

HOW TO SELECT FOODS

I. WHAT THE BODY NEEDS

CAROLINE L. HUNT and HELEN W. ATWATER

Scientific Assistants, Office of Home Economics



FARMERS' BULLETIN 808

UNITED STATES DEPARTMENT OF AGRICULTURE

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THIS BULLETIN does not attempt to make definite suggestions for obtaining food at low cost or to recommend any special foods or combinations of foods. It tells very simply what the body needs to obtain from its food for building its tissues, keeping it in good working order, and providing it with fuel or energy for its muscular work. It shows in a general way how the different food materials meet these needs and groups them according to their uses in the body. It suggests that, by remembering these groups and having them all suitably represented in the daily diet, the housekeeper can easily plan attractive meals which meet the needs of her family without waste of money or material.

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HOW TO SELECT FOODS.¹

I. WHAT THE BODY NEEDS.

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PURPOSE OF THIS BULLETIN.

How can the housekeeper tell whether or not she is providing the food which her family needs and is getting the best possible returns for the money she spends? Unfortunately, the price she pays for food is no test of the nourishment it yields to the body. Tomatoes at 5 or 10 cents apiece in winter do not build body tissues nor furnish fuel for the body engine any better than those at 5 cents a quart in summer, nor does fancy capon at 40 cents a pound nourish the healthy body more generously than fowl at half the price. Appetite is not always a safe guide. A child's appetite might be satisfied with a diet of nothing but sugar, but this certainly would not be good for him. Neither can hunger and its satisfaction always be relied on. A bulky diet of potatoes or bananas alone would soon make a person feel that he had eaten enough, but would not furnish all that the body needs.

Evidently what a person who plans meals ought to know is what things the body needs in its food and how these needs can be filled by the ordinary food materials. This paper is intended to give such information in a simple way. It should make plain that different kinds or classes of foods serve different uses in the body and should help the housekeeper to choose those which will serve all these uses without waste.

¹ Prepared under the direction of C. F. Langworthy, Chief, Office of Home Economics.

NOTE.—This bulletin gives a simple method of selecting and combining food materials to provide an adequate, attractive, and economical diet.

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I. WHAT THE BODY NEEDS.

Chart 5. Cereals Grains

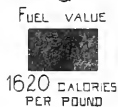
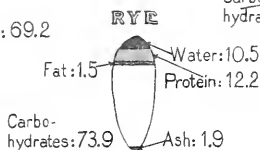
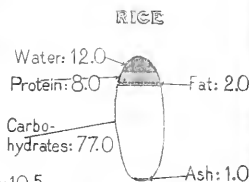
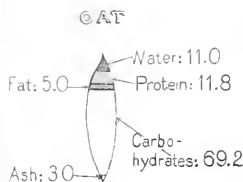
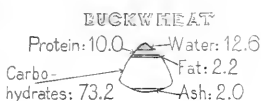
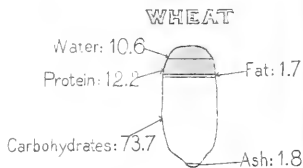
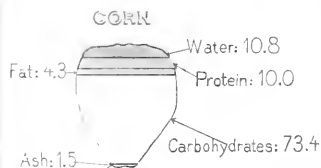
Revised Edition.

U.S. Department of Agriculture
States Relations Service
A.C. True, Director

Prepared by
C.F. LANGWORTHY
Chief, Office of Home Economics

COMPOSITION OF FOOD MATERIALS.

Protein
 Fat
 Carbohydrates
 Ash
 Water
 Fuel Value
1 Sq. In. Equals 1000 Calories



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mbining food materials

THE DAY'S FOOD.

A man who does fairly hard muscular work would be likely to get the food which his body needs if supplied daily with such a combination of foods as the following:

- 1½ pounds of bread, having about the same food value as 1 pound of such cereal preparations as wheat or rye flour, oatmeal, cornmeal, rice, etc.
- 2 ounces, or ¼ cup, of butter, oil, meat drippings, or other fat.
- 2 ounces, or ¼ cup, of sugar; or ⅓ cup of honey, or sirup, or an equivalent amount of other sweet.
- 1½ pounds of food from the following: Fresh fruits and green or root vegetables.
- 12 ounces of food from a class which may be called "meats and meat substitutes"; that is, moderately fat meats, poultry, fish, eggs, cheese, dried legumes (beans, peas, lentils, cowpeas, and peanuts). Milk also belongs among these foods, but because of the large amount of water it contains half a glass, or 4 ounces, of it would be required to equal an ounce of any one of the others.

A man who works hard out of doors all day probably would need more food than this, and one who sits all day at his desk would need less. The amounts given are suitable for a man who, like a salesman in a store, walks about more or less and does more or less of such work as lifting.

A family consisting of a man and a woman who do moderately hard muscular work and three children—say, between 3 and 12 years of age—would get the food they require if supplied daily with:

- 4½ pounds of bread, having the same food value as 3 pounds of wheat or rye flour, oatmeal, cornmeal or hominy, or rice; or about 2½ pounds of cereals and 5 or 6 medium-sized potatoes.
- ¾ cup of fat (butter or butter with oil, beef drippings, or other fat)—a weekly allowance of 2½ to 3 pounds.
- A little more than 1 cup of sugar, or a weekly allowance of 4 pounds; or an equivalent amount of some other sweet.
- 4 pounds in all of fresh fruits and fresh or root vegetables.
- One of the two following, the choice depending on the age of the children:
- 3 quarts of milk and 1 pound of other foods taken from the meat and meat-substitute group.
- 2 quarts of milk and 1½ pounds of other foods taken from the meat and meat-substitute group.

This rather rough calculation is based on the assumption that cereals contain, on the average, about 12 per cent protein (see p. 7, B), 1 per cent fat, and 75 per cent carbohydrates, and that 1 pound of bread contains about ⅔ of a pound of cereal; that butter, oil, lard, and other fatty foods average 90 per cent fat; that fresh fruits and fresh and root vegetables average about ½ per cent protein and 10 per cent carbohydrates, with negligible quantities of fat; and that meats, fish, eggs, cheese, etc., as purchased, may be considered to average about 14 per cent each of protein and fat. The estimate also assumes that all the fat obtained with the meats, etc., is utilized, being either eaten with the meat or saved for use in cookery. Under these conditions

the fuel value of the diet would be about 10,000 calories per family per day, or the equivalent amount of 3,000 calories per man per day; the protein value would be about 330 grams per family, or 100 grams per man per day.

Figure 1 represents the materials in such a ration. The cereals include $1\frac{1}{2}$ pounds of bread, one ordinary-sized portion of rolled oats (one-fourth pound in all), and one of rice for each person (one-half pound in all), and a pound of flour for use in cooking. The meat and meat-substitute group includes 2 quarts of milk, 1 pound of beef, and two eggs. The food value of the ration pictured on the cover is practically the same as in figure 1, but there more bread is used and a little more meat is given to make up for the eggs shown in figure 1. The combinations of food materials shown in these pictures

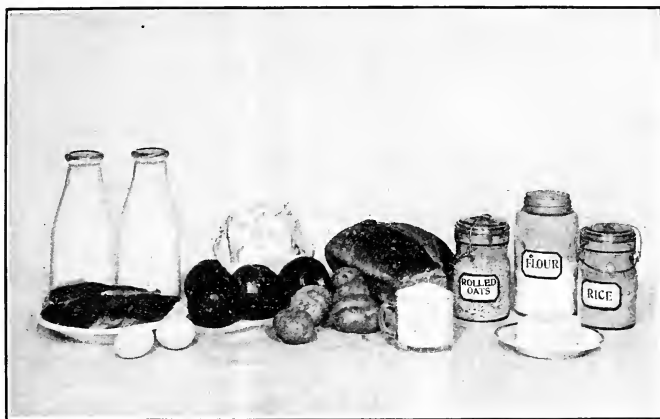


FIG. 1.—A day's food for a family of five.

are no better than many others. By studying them in connection with what is said in the text the housekeeper may understand better how to make wise combinations of her own.

In the combinations of food materials here pictured bread and other preparations of cereals are used as freely as they can conveniently be without making the ration one sided or unattractive. Such cereal foods form a very wholesome and economical basis for the diet, whether the cereal is used as a breakfast dish, as flour or meal in bread and cakes, or in other ways. A diet equally nourishing and wholesome might be planned with less cereal, but this would make it necessary to increase the amount of the more costly foods, such as meat, fruits, vegetables, and sweets. When cereals are used as largely as in the diet just described it is most important that they

be made as attractive as possible. This means good bread, well-cooked and carefully salted breakfast cereals, and inexpensive but well-made and seasoned cakes and puddings. Rice, macaroni, and hominy can often be made more appetizing and nutritious by combining with them small amounts of materials which are not so cheap and have more distinctive flavors. Among these are meat and cheese, and onion, tomato, and other seasoning vegetables. Examples of such combinations are rice and meat, meat pie, or meat with dumplings; macaroni and cheese; tomatoes cooked with bread crumbs or rice; and cereal and fruit puddings, or cereal and milk puddings.

Food materials such as those shown in the pictures may be combined into three meals in many ways. The following meals are given, not because they are recommended above many others that might be used, but simply to show that such foods can be combined into dishes such as are commonly used in American homes.

SAMPLE MEALS FOR A FAMILY.

(Man, woman, and three small children.)

BREAKFAST.

Fruit, $1\frac{1}{4}$ pounds of fresh fruit (equivalent to 3 medium-sized oranges, 5 small apples, or a quart-box of strawberries), or 3 or 4 ounces of dried fruits (equivalent to 10 or 12 dates or 4 or 5 figs).

Cereal breakfast food, 4 ounces before being cooked, or about $1\frac{1}{2}$ pints after it is cooked. The equivalent in food value in puffed or flaked, ready-to-eat cereals would be 5 or 6 cups.

Milk on cereal, $\frac{1}{4}$ cup for each person.

Sugar on fruit, on cereal, or in coffee, $2\frac{1}{2}$ level tablespoons or $1\frac{1}{4}$ ounces.

Bread, 8 slices, or 8 ounces.

Butter, $1\frac{1}{4}$ ounces, or $2\frac{1}{2}$ cubic inches.

An egg or 2 ounces of meat, fish, or poultry for each older person, and a glass of milk for each young child.

DINNER.

Meat, or fish, $\frac{1}{4}$ pound per grown person; or, for each child, an egg or a glass of milk.

Potatoes (5 medium sized), $1\frac{1}{4}$ pounds.

Another vegetable (turnips, spinach, corn, cauliflower, or other), 1 pound.

Bread, 8 slices, or 8 ounces.

Butter, $1\frac{1}{4}$ ounces, or $2\frac{1}{2}$ cubic inches.

Steamed apple (or other fruit) pudding. (Ingredients: Two cups flour, 2 tablespoons butter, $\frac{3}{4}$ cup milk, 4 apples, 1 tablespoon sugar.)

Sauce. (Ingredients: One-half cup sugar, $1\frac{1}{2}$ tablespoons flour, 2 teaspoons butter, $\frac{1}{4}$ cup water, flavoring.)

SUPPER.

A gravy made out of 1 pint of skim milk, $\frac{1}{4}$ cup flour, 2 level teaspoons butter, and 4 ounces salt or smoked fish (just enough for flavor). To this can be added the egg yolk left from the frosting of the cake. (See below.)

Rice, 8 ounces, or 1 cup, measured before being cooked.

Bread, 8 slices, or 8 ounces.

Butter, $1\frac{1}{4}$ ounces, or $2\frac{1}{2}$ cubic inches.

One-half of a cake. (Ingredients for whole cake: One-fourth cup butter, $\frac{1}{2}$ cup sugar, 1 egg, $\frac{1}{2}$ cup milk, $1\frac{1}{2}$ cups flour, $2\frac{1}{2}$ teaspoons baking powder.)

Frosting made with 1 egg white and $\frac{1}{4}$ cup sugar.

WHAT THE DAY'S FOOD SHOULD PROVIDE.

The above meals would supply the following substances in about the right proportions to keep the family in healthful condition and to make the food taste good, providing they were well prepared.

A. *Mineral substances* of great variety (lime salts, compounds of phosphorus, iron, and others).—These are used by the body for building material and are found in all parts of it. They also produce substances within the body tissues which tend to offset acid substances produced in the tissues in the course of digestion of meats and cereals and serve many other important uses. Without fruits and vegetables the meals would be likely to lack certain mineral substances. Without milk they would be lacking in a mineral substance specially needed by children; that is, lime.

B. *Protein*.—Protein serves as fuel for the body and also provides a certain important element, nitrogen, which is needed in the case of children for growth and in the case of both children and grown people to keep the body in repair. Without the meat or meat substitutes (including milk) the meals would be lacking in this body-building material.

C. *Starch*.—This is one of the chief fuels of the body and is supplied mainly by the cereal foods.

D. *Sugar*.—This serves as fuel for the body and to flavor the food. It is found in milk, fresh fruits, and many other materials, but unless small amounts of very sweet materials—sugar itself, sirup, or honey—are used, the diet is likely to be lacking in it.

E. *Fat*.—This serves as body fuel and also improves the flavor and texture of the food. It is present in meats, nuts, and many other foods, but unless small amounts of specially fat materials, like butter, oil, or cream, are used, the meals are likely to be lacking in it. Moreover, dishes cooked without a certain amount of fat and meals served without butter or some substitute seem, to most persons, dry and unpalatable.

F. *Cellulose*.—This is the material which makes up the framework of plants. It gives bulk to the diet and may tend to prevent constipation. Without the fruits and vegetables the meals would be lacking in this important element.

G. *Certain newly discovered substances in very small amounts*, which are believed to play an important part in keeping people well and in promoting the growth of children. Without milk in the diet some of these substances, particularly those necessary for children, would be lacking, and without meat, milk, eggs, fruits, and vegetables others needed by persons of all ages might not be present in sufficient amounts.

H. *Flavorings and condiments.*—In most families some materials are used in preparing or serving food which add to the attractiveness of the meals without furnishing the body any nourishment. Among these are salt, pepper, vinegar, lemon juice, spices, seasoning herbs, horse-radish, flavoring extracts, and many other materials often spoken of as “condiments.” These are not discussed at length, because they are not absolutely needed by the body. They may, however, be very useful in making an otherwise unattractive diet taste good. In fact, the secret of making inexpensive meals attractive lies largely in the skillful use of seasoning and flavors, and in this way they may well be worth the cost they add to the diet even if they do not increase its actual food value.

Any kind of food contains one or more of the substances just described, and they are combined in as many different ways as there are kinds of food. A satisfactory diet contains all of them and each in its proper proportion, and the problem of planning meals is really that of choosing foods which will do this.

GROUPING FOODS TO SHOW THEIR USES.

Perhaps as easy a way as any to select the right foods is to group the different kinds according to their uses in the body and then to make sure that all the groups are represented regularly in the meals. Fortunately no more than five groups need be considered: (1) Fruits and vegetables; (2) meats and other protein-rich foods; (3) cereals and other starchy foods; (4) sweets; and (5) fatty foods. The materials under each of these heads have their special uses. It will be helpful, therefore, for the housekeeper to form the habit of thinking of the many different kinds of food which she handles as grouped in some such way as the following:

Group 1.—Fruits and vegetables, such as apples, bananas, berries, citrus fruits, spinach and other greens, turnips, tomatoes, melons, cabbage, green beans, green peas, green corn, and many other vegetables and fruits. Without these the food would be lacking in mineral substances needed for building the body and keeping it in good working condition; in acids which give flavor, prevent constipation, and serve other useful purposes; and in minute quantities of other substances needed for health. By giving bulk to the diet they make it more satisfying to the appetite.

Group 2.—Meat and meat substitutes, or protein-rich foods: Moderately fat meats, milk, poultry, fish, cheese, eggs, dried legumes (beans, peas, lentils, cowpeas, peanuts), and some of the nuts. These are sources of an important body-building material, protein. In the case of children part of the protein food should always be whole milk.

Group 3.—Foods rich in starch: Cereals (wheat, rice, rye, barley, oats, and corn) and potatoes (white and sweet). Cereals come near to being complete foods, and in most diets they supply more of the nourishment than any other kind of food. It is not safe, however, to live only on cereals. The grains may be simply cleaned and partially husked before cooking, as in cracked wheat and Scotch oatmeal; they may be ground into flour and used as the basis of breads, cakes, pastry, etc.; or they may be partially cooked at the factory, as in many breakfast preparations; or they may be prepared in the form of such pastes as macaroni, noodles, etc. In all these forms they furnish the body with the same general materials, though in different proportions.

Group 4.—Sugar (granulated, pulverized, brown, and maple), honey, molasses, sirup, and other sweets. Unless some of the fuel is in this form the diet is likely to be lacking in flavor.

Group 5.—Foods very rich in fat: Bacon, salt pork, butter, oil, suet, lard, cream, etc. These are important sources of body fuel. Without a little of them the food would not be rich enough to taste good.

Some food materials really belong in more than one group. Cereals, for example, supply protein as well as starch; potatoes supply starch as well as the mineral matters, acids, cellulose, and body-regulating substances, for which they are especially valuable; and most meat supplies fat as well as protein. For the sake of simplicity, however, each material is here grouped according to the nutrient for which it is usually considered most valuable. These points are all brought out in more detail in other bulletins which discuss the special groups.

The lists given below show some of the common food materials arranged in these five groups. If the housekeeper will consult them in planning meals until she has learned where each kind of food belongs, she will have taken the first step toward providing a diet which will supply all the food needs of her family. It will be only one step, to be sure, but it should prevent two mistakes—that of serving meals that have not sufficient variety, and that of cutting down in the wrong places when economy either of time or money is needed:

GROUP 1.—*Foods depended on for mineral matters, vegetable acids, and body-regulating substances.*

Fruits:

Apples, pears, etc.
Bananas.
Berries.
Melons.
Oranges, lemons, etc.
Etc.

Vegetables:

Salads—lettuce, celery, etc.
Potherbs or "greens."
Potatoes and root vegetables.
Green peas, beans, etc.
Tomatoes, squash, etc.
Etc.

GROUP 2.—*Foods depended on for protein.*

Milk, skim milk, cheese, etc.	Fish.
Eggs.	Dried peas, beans, cowpeas, etc.
Meat.	Nuts.
Poultry.	

GROUP 3.—*Foods depended on for starch.*

Cereal grains, meals, flours, etc.	Cakes, cookies, starchy puddings, etc.
Cereal breakfast foods.	Potatoes and other starchy vegetables.
Bread.	
Crackers.	
Macaroni and other pastes.	

GROUP 4.—*Foods depended on for sugar.*

Sugar.	Candies.
Molasses.	Fruits preserved in sugar, jellies, and dried fruits.
Sirups.	Sweet cakes and desserts.
Honey.	

GROUP 5.—*Foods depended on for fat.*

Butter and cream.	Salt pork and bacon.
Lard, suet, and other cooking fats.	Table and salad oils.

Thinking of foods according to the group to which they belong or according to the nutrient which they supply in largest amount will help the housekeeper to see whether in the meals she plans she has supplied all the different materials needed, especially whether there is the necessary, though small, amount of tissue-building mineral matters and body-regulating materials (group 1), and of tissue-building protein (group 2). When she has made sure that these are present, she may safely build up the bulk of the diet from whatever materials from the other groups that seem economical, wholesome, and appetizing. By means of this grouping she will be reminded that meals consisting only of cereal mush (group 3) served with butter (group 5) and sirup (group 4) would not be a complete ration, and would almost surely be lacking in body-building material, because there are no foods from either group 1 (fruits and vegetables) or group 2 (protein rich). It will become clear, also, that a school lunch of a kind far too frequently served, consisting of bread and cake, is lacking in the same way, and that a glass of milk (group 2) and an apple or an orange (group 1) would make it far more nearly complete. She will learn the wisdom of serving fruit (group 1) rather than a whipped-cream dessert (group 5) or a suet pudding (groups 3 and 5) after a course including a generous portion of fat meat (groups 2 and 5).

The grouping will also help the housekeeper who wishes to save money or time to simplify her meals without making them one-sided

or incomplete. For example, if she has been serving bread, potatoes, and rice or hominy in one meal, she will see that one or even two of them may be left out without omitting any important nutrient, providing a reasonable quantity of the one or two remaining is eaten. It will show her that a custard which is made of milk and eggs, two foods from group 2, would hardly be needed after a meal in which a liberal supply of meat had been served, provided one ate heartily of all, and that a child does not need milk at the same meal with an egg or meat. It will suggest that baked beans or other legumes, or thick soups made of legumes, are substitutes for meat rather than foods to be eaten with meat.

This method of planning prevents substituting one food for another which has an entirely different use. It prevents the housekeeper, for example, from trying to give a pleasant variety by using an extra amount of cakes or sweet desserts in the place of fruit and vegetables when the latter seem difficult to obtain. Sugar is nutritious and has a valuable place in the diet, but the nourishment it furnishes is fuel and not the body-building and body-regulating materials which are found in fruits and vegetables, and it is not safe to cut them out, even if the meals can be made attractive without them. Fortunately, they are not always so hard to obtain as it seems, and the wise housekeeper will make every effort to supply them. In general, economy within each group is safer than using an inexpensive food from one group in place of an expensive one from another group.

Thinking in terms of these groups will also help when laying in supplies. Dried peas and beans and dried fish, canned fish, and meat, and some kinds of cheese keep for a long time and can be used in place of fresh meat in an emergency. Fruits and vegetables put up when they are abundant will help to supply this important group in winter.

Farm women can look even farther ahead, and often can plan to raise a variety of foods for use when it is difficult to buy at reasonable prices; for example, enough beans to give the family a generous supply. Though navy beans have been most largely used in this country, there are many other good and easily grown kinds that can be chosen to give variety. In the South cowpeas should not be overlooked. If sugar is high in price honey can be produced, and home-made or purchased sorghum, maple, or cane sirup can be used.

HOW TO TELL WHETHER OR NOT THE DIET IS ADEQUATE.

It is very hard for a housekeeper to know exactly how much of each of the food substances or nutrients her family needs or exactly how much of each she is giving them. The exact amount which each person needs depends upon age, sex, size, and amount of work done with the muscles. An elderly person, or one of quiet habits, needs

less food than a vigorous, young one; a large person more than a small one; a man more than a woman; grown persons more than children; and a farmer working in the hayfield, a mechanic, or a football player more than a man who sits at his desk all day.

In order to calculate exactly how much starch, sugar, fat, protein, etc. (or, what is equivalent to this, how much protein and energy) the family needs one would have to know exactly how much muscular work each member was performing and also exactly how much of the different nutrients each food contained and exactly how much each person would eat. This, of course, would mean a great deal of figuring. Fortunately, such exactness is not necessary in ordinary life. If a little too much or too little of one nutrient is provided at a single meal or on a single day a healthy body does not suffer, because it has ways of storing such a surplus and of using its stored material in an emergency. The danger would come if the diet taken week in and week out always provided too much or too little of some one nutrient. Against this danger the housekeeper can more easily protect her family.

Habit and custom help greatly, because they usually are based on what the experience of generations has proved is wise and healthful, though, of course, there are bad habits and outgrown customs in food as in everything else. Good food habits, it must be remembered, include more than cleanliness and order in everything that has to do with food and meals and leisurely ways of eating. Equally important are a liking for all kinds of wholesome foods, even if they have not always been used in one's home or neighborhood, and eating reasonable amounts, without being either greedy or overdainty. Every effort should be made to train children in such good food habits. If older people have not learned them, they, too, should try to do so, for such things are very important not only to health but also to economy. To refuse to eat some wholesome dish simply because one is not accustomed to it may prevent the use of some very desirable and economical food. To feel that there is any virtue in providing more food than is needed shows poor taste as well as poor economy.

The health and appearance of the family are a good test of the wholesomeness of their diet. If they are strong, well developed for their ages, free from ailments, and full of energy and ambition, one may safely say their food agrees with them. But if they are listless and ailing, or not as well developed either physically or mentally as they should be, and if a competent physician finds that there is no special disease to account for these bad symptoms, a mother may well ask herself if the food is right, and if not, how she can make it so.

In such cases she might, for instance, apply for information on food and diet to her State leader in agriculture and home economics and to the home-economics department of her State agricultural college.

GENERAL SUGGESTIONS.

It is believed that it is impossible to plan the meals for a family wisely without at least as much knowledge of how different kinds of food serve the body as this bulletin has given and that the safest short cut to good planning lies in considering foods in the five groups here described. Ways of making economical use of the materials in each group can not be discussed in this bulletin, but a few general suggestions for getting the most for one's money in the matter of food may be made here.

Use cereals (flour, meal, cereal breakfast foods, etc.) freely, taking pains to prepare them with great care and to vary the kind used from day to day if necessary to keep people from tiring of them.

Remember that a quart of whole milk a day for each child, to be used as a beverage and in cookery, is not too much.

Remember that while skim milk should never be substituted for whole milk as the principal food in a child's diet, it is as valuable as whole milk as a source of protein and mineral matters in the general diet.

Remember that, except in the case of milk for children, the amount needed of foods specially useful for body-building purposes—that is, meats and meat substitutes, fruits, and vegetables—is not large, but what is needed is needed very much.

Do not be ashamed to plan closely. Thrift in food means providing enough food, neither too little nor too much.

Notice carefully how much of such staples as flour, sugar, milk, cooking fat, etc., is used each week for a month, and see if there are any ways of cutting down the quantity consumed.

Buy nonperishable materials in quantities if better prices can be secured and there is a good storage place in the home. Neighbors can sometimes club together to get lower rates.

Try to make the dishes served of such size that there will be enough to satisfy the appetite of the family and no unnecessary table and plate waste.

Do not be above noticing whether anything usable is thrown away with the garbage, which always shows how thriftily food is used in a household.

Many inexpensive materials can be made attractive and the diet can be pleasantly varied by a wise use of different flavorings.

"Finicky" tastes in food often prevent the use of many valuable materials which might be the means of saving money.

Good food habits are an important part of personal hygiene and thrift. Children get such habits by having suitable amounts of suitable foods served to them and then being expected to eat what is set before them.

True economy lies not only in buying wisely, but also in making the fullest possible use of what is bought.

PUBLICATIONS OF THE UNITED STATES DEPARTMENT OF AGRICULTURE OF INTEREST IN CONNECTION WITH THIS BULLETIN.

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