

done as when a longer time is taken. At present we take from forty to fifty minutes to churn, and as a result the butter nearly always comes out of the churn nice and firm and in granular form. This, we think, pays us for the extra time taken, and if we wish it may be salted, worked and printed ready for market at once, which cannot be done if the butter comes out of the churn soft. Another cause of soft butter is allowing the cream to become too warm while it is being collected for churning. It should never be above 65° in hot weather. The time required to churn depends upon:—

1. *The Temperature of the Cream.*—The warmer the cream to about 70° the more quickly will it churn and the softer will be the butter. The lower the temperature at which the butter will come in from forty to sixty minutes (or less time) the firmer will the butter be. The right temperature for churning each churner must find out for himself. From 56° to 60° in summer will be a fair range for most cream; at present we are churning at about 58°.

2. *The Temperature of the Churn and Room.*—These have quite a marked influence on the time required to churn. The warmer the room (other things being equal) the more quickly will the cream churn. The same may be said of the temperature of the churn. If it is wished to churn at 58° the churn should be about that temperature when the cream is put in. In nearly every case the temperature rises after churning for some time, due to friction.

3. *The Relation Between the Size of the Churn and the Amount of Cream to be Churned.*—The larger the churn, or the smaller the amount of cream to be churned, the more quickly will the churning be finished. A box or barrel churn, without dashers of any kind, ought not to be filled much over one-third full.

4. *The Ripeness of the Cream.*—In reference to this latter point we have found that by raising the temperature a few degrees sweet cream may be churned in about the same time as ripe or sour cream. The loss of butter, however, will be considerable, as sweet cream to be effectively churned requires a temperature of from 50° to 55°, and one to one and a-half hours to churn.

5. *The Character of the Cream.*—Cream from strippers' milk usually takes a longer time to churn than that from fresh cows.

The lesson to be learned is, that it will pay to take a little more time at the churning and have it completely churned, and the butter firm and granular when lifted from the churn. Quick churning and soft butter nearly always go together.

Practical Buttermaking.

BY C. C. MACDONALD, SUPERINTENDENT EXPERIMENTAL DAIRYING.

I have had occasion to notice many mistakes in buttermaking in the province of Manitoba, and feel that I would not be doing my duty well did I not bring my observations along this line before the buttermakers and would-be buttermakers of Manitoba.

Having the equipment proper for buttermaking, the first matter to be considered is *cleanliness*, ever keeping in mind that cleanliness is next to godliness, and without cleanliness there can be nothing wholesome nor healthy. I feel that I cannot say too much on this subject of cleanliness and tidiness. He is a worthless being who says "anything will do, we don't have to eat it anyway." The buttermaker should exercise woman's pride in being neat and tidy about his work, and entertain a creepy dislike for anything greasy—a greasy dishcloth, a yellow strainer. My remarks as I proceed will bring out the terrible mistakes that I have actually seen and smelled during my tour through the province.

SETTING MILK FOR CREAMING.

Where a separator is not in use, great care must be exercised in handling the milk in order to recover all the butterfat. The milk should be properly strained, and set immediately as it is drawn from the cows. A delay of fifteen or twenty minutes between milking and setting will cause a loss of one per cent., and often one and a-half per cent. of butterfat that will not be recovered, and will be retained in the skim milk. I have had people say to me, "Oh, well, the calves got it"; quite true, but no intelligent dairyman will feed calves and pigs butterfat worth 25 cents per pound, if they are making butter for profit, when there are cheaper foods that will answer the purpose of raising a calf, after it has had a start of three weeks in springtime, just as well as butterfat.

In order to get all the cream to the top of the setting-can the milk must be set at a temperature of from 94° to 98°, the temperature surrounding the milk should be as low as at least 45°, and a lower temperature is better. The milk should be set twelve hours, and all the cream should be raised in that time, if the above rules are carried out. It is a mistake that many dairymen make to think they must have the milk setting until it is sour, and some have it until it shows some of the colors of the rainbow. No cream rises after the milk has become *sour*. The cream should be taken off while the milk is sweet. The atmosphere of the creaming room should be moist; if not, the top of the cream will become dried out and tough, and thereby cause a serious loss in moisture. This toughness in

the cream is often considered by some dairymen as richness on account of its being tough, but a great deal of the richness and flavor have gone out of it, caused by a dry atmosphere in the room.

The skimming should be done with a conical shaped dipper, which is far superior to a perforated skimmer. The cream when removed from the milk should be placed in a pure, sweet, clean vat or can to mature before churning. Where the churning is done every day, the cream should be set for twelve hours at a temperature of 68° to 70° for summer buttermaking. When the churning is done twice or three times a week, the cream should be thoroughly mixed for twelve hours before churning, in order that the cream from the different days' milk will all be matured alike. If *sweet cream* be added to the *sour* just before churning, there will be a loss in the buttermilk of nearly all the fat that the *sweet cream* contained. It takes longer to churn sweet cream than it does to churn sour cream, and when the sour cream butter has broken and formed into butter the fat of the sweet cream is still held in suspension in the buttermilk.

The temperature of the churning should be 58° for summer and 60° to 62° for winter. The cream should in all cases be strained into the churn—the straining will do away with white streaks in the butter to a very great extent. The churning should not last more than fifteen minutes, i. e., the cream should be in such a condition at such a stage of maturity that the butter will come in fifteen minutes. When the butter appears in the churn as granules about the size of clover seed, the contents of the churn should be cooled about 2° by adding ice water, then the churning continued until the grains of butter are as large as plump wheat, then the churning is done. I wish to emphasize this: *Never churn butter past the granular stage; keep this always in mind as thoroughly as your duty to Heaven.*

When the churning is carried so far that the butter is in one solid mass in the churn, the grain, the texture of the butter, is ruined, and the article is inferior.

The buttermilk should be drawn off, and about the same quantity of water at a temperature of 45° should be added, and then give the churn half a dozen rapid turns, and then draw the water off; usually one washing is sufficient, but should the first water appear milky, add a second washing. The water should be pretty clear when it is drawn from the churn.

After the butter is thoroughly drained, it may be taken out and salted—use nothing but pure salt of the best brand. In salting butter just put the salt on and work the butter enough to mix the salt through it; this will take but one or two workings. Salt at the rate of three-quarters to one ounce to the pound of butter. Never put salt on by guess, or you may get "pound for pound," and I have often tested butter that had nearly that indication. Salt is heavy stuff, but large quantities do not taste good. Weigh every thing, and test all temperatures with a correct thermometer. (The finger is not nearly so sensitive as mercury, and, therefore, is not a safe guide.)

After the salt is mixed through the butter, the butter should be placed in a tub or something of that sort, and set aside for four or five hours to allow the salt to work through it. Never try to force the salt into the butter, for in so doing the grain of the butter is injured. Now the butter may be again placed upon the worker for the last time. It should not be worked very much—the best butter is made by least working. Never *claw*, or *paw*, or rub the butter, but work it by pressure until the color all is uniform and then *stop*. Perfect butter when broken down on the trier will break like steel, having a grainy appearance, and when it is cut through it will be smooth and all of the same color. There are thousands of pounds of butter spoiled every year by harsh treatment.

PACKING BUTTER.

When packing butter, learn what sort of a package suits your customers best, and give it to them as they desire it. A square brick of butter is always suitable, and neat and tidy in appearance. These bricks are made by the use of a square printer; they usually weigh one pound. They are wrapped in parchment paper, which can be obtained from anyone dealing in dairy supplies. This paper can be printed in nice letters, with the name of the farm or dairy on it. It preserves the butter in every respect, the air is excluded, and I have seen butter kept in this paper fully as good as it was in tubs.

The pound package is just the size that a family in a city would want to buy at a time, in order to have fresh butter on the table every time, and any one would pay more for butter put up in that way than they would for butter that has been dragged out of a tub and has a mangled appearance.

Avoid putting butter up in fancy, funny little packages; they do not please the eye of the consumer any too well, and besides it takes too much working and will make the butter greasy, which is very objectionable.

I trust that if I have "hit" any one in this article, that they will take it earnestly and mend their ways. If there is bad butter made in Manitoba it is wholly the fault of the buttermaker, as the natural advantages of the province for dairying are equal to any in the Dominion of Canada.

NOTE.—Most buttermakers will not agree with Mr. Macdonald's idea of 15-minute churning. —ED.

Points in Dairy Practice.

Two of the most important items of a cow's diet are an abundance of good, clear, wholesome water and a constant supply of salt. If possible, let them have full access to both.

These alleged dairy experts who are taking such pains to impress upon their hearers that food has nothing to do with the quality of milk, are inculcating an erroneous doctrine that will work serious mischief if acted upon. Said a milkman to the writer recently:—"Within a day or so after I begin to feed my cows certain watery foods, my customers begin to complain about the quality of the milk, and some have actually charged me with watering it." No greater nonsense was ever talked than that food does not influence the quality of milk.

Robert McAdam, of Rome, N. Y., writes:—"Three years ago an old friend of mine, Mr. Hugh Taylor, of Kaimshill, Kilmarnock, Scotland, told me that he had learned of an almost certain cure for milk fever, if taken in time, viz.: Half pound doses of carbonate of soda in tepid water, drenched every two hours, as soon as milk secretion is seen to fail, and continued until it is restored. I have the most implicit confidence in Mr. Taylor's statement. He supplies several thousand (late calving) cows annually to cow-keepers in large cities, and these mostly come in upon his home premises; and what was once a dread and heavy loss to him, is now only trifling from the use of carbonate of soda."

The Dairymen's Association of Western Ontario employ Mr. T. B. Millar to visit the cheese factories in their territory, to inspect the milk, and give instructions in making first-class cheese. Since the beginning of the season a number of factories have been visited, and reported to be gradually improving in the quality of the milk, due, no doubt, to the never-failing detective—the Babcock Tester. A number of patrons who ventured a step beyond covetousness, by skimming, stripping, or adding water, when questioned about their crookedness, acknowledged their faults and paid the penalties of fines and costs. There is a noticeable improvement in the quality of cheese made. The dairy school work and the system of travelling instructors are tending to bring about uniformity in the different localities. There are some makers who are loth to adopt new ideas that would have a tendency to detain their work a little later in the day. We regret to see this slackness, as the quality of their cheese would, in some instances, be raised a grade or two.

CAN BE BUILT UP.

There is one decided advantage in dairying, whether in the form of making butter on the farm or of selling the milk or cream to a creamery, and that is, the business can be commenced on a very small scale at first, and then be gradually built up as the profits and experiences warrant. It is an exceptional case when it will warrant the farmer to make a radical change in his plan of work. With dairying, as with fruit growing, the better plan is to grow into it rather than go into it. There is much that can be learned from others—the feed and care of the cows, milk and cream—but only what may be considered in a general way. The details as best suited to your condition can best be learned by experience, and in nearly all cases it will be more economical to get this experience on a small scale at first and thus profit by it when branching out. No matter how well one may understand the theory of management, either with the cows, milk or butter, there are many little details of management that must be learned that can only be learned by experience, and in a majority of cases those who have made the greatest success are the ones that commenced in a small way and gradually worked up as their business warranted. Understand thoroughly how to manage a few cows so as to derive the largest amount of profit, and then it will be much easier to succeed with a larger number. In many localities, one of the chief causes of failures with creameries is commencing the business on too large a scale before the farmers know or understand what is required. Be sure of your position, and then make the additions.—(Creamery and Dairy.)

Branding American Cheese.

It has in the past been a practice to ship American cheese to Britain by way of Canada, as Canadian goods, thus injuring the good reputation which Canadian cheese has won by its excellence. The Customs department have now under their supervision the branding of United States cheese passing through Canada in bond. So far, we have heard of no difficulties arising of a serious nature, though at first there was a little grumbling and irritation on the part of some of the shippers.

Dairy Exhibits for Chicago.

The exhibits of cheese and butter from Canada at the World's Fair, in October, are likely to be very large, and we trust excellent. The magnificent success which attended the exhibition in June has stirred up the factorymen and private dairymen throughout the whole Dominion to take a more active interest in the closing competition. Applications for address labels and entry forms are coming in to the Dairy Commissioner and his representatives in large numbers every day.