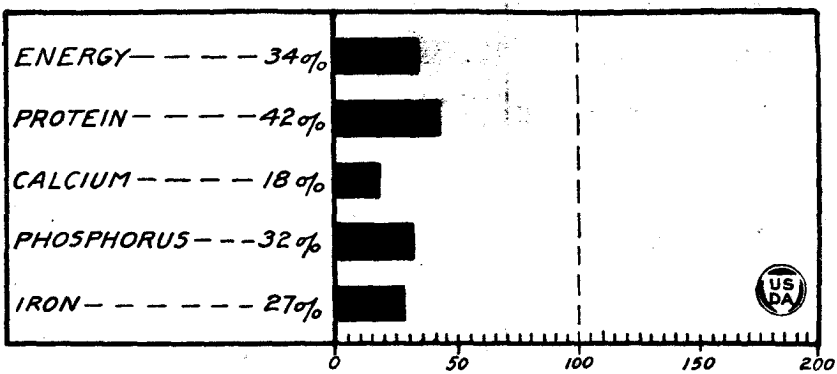

CHART 37.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of wheat bread.

CHART 38.—ONE POUND OF "SODA" CRACKERS.

One pound of "soda" crackers supplies about 1,875 calories of energy, 44 grams (about 1½ ounces) of protein, 0.10 gram of calcium, 0.46 gram of phosphorus, and 6.8 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:

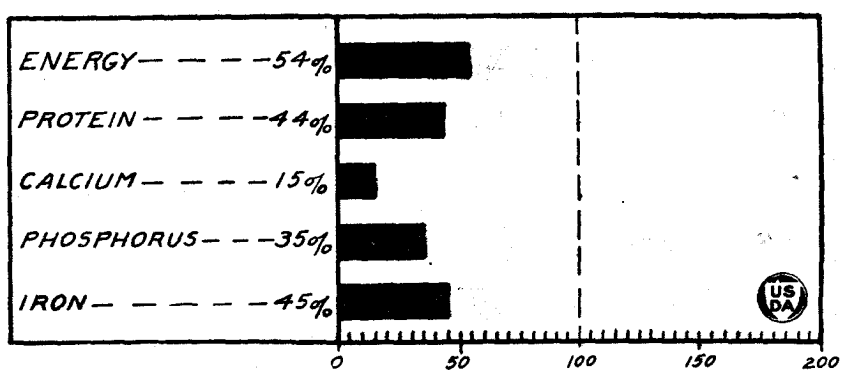

CHART 38.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of soda crackers.

GROUP IV.—SUGAR AND SUGARY FOODS.

CHART 39.—ONE POUND OF SUGAR.

One pound of sugar supplies about 1,815 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:

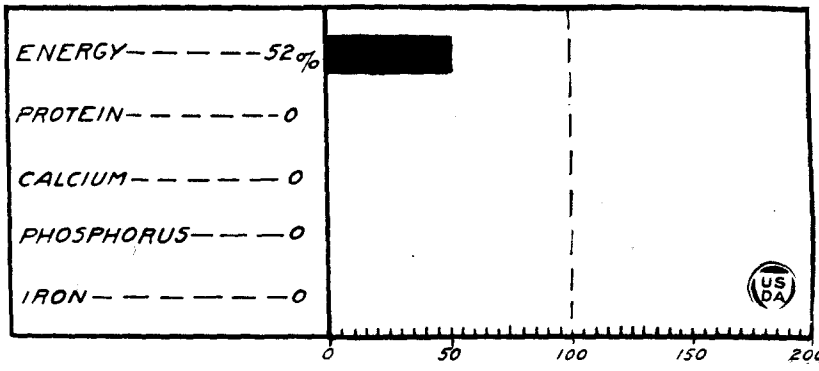

CHART 39.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of sugar.

CHART 40.—ONE POUND OF HONEY.

One pound of honey supplies about 1,480 calories of energy, 2 grams (about one-fourteenth ounce) of protein, 0.005 gram of calcium, 0.06 gram of phosphorus, and 3.2 milligrams of iron. It would furnish, therefore, 42 per cent of the energy a man needs daily, 2 per cent of the protein, practically no calcium, 5 per cent of the phosphorus, and 21 per cent of the iron. This is shown in the following chart:

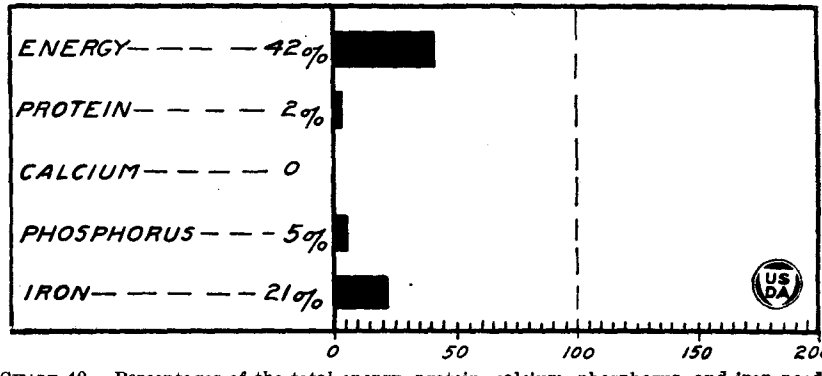

CHART 40.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of honey.

CHART 41.—ONE POUND OF CURRANT JELLY.

One pound of currant jelly supplies about 1,175 calories of energy, 1 gram (an almost negligible amount) of protein, 0.06 gram of calcium, 0.04 gram of phosphorus, and 1.4 milligrams 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:

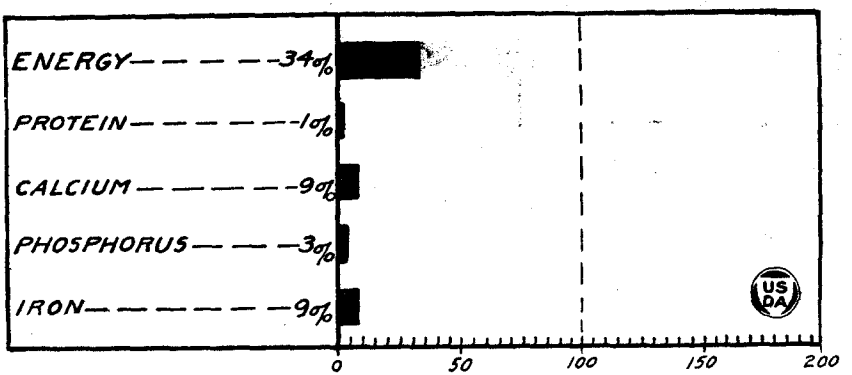

CHART 41.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of currant jelly.

CHART 42.—ONE POUND OF PRESERVED BLACKBERRIES.

One pound of preserved blackberries supplies about 1,125 calories of energy, 4 grams (about one-seventh ounce) of protein, 0.16 gram of calcium, 0.10 gram of phosphorus, and 1.4 milligrams 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:

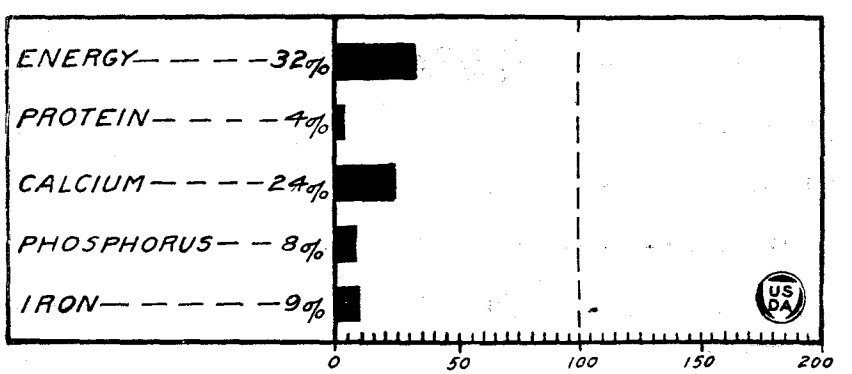

CHART 42.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of preserved blackberries.

GROUP V.—FATS AND FAT FOODS.

CHART 43.—ONE POUND OF LARD.

One pound of lard supplies about 4,080 calories of energy, and, if thoroughly refined, no other nutrients. It would furnish, therefore, 117 per cent of the energy a man needs daily. This is shown in the following chart:

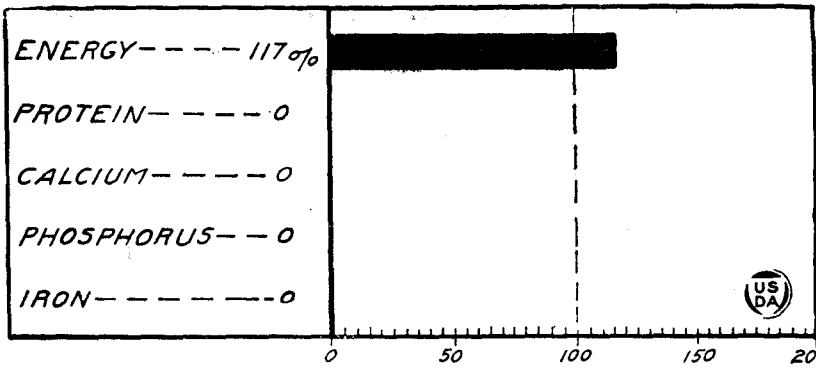

CHART 43.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of lard.

CHART 44.—ONE POUND OF BUTTER.

One pound of butter supplies about 3,365 calories of energy, 5 grams (about one-sixth ounce) of protein, 0.07 gram of calcium, 0.08 gram of phosphorus, and 0.9 milligram 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:

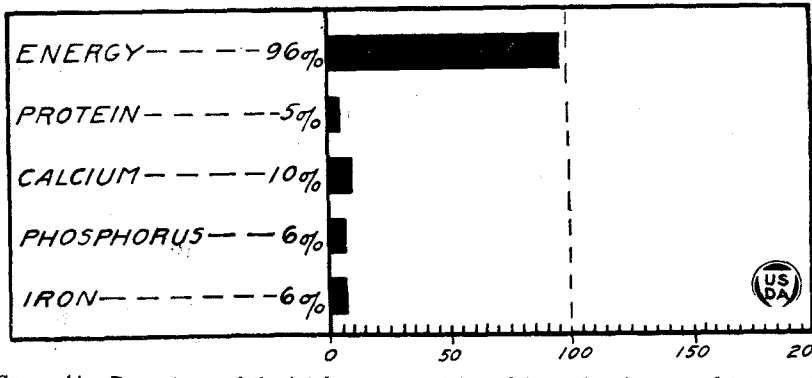

CHART 44.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of butter.

CHART 45.—ONE POUND OF CREAM (40 PER CENT MILK FAT).

One pound of cream (40 per cent milk fat) supplies about 1,725 calories of energy, 9 grams (about one-third 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:

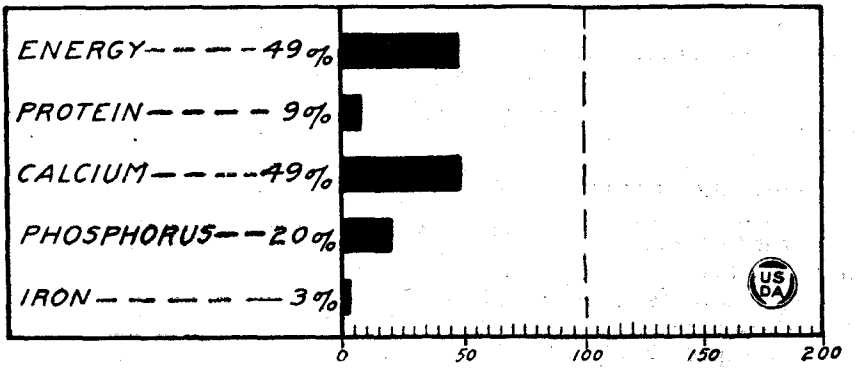

CHART 45.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of cream (40 per cent milk fat).

CHART 46.—ONE POUND OF FAT SALT PORK.

One pound of fat salt pork supplies about 2,850 calories of energy, 34 grams (about 1¼ ounces) of protein, 0.02 gram of calcium, 0.34 gram of phosphorus, and 5.0 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, 26 per cent of the phosphorus, and 33 per cent of the iron. This is shown in the following chart:

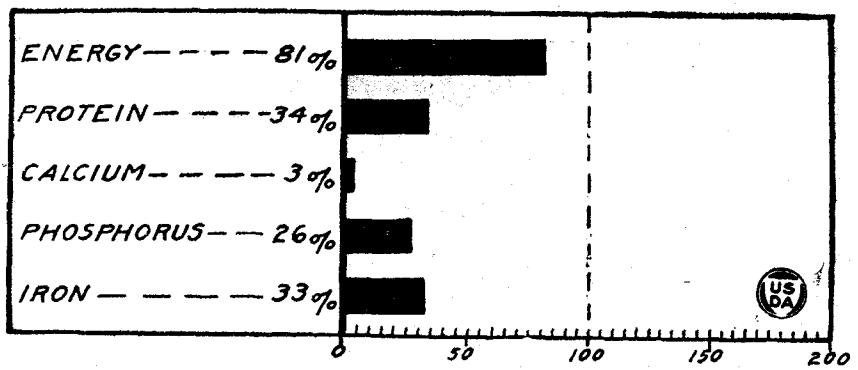

CHART 46.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of fat salt pork.

CHART 47.—ONE POUND OF CHOCOLATE.

One pound of chocolate supplies about 2,770 calories of energy, 59 grams (about 2 ounces) of protein, 0.42 gram of calcium, 2.06 grams of phosphorus, and 12.2 milligrams of iron. It would furnish, therefore, 79 per cent of the energy a man needs daily, 59 per cent of the protein, 62 per cent of the calcium, 156 per cent of the phosphorus, and 81 per cent of the iron. This is shown in the following chart:

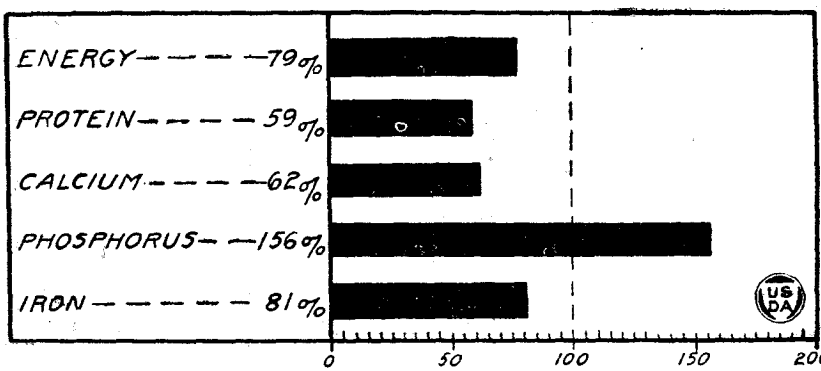

CHART 47.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of chocolate.

CHART 48.—ONE POUND OF SHELLED ENGLISH WALNUTS.

One pound of shelled English walnuts supplies about 3,200 calories of energy, 84 grams (nearly 3 ounces) of protein, 0.40 gram of calcium, 1.62 grams of phosphorus, and 9.5 milligrams of iron. It would furnish, therefore, 91 per cent of the energy a man needs daily, 84 per cent of the protein, 59 per cent of the calcium, 123 per cent of the phosphorus, and 63 per cent of the iron. This is shown in the following chart:

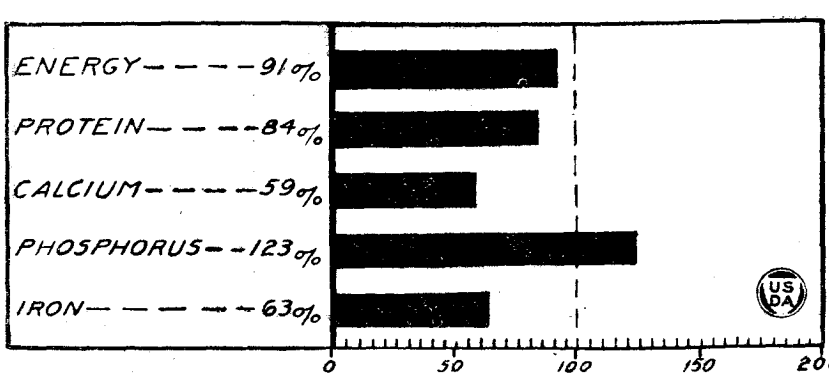

CHART 48.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of shelled English walnuts.

MISCELLANEOUS.

CHART 49.—ONE POUND OF CAKE.

One pound of cake (representing seven-eighths of the following recipe: ½ cup butter, 1 cup sugar, ½ cup milk, 2 eggs, and 1¾ cups flour) supplies about 1,745 calories of energy, 29 grams (about 1 ounce) of protein, 0.21 gram of calcium, 0.31 gram of phosphorus, and 3.2 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:

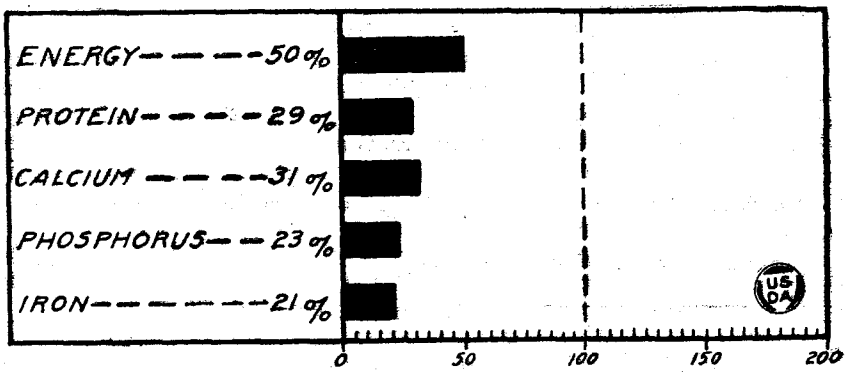

CHART 49.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of cake.

CHART 50.—ONE POUND OF APPLE PIE.

One pound of apple pie supplies about 1,235 calories of energy, 14 grams (about one-half ounce) of protein, 0.02 gram of calcium, 0.06 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, 5 per cent of the phosphorus, and 6 per cent of the iron. This is shown in the following chart:

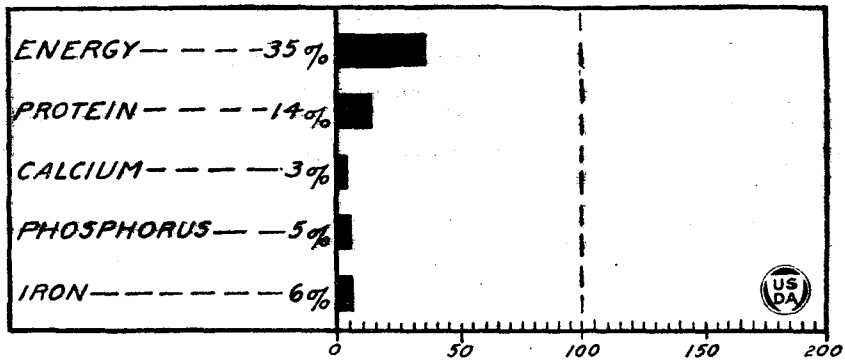

CHART 50.—Percentages of the total energy, protein, calcium, phosphorus, and iron needed per man per day which would be furnished by 1 pound of apple pie.

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—energy, 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 for other foods by using the figures for the nutritive requirements (p. 2) in relation to the amount of energy, protein, calcium, phosphorus, and iron present in the foods as reported in tables showing food composition.

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.

Another use of 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 these mineral substances come to more than 100 per cent. In classroom or lecture use adding together the percentage of the constituents shown on the charts may not be so effective as filling in the lines on a skeleton chart, as the different foods making up a ration are discussed. Allowance must also be made for bulk, vitamins, and the character of the protein, all of which are important factors in the diet, although they can not be definitely measured.

VITAMINS.

Though no method of weighing or measuring vitamins has yet been devised, some foods are known to be richer than others in one or more of these substances. The following table[5] gives the results of studies on the vitamin content of 35 of the 50 common foods discussed in this bulletin:

[5] This table is based chiefly on that published in The Vitamins, by H. C. Sherman and S. L. Smith, with a few additions from more recent literature.

VITAMINS IN SOME COMMON FOODS.

+ indicates that the food contains the vitamin.
++ indicates that the food is a good source of the vitamin.
+++ indicates that the food is an excellent source of the vitamin.
−indicates that the food contains no appreciable amount of the vitamin.
? indicates doubt as to presence or relative amount.

Name of food.	Vitamin A.	Vitamin B.	Vitamin C.
VEGETABLES AND FRUITS.			
Potatoes	+	++	++
Potatoes, sweet	++	+	+
Onions	Not determined	++	++
Turnips	−	++	++
Asparagus	Not determined	++	++
Lettuce	++	++	+++
Cabbage	+	+++	+++
Spinach	+++	+++	Not determined.
Beans, string	++	++	++
Corn, green, canned	Not determined	Not determined	Not determined.
Tomatoes, canned	++	+++	+++
Orange juice	+	++	+++
Apples	+	+	+
Bananas	+ ?	+	+
Muskmelon	Not determined	Not determi ned	Not determined.
Beans, navy, dried	Not determined	+++	−
Raisins	Not deterimned	Not determined	Not determined.
EFFICIENT-PROTEIN FOODS.			
Milk, whole	+++	++	+ variable.
Milk, skimmed	+	++	+ variable.
Cheese, cottage	+	Not determined	Not determined.
Cheese, American	++	Not determined	Not determined.
Eggs	++	+	+ ?
Beef	Not determined	+	Not determined
Mutton	Not determined	+	Not determined.
Pork	Not determined	++	Not determined.
Fowl	Not determined	Not determined	Not determined
Codfish	Not determined	Not determined	Not determined.
Salmon	Not determined	Not determined	Not determined.
Oysters	Not determined	Not determined	+
Peanuts	+	++	Not determined.
CEREALS AND CEREAL PREPARATIONS.			
Oatmeal	+	++	−
Wheat flour	−	+	−
Graham flour	+	++	−
Corn meal (yellow)	+	++	−
Rice, polished	−	−	−
Macaroni	Not determined	Not determined	Not determined.
Bread, white (water)	?	+	−
Bread, white (milk)	+	+	?
Crackers, soda	Not determined	Not determined	Not determined.
SUGAR AND SUGARY FOODS.			
Sugar	−	−	−
Honey	−	+	−
Jelly, currant	Not determined	Not determined	Not determined.
Blackberries, preserved	Not determined	Not determined	Not determined.
FATS AND FAT FOODS.			
Lard	+ ?	−	−
Butter	+++	−	−
Cream	+++	++	+ variable.
Fat salt pork	Not determined	Not determined	Not determined.
Chocolate	Not determined	Not determined	Not determined.
Walnuts, English	+	++	Not determined.
Cake	Not determined	Not determined	Not determined.
Pie	Not determined	Not determined	Not determined.

Too great value should not be attached to these data, for, as will be seen at a glance, they are very incomplete and may be changed as new investigations are reported. It should be clearly understood also that the symbols used in no way represent quantity but merely indicate the value of one food compared with another as a source of vitamin A, B, or C. In other words, this table does not show that a pound of spinach contains three times as much vitamin A as a pound of cabbage, but simply that it is a relatively richer source of this substance.

ORGANIZATION OF THE UNITED STATES DEPARTMENT OF AGRICULTURE.

November 24, 1923.

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