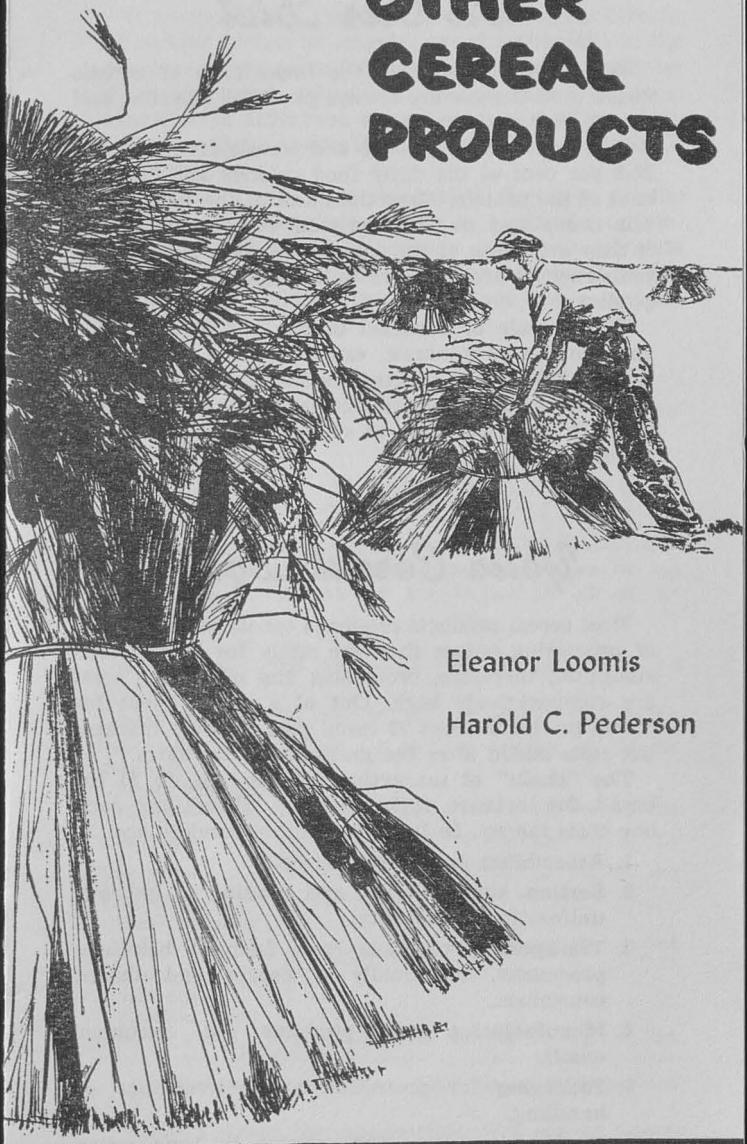
Extension Folder 186
December 1954

KNOW BREAD AND OTHER CEREAL PRODUCTS



Eleanor Loomis

Harold C. Pederson

UNIVERSITY OF MINNESOTA
Agricultural Extension Service
U. S. DEPARTMENT OF AGRICULTURE

BREADS AND CEREALS ARE NUTRITIOUS AND INEXPENSIVE

Cereals Are Important In Our Diet

Few people appreciate the importance of cereals in the diet. Cereals are always plentiful, storable, and usually a "good buy."

In a balanced diet, bread and cereals furnish about 28.8 per cent of the daily food calories and 29.8 per cent of the protein. More than half of the body's protein needs may be obtained from cereals and breads if they are eaten at the same meal with animal proteins such as are found in milk, eggs, meat, fish, and poultry.

Whole grain or enriched breads and cereals are a good source of minerals, especially iron, as well as the B vitamins—thiamine, riboflavin, and niacin.

Cereals and cereal products are also good sources of trace elements such as copper, sulfur, and manganese.

Your Cereal Dollar

Most cereal products require a considerable amount of processing before they are ready for human consumption; therefore, processing and marketing costs are comparatively high. Out of a dollar spent for cereal products about 78 cents goes to cover marketing costs added after the grain leaves the farm.

The "chain" of marketing services (figure 1) for bread, for instance, includes many "links" and each one costs money. In brief, marketing services are:

1. **Assembling** grain from farms.
2. **Sorting, standardizing,** and **grading** to improve uniformity and quality.
3. **Transporting** products from farm to handlers, processors, and finally to nearby and distant consumers.
4. **Manufacturing** into products the consumer wants.
5. **Packaging** for protection and convenience of handling.
6. **Storing** from time of surplus to time when needed.
7. **Financing** of plants, equipment, and operation.
8. **Carrying risk** due to price changes or shrinkage and quality loss.
9. **Gathering market information** to get the right products to the right places, in the right amounts, at the right time.
10. **Selling** the products, finding buyers, and arriving at prices.

The line between the production and marketing phases are not always as clearly drawn as figure 1 may indicate. Producers often perform some marketing services and in such instances receive a larger share of the consumer's dollar. Likewise, people engaged primarily in the marketing aspects of food products sometimes become active in the production phases. Either group is relatively free to concentrate its effort where it will receive the greatest return for labor, capital, and management.

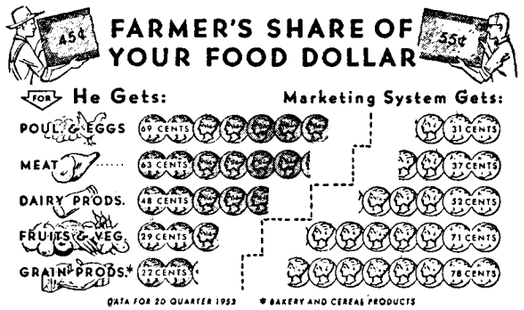


Fig. 1. Farmer's share of your cereal dollar.

The farmer's share of the retail price of a pound of bread was only 19 per cent for all ingredients in 1953, and only 15 per cent for the wheat it contained

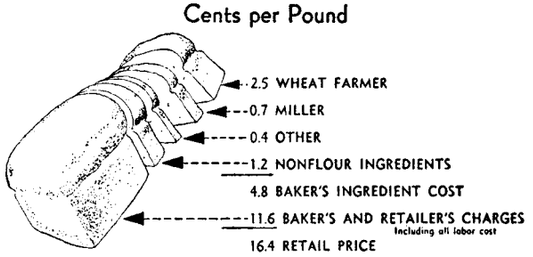


Fig. 2. Your loaf of bread.

(figure 2). The 4 per cent included other farm products such as milk, sugar, yeast, and shortening. This explains why price fluctuations in wheat have so little effect on bread prices.

Eating Habits Change

Most of the food consumed in the United States is produced here. Wide variation in climate, soil, and other conditions provides a wide choice of food for consumers. Increased knowledge of nutrition, changes in income, improved food processing techniques, and changes in food habits are responsible for variations in demand. Figure 3 shows that an increase in consumption of meats, milk, eggs, fruits, and vegetables has occurred in recent years. Conversely, there has been a decrease in cereal products and potatoes.

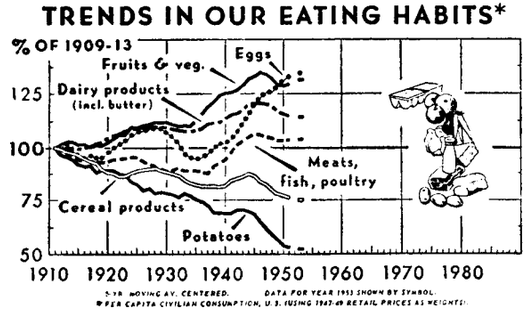


Fig. 3. Trends in our eating habits.

Importance of Various Cereals as Food

About half of the wheat, less than a third of the barley, about one-fourth of the rice, and less than one-tenth of the corn grown in the United States is used for human consumption. Small amounts of oats, buckwheat, and some other grains are also used for direct human food. Cereals not used in this manner are used for animal feeds, industrial products, and export. In some areas of the world where the population pressure on the food supply is exceedingly strong, a much larger percentage of the grains produced is used for food.

Food Value and Cost

Consumers have choices to make in buying cereals. Important factors to consider are the nutrients in the cereals and the price differential between a ready-to-eat product and one which must be cooked. There is also a price difference among cereals of either class.

Some cereals are fortified with additional minerals and vitamins.

In table 1 we have assembled the data on the nutrients in an average serving or 1 cup of ready-to-eat cereals. It would be an easy matter to calculate the cost per serving of each type of cereal to see which cereal offered the most food value for the money spent.

Table 1. Composition of 1 Cup Ready-to-Eat Cereals*

Food	Calories	Protein	Fat	Carbohydrate	Calcium	Phosphorus	Iron	Thiamine	Riboflavin	Niacin
	gm.	gm.	gm.	gm.	mg.	mg.	mg.	mg.	mg.	mg.
Wheat flakes	125	3.8	.6	28.1	16	115	1.0	.03	.06	1.7
Wheat flakes (added iron, thiamine, niacin)	125	3.8	.6	28.1	16	115	1.5	.20	.06	2. 2
Wheat shredded (large biscuit)	102	2.9	.7	22.7	13	102	1.0	.06	.03	1.3
Corn flakes	96	2.0	.1	21.2	3	14	0.3	.01	.02	0.4
Corn flakes (added thiamine, niacin, and iron)	96	2.0	.1	21.2	3	14	0.6	.10	.02	0.6
Rice flakes	118	1.8	.2	26.3	6	35	0.5	.02	.03	0.3
Rice, puffed	55	.8	.1	12.3	3	16	0.3	.01	.01	0.1
Rice, puffed (added thiamine and niacin)	55	.8	.1	12.3	3	16	0.3	.06	.01	0.8
Oat cereal (added iron, thiamine, riboflavin, niacin)	100	3.6	1.8	17.6	40	88	1.0	.20	.05	0.5

* Source: *Composition of Foods,* USDA Agriculture Handbook 8.

Table 2 shows the composition of 1 cup of home-cooked cereals. Here again it would be a simple matter to calculate the cost of the serving in relation to the food nutrients. Compare the nutrients in 1 cup of home-cooked cereals with 1 cup of ready-to-eat cereal in table 1.

Table 2. Composition of 1 Cup of Home-Cooked Cereals (After Cooking)

Food	Calories	Protein	Fat	Carbohydrate	Calcium	Phosphorus	Iron	Thiamine	Riboflavin	Niacin
	gm.	gm.	gm.	gm.	mg.	mg.	mg.	mg.	mg.	mg.
Ground wheat cereals	104	3.1	.2	21.7	7	31	.2	.01	.02	.2
Ground wheat cereals (added iron, thiamine, riboflavin, niacin	104	3.1	.2	21.7	7	31	.5	.10	.07	.4
Oatmeal	148	5.4	2.8	26.0	21	158	1.7	.22	.05	.4

Flour and Bread

Flour is the major ingredient in bread, and flour is made from cereal grains, mainly wheat. United States is a major wheat-producing country.

The characteristics of different kinds of wheat, however, are not the same. Wheat varies as to quality or bread-making characteristics, by regions, and between farms and fields. Millers, therefore, exercise extreme care in selecting various combinations of different wheats or other grains from which to make flour particularly suited for specific uses.

The family household used to be the major market for flour, but more recently bakers and processors of cereal food products have become the major users. This trend means more consumers are buying bread instead of flour.

Best Buy in Breads

To determine which is the best buy in breads, it is important to know what nutrients are in the bread, then compare the cost per unit to see which bread gives the most food value for the money.

Breads are made with 2 to 6 per cent of nonfat dry milk solids. Some breads are enriched with an additional amount of iron and the B vitamins—thiamine, riboflavin, and niacin. Since many bakers who enrich do not use the word "enriched" on their wrappers or in their advertising, it would be well to ask if the bread purchased is enriched.

There is no great difference in price between enriched and nonenriched bread, but there is a great difference in food value.

Table 3 gives the food value in 3⅓ ounces (about 3 slices) of some of the breads on the market.

Table 3. Food Value in 3½ Ounces of Bread* (About 3 Slices)

Bread	Calories	Protein	Fat	Carbohydrate	Calcium	Phosphorus	Iron	Vitamin A	Thiamine	Riboflavin	Niacin
	gm.	gm.	gm.	gm.	mg.	mg.	mg.	IU	mg.	mg.	mg.
Cracked wheat											
Enriched	259	8.5	2.2	51.4	83	126	2.0	—	.25	.19	2.5
Unenriched	259	8.5	2.2	51.4	83	126	1.0	—	.11	.10	1.4
Raisin											
Enriched	284	7.1	3.1	57.8	80	104	1.8	10	.24	.15	2.2
White (unenriched)											
2% nonfat milk solids	276	8.2	3.3	52.3	65	81	.6	—	.05	.08	.9
4% nonfat milk solids	275	8.5	3.2	51.8	79	92	.6	—	.05	.11	.9
6% nonfat milk solids	276	8.6	3.1	52.3	92	101	.6	—	.05	.12	.9
White (enriched)											
2% nonfat milk solids	276	8.2	3.3	52.3	65	81	1.8	—	.24	.15	2.2
4% nonfat milk solids	275	8.5	3.2	51.8	79	92	1.8	—	.24	.15	2.2
6% nonfat milk solids	276	8.6	3.1	52.3	92	101	1.8	—	.24	.15	2.2

* Source: *Composition of Foods*, USDA Agriculture Handbook 8.

Buying Information

Commodity	Approximate measure in one pound
White flour, all purpose, sifted once	3½-4½ cups
Cake flour, sifted once	4-4¾ cups
Rye flour, sifted	5-5⅔ cups
Whole wheat flour	3¾ cups
Cornmeal	3 cups
Crackers, 2"x2"	108 crackers
Rice	2 cups
Rice flakes	13 cups
Rice, puffed	27 cups
Bran	6 cups
Bran flakes	12 cups
Ground wheat cereals	3 cups
Oats, rolled	4¾-5¾ cups
Wheat, cracked	3 cups
Wheat, puffed	32 cups

Quantity Guide

Bread is measured without end crusts.

1 pound loaf white bread cuts 16 slices, ⅝ inch thick.

1¼ pound loaf white bread cuts 19 slices, ⅝ inch thick.

1½ pound loaf white bread cuts 24 slices, ⅝ inch.

2 pound sandwich loaf white bread cuts 28 slices, ½ inch thick, or 36 slices, ⅜ inch thick.

3 pound sandwich loaf white bread cuts 44 slices, ½ inch thick, or 56 slices, ⅜ inch thick.
1 pound loaf whole wheat bread cuts 16 slices, ⅝ inch thick.
2 pound loaf whole wheat bread cuts 28 slices, ½ inch thick.
3 pound loaf whole wheat bread cuts 44 slices, ½ inch thick, or 56 slices, ⅜ inch thick.
1 pound loaf rye bread cuts 23 slices, ¾ inch thick.
2 pound loaf rye bread cuts 33 slices, ¾ inch thick.
Note: the thickness and number of slices will vary in different localities.

Sandwich filling supplies for 100 sandwiches—1 gallon of any filling will spread 100 sandwiches, if approximately 2½ tablespoons is used per sandwich.

Peanut butter—3 quarts.

American cheese—6 pounds, if approximately 1 ounce slices are used per sandwich.

Mayonnaise—1 pint, if approximately 1 teaspoon is used per sandwich.

Lettuce—5 medium heads.

Poultry stuffings—Allow ¾ cups of stuffing per pound of poulry, dressed weight, or 1 cup per pound, ready-to-cook weight, to fill cavity and neck.

Bread Measurements

(Each slice ⅝ inch thick)

★ 1 slice fresh enriched bread yields approximately 1 cup soft bread cubes.

★ 1 slice fresh enriched bread yields approximately 1 cup soft bread crumbs.

★ 1 slice fresh enriched bread yields approximately ¾ cup toasted bread cubes.

★ 1 slice dry enriched bread yields approximately ¾ cup dry bread cubes.

★ 1 slice very dry enriched bread grated yields approximately ⅓ cup dry bread crumbs.

Why Buy Bread, Cereals?

Breads and cereals are one of the most economical sources of energy, minerals, and vitamins. When combined with animal proteins, cereals and breads are an excellent source of protein. For health's sake and for a low food budget, serve enriched breads and cereals three times daily.

UNIVERSITY OF MINNESOTA, INSTITUTE OF AGRICULTURE, ST. PAUL 1, MINNESOTA
Cooperative Extension Work in Agriculture and Home Economics, University of Minnesota, Agricultural Extension Service, Institute of Agriculture Cooperating.
Distributed in furtherance of Agricultural Extension Act of May 8, 1914. 10M—11-54