HOW TO MAKE CHEESE

ON THE FARM AND IN THE HOME
"HANSEN'S" DAIRY PREPARATIONS
for Farm and Home

Ask your local Druggist or Grocer for them . . . Also for "HANSEN'S" Butter Color . . . If you cannot get "HANSEN'S" Dairy Preparations locally please order direct from us.

"HANSEN'S" Cheese Rennet Tablets; a reliable, highly concentrated form of rennet, particularly convenient in Cheesemaking on the Farm.

Sold in packages of 24 or 200 Tablets

"HANSEN'S" Cheese Color Tablets are especially convenient. They impart to the cheese an appetizing yellow shade. Sold in packages of 12 tablets.

"HANSEN'S" Lactic Ferment Culture is used to make a good clean flavored "starter." Sold in single packages, and shipped only from factory in Milwaukee.

"JUNKET" Rennet Tablets, well known for the highly nutritious rennet-custards, ice cream, etc., they make. They are also widely used in making Cottage Cheese. One-tenth the strength of "HANSEN'S" Cheese Rennet Tablets. Sold in packages of 10 Tablets at grocers or druggists.

CHR. HANSEN'S LABORATORY, Inc.
LITTLE FALLS, N. Y.

MILWAUKEE, WIS. TORONTO, CAN.
Cheesemaking is an art; experience the best teacher.

The art of cheesemaking is nearly as old as our civilization. Cheese is mentioned in the Old Testament (I Samuel 17:28), and we have exact recipes for the manufacture of cheese from the first century after Christ. Today cheesemaking has become a world-wide industry, and many hundreds of different varieties of cheese are known.

Of all these types, we can here describe only a few, first briefly discussing the points that are common for practically all cheesemaking, namely: the MILK, and the RENNET which curdles the milk and enables us to separate the curd from the whey.

THE MILK

First of all, good clean, sweet milk from normal cows in good health, is absolutely necessary for making a real first class cheese. There are a few very important points which should always be kept in mind, such as:

1. Cleanliness in milking, and in handling milk.
   (Read “Selection of Milk,” page 6).
2. Proper cooling of the milk—well cooled but not frozen.
3. Clean and scalded utensils, cheese vat, etc.
4. Flies should be avoided; they are enemies of good milk.
5. The milk should be ripened only to the proper degree. Sour milk that cannot be boiled without curdling should never be used.

It is well known that the milk from a cow just before calving, and a week or so after, is completely changed in composition and properties. This milk is known as Colostrum Milk, and cannot be used in Cheesemaking.
THE RENNENT

Next to good milk
---and experience of the cheesemaker
---comes good Rennet;
it has a powerful influence
on the quality of the cheese.

Rennet is added to milk to curdle it so that the whey may be
drained off and the remaining solids made into cheese. The time it
takes, after rennet has been added to the milk, until the curd is firm
enough to be cut, is called “the curdling time.” While in making
American Cheese, enough rennet should be added to the milk to make
it curdle within 25 minutes, each variety of cheese requires a different
curdling time. For instance, Cottage Cheese may require as long as
12-16 hours. Therefore, the amount of rennet used varies. In addition (1) temperature and (2) acidity of the milk have a very definite
influence on the speed with which the rennet acts.

The temperature of the milk—For most varieties of cheese the
temperature of the milk at the time of adding rennet is 86° F.

If the milk is too cool, it will retard the rennet action and take too
long to curdle, so that the curd will need a longer time to expel the
whey, and there will be a loss in the amount of cheese obtained.

If milk is too warm when adding rennet, the curdling time will be
faster, and the curd will firm up too quickly to handle conveniently.

The acidity of the milk—All milk, from the time it is drawn
from the cow, has a certain amount of acidity—it does not necessarily
have to be sour to the taste. The warmer milk is kept the more acid
is developed by the lactic acid bacteria which are in all milk.

The higher the acid development in the milk, the less rennet will
be needed. Likewise, the lower the acid development, the more ren-
net will be needed. Therefore, in the winter, when the temperature is
such that the acid development in the milk is very slow, more rennet
will be needed, or the temperature of the milk will have to be raised
to develop a little more acidity before adding the rennet.

A properly balanced curdling process results in curd with just the
right body, firm but not leathery, so the whey will drain off properly.

The action of rennet is not confined to curdling the milk; it has
proven beneficial in the whole curing process, and helps in making
that soft mellow body found in a well cured American Cheese.
HOW TO ADD CHEESE COLOR AND RENNERT

An important part in making cheese

First add "HANSEN'S" Cheese Color

1. Dissolve each "HANSEN'S" Cheese Color Tablet in 2 ozs. cold water. (Experience must show you just how much color you need to get the shade you want). If less than one tablet is used at a time, cut in half or quarters.

2. When Cheese Color Tablet is completely dissolved—add solution to the milk. Stir very thoroughly to distribute it evenly before adding the rennet.

Then add "HANSEN'S" Cheese Rennet

3. Dissolve each "HANSEN'S" Cheese Rennet Tablet in 1/2 pint cold, clean water. Never dissolve more than you can use within one-half hour.

4. When Rennet Tablets are completely dissolved, pour solution into the milk very slowly in a fine stream, stirring the milk vigorously, to quickly distribute the solution evenly. After all rennet is added, stir for a few minutes, to distribute thoroughly the rennet solution.

Let set until "Clean Break"

5. Then, in order to get an even curd, stop all agitation in the milk. Cover the vat until curd is ready. See that no cold air comes in through windows or doors.

Do not start cutting until Curd gives "Clean Break" when forefinger is inserted in curd and lifted gently.
During the past several years there has been a revival of interest in the manufacture of dairy products on the farm. American or Cheddar cheese has received particular attention in many communities in Texas. The results secured, however, in the farm manufacture of American cheese have not been entirely satisfactory in many instances. The reasons for the varying quality has been due largely to a lack of uniform methods of manufacture and a lack of proper curing facilities.

The author of this bulletin has had the opportunity of judging farm cheese at various shows held in the Panhandle of Texas, and also the opportunity of meeting at various times with the home demonstration agents of West Texas and discussing the problems of cheese making under farm home conditions. The methods of manufacture herein enumerated are the results of considerable study and actual manufacture of American cheese under farm conditions.

The manufacture of quality farm cheese involves three distinct processes, namely: selection of the milk, the manufacturing process, and the curing of the cheese. Each process will be discussed separately. Since cheese making is an art in itself and conditions vary in different sections, the cheese maker will often find it necessary to make minor adjustments in some of the actual manufacturing processes. However, the maker should remember that there are no short cuts to the method described, and that careful attention should be given to each detail.

Selection of the Milk. American cheese is made from whole milk. Milk for cheese making should be of the highest quality possible. The milk should be produced from normal cows in good health. The cows should be groomed before milking, especially if there is any coarse dirt adhering to the flanks and udder. The udder and teats should be cleaned with a damp cloth, preferably dipped in a chlorine solution. The milking should be done in a clean sterilized milk bucket, preferably a small top bucket. Then the milk should be strained through a clean cheese cloth. The cheese cloth should have been boiled to sterilize it and should be made into a pad of at least four layers of cloth for most effective straining.

*We are indebted to Professor Renner, Head, Department of Dairy Manufactures, Texas Technological College, Lubbock, Texas, for privilege of using these instructions.
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All utensils used in milking and storing the milk should be thoroughly sterilized either by boiling water or a chlorine solution before use. The chlorine solution can be purchased at any drug store or creamery. Directions for use as a sterilizer of dairy utensils are given with each bottle of solution.

The milk should be cooled immediately after milking to as low a temperature as possible; 60° F. will be sufficient and is about as cold as the milk can be cooled under average farm conditions. If impossible to cool to this temperature, then only the morning's milk should be used. Where the amount from one milking is not sufficient to make cheese, the previous night's milk should be cooled and held over until the next morning, then mixed with the morning's milk.

The selection of milk is one of the most important points in the manufacture of cheese, and extreme care should be used. The milk should be free from any off flavor and should be absolutely clean and free from harmful bacteria. If the milk is of poor quality, the cheese will also be of poor quality, regardless of the care used in the actual manufacturing and curing processes.

Apparatus Required. The following equipment is essential:

1 thermometer guaranteed accurate to two degrees Fahrenheit. This is especially important as the ranges in temperatures employed in cheese making are within narrow limits, and the temperatures used will affect the manufacturing process to a great extent.

1 box @ 24 “HANSEN’S” Cheese Rennet Tablets to set the milk.
1 vial @ 12 “HANSEN’S” Cheese Color Tablets.
1 five gallon container to be used as a cheese vat. This container should be of heavy tinned material and preferably rectangular in shape. If any quantity of cheese is to be made, it would pay to have a local tinner construct a regular cheese vat. In this case it should be a double vat so constructed that water can be used as a heating medium. The outside shell should be made of Armco iron, and the inside shell of heavy tin. Leave one inch on the sides and bottom between the two shells and seal the tops together. If only a few cheese are to be made, a good, clean wash boiler will answer the purpose.

A five gallon container is suggested, as this amount of milk will give enough curd to enable the manufacturer to handle a mass sufficient to keep and maintain the proper temperatures during the manu-
facturing periods. A smaller amount of milk yields such a small amount of curd that temperature control is extremely difficult.

1 long piece of galvanized wire.* This wire should be long enough so that when the ends are bent at right angles the bottom will be the same width as the cheese vat, and the vertical ends will extend high enough above the vat to form good hand holds.

1 deep pan, rectangular in shape, with a hole punched in the bottom near one end to allow whey to escape. This is to be used in the cheddaring process. The top or bottom of an old-fashioned roasting pan is very good.

1 cheese hoop for holding the curd during pressing. If a large quantity of cheese is to be made, a regular cheese hoop can be purchased for a small amount; however, an ordinary one-gallon syrup bucket will do. Trim the top smooth and cut out the bottom. Punch a few holes in the sides to assist the whey in draining.

2 round wood followers or circles just slightly smaller than the diameter of the syrup bucket. The follower for the bottom of the hoop should have small holes drilled through it about $\frac{1}{8}$ inch in diameter.

1 ordinary flat iron or a piece of heavy iron bar to be used in making the hot iron test.

1 cheese press—a common lard press is very satisfactory. However, an automobile jack can be used to advantage, provided the proper leverage can be used. A simple method for making a home made press is described under “Pressing the Curd.”

Cheese cloth for bandages and unbleached muslin for cap cloths.

If you wish to make cheese regularly in somewhat larger quantities it is advisable to get an outfit suitable for the amount of milk you can employ, from a dealer in dairy supplies. Dealers can fur-

*Factory-made horizontal and vertical Curd Knives as shown in pictures, are more convenient.
nish an outfit similar to the one pictured below, which consists of a 20-gallon heating vat, press, hoops, etc.

**Ripening of Milk.** Fresh clean milk is usually low in acidity and in order to secure the proper amount of acidity, it is necessary to add a small amount of "starter." This starter can be secured from almost any milk plant or creamery. A starter can be made in the home by allowing good, clean milk to stand at a temperature of 70° F. until a smooth curd has formed. The curd should be free from gas holes, and there should be no whey present.

A more uniform and reliable starter can be easily made with commercial lactic culture, which incorporates to milk desirable lactic acid organisms. Simple directions are sent with each package.

Add about one per cent of good starter to the milk. One pint of starter is required for five gallons of milk. Make certain that the starter is of good quality. A poor starter should never be used. Allow the milk to stand for about thirty minutes, and during this time bring it to a temperature of 86° F.

Color is added at the rate of from one-half to one teaspoonful to five gallons of milk. If the color is in tablet form, read the directions carefully before adding. The color should be diluted in about ten or twenty times its volume of water. The color should be very thoroughly mixed with the milk.

**Addition of Rennet.** See also page 5. The amount of rennet to add may vary, but as a usual rule $\frac{1}{2}$ of a Cheese Rennet Tablet
dissolved in about 4 ozs. of cold water is sufficient for five gallons of milk. Enough rennet should be added so that the curd will be ready to cut in from twenty to twenty-five minutes. The diluted rennet should be poured into the milk in a small stream and the milk stirred continuously for two minutes, in order to get an even distribution of the rennet throughout the milk.

**Cutting the Curd.** The curd should be cut when the curd will pull away from the side of the vat by light pressure of the back of the hand.* The most accurate method is two and one-half times the period from adding the rennet until the first thickening appears.

*Example:* Rennet added at 8:00 A. M.  
First thickening at 8:10 A. M.  
2½ times 10 minutes = 25 minutes.

The curd should be cut as uniformly as possible into cubes from ⅜ to ½ inch in size. First cut lengthwise into ½ inch strips with the spatula. Then cut crosswise into ½ inch strips with the spatula. Take the bent horizontal wire and cut lengthwise of the vat. Have the bottom of the wire on the bottom of the vat. Raise each handle ½ inch and cut again. Repeat the operation raising the wire handles ½ inch

*Another test, often used, is the “clean break”, as shown on page 5. C.H.L.*
at each operation until all of the curd has been cut with the horizontal wire.

About three minutes after cutting begin to gently stir the curd to prevent its matting back together. At this stage it is best to use the hands in stirring the curd to prevent excessive breaking up of the curd.

After about ten minutes of hand stirring, apply heat very gradually to the milk raising the temperature about one degree Fahrenheit each five minutes. If the curd appears to be contracting quite rapidly, the temperature may be raised two degrees each five minutes. Good fresh milk, however, is usually low in acidity and requires more time for raising the temperature than milk which has been held over night.

**Temperature of Heating.** Four per cent milk should be heated to about 98° F. Five per cent milk should be heated to about 100°-102° F.

The temperature at which to heat will depend upon the firmness of the curd. Usually the richer the milk the higher the temperature required. The time required for bringing the temperature of the curd from 86° F. up to the final temperature of 98° to 100° F. should take from 40 to 60 minutes. The fresher the milk the more time required. The curd should be continually stirred during the heating process and held at the final heating temperature with continual agitation until the whey is ready to be removed.

**When to Remove the Whey.** The whey should be removed from the curd when the curd has contracted to about one-half its original size. The curd should be firm and when pressed together between the hands the curds should show no tendency to stick together. The
curds when rubbed on a clean, hot iron and drawn away should show fine threads about 1/8 inch long. If an acidity tester is available, the acidity of the whey should be from 0.16 to 0.175 per cent acid.

The whey can be removed by either dipping or pouring. Pouring is more rapid. A wooden rack with slats placed 1/2 inch apart makes a good drain rack. Place a coarse muslin cloth over the slats and pour whey and curd on the rack. Allow the free whey to escape. Keep the curd agitated by stirring with the hands during the draining process.

Cheddaring Process. The cheddaring process is the main distinctive feature of this type of cheese making. When the free whey has drained from the cheese on the drain rack, remove the curd to the roasting pan. Care should be taken that the curd does not cool off during the draining and cheddaring process.

The curd is piled evenly in the roasting pan to a depth of from six* to eight inches. Cut a small channel through the center of the cheese about two inches wide and lengthwise of the pan in order to allow the whey to drain towards the hole in the end of the pan. Spread this curd evenly on top of the curd on each side of the channel. The pan should be slightly tilted to facilitate rapid removal of whey.

In order to keep the cheese at a temperature of 98° to 100° F. during the cheddaring process, place the pan containing the curd in the upper shelf of the stove oven and turn on enough heat in the oven.

*The ordinary roasting pan will allow piling of the curd to a depth of only 4 inches.
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in order to keep the cheese at a temperature of 98° to 100° F. It will require careful heat regulation in order to get desirable results. Too much heat will ruin the cheese at this stage. Place a pan on the bottom shelf of the oven to catch the whey which will drip from the curd.

After the curd has firmly matted together which usually requires about twenty minutes, cut the curd into blocks about six to eight inches long and turn them over so that the top of the curd will be underneath or next to the bottom of the pan. Turn the pieces of curd about every fifteen minutes and at the end of the third turning pile the blocks of curd two deep. In another fifteen minutes repile three deep, unless the curd appears very moist. If the curd appears moist, do not pile over two deep, but if it appears dry pile three deep. In repiling always put the top block of curd on the bottom and the bottom on the top.

The temperature of the curd should never be allowed to go below 90° F. Keep the thermometer inserted in the curd during the cheddaring process and note that the temperature is kept above 90° F, and below 100° F.

The cheddaring process is completed when the whey shows an acidity of 0.5 to 0.6 per cent or when the curd shows strings from one-half to one and one-half inches long on the hot iron test. In either test the curd should tear apart like the breast meat of a chicken. When the curd reaches this stage, it is ready to mill or be cut up into small pieces.

Milling the Curd. The curd should be cut into small pieces about 1/2 inch wide by 1 to 1 1/2 inches long. This can be done readily with a butcher knife. After cutting the curd stir the curd thoroughly until it does not mat back together. It usually requires about fifteen minutes stirring before the curd is ready for salting.

Salting the Curd. The amount of salt to add to cheese depends upon several factors chief of which is the amount of curd. Usually from 2 to 3 ounces of salt will be sufficient for the curd from five gallons of milk. The salt should be rather coarse and flaky.

Spread the curd on the bottom of the roaster and cool to 86°-90° F. The salt should be put on in at least two applications. Stir the curd thoroughly after each application and give the salt time to dissolve. It will require from twenty to thirty minutes to get the salt dissolved. After the salt is thoroughly dissolved the curd is ready for the press.
Pressing the Curd. While the salt is dissolving prepare the curd hoop. Line the hoop with clean cheese cloth allowing a lap of about one inch on the side. The cheese cloth should extend about 1/2 inch below the bottom of the bucket to be used as a cheese hoop. Place one of the wooden followers on the bottom of the lard press or on the floor if an auto jack is to be used. Fold the bottom of the cheese cloth neatly over the top of this wooden follower and place a small cheese cloth circle over the neatly folded edges.

The curd should have a temperature of about 85° F. at the time it is placed in the hoop. Press the curd into the hoop with the hands. Fold the top of the cheese cloth neatly over the top of the cheese and place a wooden follower on top of the cheese.

A home-made lever press, as outlined in the diagram, may be made of a plank or bar, one end of which is stuck under a piece of board and nailed on the wall while at the other end a weight is applied which may be moved in and out to regulate the pressure. The hoop is placed under the plank near the wall. It is important that the pressure is applied straight so as to make the cheese even and not one side lower than the other.

Apply pressure gradually until the whey runs freely. When the whey stops flowing, apply pressure until it starts flowing again. This gradual application of pressure is continued until no more whey flows from the curd.

Diagram for Lever Press
Dressing the Cheese. After about forty-five minutes of constant pressure the curds should be firmly cemented together. Remove the curd hoop from the press and lift off the wooden follower. The cheese cloth bandage is gently pulled up around the cheese in order to remove any wrinkles that may have formed. The top is folded over and trimmed with the scissors to form a lap of one-half inch. Place a cheese cloth circle over the top of the cheese, replace the wooden follower, and apply full pressure for eighteen hours.

Drying and Paraffining. The cheese is taken from the press and placed in the curing room. The cheese should be placed on a clean board shelf and turned once each day. Wipe the board clean each time the cheese is turned. When the outside of the cheese is dry, it is ready to be paraffined.

The paraffin should be heated to a temperature of 210° to 220° F. The cheese should be turned on its side and slowly turned around until a smooth even coat of paraffin is applied. This is best accomplished by having the paraffin in a deep pan. After the paraffin has been applied to the sides of the cheese, then dip each end into the paraffin.

Interior of Modern Cheese Factory
(Courtesy Stoelting Bros. Co., Kiel, Wis.)
Curing the Cheese. One of the most difficult problems in the manufacture of farm cheese is to secure the proper curing facilities. Cheese should be cured at a temperature of from 50° to 55° F. and in addition the room in which it is cured should have a relative humidity of about 85. However, the room should not be damp. The curing process will take from six to twelve weeks, depending entirely upon the temperature of curing and the desired flavor. The longer the curing period, the more characteristic becomes the flavor of the cheese. The cheese should be turned at least once a week during the curing period and if any mold growth appears, it should be washed off with a 10 per cent formaldehyde solution.

In many cases it may be possible to secure space in a local cold storage plant, creamery, or milk plant. This would be the ideal method of curing the cheese, but will require a slightly longer curing period due to the lower temperature at which these storage rooms are usually kept.

The quality of the finished cheese will depend largely upon the following factors:

1. Quality of the original milk.
2. The use of proper temperatures throughout the entire process.
3. The development of proper acidity as shown by the acidity and hot iron tests.
4. Sufficient pressing of the curd.
5. Proper curing of the cheese.

If the methods of controlling the above factors are carefully studied, the manufacture of American cheese under farm conditions should result in a cheese of good quality. The cheese maker will find that experience is a valuable instructor.

Common Defects in Cheese. (Their cause and remedy).

1. Sour or acid cheese—caused by milk too high in acid at the time of manufacture of the cheese. Use milk of good quality and low in acidity. Sour cheese may also be the result of not getting sufficient whey removed from the curd. This can be remedied by cooking at a higher temperature and cutting the curd into smaller pieces.
2. Bitter cheese—caused by undesirable bacteria which are present in the original milk. Take all precautions to see that the milk is produced under sanitary conditions.

3. Sweet or fruity flavor—caused by lack of proper cleanliness of utensils used in the manufacture of the cheese and also by lack of development of the proper acidity during the process of manufacture.

4. Open texture—usually caused in farm cheese by pressing at too low a temperature or not applying sufficient pressure to the curd.

5. Pasty body—caused by not properly firming the curd during manufacture which causes an excess of whey to remain in the curd. Usually associated with a sour or acid cheese.

All of the above defects are intensified by improper curing of the cheese. High curing temperatures above 55° F. will help materially in developing flavor defects.

COTTAGE CHEESE ON A SMALL SCALE

"JUNKET" Rennet Tablets make a convenient form of rennet to be used in making small amounts of Cottage Cheese. Following is a method used by U. S. Government teachers:

"Any small amount of skim milk may be used for Cottage Cheese, using a tablespoonful of good sour milk and one-eighth of a "JUNKET" Rennet Tablet. Directions as follows:

"Take one gallon of sweet skim milk, add three-fourths of a cup of clean, sour milk and stir as it is put in. Raise the temperature in hot water to 75° F., using a dairy thermometer. Remove from heat and place where it is to remain until set. Add one-eighth of a "JUNKET" Rennet Tablet thoroughly dissolved in four tablespoonfuls of cold water; stir while adding. Cover with cloth and leave from 12 to 16 hours in even temperature, about 75° F. There should be a slight whey on the top and when poured out the curd should cleave sharply. Drain through cotton cloth, not cheesecloth. When whey has drained out, work in one or two teaspoonfuls of salt to the cheese, according to taste. 1 1/2 to 2 pounds of cheese should be obtained from a gallon of milk."—American Cookery.
**SWEET CURD COTTAGE CHEESE**

**Milk Used.** Sweet, clean skim milk is pasteurized to 145° F. for 30 minutes, or flash pasteurized at 160° F. It should then be cooled to 68-72° F., which temperature is best suited to growth of lactic acid organisms.

**Adding the Starter.** When the milk is adjusted to the correct temperature one half of one per cent to one per cent starter is added. The milk is stirred thoroughly so that the starter is well distributed. The starter should be prepared from “HANSEN’S” Lactic Ferment Culture.

**Adding the Rennet.** After adding the starter, add the rennet. One “JUNKET” Rennet Tablet (household rennet) contains the right amount of coagulant for about 500 pounds of milk. “HANSEN’S” Cheese Rennet Tablets have approximately ten times the strength of “JUNKET” Rennet Tablets and a single Cheese Rennet Tablet is sufficient for 5000 pounds of milk. “JUNKET” Rennet Tablets and Cheese Rennet Tablets dissolve readily in a tablespoon of cold water—never use hot water. Dilute this solution with fifteen to twenty times its own volume of pure, clean water, and use immediately after tablets are dissolved, as it will not keep well if held from day to day. Add the mixture of water and rennet to the milk and stir well.

**Cutting the Curd.** About 12 to 14 hours are required for the milk to curdle to what a cheesemaker terms a “clean break”. This is determined by inserting the finger in the curd obliquely and on raising, the curd should break fairly clean over the finger. At the time of cutting the acidity of the whey should be 0.5 to 0.6 of one per cent. Horizontal and vertical knives are used to cut the curd in cheddar fashion, into cubes 3/4” to 1” in size. Care should be taken when inserting knives to avoid breaking the curd.

**Cooking the Curd.** The curd is heated very slowly and stirred only occasionally to insure even distribution of heat. If temperature is raised too rapidly a tough cooked film will surround each particle making it impossible for whey to escape from center of the curd. Raise the temperature at rate of 10° per hour, stirring by hand or with a board which may be used as a scraper to lift cheese from bottom of the vat. As curd particles become firmer heat can be applied more rapidly and stirring done with a rake.
When is Curd Sufficiently Cooked? No two curds are exactly alike. Sometimes 110° F. is high enough and then again a temperature of 140° or even 150° F. may be required. One of the first indications of sufficient cooking is that most of the curd will sink to the bottom, due to whey being expelled, making the curd heavier than the whey it displaces. Break open a particle of curd. It should, when finished, break clean, leaving a glossy, smooth surface at the breaking point. A handful of curd cooled in water will tend to shrink and when released after pressing in the hand, the particles will spring apart and retain original shape.

Washing the Curd. Push the curd to back of vat, make a channel through the middle and drain exactly as in draining a cheddar cheese vat. Wash the curd two or three times in cold water to remove all traces of whey. No pressing or draining of any kind is required except to allow curd to drain about fifteen to twenty minutes. Cool to 30 to 40° F. as soon as convenient.

Creaming and Salting. After cooling, a small amount of sweet, rich cream may be added. Mix the cream and curd thoroughly. When adding the cream also add about one ounce of salt to each ten pounds of curd. If cheese is dry, cold water is mixed in when salting.

CREAM CHEESE

Genuine cream cheese is made from rich cream thickened by souring, with or without the addition of dissolved "JUNKET” Rennet Tablets. The thickened cream is put into a cloth and allowed to drain, the cloth being changed several times during the draining, which requires about four days. It is then placed on a board covered with a cloth, sprinkled with salt and turned occasionally. It is ready for consumption in from five to ten days.

Another variety of Cream Cheese is made from fresh milk which has had sufficient cream added so that it has from 6 to 10% of butterfat. The milk is usually pasteurized.

The action of the starter and the rennet are simultaneous and in preparing the milk it is brought to 78° F.—most conveniently handled in a shot-gun can.

Starter is added at the rate of \( \frac{1}{4} \) to \( \frac{1}{2} \) of 1%. The rennet is added at the rate of one “JUNKET” Rennet Tablet (dissolved in tablespoonful of water) to 100 lbs. of milk. It is held at 78° F. for 15 to
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18 hours. The curd is poured into a drain cloth and drained undisturbed for 3 to 4 hours. It is then worked to the center of the cloth, the corners of the cloth tied, and cheese pressed overnight. The cheese is then worked and salt is added at the same time at the rate of 2 to 2 1/2 ozs. to 10 lbs. of curd.

It is moulded by forcing through a form attached to the end of a meat chopper and the cut pieces are wrapped in tinfoil.

ITALIAN CHEESE

Heat ten quarts of fresh milk to 85° F. and add a solution of rennet from one "HANSEN'S" Cheese Rennet Tablet dissolved in a little cold water. Let stand until the curd is quite firm, which should take about forty minutes. The curd is broken up with the hands and the mass then heated in the whey until it is as hot as your hand can stand. Then gather the curd with the hands and mat together until firm.

Remove the curd from the whey and put in your hoop. Press the curd until it shapes itself well in the hoop, then reverse it in the hoop and continue to press until very firm. Put hoop back into the whey and heat until just below the boiling point, being cautious that the mixture does not boil. Remove from stove and leave the hoop with the cheese in the whey until the mixture is cold. Then remove and let drain for 24 hours. It may then be removed from the hoop. At this stage, the cheese is often eaten. It is soft and quite palatable.

For grating cheese, rub with salt and leave on a shelf in cool temperature 3 or 4 days until dry. When quite dry, put it in a jar of strong brine for another 3 or 4 days, after which it should be put on a shelf to dry. This will take a few days more, and the cheese should be left to cure from 4 to 6 months in a jar. It should be rubbed with salt lightly about once a week during the first month.

RICOTTA CHEESE

Ricotta is a type of soft cheese, eaten fresh. It is usually made with the Italian Cheese for grating, as it is made from the whey.

Before the grating cheese, which is still in the hoop, is put back in the whey, heat the whey until a coat of cream rises to the top, after which add one quart of whole milk for whey from ten quarts of milk. Stir, and then heat until nearly boiling, but do not let it boil. When
the curd rises to the top and tends to draw away from the ends of the pan or container, add a little less than one-half cup of strong vinegar, and stir well. Before long the curd will rise to the top, after which it should be skimmed off and put in a hoop to drain for about eight hours. It is then ready to eat, and salt may be added to suit the taste.

As soon as the curd for Ricotta is gathered, the hoop containing the grating cheese should be put in the whey. The whey should be hot enough at this time so that it will not be necessary to heat it any more, but just leave the cheese in the whey to cool.

**GOAT'S MILK CHEESE**

Directions given by "THE GOAT WORLD," Baldwin Park, Calif. Use equal quantities of evening's and morning's milk and bring to a temperature of 84° F. If using "JUNKET" Rennet Tablets for a small quantity of milk use 1 to 2 tablets for each gallon of milk. If making larger quantities of cheese, use one "HANSEN'S" Cheese Rennet Tablet for 100 lbs. of milk. Should these quantities not bring about coagulation in 40 minutes, more tablets must be used next time.

When the curd shows a clean split, cut it across two ways and divide into cubes, first using a knife and then a cream skimmer.

Stir very gently with the hands for 10 minutes, being careful not to bruise the curd, and then bring up slowly to a temperature of 98° F. This process should take, if possible, 40 minutes. Stir gently all the time and continue stirring for 15 to 20 minutes after 98° F. has been reached. Squeeze a little of the curd in the hand. When the particles cohere to form a "rubbery" mass, it is time to drain whey.

Line a mould of the size desired with butter-muslin or cheese cloth, pack the curd in lightly, and, if not more than 2½ gallons have been used, put under pressure (7 to 10 lbs.) for 10 minutes. Turn out the cheese, invert it and put under greater pressure (14 to 20 lbs.) for an hour, turn out and invert again, leave under increased pressure for 4 hours. For a larger quantity of cheese, increase the pressure.

Turn out, remove cloth and trim. In warm weather, leave exposed to the air all night, in cold weather return to the mould and leave without pressure until morning. Rub all over with dry salt. In the evening, turn and salt again. Next morning, dip in brine (1 lb. salt to 1 gallon water) and put on shelf to ripen. Turn every day. In three weeks, it should be ready to use.
CHEESE FROM SKIMMILK

Many farmers who make butter, have the problem of what to do with the skimmilk. It can be made into a low cost, wholesome, palatable cheese. When sold within a reasonable time, the best paying product is Cottage Cheese. But, where distances are great, it may be worth while to make a firm cheese of the American type. Following is a general idea of changes in directions for making if skimmilk is used:

In some cases, the answer is to use half skimmilk; but at any rate, the milk should contain at least one-half of 1% fat—or 1/5 to 1/6 the original fat content—to make the cheese palatable.

In making cheese from milk with low fat content, one of the main points is to prevent it from getting hard and leathery. To accomplish this, the cheese is made so that it will retain more of the whey than if made from whole milk.

Therefore, the curd should not be cut too fine, nor heated too high, and should go to press before too much acid has developed. Skimmilk may be heated to a temperature, for adding the rennet, which is 3° to 4° lower than when whole milk is used and the curd cut just before it gives a clean break.

OTHER VARIETIES OF CHEESE

Years of apprenticeship, dairy school and practical work are necessary to make a good Swiss Cheese or Camembert. Loaf or Processed Cheese is only made in big factories, and exact recipes are kept secret. Some other varieties, although requiring considerable experience, can be made with satisfactory results on farms. We are always glad to supply any available information on other varieties of cheese.

BOOKS ON CHEESE

Cheese by VanSlyke & Price (Orange Judd Pub. Co.)
A B C in Cheesemaking by J. H. Monrad (Urner Barry Co.)
The Story of Milk by J. D. Frederiksen (Macmillan Co.)
Cheesemaking by Decker & Sammis (Mendota Book Co.)
BULLETINS ON CHEESEMAKING

The Bureau of Dairy Industry, U. S. Department of Agriculture, Washington, D. C., will send you at your request:

Varieties, Description and Analyses of Cheese. Bulletin No. 608.

Soft Cheeses That Are Easily Made. Circular No. 94. Published by Iowa State College, Ames, Iowa.

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