

Ontario Department of Agriculture

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FOOD VALUES

By

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R. HARCOURT.

The cost of living has increased rapidly. The price of flour has advanced over 50 per cent. in the last year or two; potatoes are almost double what they were a short time ago, and breakfast foods, meats, eggs, etc., are all selling for much higher prices than formerly. It is not the increase in the cost of those foods which may be called luxuries that is bothering the consumer; but it is the fact that the cost of the plain necessities of life have advanced so much that providing for the wants of the family has become a serious problem.

It is not necessary to discuss the causes for this; but, undoubtedly, the shortage in our own field and garden crops and the heavy demands for overseas consumption has resulted in a decreased supply for home use. These changed conditions render it necessary for us to study the foods available in order that we may determine which are our best and cheapest foods and how these may be combined to produce the best results. It is true that palatability and agreeableness enter largely into the problem, and that the cheapness of a nutritious food is not the only point to be considered; for few people, even to effect economy, will eat a food they do not like unless driven to it by necessity. However, people differ in their likes, and we shall discuss the foods on the basis of their nutritive value, pointing out those foods which furnish the most nourishment for a given sum of money, leaving the question of palatability to be decided by the consumer.

The constituents we value most in our foods are: protein, fat, carbohydrates and ash. *Protein* is the name commonly given to a class of substances which furnish the materials for the formation of bone, flesh, blood, etc. This constituent is absolutely essential in the food of animals; for, without it, no animal can grow or even subsist. Moreover, the animal is totally unable to create protein; that is a function of plant life. The animal can simply appropriate and transform the protein of plants into the particular protein of the body. Protein, when oxidized or burned in the body, will produce heat, and if eaten in excess of that required for other purposes, may form fat. Altogether protein is one of the most important constituents of a food, and the one which is the most expensive. Hence we naturally like to find a food rich in this substance.

Fat, or ether extract, is that part of the food which may be extracted from the water-free material by ether, benzine, gasoline, etc. It is of value for the formation of fat in the body and for the production of energy and heat. For this latter purpose it has more than twice the value of protein and carbohydrates. Fat may, therefore, be looked upon as a concentrated heat producer.

The Soluble Carbohydrates, or nitrogen-free extract, consist mainly of starches, sugars, and closely allied compounds. In the cereal breakfast foods these soluble carbohydrates form about two-thirds of the whole material. Their particular function in the body is to form fat, or, when oxidized, to produce heat and energy. They are frequently called the energy, or heat, producers.

Crude Fibre is the term applied to a group of carbohydrate substances which form the woody or straw-like framework of plants. It is so indigestible that it has almost no food value, and, further, it frequently renders the rest of the food less digestible by protecting it from the action of the digestive fluids. Therefore, a large amount of it in a food is not desired. Yet it is undoubtedly physiologically useful in giving the needed bulk to the food.

Ash is the inorganic or mineral part of foods. It is of great importance in the food of the young, as it furnishes the phosphates, chlorides, and other salts of calcium, magnesium, sodium, potassium, iron, etc., which are needed in building up bone and the tissues of the body.

HEAT OF COMBUSTION.—The various nutrients above referred to when supplied in the food enable the body to grow and to repair its tissues as they are worn out in the necessary exercise of the body functions. They also supply the body with the energy needed for doing work, both internal and external, and furnish the heat to keep the body warm. All the nutrients, except the ash, may be oxidized or burned in the body, and are, therefore, sources of energy. Consequently, the total energy value of a food may be determined by measuring the amount of heat given off when a definite weight of the food is burned. This energy value is conveniently stated in terms of heat, the Calorie, or unit of heat, being used for this purpose. The number of Calories of heat a gram of each food is capable of producing, if fully burned, is given in the last column of the Table.

Comparatively recent investigations in the problem of nutrition indicate that there are probably very small quantities of certain unidentified compounds in our foods which have a very marked influence on their nutritive value. Very little is known about these accessory compounds, and we are not in a position to ascribe values to them. We can, therefore, assume that in foods of like nature, especially when used in a mixed diet, the digested protein, fat and carbohydrates from one source are as valuable as those from any other. To make the comparison closer, however, we must bring these various factors to some common basis. As one of the main objects of food is to produce heat and energy, it is generally considered that if there is sufficient protein in the diet to do the work which it alone is able to perform, the amount of heat a food is capable of producing is the best basis upon which to make a comparison. With this idea in view, we have figured the number of Calories of heat as well as the pounds of protein, fat, and carbohydrates that will be furnished in one dollar's worth of a number of our common foods. This data is given in the following table, with the foods arranged in the order of their heat-producing power.

A study of the accompanying table shows that the foods derived from the cereal grains stand at the top of the list. This is not surprising, as they contain a large amount of carbohydrates, which are the cheapest fuel material among our foods. But it is worthy of note that they also furnish comparatively large quantities of protein and fat, much more than can be purchased for the same money in the form of meat, fish or eggs. Thus one dollar's worth of oatmeal at prevailing prices will contain two and a half pounds of protein. The same amount of money expended on a good spring wheat flour will furnish three pounds of protein; bread, a little over one and a half pounds; milk, over one pound; while sirloin steak will only supply two-thirds

of a pound and eggs about one-third of a pound. Consequently the cereal foods not only stand first on the list in fuel value, but they also are capable of furnishing more protein for a given amount of the money expended than can be procured in meat, fish or eggs. It is true that the protein of these latter foods is more easily and com-

PROTEIN, FAT, CARBOHYDRATES AND FUEL VALUE OF ONE DOLLAR'S
WORTH OF EACH FOOD.

	Price.	Protein lbs.	Fat lbs.	Carbohy- drates lbs.	Fuel Value Calories.	Compara- tive Values.
	\$ c					
Rolled Oats.....	5 per lb.	2.5	1.36	14.3	36,950	100.
Fall Wheat Flour.....	4 75 " cwt.	2.0	.20	16.0	34,307	92.8
Spring Wheat Flour.....	5 00 " "	3.0	.20	14.3	33,780	91.4
Corn Meal.....	5 " lb.	1.31	.25	16.26	33,735	91.3
Farinas.....	5 " "	1.9	.20	15.6	33,394	90.4
Rolled Oats (package)....	25 for 4 lb.	2.00	1.09	11.5	29,560	80.6
Sugar.....	8 00 per cwt.			12.5	23,250	62.9
Rice.....	7 " lb.	1.06	.05	11.3	23,210	62.8
Peas.....	7 " "	3.00	.19	9.0	23,121	62.6
Farinas (package).....	15 for 2 lb.	1.26	.14	10.3	22,207	60.1
White Bread.....	16 " 3 "	1.58	.38	9.1	21,650	58.6
Buttermilk.....	10 per gallon	3.0	.50	4.8	17,362	47.0
Skim Milk.....	10 " "	3.4	.30	5.1	17,070	46.2
Barley, pearl.....	10 " lb.	.84	.10	7.8	16,492	44.6
Beans.....	10 " "	1.95	.27	6.0	15,500	42.0
Potatoes.....	2 25 " bag.	.87	.04	6.24	13,797	36.2
Malta Vita.....	10 " 12 oz.	.74	.10	5.87	12,716	34.4
Toasted Corn Flakes.....	10 " 12 "	.42	.11	6.06	12,517	34.0
Grape Nuts.....	15 " 17 "	.81	.07	5.56	12,143	33.0
Milk.....	8 " qt.	1.04	1.27	1.66	10,402	28.2
Shredded Wheat.....	13 " 12 oz.	.63	.05	4.42	9,659	26.1
Beef, flank.....	14 " lb.	1.21	1.36		7,970	21.6
Butter.....	45 " "		1.88		7,963	21.5
Cheese.....	30 " "	.93	1.22	1.4	7,138	19.3
Mutton Chops.....	24 " "	.56	1.20		6,106	16.5
Ham, smoked.....	28 " "	.51	1.19		5,963	16.1
Beef, sirloin.....	25 " "	.66	.65		4,000	10.8
" round steak.....	24 " "	.79	.53		3,718	10.6
Lamb, hind quarter.....	27 " "	.61	.60		3,672	10.0
Ham, smoked and cooked.....	45 " "	.44	.50		2,930	8.0
Salmon, canned.....	25 " "	.78	.30		2,716	7.3
Salmon Trout (fresh).....	15 " "	.61	.34		2,569	7.0
Cod (salted).....	18 " "	1.05	.02		2,307	6.2
Eggs.....	48 " doz.	.37	.29		1,912	5.2
Halibut (fresh).....	25 " lb.	.61	.18		1,894	5.1

pletely digested, but the foods from the cereal grains contain so much more of it that this could not possibly make up the difference, and, furthermore, these cereal foods contain an abundance of the cheap heat-producing carbohydrates to do the work of digestion. Among the foods placed in the table buttermilk and skimmed milk are our cheapest source of protein, and they are probably as fully and as easily digested as the protein of meats.

Among the vegetable foods, the legumes contain the largest percentage amount of protein; but, owing to the present high price of beans, a dollar's worth of this food does not furnish so much protein as wheat or oat products.

The cereal products have not the same decided advantage over the meats in the fat purchased for one dollar. Some of them do supply more fat than the meats;

but, owing to the separations made in the preparation, others are low in fat. Thus the higher grades of flour and some of the wheat farinas are low in fat.

Among foods of unlike nature, such as we have in the above table, it is admittedly hard to make an absolutely just comparison. Students of these problems are, however, pretty well agreed on the principle that when there is sufficient protein in the diet the number of calories of heat a given amount of food will furnish is the best method upon which to compare this nutritive value. It is true that some foods may be prized for their content of certain substances; thus meats contain a high proportion of protein, which is after all the expensive part of our foods and, furthermore, the meats have a condimental value when used with vegetables. These facts give meats a peculiar value for which they possibly do not receive full credit in this method of comparison. Reference to the column of the above table giving fuel values, shows that this method of comparing the foods places the meats so far below the cereals that it cannot be lightly explained away. To bring out this comparison more clearly, rolled oats, which stands first on the list, is given a mark of 100, and all the others figured in proportion. Thus, according to this basis of comparison, if rolled oats be given a value of 100, fall wheat flour, at the prices used in the figuring, should be assigned 92.8, bread 58.6, cheese 19.3, sirloin steak 13.5 and eggs 5.2. Or, in other words, assuming, because rolled oats stands highest in the list of foods given, that one dollar spent on this food will give us full value, or 100, an equal amount of money spent on flour will furnish only 92.8 per cent. as much, steak 13.5 per cent., and eggs 5.2 per cent. Or that one dollar spent on eggs procured only 5.2 cents' worth of food material when compared with what could be got if the money had been spent on rolled oats, which is only about one-twentieth the returns for the money.

Turning now more especially to the cereal foods, it will be noticed that oatmeal, cornmeal, wheat farinas, and flour are our cheapest foods. The cost of buying the breakfast foods in package is well illustrated. According to the above data, when rolled oats are bought in package we only get 80 cents' worth for the dollar, that is, one-fifth of the dollar was spent on the package. In the case of wheat farinas, which are prepared from approximately the same part of the wheat kernel as the high patent flour, and are sold under the name of cream of wheat, meat of wheat, wheat crystals, etc., the difference in price is even more marked. Thus, the data in the table shows that in purchasing these goods we obtain 90.4 cents' worth of food for the dollar, taking rolled oats in bulk as our standard, and that this shrunk to 60.1 cents' worth when the farinas were purchased in package. Or, in other words, we pay 30 cents for the package, and it is extremely doubtful if we get anything else for the money. The goods put into the package are usually no different to those that are put into the barrel, and if, as is frequently the case in the larger stores, the whole of the contents of the barrel is done up in parcels at one time ready to hand out when required, the goods will be as fresh and clean as the package goods.

The prepared breakfast foods stand much lower in the list than the oat, wheat and corn meals. It must be said these ready-to-serve foods are put up in neat packages and that the goods have a clean, appetizing appearance, and, furthermore, that there is no expense incurred in their preparation for the table; but they are expensive. Toasted Corn Flakes furnish only 34 cents' worth of food and Shredded Wheat only 26 cents' worth for the dollar, taking oatmeal as the standard. What it costs to cook oatmeal is hard to estimate; much will depend upon whether a special fire has to be kept going for the purpose.

The position of bread in the table is interesting. The bread, like the prepared breakfast foods, is ready to serve; and one dollar, even at 16 cents for the large loaf,

will purchase approximately twice as much actual food as if spent on these prepared cereals. It stands first in our list of cooked foods. It is worthy of note, however, that while a dollar expended on spring wheat flour furnishes 91.4 cents' worth of food material, bread only supplies 58.6. The difference presumably is what it costs to make and deliver the bread.

Skim milk and buttermilk at 10 cents a gallon hold a good position in the list of common foods, and too little of these cheap foods are used. At present prices they furnish the cheapest source of food protein. Milk and corn meal or milk and bread form an almost perfectly balanced diet. It may not be the most appetizing diet, and it may be too bulky for the adult, but it is one that will be sustaining.

Potatoes have been figured at two dollars and twenty-five cents a bag, an unusually high price, yet they hold a fairly good position in the table. At present prices, however, the American practice of substituting rice for potatoes with meats is an economy.

Beans and peas are the only legumes included in the table. They do not hold the high place that might be expected of them. This is owing to the fact that they are in great demand for export and are consequently very high in price. The legumes are frequently referred to as the poor man's beef, but at present prices they do not furnish this constituent any more cheaply than the cereal grains.

The meats, fish and eggs are evidently our most expensive foods. Beef flank at 14 cents per pound stands highest in the list; but it lacks the cheap heat-producing carbohydrates, and, consequently, does not furnish as much heat as can be purchased in many forms of cereal foods for the same money. Neither does it supply an equal amount of protein. In fact, using its heat-producing power as the basis for comparison, beef flank is five times more expensive than oatmeal. On the same basis smoked and cooked ham costs twelve times as much as oatmeal, sirloin steak about nine times, round steak ten times, eggs twenty times as much as the oatmeal product. As previously stated, meats have a condimental value, the gravy often adds a decided relish to the vegetable used with it, and, possibly, the animal foods, including milk, add something to the diet that cannot be secured from any other source. Yet it is evident that if economy is any object the amount of meat used should be reduced to the minimum. Meat once a day is ample, especially when milk and milk dishes form an important part of the diet. In fact, under these conditions, no ill results will follow doing away with meat altogether.

There appears to be quite an erroneous idea abroad regarding milk. In many families it is purchased so sparingly that it is more a luxury than a staple food. It furnishes animal protein more cheaply, even at 8 cents a quart, than most cuts of the meats. Cheese has gone up so much in price recently that it has not the same advantage over meats it had a few years ago, but it is still a cheaper source of animal protein and fat than meats.

At the prices prevailing so far inland as Guelph it is evident that fish are even more of a luxury than meat. All these foods lend variety to the diet and are valuable, but if economy is an object it is evident they must be used sparingly.

Many people will possibly be surprised at the position of eggs in the table, as we have often been told of the wonderful nutritive value of an egg. It is safe to say, however, that when eggs cost more per dozen than an equal weight (one and one-half pounds) of steak they are more expensive. On the other hand, a pound of eggs (usually eight) will go further in serving a number of people than a pound of meat. In this sense they may be more economical than meat.

A great deal has been said about the advance in the price of food materials. To show more clearly how much they have advanced, we have calculated the amount of

each constituent supplied by some of our most common foods at the old prices. These figures are given in the following table.

PROTEIN, FAT, CARBOHYDRATES AND THE FUEL VALUE OF ONE DOLLAR'S WORTH OF EACH FOOD AT THE OLD PRICES

Name of Food	Price	Protein lbs.	Fat lbs.	Carbohy- drates lbs.	Fuel Value Calories	Present Purchasing Price of \$1.00
Spring Wheat Flour.....	\$3.00 per cwt.	3.90	.03	25.1	55,000	61.3
Rolled Oats.....	7 lbs. for 25c.	3.5	1.9	20.0	51,730	71.4
Farinas.....	6 " " 25c.	2.3	.24	18.7	40,070	83.3
White Bread.....	3 " " 10c.	2.52	.6	14.6	34,375	62.9
Potatoes.....	90c. per bag	2.18	.10	15.6	33,492	40.0
Beef, flank.....	8c. " lb.	2.12	2.37	13,944	57.1
Cheese.....	17c. " lb.	1.63	2.16	.24	12,593	56.6
Beef, sirloin.....	18c. " lb.	.92	.90	5,509	72.0
Eggs.....	25c. " doz.	.79	.56	3,853	50.0

The above data shows that at the old prices spring wheat flour was cheaper than rolled oats, and that we got 55,000 calories of heat for the dollar instead of 33,780, showing that the purchasing power of the dollar, so far as flour is concerned, has shrunk to 61.3 cents, and that when the three-pound loaf of bread sold for 10 cents a greater return for the money was secured than is got from the raw flour at present prices. In the last column of this table we have shown the calculated reduction in the purchasing power of one dollar for the various foods. Thus at present prices one dollar spent on rolled oats only goes as far as 71.4 cents would have some time ago, while the purchasing power of one dollar has fallen to 62.9 cents in the case of bread and to 40 cents with potatoes.

No attempt has been made to show the decrease in the value of the dollar when spent on what might be termed luxuries. It is worthy of note, however, that it is very easy to have the condiments and relishes cost as much as the real substantial part of a meal, and that to-day, even with the high price of living, it is possible to supply the real necessities of life for very little money. Thus Hutchison, in his book on Dietetics, says that the average man doing light work can get along very well on 120 grams of protein, 50 grams of fat and 500 grams of carbohydrates per day. This may be supplied by using $1\frac{1}{4}$ pounds of rolled oats, 1 pint of whole milk, 2 pints of skim milk and 2 ounces of sugar per day, at a cost of $12\frac{1}{2}$ cents for the materials. All whole milk would raise the quantity of fat above that required. Corn meal or wheat farinas and whole milk may also be arranged so as to form a balanced diet. These are extreme diets, and probably we would soon tire of such daily food, but they are no more extreme than what many good people have been brought up on in the past, and they serve to illustrate the fact that the cost of living can be very much reduced if necessary.

Furthermore, the methods used to prepare many of our foods to meet present-day demands has added much to the cost of living. Thus, in the case of corn meal, in order that it may keep longer the germ is removed in grinding and with it the fat. Consequently, most of the corn meal we have on the market contains less than half a per cent. of fat, while the grain contains 5 per cent. If all this fat was retained in the meal, the food would be much more nourishing, but it would have to be used when it is fresh. Somewhat the same thing takes place in making flour from wheat. The demand has been for a white flour and naturally the millers have

produced the article, with the result that much of the valuable part of the grain has gone for cattle food. Good, wholesome, nutritious bread can be made from the ground, unbolted wheat flour, or what is true Graham flour, and the cost of preparation be much reduced. A case is reported, where a farmer had some flour made in this way at a cost of seven cents per bushel and the family were delighted with the bread made from the flour. Allowing \$1.80 for the bushel of wheat and 7 cents for grinding, this flour cost \$3.10 per hundred pounds. Another case is reported of where a small coffee mill is used in the home to break down wheat for use as a breakfast food. The actual cost of this food was what was paid for the wheat, which at \$1.80 per bushel is 3.0 cents per pound. The wheat farinas cost 5 cents per pound.

The step taken by the British Government in demanding that all flour sold for home consumption shall represent a certain percentage of the grain, appears to be in the right direction. The object is to force the production of a straight grade flour and retain more of the grain for human consumption. The demand has been for highly refined products. This has not only increased the cost of the food, but it has also, in some cases, reduced the nutritive value of the food. A swing back to the simply prepared foods would do much to reduce the cost of living.

The following notes on food economy were prepared by Miss M. U. Watson, Director of Home Economics, for another purpose, but they are so suitable to the present conditions that it has been thought well to include them in this publication.

1. INTELLIGENT BUYING OF FOODS.

Learn the real cost—not how little did it cost, but how much real nourishment was secured with the money spent.

Plan the meals ahead so that one may dovetail with another, and the leftovers be satisfactorily used in succeeding meals, and so that you may avoid constant orders to the tradesmen. Remember that the customer pays for paper bags, string and delivery.

Avoid the expensive meats and other foods, the price of which is high in the early season and lowers later, e.g., spring lamb, broiling chickens, early strawberries, early vegetables, etc.

Buy sparingly the foods which are procured more for their taste than their nourishment, e.g., bouillon, many relishes and condiments, many imported or hot-house fruits and vegetables.

Buy Canadian grown and Canadian manufactured foods. There are too many imported jams and canned foods on our grocers' shelves. Leave them there and they will disappear.

People with a garden and the necessary time can greatly lessen the food cost by canning their own fruits and vegetables. Meats also may be canned to advantage when prices are low.

2. FRUIT ECONOMY.

Home-grown fruit is cheaper than any other. A small garden may be made to yield a great variety.

Fruit from the grocer or fruit-dealer always costs more because, in addition to the dealer's profits, the consumer must pay enough to cover the cost of the package, the cost of transportation, and the cost of what spoils on the dealer's hands.

It is always poor policy to buy poor fruit; not only is the flavor usually poorer, but usually the same money spent on good fruit will go farther.

As a rule it is well to see fruit before purchasing. Telephoned orders frequently result in mushy berries, bruised fruit, or green fruit.

As much as possible use fruit when fresh, and at its best and cheapest season, when it is most wholesome; the family enjoys it better, and it takes the place of cooked dishes, which take more time and labor to prepare.

Store fruit supplies with care. Turn berries and small fruits out on platters or trays in a shallow layer to prevent their further crushing and to prevent moulding, and keep in a cold place. Pick over the basket of apples, plums, peaches, etc.; remove any showing the least decay, spread the rest on trays and keep in a cold place. Oranges, grape-fruit and cranberries will keep in ordinary rooms, but are better spread out on shelves.

Watch fresh fruit stores closely, and if it cannot be used while fresh, stew or preserve it before it spoils.

At the beginning of the preserving season, it is a good plan to get out the jars, match up jars and tops, and make sure they are thoroughly clean and ready for sterilizing, and do them all in one big job instead of waiting until fruit is on one's hands.

If the garden yields little fruit at a time, the preserving is lightened if sugar syrup is made by the crockful and stored away. It is then an easy matter to fill a jar or two with the fresh fruit, fill up with the syrup, and place it in the oven on a block of wood, to cook while other work is going on.

Fruit supplies valuable mineral matter, which helps to keep the blood in good condition, therefore it is unwise to do without it. A fruit bill yields more satisfaction than a doctor's.

3. VEGETABLE ECONOMY.

Home-grown vegetables are the cheapest, and a very small garden yields great variety.

All fresh vegetables are valuable for their mineral matter, and some yield a good deal of carbohydrates, while the legumes yield cheap protein. Reference to the Food Value tables will show that there is great opportunity to lessen the vegetable bill by using more of the root vegetables, especially in winter, and less canned stuff or expensive green stuff.

Canadians need to pay more attention to the cooking of vegetables. Too frequently they are spoiled by under-cooking or over-cooking, or careless seasoning. Their value as meat substitutes or meat seasonings is not half appreciated. Too frequently their valuable mineral matter, our chief excuse for buying them, is poured down the drain with the cooking water.

Canadians need to study the possibilities of the legume vegetables. Even at present prices they furnish cheap protein. Split pea soup and baked beans are not the only dishes to be made from them. With potatoes at the present price, legume dishes are cheap substitutes for both meat and potatoes.

4. MILK ECONOMY.

Secure the best milk at any price for the babies. Their lives depend upon it.

Whole milk, skimmed milk, buttermilk for the children, instead of so much meat, is both more wholesome and cheaper. Give them all they will take.

Buy skimmed milk for milk soups and desserts, because it is a substitute for meat protein and costs about a quarter the money.

5. MEAT ECONOMY.

Use less; once a day is ample if supplemented with legume dishes, milk soups, cheese dishes, attractive bread and cereal dishes, and eggs when they are cheap enough.

Serve carefully at the table; it is better to serve twice than to send remnants to the garbage pail.

Use cheaper cuts. We pay largely for flavor, tenderness and excessive fat in the expensive cuts.

We buy meats chiefly for their protein food value. The cheaper round, shank and neck cuts give more for the money.

The cheaper cuts chopped fine make a Hamburg steak as quickly broiled as a porterhouse.

Prolonged cooking at the lower temperatures will make the toughest cuts tender and improve their flavor. This can be accomplished economically in the double-boiler when the coal or wood fire is being used for other things; in the casserole or close-covered stone crock in the coal-stove oven when it is left for the night; or in the fireless cooker when gas or electric stoves are used.

Stews.—To many Canadians the word brings a memory of savorless chunks of meat swimming in a watery gravy. In intelligent hands it becomes a dish of infinite variety through the combination of different meats with different vegetables and seasonings, into juicy pieces of meat bedded in most savory sauce.

Make a little meat go a long way. Spread the flavor over other nutritious but more neutral-flavored food, e.g., meat pies, Irish stew, potpies with dumplings, stews with plenty of savory gravy, served in a border of rice, mashed potatoes, boiled beans, macaroni or vegetables.

Use every part of a meat purchase. Try out the fat not used for the table, and use for shortening and other purposes; trimmings and bones for soups, and leftovers for "made" dishes. Avoid using too strong heat for roasting and broiling, which ruins bones and trimmings for the soup pot, besides wasting heat.

Eliminate meat from the diet of the small children. The normal child will thrive better on milk, cereals and eggs in place of meat. A child's appetite is what the parents make it. Do not feel sorry for the child whose breakfast is oatmeal and milk, and supper is bread and milk with a bit of biscuit and jam; the child is well fed.

Eggs may replace meat in the adult diet whenever the price per dozen goes below the cost of 1½ pounds round steak.

6. FAT ECONOMY.

The cost of meat fat is high. At the present time we pay 28 cents for bacon, 30 cents for ham, 26 cents for porterhouse steak, 24 cents for pork chops, and 35 cents for early lamb. It must always be remembered the fat is paid for at the same price as the lean.

Much of the fat paid for tries out of the meat in the cooking and is not sent with the meat to the table. Much of the fat of the meat sent to the table is not eaten. What becomes of it? Much of it never reaches the table again. Too frequently it is fed to a useless dog, dumped into the soapgrease, scraped into the garbage pail, or even thrown into the fire and burned.

The thrifty housewife saves every ounce of sweet fat for future cooking, and seldom has to buy special lard or oil for cooking. When any fat cannot be used for cooking it is converted into soap.

One housekeeper reports her experience of saving and keeping the different kinds separate for different purposes as follows:

Beef drippings for potatoes.

Pork drippings for sweet potatoes, gingerbread and ginger cookies; mixed with beef dripping for meat pastry.

Ham, bacon and sausage fats for soups, vegetables and things too numerous to mention.

Lamb fat for warming over beans.

Veal fat for omelets.

Chicken, duck and goose fat for cookies, gingerbread and spiced cakes.

Chicken fat with a little bacon proved especially delectable for cooking oysters in.

There is no doubt that a careful saving and use of meat fats lessens the butter bill to a considerable extent.

7. IN GENERAL.

Excessive tea and coffee is costly in nerves as well as money.

Use all the cereal foods possible. Their protein is quite as valuable as animal food protein and much cheaper.

Cheese is especially valuable as a flavoring for combination with breads and more neutral flavored foods.

Use leftovers attractively.

Too often leftovers are served unattractively. There are many simple ways of converting them into dishes the family welcomes.

Use more time and lower heat in cookery to develop flavors and secure all the goodness in the foods. This means forethought in marketing and planning for the work.

METHODS OF MAKING BREAD IN THE HOME.

At the present time an unusual interest is being taken in making bread in the home. How much more economical this home made bread may be depends upon many conditions which we will not attempt to discuss here. But without allowing anything for labor and presuming that the fuel used in baking the bread would be burned anyway for cooking, heating, etc., there is sufficient margin to warrant the economical housekeeper to seriously consider the matter. For the convenience of those who wish to try making bread the following long and short methods are given:

Long Fermentation Method.

1 dry yeast cake	2 tablespoons sugar
2 quarts liquid	2 tablespoons lard
2 tablespoons salt	flour

NOTE.—All measurements are level.

PREPARATION OF FERMENT.—Put a pint of water at a temperature of about 90 degrees F. into a bowl, drop the dry yeast cake into it and soak for half an hour, then stir in enough flour to make a thin batter, add one tablespoon sugar, and

beat with a dover beater until well mixed and full of bubbles. Stand in a warm place (about 70 to 80 degrees F.) until light, which will take from four to five hours.

PREPARATION OF SPONGE.—When the ferment is ready put the rest of the sugar, salt and lard into a bread-pan, bring the rest of the liquid to 90 degrees F. and add it to the ingredients in the pan. Add enough strong flour to make a batter that will beat without spattering; add the ferment and beat until it looks smooth and elastic. This will probably take 15 or 20 minutes. Cover closely and keep at a temperature of 70 degrees F. until light and spongy. This will take from 9 to 10 hours.

PREPARATION OF DOUGH.—When the sponge is ready stir in strong flour until too stiff to use the spoon, then mix in more with a stiff-bladed knife or the hand until the dough no longer sticks to the fingers. Turn the dough out on the moulding-board to knead, leaving the pan quite clean. The dough should knead without flour being put on the board or hands; if it proves sticky return it to the pan and mix in more flour. Remember that while too slack a dough makes coarse textured bread, too stiff a dough makes slow-rising bread which will dry out quickly. Knead lightly until the mass is elastic and velvety, the surface covered with a film of tiny bubbles, and a cut with a sharp knife shows the inside full of fine even bubbles and free from lumps or unmixed portions. Grease the bread-pan lightly with sweet dripping, warm both pan and cover if they are cold, put in the dough, cover closely, and keep in a warm place (about 80 degrees F.) until rather more than doubled in volume, or until a gentle slap with the tips of the fingers causes it to fall in. This will take from two to three hours.

Knead lightly in the pan for a minute to get rid of the larger bubbles and return to rise a second time until double in volume. This will take from one to two hours.

Divide into loaves that will half fill the bread tins. Knead each piece only enough to get rid of large bubbles and smooth the surface and put it into a greased tin. Keep in a warm place (about 70 or 80 degrees F.) until doubled in volume, when they should have a bold, nicely-rounded appearance.

Bake an hour in a moderate oven. When done, the loaves should give a hollow sound when tapped on the bottom.

When baked remove at once from the pan and stand on edge or across the top of the pans that the air may get to all parts and cool it quickly.

Short Fermentation Method.

2 cups scalded milk	2 cups water
2 tablespoons sugar	2 tablespoons shortening (butter or lard)
4 teaspoons salt	1 compressed yeast cake

Dissolve yeast and sugar in half a cup of luke warm water. To the rest of the luke warm liquid (90 degrees F.) add sufficient warm flour to make a batter that can be beaten without spattering, add yeast mixture and beat until smooth and silky. Cover and put in a warm place free from drafts for from one and one-half to two hours. When light, add lard, salt and enough flour to make a dough that will not stick to the hands or board. Knead until smooth and elastic. Place in warmed and greased dish to rise again until double in bulk, about two hours, shape

to half fill well greased bread pans. Cover, let rise till double in bulk and bake in moderate oven for about one hour.

The above calls for strong spring wheat flour. Soft fall wheat flour may be used for the dough stage, but must be kneaded down before it has quite doubled in volume each time. It is not advisable to use soft flour for the ferment and sponge stages as it does not stand the long fermentation.

Home-made yeast may be used instead of the dry yeast. Use one cup home-made yeast and only $3\frac{1}{2}$ pints of liquid.

The liquid may be part milk (scalded) and part water. The latter may be potato water, i.e., water in which two or three potatoes have been boiled, removed and finely mashed and returned to the liquid.

The potato water may form the liquid for the ferment stage, and the mashed potatoes added when the sponge is made. Potatoes give that silkiness of texture so much desired by good breadmakers.

If the dough is kept covered while rising it will not form a crust. If it seems inclined to form a crust moisten with warm milk and water. A crust is to be avoided as it makes a streak through the loaf if kneaded in at the early stages and an unsightly crust on the baked loaf if allowed to form in the last stages.

The second rising of the dough may be omitted, although the extra rising makes the loaf a rather finer texture.

The bread-mixer may be used to knead the dough after it is known exactly how much flour the liquid will need to make dough of the right stiffness.

