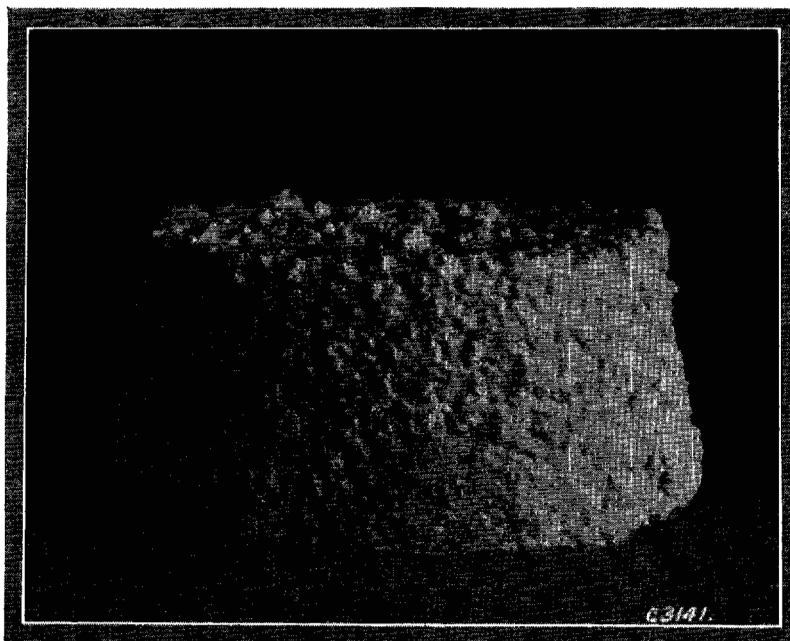


AGRICULTURAL EXPERIMENT STATION

KANSAS STATE AGRICULTURAL COLLEGE
MANHATTAN, KANSAS

DEPARTMENT OF DAIRY HUSBANDRY



ACID-TYPE COTTAGE CHEESE READY TO SERVE

MAKING COTTAGE CHEESE ON THE FARM¹

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American people have been slow in recognizing the desirability and economy of using more cottage cheese in their diets. This is true not only of cottage cheese but applies to other types of cheese as well. It is gratifying, however, to note that cheese consumption is increasing at a rapid rate at the present time. Cottage cheese, especially, is rapidly gaining favor and is assuming a more important place in the diet of the American people than ever before. The

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more liberal use of cottage cheese is especially striking in the towns and cities but there can be no question as to the desirability of using more of this product on the farm.

The increased consumption of cottage cheese in the cities has been brought about very largely by improved and standardized methods of manufacture in the commercial dairy plants, resulting in a highly palatable and appetizing product that is uniform from day to day. Since city consumption has been stimulated by an improvement in the quality of the product it would seem entirely reasonable and logical that a greater consumption could also be expected in the country if more attention were paid to the manufacturing process.

It should not be inferred that the home will be able to compete with the commercial dairy in the manufacture of cottage cheese as a commercial enterprise. The specialized equipment, specialized labor, and storage facilities necessary for the successful manufacture and sale of cottage cheese can be provided economically only by the relatively large commercial dairy. It is possible, however, to make good cottage cheese on the farm for home consumption. On practically every farm fresh skim milk is available which could be utilized in no better way than in the making of cottage cheese.

SELECTING THE MILK

Cottage cheese is almost universally made from skim milk, but in many cases very little attention has been paid to the quality of skim milk used. The customary method of making cottage cheese in the past has been to allow skim milk to sour until a firm clabber has formed. The formation of this characteristic clabber is due primarily to one particular species of bacteria known as the milk-souring or lactic-acid bacteria. This species of bacteria is always present in milk but in addition there may be a number of other species present which are entirely undesirable since they are harmful to the quality and flavor of the resulting cheese. The number of undesirable species of bacteria present is closely associated with the care exercised in producing and handling the milk. With dirty cows, dirty utensils, an improperly washed separator, and unclean stables, many undesirable bacteria are bound to be introduced into the milk. It is impossible to control to any extent the fermentations that take place in the milk due to bacterial action; hence, it is obvious that only milk that has been produced under clean, sanitary conditions should be used for cottage cheese.

SOURING THE MILK

Having selected a suitable quantity of fresh skim milk, the next step is to sour the milk. In souring the milk the most suitable conditions should be provided for the growth and development of the desirable milk-souring bacteria, at the same time inhibiting the growth of the other types of bacteria as much as possible. Fortunately, by carefully controlling the temperature at which the milk is held during the souring period it is, in a measure, possible to do this. By setting the milk in a half barrel or tank of water (fig. 1)

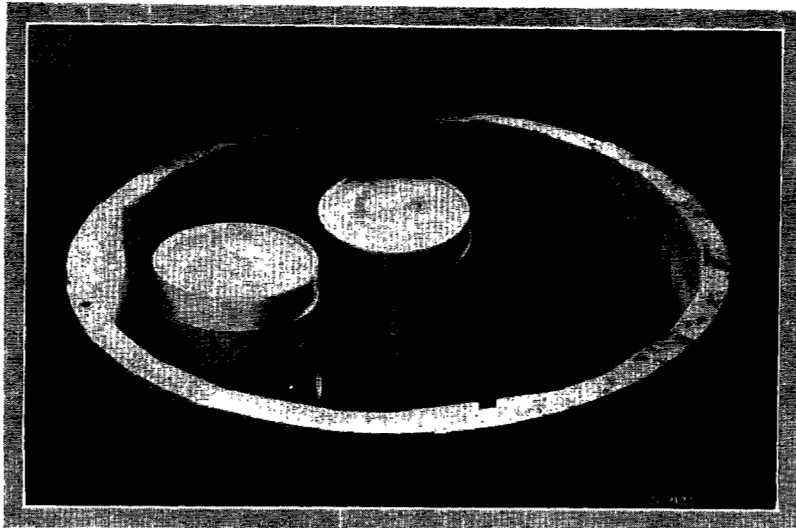


FIG. 1.—Milk set in water in preparation for cottage cheese.

at 70° F. and holding it at that temperature until a firm curd is formed the best results will be secured. Approximately 24 hours will be required for coagulation to take place. At 70° F. the desirable milk-souring bacteria will grow and develop more rapidly than will the other types of bacteria present.

The importance of controlling the temperature of the milk during the souring period cannot be overemphasized, for it is the only practical way of exercising any control over the fermentations taking place in the milk. The flavor of the finished cheese will be dependent to a large extent upon the care exercised in controlling the temperature during the souring period. The ordinary shotgun can holding approximately thirty pounds of milk provides a convenient receptacle in which to sour the milk. A half barrel or cool-

ing tank full of water at the proper temperature is an inexpensive but fairly efficient way of controlling the temperature of the milk. The temperature of the water should be adjusted occasionally. The milk should be held in a protected place free from dust and undesirable odors and flavors until the curd is formed. The milk house is a desirable place to sour the milk for cottage cheese.

The milk should be allowed to set at 70° F. until a firm curd has formed. A good way to tell when the curd is sufficiently firm is to insert a thermometer into the curd obliquely and then carefully raise it to the surface. If the curd breaks clean over the thermometer the curd is sufficiently firm to cut. At this time a little free whey will usually appear over the curd. When a firm curd is formed it should be cut at once.

CUTTING THE CURD

It would be desirable if possible to cut the curd into uniform-sized cubes which will cook and drain uniformly. Since the average farm does not have the necessary curd-cutting equipment, it must be broken into relatively coarse pieces with a big spoon or milk-stirrer. The object of breaking is to make possible a rapid loss of moisture from the curd.

COOKING THE CURD

The cooking process must be given a great deal of care and attention if a cheese of proper texture is to be produced. The temperature must be carefully watched and adjusted. The first step in cooking is to set the can holding the curd in water at the same temperature as the curd and heat very slowly. The temperature should not be raised more than 1 to 2 degrees in five minutes. When the curd begins to draw away from the sides of the can it is an indication that the curd may be stirred very gently. The stirring can be accomplished with a milk-stirrer or large spoon. The stirring should be just sufficient to maintain a uniform temperature and to prevent the formation of masses or lumps of curd. As the curd becomes firmer the rate of heating may be increased slightly.

The cooking process determines to a large extent the texture of the cheese. Too rapid heating results in a tough, rubbery texture, a common fault in home-made cheese. The curd is raised slowly to 100° to 110° F. with 110° as the maximum temperature. The cooking temperature is maintained until the curd acquires the desired firmness and texture, usually 15 to 30 minutes. The curd is sufficiently cooked when a small portion worked between the thumb

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and finger does not break down and become milky in appearance; at this time there should be no free whey in the center of the curd particles. A handful of curd washed in a pail of cold water will give a good indication of what the finished cheese will be like. The entire cooking process will require approximately an hour and a half to two hours. Experience alone must guide the maker in determining when the curd is sufficiently cooked.

DRAINING AND WASHING

The most convenient method of draining cottage cheese on the farm is to pour it directly into a sugar sack or some similar type of bag and hang it up over a sink. (Fig. 2.) If the curd has been properly cooked the whey will drain rapidly.



FIG. 2.—The curd being drained in the process of making cottage cheese.

The flavor and keeping quality of the cheese may be very materially improved by washing it two or three times with water. The first washing is done with water at approximately 70° F. and drained at once. The second washing should be done with a colder water around 50° to 60° F. and the curd should be soaked at this temperature until the curd has been cooled down. It is desirable to wash a third time with even colder water, around 40° F., which will check the acid development and chill the curd. On most farms it will be impossible to secure water much lower than 50° F. unless ice is available.

SALTING

As soon as the curd is chilled it may be salted. The salt should be added in small installments and mixed with the curd. The curd is usually salted at the rate of one-fourth of an ounce of salt per gallon of milk. After salting, the cheese should be placed in an earthen jar or crock and stored in the coolest place available. The keeping quality of this cheese is limited and it must be consumed as quickly as possible. Two or three days will be the maximum length of time that this cheese should be kept.

RENNET TYPE COTTAGE CHEESE

A soft curd cheese, similar to cottage cheese in many respects, that is made with the aid of rennet is becoming more popular each year. The curd formation is accomplished by an associative action of rennet and the common milk-souring bacteria. Rennet, obtained from the stomach of young calves, is an enzyme with tremendous coagulating power. Rennet is put up in a special tablet form for farm cheese making and may be obtained from any dairy supply house. It is extremely important that the correct amount of rennet be used or the resulting cheese will be ruined.

In making this type of cheese the milk is set at 70° F. and the correct amount of rennet added at once. The rennet tablets vary in strength according to their size and the concentration of rennet extract in the tablet. A tablet weighing half a gram is manufactured by Chr. Hansen Laboratories, Little Falls, N. Y., and contains sufficient rennet for 100 pounds of whole milk in making American Cheddar cheese. Using this strength of tablet as a basis the following directions should be followed in using it for cottage cheese: (1) Divide the tablet into halves; (2) dissolve one half of the tablet in one pint (2 full cups) of cold water; (3) use one-fourth of a teaspoonful of this solution per gallon of milk, mixing it with the milk thoroughly. (Fig. 3.)

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It will be noted that a relatively small amount of rennet is used in making the rennet type cottage cheese. The directions given will apply only when a half-gram rennet tablet possessing nine times the curdling power of 1 c.c. of liquid rennet is used. Rennet is added at the rate of 1 c.c. of liquid rennet per 1,000 pounds of milk in making this type of cottage cheese.

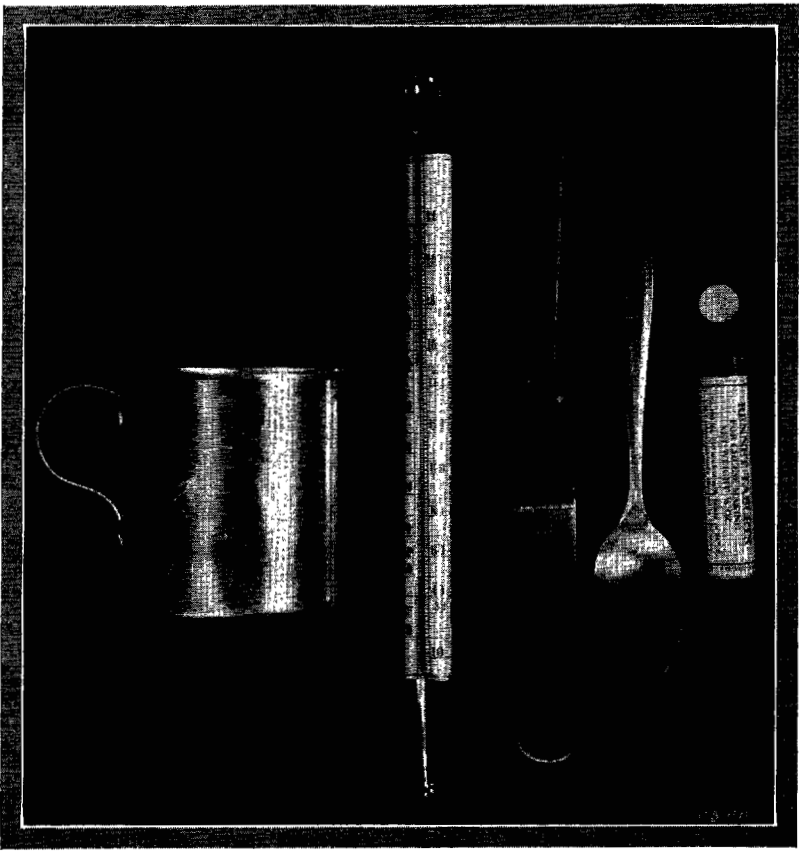


FIG. 3.—Equipment for preparing rennet solution.

The remainder of the process is essentially the same as far the ordinary acid-type cottage cheese. It is important that a firm curd be formed before the curd is broken. Sixteen to twenty hours is about the usual time required for coagulation to take place when rennet is used. The curd is somewhat softer at the beginning of the cooking period. It is really best not to break or cut the curd until it has been firmed very slightly by heating. It may be necessary to

increase the cooking temperature to 115° F. in making this type of cheese as the curd is somewhat difficult to firm. The curd must be stirred very gently or the curd pieces will break up into extremely fine milky particles. Best results are obtained when a uniform temperature is maintained with as little stirring as possible. If the curd is salted immediately after washing do not stir the curd any more than is necessary to mix the salt with the curd.

Rennet type cottage cheese is characterized by its mild acid flavor. The individual curd particles should be distinctly visible and in the aggregate suggest the appearance of popcorn. The body is meaty but not tough or rubbery and the cheese is free from hard gritty particles.

USING PASTEURIZED SKIM MILK

Pasteurized skim milk is not so desirable as raw skim milk for the manufacture of cottage cheese in the home. The pasteurization process destroys most of the bacteria present in the milk and the coagulation period will be unduly prolonged. If pasteurized milk is to be used, the pasteurization temperature should not have exceeded 145° F. If skim milk is secured from a creamery or milk plant to be used for cottage cheese be sure it has not been pasteurized at a high temperature. Good-quality raw skim milk will give better results for cottage cheese making in the home than pasteurized skim milk.

DETERMINING YIELD

The yield of cottage cheese is dependent almost entirely upon the dryness of the curd and will usually vary from 15 to 20 pounds of curd per 100 pounds of skim milk. Souring the milk at too high a temperature, cooking the curd at too high a temperature or too long, will make for a dry cheese of low yield.

CREAMING

It is desirable to add cream to either type of cottage cheese before serving. Cream adds very materially to the food value of the product and also enhances the flavor and appearance.

There are two methods used to cream cottage cheese. In one case the cream is added immediately after the curd is washed and in the other case the cream is added just before serving. If the cream is to be added immediately after the curd has been washed the following directions should be followed: (1) Use equal parts of milk and cream. The cream should contain at least 28 per cent butter fat. (2) Dissolve the salt in the mixture of milk and cream.

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(3) After placing the curd in an earthen crock pour the mixture of milk, cream, and salt over the curd and place in a cool place, allowing the curd to absorb the cream and salt. The quantity of cream should be so regulated that the finished cheese will be moist but not wet and sloppy. As a general rule about one pint of the above mixture to four pounds of curd will give good results.

This method of creaming can be recommended only for farm use when ice is available so the cheese may be stored at a low temperature. Otherwise the mixture of cheese and cream will sour rapidly or deteriorate in other ways.

The most practical method of creaming cheese on the farm is to mix the cream with the cheese just before it is served. The quantity of cream and its richness are matters for the individual making the cheese to decide.

SERVING COTTAGE CHEESE

Unlike most other foods, cottage cheese can be served in a number of different ways so that people do not become tired of it even though it appears daily. Cottage cheese is much used as a dish itself. (Fig. 4.) Also it appears as an ingredient in recipes for a variety of dishes.

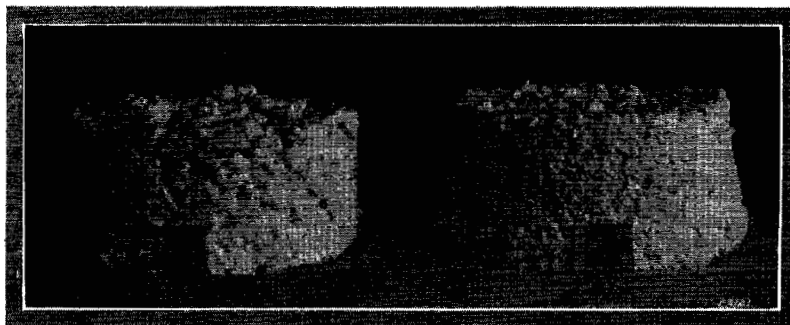


FIG. 4.—Cottage cheese ready to serve. (1) Rennet type. (2) Acid type.

Cottage cheese may be served with many kinds of salads, usually as small mounds or as cheese balls. The cheese may be used plain or it may have nuts, pimento, green pepper, parsley, and the like combined with it in various ways. For instance, chopped nuts or chopped peppers may be added to the cheese before it is made into balls. The cheese balls may also be rolled in chopped nuts. Again, a simple whole nut meat, a strip of red pimento or of green pepper,

a tiny sprig of parsley, or a dash of paprika may be placed on top of each cheese ball.

Cottage cheese pineapple salad is made by placing a cottage cheese ball in the center of a slice of pineapple on a prepared nest of lettuce leaves. Any one of the above-mentioned garnishes might be used with the cheese. Serve with mayonnaise or mayonnaise and whipped cream or French dressing.

Cottage cheese pear salad may be made in the same way, using large halves of pears instead of the slices of pineapple. It is very nice to use chopped or whole nut meats in making the cheese balls for this salad.

Cottage cheese peach salad is made in the same way as the pear salad. Instead of cheese balls, small mounds of cheese may be placed on the lettuce leaves beside the peaches.

Cottage cheese with head lettuce salad is made with cheese balls or mounds of cheese, garnished as desired. Pimento or paprika is very pretty here. More generous servings of cheese may be desired than for the fruit salads.

Cottage cheese may be used to prepare stuffed products for salads. Chopped nuts and the like may be added to the cheese before it is used for this purpose.

Prune and cottage cheese salad is made by stuffing with cheese well-cooked pitted prunes. Several of these stuffed prunes are then served on a nest of lettuce leaves with a salad dressing.

Date and cottage cheese salad is made and served in the same way as the prune salad. The dates need not be cooked.

Green gage plum and cottage cheese salad is made in much the same way. Canned green gage plums may be used here to make a desirable salad.

Green pepper and cottage cheese salad is made by stuffing green peppers solidly with the cheese. The stuffed peppers are sliced and the slices served on lettuce with a salad dressing.

Stuffed celery is made by stuffing short stalks of celery with cottage cheese. A little pimento is very nice as a garnish. Stuffed celery is often eaten with the fingers, in which case no salad dressing should be used.

Cottage cheese may also be used in the preparation of other dishes.

Cottage cheese dressing may be made with the following ingredients:

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| ¼ cup milk. | 1 teaspoonful of salt. |
| ¼ cup vinegar (not too strong). | 1 teaspoonful of mustard. |
| 1 egg. | ½ teaspoonful of paprika. |
| 1 cup soft cottage cheese. | 2 teaspoonfuls of flour. |
| 1 cup sour cream, whipped. | 1½ teaspoonfuls of melted butter. |

Mix the dry ingredients together and cream them with the melted butter. Add the creamed mixture to the heated milk and stir until very thick. After the mixture has boiled, add vinegar slowly, stirring all the while. Cool slightly and add beaten egg. Put the cottage cheese through a sieve if necessary to break up lumps. Using an egg beater, beat the cottage cheese gradually into the dressing until smooth. Lastly fold the whipped cream into the dressing.

Cottage cheese mayonnaise dressing is made by adding cottage cheese to a good mayonnaise dressing, beating until smooth. This is good with different kinds of salad, especially head lettuce salad.

Cottage cheese club sandwich is made of three good-sized slices of toasted bread, one or more being spread thickly with cottage cheese. Lettuce or water cress and salad dressing also are used. The remainder of the filling may be varied to suit the taste or the larder. The sandwich is cut diagonally and served on an individual plate with the halves arranged in diamond shape. It is desirable to toast the bread on one side only and to cut it immediately after toasting, as otherwise the pressure of cutting crushes out the cheese and spoils the appearance of the sandwich. The cut slices may be placed together again while the sandwich is being filled and the filling may be sliced through with a sharp knife. In addition to cottage cheese the club sandwich may contain:

1. Tomato, lettuce, mayonnaise dressing.
2. Thin-sliced cold ham spread with mustard, lettuce, mayonnaise.
3. Sliced tart apples, nuts, lettuce, mayonnaise.
4. Sliced oranges, water cress, mayonnaise.
5. Sliced Spanish onion, pimento, lettuce, mayonnaise.
6. Strips of broiled bacon, lettuce, mayonnaise.
7. Cucumber, green pepper, pimento, lettuce, and mayonnaise.
8. Marmalade, jelly or a paste made of dried fruits. This makes a sweet sandwich. Lettuce and mayonnaise are usually omitted.

Cottage cheese and nut roast requires:

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| 1 cup chopped English walnuts. | 1 tablespoonful of butter. |
| 1 cup cottage cheese. | Juice of half a lemon. |
| 1 cup bread crumbs. | Salt and pepper. |
| 2 tablespoonfuls of chopped onion. | |

Cook the onion in the butter and a little water until tender. Mix the other ingredients and moisten with the water in which the onion has been cooked. Pour into a shallow baking dish and brown.

Cottage cheese timbales may be made of:

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| 1 egg. | Paprika. |
| 1 cup milk. | $\frac{1}{2}$ cup of cottage cheese. |
| $\frac{1}{2}$ teaspoonful of salt. | 1 tablespoonful minced green pepper. |

Beat the egg, add the other ingredients and turn the mixture into greased molds. Set the molds in a pan of hot water and bake until the contents are firm—about 30 minutes.

Cottage cheese pie is particularly good. For the crust use:

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| 1 cup flour. | $1\frac{1}{2}$ teaspoonfuls of baking powder. |
| $\frac{1}{8}$ cup fat. | 1 egg. |
| $\frac{1}{4}$ cup sugar. | Milk. |

Mix dry ingredients, add milk enough to give consistency of biscuit mixture, line a deep pie tin and fill with the following custard:

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| 1 egg. | $\frac{1}{2}$ cup cottage cheese. |
| $\frac{1}{2}$ cup milk. | $\frac{1}{4}$ cup sugar. |
| $\frac{1}{4}$ teaspoonful of salt. | $\frac{3}{4}$ cup seeded raisins. |
| $\frac{1}{8}$ teaspoonful of soda. | 1 teaspoon nutmeg. |

Beat egg yolk and white separately. Blend yolks, milk, sugar, salt, and cheese to which soda has been added. Add spice and raisins and lastly fold in whites. A slice of stale bread may be placed on the crust before this mixture is poured in. Bake in a moderate oven.

