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DIETS AT FOUR LEVELS OF NUTRITIVE CONTENT AND COST

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INTRODUCTION

The present economic situation has focused attention upon national as well as individual planning for the best use of food resources. Basic to any such planning is a knowledge of food values, of the nutritional needs of the body, and of the relation of food to health. Scientific studies have been accumulating information on these subjects for the last half century. Hence with considerable confidence diets designed to raise the level of nutrition among many groups of the population can now be planned.

Both the consumer and the producer are demanding information on food selection based on this new knowledge of food values and nutritional needs. The consumer, interested in getting good returns for what he can afford to spend, wishes to have this information interpreted at several economic levels. The producer on his part, wants to know how much of different foods may well appear in the diets of different consumer groups, and to what extent consumption may rise or fall as the economic situation changes.

This publication presents diets at four levels of nutritive content and cost, and includes information on certain aspects of food purchasing. The four diets are stated in terms of the quantities of foods or groups of food required yearly for individuals of different ages and degrees of activity, and also in terms of the quantities needed yearly and weekly by families of typical composition. The nutritive value and cost of each diet are discussed so that extension agents, teachers of nutrition, social workers, relief agencies, and economists can readily see which suits the needs of the particular group with which they are concerned.

Extension workers will find the yearly food allowances useful in helping farm families to plan their programs of food production for home use. Welfare agencies and teachers will find the weekly food allowances helpful in discussing food budgeting problems with city families. Institutional managers will find the allowances for individuals by age groups of assistance in planning for quantity purchases of food. And economists and others interested in coordinating food production, manufacture, and distribution with consumer needs will find in the yearly per capita figures a basis for planning the best use of the food resources of a community, region, or nation. The general use of either of the two diets at the higher levels of nutritive content would not only improve the health and efficiency of the population, but at the same time would foster the type of agriculture which represents wise utilization of land for the country as a whole.

DESCRIPTION OF THE SUGGESTED DIETS

The four diets planned are (1) restricted diets for emergency use, (2) adequate diets at minimum cost, (3) adequate diets at moderate cost, and (4) liberal diets.

Table 1 presents the quantities of different kinds of food which, according to each of these four diets, would supply the yearly per capita needs of our population. These quantities were computed from diets adapted to the needs of individuals in different age, sex, and activity groups (table 6), and from the number of persons in each group as shown by the 1930 census of population (*30*).[1] It was assumed, for purposes of dietary computations, that 40 percent of the men and 30 percent of the women between the ages of 20 and 65 years were very active physically, the others moderately active. The figures in table 1 apply to the population as a whole or to large representative groups, but not to individuals or to single families. For such data see tables 6 and 15 to 22, inclusive.

TABLE 1.—*Four diets: Approximate yearly quantities*[1] *of various foods or groups of food needed per capita for the population of the United States*

Item	Restricted diet for emergency use	Adequate diet at minimum cost	Adequate diet at moderate cost	Liberal diet
Flour, cereals ... pounds	240	224	160	100
Milk, or its equivalent [2] ... quarts	155	260	305	305
Potatoes, sweetpotatoes ... pounds	165	165	165	155
Dried beans, peas, nuts ... do	30	30	20	7
Tomatoes, citrus fruits ... do	50	50	90	110
Leafy, green, and yellow vegetables ... do	40	80	100	135
Dried fruits ... do	10	20	25	20
Other vegetables, fruits ... do	40	85	210	325
Fats (including butter, oils, bacon, salt pork) ... do	45	49	52	52
Sugars ... do	50	35	60	60
Lean meat [3], poultry, fish ... do	30	60	100	165
Eggs ... dozen	8	15	15	30

[1] The figures given in this table are computed from diets adapted to the needs of individuals of different age, sex, and activity groups (table 6) and from the number of persons in each group as shown by the 1930 census of population. The quantities are those which should be delivered to the family kitchen. To convert them into production figures, suitable margins must be added to the different food groups to cover the unavoidable losses in harvesting, grading, storage, manufacture, or distribution.

[2] The following are approximately equivalent to the food value of 1 quart of fluid whole milk: 17 ounces of evaporated milk; or 1 quart of fluid skim milk and 1½ ounces of butter; or 5 ounces of American Cheddar cheese; or 4½ ounces of dried whole milk; or 3½ ounces of dried skim milk and 1½ ounces of butter.

[3] Retail cuts.

[1] Italic numbers in parentheses refer to Literature Cited, p. 57.

The quantities of different foods or groups of food shown in table 1 are in terms of products delivered to the consumer's door. Fats and fat meats are listed separately from the lean meat because their nutritive values are very different. The separation is pointed out here, inasmuch as most figures on apparent meat consumption are given in terms of the weight of the entire carcass and include, therefore, much more fat (and probably relatively more bone) than is usually delivered to the family kitchen. The figures in table 1 make a small allowance for waste by the consumer. It is recognized, however, that waste is a highly variable factor in households and institutions, and is probably a very large factor in public eating places. Much edible food, especially fats and sugar, is likely to be discarded unless care for its conservation is taken in food preparation and service. Nor do the figures in table 1 make any allowance for wastes in distribution. To convert these data into estimates of the production necessary to supply human needs, suitable margins must be added to different types of food to cover the unavoidable losses in harvesting, deterioration in transportation and storage, and the rejection of products as a whole or in part, in grading or processing, and in retail distribution.

For purposes of comparison, table 2 presents a summary of the food value of each of the four diets in terms of specified nutrients, and shows the distribution of calories among different groups of food. It will be noted that the adequate diets furnish somewhat less than 3,000 calories per capita per day. Although, as has just been pointed out, this average figure includes a small margin beyond dietary standards (p. 26) to cover household waste, it is, nevertheless, about 20 percent [2] less than the calorie consumption implied by figures on "apparent" per capita consumption (based on statistics of production, export, and import of food intended for human consumption). Such statistics are important as measures of trends in food consumption and of the estimated disappearance of food rather than as measures of the quantities of food actually required for human consumption.

TABLE 2.—*Summary of the food value of diets shown in table 1 in terms of quantities of specified nutrients per capita per day and distribution of calories among different food groups*

Item	Restricted diet for emergency use	Adequate diet at minimum cost	Adequate diet at moderate cost	Liberal diet
QUANTITIES OF SPECIFIED NUTRIENTS				
Energy value ... calories	2,675	2,980	2,985	2,930
Calories from protein ... percent	11	12	11	12
Protein ... grams	75	89	84	87
Fat ... do	87	115	130	149
Carbohydrates ... do	398	397	370	310
Calcium ... do	.85	1.28	1.26	1.27
Phosphorus ... do	1.34	1.72	1.58	1.61
Iron ... do	.0111	.0134	.0144	.0152
Vitamin A ... units	2,746	5,067	5,692	6,495
Vitamin C ... do	86	118	168	206
DISTRIBUTION OF CALORIES AMONG DIFFERENT FOOD GROUPS				
Bread, flour, cereals ... percent	43	35	24	15
Milk ... do	12	18	19	19
Fruits, vegetables ... do	14	15	18	18
Fats ... do	17	17	18	18
Sugars ... do	9	7	9	9
Lean meat, fish, eggs ... do	5	8	12	21

[2] Computation based on estimated per capita consumption for 1923–27 (*19*).

The restricted diet for emergency use provides approximately the minimum requirements of the body for the various nutrients, but allows little margin for safety. It represents good food selection when a fully adequate diet is beyond reach, but is not recommended for use over indefinite periods. It represents quantities of "protective" and other foods below which it is not safe to reduce the food supply. Continuous effort should be made to increase the quantities of milk, vegetables, fruits, lean meat, and eggs in accordance with the allowances suggested in the adequate diets. The minimum- and moderate-cost adequate diets provide, it is believed, enough of the different nutrients to cover average requirements for maintenance and growth and to furnish a margin of safety as well. The liberal diet is fully adequate. It includes items from different food groups in such quantities and proportions as to promote better-than-average nutrition. It permits a greater variety in food than may be provided by the other diets.

At the 1931–32 retail prices shown in table 3, the costs were $61, $85, $140, and $165 per capita per year, respectively, for the restricted diet for emergency use, the adequate diet at minimum cost, the adequate diet at moderate cost, and the liberal diet. While it is recognized that identical expenditures for food do not mean that diets will have similar nutritive content, it is nevertheless of interest to see how these four diets compare in cost level with the food selected by different social and economic groups, as shown by cost- or standard-of-living studies made in recent years.

The restricted diet for emergency use has a lower retail value than have diets budgeted by many if not most organized social agencies for dependent families in times of national prosperity. It has a higher retail value, however, than does the food which can be procured with the relief allowances furnished thousands of families in the period of widespread unemployment during 1931–33. Unfortunately, many families find it necessary even in normal times to live for long periods on supplies of food less plentiful and less well balanced than the restricted diet here suggested for emergency use. Under such conditions, health is greatly endangered. In sections of the South where pellagra constitutes a great public-health problem, the disease is most prevalent (*13*) among families with very low incomes and with very inadequate food supplies. Pellagra is rarely found (*26*) when diets are similar in food value to the restricted diet here suggested for emergency use.

As far as can be judged from the available data, the retail money value of the food of the majority of the families in the United States in the years 1922 to 1929 was between the values of the minimum- and moderate-cost adequate diets. For example, when allowance is made for differences in price levels, the average money value of the food supply reported per family by approximately 3,000 farm families in 11 States (*16*) fell between the retail values of these two diets. The fact that the food produced on the farm for home use was usually valued at farm prices rather than at the prices which the families would have paid had they purchased it, probably accounts for the fact that the average value of food per farm family in most of the States was more like that of the minimum-cost than the moderate-cost adequate diet. With home-produced food valued at prices which farm and village families would have had to pay, the diets of a group

of adequately fed families studied in central New York (*36*) had a money value midway between those of the minimum- and moderate-cost adequate diets here recommended. The food expenditures of many wage-earners' families also fall within this same range of money-value-of-food figures, as for example, those reported for clients of health centers and welfare agencies in New York City (*12*) and for a group of employees of the Ford Motor Co. in Detroit (*34*).

The retail cost of the liberal diet corresponds to amounts which are spent by families of skilled wage earners and of business and professional workers. The families of a small group of professional workers studied in Berkeley, Calif., (*18*) and of a group of skilled wage earners and salaried employees living in a model housing project in New York City (*1*) were spending about what the liberal diet would have cost at comparable price levels. Families of lower salaried Federal employees in Boston, Chicago, and New Orleans (*33*) and those of semiskilled wage earners in San Francisco (*14*) were spending for food an amount midway between the retail values of the liberal diet and the moderate-cost adequate diet.

The type of diet selected by the consumer and shifts in food consumption have far-reaching implications for agriculture. Some food materials are much more costly to produce than others. In land requirement, for example, the acreage necessary for the production of the food entering each of the four diets is very different, even omitting grazing lands, which are exceedingly variable in their per-acre contribution to the production of meat animals. According to calculations made by the Bureau of Agricultural Economics [3] about 1.2 acres (exclusive of grazing lands) would be required per capita per year to produce the restricted diet for emergency use. For the adequate diet at minimum cost the requirement would be about 1.5 acres; for the adequate diet at moderate cost, 1.8 acres; and for the liberal diet, 2.1 acres per capita. These figures are based on the average per-acre yields of different commodities in this country during the 10-year period 1917–26. Calculated on the same basis, 1.9 acres would be required to produce the food apparently consumed per capita per year during the period 1927–31. Data such as these are of great importance when planning the utilization of the land, so as to bring about a satisfactory adjustment between supply and demand.

Diets which are inexpensive to the consumer include a large proportion of the foods that require relatively little land and labor to produce, and that are relatively nonperishable, and therefore stored and distributed cheaply. They include a much larger proportion of grain products, potatoes, dried legumes, and a smaller proportion of other vegetables, fruits, milk, and lean meats than do the liberal diets. Hence, depending on the type of nutritionally adequate diet which is selected, from 1.5 to 2.1 acres of land may be required for the production of the yearly per-capita food supply. This area is from 20 percent less to 10 percent more than the acreage required to produce the type of food apparently consumed during 1927–31.

Obviously, when low purchasing power forces families to economize to the point of subsisting on nutritionally inadequate rations, or to the point of selecting the cheapest food combinations that will give them an adequate diet, the acreage required to supply these foodstuffs will be smaller than is normal or optimal. Also unless pro-

[3] Data supplied by O. E. Baker, Land Resources and Utilization Section, Division of Land Economics.

duction is quickly adjusted to meet this situation an excess of certain foods accumulates. One set of circumstances is disastrous to human welfare; the other, to the business of agriculture. But by no means are all of our current surpluses of food materials attributable to domestic underconsumption. Of some commodities production has long been considerably in excess of the requirements for a liberal nutritionally adequate diet. In such instances production may well be curtailed (if domestic consumption is the main outlet) and the land devoted to other nutritionally essential food commodities.

Among the foods which are consumed in far less than desirable amounts, milk, certain fruits, and many of the leafy vegetables stand out prominently. The consumption of milk per capita indicated in the adequate diet at moderate cost and the liberal diet is nearly twice the present consumption, while from the standpoint of health the use of certain fruits and vegetables should be increased several fold.

BASIS FOR FOOD SELECTION

Each of the four diets presented in table 1 includes products from all of the main groups of food, but the total allowance in pounds from each group differs. This is due to the fact that some foods or food groups yield the various nutrients more cheaply than others.

The relative returns in nutritive values (calories, protein, certain minerals, and certain vitamins) for a definite outlay in money may be studied for individual foods or for groups of foods, as shown in figure 1. For such comparisons data on food composition and on food prices are the basis. The figures on proximate composition used in the computations were taken mainly from Atwater and Bryant (*2*), supplemented for vegetables and fruits by data issued by this bureau (*5*, *6*). Figures on the vitamin and mineral content of food materials were taken mainly from Sherman (*23*).

The retail prices which were used to compute the money values of the different foods are shown in table 3. These include averages of the retail prices reported from 51 cities to the United States Bureau of Labor Statistics from July 1931 to June 1932, inclusive, supplemented with prices from other sources for the commodities for which that bureau does not collect prices. Most of the supplementary figures, which appear in parentheses, are averages of prices received month by month from cash-and-carry stores located in 14 widely scattered cities. Prices in Washington, D.C., or in New York City, were used for the few foods for which average prices were not available.

While country-wide average prices were used as far as possible, it should be remembered that locally grown food products are often obtainable at figures much lower than those here given. For example, in the Southern States where corn meal is much used, its price per pound is often lower than that of wheat flour. Sweetpotatoes in some sections are lower in price than potatoes. Numerous similar examples could be cited. Many economies may be effected by taking full advantage of regional products instead of products from a distance which must have transportation costs included in the retail price. Conversely, many higher-priced commodities are also available, and the upper limit of the cost of any diet depends upon the extent to which the consumer indulges in the relatively expensive forms or varieties of food.

TABLE 3.—*Retail prices of food materials used in computing costs*

Item	Price per pound
Bread, flour, cereals:	*Cents*
Bread	7.2
Wheat flour	3.3
Corn meal	4.2
Prepared flour	[1] (7.3)
Rolled oats	7.8
Rice	7.4
Macaroni	16.0
Wheat cereal	13.2
Rye flour	(5.1)
Corn flakes	17.4
Cornstarch	(14.0)
Milk, cheese:	
Fresh whole milk	5.3
Evaporated milk	8.6
Cheese, American Cheddar	25.1
Potatoes, sweetpotatoes:	
Potatoes	1.9
Sweetpotatoes	[2] (3.7–4.1)
Dried beans, peas, nuts:	
Navy beans	6.2
Peanuts, peanut butter	(4.6–25.0)
Dried peas	(10.1)
Nuts (in shell)	(23.0)
Tomatoes, citrus fruits:	
Tomatoes, fresh	(11.5)
Tomatoes, canned	7.8
Oranges	7.5
Grapefruit	(7.2)
Lemons	(11.6)
Leafy, green, or yellow vegetables:	
Cabbage	4.4
Lettuce	(20.0)
Peas, canned	10.7
Snap beans	(10.0)
Carrots	(6.2)
Spinach	(8.0)
Asparagus	(25.0)
Leafy, green, or yellow vegetables—Continued.	*Cents*
Peppers	(30.0)
Other vegetables and fruits:	
Apples	(5.2–6.0)
Bananas	6.0
Grapes	(13.0)
Peaches	(5.3)
Corn, canned	9.4
Onions	6.0
Watermelon	(2.0)
Cantaloup	(11.0)
Pears	(5.0)
Cucumbers	(4.5)
Celery	(12.2)
Strawberries	(23.2)
Pineapple	(7.2)
Dried fruits:	
Raisins	11.4
Prunes	10.5
Figs	(25.0)
Apricots	(27.1)
Butter	32.0
Other fats:	
Lard	10.6
Vegetable shortening	21.9
Margarine	17.3
Sugar, molasses:	
Sugar	5.4
Molasses	(11.5–12.6)
Lean meat, poultry, fish:	
Beef	[3] 15.7–[4] 24.9
Pork	[5] (15.8)–[6] 24.7
Lamb	[7] 26.2
Veal	(27.0)
Hens	28.2
Fish	[8] (15.0–22.2)
Eggs	19.3

[1] Figures in parentheses compiled from many sources; others from reports of the Bureau of Labor Statistics, July 1931 through June 1932.
[2] Where 2 figures are given the lower was used in computing the costs of the restricted diets for emergency use and adequate diets at minimum cost; the higher, for computing the costs of the adequate diet at moderate cost and the liberal diet.
[3] Average of chuck and plate.
[4] Average of sirloin steak, round steak, rib roast, chuck roast, and plate.
[5] Retail prices New York Oct. 15, 1931, to June 30, 1932. Average of 6 cuts—end chops, fresh whole picnics, spareribs, smoked ham no. 2, ham ends, and smoked picnics.
[6] Pork chops.
[7] Leg of lamb.
[8] At least 15 varieties sold in New York markets 1931–32 for 15 cents per pound or less. Canned pink salmon 11 cents per can.

As may be seen from figure 1, breadstuffs and cereals yield for the expenditure excellent returns in calories, protein, phosphorus, and iron. Their proteins are not wholly adequate, but can be used to advantage when supplemented, as with milk. The less highly the grain is milled, the more it contributes in minerals and vitamins.

Milk is an inexpensive source of calcium, phosphorus, proteins of good quality, vitamin A, and vitamin G, and it is important for its pellagra-preventing value. In all these factors it supplies cheaply what most cereals lack. Hence milk and grain products together form a large share of low-cost adequate diets. If skim milk is used instead of whole, extra butter or its equivalent in fat and vitamins A and D should be included in the diet. Whole-milk cheese furnishes practically the same food value that whole milk supplies; 5 ounces of American Cheddar cheese has approximately the same food value as a quart of milk.

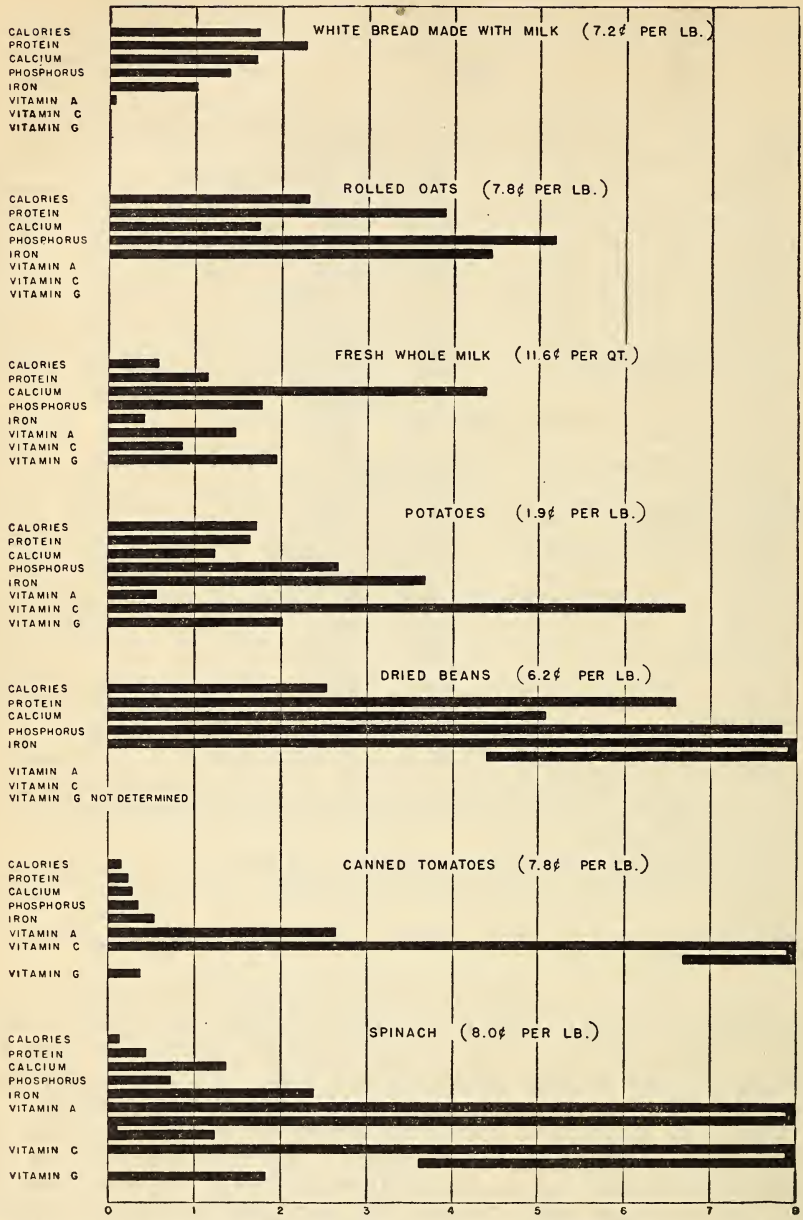

FIGURE 1.—Nutrients purchasable for 1 cent. One unit in the graph represents one thirtieth of the daily allowance for an adult man at moderate muscular work, i.e., 100 calories, 2.5 grams of protein, 0.023 gram of calcium, 0.044 gram of phosphorus, 0.0005 gram of iron, 133 units of vitamin A, 3⅓ units of vitamin C, 25 units of vitamin G. Unless otherwise indicated, a blank space indicates none or only a negligible amount of the nutrient. Prices as of 1931–32 (table 3).

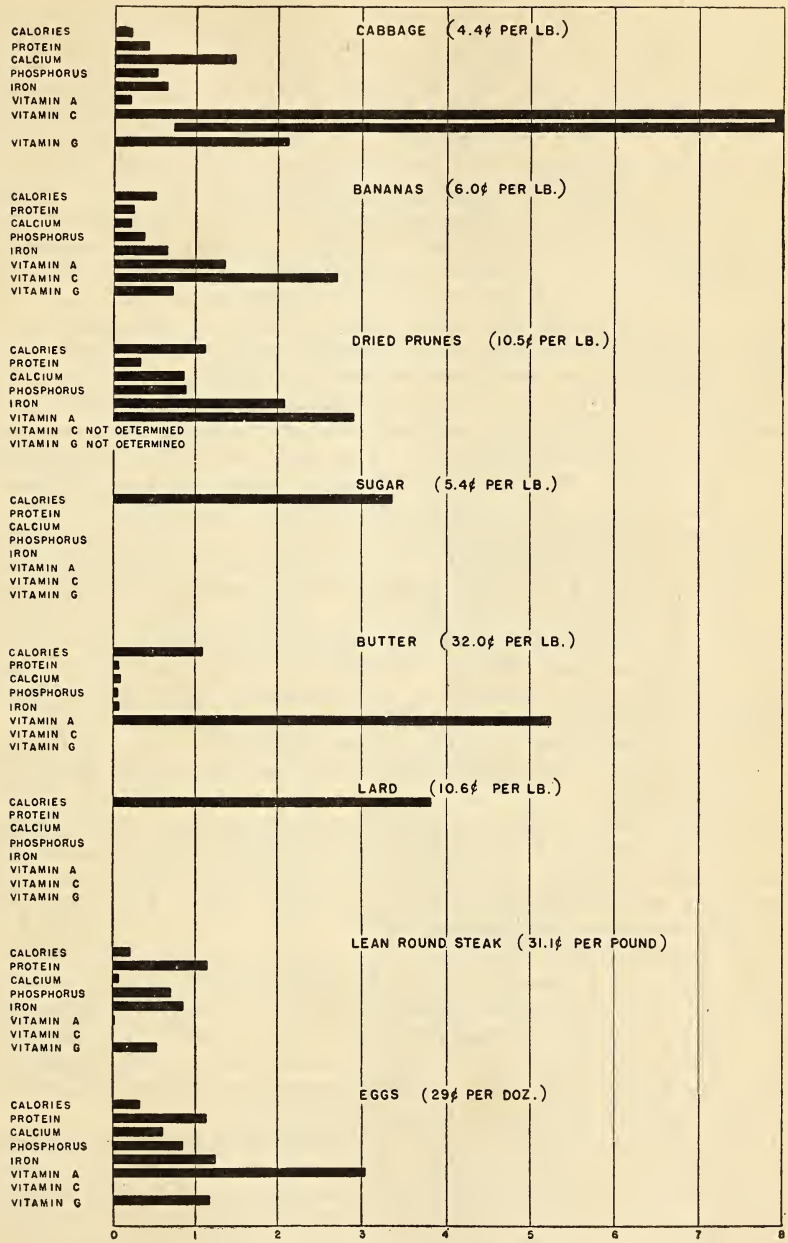

FIGURE 1.—(See legend on opposite page.)

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Vegetables and fruits vary widely in their energy and protein values and in their mineral and vitamin content. Hence several different groups are specified in the dietary lists. Potatoes, dried legumes, and dried fruits with their high starch or sugar content yield considerable energy. The dried legumes are also important for their protein, calcium, iron, and vitamin B values. In general, the quality of the protein of legumes tends to be poor, but certain ones, soybeans, for example, contain proteins adequate for growth. As a group, however, vegetables and fruits make their chief contributions to the diet as sources of the minerals and vitamins. Green leafy vegetables, such as spinach, kale, collards, turnip greens, beet tops, or mustard greens, and others of green color, such as peas, asparagus, and snap beans, are economical sources of iron, vitamin A, and vitamin G. Carrots, apricots, and some other orange- and yellow-colored vegetables and fruits are also good sources of vitamin A. Most fresh vegetables and fruits contribute vitamin B and many furnish some vitamin G. Tomatoes, raw cabbage, and citrus fruits deserve special mention as sources of vitamin C. Vegetables and fruits also furnish roughage and are an aid in maintaining good intestinal hygiene. They add variety in color, flavor, and texture to the diet.

Most fats are important primarily as low- or moderate-cost sources of energy in concentrated form. They help to make a high-cereal diet palatable and give a "staying quality" to the food eaten. Too much fat, however, interferes with digestion. Butter carries most of the vitamin A of the milk or cream from which it is derived and is a fairly cheap source of this vitamin. Cod-liver oil, because of its high content of vitamins A and D, is recommended for young children, especially during the winter months.

Pure sugar provides only energy to the body. Cane and sorgo molasses or sirups contain considerable calcium and iron in addition to the carbohydrates.

Lean meat, fish, poultry, and eggs are important for their proteins of excellent quality, for vitamin G, for their pellagra-preventing values, and for the flavor and interest which they add to the diet. Eggs, liver, and lean meats are good sources of iron. Liver and eggs are also good sources of vitamin A.

It is on the basis of these facts and such information as shown in figure 1 that the prominence given to different food groups is determined for each of the four diets presented in table 1. Milk and other dairy products are given great prominence in all of the adequate diets. Grain products, dried beans, and potatoes are especially important in low-cost diets. Other vegetables, fruits, lean meat, fish, and eggs are more prominent in liberal diets.

Table 4 shows the different food groups listed in the diets, the chief articles of food included within each, and the relative importance assigned to each article for purposes of computation of nutritive values and cost. The articles of food included in any one group are often quite different in texture and flavor, but in nutritive values they are more like each other than like foods in other groups. The first column of percentages given in table 4 shows the figures which were used in computing the nutritive values and cost of the liberal diet, and the adequate diet at moderate cost. Within each group the figures were based on the approximate relative consumption of the several articles of food in this country, and do not represent the selection which would

give highest nutritive content to the diets. The second column of percentages applies to those foods in each group used in computing the nutritive values and costs of the adequate diets at minimum cost and the restricted diets for emergency use. The foods selected were low-priced foods, or those often produced for home use.

TABLE 4.—*Groups of food in diets and the proportion of specified articles comprising each group (percent)*

Item	Proportion of total pounds in diets suggested for— Liberal- and moderate-cost level	Minimum-, adequate-, and emergency-cost level
Flour, cereals:		
Wheat flour	76	70
Corn meal	10	
Prepared flour	3	
Oat breakfast foods	3	
Rice	2	
Macaroni, noodles	2	30
Wheat breakfast foods	1	
Rye flour	1	
Corn breakfast foods	1	
Cornstarch	1	
Total	100	100
Milk:		
Fresh whole milk	97	50
Condensed and evaporated milk	3	50
Total	100	100
Potatoes, sweetpotatoes:		
Potatoes	83	100
Sweetpotatoes	17	
Total	100	100
Dried beans, peas, nuts:		
Dried beans	45	
Peanuts	33	100
Dried peas	5	
Nuts (in shell)	17	
Total	100	100
Tomatoes, citrus fruits:		
Tomatoes, fresh	15	
Tomatoes, canned	35	
Oranges	32	100
Grapefruit	10	
Lemons	8	
Total	100	100
Leafy, green, or yellow vegetables:		
Cabbage	50	50
Lettuce	18	
Peas	11	
Snap beans	6	
Carrots	5	50
Spinach, kale, collards, etc.	5	
Asparagus	3	
Peppers	2	
Total	100	100

Item	Proportion of total pounds in diets suggested for— Liberal- and moderate-cost level	Minimum-, adequate-, and emergency-cost level
Other vegetables and fruits:		
Apples	34	
Bananas	11	
Grapes	11	
Peaches	9	
Corn	8	
Onions, turnips, beets, etc.	6	
Watermelons	5	100
Cantaloup	4	
Pears	4	
Cucumbers	2	
Celery	2	
Strawberries	2	
Pineapples	2	
Total	100	100
Dried fruits:		
Raisins	40	
Prunes	40	100
Other	20	
Total	100	100
Butter	100	100
Other fats:		
Lard	40	
Vegetable oils and shortenings	40	100
Bacon, salt pork	14	
Margarine	6	
Total	100	100
Sugar, molasses, other sweets:		
Sugar	75	
Molasses	16	100
Other	9	
Total	100	100
Lean meat, poultry, fish:		
Beef	34	30
Pork	39	50
Veal	5	
Lamb and mutton	3	20
Poultry	11	
Fish	8	
Total	100	100
Eggs	100	100

Some readers may be interested in comparing the diets presented in this publication with the apparent consumption of different articles of food by certain groups in the population. For their benefit, the quantities of various items used in computing nutritive values and costs of the four suggested diets are presented in table 5, in terms of per capita per year allowances. As pointed out on p. 10, the relative importance assigned to each article of food does not necessarily represent ideal choice. In the case of the two diets of higher nutritive content, it represents what seems to be common practice in selection within each food group. In the case of the two diets of lower nutritive content, figures for a food group rather than for individual foods are usually given. Local prices and food resources greatly influence the choices within the group when the consumer is primarily concerned with getting the best returns in nutritive value for the money or effort spent.

TABLE 5.—*Four diets: Approximate yearly quantities of various foods or groups of food needed per capita for the population of the United States*

Item	Liberal diet	Adequate diet at moderate cost	Adequate diet at minimum cost	Restricted diet for emergency use
Flour, cereals:				
Wheat flour ... pounds	76	122	157	168
Corn meal ... do	10	16		
Prepared flour ... do	3	5		
Oat breakfast foods ... do	3	5		
Rice ... do	2	3		
Macaroni, noodles ... do	2	3	67	72
Wheat breakfast foods ... do	1	2		
Rye flour ... do	1	2		
Corn breakfast foods ... do	1	1		
Cornstarch ... do	1	1		
Total ... do	100	160	224	240
Milk:				
Fresh whole milk ... quarts	296	296	130	78
Evaporated milk ... pounds	10	10	138	83
Potatoes, sweetpotatoes:				
Potatoes ... do	129	137	165	165
Sweetpotatoes ... do	26	28		
Total ... do	155	165	165	165
Dried beans, peas, nuts:				
Dried beans ... do	3	9		
Peanuts ... do			30	30
Dried peas ... do	4	11		
Nuts (in shell) ... do				
Total ... do	7	20	30	30
Tomatoes, citrus fruits:				
Tomatoes, fresh ... do	17	14		
Tomatoes, canned ... do	38	31		
Oranges ... do	35	29	50	50
Grapefruit ... do	11	9		
Lemons ... do	9	7		
Total ... do	110	90	50	50
Leafy, green, or yellow vegetables:				
Cabbage ... do	68	50	40	20
Lettuce ... do	24	18		
Peas ... do	15	11		
Snap beans ... do	8	6		
Carrots ... do	7	5	40	20
Spinach, kale, collards, etc ... do	6	5		
Asparagus ... do	4	3		
Peppers ... do	3	2		
Total ... do	135	100	80	40

TABLE 5.—*Four diets: Approximate yearly quantities of various foods or groups of food needed per capita for the population of the United States*—Continued

Item	Liberal diet	Adequate diet at moderate cost	Adequate diet at minimum cost	Restricted diet for emergency use
Dried fruits:				
Raisins ... pounds	8	10		
Prunes ... do	8	10	20	10
Other ... do	4	5		
Total ... do	20	25	20	10
Other vegetables, fruits:				
Apples ... do	110	71		
Bananas ... do	36	23		
Grapes ... do	36	23		
Peaches ... do	29	19		
Corn ... do	26	17		
Onions, turnips, beets, etc ... do	20	14		
Watermelon ... do	16	11	85	40
Cantaloup ... do	13	8		
Pears ... do	13	8		
Cucumbers ... do	7	4		
Celery ... do	7	4		
Strawberries ... do	6	4		
Pineapples ... do	6	4		
Total ... do	325	210	85	40
Fats:				
Butter ... do	35	35		
Lard ... do	7	7		
Vegetable oils and shortenings ... do	7	7	49	45
Bacon, salt pork ... do	2	2		
Margarine ... do	1	1		
Total ... do	52	52	49	45
Sugar, molasses, other sweets:				
Sugar ... do	45	45		
Molasses ... do	10	10	35	50
Other ... do	5	5		
Total ... do	60	60	35	50
Lean meat, poultry, fish:				
Beef ... do	56	34	18	9
Pork ... do	65	39	30	15
Lamb and mutton ... do	5	3		
Veal ... do	8	5	12	6
Poultry ... do	18	11		
Fish ... do	13	8		
Total ... do	165	100	60	30
Eggs ... dozen	30	15	15	8

DIETS FOR INDIVIDUALS

YEARLY QUANTITIES OF FOOD REQUIRED

Table 6 presents the four diets in terms of a yearly food supply for individuals of different age, sex, and activity groups. Below each list of approximate quantities of various foods or groups of food are given the nutritive value of each diet, the distribution of calories among various groups of food, the money value of the diet at the 1931–32 retail prices shown in table 3, and the proportion of money devoted to specified groups of food. These figures were calculated for each diet assuming that selections within the several food groups were made as indicated in table 4. The data pertaining to the four diets for each individual are presented in parallel, so that they may be readily compared.

TABLE 6.—*Diets at four levels of nutritive content and cost*

APPROXIMATE YEARLY QUANTITIES OF FOOD FOR PERSONS OF DIFFERENT AGE, SEX, AND ACTIVITY

Item	Child under 4 years				Boy 4–6; girl 4–7 years				Boy 7–8; girl 8–10 years			
	Restricted diet, emergency	Adequate diet, minimum cost	Adequate diet, moderate cost	Liberal diet	Restricted diet, emergency	Adequate diet, minimum cost	Adequate diet, moderate cost	Liberal diet	Restricted diet, emergency	Adequate diet, minimum cost	Adequate diet, moderate cost	Liberal diet
Flour, cereals ... pounds	85	70	60	45	140	100	80	55	175	150	110	65
Or—												
Bread ... do	40	30	50	30	65	50	75	45	80	70	100	60
Flour, cereals ... do	60	50	30	25	95	70	30	25	120	105	40	25
Milk, or its equivalent [1] ... quarts	182	365	365	365	182	365	365	365	182	[2] 273–365	365	365
Potatoes, sweetpotatoes ... pounds	100	100	100	100	110	110	100	100	125	125	100	100
Dried beans, peas, nuts ... do					8	8	7	2	18	18	10	3
Tomatoes, citrus fruits ... do	50	50	75	75	50	50	75	75	50	50	75	80
Leafy, green, and yellow vegetables ... do	30	60	60	60	30	60	75	75	45	90	90	90
Dried fruits ... do	3	3	7	5	3	5	10	5	6	12	15	8
Other vegetables, fruits ... do	12	25	90	140	20	40	100	200	30	60	125	300
Fats (including butter, oils, bacon, salt pork) ... do	10	8	10	10	20	12	15	15	30	25	28	27
Sugars [3] ... do	8	5	7	7	20	12	15	15	30	25	30	30
Lean meat, poultry, fish ... do				10	5	10	25	40	15	30	60	90
Eggs ... dozen	10	20	20	25	10	20	20	30	10	20	20	30
Cod-liver oil,[4] or its equivalent in vitamin value												

APPROXIMATE NUTRITIVE VALUE PER DAY OF DIETS SUGGESTED ABOVE

Energy value ... calories	1,085	1,393	1,354	1,356	1,564	1,728	1,672	1,653	1,995	2,135	2,156	2,132
Calories from protein ... percent	14	17	15	15	13	16	14	15	12	13	13	14
Protein ... grams	38	59	50	51	49	68	60	60	60	72	71	72
Protein from animal sources ... percent	58	76	74	78	47	68	70	77	42	55	68	77
Fats ... grams	18	58	56	60	52	67	71	76	68	79	97	104
Carbohydrates ... do	150	158	161	152	223	211	197	180	284	286	249	224
Calcium ... do	0.79	1.50	1.31	1.32	0.84	1.54	1.34	1.35	0.89	1.26	1.38	1.39
Phosphorus ... do	0.84	1.38	1.21	1.23	1.00	1.53	1.33	1.35	1.17	1.48	1.47	1.50
Iron ... do	0.0049	0.0069	0.0068	0.0072	0.0066	0.0086	0.0085	0.0089	0.0086	0.0106	0.0106	0.0112
Vitamin A ... unit	2,605	4,720	4,372	4,562	2,628	4,771	4,491	4,866	2,999	4,908	5,245	5,688
Vitamin C ... do	71	99	125	130	73	102	133	145	85	119	144	166

PROPORTION OF CALORIES DERIVED FROM SPECIFIED TYPES OF FOOD

Bread, flour, cereals ... percent	37	23	20	15	42	28	21	15	41	33	22	14
Milk ... do	35	55	51	51	24	44	41	42	19	27	32	32
Vegetables, fruits ... do	12	11	16	18	12	12	17	18	13	15	15	18
Fats ... do	10	6	7	7	13	7	9	9	16	12	13	13
Sugars ... do	4	2	2	2	6	4	4	4	7	6	7	6
Lean meat, fish, eggs ... do	2	3	4	7	3	5	8	12	4	7	11	17

APPROXIMATE RETAIL MONEY VALUE AT 1931–32 PRICE LEVEL

1931–32 price level:												
Per day ... dollars	0.103	0.169	0.221	0.235	0.123	0.184	0.255	0.283	0.145	0.193	0.308	0.360
Per week ... do	0.72	1.16	1.55	1.65	0.86	1.29	1.79	1.99	1.02	1.36	2.16	2.52
Per year ... do	38	61	81	86	45	67	93	103	53	71	113	131

PROPORTION OF RETAIL MONEY VALUE USED FOR SPECIFIED TYPES OF FOOD

1931–32 price level:												
Bread, flour, cereals ... percent	14	7	7	4	18	9	7	4	19	12	8	4
Milk ... do	50	63	54	51	43	57	47	42	36	41	38	33
Vegetables, fruits ... do	23	18	27	30	23	20	28	31	24	25	27	32
Fats, sugars ... do	5	2	5	4	8	3	4	5	11	7	8	7
Lean meat, fish, eggs ... do	8	10	7	11	8	11	14	18	10	15	19	24

[1] The following are approximately equivalent to the food value of 1 quart of fluid whole milk: (1) 17 ounces of evaporated milk; (2) 1 quart of fluid skim milk and 1½ ounces of butter; (3) 5 ounces of American Cheddar cheese; (4) 4½ ounces of dried whole milk; (5) 3½ ounces of dried skim milk and 1½ ounces of butter.

[2] Data on nutritive value based on lower figures.

[3] 1 pint (1½ pounds) of molasses or heavy cane or sorgo sirup is approximately equivalent in fuel value to 1 pound of granulated sugar. The unrefined molasses and sirups are also valuable for their calcium and iron content.

[4] 2 to 4 teaspoonfuls daily are recommended for children under 2 years. These quantities may also be taken by persons of other ages, when it is desired to enhance the vitamin A and D values of the diet. The figures on nutritive value presented in this table do not include the food values of cod-liver oil.

TABLE 6.—*Diets at four levels of nutritive content and cost*—Continued

APPROXIMATE YEARLY QUANTITIES OF FOOD FOR PERSONS OF DIFFERENT AGE, SEX, AND ACTIVITY

Item		Boy 9–10; girl 11–13 years				Moderately active woman; boy 11–12 years; girl over 13 years				Very active woman; active boy 13–15 years			
		Restricted diet, emergency	Adequate diet, minimum cost	Adequate diet, moderate cost	Liberal diet	Restricted diet, emergency	Adequate diet, minimum cost	Adequate diet, moderate cost	Liberal diet	Restricted diet, emergency	Adequate diet, minimum cost	Adequate diet, moderate cost	Liberal diet
Flour, cereals	pounds	195	170	120	65	195	175	120	65	280	260	170	105
Or—													
Bread	do	90	80	120	60	90	80	120	60	130	120	190	120
Flour, cereals	do	135	115	40	25	135	120	40	25	195	180	40	25
Milk, or its equivalent [1]	quarts	182	[2] 273–365	365	365	[2] 182–365	[2] 273–365	365	365	[2] 182–365	[2] 273–365	365	365
Potatoes, sweetpotatoes	pounds	140	140	110	100	140	140	125	110	160	160	160	150
Dried beans, peas, nuts	do	20	20	15	5	25	25	15	5	30	30	30	10
Tomatoes, citrus fruits	do	50	50	90	90	50	50	90	110	50	50	100	120
Leafy, green, and yellow vegetables	do	50	100	90	90	50	100	110	120	40	75	110	150
Dried fruits	do	8	17	20	10	10	20	25	15	15	30	30	25
Other vegetables, fruits	do	40	80	150	300	45	90	175	300	50	100	270	350
Fats (including butter, oils, bacon, salt pork)	do	30	32	35	35	35	40	42	40	55	65	65	65
Sugars [3]	do	40	35	40	35	45	40	45	40	65	50	75	75
Lean meat, poultry, fish	do	22	45	75	120	28	55	90	150	35	70	110	200
Eggs	dozen	8½	17	20	30	8½	17	15	30	7½	15	15	30
Cod-liver oil,[4] or its equivalent in vitamin values													

APPROXIMATE NUTRITIVE VALUE PER DAY OF DIETS SUGGESTED ABOVE

Energy value	calories	2,205	2,436	2,454	2,356	2,335	2,634	2,638	2,570	3,127	3,469	3,474	3,479
Calories from protein	percent	12	13	13	13	11	12	12	13	11	12	11	12
Protein	grams	65	78	77	78	67	82	79	84	83	100	95	101
Protein from animal sources	percent	40	53	65	78	40	53	65	78	34	46	58	73
Fats	grams	67	92	110	123	75	105	122	137	106	140	158	182
Carbohydrates	do	325	320	286	233	336	337	301	248	457	449	414	355
Calcium	do	0.91	1.29	1.41	1.40	0.92	1.31	1.42	1.43	.98	1.36	1.50	1.51
Phosphorus	do	1.25	1.58	1.57	1.57	1.29	1.64	1.61	1.65	1.52	1.88	1.84	1.90
Iron	do	0.0095	0.0117	0.0121	0.0122	0.0102	0.0126	0.0130	0.0137	0.1023	0.0149	0.0165	0.0176
Vitamin A	units	3,101	5,420	5,660	6,048	3,135	5,776	5,973	6,652	2,980	5,342	6,758	7,610
Vitamin C	do	91	129	156	172	91	130	170	198	88	119	190	229

PROPORTION OF CALORIES DERIVED FROM SPECIFIED TYPES OF FOOD

Bread, flour, cereals ..... percent	41	33	22	12	39	31	20	11	42	35	21	13
Milk ..... do	17	24	28	29	16	22	26	27	12	17	20	20
Vegetables, fruits ..... do	14	15	16	17	14	15	17	17	13	14	18	17
Fats ..... do	14	13	14	15	16	15	16	16	18	19	19	19
Sugars ..... do	9	7	8	7	10	8	8	7	10	7	10	10
Lean meat, fish, eggs ..... do	5	8	12	20	5	9	13	22	5	8	12	21

APPROXIMATE RETAIL MONEY VALUE AT 1931–32 PRICE LEVEL

1931–32 price level:												
Per day ..... dollars	0.156	0.214	0.345	0.391	0.164	0.228	0.371	0.432	0.192	0.259	0.451	0.529
Per week ..... do	1.09	1.50	2.42	2.74	1.16	1.60	2.60	3.03	1.35	1.82	3.16	3.72
Per year ..... do	57	78	126	143	60	83	135	158	70	95	165	193

PROPORTION OF RETAIL MONEY VALUE USED FOR SPECIFIED TYPES OF FOOD

1931–32 price level:												
Bread, flour, cereals ..... percent	20	13	8	4	19	12	8	3	24	16	9	5
Milk ..... do	34	37	34	31	32	35	32	28	27	30	26	22
Vegetables, fruits ..... do	25	26	28	30	26	26	29	31	23	24	32	31
Fats, sugars ..... do	11	9	10	8	12	11	11	9	15	14	13	11
Lean meat, fish, eggs ..... do	10	15	20	27	11	16	20	29	11	16	20	31

[1] The following are approximately equivalent to the food value of 1 quart of fluid whole milk: (1) 17 ounces of evaporated milk; (2) 1 quart of fluid skim milk and 1½ ounces of butter; (3) 5 ounces of American Cheddar cheese; (4) 4½ ounces of dried whole milk; (5) 3½ ounces of dried skim milk and 1½ ounces of butter.

[2] Data on nutritive value based on lower figures.

[3] 1 pint (1½ pounds) of molasses or heavy cane or sorgo sirup is approximately equivalent in fuel value to 1 pound of granulated sugar. The unrefined molasses and sirups are also valuable for their calcium and iron content.

[4] 2 to 4 teaspoonfuls daily are recommended for children under 2 years. These quantities may also be taken by persons of other ages, when it is desired to enhance the vitamin A and D values of the diet. The figures on nutritive value presented in this table do not include the food values of cod-liver oil.

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TABLE 6.—*Diets at four levels of nutritive content and cost*—Continued

APPROXIMATE YEARLY QUANTITIES OF FOOD FOR PERSONS OF DIFFERENT AGE, SEX, AND ACTIVITY

Item	Active boy over 15 years				Moderately active man				Very active man			
	Restricted diet, emergency	Adequate diet, minimum cost	Adequate diet, moderate cost	Liberal diet	Restricted diet, emergency	Adequate diet, minimum cost	Adequate diet, moderate cost	Liberal diet	Restricted diet, emergency	Adequate diet, minimum cost	Adequate diet, moderate cost	Liberal diet
Flour, cereals ... pounds	370	350	230	125	280	260	220	125	455	435	290	200
Or—												
Bread ... do	170	160	240	150	130	120	240	150	210	200	350	240
Flour, cereals ... do	255	240	70	25	195	180	60	25	315	300	60	40
Milk, or its equivalent [1] ... quart	182	[2] 273–365	[2] 240–365	[2] 240–365	91	182	182	182	91	182	182	182
Potatoes, sweetpotatoes ... pounds	225	225	300	300	160	160	160	150	300	300	350	350
Dried beans, peas, nuts ... do	30	30	30	10	40	40	30	10	50	50	35	10
Tomatoes, citrus fruits ... do	50	50	100	120	50	50	100	120	50	50	100	120
Leafy, green, and yellow vegetables ... do	25	50	100	180	40	75	100	180	25	50	100	180
Dried fruits ... do	10	20	45	30	15	30	35	25	10	20	40	30
Other vegetables, fruits ... do	50	100	300	400	50	100	270	400	50	100	270	400
Fats (including butter, oils, bacon, salt pork) ... do	65	75	80	80	55	65	65	65	75	85	95	100
Sugars [3] ... do	70	55	115	115	70	60	75	75	80	65	115	115
Lean meat, poultry, fish ... do	35	75	150	250	40	75	125	220	50	100	150	250
Eggs ... dozens	6	12	15	30	6	12	15	30	6	12	15	30
Cod-liver oil,[4] or its equivalent in vitamin values												

APPROXIMATE NUTRITIVE VALUE PER DAY OF DIETS SUGGESTED ABOVE

Energy value ... calories	3,701	4,039	4,218	4,053	3,021	3,385	3,428	3,326	4,286	4,660	4,566	4,528
Calories from protein ... percent	10	11	10	11	10	11	10	11	10	11	9	10
Protein ... grams	96	112	103	106	76	92	88	92	109	126	107	112
Protein from animal sources ... percent	29	41	50	67	25	39	47	66	18	32	42	59
Fats ... grams	120	155	177	203	98	151	144	169	129	167	190	220
Carbohydrates ... do	557	544	550	448	457	455	442	356	670	658	601	520
Calcium ... do	1.03	1.40	1.16	1.17	0.65	1.03	0.91	0.93	0.78	1.15	0.99	1.01
Phosphorus ... do	1.73	2.08	1.81	1.80	1.32	1.67	1.49	1.52	1.82	2.18	1.78	1.79
Iron ... do	0.0139	0.0163	0.0203	0.0210	0.0124	0.0149	0.0166	0.0176	0.0172	0.0198	0.0211	0.0221
Vitamin A ... unit	2,626	4,683	6,072	7,197	2,357	4,676	5,563	6,690	2,120	4,179	5,737	7,486
Vitamin C ... do	87	112	193	254	84	115	169	233	89	116	190	254

PROPORTION OF CALORIES DERIVED FROM SPECIFIED TYPES OF FOOD

Bread, flour, cereals ..... percent	47	40	24	14	44	36	29	17	50	44	28	19
Milk ..... do	10	14	11	11	6	11	10	10	4	8	8	8
Vegetables, fruits ..... do	12	13	20	20	14	15	19	19	14	14	19	18
Fats ..... do	18	19	20	20	19	20	19	20	18	19	22	23
Sugars ..... do	9	7	13	13	12	9	10	10	9	7	12	12
Lean meat, fish, eggs ..... do	4	7	12	22	5	9	13	24	5	8	11	20

APPROXIMATE RETAIL MONEY VALUE AT 1931–32 PRICE LEVEL

1931–32 price level:												
Per day ..... dollars	0.209	0.274	0.483	0.573	0.169	0.236	0.415	0.508	0.217	0.286	0.490	0.590
Per week ..... do	1.47	1.93	3.39	4.02	1.19	1.66	2.91	3.56	1.52	2.01	3.44	4.14
Per year ..... do	76	100	176	209	62	86	152	185	79	104	179	215

PROPORTION OF RETAIL MONEY VALUE USED FOR SPECIFIED TYPES OF FOOD

1931–32 price level:												
Bread, flour, cereals ..... percent	29	20	12	6	27	18	13	6	34	24	16	9
Milk ..... do	25	29	16	14	15	22	14	12	12	18	12	10
Vegetables, fruits ..... do	21	21	33	33	27	27	34	36	24	24	32	33
Fats, sugars ..... do	16	15	15	13	18	16	15	12	18	16	17	15
Lean meat, fish, eggs ..... do	9	15	24	34	13	17	24	34	12	18	23	33

[1] The following are approximately equivalent to the food value of 1 quart of fluid whole milk: (1) 17 ounces of evaporated milk; (2) 1 quart of fluid skim milk and 1½ ounces of butter; (3) 5 ounces of American Cheddar cheese; (4) 4½ ounces of dried whole milk; (5) 3½ ounces of dried skim milk and 1½ ounces of butter.

[2] Data on nutritive value based on lower figures.

[3] 1 pint (1½ pounds) of molasses or heavy cane or sorgo sirup is approximately equivalent in fuel value to 1 pound of granulated sugar. The unrefined molasses and sirups are also valuable for their calcium and iron content.

[4] 2 to 4 teaspoonfuls daily are recommended for children under 2 years. These quantities may also be taken by persons of other ages, when it is desired to enhance the vitamin A and D values of the diet. The figures on nutritive value presented in this table do not include the food values of cod-liver oil.

NUTRITIVE VALUE OF THE SUGGESTED DIETS

The figures on the food value of the four diets for individuals shown in table 6 are useful for two purposes. They make it possible to compare one diet with another on the basis of its nutritive content, and also to compare the nutritive content of the suggested diets with dietary standards. The three adequate diets for any individual are very much alike in energy value, total protein, calcium, phosphorus, and iron. The proportion of protein derived from animal sources and the vitamin A and vitamin C content are higher in the liberal diet than in the moderate-cost adequate diet, and in both of these higher than in the minimum-cost adequate diet. The restricted diet for emergency use is considerably lower in nutritive content than any of the adequate diets.

In comparing the nutritive content of the suggested diets with dietary standards it must be kept in mind that dietary standards are tentative, and also that the figures on nutritive value shown in table 6 apply closely only when the selections within food groups are made in accordance with table 4.

ENERGY VALUE

The various adequate diets listed in table 6 provide energy to an extent well above the median requirement of the group for which they are planned, whereas the restricted diet for emergency use is somewhat less generous. However, as is shown in tables 7 and 8, the energy expenditures of individuals are subject to wide variations. Increases or decreases in the food supply to adjust to these individual variations in need may best be made in the quantities of those foods important primarily for their fuel value, that is, breads, flours, cereals, potatoes, dried legumes, fats, and sugars. The suggested quantities of milk, other vegetables, fruits, eggs, and lean meat should be retained.

TABLE 7.—*Daily energy allowances for young and middle-aged adults of average height and weight at various degrees of activity (calories)*

Degree of activity	Men	Women
Sedentary work, involving little movement	2,100–2,500	1,800–2,100
Light exercise, sitting at work	2,500–2,800	2,100–2,400
Moderate exercise, standing or walking at work	2,800–3,100	2,400–2,700
Active work, involving muscular strength	3,100–3,500	2,700–3,000
Very active muscular work	3,500–4,500	
Very severe muscular work	4,500–6,000	

The adult uses energy in the continuous internal life processes of the body. He also spends energy in the muscular activity of his daily routine. The total (measured in calories) is fairly constant for individuals of similar age and physique engaged in similar occupations, but differs with activity, as shown in table 7, with age, and with size of body. In old age, the energy requirement diminishes both because the capacity for vigorous muscular work declines and because cellular activity is lessened. The differences between requirements of men and women who are equally active are largely due to differences in weight of active protoplasmic tissue.

In early life both internal and external activity is relatively very great, and much energy-yielding material goes into making new

tissue. In proportion to size of body, therefore, the demands for energy during the period of growth are much higher than in adulthood. Table 8 shows the average calorie value of the food eaten by normal healthy children of different ages, derived from a limited number of well-controlled dietary studies. The table also indicates a range in daily calorie allowances for children of different ages. The latter figures are based on average weights at various ages, and upon a range in energy allowances per unit of weight at different stages of growth and with different degrees of activity.

TABLE 8.—*Daily energy allowances for boys and girls during period of growth (calories)*

Age of individual (nearest birthday)	For boys, based on—		For girls, based on—	
	Average calorie intake of moderately active boys [1]	Range in requirement per unit weight multiplied by average weight [2]	Average calorie intake of moderately active girls [1]	Range in requirement per unit weight multiplied by average weight [2]
1 year		900–1,200		800–1,000
2 years		1,100–1,300		1,000–1,250
3 years	1,270	1,100–1,400	1,245	1,050–1,350
4 years	1,429	1,200–1,500	1,362	1,150–1,400
5 years	1,599	1,300–1,600	1,532	1,200–1,500
6 years	1,771	1,500–1,900	1,641	1,450–1,800
7 years	1,918	1,600–2,100	1,757	1,500–1,900
8 years	2,092	1,700–2,300	1,867	1,600–2,200
9 years	2,287	1,900–2,500	1,932	1,800–2,500
10 years	2,333	2,100–2,700	2,001	1,900–2,600
11 years	2,406	2,100–2,800	2,096	2,000–2,800
12 years	2,417	2,300–3,000	2,185	2,100–3,000
13 years	2,522	2,500–3,500	2,381	2,300–3,400
14 years	2,786	2,600–3,800	2,409	2,400–3,000
15 years	3,068	2,700–4,000	2,337	2,400–2,800
16 years	3,330	2,700–4,000	2,285	2,200–2,800
17 years	3,524	2,700–3,800	2,122	2,100–2,800
18 years	3,613			

[1] White House Conference on Child Health and Protection (*35*). [2] Rose (*21*).

PROTEINS

The approximate quantities of protein provided by the diets suggested in table 6 range from 76 to 92 grams per day for the moderately active man and from 107 to 126 grams for the very active man. The corresponding figures for the adult woman are from 67 to 84 and from 83 to 101 grams. These quantities represent liberal allowances. One gram of protein daily per kilogram (2.2 pounds) of body weight, or about 70 grams for the adult man, allows somewhat more than a 50 percent margin of safety over the average requirement for the maintenance of the adult (*23*). From the standpoint of good nutrition, adding to minimum requirements a margin of 50 percent for safety makes a modest allowance for protein.

Proteins enter into the composition of every living cell, and furnish material for the structure of many of the substances which regulate body processes. The proteins found in foods differ in composition, and some are more like those found in human tissue than others. Hence, certain kinds, especially those derived from animal products, as milk, cheese, eggs, lean meats, but also those from certain legumes, are more efficient than others in supplying materials for building and

maintaining the human body. These high-quality proteins supplement those found in grain products, and together they make a combination which the body can use to good advantage. A fair share of the total protein in the diets suggested for adults is of the high-quality type derived from animal sources—about one fourth of the total in the case of the restricted diet planned for the moderately active man, for example, and about two thirds of the total in the case of the liberal diet.

During childhood the protein requirements per unit of body weight are very high. From 2½ to 3 grams per kilogram may be needed daily in infancy (*21*). This requirement decreases gradually as the rate of growth lessens. The food eaten daily by normal healthy preschool children often includes as much as 3 or 4 grams of protein per kilogram of body weight; by children of elementary school age, from 2 to 3 grams; and by children of high-school age, from 1 to 2 grams. These quantities are probably well above minimum requirements. The diets suggested in table 6 furnish a generous supply of protein of which from about 40 to 80 percent is derived from animal sources. A quart of milk per day for each child insures a liberal supply of high-grade proteins.

It will be observed that the proportion of the calories coming from protein in the diets presented in table 6 ranges from 9 to 17 percent. These percentages are similar to those found by other investigators who have, at different times, planned or observed adequate diets for children and adults. When there is no need for reducing protein to a minimum, the proportion of the calories derived from protein in nutritionally adequate American dietaries varies from about 10 to about 15 percent. This is not to be interpreted, of course, as meaning that the protein requirement rises with increased energy expenditure. The percentage varies with the type of diet, which in turn varies with money and food resources as well as with the age, sex, and activity of the individual.

MINERAL ELEMENTS

All of the diets for adults suggested in table 6 furnish calcium and phosphorus more generously than the standards suggested by Sherman (*23*), which are 0.68 gram of calcium and 1.32 grams of phosphorus per man per day. These quantities are about 50 percent larger than the average requirements for the maintenance of the adult body. Of course, during pregnancy and lactation women need more calcium, probably at least a gram daily.

The adequate diets furnish at least 0.0005 gram of iron per 100 calories for individuals whose total food provides less than 3,000 calories. For individuals whose food furnishes 3,000 or more calories, the adequate diets provide 0.015 gram of iron (Sherman's allowance per man per day) (*23*), or more per day. The restricted diet for emergency use, with selections within food groups made in accordance with table 4, provides somewhat less iron than these standard allowances, but probably furnishes enough to cover requirements for maintenance. The iron content of the diet can be much increased if the selection of food is made with this point in mind.

Many other elements are included among the normal constituents of the body. Adults need enough of each essential element to permit the body to function properly and to replace the quantities eliminated

in the products of metabolism. Children must have a surplus beyond daily needs, in order to build tissues of normal composition. Calcium, phosphorus, and iron are here mentioned in particular, because the food habits of American people do not make it safe to leave to chance the supply of these elements, especially of calcium and iron. Milk, cheese, and the green leafy vegetables are outstanding sources of calcium. Green-colored vegetables, whole grains, eggs, lean meats, liver, and the dried legumes are excellent sources of iron. When these two elements are amply supplied through natural foods, enough of the other necessary mineral elements will usually be provided at the same time. In some localities, however, the water and food materials are so low in iodine that they do not adequately supply this element. Public health or medical authorities will then recommend suitable measures.

The adequate diets for children shown in table 6 furnish more than a gram each of calcium and phosphorus daily. These quantities are sufficient to provide for the rapid development of sturdy tissue (*23*). The efficient utilization of calcium and phosphorus in bone and tooth development is dependent upon several factors—an ample supply of each of these elements and of vitamin D, and a suitable ratio of calcium to phosphorus (between 1:1 and 1.5:1). A quart of milk contains a generous supply of calcium and phosphorus in proportions suitable for retention by the body. Some of the vegetables, particularly the green leafy ones, are good sources of calcium, but there is evidence (*24*) that children utilize the calcium from vegetables less efficiently than that from milk. The restricted diet for emergency use, with its relatively low milk allowance, provides less than a gram of calcium daily, and supplies calcium and phosphorus in a ratio somewhat less favorable for good retention than do the adequate diets. The quantity of calcium is, however, above the minimum required for growth with some storage. If the supply of vitamin D is ample, it will compensate for the slightly inferior ratio between calcium and phosphorus, and there will probably be satisfactory utilization of these bone-building elements.

The quantities of iron provided by the adequate diets suggested for young children are larger than those which have permitted very good retention in four preschool children on whom iron balance studies have been made (*17*), and furnish throughout the period of growth at least 0.0005 gram per 100 calories, the amount indicated by the lower allowance in table 10. There is, however, little direct information on the iron requirements of young children. Because some children have been found to require a very liberal allowance (*22*), many will prefer to provide 0.0006 to 0.0008 gram of iron per 100 calories, wherever possible. This may be accomplished without significantly changing the total calories or protein, by giving more prominence to whole-grain products and to the thin leafy vegetables than table 4 indicates, within the total quantities allotted in different diets to bread, flour, and cereals, and to leafy, green, and yellow vegetables, respectively.

In the case of the older children with high calorie allowances, the iron content of the suggested adequate diets totals as much as 0.015 gram, the daily allowance for the adult man. The restricted diet for emergency use does not meet this standard which includes a fair margin for safety. It is probable, however, that the restricted diet for

emergency use provides enough iron to satisfy the minimum requirements of the average child. The fact that this diet is not recommended for use over an indefinite period of time has already been pointed out.

VITAMINS

The term vitamins is applied to a group of newly discovered, chemically unrelated substances, essential to the growth, vigor, and general well-being of the body. The specific functions and the distribution of these factors in common food materials are summarized in another publication of this department (*25*).

In planning adequate food supplies, some of the vitamins must be given more attention than others. In the diets of many American people vitamin A and vitamin C are not abundant enough to promote optimal nutrition. The foods selected when choice is limited by economic pressure are likely to be low in vitamin B and vitamin G. During the years of rapid growth children need vitamin D in relatively large quantities, and special attention must then be given to supplying it, because it is not widely distributed in food materials. Vitamin E, on the other hand, is widely distributed, and is required in relatively small quantities. It is probable, therefore, that enough vitamin E will be supplied whenever diets consist largely of natural food materials.

It is difficult to state dietary standards for vitamins because there is little direct evidence on human requirements. The body can store large reserves of some vitamins, notably A, D, E, and G, and there is a wide range between the minimum amounts required to prevent symptoms of dietary deficiency and the optimal allowances which promote a better-than-average nutritional condition. Numerical expressions of value are given for only two of the vitamins, A and C, in the section of table 6 which shows the nutritive content of each diet. Sufficient data for similar calculations on the other vitamins have not yet been assembled.

The three adequate diets listed in table 6 furnish (approximately) from 4,200 to 7,600 units of vitamin A per person per day; the restricted diet for emergency use, from 2,100 to 3,100 units daily. Rose (*21*) has tentatively suggested that a good reserve of vitamin A in children or adults may be maintained by the daily intake of an amount equal to that furnished by 1 to 1½ quarts of whole milk (2,250–3,500 units). It is known, however, that general health and stamina may be improved by greatly increasing the allowance of vitamin A, even in cases where there is no question of shortage. In view of this and of the fact that diets can easily be greatly enriched in this factor by careful food selection, Rose's tentative allowance, while probably considerably above minimum requirement, may well be increased 2 to 4 times or more. The restricted diet for emergency use includes as much vitamin A as is suggested by Rose. The adequate diets furnish at least twice as much.

No estimate is made in this publication of the vitamin B content of the four diets suggested. Fewer data are available on the vitamin B than on the vitamin A content of common foods. The prominence of whole-grain products and dried legumes in the suggested low-cost diets, and of vegetables and fruits in the more liberal diets probably insures a good supply of vitamin B.

The food materials included in the adequate diets listed in table 6 furnish in their raw state 100 or more units of vitamin C, with the amounts reaching 250 units in the case of the liberal diets suggested for adults. The restricted diets for emergency use carry from about 70 to 90 units per person per day. It has been estimated (*23*) that the daily human requirement for vitamin C is probably covered by the quantity contained in an ounce of orange, or grapefruit, or canned tomato, or raw cabbage. These quantities contain about 15 Sherman units (*23*). A liberal intake appears to be highly advantageous, however, and several times these minimal amounts are supplied by the four suggested diets. Enough tomatoes, citrus fruits, and other fruits and vegetables which may be eaten raw are included in each diet so that undoubtedly vitamin C is amply provided even after account is taken of losses in food preparation.

The adult requirement of vitamin D is not known. Most adults in temperate or semitropical zones get enough sunshine so that the needed amounts of vitamin D are provided by the activation of the ergosterol in the skin by ultraviolet rays. But in temperate zones, at least in the winter, most infants and young children need cod-liver oil, or its equivalent. It should be provided in addition to the foods listed in table 6. For children under 2 years of age, from 2 to 4 teaspoonfuls of cod-liver oil daily is recommended for rickets prevention, and for the vitamin A content of the oil as well. These quantities may also be taken by persons of other ages, when it is desired to enhance the vitamin A and vitamin D values of the diet.

TABLE 9.—*Approximate quantities of specified food materials required for pellagra prevention when the diet is otherwise very deficient in pellagra-preventing value* [1]

Item	Quantities required per person—	
	Daily	Weekly
Milk:		
Whole	1 quart	7 quarts.
Skim	do	Do.
Buttermilk	do	Do.
Evaporated unsweetened, whole	1 pound	7 pounds.
Dried:		
Whole	5 ounces	2.2 pounds.
Skim	3.5 ounces	1.5 pounds.
Lean meat, cooked:		
Muscle	0.5 pound	3.5 pounds.
Liver	do	Do.
Fish:		
Salmon, canned	do	Do.
Haddock, canned	12 ounces	5.25 pounds.
Vegetables:		
Tomatoes, canned	1.25 quarts	8.75 quarts.
Turnip greens, canned (including can liquor)	1 pound	7 pounds.
Green peas, canned (including can liquor)	do	Do.
Other foods:		
Wheat germ	5 ounces	2.2 pounds.
Yeast, pure dried, bakers', brewers'	1 ounce [2]	7 ounces. [2]
Do	0.5 ounce [3]	3.5 ounces.[3]
Yeast, autoclaved 7½ hours at 15 pounds pressure	2.1 ounces [2]	14.7 ounces.[2]

[1] Based on reports of the U.S. Public Health Service.
[2] Adult.
[3] Child under 12 years.

Well-chosen diets in which milk, the green leafy vegetables, eggs, and lean meats are prominent, furnish an abundance of vitamin G. From 500 to 1,000 Sherman-Bourquin units (*23*) per person daily are

probably an ample supply. The adequate diets listed in table 6 provide at least this much. Table 9 shows the approximate quantities of certain foods which will protect a human being from pellagra if his diet contains practically no other preventive foods. Undoubtedly many other foods contain this factor, and while some may contain too little to serve alone as an adequate source, each adds its bit of protection when included in a mixed diet. All of the diets given in this publication are pellagra preventing.

NUTRITIVE CONTENT OF DIETS COMPARED WITH DIETARY STANDARDS

Table 10 presents the approximate quantities of nutrients which should appear in well-balanced diets if they are to furnish not only the minimum requirements of the body but a fair margin of safety as well. Table 11 presents the nutritive content of the four diets suggested for each group of individuals in terms of a percentage of the dietary allowances shown in table 10 for that group. A figure of 100 or more means that dietary standards have been amply met.

If in table 11 a figure below 100 appears for energy it means that the diet furnishes less food than will provide for as much activity as the dietary standard permits. Figures below 100 for energy appear for relatively few individuals even in the case of the restricted diet for emergency use, and no figure is strikingly low. A small surplus of energy-yielding food is provided by most of the diets.

All of the adequate diets provide an ample amount of protein. The restricted diet for emergency use provides protein about as generously as any of the specified nutrients.

A figure as low as 65 for the mineral elements means that probable minimum requirements have been met, but that there is no margin for safety. The restricted diet for emergency use furnishes a somewhat smaller margin for safety in calcium, phosphorus, and iron than is desirable, but undoubtedly it provides enough for minimum requirements. The adequate diets furnish a margin of safety which is very generous in the case of calcium and phosphorus. In the case of iron, the margin of safety is ample, but smaller than for other nutrients.

A figure as low as 50 for the vitamins means that probable minimum requirements have been met, but that the margin of safety is less than is desirable. All of the adequate diets are very well fortified with both vitamins A and C.

TABLE 10.—*Quantities of nutrients for individuals per day, used in comparing the adequacy of the 4 suggested diets*

Individuals by age, sex, and activity groups	Dietary allowance in—						
	Energy value	Protein	Calcium	Phosphorus	Iron	Vitamin A	Vitamin C
	Calories	*Grams*	*Grams*	*Grams*	*Grams*	*Units*	*Units*
Child under 4 years	1, 200	45	1. 00	1. 00	0. 006–0. 009	3, 000	75
Boy 4–6; girl 4–7 years	1, 500	55	1. 00	1. 00	. 008– . 011	3, 000	80
Boy 7–8; girl 8–10 years	2, 100	65	1. 00	1. 00	. 011– . 015	3, 500	85
Boy 9–10; girl 11–13 years	2, 400	75	1. 00	1. 20	. 012– . 015	3, 500	90
Moderately active woman; boy 11–12 years; girl over 13 years	2, 500	75	1. 00	1. 20	. 013– . 015	4, 000	95
Very active woman; active boy 13–15 years	3, 000	75	. 88	1. 32	. 015	4, 000	100
Active boy over 15 years	3, 000–4, 000	75	. 88	1. 32	. 015	4, 000	100
Moderately active man	3, 000	67	. 68	1. 32	. 015	4, 000	100
Very active man	4, 500	67	. 68	1. 32	. 015	4, 000	100

TABLE 11.—*Nutritive content of the 4 suggested diets for individuals by age, sex, and activity groups, in terms of percentages of dietary allowances for each group*

[Dietary allowances shown in table 10=100]

Individuals by age, sex, and activity groups	Percentage of dietary allowances provided by suggested diet in—						
	Energy	Protein	Calcium	Phosphorus	Iron	Vitamin A	Vitamin C
RESTRICTED DIET FOR EMERGENCY USE							
Child under 4 years	90	84	79	84	54–82	87	95
Boy 4–6; girl 4–7 years	104	89	84	100	60–82	88	91
Boy 7–8; girl 8–10 years	95	92	89	117	57–78	86	100
Boy 9–10; girl 11–13 years	92	87	91	104	63–79	89	101
Moderately active woman; boy 11–12 years; girl over 13 years	93	89	92	108	68–78	78	96
Very active woman; active boy 13–15 years	104	111	111	115	82	74	88
Active boy over 15 years	93–123	128	117	131	93	66	87
Moderately active man	101	113	96	100	83	59	84
Very active man	95	163	115	138	115	53	89
ADEQUATE DIET AT MINIMUM COST							
Child under 4 years	116	131	150	138	77–115	157	132
Boy 4–6; girl 4–7 years	115	124	154	153	78–108	159	128
Boy 7–8; girl 8–10 years	102	111	126	148	71– 96	140	140
Boy 9–10; girl 11–13 years	102	104	129	132	78– 98	155	143
Moderately active woman; boy 11–12 years; girl over 13 years	105	109	131	137	84– 97	144	137
Very active woman; active boy 13–15 years	116	133	155	142	99	134	119
Active boy over 15 years	101–135	149	159	158	109	117	112
Moderately active man	113	137	151	127	99	117	115
Very active man	104	188	169	165	132	104	116
ADEQUATE DIET AT MODERATE COST							
Child under 4 years	113	111	131	121	76–113	146	167
Boy 4–6; girl 4–7 years	111	109	134	133	77–106	150	166
Boy 7–8; girl 8–10 years	103	109	138	147	71– 96	150	169
Boy 9–10; girl 11–13 years	102	103	141	131	81–101	162	173
Moderately active woman; boy 11–12 years; girl over 13 years	106	105	142	134	87–100	149	179
Very active woman; active boy 13–15 years	116	127	170	139	110	169	190
Active boy over 15 years	105–141	137	132	137	135	152	193
Moderately active man	114	131	134	113	111	139	169
Very active man	101	160	146	135	141	143	190
LIBERAL DIET							
Child under 4 years	113	113	132	123	80–120	152	173
Boy 4–6; girl 4–7 years	110	109	135	135	81–111	162	181
Boy 7–8; girl 8–10 years	102	111	139	150	75–102	162	195
Boy 9–10; girl 11–13 years	98	104	140	131	81–102	173	191
Moderately active woman; boy 11–12 years; girl over 13 years	103	112	143	138	91–105	166	208
Very active woman; active boy 13–15 years	116	135	172	144	117	190	229
Active boy over 15 years	101–135	141	133	136	140	180	254
Moderately active man	111	137	137	115	117	167	233
Very active man	101	167	149	136	147	187	254

DISTRIBUTION OF CALORIES AMONG THE VARIOUS GROUPS OF FOOD

A clue to dietary adequacy and to cost as well may be found in the percentage of calories derived from the several foods or food groups, as shown in table 6. The percentage distribution differs from one age and activity group to another, because the prominence given to different foods varies. For example, the quantity of milk suggested in adequate dietaries may remain constant throughout the period of growth, but, obviously, as the total calorie intake increases the proportion of calories derived from milk decreases. The figures in table 6 may be compared with the distribution of calories recommended by Rose (*21*) in her working plans for the construction of adequate diets for individuals (table 12).

TABLE 12.—*Working plans suggested by Rose (21) for construction of adequate diets for children and adults*

Type of diet	Percentage of calories derived from—					
	Bread, flour, cereals	Milk	Vegetables, fruits	Fats	Sugars	Lean meat, fish, eggs
For children under 13 years:						
Under 2 years	10–20	65–75	5–10	1–3	0–1	2–3
3 to 5 years	20–25	45–55	10–18	3–8	0–5	3–6
6 to 7 years	25	45	14	10	3	4
8 to 9 years	24	40	15	12	4	5
10 to 12 years	22	34	17	13	6	8
For children 13 years and over requiring:						
2,300–2,800 calories	18	25	20	18	10	9
3,000 calories	22	24	18	18	10	8
4,000 calories	26	18	18	18	10	10
5,000 calories	27	15	18	18	10	8
For moderately active adults:						
Low-cost diet	40	18	12	12	10	8
Moderate-cost diet	30	13	15	17	10	15
High-cost diet	20	16	20	18	10	16

MONEY VALUE OF THE SUGGESTED DIETS

With the constant shifting in food prices, it is obvious that the cost or money value of any given diet may vary greatly from time to time. Some of the factors affecting price changes and variations in food costs are discussed on pages 38 to 56. For purposes of comparison, however, there is presented in table 6 the per day, per week, and per year retail money value of the various suggested diets for individuals These values were computed on the basis of the 1931–32 prices shown in table 3, and on the basis of food selected in accordance with table 4. Table 13 shows the cost of each diet per 1,000 calories at 1931–32 retail prices. It also presents for individuals, by age, sex, and activity groups, the relative cost of each of the four diets. The restricted diet for emergency use costs about two fifths as much, and the adequate diet at minimum cost from about one half to two thirds as much as the liberal diet.

TABLE 13.—*Costs of each of four diets for individuals of different age, sex, and activity*

COST PER 1,000 CALORIES AT 1931–32 RETAIL PRICES

Diets	Child under 4 years	Boy 4–6 years; girl 4–7 years	Boy 7–8 years; girl 8–10 years	Boy 9–10 years; girl 11–13 years	Boy 11–12 years; girl over 13 years; moderately active woman	Active boy 13–15 years; very active woman	Active boy over 15 years	Moderately active man	Very active man
Restricted diet for emergency use	$0.095	$0.078	$0.073	$0.071	$0.070	$0.061	$0.056	$0.056	$0.050
Adequate diet at minimum cost	.120	.106	.090	.088	.086	.075	.068	.070	.061
Adequate diet at moderate cost	.163	.152	.143	.141	.140	.130	.114	.122	.107
Liberal diet	.173	.171	.169	.166	.168	.152	.141	.152	.130

RELATIVE COST OF TOTAL FOOD SUPPLY (PERCENT)

[Cost of liberal diet=100]

Restricted diet for emergency use	44	44	40	40	38	36	36	34	37
Adequate diet at minimum cost	71	65	54	54	52	49	48	46	48
Adequate diet at moderate cost	94	90	86	88	85	86	84	82	83
Liberal diet	100	100	100	100	100	100	100	100	100

RELATIVE COST OF FOOD FOR INDIVIDUALS

Table 14 shows for each diet the relative cost of food for different individuals in terms of the cost of the diet for the moderately active man. The food of young children costs from one half to three fourths as much as that of the moderately active man. These relative values may be used as scales for estimating the cost of food for a family group when the cost of a well-balanced diet for one individual is known. They may also be used as factors for determining the number of adult-food-cost units in family or institutional groups when estimating the cost of food per man per day.

TABLE 14.—*Relative cost of food for different individuals according to each of 4 diets (percent)*

[Cost of food for moderately active man=100]

Individual	Restricted diet for emergency use	Adequate diet at minimum cost	Adequate diet at moderate cost	Liberal diet
Child under 4 years	61	71	53	47
Boy 4–6; girl 4–7 years	72	78	61	56
Boy 7–8; girl 8–10 years	86	83	74	71
Boy 9–10; girl 11–13 years	92	91	83	77
Boy 11–12 years; girl over 13 years; moderately active woman	97	96	89	85
Active boy 13–15 years; very active woman	113	110	109	104
Active boy over 15 years	124	117	117	113
Moderately active man	100	100	100	100
Very active man	128	122	118	117

DISTRIBUTION OF EXPENDITURES AMONG DIFFERENT GROUPS OF FOOD

Table 6 shows the percentage of food costs entailed by different foods or groups of foods at each dietary level for each age, sex, or activity group. These figures may serve as a guide for budgeting food expenditures for groups of individuals similar in age, sex, and activity.

DIETS FOR FAMILY GROUPS

YEARLY AND WEEKLY QUANTITIES OF FOOD REQUIRED

Tables 15, 16, 17, and 18 present figures on the yearly and weekly quantities of different kinds of food suggested at each of the four dietary levels for family groups of specified composition. Tables 19, 20, 21, and 22 recapitulate the data for individuals given in table 6, with figures pertaining to each diet. These are brought together so that the food supplies needed by still other family groups or by institutional groups may readily be computed at any desired level of nutritive content and cost. The nutritive value of the food allowances for any family or institutional group is equal to the sum of the values for the corresponding individuals shown in table 6.

TABLE 15.—*Restricted diet for emergency use: Approximate yearly and weekly quantities of food for families of given composition*

RESTRICTED DIET FOR FAMILIES WITH VERY ACTIVE ADULTS

Item	2 adults		2 adults, 1 child aged 3 years		2 adults, 2 children aged 3 and 5 years		2 adults, 3 children aged 3, 5, and 8 years		2 adults, 3 children aged 3 and 5 years, boy 13 years		2 adults, 3 children aged 8 years, girl 12, boy 15		2 adults, 5 children aged 3, 8, 10 years, boy 13, girl 15	
	Year	*Week*	*Year*	*Week*	*Year*	*Week*	*Year*	*Week*	*Year*	*Week*	*Year*	*Week*	*Year*	*Week*
Flour, cereals ... pounds	737	14	823	16	962	18	1,135	22	1,244	24	1,387	27	1,668	32
Or—														
Bread ... do	340	6	380	7	444	8	524	10	574	11	640	12	770	15
Flour, cereals ... do	510	10	570	11	666	13	786	15	861	17	960	19	1,155	22
Milk, or its equivalent [1] ... quarts	182	3½	365	7	456	10½	730	14	730	14	730	14	1,095	21
Potatoes, sweetpotatoes ... pounds	460	9	560	11	670	13	795	15	830	16	885	17	1,125	22
Dried beans, peas, nuts ... do	80	1½	80	1½	88	1¾	106	2	118	2¼	148	2¾	173	3¼
Tomatoes, citrus fruits ... do	100	2	150	3	200	4	250	5	250	5	250	5	350	7
Leafy, green, yellow vegetables ... do	65	1	95	2	125	2	170	3	165	3	200	4	280	5
Dried fruits ... do	25	½	28	½	31	½	37	¾	46	1	54	1	67	1¼
Other vegetables, fruits ... do	100	2	112	2	132	3	162	3	182	3	220	4	277	5
Fats [2] ... do	130	2½	140	2¾	160	3	190	3¾	215	4	245	4¾	290	5½
Sugars [3] ... do	145	2¾	153	3	173	3¼	203	4	238	4½	280	5½	333	6½
Lean meat, fish, poultry ... do	85	1½	85	1½	90	1¾	105	2	125	2½	157	3	185	3½
Eggs ... dozen	16½	¼	26½	½	36½	¾	46½	1	44	¾	42½	¾	61	1¼

RESTRICTED DIET FOR FAMILIES WITH MODERATELY ACTIVE ADULTS

Flour, cereals ... pounds	480	9	560	11	700	13	880	17	985	19	1,130	22	1,400	27
Or—														
Bread ... do	220	4	260	5	325	6	400	8	455	9	520	10	650	12
Flour, cereals ... do	330	7	390	7	485	10	610	11	680	13	780	15	975	19
Milk, or its equivalent [1] ... quarts	182	3½	365	7	456	10½	730	14	730	14	730	14	1,095	21
Potatoes, sweetpotatoes ... pounds	300	6	400	8	510	10	635	12	670	13	725	14	965	19
Dried beans, peas, nuts ... do	65	1	65	1	73	1½	91	2	103	2	133	2½	158	3
Tomatoes, citrus fruits ... do	100	2	150	3	200	4	250	5	250	5	250	5	350	7
Leafy, green, yellow vegetables ... do	90	2	120	2	150	3	195	4	190	4	225	4	305	6
Dried fruits ... do	25	½	28	½	31	½	37	¾	46	1	54	1	67	1¼
Other vegetables, fruits ... do	95	2	107	2	127	2	157	3	177	3½	215	4	272	5
Fats [2] ... do	90	1½	100	2	120	2½	150	3	175	3½	205	4	250	5
Sugars [3] ... do	115	2	123	2½	143	2½	173	3½	208	4	250	5	303	6
Lean meat, fish, poultry ... do	68	1	68	1	73	1½	88	1½	108	2	140	2½	168	3
Eggs ... dozen	14½	¼	24½	½	34½	¾	44½	1	42	1	40½	1	59	1

[1] Approximately equivalent to the food value of 1 quart of fluid whole milk: 17 ounces of evaporated milk; 1 quart of fluid skim milk and 1½ ounces of butter; 5 ounces of American Cheddar cheese; 4½ ounces of dried whole milk; 3½ ounces of dried skim milk and 1½ ounces of butter.

[2] Including butter, oils, bacon, and salt pork.

[3] 1 pint (1½ pounds) of molasses or heavy cane or sorgo sirup is approximately equivalent in fuel value to 1 pound of granulated sugar. The unrefined molasses and sirups are also valuable for their calcium and iron content.

TABLE 16.—*Adequate diet at minimum cost: Approximate yearly and weekly quantities of food for families of given composition*

Item	2 adults		2 adults, 1 child aged 3 years		2 adults, 2 children aged 3 and 5 years		2 adults, 3 children aged 3, 5, and 8 years		2 adults, 3 children aged 3 and 5 years, boy 13 years		2 adults, 3 children aged 8 years, girl 12, boy 15		2 adults, 5 children aged 3, 8, 10 years, boy 13, girl 15	
	Year	*Week*	*Year*	*Week*	*Year*	*Week*	*Year*	*Week*	*Year*	*Week*	*Year*	*Week*	*Year*	*Week*
MINIMUM-COST DIET FOR FAMILIES WITH VERY ACTIVE ADULTS														
Flour, cereals ... pounds	690	13	760	15	870	17	1,020	20	1,130	22	1,270	24	1,520	30
Or—														
Bread ... do	320	6	350	7	400	8	470	9	520	10	590	11	700	14
Flour, cereals ... do	480	9	530	10	600	11	705	14	780	15	880	17	1,050	20
Milk, or its equivalent [1] ... quarts	365	7	730	14	1,095	21	1,278	24½–28	1,278	24½–28	1,278	24½	1,640	31½–35
Potatoes, sweetpotatoes ... pounds	460	9	560	10	670	13	795	15	830	16	885	17	1,125	22
Dried beans, peas, nuts ... do	80	1½	80	1½	88	1½	106	2	118	2	148	3	173	3½
Tomatoes, citrus fruits ... do	100	2	150	3	200	4	250	5	250	5	250	5	350	7
Leafy, green, and yellow vegetables ... do	125	2	185	4	245	5	335	6	320	6	390	7	550	11
Dried fruits ... do	50	1	53	1	58	1	70	1½	88	1½	109	2	132	2½
Other vegetables, fruits ... do	200	4	225	4	265	5	325	6	365	7	440	8	555	11
Fats [2] ... do	150	3	158	3	170	3	195	3½	235	4½	272	5	320	6
Sugars [3] ... do	115	2	120	2½	132	2½	157	3	182	3½	225	4½	270	5
Lean meat, fish, poultry ... do	170	3	170	3	180	3½	210	4	250	5	315	6	370	7
Eggs ... dozen	27	½	47	1	67	1	87	1½	82	1½	79	1½	116	2
MINIMUM-COST DIET FOR FAMILIES WITH MODERATELY ACTIVE ADULTS														
Flour, cereals ... pounds	435	8	500	10	610	12	760	15	870	17	1,015	20	1,260	24
Or—														
Bread ... do	200	4	230	5	280	6	350	7	400	8	470	9	580	12
Flour, cereals ... do	300	6	350	6	420	8	525	10	600	11	700	14	870	16
Milk, or its equivalent [1] ... quarts	365	7	730	14	1,095	21	1,278	24½–28	1,278	24½–28	1,278	24½	1,640	31½–35
Potatoes, sweetpotatoes ... pounds	300	6	400	8	510	10	635	12	670	13	725	14	965	19
Dried beans, peas, nuts ... do	65	1	65	1	73	1½	91	2	103	2	133	2½	158	3
Tomatoes, citrus fruits ... do	100	2	150	3	200	4	250	5	250	5	250	5	350	7
Leafy, green, and yellow vegetables ... do	175	3	235	5	295	6	385	7	370	7	440	9	600	12
Dried fruits ... do	50	1	53	1	58	1	70	1½	88	1½	109	2	132	2½
Other vegetables, fruits ... do	190	4	215	4	255	5	315	6	355	7	430	8	545	10
Fats [2] ... do	105	2	113	2	125	2½	150	3	190	3½	227	4	275	5
Sugars [3] ... do	100	2	105	2	117	2	142	2½	167	3	210	4	255	5
Lean meat, fish, poultry ... do	130	2½	130	2½	140	2½	170	3	210	4	275	5	330	6½
Eggs ... dozen	29	½	49	1	69	1½	89	1½	84	1½	81	1½	118	2½

[1] Approximately equivalent to the food value of 1 quart of fluid whole milk: 17 ounces of evaporated milk; 1 quart of fluid skim milk and 1½ ounces of butter; 5 ounces of American Cheddar cheese; 4½ ounces of dried whole milk; 3½ ounces of dried skim milk and 1½ ounces of butter.

[2] Including butter, oils, bacon, and salt pork.

[3] 1 pint (1½ pounds) of molasses or heavy cane or sorgo sirup is approximately equivalent in fuel value to 1 pound of granulated sugar. The unrefined molasses and sirups are also valuable for their calcium and iron content.

TABLE 17.—*Adequate diet at moderate cost: Approximate yearly and weekly quantities of food for families of given composition*

MODERATE-COST DIET FOR FAMILIES WITH VERY ACTIVE ADULTS

Item	2 adults		2 adults, 1 child aged 3 years		2 adults, 2 children aged 3 and 5 years		2 adults, 3 children aged 3, 5, and 8 years		2 adults, 3 children aged 3 and 5 years, boy 13 years		2 adults, 3 children aged 8 years, girl 12, boy 15		2 adults, 5 children aged 3, 8, 10 years, boy 13, girl 15	
	Year	*Week*	*Year*	*Week*	*Year*	*Week*	*Year*	*Week*	*Year*	*Week*	*Year*	*Week*	*Year*	*Week*
Flour, cereals ... pounds	460	9	520	10	600	12	710	14	770	15	850	17	1,040	20
Or—														
Bread ... do	540	10	590	11	665	13	765	15	855	16	950	18	1,120	22
Flour, cereals ... do	100	2	130	2½	160	3	200	4	200	4	220	4	290	5½
Milk, or its equivalent [1] ... quarts	365	7	730	14	1,095	21	1,460	28	1,460	28	1,460	28	2,190	42
Potatoes, sweetpotatoes ... pounds	510	10	610	12	710	14	810	16	870	17	880	17	1,100	21
Dried beans, peas, nuts ... do	65	1¼	65	1¼	72	1⅓	82	1½	102	2	120	2⅓	135	2½
Tomatoes, citrus fruits ... do	200	4	275	5	350	7	425	8	450	9	465	9	630	12
Leafy, green, yellow vegetables ... do	210	4	270	5	345	7	435	8	455	9	500	10	670	13
Dried fruits ... do	70	1½	77	1½	87	1¾	100	2	117	2¼	135	2⅔	167	3¼
Other vegetables, fruits ... do	540	10	630	12	730	14	855	16	1,000	19	1,085	21	1,350	26
Fats [2] ... do	160	3	170	3¼	185	3½	213	4	250	5	288	5½	340	6½
Sugars [3] ... do	190	3½	197	3¾	212	4	242	4¾	287	5½	335	6	387	7½
Lean meat, fish, poultry ... do	260	5	260	5	285	5½	345	6⅔	395	7½	505	9¾	595	11½
Eggs ... dozen	30	⅔	50	1	70	1⅓	90	1¾	85	1⅔	85	1⅔	120	2½

MODERATE-COST DIET FOR FAMILIES WITH MODERATELY ACTIVE ADULTS

Flour, cereals ... pounds	340	7	400	8	480	9	590	11	650	13	730	14	920	18
Or—														
Bread ... do	360	7	410	8	485	9	585	11	675	13	770	15	940	18
Flour, cereals ... do	100	2	130	2½	160	3	200	4	200	4	220	4	290	5½
Milk, or its equivalent [1] ... quarts	365	7	730	14	1,095	21	1,460	28	1,460	28	1,460	28	2,190	42
Potatoes, sweetpotatoes ... pounds	285	5	385	7	485	9	585	11	645	12	655	13	880	17
Dried beans, peas, nuts ... do	45	1	45	1	52	1	62	1¼	82	1½	100	2	115	2
Tomatoes, citrus fruits ... do	190	4	265	5	340	7	415	8	440	8	455	9	620	12
Leafy, green, yellow vegetables ... do	210	4	270	5	345	7	435	8	455	9	500	10	670	13
Dried fruits ... do	60	1	67	1⅓	77	1½	92	1⅔	107	2	125	2½	157	3
Other vegetables, fruits ... do	445	9	535	10	635	12	760	15	905	17	990	19	1,255	24
Fats [2] ... do	107	2	117	2¼	132	2½	160	3	197	3¾	235	4½	287	5½
Sugars [3] ... do	120	2⅓	127	2½	142	3	172	3½	217	4¼	265	5	317	6
Lean meat, fish, poultry ... do	215	4	215	4	240	5	300	6	350	7	460	9	550	11
Eggs ... dozen	30	⅔	50	1	70	1⅓	90	1¾	85	1⅔	85	1⅔	120	2½

[1] Approximately equivalent to the food value of 1 quart of fluid whole milk: 17 ounces of evaporated milk; 1 quart of fluid skim milk and 1½ ounces butter; 5 ounces of American Cheddar cheese; 4½ ounces of dried whole milk; 3½ ounces of dried skim milk and 1½ ounces of butter.

[2] Including butter, oils, bacon, and salt pork.

[3] 1 pint (1½ pounds) of molasses or heavy cane or sorgo sirup is approximately equivalent in fuel value to 1 pound of granulated sugar. The unrefined molasses and sirups are also valuable for their calcium and iron content.

TABLE 18.—*Liberal diet: Approximate yearly and weekly quantities of food for families of given composition*

LIBERAL DIET FOR FAMILIES WITH VERY ACTIVE ADULTS

Item	2 adults		2 adults, 1 child aged 3 years		2 adults, 2 children aged 3 and 5 years		2 adults, 3 children aged 3, 5, and 8 years		2 adults, 3 children aged 3 and 5 years, boy 13 years		2 adults, 3 children aged 8 years, girl 12, boy 15		2 adults, 5 children aged 3, 8, 10 years, boy 13, girl 15	
	Year	*Week*	*Year*	*Week*	*Year*	*Week*	*Year*	*Week*	*Year*	*Week*	*Year*	*Week*	*Year*	*Week*
Flour, cereals ... pounds	300	6	350	7	400	8	470	9	510	10	540	11	650	13
Or—														
Bread ... do	360	7	390	8	435	9	495	10	555	11	600	12	690	13
Flour, cereals ... do	65	1	90	1½	115	2	140	2½	140	2½	140	2½	190	3½
Milk, or its equivalent [1] ... quarts	365	7	730	14	1,095	21	1,460	28	1,460	28	1,460	28	2,190	42
Potatoes, sweetpotatoes ... pounds	500	10	600	12	700	13	800	15	850	16	850	16	1,060	20
Dried beans, peas, nuts ... do	20	½	20	½	22	½	25	½	32	½	38	¾	43	1
Tomatoes, citrus fruits ... do	240	5	315	6	390	8	470	9	510	10	530	10	715	14
Leafy, green, yellow vegetables ... do	330	6	390	7	465	9	555	11	615	12	660	13	840	16
Dried fruits ... do	55	1	60	1	65	1¼	73	1½	90	1¾	98	2	118	2¼
Other vegetables, fruits ... do	750	14	890	17	1,090	21	1,390	27	1,440	28	1,700	33	2,140	41
Fats [2] ... do	165	3	175	3¼	190	3½	217	4	255	5	292	5½	342	6½
Sugars [3] ... do	190	3½	197	4	212	4¼	242	4¾	287	5½	330	6½	377	7
Lean meat, poultry, fish ... do	450	8½	460	9	500	9½	590	11½	700	13½	860	16½	1,020	19½
Eggs ... dozen	60	1	85	1½	115	2¼	145	2¾	145	2¾	150	2¾	205	4

LIBERAL DIET FOR FAMILIES WITH MODERATELY ACTIVE ADULTS

Flour, cereals ... pounds	190	4	235	4½	290	5½	355	7	395	7½	425	8	535	10
Or—														
Bread ... do	210	4	240	5	285	6	345	7	405	8	450	9	540	10
Flour, cereals ... do	50	1	75	1½	100	2	125	2½	125	2½	125	2½	175	2½
Milk, or its equivalent [1] ... quarts	365	7	730	14	1,095	21	1,460	28	1,460	28	1,460	28	2,190	42
Potatoes, sweetpotatoes ... pounds	260	5	360	7	460	9	560	11	610	12	610	12	820	16
Dried beans, peas, nuts ... do	15	¼	15	¼	17	½	20	½	27	½	33	¾	38	1
Tomatoes, citrus fruits ... do	230	4	305	6	380	7	460	9	500	10	520	10	705	14
Leafy, green, yellow vegetables ... do	300	6	360	7	435	8	525	10	585	11	630	12	810	16
Dried fruits ... do	40	1	45	1	50	1	58	1	75	1½	83	1½	103	2
Other vegetables, fruits ... do	700	13	840	16	1,040	20	1,340	26	1,390	27	1,650	32	2,090	40
Fats [2] ... do	105	2	115	2	130	2½	157	3	195	3¾	232	4½	282	5½
Sugars [3] ... do	115	2½	122	2½	137	2½	167	3	212	4	255	5	302	6
Lean meat, poultry, fish ... do	370	7	380	7½	420	8	510	10	620	12	780	15	940	18
Eggs ... dozen	60	1	85	1½	115	2¼	145	2¾	145	2¾	150	2¾	205	4

[1] Approximately equivalent to the food value of 1 quart of fluid whole milk: 17 ounces of evaporated milk; 1 quart of fluid skim milk and 1½ ounces of butter; 5 ounces of American Cheddar cheese; 4½ ounces of dried whole milk; 3½ ounces of dried skim milk and 1½ ounces of butter.

[2] Including butter, oils, bacon, and salt pork.

[3] 1 pint (1½ pounds) of molasses or heavy cane or sorgo sirup is approximately equivalent in fuel value to 1 pound of granulated sugar. The unrefined molasses and sirups are also valuable for their calcium and iron content.

TABLE 19.—*Restricted diet for emergency use: Approximate yearly quantities of food for individuals of different age, sex, and activity*

Item	Child under 4 years	Boy 4 to 6 years; girl 4 to 7 years	Boy 7 to 8 years; girl 8 to 10 years	Boy 9 to 10 years; girl 11 to 13 years	Boy 11 to 12 years; girl over 13 years; moderately active woman	Active boy 13 to 15 years; very active woman	Active boy over 15 years	Moderately active man	Very active man
Flour, cereals ... pounds	85	140	175	195	195	280	370	280	455
Or—									
Bread ... do	40	65	80	90	90	130	170	130	210
Flour, cereals ... do	60	95	120	135	135	195	255	195	315
Milk, or its equivalent [1] ... quarts	182	182	182	182	[2] 182	[2] 182	182	91	91
Potatoes, sweetpotatoes ... pounds	100	110	125	140	140	160	225	160	300
Dried beans, peas, nuts ... do	------	8	18	20	25	30	30	40	50
Tomatoes, citrus fruits ... do	50	50	50	50	50	50	50	50	50
Leafy, green, and yellow vegetables ... do	30	30	45	50	50	40	25	40	25
Dried fruits ... do	3	3	6	8	10	15	10	15	10
Other vegetables, fruits ... do	12	20	30	40	45	50	50	50	50
Fats [3] ... do	10	20	30	30	35	55	65	55	75
Sugars [4] ... do	8	20	30	40	45	65	70	70	80
Lean meat, fish, poultry ... do	------	5	15	22	28	35	35	40	50
Eggs ... dozen	10	10	10	8½	8½	7½	6	6	6

[1] Approximately equivalent to the food value of 1 quart of fluid whole milk: 17 ounces of evaporated milk; 1 quart of fluid skim milk and 1½ ounces of butter; 5 ounces of American Cheddar cheese; 4½ ounces of dried whole milk; 3½ ounces of dried skim milk and 1½ ounces of butter.

[2] For the adult woman this may be reduced to 91 quarts. For pregnant or nursing mother it should be increased to 273 quarts.

[3] Including butter, oils, bacon, and salt pork.

[4] 1 pint (1½ pounds) of molasses or heavy cane or sorgo sirup is approximately equivalent in fuel value to 1 pound of granulated sugar. The unrefined molasses and sirups are also valuable for their calcium and iron content.

TABLE 20.—*Adequate diet at minimum cost: Approximate yearly quantities of food for individuals of different age, sex, and activity*

Item	Child under 4 years	Boy 4 to 6 years; girl 4 to 7 years	Boy 7 to 8 years; girl 8 to 10 years	Boy 9 to 10 years; girl 11 to 13 years	Boy 11 to 12 years; girl over 13 years; moderately active woman	Active boy 13 to 15 years; very active woman	Active boy over 15 years	Moderately active man	Very active man
Flour, cereals ... pounds	70	100	150	170	175	260	350	260	435
Or—									
Bread ... do	30	50	70	80	80	120	160	120	200
Flour, cereals ... do	50	70	105	115	120	180	240	180	300
Milk, or its equivalent [1] ... quarts	365	365	273–365	273–365	[2] 273–365	[2] 273–365	273–365	182	182
Potatoes, sweetpotatoes ... pounds	100	110	125	140	140	160	225	160	300
Dried beans, peas, nuts ... do	------	8	18	20	25	30	30	40	50
Tomatoes, citrus fruit ... do	50	50	50	50	50	50	50	50	50
Leafy, green, and yellow vegetables ... pounds	60	60	90	100	100	75	50	75	50
Dried fruits ... do	3	5	12	17	20	30	20	30	20
Other vegetables, fruits ... do	25	40	60	80	90	100	100	100	100
Fats [3] ... do	8	12	25	32	40	65	75	65	85
Sugars [4] ... do	5	12	25	35	40	50	55	60	65
Lean meat, fish, poultry ... do	------	10	30	45	55	70	75	75	100
Eggs ... dozen	20	20	20	17	17	15	12	12	12

[1] Approximately equivalent to the food value of 1 quart of fluid whole milk: 17 ounces of evaporated milk; 1 quart of fluid skim milk and 1½ ounces of butter; 5 ounces of American Cheddar cheese; 4½ ounces of dried whole milk; 3½ ounces of dried skim milk and 1½ ounces of butter.

[2] For the adult woman this may be reduced to 182 quarts. For pregnant or nursing mother it should be increased to 365 quarts.

[3] Including butter, oils, bacon, and salt pork.

[4] 1 pint (1½ pounds) of molasses or heavy cane or sorgo sirup is approximately equivalent in fuel value to 1 pound of granulated sugar. The unrefined molasses and sirups are also valuable for their calcium and iron content.

TABLE 21.—*Adequate diet at moderate cost: Approximate yearly quantities of food for individuals of different age, sex, and activity*

Item	Child under 4 years	Boy 4 to 6 years; girl 4 to 7 years	Boy 7 to 8 years; girl 8 to 10 years	Boy 9 to 10 years; girl 11 to 13 years	Boy 11 to 12 years; girl over 13 years; moderately active woman	Active boy 13 to 15 years; very active woman	Active boy over 15 years	Moderately active man	Very active man
Flour, cereals ... pounds	60	80	110	120	120	170	230	220	290
Or—									
Bread ... do	50	75	100	120	120	190	240	240	350
Flour, cereals ... do	30	30	40	40	40	40	70	60	60
Milk, or its equivalent [1] ... quarts	365	365	365	365	[2] 365	[2] 365	240	182	182
Potatoes, sweetpotatoes ... pounds	100	100	100	110	125	160	300	160	350
Dried beans, peas, nuts ... do	------	7	10	15	15	30	30	30	35
Tomatoes, citrus fruits ... do	75	75	75	90	90	100	100	100	100
Leafy, green, and yellow vegetables ... pounds	60	75	90	90	110	110	100	100	100
Dried fruits ... do	7	10	15	20	25	30	45	35	40
Other vegetables, fruits ... do	90	100	125	150	175	270	300	270	270
Fats [3] ... do	10	15	28	35	42	65	80	65	95
Sugars [4] ... do	7	15	30	40	45	75	115	75	115
Lean meat, fish, poultry ... do	------	25	60	75	90	110	150	125	150
Eggs ... dozen	20	20	20	20	15	15	15	15	15

[1] Approximately equivalent to the food value of 1 quart of fluid whole milk: 17 ounces of evaporated milk; 1 quart of fluid skim milk and 1½ ounces of butter; 5 ounces of American Cheddar cheese; 4½ ounces of dried whole milk; 3½ ounces of dried skim milk and 1½ ounces of butter.

[2] For the adult woman this may be reduced to 182 quarts. For pregnant or nursing mother it should be increased to 365 quarts.

[3] Including butter, oils, bacon, and salt pork.

[4] 1 pint (1½ pounds) of molasses or heavy cane or sorgo sirup is approximately equivalent in fuel value to 1 pound of granulated sugar. The unrefined molasses and sirups are also valuable for their calcium and iron content.

TABLE 22.—*Liberal diet: Approximate yearly quantities of food for individuals of different age, sex, and activity*

Item	Child under 4 years	Boy 4 to 6 years; girl 4 to 7 years	Boy 7 to 8 years; girl 8 to 10 years	Boy 9 to 10 years; girl 11 to 13 years	Boy 11 to 12 years; girl over 13 years; moderately active woman	Active boy 13 to 15 years; very active woman	Active boy over 15 years	Moderately active man	Very active man
Flour, cereals ... pounds	45	55	65	65	65	105	125	125	200
Or—									
Bread ... do	30	45	60	60	60	120	150	150	240
Flour, cereals ... do	25	25	25	25	25	25	25	25	40
Milk, or its equivalent [1] ... quarts	365	365	365	365	[2] 365	[2] 365	240	182	182
Potatoes, sweetpotatoes ... pounds	100	100	100	100	110	150	300	150	350
Dried beans, peas, nuts ... do	------	2	3	5	5	10	10	10	10
Tomatoes, citrus fruits ... do	75	75	80	90	110	120	120	120	120
Leafy, green, and yellow vegetables ... do	60	75	90	90	120	150	180	180	180
Dried fruits ... do	5	5	8	10	15	25	30	25	30
Other vegetables, fruits ... do	140	200	300	300	300	350	400	400	400
Fats [3] ... do	10	15	27	35	40	65	80	65	100
Sugars [4] ... do	7	15	30	35	40	75	115	75	115
Lean meat, poultry, fish ... do	10	40	90	120	150	200	250	220	250
Eggs ... dozen	25	30	30	30	30	30	30	30	30

[1] Approximately equivalent to the food value of 1 quart of fluid whole milk: 17 ounces of evaporated milk; 1 quart of fluid skim milk and 1½ ounces of butter; 5 ounces of American Cheddar cheese; 4½ ounces of dried whole milk; 3½ ounces of dried skim milk and 1½ ounces of butter.

[2] For the adult woman this may be reduced to 182 quarts. For pregnant or nursing mother it should be increased to 365 quarts.

[3] Including butter, oils, bacon, and salt pork.

[4] 1 pint (1½ pounds) of molasses or heavy cane or sorgo sirup is approximately equivalent in fuel value to 1 pound of granulated sugar. The unrefined molasses and sirups are also valuable for their calcium and iron content.

DISTRIBUTION OF CALORIES AMONG VARIOUS GROUPS OF FOOD

The distribution of calories among specified types of food is, of course, not the same for all family groups. The large proportion of calories derived from milk in the diets of young children and the large proportion derived from the grain products in diets of very active adults are largely responsible for variations such as are shown in table 23.

The percentages of calories derived from different types of food in the diets suggested for a family of five with three children are compared in table 24 with the working plan of Rose (*20*) for adequate diets at three levels of income. As has been emphasized before, grain products are prominent in low-cost adequate diets. If, however, they furnish more than 45 percent of the calories in a family diet, it is likely that they have displaced other essential foods. As the money allowance for food increases, greater prominence may be given to vegetables, fruits, and lean meat, fish, and eggs. At any cost level, milk furnishes about 25 percent of the calories in adequate diets for a family with three children.

TABLE 23.—*Proportion of calories derived from various groups of food in diets for families of different composition (percent)*

Type of diet and family composition	Calories derived from—					
	Bread, flour, cereals	Milk, cheese	Vegetables, fruits	Fats	Sugars	Lean meat, fish, eggs
Restricted diet for—						
2 adults:						
Moderately active	42	11	14	17	11	4
Very active	47	8	13	18	10	5
2 moderately active adults and—						
2 children	41	14	14	16	10	5
3 children	42	15	13	16	9	5
5 children	41	15	14	16	9	5
Minimum-cost adequate diet for—						
2 adults:						
Moderately active	34	16	15	18	8	9
Very active	40	12	14	19	7	8
2 moderately active adults and—						
2 children	33	19	15	16	8	9
3 children	32	24	14	15	7	8
5 children	33	22	15	15	7	8
Moderate-cost adequate diet for—						
2 adults:						
Moderately active	25	17	18	18	9	13
Very active	25	13	19	21	11	11
2 moderately active adults and—						
2 children	23	22	18	16	9	12
3 children	23	24	18	16	8	11
5 children	22	25	17	16	8	12
Liberal diet for—						
2 adults:						
Moderately active	14	18	18	18	9	23
Very active	17	13	18	21	11	20
2 moderately active adults and—						
2 children	13	22	18	17	8	22
3 children	14	25	18	16	8	19
5 children	13	25	18	16	8	20

TABLE 24.—*Proportion of calories derived from various food groups in different family* [1] *diets (percent)*

DISTRIBUTION OF CALORIES IN THE 4 SUGGESTED DIETS

Type of diet	Calories derived from—					
	Bread, flour, cereals	Milk, cheese	Vegetables, fruits	Fats	Sugars	Lean meat, fish, eggs
Restricted diet for emergency use	42	15	13	16	9	5
Adequate diet at minimum cost	32	24	14	15	7	8
Adequate diet at moderate cost	23	24	18	16	8	11
Liberal diet	14	25	18	16	8	19
WORKING PLANS SUGGESTED BY ROSE (*20*) FOR ADEQUATE DIETS						
Very economical	30–40	20–25	12–15	10–12	10–12	[2] 5–10
Moderately priced	25–30	25	15–20	10–20	10–12	[2] 8–15
Without cost restrictions	20	20–25	18–24	15–20	10–12	[2] 10–15

[1] Based on family of 2 moderately active adults and 3 children.
[2] Includes cheese.

DISTRIBUTION OF EXPENDITURES AMONG VARIOUS GROUPS OF FOODS

If families with children purchase their food supplies in accordance with the diets suggested in tables 15 to 18, each food dollar will be spent approximately as follows:

RESTRICTED DIET FOR EMERGENCY USE

25 to 30 cents for milk and cheese (one fourth or more).
25 to 20 cents for fruits and vegetables (not more than one fourth).
10 cents for lean meat, fish, and eggs (about one tenth).
20 cents for bread, flour, and cereals (one fifth or more).
20 cents for fats, sugars, and accessories (about one fifth).

ADEQUATE DIET AT MINIMUM COST

30 to 35 cents for milk and cheese (one third or more).
25 to 20 cents for fruits and vegetables (not more than one fourth).
15 cents for lean meat, fish, and eggs (about one seventh).
15 cents for bread, flour, and cereals (about one seventh).
15 cents for fats, sugars, and accessories (about one seventh).

ADEQUATE DIET AT MODERATE COST

25 to 30 cents for milk and cheese (one fourth or more).
30 to 25 cents for fruits and vegetables (one fourth or more).
20 to 15 cents for lean meat, fish, and eggs (not more than one fifth).
10 cents for bread, flour, and cereals (about one tenth).
15 to 20 cents for fats, sugars, and accessories (about one sixth).

LIBERAL DIET

30 cents for milk, cheese, butter, and cream (one fourth to one third).
30 cents for fruits and vegetables (not more than one third).
25 to 30 cents for lean meat, fish, and eggs (about one fourth).
15 to 10 cents for bread, flour, cereals, fats, sugars, and accessories (about one eighth).

Families of adults will spend relatively less for milk, perhaps more for fats, sugars, and cereals, and more for lean meat, fish, and eggs than families with children. The budgeting of the food money suggested above may be compared with Sherman's recommendation (*23*) that—

> Whatever the level of expenditure, it seems wise to observe the two following rules: (1) At least as much should be spent for milk (including cream and cheese if used) as for meats, poultry, and fish; and (2) at least as much should be spent for fruits and vegetables as for meats, poultry, and fish.

SOME FACTORS AFFECTING FOOD PRICES AND FOOD COSTS

The cost of the family food supply depends upon many factors. As already pointed out, within the general price level for any given period or community, food costs are influenced by the prominence that the housewife gives to different groups of food in the diet and by the specific articles of food she selects within each group. Food costs are further influenced by variations in prices due to such factors as the choice of store, the number and kind of services demanded from the food dealer, the type of packaging or the size of container selected, the quantity of food bought at a time, the advantage taken of special sales or of low prices due to market surpluses, and the grade or quality of food selected. Information on some of these factors is presented as an aid to the housewife or the institutional buyer.

PACKAGING OF FOOD AND SIZE OF CONTAINER

When purchasing certain groceries the consumer must choose between bulk and packaged foods. Dried fruits, dried legumes, butter, lard, cookies, crackers, tea, coffee, some cereals, and a few other commodities are still available by bulk, even though bins, boxes, sacks, and barrels are rapidly being replaced in modern stores by packaged goods. Packaged foods have the advantage of greater sanitation, convenience in handling, and ease of identification. On the other hand, bulk goods usually cost somewhat less, and their quality is often as good as that of the packaged food.

When purchasing foods in packages, cans, or jars, it is economical in many cases to buy a large rather than a small container. The comparative costs of two sizes of containers are shown for a number of foods in table 25. Assuming that none of the food is wasted, savings of from 8 to 38 percent appear with the larger containers. Each comparison shown is for merchandise of identical brand and quality on sale in the same Washington, D.C., store on the same day. The comparisons were not all made on the same date but at different times between October 1931 and May 1933, inclusive.

Many types of food containers are not well standardized either in size or shape. Legally, a package may contain any amount of food provided the label plainly states the net weight of the contents. The package size is often no guide to net weight. For example, packages of well-known breakfast cereals having approximately the same measure of contents may have net weights which vary from 4½ to 20 ounces.

TABLE 25.—*Comparative costs* [1] *of specified articles of food of identical quality purchased in large and small containers*

Item	Large container			Small container			Saving by purchase in large container
	Size	Price per container	Price per pound	Size	Price per container	Price per pound	
							Percent
Flour, white	24 pounds	$0.65	$0.027	5 pounds	$0.19	$0.038	29
Flour, self-rising	do	.79	.033	2 pounds	.10	.050	34
Wheat cereal	28 ounces	.21	.120	14 ounces	.13	.149	19
Oatmeal	55 ounces	.23	.067	20 ounces	.10	.080	16
Evaporated milk	14½ ounces	.08	.088	6 ounces	.04	.107	18
Prunes, dried	2 pounds	.19	.095	1 pound	.12	.120	21
Cherries, canned	31 ounces	.29	.150	11.5 ounces	.17	.236	36
Fruit cocktail do	30 ounces	.25	.133	8 ounces	.10	.200	34
Fruit for salad do	do	.35	.187	11 ounces	.20	.291	36
Pineapple do	do	.21	.112	14 ounces	.15	.172	35
Tomato juice do	50 ounces	.25	.080	12.5 ounces	.10	.128	38
Tomatoes do	33 ounces	.10	.048	20 ounces	.09	.072	33
Corn do	20 ounces	.13	.104	11 ounces	.08	.116	10
Lima beans do	do	.15	.120	do	.13	.189	37
Peas do	do	.13	.104	do	.09	.131	21
Pork and beans do	18 ounces	.10	.089	do	.08	.116	23
Salmon steak	15½ ounces	.50	.515	7¾ ounces	.29	.598	14
Walnut meats	8 ounces	.49	.980	3 ounces	.23	1.230	20
Peanut butter	1 pound	.23	.230	5 ounces	.10	.320	28
Mayonnaise	do	.23	.230	8 ounces	.13	.260	12
Olive oil	1 quart	1.00	[2] 1.000	½ pint	.30	[2] 1.200	17
Cooking oil	do	.52	[2] .520	1 pint	.29	[2] .580	10
Honey	1 pound	.60	.600	3½ ounces	.20	.915	34
Molasses	40 ounces	.18	.072	18 ounces	.09	.080	10
Sirup	5 pounds	.35	.070	1 pound	.09	.090	22
Sugar	10 pounds	.49	.049	do	.06	.060	18
Olives	32 ounces	.35	.175	6 ounces	.10	.267	34
Vinegar	1 gallon	.49	[2] .123	1 pint	.09	[2] .180	32
Cocoa	1 pound	.25	.250	3 ounces	.07	.373	33
Coffee	do	.25	.250	8 ounces	.14	.280	11
Tea	8 ounces	.35	.700	4 ounces	.19	.760	8
Baking powder	1 pound	.32	.320	do	.09	.360	11

[1] Based on Washington, D.C., retail prices as of October 1931 to May 1933. [2] Price per quart.

In the canning industry attention has been given to the standardizing of can sizes. The sizes most frequently used for fruits and vegetables are shown in table 26. The most commonly used can size for fruits is no. 2½ and for vegetables, no. 2. Larger and smaller sizes are available to suit the needs of any group. One large can is generally a more economical purchase than several small ones. The nos. 5 and 10 sizes are used chiefly by institutions and are purchased wholesale, but on demand they may be obtained from retail stores. Table 27 shows how differences in size of can influence the per-pound cost of the contents.

TABLE 26.—*Common sizes of standard cans for fruits and vegetables*

Can size	Average net weight	Contents	Approximate number of servings	Can size	Average net weight	Contents	Approximate number of servings
		Cups				*Cups*	
Buffet or picnic	8 ounces	1	[1] 2	No. 2½	28 ounces	3½	5–7
No. 1	11 ounces	1⅓	2	No. 3	33 ounces	4	6–8
No. 1 tall	16 ounces	2	3–4	No. 5	3 pounds, 8 ounces	7	10–14
No. 2	20 ounces	2½	4–5	No. 10	6 pounds, 10 ounces	13	20–26

[1] Small

TABLE 27.—*Price per pound*[1] *of foods of identical quality when sold in cans of different sizes*

Food	Commercial grade as indicated by the distributor	Price per pound when in—				
		8- or 9-ounce can	No. 1 can	No. 2 can	No. 2½ can	No. 3 can
		Cents	*Cents*	*Cents*	*Cents*	*Cents*
Vegetables:						
Beans, cut	Extra standard		9.1	6.6		
	Standard		8.7	5.0		
Beans, lima	Extra Standard		14.0	10.0		
Corn	Fancy		10.9	9.2		
	Extra Standard		9.1	6.6		
	Standard		8.2	5.0		
Peas	Extra Standard		14.0	10.0		
Tomatoes	Fancy			10.1		8.2
	Extra Standard		10.0	7.0		
Fruits:						
Apricots	Choice	16.0	12.5		12.3	
Cherries	do		12.5		12.3	
Fruit salad	Choice		17.0		14.4	
Grapefruit	Fancy	12.5		10.0		
Peaches	do	14.0	12.5		9.1	
Pears	do		15.0		11.2	
Pineapple, sliced	do	22.2			8.9	
	Fancy		13.0		9.6	

[1] Based on retail prices of 1932, Washington, D.C.

By Federal law, the average net weight of the contents must be stated on the labels of all canned foods. This weight indicates the combined weight of the liquid and solid contents of the can. The buyer should remember this, because with the exception of tomatoes, sweetpotatoes, and pumpkin, most vegetables are canned in water. Fruits are generally canned in a sugar sirup, although some fruits intended for use in pies are waterpacked. If waterpacked, an explanatory statement appears on the label.

Under the provisions of the McNary-Mapes amendment to the Federal Food and Drugs Act, "canned food is of standard fill when neither the head space nor the amount of water, brine, sugar solution, or other packing medium is excessive." Canned foods failing to meet these requirements are placed in the substandard grade because of "slack-fill." The Bureau of Agricultural Economics of the Department of Agriculture has recommended minimum drained weights of solids for specified foods, packed in cans of stated size.

GRADES AND QUALITY

Many foods appear in the market bearing terms indicating quality grading. In some cases these grades have been developed by the Federal Government; in others by local authority; in still others by the industry. So far, grading has been developed largely from the producer's end of the marketing process, and chiefly benefits the distributor, and the consumer who can buy according to specification on the wholesale market.

Certain items, however, can now be purchased by grade in some retail markets. Progress in bringing information on grades to consumers will depend largely on consumer demand for such information. At the present time the adjustment of price to size and quality grades is not very sensitive, and probably it will not be until more purchasing information is available for the use of the individual housewife.

The following paragraphs summarize briefly what different agencies have done, or are doing, to bring such information to the consumer directly or through the retail dealer.

CANNED FRUITS AND VEGETABLES

Definite grade terms referring to canned fruits and vegetables do not always appear on the labels where they would serve to guide the consumer's selection. They are not required by Federal law except on certain low-quality products. Under the McNary-Mapes amendment (July 1930) to the Food and Drugs Act, the Secretary of Agriculture is given the power to establish a standard of quality for each kind of canned food except meat and milk products. After the standard is established, any canned vegetable entering into interstate commerce which does not measure up to the requirements must have conspicuously printed on the label the words "Below U.S. Standard. Low Quality But Not Illegal." Substandard fruits must be labeled "Below U.S. Standard. Good Food—Not High Grade." In certain special cases such as soaked dry peas and artificially colored peas some explanatory information must appear in addition to the conventional substandard legend. Slack-filled containers, including those carrying an excess of liquid packing medium, must be labeled "Slack Fill" and, when such is the case, "Contains Excess Added Liquid." This requirement applies even to food for which no quality standards have as yet been issued. To date (May 1933) standards (*29*) have been established for canned peaches, pears, peas, tomatoes, apricots, and cherries. Products which carry the substandard labeling are wholesome food, even though they may not be up to the recognized standard in some other respects.

Although this substandard labeling is the only quality information required by Federal law, the Secretary of Agriculture, under the farm products grading law, has promulgated grade standards for canned corn (both whole and cream style), peas, snap beans, and tomatoes. Tentative standards are being prepared for other fruits and vegetables. These standards bear the designations Grade A (Fancy), Grade B (Extra Standard or Choice), Grade C (Standard), and Off-grade (Substandard). Many canners are voluntarily labeling their products by these grade designations. If so labeled, the products must conform to the standards set. This simple system of grading of canned foods, if generally used, will do much to eliminate some of the present purchasing problems of the consumer.

In addition to these grade designations recently established by the Department of Agriculture, certain terms are recognized by the canning trade and by wholesale distributors as descriptive of quality, and sometimes appear on the labels. Under this terminology fruits are graded as Fancy, Choice, and Standard; vegetables as Fancy, Extra Standard, and Standard. The Fancy grades in both cases are carefully selected for uniformity of size, color, and maturity and always represent the most perfect portion of the crop. The Choice fruits and Extra Standard vegetables are next best, the Standard grade ranks third. Effort is made to keep these grades uniform from year to year regardless of crop conditions. Fancy fruits are commonly packed in a heavier sirup than the Choice and Standard grades.

In buying canned goods, the consumer would expect the finest grades to command the highest retail prices, and this is generally true when the products bear definite quality designations. However, price is not always a reliable guide if a statement of grade does not appear on the label and if selection must be made on the basis of price and brand name only. Grading tests have shown that sometimes the lower priced canned food receives the higher grade rating. Table 28 shows the price per can of some fruits and vegetables, classified according to commercial grades which were recognized by the distributor but not always definitely stated on the labels.

TABLE 28.—*Price*[1] *of foods of different commercial grades as indicated by the distributor, when sold in cans of same size*

Food	Size of can	Price per can of grades—		
		Fancy	Choice or Extra Standard	Standard
Fruits:	*No.*	*Cents*	*Cents*	*Cents*
Apricots	2½	25.00	22.50	----------
Fruits for salad	2½	----------	25.00	21.00
Peaches	2½	16.33	14.50	12.50
Pears	2½	23.00	19.50	13.50–17.00
Plums	2½	----------	19.00	12.50
Vegetables:				
Corn	1	7.50	----------	5.60
	2	11.50–14.50	9.50	6.25
Peas	1	14.00	10.00	6.30
	2	19.00	15.00	9.50–11.50
Spinach	2½	15.00	12.50	----------
Snap beans	2	19.00	----------	6.25–8.30
Tomatoes	2	----------	12.00	6.25–7.50
	3	----------	17.00	12.00

[1] Based on retail prices of 1932, Washington, D.C.

DRIED FRUITS

Dried apples, apricots, peaches, and pears are classified into five size and quality grades as Extra Fancy, Fancy, Extra Choice, Choice, and Standard. The Extra Fancy grade contains the largest, most uniform, cleanest, and best fruit. Figs are graded as Fancy, Choice, and Standard. Stemmed raisins have a size grading and are referred to as 4-, 3-, 2-, or 1-crown, the 4-crown being the largest size. The largest cluster raisins are the 6-crown or Imperial clusters, the smallest are the 3-crown layers (*7*). The smaller sizes are less expensive and can be used to equally good advantage for many purposes.

Prunes, when sold by bulk, are graded according to the number required to make a pound, and are referred to as 20–30's, 30–40's, and so forth, down to the very small 110–120's. There are fewer prune pits, and therefore there is a larger percentage of edible prune meat in a pound of the larger ones. However, the prices are generally enough lower on the smaller prunes to make them the more economical purchase when the cost per pound of edible prune meat is considered. Whenever two sizes of prunes are quoted at the same price per pound it is better to buy the larger size. The actual cost per pound of edible prune meat from different sizes of prunes, figured from representative 1931 retail prices, is shown in table 29.

TABLE 29.—*Cost per pound*[1] *of edible prune meat from prunes of different sizes*

Size (number of prunes per pound)	Price per pound as purchased	Edible portion from 1 pound as purchased [2]	Cost per pound of edible portion	Size (number of prunes per pound)	Price per pound as purchased	Edible portion from 1 pound as purchased [2]	Cost per pound of edible portion
	Cents	*Ounces*	*Cents*		*Cents*	*Ounces*	*Cents*
20–30	15.00	13.75	17.46	60–70	6.25	13.25	7.55
30–40	12.50	13.50	14.82	70–80	5.00	12.75	6.27
40–50	9.00–10.00	13.50	10.67–11.86	80–90	5.00	12.38	6.46
50–60	7.50	13.50	8.89	90–100	5.00	12.25	6.53

[1] Based on representative retail prices of 1931. [2] Todoroff (*27*).

FRESH FRUITS AND VEGETABLES

Standards for grading fresh fruits and vegetables have been drawn up by the United States Department of Agriculture. In establishing the standards for different grades some of the points considered are degree of ripeness, uniformity of size and shape, color, and freedom from injuries caused by mold, decay, freezing, cuts, bruises, worms, insects, and plant diseases. While the grade terms and the number of grades established for the different varieties of fruits and vegetables differ somewhat, in general U.S. Fancy is the finest grade, and is applied only to the choicest specimens. Fancy grades, as a rule, command the highest prices. U.S. No. 1 and U.S. No. 2 designate the next two grades. The United States Department of Agriculture has issued a buying guide for consumers (*15*) which gives many details as to the selection of specified fruits and vegetables.

Citrus fruits are graded for quality and also for size. Orange sizes run from 80 to 324, according to the number per crate. Table 30 shows the approximate diameter of oranges of different sizes, as well as the approximate weight and volume of juice per dozen. A pound of oranges usually yields about 1 cup of unstrained orange juice. Navel oranges, however, usually yield somewhat less per pound than some other varieties. The relative economy of the different sizes of oranges depends upon the price per dozen. Any size larger than 176 is good to serve cut in halves as a breakfast fruit.

Grapefruit are also graded according to the number in a crate, the sizes ranging from the large number 28's to the small 126's. Table 31 shows the diameter, approximate weight, and minimum juice content for grapefruit of the different sizes. Lemon sizes range from 240 per box for the very large to 490 for the very small. Tangerine sizes run from 48 for the large to 216 for the small. As a rule citrus fruits having smooth, thin skins are juicier than the varieties having rough, thick skins.

TABLE 30.—*Oranges: Number in crate, approximate diameter per orange, approximate weight per dozen, and volume of juice per dozen of specified size*

Size and number in crate	Approximate diameter of fruit [1]		Approximate weight per dozen [2]		Approximate volume of juice per dozen [3]		
	Florida oranges	California oranges	Florida oranges	California oranges	Florida oranges	California navel oranges	California Valencia oranges
Large:	*Inches*	*Inches*	*Pounds*	*Pounds*	*Cups*	*Cups*	*Cups*
80		3¾		10.4		8.5	
96	3⅝	3⅝	10.0	8.8			
100		3½		8.4		7.1	
126	3¼	3⅛	7.6	6.7	9.9		7.1
Medium:							
150	3⅛	3	6.4	5.6	7.1	5.7	
176	3	2⅞	5.4	4.8	5.9	4.2	
200	2⅞	2¾	4.8	4.2			
216	2¾	2⅝	4.4	3.9	4.8	3.4	4.0
Small:							
250	2⅝		3.8		4.2		
252		2½		3.3		2.9	3.5
288	2½	2⅜	3.3	2.9	3.5		
324	2⅜	2¼	3.0	2.6	2.8		

[1] Data for Florida oranges from Bureau of Agricultural Economics, U.S. Department of Agriculture; for California oranges, from California Fruit Growers Exchange.
[2] The approximate net weight of 1 crate of Florida oranges is 80 pounds; of California oranges, 70 pounds.
[3] Data from Food Utilization Section, Bureau of Home Economics.

TABLE 31.—*Grapefruit:* [1] *Number in crate, diameter, approximate weight, and minimum amount of juice for single fruit of specified size*

Size and number in crate	Diameter			Approximate weight [2]	Minimum juice content	
	Minimum	Maximum	Average			
Large:	*Inches*	*Inches*	*Inches*	*Pounds*	*Cubic centimeters*	*Cups*
28				2.5	235	0.99
36	5 1/16	5¾	5¼	1.9	220	.93
46	4 13/16	5 3/16	5	1.5	207	.87
Medium:						
54	4 7/16	4 15/16	4¾	1.3	190	.80
64	4 3/16	4 11/16	4⅜	1.1	170	.72
Small:						
70	3 15/16	4 5/16	4⅛	1.0	150	.63
80	3 11/16	4 1/16	3⅞	.9	145	.61
96	3 5/16	3 13/16	3⅝	.7	125	.53
126	3 3/16	3 9/16	3¼	.6	105	.44

[1] Data from Bureau of Agricultural Economics, U.S. Department of Agriculture, and Florida State Department of Agriculture.
[2] The approximate net weight of 1 crate of grapefruit is 70 pounds

MILK

The consumer may choose from among several grades of whole milk which are on the market. Points to consider in selecting milk are given in some detail in Farmers' Bulletin 1705 (*4*). Prices of milk vary with the grade. Raw certified milk is the most expensive grade because it is costly to conform to the conditions of handling and cleanliness which must be fulfilled to insure the low bacterial count required for milk of this grade. Most milk is graded as A, B, or C, and milk sold in the city is, as a rule, pasteurized. Grade A pasteurized milk is produced under more sanitary conditions than either Grade B or C pasteurized milk, and hence when delivered to the customer has a lower bacterial count (*3*, *4*). Grade A milk may cost from 2 to 5 cents per quart more than Grade B milk. No grade lower than B is recommended for drinking purposes unless it is boiled.

While the purchase of "loose" or unbottled milk is not recommended, the unbottled milk may be obtained in some cities at from 2 to 4 cents less per quart than the same grade of bottled milk.

In addition to fluid milk of different grades, the market affords milk in evaporated and dried forms. Evaporated milk is sold in "tall" cans containing 14½ ounces and in "baby size" cans containing 6 ounces. Seventeen ounces of evaporated milk has approximately the food value of a quart of whole milk. To compare its cost with the price of a quart of whole milk, one sixth should be added to the price of the 14½-ounce can or the price of the 6-ounce can be multiplied by 2.8. The price of evaporated milk varies little with the geographical location. Hence the savings possible through use of evaporated milk in place of fresh milk depend mostly upon the local price of fresh whole milk. In 51 cities during 1932 fresh whole milk ranged in price from 7 to 16 cents per quart (*31*). The 14½-ounce can of evaporated milk during the same period cost from 5 to 8.9 cents. Fresh whole milk cost less than an equivalent amount of evaporated milk in some cities. In other cities considerable savings were possible through the use of evaporated milk.

To estimate the approximate relative costs of fresh and dried milk, the price of one fourth pound of dried whole milk may be compared with the price of a quart of fresh whole milk, or the price of one fifth pound of dried skim milk with that of a quart of fresh skim milk. As yet, dried skim milk is not widely available in the retail food stores, but it can often be purchased in small amounts from bakeries or ice-cream companies, or may be purchased from the wholesaler or manufacturer. In many communities it is the cheapest form in which milk solids not fat can be obtained.

BUTTER

The United States Department of Agriculture under the provisions of the Food Products Inspection Law maintains a service for the grading of butter (*28*). According to official ruling butter is classified as (1) Dairy butter, which is made on a farm, (2) Creamery butter, made in a creamery or factory, (3) Packing Stock butter, (4) Ladled butter, (5) Process or Renovated butter, (6) Grease butter.

In scoring the first three classes of butter, maximum ratings are given to various factors as follows: Flavor, 45; body, 25; color, 15; salt, 10; package, 5; total, 100. Butter scoring above 94 shall be fine, sweet, fresh, mild, and clean in flavor. * * * Diminishing desirability is expressed by lowered scores. Any butter scoring below 75 is considered unfit for food and is classified as grease butter. Only butter officially scoring 92 or more may be accompanied by a dated "certificate of quality" issued by authority of the United States Department of Agriculture. Under proper methods of distribution, which include adequate refrigeration, this certified butter should reach the consumer in first-class condition within 2 weeks of the time of the grading. Except for butter sold under the United States certification of quality, the score of the butter sold in most retail outlets is not made easily available for the information of the consumer. Regardless of the score given to the butter on the above scale of rating, any butter which contains less than 80 percent of butter fat is considered as an adulterated product under the terms of the Food and Drugs Act, and is therefore illegal.

EGGS

In some retail markets, eggs are sold in sealed cartons bearing on the seal the date of grading and either the inscription U.S. Specials, or U.S. Extras. Either of the inscriptions on the dated seal indicates that, on the date specified, the eggs were examined by a Federal egg grader, who noted the size of the eggs, the condition of the shell, and by candling, the size of the air cell and the condition of the yolk and white.[4]

To be graded as first quality, or U.S. Special, eggs must have clean, sound shells; regular, localized air cells not more than one eighth inch in depth; the yolks may be dimly visible; the whites must be firm and clear; and there must be no visible development of the germ. The requirements for the second quality eggs, or U.S. Extra, which are usually the best quality available, are similar to those of the first, except that the air cell may be one fourth inch in depth, and the yolk visible. There are several lower grades for eggs but only the two mentioned are retailed under a "certificate of quality." It is very important to note the date on the seal or certificate of quality because under unfavorable holding conditions, the quality of eggs may deteriorate rapidly after inspection.

Besides being graded for quality the eggs are graded for size. In either quality, one may obtain large eggs, having a minimum weight of 24 ounces per dozen; medium-sized eggs, weighing at least 20½ ounces per dozen; or small eggs weighing 17 ounces per dozen.

MEATS

Meats from establishments whose products enter interstate commerce are inspected and passed by the Bureau of Animal Industry of the United States Department of Agriculture. The circular purple stamp "U.S. INSP'D P'S'D" on fresh meats, and appropriate labels on cured, canned, and packaged products containing meat, show that the meat came from healthy animals and is wholesome food. Many State laws and city ordinances provide for the inspection of meat distributed within their jurisdiction.

In addition to this required inspection meats may be classified and graded for quality according to a system worked out by the Bureau of Agricultural Economics. Under this system beef (*11*) is divided into five classes: Steer, Heifer, Cow, Bull, and Stag. Each class is then subdivided into grades as follows: Prime, or No. A 1; Choice, or No. 1; Good, or No. 2; Medium, or No. 3; Common, or No. 4; Cutter, or No. 5, and Low Cutter, or No. 6. The standards for a Prime piece of beef are so very high that only a small percentage of carcasses can be stamped as of that grade. Most beef falls into the Medium grade. About one fifth is of the Common grade. Lamb, mutton (*9*), veal, and calf (*10*) carcasses are graded as Prime, or No. A 1; Choice, or No. 1; Good, or No. 2; Medium, or No. 3; Common, or No. 4; and Cull, or No. 5.

After being graded (*8*), the meats are stamped by, or under the immediate supervision of, a Federal official. The imprint, which shows the class and the grade of the meat, is applied to the carcass

[4] U.S.Dept.Agr., Bur. Agr. Econ. EGG STANDARDIZATION. Leaflet no. 2, 21 p. 1929. [Mimeographed.]

by a roller in such a way that the information appears on all the major retail cuts. This stamp, at a little distance, appears like a purple band across the meat. "The ink used is a pure vegetable compound and is entirely harmless. Under most conditions it disappears when the meat is cooked."

As it is extremely difficult to make an accurate judgment of meat quality from appearance, this grading of meat by an expert should be very helpful to the consumer. The quality of any given grade is uniform throughout the country and does not change from season to season. The stamp of quality on each meat cut prevents substitution of a quality inferior to the one ordered. The use of meat grading for retail markets will probably become more widespread as customers develop the habit of ordering by grade. The different cuts of meat are priced to correspond with quality grades, and to conform to general ideas of desirability.

SEASONAL VARIATIONS IN FOOD PRICES

Some variations in food costs cannot be readily anticipated by the consumer. This, however, is not true of the seasonal price changes which tend to follow somewhat regular patterns. These seasonal changes are shown in figure 2 for a number of different foods.

Of these foods, eggs show the most marked variations, with the low prices of the year in April and May, and the high prices in November and December. The high winter prices are often from 60 to 100 percent higher than the low prices of the previous spring. Commercial cold storage plants take advantage of the spring egg surplus and low prices, to store eggs for future use. Storage eggs are carefully selected and stored, and as a rule reach the consumer in good condition. These eggs, especially during the peak winter prices, are much less expensive than strictly fresh eggs. Storage eggs are sometimes retailed as "selected" eggs, a term which is confusing to the consumer. Any home maker can take advantage of the egg surplus in the spring and preserve eggs in water glass for use during periods of scarcity and high prices.

As shown in figure 2, dairy products are low in price during the spring and summer, with butter showing a greater relative price change than either milk or cheese. Most meats, on the other hand, have low prices during the winter and high prices during the summer. Prices of fresh pork generally vary more during the year than those of the other meats. Cereals change only slightly from season to season.

The relative seasonal variations of cabbage, onions, and potatoes are very great, although these articles of food are, as a rule, low in price as compared with more perishable vegetables. The higher prices for these vegetables usually come in the late spring or early summer when the new crops first become available. The low prices for the year occur during the fall or winter.

Orange prices vary less than the prices of the more staple vegetables, but they are relatively low in winter and high in summer. Bananas show an almost negligible seasonal price change.

Although the patterns of the seasonal price changes for other fresh fruits and vegetables are not shown in figure 2, the shaded sections on

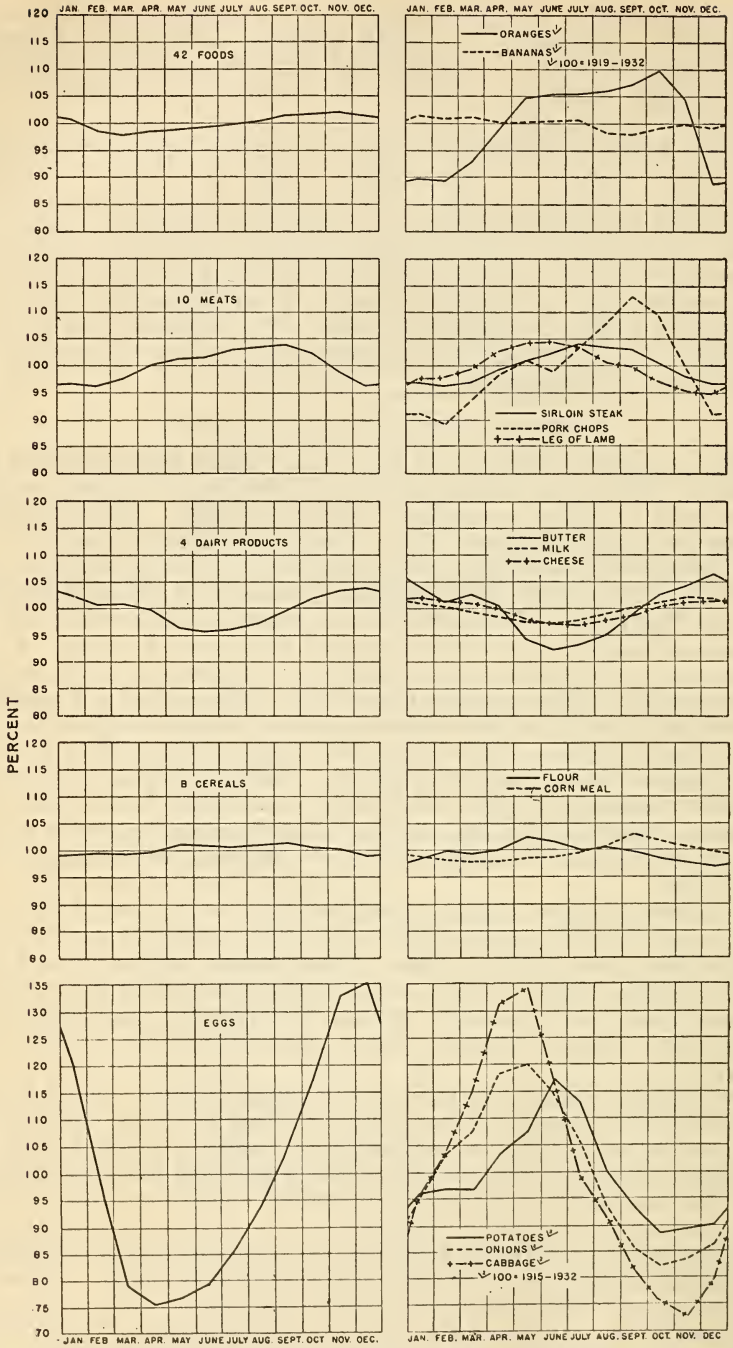

FIGURE 2.—Relative monthly price changes of specified foods and food groups. Based on data from the United States Bureau of Labor Statistics. Average prices for 1913–32 = 100.

figure 3 indicate the months of probable greatest abundance for certain fresh fruits. Figure 4 gives similar information for certain fresh vegetables. As periods of greatest abundance generally coincide with periods of lowest prices, these charts may guide the consumer who wishes to give variety to an economical menu.

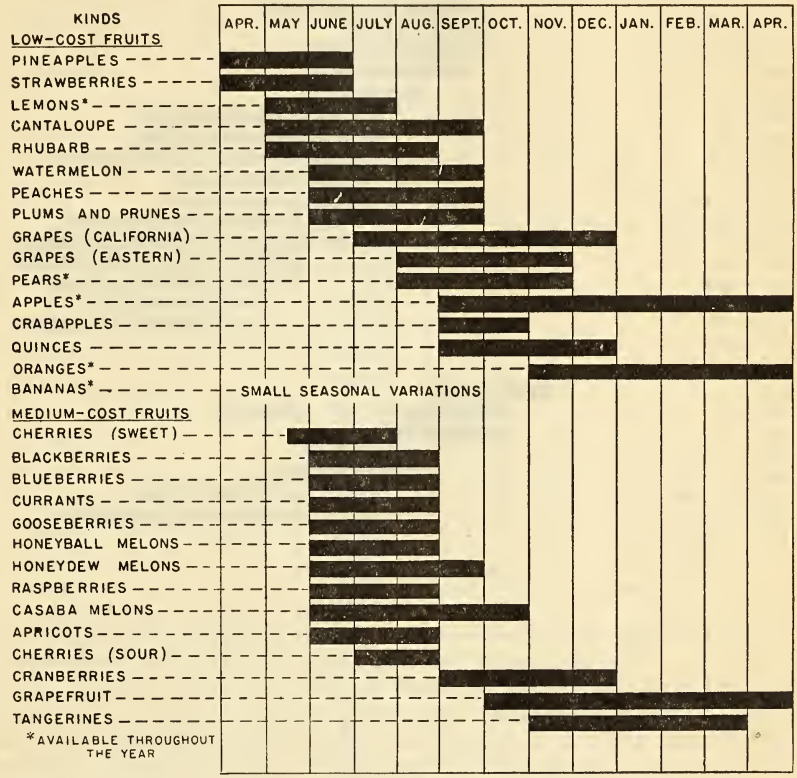

FIGURE 3.—Low- and medium-cost fresh fruit. Months of greatest abundance indicated by bars.

Due to the great variation in local conditions, these charts can be only suggestive and very general in their application. Peak production periods for a specific locality may not coincide with the shaded portions as given in the figures. The United States covers so much territory and has such a great range of climate that it is impossible to indicate on any one chart conditions which would apply simultaneously to the whole area. In the southern sections of the country periods of greatest abundance may come earlier in the year than indicated; in the northern sections the greatest abundance of specified products may occur later than the charts show. Many of the products listed are available during every month of the year at reasonable prices.

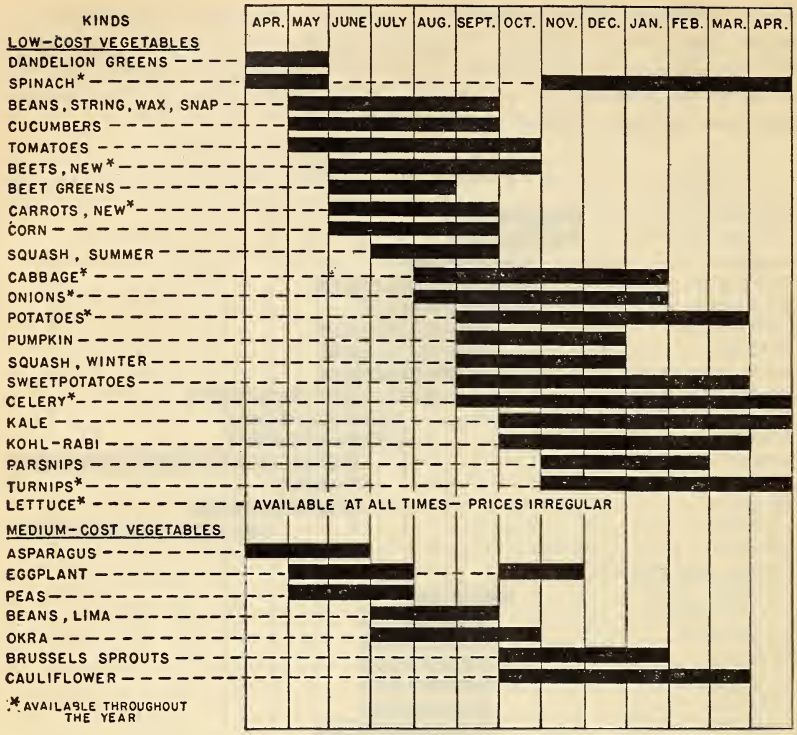

FIGURE 4.—Low- and medium-cost fresh vegetables. Months of greatest abundance indicated by bars.

Figure 5 shows the relative extent of seasonal price swings for each of 42 foods. The difference between the high and the low price of each food was calculated for each of the 10 years, 1923 to 1932, inclusive. These differences were averaged and expressed in terms of the average price over the period. The more perishable foods, such as fresh fruits, fresh vegetables, eggs, and meats show relatively large price variations within a 12-month period. On the other hand, most of the cereals, canned goods, and other comparatively nonperishable foods show relatively small variations.

LOCAL AND GENERAL PRICE LEVELS

At any one time prices quoted in different localities on identical products may vary greatly. For individual foods these price differences are sometimes very great, but when a group of foods is considered the extreme variations in costs are less apparent. To show geographical differences, the cost of the minimum-cost adequate diet suggested in this publication for a family of 5 was computed for 30 cities, using June 15, 1932, retail prices. The foods used were common articles of diet such as are always available even in very small communities.

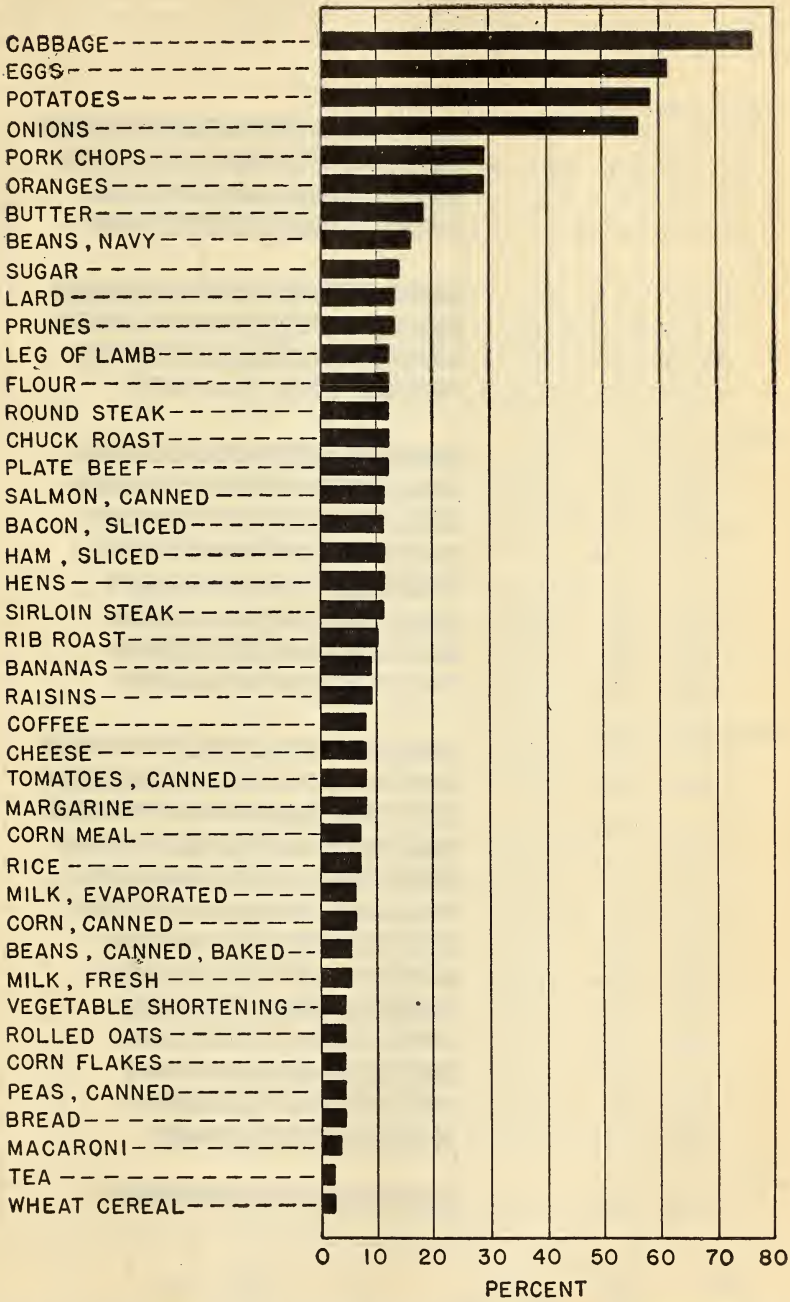

FIGURE 5.—Variations in retail prices of specified foods, expressed as percentage of average prices. Averages for 1923-32=100.

This food-cost comparison is shown graphically in figures 6 and 7. Marked variations are apparent within the smaller geographical divisions as well as for the country as a whole. Figure 6 shows the total

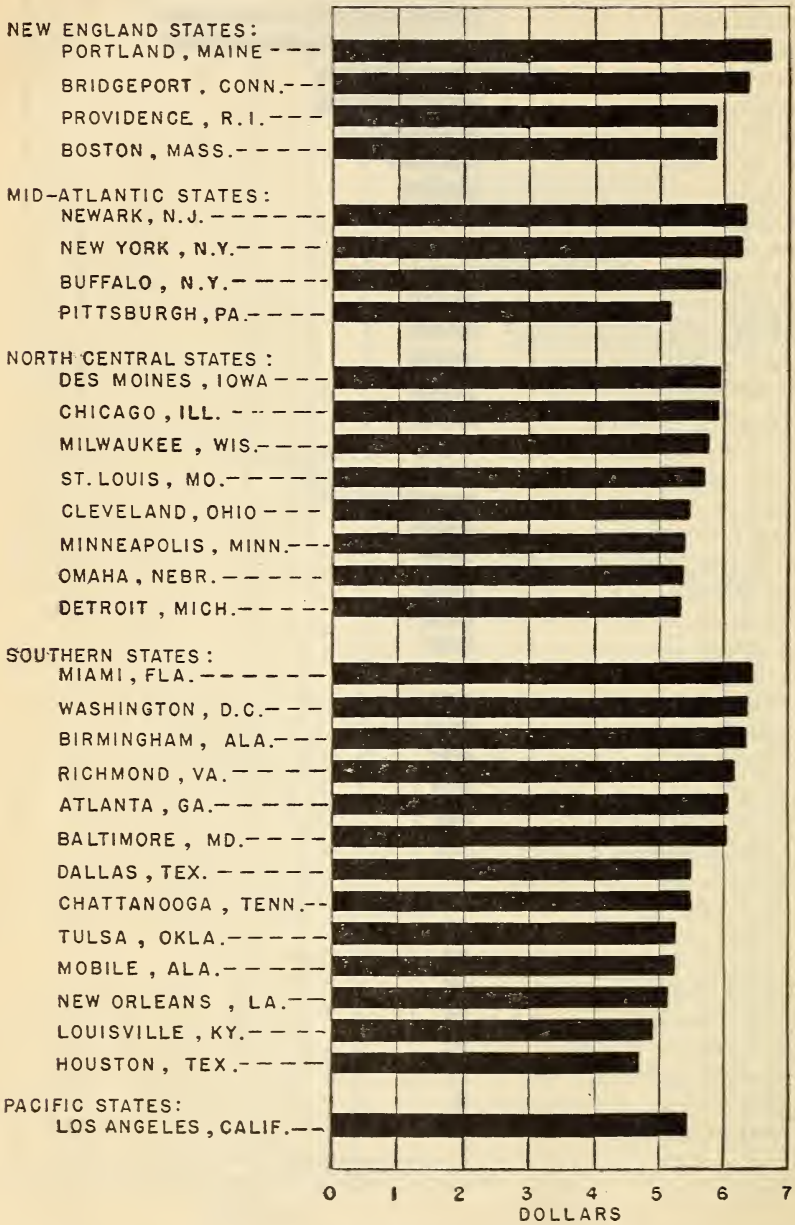

FIGURE 6.—Retail weekly cost of minimum-cost adequate diet for a family of 5 (2 moderately active adults and 3 children aged 3, 5, and 13 years) in cities in various sections of the United States. Prices as of June 15, 1932.

cost of the weekly adequate diet in each of the 30 cities. In Portland, Maine, the city having the highest cost for the week's food, the total was 42 percent higher than in Houston, Tex., the city having the lowest food costs. In figure 7 the cost of the week's food in each city is divided to show the cost of each of five important subdivisions of the food supply. Variations in cost for the food in each subdivision are relatively larger than the variations in the cost of the total supply. Taking the lowest cost for each subdivision food group as 100, the highest cost found for each was as follows: Cereals, 154 percent; milk, 173; vegetables and fruits, 192; fats and sugars, 141; and lean meat, fish, and eggs, 186.

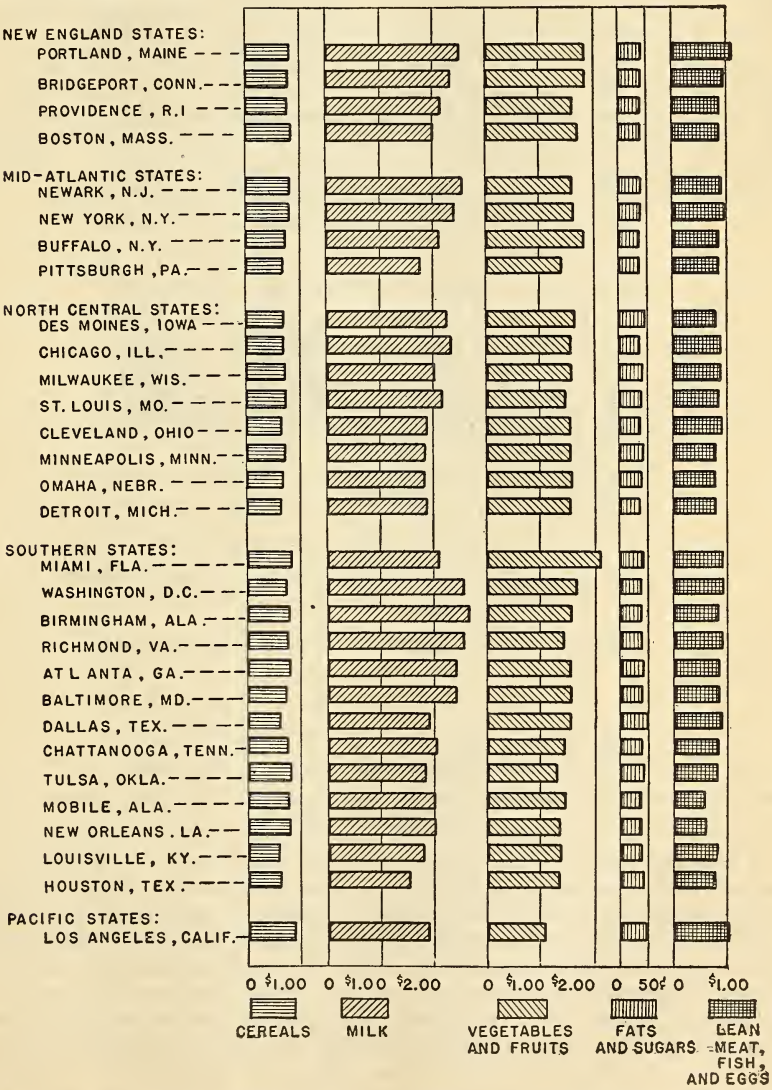

FIGURE 7.—Retail weekly cost of various food groups included in minimum-cost adequate diet for a family of 5 (2 moderately active adults and 3 children aged 3, 5, and 13 years) in cities in various sections of the United States. Prices as of June 15, 1932.

In addition to those factors determining food costs which are more or less under the control of the consumer, and the variations in prices of individual foods due to season or geographic location, there are fluctuations in food prices due to the general economic situation.

Figure 8 shows the retail price trend of foods for the 43-year period from 1890 to 1932, inclusive. These data were compiled by the United States Bureau of Labor Statistics (*32*), with the average of 1913 prices serving as a basis for comparison. Between 1890 and 1915 the annual change was very slight with a gradual decline during the first 6 years to a low point in 1896–97 of 65 percent of the 1913 prices. A gradual rise of about 2.5 percent per year continued from 1897 until the sharp rise of prices during and immediately after the World War carried this food index in 1920 to a peak of 203 percent of of the 1913 prices. Food prices dropped rapidly in 1921–22 to an index of 142 percent, then advanced irregularly to 157 percent in 1929, when a second sharp drop in prices occurred which continued into 1932 and brought the 1932 average to approximately the 1913 level. In the early months of 1933 prices dropped still lower. During 27 years retail food prices rose, and during 15 years they fell.

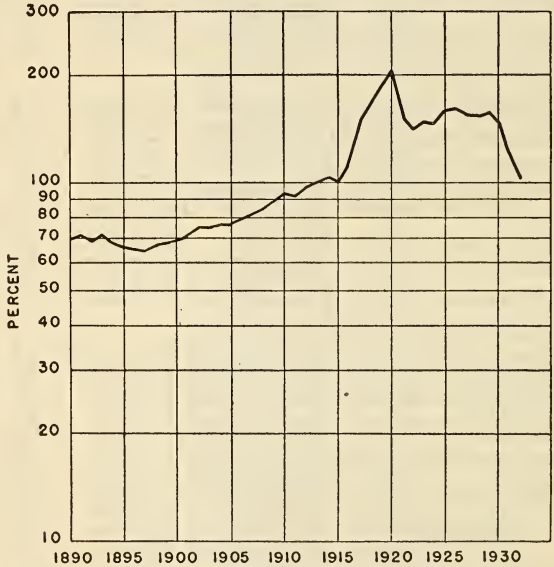

FIGURE 8.—Trend of retail food costs, 1890–1932, based on data from United States Bureau of Labor Statistics. 1913=100.

While the prices of the group of foods observed by the Bureau of Labor Statistics were, in 1932, only 2 percent above the 1913 level, the individual articles of foods differed widely in relation to their 1913 prices. Figure 9 compares the 1932 average prices of 23 foods with their 1913 average prices. In 1932 14 foods were from 1 to 31 percent higher in price than in 1913. Eight foods were from 6 to 20 percent lower. Potato prices averaged the same for the 2 years. For the 20-year period, 1913 to 1932, inclusive, 10 foods were at their lowest prices in 1913; 5, in 1915, and 8, in 1932. Fourteen were at their highest prices between 1918 and 1920; 1, in 1925; 1, in 1926; and 7, in 1929.

FIGURE 9.—Retail prices of 23 foods in 1932, and high and low prices between 1913 and 1932, relative to 1913 prices. Based on data from the United States Bureau of Labor Statistics. 1913=100.

From July 1931 through June 1932, the months for which the retail prices for food were averaged as a basis for computing food costs, the food index of the Bureau of Labor Statistics dropped from 119.0 to 101.3 percent of the 1913 level. The average for the period was 111.1 percent. Computed on the basis of the retail prices listed in table 3, the cost of a monthly food supply for a family of five (two moderately active adults and children aged 3, 5, and 13 years) was

$22.85, $32.24, $51.44, and $59.48, respectively, for the restricted diet for emergency use, the adequate diet at minimum cost, the adequate diet at moderate cost, and the liberal diet. Computed on April 1933 retail prices (derived by the same method as those listed in table 3) the monthly supplies of food described above cost $18.96, $26.33, $42.50, and $48.99, respectively. The April retail costs of these four diets were, therefore, 17.0, 18.3, 17.4, and 17.6 percent lower than the 1931–32 costs.

These figures are of interest in light of the fact that during the same period the Bureau of Labor Statistics food index dropped from 111.1 to 90.4 percent of the 1913 price level, representing a decline of 18.6 percent in food costs. These results show that although the several articles of food used in computing the Bureau of Labor Statistics food index appear in a somewhat different proportion from that in the various diets suggested in this publication, the Bureau of Labor Statistics index may well be used as an approximate measure of variations in the costs of these diets from one time to another. The changes in cost presented here are figured, of course, from the index for the country as a whole. The Bureau of Labor Statistics also publishes indexes for 51 individual cities, and these indexes could be used to measure increases or decreases in the costs of diets computed from local prices in these cities.

SUMMARY

For each of four diets, a restricted diet for emergency use, an adequate diet at minimum cost, an adequate diet at moderate cost, and a liberal diet, this circular presents (1) the quantities of foods or food groups required, (2) the nutritive value of the diet, and (3) the retail cost of the food supply as a whole. These data are presented in per capita figures, as well as for individuals classified according to age, sex, and activity, and for family groups.

The prominence assigned to different kinds of food varies from diet to diet because relative to their cost some foods and groups of foods yield better returns in nutritive values than others. Grain products, dried legumes, and potatoes are given special prominence in the two diets of lowest cost; other vegetables, fruits, lean meats, fish, and eggs, in the two diets of highest nutritive content and cost. Milk and other dairy products are emphasized in all diets, but are given special prominence in three adequate diets.

The nutritive values of the four diets are compared with each other and with tentative dietary standards. The restricted diet for emergency use provides approximately the minimum requirements of the body for the various nutrients and allows but little margin for safety. The minimum- and moderate-cost adequate diets provide enough of the different nutrients to cover average requirements for maintenance and growth and to furnish a fair margin of safety. The liberal diet is fully adequate. It includes items from different food groups in such quantities and proportions as to promote better-than-average nutrition.

The retail costs of the four diets range from $61 to $165 per capita per year when calculated on the basis of 1931–32 prices. The liberal diet costs about one fifth more than the adequate moderate-cost diet, almost twice as much as the adequate minimum-cost diet, and between 2½ and 3 times as much as the restricted diet for emergency use. The diets of the majority of families in the United States had a money value during the period 1922–29 somewhere between the retail costs, at corresponding price levels, of the suggested minimum-cost and moderate-cost adequate diets.

Both the nutritive values and the costs of the four suggested diets may be modified by the selection made among individual articles of food within each food group. Costs are also greatly affected by the quality of the foods selected. Therefore a brief summary of quality and size grades for many foods has been included. Some of the other factors affecting costs are discussed briefly, including the packaging of food, the size of purchase, the seasonal variations in food prices, and local and general price levels. Many of these points are illustrated by tables and graphs.

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