

DAIRY RESEARCH.

The habit of cleanliness in the production of market milk is very clearly emphasized by illustration and argument in a recent bulletin, No. 42, from the Storrs Agricultural Experiment Station. Mr. W. A. Stocking, Jr., Bacteriologist at the Station, is the author of the bulletin, which is entitled, "Quality of Milk Affected by Common Dairy Practice." In a graphic way the author illustrates the teachings of his experiments in his tests of the bacterial content of milk produced and handled under various sanitary conditions. The adulteration of milk and milk products, and various sanitary requirements relative to the marketing of milk, have received Legislative attention, but an improvement in the practice of producing and handling milk on the individual farm is yet to be sought. The bulletin contains some practical common-sense suggestions, which, if followed should materially lead to such an improvement with, in truth, little or no increase in the cost of production.

Milk, as a disease-communicating medium, has been receiving much study of late, and physicians agree that impure milk is more or less directly the cause of death in many cases of young children, infants and invalids, and that the danger in these instances lies, not in adulterants or preservatives, but in the presence of injurious bacteria, which, through careless handling, very readily find an entrance into milk and thrive and flourish therein. "It is in the stable that milk usually gets its greatest bacterial contamination," and a study of the bacterial content under different conditions reveals some interesting facts, and suggests the desirability of cleanliness in the habits of the stableman, and the necessity of proper sanitary precautions being taken to preserve purity in the atmosphere of the cow barn.

The practice of feeding cows just before or during milking time is a custom that results in a serious contamination of the milk as it is being drawn, according to Mr. Stocking's report. An increase of more than 80 per cent. was noted in the count of the number of bacteria present in the milk under such conditions, over and above the normal number present when milking was done before feeding. The more dusty the feed, and the greater the disturbance in the air, the more bacteria will be found to be present. When cows become accustomed to the practice of milking before feeding, they will usually stand more quietly, notwithstanding current opinion, than with feed in their manger, and it may be added, many of our best dairymen have adopted this system. The feeding of corn stover just before milking was found to be an even more prolific source of evil, as the increase in bacteria amounted to almost 200 per cent. We cannot but be reminded, in reference to the above, of the prevalent custom in many stables of throwing down litter from the barn floor above and of bedding the cows at milking time. The dust in itself is probably harmless, but it bears with it elements which will at least serve to destroy the wholesomeness of the milk, and which may possibly breed disease as well.

In the filth and dirt, however, which accumulates at the roots of the hair on the skin and about the udder of the cow will be found a more fertile source of contamination. The author conducted a number of experiments in which he tested the germ content of milk drawn from cows whose udders previous to milking had been carefully wiped off with a damp cloth, and of milk from cows whose udders had not been wiped. It was remarked that the cows tested in these experiments were kept in a condition cleanly above the average, but, even so, the results are striking. There were almost ten times as many bacteria present in the milk taken from the cows whose udders were unwiped as from those whose udders were wiped. In an unsanitary stable the result must have been much worse, and the experiment teaches the desirability of the frequent and thorough use of the brush upon the skin of the cow, and of the use of the damp cloth to cleanse the udder at milking time. It was found, however, that brushing the cows just at milking time resulted in an increased germ content of milk, and the author advises that this work be done at some other period of the day.

It was found that the first two or three streams drawn from the udder contain relatively rather a large number of bacteria, but it was found that the rejection of this fore milk did not appreciably lower the average bacterial content of the whole product, and it was thought decidedly unwise to advise the rejection of the fore milk because of the loss which such rejection would entail. It was found, however, that milk left in the udder at a previous milking tended toward an increase in the germ content of the milk at the next, and a thorough stripping of the cow gave, therefore, uniformly the best results. The careful milker, then, will find a satisfaction in a way that probably he has not thought of before.

An interesting phase of the experiment appears in the test of the individual milkers. Two regular attendants were pitted against two students who had had some training in dairy bacteriology. The

same instructions were given to all, but without exception, the students were able to present a much more creditable record than the regular attendants, in that the germ content of the milk drawn by them was decidedly lower than that drawn by the others. Cleanliness, therefore, in the habits of the milkers and intelligence in their method of work are important considerations in the effort to preserve the wholesomeness of the milk supply.

The record of the experiments in this bulletin are very suggestive. There is a vital relation between the purity of this food product and the general health of the people, and a wholesome interest is aroused in any movement making for greater intelligence in the method of its production. Mr. Stocking's conclusions are reasonable and sane. We could wish for a more widespread knowledge of the injurious influence of the presence of bacteria in the stable, and of the corresponding benefit of cleanliness, sanitation, ventilation and sunlight. There is merit in a knowledge of the conditions of health. There is a virtue in the practical application of such knowledge.

BRUCE.

P. E. ISLAND DAIRY ASSOCIATION ANNUAL MEETING.

The annual meeting of the Prince Edward Island Dairymen's Association was held in Charlottetown on the 21st of February. There was a good attendance of the representatives of the dairy stations. The address of the President, as well as the report of the Secretary, were decidedly optimistic. The increase in the dairy output last season over that of 1905 was considerable, and the high price realized for cheese and butter made the season's business very profitable. President Simpson, in his address, said the tide had turned, and dairying was again becoming popular after the setback it had suffered. It was now established on a firmer basis, and would be more intelligently and profitably carried on in future. The following figures are from the excellent report of the Secretary, John Anderson, and showing, as they do, the very material increase in the cheese business, are inclined to make patrons of the factories hopeful for another season:

Last year there were manufactured, from 22,299,012 pounds of milk, 2,110,456 pounds cheese; in 1905, 17,035,417 pounds of milk yielded 1,641,780 pounds cheese, an increase in milk supply for cheese of 5,263,595 pounds, and an increase in cheese itself of 468,676 pounds.

The gross value of the cheese for 1906 was \$257,370.13, and for 1905, \$177,291.09, an increase of \$80,079.04. The net value to patrons was \$205,692.78 in 1906, and \$137,896.93 in 1905, an increase of \$68,295.85.

In butter, the showing was not quite so good. In 1906, 9,675,718 pounds milk gave 418,350 pounds butter; in 1905, 11,116,303 pounds milk gave 481,699 pounds butter. The gross value of butter for 1906 was \$98,412.21, and for 1905, \$104,633.24, a decrease of \$6,621.03. The net value to patrons for 1906 was \$73,905.36, and for 1905 was \$78,464.37, a decrease of \$4,559.01.

Taking butter and cheese together, there has been a net increase in the total milk supply of 3,822,683 pounds; in the gross value of the output a net increase of \$73,458.01; and in the net value to patrons a net increase of \$63,636.62.

The report of Inspector Morrow showed that the factories were well managed and the quality of the output was excellent, and that, notwithstanding the extreme heat of last season, our cheese reached the English market in good condition. He said our cheese were of an excellent quality and uniform in make, and that we should now turn our attention to producing greater quantities of milk at the least possible cost.

The afternoon session was given up to a discussion of the present dairy situation, and how to still further improve and increase the business. The principal points brought out were: Improving the dairy herds by weeding out non-producers; better and cheaper feed all through the year; more liberal feeding of dairy cattle; the absolute necessity of keeping records of each cow's production; raising the production per cow to a profitable standard; keeping the temperature of curing-rooms down to near 60 degrees F.; better boxes for cheese; milk-testing (nearly all our cheese factories are run by the "butter-fat-casein test"); and freight rates on cheese, which, by the way, have nearly doubled the last two years on the P. E. Island Railway.

The old board of directors were elected.

The evening session opened with an address by Professor Whitley, of the Dairy Commissioner's staff, illustrated by lantern slides giving us views of dairy stations all around the world, and giving us an idea of the methods of our competitors in the dairy business, and also of the different types of milk cows of the different countries.

The next item on the programme was a paper by Walter Simpson on "Some Pressing Needs of our Dairy Industry." The most pressing need was the production of more milk within reasonable distance of the factory, so as to cheapen

manufacture. Mr. Simpson stated that at the factory with which he was connected it cost one cent per pound of cheese to draw the milk. Another pressing need was some means to keep down the temperature of curing-rooms during July and August. Some curing-rooms, during those months last season had gone as high as 80 degrees. He advocated the shortening of the cheese season by making butter in June and October, so that our bacon industry might go hand in hand with our dairy business, as skim milk was very valuable in spring and fall to give young pigs a start.

This was followed by a most interesting and instructive address by Walter Lea, of Victoria, a noted Holstein breeder and dairyman. Mr. Lea said that, by weighing the feed of the milk cow, and valuing it at market prices, he had no trouble to get back from the cow more than its value in milk. His cows are giving him a good profit all the year round. He spoke strongly of the necessity of feeding the calf liberally in order to develop it into a profitable cow; breed would not do without feed and care.

J. R. Edwards, one of our foremost dairymen, in an address, told us how he had brought up a herd of 27 ordinary cows, of no particular breed, by good care and liberal feeding, to give him a profit of \$58 each for a year. He had done this by noting the best producers, and sending those not paying him to the butcher. Mr. Edwards buys his cows, and selects the best he can get. He also finds it profitable to buy feed when his farm does not produce enough.

The addresses of such practical men will have the effect of convincing farmers that it will pay them to feed their dairy cattle liberally, and if all the patrons of our dairy stations were convinced of this, our dairy output would soon be doubled, and the milch cows would be the best money-makers on the farm.

There were a number of the members of the Legislature present at this meeting, and addresses were delivered by Hon. F. L. Hazzard, who is interested in the condensed-milk factory here. Mr. Hazzard spoke strongly on the matter of increased milk supply, and advocated the growing of mixed grain as the best food for the milk cow.

Mr. J. D. McInnis, a member of the Legislature, delivered a lively address on dairying and hog-raising.

Mr. Theodore Ross, Secretary of Agriculture, also spoke encouraging words of the dairy industry.

Your correspondent gathered from the tone of the different addresses that P. E. Island dairymen were hopeful of the future, believing that the worst was now past, and that the experience gained from their successes and failures of the past years would be a great help to them in the future in their effort to make the dairy business profitable and permanent.

"FIVE POUNDS OF FOAM."

Editor "The Farmer's Advocate":

The North Oxford Cow-testing Association is being continued a second year, the same officers being reappointed at a meeting called at the conclusion of our annual cheese meeting, held on Feb. 12th. Although the interest manifested is not so general as one would expect in a dairy section so long established, there is evidence that it is growing, that the general public is awakening to the importance of knowing just as definitely what each cow is making, or what the herd on the whole is doing. One thing that seems to work against the more general adoption of testing in this particular Association is the fact that this factory always has and is likely for some time to pay for milk on the pooling system. For that reason, too, many do not yet see any need for knowing the amount of butter-fat contained in their milk. It is gratifying to know, however, that the members of the Association who have taken an interest in weighing, independently of testing, have found that they cannot guess very accurately how many pounds a cow gives by the amount of milk which seems to be in the pail. One member puts it very pertinently when he said he had two cows, both of which filled a large pail. But when he began weighing, he found that while one gave twenty-five pounds of milk, the other gave twenty pounds of milk and five pounds of foam or air.

From my own experience for two seasons, and by careful inquiry from others, I would say that the time taken for weighing and testing each cow's milk should not exceed one-half minute each time of milking, or three minutes per month, or thirty minutes for each cow for a season of ten months. That amount of time, and, including a few minutes each month for copying sheets, figured at the present high rate of wages, should not exceed seven cents per cow per year.

Here, and I understand in other sections also, the general public do not clearly understand the object of the cow-testing associations. The individual must be got to see thoroughly that he is doing it for his own personal benefit, and not for that of the other fellow, and it certainly rests with you editors of agricultural papers to see that it is done.

A. DUNN, Secretary.
North Oxford Cow-testing Association.