

CHAPTER XIX.

MILK, MILK PRODUCTS AND EGGS.

MILK, in one form or another, is common throughout the civilized world. It is estimated that fifty-three gallons per year are consumed by every man, woman and child in the United States.

In this country the animal that is generally bred for the production of a supply of milk is the cow. It is not asserted that the milk of cows is any more desirable for human food than that of some other mammals, but their milk producing power is generally more satisfactory. Our preference for cow's milk is undoubtedly owing to custom and acquired taste. In India buffalo milk is used, and in South America that of the llama. In Switzerland and other rough and hilly countries of Europe it is the milk of the goat, while in the faraway frozen North the milk of the reindeer is a staple article of diet. Other lands favor other milk.

AVERAGE COMPOSITION OF MILK.—The average composition of milk obtained from the various mammals is as follows:

| <i>Average composition of milk of various kinds.</i> | | | | | | | | | | |
|--|----------------|----------------|----------------|----------------|----------------|----------------|--|--------------------------|--------------------------------|----------------|
| KIND OF MILK. | Water. | Total solids. | Protein. | | | Fat. | Carbohy- drates (milk sugar). | Mineral mat- ters. | Fuel value per pound. | Calo- ries. |
| | | | Casein. | Albu- min. | Total. | | | | | |
| | <i>Per ct.</i> | <i>Per ct.</i> | <i>Per ct.</i> | <i>Per ct.</i> | <i>Per ct.</i> | <i>Per ct.</i> | <i>Per ct.</i> | <i>Per ct.</i> | <i>Per ct.</i> | |
| Woman | 87.58 | 12.6 | 0.80 | 1.21 | 2.01 | 3.74 | 6.37 | 0.30 | | 310 |
| Cow | 87.27 | 12.8 | 2.88 | .51 | 3.39 | 3.68 | 4.94 | .72 | | 310 |
| Goat..... | 86.88 | 13.1 | 2.87 | .89 | 3.76 | 4.07 | 4.64 | .85 | | 315 |
| Sheep..... | 83.57 | 16.4 | 4.17 | .98 | 5.15 | 6.18 | 4.73 | .96 | | 410 |
| Buffalo (Indian).. | 82.16 | ..... | 4.26 | .46 | ..... | 7.51 | 4.77 | .84 |  | ..... |
| Zebu..... | 86.13 | ..... | ..... | ..... | 3.03 | 4.80 | 5.34 | .70 |  | ..... |
| Camel..... | 87.13 | ..... | 3.49 | .38 | ..... | 2.87 | 5.39 | .74 |  | ..... |
| Llama..... | 86.55 | ..... | 3.00 | .90 | ..... | 3.15 | 5.60 | .80 |  | ..... |
| Reindeer | 67.20 | ..... | 8.38 | 1.51 | ..... | 17.09 | 2.82 | 1.49 |  | ..... |
| Mare..... | 90.58 | 9.9 | 1.30 | .75 | ..... | 1.14 | 5.87 | .36 |  | ..... |
| Ass | 90.12 | 10.4 | .79 | 1.06 | ..... | 1.37 | 6.19 | .47 | | 215 |

The average composition of milk products as compared with

other foods in common use is shown as per Government analyses in the accompanying table:

Average composition of milk products compared with other food materials.

| MATERIAL. | Refuse. | Water. | Protein. | Fat. | Carbo- hy- drates. | Ash. |
|---|----------------|----------------|----------------|----------------|--------------------------|----------------|
| | <i>Per ct.</i> | <i>Per ct.</i> | <i>Per ct.</i> | <i>Per ct.</i> | <i>Per ct.</i> | <i>Per ct.</i> |
| Whole milk | | 87.0 | 3.3 | 4.0 | 5.0 | 0.7 |
| Skim milk | | 90.5 | 3.4 | .3 | 5.1 | .7 |
| Cream | | 74.0 | 2.5 | 18.5 | 4.5 | .5 |
| Buttermilk | | 91.0 | 3.0 | .5 | 4.8 | .7 |
| Whey | | 93.0 | 1.0 | .3 | 5.0 | .7 |
| Condensed milk, unsweetened | | 71.3 | 7.4 | 8.5 | 11.1 | 1.7 |
| Condensed milk, sweetened | | 26.0 | 8.2 | 9.6 | 54.8 | 1.9 |
| Butter | | 13.0 | 1.0 | 83.0 | ..... | 3.0 |
| Cheese, American Cheddar | | 33.5 | 26.0 | 35.5 | 1.5 | 3.5 |
| Cheese, cottage | | 53.0 | 19.6 | 23.2 | 2.1 | 2.1 |
| Cheese, Swiss | | 31.4 | 27.6 | 34.9 | 1.3 | 4.8 |
| Milk powder (from skimmed milk) | | 3.0 | 34.0 | 3.1 | 51.9 | 8.0 |
| Kephir..... | | 89.6 | 3.1 | 2.0 | <i>a</i> 4.5 | .8 |
| Koumiss | | 90.7 | 2.2 | 2.1 | <i>b</i> 4.1 | .9 |
| Infant and invalid foods, farinaceous | | 9.4 | 9.4 | .4 | <i>c</i> 79.9 | .9 |
| Infant and invalid foods containing milk and starches | | 4.3 | 9.6 | 3.8 | <i>d</i> 80.2 | 2.1 |
| Infant and invalid foods, malted preparations | | 4.2 | 12.0 | 1.0 | <i>e</i> 79.8 | 3.0 |
| Beef, sirloin steak | 12.8 | 54.0 | 16.5 | 16.1 | ..... | .9 |
| Eggs, as purchased | 11.2 | 65.5 | 11.9 | 9.3 | ..... | .9 |
| Wheat flour, patent roller process | | 12.0 | 11.4 | 1.0 | 75.1 | .5 |
| Wheat bread, white | | 35.3 | 9.2 | 1.3 | 53.1 | 1.1 |
| Beans, baked | | 68.9 | 6.9 | 2.5 | 19.6 | 2.1 |
| Potatoes, as purchased | 20.0 | 62.6 | 1.8 | .1 | 14.7 | .8 |
| Apples, as purchased | 25.0 | 63.3 | .3 | .3 | 10.8 | .3 |

a Including 2.1 per cent. alcohol and 0.8 per cent. lactic acid.

b Including 1.7 per cent. alcohol and 0.9 per cent. lactic acid.

c Including 6.62 per cent. soluble carbohydrates (sugars).

d Including 49.05 per cent. soluble carbohydrates (sugars).

e Including 48.39 per cent. soluble carbohydrates (sugars).

As the table shows, the three groups of protein, fat and carbohydrates are represented by fair proportions as compared with other foods, the quantities of protein and fat being especially noteworthy, as it is these elements and the mineral matter, ash, which give milk its peculiar value as food.

Milk varies very much in quality owing to the different nutrient elements found. It is entirely possible for one man to pay nearly twice as much as his neighbor for an equivalent nutritive value in milk at the same price per quart, but from different dealers. In other words, if one pays ten cents a quart for milk that contains only half the quantity of nutritive food

elements contained in a quart for which his neighbor pays only ten cents, he has paid twice as much as his neighbor.

This is what leads the creameries to buy milk not in accordance with its quantity, but on the basis of the amount of chemical fats it contains. The wise owner of cows, therefore, whose cows are kept for the purpose of giving milk, will make it his effort to develop animals that will produce milk that contains large proportions of the fat elements. The Guernsey and Jersey, both Channel Island breeds, are well known for their rich cream-producing qualities. Yet there are many other breeds that yield milk containing fairly good proportions of all the food ingredients.

It is this variation in the milk of different cows that leads dairymen who supply the milk trade to mix the milk drawn from all the cows of the herd as speedily as possible after milking. This is an advantage to the consumer, as it keeps the milk day by day at a reasonable uniformity.

Where one is purchasing from unprincipled dealers, however, the variation in the quality of the milk is determined by the amount of water added. Sometimes a dealer will allow the milk to stand and remove the cream. While this is not adulteration in the sense of any added ingredient to the milk, it is however adulteration under the law if the product is sold as whole milk, and it is a theft to the consumer because it deprives him of the food values for which he pays.

CLEANLINESS AND QUALITY ESSENTIAL.—In those cities that carefully guard the health and pocket of its citizens a certain standard has been established for the quality of milk. Any milk found below this standard is condemned. Every city and town in the United States should have such a standard and see that it is rigidly maintained. Necessarily the higher the requirement, the better for the purchaser. The retail trade might be conducted on somewhat the same plan as the dairies which make butter and cheese, where they buy and pay for the milk according to the amount of fat which it contains. In such a case the milk could be tested by the regular standard and if the milk surpasses the quality required, the price could be

correspondingly increased. If it fell below, the price would be reduced. Under such methods both producer and consumer would be fairly treated, and the producer whose uniform product was of an extra high grade would soon establish a reputation that would be of value to him, as well as give the consumer a reliable hint as to where the richest milk could be obtained.

Unless one is perfectly familiar with those dealers who advertise "sanitary" and "hygienic" milk, it would be well to regard their products with suspicion, for it has been found that those dealers who claim the most for their milk in these points often secure their milk from dairies which are in a most decidedly unsanitary condition.

It cannot be too strongly emphasized that one cannot exercise too great care in keeping everything connected with milk in the most cleanly and sanitary state. A properly conducted dairy will be as clean as a well-conducted kitchen. There will be neither piles of refuse nor ponds of vile-smelling liquids to attract and breed flies either in the cow-shed or the nearby yard. The udders and teats of the cows will be washed before being milked and every care taken to see that the milk is kept clean and uncontaminated up to the time that it is placed in the hands of the consumer. This means the scrupulous washing of all utensils that come in contact with it in any way, and more than ordinary care on the part of those handling it. If there is the slightest suspicion in any one of these particulars, the consumer should find a new and more careful dealer.

There are times when milk that has not been mixed has a somewhat unpleasant taste. This can easily be remedied by aerating it. This is done by pouring the milk from one vessel to another half a dozen times, so as to produce air bubbles in it. An improved taste is the result from this contact with air.

GOAT'S MILK.—Next to cows the goat is the most useful milch animal. It is said that as a food for man, its milk is far superior to cow's milk. It is purer, more nutritious, more easily digested, and more nearly a perfect food for the human system.

In composition, goat's milk has a smaller proportion of water, and a considerably larger proportion of both fat and albumin. In the proportions of sugar, casein, and dry substance, the two kinds of milk are about equal. Some analyses give the goat's milk a higher proportion of sugar. Even if the percentage of sugar is equal, however, the milk of the goat is much richer in nutritive composition.

Goat's milk is particularly wholesome for infants, because its composition is almost the same as that of human milk. Furthermore, as its cream rises far less rapidly, it remains more nearly in an unchanged condition for several hours.

Foreign writers commend goat's milk not only as food for children but also as food for invalids and for use in cooking. Some of them hold that the milk is highly beneficial when used as a medicine for certain diseases and ailments. In a number of sanitariums in France and Switzerland, this milk is considered as an important factor in certain systems of treatment. In these places the goat's milk is used extensively in cooking, and is also given to the patients in large quantities in its natural state.

The whey of the goat's milk is highly commended for its nourishing and medicinal properties. It is held to be especially beneficial for lung diseases and for weakness resulting from innutrition.

On account of the comparatively low cost of keeping, the milch goat is especially valuable to the poorer classes. It is estimated that seventy-five per cent of the families in Germany keep goats. In that country, many people too poor to keep cows are able to have a goodly supply of milk by keeping goats.

Both in relation to the supply of food and in relation to the weight of the body, the goat's yield of milk is exceedingly large, about twice that of the cow. About three quarts a day is a good yield for one goat.

While goats probably require greater gentleness in handling than cows, yet when treated kindly they are exceptionally easy to milk. In some countries, the people train their goats to allow children to suckle.

In the American Southwest, among the Mexican population, goats are largely used, both as milk and cheese-producing animals. Over twenty thousand pounds of goats' cheese are annually shipped from Trinidad, Colo., to eastern markets, besides the large amounts that are made for home consumption.

INVALIDS AND MILK.—A diet of milk has been from the earliest times recommended for invalids in general, and for persons suffering from specific diseases. Hippocrates, the father of medicine, advises consumptives to drink large quantities of asses' milk. We have many records of cures of disease made by celebrated Arabian and Persian physicians by the use of camels' milk and its sour products.

Of late years, physicians in both Europe and America have called attention to the beneficial effects of the use of milk in certain diseases, but there have been few efforts to confine the diet exclusively to milk. The great mistake has been made of combining other foods with the milk, even meat, eggs, vegetables and fruits, with a total want of knowledge and a disregard of the clear evidence that such mixtures not only fail to benefit but are positively injurious.

Experience has demonstrated that where invalids suffering from certain diseases live exclusively upon the milk diet, taking it in as large quantities as possible, at definitely regular intervals, the whole system becomes "flushed" as it were, with the nutrient qualities of the milk, thus eliminating the diseased cells and forcing the body to take on and build new cells, free from disease and full of vigor.

In Volume III of this book there are included full and complete instructions for the use of the milk diet as a curative agent.

Buttermilk has always been regarded as a most agreeable beverage and it is well known that it has a decided food value. Buttermilk is very much like skimmed milk in composition, having about the same food value, but it usually has a mild acid taste because the cream is allowed to sour before churning. During the process of churning the fat globules are brought together by churning and removed, and the thin liquid that

remains is very similar in its constituent elements to skimmed milk. An ordinary glass contains about as much nourishment as two ounces of bread, a good sized potato, or a half pint of oysters. Many people find it more palatable than milk, but others find the sour taste unpleasant. It is as digestible as milk and often more so, for its casein forms a more flaky curd than that of ordinary milk. In Holland babies are fed on buttermilk and it often proves satisfactory when the protein of sweet milk proves indigestible. It is a good sign that its use is increasing in this country. Buttermilk ice-cream is considered a delicacy in some parts of the country, being especially favored for invalids.

There is a difference in buttermilk churned from sweet cream and that from soured cream. In the souring process lactic acid is produced. This is caused by a bacterial growth in the cream which feeds upon the milk sugar. Some people prefer the sweet buttermilk, but as far as nutritive value is concerned they are both about equal. There are cases, however, where the lactic acid is an extra aid to digestion in that it supplies to some stomachs, in an easily assimilative form, the acid that it requires.

Buttermilk being a good food and easily digested, aids in the purification of the blood, and thus may be used to give the complexion that healthful purity which is so much desired.

SOUR MILK.—Sour milk, known as clabber, although little used in this country, has been a common article of diet in many parts of Europe for centuries. Whether made from whole milk or skimmed milk it is valuable because of its nutritious qualities, but if made from skimmed milk the fat elements are removed and its nutritive value is correspondingly lowered. The souring process produces lactic acid, but this makes no appreciable difference in the fats, whether they are used for the making of butter or are used just as they are for food.

Milk allowed to sour often develops a bitter or otherwise unpleasant flavor. This is owing to the fact that other bacteria besides those which produce the lactic acid are developed at

the same time within the milk and cause chemical changes which produce these unpleasant flavors. These bacteria require the air for their development and usually appear in a yeasty mould form on the top of the milk. Hence, whenever one leaves milk to stand for the purpose of making sour milk, it should be carefully kept in an air-tight vessel or bottle, and if a "mouldy" part forms on top it should be carefully removed, since otherwise an extremely unpleasant bitterness will mar the flavor. In 1905 Professor Metchnikoff, sub-director of the Pasteur Institute of Paris, made known to the world the results of a number of experiments with sour milk. As a result of these he made some striking claims for this food beverage, the chief of which was that sour milk preserves the balance between two opposing elements in the blood and so leads to long life.

Sumik, a special form of sour milk used as a beverage, is made as follows: The milk is allowed to turn to a clabber in an air-tight vessel. An ordinary fruit jar can be used to advantage. Simply fill the jar with sweet milk and screw down the lid very tightly, using the rubber ring that is essential for this purpose. As soon as the milk turns to a clabber, it is ready to prepare.

The preparation consists simply in thoroughly beating and aerating the milk with an egg-beater or some similar device. When beaten until it is frothy, like whipped cream, it will in no way taste like ordinary sour milk. Do not forget that if soured while allowed to remain open to the air, the "mould" that frequently forms on the top of the fluid should be removed. If this is neglected the sumik will have a bitter, unpleasant taste.

Since earliest times fermented-milk products have been used as beverages and articles of diet in Central Asia, Turkey and other countries. These products are prepared by allowing special ferments or yeasts to develop in milk, for, like all fermented beverages, they owe their sparkling or effervescent qualities to the carbon dioxide produced by the action of organism. The flavor differs with the process of manufacture.

These fermented-milk beverages have proved very satisfactory in invalid dietetics and are now well known and commonly used. Fermented-milk beverages may be made at home, though they are common commercial products in the United States. In this country cow's milk is almost universally used to make these beverages, but other milk, for instance mare's milk, is more common in Central Asia and other regions.

A carbonated milk, which is made by charging milk with carbon dioxide, is sometimes found on sale, but, of course, it lacks the special qualities which all the fermented products contain.

Some of these fermented-milk products contain lactic acid-forming bacteria in great abundance, and their extensive use has been extensively discussed, because of Metchnikoff's theory and claims as previously stated.

MILK FAT—BUTTER.—Butter is practically the fat of milk largely separated from the liquid. It is one of the most important sources of fat in the diet of most people and is undoubtedly the most palatable and digestible, yet, like all other concentrated articles of diet, there is great danger of one's eating too much of it. If too much is used it is indigestible, and a long-continued course of excessive eating of butter will cause a variety of digestive disturbances, such as biliousness and headache.

The flavor of butter depends upon the milk from which it is made and the bacteria that develop therein. If eaten moderately, butter is a more economical source of food fat than is milk. One great objection to its use is the large amount of salt used in its manufacture. Salt is added because most people prefer the taste, and also because it improves its keeping qualities. However, since cold storage and domestic ice-chests have come into such universal use, butter is less salted than formerly. This is an advantage, for nothing is gained by the excessive use of salt, and much injury often results from it.

In Europe sweet or unsalted butter is very popular, and its popularity is growing in the United States. Such butter

has a mild creamy flavor which many people relish. Naturally it will grow rancid if kept too long, consequently it must be used soon after it is made. A large number of people now make sweet butter at home as needed, churning the cream with an egg-beater, or any of the other devices that can be obtained in any hardware store. In some countries a peculiar form of butter, called "ghee," is commonly used. The water is boiled out of freshly made butter and the product is kept for general use, especially for cooking. In the cold, high regions of Thibet, ghee is used in large quantities, lumps of it being put into tea, as the ordinary tea-drinker uses cream. Ghee is very similar to the rendered butter which is used by orthodox Hebrews in kosher cookery.

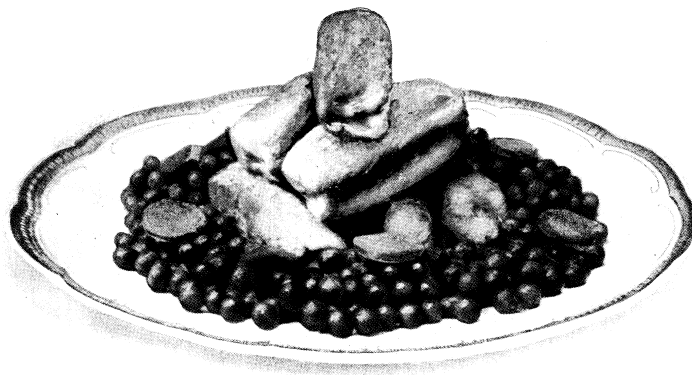
In keeping butter in a refrigerator, care should be taken that foods with a strong odor, such as cabbage, onions, celery, etc., are not placed near it, as it has the power of absorbing these flavors and thus vitiating its own.

OLEOMARGARIN.—Oleomargarin is a substitute for butter used largely for purposes of economy. It is composed of animal fats from which the fiber has been removed, churned up with milk and cream and a little real butter to give it the appearance, consistency and flavor of real butter. When properly made from pure beef and other fats, it is no more unhealthy than any other animal product, but unless one is convinced of the integrity of the manufacturer, there are so many incitements to use inferior and unhealthful articles that the risk of adulteration is too great to run. Naturally only the poor will use this product and it is a remarkable comment upon the force of example and habit that where economy is necessity, though the food values obtained from oleomargarin can better be gained in cheaper and equally healthful forms of vegetable oils, many people prefer to purchase oleomargarin, as otherwise they seem to be "eating their bread without butter." One should remember, however, that pure butter contains the valuable vitamins not found in substitutes.

Cheese is another of the products of milk that has long been regarded with universal favor. It consists of the casein of



Cheese Ramekin.—Stir and boil until smooth one cup of bread crumbs and one half cup of milk. Add a small lump of butter and four tablespoonfuls of grated cheese. Salt to taste. Stir until cheese is dissolved, remove from fire. Stir in the beaten yolks of two eggs and then the whites beaten to a froth. Bake in a buttered pudding dish fifteen or twenty minutes.



Rice Croquettes.—To two cups of cold boiled rice add one well beaten egg, one teaspoonful of butter and salt to taste. Mix thoroughly, and with the floured hands make into little rolls and fry in deep pan of olive oil. Arrange on platter with green peas, garnish with slices of boiled carrot.

milk and small proportions of fat and mineral matters which are precipitated along with it when rennet is added to milk. The flavor of cheese is due chiefly to the action of ferments or bacteria, and, in the case of some of the expensive and highly prized varieties, to the action of moulds. The richness of the various kinds depends upon the quality of the milk and the proportion of the butter-fats contained therein. When cream itself is converted into cheese, it makes the richest variety, but it will not keep long, and so has to be eaten almost fresh. When cream is added to fresh milk and then converted into cheese, the product is one of the richer varieties such as the English cheese "Double Gloucester" and "Stilton." If new milk alone is used, the cheese is less rich, but is still of high quality, such as the English "Cheddar." When an eighth or tenth of the cream has been taken and the remainder converted into cheese, it produces the average cheese generally purchased. The poorer varieties of cheese are made entirely of skimmed milk. The various methods and the different kinds of milk used in making even these poor cheeses produce such different results as the Dutch cheese, Swiss cheese, Welsh cheese, etc., all of which have about the same nutritive value, although they are markedly different in their general flavors.

When first made, all cheeses are soft and comparatively tasteless since it is during the so-called processes of "ripening" that the bacterial changes occur which develop the flavors. These changes are now so well understood by cheese manufacturers that they are utilized with as much certainty as the housewife feels when she puts by a pan of milk expecting the cream to rise thereon.

Cheese has long had a reputation for indigestibility. It is no more indigestible than any other concentrated food. It has gained this reputation, however, thru the fact that it has been used, not as a regular article of diet, but, like nuts, as a tid-bit at the close of a meal; besides, it is seldom thoroughly masticated and the resulting digestive disturbances are then unjustly blamed on the cheese. A large number of scientific digestive experiments have been carried on with cheese, all of

which, without exception, have shown that relatively large amounts, if properly masticated, are thoroughly assimilated without causing any disturbances whatever. Indeed, a good quality of American cheese is a very nutritious food, rich in protein and fat, and it can well be added to the diet of those who wish increased vigor at a low cash outlay, but who are willing thoroughly to masticate a concentrated food to obtain it.

In regard to the use of Limburger and other expensive cheeses of like character, it can only be said that the bacterial and moulding processes have so far continued as to develop a high flavor and smell which are very objectionable to all those who have not cultivated the habit of eating them. Like the taste for the high flavors developed by allowing game to hang, the taste for these cheeses is abnormal and therefore harmful, and the less a health-seeker has to do with such putrefied substances the better.

Cottage cheese, as made at home from sour milk, with or without cream, is a nutritious and palatable food. It is inexpensive and is also an economical method of using sour milk. Neufchatel cheese, while a regular commercial product sold in large quantities in cities, is merely a commercial form of cottage cheese.

Junket is a favorite dish which is prepared by adding rennet to milk and allowing it to stand undisturbed until it thickens or coagulates. If the process is carefully carried out, a thick custard-like product results. If, however, it is stirred, the casein readily breaks up and separates from the whey. Rennet for the preparation of junket may be purchased at any of the large grocery stores and all of those that have been tested give satisfactory results.

PROBLEM OF MILK SUPPLY.—All intelligence and all modern scientific investigation agree in rating milk and milk products as of the very highest food value. The milk supply, particularly of large cities, is vitally important to the health and welfare of the inhabitants and is a matter of life and death to the young children. It is important, therefore, that the milk supply keeps pace with the demands, and that the prices of

milk in the cities do not increase so as to make milk too expensive for poor people to buy.

If this pressing problem is to be solved, two things must be done. In the first place, dairy farming must be encouraged in regions near to the larger centers of population and a price be paid to farmers for this milk that will meet the cost of production and maintain dairy herds in prime health and vigor. In the second place, less expensive methods must be utilized in distributing the milk in the cities. Closely related to these problems is use of skim-milk for hog food. Butter is one of our best foods but it represents only a part of the milk values. It might be better to use butter substitutes in cookery and a larger portion of the whole milk as food than to use the churned butter, discarding the skim-milk as human food. Each and every child should drink or get in his food an equivalent of one or two quarts of milk a day. Skim-milk is excellent food for growing boys and girls because of its protein and mineral elements.

The practical problem is rendered more difficult by the fact that the most fertile farm regions are too far from our large cities to permit the milk to be shipped in the fresh state. Milk can be cheaply condensed either in the form of the "evaporated" milk or the sweetened condensed product. While not quite equal to fresh, these condensed products are wholesome, as all the milk nutrients are preserved in them; but this does not offer sufficient economy to help much because the condensed milk still weighs about half as much as the fresh article and expensive tin containers are required to preserve and transport it. A much more promising method is the dehydration or drying of milk. In this process the entire water content is removed; the dried milk weighs only from ten to fifteen per cent as much as the fresh equivalent, and may be preserved without canning.

Dried milk, prepared by the proper process, is wholesome and palatable. It is not cooked since the maximum temperature used in the dehydration need not exceed 145 degrees. The vitamins are preserved, and so are the mineral salts and the proteins. Dried milk can be made from either the whole or

the skim-milk. The latter keeps perfectly, though the dried whole milk must be kept away from the air, or the fats may become somewhat rancid. The dried whole milk is equivalent to and should sell for not more than seven times the price per pound of the fresh milk. The dried skim-milk is equal to ten times the weight of the fresh skim-milk. By adding one-third as much butter as there is of the dried powder and whipping or churning the mixture, a reconstructed whole milk can be made that can hardly be told from the fresh article. Such means of preserving and reconstructing milk will enable the milk from the western farms and ranches, and from the abundant production of the flush season to be used in distant cities in the time of scarcity. It appears that only by such a system will our city poor be supplied in the near future with sufficient milk.

There is great need for suitable legislation both to discourage the present waste of land and feed in the production of excessive quantities of meat and in the encouragement of the milk-producing industry and the proper preservation and distribution of the product.

SUBSTITUTING EGGS FOR MEAT.—The place of eggs in the natural dietetic groups has already been referred to in previous chapters. Eggs unquestionably share with milk freedom from the objections made against flesh foods, and are therefore exceedingly valuable in a vegetarian diet. That fact, however, does not warrant us to accept the usual exaggerated claims of the economy of eggs as meat substitutes. The foolish statement that an egg contains more nutriment than a pound of steak has no foundation in the facts as far as its quantity of protein or its wheat-pound value is concerned. Figured on that basis, eggs are about equivalent to lean meat with a small proportion of fat, and are worth about fifty per cent. more per dozen than meat is per pound.

The real value of eggs compared with meat is the fact of the better quality of the nutritive material, and the use of eggs in the place of meat permits the meat eater to discard the extravagant and injurious flesh food for a more delicate and wholesome substitute. Although the most common use of eggs

is as a cooked dish used in the meal as is meat, eggs also may be used raw as milk is used. Some people like raw eggs eaten straight or with a pinch of salt; the majority, however, will not find them palatable in this form, but there are many ways of making them palatable while raw, even to the most finicky taste. For instance, an egg-nog can be made of milk, flavored with almost any kind of flavoring that appeals to the taste. Or an egg can be shaken up with any kind of fruit juice. Or if the whites and yolks are beaten up separately, and afterward combined, with the addition of a little sugar or some sweet fruit, the combination is very palatable.

Raw eggs, soft-boiled, or poached eggs, are popularly considered easier to digest than those that are hard-boiled, and so they are if the white of the hard-boiled egg is not thoroughly masticated. When the white is well chewed the hard-boiled egg is as digestible as any other kind. Jorissenne, a French dietetist, states that he regards the yolk of raw, soft-boiled, and hard-boiled eggs as equally digestible. The white of soft-boiled eggs, being semi-liquid, offers little more resistance to the digestive juices than raw white. The white of a hard-boiled egg is not generally very thoroughly masticated. Unless finely divided, it offers more resistance to the digestive juices than the fluid or semi-fluid white. Provided mastication is thorough, marked differences in the completeness of digestion of the three sorts of eggs will not be found.

Eggs are excellent as a separate dish, but they are even more valuable in cookery. This use of eggs depends chiefly upon their quality of viscosity and their coagulation when heated. The latter property is the essential factor in custards. Custard is not only used alone, but as a basis for pudding and for cocoanut, pumpkin and lemon pies. This same property of viscosity in eggs makes them useful in salad dressings, cake frostings and the foamy whips or meringues used to top off many dishes.

These same properties of eggs gives them the power of lightening all sorts of baked products. The following experiment will give you a very clear conception of this property of

eggs. Mix a little water in a cup and add to it a spoonful of baking powder. It will foam beautifully, but the foam will immediately die down as the gas bubbles escape. Now stir a little egg white into the water and add baking powder, and the resulting foam will be more permanent. Eggs do not make the "lightness"; that must be secured by gas bubbles of some sort, either by the use of yeast, baking powder, or soda and sour milk. But the viscous property of the egg causes the bubbles to be retained until the material is hardened by heat and made permanently light. There is no other food substance that may be used for this purpose except the gluten of wheat flour.

This lightness, due to the presence of bubbles, adds nothing to the food value, but it accords with our notions of good baking. Because eggs are expensive, many foods, notably corn bread, that we at first think to be economical prove to be expensive on account of the use of eggs. If you cannot afford eggs, you must learn to accept "heavier" breads and cakes. The hygienic value of such lightness has been exaggerated. If baked products are thoroughly cooked so that they contain no raw or soggy dough, and if they are well masticated, and if one does not overeat of them, they will not be indigestible.

Richness is a term loosely applied to dishes such as plum pudding and fruit cakes that are heavy in texture and contain large quantities of both sugar and fat. The proverbial indigestibility of such products has little foundation in fact. Eat carefully and eat moderately and you need not worry.

There is no efficient substitute for eggs in cookery. Use them for this purpose if you can afford them, if not go without—but do not be taken in by the fake egg "substitutes," which are usually made of artificially colored corn starch and cost about five per cent of the price they are sold for, and are utterly worthless.

UNSCRUPULOUS EGG DEALERS.—The quality of eggs is very important. Like milk they are prone to spoilage, and decomposed eggs are not only harmful but offensive. There is little danger that one will use bad eggs when they are bought in the shell, but when bought in the disguised form of cheap

bakery products the amount of bad eggs consumed is appalling. The government and city health departments have long made strenuous efforts to stamp out the trade in spoiled eggs. But because the eggs are high in price and necessary to make conventional bakery products, these worthy efforts are repeatedly frustrated by unscrupulous dealers and bakers. Since bakers' cakes are usually unwholesome in other aspects as well, I should advise one to leave them out of the diet altogether, and so avoid the possibility of eating decayed eggs in this form.

The question of the cold storage of eggs has attracted wide attention, both from the standpoint of wholesomeness and of the supposed injustice done the consumer in this system of the speculative storing of eggs in the season of low prices and their sale to the public in the season of scarcity. As a matter of fact, the egg storers do not make as much profit as is commonly supposed, for, while they make big money some years, they often lose when the season goes against them. It is rather the retailer who offends against honesty here by selling the cold storage eggs either as fresh or at an unreasonable profit over the wholesale price. You can at least know whether you are being mulcted in this manner by consulting the wholesale price of cold storage eggs as given in the market reports and comparing this with the grocer's figure.

As for wholesomeness, the cold storage egg is never equal to the fresh article, because the process slows down and does not wholly stop the deterioration of the eggs. But cold storage eggs are put away in the season of plenty when the prices are falling and eggs are being rushed promptly to market. Hence, when the eggs come out of storage they may be as good or better than so-called fresh eggs that have been marketed in hot weather or have been held on the farms or by the country buyer in the early fall awaiting an advance in price.

While fresh eggs are the only kind that particular people care to use, there are not enough of them to go around in the fall and winter months, and the average consumer must therefore use the cold storage product or go without. In that case I would recommend that storage eggs, bought as such at

storage prices, be used in cookery and that fresh eggs be secured for use raw, poached or soft boiled, in which cases perfect flavor is essential to palatability.

There is no need at any time to be fooled into paying higher prices because the eggs are given fancy labels or are done up in fancy boxes. Neither is there any virtue in eggs of a peculiar shell color or from a certain breed of chickens.

For those who wish to economize eggs may be preserved at home. Of the many methods recommended the only one really effective is the preservation in water glass. Details of the process can be secured from the Department of Agriculture. It is not a perfect method of preservation and the product is no better than cold storage, though the eggs are not unwholesome and will serve for cooking purposes.