

FAMILY FOOD PLANS AND FOOD COSTS

For nutritionists
and other leaders
who develop or
use food plans

HOME ECONOMICS RESEARCH REPORT NO. 20

AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

Food budgets developed by the U.S. Department of Agriculture are designed to help families plan nutritionally adequate and satisfying meals for the money they can afford. Many welfare agencies use the USDA food plans as a basis for estimating money allotments for food, and in part, for determining the ability of families to pay for social services. Social workers, lawyers, and judges often use the cost of food for the plans as a base for setting foster care and dependency fees. The plans are used extensively by home economists, nutrition teachers, home demonstration agents, and others who are counseling families at all income levels. Farm families find the plans helpful as a guide for planning food production and preservation. Economists use them in estimating potential demand for agricultural products.

This publication brings up to date and extends the information in "Helping Families Plan Food Budgets," U.S. Department of Agriculture Miscellaneous Publication No. 662. The report is divided into three parts. Part I describes food plans at different cost levels and shows how they can be used in figuring food requirements for families. Part II gives the history of food budgets and provides background information on the procedures used in developing the current food plans for those interested in the basic construction of the plans and the estimation of nutritive values. Part III presents the method followed in estimating the cost of the food included in each plan, together with suggestions for adapting the procedure for use with local food prices.

The assistance of staff members of the Consumer and Food Economics Research Division who participated in the development of the food plans and the preparation of the publication is acknowledged. Special acknowledgment is made to Dr. Hazel K. Stiebeling, Deputy Administrator, Agricultural Research Service, for her suggestions in developing the food plans and in the preparation of this publication.



FAMILY FOOD PLANS AND FOOD COSTS

*For nutritionists and other leaders
who develop or use food plans*

By
Eloise Cofer
Evelyn Grossman
Faith Clark

Home Economics Research Report No. 20

CONSUMER AND FOOD ECONOMICS RESEARCH DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

Washington, D.C.

Issued November 1962

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington 25, D.C. Price 35 cents

CONTENTS

	Page		Page
Part I.—The food plans and their use.....	1	Part II.—Procedures for developing the food plans—	
Criteria used in developing the plans.....	1	Continued.	
Food plans at different cost levels.....	6	Development of current food plans—Continued.	
Selecting a food plan and estimating food costs...	8	Calculation of group nutritive values used	
Using the food plans with families.....	14	with plans.....	33
Food buying guide.....	16	Part III.—Procedures used in pricing the food	
Low-cost menus for 1 week.....	18	plans.....	38
Food for the week's menu.....	19	Rationale.....	38
Part II.—Procedures for developing the food plans.	21	Computation method—development.....	39
History of the food plans.....	21	Computation method—as performed.....	41
Development of current food plans.....	23	Adaptations.....	41
Use of survey data with food plans.....	23	Appendix A.—Weights and price multipliers for	
Other ways of developing food plans.....	27	pricing food plans, by food group.....	45
Food plans for individuals.....	27	Appendix B.—Procedures used for estimating	
		family size adjustments in food plan costs.....	52
		Literature cited.....	Inside back cover

LIST OF TABLES

	Page		Page
1. Daily dietary allowances used as standards for nutritive adequacy.....	3	15. Distribution of expenditures among groups of foods for all households, for households meeting specified percentage of NRC allowances, and for low-cost food plans.....	27
2. Distribution among food groups of money spent and nutrients consumed by nonfarm families in spring 1955.....	4	16. Nutritive value per pound of food groups for use with food plans.....	28
3. Food Plan at Low Cost: Suggested weekly quantities of food (as purchased) for 17 sex-age groups, pregnant and lactating women...	7	17. Nutritive values of the food suggested in plans for individuals by age and sex, in terms of percentages of National Research Council's Daily Dietary Allowances.....	29
4. Another Food Plan at Low Cost: Suggested weekly quantities of food (as purchased) for 17 sex-age groups, pregnant and lactating women.....	9	18. Food energy from protein, fat, and carbohydrate content of food in the food plans, by sex-age groupings.....	32
5. Economy Plan: Suggested weekly quantities of food (as purchased) for 17 sex-age groups, pregnant and lactating women.....	10	19. Estimated fats, fatty acids, and carbohydrates per day in food plans by selected sex-age groupings.....	33
6. Food Plan at Moderate Cost: Suggested weekly quantities of food (as purchased) for 17 sex-age groups, pregnant and lactating women...	11	20. Consumption weights used in deriving average nutritive values per pound of 11 food groups.	35
7. Food Plan at Liberal Cost: Suggested weekly quantities of food (as purchased) for 17 sex-age groups, pregnant and lactating women...	12	21. Weights and price adjustment factors for pricing fats and oils in the moderate-cost food plan.....	40
8. Food plans attainable by families of different size and income when they spend average proportions of income for food.....	13		
9. Estimated cost of 1 week's food, January 1962—U.S.A. average.....	13	APPENDIX A	
10. Sample worksheet (low-cost food plan).....	15	22. Weights and price multipliers for pricing food plans, by food group.....	45
11. Food groups and approximate servings per person per week, low-cost, moderate-cost, and liberal plans.....	20		
12. Food used at home by urban families in a week in spring, by income thirds.....	24	APPENDIX B	
13. Quantities of food groups in food plans per capita per week.....	24	23. Percentage of households meeting specified nutrient allowances by household size and money value of food used per person per week.....	53
14. Distribution of nonfarm households by money value per person of food used at home in a week, April–June 1955, for selected incomes...	26	24. Estimated percentage of households meeting specified nutrient allowances by household size and money value of food used per person per week.....	53

NOTE: Charts are on pages 5 and 6. They represent yield for 1 dollar spent for various food groups; calories, protein, calcium, iron, vitamin A, thiamine, riboflavin, niacin, and ascorbic acid.

FAMILY FOOD PLANS AND FOOD COSTS

By Eloise Cofer, Evelyn Grossman, and Faith Clark, *Consumer and Food Economics Research Division, Agricultural Research Service*

PART I.—THE FOOD PLANS AND THEIR USE

Five food plans at four levels of cost are described in this report. They include a plan at liberal cost, one at moderate cost, two at low cost, and an economy plan for emergency use. These plans are guides for estimating the quantities of food from each of 11 groups needed in a week to provide meals for individuals in 17 sex-age groupings and for women during pregnancy and lactation. From the suggested quantities for individuals, food budgets for families of varying size and composition can be constructed. Any one of the plans can be a basic part of a total plan for family or individual budgeting.

Criteria Used in Developing the Plans

In the development of the plans the following criteria were applied: (1) Nutritional adequacy; (2) the relative nutritional economy of the different food groups as sources of specified nutrients; and (3) the suitability of the food in relation to meal patterns common in the United States.

Nutritional adequacy.—The National Research Council's (NRC) 1958 recommended dietary allowances (8)¹ serve as the standards for nutritional adequacy of the plans. These allowances, with calories and related nutrients for adults as modified by LeBovit and Stiebeling (6), are used as minimum goals for eight nutrients and as maximum goals for calories (table 1).

The vitamin D value of the food in the plans has not been estimated. The National Research Council recommends 400 I.U. of vitamin D for infants and children throughout growth and for pregnant and lactating women. It may be supplied by some foods—milk fortified with vitamin D; for example, by sunshine, or, on the advice of a physician, from a natural or synthetic vitamin D preparation.

The NRC recommended dietary allowances are for nutrients in food as eaten, whereas the quanti-

ties in the food plans are for food as it enters the kitchen, some of which may not be eaten. Since there is little information about the amount of edible food discarded in households in the United States, an arbitrary calorie allowance above the NRC allowance was made for the plans at each cost level. It seemed reasonable to assume that losses and discards on a low-cost food plan would be minimum, with larger discards at the moderate-cost and liberal levels. Therefore, foods purchased in accordance with the low-cost plans have an average calorie value of 105 to 108 percent of the NRC allowances, the moderate-cost 115 percent, and the liberal 120 percent.

Relative nutritional economy of food groups.—In the selection of quantities and combinations of food from the 11 groups for the budgets, the cost of the food in each group in relation to the return in nutrients was taken into consideration.

Foods within a group are similar to each other in nutritive value and generally can be used interchangeably in meals. Though each group is of special importance for one or more key nutrients, several groups may provide appreciable amounts of the same nutrient. However, the unit cost of the nutrient may vary widely among groups.

The 11 food groups, with the common foods included in each, are as follows:

Milk, Cheese, Ice Cream

Milk—whole, skim, buttermilk, dry, evaporated, condensed; cheese; cream; ice cream.

Meat, Poultry, Fish

Beef, veal, lamb, pork.

Variety meats, such as liver, heart, tongue.

Luncheon meats, bacon, salt pork; also, mixtures that are mostly meat.

Poultry.

Fish and shellfish.

Eggs

Eggs.

Including those used in cooking.

¹ Italic numbers in parentheses refer to Literature Cited, inside back cover.

Dry Beans, Peas, Nuts

Dry beans of all kinds, dry peas, lentils, soybeans and soya products, peanuts, peanut butter, and tree nuts; also soups that are mostly legumes.

Flour, Cereals, Baked Goods

Flour and meal.

Cereals, including ready-to-eat cereals.

Rice, hominy, noodles, macaroni, spaghetti.

Bread, cake, other baked goods; also mixtures that are mostly grains.

Citrus Fruit, Tomatoes

Grapefruit, lemons, limes, oranges, tangerines.

Tomatoes.

Dark-green and Deep-yellow Vegetables

Broccoli, chard, collards, kale, spinach; other dark greens, green peppers.

Carrots, pumpkin, yellow winter squash, sweetpotatoes.

Potatoes

Potatoes.

Other Vegetables and Fruits

Asparagus, beets, brussels sprouts, cabbage, cauliflower, celery, corn, cucumbers, green lima beans, snap beans, lettuce, okra, onions, peas, rutabagas, sauerkraut, summer squash, turnips; apples, bananas, berries, dates, figs, grapes, melons, peaches, pears, plums, prunes, raisins, rhubarb—all vegetables and fruits not included in other groups.

Fats and Oils

Butter, margarine, mayonnaise, salad dressing, salad and cooking oils, drippings, fat, lard, and other shortening, suet.

Sugars, Sweets

Sugar (beet and cane), granulated, powdered, brown, maple sugar.

Molasses, sirup, honey, candy.

Jams, jellies, preserves, and powdered and prepared desserts.

Table 2, based on data from the U.S. Department of Agriculture's Household Food Consumption Survey, 1955, Report No. 6 (16), illustrates the relationship between money spent for food in the various groups and the nutrient return. If the percentage of a nutrient is high in comparison with the percentage of money spent, the food group is an economical source of that nutrient. Charts 1 through 9 show the relationship in another way—the return in specified nutrients per dollar spent for food in selected groups.

Milk is important in all the food plans, for it is

our most economical and widely acceptable source of calcium and riboflavin (charts 3 and 7). It is not an economical source of iron and vitamins other than riboflavin. However, many foods can serve to complement milk in these nutrients.

Whole grain or enriched cereal products and dry beans, peas, and nuts are inexpensive sources of the nutrients, other than ascorbic acid, in which milk is low. These foods also provide additional calories and proteins economically, and the nutritional value of their proteins is enhanced when they are served with milk or other foods that supply animal proteins. Milk and cereals combined form an economical foundation for the low-cost plans, contributing over half the food energy and protein. Meat, poultry, fish, and eggs have good supplies of the nutrients provided by cereals and legumes, but being animal products they are relatively more expensive.

To supply ascorbic acid, citrus fruits are usually most economical. During most seasons of the year tomatoes and tomato products are more expensive as a source of this vitamin, but they yield good amounts of vitamin A as well. Other vegetables and fruits contain varying amounts of these two nutrients. Dark-green and deep-yellow vegetables are especially valuable for their high return in vitamin A value for the money spent. Potatoes are a relatively inexpensive source of several nutrients, including iron and ascorbic acid.

The groups of fats and oils and sugars and sweets are notable as inexpensive sources of food energy. With few exceptions they provide only small amounts of other nutrients. Because butter and margarine form a large portion of the fats and oils group, the group is an economical source of vitamin A.

The ability of certain foods to supplement each other as sources of nutrients, together with the relative economy of the nutrients in the food groups, helps to determine the quantities of different groups in the food plans.

Suitability of the food for family meals.—While many different combinations of foods will provide the nutrients for an adequate diet, the average person's food habits and tastes must be considered in making acceptable combinations. Surveys of family food consumption provide information on family food patterns and the prices families at different income levels pay for groups of food.

The 1955 Household Food Consumption Survey was the source of information on family food patterns for the current food plans. Data on the

TABLE 1.—Daily dietary allowances¹ used as standards for nutritive adequacy

Sex and age	Height	Weight	Energy	Protein	Calcium	Iron	Vitamin A value	Thiamine	Riboflavin	Ascorbic acid
	<i>In.</i>	<i>Lb.</i>	<i>Cal.</i>	<i>Gm.</i>	<i>Gm.</i>	<i>Mg.</i>	<i>I. U.</i>	<i>Mg.</i>	<i>Mg.</i>	<i>Mg.</i>
Children:										
7 months to 1 year.....	28	20	900	32	0.8	7	1,500	0.5	0.8	30
1-3 years.....	34	27	1,300	40	1.0	7	2,000	.7	1.0	35
4-6 years.....	43	40	1,700	50	1.0	8	2,500	.9	1.3	50
7-9 years.....	51	60	2,100	60	1.0	10	3,500	1.1	1.5	60
10-12 years.....	57	79	2,500	70	1.2	12	4,500	1.3	1.8	75
Girls:										
13-15 years.....	63	108	2,600	80	1.3	15	5,000	1.3	2.0	80
16-19 years.....	64	120	2,400	75	1.3	15	5,000	1.2	1.9	80
Boys:										
13-15 years.....	64	108	3,100	85	1.4	15	5,000	1.6	2.1	90
16-19 years.....	69	139	3,600	100	1.4	15	5,000	1.8	2.5	100
Women:										
20-34 years.....	64	128	2,000	60	.8	12	4,000	1.0	1.5	70
35-54 years.....	63½	126	1,900	60	.8	12	4,000	1.0	1.5	70
55-74 years.....	62½	123	1,700	60	.8	12	4,000	1.0	1.5	70
75 years and over.....	62	121	1,600	55	.8	12	4,000	1.0	1.4	70
Pregnant (2d half) ²			2,300	80	1.5	15	6,000	1.3	2.0	100
Lactating ²			3,000	100	2.0	15	8,000	1.7	2.5	150
Men:										
20-34 years.....	69	160	3,000	75	.8	10	5,000	1.5	1.9	75
35-54 years.....	68	156	2,700	75	.8	10	5,000	1.4	1.9	75
55-74 years.....	67	153	2,500	70	.8	10	5,000	1.3	1.8	75
75 years and over.....	66	150	2,300	70	.8	10	5,000	1.2	1.8	75

¹ Allowances for all nutrients for children and allowances for adults for calcium, iron, and ascorbic acid are from Recommended Dietary Allowances (8); other nutrient allowances for adults adjusted for body size, for age, and for American activity level and environmental temperature as described by

LeBovit and Stiebeling (8). Niacin allowance is 10 times that of thiamine for all individuals.

² Based on allowances for women 20-34 years.

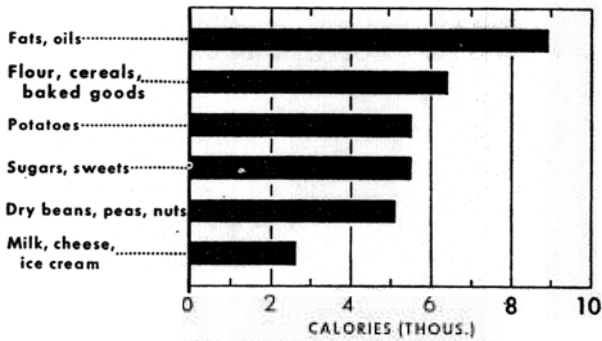
TABLE 2.—Distribution among food groups of money spent and nutrients consumed by nonfarm families in spring 1955

Food group	Money spent	Food energy	Protein	Calcium	Iron	Vitamin A value		Riboflavin	Niacin	Ascorbic acid
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Milk, cheese, ice cream.....	14	15	22	64	3	13	12	44	3	6
Meat, poultry, fish.....	33	21	39	3	31	19	24	20	46	1
Eggs.....	4	2	6	2	7	6	3	6	(¹)	0
Dry beans, peas, nuts.....	2	3	4	2	5	(¹)	3	2	6	(¹)
Flour, cereals, baked goods.....	10	26	21	16	28	1	38	16	27	(¹)
Citrus fruit, tomatoes.....	5	2	1	2	4	9	6	2	4	48
Dark-green and deep-yellow vegetables.....	1	(¹)	1	2	3	31	-	-	1	9
Potatoes.....	2	3	2	1	4	(¹)	5	2	6	9
Other vegetables and fruits.....	12	5	4	6	12	11	8	6	7	27
Fats, oils.....	4	13	(¹)	1	(¹)	10	(¹)	(¹)	(¹)	0
Sugars, sweets.....	5	10	(¹)	1	2	(¹)	(¹)	1	(¹)	(¹)
Miscellaneous.....	8	(¹)	(¹)	(¹)	1	(¹)	(¹)	(¹)	(¹)	(¹)
Total.....	100	100	100	100	100	100	100		100	100

¹ 0.5 percent or less.

Source: U.S. Department of Agriculture (16, table 6).

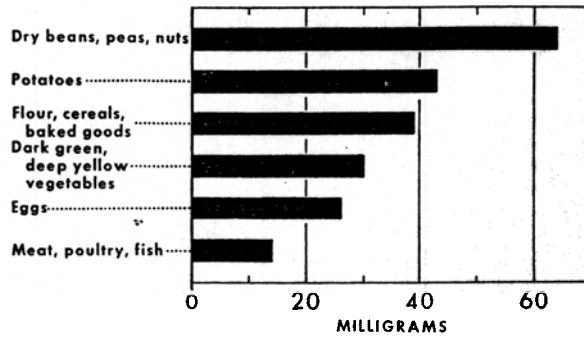
CALORIE YIELD
For One Dollar Spent



ITEMS IN FOOD GROUPS REPRESENT CHOICES MADE BY FAMILIES, SPRING 1955. PRICES ADJUSTED TO OCTOBER, 1961.

CHART 1.—Yield in calories for 1 dollar spent for various food groups.

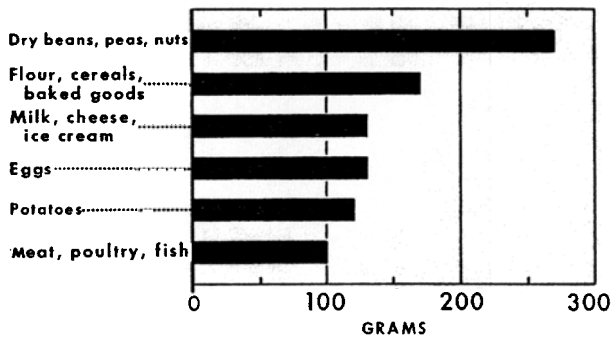
IRON YIELD
For One Dollar Spent



ITEMS IN FOOD GROUPS REPRESENT CHOICES MADE BY FAMILIES, SPRING 1955. PRICES ADJUSTED TO OCTOBER, 1961.

CHART 4.—Yield in iron for 1 dollar spent for various food groups.

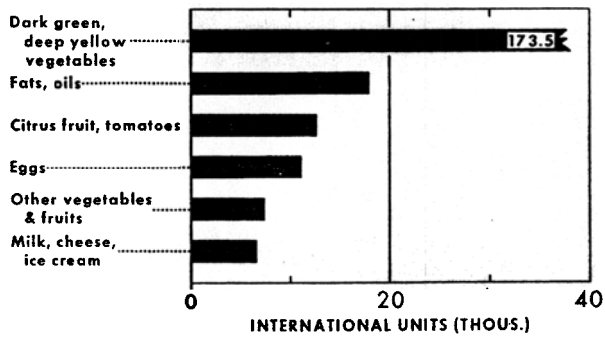
PROTEIN YIELD
For One Dollar Spent



ITEMS IN FOOD GROUPS REPRESENT CHOICES MADE BY FAMILIES, SPRING 1955. PRICES ADJUSTED TO OCTOBER, 1961.

CHART 2.—Yield in protein for 1 dollar spent for various food groups.

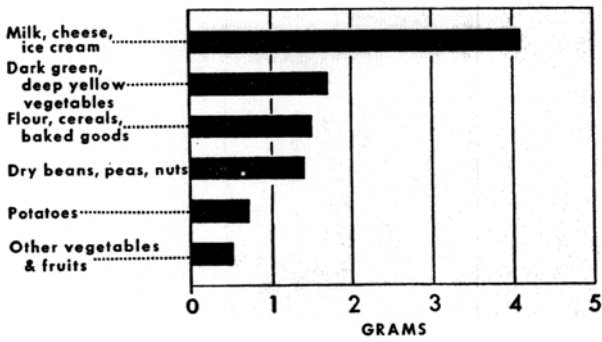
VITAMIN A YIELD
For One Dollar Spent



ITEMS IN FOOD GROUPS REPRESENT CHOICES MADE BY FAMILIES, SPRING 1955.

CHART 5.—Yield in vitamin A value for 1 dollar spent for various food groups.

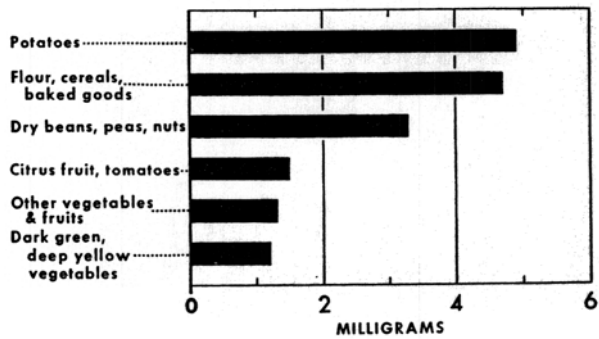
CALCIUM YIELD
For One Dollar Spent



CHOICES MADE BY FAMILIES, SPRING 1955.

CHART 3.—Yield in calcium for 1 dollar spent for various food groups.

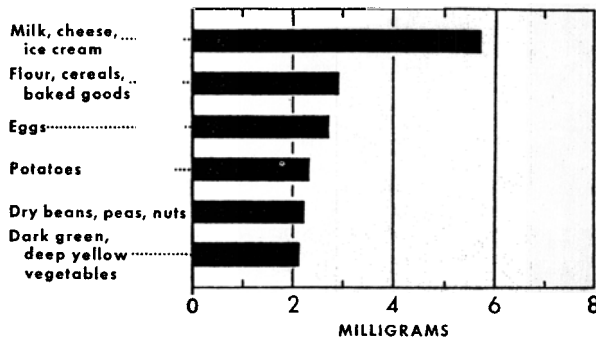
THIAMINE YIELD
For One Dollar Spent



ITEMS IN FOOD GROUPS REPRESENT CHOICES MADE BY FAMILIES, SPRING 1955. PRICES ADJUSTED TO OCTOBER, 1961.

CHART 6.—Yield in thiamine for 1 dollar spent for various food groups.

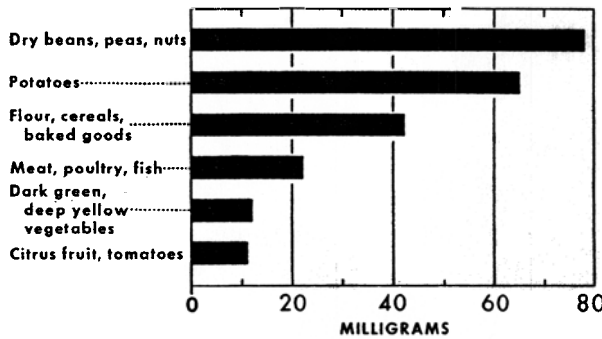
RIBOFLAVIN YIELD For One Dollar Spent



ITEMS IN FOOD GROUPS REPRESENT CHOICES MADE BY FAMILIES, SPRING 1955. PRICES ADJUSTED TO OCTOBER, 1961.

CHART 7. Yield in riboflavin for 1 dollar spent for various food groups.

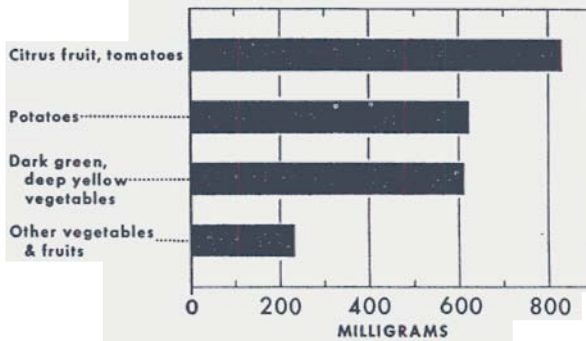
NIACIN YIELD For One Dollar Spent



ITEMS IN FOOD GROUPS REPRESENT CHOICES MADE BY FAMILIES, SPRING 1955. PRICES ADJUSTED TO OCTOBER, 1961.

CHART 8. Yield in niacin for 1 dollar spent for various food groups.

ASCORBIC ACID YIELD For One Dollar Spent



ITEMS IN FOOD GROUPS REPRESENT CHOICES MADE BY FAMILIES, SPRING 1955. PRICES ADJUSTED TO OCTOBER, 1961.

CHART 9. Yield in ascorbic acid for 1 dollar spent for various food groups.

kinds and quantities of food consumed weekly by families at different income levels as compared with data for families reporting in earlier surveys showed some changes in food patterns. These changes are reflected in the food group quantities of the present plans as compared with earlier ones. The principal change is the larger amounts of meat, poultry, and fish in the low-cost plan. This reflects the considerable increase in meat consumption by lower income families.

Food Plans at Different Cost Levels

The food plans at different cost levels shown in tables 3 to 7 have been developed as bases for nutritionally adequate diets for groups of families with varying amounts of money to spend for food. The plans indicate the quantities of food needed in 1 week from each of the 11 food groups to provide 3 meals at home every day for family members in different age-sex classifications. It is assumed that choices of individual items within the food groups will be "average," as determined by reference to choices made by families reporting in the 1955 Household Food Consumption Survey.

The food group quantities suggested in the food plans provide the servings outlined in the foundation diet of the Daily Food Guide (20) and, in addition, food to round out meals, satisfy appetites, and complete food energy and nutrient needs.

Low-cost plans.—The low-cost food plans (tables 3, 4, and 5) are designed for low-income families that must buy all or most of their food. The designation "low-cost" is relative. The cost of the food is lower than in the moderate-cost plan but none of the three low-cost plans represent the minimum cost at which nutritional needs can be met.

The basic low-cost plan (table 3) provides for a diet consistent with food patterns that are acceptable to most groups in this country. It is the plan most often used by social welfare and public health agencies for calculating allotments and planning family food budgets.

Compared with the moderate-cost and liberal plans, the low-cost plan has larger quantities from the food groups for which the relative economy of nutrients is high—potatoes, dry beans and peas, and flour and cereal—and smaller amounts of meat, poultry, and fish, and of fruits and vegetables other than potatoes. Furthermore, it is assumed that users of this plan will select the cheaper foods within the groups. In the dry beans, peas, and nuts group, for example, dry beans and peas

TABLE 3.—Food Plan at Low Cost: Suggested weekly quantities of food (as purchased) for 17 sex-age groups, pregnant and lactating women

Sex-age group ¹	Milk, cheese, ice cream ²		Meat, poultry, fish ³		Eggs	Dry beans, peas, nuts		Flour, cereals, baked goods ⁴		Citrus fruit, tomatoes		Dark-green and deep-yellow vegetables		Potatoes		Fats, oils		Sugars, sweets	
	Qt.	Lb. Oz.	No.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.		
Children:																			
7 months to 1 year	5½	1 0	5	0 0	0 12	1 8	0 2	0 8	1 0	1 0	0 1	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4
1-3 years	5½	1 4	5	0 1	1 4	1 8	0 4	0 12	2 4	2 4	0 4	0 4	1 4	3 4	0 6	0 6	0 6	0 6	0 6
4-6 years	5½	1 8	5	0 2	2 0	1 12	0 4	1 4	3 4	3 4	0 6	0 6	4 4	4 4	0 8	0 8	0 8	0 8	0 10
7-9 years	5½	2 0	6	0 4	2 4	2 0	0 8	2 0	4 4	4 4	0 8	0 8	2 0	4 4	0 8	0 8	0 8	0 8	0 10
10-12 years	6½	2 4	6	0 6	3 0	2 4	0 8	2 8	5 0	5 0	0 8	0 8	2 8	5 0	0 8	0 8	0 8	0 8	0 12
Girls:																			
13-15 years	7	2 8	6	0 4	3 0	2 4	0 12	2 8	5 0	5 0	0 10	0 10	2 8	5 0	0 10	0 10	0 10	0 10	0 12
16-19 years	7	2 8	6	0 4	2 12	2 4	0 12	2 4	4 12	4 12	0 6	0 6	2 4	4 12	0 6	0 6	0 6	0 6	0 10
Boys:																			
13-15 years	7	2 8	6	0 6	4 4	2 8	0 12	3 4	5 4	5 4	0 12	0 12	3 4	5 4	0 12	0 12	0 12	0 12	0 12
16-19 years	7	3 4	6	0 8	5 4	2 8	0 12	4 12	5 8	5 8	0 14	0 14	4 12	5 8	0 14	0 14	0 14	0 14	0 14
Women:																			
20-34 years	3½	2 8	5	0 4	2 8	2 0	0 12	2 0	5 0	5 0	0 6	0 6	2 0	5 0	0 6	0 6	0 6	0 6	0 10
35-54 years	3½	2 8	5	0 4	2 8	2 0	0 12	1 8	4 8	4 8	0 4	0 4	1 8	4 8	0 4	0 4	0 4	0 4	0 10
55-74 years	3½	2 8	5	0 4	2 4	2 0	0 12	1 4	3 8	3 8	0 4	0 4	1 4	3 8	0 4	0 4	0 4	0 4	0 6
75 years and over	3½	2 8	5	0 4	2 0	2 0	0 12	1 4	3 0	3 0	0 4	0 4	1 4	3 0	0 4	0 4	0 4	0 4	0 6
Pregnant	7	2 8	7	0 4	2 8	3 8	1 8	2 0	5 0	5 0	0 6	0 6	2 0	5 0	0 6	0 6	0 6	0 6	0 8
Lactating	10	3 4	7	0 4	3 0	4 8	1 8	3 4	5 8	5 8	0 8	0 8	3 4	5 8	0 8	0 8	0 8	0 8	0 10
Men:																			
20-34 years	3½	3 12	6	0 6	4 4	2 4	0 12	3 4	5 8	5 8	0 12	0 12	3 4	5 8	0 12	0 12	0 12	0 12	1 0
35-54 years	3½	3 8	6	0 6	3 12	2 4	0 12	3 0	5 0	5 0	0 10	0 10	3 0	5 0	0 10	0 10	0 10	0 10	0 12
55-74 years	3½	3 4	6	0 4	3 8	2 4	0 12	2 8	4 12	4 12	0 10	0 10	2 8	4 12	0 10	0 10	0 10	0 10	0 10
75 years and over	3½	3 4	6	0 4	3 4	2 0	0 12	2 4	4 8	4 8	0 8	0 8	2 4	4 8	0 8	0 8	0 8	0 8	0 10

¹ Quantities of food suggested here are based on growth needs and activity levels suitable for people in the U.S.A.

² Fluid whole milk, or its equivalent in cheese, evaporated milk, dry milk, or ice cream. See p. 16 for factors to convert milk products to calcium equivalent of whole fluid milk.

³ Includes bacon and salt pork not to exceed 1/3 pound for each 5 pounds of meat group.

⁴ Weight in terms of flour and cereal. See p. 16 for factors to convert baked goods to flour and cereal equivalent.

would be used in larger quantities than nuts, and in the cereal group selections would include more of the cereals to be cooked at home than of the ready-to-eat varieties.

Another low-cost food plan, presented in table 4, suggests quantities of grain products suitable for families who are high consumers of cereal products. Families using this plan would purchase a large part of the cereal products group as flour for home baking. Fat is included in the plan for preparation of hot bread. The quantities of the cereal group in this second low-cost plan would allow for more rice and corn products than does the basic low-cost plan. This plan may be useful particularly for families in the Southeastern States.

As stated before, quantities of food in the low-cost plans are sufficient to allow for only a minimum of discard and plate waste beyond the normal loss of bone and inedible refuse. Menus based on the plans will not be elaborate. They will include foods that require a considerable amount of home preparation and call for skill in cooking to make varied and appetizing meals.

The economy plan (table 5) includes combinations and quantities of food to provide a good diet for a cost lower than the low-cost plans and yet suitable to the food habits of many groups. The plan relies heavily on the cereals, dry beans, peas, and nuts and potato groups, and on the selection of the less expensive items in each of the 11 food groups. The food for the economy plan can be purchased for 20 to 25 percent less than that in the basic low-cost plan.

Plans for adequate diets at still lower cost could be developed, and while they would deviate further from average food habits, they could be made acceptable to some groups of people.

Moderate-cost plan.—This plan (table 6) is suitable for the average U.S. family. It is used by many private and some public agencies as an aid in determining the ability of families to pay for social services. The moderate-cost plan includes larger quantities of milk, eggs, meats, fruits, and vegetables than the low-cost plan. It allows for some of the higher priced cuts of meat, a few out-of-season foods, and some partially prepared foods. The moderate-cost plan allows for meals with more variety and less home preparation than does the low-cost plan.

Liberal plan.—The liberal plan (table 7) is for families who want greater variety and more of the animal products and fruits and vegetables than

the other plans allow. While there are some quantity differences in the food groups between the liberal and moderate-cost plans, more expensive choices within the groups will usually account for most of the greater cost if the liberal plan is followed.

Selecting a Food Plan and Estimating Food Costs

When selecting a food budget from those given in this publication a family may ask, "How much money should we spend for food?" There is no rule for answering this question. However, food consumption surveys yield data that show the proportion of incomes families of different size spend for food. Table 8 indicates the food plan that might be used for families of various size at different income levels, assuming families devote the same proportion of their income to food that the average family does.

Food for the plans suggested at the different income levels will cost, on the average, less than the total amount survey data show families in similar circumstances spend for food. The differential represents an amount for food away from home.

The cost to individual families who use these plans will depend on the age and sex of family members, the community in which they live, the kinds of stores in which they shop, whether they shop for bargains, whether they produce some of their food, and how many of their meals they eat away from home.

For families who buy all of their food for use in meals served at home or from the home food supply, the weekly costs of the foods in these plans were estimated in January 1962 to be as shown in table 9.

Adjustment for meals eaten away from home.—Since many families have one or more members who regularly eat some of their meals away from home, it may be desirable to estimate the cost of the food for just those meals served at home (or carried from home in packed meals). This may be done by subtracting from the estimated cost of a week's food for the plan being used an amount equal to the value of the meals missed. Thus, a man who eats his noon meal at work 5 days a week is eating 5, or 24 percent, of 21 meals from food not included in the family cost estimate as given on page 13. The estimated cost of food at home for a family of four presumed to be following the

TABLE 4.—Another Food Plan at Low Cost: ¹ Suggested weekly quantities of food (as purchased) for 17 sex-age groups, pregnant and lactating women

Sex-age group ²	Milk, cheese, ice cream ³	Meat, poultry, fish ⁴		Eggs	Dry beans, peas, nuts		Flour, cereals, baked goods ⁵		Citrus fruit, tomatoes		Dark-green and deep-yellow vegetables		Potatoes		Other vegetables and fruits		Fats, oils		Sugars, sweets		
		Qt.	Lb.		Oz.	No.	Lb.	Oz.	Lb.	Oz.	Lb.	Oz.	Lb.	Oz.	Lb.	Oz.	Lb.	Oz.	Lb.	Oz.	Lb.
Children:																					
7 months to 1 year	5½	0	12	5	0	0	0	12	1	8	0	2	0	8	1	0	0	1	0	1	0
1-3 years	5½	1	0	5	0	1	1	8	1	8	0	4	0	8	2	0	0	4	0	4	0
4-6 years	5½	1	4	5	0	2	2	4	1	8	0	4	0	8	3	0	0	8	0	8	0
7-9 years	5	1	12	6	0	6	2	12	1	12	0	8	1	8	4	0	0	10	0	10	0
10-12 years	6	2	0	6	0	8	3	8	2	0	0	8	2	0	4	12	0	10	0	10	0
Girls:																					
13-15 years	7	2	0	6	0	6	3	8	2	4	0	12	2	0	4	12	0	12	0	12	0
16-19 years	7	2	0	6	0	6	3	4	2	4	0	12	1	12	4	8	0	8	0	10	0
Boys:																					
13-15 years	6½	2	0	6	0	8	4	12	2	4	0	12	2	12	5	0	0	14	0	12	0
16-19 years	6½	2	12	6	0	10	5	12	2	4	0	12	4	4	5	4	1	0	0	14	0
Women:																					
20-34 years	3½	2	0	5	0	6	3	0	1	12	0	12	1	0	4	12	0	8	0	10	0
35-54 years	3½	2	0	5	0	6	3	0	1	12	0	12	1	0	4	4	0	6	0	10	0
55-74 years	3½	2	0	5	0	4	2	8	1	12	0	12	1	0	3	0	0	6	0	6	0
75 years and over	3½	2	0	5	0	4	2	4	1	12	0	12	1	0	2	12	0	6	0	6	0
Pregnant	7	2	4	7	0	4	3	0	3	4	1	8	1	0	4	12	0	8	0	8	0
Lactating	10	2	12	7	0	6	3	8	4	8	1	8	2	4	5	4	0	12	0	8	0
Men:																					
20-34 years	3	3	4	6	0	8	4	12	2	0	0	12	2	12	5	4	0	14	1	0	0
35-54 years	3	3	0	6	0	8	4	4	2	0	0	12	2	8	4	12	0	12	0	12	0
55-74 years	3	2	12	6	0	6	4	0	2	0	0	12	2	0	4	4	0	12	0	10	0
75 years and over	3	2	12	6	0	6	3	8	2	0	0	12	2	0	4	0	0	10	0	10	0

¹ Especially suitable for food habits of families in the Southeastern States.

² Quantities of food suggested here are based on growth needs and activity levels suitable for people in the U.S.A.

³ Fluid whole milk, or its equivalent in cheese, evaporated milk, dry milk, or ice cream. See p. 16 for factors to convert milk products to calcium equivalent of whole fluid milk.

⁴ Includes bacon and salt pork not to exceed ½ pound for each 5 pounds of meat group.

⁵ Weight in terms of flour and cereal. See p. 16 for factors to convert baked goods to flour and cereal equivalent.

TABLE 5.—*Economy Plan:*¹ Suggested weekly quantities of food (as purchased) for 17 sex-age groups, pregnant and lactating women

Sex-age group ²	Milk, cheese, ice cream ³	Meat, poultry, fish ⁴	Eggs	Dry beans, peas, nuts	Flour, cereals, baked goods ⁵	Citrus fruit, tomatoes	Dark-green and deep- yellow vegetables	Potatoes	Other vegetables and fruits	Fats, oils	Sugars, sweets
	Qt.	Lb. Oz.	No.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.
Children:											
7 months to 1 year.....	5½	0 8	4	0 0	0 12	1 0	0 4	0 8	1 0	0 1	0 1
1-3 years.....	5	0 12	4	0 1	1 8	1 0	0 4	1 0	2 0	0 4	0 4
4-6 years.....	5	1 0	4	0 4	2 4	1 4	0 4	1 8	2 0	0 6	0 6
7-9 years.....	5	1 8	5	0 6	2 8	1 8	0 8	2 4	3 0	0 10	0 10
10-12 years.....	6	1 12	5	0 8	3 4	1 12	0 8	2 12	3 4	0 10	0 12
Girls:											
13-15 years.....	6½	2 0	5	0 8	3 4	1 12	0 12	3 0	3 8	0 12	0 10
16-19 years.....	6½	2 0	5	0 8	3 0	1 12	0 12	2 12	3 4	0 8	0 10
Boys:											
13-15 years.....	6	2 0	5	0 10	4 8	2 0	0 12	3 4	3 8	0 14	0 12
16-19 years.....	6	2 8	5	0 12	5 8	2 0	0 12	4 12	3 8	1 0	0 14
Women:											
20-34 years.....	3	1 4	4	0 4	3 0	1 12	0 12	3 0	3 0	0 8	0 12
35-54 years.....	3	1 4	4	0 4	3 0	1 12	0 12	2 12	2 12	0 6	0 12
55-74 years.....	3	1 4	4	0 4	2 8	1 12	0 12	2 8	2 8	0 6	0 6
75 years and over.....	3	1 4	4	0 4	2 4	1 12	0 12	2 4	2 4	0 6	0 6
Pregnant.....	7	2 0	7	0 4	2 8	3 0	1 8	2 8	4 0	0 6	0 8
Lactating.....	10	2 0	6	0 4	3 4	4 0	1 8	3 12	4 8	0 10	0 12
Men:											
20-34 years.....	3	2 0	5	0 10	4 12	1 12	0 12	4 4	3 8	0 14	1 2
35-54 years.....	3	2 0	5	0 10	4 4	1 12	0 12	3 8	3 0	0 12	0 14
55-74 years.....	3	2 0	5	0 6	4 0	1 12	0 12	3 0	2 12	0 12	0 12
75 years and over.....	3	2 0	5	0 6	3 8	1 12	0 12	2 12	2 8	0 10	0 12

¹ Especially suited for families who due to limited purchasing power deviate further from average U.S. food habits than the two low-cost plans (tables 3 and 4).

² Quantities of food suggested here are based on growth needs and activity levels suitable for people in the U.S.A.

³ Fluid whole milk, or its equivalent in cheese, evaporated milk, dry milk,

or ice cream. See p. 16 for factors to convert milk products to calcium equivalent of whole fluid milk.

⁴ Includes bacon and salt pork not to exceed ½ pound for each 5 pounds of meat group.

⁵ Weight in terms of flour and cereal. See p. 16 for factors to convert baked goods to flour and cereal products.

TABLE 6.—Food Plan at Moderate Cost: Suggested weekly quantities of food (as purchased) for 17 sex-age groups, pregnant and lactating women

Sex-age group ¹	Milk, cheese, ice cream ²	Meat, poultry, fish ³	Eggs	Dry beans, peas, nuts	Flour, cereals, baked goods ⁴	Citrus fruit, tomatoes	Dark-green and deep-yellow vegetables	Potatoes	Other vegetables and fruits	Fats, oils	Sugars, sweets
	Qt.	Lb. Oz.	No.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.
Children:											
7 months to 1 year	6	1 4	6	0 0	0 12	1 8	0 2	0 8	1 8	0 1	0 2
1-3 years	6	1 12	6	0 1	1 0	1 8	0 4	0 12	2 12	0 4	0 4
4-6 years	6	2 4	6	0 1	1 12	2 0	0 4	1 0	4 0	0 6	0 10
7-9 years	6	3 0	7	0 2	2 0	2 4	0 8	1 12	4 12	0 10	0 14
10-12 years	6½	4 0	7	0 4	2 12	2 8	0 12	2 4	5 8	0 10	0 14
Girls:											
13-15 years	7	4 8	7	0 2	2 12	2 8	0 12	2 4	5 12	0 12	0 14
16-19 years	7	4 4	7	0 2	2 8	2 8	0 12	2 0	5 8	0 10	0 12
Boys:											
13-15 years	7	4 12	7	0 4	4 0	2 12	0 12	3 0	6 0	0 14	1 0
16-19 years	7	5 8	7	0 6	5 0	3 0	0 12	4 4	6 4	1 2	1 2
Women:											
20-34 years	3½	4 4	6	0 2	2 4	2 8	0 12	1 8	5 12	0 8	0 14
35-54 years	3½	4 4	6	0 2	2 0	2 8	0 12	1 4	5 4	0 8	0 12
55-74 years	3½	4 4	6	0 2	1 12	2 4	0 12	1 4	4 4	0 6	0 8
75 years and over	3½	3 12	6	0 2	1 12	2 4	0 12	1 0	3 12	0 6	0 8
Pregnant	7	4 4	7	0 2	2 4	3 8	1 8	1 8	5 12	0 8	0 12
Lactating	10	5 0	7	0 2	2 12	5 0	1 8	2 12	6 4	0 12	0 12
Men:											
20-34 years	3½	5 8	7	0 4	4 0	2 12	0 12	3 0	6 8	1 0	1 4
35-54 years	3½	5 4	7	0 4	3 8	2 12	0 12	2 8	5 12	0 14	1 0
55-74 years	3½	5 0	7	0 2	3 4	2 12	0 12	2 4	5 8	0 12	0 14
75 years and over	3½	5 0	7	0 2	2 12	2 8	0 12	2 0	5 4	0 10	0 12

¹ Quantities of food suggested here are based on growth needs and activity levels suitable for people in the U.S.A.

² Fluid whole milk, or its equivalent in cheese, evaporated milk, dry milk, or ice cream. See p. 16 for factors to convert milk products to calcium equivalent of whole fluid milk.

³ Includes bacon and salt pork not to exceed ½ pound for each 5 pounds of meat group.

⁴ Weight in terms of flour and cereal. See p. 16 for factors to convert baked goods to flour and cereal equivalent.

TABLE 7.—*Food Plan at Liberal Cost: Suggested weekly quantities of food (as purchased) for 17 sex-age groups, pregnant and lactating women*

Sex-age group ¹	Milk, cheese, ice cream ²		Meat, poultry, fish ³		Eggs	Dry beans, peas, nuts		Flour, cereals, baked goods ⁴		Citrus fruit, tomatoes		Dark-green and deep-yellow vegetables		Potatoes		Other vegetables and fruits		Fats, oils		Sugars, sweets		
	Qt.	Lb.	Oz.	No.	Lb.	Oz.	Lb.	Oz.	Lb.	Oz.	Lb.	Oz.	Lb.	Oz.	Lb.	Oz.	Lb.	Oz.	Lb.	Oz.	Lb.	Oz.
Children:																						
7 months to 1 year.....	6	1	4	7	0	0	0	12	1	12	0	2	0	8	1	8	0	2	0	2	0	2
1-3 years.....	6	2	4	7	0	1	1	0	1	12	0	4	0	12	2	12	0	4	0	4	0	4
4-6 years.....	6	3	0	7	0	1	1	8	2	4	0	8	0	12	4	8	0	8	0	8	0	12
7-9 years.....	6	3	12	7	0	2	1	12	2	12	0	8	1	8	5	4	0	10	0	10	1	0
10-12 years.....	6½	4	12	7	0	4	2	12	3	0	0	12	2	4	6	0	0	10	0	10	1	0
Girls:																						
13-15 years.....	7	5	8	7	0	2	2	8	3	0	0	12	2	4	6	0	0	12	0	12	1	2
16-19 years.....	7	5	4	7	0	2	2	4	3	0	0	12	1	12	5	12	0	10	0	10	1	0
Boys:																						
13-15 years.....	7	5	8	7	0	4	4	0	3	4	0	12	3	0	6	8	0	14	0	14	1	4
16-19 years.....	7	6	4	7	0	6	5	0	3	8	0	12	4	4	7	4	1	4	1	4	1	2
Women:																						
20-34 years.....	4	4	12	6	0	1	2	0	3	0	0	12	1	4	6	4	0	8	0	8	1	2
35-54 years.....	4	4	12	6	0	1	1	12	3	0	0	12	1	0	6	0	0	8	0	8	1	0
55-74 years.....	4	4	12	6	0	1	1	8	3	0	0	12	1	0	4	8	0	6	0	6	0	12
75 years and over.....	4	4	4	6	0	1	1	8	3	0	0	12	0	12	4	0	0	6	0	6	0	10
Pregnant.....	7	4	12	7	0	1	2	0	4	8	1	8	1	4	6	4	0	8	0	8	1	0
Lactating.....	10	5	12	7	0	2	2	12	5	8	1	8	2	8	6	4	0	12	0	12	1	2
Men:																						
20-34 years.....	4	6	0	7	0	4	3	12	3	0	0	12	2	12	7	12	1	0	1	0	1	8
35-54 years.....	4	5	8	7	0	4	3	8	3	0	0	12	2	4	6	8	0	14	0	14	1	4
55-74 years.....	4	5	4	7	0	2	3	4	3	0	0	12	2	0	6	0	0	12	0	12	1	2
75 years and over.....	4	5	4	7	0	2	2	12	2	12	0	12	1	12	5	12	0	10	0	10	1	0

¹ Quantities of food suggested here are based on growth needs and activity levels suitable for people in the U.S.A.

² Fluid whole milk, or its equivalent in cheese, evaporated milk, dry milk, or ice cream. See p. 16 for factors to convert milk products to calcium equivalent of whole fluid milk.

³ Includes bacon and salt pork not to exceed ½ pound for each 5 pounds of meat group.

⁴ Weight in terms of flour and cereal. See p. 16 for factors to convert baked goods to flour and cereal equivalent.

TABLE 8.—Food plans attainable by families of different size and income when they spend average proportions of income for food¹

Income in year (after income taxes)	Family size			
	2 persons	3 persons	4 persons	5 persons
\$2,000-\$4,000.....	Low-cost or moderate-cost.	Low-cost.....	Economy or low-cost..	Economy or low-cost.
\$4,000-\$6,000.....	Moderate-cost or liberal.	Low-cost or moderate-cost.	Low-cost or moderate-cost.	Low-cost or moderate-cost.
\$6,000-\$8,000.....	Liberal.....	Moderate-cost or liberal.	Moderate-cost or liberal.	Moderate-cost or liberal.
\$8,000-\$10,000.....	Liberal.....	Liberal.....	Liberal.....	Moderate-cost or liberal.
\$10,000 and over.....	Liberal.....	Liberal.....	Liberal.....	Liberal.

¹ Based on the estimated cost of the food in the plans, January 1962, and the percentage of income spent for food by urban families as indicated by consumer expenditure surveys. Allows for some meals eaten away from home.

TABLE 9.—Estimated cost of 1 week's food, January 1962—U.S.A. average

Sex-age group	Low-cost plan	Another low-cost plan	Economy plan	Moderate-cost plan	Liberal plan
FAMILIES					
	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Family of two, 20-34 years ¹	13. 80	11. 20	10. 20	18. 80	21. 30
Family of two, 55-74 years ¹	12. 40	9. 90	9. 40	17. 00	19. 00
Family of four, preschool children ²	20. 60	17. 00	15. 70	27. 50	31. 50
Family of four, school children ³	23. 80	19. 60	18. 60	32. 10	36. 60
INDIVIDUALS					
Children:					
Under 1 year.....	3. 10	2. 60	2. 50	3. 90	4. 20
1-3 years.....	3. 70	3. 10	3. 00	4. 70	5. 30
4-6 years.....	4. 40	3. 70	3. 40	5. 70	6. 80
7-9 years.....	5. 20	4. 30	4. 30	6. 80	7. 80
10-12 years.....	6. 10	5. 10	5. 00	8. 20	9. 40
Girls:					
13-15 years.....	6. 40	5. 40	5. 30	8. 70	10. 00
16-19 years.....	6. 50	5. 50	5. 40	8. 70	9. 90
Boys:					
13-15 years.....	7. 00	5. 60	5. 60	9. 60	10. 90
16-19 years.....	8. 20	6. 70	6. 60	11. 20	12. 60
Women:					
20-34 years.....	5. 40	4. 50	4. 00	7. 50	8. 50
35-54 years.....	5. 30	4. 40	3. 90	7. 30	8. 30
55-74 years.....	5. 00	4. 00	3. 70	6. 90	7. 80
75 years and over.....	4. 80	3. 90	3. 60	6. 40	7. 30
Pregnant.....	6. 80	5. 80	5. 80	8. 80	9. 80
Lactating.....	8. 50	7. 30	7. 10	10. 90	12. 10
Men:					
20-34 years.....	7. 10	5. 70	5. 30	9. 60	10. 90
35-54 years.....	6. 60	5. 30	5. 00	9. 00	10. 10
55-74 years.....	6. 30	5. 00	4. 80	8. 60	9. 50
75 years and over.....	6. 10	4. 90	4. 60	8. 20	9. 10

¹ Man and woman. Ten percent added for family size adjustment. For derivation of factor for adjustment, see appendix B.

² Man and woman 20-34 years; children, 1-3 and 4-6 years.

³ Man and woman 20-34 years; children, 7-9 and 10-12 years.

NOTE.—Estimates based on current prices, issued quarterly, are available from Consumer and Food Economics Research Division, Agricultural Research Service, U.S. Department of Agriculture, Washington 25, D.C.

moderate-cost plan in January 1962 would then be as follows:

Man: 20-34 years	----	\$7. 30	(\$9.60 less 24 percent)
Woman: 20-34 years	----	7. 50	
Child: 2 years	-----	4. 70	
Child: 5 years	-----	5. 70	

\$25. 20 instead of the \$27.50 shown in table 9

The above procedure is not precise, because the three meals of the day may not be equal in cost. The noon meal is the meal most frequently eaten away from home. Since it may be about average in cost for the three meals of the day, the rather rough procedure suggested above is probably satisfactory.

An individual family will be able to estimate its own expenditures for meals away from home. For teachers, social welfare workers, and others needing guidelines for setting up family budgets, it may be helpful to know that in the 1955 Household Food Consumption Survey, the expense of the average meal away from home was nearly twice the expense for the average meal at home. This relationship held for families in all income classes except for the highest.

In the example given above, the family would need to add an additional \$4.60 for an estimated five meals away from home. This estimate was made by obtaining (1) the average cost per meal of food at home on the moderate-cost plan for the man ($\$9.60 \div 21 = \0.46); (2) the average cost per meal of food away from home by multiplying by 2 ($\$0.46 \times 2 = \0.92); and (3) the cost of the number of meals eaten away from home ($\$0.92 \times 5 = \4.60).

Between-meal snacks eaten away from home.—Most families purchase some foods for between-meal snacks eaten away from home. In the 1955 Household Food Consumption Survey, about 60 percent of all nonfarm families reported such purchases during the week of the survey. The average expenditure made by all families (average based on all nonfarm families in the survey) was \$1.33; the average for those families that made such purchases during the week was \$2.17. The amounts of the purchases were larger for the higher than for the lower income families—just as total expense for food at home and for meals eaten away from home was also larger. The proportion of expenditures for between-meal food eaten away from home to total food expenditures varied relatively little among

the several income classes—tending to range around 5 percent. As a rough estimate, it is therefore proposed that a family add 5 percent to the estimated cost of meals (at home and away) for between-meal snacks.

For the sample family of four, the total food budget for a week in early 1962 would be as follows:

For meals at home	-----	\$25. 20
For meals away from home	-----	4. 60
Subtotal	-----	\$29. 80
For between-meal food away from home (5 percent of subtotal)	-----	1. 50
Total	-----	\$31. 30

Using the Food Plans With Families

The food plans can serve as a guide in working out a food budget that will provide an adequate diet for a family of any given size and composition.

Figuring weekly food quantities.—To use the plans to determine the kinds and quantities of food needed in a week, start by listing the family members and their ages.² After each name, copy from the chosen food plan the amount of food in each individual plan according to age and sex. (See sample worksheet, table 10.) Add the amounts in each of the groups. These quantities will provide 21 meals for the family—3 meals a day for a week. If lunch or other meals are purchased away from home regularly, estimated quantities of food consumed away from home should be deducted from the appropriate food groups.

Quantities for the food groups shown in the plans are in terms of food as brought into the kitchen. It may sometimes be necessary to provide for a range in these quantities to allow for the different forms in which foods are purchased. In the fruit and vegetable groups, for instance, it is assumed that fresh, canned, and frozen items are purchased in proportions typical of average consumption (see table 20). In seasons when large proportions

² The plans for children under 1 year of age are more suitable for infants over 7 months of age than for younger infants. Since infants are breast fed or have formulas and specially prepared food, they eat a different assortment of foods within the groups than those assumed for the older children and adults. Also, their food needs increase from month to month so that new feeding plans are required frequently. The plan is suitable, however, as a base for estimating a cost for feeding all infants to 1 year. "Infant Care," a publication of the U.S. Children's Bureau (9), gives information on infant feeding.

TABLE 10.—Sample worksheet (Low-Cost Food Plan)

Family members (sex and age)	Milk, cheese, ice cream	Meat, poultry, fish	Eggs	Dry beans, peas, nuts	Flour, cereals, baked goods	Citrus fruit, tomatoes	Dark-green and deep- yellow vegetables	Potatoes	Other vegetables and fruits	Fats, oils	Sugars, sweets
	Qt.	Lb. Oz.	No.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.	Lb. Oz.
1. Father, 33 years.....	3½	3 12	6	0 6	4 4	2 4	0 12	3 4	5 8	0 12	1 0
2. Mother, 33 years.....	3½	2 8	5	0 4	2 8	2 0	0 12	2 0	5 0	0 6	0 10
3. John, 11 years.....	6½	2 4	6	0 6	3 0	2 4	0 8	2 8	5 0	0 8	0 12
4. Mary, 8 years.....	5½	2 0	6	0 4	2 4	2 0	0 8	2 0	4 4	0 8	0 10
5.											
6.											
	19 18 to 20		23 23 to 24	1 4 1¼ to 1½ lb.	12 0 11 to 13 lb.	8 8 8 to 9 lb.	2 8 2 to 4 lb.	9 12 9 to 10 lb.		2 2 2 to 2½ lb.	3 0 2¼ to 3½ lb.

of fresh fruits and vegetables are used, the quantities in these groups will need to be increased to allow for the greater amount of refuse. If at any time all the fruits and vegetables are bought in canned or frozen form, smaller amounts of the groups would be needed. Also, if during a given week several cuts of meat with a high percentage of bone, such as shank and spareribs, are used, the quantity suggested can be increased by about a third to allow for the larger proportion of bone. If, however, as is usual for most weeks of the year, some fresh and some canned or frozen fruits and vegetables are purchased and the meats are apportioned between bony and meaty pieces, no changes in quantities are needed.

If in 1 week more than the suggested quantity of dark-green and deep-yellow vegetables is purchased, a corresponding decrease in the "other vegetables and fruits" group can be made. Larger amounts of the "other" group, however, cannot substitute for the dark-green and deep-yellow vegetables group without changing the nutritive value of the diet. Substitutions may also change the total cost of the food.

The quantities of milk, cheese, and ice cream suggested in the plans are in terms of quarts of fluid milk. To convert the units in which milk products are commonly purchased to the calcium equivalent of fluid milk, use the factors in column 3 of the following tabulation.

Milk product (1)	Measure (2)	Equivalent quarts of fluid milk (3)
Evaporated milk.....	14½-oz. can....	0.9
Nonfat dry milk.....	1 lb.....	5.2
Cheese, Cheddar-type, processed.....	¼ lb.....	1.3
Cheese, cottage, creamed.....	12 oz.....	.3
Ice cream.....	1 qt.....	.6

The quantities for the flour, cereal, and baked goods groups are in terms of pounds of flour and cereal. Bread and baked goods average almost two-thirds of a pound of flour per pound of product. Therefore, in general, count a pound of these foods as 0.6 pound flour or cereal.

A more detailed list of conversion factors is given in the appropriate food groups in table 20, page 35.

Planning menus and market orders.—The surest way of getting all the recommended foods into the

family diet is to plan menus for a week at a time.

Given below are the approximate number of servings per pound for important foods in each group. This information is based on the weight of food as purchased. These figures were used in estimating servings of food per person provided in the plans (table 11).

Food Buying Guide

Meat, Poultry, Fish

Fresh or frozen:

Meat	Amount to buy per serving
Much bone or gristle.....	½ to 1 pound
Medium amounts of bone.....	⅓ to ½ pound
Little bone.....	¼ to ⅓ pound
No bone.....	⅕ to ¼ pound

Poultry (ready-to-cook)

Chicken:

Broiling.....	¼ to ½ bird
Frying, roasting, stewing....	About ½ pound
Duck.....	About 1 pound
Goose.....	About ⅔ pound
Turkey.....	About ½ pound

Fish and shellfish

Whole or round.....	1 pound
Dressed, large.....	½ pound
Steaks, fillets.....	⅓ pound
Oysters, shucked.....	⅓ pint (8-12 oysters).
Shrimp (green).....	¼ pound
Shrimp, cooked, peeled, cleaned....	⅛ pound

Canned:	Size of serving	Servings per unit
Pork loaf, 12-ounce can.	2 slices (3½ in. × 1¾ in. × ⅜ in.).	4 per can
Corned beef, 12-ounce can.	3 ounces.....	4 per can
Chicken, turkey, boned, 6-ounce can.	3 ounces.....	2 per can
Salmon, 16-ounce can.	3 ounces.....	4 per can
Tunafish, in oil, solid or chunk packed, 7-ounce can.	3 ounces.....	2 per can

Dried:

Chipped beef.....	¾ cup creamed.	10 per pound.
-------------------	----------------	---------------

Vegetables and Fruits: ¹

Fresh:	Size of serving	Servings per pound ¹
Asparagus:		
Cut	1/2 cup	4
Spears	4-5 stalks	4
Beans, lima	1/2 cup	² 2
Beans, snap	1/2 cup	5-6
Beets, diced	1/2 cup	³ 4
Broccoli	2 stalks	3-4
Brussels sprouts	1/2 cup	4-5
Cabbage:		
Raw, shredded	1/2 cup	7-8
Cooked	1/2 cup	4-5
Carrots:		
Raw, shredded	1/2 cup	³ 6-7
Cooked	1/2 cup	³ 4
Cauliflower	1/2 cup	4
Celery, cooked	1/2 cup	5
Chard	1/2 cup	3 1/2
Collards	1/2 cup	4
Eggplant	1/2 cup	5
Kale	1/2 cup	3 1/2
Onions, cooked	1/2 cup	4
Parsnips	1/2 cup	³ 4
Peas	1/2 cup	² 2
Potatoes	1/2 cup	3-4
Spinach	1/2 cup	2-3
Squash	1/2 cup	2-3
Sweetpotatoes	1/2 cup	3
Tomatoes, sliced or diced	1/2 cup	5
Turnips	1/2 cup	³ 4
Apricots	2 medium	5
Berries, raw	1/2 cup	4-5
Cherries, pitted, cooked	1/2 cup	3
Plums	2 medium	4
Rhubarb, cooked	1/2 cup	3

For apples, bananas, oranges, and pears, count on about 3 (medium size) to a pound; peaches, 4 to a pound.

Dry:	Size of serving	Servings per pound
Beans	1/2 cup	11
Peas, lentils	1/2 cup	10-11
Canned:		Servings per can
8-ounce can	1/2 cup	2
No. 2 can	1/2 cup	4-5
No. 2 1/2 can	1/2 cup	6-7
No. 3 cylinder (46 oz.)	1/2 cup	11-12
No. 303 can	1/2 cup	4

See footnotes at end of guide.

Frozen:	Size of serving	Servings per package (9 to 16 oz.)
Broccoli:		
Spears	2 stalks	3-5
Chopped	1/2 cup	3-5
Cauliflower	1/2 cup	4-5
Corn, whole kernel	1/2 cup	3-5
Peas	1/2 cup	3-5
Others	1/2 cup	3-6

Cereals and Cereal Products:

	Size of serving	Servings per pound
Bread, sliced, 1-pound loaf	1 slice	16
Crackers, graham, 1 pound (about 66 crackers)	2 crackers	33
Crackers, saltines, 1 pound (about 140 2" x 2" crackers)	4 crackers	35
Flaked corn cereals	1 cup	18-24
Other flaked cereals	3/4 cup	21
Puffed cereals	1 cup	32-38
Cornmeal	1/2 cup	22
Wheat cereals:		
Coarse	1/2 cup	16
Fine	1/2 cup	20-27
Oatmeal	1/2 cup	16
Hominy grits	1/2 cup	20
Macaroni and noodles	1/2 cup	17
Rice	1/2 cup	16
Spaghetti	1/2 cup	18

¹ As purchased.

² In pod.

³ Without tops.

Another way to work out the food plan is to make a week's menus using general principles of meal planning; then list the kinds and quantities of food needed to prepare the menus. When the amounts of individual foods needed are classified in their respective groups, the group totals should approximate the quantities suggested in the family food plan. Some adjustment may be needed at first to get the right proportion of foods from each group into menus. With a little practice, however, the family who is following the plan will be able to make menus and market orders to fit their own needs and to stay within the plan at the cost level they have chosen. A sample set of low-cost menus and the accompanying lists of food to supply these menus are given on pages 18-19.

Low-Cost Menus For 1 Week

SUNDAY

Orange juice
 Pancakes Sirup Butter or margarine
 Bacon

Fried chicken ¹
 Browned potatoes Snap beans
 Lettuce salad—cottage cheese dressing
 Ready-to-serve rolls Butter or margarine
 Apple brown betty ¹

Baked beans with cheese
 Toasted rolls
 Celery, carrot strips
 Plums



MONDAY

Orange juice
 Oatmeal Sugar Milk
 Toast Butter or margarine

Split-pea soup
 Deviled egg sandwiches
 Raw relishes

Meat loaf ¹
 Scalloped potatoes ¹ Carrots
 Green salad
 Combread ¹ Butter or margarine
 Peach upside-down cake ¹



TUESDAY

Bananas
 Ready-to-eat cereal Sugar Milk
 Toast Butter or margarine

Tomato juice
 Peanut butter and lettuce sandwiches
 Apples

Frankfurters and boiled potatoes
 Coleslaw with shredded carrots
 Bread Butter or margarine
 Peach upside-down cake (left from Monday)



WEDNESDAY

Farina
 Sugar Milk
 Toast Butter or margarine

Meat loaf sandwiches
 (meat loaf left from Monday)
 Apple-celery-raisin salad

Chili con carne with beans ²
 Crackers
 Rice Raw carrot strips
 Oranges

THURSDAY

Grapefruit and orange juice
 Omelet
 Toast Butter or margarine

Corn chowder ¹ Crackers
 Spiced beet salad
 Oatmeal cookies ¹

Braised steak and onions ¹
 Boiled potatoes
 Green salad
 Bread Butter or margarine
 Vanilla pudding



FRIDAY

Grapefruit juice
 Fried mush (farina left from Wednesday)
 Sirup
 Toast Butter or margarine

Vegetable soup Crackers
 Coleslaw
 Oatmeal cookies

Broiled fish ¹
 Potatoes Spinach
 Bread Butter or margarine
 Pineapple and cottage cheese salad



SATURDAY

Tomato juice
 French toast Sirup
 Butter or margarine
 Bacon

Cheese rarebit on toast
 Green peas
 Cookies

Ragout of beef ¹
 Noodles Chopped broccoli Celery sticks ²
 Biscuits Butter or margarine
 Cherry crisp

NOTE: There will be milk to drink at each meal for the children, and at one meal a day for parents. Also coffee or tea as desired.

¹ Recipes from "Family Fare," Home and Garden Bul. No. 1.

² Recipe from "Dry Beans, Peas, Lentils . . . modern cookery," Leaflet No. 326.

³ Replace with tomato-cucumber salad when vegetables are in season.

Food for the Week's Menu

Milk, Cheese, Ice Cream

- 18 quarts fluid whole milk.
- $\frac{1}{2}$ – $\frac{3}{4}$ pound Cheddar cheese.
- 1 12-ounce carton cottage cheese.

Meat, Poultry, Fish

- 3 to $3\frac{1}{2}$ pounds frying chicken.
- 1 pound round steak.
- $2\frac{1}{2}$ pounds ground beef.
- 1 to $1\frac{1}{2}$ pounds stew beef.
- 1 pound fish fillet.
- $\frac{1}{2}$ pound bacon.
- $\frac{1}{2}$ pound pork sausage.
- $\frac{3}{4}$ pound frankfurters.

Eggs

- 2 dozen eggs.

Dry Beans, Peas, Nuts

- $\frac{1}{3}$ pound dried navy beans.
- $\frac{1}{3}$ pound dried or 1 No. 303 can red kidney beans.
- 4-ounce package dried split pea soup.
- $\frac{1}{3}$ pound peanut butter.

Flour, Cereals, Baked Goods

- 6 loaves enriched white bread.
- 1 loaf whole-wheat bread.
- 1 loaf cracked-wheat bread.
- 12 ready-to-serve rolls.
- 1 pound crackers.
- 2 pounds all-purpose flour.
- $\frac{2}{3}$ pound pancake mix.
- $\frac{1}{2}$ pound ready-to-eat cereal.
- $\frac{1}{2}$ pound rolled oats.
- $\frac{3}{4}$ pound farina.
- $\frac{1}{2}$ pound rice.
- $\frac{1}{3}$ pound commeal.
- $\frac{1}{3}$ pound noodles.

Citrus Fruit, Tomatoes

- $1\frac{1}{2}$ to 2 pounds oranges.
- 1 46-ounce can orange juice.
- 2 No. 2 cans tomato juice.
- 1 No. $2\frac{1}{2}$ can tomatoes.
- 1 No. 2 can grapefruit juice.
- 1 pound tomatoes (when in season).

Dark-green, Deep-yellow Vegetables

- $1\frac{1}{4}$ pounds carrots.
- $\frac{2}{3}$ pound salad greens in season.
- 1 to $1\frac{1}{2}$ pounds spinach.
- 1 10-ounce package frozen chopped broccoli.

Potatoes

- 9 to 10 pounds white potatoes.

Other Vegetables and Fruits

- 1 pound green beans.
- $1\frac{1}{2}$ to 2 pounds cabbage.
- 1 bunch celery.
- 1 cucumber (in season).
- 1 head lettuce.
- 1 pound onions.
- 1 No. 303 can beets.
- 1 No. 303 can corn.
- 1 10-ounce package frozen green peas.
- 3 pounds apples.
- 3 bananas.
- 1 No. 2 can cherries.
- 1 No. 303 can sliced peaches.
- 1 No. 1 flat can pineapple slices.
- 1 No. 303 can plums.
- 4 ounces raisins.

Fats and Oils

- 1 pound butter or margarine.
- $\frac{1}{2}$ pound shortening.
- $\frac{1}{2}$ pint salad dressing.
- $\frac{1}{8}$ pint salad oil.

Sugars, Sweets

- 1 pound granulated sugar.
- $\frac{1}{2}$ pound brown sugar.
- 1 pint sirup.
- 1 $4\frac{1}{2}$ -ounce package vanilla pudding.

NOTE: There is a money allowance for coffee, tea, and accessories such as vinegar, baking powder, and spices in the estimated cost of each food plan. Sufficient money is allowed in the estimated cost of food for the low-cost plan to buy about $\frac{1}{3}$ pound coffee and 4 tea bags per adult as well as the necessary accessories.

TABLE 11.—*Food groups and approximate servings per person per week, low-cost, moderate-cost, and liberal plans*¹

Food groups ²	Servings per person per week		
	Low-cost plan	Moderate-cost plan	Liberal plan
Milk, cheese, ice cream (in terms of fluid milk).	Children under 10 years about 3 cups a day. Boys and girls over 10 3½ to 4 cups a day. Pregnant women, 1 quart per day. Lactating women, about 1½ quarts per day. Other adults 2 cups a day.	Children under 10 years about 3½ cups a day. Boys and girls over 10 3½ to 4 cups a day. Pregnant women, 1 quart per day. Lactating women, about 1½ quarts per day. Other adults 2 cups a day.	Children, boys and girls, pregnant and lactating women same as moderate-cost. Other adults, 1 pint more per week than low-cost or moderate-cost plans.
Meat, poultry, fish.....	6-9 servings of 3 ounces cooked lean meat.	9-13 servings of 3 ounces cooked lean meat.	10-14 servings of 3 ounces cooked lean meat.
Eggs.....	5-6 a week or in cooking...	6-7 a week or in cooking...	6-7 a week or in cooking.
Dry beans, peas, nuts.....	2-3 servings a week.....	1-2 servings a week.....	1 serving a week.
Flour, cereals, baked goods..	Bread at every meal and a cereal dish once a day.	Bread at every meal and a cereal dish once a day.	Bread at every meal and a cereal dish once a day.
Citrus fruits, tomatoes ³	5-6 servings a week.....	6-8 servings a week.....	8-9 servings a week.
Dark-green and deep-yellow vegetables. ³	2-3 servings a week.....	2-3 servings a week.....	2-3 servings a week.
Potatoes ³	5-11 servings a week.....	4-10 servings a week.....	3-9 servings a week.
Other vegetables and fruits ³ ..	11-20 servings a week.....	18-23 servings a week.....	20-28 servings a week.
Fats and oils.....	As needed.....	As needed.....	
Sugars, sweets.....	As needed.....	As needed.....	

¹ The servings are based on information about food buying on pages 16-17 and the quantities of food groups suggested in the food plans for adults. The smaller number of servings is for women, the larger number for men. For children, the size and number of servings expected from each food group varies for each age and sex group.

² There are also certain miscellaneous food items to be considered in the total food plan. The miscellaneous

group includes such items as tea, coffee, chocolate; salt, pepper, other flavorings; baking powder and soda. No quantities are suggested for these items but allowance is made for their cost (pp. 19, 51).

³ Serving size approximately ¼ cup, or a portion as ordinarily served, such as 1 medium apple, banana, orange, potato, or ½ medium grapefruit.

PART II.—PROCEDURES FOR DEVELOPING THE FOOD PLANS

Before budgets reach the stage at which they become useful tools, they move through many stages of development. The present USDA food budgets have their roots in the early foundations of the science of nutrition. In this part the development of the food budgets and the methods used to keep food plans current are discussed.

History of the Food Plans

Guides for food budgeting developed by the U.S. Department of Agriculture have been in use for more than 65 years. In 1894 Atwater (1), pioneer nutrition investigator and first director of the Department's Office of Experiment Stations, published the first U.S. nutrient standard—an adaptation for the American male of Voit's recommendations for energy and protein needs of the German laborer. In this bulletin, Atwater gave food composition tables in terms of the food nutrients for which values were available at that time—protein, carbohydrate, fat, and "mineral matters." Using these nutritive values of foods and current prices for food he charted the relative economy of the food nutrients. On the basis of these analyses Atwater suggested quantities of several combinations of foods to meet the nutrient standard for the "average" American male at "moderate muscular work." In these early food plans, therefore, consideration was given to the same criteria used for all later plans—nutrient needs, food composition, and relative cost of nutrients in foods in average American diets.

In a later publication, Atwater extended his dietary standards to include values for men at different activity levels and for women at light and at moderately active muscular work. He noted the value of these dietary standards and of the food composition tables for planning diets for different individuals or classes of individuals or in estimating the true nutritive value of food consumed by families or individuals.

In 1905 after Atwater's retirement, C. F. Langworthy, an associate of Atwater, became the chief

of nutrition investigation for the USDA and continued the study of American dietaries—the development of dietary standards and the application of research in the formulation of family food plans. In 1915, when the office of Home Economics was created in the Department of Agriculture, Langworthy was the first director.

Between 1909 and 1927, Caroline L. Hunt, who came to the Department from Hull House, Chicago, translated the scientific nutritive investigations of the period into practical publications for the homemaker. She popularized the idea of discussing the well-balanced diet in terms of five groupings of food classified according to their composition and uses: (1) vegetables and fruits; (2) foods depended on for efficient protein (milk, cheese, eggs, meat, fish, poultry, peanuts, and soybeans); (3) cereal grains and their products; (4) sugars and sugary foods; and (5) fats and fat foods. In Department bulletins such as the one issued in 1923, Miss Hunt (5) discussed the five food groups, the food contained in each group, and the nutritional merits of the important foods in the groups.

Food composition and nutrition research had advanced by the early twenties to the place where the presence of minerals and vitamins in food and their value to the diet was known. Nutritionists assumed that if the foods of the diet provided sufficient calcium, phosphorus, iron, and iodine, other minerals probably would be supplied. Vitamin research had not advanced to the stage of setting levels of requirements, but several food sources of vitamin A, vitamin B complex, and vitamin C had been identified.

Calculations of nutritive values and food costs indicated to Miss Hunt that by following certain rules for proportioning the calorie needs among the five food groups, the dietaries of families would be adequate in nutrients, satisfying in flavor, and moderate in cost. The basic food plan at a moderate-cost level was for the "average" or "census" family consisting of a moderately active man and woman and three children under 12 years

of age. In the suggested diet, fruits and vegetables provided 20 percent of the calories; meat, eggs, milk, and similar foods, 25 percent; cereal foods, 25 percent; sweets, 10 percent; fats and fat foods, 20 percent. Suggestions for quantities of various kinds of foods from each food group were given in terms of both hundred-calorie portions and pounds to illustrate a weekly food supply for the "average" family. The choices of individual foods for the sample dietary were based on their contributions to the total nutritive value of the diet, as well as on their energy value.

By using the information in the Farmers' Bulletin (5), other satisfactory combinations of foods could be made. Also, the quantities of food for the "average" family could be adapted to families of other size and composition and at other economic levels. For example, it was suggested that families needing to economize could increase quantities of cereal foods to provide as much as 37½ percent of the calories. Warnings were given against increasing cereals at the sacrifice of milk or "green leaf" vegetables and against using only refined flour and cereal products. While enrichment of white flour and bread was not practiced in the twenties, home economists knew the importance of whole-grain cereals.

Several food plans for families of different size and composition were prepared in the early 1930's especially for low-income families distressed by the drought and depression. A publication, "Buy Health Protection With Your Food Money," (Stiebelling and others 10) helped home economists and other professional workers to guide families in buying adequate diets with limited resources. Low-income rural families with a shortage of home-grown food, as well as unemployed urban families, needed such guidance. Pellagra was prevalent in the South; therefore, in the bulletin, special attention was given to the kinds and quantities of foods needed weekly to prevent this disease. Also, the food plans were published in popular form for use by individual families.

During this period, Dr. Hazel K. Stiebelling, now Deputy Administrator, for Nutrition and Consumer-Use Research (ARS), developed the first food plans for individuals of different ages and levels of activity. Through the plans for individuals, she interpreted the growing knowledge about food composition and food needs in terms of quantities of the following 12 groups of food: (1) Flour, cereals; (2) milk or its equivalent; (3) potatoes, sweetpotatoes; (4) dried beans, peas,

nuts; (5) tomatoes, citrus fruits; (6) leafy, green, and yellow vegetables; (7) dried fruits; (8) other vegetables, fruits; (9) fats; (10) sugar, molasses, other sweets; (11) lean meat, poultry, fish; and (12) eggs. The plans provided weekly and yearly food supplies at different levels of cost.

In "Diets at Four Levels of Nutritive Content and Cost," 1933, Stiebelling and Ward (11) suggested quantities of the food groups for individuals for (1) a restricted diet for emergency use with nutrients sufficient to meet the minimum needs of the body, but with little margin for safety; (2) and (3) minimum-cost and moderate-cost adequate diets with sufficient nutrients to meet the body's needs with some margin of safety; and (4) a liberal diet that provided for better than average nutrition and a greater variety of food than was possible with the other plans. A popular publication, "Diets To Fit the Family Income," 1936, (2) helped families to choose an adequate diet appropriate to their incomes and to their goals for satisfactory family living.

While both of these plans included food from the same 12 food groups, the quantities from each group varied with the nutritive value and cost level of the plan. The proportionment of quantities of foods among the food groups followed the principles that some groups supply nutrients more cheaply than others and that the nutritive values of the food groups supplement each other.

The proportionment of calories among the food groups served as an indicator of the nutritive value and cost of food plans. For example, in the discussion of the plans, Dr. Stiebelling pointed out that while grains are the most economical source of many nutrients, family diets with more than 45 percent of the calories from grains usually will be relatively low in some essential nutrient. For a family of two moderately active adults and three children the restricted diet and the minimum-cost adequate diet derived 42 and 32 percent, respectively, of their calories from this group. Cereals, supplemented by milk which supplies many nutrients economically, formed the foundation of the low-cost adequate diet. The restricted diet for emergency use included less milk than recommended as desirable. However, the amount of milk was sufficient when combined with the suggested amounts of other protective foods to prevent nutritional diseases such as pellagra. The proportions in the diets of the more expensive foods, such as fruits and vegetables other than potatoes, and the animal products—meat, poultry,

fish, and eggs—then as now—increased with increase in cost level of the diet.

The food plans at four levels of nutritive content and cost were used throughout the thirties by economists planning production programs, by home economists, by social welfare workers, and by homemakers. The plans were used as a pattern for later food plans, being adjusted and modified as necessary to take advantage of the advances in the knowledge of nutrition, changes in economic conditions, the availability of foods, and changes in the relative economy of nutrients in foods.

The nutrient standards used to appraise the adequacy of the early diets planned for individuals were developed by Dr. Stiebeling from research studies. In 1941 the Committee on Food and Nutrition of the National Research Council (7) published its first recommended daily allowances for calories, protein, calcium, iron, vitamin A, thiamin (B₁), riboflavin, nicotinic acid, ascorbic acid, and vitamin D for individuals in 17 sex-age and activity categories. The daily allowances were presented as a "yardstick" by which individuals or population groups could measure their progress toward good nutrition.

In July 1941 the Bureau of Home Economics published "Planning Diets by the New Yardstick of Good Nutrition" (12), in which the food plans for individuals were adjusted slightly to comply with the new allowances. Their plans included two low-cost adequate diets—one for general use and one for the Southeast—a moderate-cost diet, and a liberal diet. The 1941 low-cost plans when compared with those in "Diets at Four Levels of Nutritive Content and Cost" (11) suggested, on the average, larger amounts of milk, leafy, green, and yellow vegetables, and citrus fruits and less of potatoes, other vegetables and other fruits, fats, and sugars. Other adjustments were made for wartime conditions, and later for the rising economic conditions during the postwar years.

The low-cost and moderate-cost food plans were revised in 1948 to comply with the National Research Council's allowances issued in that year. The plans were first published in "Helping Families Plan Food Budgets" (13). A second low-cost food plan also included in this publication suggested quantities of grain products, dry beans and peas, and potatoes, and much smaller quantities of meat, fish, poultry, and eggs than the revised low-cost plan.

When the National Research Council revised their allowances in 1953 and 1955, minor adjustments were again made in the food plans.

When developing new food plans and when making adjustments in the existing food plans, large-scale food consumption surveys have been guides for showing the changes in food patterns of families at different economic levels. These surveys, notably the Consumer Purchases Study of 1935-36, the Spending and Saving in Wartime Study of 1942, Food Consumption of Urban Families in 1948, and the nationwide Household Food Consumption Survey of 1955, have been important also in providing bases for estimating the cost of food for the plans.

Development of Current Food Plans

The food plans published in this report represent the first major revision since 1948. The plans take account of the 1958 edition of the NRC allowances (table 1) and the changes in the relative economy of foods and in food habits since 1948. While the number of food groups remains 11 as in the previous plans, some changes have been made in the kinds of foods included in the meat, poultry, and fish group, the vegetable and fruit groups, and the fats and oils group. (See pages 1-2 for foods included in each group.)

Use of Survey Data With Food Plans

The availability of food and the ability of families in different income classes to buy it is shown by changes over time in family food consumption. When food is plentiful and income rises, the consumption of animal foods—milk, meat, eggs—increases. Conversely, a decrease in family income results in increased use of the more inexpensive though highly nutritious grain products, dry beans and peas, and potatoes.

Data on food consumption from household surveys were used to indicate changes in the food patterns of families in the top, middle, and bottom economic thirds since the last major revision of the food plans (1948).

The food consumption survey made in 1948 included only urban families; therefore, only the data from the urban portion of the 1955 survey were compared with the earlier data in showing trends in family food consumption. Table 12 gives for income thirds the average quantities from the 11 food groups consumed per person per week as shown in the two surveys.

TABLE 12.—Food used at home by urban families in a week in spring, by income thirds

Food groups	1948			1955		
	Low income third	Middle income third	High income third	Low income third	Middle income third	High income third
Milk, cheese, ice cream ¹quarts	3.95	4.44	4.64	3.77	4.50	4.71
Meat, poultry, fish (incl. bacon and salt pork).....pounds	2.89	3.14	3.50	4.02	4.26	4.68
Eggs.....dozen	.53	.56	.60	.55	.57	.62
Dry beans, peas, nuts.....pounds	.36	.33	.28	.39	.35	.36
Flour, cereals, baked goods ²do	2.98	2.78	2.52	2.65	2.41	2.30
Citrus fruit (juice equivalent), tomatoes.....do	1.97	2.17	2.60	1.75	2.19	2.68
Dark-green, deep-yellow vegetables (incl. sweetpotatoes).....do	.76	.72	.80	.67	.63	.67
Potatoes.....do	1.98	2.21	1.94	1.60	1.71	1.63
Other vegetables and fruits.....do	4.64	5.26	5.98	4.57	5.07	5.83
Fats, oils.....do	.88	.89	.87	.83	.81	.86
Sugars, sweets.....do	1.41	1.49	1.37	1.24	1.23	1.25

¹ Fluid whole milk, or its equivalent in cheese, evaporated milk, dry milk, or ice cream.

² Weight in terms of flour and cereal.

Source: U.S. Department of Agriculture (18, table 21).

TABLE 13.—Quantities of food groups in food plans per capita per week

Food group	Food plans				
	Low-cost	Another low-cost ²	Economy	Moderate-cost	Liberal
Milk, cheese, ice cream ²quarts	4.6	4.4	4.1	4.7	5.0
Meat, poultry, fish.....pounds	2.6	2.2	1.6	4.1	4.7
Eggs.....dozen	.5	.5	.4	.5	.6
Dry beans, peas, nuts.....pounds	.3	.4	.4	.2	.1
Flour, cereals, baked goods ⁴do	2.9	3.3	3.2	2.6	2.4
Citrus fruit, tomatoes.....do	2.1	1.9	1.7	2.5	2.9
Dark-green and deep-yellow vegetables.....do	.7	.7	.7	.7	.7
Potatoes.....do	2.1	1.6	2.8	1.9	1.7
Other vegetables and fruits.....do	4.4	4.1	2.8	5.1	5.6
Fats, oils.....do	.5	.6	.6	.6	.6
Sugars, sweets.....do	.6	.6	.7	.8	1.0

¹ Based on population weights of 1960 census.

² Particularly suitable for food habits of families in the Southeastern States.

³ Fluid whole milk or its equivalent in cheese, evaporated milk, dry milk, or ice cream.

⁴ Weight in terms of flour and cereal.

The outstanding change in urban food consumption patterns for all income groups between 1948 and 1955 was the increase in the consumption of meat, poultry, and fish. While there was some trend toward lower consumption of grain products and vegetables, the trend was not as significant as the increased use of meats. As the nonfarm component of the survey data is composed in large part of urban families, we assumed that similar trends are true for all nonfarm families.

Income classes used in developing and pricing of food for plans.—To study the current food patterns of families and to obtain basic data for estimating the cost of food for the plans, food consumption data from selected income classes of nonfarm families reporting in the 1955 survey were used. These representative classes are the ones containing the median incomes of the low, middle, and high third, respectively, of the income distribution. The ranges of the income thirds, their medians, and the representative intervals follow:

U.S. nonfarm:	Income third	Range	Median	Income class in which median falls
Low third.....	Under \$3,380.....		\$2, 258	\$2, 000—\$2, 999
Middle third.....	\$3,381—\$5,095.....		\$4, 236	\$4, 000—\$4, 999
High third.....	\$5,096 and over.....		\$6, 846	\$6, 000—\$7, 999
South nonfarm:				
Low third.....	Under \$2,419.....		\$1, 436	\$1, 000—\$1, 999

Food consumption data from farm families were not included, because by producing some of their own food farm families can usually afford a diet more costly to buy than their money incomes would suggest.

Food group quantities from survey data and in food plans.—In table 13 are given the per capita quantities of food groups for each of the food plans. Because one important use of the lower cost budgets is to show low-income families how to get diets that are nutritionally more adequate than those customarily bought, quantities of food groups are suggested that will result in lower food costs than the averages reported by families in these lower income groups. More affected than any other group is the meat, poultry, and fish group, because a large share of the food budget, as a rule, goes for these products and because they are relatively expensive sources of the important nutrients they supply.

Although the amounts of meat in the low-cost plans are less than the amounts families reported in the survey, there is more meat in these revised plans than in the previous low-cost plans. The amounts of meat, poultry, and fish suggested for the moderate-cost and liberal plans are close to the average amounts families in the higher income classes reported consuming in the spring of 1955.

Quantities of foods in the milk group in the low-cost food plans are greater, on the average, than those used by the survey families. The quantities in the plans will provide each adult with 2 cups and each child with 3 or 4 cups of milk or its equivalent daily.

The food consumption data also indicate that families with low incomes use large amounts of some of the food groups such as cereals that give good returns nutritionwise for the money spent. The low income third of the urban families in the spring of 1955 used about one-third of a pound per person more of grain products (flour equivalent basis) in a week than families in the high income third.

The ceiling placed on the food energy value of the diets, together with the need for including enough of the foods outstanding for certain minerals and vitamins, prevented the inclusion in low-cost plans of some foods in as large quantities as some low-income families used. Sugars and sweets are a case in point.

The data from the 1955 survey show that the southern low-income families consumed about

three-fourths of a pound more grain products per person per week than the U.S.A. average for low-income families. The lower consumption of potatoes by the southern low-income families than by the families in the U.S.A. as a whole indicates that some alternate for this inexpensive vegetable is used by southern families. Rice, cornmeal, hominy, and grits are used in the South as menu alternates for potatoes. The purchase of larger quantities of flour and smaller quantities of commercially baked goods indicates the southerner's preference for home-baked breads. Amounts of the various cereal items used per person in a week in the spring of 1955, by income groups representing in each case the lower third of the income range, were as follows:

	<i>All U.S. nonfarm Pounds</i>	<i>Southern nonfarm Pounds</i>
Flour, cereals, baked goods:		
Flour.....	0.98	1.60
Mixes.....	.15	.08
Cornmeal, hominy, grits, rice.	.50	1.12
Breakfast cereals and pastes.	.42	.29
Bread, baked goods.....	.95	.68
Total.	3.00	3.77

These differences in food patterns between the Southern and All U.S. nonfarm families were considered in preparing a low-cost food plan for families who normally consume large amounts of cereal products as do families with southern food habits. To allow each individual using the plan to have the number of servings of these groups suggested by the Daily Food Guide (20), this second food plan has larger amounts of vegetables and fruits than low-income families in the South reported consuming.

The economy food plan was designed as a nutritionally adequate diet for use when the cost of food must be lower than the average food expenditures of low-income families. It is essentially for emergency use. It deviates further from average food habits than the other plans and relies heavily on dry beans and peas, potatoes, and grain products—foods that are inexpensive sources of many nutrients. It assumes, as well, that major selections within each food group will be the less expensive foods such as nonfat dry milk and seasonally best buys in vegetables and meats.

Cost of food bought according to plans compared with family food expenditures.—Because the margin for household loss or discards between purchase and consumption is more restricted in the food

plans than is customary in practice, the weekly food plans suggest less food than survey families reported buying in a week in spring 1955. The energy value of food for the plans is about one-fifth less than that of food reported used by families. Therefore, the estimated costs of food for the plans are less than the average amounts spent in a week by families in the income classes chosen for comparison. A comparison of the costs in 1955 of the food listed in the budgets with the money value of food (excluding alcoholic beverages) reported consumed at home per person by nonfarm survey households in a week of spring 1955 follows:

Food budgets	Estimated cost	Nonfarm survey families	
		Income class	Average expenditure
Economy plan.....	\$4.30	\$1,000-\$1,999..	\$5.55
Low-cost plan.....	5.40	\$2,000-\$2,999..	6.38
Moderate-cost plan..	7.20	\$4,000-\$4,999..	7.50
Liberal plan.....	8.20	\$6,000-\$7,999..	8.43

The estimated costs of food for the economy and the low-cost plans are considerably lower than the average expenditures for food by families in comparable income classes. Many families classified in lower income brackets on the basis of a single year's reported income, however, may have higher real income status. These families tend to raise the average expenditures of the low-income groups.

The averages for food expenditures by families do not show the wide range of expenditures in the different income classes. How greatly expenditures varied within income classes can be seen in table 14, which shows the percentage distribution of families in four income groups according to the money value of the food they used in a week. It is estimated that three-fourths of the nonfarm families with incomes of \$1,000-\$1,999 in 1955 had food with money value over \$4.30, the cost of food per person for the economy plan in that year. Over two-thirds of those families with incomes of \$2,000-\$2,999 had food with money value greater than the \$5.40 estimated as the cost of food for the low-cost plan. The food of three-fifths of the families with incomes of \$4,000-\$4,999 had a money value greater than the cost of food for the moderate-cost plan (\$7.20 in 1955). The cost of food for the liberal plan (\$8.20) is slightly less than the average money value of the food used by families with incomes of \$6,000-\$7,999 in 1955. In other words, by careful food management many families can have nutritionally adequate diets for less money than they now spend.

TABLE 14.—Distribution of nonfarm households by money value per person of food used at home in a week, April-June 1955, for selected incomes

Money value of food	Income class			
	\$1,000-\$1,999	\$2,000-\$2,999	\$4,000-\$4,999	\$6,000-\$7,999
Under \$2.00....	Percent 2	Percent (1)	Percent (1)	Percent 0
\$2.00-\$3.99....	21	11	2	1
\$4.00-\$5.99....	30	28	21	11
\$6.00-\$7.99....	27	28	28	27
\$8.00-\$9.99....	12	18	27	26
\$10.00 and over	8	15	22	35

¹ Less than 0.5 percent.

Source: U.S. Department of Agriculture (16, table 16).

Families with a limited amount of money to spend will find the low-cost food plans a valuable guide to an adequate diet. Many survey families whose food had a money value similar to the cost of the food for the low-cost food plan (\$5.40 per person per week) failed to have a diet that met or nearly met the NRC allowances. Those families who did have excellent diets distributed their food money in a manner comparable to that of the low-cost food plan. The relationship of the nutritive value of the diet to the distribution of the food money among the various food groups is illustrated in table 15.

Families with excellent and good diets spent more of their food dollars for milk and milk products and for fruits and vegetables and less for meat and miscellaneous food items than did families with diets at the lowest nutrient level.

In the low-cost food plans and among survey families with good diets, about the same share of the food dollar went for milk and meat combined. However, in the food plans a greater part is allotted to milk.

The supply of vitamin C is often low in family diets. As shown in table 15, the percentage of the food dollar allotted to citrus fruit and tomatoes by survey families with diets fully meeting the NRC allowances is the same as in the food plans. However, families whose diets were at the lower nutrient levels spent less for this group. These families, moreover, spent more for the miscellaneous foods that contribute little or no nutritive value than did the families meeting NRC allow-

TABLE 15.—*Distribution of expenditures among groups of foods for all households, for households meeting specified percentage of NRC allowances, and for low-cost food plans*

[Nonfarm households with incomes of \$2,000–\$3,999 spending \$4.00–\$5.99 weekly per person for food, spring 1955. Estimated cost of food for food plan, April–June 1955.]

Food group	All households	Households with diets meeting specified percentage of NRC allowances			Low-cost food plan
		100 percent for all nutrients	67 to 100 percent for all nutrients	Less than 67 percent for 1 or more nutrients	
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Milk, cheese, ice cream.....	16.1	19.9	16.6	11.4	20.6
Meat, poultry, fish.....	29.8	25.6	28.9	35.7	25.2
Eggs.....	5.2	4.9	5.3	4.9	4.3
Dry beans, peas, nuts.....	1.5	1.4	1.6	1.4	1.5
Flour, cereals, baked goods.....	12.5	12.3	12.3	13.2	12.9
Citrus fruit, tomatoes.....	4.0	5.0	3.9	3.4	5.2
Potatoes.....	2.3	2.6	2.2	2.4	3.0
Dark-green, deep-yellow vegetables.....	1.3	1.9	1.4	.8	15.3
Other vegetables, fruits.....	11.6	11.6	12.2	10.2	
Fats, oils.....	5.0	4.8	5.1	4.9	2.8
Sugars, sweets.....	4.0	4.5	3.7	4.2	2.1
Miscellaneous foods ¹	6.7	5.5	6.7	7.5	7.1

¹ No nutritive value calculated; includes coffee, tea, spices.

ances for all nutrients. In the low-cost food plans less money is proportioned for fats and sugars combined than the survey families spend for fats alone. Also in the food plans more of the food dollar is allowed for fruits and vegetables than the average family in the survey spent.

Other Ways of Developing Food Plans

There are many combinations of foods that would provide nutritionally adequate diets at specified cost levels. These could be developed by following other criteria than we have followed. For example, income levels different from those used in the USDA food budgets could have been chosen as the starting point for estimating costs of food. Different assumptions with regard to allowable waste could have been made. Different standards for nutritional adequacy could also have been used. Finally, an entirely different technique could have been followed; for example, linear programming in which the problem is to select a set of quantities of foods that will meet nutritional and conventional specifications (in the food pattern) at the least cost. At least one econometrician (9) has set up several models using this method. The variety and cost of the models have depended

upon the “restraints” used in the model. The use and level of the restraints (in an effort to obtain palatability in the diet) are matters of judgment for the research worker just as are the assumptions used in the development of the USDA food plans.

Food Plans for Individuals

No systematic compilation of data has been made that shows consumption of food by persons of different age and sex. Quantities of food from the various food groups were tentatively established on the basis of general knowledge of food consumption habits. The nutritive content of the food in each group was then calculated by application of unit nutritive values that had been determined for the group (table 16) and the total for each nutrient was computed. These estimated values were compared with the NRC allowances for the man 20 to 34 years of age as adapted and shown in table 1, and adjustments were made in the food quantities if necessary. When food group quantities for the man were satisfactorily developed, the distribution of calories among the groups served as a starting point for setting food group quantities for the other adult sex-age categories.

TABLE 16.—Nutritive value per pound of food groups for use with food plans

Items	Food energy	Protein	Fat	Carbo- hydrate	Calcium	Iron	Vitamin A value	Thiamine	Ribo- flavin	Niacin	Ascorbic acid
	<i>Cal.</i>	<i>Gm.</i>	<i>Gm.</i>	<i>Gm.</i>	<i>Mg.</i>	<i>Mg.</i>	<i>I. U.</i>	<i>Mg.</i>	<i>Mg.</i>	<i>Mg.</i>	<i>Mg.</i>
Milk, cheese, ice cream (milk equiv.) ¹	300	17	16	22	540	0.4	700	0.14	0.76	0.5	5
Meat, poultry, fish ^{1 2}	780	63	58	1	50	9.2	1,500	.62	.68	14.0	2
Eggs ¹	650	52	46	3	220	10.9	4,600	.33	1.11	.3	0
Dry beans, peas, nuts ¹	1,910	106	85	210	600	25.3	100	1.59	.92	26.1	5
Flour, cereals, baked goods (flour equiv.) ^{3 4}	2,010	54	24	392	460	12.4	100	1.48	.93	13.1	0
Potatoes ¹	320	8	0	73	40	2.7	0	.32	.13	4.0	42
Citrus fruit, tomatoes ¹	150	4	1	36	60	1.9	2,400	.24	.13	1.9	117
Dark-green and deep-yellow vege- tables ¹	210	7	2	46	240	4.0	28,000	.18	.30	2.2	87
Other vegetables and fruits ¹	190	5	1	44	90	2.4	1,400	.16	.18	1.7	35
Fats and oils ¹	3,770	1	424	1	30	0	5,200	0	0	0	0
Sugars, sweets ¹	1,670	3	6	400	80	2.3	0	.03	.10	.4	3
Used for southern adaptation of low-cost plan:											
Meat, poultry, fish ⁵	860	60	67	2	60	8.2	2,500	.60	.68	13.3	2
Flour, cereals, baked goods (flour equiv.) ^{4 5}	1,850	49	18	366	480	11.6	100	1.40	.88	12.2	0

¹ Weights used in calculating the nutritive values per pound of food group were based on per capita civilian supplies for 1955 (19).

² Estimated average losses of fat in cooking of meat were deducted from food energy and fat values of the meat, poultry, fish group.

³ Weights used in calculating the nutritive values per pound of food group were based on average consumption of U.S.A. housekeeping families (16)

⁴ Assumes enrichment of most of flour and cereal products.

⁵ Weights used in calculating the nutritive value per pound of food group were based on average consumption of southern nonfarm housekeeping families (17).

Source: Based on nutritive values published in Agriculture Handbook No. 8 (21) and unpublished data; from these values cooking losses were deducted for thiamine, riboflavin, niacin, and ascorbic acid.

The nutritive values of food for each individual plan were determined and compared with appropriate NRC allowances. The nutritive value of the food for the various sex-age categories as finally determined is shown as a percentage of the NRC allowances (table 17). Though the level of

some nutrients seems high, recognition must be taken of the fact that all group quantities suggested are for food as it enters the kitchen, whereas NRC allowances are for food ingested. The margins then make allowance for this and for reasonable discards and waste.

TABLE 17.—Nutritive values of the food suggested in plans for individuals by age and sex, in terms of percentages of National Research Council's Daily Dietary Allowances

[Dietary allowances shown in table 1=100]

Individuals by age and sex	Percentage of dietary allowances provided by suggested diet in—							
	Food energy	Protein	Iron	Vitamin A value	Thiamine	Riboflavin	Niacin	
Low-cost food plan								
Children:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1-3 years.....	108	148	109	106	201	114	179	124
4-6 years.....	107	138	116	124	179	117	151	127
7-9 years.....	105	135	123	126	173	126	143	129
10-12 years.....	106	139	123	129	146	120	142	123
Girls:								
13-15 years.....	106	126	120	103	156	121	134	124
16-19 years.....	104	130	118	99	152	126	139	129
Boys:								
13-15 years.....	105	133	118	124	161	120	138	122
16-19 years.....	107	132	125	150	168	128	126	128
Women:								
20-34 years.....	104	127	116	114	168	128	118	143
35-54 years.....	104	126	115	111	163	125	116	139
55-74 years.....	107	121	111	103	158	116	112	131
75 years and over.....	108	128	108	98	155	110	117	125
Pregnant.....	107	123	104	102	186	117	134	119
Lactating.....	105	127	106	123	156	113	143	163
Men:								
20-34 years.....	105	142	136	199	151	125	117	144
35-54 years.....	104	132	131	184	146	123	110	141
55-74 years.....	105	132	126	168	144	123	111	138
75 years and over.....	107	128	123	161	139	126	108	144
Per capita.....	105	132	126	133	159	117	131	140
Another low-cost food plan								
Children:								
1-3 years.....	109	142	110	100	203	113	178	115
4-6 years.....	109	132	118	115	182	111	148	114
7-9 years.....	109	130	119	127	174	115	137	128
10-12 years.....	109	134	120	128	148	120	136	121
Girls:								
13-15 years.....	110	122	123	101	161	122	134	120
16-19 years.....	109	127	121	97	156	128	139	124
Boys:								
13-15 years.....	106	126	116	120	162	118	131	116
16-19 years.....	107	124	123	145	171	126	120	122
Women:								
20-34 years.....	109	122	122	110	171	127	117	135
35-54 years.....	110	122	120	108	166	126	116	133
55-74 years.....	108	110	112	93	160	110	108	117
75 years and over.....	110	116	110	89	159	105	114	112
Pregnant.....	111	119	106	98	189	115	134	113
Lactating.....	109	123	108	119	161	112	142	155
Men:								
20-34 years.....	106	132	132	192	155	123	109	137
35-54 years.....	106	124	126	177	149	121	103	134
55-74 years.....	107	123	121	162	146	121	103	132
75 years and over.....	107	119	117	153	142	122	99	134
Per capita.....	108	126	126	127	162	117	125	133

	Food energy	Protein	Calcium	Iron	Vitamin A value	Thiamine	Riboflavin	Niacin	Ascorbic acid
Economy food plan									
Children:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>		<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1-3 years.....	105	131	100	98		110	163	112	126
4-6 years.....	105	129	109	118		114	138	122	103
7-9 years.....	106	126	114	121		112	131	126	114
10-12 years.....	106	131	115	123		116	132	119	105
Girls:									
13-15 years.....	107	122	114	103		122	126	125	106
16-19 years.....	107	126	99	99		126	131	130	103
Boys:									
13-15 years.....	105	126	107	122		117	124	120	100
16-19 years.....	106	123	113	145		124	113	123	100
Women:									
20-34 years.....	106	109	84	102		124	103	127	110
35-54 years.....	107	108	84	101		123	102	126	106
55-74 years.....	105	100	100	92		110	96	114	102
75 years and over.....	106	105	98	86		103	100	107	98
Pregnant.....	104	117	103	96		112	131	111	115
Lactating.....	105	116	106	112		108	138	145	98
Men:									
20-34 years.....	106	125	129	187	130	123	103	131	117
35-54 years.....	106	119	121	173	126	120	98	131	107
55-74 years.....	107	118	116	157	125	119	98	127	101
75 years and over.....	106	111	113	146	122	119	94	129	98
Per capita.....	106	120	117	124	140	115	117	129	107
Moderate-cost food plan									
Children:									
1-3 years.....	113	164	117	115	221	119	196	136	161
4-6 years.....	115	155	125	136	202	121	166	139	145
7-9 years.....	114	150	131	135	192	118	156	142	148
10-12 years.....	114	158	123	145	184	127	151	144	138
Girls:									
13-15 years.....	115	145	120	118	173	130	144	149	132
16-19 years.....	116	149	118	111	169	134	147	152	128
Boys:									
13-15 years.....	115	154	119	141	179	129	148	145	129
16-19 years.....	117	149	126	167	189	135	134	147	129
Women:									
20-34 years.....	116	150	117	130	189	138	129	170	137
35-54 years.....	116	145	114	124	187	130	125	162	131
55-74 years.....	116	140	109	116	177	122	121	154	118
75 years and over.....	118	144	108	108	172	115	125	142	112
Pregnant.....	116	138	103	112	196	122	141	139	127
Lactating.....	114	139	106	134	167	118	149	185	112
Men:									
20-34 years.....	116	160	138	220	171	132	125	162	151
35-54 years.....	116	150	131	202	165	130	119	160	142
55-74 years.....	115	152	127	188	161	131	120	160	138
75 years and over.....	113	145	122	176	156	130	116	163	129
Per capita.....	115	151	128	146	179	125	138	160	136

TABLE 17.—Nutritive values of the food suggested in plans for individuals by age and sex, in terms of percentages of National Research Council's Daily Dietary Allowances—Continued

[Dietary allowances shown in table 1=100]

Individuals by age and sex	Percentage of dietary allowances provided by suggested diet in—								
	Food energy	Protein	Calcium	Iron	Vitamin A value	Thia-mine	Ribo-flavin	Niacin	Ascorbic acid
	Liberal food plan								
Children:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1-3 years.....	118	178	118	128	235	127	203	154	173
4-6 years.....	123	167	126	149	263	125	173	154	163
7-9 years.....	116	158	131	143	204	121	160	153	164
10-12 years.....	120	169	125	156	194	134	156	157	153
Girls:									
13-15 years.....	120	154	120	126	182	135	148	162	145
16-19 years.....	120	158	118	118	178	138	152	165	139
Boys:									
13-15 years.....	120	163	120	150	188	135	153	156	141
16-19 years.....	122	157	128	177	201	141	139	157	143
Women:									
20-34 years.....	121	157	126	133	201	139	138	174	152
35-54 years.....	121	153	124	127	200	132	135	168	148
55-74 years.....	121	148	119	118	190	123	130	159	137
75 years and over.....	121	152	117	110	185	117	135	146	131
Pregnant.....	118	141	103	115	205	123	143	143	145
Lactating.....	120	146	106	142	171	122	152	197	117
Men:									
20-34 years.....	119	168	149	227	182	135	134	168	164
35-54 years.....	121	157	143	209	173	134	127	165	152
55-74 years.....	121	159	139	194	168	135	129	165	146
75 years and over.....	120	152	133	182	163	135	125	168	137
Per capita.....	120	160	134	154	192	128	148	169	150

The combinations of food from the 11 groups in the quantities indicated in the plans provide most of the nutrients at a level well above the NRC allowances. The margins of safety are not so great in the economy plan as in the other plans, but no nutrient is at a level lower than 80 percent of the NRC allowances. Adolescent girls, pregnant women, and older women whose calorie allowances are low in relation to high recommended nutrient allowances will need to take care to select meats and vegetables high in iron in order to meet their allowance for this nutrient. This is especially true for those following the low-cost plans. A serving of liver weekly would insure the extra iron needed.

Because of the interest in the kinds and amounts of protein, fat, and carbohydrate in diets, calculations of the energy components of the plans were

made. Table 18 gives the percentages of calories from each foodstuff—protein, fat, and carbohydrate. The protein in the food plans averages between 13 and 15 percent of the calories. Fat provides from 35 to 40 percent of the calories in the food as brought into the kitchen.³ As expected, carbohydrate provides a larger percentage of calories in the low-cost than in the moderate-cost or liberal plans.

In the low-cost plans, approximately two-thirds of the carbohydrate is from starch, and one-third is from sugar (table 19). In the moderate-cost and liberal plans, smaller proportions of the carbohydrate come from starch. In table 19 also are estimates for selected age groups of the amounts

³ In computing these figures, considerable loss or discard of fat in trimming and cooking meat is assumed. (See pp. 34-35.)

TABLE 18.—Food energy from protein, fat, and carbohydrate content of food in the food plans, by sex-age groupings

Sex-age groupings	Low-cost food plan				Another low-cost food plan				Economy food plan				Moderate-cost food plan				Liberal food plan				
	Food energy	Protein	Fat	Carbohydrate	Food energy	Protein	Fat	Carbohydrate	Food energy	Protein	Fat	Carbohydrate	Food energy	Protein	Fat	Carbohydrate	Food energy	Protein	Fat	Carbohydrate	
	Cal.	Pct.	Pct.	Pct.	Cal.	Pct.	Pct.	Pct.	Cal.	Pct.	Pct.	Pct.	Cal.	Pct.	Pct.	Pct.	Cal.	Pct.	Pct.	Pct.	
Children:																					
1-3 years	1,410	17	40	43	1,410	16	39	45	1,360	15	37	48	1,460	18	42	40	1,540	18	44	38	38
4-6 years	1,830	15	38	47	1,850	14	40	46	1,790	14	36	50	1,950	16	39	45	2,080	16	42	42	42
7-9 years	2,200	15	37	48	2,290	14	38	48	2,220	13	39	48	2,390	15	41	44	2,450	15	42	42	43
10-12 years	2,650	14	35	51	2,720	14	36	50	2,650	14	35	51	2,860	15	39	46	2,990	16	39	45	45
Girls:																					
13-15 years	2,760	14	37	49	2,860	14	38	48	2,790	14	38	48	3,000	15	41	44	3,110	16	42	42	42
16-19 years	2,500	15	35	50	2,610	14	36	50	2,570	15	35	50	2,780	16	41	43	2,890	16	41	43	43
Boys:																					
13-15 years	3,270	13	36	51	3,290	13	36	51	3,260	13	35	52	3,570	15	38	47	3,730	15	38	47	47
16-19 years	3,850	14	34	52	3,850	13	35	52	3,800	13	34	53	4,200	14	38	48	4,390	14	39	47	47
Women:																					
20-34 years	2,090	14	34	52	2,170	13	35	52	2,120	12	31	57	2,320	15	38	47	2,410	15	39	46	46
35-54 years	1,990	15	32	53	2,090	14	33	53	2,040	13	29	58	2,200	16	40	44	2,290	16	41	43	43
55-74 years	1,810	16	34	50	1,840	14	37	49	1,790	13	32	55	1,970	17	41	42	2,050	17	41	42	42
75 years and over	1,730	16	36	48	1,760	14	38	48	1,700	13	34	53	1,890	17	41	42	1,940	17	42	41	41
Pregnant	2,460	16	36	48	2,540	15	37	48	2,390	15	35	50	2,670	16	40	44	2,720	16	40	44	44
Lactating	3,150	16	37	47	3,280	15	39	46	3,150	15	36	49	3,410	16	41	43	3,590	16	41	43	43
Men:																					
20-34 years	3,140	13	34	53	3,180	12	35	53	3,180	12	32	56	3,470	14	39	47	3,580	14	39	47	47
35-54 years	2,820	14	35	51	2,870	13	35	52	2,860	12	33	55	3,120	14	39	47	3,270	14	39	47	47
55-74 years	2,630	14	36	50	2,670	13	37	50	2,660	12	34	54	2,880	15	39	46	3,020	15	39	46	46
75 years and over	2,460	14	35	51	2,460	13	36	51	2,430	13	34	53	2,610	15	40	45	2,750	15	39	46	46
Per capita	2,350	14	35	51	2,410	14	36	50	2,360	13	34	53	2,570	15	40	45	2,680	15	40	45	45

of the important fatty acids in food for the plans. In all of the plans, saturated fatty acids account for about two-fifths of the fatty acids. Linoleic acid provides about 4 percent of the calories and from 11 to 14 percent of the fatty acids. The ratio of linoleic acid to saturated fatty acid ranges from 1:2.9 in the economy diet to 1:3.7 in the liberal diet. The ratios are lowest for children and older girls and highest for men and older boys.

Calculation of Group Nutritive Values Used With Plans

As previously indicated the nutritive values of the food in the budgets were computed by use of a set of nutritive values per pound of the food group (table 16). This method is a more rapid one than computing item by item any combination of choices within the groups. It is accurate insofar as the values per unit represent average choices

TABLE 19.—Estimated fats, fatty acids, and carbohydrates per day in food plans by selected sex-age groupings

Selected sex-age groupings by food plan (1)	Total fat ¹ (2)	Fatty acids				Carbohydrates		
		Satu- rated ² (3)	Unsaturated			Total ¹ (7)	Proportion from—	
			Total ² (4)	Oleic (5)	Linoleic (6)		Starch (8)	Sugar (9)
LOW-COST PLAN								
Men, 20-34 years.....	121	41	70	50	15	415	67	33
Women, 20-34 years.....	79	28	44	32	9	275	62	38
Girls, 7-9 years.....	93	35	50	37	9	267	58	42
Boys, 10-12 years.....	104	39	57	42	11	338	60	40
Per capita ³	93	34	51	37	10	299	63	37
ANOTHER LOW-COST PLAN ⁴								
Men, 20-34 years.....	126	41	74	52	17	418	71	29
Women, 20-34 years.....	86	30	49	35	10	282	66	34
Girls, 7-9 years.....	98	35	55	40	11	278	64	36
Boys, 10-12 years.....	109	40	61	44	12	346	65	35
Per capita ³	97	34	55	40	11	304	67	33
ECONOMY PLAN								
Men, 20-34 years.....	116	38	68	48	17	449	70	30
Women, 20-34 years.....	75	26	42	30	9	303	67	33
Girls, 7-9 years.....	94	34	53	38	11	274	63	37
Boys, 10-12 years.....	106	39	59	43	12	341	64	36
Per capita ³	90	32	51	36	11	318	67	33
MODERATE-COST PLAN								
Men, 20-34 years.....	150	51	86	62	18	418	62	38
Women, 20-34 years.....	100	36	56	41	10	273	55	45
Girls, 7-9 years.....	109	41	59	44	11	269	51	49
Boys, 10-12 years.....	125	46	68	50	12	331	57	43
Per capita ³	114	41	63	46	12	294	58	42
LIBERAL FOOD PLAN								
Men, 20-34 years.....	156	54	89	64	18	429	58	42
Women, 20-34 years.....	106	38	58	43	10	278	49	51
Girls, 7-9 years.....	115	43	62	46	11	265	47	53
Boys, 10-12 years.....	131	49	72	53	13	344	55	45
Per capita ⁴	121	44	67	49	12	303	53	47

¹ Total fat and carbohydrate computed from Agriculture Handbook No. 8 (21). Fat total includes other components than fatty acids, as glycerol and unsaponifiable matter.

² Fatty acid composition computed using "Fatty Acids in Food Fats" (4).

³ Based on population weights of 1960 Census.

⁴ Especially suitable for food habits of families in the Southeastern States.

within each food group. For use with family food plans, the combinations of foods within the groups should reflect choices of families. Two available sources of information have special validity for this purpose—currently the spring 1955 Household Food Consumption Survey and the U.S. per capita food supply.

Since this latest survey was made in the spring, a set of nutritive values for foods based on the assortment of foods reported at that time may have the disadvantage of seasonal bias. However, by using group values based on the yearly averages of per capita food consumption (so-called "disappearance" statistics), seasonal differences are avoided. These data can be used with the food plans for 8 of the 10 food groups for which weights are required: (1) Milk and milk products; (2) meat, poultry, fish; (3) dry beans, peas, nuts; (4) citrus fruit, tomatoes; (5) dark-green and deep-yellow vegetables; (6) potatoes; (7) other vegetables and fruits; and (8) fats and oils. (Eggs in a single form make up one group and no percentage distribution is needed.)

For two groups; namely, flour, cereals, and baked goods, and sugars and sweets, nutritive values based on national food supply data are not appropriate, because family purchases of most of the items in these groups differ in form or in relative proportion within the group from the form or relative proportion in which they "disappear" into consumption channels. For example flour "disappears" as flour but is purchased chiefly as bread, which also includes some fat and sugar. Families buy as sugar a relatively small proportion of the sugar disappearing into consumption channels, because a large proportion of it is used commercially in the manufacture of soft drinks or in canning fruit or in making baked goods. Because family food budgets should represent average nutritive values of food entering family kitchens, the 1955 family consumption figures are used for these two groups of food. For these groups, seasonal variation in consumption is probably not great.

While there are no important differences in group nutritive values by income, there are regional differences. The meat, poultry, and fish group and the grain products group show the greatest regional differences. Families in the South use a different assortment of meat and do more home baking than their counterparts in other regions. For these two food groups, nutritive values per pound of food were calculated

from the assortment of foods consumed by non-farm families in the South as reported in the 1955 food consumption survey. These values rather than those based on the national food supply and average household food consumption data were used with the low-cost plan adapted for the South. For the other nine food groups the same values were used for all the plans. The percentage distribution of individual foods within the groups used in deriving the nutritive value is shown in table 20.

The group nutritive values are more useful, of course, for groups of families than for calculations of the diets of individuals or families where computations can be based on specific food items.

It is not to be expected that individual families using the food plans will buy, week by week, the exact assortment within the food groups corresponding to the weighting in table 20. However, over a period of a year the distribution within food groups, on the average, may be assumed to follow a similar pattern. If families make better than average choices nutritionally, their meals will exceed the nutritive values calculated for the plans. Conversely, consistently poor choices will result in meals with nutritive values below those calculated. For example, the per pound values for the citrus fruit and tomatoes group are based on the use of about 58 percent citrus fruit and 42 percent tomatoes. If tomato juice were used for the entire quantity suggested for the group in the food plans, it would contribute 40 percent less ascorbic acid than the 117 milligrams per pound estimated for average selections of citrus fruit and tomatoes combined. However, because foods of similar nutritive values are grouped together, there is less scope for variation in the group averages than might be expected. Even consistently poor selections of foods within the food groups does not preclude the family's having a fair (but not an excellent) diet if the suggested quantities of food groups are used.

Sources of data on nutritive values of foods.—The nutritive values of the foods in the groups were calculated by use of values for energy and 10 nutrients as published in table 2 of Agriculture Handbook 8 (21). This table gives the quantities of nutrients obtained from the foods purchased in generally good condition with adjustment for inedible portions such as bones, pits, and shells. The loss of fat in cooking and in trimming of the separable fat is taken into account in estimating the energy and fat values of meat by assuming the

The fatty acid values of the fat in the food groups were computed from data in "Fatty Acids in Food Fats" (9). Since this report does not include all the items used in the food plans (those shown in table 20), assumptions were made in selecting listed foods to represent those for which no values are given in this report.

average nutritive values per pound of 11 food groups

Food item (1)	Distribution of food as purchased		Conver- sion factor for calcium equivalent (4)	Distribution of con- verted amounts (calcium equivalent basis)	
	Pounds per person per week (2)	Percent (3)		Converted pounds (5)	Percent (6)
	5.87	72.4	1.0	5.9	
	.29	3.6	2.1	.6	
	1.06	13.1	1.0	1.1	
	.12	1.5	11.0	1.3	
	(?) .14	(?) 1.7	(?) .8	(?) .1	
	.15	1.8	5.9	.9	
	.08	1.0	.5	(?)	(?)
	.10	1.2	1.0	.1	1.0
	.10	1.2	.7	.1	1.0
	.20	2.5	2.1	.4	3.8
	8.11			10.5	100.0
	1.04	26.9	1.00	1.04	36.3
	.54	14.0	1.00	.54	18.8
Mixes.....	.18	4.7	.60	.11	3.8
Baked products:					
Bread, rolls	1.48	38.4	.60	.89	31.0
Crackers.....	.14	3.6	1.00	.14	4.9
Cake, other baked goods..	.39	10.1	.30	.12	4.2
Soups, mixtures, mostly grains...	.09	2.3	.30	.03	1.0
	3.86	100.0		2.87	100.0
Flour, cereals, baked goods, ⁴ used					
Flour, cereals:					
Flour and meal including grits, hominy.	1.86	43.2	1.00	.86	54.2
Cereals and pastes....	.48	11.1	1.00	.48	14.0
Mixes.....	.14	3.2	.60	.08	2.3
Baked products:					
Bread, rolls ..	1.25	29.0	.60	.75	21.9
Crackers.....	.13	3.0		.13	3.8
Cake, other baked goods..	.34	7.9		.10	2.9
Soups, mixtures, mostly grains....	.11	2.6		.03	.9
	4.31	100.0		3.43	100.0

TABLE 20.—Consumption weights used in deriving average nutritive values per pound of 11 food groups—Continued

Food item (1)	Distribution of food as purchased		Food item (1)	Distribution of food as purchased	
	Pounds per person per week (2)	Percent (3)		Pounds per person per week (2)	Percent (3)
Eggs,¹ used with U.S.A. and southern plans:			Citrus fruit, tomatoes,¹ used with U.S.A. and southern plans—Con.		
Eggs.....	0.89	100.0	Tomatoes:		
Dry beans, peas, nuts,¹ used with U.S.A. and southern plans:			Fresh:		
Beans and peas.....	.16	53.3	Tomatoes.....	0.55	
Nuts, shelled.....	.12	40.0	Canned:		
Other (soya flour and grits).....	.02	6.7	Tomato products (including juice).....	.19	
Total.....	.30		Concentrate (including soup, pulp, paste, catsup, and chili sauce).....	.18	8.3
Meat, poultry, fish,¹ used with U.S.A. plan:			Total.....	2.17	
Meat, retail weight:			Dark-green and deep-yellow vegetables,¹ used with U.S.A. and southern plans:		
Beef.....	1.25	33.8	Fresh:		
Veal.....	.17	4.6	Sweetpotatoes.....	.15	26.0
Lamb.....	.08	2.2	Carrots.....	.16	27.7
Pork.....	.83	22.5	Dark-green, leafy.....	.09	15.5
Poultry.....	.52	14.1	Other dark-green and yellow.....	.08	
Fish.....	.22	6.0	Canned:		
Bacon and salt pork.....	.36	9.8	Sweetpotatoes.....	.02	3.4
Other (variety meat, game).....	.26	7.0	Carrots.....	.02	3.4
Total.....	3.69		Dark-green, leafy.....	.02	3.4
Meat, poultry, fish,⁴ used with southern plan:			Other dark-green and yellow.....	.01	1.7
Meat, retail weight:			Frozen:		
Beef.....	.89	22.3	Carrots.....	(?)	(?)
Veal.....	.04	1.0	Dark-green, leafy.....	.02	3.4
Lamb.....	.03	.8	Other dark-green and yellow.....	.01	1.7
Pork.....	.84	21.2	Total.....	.58	
Poultry.....	.71	17.9	Potatoes,¹ used with U.S.A. and southern plans:		
Fish.....	.42	10.6	Fresh: White potatoes.....	1.99	99.5
Bacon and salt pork.....	.45	11.3	Canned: White potatoes.....	.01	.5
Other (variety meat and luncheon meat) ⁵59	14.9	Total.....	2.00	
Total.....	3.97		Other vegetables and fruits,¹ used with U.S.A. and southern plans:		
Citrus fruit, tomatoes,¹ used with U.S.A. and southern plans:			Fresh:		
Citrus fruit:			Light-green and yellow vegetables.....	.92	17.9
Fresh:			Other vegetables.....	1.10	21.3
Oranges and other citrus fruit.....	.76	35.0	Other fruit.....	1.70	33.0
Canned:					
Orange juice.....	.08	3.7			
Other citrus.....	.08	3.7			
Citrus segments.....	.02	.9			
Frozen:					
Orange juice.....	.28	12.9			
Other citrus.....	.03	1.4			

See footnotes at end of table.

TABLE 20.—Consumption weights used in deriving average nutritive values per pound of 11 food groups—Continued

Food item (1)	Distribution of food as purchased		Food item (1)	Distribution of food as purchased	
	Pounds per person per week (2)	Percent (3)		Pounds per person per week (2)	Percent (3)
Other vegetables and fruits,¹ used with U.S.A. and southern plans—Continued			Fats, oils,¹ used with U.S.A. and southern plans:		
Canned:			Butter and margarine.....	0.33	35.6
Light-green and yellow vegetables.....	0.20	3.9	Shortening.....	.22	23.6
Other vegetables.....	.45	8.8	Lard.....	.19	20.4
Other fruit.....	.44	8.6	Other edible fats and oils.....	.19	20.4
Fruit juices.....	.10	1.9	Total.....	.93	100.0
Frozen:			Sugar, sweets,² used with U.S.A. and southern plans:		
Light-green and yellow vegetables.....	.07	1.4	Sugar.....	.83	61.5
Other vegetables.....	.02	.4	Sirups, molasses.....	.16	11.9
Other fruit.....	.07	1.4	Jams, jellies, preserves.....	.18	13.3
Dried: Other fruit.....	.07	1.4	Desserts, other.....	.18	13.3
Total.....	5.14		Total.....	1.35	

¹ Consumption weights based on data from 1955 United States Per Capita Food Supply (19).

² Less than 0.05.

³ Consumption weights based on data for U.S.A. non-farm households (14).

⁴ Consumption weights are based on data for nonfarm households in the South (15).

⁵ Includes soups, baby food, meat mixtures, and baby junior foods.

PART III.—PROCEDURES USED IN PRICING THE FOOD PLANS

After the plans were developed, the next step was to compute the cost of the food. The procedure of multiplying the food plan quantities by their prices and summing the costs can be performed for the survey period (spring 1955) when data are available on quantities used and prices paid. But a method is needed to estimate costs at regular intervals of time to take account of any changes in prices.

Because the food plan quantities are expressed in terms of groups of food, average prices for food groups are needed. But food groups, as such, cannot be priced; items must be defined specifically in order to be sure the same ones are priced each period. Because it would be an insurmountable task to price periodically all items used by families, a sample of them is used instead. The sampling procedure involves selecting the items, determining the weight to be assigned to each, and introducing some adjustments to take account of the manner of selection and computation.

The selection of any particular set of prices as a sample representing price *movement* in no way determines the cost *level* of the food plans.

The prices of 80 food items published periodically by the Bureau of Labor Statistics for their Consumer Price Index are used as the sample of prices. The weights are different for the low-cost, moderate-cost, and liberal food plans. They were computed from the amounts reported by families surveyed in 1955 at several income levels. For the Northeast, the North Central, the West, and the U.S. as a whole, one set of income levels was used; for the South, another set was used as follows:

Plan	United States, Northeast, North Central, West	South
Low-cost.....	\$2, 000—\$2, 999	\$1, 000—\$1, 999
Moderate-cost.....	\$4, 000—\$4, 999	\$3, 000—\$3, 999
Liberal.....	\$6, 000—\$7, 999	\$5, 000—\$5, 999

To use the reported quantities as the basis for the weights, it must be assumed that families will continue to choose the items within each group in the same proportion as they did during the survey period. This assumption must hold even if the

total quantity of that group in the food plan is different from that actually used by the families of the survey or if the prices of the items within the group shift in relation to each other.

Rationale

For estimating costs, the price of each BLS item is used as a price representative of a combination of items in the same food group. Such combinations are known as "pricing groups." They are the same for the three food plans and have the following characteristics:

- a. The items in a pricing group have prices which tend to change at the same rate.
- b. Each item is in one, but only one, pricing group.
- c. Each pricing group includes one item that is priced by the Bureau of Labor Statistics.

The stub (col. 1) of table 22 in appendix A shows the survey food items as they have been placed in their pricing groups within the food groups.⁴ The first item in each pricing group (identified by *) is, or includes, the specific food priced by BLS.

Distributions within food groups of the quantities actually used by the families in each of the three income classes are shown for nonfarm households in the U.S.A. in table 22 (columns 2 to 4).

A little over 70 percent of the total food consumed is priced when measured in terms of poundage of these items identified by the asterisk. The percentage in terms of money value is a little more than 60 percent.

The weight assigned to each priced item is the proportion of the food group poundage that is in its pricing group (boldface italics in columns 2 to 4). That is, the priced item is given the weight of its pricing group. For example, the priced item "frankfurters" is given a weight of about 6 percent in the meat group. About 4 percent is actually frankfurters. The other 2 percent is the

⁴ For pricing purposes, 2 of the 11 food groups included in the food plans have been combined; namely, "dark-green and yellow vegetables" and "other vegetables and fruits." "Accessories" are shown as 4 separate units.

rest of the pricing group—sausage—for which the price movement has usually been the same as for frankfurters.

In order to use each BLS price as representative of the price of a group of foods (the pricing group), an adjustment factor is needed. This factor may be thought of as a number by which the BLS item price can be multiplied to “convert” it to the average price families in the survey paid for the pricing group. In another sense, the factor may be thought of as adjusting the BLS prices to the same level as that of the prices paid by the survey families. At a time when both sets of prices are available, the factor can be calculated by dividing the pricing group price by the BLS item price. It makes allowance for:

- a. The priced item having a different price level from the other items in the pricing group which it has been chosen to represent; e.g., “frankfurters” represents “sausage” as well as “frankfurters.”
- b. The specifically defined item priced by BLS being different from the similarly named item casually defined by families; e.g., “pork chops” are limited to center cut when priced by BLS, whereas all pork chops are included in the survey item of the same name.
- c. The unit of purchase being different; e.g., white granulated sugar is priced by BLS in a 5-pound package, whereas the survey price is for 1 pound.
- d. Families in the different income classes paying different prices for the same item or different items called by the same name; e.g., rib roast was purchased at 58 cents per pound by families with \$2,000–\$2,999 income, at 64 cents per pound by the \$4,000–\$4,999 income families, and at 72 cents per pound by the families with \$6,000–\$7,999 income.
- e. The form of the item being different; e.g., a 1-pound loaf of bread as priced by BLS is expressed as 0.6 of a pound of flour for the survey price per pound of flour equivalent. The conversion factors used for the survey are shown on table 20.

In table 22, the average price of the foods in each pricing group is in boldface italics in columns 5 to 7 with the individual item prices under it. The BLS prices are in column 8 and the price adjustment factors, in columns 9 to 11. There are

three sets of survey prices, one for each income level, and therefore three corresponding sets of price adjustment factors.

Computation Method—Development

To understand how the procedure was developed, consider finding for the moderate-cost plan (income \$4,000–\$4,999) the average prices per pound of fats and oils as of January 1961, when BLS reported the following prices:

Butter.....	76.5¢/lb.
Margarine.....	27.2¢/lb.
Lard.....	20.1¢/lb.
Salad dressing.....	36.0¢/lb.

The portions of table 22 needed for explanation are reproduced in table 21 with the same footnote and column numbers.

The first step is to “convert” the January 1961 BLS item prices to an estimate of prices survey families would have paid per pound of each pricing group in January 1961. This is done by multiplying each item price by its adjustment factor.

	<i>BLS price January 1961</i>		<i>Price adjustment factor (col. 10)</i>		<i>Price paid by survey families; estimated for January 1961</i>
Butter.....	76.5	×	0.960	=	73.4
Margarine.....	27.2	×	.969	=	26.4
Lard.....	20.1	×	1.340	=	26.9
Salad dressing....	36.0	×	.915	=	32.9

This adjustment takes care of such things as (a) the use of the margarine price to reflect the price of hydrogenated fats as well as margarine; (b) the discrepancy between the survey item, which includes chicken fat with the lard, and the BLS item which is lard alone; (c) conversion of 1 pint of salad dressing to a pound; and (d) the fact that families with an income of \$4,000–\$4,999 do not pay the same price on the average for various fats and oils as do all other families.

The second step is to compute the weighted average of the estimated survey prices, using the weights of column 3:

	<i>Price paid by survey families; estimated for Jan- uary 1961</i>		<i>Weight (col. 3)</i>		<i>Weighted cost</i>
Butter.....	73.4	×	0.2056	=	15.09
Margarine.....	26.4	×	.4439	=	11.72
Lard.....	26.9	×	.1569	=	4.22
Salad dressing..	32.9	×	.1936	=	6.37
			1.0000		37.40
			$\frac{37.40}{1.0000}$		<i>37.4¢/lb.</i>

This 37.4¢ is the average price per pound of all fats and oils and is an estimate of what families in the \$4,000-\$4,999 income class would have paid in January 1961 if they ate according to the same consumption pattern they followed in 1955.

Since dividing by 1.0000 is an unnecessary process, it will be omitted in the future computations.

Inasmuch as the calculations are performed frequently (BLS provides item prices monthly, and food plan costs for the U.S.A. are estimated quarterly by USDA), shortcut methods introduce considerable saving. If the computation is set up so that steps one and two are shown side by side, we have:

	BLS price January 1961		Price adjustment factor (col. 10)		Weight (col. 3)	=	Weighted cost
Butter.....	76.5	×	0.960	×	0.2056	=	15.09
Margarine.....	27.2	×	.969	×	.4439	=	11.72
Lard.....	20.1	×	1.340	×	.1569	=	4.22
Salad dressing.....	36.0	×	.915	×	.1936	=	6.37
					1.0000		37.40=37.4¢/lb.

TABLE 21.—Weights and price adjustment factors for pricing fats and oils in the moderate-cost food plan

Food group, pricing groups, and constituent items (1)	Weight (3)	Average price—1955		Price adjust- ment factor ³ (10)	
		Survey (per pound) (6)	BLS		
			Price (8a)		Unit (8b)
Fats and oils.....	1.0000	<i>Cents</i> 37.0			
Butter.....	.2056	67.7		0.960	
*Butter.....	.2056	67.7	70.5	Lb.....	
Margarine.....	.4439	27.9		.969	
*Margarine.....	.2556	26.6	28.8	Lb.....	
Hydrogenated fats.....	.1884	29.8			
Lard.....	.1569	28.0		1.340	
*Lard and chicken fat.....	.0761	20.7	20.9		
Salad, cooking oils.....	.0808	34.8			
Salad dressing.....	.1936	32.3		.915	
*Salad dressing including sandwich spreads.....	.0776	21.0	35.3		
Mayonnaise type.....	.0962	39.2			
French type.....	.0198	43.4			

*Is (or includes) item priced by BLS.

³Pricing group price (boldface italics in col. 6) ÷ item price (col. 8a).

Source: Appendix A, table 22.

After the indicated multiplication is performed, the result is the same as for steps one and two shown above.

Neither the price adjustment factors nor the weights change as long as we continue to use the same base period. Multiplying them once and putting the results on a permanent worksheet eliminates the need to repeat this step each pricing period. The product of the price adjustment factor and the weight is here called the price multi-

plier. It is shown in table 22, columns 12 to 14 for the base period April-June 1955. For the fats and oils example, the price multipliers are as follows:

	Price adjust- ment factor (col. 10)		Weight (col. 3)	=	Price multiplier (col. 13)
Butter.....	0.960	×	0.2056	=	0.197
Margarine.....	.969	×	.4439	=	.430
Lard.....	1.340	×	.1569	=	.210
Salad dressing.....	.915	×	.1936	=	.177

Computation Method—as Performed

To determine the average price by use of price multipliers, the computation is:

	BLS price January 1961		Price multiplier (col. 13)		Weighted cost
Butter.....	76.5	×	0.197	=	15.07
Margarine....	27.2	×	.430	=	11.70
Lard.....	20.1	×	.210	=	4.22
Salad dressing.	36.0	×	.177	=	6.37
					37.36
	37.36				
	1.0000 = 37.4¢/lb.				

The small differences in the examples as “developed” and as “performed” are due to rounding. They make no substantial difference in the results. Although the weights are hidden in the price multiplier, it is the weights—not the price multipliers—that add to 1.0000.

At any time when new prices are available, they can be used with the same price multipliers. The only restrictions are that the same items in the same unit of purchase must be priced and that the quantity consumption pattern and price relations within the food groups continue to have validity. It might be appropriate to emphasize at this point that the items priced by BLS are chosen to represent price changes only. They are not necessarily the ones any individual family will serve in a given week.

Worksheets for estimating the price of the food groups have been developed. They list only the priced items within each food group and the price multipliers. There is a column for entering the current BLS price and another for the weighted cost (product of the price and its price multiplier). The sums of the weighted costs are the prices per pound for the various food groups. These prices are carried to a second set of worksheets that show the quantities of the food groups in the food plans for individuals. The prices are multiplied by the quantities of the food groups and the products are added to determine the cost of the food for individuals in each of the 17 sex-age categories and for pregnant and lactating women separately.⁵

⁵ Sample copies of the worksheets and of instructions for using them are available from Consumer and Food Economics Research Division, Agricultural Research Service, U.S. Department of Agriculture, Washington 25, D.C.

Adaptations

Many users of the food plans are interested in adapting the basic data to reflect local conditions.

Therefore, the USDA publishes⁶ cost estimates quarterly for the U.S.A. as a whole and annually⁷ for each of the four regions.

The BLS prices used to adjust the 1955 costs to current levels are from the following places:

	Represented by—
U.S.....	46-city average
Northeast.....	Boston
North Central.....	St. Louis
West.....	Los Angeles
South.....	Atlanta

Some of the regional differences in cost are substantial. They occur in both level and change-over time. This is evident from the following figures relating to the low-cost plan for a family of four with school children:

Region:	Cost as of April-June 1955 Dollars	Cost increase April-June 1955 to January 1961 Percent
Northeast.....	25.00	7.2
North Central.....	23.80	6.7
West.....	24.10	12.9
South.....	19.60	7.2

These differences among regions result from starting with different data for the consumption pattern, both quantity (cols. 2 to 4 of appendix A, table 22) and price (cols. 5 to 7).⁸ Substitution of only one of these patterns must be done cautiously. If, for example, wholesale or Army Post Exchange prices were used, it is possible that the quantity pattern would no longer be applicable.

Adaptations are time consuming, and unless the fundamental structure is adjusted in large dimensions, the revised costs will differ little from the USDA's estimates. Note on page 43 the negligible differences when prices in five northeastern cities are used with the consumption weights for the Northeast.

Some minor adjustments in consumption patterns will also be illustrated, but none of these make substantial changes in cost either. For

⁶ In *Family Economics Review*, a quarterly publication of the Consumer and Food Economics Research Division.

⁷ March issue of *Family Economics Review*.

⁸ Regional data corresponding to appendix A, table 22 available from Consumer and Food Economics Research Division, Agricultural Research Service, U.S. Department of Agriculture, Washington 25, D.C.

example, if mayonnaise-type salad dressing were to be omitted from the moderate-cost food plan (table 21), its weight, 0.0962, could be prorated among the other fats and oils, with resultant April-June 1955 prices as follows:

$$\text{Revised weight} = \text{Original weight} \times \frac{1.0000}{1.0000 - 0.0962}$$

	Revised weight	Revised price per pound
Fats and oils.....	1.0000	36.7
Butter.....	.2275	67.7
*Butter.....	.2275	67.7
Margarine.....	.4911	27.9
*Margarine.....	.2828	26.6
Hydrogenated fats.....	.2084	29.8
Lard.....	.1736	28.0
*Lard and chicken fat....	.0842	20.7
Salad, cooking oil.....	.0894	34.8
Salad dressing.....	.1078	25.6
*Salad dressing.....	.0859	21.0
French type.....	.0219	43.4

*Is (or includes) item priced by BLS.

The average prices per pound of the individual items and the first three pricing groups remain the same. But, because of the revised weights, the salad dressing pricing group was changed from 32.3 cents per pound to 25.6 cents, and the group price for fats and oils was changed from 37.0 cents to 36.7 cents per pound.

If a more specific substitution is desired, for example, margarine instead of butter, the changes in weights and prices are as follows: In table 21, add the weight of butter (0.2056) to that of margarine (0.2556) resulting in revised weights of 0.4612 for margarine, 0.6495 for the margarine pricing group, and 0 for butter. The survey price per pound of the margarine pricing group would be changed from 27.9 to 27.5 cents and the fats and oils group price reduced from 37.0 to 28.5 cents.

After the new weights and average prices have been computed, price adjustment factors and price multipliers must be changed in accordance with the explanations given above.

Another minor adjustment that might be made is the omission of some accessories, such as coffee or soft drinks. (Coffee and tea have not been included in cost of accessories for children's food plan.) The accessories in appendix A, table 22 have been set up as four separate groups (each with weight of 1.000 in columns 2 to 4), so that any of the four can be omitted without further computations.

The usefulness of the adjustments may be evaluated in terms of the magnitude of the cost changes that result: For a family of four (including two school-age children) as of January 1961, when the U.S. averages were \$24.10 for the low-cost and \$32.60 for the moderate-cost plan, omitting mayonnaise and increasing the quantity of other fats and oils proportionately resulted in a reduction of about 1 cent. Substituting margarine for butter reduced the weekly family food cost 16 and 27 cents in the low- and moderate-cost plans, respectively. Omitting the soft drinks cuts the cost about 30 and 38 cents for the two plans, respectively.

Using local prices to make finer estimates of changes over time (but not changing the original cost level)* is not likely to be worthwhile. It involves replacing the BLS prices in column 8 of appendix A, table 22 with the local prices in 1955. (These must be a good sample of prices with proper weights by type of store, neighborhood and so forth.) The price adjustment factors (cols. 9 to 11) and price multipliers (cols. 12 to 14) must be recomputed to maintain the same price and consumption levels.

If the 1955 local prices are not available, a linkage in the form of a secondary factor can be applied. The price adjustment factors of appendix A, table 22 can be corrected by multiplying each

* Note that no matter which 1955 prices are put into column 8, the use of the resulting price multipliers with those same 1955 prices will yield the average price of the food groups paid by the survey families.

by the ratio of the BLS price to the local price at some period when both are available. The corrected price adjustment factor multiplied by the weight yields a corrected price multiplier. Or the correction ratio can be applied directly to the price multiplier. This method of linkage implies that the ratio of BLS to local prices is the same in spring 1955 and at the time of adjustment.¹⁰ If this is so, the next question is whether the ratio holds constant at all times. If it does, then both sets of prices move at the same rate and the BLS prices might just as well be used, as is done for the USDA estimates. To show differences that might be expected, various local prices were used to update the \$25 cost of the low-cost plan for four people in the Northeast from April-June 1955 to January 1961. The BLS

prices for the following individual cities were used with the resultant costs:

New York.....	\$27.00
Philadelphia.....	27.00
Seranton.....	26.80
Pittsburgh.....	26.90
Boston.....	26.80

The Boston prices are the ones used by the USDA to represent the Northeast.

These substitutions and omissions illustrate the mechanical means of computing the related changes in cost. The food plans take into account both nutritional balance and the consumption patterns of the families who will make use of the plans. Adaptations in the cost estimating procedures which go beyond the scope of these assumptions should not be attempted.

$$^{10} \text{ Price Adjustment Factor (local)} = \frac{\text{Survey Price (1955)}}{\text{Local Price (1955)}}$$

$$\text{If } \frac{\text{Local Price (1955)}}{\text{BLS Price (1955)}} = \frac{\text{Local Price (T)}}{\text{BLS Price (T)}}, \text{ where T is some time after 1955}$$

$$\text{Then } \text{Local Price (1955)} = \text{BLS Price (1955)} \times \frac{\text{Local Price (T)}}{\text{BLS Price (T)}}$$

$$\text{And } \text{Price Adjustment Factor (local)} = \frac{\text{Survey Price (1955)}}{\text{BLS Price (1955)}} \times \frac{\text{BLS Price (T)}}{\text{Local Price (T)}}$$

$$\text{But } \frac{\text{Survey Price (1955)}}{\text{BLS Price (1955)}} = \text{Original Price Adjustment Factor}$$

$$\text{Therefore, Price Adjustment Factor (local)} = \text{Original Price Adjustment Factor} \times \frac{\text{BLS Price (T)}}{\text{Local Price (T)}}$$

APPENDIX A.—WEIGHTS AND PRICE MULTIPLIERS FOR PRICING FOOD PLANS, BY FOOD GROUP

TABLE 22.—Weights and price multipliers for pricing food plans, by food group

Food group, pricing group, and constituent items (1)	Weight			Average price			Price adjustment factor †			Price multiplier ‡				
	Distribution of quantity within food groups for survey households † with income:			Per pound paid by survey households † with income:									Per unit priced by BLS ‡	
	\$2,000- \$2,999	\$4,000- \$4,999	\$6,000- \$7,999	\$2,000- \$2,999	\$4,000- \$4,999	\$6,000- \$7,999	Price	Unit	\$2,000- \$2,999	\$4,000- \$4,999	\$6,000- \$7,999	\$2,000- \$2,999	\$4,000- \$4,999	\$6,000- \$7,999
	(2)	(3)	(4)	(5)	(6)	(7)	(8a)	(8b)	(9)	(10)	(11)	(12)	(13)	(14)
Milk, cheese, ice cream †	1.0000	1.0000	1.0000	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>							
Milk.....	.6847	.7679	.7642	24.1	25.5	26.8								
* Milk, whole, fresh.....	.6116	.7164	.6926	22.3	23.6	23.3	21.9	Qt.	1.018	1.032	1.064			
Buttermilk.....	.0437	.0217	.0219	17.3	17.9	18.9						0.667	0.792	0.813
Skim milk.....	.0125	.0136	.0258	17.5	18.2	17.9								
Chocolate milk.....	.0107	.0080	.0105	25.9	26.3	26.9								
Half and half.....	.0025	.0025	.0070	63.0	68.4	69.0								
Sweet cream, light.....	.0013	.0016	.0028	101.5	113.7	115.5								
Sweet cream, heavy.....	.0023	.0031	.0036	210.8	216.0	198.0								
Ice cream.....	.0359	.0398	.0435	86.7	90.5	94.8								
* Ice cream †.....	.0356	.0397	.0433	87.2	90.6	95.0	20.1	Pt.	2.979	3.110	3.258			
Liquid ice cream mix.....	.0002	0	0	14.0								.107	.124	.142
Ice cream mix, freezer.....	.0001	.0001	.0002	44.6	55.3	42.6								
Cheese.....	.1231	.1073	.1229	28.9	31.2	32.3			.460	.541	.560			
Processed:														
* American, Swiss, other †.....	.0737	.0616	.0589	19.8	21.2	21.9	57.7	Lb.					.057	.058
Cheese food.....	.0006	.0013	.0004	20.5	20.6	26.8								.069
Cheese spreads.....	.0020	.0035	.0037	57.3	54.9	61.2								
Nonprocessed:														
Cottage cheese.....	.0058	.0062	.0081	122.0	124.8	120.1								
American.....	.0322	.0232	.0262	20.7	22.1	24.2								
Swiss.....	.0051	.0039	.0066	18.8	23.4	21.2								
Cream.....	.0005	.0009	.0011	252.9	255.4	261.5								
Other.....	.0032	.0062	.0079	36.8	30.7	28.1								
Evaporated milk.....	.1563	.0850	.0694	15.1	14.6	14.1								
* Evaporated milk.....	.1214	.0586	.0465	16.0	15.7	14.0	13.7	14 1/4-oz. can.	1.102	1.060	1.029			
Condensed milk.....	.0048	.0027	.0020	17.0	20.1	18.8							.091	.071
Dry, skim.....	.0221	.0158	.0109	8.4	8.3	9.2								
Dry, whole.....	.0062	.0057	.0039	11.0	12.1	16.9								
Other dry milk products.....	.0015	.0020	.0057	23.4	29.6	19.7								
Powdered cream.....	0	(?)	(?)		233.3	200.0								
Miscellaneous.....	.0003	.0002	.0004	146.1	20.7	21.8								

See footnotes at end of table.

Accessories: ¹⁰	1.0000	1.0000	1.0000	33.0	39.6	37.0									
Coffee.....	.9122	.9508	.9612	26.2	32.0	30.1				.362	.434	.406			
* Bean.....	.0789	.0425	.0424	6.3	6.4	6.5	91.2	Lb. can.....					.382	.434	.406
Instant.....	.0090	.0067	.0039	.4	.5	.4									
Substitute.....	0	0	.0025	.0	.0	.1									
Liquid concentrate.....	1.0000	1.0000	1.0000	5.5	6.4	6.1									
Tea.....	1.0000	1.0000	1.0000	5.5	6.4	6.1	40.7	1/4 lb.....	.135	.157	.150		.135	.157	.150
* Tea ¹	1.0000	1.0000	1.0000	8.4	10.3	11.1									
Soft drinks.....	.9915	.9920	.9962	7.8	9.9	10.9	32.5	36 oz. ctn.....	.258	.317	.342		.258	.317	.342
* Bottled drinks.....	.0285	.0074	.0038	.5	.4	.2									
Powdered drinks.....	1.0000	1.0000	1.0000	5.0	4.6	4.3									
Other accessories.....	.0320	.1410	.0881	.2	.6	.4									
Chocolate.....	.2126	.1649	.1667	1.1	.8	.7									
Cocon.....	.0428	.0364	.0485	.2	.2	.2									
Yeast.....	.1404	.0815	.0652	.7	.4	.3									
Leavening agents, excluding yeast.....	.1048	.1490	.1954	.5	.7	.8									
Vinegar.....	.1705	.1797	.1560	.8	.8	.7									
Salt.....	.2963	.2453	.2780	1.5	1.1	1.2									
Seasonings, excluding vinegar and salt.....	.0005	.0008	0	.0	.0	.0									
Miscellaneous sweets, NEC.....															

¹ Is (or includes) item priced by BLS.

From unpublished data from Food Consumption of Households in the U.S. 1955 Nonfarm, food from all sources. Approximately the same results could have been derived from the published data, Report No. 1, (14). However, rounding errors and small classification differences because of food mixtures would have been introduced.

² Retail Food Prices by City. Table 2, U.S. average April, May, June 1955.

³ Pricing group price (boldface italics in cols. 5, 6, and 7) + item price (col. 8a).

⁴ Weight X price adjustment factor.

⁵ All measurements for this group in terms of quarts of milk (calcium) equivalent.

⁶ BLS prices as of January 1961 are for different size unit or different item from those in 1955.

⁷ 0.00005 or less.

⁸ All measurements for this group in terms of dozens.

⁹ Includes dark-green and deep-yellow vegetables.

¹⁰ Columns 5 through 7 show average money value per person 16 years or older for coffee and tea and average money value per capita for soft drinks and other accessories.

¹¹ Distributed on the basis of money value.

NOTE.—Items will not necessarily add to totals because of rounding.

NEC (in stub) means "not elsewhere classified."

APPENDIX B.—PROCEDURES USED FOR ESTIMATING FAMILY SIZE ADJUSTMENTS IN FOOD PLAN COSTS ¹⁰

Data from the 1955 Survey of Household Food Consumption were drawn upon to provide evidence as to the average advantage in cost that large families have over small families through economies of buying in quantity or through having less spoilage or other food losses.

To use the data for this purpose it was necessary to identify differences in food costs among various household size groups attributable to real "economy of scale" factors as distinct from income or family composition factors. The procedure by which it was hoped to accomplish this involved two major steps.

The first step was to determine the per person food cost for each household size group at a point at which each achieved the same level of nutritional adequacy. "The same level of nutritional adequacy" was defined as a level at which the same proportion of households in each group met at least two-thirds of the National Research Council's recommended allowances for each of eight nutrients.

The nonfarm survey households in each household size class (from 1-person through 6-person) were grouped by money value of food used per person per week. The percentage of households that met allowances of approximately two-thirds of the National Research Council's recommendations for eight nutrients is shown in appendix B, table 23.

In general, more of the larger households than the smaller households met the stated standard at each of the food cost (money value) levels.

The irregularities in the progression of the percentages from the small to the large households were believed to arise from sampling variation; hence, smoothed values were computed for the food cost levels below \$10 (virtually all the households with per person money value of food of \$10 or more had diets with at least two-thirds the recommended allowances in each nutrient). The

estimated or "smoothed" percentages are shown in appendix B, table 24.

Per person food costs for each household size group at the level at which 75 percent of the households met two-thirds of the recommended allowances were estimated from these data by means of graphic interpolations with the following results:

Persons:	Household size	Money value of food used per person per week	
		Dollars	Index
1-----		5.98	118
2-----		5.69	113
3-----		5.45	108
4-----		5.05	100
5-----		4.70	93
6-----		4.38	87

This 75-percent level seemed to represent those households on whose food patterns the low-cost food plans were based. The per person food costs shown above fall within the range of the costs of the low-cost food plans in 1955.

The second step in determining the differences arising from economy of scale was to take into account the composition of the households. On the average, the larger families in the survey had a greater proportion of young children than did the smaller families, and it costs less, in general, to provide adequately for a child than for an adult. The 1-person households, although always adult, have a larger proportion of elderly women who require less than most adults in larger families.

This adjustment, in turn, was made in two steps. In the first place, estimates of the size of each of the six family size classes were obtained in terms of "equivalent cost units." Size in equivalent cost units was defined as the average number of 20-34 year old male cost equivalents in each family size group. The cost of the food in the food plan for each of 17 sex-age groups (and pregnant and lactating women) in the 1955 survey period was used in this computation. The cost for a 20-34 year old male was \$6.70, which was

¹⁰ Prepared by Janet Murray.

TABLE 23.—Percentage of households meeting specified nutrient allowances¹ by household size and money value of food used per person per week

Money value of food per person per week	Household size (number of persons)					
	1	2	3	4	5	6
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under \$4.00.....	27.3	24.4	21.2	34.8	48.7	50.0
\$4.00-\$5.99.....	51.6	61.3	76.1	74.4	81.5	81.1
\$6.00-\$7.99.....	88.8	92.3	93.1	97.7	96.6	97.0
\$8.00-\$9.99.....	94.8	97.0	97.5	99.4	98.8	100.0
\$10.00-\$11.99...	92.3	97.9	99.2	100.0	100.0	100.0
\$12.00 and over.	96.2	99.7	100.0	100.0	100.0	100.0

¹ Allowances are approximately two-thirds of the quantities recommended by the National Research Council for eight nutrients.

Source: U.S. Department of Agriculture *Household Food Consumption Survey 1965* unpublished data.

TABLE 24.—Estimated¹ percentage of households meeting specified nutrient allowances² by household size and money value of food used per person per week

Money value of food per person per week	Household size (number of persons)					
	1	2	3	4	5	6
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under \$4.00.....	20.1	25.8	31.5	37.2	43.0	48.7
\$4.00-\$5.99.....	56.3	62.2	68.1	74.0	79.9	85.8
\$6.00-\$7.99.....	90.1	91.7	93.4	95.1	96.8	98.4
\$8.00-\$9.99.....	95.5	96.5	97.4	98.4	99.3	100.0

¹ Percentages of table 23 "smoothed" to adjust for irregularities due to small samples.

² Allowances are approximately two-thirds of the quantities recommended by the National Research Council for eight nutrients.

set equal to 1.00 on the relative scale of cost equivalent units. For example, in a family with man and woman each 20-34 years old, one child under 1 year, and another 4-6 years, the food costs and cost-equivalent units are as follows:

Family member	Food plan cost	Cost equivalent unit
Male: 20-34 years.....	\$6.70	1.00
Female: 20-34 years.....	5.10	.76
Child:		
Under 1 year.....	2.80	.42
4-6 years.....	3.90	.58
Family.	\$18.50	2.76

Family cost-equivalent units were, in effect, averaged for each of the six family size classes for nonfarm survey families in the \$2,000-\$2,999 income class.¹¹ The average number of male

¹¹ Families in this income class had been used in developing the low-cost food plans. The actual computation of averages was performed by aggregating the number of persons weighted by their cost relatives and dividing by the number of families in that family size class.

cost-equivalent units (by family size) was as follows:

Family size Persons:	Size in cost- equiv- alent units
1.....	0.75
2.....	1.61
3.....	2.38
4.....	3.11
5.....	3.85
6.....	4.58

Secondly, the ratio of the size in count of persons to size in equivalent units was then used to adjust the per person money value of food as previously determined for each household group, as follows:

Household size Persons:	Money value of food used per person per week (unadjusted for family composition) Dollars	Adjust- ment factor	Money value of food used per person per week in male equiv- alent units	
			Dollars	Index
1.....	5.98	1/0.75	7.97	122.6
2.....	5.69	2/1.61	7.07	108.8
3.....	5.45	3/2.38	6.87	105.7
4.....	5.05	4/3.11	6.50	100.0
5.....	4.70	5/3.85	6.10	93.8
6.....	4.38	6/4.58	5.74	88.3

Thus, the adjustment for family composition reduced the difference in index points between the per person cost in the 6-person household and the 2-person household from 26 to 20, but increased the difference between the 1- and 6-person household. It is suggested that the differentials be rounded to 5 percent for each change in size from the 4-person family, except for the 1-person family. The differential for the 1-person family appears to fall between 20 and 25 percent above the 4-person family level. At this time the 20-percent differential has been adopted. The differentials would be applied as follows: Food costs in the USDA food plans are quoted for each person as a member of a 4-person family. In planning a low-cost food budget for a smaller family, the differential would be added to the food plan costs—5 percent for 3 persons, 10 percent for 2 persons, and 20 percent for 1 person. For a larger family, the differential would be subtracted—5 percent for 5 persons and 10 percent for 6 persons. The survey did not provide sufficient information for

producing an estimate for families of more than 6 persons. It is assumed that the 10-percent differential or slightly more will be applied to families of 7 or more persons.

To test the reasonableness of the differentials estimated from the survey data as described above, menus and market orders for a week's food for 1-, 2-, 4-, and 6-member families, based on the low-cost food plans, were prepared and priced in the Washington, D.C., area. The cost per male equivalent unit of the food at these prices was then calculated for each family size group. The differentials in cost per male equivalent unit in the 1-, 2-, and 6-person families as compared with the 4-person family were reasonably close to the above estimates.

Only limited information is currently available on the food losses in families of different sizes, but the data that are available do indicate that the percentage of calories in the food discards in 5- and 6-person families is less than in 2- to 4-person families.

LITERATURE CITED

- (1) ATWATER, W. O.
1894. FOODS: NUTRITIVE VALUE AND COST. U.S. Dept. Agr. Farmers' Bul. 23, 32 pp., illus.
- (2) CARPENTER, R. S., and STIEBELING, H. K.
1936. DIETS TO FIT THE FAMILY INCOME. U.S. Dept. Agr. Farmers' Bul. 1757, 38 pp., illus.
- (3) CHILDREN'S BUREAU.
1955. INFANT CARE. U.S. Dept. Health, Education, and Welfare, Soc. Sec. Adm., Pub. 8, 106 pp., illus.
- (4) GODDARD, V. R., and GOODALL, L.
1959. FATTY ACIDS IN FOOD FATS. U.S. Dept. Agr., Home Econ. Res. Rpt. 7, 4 pp.
- (5) HUNT, C. L.
1923. GOOD PROPORTIONS IN THE DIET. U.S. Dept. Agr. Farmers' Bul. 1313, 24 pp., illus.
- (6) LeBOVIT, C., and STIEBELING, H. K.
1957. APPLYING 1953 DIETARY ALLOWANCES TO U.S. POPULATION GROUPS. Amer. Dietet. Assoc. Jour. 33: 219-224.
- (7) NATIONAL RESEARCH COUNCIL, COMMITTEE ON FOOD AND NUTRITION.
1941. RECOMMENDED DIETARY ALLOWANCES. Natl. Res. Council, unnumbered pub., 5 pp.
- (8) NATIONAL RESEARCH COUNCIL, FOOD AND NUTRITION BOARD.
1958. RECOMMENDED DIETARY ALLOWANCES, REVISED 1958. Natl. Res. Council Pub. 589, 36 pp.
- (9) SMITH, V. E.
1959. LINEAR PROGRAMMING MODELS FOR THE DETERMINATION OF PALATABLE HUMAN DIETS. Jour. Farm Econ. 41: 272-283.
- (10) STIEBELING, H. K., MUNSELL, H. E., BIRDSEYE, M., and others.
1930. BUY HEALTH PROTECTION WITH YOUR FOOD MONEY. U.S. Dept. Agr. Ext. Serv. Cir. 139, 23 pp. (Processed.)
- (11) ——— and WARD, M. M.
1933. DIETS AT FOUR LEVELS OF NUTRITIVE CONTENT AND COST. U.S. Dept. Agr. Cir. 296, 59 pp., illus.
- (12) U.S. BUREAU OF HOME ECONOMICS.
1941. PLANNING DIETS BY THE NEW YARDSTICK OF GOOD NUTRITION. U.S. Dept. Agr. Unnumbered Pub., 14 pp. (Processed.)
- (13) U.S. BUREAU OF HUMAN NUTRITION AND HOME ECONOMICS.
1948. HELPING FAMILIES PLAN FOOD BUDGETS. U.S. Dept. Agr. Misc. Pub. 662, 16 pp.
- (14) U.S. DEPARTMENT OF AGRICULTURE.
1956. FOOD CONSUMPTION OF HOUSEHOLDS IN THE UNITED STATES. HOUSEHOLD FOOD CONSUMPTION SURVEY, 1955. Rpt. 1, 196 pp.
- (15) ———
1956. FOOD CONSUMPTION OF HOUSEHOLDS IN THE SOUTH. HOUSEHOLD FOOD CONSUMPTION SURVEY, 1955. Rpt. 4, 196 pp.
- (16) ———
1957. DIETARY LEVELS OF HOUSEHOLDS IN THE UNITED STATES. HOUSEHOLD FOOD CONSUMPTION SURVEY, 1955. Rpt. 6, 68 pp.
- (17) ———
1957. DIETARY LEVELS OF HOUSEHOLDS IN THE SOUTH. HOUSEHOLD FOOD CONSUMPTION SURVEY, 1955. Rpt. 9, 68 pp.
- (18) ———
1961. DIETARY EVALUATION OF FOOD USED IN HOUSEHOLDS IN THE UNITED STATES. HOUSEHOLD FOOD CONSUMPTION SURVEY, 1955. Rpt. 16, 55 pp.
- (19) ———
1957. SUPPLEMENT FOR 1956 TO CONSUMPTION OF FOOD IN THE UNITED STATES, 1909-52. Agr. Handb. 62, 120 pp.
- (20) U.S. INSTITUTE OF HOME ECONOMICS.
1958. FOOD FOR FITNESS . . . A DAILY FOOD GUIDE. U.S. Dept. Agr. Leaflet 424, 8 pp., illus.
- (21) WATT, B. K., MERRILL, A. L., ORR, M. L., and others.
1950. COMPOSITION OF FOODS . . . RAW, PROCESSED, PREPARED. U.S. Dept. Agr. Handb. 8, 147 pp.