

# HINTS TO CHEESEMAKERS.

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Great vigilance should be exercised in receiving milk, as sour milk or milk overripe means fast heating, and fast heating means quick handling of the curd to get an even distribution of heat through the entire mass while scalding to the right temperature. A maker should insist on his patron's taking the greatest care of his milk, as it is better for a maker to ripen his own milk to the right degree of acidity. He should also make it a point to examine all cans, covers and seams once or twice a week to see that all patrons keep their cans thoroughly clean. As soon as cans are brought home they should be at once emptied and washed with warm water, then scalded with boiling water and sufficiently aired during the day to be kept sweet. Nothing but tin pails should be used for milking.

After the milk is in the vat, it should be heated to 85° Fahr. stirring occasionally to keep the cream down, and get an even distribution of heat. Then the rennet test should be applied. Where the milk is inclined to show taint, which might produce a floating curd, the ripening of the milk should be carried on further to hasten the development of lactic acid, or even a starter of sour milk or buttermilk may be used to advantage. I will here describe the rennet or cup test which is used principally throughout Canada in the cheese district. It is a good practical test, and is used to ascertain the degree of acidity, or ripeness for cheese making. This test may be described as follows: After the vat of milk has been heated to the desired temperature, take 8 oz. of milk from the vat, a teacup or small vessel to manipulate the test in, add 1 drachm of rennet extract of known strength, diluted with 1 drachm of water. Just before adding the rennet take your watch in one hand and the teaspoon containing the rennet in the other, and when the second hand of your watch comes to some known number, drop the rennet into the cup, thoroughly stirring from ten to twelve seconds, rotary motion. The

most accurate way of telling when the milk in the cup has begun to coagulate is to put a small piece of burnt match or scaleboard, or something that will float in the cup or vessel just before adding your rennet extract. By stirring, the black speck is put in motion with the milk. When it suddenly stops the milk has begun to coagulate. If it coagulates in from 25 to 30 seconds it is ready to set.

Milk that is rightly ripened will give you a better yield, as the rennet will do its work better, and will make better cheese. After operating a few tests of this kind a maker will be able to accurately understand the acidity of his milk. It is just as important that a maker should have his raw material in proper condition as for a baker to have his bread in right condition before baking.

Great care should be taken not to overripen your milk, as milk running through too fast will give you a weak bodied cheese. I have been using lately at the experimental station the Monrad test, which is sold by J. H. Monrad, of Chicago. I must say it is one of the most accurate tests I have ever used.

After the milk has been ripened, the coloring should be added diluted with warm water, using about  $\frac{1}{2}$  oz. to the 1,000 pounds of milk in the summer and fall, in early spring before grass grows and cows are on dry feed  $\frac{3}{4}$  oz. should be used. This should be thoroughly stirred in. The trade in Iowa demands a light, straw colored cheese, close and moist with good texture.

For early ripening cheese in the spring of the year use sufficient rennet to coagulate your vat of milk fit for cutting in 20 min. Dilute your rennet with water, using about two-thirds of an ordinary pailful of the same temperature as your milk. Stir your rennet well through your vat of milk from three to four minutes. Then take the bottom of your dipper and gently stir the surface for about a minute to keep the cream down, and to quiet the agitation of the milk. For summer and fall cheese use enough rennet to coagulate your milk fit for cutting in from 30 to 35 min. To test when the milk is fit for cutting insert the forefinger, and if it breaks clear over it then it is fit for cutting. Use the horizontal knife lengthways of the vat first, then wait until the whey

mostly covers the surface of the curd, then cut crossways with the perpendicular knife. Gently remove all the curd from the sides and bottom of the vat with the hands, then cut lengthways with the perpendicular knife and again crossways with the same knife. Gently stir the curd for about ten or fifteen minutes by hand until the outside of the pieces of curd show the appearance of a slight film. The greatest care should be taken in heating the curd. A maker can easily lose as much as his wages every day in the loss of butter fat that passes off in the whey. The loss is done principally after the curd is coagulated in one solid mass and cut in small cubes, not more than  $\frac{1}{2}$  in. in diameter. The fat globules on the surface of each small piece of curd are easily detached, therefore in cutting and subsequent handling any undue mangling or violence increases the amount of fat lost in the whey. Apply the heat, raising it one degree every four minutes until a temperature of  $98^{\circ}$  is reached. Great care should be taken in stirring the curd while it is soft. If you have old milk which is working fast the temperature must be raised quicker, and should be increased to  $100^{\circ}$  or  $102^{\circ}$ .

Curd should be stirred after being raised to the right temperature until it is firm to the hand, and then stirred occasionally until the whey is removed. In the spring of the year the whey should be removed at the first sign of acidity, or as Prof. Harris would say, when the acid is knocking at the door. The hot iron test is the best for discovering the first sign of acidity.

Take a piece of piping or a piece of iron a couple of feet long, heat it hot, but not enough to scorch the curd. Take a handful of curd from your vat, squeezing out the whey, press it against the iron, and if it adheres to it and on removing strings out in fine threads like hairs, the acid is developed and all whey should be removed. In the spring the whey should be removed at the first signs of acid. In the summer and fall allow the curd to stay in whey until it will string on the hot iron from one-eighth to one-fourth of an inch. Great care should be taken not to allow too much acid to develop in the vat before whey is removed.

About twenty minutes after the curd has been heated to the right temperature, part of the whey may be removed with advantage to prevent a maker from being caught with too much acid and all the whey yet to be removed.

After your whey is all run off, dip your curd into your sink, if you have one, and stir dry. If you have none use your vat, tipping it at one end to allow the whey to drain, pile your curd to the sides of the upper end, leaving your whey to gradually run off, and when the curd is amalgamated, cut it in strips about six inches wide, pile them about one inch apart, one layer deep, leaving the central drain for the whey to run off. Turn the pieces over every fifteen or twenty minutes and increase the depth at each turning by piling pieces on top of one another, or turn them oftener if whey shows on the curd.

When the curd has a soft mellow feeling to the hand, and a smell like new made butter, it is ready to grind.

A knife mill which will cut pieces in a uniform size, is preferable to a peg mill that will tear the curd apart. A knife mill gives a smooth surface, preventing a waste.

After the curd is cut it should be stirred for fifteen or twenty minutes, then the salt applied, using in the spring for early ripening cheese,  $1\frac{3}{4}$  pounds of salt, to the 1,000 pounds of milk. In the summer about  $2\frac{1}{2}$ . In the fall, when milk is very rich, use  $2\frac{3}{4}$  pounds of salt to the 1,000, to prevent a pasty cheese. After salting, stir your curd thoroughly for twenty minutes, or until the harsh feeling of the salt gives way to a mellow feeling.

Curd should be kept warm while the acid is developing, and at an even temperature. It should go to press at a temperature of about  $80^{\circ}$ . If it has any bad odors, stirring for an extra half hour will greatly help the flavor, that is, when everything is kept sweet and clean in the making room, as it should be.

Hoops should be evenly filled so as to have cheese of uniform size. Light pressure should be applied at first, gradually increasing it every ten minutes for from half to three-quarters of an hour, allowing the cheese to gradually knit together, which will give a closer body than if hard pressure be applied at once. Cheese should now be taken out, ban-

dages pulled up and neatly folded over the ends, allowing about one inch to lap over the ends, then put to press again and pressure applied. The last thing at night, about eight or nine o'clock, apply all the pressure you can. The first thing in the morning apply still more. When needing the hoops for the day's make, take out your cheese and put them in the curing room on the shelves, about one-half inch apart, so as to allow a free circulation of air.

When the curing room is kept close in the late fall and winter, opening doors or windows occasionally and allowing free circulation of pure air, is of great benefit. The curing room should be so built that the temperature of the room could be controlled during all kinds of weather and well ventilated, both at top and bottom, allowing a free circulation of air.

One of the principal things in ripening cheese is to be able to keep an even temperature. The peculiar mellow appearance of good cheese, though due to some extent to the butter it contains, depends in a higher degree upon a gradual transformation, which casein or curd undergoes in ripening. Now if this ripening process is badly conducted or the original character of the curd is such that it adapts itself but slowly to the transformation, the cheese, when sold, will be comparatively tough and appear much less rich in butter fat than it really is. A cheese that is properly made, with uniform ripening, will have that rich buttery body, also that fine, nutty flavor, which is so much desired in cheese.

Cheese should be turned on the shelves every day and carefully rubbed. When they are put in the curing room, if the head cloths are not left on, they should immediately be greased with hot grease to prevent them from cracking.

When they are sold they should be carefully weighed and boxed, using scale boards on each end, and the weights should be plainly marked on the box. Boxes should be shaved down to within a quarter of an inch of cheese.

Shelves should be thoroughly cleaned after each shipment so as to keep everything sweet and in good order.