

DAIRY.

Creamery Buttermaking --- The Creamery Described --- Pasteurizing the Cream.

BY J. W. HART, KINGSTON DAIRY SCHOOL.

It has been a great source of satisfaction to our dairymen that prices of dairy produce have ruled so high for the season now about closed. At the same time it is a matter for regret that the butter exports have fallen off so materially. The exports of butter for this year of 1900 will be two million dollars less than in 1899. At the same time the importance of our butter industry is not measured by the exports to the same extent as is the cheese manufacturing business. With the majority of our people butter is a necessary adjunct to the daily diet, while cheese is partaken of more as a luxury and is not found on the regular bill of fare.

There can be no doubt but that the quality of our butter is steadily improving, and with this improvement in quality we naturally expect a greater consumptive demand. Again, with the greater industrial prosperity prevailing during the past season, the per capita consumption of butter has been largely increased. The high relative price of cheese has tempted the combination butter and cheese factories to manufacture cheese instead of butter. If the farmers fully appreciated the high feeding value of the skim milk as compared with whey, they would usually find it to their advantage to have butter made rather than cheese during the fall, winter and early spring months. Especially is this true where the calves are being raised. By means of separator skim milk, the calves can be fed much more economically and quite as satisfactorily as if they were allowed to take the milk in nature's own way.

It has been said that there are two classes of farmers—those who consume at home what they cannot sell, and those who sell what they cannot dispose of at home. We sell our cheese because we do not care to eat it, while we eat nearly all of our butter because we esteem it so highly as an article of food that we do not care to sell it. As an indication of present home requirements, it is stated that in Montreal about 550 packages of butter, averaging 60 lbs. each, are consumed daily. In Toronto probably as much more is eaten, and it is this growing local demand for creamery butter that is largely responsible for the falling off in exports. While the value of milk and the products manufactured from it is being better appreciated than formerly, there is still room for a great deal more of our milk supply to be economically consumed in our homes. Prof. Atwater, the eminent American authority on nutrition, states that a quart of milk contains as much nutriment as a pound of the best beefsteak. There are yet too many homes where milk is regarded as a luxury instead of being appreciated as one of the best and cheapest tissue-building foods that can be obtained.

The patrons of our winter creameries sometimes state that it costs too much to produce milk in winter, and I know a number of farmers allow their cows to go dry rather than milk them during the winter months, on account of the expense. Others, again, who are making a study of the business, find many ways of reducing the cost of production and report that they find the production of winter milk profitable. How can we reconcile those conflicting statements, and how can we induce those farmers who are not producing milk economically, and those whose cows are standing in the stable idle and a source of expense to their owners, to so breed, feed and handle their cows as to produce cheap milk? There is no doubt but that corn silage forms the basis of the cheapest winter food, and milk is produced more economically where it is part of the ration. I say a part, for no intelligent dairyman will feed corn silage without bran, pea meal, clover hay or some other available feeding stuff rich in protein. Corn silage supplies the heat and force-producing part of the ration, while the clover hay, bran, pea meal, etc., are needed for the sustenance of the cow's body and for the growth of the calf. A great deal of the prejudice against silage is on account of this fact not being appreciated, the silage being fed without any knowledge of its composition and its uses in the animal body, and the proper feeds not being given along with it to form a balanced ration. It is true that some of the owners of milk-condensing factories object to the use of silage, but the cause of their opposition to silage feeding is on account of the stables being badly ventilated and the milk left setting in the stable after it has been milked. Where silage is properly fed we get a much finer quality of butter in winter at less cost as compared with dry feed.

The inevitable effect of the high price of cheese prevailing during the past season is to cause a large stream of milk to be turned in that direction. This in its turn will bring about a scarcity of butter, so that we are likely to have a reaction in favor of buttermaking. Already there are signs that there will be a great scarcity of good butter before the grass springs again.

THE CREAMERY.

The tendency to build small and poorly equipped creameries should be discouraged. These cannot be operated with profit to anyone, and are a constant source of loss to all interested; in fact, the decline in winter buttermaking can be largely

traced to these small concerns where the output is not large enough to enable them to hire a thoroughly-skilled buttermaker. Where one large and modern creamery, in charge of a good buttermaker and properly equipped with a buttermaking outfit, having its outlying skimming stations, and in which could be made the finest grades of butter at the lowest possible cost, would be a profitable investment, we often find a number of small and inferior plants grafted on to as many small cheese factories. Hundreds of such plants scattered all over the country, the most of them closed for the lack of patronage, attest the folly of attempting to carry on the business of creamery buttermaking in small and poorly-equipped creameries. Rather than adopt this style of creamery buttermaking, let us go back to private dairy, where at least everything was under the control of one responsible person. We have, however, a number of successful creameries—and I am glad to say that the number is increasing—where skilled buttermakers are employed and where the butter produced is of the very best quality.

In building a creamery, we should have sufficient faith in the permanency of the business to erect a neat and substantial building. The building should not be set up on piers or cedar blocks, but put on a solid stone foundation. The floor should be of cement. A good cement floor is practically indestructible and will prove the cheapest in the end. In the buttermaking department of the Kingston Dairy School, the wooden floor had been laid about six years. Under the separators it had rotted so badly that it was necessary to replace portions of it in four years. It was no ordinary wooden floor. The joists, three by eight inches, were laid 12 inches apart, and the best quality of 1½-inch pine flooring, tongued and grooved, was used. To preserve it and add to its appearance, it was always kept well oiled, but when it was taken up it was found that some of the joists had rotted completely away. Last summer it was entirely removed. In laying our cement floor it was necessary to fill in about three feet; large stones were used, and these were well hammered down. These stones were laid to within six inches of the old floor line; next a layer of concrete was spread to the depth of 4½ inches. This concrete was composed of one part best Portland cement, three parts sand and five parts rock broken to pass through a 2-inch ring. Before this had thoroughly dried, the surface course was laid. This surface course was 1½ inches in thickness and consisted of one part best Portland cement and two parts crushed granite, mixed dry and afterwards mixed with water. This left the surface of the finished floor one inch below the level of the old floor line, which allowed the edges of the floor being raised to the old floor level to throw the water away from the walls. The floor slopes to ample gutters, and these gutters are connected with trapped drains. The contract price of the floor was \$2.00 per square yard, and so far it has given complete satisfaction. In laying a new floor, the walls for some distance above the floor should be of stone or brick, so that in the daily scrubbing the walls would not be constantly wet and thereby decay in a short time. If stone were plentiful, I should like to have the stone foundation walls continued up as high as the window sills. In many factories there is more water on the floor than is necessary; some slop is unavoidable, and the building will be damp unless it is properly ventilated. The ceiling should be quite high, at least ten feet, and the ventilator should run from the making rooms up through the highest part of the roof. These ventilators can be provided with slides operated from the floor, so that the air inside can be kept comparatively dry at all times. In some cases where a creamery plant has been installed in a cheese factory, the partition between the boiler room and the factory proper has been taken away in order to utilize the heat from the boiler in warming the room. The dust, ashes, smoke and smell of grease from the engine room will not improve the quality of the butter, and some other means of heating the building, preferably steam pipes or radiators, should be used. All the machinery should be the best of its kind, and should be arranged with special regard to saving labor. With economy of production we want economy in manufacturing, so that the largest possible net returns will go to the man who handles the cow.

PASTEURIZING THE MILK.

At the Kingston Dairy School our custom is to pasteurize the whole milk. In some cases we have brought the milk up to boiling point and have failed to discover any injury to the cream or butter owing to the high temperature. Up to within a short time ago our practice was to cool the cream as soon as separated down to 50 degrees or lower. I do not find, however, that there is any advantage in cooling it so low, and am satisfied if it is brought to 70 degrees and the starter at once added, we not only save ourselves the trouble and fuel required to heat the cream to ripening temperature, but get the process of ripening completed earlier in the day and do not have to attend to the cream at night. Our practice is to take rather rich cream from the separator, say about 40 per cent. fat, and to use quite a heavy starter. By this means we get the cream ripened in six or eight hours and can allow considerable time to elapse before churning it the next morning. In winter, when we are troubled with

stable taints, by all means take a heavy cream and ripen with an ample starter. By having the cream held a long time at a low temperature we get that firm waxy butter so highly esteemed by the trade. A great advantage in pasteurizing the milk is that we are enabled to return the skim milk sweet to the patrons. We also get more exhaustive results in separating and churning. At the same time, I cannot say that there is an increase in the butter over handling raw cream, probably owing to the fact that the butter made from pasteurized cream contains less moisture. Between Nov. 19th and 30th, in the dairy school, we received 26,956 lbs. of milk, which contained 1,226 63 lbs. of fat, from which was churned 1,384 lbs. of butter, being 112 lbs. of butter to 100 lbs. of fat in the milk. This I think rather a good average, as all the butter was made into pound prints.

In Scandinavian countries, pasteurizing is almost universally practiced, and we know that their butter brings the very highest prices in the British market. In Denmark their custom is to heat the milk to about 90 degrees for separating, following which the skim milk and cream are separately pasteurized. To prevent the spread of tuberculosis, the law compels the pasteurization of the skim milk. In Norway and Sweden the practice is to pasteurize the whole milk, as we do the most of the time at the dairy school. We cannot expect that our creamery butter will supplant the Danish so long as we continue to export butter made from raw cream during the winter months. In the local markets, too, we find the pasteurized creamery butter very much sought after.

From a national standpoint there is another phase of the export business to which we shall be compelled, by the diminishing fertility of our farms, to pay more attention. To maintain soil fertility, we must return as large a proportion of the fertilizing constituents of the crops as possible to the land. In making and selling butter, we may practically retain on the farm all of the fertilizing constituents utilized during the process; while in selling cheese we are removing some of those valuable materials—less rapidly, it is true, than in selling grain, but still amounting in value to about \$20.00 for each ton of cheese made, or, in other words, 10 cents for each 100 lbs. of milk manufactured into cheese. In contrasting the returns from butter and cheese, this great drain upon soil fertility is scarcely ever taken into consideration, while the increased feeding value of skim milk over whey is also rarely taken into account. The farmer of the future will pay more attention to the value of these by-products, and will not measure his returns entirely by the size of the check he gets from the factory or creamery.

The Cow's Own Testimony.

Patrick O'Sullivan, one of the average farmers of Ordinary township, went down to his barn lot the other morning to milk his one cow, which he considered a great milk-producing machine, and which would give an abundant flow until cold weather arrived, says *Farmer's Voice*. Then she didn't do so well, and Pat didn't know why. So he asked her, and this is what she said:

"I can secrete milk and yield it to you in normal quantities so long as I am comfortable, having clean quarters and decent water, as well as good bedding and protection from cold and rain and snow. You have supplied me with none of these, and the result is I cannot keep up my usual production of milk, no difference how much and what you feed me. This decrease in milk is no desire of my own; I don't begrudge you my milk; it makes no difference with me how much milk you get; I have no interest whatever in giving you a reduced yield for your feed. The point is simply this: I am a cow endowed with certain nature-given peculiarities, habits, characteristics; I am governed by these things which constitute me; I can't master them—they master me. The thing for you to do is to study them and then act as you think wise. If your efforts are not in vain you doubtless will see me turning out more goods. I can't help it. It's a way nature has. It's nothing to me. It's all with you. That's all."

And Pat said, "Begorra, that cow knows more than meself." And she did.

Ayrshires as Milkers.

Where quantity rather than quality of milk is the object to be aimed at it is very hard to beat an Ayrshire cow of a good milking strain. Though of comparatively small size, animals of this breed are remarkably deep milkers. Where a good price can be obtained for new milk, it is not considered an unusual result for a cow of this breed to give milk to the value of 10s. per week, or over £25 per annum. One of the great points in favor of Ayrshires is that they are comparatively hardy, and in addition to this, very thrifty cattle, and are consequently adapted for being kept on light lands which do not produce sufficiently good grass for carrying heavy stock such as Shorthorns and Red Polls. Like all deep milkers, however, Ayrshires are, of course, heavy feeders, and when cows of this breed are being specially kept for milking purposes they must be fed with unstinted liberality. As it is from the food that the milk is manufactured, it follows, as a matter of course, that in the absence of an abundance of food good milking results cannot be looked for.—*Farmer's Gazette*.