

curdled the casein, enclosing most of the fat contained in the milk, some of the other milk solids, and a proportion of the water of milk. The feeding value of whey is largely found in the fat and solids not fat. Of the latter, the chief constituent is milk-sugar, which, when milk sours, is changed into an acid, known as lactic. While the latter has little or no direct food value, it seems to exert a beneficial effect upon food digestion in older animals. For young stock, however, the dairy by-products are more valuable without the lactic acid. In tests made at Western Ontario factories, it was found that whey unpasteurized contained from 1 to 1.7 per cent. lactic acid; whereas, whey pasteurized contained but .4 per cent acid, and in some cases as low as .25 per cent.

There is another beneficial effect of pasteurization, in that it prevents the fat separating from the other solids and the liquid, thus insuring an even distribution of the fat contained in the whey among all the patrons, and preventing that greasy mess in the whey tank, or in one or two patrons' cans, which is an abomination to those who have to wash tank or cans.

FEEDING VALUE OF WHEY FAT.

During the season of 1908 we conducted rather extensive experiments at the O. A. College regarding the whey-butter question, details of which can be found in the annual report of the College. In conjunction with the Animal Husbandry and Farm Department, we carried on a series of experiments to ascertain the relative feeding values for hogs of whey containing an average of about .25 per cent. fat, and similar whey from which the fat had been practically all extracted by means of a cream separator.

Prof. G. E. Day has kindly furnished the following summary of the results with pigs:

"Eleven pigs were fed ordinary whey and meal, ten pigs were fed separated whey and meal, and twelve pigs were fed water and meal, as a check group. The meal consisted of ground barley, frozen wheat and middlings. The experiment lasted 120 days.

"On ordinary whey, the average daily gain per pig was 1.16 pounds; for separated whey, 1.07 pounds; and for meal alone, .7 pounds.

"The feed consumed per 100 pounds gain for ordinary whey was 269 pounds of meal and 747 pounds of whey. For the separated whey, it was 297 pounds meal and 774 pounds whey. For the group fed meal alone, it required 430 pounds meal.

"From these figures we deduce that, if the value of separated whey be represented by 100; the value of ordinary whey would be 125, or 25 per cent. higher.

"I may say that, in this experiment, we found an abnormally high feeding value for both kinds of whey, and the only reason I can give for this state of affairs is that we fed a very small proportion of whey to meal. On an average, we fed hardly two and three-quarter pounds of whey for each pound of meal, and it is a well-known fact that, where small proportions of dairy by-products are used, they give a much higher feeding value per 100 lbs. than when they are used in larger quantities. As whey is ordinarily used, a much lower feeding value per 100 pounds would be obtained. In our experiment, however, we were anxious not to have any of the pigs put off their feed, and consequently we kept the whey down in quantity. Though the results show a higher feeding value for whey than normal, at the same time I think that the method of feeding should not affect the comparison of the two kinds of whey."

DIFFERENCE IN VALUE OF ORDINARY AND SEPARATED WHEY.

Assuming that live hogs are worth \$5.50 per 100 pounds, and that the meal cost \$1.50 per 100 pounds, we have a value of 18.2 cents per 100 pounds, for ordinary whey, and 13.4 cents, for whey from which the fat has been extracted—a difference of 4.8 cents per 100 pounds in favor of the whey containing the fat.

This means that in a factory where the fat is separated from the whey, or where the fat rises to the top of the whey in the tank, and is practically lost for feeding purposes, that the loss in feeding value is nearly five cents per 100 pounds whey.

THE WHEY-BUTTER QUESTION.

Looking at the whey-butter question for a moment, and taking the average of experiments made at the O. A. College during 1908, where the amount of whey butter made averaged from 2½ to 3 pounds per 1,000 pounds whey, we can see that whey butter must sell for an exceptionally high price to give any profit. Assuming that the yield be 3 pounds butter per 1,000 pounds whey, at 20 cents per pound, we have a value of 60 cents. According to the price of butter, as quoted, the difference in value between ordinary and separated whey is 48 cents per 1,000 pounds, or only 4.8 cents per 100 pounds. If the price of the butter increases, the margin is greater, being 27 cents per 100 pounds.

pounds whey, if the butter sells for 25 cents per pound, and 42 cents if 30 cents be received for the butter. These facts may very well cause farmers and factorymen to consider carefully whether or not it pays to manufacture whey butter.

The estimated cost of pasteurizing whey at the cheese factory is from 50 cents to \$1.00 per ton of cheese. Considering the enhanced feeding value of the whey, the reduction in risk of spreading bad flavors and disease, and the greater ease with which tanks and cans may be cleaned, we strongly recommend the cheese-factory managers of Eastern Ontario to make the necessary provision for pasteurization of whey during the season of 1909.

How a Prizewinning Herd was Handled.

Being unable to attend the Western Ontario Dairymen's Convention, owing to sickness in his family, Mr. John W. Cornish, of Harrietsville, Middlesex Co., winner of first prize and silver medal in the cheese-factory patrons' branch of the dairy-herd competition, sent Secretary Hems the following notes as to how his herd had been handled during the season. After thanking the President and Directors of the Association for the very satisfactory way in which they had handled the competition, he proceeded:

"My herd consists of eight grade Holsteins, one of which is a three-year-old heifer. Three of my cows freshened in March, the other five during April and the first week in May. About three weeks before freshening I gave a ration consisting of silage, straw or clover hay, and about a pint of oat chop, with a little oil cake added. Of course, the grain ration varied, according to the condition of the cow. After freshening, I increased the grain ration to three or four quarts per cow, at the morning and night feedings, and continued the silage and clover hay until they were turned out on grass, from which time I reduced the grain to one or two quarts per cow, and changed to bran or shorts in place of oat chop.

"I had half an acre of Hungarian grass convenient to the stable for green feed during the dry spell in the summer. I commenced feeding it as soon as it began to head out; always fed in the stable morning and evening. This feed lasted until my corn crop was available. We then fed corn morning, and roots at night.

"Another point that is very important is to salt and water one's cows often and regularly. I salt mine three times a week, and always water during the warm weather three times a day. We always milk at the same hour night and morning, and have the same person milk the same cow.

"I always send the laziest man on the farm after the cows—I generally go myself. I never allow the dog to accompany me, as I believe better results will be secured by slow driving of my cattle before milking. The more kindness you bestow upon your herd, along with proper feeding, the better will your herd results be."

Uses for Ice on Farm.

Among the uses for ice on the farm may be mentioned:

1. To put in tanks of water for cooling the cans of milk as soon as milked. If the ice be broken into small pieces, it will cool the milk more rapidly, because it melts more rapidly.

2. To cool water for raising the cream on milk set in deep cans, by gravity. Ice is almost a necessity for this form of creaming milk.

3. For cooling cream as soon as the milk is separated with a cream separator on the farm. Most of the troubles in cream-gathering creameries are caused by patrons neglecting to cool the cream at once after separating. Cream allowed to stand for some time after separation, without cooling, sours quickly, and usually develops a bad flavor.

4. For keeping butter, cream, milk, meat and other perishable household necessities in hot weather. A great deal of food is wasted in the average house in summer because of lack of ice to keep the food cool, thus causing a loss of what otherwise would be valuable human food.

5. For making cooling drinks in summer. While it is an error to pour icy-cold water down one's esophagus, a cool drink in hot weather is always refreshing.

The storing of ice on the farm is not increasing as rapidly as it should, neither is the building of cooling rooms. These are two points where a determined effort should be made to increase incentive for improvement. The benefit of storing ice on the farm do not seem to be appreciated by the average patron; he needs to be educated as the city resident, to preserve food and to keep his family healthy.

Udder and Its Affections.

(Abstract of a paper prepared by Dr. F. L. Russell, University of Maine, and given before the Maine Dairymen's Association at Dexter.)

First describing the structure and function of the udder, Dr. Russell divided its diseases into two classes—local, which affect no other part of the cow, and general, in which the udder is only one of the organs affected. Touching the first class, the following, with their remedies, were considered: Warts are not serious, though sometimes unsightly, and if they bleed at time of milking are decidedly objectionable. A little grease after milking will cause them to disappear.

Sore teats are frequently caused by exposure, or by the teeth of the sucking calf. A little vaseline applied after each milking, when the trouble first begins, is often all that is needed; the more serious cases yield readily to oxide of zinc ointment in place of the vaseline.

If a cow is such a hard milker that she is valueless to the dairyman, or if in the case of a heifer the upper valve is too rigid or is closed by a membrane, the teat bistoury should be used to remedy the conditions. It can sometimes be used to advantage in removing an obstruction in the duct of the teat. In the latter case it is sometimes necessary to use a milking tube until the quarter is dried off, when the obstruction can be cut out.

Fistulas can be dissected out with a sharp knife, or cauterized with a piece of large wire heated red hot. When the resultant wound heals the opening will be closed. Cows that are heavy milkers are often affected with bloody milk. This condition is due to the rupture of small blood vessels, and pulling down on the udder when milking is likely to aggravate it. The trouble may result from swollen or injured udder, or from abrupt increase of rich food. Sometimes it is necessary for the cow to go dry, but usually restricted diet and careful milking will lead to recovery in from three to ten days.

In the case of torn or cut udder, the wound must first be thoroughly disinfected, when stitches may be taken near together to close it. A disinfectant must be used as a wash while the wound is healing. Superficial wounds may be treated with creoline or zinc ointment.

In the case of congested udder, which is liable to affect heavy milkers just after calving, careful treatment is necessary or a valuable cow may become permanently injured. The feed should be laxative, and not too abundant; the udder should be bathed frequently with hot water and rubbed a long time with the bare hand. Camphorated oil may sometimes be applied to advantage. More can be accomplished the first day or two than is possible later if neglected at first. Some of the more serious cases require daily doses of an ounce of saltpetre and 20 to 30 drops of aconite.

In the second class of diseases, Dr. Russell placed milk fever, cow pox, tuberculosis and simple and contagious garget.

Milk fever has lost most of its terror, for now recoveries are the rule. The treatment consists in filling the udder with sterilized air, after which the cow may be expected to regain her normal condition in from eight to ten hours. A comfortable bed and warm clothing are desirable for the cow, yet not essential. The preventive for this disease consists in leaving the udder partially filled with milk until the calf is three or four days old.

Cow pox is characterized by considerable fever and sores on the udder or teats of the cow, and it is not usually considered a dangerous disease. These sores begin as small tender red spots, that later break and discharge, then gradually scab over and heal in about 20 days. The use of a milking tube and antiseptic washes hastens healing. It must run its course, and treatment is along the line of preventing its spread in the herd.

Tuberculosis of the udder is not very common. Hard, slightly tender lumps in the glands grow more or less slowly until the whole quarter may be filled, while the milk is normal in appearance. It is, of course, unfit for food, and the cow must be destroyed.

Garget is one of the most troublesome diseases that the dairyman has to contend with. In its mildest form it manifests itself in a scant supply of milk from one quarter of the udder, which may contain thick, stringy particles. In more severe cases all quarters of the udder may be seriously swollen and hot, and the secretion almost entirely suspended. The cow will be stiff and lame, with little appetite. The disease results from mistakes in feeding, but it may be produced from direct injury of the udder. Rough milkers have more trouble with garget than careful ones. The first attack, even if severe, usually yields to a moderate dose of physic, and daily yields of an ounce of saltpetre, with light laxative food. Sometimes distending the udder with sterile air is beneficial. Old cows that have frequent attacks of garget are best treated by sending to the butcher.

Contagious garget manifests itself at first as a hard, hot, painful swelling at one end of the teat, caused by the presence of certain bacteria. A frequent use of disinfectants on the outside and