MAKING COTTAGE CHEESE IN THE HOME

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Cottage cheese is a nutritious and easily digested food product. If properly made and cared for, it is valued and relished by a large consuming public. Each person in the U.S. consumes an average of slightly over 5 pounds of cottage cheese per year. Made from skim milk, cottage cheese contains 16 to 20% protein, extremely small amounts of high-calorie fats and sugars. It, therefore, is quite popular and an excellent food for people who are dieting as well as an excellent protein supplement in the diet.

Rural homemakers, keeping 1 or 2 cows to supply milk for the family, are often faced by surpluses of skim milk during certain times of the year. Cottage cheese can be easily made in small batches and is an excellent way to use excess skim milk. Like most dairy products, cottage cheese is highly perishable. Therefore, it is best to make small batches frequently and maintain a fresh supply for the family table. This cheese can be made with equipment normally found in the home. Approximately 1-1/2 lbs. of cheese curd can be obtained from each 10 lbs. of skim milk. (one gallon weighs about 8.6 pounds)

Good Skim Milk is Necessary

High-quality cottage cheese can only be made from skim milk obtained from clean, good-flavored milk. Good sanitary milking practices, rapid, thorough cooling of the milk, and the use of clean, sanitized milk utensils are important to the maintenance of quality in milk. It is best to obtain skim milk by mechanical separation. If this is not possible, the milk should be cooled and kept refrigerated while the cream is rising to the top for later skimming. Skim the cream off thoroughly to prevent lost butterfat in the whey. In order to obtain larger yields of cheese curd per volume of skim milk, add, and mix in thoroughly, one to one and one-half cup(s) of instant non-fat dry milk per gallon of skim milk (optional).

When fresh skim milk is not available, it may be prepared by reconstituting commercially-available instant non-fat dry milk. Add 5-1/3 cups of instant dry milk to...
15 cups (3-3/4 quarts) of water to prepare one-gallon of milk. It is recommended that the water be boiled and cooled to the incubation temperature prior to mixing the water and dry milk. To obtain larger yields of cheese per gallon of milk, add 1-1/3 cups additional non-fat dry milk per gallon of milk to be prepared.

Cottage cheese made from raw skim milk is sometimes poor in quality because of the growth of the wrong types of microorganisms which may have contaminated the raw milk. Pasteurizing the skim milk destroys most of these troublesome microorganisms. Either pasteurize the milk immediately after it is taken from the cow or pasteurize the skim milk after separation. (See Food Science and Technology Notes entitled "Milk Pasteurization Facts" for instructions on pasteurizing milk in the home.)

Setting the Skim Milk

The coagulating (clabbering or curdling) process requires growth of certain types of bacteria with the ability to change lactose (milk sugar) into lactic acid, which is a sour compound. When enough lactic acid has been developed in the skim milk, it coagulates the casein (which is the main protein of milk) and forms a gel. In order for the population of these acid-producing bacteria to be great enough to bring about proper coagulation in the skim milk, it is necessary to add a starter which contains the desired microorganisms. This starter can consist of freshly made cultured buttermilk sold by almost any dairy plant. Cultured buttermilk contains the desirable types of bacteria and is made under strict sanitary conditions to prevent contamination by other types of microorganisms. The amount of starter to be used depends on the method to be used, long-set or short-set.

Long-Set (overnight) Method. Regulate the temperature of the skim milk to a temperature between 68 F (20 C) to 72 F (22 C)*. Inoculate the skim milk by adding one and one-half to two fluid ounces of the starter per gallon of milk. Mix thoroughly for a few minutes in order to disperse the starter organisms. If a floating thermometer is available, leave it in the inoculated milk. Cover the container and allow it to sit undisturbed at a temperature between 68 F (20 C) and 72 F (22 C) for from 12 to 16 hours until the milk gels.

This method might be ideal to some persons because it is possible to set the milk in the evening and process it into cheese curd the following morning.

Short-Set Method. This method makes it possible to begin the inoculating-setting steps during the morning and completion of cooking during the afternoon. Warm the skim milk to 90 F (32 C). Add 6 to 8 fluid ounces of starter per gallon to the milk and mix thoroughly. Place the container of inoculated milk in a larger container of water having a temperature of 90 F (32 C) and of sufficient depth to equal the depth of the milk in the milk container.

Check the temperature of the milk each hour; if below 90 F (32 C), remove some water from outer pan and add enough hot water to raise the average temperature of the water to 90 F (32 C); repeat if necessary. Four to six hours will be required for the milk to gel.

*F refers to degrees Fahrenheit and C refers to degrees Centigrade.
Checking Curd for Readiness

The coagulated mass should consist of a firm gel (having the appearance of "milk-jello"). It will produce a sharp, smooth break as a thermometer is inserted on a slant and lifted slowly while slanted.

The flavor should be mildly and pleasantly sour at this time. Also, it should have a mild aroma caused by the flavor and aroma compound, biacetyl, produced by certain other bacteria while the acid-producing organisms were producing lactic acid.

Processing the Curd

The manner in which the curd is handled from this point depends on the type of cheese desired.

Schmierkase. If a smooth, finely grained cheese, commonly called Schmierkase (also known as pot cheese, Dutch Cheese, or bakers cheese) is desired, the coagulated curd is simply stirred until smooth, heated slowly to between 110 F (43 C) and 120 F (49 C), and then ladled or poured into tightly seamed muslin bags. The bags are then hung in a cool place until enough whey has drained from the curd to produce a smooth, pasty-bodied cheese. Add salt at the rate of 1 teaspoon to each pound of curd and mix well. Light cream may also be added to suit the taste. This cheese usually has a sour taste; if less acid flavor is desired, soak the bagged curd in cold water for a few minutes, then drain as before. Repeat if necessary until the desired degree of acid is obtained.

Cottage Cheese. Cut the curd in cubes. Most curd is cut, and the finished cheese resembles small kernals of popcorn. The size of the finished curd particles depends on the size of the cut. Large curd particles result when the curd has been cut into 3/4" cubes or larger. Small curd (country style) particles require a curd cut of 1/2" to 1/4". Regardless of the size desired, the coagulated mass should be cut into fairly uniform cubes, because variable size curd particles will "cook out" at different speeds. Cut the curd with a long bladed knife as illustrated below:

![Diagram of Positions of Knife in Cutting Curd]
Cook the curd. As soon as the curd is cut, clear whey will begin to appear between the curd particles. Allow the curd to set quietly for 10 minutes. During this time enough free whey will be expelled from the curd to make stirring easier. Freshly cut curd is fragile and will break easily if stirred excessively, particularly when not enough liquid is present. Adding 1" to 2" of warm water 120 F (49 C) to 125 F (51.6 C), poured down the sides of the container on the top of the curd while the cut curd is setting idle will aid subsequent stirring.

Heat makes the whey separate rapidly and aids in developing a firm body in the curd. If a relatively small container of curd is being processed, set the container in another vessel of warm water. Apply heat to the water and gradually increase the temperature of the curd and whey within a period of 1 hour to about 120 F (49 C) to 130 F (54.5 C). If a large container is being used, and direct heat is being applied to the bottom of the container, be careful to apply low heat slowly, making sure that the curd does not stick to the sides and bottom. Stir slowly at first with an appropriate spatula. As more whey is expelled and curd becomes firmer, there is less likelihood that it will be broken by stirring. Stir often enough to prevent the curd particles from settling to the bottom and matting together. If properly heated and stirred, the curd particles will retain their original shapes. Increasing the heat slowly during the cooking process is important for the removal of whey from the center of the cubes of curd. Too rapid heating will cause the surface to toughen and prevent passage of whey from the inside resulting in soft interiors, tough exterior coating, and a sour flavor.

To determine when the curd is sufficiently cooked, drop a few cubes into a cup of ice water. Allow a few minutes for the curd to cool. When the curd particles appear to be moderately firm and meaty, the cooking process is complete. Do not cook too long since this can cause the cheese to be dry and grainy.

Draining and Washing the Curd. Remove the container from the heat and allow the curd to settle. Pour off the whey, leaving only enough to float the curd. Add cold tap water to equal the volume of whey removed. Stir the curd in this first wash water for 10 minutes. Allow to settle, and pour off most of the water. Again add cold water (ice water is preferred if it is available) until the contents are equal to the original volume. Stir for 10 minutes and allow the curd to settle. Pour off the second wash water, and drain in a colander or through a cheesecloth until the water stops dripping freely--usually 20 to 30 minutes.

Cream and Salt the Curd. Empty the curd into a bowl and add sweet cream and salt to taste. Usually 4 to 5 ounces of light cream and 1 teaspoon of salt to each pound is sufficient. Mix the cream and salt thoroughly into the curd, cover the bowl, and keep refrigerated until used. If good sanitary precautions are used throughout the manufacturing process, the cheese should keep under refrigeration for 1 to 2 weeks without spoilage.