The Makers' Corner

Butter and Cheese Makers are invited to send contributions to this department, to ask questions on matters relating to cheese making and to suggest subjects for discussion.

Experiments in Cream Cooling

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During the warm weather, when cream arrives at the creamery around 60 degrees, and sometimes higher in temperature, the importance of having proper facilities for quickly cooling the cream cannot be too strongly emphasized. The cream is, in some cases, over ripe, and although the ripening process may continue up to the time of churning, immediate chilling tends to check the development of acid which means butter of better keeping quality. In some cases it takes so long to cool the cream that it does not reach churning temperature before it is put in the churn the following morning. If the fat has not had time to solidify, the result is weak-bodied butter and a heavy loss of fat in the buttermilk.

Under our cream collecting system the cream often arrives at the creamery late in the afternoon, and the buttermaker can hardly be expected to remain in the creamery half the night stirring cream in order to get it properly cooled. In view of these facts, some system of quick cooling to check the acid would be an advantage. If the cream is pasteurized a cooling equipment is a necessity.

A number of creameries in Western Ontario (49) are provided with coolers but a considerable number still depend on vat cooling. As the number of creameries has increased and the quantity of butter doubled in the past few years, it is to be expected that some of our makers have not yet realized the importance of quick cooling as a factor in good buttermaking.

If the cream is left at too high a temperature during the night (especially if the flavor is not very good) and has not had long enough time at low temperature before churning, the buter, though it may appear good when churned, yet as a result of the excess fermentation in the cream and churning at too high a temperature, butter of poor keeping quality may be expected.

With a view of getting some information in regard to cost of cooling cream, some experiments were conducted at one of the creameries last August, a summary of which is herewith given.

COOLING WITH BRINE (CIRCULAR COOLER)

In four experiments 6,490 lbs. of cream were used, or an average of 1,622 lbs. of cream for each experiment. Cream cooled on an average from 77 to 49 degrees, in 33 minutes, at the rate of 3,125 lbs. an hour, using 387 lbs. of ice and 55 lbs. of salt. Cost of ice, $.45. Cost of salt, $.22. Total cost of ice and salt, $.67. degree of temperature cooled, 28. Cost of cooling 100 lbs. of cream one degree, $.0015.

Note.—On August 12th room temperature at three p.m., 70 degrees. Following morning, 70 degrees. Cream cooled at three p.m. to 46 degrees and allowed to stand in open cream vats for 17½ hours, at the end of which time temperature of cream had risen to only 56 degrees. Per cent of fat in the cream, 28. On August 13th room temperature at three p.m., 76 degrees. Cream cooled at three p.m. to 54 degrees, and water at 54 degrees was at this time put around the vat and cream allowed to stand for 15 hours. At the end of this time the temperature of the cream had risen to 59 degrees. This would indicate that by cooling the cream to a low temperature (46 degrees) the temperature will not rise much above churning before morning.

COOLING WITH WATER AND ICE (CIRCULAR COOLER)

In three experiments 5,050 lbs. of cream were used, or an average of 1,683 lbs. for each experiment. Cream cooled on an average from 71 degrees to 51 degrees, in 42 minutes, at the rate of 2,477 lbs. an hour, using 316 lbs. of ice. Cost of ice, $0.38. Degrees of temperature cooled, 21. Cost of cooling 100 lbs. of cream one degree, $.00104.

Note.—On August 8th room temperature at three p.m., 80 degrees. Cream was cooled at this time to 50 degrees, and allowed to stand in vat for about three hours. The temperature had then risen to 55 degrees' It was then run in churn to get vat room and remained until following morning, when temperature had risen to 58 degrees. Per cent. of fat in cream, 37.5.

COOLED WITH WATER (CIRCULAR COOLER)

In one experiment 1,600 lbs. of cream cooled from 80 to 60 degrees, in 36 minutes, at the rate of 2,624 lbs. an hour. Degrees cooled, 20. Temperature of water, 50.

Note.—July 3rd, room temperature, 80 degrees. After cream was all in vat ice and water were put around vats to cool cream from 60 degrees to churning temperature. Cost of ice not known.

In one experiment 1,700 lbs. of cream was cooled from 72 to 55 degrees in two hours and 35 minutes, using 390 lbs. of ice. Cost of ice, $0.47. Degrees cream cooled, 17. Temperature of water, 52 degrees. Cost of cooling 100 lbs. of cream one degree, $.0015.

Note.—On August 18th, room temperature, 82 degrees. After adding ice, cream was stirred continuously for one hour and 30 minutes. This reduced the temperature to 60 degrees. Cream was then allowed to stand for 40 minutes. During this period temperature was reduced one degree. Cream was then again stirred continuously for one hour and 15 minutes. Temperature was then 55 degrees.

Note.—The cost of ice and salt used in these experiments was 12 cents and 40 cents a cwt. respectively.

According to these experiments, it cost with the brine system (using circular cooler) to cool 100 lbs. of cream one degree, $.0015; with water and ice (using circular cooler), $.00104; with water and ice around vats, $.0015.

It cost equally as much to cool cream with water and ice around the vats as it did with the brine system and more than with ice and water (using a circular cooler), and it required two hours and 35 minutes' continuous stirring to cool the cream, compared with very quick cooling with either of the other systems. Practically no time was lost in stirring the cream, when the brine system or water and ice system was used.

When plenty of cold water is available, the temperature of the cream can be lowered materially with the water and cooler, but ice is also likely to be required around the vat. (Note.—Cost of ice and salt considered only.)

Further work along this line will be attempted in 1914 with pasteurized cream. No knowledge was obtained with regard to the effect of brine on the inside of the circular cooler.

Smoothing the sides of a butter print with the ladle gives the butter a greasy appearance. The same applies to smoothing the butter on the top of a tub.