

request of the maker or factory manager, who is expected to notify his instructor when in trouble and invite him to render assistance.

It was intended at first to visit the farms of all the patrons, but this was found impracticable, as there are 38,583 patrons in the territory, and only those patrons delivering milk out of condition could be visited. As it was, the farms of 3,369 patrons were visited, and many more would have been had it not been that many of the patrons delivered their own milk.

TROUBLE FROM NOT COOLING THE MILK.

These visits revealed the fact that 90% of the defective samples were delivered by patrons who gave little or no heed to the cooling of the milk or the sanitary conditions surrounding its production. While there is a general improvement in the condition in which the milk is being delivered at the factories, not more than 50% of the patrons have appliances necessary for efficient cooling during warm weather.

PAY ACCORDING TO QUALITY.

The amount of fines imposed for adulteration was \$1,288. This is a disagreeable feature of the instructors' work, of which they should be relieved, as it takes up a great deal of time that could be spent much more profitably. The remedy is to pay according to quality, but as only 95 factories in Eastern Ontario are yet doing so, it will be necessary for a good while to come to give attention to testing for adulteration. Men should be specially appointed to look after the testing and prosecuting, which at present is left in the hands of the factorymen, and as they do not, generally speaking, wish to deal with the matter, many cases go by default.

FACTORIES IMPROVING; ADVANTAGES OF COOL-CURING ROOMS.

It is gratifying to be able to report a very marked improvement in the condition of factory buildings and surroundings. On the whole, the factories were never before in such good order. Twenty-nine old factories were displaced by new ones, while 605 made improvements in various ways. The estimated value of the expenditures, including new buildings, was \$153,862, being \$33,874 more than was spent in 1906. With very few exceptions, the factorymen responded readily to the instructors' recommendations. In fact, many of them spent more than the profits from their business would warrant. While a considerable proportion of the money was spent in improving curing-rooms, yet there are only 36 factories that have what are known as cool-curing rooms, and of these 17 are in the Prince Edward County district. Cool-curing rooms make it possible to turn out cheese of superior quality, for which the buyers paid more than ruling prices last season, and, besides, they render the factorymen independent in many ways, especially as to time of sale.

Notwithstanding the more critical inspection by the buyers last season, the May and June make of cheese was reported as the best in the history of the trade, but as soon as the warm weather set in, general complaints were received regarding flavor, texture, and coarseness. The coarseness in texture was largely due to the too heavy salting, the receiving of overripe milk, and the treatment given in its manufacture, the makers in many cases being forced to receive milk of this character, owing to the keen competition of factories.

THE TROUBLE FROM WHEY TANKS.

In the districts where the whey was returned in the milk cans from whey tanks that were badly located or not properly cleaned, the greatest number of complaints regarding flavor were received. While I believe the whey tanks to be the most fruitful source of contamination at the factory, it was the one improvement to which we met with more opposition than against all the others asked for. It would appear as though one or two things would have to be insisted on—either the necessary care be given to the tanks to keep them clean or the whey be heated. The latter seems the more effective remedy.

In several factories bad flavor was traced to the water supply. Suspected samples were sent to Dr. Connell, at Kingston, before the factories were put to the expense of securing a new supply.

SPECIAL DISTRICT AND ANNUAL FACTORY MEETINGS.

A series of special district meetings have been held, numbering 26, with an average attendance of 130. At each of these a report was given by the local instructor of existing conditions, which were clearly and forcefully discussed, and the meetings should prove a great factor in bringing about improvement another year.

A further means of education, which should prove very effective, was the supplying of speakers to the annual meetings of all factories which make application. Some 200 were attended up to January 1st, and a much larger number were expected to be attended after this date.

WHEY BUTTER.

An old idea reintroduced this past season was the skimming of whey and the making of whey butter. At the end of the season some 14 factories were engaged in this work. I think it is well to sound a note of warning regarding this matter, and would advise any person who has not a butter plant in connection with his factory to make no provision for any such work until we have sufficient proof that it will pay to do so. The factories that have been engaged in this work were previously equipped for buttermaking, and have been able to enter into the matter without much extra expense, which may have made it possible to carry on the work with more or less profit. My opinion is that

when the milk is properly cared for and skilfully handled in the manufacture of cheese it will not pay to adopt the practice unless the make is very large. Then there is danger of the cheesemaking being neglected, and also the injury that might come to the reputation of Canadian butter. Should the practice become generally adopted, an act might be required compelling the branding of whey butter.

ADVICE FROM THE OFFICIAL REFEREE.

On the whole the cheese were not shipped nearly so green as last year, yet in some districts the instructors were seriously handicapped, owing to the cheese being shipped so soon after being made, and had to be governed to a certain extent by reports from Montreal. In this respect valuable assistance was received from Mr. Barr, who sent weekly reports on the quality of all cheese he was called upon to inspect. From this information the field instructors were kept well posted and defects were promptly remedied, so that it was seldom the same factory would be reported on the rejected list two consecutive weeks.

For Mr. Barr, who was acting as the official referee in Montreal, for the splendid staff of dairy instructors, and for the Executive Committee of the Association, Mr. Publow had words of unstinted praise, to which we may fittingly add the universal testimony to his own tactful, capable and indefatigable efforts as Chief of the Instruction staff.

DISCUSSION.

Would it not be well, Mr. Publow was asked, if every patron could draw his own milk for at least a part of the year?—to which he replied that possibly fifty per cent. of all our patrons haul their own milk, principally in the easterly section of Eastern Ontario, and here we get the poorest milk. The trouble is that here we have small factories poorly equipped, and, as a rule, indifferent makers, as they cannot well afford to employ better ones. The curse of the industry is the lack of ability of the makers in some of these small factories.

CLEANLINESS AND COOLNESS.

There is a direct relation between the number of bacteria and the cleanliness exercised in milking, said Dr. W. T. Connell, of Queen's University, in his annual address on "Bacteria in relation to dairying." It has been shown many times that the greater the care and cleanliness exercised in securing milk, the fewer bacteria there will be present, and, as a rule, there will be less chance of undesirable forms of bacteria being present. The difference is frequently very marked, even in the same herd under different conditions of care and cleanliness, being in proportion of from 1 to 6 up to 1 to 30 between careful and slovenly methods.

Once in the milk, the rate at which the bacteria multiply depends upon the conditions to which they are subjected. At low temperatures they develop slowly, but the temperature becomes more favorable to them the more nearly it approaches that of our bodies, viz., 98° to 100° F.; hence to prevent such bacterial development it is necessary to cool the milk down to or below 65° F. Cleanliness and coolness epitomize the main teachings of bacteriology in relation to dairy husbandry.

HINTS FROM THE DAIRY COMMISSIONER.

Following Dr. Connell's address, J. A. Ruddick, Dairy and Cold-storage Commissioner, was billed to lead an open discussion, though whether the discussion was to be on cows, weather or politics, the delegates were left to surmise. We quote a few of the points:

He approved the idea of marking the cheese, so as to identify all those from each particular vat. As in Western Ontario this is the regular practice.

He did not approve the making of whey butter, and pointed out that it was by no means a new idea.

GREEN CHEESE.

He had had many object lessons last summer in England as to the importance of having our cheese well cured before being placed before the consumer, otherwise our export trade will be seriously affected. While some of our Montreal merchants have excellent warehouses, where the cheese may be held and the ripening process advanced, others cannot be depended upon to refrain from marketing uncured cheese, and the only way to prevent the marketing of green cheese is for the factorymen to refuse to ship them so promptly from the hoops.

While in the Old Country he visited the Cheddar-cheese district in Somersetshire, and among other experiences he saw one dairyman who always gets 84 shillings per cwt., or 18 cents a pound for his cheese, which are made by what is there called a quick-ripening process, although none of them leave the shelves until ten weeks old. While over England the usual custom is to milk in the stable, in Somersetshire the milking is done out of doors, not in a milking yard, but in the open pasture, free from dust and dirt. Of course these cheeses are well made, but their great special value lies in their flavor. In Canada we have set up a wrong standard; we are satisfied if the cheese are free from bad flavor, but in Somerset they not only have this negative virtue, but have a distinct cheesy flavor, and it is chiefly on this account that a premium of 6 cents a pound was commanded by these special cheese.

THE REFRIGERATED-CAR SERVICE.

Re icing cars: The Dominion Department of Agriculture does not operate any of these cars, but merely pays the railroad \$5.00 for the icing of a limited number of cars, say 115 to 120 per week. It is not done by way of a bonus to any section or to any industry,

but as a means of introducing the idea of refrigerated cars, the expectation being that eventually shippers would be willing to bear the expense of icing themselves. The demand for the iced cars, and the interest taken in the subject, indicate that the expectations are being realized.

IMPROVED ROTATIONS FOR DAIRY FARMING.

If we want to succeed as a dairy country we must get rid of some of our old notions and practices. We must consider our cattle first and other things afterwards, said J. H. Grisdale, of the Central Exp. Farm. The first condition for successful dairying is ample food for summer and winter; we must have better pastures and better means for supplementing them. In the past we have bent our energies to carrying our cattle through the winter; we must now study how to carry them well through the summer. Cattle roaming through sunlit fields, enduring heat and fighting flies, are not comfortable. The aim of every feeder should be to persuade his cattle to eat all the good food they will, and a primary condition must be economy of production. To this end we must study crop production and systematize our cropping. On the farm, more than in any other industry, it is essential that system prevail. The farmer who does things in a haphazard way cannot make the best success of his business; he cannot make the best use of his feeds.

ROTATION OF SOILING CROPS.

In laying out a system of rotation for a dairy farm, Prof. Grisdale advised dividing the farm into two parts, one for the production of pasture and winter feeds, the other near the buildings for raising soiling crops to be used green, to supplement the pasture. For the latter purpose, a farmer with 100 acres of land should set aside 12 or 15, the crops grown thereon to be used green, if required, any excess being used for winter fodder. Divide this portion into three equal fields, say of 5 acres each, and on each of them follow a rotation of clover, corn and peas and oats, reseeded to clover. The corn should be part early and part late, while the grain mixture should be sown at intervals to suit the size and probable needs of the herd. Under this rotation, bringing in clover frequently as it does, little manure will be required, and the soil will improve in condition. Care must be taken that the peas and oats are not allowed to lodge and smother the young clover.

The balance of the farm he would arrange in four equal parts. If preferred, existing fields may be utilized, and the four sections practically equalized by removing or adding a fence or two. Here the rotation would be grain seeded to clover and timothy; next year hay, following year pasture, broken for corn, roots, potatoes, and, if necessary, a little mixed crop the fourth year. This rotation is likewise favorable to soil enrichment. Experiments for ten or fifteen years at Ottawa showed that the first year's growth of clover from a seeding of 12 pounds per acre enriched the soil as much as the addition of ten tons of manure. Q.—Why plow the sod in the spring for corn? Because when the plowing is left till spring, the spring growth of grass furnishes a large amount of vegetable matter in addition to the manure, and this not only provides extra fertility for the corn roots, but, by its fermentation, helps to warm the soil.

PHILOSOPHY OF ROTATION.

He then explained briefly the philosophy of his rotation. For crops like corn, roots and fodder, where we want a large growth of leaves and stalks, a soil rich in humus and nitrates is wanted, and inverted sod, manured, is the ideal. For grain, we are not anxious for an excess of humus, but what the crop needs should be in a well-decomposed state. The fine tilth following a hoe crop is excellent preparation for grain. Sowing two consecutive years to grain is not good practice. In a recent experiment they found that by plowing a sod in August, working it well in autumn, and ridging up in the fall, the yield of oats obtained was nearly double that on late fall plowing worked down in spring, and almost twice as good a catch of clover was secured. Grain crops demand a fine state of tilth.

RESULTS OF SHORT ROTATIONS.

Rotations of crops are necessary, if good results are to be secured. He cited the case of an abandoned farm taken hold of five years ago by a young man who in the first season was unable to winter twelve cattle and two horses. Last year he wintered thirty cattle and four horses without buying feed. He followed a rotation. In Ontario County is a farm where ten or twelve cows would ordinarily be kept. Some years ago a three-year rotation was adopted. Fifty cattle are kept, besides a large stock of swine, and eight or ten horses, no feed being bought, except some concentrates for the cows.

GOOD RETURNS FOR LABOR APPLIED TO AGRICULTURE.

A year ago last fall the speaker had visited farms in many parts of Ontario, studying systems of farming and crop rotation, and the conclusion was forced home that we are not getting out of the land half what we ought. Some interesting data were supplied by a comparison of representative farms devoted to different lines of production. In Western Ontario, in the district of London, was a section of splendid land where practically no labor was applied at all. The young men had gone West, for "goodness knows why," and the fathers moved into the villages. Many of the farms were rented to men who seed them down and graze cattle. These farms usually paid a rental of