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Volume 2: Milk, Butter and Cheese; Eggs; Vegetables

Woman's Institute of Domestic Arts and Sciences

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WOMAN'S INSTITUTE LIBRARY OF COOKERY

VOLUME TWO

MILK, BUTTER, AND CHEESE

EGGS

VEGETABLES

WOMENS INSTITUTE OF DOMESTIC ARTS AND SCIENCES, Inc.

PREFACE

This volume, which is the second of the Woman's Institute Library of Cookery, deals with such essentials of diet as the dairy products--milk, butter, and cheese--the protein food, eggs, and the energy-producing nutrients, vegetables.

In _Milk, Butter, and Cheese_, Parts 1 and 2, are explained the place that milk occupies in the diet, its composition, grades, and the dishes for which it is used; the purchase, care, and use of butter and butter substitutes; and the characteristics, care, and varieties of both domestic and imported cheeses, as well as a number of excellent recipes for cheese dishes. A luncheon menu, in which a cheese dish is substituted for meat, is of interest in this connection, for it shows the housewife, early in her studies, not only how to combine dishes to produce a balanced meal, but also how to make up a menu in which meat is not needed.

In _Eggs_ are discussed the nutritive value of eggs, the ways in which to select, preserve, cook, and serve them, and how to utilize left-over eggs. So many uses have eggs in the diet and so nourishing is this food that too much attention cannot be paid to its preparation. In this lesson, also, is given a breakfast menu to afford practice in preparing several simple dishes usually served in this meal.

In _Vegetables_, Parts 1 and 2, every variety of vegetable is discussed as to food value, preparation, place in the meal, and proper methods of serving. With such a fund of knowledge, the housewife will be well equipped to give pleasing variety to her meals.

In addition to the instruction in these matters, there are a large number of illustrations, which make clear the important details in every process employed and in many recipes show certain steps as well as the finished result. With such detailed information, it is our desire that as many of the recipes as possible be tried, for it is only through constant practice that the rules and principles of cookery will become thoroughly instilled in the mind. Nothing is of more value to the housewife than such a knowledge of food and its preparation, for, as

every one knows, proper diet is the chief requisite of good health.

To be of the greatest assistance to the woman in the home is the purpose of these volumes--to relieve her household tasks of much of their drudgery and to help her come to a realization of the opportunity for good that is hers. In no better way can she create happiness and contentment in her home than by preparing appetizing, nutritious meals and serving them in the most attractive manner.

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MILK, BUTTER, AND CHEESE (PART 1)

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MILK

MILK IN THE DIET

1. As is well understood, milk is the liquid that is secreted by the mammary glands of female mammals for the nourishment of their young. The word milk as it is commonly used, however, refers to _cow's milk,_ because such milk is employed to a greater extent as human food than the milk from any other animal. Cow's milk in its perfectly fresh raw state is a yellowish-white, opaque fluid, called _whole milk,_ and, as is well known, possesses a distinctly sweet taste and characteristic odor. When such milk is allowed to stand for some time without being disturbed, it separates into two distinct layers, an upper and a lower one. The upper layer, which is lighter than the lower one and occupies a smaller space, consists largely of globules of fat and is called _cream;_ the lower layer, which is white or bluish-white in color and is composed of water, solids, and protein, is, when separated from the cream, called _skim milk._

2. As an article of diet, milk is very important, because its sole function in nature is to serve as food. It is required by the infant; it is needed in the diet of all growing children; and it is desirable in the preparation of dishes for both young and old.

Milk is used to such a great extent because it fills many of the

requirements of an ideal food. It is generally liked, requires little or no time for preparation, agrees with the majority of persons when used properly, and contains substances that supply energy and build and repair tissue. Still, it does not contain these substances in such proportions as to make it an ideal or exclusive article of diet for adults, and it must often be modified to suit the needs of infants, because it is ideal for only the young of the species for which it is intended. Therefore, while milk is often called a perfect food, in reality it is perfect for only the calf. When it is desired for the feeding of a very young child, it must be changed to meet the requirements before it can be used with good results.

3. So important is milk as an article of food that, outside of the purely rural districts, producing the milk supply is a business of considerable importance. This is due to the fact that the purity of milk must be constantly safeguarded in order that clean, safe milk may be provided for the countless numbers that depend on it. In fact, milk undoubtedly bears a closer relation to public health than any other food. To produce an adequate amount of clean, safe, pure milk is one of the food problems of the city and country alike. In the city much of the difficulty is overcome by the ordinances that provide standards of composition and cleanliness, as well as inspection to insure them; but such ordinances are rarely provided for in villages and country districts.

When there is no law to prevent it, unclean milk is sometimes used in the manufacture of butter and cheese, but when this happens, great injustice, if not positive harm, is done to the consumers of these articles. Then, too, unless milk is carefully inspected, tubercular milk is liable to be used in the making of butter, and such a condition will cause the spreading of tuberculosis as readily as the use of the contaminated milk itself.

4. With its various products, milk helps to form a very large part of the dietary in most homes, but while nothing can take the place of this food and while it is high in food value, there seems to be a general tendency to think of it as an addition to the bill of fare, rather than as a possible substitute for more expensive food. For instance, milk is very often served as a beverage in a meal in which the quantity of meat or other protein foods is not reduced. From an economical standpoint, as well as from the point of view of the needs of the body, this is really extravagant, for milk is itself largely a protein food. The serving of a glass of milk or of a dish that contains generous quantities of milk offers the housewife an opportunity to cut down considerably the allowance of meat and eggs. Because of this fact and because milk and its products may be used to add nutritive value to a food, to give variety, and to improve flavor, they deserve considerable study on the part of the housewife.

5. Since milk may be used in such a variety of ways, it may be easily included in the dietary for the family. Being liquid in form, it may always be served without any preparation as a beverage or with other beverages, cereals, and fruits. It also has numerous other uses, being employed in the making of sauces for vegetables and meats, in the place of stock for soups, and as the liquid for bread, cakes, puddings, custards, and many frozen desserts. Because of its extensive use, every housewife not only should know how to buy milk and care for it, but should be familiar with its composition, so that she may determine whether or not it suits the needs of her family. In addition, she should

know the effect of heat on milk and the various methods of preparation if she would be able to judge what food combinations can be used with milk.

COMPOSITION OF MILK

6. As milk is usually taken into the body in liquid form, the common tendency is to regard it as a beverage, rather than as an important source of nourishing food material. However, a knowledge of its composition, as well as the fact that milk becomes a solid food in the stomach and must then be dissolved in the process of digestion, will serve to show that milk contains solids. That it possesses all the elements required to sustain life and promote health is proved by the fact that a child may live for months on milk alone and during this time increase in weight.

7. The solids contained in milk are proteins, fat, carbohydrate in the form of sugar, and mineral salts, besides which, of course, water occurs in large quantities. The sugar and fat of milk serve as fuel; the mineral salts are chiefly valuable for the growth of bones and teeth and for their effect on the liquids of the body; and the proteins, like the fat and sugar, serve as fuel, but they also make and repair the muscular tissues of the body.

In considering the food substances of milk, it will be well to note also that they vary according to the breed, feeding, and individual characteristics of the cow. Jerseys and Guernseys give milk rich in fat and total solids, and while Holstein cows give a greater quantity of milk, such milk has a smaller proportion of fat and total solids. As a rule, though, the composition of milk may be considered as approximately 3.3 per cent. protein, 4 per cent. fat, 5 per cent. carbohydrate, and .7 per cent. mineral matter, making a total of 13 per cent. This indicates the quantity of actual food material in milk, the remainder, or 87 per cent., being water.

8. PROTEIN IN MILK.--Because of the double usefulness of protein--to serve as fuel and to make and repair muscular tissue--this element is regarded as an important ingredient of milk. The protein in milk is called _casein_. The opaque whiteness of milk is largely due to the presence of this substance. As long as milk remains sweet, the lime salts it contains hold this casein in solution; but when it sours, the salts are made soluble and the casein thickens, or coagulates. In addition to casein, milk contains a small amount of protein in the form of _albumin_. This substance, upon being heated, coagulates and causes the formation of the skin that is always found on the top of milk that has been heated. The skin thus formed contains everything that is found in milk, because, as it forms, casein is dried with it and sugar and fat, too, are caught and held there. It is the protein of milk and its characteristic coagulation that are made use of in the making of cheese. In cooking, the protein of milk is probably more affected than any of the other substances, but the degree to which the digestion of milk is thus affected is not definitely known, this being a much disputed question.

9. FAT IN MILK.--The other substance in milk that serves as fuel, or to produce energy, is fat. It occurs in the form of tiny particles, each surrounded by a thin covering and suspended in the liquid. Such a mixture, which is called an _emulsion_, is the most easily digested form

in which fat is found. The fat in milk varies more than the other food substances, it being sometimes as low as 2 per cent, and again as high as 6 per cent. However, the average of these two, or 4 per cent., is the usual amount found in most milk.

As has been mentioned, the fat globules of milk rise to the top because fat is lighter than water, so that when milk has been undisturbed for some time the top, which is known as _cream_, will be found to contain most of the fat. Because of the fat it contains, the cream is yellower in color than the milk underneath. If the cream is beaten, or churned, these fat particles will adhere in a mass, advantage of this fact being taken in the making of butter.

10. CARBOHYDRATE IN MILK.--The carbohydrate contained in milk is in the form of sugar called _lactose_. It is unlike other sugars in that it is not very sweet and does not disagree with most persons nor upset their digestion. For this reason, it is often given to children, invalids, and persons who have digestive disturbances. However, it is like other carbohydrates in that in solution it ferments. The result of the fermentation in this case is the production of _lactic acid_, which makes the milk sour. With the fat, lactose makes up the bulk of the energy-producing material of milk, and while this is important it is only secondary when compared to the tissue-building power of the protein and minerals. Besides being an important part of milk itself, lactose is a valuable by-product in the manufacture of cheese. After being taken from _whey_, which is the clear, straw-colored liquid that remains when the curd, or coagulated portion, is completely removed from the milk, the lactose is refined and sold in the form of a powder that is used for various kinds of infant and invalid feeding.

11. MINERAL MATTER IN MILK.--Considerable quantities of mineral salts, which are chiefly _lime_, _potash_, and _phosphates_, are found in milk. As has already been pointed out, these are important in the building of bone and hard tissue in the body, but in addition they help to keep the fluids of the body in the right condition. Because of the work they do, these mineral salts are necessary in the building of the bodies of growing children, and are useful for repair and the regulation of the body processes in adults. In cheese, butter, and cream, which are the products of milk, less of the mineral salts are found in proportion to the quantity than in whole milk, skim milk, and whey.

12. WATER IN MILK.--The percentage of water in milk is much greater than that of all the other food substances combined, there being more than six times as much. While this quantity seems very large, it is an advantage, for milk provides nourishment to persons when they can take neither solid nor more condensed food. On the other hand, the water is a disadvantage, for it is responsible for the rapid spoiling of milk. This fact is clearly shown in the case of condensed milk, where the water is partly or completely evaporated, for milk of this kind keeps much longer without spoiling than either whole or skim milk.

PRODUCTS OBTAINED FROM MILK

13. Although milk is used extensively in its natural liquid form, considerable use is also made of the numerous products of milk, chief among which are cream, skim milk, buttermilk, sour milk, whey, butter, and cheese. In fact, all of these occupy such an important place in the dietary of the majority of homes that it is well for every housewife to

understand their value. Butter and cheese are discussed in detail later, so that at this time no attention need be given to them. The other products, however, are taken up now, with the intention of enabling the housewife to familiarize herself with their production, nature, and use.

14. CREAM.--As has been pointed out, the particles of fat that rise to the top of milk when it is allowed to remain undisturbed for some time form the product known as cream. Cream may be removed from the milk by skimming it off, or it may be separated from the milk by means of machinery especially designed for the purpose. The greater the proportion of fat in milk, the thicker, or "heavier," will be the cream.

Various grades of separated cream are placed on the market, the usual ones being those which contain 8, 12, 16, 20, and 40 per cent, of fat. Thin cream, which includes the grades that have only a small percentage of fat, contains a larger quantity of milk than the others and is not so desirable for many purposes. Still, it is used to some extent, because it is cheaper and there are definite uses to which it can be put. Medium-heavy cream is the kind to select when it is desired for _whipping_. This is a process that consists in beating the cream rapidly until a mass of tiny bubbles form and become stiff, very much as the white of egg does.

15. SKIM MILK.--After a part or all of the cream has been removed from whole milk, that which remains is called skim milk. While practically all of the fat is taken out when milk is skimmed, very little protein or sugar is removed. Therefore, skim milk is still a valuable food, it being used to a large extent for cheese making, for the manufacture of certain commercial foods, and for the feeding of animals. The housewife does not, as a rule, buy skim milk; indeed, in some localities the laws prevent its sale because it is considered an adulterated food. However, it is really a wholesome, valuable food that is cheaper than whole milk, and its use in the home should therefore be encouraged from an economical standpoint. Here it may be used in the preparation of many dishes, such as sauces, cakes, biscuits, muffins, griddle cakes, bread, etc., in which butter or other fats are used, and in custards, puddings, ices, and numerous other desserts.

16. BUTTERMILK.--The milk that remains in butter making after the butter fat has been removed from cream by churning is known by the name buttermilk. Such milk is similar to skim milk in composition, and unless butter is made of sweet cream, buttermilk is sour. Buttermilk is used considerably as a beverage, but besides this use there are numerous ways in which it may be employed in the preparation of foods, as is pointed out in various recipes. An advantage of buttermilk is that its cost is less than that of whole milk, so that the housewife will do well to make use of it in the preparation of those foods in which it produces satisfactory results.

17. ARTIFICIAL BUTTERMILK.--Several kinds of sour milk that are called buttermilk are to be had, particularly at soda fountains and restaurants. While they are similar to buttermilk they are not the same, because they are produced artificially from whole or skimmed sweet milk. The usual method employed in the making of these artificial buttermilks, as they may well be called, consists in adding to sweet milk tablets containing lactic acid or a certain culture of bacteria that induce fermentation, very much as yeast does, and then keeping it at about body temperature for a number of hours in order to allow the milk to thicken and sour. Such milks exert a beneficial action in the digestive tract,

and their food value, provided they are made from whole milk, is just as high as that of the original sweet milk. Artificial buttermilks therefore prove a valuable source of food supply for persons who find them palatable and who do not care for sweet milk. Their food value may be increased by adding cream to them.

18. SOUR MILK.--Ordinary milk contains large numbers of bacteria that produce fermentation. When it is allowed to stand for some time, these bacteria act upon the sugar, or lactose, contained in the milk and change it into lactic acid. This acid gives to the milk a sour taste and at the same time causes the casein of the milk to become a mass known as _curd_, or _clabber_. This mass continues to grow sour and tough until all the milk sugar is converted into lactic acid, so that the longer the milk stands, the more acid it becomes. Sour milk, however, is useful in the preparation of various dishes, such as hot breads and griddle cakes.

[Illustration: FIG. 1]

19. WHEY.--When the curd is completely removed from milk, as in making cheese, a clear, light, yellowish liquid known as whey remains. Whey is composed of water, minerals, and milk sugar or lactic acid, and is the least valuable part of the milk. The ingenious housewife will never be at a loss to make use of this product, for, while its food value is slight, the minerals it contains are important ones. Whey is sometimes used to furnish the liquid for bread making and, in addition, it may be used as a beverage for persons who cannot digest food as heavy as milk itself.

20. COMPARISON OF FOOD VALUES OF MILK PRODUCTS.--So that the housewife may become familiar with the food values of milk products, there is here given, in Fig. 1, a graphic table for the comparison of such products. Each glass is represented as containing approximately 1 pint or 1 pound of the milk product, and the figures underneath each indicate the number of calories found in the quantity represented. The triangle at the side of each indicates the proportion of ash, protein, fat, carbohydrate, and water, the percentage composition being given at the side. Housewives as a rule fully appreciate the food value that is to be found in whole milk and cream, but such products as skim milk, buttermilk, and whey are likely to be ignored.

CHARACTERISTICS OF WHOLESOME MILK

21. So far as the housewife is concerned, the qualities that characterize wholesome milk are without doubt of great interest. She may know of what use milk is in the diet and the food substances of which it is composed, but unless she understands just what constitutes milk of good quality, as well as the nature of inferior milk, she cannot very well provide her family with the kind it should have. Therefore, to assist her in this matter, the characteristics of wholesome milk are here discussed. Such milk, it will be well to note, must be of the right composition, must not be adulterated, must be fresh--that is, not older when delivered than is permitted by law--and must be as clean as possible.

22. STANDARD OF MILK COMPOSITION.--The housewife usually judges the quality of milk by the amount of cream that rises to the top when milk in a bottle is allowed to remain undisturbed for some time. This is

really an excellent test, because milk that contains only a small amount of cream is of poorer quality than that which contains a larger amount; in other words, the more cream milk contains, the higher will be its food value and the greater its energy-producing ability. Then, too, milk that is rich in cream usually contains proportionately large amounts of protein and sugar.

While the composition of milk has much to do with the quality of this food, it varies, as should be noted, in different breeds and even in individual cows, depending on both the food and the care given to them. For this reason, milk that is mixed is preferable to the milk of a single cow, as the mixing of the milk of a number of cows insures a better average composition.

23. ADULTERATION OF MILK.--The composition of milk, and hence its quality, is seriously affected by its adulteration. By this is meant the extraction of any of the food substances from whole milk; the addition of anything that tends to weaken or lower its quality or strength; the use of coloring matter to make it appear of greater value than it actually is; or the use of preservatives to prevent it from souring as soon as it ordinarily would. It is, of course, illegal to adulterate milk, yet it is sometimes done. The most convenient and possibly the most common materials used to adulterate milk are water and skim milk. The addition of water to milk decreases the quantity of all its food substances, but the addition of skim milk reduces the quantity of fat only. The color of the milk is often affected by the use of these adulterants, but when this happens, yellow coloring is usually added to restore the original appearance.

Sometimes the milk that a dairyman markets contains more fat than the law requires; but even such milk cannot legally be skimmed nor diluted with skim milk. The only thing that may be done to it is to mix it with milk that is low in butter fat and thus obtain a milk that will average the legal percentage. For instance, if milk from a dairy averages 5 per cent, of butter fat, it may be diluted with milk that contains only 3 per cent, of butter fat, because the result of such mixing, which will be milk averaging 4 per cent, of this food substance, will be the legal standard.

24. To prevent milk from souring, dishonest milk dealers often put into it such preservatives as soda, borax, and formaldehyde. There is no definite way of telling whether or not one of these has been used, except by a chemical analysis. However, if milk does not sour within a reasonable time when no precautions have been taken to keep it sweet, it should be looked on with suspicion, for it undoubtedly contains a preservative.

25. FRESHNESS OF MILK.--To be most satisfactory for all purposes, milk should be absolutely fresh. However, it is almost impossible to obtain milk in this condition, because it is generally sold at a distance from the source of supply. Milk that is sold in small towns and cities is usually 12 and often 18 to 21 hours old when it is delivered; whereas, in large cities, where the demand is so great that milk must be shipped from great distances, it is often 24 to 36 or even 48 hours old when it reaches the consumer. In order that milk may remain sweet long enough to permit it to be delivered at places so far removed from the source of supply, it must be handled and cared for in the cleanest possible way by the dealers. Likewise, if the housewife desires to get the best results from it, she must follow the same plan, cooling it immediately on

delivery and keeping it cool until it is consumed. The freshness of milk can be determined only by the length of time it will remain sweet when proper care is given to it.

26. CLEANLINESS OF MILK.--Milk may be of the right composition, free from all adulteration, and as fresh as it is possible to obtain it, but unless it is clean, it is an injurious food. Milk is rendered unclean or impure by dirt. In reality, there are two kinds of dirt that may be present in milk, and it is important to know just what these are and what effect they have on milk.

27. The less harmful of the two kinds of dirt is the visible dirt that gets into the milk from the cow, the stable, the milker, the milking utensils, and similar sources when these are not scrupulously clean. If milk containing such dirt is allowed to stand long enough in pans or bottles for the heavier particles to settle, it will be found as sediment in the bottom of the receptacle. To say the least, the presence of such dirt is always disagreeable and frequently produces foreign flavors.

Straining the milk through clean absorbent cotton will reveal the presence of such dirt and another kind of dirt that does not show through the opaque fluid. This second kind of dirt is generally found in milk when the first kind is present in any quantity. It is more liable to be harmful than the other, because it enters the milk from the water used in cleaning the receptacles or from some contaminated source.

[Illustration: FIG. 2]

28. Whenever dirt is present in milk, bacteria are sure to be there; and the greater the quantity of dirt the greater will be the number of bacteria. Should the housewife desire to compare the cleanliness of several lots of milk, she may filter a like quantity from each lot, say a quart or a pint, through small disks of absorbent cotton. If, after the milk has passed through the cotton disk, very little dirt remains on it, as in Fig. 2 (_a_), the milk may be considered as comparatively clean; if the cotton disk appears as in (_b_), the milk may be said to be only slightly dirty; if it appears as in (_c_), the milk is dirty; and if it appears as in (_d_), the milk is very dirty. Milk that leaves a stain like that in (_d_) contains more bacteria than milk that leaves a stain like that in (_c_), and so on through all the lots of milk. Filtering milk in this manner, however, does not indicate whether the bacteria are disease producing. Such information can be secured only by microscopic examination, and only then by persons who have a knowledge of such matters.

29. Since, as has been pointed out, bacteria cling to all dirt, the dirt that milk contains is one of the causes of souring and putrefaction of milk, and may be a cause of disease. Indeed, it is definitely known that dirty milk sours much more quickly than does clean milk. Actual tests in which clean milk was put in a cool place have proved that it will keep for weeks, whereas dirty milk will sour in a day or two, especially in warm weather. This information should point out clearly to the housewife that it is not merely heat that changes milk or causes it to sour. She should understand in addition, that bacteria grow and multiply very rapidly when conditions for their growth are provided. These conditions are moisture, warmth, and the right kind of food, and as all of these are found in milk, this product is really ideal for bacterial development. The only way in which to protect milk is to make

sure that no bacteria enter it, or, if they do, to make it impossible for them to grow. This may be done by keeping the milk so cold that they cannot thrive, or by destroying them in various ways, which are taken up later.

30. In former times, there was not much danger of wide-spread disease from the milk supply, for it was cared for almost entirely by those who kept a few cows and distributed milk to a small number of customers. In fact, it has been only within the past 50 years that large quantities of milk are handled by separate dairies and shipped great distances from the source of supply and that the distribution of milk has become a great industry. When so much milk is handled in one place, it is more or less unsafe unless the dairy is kept extremely clean and is conducted in the most sanitary manner. Experience has shown that too much attention cannot be given to the care of milk, for the lives of great numbers of children have been sacrificed through the carelessness of dairymen and persons selling and distributing milk, as well as through the negligence of those who handle the milk after it has entered the home. To overcome much of this carelessness, both the Federal Government and the various states of this country have set standards for safe milk production, and in order to make their laws effective have established inspection service. Independently of these state and national laws, many of the cities, particularly the large ones, have made their own standards, which, as a rule, are very rigid. One of the usual requirements is to compel each person who wishes to sell milk in the city to buy a license, so that the city authorities may keep in touch with those handling milk and so that conditions may be investigated at any time. In view of the care required of dealers in handling milk, the housewife owes it to herself and the members of her family to keep the milk in the home in the best possible manner.

GRADES OF CLEAN MILK

31. Ever since milk has come to be a commercial product, authorities have been devising ways in which it may be brought to the consumer in a condition that will permit it to be used without causing ill results. Their efforts have been rewarded to such an extent that nowadays consumers have little to fear from the milk they purchase, provided they get it from dealers who live up to the laws. Chief among the different grades of clean milk is _certified milk,_ and next in order comes _pasteurized milk,_ followed by _sterilized milk_.

32. CERTIFIED MILK.--The grade of clean milk sold under the name of certified milk is simply natural, raw milk that is produced and marketed under conditions that permit it to be guaranteed as pure, wholesome, and of definite composition. Such milk is necessarily higher in price than milk that is less wholesome and sanitary, because of the extra cost to the dairyman in meeting the requirements that make it possible for him to produce clean milk under sanitary conditions. These requirements pertain to the health and cleanliness of those who handle the milk, to the health, housing condition, and care of the herd and the dairy cows, and to the handling and care of milk in the dairy and during transportation and delivery. They are usually established and enforced by an inspection commission appointed by the city, county, or state in which the milk is produced.

33. If a little careful thought is given to the milk situation, it will be admitted that such precautions are necessary if clean milk is to be

the result. Such milk cannot be produced if the surroundings are dirty, because dust and flies, which are two sources of contamination, are practically always present in such places. A stable with poor ventilation, without screens to keep out flies, and with floors that will not permit of cleaning, but cause filth and refuse to accumulate, is sure to contaminate milk that is handled in it. In addition, cows that are not well fed, comfortably housed, or carefully groomed cannot be expected to give milk of as good quality as cows that are properly cared for. Likewise, if the persons who do the milking are not clean, the milk is subject to contamination from this source.

34. All such unfavorable conditions can be remedied, and must be in the production of certified milk; but the good accomplished in this direction will be lost if the milk is carelessly handled after milking. Therefore, in producing certified milk, only the cleanest water available is allowed to be used in the dairy. Impure water is a common source of the contamination of milk in such places. On some farms, the water supply comes from a well that is too near the barn or that is too shallow to avoid being made impure by the germs that filter into it from the barnyard or a cesspool. If vessels in which milk is placed are washed in such water, it is necessary to sterilize them by boiling or steaming before milk is put into them, in order to kill the germs that come from the water. If such a precaution as this is not observed, the germs will multiply rapidly in the milk and, provided they are disease-producing, will make the milk extremely dangerous.

Besides observing the precautions mentioned, it is necessary that all utensils used in a dairy, such as pails for milking, strainers, containers, etc., be kept scrupulously clean. Likewise, they must be sterilized by boiling each time they are used, for, while disease germs may be absent, those which cause the milk to sour are always present and must be destroyed. Finally, to prevent any germs that enter milk from multiplying, even when it is properly cared for, the milk has to be cooled to a temperature of 45 degrees Fahrenheit or lower immediately after milking and then bottled in sterilized bottles, sealed, and packed in ice, within 20 minutes after milking.

35. It is by giving attention to all such matters that certified milk is possible. Such milk, as will be understood from what has been said, is neither a cooked milk nor a dirty milk that is processed, but a natural, raw milk that is clean at all stages of its production and marketing. Because of this fact, it is the best and cleanest milk to be had and may be used without hesitation, not only by grown persons in good health, but for infants and invalids.

The sanitary condition of certified milk and the consequent length of time it will remain sweet was demonstrated conclusively as far back as 1900 at the Paris Exposition. At this time, two model dairies in the United States--one located at the University of Illinois and the other at Briarcliff Manor, Westchester County, New York--delivered to their booths at the Exposition milk that was bottled under the most sanitary conditions at their dairies. During its transit across the ocean the milk was kept at a temperature of 40 to 42 degrees Fahrenheit, and on its arrival, 2 weeks after leaving the dairies, it was found to be in a perfectly sweet condition. Similar experiments made at later dates, such as shipping certified milk from the East to California, serve to bear out the test made in 1900, and prove what can be done with milk so produced as to be as free as possible from bacteria or the conditions that permit their growth.

36. PASTEURIZED MILK.--While certified milk is undoubtedly the safest kind of milk to use and is constantly growing in favor, much of the milk received in the home is pasteurized. By pasteurized milk is meant milk that has been heated to a temperature of 140 to 155 degrees Fahrenheit, kept at this temperature for 15 to 20 minutes, and then cooled rapidly. The result of such a treatment is that any disease-producing germs that are present in the milk, as well as those which are likely to cause intestinal disturbances, are destroyed, and that the milk is rendered safe as food for a time. Pasteurizing does not materially change the taste of milk, nor does it seriously affect the digestive properties of this food. It is true, of course, that pasteurized milk is not so good as clean raw milk. Still it is better to use such milk than to run the risk of using milk that might be contaminated with the germs of tuberculosis, typhoid fever, scarlet fever, diphtheria, or any other of the numerous diseases that have been known to be carried to whole families and communities through the milk supply.

37. Although pasteurizing is done on a large scale in dairies, there is no reason why the housewife cannot pasteurize the milk she buys, provided it is raw milk and she feels that it is not safe to use. If pasteurizing is to be done frequently and large quantities of milk are to be treated, it would be advisable to purchase the convenient apparatus that is to be had. However, if only a small quantity of milk is to be pasteurized at a time, a simple improvised outfit will prove satisfactory, because milk pasteurized in the home may be heated in the bottles in which it is received. Such an outfit consists of a dairy thermometer, a deep vessel, and a perforated pie tin or a wire rack of suitable size.

38. To pasteurize milk in the home, proceed in the manner illustrated in Fig. 3. Place the rack or invert the perforated pie tin in the bottom of the vessel, and on it place the bottles of milk from which the caps have not been removed. Make a hole through the cap of one bottle, and insert the thermometer into the milk through this hole. Then fill the vessel with cold water to within an inch or so of the top of the bottles, taking care not to put in so much water as to make the bottles float. Place the vessel over the fire, heat it until the thermometer in the bottle registers a few degrees over 150 degrees Fahrenheit, and keep the milk at this temperature for 15 to 20 minutes. At the end of this time, the milk will be sufficiently pasteurized and may be removed from the fire. As soon as it is taken from the water, cool it as rapidly as possible by running cold water into the vessel slowly or by placing the bottles in several changes of water, taking care not to place the hot bottles in very cold water at first, as this may cause them to crack.

[Illustration: Fig. 3]

When the milk has been cooled by some rapid method, keep it cool until it is used. This precaution is necessary because of the nature of pasteurized milk. The temperature at which milk is pasteurized is sufficient to kill all fully developed bacteria, but those which exist in an undeveloped state, or in the form of spores, develop very rapidly after pasteurization unless the milk is kept cold and clean. If these bacteria were allowed to develop, the purpose of pasteurization would be lost, and the milk would become as dangerous as it was originally. The advantage of cooling milk rapidly will be fully appreciated upon referring to Fig. 4, which illustrates the development of a single germ in milk that is cooled rapidly and in milk that is cooled slowly.

[Illustration: Fig. 4]

39. STERILIZED MILK.--By sterilized milk is meant milk in which all germs are destroyed by sterilization. Such milk is not sold by dealers, but the process of sterilization is resorted to in the home when pasteurization is not sufficient to render milk safe. This process, which is the only positive means of destroying all germs, consists in bringing the milk to the boiling point, or 212 degrees Fahrenheit, allowing it to boil for three quarters of an hour, and then cooling it rapidly. One who undertakes to treat milk in this way should remember that it is difficult to boil milk, because the solids in the milk adhere to the bottom and sides of the vessel and soon burn. However, this difficulty can be overcome by sterilizing the milk in the bottles in which it is bought.

40. To sterilize milk, place the sealed bottles on a wire rack or a perforated pie tin in a deep vessel, as for the pasteurizing of milk, and pour cold water into the vessel until it nearly covers the bottles. Then raise the temperature of the water quickly to the boiling point, and after it has begun to bubble, allow it to boil for three quarters of an hour. At the end of this time, cool the milk rapidly and then keep it cool until it is used.

41. Although milk thus treated becomes safe, sterilization changes its flavor and digestibility. If milk of this kind must be used, some raw food should be given with it. A diet composed entirely of cooked food is not so ideal as one in which some raw food is included, because raw foods contain substances that are essential to health. The change that takes place in the composition of milk that has been sterilized can be easily observed. Such milk on becoming sour does not coagulate as does pasteurized or raw milk, owing to the fact that the lime salts in the milk are so changed by the high temperature as to prevent the thickening process from taking place. Then, too, sterilized milk is not likely to become sour even after considerable time. Still, such milk is not safe to use except when it is fresh, for instead of fermenting in the usual way it putrefies and is liable to cause such a dangerous sickness as ptomaine poisoning.

42. MODIFIED MILK.--For infants who cannot be fed their normal diet, cow's milk must be used as a substitute, but in order to make it a more nearly ideal food for them it must usually be modified, or changed, by adding other materials. When it is so treated, it is known as modified milk. The materials used to modify milk are sterile water, lime water, barley water, cream, skim milk, milk sugar, or some other easily digested carbohydrate, one of these or a combination of them always being employed. The proportion of these ingredients to use varies with the age of the child that is to be fed and must be constantly changed to meet the child's requirements. In the production of modified milk, a physician's prescription and directions should always be followed closely. Only the best quality of milk should be used, and, in addition, the greatest care should be taken to have all the bottles, utensils, and materials used as clean and sterile as it is possible to make them. If such conditions cannot be met, it is advisable to pasteurize the modified-milk mixture after the materials have been put together.

PRESERVED MILK

43. Besides milk that is commonly sold by dairymen and milk dealers, it is possible to buy in the market many grades of so-called PRESERVED MILK. Such milk is produced by driving off all or part of the water contained in milk, and it is sold as _condensed, evaporated,_ and _powdered milk_. Usually, it is put up in tin cans, and while it is not used so extensively as regular milk, many firms are engaged in its preparation.

44. CONDENSED AND EVAPORATED MILK.--As has just been mentioned, condensed and evaporated milk is produced by the complete or partial evaporation of the water contained in milk. Such milk can be shipped long distances or kept for long periods of time, because it does not contain sufficient moisture to permit the growth of bacteria. In evaporating milk to produce these preserved milks, each gallon is diminished in quantity to about two and one quarter pints, the original 87 per cent. of water being reduced to about 25 per cent. Therefore, in order to use such milk, sufficient water must be added to restore it to its original composition. Sometimes comparatively large amounts of cane sugar are added to such milks, which, besides sweetening them, assist in their preservation. If cane sugar is not used, the milks are usually made sterile in order to prevent them from spoiling.

45. POWDERED MILK.--The form of preserved milk known as powdered milk is the result of completely evaporating the water in milk. Such milk has the appearance of a dry powdered substance. It does not spoil easily and is so greatly reduced in quantity that it can be conveniently stored. Because of these characteristics, this product, for which skim milk is generally used, is extensively manufactured. It is used chiefly by bakers and confectioners, and, as in the case of evaporated or condensed milk, the water that has been evaporated in the powdering process must be supplied when the milk is used.

STANDARD GRADING OF MILK AND CREAM

46. In order that a definite idea may be formed of the sanitary and bacteriological standards that are set by milk commissions, there are here given, in Table I, the regulations governing the grades and designation of milk and cream that may be sold in the city of New York. As will be observed from a study of this table, only definite grades of milk and cream can be sold in that city; likewise, it must conform to certain standards of purity and the producer must handle it in such a way that it may be delivered to the consumer in as clean and fresh a condition as possible.

Without doubt, a grading similar to this one will become general throughout the United States eventually, for this is the only way by which the housewife may know with certainty whether or not the milk she purchases is of the right composition and is safe, fresh, and sanitary in every respect. The different qualities of milk and cream as shown by this grading are, of course, sold at different prices, those which require the greatest care and expense in handling selling for the highest price.

MILK IN THE HOME

PURCHASE OF MILK

47. After the housewife has become familiar with the points that she should know concerning milk, she will be much better equipped to purchase milk of the right kind for her home. However, there are still some points for her to observe when she is purchasing milk if she would supply her family with the best quality of this food.

48. In the first place, she should buy milk from a reliable dealer who will not object to questioning, and, if possible, she should make an investigation of the dairy that supplies the milk that she uses. If she cannot investigate the dairy personally, she should at least endeavor to obtain information from those who are prepared to give it. If she learns that the conditions in the dairy that is supplying her with milk are not what they should be, she should try to obtain milk from some other source. Of course, she should remember that milk of the best and cleanest quality is the highest in price, because of the increased cost of production; but it is usually advisable to pay the higher price, especially if children are to be fed, because cheap milk is liable to be unsafe, at least for any purpose that will require it to be served without cooking. Should the income not allow the best quality of milk to be used for all purposes, a cheaper grade can be used for cooking, but it is always economical to purchase the best quality when this food is to be used as a beverage.

[Illustration: FIG. 5]

49. In the next place, the housewife should purchase milk from a dealer who delivers cold milk, because, as has been mentioned, bacteria multiply rapidly in warm milk. She should also try to obtain milk put up in bottles, for such milk has advantages over milk dipped from a can in that it does not have the same chance to become dirty and it affords a greater opportunity to secure accurate measurement. The kind of caps used on milk bottles should also be observed. Caps that have to be pried out with a knife or a similar utensil are not nearly so satisfactory as those shown in Fig. 5 (_a_), which have small tabs _a_ that permit the cap to be lifted out. In addition to the caps, which serve to keep dirt out of the milk and permit it to be delivered without being spilled, some dealers use covers like that shown in (_b_). Such covers are held in place by a wire and serve further to protect the milk from contamination.

If milk purchased in bottles is clean, there should be no sediment in the bottom of the bottle after it has been allowed to stand for some time. Also, if it is fresh, it will not sour quickly after it is delivered, so that in case it is properly cared for and sours quickly, it may be known to be stale milk. However, if it does not sour in the normal length of time, it should be looked on with suspicion, for, as has been pointed out, such milk may have added to it a preservative to prevent souring. The housewife may expect milk that is delivered cold and is guaranteed to be sanitary and fresh to remain sweet at least 24 hours, provided, of course, it is placed in the refrigerator immediately upon delivery and kept there until used.

* * * * *

REGULATIONS GOVERNING THE GRADES AND DESIGNATION OF MILK AND CREAM WHICH
MAY BE SOLD IN THE CITY OF NEW YORK

The following classifications apply to milk and cream. The regulations

regarding bacterial content and time of delivery shall not apply to sour cream.

Grades of Milk or Cream Sold in the City of New York:

GRADE A Milk or cream (Raw)

Definition: Grade A milk or cream (raw) is milk or cream produced and handled in accordance with the minimum requirements, rules and regulations as herein set forth.

Tuberculin Test And Physical Condition: 1. Only such cows shall be admitted to the herd as have not reacted to a diagnostic injection of tuberculin and are in good physical condition. 2. All cows shall be tested with tuberculin and all reacting animals shall be excluded from the herd.

Bacterial Contents: Grade A milk shall not contain more than 60,000 bacteria per cubic centimeter, and cream more than 300,000 bacteria per cubic centimeter when delivered to the consumer or at any time prior to such delivery.

Necessary Scores: Equip. 25, Meth. 50, Total 75

Time of Delivery: Shall be delivered within 36 hours after production.

Bottling: Unless otherwise specified in the permit, this milk or cream shall be delivered to consumers only in bottles.

Labeling: Outer caps of bottles shall be white and shall contain the words Grade A, Raw, in black letters in large type, and shall state the name and address of the dealer.

Pasteurization: None.

Milk or cream (Pasteurized)

Definition: Grade A milk or cream (pasteurized) is milk or cream handled and sold by dealers holding permits therefor from the Board of Health, and produced and handled in accordance with the requirements, rules, and regulations as herein set forth.

Tuberculin Test And Physical Condition: No tuberculin test required, but cows must be healthy as disclosed by physical examination made annually.

Bacterial Contents: Grade A milk (pasteurized) shall not contain more than 30,000 bacteria per cubic centimeter and cream (pasteurized) more then 150,000 bacteria per cubic centimeter when delivered to the consumer or at any time after pasteurization and prior to such delivery. No milk supply averaging more than 200,000 bacteria per cubic centimeter shall be pasteurized for sale under this designation.

Necessary Scores: Equip. 25, Meth. 43, Total 68.

Time of Delivery: Shall be delivered within 36 hours after pasteurization.

Bottling: Unless otherwise specified in the permit, this milk or cream shall be delivered to the consumer only in bottles.

Labeling: Outer cap of bottles shall be white and contain the word Grade A in black letters in large type, date and hours between which pasteurization was completed; place where pasteurization was performed; name of the person, firm, or corporation offering for sale, selling, or delivering same.

Pasteurization: Only such milk or cream shall be regarded as pasteurized as has been subjected to a temperature averaging 145 degrees Fahrenheit for not less than 30 minutes.

Grade B Milk or cream (Pasteurized)

Definition: Grade B milk or cream (pasteurized) is milk or cream produced and handled in accordance with the minimal requirements, rules, and regulations herein set forth and which has been pasteurized in accordance with the requirements and rules and regulations of the Department of Health for pasteurization.

Tuberculin Test And Physical Condition: No tuberculin test required, but cows must be healthy as disclosed by physical examination made annually.

Bacterial Contents: No milk under this grade shall contain more than 100,000 bacteria per cubic centimeter and no claim shall contain more than 500,000 bacteria per cubic centimeter when delivered to the consumer or at anytime after pasteurization and prior to such delivery. No milk supply averaging more than 1,500,000 bacteria per cubic centimeter shall be pasteurized in this city for sale under this designation. No milk supply averaging more than 300,000 bacteria per cubic centimeter shall be pasteurized outside of the city for sale under this designation.

Necessary Scores: Equip. 20, Meth. 35, Total 55

Time of Delivery: Milk shall be delivered within 36 hours and cream within 48 hours after pasteurization.

Bottling: May be delivered in cans or bottles.

Labeling: Outer caps of bottles containing milk and tags affixed to cans containing milk or cream shall be white and marked Grade B in bright green letters in large type, date pasteurization was completed, place where pasteurization was performed, name of the person, firm, or corporation offering for sale, selling, or delivering same. Bottles containing cream shall be labeled with caps marked Grade B in bright green letters, in large type and shall give the place and date of bottling and shall give the name of person, firm, or corporation offering for sale, selling, or delivering same.

Pasteurization: Only such milk or cream shall be regarded as pasteurized as has been subjected to a temperature averaging 145 degrees Fahrenheit for not less than 30 minutes.

Grade C Milk or cream (Pasteurized) (For cooking and manufacturing purposes only.)

Definition: Grade C milk or cream is milk or cream not conforming to the requirements of any of the subdivisions of Grade A or Grade B and which has been pasteurized according to the requirements and rules and

regulations of the Board of Health or boiled for at least two (2) minutes.

Tuberculin Test And Physical Condition: No tuberculin test required, but cows must be healthy as disclosed by physical examination made annually.

Bacterial Contents: No milk of this grade shall contain more than 300,000 bacteria per cubic centimeter and no cream of this grade show contain more than 1,500,000 bacteria per cubic centimeter after pasteurization.

Necessary Scores: Score 40

Time of Delivery: Shall be delivered within 48 hours after pasteurization.

Bottling: May be delivered in the cans only.

Labeling: Tags affixed to cans shall be white and shall be marked in red with the words, Grade C in large type and "for cooking" in plainly visible type, and cans and shall have properly sealed metal collars, painted red on necks.

Pasteurization: Only such milk or cream shall be regarded as pasteurized as has been subjected to a temperature averaging 145 degrees Fahrenheit for not less than 30 minutes.

NOTE.--Sour milk, buttermilk, sour cream, kumyss, matzoon, zoolac, and similar products shall not be made from any milk of a less grade than that designated for Grade B and shall be pasteurized before being put through the process of souring. Sour cream shall not contained a less percentage of fats than that designated for cream.

No other words than those designated herein shall appear on the label of any container containing milk or cream or milk or cream products except the word certified when authorized under the State law.

* * * * *

CARE OF MILK

50. NECESSITY FOR CARE IN THE HOME.--If milk of good quality is bought, and, as has been suggested, this should be done whenever it is possible, the next thing to do is to care for it in such a way that it may be fed to the family in the same condition as it was when delivered. It is, of course, of prime importance that the dairyman deliver clean fresh milk, but this is not sufficient; the milk must remain in this condition until it is used, and this can occur only when the housewife knows how to care for it properly after it enters the home. It is possible to make safe milk unsafe and unsafe milk positively dangerous unless the housewife understands how to care for milk and puts into practice what she knows concerning this matter. Indeed, some of the blame laid to the careless handling of milk by dairymen really belongs to housewives, for very often they do not take care of milk in the right way after delivery. As too much attention cannot be given to this matter, explicit directions are here outlined, with the idea of assisting the housewife in this matter as much as possible.

51. KEEPING MILK CLEAN IN THE HOME.--Immediately upon delivery, the bottle containing the milk should be placed in the coolest place available, never being allowed to stand on the porch in the sun or where such animals as cats or dogs may come in contact with it. When the milk is to be used, the paper cap should be carefully wiped before it is removed from the bottle, so that any dirt that may be on top will not fall into the milk. If not all the milk is used and the bottle must be returned to the cool place where it is kept, it should be covered by means of an inverted drinking glass or, as shown in Fig. 6, by a glass or porcelain cover. Such covers, or _sanitary milk_ _caps_, as they are called, are very convenient for this purpose and may be purchased at a slight cost.

52. Another precaution that should be taken is never to mix stale milk with fresh milk, because the entire quantity will become sour in the same length of time as the stale milk would. Also, milk that has been poured into a pitcher or any other open vessel and allowed to stand exposed to the air for some time should never be put back into the bottle with the remaining milk. Such milk is sure to be contaminated with the germs that are always present in the dust constantly circulating in the air. It is sometimes necessary to keep milk in a vessel other than the bottle in which it is delivered. In such an event, the vessel that is used should be washed thoroughly, boiled in clean water, and cooled before the milk is poured into it.

[Illustration: Fig. 6]

53. Particular care should be taken of the empty milk bottles. They should never be used for anything except milk. Before they are returned to the dairyman to be used again, they should first be rinsed with cold water, then washed thoroughly with hot, soapy water, and finally rinsed with hot water. If there is illness in the home, the washed bottles should be put into a pan of cool water, allowed to come to a boil, and permitted to boil for a few minutes. Such attention will free the bottles from any contamination they might have received. The dairyman, of course, gives the bottles further attention before he uses them again, but the housewife should do her part by making sure that they are thoroughly cleansed before they are collected by him.

54. KEEPING MILK COOL IN THE HOME.--As has been pointed out, milk should, upon being received, be kept in the coolest place available, which, in the majority of homes at the present time, is the refrigerator. In making use of the refrigerator for this purpose, the housewife should put into practice what she learned in _Essentials of Cookery_, Part 2, concerning the proper placing of food in the refrigerator, remembering that milk should be placed where it will remain the coolest and where it is least likely to absorb odors. She should also bear in mind that the temperature inside of a refrigerator varies with that of the surrounding air. It is because of this fact that milk often sours when the temperature is high, as in summer, for instance, even though it is kept in the refrigerator.

55. In case a refrigerator is not available, it will be necessary to resort to other means of keeping milk cool. A cool cellar or basement is an excellent substitute, but if milk is kept in either of these places, it must be tightly covered. Then, too, the spring house with its stream of running water is fully as good as a refrigerator And is used extensively in farming districts. But even though a housewife has none of these at her disposal, she need not be deprived of fresh milk, for

there are still other ways of keeping milk cool and consequently fresh. A very simple way in which to keep milk cool is to weight down the bottles in a vessel that is deeper than they are and then pour cold water into the vessel until it reaches the top of the bottles, replacing the water occasionally as it becomes warm. A still better way, however, so far as convenience and results are concerned, is that illustrated in Fig. 7. As shown, wrap the bottle in a clean towel or piece of cotton cloth so that one corner of it is left loose at the top. Then place this end in a pan of cold water that stands higher than the bottle. Such an arrangement will keep the cloth wet constantly and by the evaporation of the water from it will cause the milk to remain cool.

[Illustration: FIG. 7]

COOKING MILK

56. POINTS TO BE OBSERVED IN COOKING MILK.--Because of the nature of milk and its constituents, the cooking of this liquid is a little more difficult than would appear at first thought. In fact, heating milk to a temperature greater than 155 degrees Fahrenheit causes several changes to occur in it, one of which, the coagulation of the albumin, has already been mentioned. As the albumin hardens into the layer that forms on the top of boiled milk, a certain amount of fat, sugar, and casein becomes entangled in it, and if the coagulated skin is rejected, these food substances, in addition to the albumin, are lost. Another change that results from boiling is in the fat globules that remain, for these separate and exist no longer in the form of cream.

57. When milk that is not perfectly fresh is cooked with other materials or soups, sauces, and puddings it sometimes curdles. To prevent curdling, the milk should be heated as rapidly as possible before it is used with the other ingredients. While the separate heating of the milk involves a little more work, time may be gained by heating the milk while the remaining ingredients are being prepared. The curdling of comparatively fresh milk is often caused by the addition of salt, especially if the salt is added when the milk is hot. However, if a pinch of bicarbonate of soda is added to the milk before it is heated, it will not be likely to curdle even though it is not absolutely fresh. When tomato is to be used in soup that contains milk or cream, curdling can be prevented if the milk or the cream to be used is thickened with flour or corn starch or a little soda is added to the tomato before the two are mixed. The mixing is accomplished by pouring the _tomato into the milk_ instead of the milk into the tomato. When acid fruit juices are to be added to milk or cream and the mixture then frozen, curdling can be prevented by thoroughly chilling the milk or cream in the freezer can before combining it with the juices.

58. As has already been learned, great care must be taken in the heating of milk, because the solids that it contains adhere quickly to the bottom of the pan and cause the milk to scorch. For this reason, milk should never be heated directly over the flame unless the intention is to boil it, and even if it must be boiled every precaution should be taken to prevent it from burning. It should be remembered, too, that a very small scorched area will be sufficient to make a quantity of milk taste burned. The utensil in which milk can be heated in the most satisfactory way is the double boiler, for the milk does not come in direct contact with the heat in this utensil. If a double boiler is not available, good results can be obtained by setting one pan into another

that contains water.

59. Milk is often used in place of water for cooking cereals, beverages, puddings, soups, etc. This is good practice and should be followed whenever possible, for when milk is added it serves to increase the nutritive value of the food. It should be observed, however, that more time is required to cook grains or cereals in milk than to cook them in water, because milk contains more solid matter than water and is not absorbed so quickly. Another frequent use of milk is in breads and biscuits, where, as is explained in _Bread_ and _Hot Breads_, it produces a browner and more tender crust than water.

60. VARIETY OF WAYS TO USE MILK IN COOKING.--Because of the numerous purposes for which milk is required in the preparation of foods, the smallest amount of it, whether sweet or sour, can be utilized in cooking; therefore, no milk need ever be wasted. A few of the uses to which this food is oftenest put are mentioned briefly in order that the housewife may be familiar enough with them to call them to mind whenever she desires to carry out a recipe that calls for milk or when she has occasion to utilize milk that she has on hand.

Milk thickened slightly with flour and flavored with such material as corn, asparagus, celery, tomatoes, beans, peas, or fish makes a delicious soup. In bisques, or thickened soups, and in chowders, the liquid used need not be milk, but these are made very appetizing if milk is used for part or all of the liquid. Then, too, sauces or gravies made with milk, thickened with flour, and made rich with butter or other fat lend themselves to a variety of uses. Dice of vegetables, meat, fish, or game added to a sauce of this kind and served in pastry cases or over toast provide dishes that are delightful additions to any meal. Milk is also used as the basis for custards, blanc manges, ices, sherbets, ice creams, and tapioca, rice, and bread puddings in which eggs, starchy materials, and flavorings are added and the mixture then baked, steamed, boiled, or frozen, as the desired result may require. As is well known, milk is practically indispensable in the making of cakes, cookies, quick breads, and in fact nearly all dough mixtures. Even if it has soured, it can be used with soda to take the place of cream of tartar in mixtures that are to be made light, the lactic acid in the sour milk acting with the soda as leavening. Left-over milk in comparatively large quantities may also be used in the home for the making of cheese, although this product of milk is usually produced commercially.

RECIPES FOR MILK DISHES AND SAUCES

FOODS CONTAINING MILK

61. From the discussion given up to this point, it will be noted that milk is used in a large variety of ways and in the making of numerous dishes. However, most of the dishes in which this liquid occurs involve other important materials, so that the recipes for them are usually listed under some other ingredient or division of cookery. For instance, milk is used in the making of ice cream, but as the ice creams are included among cold desserts, recipes for them would naturally come in the Section pertaining to this subject. Milk is also an important ingredient in puddings, but the recipes for such dishes are given in the Section in which puddings and their sauces are discussed.

Because of this fact, there are only a few recipes that have milk as

their basis, and this accounts for the small number of recipes here given. Chief among the recipes that involve principally milk are those for junket and white sauce, and while the number of these is small and the use of the dishes not so general as some kinds of food, just as much attention should be given to them as if they occurred in greater numbers and were used more commonly. Junket is very easily made and should therefore cause the housewife no concern; likewise, little difficulty will be experienced if the directions here given for white sauces are followed explicitly.

RECIPES FOR JUNKET

62. Plain Junket.--In the stomachs of all animals that use milk as food is found a digestive ferment known as _rennin_. This is taken from the stomachs of calves, made up commercially, and sold in the form of tablets called _junket_. When these tablets are used properly with milk, they coagulate the milk and make an excellent dessert that resembles custard and that is very easy to digest. Because of its nature and qualities, this kind of dessert is used largely for invalids and children. The following recipe gives the proportion and directions for making this dessert in its simplest form.

PLAIN JUNKET
(Sufficient to Serve Eight)

1 junket tablet
1 Tb. cold water
1 qt. milk
4 Tb. sugar
1/4 tsp. salt
1/2 tsp. vanilla or other flavoring

Dissolve the junket tablet in the cold water. Warm the milk very slowly to 100 degrees Fahrenheit, testing the temperature to make sure that it is right. If a thermometer is not on hand, this can be done by dropping a drop on the back of the hand. When neither heat nor cold can be felt from this drop of milk, it may be known to be very near the body temperature, the temperature at which rennin is active. If temperature is found to be too high, the milk must be cooled before the tablet is added. When the desired temperature has been reached, add the sugar, the alt, the junket dissolved in the water, and the flavoring. Then pour all into individual molds and keep it where it will remain warm for about 10 minutes, at the end of which it should be firm like a custard and may be cooled. Keep the junket cool until it is to be served, when it may be turned out of the mold or served in it. As junket will turn to whey if it is broken with a spoon to any extent, serving it in the mold is the better plan.

[Illustration: FIG. 8]

63. Junket With. Fruit.--The addition of fruit to junket, as in the dish illustrated in Fig. 8, makes an attractive dessert for both sick and well people. If the fruit used is permissible in the diet of an invalid, its combination with junket adds variety to the diet. In the making of this dessert, all juice should be carefully drained from the fruit before the junket is poured over it. Canned or fresh fruits may be used with equally good results.

JUNKET WITH FRUIT
(Sufficient to Serve Eight)

1 junket tablet
1 Tb. cold water
1 qt. milk
1/4 c. sugar
1/4 tsp. salt
Flavoring
8 halves of canned peaches or
1 c. of berries or small fruit

Make a junket as directed in the preceding recipe. Drain all juice from the fruit and place a half peach or a spoonful of fruit in the bottom of each of the eight molds and pour the junket over it to fill the mold. Let it solidify and serve cold.

64. CHOCOLATE JUNKET.--Chocolate added to plain junket not only varies the junket dessert, but also adds food value, since chocolate contains a large quantity of fat that is easily digested by most persons. Where the flavor of chocolate is found agreeable, such junket may be served in place of the plain junket.

CHOCOLATE JUNKET
(Sufficient to Serve Six)

3 c. milk
2 sq. chocolate
6 Tb. sugar
3/4 c. water
1/4 tsp. salt
1/2 tsp. vanilla
1 junket tablet

Heat the milk to 100 degrees Fahrenheit, testing in the manner explained in Art. 62. Melt the chocolate in a saucepan, add to it the sugar and 1 cupful of water, and cook until smooth; then cool and add to the warm milk, putting in the salt, vanilla, and junket tablet dissolved in cupful of the water. Turn the junket into a dish or into molds and let stand in a warm place until set; then chill and serve. In preparing this recipe, it will be well to note that if sweet chocolate is used less sugar than is specified may be employed.

65. CARAMEL JUNKET.--In the making of caramel junket, browned, or caramelized, sugar and water take the place of part of the milk, and while a certain amount of the sugar is reduced in the browning, the caramel is still very high in food value and adds nutritive material to the dessert. There is nothing about caramel junket to prevent its being given to any one able to take plain junket, and if it is made correctly it has a very delightful flavor.

CARAMEL JUNKET
(Sufficient to Serve Six)

3 c. milk
1/2 c. sugar
1/2 c. boiling water
1/4 tsp. salt
1 tsp. vanilla

1 junket tablet
Whipped cream
1/4 c. chopped nuts

Heat the milk to 100 degrees Fahrenheit. Caramelize the sugar by melting it in a saucepan directly over the flame until it is a light-brown color; then stir in the boiling water and cook until the caramel and the water become a sirup, after which cool and add to the milk Add the salt, the vanilla, and the junket tablet dissolved in a tablespoonful of cold water Pour the mixture into a dish, let it stand in a warm place until it sets; then chill, cover with sweetened whipped cream, sprinkle with chopped nuts, and serve.

RECIPES FOR WHITE SAUCE

66. Three white sauces are commonly used for different purposes, and in each one of them milk is the basis. These sauces differ from one another in thickness, and include _thin white sauce_, which is used for cream toast and soups; _medium white sauce_, which is used for dressing vegetables and is flavored in various ways to accompany meats, patties, or croquettes; and _thick white sauce_, which is used to mix with the materials used for croquettes in order to hold them together. To insure the best results, the proportion of flour and liquid should be learned for each kind, and to avoid the formation of lumps the proper method of mixing should be carefully followed out. A white sauce properly made is perfectly smooth, and since only little care is needed to produce such a result it is inexcusable to serve a lumpy sauce. Also, nothing is more disagreeable than thick, pasty sauce, but this can be avoided by employing the right proportion of flour and milk. The ingredients and their proportions for the various kinds of white sauce are as follows:

THIN WHITE SAUCE

1 c. milk
1 Tb. butter
1 Tb. flour
1/2 tsp. salt

MEDIUM WHITE SAUCE

1 c. milk
2 Tb. butter
2 Tb. flour
1/2 tsp. salt

THICK WHITE SAUCE

1 c. milk
2 Tb. butter
1/4 c. (4 Tb.) flour
1/2 tsp. salt

It will be easy to remember the proportions for these three sauces if it is observed that each one doubles the previous one in the quantity of flour used, the thin one having 1 tablespoonful to 1 cupful of milk, the medium one 2 tablespoonfuls to 1 cupful of milk, and the thick one 4 tablespoonfuls to 1 cupful of milk. To produce these sauces the ingredients may be combined in three different ways, each of which has

its advantages. These methods, which are here given, should be carefully observed, for they apply not only to the making of this particular sauce, but to the combining of fat, starch, and liquid in any sauce.

Method 1.--Heat the milk, being careful that it does not scorch. Brown the butter slightly in a saucepan, add the flour and salt, and stir the mixture until it is perfectly smooth and has a deep cream color. Then add the hot milk gradually, stirring to prevent the formation of lumps. Cook 5 minutes, stirring constantly to prevent the sauce from scorching. Sauce made according to this method does not require long cooking because the flour added to the hot fat cooks quickly. In fact, it is a very desirable method, for the browned butter and the flour lend flavor to the sauce. Many otherwise unattractive or rather tasteless foods can be made much more appetizing by the addition of white sauce made in this way.

Method 2.--Put the milk on to heat. While this is heating, stir the butter, flour, and salt together until they are soft and well mixed; then add the hot milk to them slowly, stirring constantly. Place over the heat and finish cooking, or cook in a double boiler. Sauce made by this method requires longer cooking than the preceding one and it has less flavor.

Method 3.--Heat the milk, reserving a small portion. Stir the flour smooth with the cold milk and add it to the hot milk, stirring rapidly. Add the butter and the salt, and continue to stir if cooked over the heat; if cooked in a double boiler, stir only until the mixture is completely thickened and then continue to cook for 10 or 15 minutes. When butter is added to the mixture in this way, it is likely to float on top, especially if too much is used. A better sauce may be made according to this method by using thin cream for the liquid and omitting the butter.

MILK, BUTTER, AND CHEESE (PART 1)

EXAMINATION QUESTIONS

(1) When milk is used in a meal, what kinds of food may be omitted?

(2) Name the chief uses of milk in the dietary.

(3) Why is it possible for a child to remain in normal condition if given only milk for a long period of time?

(4) Name the solids contained in milk and tell for what each one is valuable.

(5) What causes milk to sour?

(6) What are the characteristics of wholesome milk?

(7) What is meant by the adulteration of milk?

(8) What quality of milk is of the most importance to the health of those using milk?

(9) (_a_) Why is dirty milk dangerous? (_b_) Pour a quart of the milk you purchase regularly through a pad of cotton. Note the result and

report the condition of the milk by comparing the cotton with the disks shown in Fig. 2.

(10) Name some of the ways in which milk is likely to become contaminated.

(11) What is the safest kind of market milk to buy?

(12) Describe the conditions under which milk of this kind is marketed.

(13) (_a_) What is pasteurized milk? (_b_) What is the purpose of pasteurization?

(14) How may milk be pasteurized in the home?

(15) (_a_) When should milk be sterilized? (_b_) What changes take place in the sterilization of milk?

(16) What points should be considered in the purchase of milk?

(17) Why is it necessary to give milk considerable care in the home?

(18) Mention the precautions that should be observed in caring for milk.

(19) (_a_) How is milk affected by cooking? (_b_) Describe the best way to heat milk.

(20) Give the proportions of flour and liquid required in each of the three varieties of white sauce.

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BUTTER AND BUTTER SUBSTITUTES (PART 2)

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BUTTER

1. BUTTER is the fatty constituent of milk. It is obtained by skimming or separating the cream from milk and churning it in order to make the particles of fat adhere to one another. Butter is used largely in the household as an article of food, for it is one of the most appetizing and digestible forms of fat.

To supply the demand for butter, it is produced domestically in the home and on farms and commercially in dairies and large establishments. The principle of all churns used for butter making is practically the same. They simply agitate the cream so that the butter-fat globules in it are brought together in masses of such size as to enable the butter maker to separate them from the buttermilk. Butter is seasoned, or salted, to give it a desirable flavor and to improve its keeping qualities; it is washed, or worked, in order to distribute the salt evenly, to separate from it as much of the curd and other non-fatty constituents of the cream as can be conveniently removed, to bring it into a compact, waxy mass, and to give it texture. The United States authorities have set a standard for the composition of butter, which allows this product to contain not more than 16 per cent. of water and requires it to have at

least 82.5 per cent. of butter fat.

2. ECONOMICAL USE OF BUTTER.--In the home, butter is used on the table and in the cooking of many foods. Hardly any article of food has such general use as this one; in fact, a meal is usually considered to be incomplete without it, both as an accompaniment to bread, rolls, biscuits, or whatever variety of these is used, and as an ingredient in the cooking of some foods that require fat. But butter is not cheap, so that the wise and economical use of this food in the home is a point that should not be overlooked by the housewife. This precaution is very important, it having been determined that butter, as well as other fats, is wasted to a great extent; and still it is true that no other material can be so economically utilized. The very smallest amount of any kind of fat should be carefully saved, for there are numerous uses to which it can be put. Even though it is mixed with other food, it can always be melted out, clarified--that is, freed from foreign substances--and then used for some purpose in cooking. The chief way in which butter is wasted is in the unnecessary and improper use of it, points that a little careful thought will do much to remedy.

3. FLAVOR AND COMPOSITION OF BUTTER.--That the housewife may have an understanding of the food substances found in butter and also learn how to determine the quantity of butter needed for her family, she should become familiar with the composition of this food. The flavor of butter depends to a great extent on the kind of cream from which it is made, both sweet and sour cream being used for this purpose. Of these two kinds, sour cream is the preferable one, because it gives to the butter a desirable flavor. Still, the unsalted butter that is made from sweet cream is apparently growing in favor, although it is usually more expensive than salted butter. The difference in price is due to the fact that unsalted butter spoils readily.

4. So far as its food substances are concerned, butter is composed largely of fat, but it also contains water, protein in the form of casein, and mineral matter. The quantity of water contained in butter determines to a large extent the weight of butter, since water is heavier than fat; but as only 16 per cent, of water is allowed, butter that contains more water than this is considered to be adulterated. As very little milk is retained in butter, only a small percentage of protein is found in this food. However, a considerable quantity of mineral salts are present, and these make it more valuable than most of the other fats. Because of the nature of its composition--a very high percentage of fat and a low percentage of protein--butter is distinctly a fuel food, that is, a heat-producing food. Of course, there are cheaper fats, some of which are even better heat-producing foods than butter, but as their flavor is not especially agreeable to some persons, they are not used so extensively.

In view of the nature of the composition of this food, an ounce of butter a day is the average allowance for each person when the diet of a family contains meat and such other fats as lard, olive oil, etc. At the most, 1/2 pound of butter should be purchased each week for each member of the family for table use, and fats cheaper than butter should be used for cooking purposes.

5. PURCHASING BUTTER.--As in the case of milk, in order that the housewife may judge the quality of the butter she purchases, she will do well to look into the cleanliness and sanitary condition of the dairy that produces it. Too much attention cannot be given to this matter, for

if cream becomes contaminated from careless handling, the same contamination is liable to occur in the butter made from it. Butter that is produced in dairies that make large quantities of it usually has not much opportunity to become contaminated before it reaches the consumer, for it is generally pressed into 1-pound prints, and each one of these is then wrapped and placed in a paper carton. On the other hand, the farmer and the dairyman doing a small business do not find it profitable to install the equipment required to put up butter in this way, so they usually pack their butter into firkins or crocks or make it into rolls. When such butter goes to market, it is generally placed in a refrigerator with more butter of the same sort, some of which is good and some bad. As butter absorbs any strong odor present in the refrigerator and is perhaps cut and weighed in a most unsanitary manner, the good becomes contaminated with the bad. While butter of this kind is perhaps a few cents cheaper than that which is handled in a more sanitary way, it is less desirable, and if possible should be avoided by the housewife. In case butter is obtained from a certain farm, the conditions on that farm should be looked into for the same reason that the conditions in a dairy are investigated.

6. To be able to select good butter, the housewife should also be familiar with its characteristics. In color, butter to be good should be an even yellow, neither too pale nor too bright, and should contain no streaks. The light streaks that are sometimes found in butter indicate insufficient working. As to odor, butter should be pleasing and appetizing, any foreign or strong, disagreeable odor being extremely objectionable. Stale butter or that which is improperly kept develops an acid called _butyric acid_, which gives a disagreeable odor and flavor to butter and often renders it unfit for use.

7. CARE OF BUTTER.--The precautions that the farmer and dairyman are called on to observe in the making and handling of butter should be continued by the housewife after she purchases butter for home use. The chief point for her to remember is that butter should be kept as cold as possible, because a low temperature prevents it from spoiling, whereas a high one causes it to become soft and less appetizing. The most satisfactory place in which to keep butter is the refrigerator, where it should be placed in the compartment located directly under the ice and in which the milk is kept, for here it will not come in contact with foods that might impart their flavors to it. Should no refrigerator be available, some other means of keeping butter cold must be resorted to, such as a cool cellar or basement or a window box.

The way in which butter is bought determines to a certain extent the method of caring for it. If it is bought in paper cartons, it should be rewrapped and replaced in the carton each time some is cut off for use. In case it is bought in bulk, it should never be allowed to remain in the wooden dish in which it is often sold; rather, it should be put into a crock or a jar that can be tightly covered.

8. Attention should also be given to butter that is cut from the supply for the table or for cooking purposes and that is not entirely used. Such butter should never be returned to the original supply, but should be kept in a separate receptacle and used for cooking. If it contains foreign material, it can be clarified by allowing it to stand after it has melted until this has settled and then dipping or pouring the clear fat from the top. Butter that has become rancid or has developed a bad flavor need not be wasted either, for it can be made ready for use in cooking simply by pouring boiling water over it, allowing it to cool,

and then removing the layer of fat that comes to the top. Such butter, of course, cannot be used for serving on the table. Still, consideration on the part of the housewife to just such matters as these will prevent much of the waste that prevails in the household in the use of this food.

9. COOKING WITH BUTTER.--While some housewives make it a practice to use butter in cooking of all kinds, there are uses in which other fats are preferable; or, in case butter is desired, there are certain points to be observed in its use. For instance, butter is rendered less digestible by cooking it at a high temperature, as in frying or sauteing; also, it cannot be used to any extent for the frying of foods, as it burns very readily. If it is used for sauteing, the dish is made much more expensive than is necessary, so that in most cases a cheaper fat should be employed for this purpose. In addition, a point to remember is that this fat should not be used to grease the pans in which cakes and hot breads are baked unless it is first melted, because the milk contained in the butter burns easily; after it is melted, only the top fat should be used. When butter is desired for very rich cakes and for pastry, it is usually washed in cold water to remove the milk. To neutralize the sour milk contained in butter that is used for baking purposes, a little soda is sometimes employed.

Further economy can be exercised in the use of butter if a little thought is given to the matter. For instance, when butter is melted and poured over meat or fish that has been broiled or over vegetables that have been cooked in a plain way, much of it usually remains in the dish and is wasted. Such butter can be utilized again. Since butter undergoes a change when it is cooked, it should be mixed with cooked foods to flavor them, rather than be subjected to the temperature necessary for cooking.

When butter is used for spreading sandwiches, it usually will be found advisable to soften the butter by creaming it with a spoon, but it should never be melted for this purpose.

10. SERVING BUTTER.--When butter is used for the table, some consideration must be given to the serving of it. Probably the most usual way of serving butter is to place a slice of it on a plate and then pass the plate with a knife to each person at the table. The advantage of this method is that each person can take the amount desired and thus prevent waste. However, a still more desirable way of serving butter that is to be passed is to cut it into small cubes or squares or to shape it into small balls and then serve it with a fork or a butter knife. To prevent the pieces or balls of butter from melting in warm weather, cracked ice may be placed on the butter dish with them. Butter cut into cubes or squares may also be served on an individual butter dish or an individual bread-and-butter plate placed at each person's place before the meal is served. Whichever plan is adopted, any fragments of butter that remain on the plates after a meal should be gathered up and used for cooking purposes.

[Illustration: FIG 1]

11. Butter that comes in pound prints lends itself readily to the cutting of small cubes or squares for serving. Such butter may be cut by drawing a string through the print or by using a knife whose cutting edge is covered with paper, a small piece of the oiled paper such as that in which the butter is wrapped answering very well for

this purpose.

If butter balls are desired for serving, they may be rolled with butter paddles in the manner shown in Fig. 1. To make butter balls, put wads of the butter to be used into ice water so as to make them hard. Then place each wad between the paddles, as shown, and give the paddles a circular motion. After a little practice, it will be a simple matter to make butter balls that will add to the attractiveness of any meal. Paddles made especially for this purpose can be purchased in all stores that sell kitchen utensils.

[Illustration: FIG. 2]

12. Sometimes, for practical purposes, it is desired to know the quantity of butter that is served to each person. In the case of print butter, this is a simple matter to determine. As shown in Fig. 2, first mark the pound print in the center in order to divide it in half; after cutting it into two pieces, cut each half into two, and finally each fourth into two. With the pound print cut into eight pieces, divide and cut each eighth into four pieces. As there will be thirty-two small pieces, each one will represent one thirty-second of a pound, or 1/2 ounce.

BUTTER SUBSTITUTES

13. In about the year 1870, through a desire to procure a cheaper article than butter for the poorer classes of France, came the manufacture of the first substitute for butter. Since that time the use of butter substitutes has gradually increased, until at the present time millions of pounds are consumed every year. A certain amount of prejudice against their use exists, but much of this is unnecessary for they are less likely to be contaminated with harmful bacteria than the poorer qualities of butter. Then, too, they do not spoil so readily, and for this reason they can be handled with greater convenience than butter.

14. OLEOMARGARINE.--The best substitute for butter and the one most largely used is called oleomargarine, which in the United States alone constitutes about two and 1/2 per cent. of all the fat used as butter. This fat is called by various other names, such as _margarine,_ and _butterine_, but oleomargarine is the name by which the United States authorities recognize the product. It is made by churning fats other than butter fat with milk or cream until a butterlike consistency is obtained. Originally, pure beef fat was employed for this purpose, and while beef fat is used to a great extent at present, lard, cottonseed oil, coconut oil, and peanut oil are also used. Whatever fats are selected are churned with milk, cream, and, for the finest grades, a considerable percentage of the very best pure butter. After they are churned, the oleomargarine is worked, salted, and packed in the same manner as butter.

15. The manufacture and sale of butter substitutes are controlled by laws that, while they do not specify the kind of fat to be used, state that all mixtures of butter with other fats must be sold as oleomargarine. They also require that a tax of 10 cents a pound be paid on all artificially colored oleomargarine; therefore, while coloring matter is used in some cases, this product is usually sold without coloring. In such an event, coloring matter is given with each pound of

oleomargarine that is sold. Before using the oleomargarine, this coloring matter is simply worked into the fat until it is evenly colored.

16. RENOVATED BUTTER.--Another substitute that is sometimes used to take the place of the best grades of butter is renovated, or process, butter. This is obtained by purifying butter that is dirty and rancid and that contains all sorts of foreign material and then rechurning it with fresh cream or milk. The purifying process consists in melting the butter, removing the scum from the top, as well as the buttermilk, brine, and foreign materials that settle, and then blowing air through the fat to remove any odors that it might contain. Butter that is thus purified is replaced on the market, but in some states the authorities have seen fit to restrict its sale. While such restrictions are without doubt justifiable, it is possible to buy butter that is more objectionable than renovated, or process, butter, but that has no restriction on it.

17. METHOD OF TESTING BUTTER SUBSTITUTES.--Very often oleomargarine and process butter bear such a close resemblance to genuine butter that it is almost impossible to detect the difference. However, there is a simple test by which these substitutes can always be distinguished from butter, and this should be applied whenever there is any doubt about the matter. To make this test, place the fat in a tablespoon or a small dish and heat it directly over the flame until it boils, stirring it occasionally to assist in the melting. If it is oleomargarine or process butter, it will sputter noisily and take on a curdled appearance; whereas, if it is butter, it will melt and even boil without sputtering although it foams to a certain extent.

* * * * *

CHEESE

CHARACTERISTICS AND CARE OF CHEESE

18. ORIGIN, PRODUCTION, AND USE OF CHEESE.--Cheese is a product that is manufactured from the solids of milk, and it provides a valuable food. The making of cheese was known in ancient times, it having probably originated through a desire to utilize an oversupply of milk. When cheese was first made, the fact that bacteria were present was not known, nor were the reasons for the spoiling of milk understood; but it was learned that milk can be kept if most of its water is removed. This discovery was very important, for it led to various methods of making cheese and proved that cheese making was a satisfactory and convenient means of storing nourishment in a form that was not bulky and that would keep for long periods of time. From a very small beginning, the different methods of making cheese became popular, until at the present time more than three hundred varieties are made and their manufacture forms one of the large industries of the world.

In the United States, nearly all the cheese used up to about 50 years ago was made on farms, and to a great extent by housewives, but about that time a factory for the making of this product was started in the state of New York, and it proved a profitable enterprise. From this beginning, the business of making cheese commercially in this country has grown until now cheese is almost entirely a factory-made product, in the manufacture of which the states of New York and Wisconsin lead.

19. In either the commercial or the home production of cheese, skim milk with all or part of the cream removed is used for some varieties, while whole milk is used for others, the composition depending largely on the kind of milk that is employed. Rennet is added to the milk to coagulate it, and then the curd, from which nearly all the water is removed, is allowed to ripen. To produce characteristic odors, flavors, and consistency, various coloring and flavoring materials, as well as bacteria, are added to the curd. The action of these bacteria is really the chief factor in the making of cheese and they are therefore not only desirable but necessary. Non-desirable bacteria, however, result in the formation of bad odors, flavors, and gases in the finished product and these must be carefully guarded against by cheese makers.

[Illustration: Fig. 3]

20. Cheese offers a valuable source of nutriment for the body, because its food value ranks high. As is shown in Fig. 3, the food value in 1 pound of cheese is equivalent to that in 2 pounds of beef, that in 24 eggs, or that in 4 pounds of fish. The use of cheese, however, is not nearly so great as its food value warrants, the amount used in the United States per capita being only about 3-1/2 pounds annually. This is a condition that should be overcome, for there is a large variety of ways in which cheese can be used to advantage in the diet. When eaten raw, it is very appetizing, and when used with soups, sauces, and foods that have a bland taste, it lends additional flavor and makes an especially attractive dish. In addition, the fact that it is an economical food and can be conveniently kept and stored should recommend its frequent use.

21. COMPOSITION OF CHEESE.--Since cheese is a product of milk, it is somewhat similar to milk in composition, but the change that occurs in the formation of cheese causes some differences. Nearly all the water present in milk is removed during the manufacture of cheese, so that this product becomes a concentrated food made up of all the nourishment that milk contains except small amounts of albumin, milk sugar, and mineral matter. These, because they are in solution in the water, are lost when the whey is separated from the curd. The food substances that occur in the largest amounts are fat and protein in the form of casein, which is the tissue-building material of milk. Cheese made from milk that contains some cream has in it a greater amount of fat than that made from completely skimmed milk. Besides these two chief food substances, cheese contains a small amount of milk sugar, mineral matter, and water.

22. On account of the large quantity of protein found in cheese, this food can readily take the place of meat in the diet; in fact, it has some decided advantages over meat. As has been pointed out, cheese yields more than twice as much food value as an equal weight of beef. Then, too, the buying and care of cheese are much simpler matters than the buying and care of meat. As it does not require the low temperature that meat requires and does not spoil so readily, it can be bought in considerable quantity and used as desired without danger of spoiling and loss. In addition, the use of cheese as food does not require so much skill in preparation as meat does, nor is there loss of flavor and nutriment in its preparation, as is often the case with meat.

23. QUALITY OF CHEESE.--Every variety of cheese has its own standard and quality, some being hard and dry, others moist, and still others very soft. The difference in quality is due to the way in which the curd is

coagulated, the amount of pressure that is put on it, and the ripening of the cheese. The holes that often occur in cheese and give it a porous appearance are formed by gas, which is the product of the growth of bacteria. A large number of very small holes in cheese indicate that the milk used to make it was not clean and contained many kinds of bacteria. This condition could be overcome by the use of absolutely clean milk; indeed, milk of this kind is as necessary for the production of good cheese as it is for the making of good butter. Certain cheeses, such as Limburger and Roquefort, have a typical odor and flavor, the odor being due to bacteria and the flavor to mold. These are carefully grown and introduced into the cheese during its manufacture.

24. CARE OF CHEESE.--The very strong odor and flavor that characterize cheese make it necessary that care be given to cheese in the home in order to prevent it from coming in contact with other foods and transmitting its odor and flavor to them. The best place to keep cheese, particularly the soft varieties, is in the refrigerator, where it should be placed in a closed receptacle and kept as far as possible from foods that are easily tainted. It is well to avoid a damp place for the keeping of cheese, as mold frequently develops on the outside when too much moisture is present; but in case mold does appear it can be removed by cutting a thin slice from the side on which it has grown. On the other hand, cheese that is kept in a dry place becomes hard and dry unless it is wrapped in oiled paper or a damp cloth. However, such cheese need not be thrown away, for there are numerous uses, particularly in cooking, to which it can be put.

* * * * *

KINDS OF CHEESE

CLASSIFICATION OF VARIETIES

25. The cheese used in the United States may be included under two leading classes, namely, _foreign cheese_ and _domestic cheese_. Since the foreign cheeses are imported, they are more expensive than the cheeses made here, and should not be bought if cheese is to be used as an economical article of food. They are valuable chiefly for their flavor and are generally bought for this reason. The domestic cheeses can be used in larger quantities, for, besides being less expensive, they are usually of a milder type and are more easily digested. To enable the housewife to become familiar with the principal varieties of each of these classes, a discussion of them, including their names, characteristics, and, in some cases, their use and the method of making, is here given. In addition, there are shown in colors, in Fig. 4, a large number of cheeses, together with a print of butter _o_, which serves to illustrate the irregular surface that is exposed when good butter is broken apart.

IMPORTED CHEESE

26. Each of the European countries has originated its own peculiar kind of cheese, which remains representative of a certain people or locality. The majority of these cheeses have met with so much favor in the United States that large quantities of them are continually imported. A few of them have been copied here with success, but others have not been successfully made. While these are not in such common use as the domestic cheeses, it is well for every one to know their names and the

characteristics by which they can be identified.

27. ENGLISH CHEESE.--Chief among the kinds of cheeses made in England is CHEDDAR CHEESE, which is illustrated at _a_, Fig. 4. It is rich, double-thick cream cheese, ranging from a pale to a dark yellow, although when uncolored it may be white. Such cheese, when fresh, has a milk flavor, but when it is well ripened it has a characteristic sharp taste. New Cheddar cheese is soft, but not waxy, in texture and may readily be shaved or broken into small pieces; when it is well ripened, it may be grated. English Cheddar cheese is not unlike AMERICAN CHEDDAR CHEESE, or, as it is commonly called, _American cream cheese_, which is shown by _b_. In fact the American variety is made according to the method used for the English. Owing to its characteristics, flavor, and abundance, Cheddar cheese, both English and American, is the kind that is used most extensively in the United States.

ENGLISH DAIRY CHEESE, shown at _d_, is similar to Cheddar cheese, although it has a reddish color and, on account of the method of manufacture, it is harder. This kind of cheese lends itself well to cooking, as it may be easily grated.

CHESHIRE CHEESE, a well-known English variety, is a dry cream cheese made from whole cow's milk. It is deep yellow or red in color, similar in flavor to Cheddar cheese, and is used in much the same manner.

[Illustration]

[Illustration]

STILTON CHEESE, shown at _m_, is a hard cheese made from cow's milk to which cream has been added and which is coagulated with rennet. Mold is introduced into this cheese, so that it resembles Roquefort cheese, which is shown at _j_.

28. HOLLAND CHEESE.--The variety of cheese shown at _e_, Fig. 4, is known as EDAM CHEESE. It is a hard rennet cheese of a red color and is mild in flavor. This kind of cheese is molded into the shape of a ball, the outside of which is usually dyed red, and will keep for a long period of time. Edam cheese is one of the important products of the Netherlands, and while it is seldom used in cookery in the homes of this country, it is served at the table. Usually a section of the top is cut off to serve as a lid while the inside is scooped out as needed. Sometimes, after most of the cheese has been removed, the hollow shell is stuffed with macaroni or rice that has been cooked and seasoned and the food then baked in the shell.

29. FRENCH CHEESES.--Among the French cheeses, the variety called GRUYERE CHEESE, which is shown at _f_, Fig. 4, is well liked. It is usually made of skim milk, has a yellow color and a mild, sweetish flavor, and contains large holes like those found in Swiss and Emmenthal cheeses, varieties that are very similar to it. Like these cheeses, Gruyere cheese may be used in cooking or served without cooking, being used considerably in the making of sandwiches.

BRIE CHEESE is a French variety of very soft cheese, with a strong flavor and odor. It is made from whole or partly skimmed cow's milk coagulated by means of rennet. This kind of cheese is used mostly as an accompaniment to other foods.

CAMEMBERT CHEESE, which is shown at _h_, is also a soft cheese. It is made by practically the same process as Brie cheese and is used in the same way. This cheese has a typical odor. Its rind is thick and dry, but its center is very soft, being sometimes almost liquid.

NEUFCHATEL CHEESE, which is shown at _i_, is a soft rennet cheese made from cow's milk. It is made at Neufchatel-en-Bray, France, and not at Neufchatel, Switzerland. This variety of cheese is wrapped in tin-foil and sold in small packages. It is used chiefly for salads, sandwiches, etc. As it does not keep well after the package is opened, the entire contents should be used at one time.

ROQUEFORT CHEESE, which is shown at _j_, is a hard, highly flavored cheese made from sheep's milk coagulated with rennet. It has a marbled appearance, which is due to a greenish mold that is introduced. Roquefort cheese is frequently served with crackers at the end of a meal, and is well liked by many persons.

30. ITALIAN CHEESES.--From Italy is imported a cheese, called PARMESAN CHEESE, that is used extensively for flavoring soups and macaroni dishes. This cheese, which is shown at _g_, Fig. 4, is very hard and granular and, provided it is well made, it will keep for years. Owing to its characteristics, it may be easily grated. It can be bought by the pound and grated as it is needed, or it can be secured already grated in bottles.

GORGONZOLA, another Italian cheese, is shown at _k_. It is not unlike Roquefort in appearance and in use, but it is made from whole cow's milk coagulated with rennet. Into this cheese is also introduced a mold that gives its center a streaked or mottled appearance.

31. SWISS CHEESES.--Possibly the best known cheese imported from Switzerland is the variety known as SWISS, or SWITZER, CHEESE. This kind of cheese has different names, depending on the district of Switzerland in which it is made. Nevertheless all of them are similar and have a mild, sweet flavor. Swiss cheese may be readily recognized by its pale yellow color and the presence of large holes, although it resembles Gruyere cheese very closely.

EMMENTHAL CHEESE is a variety of fairly hard cheese that originated in Switzerland, but is now made in many other countries. It is similar to Swiss cheese, being made from whole cow's milk and characterized by large holes about 3 inches apart.

SAPSAGO CHEESE, shown at _n_, Fig. 4, is a skim-milk cheese made in Switzerland. It is a very hard cheese, and therefore suitable for grating. In the process of making this cheese, melilot, a clover-like herb, is added, and this gives the cheese a green color and a peculiar flavor.

32. BELGIAN CHEESE.--A cheese that originated in Belgium, but is now manufactured in other countries, is the variety known as LIMBURG, or LIMBURGER, CHEESE, cheese, which is shown at _l_, Fig. 4. It is a soft rennet cheese made from whole cow's milk. It is very strong in taste and smell, due to putrefactive germs that are added to the milk in its manufacture.

DOMESTIC CHEESE

33. In the United States, efforts that have been exerted to make cheeses similar to some of those produced in Europe have to a certain extent been successful. American cheese makers have succeeded in making several soft cream cheeses that resemble Neufchatel, some of which are spiced or flavored with pimiento, olives, etc. In addition, Limburg and Swiss cheeses have been successfully manufactured in Wisconsin, and Brie, Neufchatel, and Camembert have been copied and are produced in New York. Pineapple cheese, while of American origin, is really very much like English Cheddar cheese, except that it is harder. But while these fancy cheeses are desired by some persons and have a moderately large sale, the cheese for which there is the most demand in America is the so-called American Cheddar cheese, which, as has been stated, is made according to the method used for English Cheddar cheese.

34. AMERICAN CHEDDAR CHEESE.--Since American Cheddar cheese is the kind that is commonly used in this country, the way in which it is made will be well to know. The milk used for this kind of cheese is first inspected as to cleanliness and the extent of fermentation it has undergone, and when these points are ascertained, it is _ripened_; that is, allowed to sour to a certain degree of acidity. At this stage, coloring matter is added, after which the milk is prepared for setting by bringing it to a certain temperature. With the temperature at the right point, rennet is added to coagulate the milk, or form the curd. The milk is then allowed to remain undisturbed until the action of the rennet is at a certain point, when the curd is cut into little cube-shaped pieces by drawing two sets of knives through it and thus is separated from the whey. As soon as the curd is cut, the temperature of the mass is raised to help make the curd firm and to cause the little cubes to retain their firmness, and during the entire heating process the whole mass is stirred constantly to assist in the separation from the whey. When the curd is sufficiently firm, the whey is removed and the particles of curd are allowed to adhere and form into a solid mass. If necessary, the curd is cut again into small pieces to get rid of the excess whey; but if the curd is too dry, the pieces must be piled up until they are four or five deep. During this process, which is known as the _cheddaring_ of the cheese, the curd is treated until it is of the proper texture to be _milled_, that is, put into a mill and ground into small pieces. The object of milling the curd is to cut it into pieces small enough to permit of uniform salting and the further escape of whey. When the curd has been brought to this point, it is salted and then pressed into molds. Finally, it is wrapped and cured, or ripened.

35. BRICK CHEESE.--Another American cheese that seems to meet with a popular demand is brick cheese. This kind of cheese, which is illustrated at _c_, Fig. 4, gets its name from the fact that it is pressed into "bricks" under the weight of one or two bricks. It is made from sweet milk, coagulated with rennet, cut with curd knives, and heated in the whey to firm it. Brick cheese is mild in flavor and of a moderately close texture. It is used chiefly as an accompaniment to other foods.

36. AMERICAN HOME-MADE CHEESE.--The making of Cheddar cheese and brick cheese is, of course, done commercially, but there is a kind of cheese that can be made very conveniently in the home. This home-made cheese, which is generally known as COTTAGE CHEESE, affords an excellent way in which to utilize left-over sour milk, particularly if a quart or more can be obtained at one time; smaller quantities can generally be used for baking purposes.

If properly made, such cheese is very digestible. As it can be seasoned and served in a variety of ways, it makes a delightful addition to lunches or other light meals in which a protein dish, such as meat, is undesirable. Skim milk does very well for this kind of cheese, so that if the sour milk that is to be used has cream on it, the cream should be removed before the cheese is made; otherwise, it will remain in the whey and be lost. In case cream is desired to improve the texture and flavor of the cheese, it should be added after the cheese is made.

[Illustration: FIG. 5]

37. To make cottage cheese, allow a quantity of sour milk to clabber, that is, become curdled, and then place it on the back of the stove in a thick vessel, such as a crock, until the whey begins to appear on the top, turning it occasionally so that it will heat very slowly and evenly. Do not allow the temperature to rise above 90 degrees Fahrenheit, or the curd will become tough and dry. Remember that the two things on which the success of this product depends are the flavor of the milk used and the proper heating of it. No difficulty will be encountered in the heating of the milk if a coal or a wood stove is used, but in case a gas stove must be used, the vessel containing the milk should be placed in a larger one containing warm water and the milk should be heated in this manner until the curd and the whey begin to separate. At this point, pour off all the whey possible, and turn the curd into a cloth bag or a colander lined with cloth, as shown in Fig. 5, and allow any remaining whey to drip out. If, after the whey is removed, the curd tastes sour, wash it with warm water and allow it to drip again. Then season it with salt to suit the taste and, provided cream is desired, add it at this time, using sweet or sour cream. To work in the cream, press it into the curd with a spoon until the cheese is quite smooth.

Cheese made in this way may be flavored with anything desirable. For instance, chopped pimiento, parsley, olives, or nuts improve the flavor of the cheese very much and make a very appetizing combination. The dry curd mixed with any of these makes a delightful salad when it is pressed into balls, garnished with lettuce, and served with salad dressing.

38. JUNKET COTTAGE CHEESE.--Another variety of cottage cheese can be prepared by using sweet milk and forming the curd with a junket tablet, one tablet being required for each quart of milk. To make cheese of this kind, heat the milk until it is lukewarm, or not over 98 degrees Fahrenheit, and then add the junket tablet dissolved in cold milk or water. Keep the milk warm until the curd forms, and then break up the curd with a spoon and pour the whole mass into a bag or a colander lined with cloth. When all the whey is drained out, the curd, which will be sweet, can be seasoned in any desired way or mixed with cream and served. If more flavor is preferred, the curd may be allowed to sour or may be mixed with sour cream.

39. BUTTERMILK CREAM CHEESE.--A slight variation from the cottage cheeses just described is buttermilk cream cheese. This cheese is formed from the curd of buttermilk, which is finer in texture and not so likely to become tough as that formed from ordinary sour milk. To prepare buttermilk cream cheese, warm the buttermilk slowly, being careful not to allow the temperature to rise beyond 100 degrees Fahrenheit. As the milk is heated, the curd will form and will gradually sink to the bottom of the vessel. After this occurs, remove the whey and mix the curd with

a little thick cream. The result will be a mixture having a delightfully creamy consistency.

SERVING CHEESE

40. Cheese does not lend itself readily to many ways of serving, still it frequently adds zest to many foods. When grated, it may be passed with tomato or vegetable soup and sprinkled in to impart an unusual flavor. In this form it may also be served with macaroni and other Italian pastes, provided cheese has not been included in the preparation of such foods. When sliced, little slices may be served nicely with any kind of pie or pastry and with some puddings, such as steamed fruit puddings. Thin slices or squares of cheese and crackers served with coffee after the dessert add a finishing touch to many meals. It will be well to note that crackers to be served with cheese should always be crisp. Unless they have just been taken from a fresh package, crackers can be improved by placing them in a moderate oven for a few minutes before serving. Also, firm crackers that do not crumble easily are best to serve with cheese, water crackers being especially desirable.

* * * * *

RECIPES FOR CHEESE DISHES

EFFECT OF COOKING ON CHEESE

41. Because cheese is a highly concentrated food, it is generally considered to be indigestible; but this matter can be remedied by mixing the cheese with other foods and thus separating it into small particles that are more readily digested. The way in which this may be done depends on the nature of the cheese. Any of the dry cheeses or any of the moist cheeses that have become dry may be grated or broken into bits, but as it is difficult to treat the moist ones in this way, they must be brought to a liquid state by means of heat before they can be added to other foods. The cooking of cheese, however, has an effect on this food that should be thoroughly understood.

It will be well to note, therefore, that the application of heat to the form of protein found in cheese causes this food substance to coagulate and harden, as in the case of the albumen of eggs. In the process of coagulation, the first effect is the melting of the cheese, and when it has been brought to this semiliquid state it can be easily combined with other foods, such as milk, eggs, soups, and sauces. In forming such combinations, the addition of a small amount of bicarbonate of soda helps to blend the foods. Another characteristic of cheese that influences the cooking of it is that the fat it contains melts only at a low temperature, so that, on the whole, the methods of preparation that require a low temperature are the best for cooking these foods. However, a precaution that should be taken whenever cheese is heated is not to cook it too long, for long cooking makes it hard and leathery in consistency, and cheese in this state is difficult to digest.

VARIETY OF CHEESE DISHES

42. As has already been learned, cheese lends itself very readily to a large variety of cooked dishes. For instance, it may be grated and sprinkled on the top of mashed or creamed potatoes and then browned by

placing the dish in the oven. When it is grated or sliced, it may be arranged between the layers of macaroni or other food used to make a scalloped dish. Soups and sauces flavored with cheese are especially appetizing, a cream sauce of this kind served over toast or rice making an excellent luncheon dish. Toast or crackers spread with cheese and placed in the oven just long enough for the cheese to melt are delicious to serve with a salad course or with tea. To assist in the preparation of such combinations, as well as other cheese dishes, a number of recipes are here given. In making up these recipes, it will be well to note that unless the variety of cheese is stated explicitly, use should be made of American Cheddar cheese, or, as it is often called, _American cream cheese_, or _store cheese_. Of course, some similar hard cheese could be used if desired, but the kind mentioned is recommended for the sake of economy.

[Illustration: FIG. 6]

43. CHEESE BONBONS.--A combination of cheese and nuts in the form of cheese bonbons, besides being very tasty, is highly nutritious, since both the cheese and the nuts used in making them are high in food value. Such bonbons, which are illustrated in Fig. 6, may be served with a light salad, such as a vegetable or a fruit salad, to add food value to the dish, or they may be served with wafers to take the place of a salad, when a small amount of some kind of tart jelly goes nicely with them. If the dessert for the dinner has been a very light one, these bonbons may be served with coffee and wafers after the dessert. They may be made as follows:

CHEESE BONBONS
(Sufficient for Twelve Bonbons)

1 pkg. Neufchatel or cream cheese
2 Tb. finely chopped pimiento
1/2 tsp. salt
Few grains of paprika
1/3 c. half English-walnut meats

Work the cheese smooth with the pimiento and other seasoning, and if the mixture is too dry add a little cream. Shape this into small balls, press each ball flat, and then place a half nut on top of each. If the pimiento is not desired, it may be omitted.

44. CHEESE SOUFFLE.--As a dish that will take the place of meat in a light meal is often desired, cheese souffle, which is comparatively high in food value, finds much favor. This dish contains milk, eggs, and cheese, as is shown in the accompanying recipe, and so may actually be considered as a protein dish and used accordingly. Souffle is served in the dish in which it is baked, but if it is quite firm and is to be eaten at once, it may be removed from the ramekin to a plate.

CHEESE SOUFFLE
(Sufficient to Serve Six)

3 Tb. butter
4 Tb. flour
1-1/4 c. milk
3/4 c. grated cheese
Dash of paprika
1/2 tsp. salt

3 eggs

Melt the butter, add the flour, mix well, and then gradually add the milk, which should be scalded. To this sauce add the cheese, paprika, and salt. When thoroughly mixed, remove from the fire and add the beaten yolks of eggs, beating rapidly. Cool and fold in the stiffly beaten whites of the eggs. Pour into a buttered baking dish or in ramekins and bake 20 minutes in a slow oven. Serve at once.

45. CHEESE OMELET.--Grated cheese added to an omelet gives it a delightful flavor. Since such an omelet is a high-protein dish, it should never be served in the same meal in which meat, fish, or other protein foods are served, but should be used as the main dish of a luncheon or a light supper.

CHEESE OMELET
(Sufficient to Serve Four)

4 eggs
4 Tb. hot water
1/2 tsp. salt
2 Tb. bread crumbs
1 c. grated cheese
1 Tb. butter

Beat the egg yolks thoroughly and add to them the hot water, salt, crumbs, and cheese. Beat the egg whites until stiff, but not dry, and fold them carefully into the yolk mixture. Heat the butter in an omelet pan. Pour in the mixture, brown very slowly over the heat, and then place in the oven to cook the top. Serve at once.

46. CHEESE SAUCE.--To give a distinctive flavor to white sauce, cheese is often added to it. A sauce flavored in this way lends itself nicely to the garnishing of croquettes or souffles, and it will be found quite tasty if it is served over some vegetables, such as steamed cauliflower, mashed potatoes, or rice served as a vegetable. Such sauce may also be served over toast to make an attractive luncheon dish.

CHEESE SAUCE
(Sufficient to Serve Six)

2 c. milk
4 Tb. flour
4 Tb. butter
1/2 tsp. salt
1/4 tsp. paprika
1/2 c. grated cheese

Make a white sauce of the milk, flour, butter, salt, and paprika, and to it add the grated cheese. If desired, a dash of catsup or chili sauce may be added for flavoring.

47. CHEESE TOAST.--When toast has added to it eggs, milk, and cheese, as in the recipe here given, it is sufficiently high in protein to serve as a meat substitute and is a particularly good dish for a light meal. It combines well with a vegetable salad for luncheon and is an excellent dish to serve for Sunday night supper, when very little else need be served with it.

CHEESE TOAST
(Sufficient to Serve Six)

2 c. milk
4 Tb. flour
4 Tb. butter
1/2 tsp. salt
3/4 c. grated cheese
2 hard-cooked eggs
6 squares of toast

Make a white sauce of the milk, flour, butter, and salt, and to it add 1/2 cupful of the grated cheese and the egg whites chopped fine. Arrange the toast on a platter, pour the sauce over it, sprinkle the top with the egg yolks that have been run through a ricer or a sieve, and sprinkle the remaining 1/4 cupful of cheese over all. Place in hot oven or under a broiler until the cheese melts a little. Serve hot.

[Illustration: FIG. 7]

48. WELSH RAREBIT.--Whenever a dish that can be made in a chafing dish is desired, Welsh rarebit is immediately thought of. This is possibly due to the fact that this tasty cheese dish is very often served at evening parties, when a crowd may gather around a table and enjoy the preparation of this food in the chafing dish. This kind of cooking utensil, together with its outfit, which consists of a long-handled spoon and fork, is shown in Fig. 7. As will be observed, a chafing dish consists of a frame to which is attached a lamp that provides the heat, a pan in which water is placed, another pan with a handle in which the food is cooked, and a cover. The heat for cooking is furnished by alcohol, although it is possible to get chafing dishes that are heated by electricity. Chafing dishes are used by many housewives, for in addition to the use mentioned, they serve very well for the making of practically any kind of creamed dish, including those in which sea foods and vegetables are used, as well as for the sauteing of foods. It should not be understood, however, that Welsh rarebit must be made in a chafing dish, for this food can be prepared as well in a heavy frying pan or a double boiler; nor should it be taken for granted that it is served only at parties, for it may be served as the main dish for luncheon or supper. Rarebit is often flavored with ale or beer, but this is not required to make an appetizing dish, as the following recipe shows.

WELSH RAREBIT
(Sufficient to Serve Six)

2 Tb. butter
1 Tb. flour
1 c. milk
1/4 tsp. salt
1/8 tsp. paprika
1/2 lb. cheese cut into small pieces
6 slices of toast or 6 wafers

Melt the butter, add to it the flour, and stir until smooth. Gradually add the milk, and cook for a few minutes; then add the salt, paprika, and cheese, stirring until the cheese is melted. The finished rarebit should not be stringy. Pour over the toast or wafers and serve.

49. ENGLISH MONKEY.--Another cheese dish that is frequently made in a

chafing dish and served from it is English monkey, but this may likewise be made with ordinary kitchen utensils and served directly on plates from the kitchen or from a bowl on the table. A dish of this kind is most satisfactory if it is served as soon as the sauce is poured over toast or wafers and before they have had time to become soaked. English monkey may be made according to the following recipe and served for the same purposes as Welsh rarebit.

ENGLISH MONKEY
(Sufficient to Serve Six)

1 c. bread crumbs
1 c. milk
1 Tb. butter
1/2 c. soft cheese cut into small pieces
1 egg
1/2 tsp. salt
6 buttered wafers

Soak the bread crumbs in the milk. Melt the butter and add to it the cheese, stirring until the cheese is melted. Then add the soaked crumbs, the slightly beaten egg, and the salt. Cook for a few minutes and pour over wafers and serve. If desired, toast may be used in place of the wafers.

50. CHEESE-AND-MACARONI LOAF.--Macaroni combined with cheese makes a high-protein dish that very readily takes the place of meat and that may be served as the main dish in a dinner. If this combination is made into a loaf and baked well in an oblong bread pan, it may be turned out on a platter and cut into slices. In case a loaf is not desired, it may be baked in a baking dish and served directly from that. In either form, it is made more appetizing by the addition of a tomato sauce.

CHEESE-AND-MACARONI LOAF
(Sufficient to Serve Eight)

1/2 c. macaroni (inch lengths)
1 c. milk
1 c. bread crumbs
2 Tb. chopped green peppers
1 Tb. chopped onion
1 Tb. chopped parsley
2 eggs
2 tsp. salt
1/8 tsp. pepper
1 c. grated cheese
1 Tb. butter

Cook the macaroni according to the directions given in _Cereals_. When it is thoroughly soft, drain off the water and mix the macaroni with the milk, bread crumbs, green pepper, onion, parsley, well-beaten egg, salt, pepper, and grated cheese. Place in a baking dish, dot the top with butter, and bake in a moderate oven until the mixture is set. Serve with or without sauce, as desired.

51. CHEESE FONDUE.--A dish that is very similar to cheese souffle and that must be served as soon as it comes from the oven in order to avoid shrinking is cheese fondue. It satisfactorily takes the place of meat in a light meal, and may be served from a large dish or from individual

baking dishes with or without sauce, as desired.

CHEESE FONDUE
(Sufficient to Serve Six)

1 1/2 c. soft bread crumbs
1 1/2 c. grated cheese
1 c. hot milk
4 eggs
1/2 tsp. salt

Mix the bread crumbs and cheese, and add them to the hot milk, beaten egg yolks, and salt. Fold in the stiffly beaten egg whites. Bake in a buttered baking dish for about 30 minutes in a moderate oven. Serve at once.

52. CHEESE DREAMS.--If something delicious to serve with fruit or salad is desired for luncheon or Sunday night supper, the accompanying recipe for cheese dreams should be tried. They should be served at once on being taken from the stove, because as soon as they cool the cheese hardens and they are not appetizing. Cheese dreams may be sauted or prepared in a broiler or an oven, but if they are sauted, they may be made in a chafing dish.

CHEESE DREAMS
(Sufficient to Serve Six)

12 thinly cut slices of bread
Butter
Cheese sliced 1/8 in. thick

Spread the bread thinly with butter and make sandwiches by placing a slice of cheese between two slices of bread. Place these sandwiches under a broiler or in a very hot oven and toast them on both sides, or omit the butter from the center, place the sandwiches in a slightly oiled frying pan, and brown them on both sides. In heating the sandwiches, the cheese melts. Serve hot.

53. CHEESE WAFERS.--If made daintily, cheese wafers may be served with salad or with tea for afternoon tea. The wafers selected for this purpose should be small and the layer of cheese not very thick. If a very thin broth is served at the beginning of a meal, cheese wafers may accompany it, but they should never be served with a heavy soup.

CHEESE WAFERS
(Sufficient to Serve Six)

1 doz. wafers
Butter
3/4 grated cheese
Paprika

Spread the wafers thinly with butter and sprinkle each with 1 tablespoonful of grated cheese and a pinch of paprika. Bake in a hot oven until the cheese is melted. Cool and serve.

[Illustration: FIG. 8]

54. CHEESE STRAWS.--Nothing can be more delightful to serve with a

vegetable salad than cheese straws, which are illustrated in Fig. 8. An attractive way to serve them is to slip them through small rings made out of strips of the dough mixture and baked at the same time the straws are baked and then place them at the side of the salad plate. They may accompany a fruit salad, as well as a vegetable salad, but they are not appropriate for serving with a meat or a fish salad.

CHEESE STRAWS
(Sufficient to Serve Six)

1 Tb. butter
2/3 c. flour
1 c. bread crumbs
1 c. grated or cut cheese
1/2 tsp. salt
1/4 tsp. pepper
Pinch of Cayenne pepper
1/2 c. milk

Cream the butter and to it add the flour, bread crumbs, cheese, and seasonings. Mix thoroughly and add the milk. Roll 1/4 inch thick and then cut 1/4 inch wide and 6 inches long. Bake until brown in a moderately hot oven.

55. TOMATOES WITH CHEESE STUFFING.--The addition of cheese to the stuffing used in stuffed tomatoes means added flavor, as well as nutritive value in the form of protein, the food substance in which the tomatoes themselves are lacking. The bread crumbs used for the stuffing supply a large amount of carbohydrate, so that the completed dish, besides being a very attractive one, contains all the food principles in fairly large quantities. Stuffed tomatoes may be served as the main dish in a light meal or as a vegetable dish in a heavy meal.

TOMATOES WITH CHEESE STUFFING
(Sufficient to Serve Six)

6 tomatoes
1 c. bread crumbs
1 c. grated cheese
1/2 tsp. salt
1/8 tsp. pepper
2 Tb. butter
1/4 c. hot water

Select medium-sized tomatoes and hollow out the centers. Mix the crumbs, cheese, salt, pepper, butter, and hot water with the pulp from the centers of the tomatoes. Fill the tomatoes with this stuffing, place in a pan, and bake in a moderate oven until the tomato can be pierced easily with a fork. Serve hot.

56. FIGS STUFFED WITH CHEESE.--As cheese is a very concentrated food, it is often combined with another food to offset this effect. An excellent combination is formed by stuffing figs with cheese. Figs prepared in this way will be found to be very attractive and tasty and may be served in the place of a dessert or a salad, depending on the kind and size of the meal with which they are used.

FIGS STUFFED WITH CHEESE
(Sufficient to Serve Eight)

1 pkg. Neufchatel or cream cheese
2 Tb. cream
8 small pulled figs

Work the cheese and cream until soft. Steam the figs for 10 or 15 minutes or until they are soft; then cool them, cut out their stems, fill their centers with the soft cheese, and serve.

57. CHEESE SANDWICHES.--Very appetizing sandwiches that may be used to take the place of meat sandwiches or a protein dish at any time are made with a cheese filling. If these are made very small and dainty, they may be served with salad in a light meal. The addition of pickles, olives, and pimiento, which are included in the accompanying recipe, makes the filling more attractive than the usual plain cheese by producing in it a variety of tastes. They also add bulk, which is lacking in both the white bread and the cheese. If desired, graham or whole-wheat bread may be used in place of white bread.

CHEESE SANDWICHES
(Sufficient to Serve Six)

1/4 lb. cheese
2 medium-sized pickles
1/2 pimiento
Meat from 1/2 doz. olives
1/4 tsp. salt
1/4 tsp. paprika
Bread

Put the cheese, pickles, pimiento, and olives through a food chopper, and when chopped add the salt and the paprika. If the mixture is not moist enough to spread, add salad dressing or vinegar until it is of the right consistency. Mix well and spread on thinly cut, buttered slices of bread.

LUNCHEON MENU

58. Many of the dishes for which recipes are given in this Section, particularly those including cheese as one of the ingredients, do very well for the main dish in a light meal, such as luncheon. In order that practice may be had in preparing a well-balanced luncheon that includes a dish of this kind, a luncheon menu is here presented. The cheese souffle, which has been selected as the main dish in this menu, should be made according to the directions already given. Little difficulty will be experienced in making the other dishes, as recipes for them are given immediately after the menu. All the recipes are intended for six persons, so that if more or fewer are to be served, the recipes should be changed accordingly. This menu is presented with the intention that it be tried by each student and a report of it then prepared according to the plan outlined and sent with the work of the Examination Questions.

MENU

Cream-of-Corn Soup
Cheese Souffle
Stewed Tomatoes

Sauted Potatoes
Brown Bread and Butter
Baked Apples
Black Tea

RECIPES

CREAM-OF-CORN SOUP

1 Tb. flour
1 Tb. butter
1 pt. milk
1 c. canned corn
1 tsp. salt
1/8 tsp. pepper

Make a white sauce of the flour, butter, and milk. Force the corn through a colander or sieve and add the puree to the white sauce. Season with the salt and pepper and serve.

SAUTED POTATOES

6 medium-sized cooked potatoes
2 Tb. butter
1-1/2 tsp.
salt 1/4 tsp.
pepper

Slice the boiled potatoes thin and put the slices in a frying pan in which the butter has been melted. Add the salt and pepper. Allow the potatoes to cook until well browned, turning frequently during the cooking. Serve hot.

STEWED TOMATOES

1 Tb. butter
1 small onion
6 medium-sized ripe tomatoes or 1 can of tomatoes
1 tsp. salt
2 Tb. sugar
1/4 tsp. pepper
1 Tb. flour

Brown the butter in a saucepan, slice the onion into it, and cook for a few minutes. Add the tomatoes. If fresh tomatoes are to be used, remove the skins, cut into pieces, put into the saucepan with a few tablespoonfuls of water, and cook until the tomatoes are thoroughly softened. If canned tomatoes are to be used, merely allow them to come to the boiling point. Add the salt, sugar, and pepper, and, a few minutes before removing from the fire, moisten the flour with a tablespoonful of cold water and stir into the tomato. Cook for a few minutes and serve.

BAKED APPLES

6 medium-sized apples
1 lemon
3/4 c. sugar

1/2 c. water

Wipe and core the apples. Put them into a baking dish and place a slice of lemon on the top of each. Make a sirup of the sugar and the water, pour this around the apples, and bake slowly until they can be pierced easily with a fork. Serve hot or cold, with a teaspoonful of jelly on the top of each apple.

BLACK TEA

6 tsp. black tea
6 c. boiling water

Scald out the pot with freshly boiling water, pour in the tea, add the 6 cupfuls of freshly boiling water, and allow it to stand on the leaves until the tea is strong enough to serve. Then either pour the tea off the leaves and keep it hot or serve at once.

MILK, BUTTER, AND CHEESE (PART 2)

EXAMINATION QUESTIONS

(1) From what part of milk is butter made?

(2) What food substances does butter contain?

(3) Tell how to select good butter.

(4) After butter is purchased, what care should be given to it?

(5) (_a_) How does cooking affect butter? (_b_) How can economy be exercised in the use of butter in cooking?

(6) How may rancid butter be made fit for use in cooking?

(7) Explain the advantages of butter substitutes.

(8) Give the test for distinguishing oleomargarine and renovated butter from butter.

(9) Explain briefly the way in which cheese is produced.

(10) What food substances are found in cheese?

(11) Why can cheese be used to take the place of meat?

(12) Tell the advantages that cheese has over meat.

(13) Explain how to make cottage cheese from sour milk.

(14) Why should cheese be mixed with other foods instead of being served alone?

(15) Explain the effect of cooking on cheese.

REPORT ON MENU

After trying out the luncheon menu given in the text, send with your answers to the Examination Questions a report of your success. In making out your report, simply write the name of the food and describe its condition by means of the terms specified in the following list:

Cream-of-Corn Soup: too thick? too thin? lumpy? well seasoned? milk curdled?

Cheese Souffle: light? heavy? baked sufficiently? shrunken? underdone?

Hash-Browned Potatoes: too brown? not brown enough? well seasoned? too much fat? too little fat?

Stewed Tomatoes: sufficiently cooked? well seasoned? too sour?

Baked Apples: well done? not well done? too brown? too dry? too moist? sufficient sugar?

Black Tea: too weak? too strong? hot? taste of tannin?

* * * * *

EGGS

* * * * *

VALUE OF EGGS AS FOOD

DESCRIPTION OF EGGS AND PLACE IN THE DIET

1. Eggs are of great importance in the diet, and to appreciate this fact fully the true nature of this food must be understood. For domestic use, the eggs of guinea hens, turkeys, ducks, and geese occasionally find favor, but as eggs laid by hens are the kind that is commonly used, it is to such eggs that this Section is devoted. A hen's egg may really be considered as an undeveloped chicken, because it contains all the elements required to build the body of the chick and provide it with the energy it needs to pick its way into the world. When it emerges from the shell, it is fully developed, and in a short time it begins an independent existence, seeking and finding its own food. The fact that eggs store so much nutritive material explains to some extent why they are a valuable source of food for man and why they are used so extensively. However, as in the case of milk, the elements that eggs contain are not in just the right proportion for the sole nourishment of a human being, so they must generally be used in combination with other foods.

2. Most persons are familiar with the appearance of eggs, but in order that satisfactory results may be obtained in their selection, care, and cooking, it will be necessary to look into the details of their composition. As is well known, an egg consists of a porous shell lined with a fine, but tough, membrane that encloses the white and the yolk and serves to protect them. The yolk is divided from the white by a delicate membrane, which permits it to be separated from the white when an egg is carefully broken. This membrane extends to each end of the shell in the form of a small cord, and it is so fastened to the shell as to hold the yolk evenly suspended. The porous nature of an egg shell is

required to give air to the developing chick, but it is this characteristic that permits eggs to spoil as they grow old and are exposed to air, for through these minute pores, or openings, the water in the egg evaporates and air and bacteria enter. Of course, as the water evaporates and is replaced by air, the egg becomes lighter. Because of this fact, the freshness of eggs can be determined by placing them in water. When they are fresh, they will sink in cold water, but as they decompose they become lighter and will float.

Since it is known that the spoiling of eggs is due to the entrance of air through the porous shell, it may be inferred that their decay may be prevented either by protecting the shell so that air cannot enter or by keeping the eggs at so low a temperature that bacteria cannot grow. Although stored eggs always deteriorate more or less, both of these methods of preservation have proved very satisfactory, the former being used largely in the home and the latter finding its solution in cold storage. A knowledge of how eggs can be preserved, however, is of great value, for if there were no means of preservation and eventual marketing, the price of eggs would at times rise to actual prohibitive limits.

3. That eggs as an article of food are growing in importance is indicated by the fact that their production has come to be a large and widely distributed industry. Owing to the private consumption and sale of eggs, an accurate statement of the number of eggs produced is difficult to give. Still, in a report, the United States Bureau of Agriculture estimated the value of the yearly egg production at something more than three million dollars, with an allowance of about 210 eggs, or 17-1/2 dozen, per capita each year, or 4 eggs a week for each person. These figures, however, are only suggestive of the production, use, and value of eggs, for as the population increases so does the use of eggs. In fact, they are proving to be almost indispensable to the cook, the baker, the manufacturers of certain foods, and many others.

4. With the increase in the demand for eggs has come a corresponding steady advance in the money value of this product and, consequently, an increase in its price. The housewife who would practice economy in cookery can readily see, therefore, that with reference to the number of eggs required and the ways in which they are used, she must choose carefully the recipes and methods she employs. If the eggs are always considered a part of a meal, their use is seldom an extravagance, even at such high prices as they sometimes attain. On the other hand, if a dessert that requires the use of many eggs is added to a meal that is itself sufficient in food value, it is not unreasonable to regard such use of eggs as an extravagance. A point that should be taken into consideration in the use of eggs in the diet, especially when their price seems very high, is that there is no waste matter in them, unless the shell is regarded as waste. Therefore, they are often more economical than other foods that can be bought for less money.

It must not be understood, however, that eggs are used only as an article of diet. They are also a very important food ingredient, being employed in the preparation of many kinds of dishes. For instance, they are often used to thicken custards, sauces, etc.; to clarify soups and jellies; to lighten cakes, puddings, hot breads, and other baked mixtures; to form the basis for salad dressings; and to combine or hold together many varieties of food.

NUTRITIVE VALUE OF EGGS

5. Like milk, eggs are often spoken of as a perfect food. Still, as has been pointed out, they are not a perfect food for man, but they are of especial nutritive value and should be used freely in the diet just as long as their cost neither limits nor prohibits their use. An idea of how they compare with other nutritious foods can be obtained from Fig. 1, which shows that eight eggs are equal in food value to 1 quart of milk or 1 pound and 5 ounces of beefsteak. A better understanding of their food value, however, can be gained from a study of their composition.

[Illustration: FIG. 1]

6. Since an egg is an undeveloped chick that requires only the addition of warmth to develop it into a living, moving creature made of muscles, bones, and blood, it is evident that this food contains considerable tissue-building and energy-producing material. The exact proportion of this material, as well as the other substances found in eggs, is given in the food chart shown in _Essentials of Cookery_, Part 1. The chart relating to the composition of eggs points out that the edible portion of the whole egg consists of 73.7 per cent. of water, 14.8 per cent. of protein, 10.5 per cent. of fat, and about 1 per cent. of ash, or mineral matter. The protein, which is chiefly in the form of albumen, and the fat are the most digestible of these elements, while the mineral constituents are as valuable for the growing child as for the chick. When the total weight of an egg is taken into consideration, the shell constitutes about 11 per cent., the yolk 32 per cent., and the white 57 per cent. The composition of the yolk and the white differs somewhat, the yolk having the greater food value, a fact that is also clearly indicated in the chart. The white contains a larger proportion of water than the yolk, but the yolk contains the most of the fat and more protein and mineral matter, or ash, than the white. In addition, the chart shows that the number of calories to the pound of whole egg is 700, of egg yolk is 1,608, and of egg white is 265.

7. PROTEIN IN EGGS.--The nature of the food substances in eggs is of nearly as great importance as their amount, for they not only determine the value of this food in the body, but influence its cooking. That protein is present in both the yolk and the white is apparent from the fact that they coagulate when heat is applied. Because eggs are high in protein, containing 14.8 per cent. of this substance, they may be regarded as equivalent to a meat dish, and it is only when they are extremely high in price that they cannot be frequently substituted for meat to advantage. They are often used to take the place of milk, too, for eggs and milk are more alike in nutritive value than any other two protein foods; but, of the two, milk yields the cheaper form of protein. Like meat and milk, eggs are rich in all those food materials which enter into the construction of bone, muscle, and blood.

8. FAT IN EGGS.--A study of the food chart previously mentioned will show that eggs contain proportionately almost as much fat as protein and that nearly all this fat is found in the yolk. Since fat produces more heat or energy, weight for weight, than any other food substance, and since eggs contain neither starch nor sugar, it is evident that the fat of this food is the main source of the energy-producing material. Fat in eggs occurs in the form of an emulsion, or tiny particles, and, like the fat of milk, is very readily digested. It is for this reason that both

of these foods are particularly well adapted to the diet of both children and adults. The presence of quantities of protein and fat and the absence of carbohydrate in eggs indicate that the proper thing to combine with this food, in order to have a well-balanced meal when eggs are eaten, is carbohydrate in some form.

9. MINERALS IN EGGS.--Eggs are especially valuable for the mineral salts they contain, chief among which are lime, phosphorus, sulphur, iron, potassium, and sodium. For this reason, the addition of eggs to any kind of diet supplies a large amount of the minerals that are needed for bone, blood, and tissue building. A favorable point concerning the minerals found in eggs is that they are not affected to any extent by cooking. Therefore, in the preparation of any dish, if eggs are added to other foods, that dish will contain an additional amount of mineral salts, plus the nutritive value of the eggs.

10. DIGESTIBILITY OF EGGS.--In connection with the discussion of the food substances of which eggs are composed, it will be well to note how these affect the digestibility of this food. But just what is meant by this characteristic with reference to eggs must first be understood. In some foods, digestibility may mean the length of time required for them to digest; in others, the completeness of the digestion; and in still others, the ease and comfort with which the process of digestion proceeds. In the case of eggs, digestibility refers to the quantity of this food that is absorbed, that is, actually dissolved and permitted to enter the blood stream. The nutritive value of eggs is not so high as would naturally be supposed, for, although the protein, fat, and mineral salts of an egg make up about one-fourth of its contents, one egg equals in nutritive value only 1/2 cupful of milk, a small potato, or a medium-sized apple. However, when the proportion of the nutritive material that the body retains from this food, or its digestibility, is considered, eggs rank extremely high, it having been determined by experiments that 97 per cent. of the protein and 95 per cent. of the fat are assimilated. A point worthy of note in this connection, though, is that eggs contain no cellulose, such as that found in grains, vegetables, and fruits. Therefore, in order to add the much-needed bulk to the diet, foods that do contain cellulose should be served with eggs.

11. Whether or not the cooking of eggs has any effect on their digestibility is a matter that has also been investigated. The results of the experiments made indicate that cooking makes some difference with the rate of digestion, but very little with its thoroughness. So far as the rapidity of digestion is concerned, there is very little difference between raw eggs and slightly cooked eggs; but hard-cooked eggs, although they may be digested as completely as soft-cooked ones, require longer time for the accomplishment of the process. This is due to the fact that the whites of hard-cooked eggs are so firm in texture that, unless they are finely chopped or thoroughly masticated, the digestive juices are not able to act on them quickly. As a result, portions of them may escape digestion or remain in the digestive tract for some time and decompose. For this reason, hard-cooked eggs are usually excluded from the diet of children and invalids, and even healthy adults should be careful to masticate them thoroughly.

SELECTION OF EGGS

12. On first thought it would seem as if there is very little to guide the housewife in the selection of eggs, it being extremely difficult to

tell from their external appearance whether or not they are fresh or stale. As a rule, she must trust largely to the honesty of the person from whom she buys eggs. Still she need not depend entirely on the dealer's word, for, at least to a certain extent, there are ways in which she may judge the quality of eggs. Because of the great value of eggs as a food and for cooking purposes, it is important that the housewife make use of all available information on this matter and, in addition, become familiar with the trade practices in the egg industry.

13. MARKETING OF EGGS.--As is generally known, hens lay a large number of eggs in the spring of the year, but they do not lay readily in the cold winter months; and not alone are the greatest quantities of eggs produced in April and May, but those laid at this time are of the best quality. Because of this condition and in order that the demand during the time of scarcity may be supplied, it is necessary that a considerable number of eggs be preserved when they are comparatively cheap and abundant. Also, in the preserving of eggs for future use, it is of the greatest importance that they be kept in the best possible condition and manner, so that when they are used, months after they are laid, they may be as good as it is possible to have them.

The advance made in storage and transportation methods in recent years has done much toward making the egg supply uniform all the year around. Not long ago, because of inadequate means of storage and shipping, eggs were sold only a short distance from the place where they were produced. However, with the coming of cold storage and improved methods of shipping, eggs have been changed from a perishable and more or less seasonable food to a staple one. Now it is possible to collect them in large quantities, to keep them for a considerable time before selling them, and to ship them long distances. To safeguard the public, though, authorities have set a time limit for the storage of eggs, the legal time they may be kept being 8 months. By this is meant that eggs placed in the warehouse in May must be released or sold in December; whereas, those stored in June must be released no later than January.

14. Eggs that have been kept too long in storage are characterized by a musty odor and flavor, the breaking of the yolk and its mixing with the white, and a watery condition of the white. Such eggs, of course, cannot be sold legally. Those which may be placed on the market are graded according to their freshness, cleanliness, size, cracks, and color. With the exception of their freshness, these points can be readily told from the appearance of the eggs; but, in order to determine whether an egg is fresh or not, it is generally put through a process known as _candling_, by which the interior condition of the egg can be ascertained.

In the grading of eggs, all those of the best size, color, and condition are sold under a particular trade name and bring a high or a low price, according to the grading. Others that are not so perfect are put in another grade and sell for prices that vary according to the demand. Eggs, of course, differ in appearance and in many cases they are sorted in order to satisfy the demand. For instance, in some localities, eggs having a brown shell sell for the highest price, while in other places, eggs having a white shell are in the greatest demand and bring the highest price. Unsorted eggs are not held in much favor and do not bring so good a price as those which are all one color. Many persons have an idea that the color of the shell of an egg bears some relation to its nutritive value and flavor. However, authorities on foods agree that, other things being alike, the edible portion of white-shelled eggs has essentially the same composition and nutritive value as that of

dark-shelled eggs.

15. QUALITY OF EGGS.--The natural quality of eggs depends largely on the food of the hens and their conditions of living. Because of this fact, the selection, breeding, and care of fowls have developed into a science, particularly since the production of eggs has grown into an industry. When the quality itself is to be determined, all the characteristics of eggs must be taken into consideration; still there is one particular point on which the quality of eggs depends, and that is their freshness. Various agencies, however, are constantly at work to render this quality inferior. Chief among these are the molds and bacteria that pass through the porous shells of eggs that have been improperly cared for or have become contaminated by being allowed to remain in unclean surroundings. Such bacteria are responsible for the unpleasant flavors that are found in bad eggs. Because of their harmful effect, every effort should be made to prevent the entrance of the germs that cause decay, and, as has been stated, the best way in which to accomplish this is to protect the shell. If it is found that bacteria have entered, the eggs will become unfit for use quickly unless their growth is prevented. This may be done by storing the eggs at a temperature that will keep the bacteria dormant, or inert.

16. If the eggs are kept under the proper conditions, they will not actually spoil for a long time; but it is seldom that they are not more or less affected by storage of any kind that covers a period of several months. One change that can always be looked for in such eggs is in the air space at the broad end. When an egg is first laid, this air space is small, but since the water contained in the egg slowly evaporates through the porous shell it increases in size as the egg grows staler. For this reason, the freshness of an egg can often be determined by the size of this air space.

In addition, the purposes for which eggs are used are somewhat affected by their storage. A stale egg, although it may not be actually spoiled to the extent that it cannot be used as food, will not produce such good results in a cooking process as a fresh egg, especially if it is used for leavening. In fact, it is impossible to produce the desired results with eggs that have undergone a certain amount of change, even though their odor and their flavor do not indicate that they are spoiled.

17. JUDGING THE QUALITY OF EGGS IN THE MARKET.--While, as has been mentioned, the housewife must depend considerably on the dealer's word as to the freshness of the eggs she purchases, it will be well for her to be familiar with the trade names of eggs and their meaning. The names used differ, of course, in various localities, but all large distributors grade and name eggs in much the same way. In deciding on the grade to which eggs belong, a certain number of points are given for color, size, freshness, and appearance, and the sum total of these points determines the grade, a special name being given for each grade. For instance, eggs that can be graded 90 are called _extra fancy_; those which receive a grade of 80, _fancy_; those which are graded 70, _strictly fresh_; and those which can be graded only 60, _cooking eggs_. When eggs are put on the market under such names, it can be expected that the quality will correspond to the grade and the price will vary with the grade. Therefore, the trade name and the price are two of the principal ways in which the quality of eggs in the market may be judged.

18. Another way of judging the quality of eggs consists in observing the condition of the surface of the shell. When eggs are freshly laid, the

shell is covered with a substance, called _bloom_, that gives it a feeling much like that of a thin lime coating deposited in a pan after water boils. This coating disappears gradually as the egg is exposed to the air, but as long as it remains, the egg may be considered as fresh and germ-proof. While this way of determining freshness is probably the quickest, it is possible that the quality of some eggs from which the bloom has recently disappeared has not been injured.

19. When eggs are selected in the market, certain points in their appearance should also be noted. If eggs of the best quality are desired, medium-sized ones that are uniform in size and color should be selected. With regard to shape, they should have a comparatively long oval shell, one end of which is blunt and the other, a sharp curve.

[Illustration: FIG. 2: Internal structure of egg.]

[Illustration: FIG. 3: FRESH, 3 WEEKS, 3 MONTHS, OLDER.]

20. JUDGING THE QUALITY OF EGGS IN THE HOME.--After eggs have been received in the home, several simple tests for determining their freshness can be applied in addition to the ones already mentioned. A rather indefinite test, but one that is sometimes applied to determine the freshness of an egg, is to shake it. However, to be able to carry out this test successfully, it is well to understand the interior structure of an egg. Fig. 2 illustrates this clearly. At _a_ is shown the air space previously mentioned; at _b_, the spiral cords that run from the yolk to each end of the egg and hold the yolk in place; at _c_, the yolk; and at _d_, the white. When the water inside the shell evaporates, the yolk and white shrink so much that they can be felt moving from side to side when the egg is shaken. The staler the egg, the more pronounced does the movement become. This method should be applied only immediately before the egg is to be used, as the thin membrane between the yolk and the white and the spiral cords that hold up the yolk are liable to be disturbed by the shaking. If they are broken, the yolk will settle and finally adhere to the shell in case the egg is stored for any length of time after that.

[Illustration: FIG. 4: Testing the egg.]

[Illustration: FIG. 5: four eggs.]

21. If nothing has been done to preserve eggs, the simple test for freshness illustrated in Fig. 3, which consists in placing the eggs in a glass containing water, will be found effective. A perfectly fresh egg will sink when it is put into the water, but if the egg is 3 weeks old the broad end will rise slightly from the bottom of the glass. An egg that is 3 months old will sink into water until only a slight portion of the shell remains exposed; whereas, if the egg is older or stale, it will rise in the water until nearly half of it is exposed. 22. The test known as candling, which is usually applied to eggs before they are put on the market, can also be practiced by the housewife in the home. This method of determining the freshness of eggs consists in placing a piece of cardboard containing a hole a little smaller than an egg between the eye and a light, which may be from a lamp, a gas jet, or an electric light, and holding the egg in front of the light in the manner shown in Fig. 4. The rays of light passing through the egg show the condition of the egg, the size of its air space, and the growth of mold or the spoiling of the egg by any ordinary means.

[Illustration: FIG. 6 (_a_) (_b_)]

In Fig. 5 is shown how an egg at various stages of freshness appears when candled. When an egg is fresh, it will appear as in (_a_); that is, the yolk will be barely distinguishable from the white except as a slightly darker area in the center of the egg, and the entire egg will appear clear and bright and free from spots. In an egg that is a little older, candling will reveal a slightly darker yolk, a cloudy white, and a larger air space, as in (_b_). In a watery egg, or one that is beginning to spoil, various dark spots and blotches usually develop, as view (_c_) indicates. When an egg is rotten, the contents of the shell will look dark in candling and the yolk will appear to be mixed with the white, as in (_d_). 23. If the housewife does not wish to resort to candling, she may determine the condition of an egg by breaking it into a saucer and examining it carefully. If the egg is newly laid, no odor will be detected and the white will be clear, elastic, and rather thick; also, where it joins the yolk it will be almost solid. The yolk of such an egg will have an even yellow color, without lighter or darker spots and, as shown in Fig. 6 (_a_), will stand up well from the surface of the white. Sometimes a small spot of blood may be detected on the yolk of a perfectly fresh egg, but, while this is not pleasant to look at, it does not affect the quality of the egg. When an egg that is not real fresh is broken into a saucer, the yolk will lie flat, as in (_b_). In an egg that is quite stale, the membrane surrounding the yolk is easily destroyed, so that even when such an egg is broken carefully the yolk and the white are likely to run together.

* * * * *

PRESERVATION OF EGGS

CAUSES AND PREVENTION OF DETERIORATION

24. As has been implied in the discussion given thus far, eggs will deteriorate or spoil in a comparatively short time unless something is done to preserve them. In view of the eggs she keeps on hand at home, as well as those she buys, the causes of spoiling and the ways in which to prevent spoiling are matters with which the housewife should be familiar, particularly if she would secure for her family eggs of the best quality at prices that are not beyond her means. The spoiling of eggs is due to decomposition, which is caused by molds or bacteria that result from accidental causes, and, in fertile eggs, to the germination and development of the chick, which is a natural process. The loss of quality resulting from molds and bacteria in the egg is brought about by their growth and by the formation of chemical compounds, which give spoiled eggs their peculiar appearance, taste, and odor. Some of these molds are not injurious to health, while others may give rise to more or less serious illness.

25. Various methods have been devised whereby their rapid deterioration may be prevented, and a knowledge of these is important to those who have occasion to purchase eggs or to keep them over from the season of plenty to the season of scarcity. The method followed to prevent losses due to the development of the embryo consists in the production of infertile eggs--that is, eggs that are non-productive. This is a point that is as well worth remembering in the home production of eggs as it is in professional poultry raising. The method employed to prevent the infection of eggs by molds and bacteria is to keep them clean and dry from the time they are laid until they are finally used.

26. While the preservation of eggs is carried on to a greater extent at present than formerly, the idea is neither new nor original; indeed, it has been practiced for many years by the people of some foreign countries. For instance, in some sections of China, duck eggs are preserved by covering them with a layer of mud, and such eggs are often kept for a year or more before they are eaten. However, eggs stored in this way decompose and their odor and flavor disappear before they are used, so that they must usually be hard boiled before they can be eaten. Egg preservation such as is practiced in the United States is the opposite of this and attempts to prevent not only ripening processes and putrefactive changes but any bacterial or other changes that lessen the original quality. It will be well to note, however, that eggs preserved for any length of time deteriorate to some extent and cannot be expected to be equally as good as fresh eggs.

COMMERCIAL PRESERVATION OF EGGS

27. The usual market method of preserving eggs is by cold storage, an industry that has developed to vast proportions in recent years. The success of this method depends on the fact that germs causing decomposition will not live in a low temperature. While the plan of storing eggs is responsible for their high price at certain times, it is also a means of supplying eggs to many persons who would otherwise not be able to obtain them. The greatest point in favor of this plan, however, is that it makes possible the marketing of quantities of eggs during the winter season of scarcity at a price that, although somewhat high at times, is much more moderate than it would be if it were not possible to store eggs in large quantities.

28. In order that advantage may be taken of favorable climatic conditions, eggs are commonly purchased for storage as early in the year as they are abundant. They are selected with great care, only those which are clean, sound, and fresh being used. These eggs are packed in clean cases, and then placed in warehouses where they are kept at a temperature just above freezing, or one that ranges from 32 to 40 degrees Fahrenheit. In such storage, precaution is usually taken to prevent the eggs from freezing, for while freezing does not necessarily injure them for immediate use it breaks the shell because of the contraction that occurs. While the eggs are in storage, they are also protected as far as possible from air circulation, as this increases evaporation and causes the contents of eggs to shrink. To prevent the yolks from settling to one side, and finally adhering to the shell, the eggs are turned frequently. The usual limits of storage are from 6 to 9 months, but eggs are not generally allowed to remain in storage more than 8 months. When taken out at the end of that time, it will be found that they have deteriorated very little, and while they cannot compete with the better grades of fresh eggs, they are as desirable as most of the eggs that can be purchased in the early fall when eggs are not plentiful.

29. Sometimes eggs are removed from the shells, stored for commercial use in containers of about 50 pounds each, and kept at the freezing point until they are to be used. Eggs in this form, which may be bought with the yolks and whites either mixed or separate, find a ready market in bakeries and restaurants, where large quantities of eggs are continually used. Such eggs remain good for any length of time while they are kept frozen, but they must be used immediately after they are

removed from storage.

30. It is not always necessary to keep eggs at a cold temperature in order to preserve them, for a method that has proved very satisfactory is to reduce them to the form of powder by drying them. In this form, the bulk is greatly reduced, 1 pound of the dry material representing 30 to 40 eggs, and in order to prepare them for use in cooking they must be mixed with water. POWDERED EGGS, or _desiccated eggs_, as they are usually called, can be kept for an indefinite length of time without special care in storage, when they are wholesome and carefully handled. Tests that have been made show that eggs of this kind give fairly good results when used in cookery, but they are used principally by bakers, for they can be obtained more cheaply than fresh eggs, especially when it is difficult to secure eggs in other forms.

HOME PRESERVATION OF EGGS

31. The housewife who desires to run her household on an economical basis will not depend entirely on eggs that are commercially stored, but will take advantage of one of the many methods by which eggs may be successfully kept in the home. By being prudent in this matter, she will be prepared to supply her family with this commodity at times when the market price is high.

As many as twenty household methods have been tried out for the preserving of eggs, but each one is based on the theory that decay is hindered when the shell is covered with some substance that renders it air-tight and prevents evaporation or the entrance of bacteria and mold. Among the methods that have met with the most success are burying eggs in oats, bran, or salt; rubbing them with fat; dipping them in melted paraffin; covering them with varnish or shellac; and putting them down in lime water or in a solution of water glass.

No matter which of these methods is adopted, however, it will be well to note that only eggs laid in April, May, or June should be used for storage purposes, as these are the best ones laid during the year; also, that the eggs should always be packed with the small end down, because the yolk will not settle toward the small end so readily as toward the large end or the side.

32. Of these various ways of preserving eggs in the home, probably the oldest method is that of packing the eggs in oats, bran, or salt. This method is fairly effective, but the eggs preserved by it do not keep so long as eggs preserved by other methods, nor is their quality so good. Preserving eggs by completely covering the shells with fat, vaseline, paraffin, varnish, or other substance that will exclude the air but not impart flavor to the eggs, proves a more satisfactory method so far as the eggs are concerned, but it requires more time and handling. To assist in their preservation, eggs are sometimes immersed in boiling water for 12 to 15 seconds. This process, which causes the white to harden slightly just inside of the shell, keeps the eggs fairly well, but it is rather difficult to accomplish, as the least overcooking renders the egg unfit for use as a raw egg.

As a result of many trials, it has been found that putting eggs down in the various solutions that are used for this purpose is the most effective way of preserving them under home conditions, provided, of course, the solutions in which the eggs are immersed do not flavor the eggs. Therefore, to assist the housewife, detailed directions for using

lime water and water glass for this purpose are here given.

33. PRESERVATION WITH LIMEWATER.--To prepare limewater for the preservation of eggs, dissolve 1 pound or 1 pint of salt and 1 quart of finely slaked lime in 3 gallons of water, stir the solution at frequent intervals for a day or two, and then allow the liquid to settle. Place the eggs in tall stone crocks or kegs with their pointed ends turned down, filling the receptacles to within a few inches of the top. Pour the clear limewater over the eggs so arranged, allowing it to rise an inch or two above the top layer. Then stand the vessel in a cool place where the temperature will not exceed 50 degrees Fahrenheit. Eggs so treated will keep for at least 6 or 8 months. The only objection to this plan is that the eggs preserved by it sometimes acquire a slight lime taste.

34. PRESERVATION WITH WATER GLASS.--Putting eggs down in a solution of water glass is without doubt the most satisfactory method of storing them in the home. So effective does this method prove that the housewife who has a convenient and proper storage room should not fail to take advantage of this way of laying up a supply of eggs.

The commercial form of water glass is usually a mixture of potassium and sodium silicate, which, besides being cheaper than that which is chemically pure, is the kind that is preferred for the purpose of preserving eggs. A good quality of it either in a sirup-like solution or in the form of a powder retails in drug or grocery stores for about 10 cents a pound. To make a solution of the desired strength to preserve eggs satisfactorily, dissolve 1 part of water glass in 7 parts of warm water that has first been boiled to drive off bacteria, mold, spores, etc. One quart of water glass will make sufficient solution to cover about 12 dozen eggs. With the solution thoroughly mixed, it is ready to pour over the eggs.

In selecting eggs for the purpose of storing, be careful to choose only those which are clean, fresh, and perfectly sound, and, if possible, infertile. It is advisable not to wash them before they are put into the preservative, for they will keep better if their bloom is not removed. Place the eggs in receptacles in the manner explained for preserving eggs in limewater, and over them pour the water-glass solution until they are all covered. If the eggs so prepared are stored in a cool place, they will keep as long as those preserved in limewater; besides, there will be no danger of their acquiring any foreign flavor.

* * * * *

COOKING OF EGGS

PRELIMINARY PREPARATION

35. The successful preparation of eggs for their use as a food demands that certain points must be observed by the housewife. For instance, she must see that the eggs she uses are in the right condition; that the shells are properly broken for the most convenient removal of the egg; that the parts of the egg are separated in the right way in case the whites and the yolks are to be used separately; and that the eggs receive the right treatment for the purpose for which they are to be used. Attention to all these points not only will insure the most satisfactory results, but will enable the housewife to supply her family with food that is extremely wholesome and nutritious.

[Illustration: FIG. 7]

36. Exterior Condition of Eggs.--As has been explained, clean eggs are the most desirable, but it is not advisable to wash eggs that are to be kept for even a short time, as washing them removes the natural coating that helps to prevent the entrance of bacteria. However, as it is necessary that the shells be perfectly clean before they are broken or before the eggs are cooked, the eggs may be washed or wiped with a damp cloth immediately before such processes.

37. BREAKING OF EGGS.--In cookery, it is usually desirable to break an egg shell so that the yolk will not run into the white; that is, so that these can be kept separate. While there are several methods of doing this, the housewife should adopt the one that is most convenient for her. A quick method that is often employed consists in striking the shell on the edge of the pan or the bowl into which the contents are to be put. A preferable method, however, is illustrated in Fig. 7. It consists in striking one side of the shell, midway between the ends, a sharp blow with the edge of a knife. The advantage of this method will be evident after a trial or two, for it will be found that the depth of the cut made by the knife can be so gauged that there will be little danger of breaking the yolk. Besides, fragments of the shell are not likely to fall into the bowl or the pan with the contents of the egg.

[Illustration: FIG. 8]

38. SEPARATING OF EGGS.--Frequently recipes require that the yolks and whites of eggs be beaten separately before being added to the other ingredients. When this is the case, care must be exercised in taking the egg from the shell. The method by which this is most easily accomplished is illustrated in Fig. 8. As will be observed, the shell is first broken as nearly as possible into halves and then, while the egg is poured from 1/2 of the shell into the other, the white is dropped into a dish and the yolk is retained in the shell. During this process, the yolk should remain intact in its delicate membrane, for if it becomes mixed with the white the lightness of the white will be injured. To separate the yolk from the white is not difficult when eggs are fresh, but as they become stale the membrane surrounding the yolk grows weak and breaks easily. If the yolk breaks and any of it falls into the white, it must be completely removed before the white is beaten.

39. BEATING OF EGGS.--Sometimes eggs are cooked in the shell and other times they are used alone just as they are removed from the shell, as in the frying and poaching processes; however, when they are to be combined with other ingredients, they are usually beaten. Eggs are beaten for the purpose of mixing the yolk and the white or of incorporating air to act as a leavening agent when the eggs are heated in the cooking process. Various utensils, such as a fork, an egg whip, or an egg beater, may be employed for beating eggs, the one to select depending on the use to which the eggs are to be put. The rotary, or Dover, egg beater, previously described as a labor-saving device and illustrated in Fig. 9 (_a_), should be used to beat either whole eggs or the yolks of eggs when they are to be used in custards, mayonnaise, cakes, puddings, etc., as it will beat them sufficiently light for such purposes. However, for the beating of egg whites, use should be made of a fork or of an egg whip similar to that shown in (_b_), because the whites must be lifted instead of stirred for the incorporation of air, and it is only with a utensil of this kind that this can be

accomplished. Then, too, more air can be incorporated into the whites and the volume of the egg thereby increased by means of a fork or an egg whip than by an egg beater. An important point to remember in this connection is that eggs can be beaten more successfully when they are cold and have had a pinch of salt added to them.

[Illustration: FIG. 9]

[Illustration: FIG. 10]

40. In the beating of eggs, it should be remembered that for some purposes, as in making some kinds of sponge cake, they are beaten until nearly frothy, as shown in Fig. 10, when they do not stand up nor cling to the whip; whereas, for other purposes, as in making meringue, they are beaten until they are stiff enough to stand up well and to adhere to the whip, as Fig. 11 shows. When egg whites are to be beaten stiff, care should be taken not to continue the beating too long. If this is done, they will become dry and will break up into small pieces, a condition that will mean a loss of some of the air that has been incorporated. It is well also to observe that egg whites should always be beaten in the same direction and that the same motion should be continued throughout the beating, for a change of direction or motion always causes a loss of air. A final precaution to take is never to allow egg whites to stand after they are beaten. If this is done, the leavening power of the eggs is reduced, because the air soon escapes from beaten eggs and leaves underneath them a clear liquid that can never be beaten up. For instance, eggs that are to be used for boiled icing should not be beaten until the sirup has finished boiling. However, eggs that have been separated but not beaten may stand for a couple of hours, provided they are covered and kept in a cool place.

[Illustration: FIG. 11]

POINTS TO OBSERVE IN COOKING EGGS

41. As has been previously stated, the substance in eggs that requires special care in the cooking process is the protein, which occurs in this food in the form of albumen. Because of this, certain points concerning the treatment that the albumen requires should be kept in mind. In a raw egg, the albumen occurs in a semiliquid form, but it coagulates at a lower temperature than does the yolk, which contains a high percentage of fat. After coagulation, the consistency of the two parts is very different. The white is elastic and more or less tough, while the yolk, upon being thoroughly cooked, becomes powdery, or mealy, and breaks up into minute particles. The egg white begins to coagulate at 134 degrees Fahrenheit, and it becomes white and jellylike at 160 degrees. Bringing an egg to such a temperature produces a more desirable result than cooking it at a high temperature--boiling point, for instance--because the albumen, instead of becoming tough, as it does at a high temperature, acquires a soft, tender consistency that exists throughout the entire egg. An egg cooked in this way is more digestible and appetizing than one that is boiled until it becomes hard and tough.

42. The low temperature at which eggs will cook in the shell applies also to eggs when they are combined with other foods. Sometimes, however, a mixture in which eggs are one of the ingredients must be cooked at a high temperature because the materials mixed with them require it. This difficulty can be overcome when eggs are combined with

starchy foods, such as corn starch, rice, and tapioca, that require long cooking. In such a case, all the ingredients except the eggs may be cooked the length of time they require, after which the eggs may be added so that they will cook just long enough to become coagulated. Longer cooking is liable to spoil the texture. Often the starchy mixture retains sufficient heat to set the eggs without further cooking after they are added.

43. A very nutritious way in which to prepare eggs when they are to be used for a dessert is to combine them with milk to form a custard, which, after being sweetened and flavored, is baked. The proportion that has been accepted as ideal to produce a dessert of the right thickness is one egg to each cupful of milk; however, an entire egg is not always required, as one yolk is often sufficient to thicken 1 cupful of milk. Care should be taken in the cooking of such custards, for if they are cooked too long or at too high a temperature they will curdle and whey; whereas, a properly cooked custard--that is, one cooked slowly at a low temperature and for the required length of time--will have a smooth, jellylike consistency. A slight variation in a dish of this kind is secured by reducing the number of eggs and thickening it with corn starch or some other starchy material. While such a mixture is not a true custard, it makes an excellent dessert.

44. In the cooking of mixtures containing eggs, no utensil proves quite so satisfactory as the double boiler, which has already been explained and illustrated. In fact, it is almost impossible to cook an egg mixture directly over the flame on account of the difficulty encountered in preventing the eggs from curdling. The low temperature at which cooking is possible in the double boiler makes it a comparatively simple matter to bring a mixture to the proper consistency without the formation of curds. Still, a certain amount of precaution must be taken even with a double boiler. If the degree of heat that is reached in this utensil is applied too long, the result will be no more satisfactory than when mixtures are exposed directly to the heat and cooked at a high temperature. While every effort should be made to cook mixtures containing eggs, such as custards or mayonnaise, so as to prevent curds from forming, occasionally they will form in spite of all that can be done. However, it is sometimes possible to remedy the matter by placing the vessel at once in cold water and beating the mixture rapidly with a Dover egg beater until the curds disappear. The cold water cools the mixture and prevents the formation of more curds, and the beating breaks up those which have already formed, provided they are not too hard.

45. In addition to the uses already mentioned, eggs have numerous other uses in cooking with which the housewife should be familiar. For instance, slightly beaten egg is used to a great extent to make crumbs or meal adhere to the surface of croquettes, meat, oysters, etc. that are to be sauted or fried in deep fat, a coating of this kind preventing the food from becoming soaked with grease. In addition, egg is used to stick flour together for certain kinds of dough, such as noodles. Then, again, it is much used to puff up mixtures and produce a hollow space in them, as in popovers and cream puffs. While such mixtures do not require beating, spongy mixtures, such as omelets and sponge cakes, do. In these, eggs are an important factor, and they must be thoroughly beaten in order to incorporate the air in small bubbles and thus produce the desired texture.

SERVING OF EGGS

46. The manner of serving eggs depends, of course, on the way in which they are cooked. One point, however, that should never be overlooked, so far as eggs that are to be served hot is concerned, is that they should be served immediately upon being prepared, so that they will not have an opportunity to become cool before being eaten. This applies particularly to any spongy mixture, such as puff omelet and souffle, as these dishes shrink upon standing and become less appetizing in both appearance and texture.

Several ways of serving soft-cooked eggs are in practice, but probably the most satisfactory way is to serve them in egg cups. In case cups are used, they should be heated before being placed on the table, as the heat that they retain helps to keep the eggs warm. The eggs may be removed from the shell into the cup and eaten from the cup, or the unbroken egg may be placed point downwards in the small end of the cup, a small piece broken from the broad end of the shell, and the egg then eaten from the shell through the opening made in it. If egg cups are not available, the eggs may be removed from the shell and served in small dessert dishes, which also should be heated.

Many egg dishes are made more attractive and appetizing by means of a garnish of some kind. Small strips or triangular pieces of toast, sprays of parsley, celery leaves, lettuce, and strips of pimiento are very satisfactory for this purpose. If no other garnish is desired, just a sprinkling of paprika adds a touch of color.

47. In connection with the serving of eggs it will be well to note that they have a tendency to adhere to china and to discolor silver. Therefore, in the washing of china and the cleaning of silver that have been used in the serving of raw or slightly cooked eggs, much care should be exercised. Dishes in which eggs of this kind have been served should first be washed in cool water in order to remove all the egg, and then they should be thoroughly washed in hot water. If the hot water is applied first, the heat will cause the egg to coagulate and cling to the dishes. Silver that comes in contact with eggs tarnishes or becomes discolored through the action of the sulphur that is found in them, just as it does when it is exposed to the air. Dark spots that appear on silver from this source may be removed by means of a good silver cleaner.

EGG RECIPES

48. To enable the housewife to prepare many of the dishes already mentioned, as well as many other egg dishes, a number of recipes are here given. These recipes pertain to the cooking of eggs alone in various ways or to dishes in which eggs are the leading ingredient. There are, of course, numerous other dishes in which eggs are required, such as custards, cakes, mayonnaise, etc., but these are omitted here, as recipes for them are included in the lessons that pertain directly to them. In the first few recipes, the ingredients are omitted and merely directions given, for the eggs themselves are practically the only thing required, especially so far as the cooking is concerned. However, in the majority of cases, the ingredients are listed in the usual manner and explicit directions then given for carrying out the recipe.

49. SOFT-COOKED, OR JELLIED, EGGS.--Eggs that are cooked soft, or jellied, may be used for any meal in which plain eggs can be served. When properly prepared, they are both digestible and attractive, and any

person who is able to eat eggs at all can eat them in this form.

To prepare soft-cooked, or jellied, eggs, first bring to the boiling point sufficient water to cover well the desired number of eggs, which is usually 1 pint of water to each egg. Then drop the eggs into the water carefully, remove the pan from the fire, place a cover on it, and set it on the back of the stove, where the water will not heat further nor cool too rapidly. Allow the eggs to remain in the water for 5 minutes.

When eggs cooked in this manner are served, they will be found to be the consistency of jelly all the way through. This method of cooking is preferable to boiling them for 3, 4, or 5 minutes, because boiling cooks the white just inside the shell very hard, while the yolk of the egg remains liquid.

50. POACHED EGGS.--Eggs properly poached make a very attractive breakfast dish, but the poaching should be well done in order to have the dish attractive and digestible. The food value of a plain poached egg is, of course, identically the same as that of a soft-cooked, a hard-cooked, or a raw egg. Eggs are usually poached in a shallow pan, although egg poachers are to be had.

To poach eggs in a shallow pan, pour into the pan sufficient water to cover the eggs that are to be cooked, add a teaspoonful of salt or of vinegar for each pint of water, and bring it to the boiling point. Remove the pan from the flame or reduce the heat so that the water will cease to boil. Break the eggs, one at a time, into a saucer and then slide them carefully into the water. Do not allow the water to boil after the eggs have been added, as boiling toughens the egg white and in addition causes considerable loss by tearing it into shreds. When the eggs are set, remove them carefully from the water and season them with salt and pepper. A convenient way to remove the eggs is to use a large spoon that has holes in the bowl for draining off the water. The salt or vinegar is added to the water before cooking in order to solidify the albumen and keep it in a mass.

[Illustration: Fig. 12]

An egg poacher contains a perforated section of metal just large enough to hold an egg. In poaching eggs with such a utensil, the perforated part is placed over a pan of boiling water; then the egg is carefully slid into it, and allowed to poach. Eggs prepared in this way are really cooked by steam and are found to be very satisfactory.

51. POACHED EGGS ON TOAST.--Eggs poached according to the directions just given can be made both appetizing and attractive by serving them on toast, as shown in Fig. 12; indeed, the addition of toast to a poached egg adds a quantity of carbohydrate, a food principle in which the egg is lacking. If the toast is buttered, fat is added, and such a dish, together with fruit, makes a very excellent breakfast. A slice of toast of medium size with the usual amount of butter and egg will have a food value of about 225 calories. In preparing poached eggs on toast, the usual custom is to butter slices of freshly made toast, moisten them with hot milk or cream, and place on them freshly poached eggs. The eggs are then seasoned with salt and pepper, and, if desired, a little piece of butter may be dropped on each one. To add to the attractiveness of such a dish, the toast may be cut round with a cookie cutter or a square piece may be cut diagonally to make two triangular pieces.

52. HARD-COOKED EGGS.--Eggs that are cooked hard may be served hot or cold, or they may be used in numerous ways, as, for example, to garnish a dish to which the addition of protein is desirable or to supply a high-protein dish for some light meal.

To prepare hard-cooked eggs, bring to the boiling point sufficient water to cover well the desired number of eggs, about 1 pint of water for each egg to be cooked usually being sufficient. Carefully drop the eggs into the water and place the pan on the back of the stove where the water will not boil, but will stay hot. Allow the eggs to remain in the hot water for 45 minutes; then remove them, and if they are desired hot, serve them at once. If they are not to be served hot, pour cold water over them and allow them to cool before removing the shells in order to prevent the yolks from discoloring.

When prepared in this way, eggs will be found to be tender and at the same time well cooked; whereas, if they are cooked at the boiling point, they are certain to be tough and leathery and consequently less digestible.

53. FRIED EGGS.--Fried eggs are likely to be more or less indigestible, because the hot fat coagulates the protein and makes it very hard. The addition of fat, however, increases the food value of the eggs to a certain extent. To fry eggs, melt enough butter or other fat in a frying pan to cover its surface well. Break the eggs one at a time into a saucer and slip them into the hot fat. Season with salt and pepper. Fry until the white has become well solidified on the bottom, and then either turn them over or put a few drops of water in the pan and cover it tight with a cover, so that the steam will cook the top of the egg. Fry until the desired degree of hardness has been obtained, and then serve.

54. SCRAMBLED EGGS.--A pleasing variety from the usual methods of preparation is offered by means of scrambled eggs, which are not difficult to make. Too long cooking, however, should be guarded against, for it will cause the protein in the eggs to become too hard and to separate from the liquid and will produce watery scrambled eggs. To be most satisfactory, they should be taken from the pan just before they have finished cooking, for the heat that they hold will complete it. Eggs prepared in this way, according to the accompanying recipe, may be served on toast or with ham and bacon. If they are served with meat, a smaller portion of meat should be given to a person than is ordinarily served.

SCRAMBLED EGGS
(Sufficient to Serve Six)

6 eggs
3/4 c. milk
1/2 tsp. salt
1/8 tsp. pepper
2 Tb. butter

Beat the eggs slightly, and to them add the milk and seasonings. Melt the butter in a frying pan and, when the butter is hot, pour the egg mixture into it. As the eggs begin to thicken, stir them up from the bottom of the pan and continue to stir them until the entire mass has thickened slightly. Before the eggs are entirely cooked, remove them

from the pan. Bacon and ham fat may be used instead of butter, and they are strongly recommended if they can be secured, for they lend an excellent flavor to scrambled eggs.

55. SCRAMBLED EGGS WITH TOMATO.--The addition of tomato to scrambled eggs lends an unusual flavor as well as a little variety to the dish. The same conditions apply to the cooking of scrambled eggs with tomato as apply to plain scrambled eggs; namely, that too long cooking ruins them. The onion included in the recipe here given may be omitted from the dish if it is not desirable. The fat to be used may be in the form of butter, although bacon or ham fat may be substituted to give an agreeable flavor.

SCRAMBLED EGGS WITH TOMATO
(Sufficient to Serve Six)

3 Tb. fat
1 slice onion
1 c. stewed tomatoes
1/2 tsp. salt
1/8 tsp. pepper
6 eggs

Put the fat into a frying pan, and when this grease is hot add the slice of onion and fry it until it is brown. Remove the onion from the fat, and add the stewed tomatoes, salt, and pepper. Then beat the eggs slightly and add them to the hot tomato. Stir the mixture slowly from the bottom of the pan until it is slightly thickened. Remove from the pan and serve hot.

56. SCRAMBLED EGGS ON TOAST.--The addition of cheese to eggs, as in the accompanying recipe, makes a dish that is very high in protein and usually pleasing in flavor. So as not to overcook the eggs in this dish, they should be cooked only slightly in the pan, because they receive additional cooking when the dish is placed in the oven to melt the cheese. Browning the cheese slightly on top makes a very attractive dish, especially when garnished with parsley.

SCRAMBLED EGGS ON TOAST
(Sufficient to Serve Six)

6 eggs
3/4 c. milk
1/2 tsp. salt
1/8 tsp. pepper
2 Tb. fat
1/2 c. grated cheese
6 slices of toast

Beat the eggs slightly, and to them add the milk, salt, and pepper. Melt the fat in a frying pan, and when it is hot add the egg mixture. Stir the mixture as it cooks until it has thickened slightly; then pour it over the slices of toast placed in a shallow pan. Sprinkle the grated cheese over the top, and place under a lighted broiler or in a very hot oven until the cheese melts. Remove to a platter garnish with parsley, and serve.

57. SCRAMBLED EGGS WITH HAM.--The accompanying recipe affords an excellent way in which to use up the little scraps of ham that may be

cut from the bone when it is impossible to cut enough nice looking pieces to serve as a cold dish. Eggs prepared in this way will be found very tasty and will take the place of a meat dish for luncheon or supper.

SCRAMBLED EGGS WITH HAM
(Sufficient to Serve Six)

6 eggs
1 c. milk
1/2 tsp. salt
1/8 tsp. pepper
1 c. chopped cooked ham
2 Tb. fat

Beat the eggs slightly, and to them add the milk, salt, pepper, and ham. Melt the fat in a frying pan and scramble the mixture as directed in Art. 54 until it is slightly thickened. Remove from the stove and serve at once. If desired, this dish may be served on toast. Other left-over meat, such as roast beef or pork, may be used in place of ham, but such meats do not make so tasty a dish, the flavor of ham in such a combination being more desirable. 58. PLAIN OMELET.--The simplest type of omelet, which is known as plain omelet, does not differ materially from scrambled eggs, except that the whole is collected in a mass in an omelet shape. No difficulty will be experienced in making such an omelet if the directions in the recipe here given are followed explicitly. To make this dish more attractive, some food of a contrasting color, such as jelly or tomatoes, may be used for garnishing.

PLAIN OMELET
(Sufficient to Serve Six)

6 eggs
6 Tb. water
1/2 tsp. salt
1/8 tsp. pepper
3 Tb. fat

Beat the eggs, and to them add the water, salt, and pepper. Heat the fat in an omelet pan or a small frying pan, and when it is hot add the egg mixture. When the egg on the bottom of the pan has thickened, tip the pan and draw the thickened portion toward the handle with the end of a knife, allowing the uncooked egg to run over the pan, and when that has thickened on the bottom, draw it up as before. Repeat until all of the egg has been cooked and an oblong-shaped omelet is formed. Place on a hot platter or plate, garnish with parsley or jelly, and serve.

[Illustration: FIG. 13]

59. PUFF OMELET.--Many housewives consider it to be a very difficult thing to make a puff omelet successfully; but such need not be the case if fresh eggs are used and the usual amount of care is taken in its preparation. The whites of the eggs must not be over-beaten, as too much beating will cause the loss of air and will not permit the omelet to become sufficiently light. Another precaution is that the mixture should not be overcooked, for the application of heat after it has been sufficiently cooked will cause it to shrink. How a puff omelet made according to the recipe here given should look, is shown in Fig. 13. This is a very pleasing dish and never fails to appeal to those persons

who are fond of eggs.

PUFF OMELET
(Sufficient to Serve Six)

2 Tb. bread crumbs
4 Tb. milk
4 eggs
1/2 tsp. salt
1/8 tsp. pepper
3 Tb. fat

Soak the bread crumbs in the milk. Separate the yolks and whites of the eggs. Beat the egg yolks and add them to the crumbs and milk. Add the salt and pepper. Beat the egg whites until stiff and fold them carefully into the yolk mixture. Heat the fat in an omelet pan or a frying pan, and when it is hot pour the mixture into it. Cook over a very slow fire, being careful not to burn the mixture, until a knife can be slipped under and the whole mixture raised. By this time the top should be quite puffed up. Place the pan in a hot oven, where the omelet should puff still more, and cook until it is no longer raw. With a knife, score across through the center on a straight line with the handle. Then carefully fold the omelet double, roll it out on a hot platter or plate, as shown in Fig. 14, garnish with parsley, and serve at once. If an omelet of this kind stands for any length of time after it is served, it will shrink and be much less appetizing.

[Illustration: FIG. 14]

60. CHEESE OMELET.--If an additional amount of protein in the form of casein is desired in an omelet, the accompanying recipe for cheese omelet should be tried. The addition of cheese makes this dish even a better meat substitute than either the plain or the puff omelet. Likewise, the cheese adds flavor, which may be increased if desired by the addition of more cheese than the recipe calls for. Although this recipe mentions butter, fat other than butter may be used.

CHEESE OMELET
(Sufficient to Serve Six)

1/2 c. grated cheese
2 Tb. bread crumbs
4 Tb. milk
4 eggs
1/2 tsp. salt
1/8 tsp. pepper
3 Tb. butter

Mix the grated cheese with the bread crumbs, milk, egg yolks, salt, and pepper. Beat the egg whites until they are stiff and fold them into the other ingredients. To cook the omelet, proceed according to the directions given for making puff omelet in Art. 59.

61. TOMATO OMELET.--The addition of tomatoes to an omelet makes an attractive dish as far as color is concerned, and, at the same time, it gives variety by improving the flavor. Such an omelet is also less concentrated than a plain omelet, for the tomatoes provide bulk and additional water is added. While in a way these lower the food value of the dish, the loss is more than made up by the qualities that are added.

TOMATO OMELET
(Sufficient to Serve Six)

6 eggs
1/2 c. milk
1/2 tsp. salt
1/8 tsp. pepper
3 Tb. fat
2 medium-sized ripe tomatoes

Beat the eggs, and to them add the milk, salt, and pepper. Heat the fat in a pan large enough to make the egg mixture 1/2 inch deep when poured into it. Cook slowly until it is well done. Peel and cut the tomatoes into slices 1/3 inch thick. Place the sliced tomatoes on 1/2 of the omelet, sprinkle them with salt and pepper, score the omelet through the center, and fold the other half over the tomatoes. Then slide the omelet on a hot platter, garnish with lettuce or parsley, and serve at once.

62. VARIETY IN OMELETS.--From the recipes given for omelets, it will be noted that this dish may be made plain or may be varied by adding ingredients that provide flavoring or increase the nutritive value. In addition to the suggestions that have been made in these recipes, there is an almost endless number of ways in which omelets may be varied. For instance, left-over bits of any kind of meat, such as a roast, a steak, or chops, from the day before or bits of bacon fried for a previous meal may be chopped fine and utilized for this purpose. Cheese cut fine or grated and mixed with the eggs helps to make a delicious omelet. Bread crumbs, cracker crumbs, rice, riced potatoes, or left-over cereal may be used, as well as mushrooms, chopped or whole, and oysters raw or previously scalloped or fried and then chopped. Bits of fish, such as left-over crab or lobster, will do nicely for increasing variety. Often jelly, jam, and fruit or vegetables are folded inside after the omelet is cooked.

63. STUFFED EGGS.--A highly seasoned cold dish that is delicious for picnics or cold lunches can be made by removing the yolks from hard-cooked eggs, seasoning them, and then stuffing them into the whites, as is explained in the recipe here given. Eggs so prepared also make a desirable high-protein dish for summer weather when meat dishes fail to appeal to the appetite. Wafers or tiny bread-and-butter sandwiches served with stuffed eggs make them more attractive.

STUFFED EGGS
(Sufficient to Serve Six)

6 hard-cooked eggs
1/2 tsp. salt
1/8 tsp. pepper
1/8 tsp. paprika
1/2 tsp. mustard
2 Tb. vinegar

Cut the eggs in half, either lengthwise or crosswise. Remove the yolks, mash them, add to them the salt, pepper, paprika, mustard, and vinegar, and mix thoroughly. Fill the egg whites with the yolk mixture. The eggs will be much more appetizing in appearance if the yolk is not packed smoothly back into the white but allowed to stand up roughly. The plate on which the eggs are served should be nicely garnished with lettuce,

parsley, or celery leaves.

[Illustration: FIG. 15]

64. CREAMED EGGS.--If a dish that will serve well for luncheon or a light supper is desired, creamed eggs, as illustrated in Fig. 15, will be found very satisfactory, for the cream sauce that is served on them and the toast on which the eggs are placed add carbohydrate to an otherwise high-protein dish. The eggs used in this dish must be hard-cooked in water, so as not to be indigestible. Paprika sprinkled over the top and parsley used as a garnish add colors that make the dish very attractive.

CREAMED EGGS
(Sufficient to Serve Six)

1-1/2 c. milk
2 Tb. fat
2 Tb. flour
1/2 tsp. salt
1/8 tsp. paprika
6 hard-cooked eggs
6 slices of toast

Heat the milk. Put the fat in a saucepan and heat it until it is light brown; then add the flour, salt, and paprika to the melted fat and mix all thoroughly. Pour in the hot milk and stir the mixture constantly until the sauce has become smooth and thick. Cut the hard-cooked eggs into halves while they are hot, and place two halves with the cut sides down on each piece of toast. Pour the white sauce over all, sprinkle with paprika, and serve.

[Illustration: FIG. 16]

65. Eggs a la Goldenrod.--Closely resembling creamed eggs in composition and food value, but differing from them somewhat in appearance, are eggs a la goldenrod, which are illustrated in Fig. 16. This is, perhaps, even a more attractive dish if it is nicely made than creamed eggs, and many persons who do not like hard-cooked eggs find this dish agreeable and are able to digest it.

EGGS A LA GOLDENROD
(Sufficient to Serve Six)

2 c. milk
2 Tb. fat
2 Tb. flour
1/2 tsp. salt
1/8 tsp. pepper
4 hard-cooked eggs
6 slices of toast

Heat the milk. Brown the fat in a saucepan, add the flour, salt, and pepper, and mix well. Then add the hot milk and stir until the sauce thickens. Chop the whites of the hard-cooked eggs into small pieces, and mix them with the white sauce. Arrange the toast on a platter and pour the sauce over it. Put the hard-cooked egg yolks through a sieve or a ricer and sprinkle them on top of the white sauce. Serve hot.

66. SCALLOPED EGGS.--A quantity of carbohydrate is added to eggs when they are scalloped, for the white sauce and the cracker crumbs that are used in this dish supply this food substance. The cold meat that this dish requires and that should be well chopped into small pieces may be left-over from roasted, stewed, or even broiled meat. As this provides an additional amount of protein, the dish on the whole serves as an excellent substitute for meat with carbohydrate added.

SCALLOPED EGGS
(Sufficient to Serve Six)

2 c. milk
2 Tb. fat
1/2 tsp. salt
1/8 tsp. pepper
2 Tb. flour
1 c. cracker crumbs
4 hard-cooked eggs
1 c. chopped cold meat

Heat the milk. Brown the fat in a saucepan, add the salt, pepper, and flour, and mix well. To this add the hot milk. Cook until the sauce thickens, stirring constantly. Grease a baking dish and place in it 1/3 cupful of the cracker crumbs. Over the crumbs arrange two of the eggs sliced thinly, and on the top of the eggs put half of the meat. Repeat by adding a layer of 1/3 cupful of the crumbs, the remaining eggs sliced, and the remainder of the meat. Pour the white sauce over all and arrange the remaining 1/3 cupful of crumbs on top. Bake in a moderate oven for 1/2 hour. Serve hot from the baking dish.

67. INDIVIDUAL BAKING DISHES FOR EGG RECIPES.--Although the directions given in the preceding recipe for scalloped eggs state that this recipe is baked in a baking dish, it is not necessary that one large dish of this kind be used, for, if desired, individual baking dishes may be substituted. In fact, any recipe for which a large baking dish would ordinarily be used may be baked in the small dishes used for a single serving, and eggs prepared in this way are especially attractive. Such dishes are also used for the baking of custards or the molding of jelly and blanc mange. Since they prove very useful and find so much favor, it is advisable for every housewife to add a few of them to her supply of utensils and to become familiar with the varieties that can be secured and the proper way to use them.

Dishes of this kind may be purchased in both cheap and expensive varieties and in plain or fancy styles, being made of white porcelain, of glass, or of the brown ware so much used for large baking dishes and casseroles and having a white glazing on the inside.

68. When such dishes are used as a means of adding variety to the cooking and serving of eggs, they should be placed in the oven in a shallow pan containing enough hot water to come nearly to the top of them. The object of this plan is to keep the temperature uniform. As long as the dishes are surrounded by water, the food to be cooked will not attain a greater heat than 212 degrees Fahrenheit, because the surrounding water cannot reach a higher temperature. Food cooked in this way will be found to be baked much more evenly and to be of a better consistency than food that is subjected to the high temperature of the oven. Most of the recipes that follow, while they can be baked in large baking dishes if desired and then served from the dish, are designed

particularly to be used in individual baking dishes.

69. BAKED EGGS IN CREAM.--A dish that is particularly desirable for breakfast, but that may be served for luncheon, is made by baking eggs in cream according to the accompanying recipe. Besides being very appetizing, this dish is high in food value because of the addition of the cream and fat. Crisp toast served with eggs prepared in this way is very delightful.

BAKED EGGS IN CREAM
(Sufficient to Serve Six)

6 eggs
1 Tb. butter
1/2 tsp. salt
1/4 tsp. pepper
3/4 c. cream

Grease six individual baking dishes and break an egg into each. Put a small piece of butter on top of each egg and season with salt and pepper. Pour over each egg two tablespoonfuls of cream. Place the baking dishes in a shallow pan of hot water and bake until the eggs are as hard as desired. Serve hot.

70. SHIRRED EGGS WITH HAM.--An excellent way in which to utilize scraps of ham is to combine them with eggs to make a dish that may be served in place of meat. This dish, besides being high in food value, is very tasty because of the flavor of the ham and the fact that it is quite highly seasoned.

SHIRRED EGGS WITH HAM
(Sufficient to Serve Six)

1/2 tsp. prepared mustard
1/4 tsp. pepper
1 c. chopped ham
6 eggs
1/4 tsp. salt
1 Tb. butter

Grease six individual baking dishes. Mix the mustard and pepper with the ham, and then divide this mixture as evenly as possible into the baking dishes. Break an egg on top of the ham in each dish, season with salt, and put a small piece of butter on each. Place the dishes in a shallow pan of hot water and bake in a moderate oven until the eggs are well set or hardened. Remove from the oven and serve at once.

71. EGG SOUFFLE.--If a delicate dish for children or invalids is desired, egg souffle will answer the purpose very well. This dish is light in character, but it is high in protein and to most persons is very delightful. It is more attractive if baked in individual baking dishes, but it may be baked in a large baking dish and served directly from the dish. To improve the flavor of egg souffle and make it a more appetizing dish, tomato sauce is often served with it.

EGG SOUFFLE
(Sufficient to Serve Eight)

1 c. milk

2 Tb. fat
2 Tb. flour
1/2 tsp. salt
1 Tb. chopped parsley
4 eggs

Heat the milk. Brown the fat in a saucepan, add to it the flour, salt, and parsley, and mix well. Pour in the hot milk, stir constantly until the sauce thickens, and then remove from the fire. Separate the eggs and add the well-beaten yolks to the sauce, stirring rapidly so that the egg will not curd. Beat the whites stiff and fold them carefully into the sauce. Turn into well-greased individual baking dishes until they are about two-thirds full, place in a shallow pan of hot water, and bake until firm when touched with the finger. Serve at once in the dishes in which they are baked, because they shrink when they are allowed to cool.

72. The tomato sauce that is often served with egg souffle is made as follows:

TOMATO SAUCE

1 1/2 c. strained stewed tomatoes
2 Tb. fat
1/2 tsp. salt
1/8 tsp. pepper
2 Tb. flour

Force enough stewed tomatoes through a sieve to make 1 1/2 cupfuls of strained tomato. Heat the strained tomato and to it add the fat, salt, and pepper. Moisten the flour with a little cold water and add it to the hot tomato. Cook for 5 minutes. Serve over the souffle.

[Illustration: FIG. 17]

73. Alpine Eggs.--It is rather unusual to combine cream or cottage cheese with eggs, so that when this is done, as in the accompanying recipe, a dish that is out of the ordinary is the result. If not a sufficient amount of cottage cheese is in supply to serve for a meal, it may very well be used for this dish. Otherwise, cream cheese serves nicely.

ALPINE EGGS
(Sufficient to Serve Six)

2 10-cent pkgs. cream cheese or
1 c. cottage cheese
2 Tb. finely chopped parsley
1/8 tsp. paprika
6 eggs
1 Tb. butter
1 1/2 tsp. salt

Grease six individual baking dishes. Break up the cheese with a fork and sprinkle a layer on the bottom of each dish. Break an egg in each dish over the cheese. Season with salt. Sprinkle a layer of cheese on top of the egg, and over that put chopped parsley, paprika, and a small piece of butter. Place the baking dishes in a shallow pan of hot water and bake in a moderate oven until the eggs are set. Remove from the oven and serve at once.

74. Clipped Eggs.--The chief value of clipped eggs is their appearance, which, as will be observed in Fig. 17, is very attractive. This dish adds much to the breakfast tray of an invalid or will tempt the appetite of a child who does not feel like eating. But in addition to being attractive, this dish is high in food value, for in this respect it is exactly equivalent to a poached egg on toast or a plain egg served with a piece of toast to which is added a small amount of butter.

CLIPPED EGGS
(Sufficient to Serve Six)

6 pieces toast
3 Tb. butter
6 eggs
1/2 tsp. salt
1/8 tsp. pepper

Butter the toast with some of the butter. Separate the whites and yolks of the eggs without breaking the yolks. Beat the whites stiff, and put a mound of the beaten white on top of each piece of buttered toast. Make a hole in the center of the mound of egg white and drop the unbroken yolk into it. Season each with salt and pepper and bits of the remaining butter. Place in a hot oven and bake until the yolk is set and the white slightly browned. Serve hot.

75. LEFT-OVER EGGS.--It is not a difficult matter to utilize eggs in any form in which they may be left over, for they combine readily with many other foods. For instance, left-over hard-cooked eggs may be sliced or chopped and used to garnish dishes of vegetables, meat, fish, or salads. Eggs cooked in this way may also be stuffed according to the recipe given in Art. 63, or they may be crushed and mixed with seasoning for sandwiches. If any soft-cooked eggs remain after a meal, they should be hard-cooked in order to be used to the best advantage. Left-over omelet or scrambled, poached, or fried eggs may be chopped and added to soups, sauces, or gravies, or combined with small pieces of meat or fish and used with crumbs and white sauce to make a scalloped dish.

Even uncooked eggs that are taken from the shells, but that cannot be used at once, need not be wasted if proper care is given to them to prevent the formation of a hard crust over their surface. Such eggs should be put into a dish that will allow as little of the surface as possible to be exposed and should be covered with cold water and kept in a cool place. When they are desired for use, the water should be poured off carefully so as to prevent the loss of any of the egg.

BREAKFAST MENU

76. So that a definite idea may be formed of the student's progress in cookery, there is here presented a breakfast menu that is to be prepared and reported on at the same time that the answers to the Examination Questions are sent. This menu is practical and it may be easily prepared, as all the dishes it contains have already been considered.

MENU

Sliced Bananas
Cream of Wheat
Graham Muffins

Butter
Puff Omelet
Coffee

In most homes, breakfast is a meal that is gathered together with as little thought and preparation as possible. The reason for this is that the housewife feels that she does not wish to rise early enough in the morning to prepare an elaborate menu. Breakfast, however, should be the most attractive meal in the day, because it is one that gives to each member of the family the right start for the day and sustains him until luncheon time. In most cases, a cup of coffee and a slice or two of toast do not start one with a cheerful attitude, nor do they contain sufficient food value to nourish the individual properly. With a little forethought and planning, certain foods may be partly prepared for breakfast the day before. If this is done, the time required for the actual preparation of the breakfast need not be greatly increased. For example, in the accompanying menu, the cream of wheat may be cooked the evening before, the materials for the graham muffins measured, and even the pan in which they are to be baked greased, and the materials for the omelet collected and measured. If all this is done, the preparation necessary in the morning will consist merely of slicing the bananas, reheating the cream of wheat, preparing the coffee, baking the muffins, and making the omelet. While the coffee and cream of wheat are heating or cooking, the oven will be heating, so that when the muffins are mixed it will be ready to bake them; and while these are baking the omelet may be prepared. When this is done, all will be ready to serve.

EGGS

EXAMINATION QUESTIONS

(1) Give a brief description of the physical structure of an egg.

(2) (_a_) Why are eggs an important article of diet? (_b_) For what foods may they be substituted?

(3) (_a_) Mention the food substances that are found in an egg, and give the percentage of each one. (_b_) What food substance is lacking in eggs, and how may it be supplied?

(4) What is the chief food substance in: (_a_) an egg white? (_b_) an egg yolk?

(5) Discuss briefly the digestibility of eggs.

(6) (_a_) Of what value is the grading of eggs? (_b_) What points are considered when eggs are graded?

(7) (_a_) What conditions affect the quality of eggs? (6) Mention the agencies that render the quality of eggs inferior and explain how they work.

(8) How can the quality of eggs be determined: (_a_) in the market? (_b_) in the home?

(9) (_a_) What is the common commercial means of preserving eggs? (_b_) How is it beneficial to the housewife?

(10) (_a_) Mention the various ways by which eggs may be preserved in

the home. (_b_) Explain the preservation of eggs with water glass.

(11) When may the shells of eggs be washed?

(12) (_a_) What is the preferable method of breaking an egg? (_b_) Explain how the yolk and the white of an egg may be separated.

(13) (_a_) For what purposes are eggs beaten? (_b_) With what kind of egg beater should egg yolks or whole eggs be beaten?

(14) (_a_) With what kind of utensil should egg whites be beaten? (_b_) Why should egg whites not be allowed to stand after beating?

(15) (_a_) What is the effect of heat upon an egg? (_b_) Why are eggs cooked in the shell better if they are cooked at a temperature lower than boiling point? (_c_) Cook an egg by boiling it rapidly for 20 minutes. Cook another egg according to the directions given in Art. 52. Remove the shells while the eggs are warm, compare the texture, and report the differences.

(16) (_a_) When eggs are used in a mixture that is to be cooked for a long time, when should they be added? (_b_) What can be substituted for some of the eggs in a mixture that requires eggs for thickening?

(17) (_a_) What point should never be overlooked in the serving of eggs that are intended to be served hot? (_b_) Why should spongy egg dishes be served immediately after cooking?

(18) (_a_) How should dishes that have contained eggs be washed? (_b_) Why is such care necessary?

(19) (_a_) What precautions should be taken in the making of a puff omelet? (_b_) Mention some of the things that may be used to give variety to omelets.

(20) (_a_) What are the advantages of individual baking dishes? (_b_) State how these should be put in the oven and explain the object of this plan.

REPORT ON MENU

After trying out the menu given in the text, send with your answers to the Examination Questions a written report of your success in making it. On your report simply write the name of the food and describe its condition by means of the terms specified in the following list:

Cream of Wheat: thin? thick? properly seasoned? smooth? lumpy?

Graham Muffins: light? heavy? texture coarse? texture fine? even brown color on crust? well flavored?

Puff Omelet: light? heavy? underdone? overdone? even brown on bottom? tough? tender? properly seasoned?

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VEGETABLES (PART 1)

* * * * *

IMPORTANCE OF VEGETABLES AS FOOD

VARIETY IN VEGETABLES

1. As understood in cookery, VEGETABLES refer to plan

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