

of, a feature quite frequently entirely ingored by the average dairy farmer, but nevertheless a feature of exceeding great importance and of very high value where it is desired to get the best out of the individual or the herd.

Palatability is undoubtedly the most important characteristic to be provided for in producing crops for dairy cattle, but a feature not to be overlooked and, in fact the feature which has most commonly been dwelt upon by men dealing with this subject, is the suitability of the feed for the end in view. Suitability in this connection has been considered to mean that quality in the ration which makes it fill up and satisfy the craving of the appetite for something to distend the digestive organs, and, besides this, suitability in the way of composition for the attaining of the end in view, namely milk production. Producing large quantities of milk means, as everyone knows, the utilization of large quantities of protein, that is the flesh forming part of the foods. Fortunately, our chemists and experience have shown us what foods possess this peculiarity, and which of them are likely to please the dairy cow and enable her to give good results at the pail.

Among the feeds that we find most suitable for milk production in Eastern Ontario and that come the nearest to complying with the conditions of success in feeding as indicated above are corn ensilage, mangels, turnips, alfalfa, red clover, alsike, pea and oat hay, brome grass hay, blue grass hay and mixed hay, while for concentrates a mixture of oats, peas and barley, oats and peas or of peas alone or oats alone, barley in small quantities, corn, oil cake meal, cotton seed meal, gluten meal, wheat bran, wheat shorts or middlings are about the best that can be fed.

To the concentrates we need pay little attention since, with the exception of the by-products and mill feeds mentioned, they are grown and grown fairly cheaply on every farm. The question of the economical production of the roughage or coarse part of the forage is, however, an exceedingly important one, and a few ideas on the methods of production best suited to Eastern Ontario conditions are submitted.

To begin with "Abundance" should be the watchword. Any shortage in the supply of roughage is very much more serious than a similar condition where concentrates are considered, hence in making arrangements for forage production, a margin of at least one-quarter and better still one-third more than is likely to be necessary should be allowed.

To get the best results and to be sure of a sufficient supply year by year, some regular cropping system of rotation should be followed. Where part of the arable land has to be used for pasture each year, a four-year rotation is probably the best. Where sufficient rough land is included in the farm to permit all necessary pasturing being done thereon, then a three-year rotation is likely to give best returns.

On that part of the farm devoted to crop production a good four-year rotation is:—

1st. year.—Hoed crop. 2nd. year.—Grain seeded down as follows:—Timothy, 6 lbs.; alsike, 2 lbs.; red clover, 10 lbs., and if the land is well drained, alfalfa, 6 or 8 lbs. per acre. 3rd. year.—Hay, 2 cuttings. 4th. year.—Pasture or hay as necessary.

Corn for ensilage should be the staple crop on every dairy farm. It is a safe crop, that is, it practically never fails and provides a safe feed. Corn ensilage is of uniform quality from beginning to end of the feeding period, that is, during the whole twelve months of the year.

Mangels, sugar mangels, sugar beets and turnips are all excellent feeds for dairy cattle and can be grown profitably in Eastern Ontario, but require considerable hand work and are, as a rule, more expensive crops to produce than corn along with which, of course, they must be classed.

In the production of hay the proper points to be considered are the seeding down and the making of the hay next season. The generous seeding indicated, while apparently expensive and in the opinion of some people extravagant, is really cheap and certainly most profitable. Liberal seeding, as indicated, means greatly increased chance of getting a good "catch," a much more rapid growth when in hay, and the crop ready to cut somewhat earlier than where thinner seeding is practiced, and at the same time a growth of such character as to insure a very much better quality of hay than from thin seeding. The superior quality is due in this case to the thickness of the growth which makes finer stems and taller crops, which means considerably improved quality in flavor and digestibility of the cured hay.

The grain areas or field of the rotation might be devoted to oats, peas, and barley. It is usually well not to sow the grain too thickly, and to do everything else possible to the end of insuring a good catch of grain and clover. Thorough tilling or harrowing until the seedbed is in perfect condition for firmness and fineness, then rolling, seeding, rolling and lightly harrowing after the second rolling is the treatment likely

to give the best results under average weather conditions in this province.

Protecting the catch from cattle in the fall and spring is about the only thing that can be done by the farmer to insure a good crop of hay the next year.

To show what is possible Mr. Grisdale referred to the fact that in November, 1912, over \$1,000 worth of dairy products were sold from the herd at C. E. F., Ottawa, besides hogs and other stock, and all this from a 200-acre farm.

REPORT OF THE CHIEF INSPECTOR.

G. G. Publow, Chief Dairy Instructor for Eastern Ontario, in his annual report said that 895 cheese factories were in operation (which is 18 less than last season). This reduction is due to the fact that 6 were burned and 18 closed. Four of the factories burned down were re-built. Two were operated as creameries and two were purchased by the Dominion Government, and a model combined cheese factory and creamery built in their place (for which the government is to be commended).

1,404 full-day visits and 4,958 call visits were made by the instructors. In addition fifty-two factories made improvements in buildings or plant, the estimated expenditure, including new buildings, being \$95,044. Ten factories were equipped with cool-curing rooms. Eighty factories pay for milk according to quality. Fifty-two pay by straight fat, and twenty-eight add 2 to the reading. One hundred and six factories pasteurized the whey, the average acidity of the pasteurized whey being .36% as compared with 1.04% in the unpasteurized. One hundred and twenty-one factories manufactured whey butter, and the total pounds of butter made by same from May 1st. to November 1st. were 385, 854 lbs., which is 26,999 lbs. more than for the same period last season.

The number of patrons delivering milk to the cheese factories was 34,425, which is 682 less than last season. The milk was delivered to the cheese factories in better condition than in any previous year. Some 30,895 samples of milk were tested for adulteration. Of this number 78 were found to be deteriorated. After an investigation had been made, 60 cases were handed over to the Official Prosecutor to be dealt with. 57 of these were convicted, and fines ranging from \$5.00 to \$50.00 were imposed, amounting in all to \$1,333. Deteriorations are becoming less from year to year, the number this year being the smallest in Mr. Publow's experience.

The amount of milk delivered to the cheese factories, from May 1st to Nov. 1st, was 1,011, 725,699 lbs., and the amount of cheese manufactured from same was 94,696,819 lbs., which is 1, 062,251 lbs. more than for the same period last year, or allowing 85 lbs. as the average weight of a cheese, this would show an increase of 12,497 cheese.

The average lbs. of milk required to make a lb. of cheese, was 10.68 as compared with 10.74 last season. This does not seem to be very much of a difference, but when figured out from the 94,696,819 lbs. of cheese manufactured, it amounts to 495,171 lbs. At 13 cents per lb. (which was the average selling price of the cheese for the six months) this would mean a gain to the producers of \$64,372.23.

A special effort was made to improve the texture of the cheese, also to reduce the pounds of milk required to make a pound of cheese. To do this, instructions were given to set the milk in a sweeter condition, and to salt the curds lighter than had been the general practice, and the results have been very gratifying, as the average is lower this year than for several years.

The quality of May and June cheese was exceptionally fine. Very few complaints were made regarding acid or off-flavored cheese, but as soon as the weather became warm, came the old story of over-ripe and gassy milk, and before the makers realized it, a considerable quantity of more or less open cheese had been placed on the market. Notwithstanding this, he considered that taken on the whole, the quality was superior to that of former years, although there is still much room for improvement.

Twenty-seven creameries were in operation this season, receiving in all 33 full day visits and 19 call visits, and 3,898 patrons supplied milk to these creameries.

The average per cent. of fat in the cream was 29% as compared with 27.5% last year, and cream was reported as being delivered in a much better condition.

The amount of butter manufactured from May 1st to Nov. 1st, was 2,301,219 lbs., which is about 10,000 less than last season, for the same period. The average selling price of the butter being 26 1/2 cents per lb., which is about 3 cents per lb. higher than in 1911. The quality was reported as being much superior to that of last year, particularly in flavor.

None of the butter was exported, as it was all required for home consumption, the supply not being equal to the demand. 61 samples were

tested for moisture; the results ranging from 17.4% down to 11%, with an average of 14.56%.

A new feature of the work this year was the carrying on of a salt test by Mr. Singleton. 31 samples of butter were tested for salt, the results ranging from 4.25% to .88%, with an average of 2.25%.

During the season 31 samples of water from cheese factory and creamery wells, were expressed to Dr. Connell, for a bacteriological examination, and of this number 13 were found to be entirely unfitted for factory use, and were condemned. The managers of the factories from which these samples of water were obtained were asked to provide a new water supply.

The matter of cheese boxes was a very difficult problem for some of the factorymen this season. The quantity was very limited, and in some cases they had to pay as high as 20 cents per box. Several factories were forced to close before the end of the season, not being able to get them, even at that price. Owing to the extremely wet weather experienced this season, a large number of the boxes arrived at the factories in a very wet condition, and it is expected that complaints will be received from the Old Country, regarding excessive mould, and defective rinds, as a result of the cheese having been shipped in damp boxes.

With the exception of a few cases there was a marked improvement in the sanitary condition of the cheese factories.

The weakest points in connection with the manufacture of our cheese are: 1, lack of facilities for the proper control of the temperature of the curing rooms; 2, over-ripe and tainted condition of some of the milk during the warm weather; 3, lack of competent and sufficient help to enable the makers to manage their factories successfully at all times.

The greatest needs of the creamery business are: 1, greater production of milk and butter per cow; 2, improved quality of raw material to obtain which we need more frequent washing of the separators, and more efficient cooling of the cream; 3, more care and skill on the part of some of the makers, and better refrigerators in some of the creameries.

DAIRY RECORD CENTRES.

OTTAWA.

Chas. F. Whitley, of the Dairy Division, Ottawa, discussed the work of the dairy record centres. It is beginning to be recognized more generally that a cow is kept not simply to consume roughage and concentrates, but to produce milk and fat in abundance. Not only is a large production necessary from each, but a good profit must be made. That is the essence of modern business-like dairying. The profit made depends largely on the cow's inherent ability to convert feed into those products economically. It is evident that if the production is sixty dollars' worth of milk or fat a feed cost of fifty-five dollars, the net profit is only a bare five-dollar bill, and is not a good return for her year's work. But fifty dollars' worth of product at a feed cost of thirty dollars makes another cow, with her twenty dollars profit, just four times as profitable. Such study of dairy economics is only possible when dairy records are kept, and it is to this laudable end—a large profit from each cow—that the Dairy Division at Ottawa works through the recommendation of systematic cow testing, the bed-rock principle of dairy herd improvement.

Unless the figures are actually before one, the variations in production found in the same herd seem almost incredible. For instance, in three Ontario herds, the difference in yield between the best and the poorest cow runs actually at 8,100, 9,100 and 10,900 pounds of milk; the two extremes are 3,690 and 17,615 pounds. This proves immediately that neither an occasional sample tested or pailful weighed, nor a hasty figuring of the herd's average yield can possibly give any measure of justice either to the abundant or to the economical producer, so that the knowledge requisite to building up a good herd has still to be sought. That knowledge can be found in dairy records.

The more the question of net profit per cow is looked into, the more singular are the discoveries. A common showing in many districts is that one-third of the total net profit in a herd of eight or ten cows is made by only one, the best cow. That one good cow, earning \$43 profit over a feed cost of \$37, sometimes makes as much profit as to combine the profit and loss of the six poorest cows. Such a heavy burden is not fair play to her.

A cow giving \$41 dollars' worth of milk at a feed cost of \$37 makes only \$4 profit; the cow with \$43 profit noted above makes as much profit as ten cows of that kind. Such comparisons abundantly prove the necessity of studying each individual. Let us cease this unsatisfactory, "menlightening talking of the herd 'average'."

The accompanying chart illustrates the startling difference between average and individual profit and loss.