

DAIRY.

A New Zealand Dairy School.

We are in receipt of the first annual report issued by our old friend, Mr. J. A. Kinsella, now dairy commissioner of New Zealand. The report consists of some 60 pages, giving a very full review of the work of the Dairy Department in all its branches, contains some excellent illustrations and a number of plans of cheese and butter factories, suitable for various sites and conditions.

The total exports of butter and cheese from New Zealand for the year are given at over 14,600 tons, an increase over the previous year of 13 per cent. "Prices have been more than maintained," and the value of the exports amounted to \$5,195,000, an increase of over 15 per cent. The amount of personal work overtaken by the commissioner shows that he has done a deal of "hustling." Apart from the office work at headquarters, his work of organization, inspection, and general supervision of grading ports involved a large amount of travelling, "including six thousand miles of cycling."

Judging from the following extract from the report, much the same difficulties are experienced in New Zealand as in some other countries:

CARE AND AERATION OF MILK.

Perhaps one of the most serious dairying questions at the present time, and one to which the average factory manager is rapidly awakening, is that of better milk. When milk is filthy, impure, overripe, or gassy, no matter how it is manipulated, or how perfect and up-to-date the process of manufacture may be, it is difficult for the factory manager to make a choice article of butter or cheese.

In dealing with the causes of bad-flavored or defective milk, it may be premised that very rarely does the trouble arise from disease in the cows, and even when it does the factory manager is not, as a rule, in a position to assist remedially. Milk may be injured before being drawn from the cows, by allowing them to drink impure water, or have access to turnips, rape, onions, or any bad-flavored weeds. The main cause of the trouble, however, is dirt and uncleanness. In nearly all cases tainted milk supplied to dairy factories is infected during the milking process, or shortly afterwards. Dirty cows, dirty cow byres, dirty milkers, dirty pails, strainers and milk-cans all mean dirty milk. Where such a state of affairs exists there are generally to be found millions of bacteria, and with filth and bacteria combined we are certain to have undesirable flavors in the milk, both with butter- and cheese-making.

If we wish to insure pure-flavored milk, or what may be equally termed "clean" milk, it is essential that cleanliness be observed from beginning to end of the milking process. Every cow-byre should have a concrete or cement floor, and should be thoroughly cleaned after each milking. Plenty of light and good ventilation are also essential points. Liquid manure should not be allowed to collect in pools on defective floors, neither cobwebs or dust to collect on walls and ceilings. All byres should frequently receive a coating of lime-wash, which besides giving the place a brighter appearance also imparts a healthy odor for the cows, and prevents the growth of mould. The cows should be brushed, or at least all dried manure removed from the udder, and the udder and teats thoroughly cleansed with a damp cloth before milking begins. The milker himself should be clean. Unfortunately, with most milkers, the oldest and filthiest suit of clothing is used for milking. It is evident that if the clothing is dirty and full of dust, the hands dirty, and the fingers wetted by dipping into the pail, as is frequently the case, the milk is bound to be contaminated.

All milking-pails, utensils, etc., should be thoroughly rinsed with tepid water. Always use a brush for cleansing tinware; never use a cloth for washing or drying. After scrubbing, scald with boiling water and allow the utensils to drain. If possible, expose them to the sun, for it should be remembered that sunlight is a great destroyer of bacteria. A very serious and objectionable practice is carried out at a number of our cheese factories where the suppliers wash their cans at the factory. In many cases I found that cans were only whirled round a few times in a washing tank in tepid or practically cold water, and then steamed, thereby cooking the filth on the tin inside. This was the case more particularly where cone-necked cans were in use. In some instances a thick yellow coating, difficult to remove, was discovered formed on the inside seams of the necks of these cans. This slovenly method of can-washing is to my mind a grand medium for the growth of dangerous bacteria, and is sure to result in contamination and bad flavors both in butter and cheese.

Immediately the milk is drawn from the cows it should be removed to a suitable place, at a reasonable distance from the byre, and the milk

carefully strained and aerated. Aerators and strainers should be kept scrupulously clean. If strainers are not perfectly clean and well sterilized or scalded, they very often act as a source of infection instead of purifying the milk. Aeration is a grand means of ridding the milk of bad odors, provided the operation takes place in a pure atmosphere. If, however, the aeration is performed in an impure atmosphere the milk is sure to become contaminated, and more harm than good results. It is customary in many places to aerate within a few yards of the filthy cow-byres, where strong odors are absorbed by the milk during the process. This practice is undoubtedly a source of great and frequent trouble with the milk of many suppliers.

If a suitable place for aerating cannot be found at least 50 yards from the cow byre, I should recommend removing the milk immediately from the byre, and placing it in cold water where the temperature could be lowered to 50 degrees or 55 degrees. Cooling is much preferable to aerating when the latter is carried out in an impure atmosphere. When milk is drawn from the cow it is at a favorable temperature for the growth and multiplication of bacteria, hence the importance of having it chilled down to a temperature at which such growth is materially checked. Some species of bacteria or bad-flavor-producing germs do not multiply at temperatures below 50 degrees or 55 degrees, while other harmful ones only grow slowly.

It is usually necessary to hold milk for some time before it is sent to the factory, and here again we very often find trouble. The cans should not be left near the cow byre, manure heap, or any bad-smelling substance. It should also be realized that milk will readily absorb the



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flavor of onions and other strong-smelling vegetables. As mentioned above, the cans should, if at all possible, be placed in a tank of cold water, or in a running stream.

In the course of my work of inspection during the past year, I regret to say that I found many whey and skim-milk tanks in a very filthy condition. Such dirty tanks are, I consider, responsible for a great deal of the tainted milk delivered to factories. Sour whey or skim milk is often carted back in the suppliers' cans, and allowed to remain in them to roast all day in the sun.

This issue of the "Farmer's Advocate" is a fair sample of the rich stores in reserve for subscribers. We will appreciate your renewal.

Essentials to Success in Buttermaking.

One of the great secrets to success in securing the best buttermaking results where the old-fashioned shallow-pan system of setting the milk is followed, is that the milk should be set for creaming as soon after being drawn from the cows as possible. As is well known, cream rises most rapidly in a falling temperature, and experiments show that milk which is allowed to become cool before being set never yields so large a percentage of cream as that set directly after being drawn from the cow. The best quality of butter is always obtainable from the cream which first rises, as such cream consists of the larger butter-fat globules contained in the milk, and the larger the fat globules the better the quality of the butter.

The Ripening of Cream on the Farm.

There is more butter spoiled on the farm by having the cream improperly ripened than from any other cause, as the flavor of the butter is made before the cream goes into the churn. Cleanliness, of course, is also of great importance. As a rule, the farmers' wives keep their milk and cream clean enough; but that is not the only item of importance. The ripening of the cream is of equal if not of greater importance than the eternal vigilance that is needed to keep perfectly clean all vessels that come in contact with the product.

Some may think that I lay too much stress on this subject of ripening; but I do not think so, from what I have seen of the quality of butter made by housewives that are clean and careful to see that foreign substances or dirt does not get in. And then, not knowing anything about the varieties of bacteria their cream contains, they proceed, innocently enough, to help the bad ones on with their work of multiplying by making the conditions favorable for their growth. This is done by placing the cream crock or pail in a warm place, usually beside the kitchen stove, and keeping it there from the first or second skimming to the last, to let it sour or ferment enough, as I heard one woman say.

As a rule, there is nothing so very offensive about the butter made by these good women, while it is fresh; but it distinctly lacks that fine, delicate flavor that can so easily be obtained by using a good lactic-acid starter or culture. Any cream that has not been pasteurized contains both good and bad bacteria. These left to themselves will do the work for which they are adapted. The good ones, or lactic-acid bacteria, will do their work of souring or ripening the cream; but during this process the bad ones have not by any means been idle, and the result is a bad-flavored butter.

On the farm, of course, we cannot readily obtain a culture that is just right in all respects; but with a little care and good judgment we can easily secure one that answers the purpose very well. Some people make a practice of using buttermilk to ripen their cream, but I find that the flavor is not as good as it is when I use thickened skim milk which has a good clean acid flavor. It is worse than useless to use a culture that has not a good flavor, so be very careful what you put in your cream. Twenty-four hours before churning, I skim about one inch from the top of my culture (as that portion is very likely to contain undesirable germ life), and then break the remainder up as fine as possible before adding it to the cream, so that it will mix more readily.

Now, how much culture shall we use? This largely depends on our circumstances. I use about one pint of culture to a quantity of cream that produces from seven to eight pounds of butter, and raise the cream to 65 or 70 degrees by placing the can in a pan of hot water, stirring it constantly until the desired temperature is reached. If you wish to ripen your cream in less time, use more culture and raise your cream 5 or 10 degrees higher. On the other hand, if you wish to take more than twenty-four hours in which to ripen it, use less culture, and keep it at a lower temperature. By evening the cream should be slightly thickened, I then give it a thorough stirring, and place it where the temperature will fall to 50 degrees Fahr. or lower, to check the formation of more acid, as too much acid is injurious to the flavor of the butter.

In the morning your cream will have a thick, smooth, glossy appearance, and a pleasant acid taste. When you have cream in this condition, it is a very good plan to add a pint or two to the cream you are gathering for the next churning; keep it cool until you have sufficient gathered, and the day before you churn, warm and treat as described above. This method can be practiced from one churning to another very satisfactorily as long as the flavor keeps right; but if it shows any signs of going wrong, make a fresh start with a skim-milk culture.

By the way, how many readers of the "Farmer's Advocate" agree with the methods of handling butter described by "Farmer's Wife," in an article on "Home Buttermaking," in August 15th issue? I have watched these columns for some time, hoping to see some comment on the article referred to; but as none has appeared, I would like the privilege to make a few remarks.

What surprises me most of all is the many operations "Farmer's Wife" puts her butter through to remove the buttermilk. Now, if her butter is in the granular form, as it should be, when she puts the salty water on, gives the churn a few turns and draws the water off, repeating this operation until the water comes off clear, the buttermilk must be removed. But she goes on describing her method of dressing the buttermilk out; after this is completed, she proceeds to wash it. There are three things I would like to know:

First—Where does the buttermilk come from that she dresses out?

Second—If she dresses it out, what does she wash it for afterwards?

Third—How does she keep the butter from becoming greasy, when she puts it through all of those operations?

DAIRY MAID.