

THE DAIRY.

The Pasteurization of Milk for Cheesemaking.

Editor "The Farmer's Advocate":

There has been a revival recently of the question of pasteurizing milk for cheesemaking, and some most extravagant claims are being made for this "wonderful discovery." One agricultural editor has written a most enthusiastic introduction to an article giving the results of some experiments made on the pasteurization of milk for the manufacture of cheddar cheese, the editor going so far as to claim that the new system is likely to revolutionize Canadian cheesemaking, etc.

Our attention having been called to the article, the suggestion has been made that we give the results of experiments conducted at the Dairy Department of the College, which have apparently been overlooked or forgotten. We do this willingly for the benefit of Canadian cheesemakers, in order that they may not be led astray by extravagant claims for a "new discovery." We may also say that it is not our intention to detract from the results of any fellow worker in dairy science, but simply to point out the truth, as we believe it. The truth alone can make us free. During my connection with the dairy work of the Province of Ontario, I have seen a great many of these so-called "discoveries" which would "revolutionize" dairying, fade into nothing in a short time.

We have to go back to the year 1897 for the first work done on the pasteurization of milk for cheesemaking at the Ontario Agricultural College. In the report of the College for that year, page 51, there is a brief summary of the experiments conducted, from which we quote: "Four methods of treating milk after pasteurizing were tried, with but limited success. The heating of the milk to 160 degrees changes the character of the milk in such a way that it does not work at all like an ordinary curd. The experiments so far made would lead us to doubt the value of pasteurization for cheddar cheesemaking."

At the thirty-third annual convention of the Cheese and Butter Association of Western Ontario, held at Stratford, Jan. 16th, 17th and 18th, 1900, we gave an account of our experiments with lime solutions in cheesemaking. As it is the lime-solution phase of the pasteurization of milk for cheesemaking which is claimed to be such a discovery, would you allow me to quote quite fully from pages 87 and 88 of the Fairmen's Association Report for that year:

"Lime consists of the metal calcium united with oxygen. Calcium is a light-yellow metal having an affinity for oxygen. Pure lime combines very readily with water, giving off a great heat, and falling to a white powder known as slacked lime.

"Carbonate of lime, chalk, sulphate of lime (land plaster), and chloride of lime, are other forms of calcium commonly known.

According to Soldner, calcium exists in milk in the form of calcium phosphate, calcium citrate, and calcium oxide, in combination with casein, in the proportion of 100 parts casein to 1.55 of calcium oxide.

"Under the influence of high temperatures, the lime salts of milk are changed. . . . The pasteurization of milk for cheesemaking renders the curd mealy, flaky, and crumbly in nature, and it does not become 'meaty,' as is the case with ordinary curds.

"During the past two years a number of experiments have been made at the Dairy Department of the College with the solutions of ordinary lime-water, calcium chloride solutions, and a mixture of the two. These solutions have been used with both normal milk, and milk which had been pasteurized, or heated to a temperature of 160 degrees F.

"The quantity of the lime solution added to the milk varied from 3 to 6 of one per cent., and of the chloride there was used about .1 per cent. In some cases the lime solutions were mixed with the rennet for from three minutes to twelve hours before adding to the milk, and in other cases the lime solution was added to the milk a short time before setting. The conclusions from all these experiments are summarized as follows:

"1. An ordinary lime-water solution, when mixed with the rennet for ten or twelve hours before the rennet is added to the milk, destroys the action of rennet, but such an effect does not result if the rennet and lime water are mixed shortly before renneting the milk.

"2. Calcium chloride solutions do not affect rennet action adversely.

"3. The yield of cheese was slightly greater

metal is wasted. Let us hear, then, the conclusion of the whole matter: If you want good summer roads, use four-inch tires on your wagons.

However, there are two serious obstacles in the path of the broad tires. The first has ever stood in the way of all improvement—ignorance. The second is more excusable, as far as individuals go—expense. The overcoming of the second will do away with the first, except in the case of unreasonable people.

If my memory serves me right, a short time ago there was something said in Parliament about making it unlawful to use narrow tires on wagons. Some of our cities and towns have by-laws to that effect, but they are merely on the book—not enforced at all. Yet, I could point out, in a city not 1,000 miles from London, where a great deal of money was spent recently in order to pave the streets which the farmers used in bringing their produce to market. It would seem to me that if the city had used this money in paying a part of the cost for wide tires for farmers who used those streets, the city would be money in pocket at the time, and any paving done would be permanent, whereas, as long as the farmers and others continue drawing heavy loads over them with narrow-tired wagons, the time will soon come when the street is cut up once more. A good system for a city to adopt would be to pay a part of the price of wide tires to the farmers who show tickets from the weigh scales totalling a certain tonnage. Each farmer who drew in the required weight (showing that he used the streets a good deal, and would thus harm them with his narrow tires), would be entitled to his share of the 4-inch-tire fund. Thus, the city would really profit by spending money for proper tires for farmers' wagons.

The Ontario Government is spending annually considerable money for the improvement of roads, and anyone who looks for it can see that the roads dealt with are improved. But it is just as easy to see that the good roads made in this way are being cut to pieces with narrow tires as fast as the farmers can do it, and thus the public money is to a large extent wasted. Now, if this "good-roads money" were spent in part buying wide tires for the farmers' wagons, much more would be accomplished in the making of good roads. The Government should also appoint capable men to oversee the construction of permanent roads, as well as making a standard day's work for those employed. Good results cannot be obtained as long as teamsters doing the road work are allowed to draw a wheelbarrowful of gravel or crushed stone, and call it a load.

In order to introduce the broad tires generally, a good step would be for the ratepayers to pledge their township council to use its influence against narrow tires. The same pressure could be brought to bear on the county council, and also on our representatives in the Legislative Assembly. Agricultural papers would do a good work in agitating for the use of the four-inch tire. Those buying new wagons should see that no new tire is less than four inches in width. Once a start is made, their use will rapidly become general. Farmers should all start together.

Perth Co., Ont. A. DOUGLAS CAMERON.

Good General Crop Prospects in Canada.

The Census and Statistics Office reported last week on the condition of field crops, and the number and condition of farm animals of the Dominion at June 30. Fall wheat is 85.47 this year, compared with 77.28 in 1909, and 89 in 1908. Oats was 90 in 1908, and 93.81 in 1909, and this year it is 86.22. Peas is 86.94 this year; last year it was 84.10, and in the previous year 82. The condition of mixed grains is nearly the same, being 84.53 this year, 86.58 last year, and 84 in 1908. Hay and clover is better this year than in either of the previous years, being 91.12, compared with 76 in 1909, and 87 in 1908. The condition of alfalfa has been recorded this year for the first time, and its average is 88.94. Pasture has a condition of 89.02 this year, compared with 99 in 1908, and 87.71 last year. The conditions of all field crops are good in Ontario, the highest being 94.29 for fall wheat and the lowest 81.79 for spring wheat. Quebec crops range from 74.45 for mixed grains, to 102.58 for hay and clover. Peas is 84.42, and its condition is the next after mixed grains. In Prince Edward Island and Nova Scotia, all field crops are reported for a condition above 90 except alfalfa, which is 83.33 in the Island. Hay and clover are 104.31 in the Island, and 105.79 in Nova Scotia. Wheat, oats, mixed grains and alfalfa are reported in a condition above 90 in New Brunswick, and all other crops between 83 and 89 except alfalfa, which is 92. Hay and clover are reported at 100.5 in Atlantic, Saskatchewan and Alberta. The crops are good throughout, owing to a light rainfall and a moderate frost. The general condition of crops in Manitoba is much below the average. Correspondents generally every district report no rains, only a few light showers, and hot, dry winds, which absorbed the moisture and withered the crops.

The lowest average condition is reported from around Brandon and Morden, and the highest from Marquette, where it is placed at a standard. In Saskatchewan the crops do not appear to have suffered from climatic conditions to the same extent as in either Manitoba or Alberta, as there have been many local showers. The reports from Lloydminster, Battleford, Indian Head and Qu'Appelle are very favorable, the condition of wheat being placed at 100 and over. The prevailing condition of crops in that part of Alberta south of Townships No. 30 is below the average, in consequence of drouth and hot winds. In the Edmonton district, the grains, although suffering to some extent from the same causes, are in much better condition. The best reports come from the Strathcona district, and those from Athabasca Landing and Saddle Lake districts are also particularly favorable. The field crops of British Columbia are all good. The areas of late cereals—barley, wheat, flax, corn for husking, beans, potatoes, turnips and other roots, sugar beets, and corn for fodder—have increased this year to 2,150,382 acres, which is 279,526 acres more than last year, and 217,869 acres more than in 1908. But this increase is altogether in flax, which, owing to the high price offered for seed, has come into favor with the farmers of the Northwest.

The only farm animals which show a noticeable increase since 1907 are horses, while sheep and swine have declined. The condition of all these animals over the Dominion exceeds 99.

Dust Prevention and Road Preservation.

Experiments were made during the summer of 1909 at Washington, D. C., Youngstown, Ohio, and Ithaca, N. Y., with different preparations for the prevention of dust and the preservation of roads.

At Washington, waste sulphite liquor was used on a macadam driveway subjected to light traffic. Sulphite liquor is a dense, sticky liquid, produced in the manufacture of wood pulp. It was applied in mixtures with water in varying proportions. The results show that it has but little value as a permanent road treatment, but that in concentrated form it may be classed as a temporary or semi-permanent dust preventive and road-binder.



Dairy Cattle on Pasture, Prince Edward Island.

At Youngstown, blast-furnace slag was used alone, and in different combinations with lime, sulphite liquor and tar, to determine the best method of utilizing slag for road construction. While sufficient time has not elapsed since these experiments were made to show definite and permanent results, it is believed that they will be valuable in determining what combinations will produce the best road.

At Ithaca, tar, oil, artificial asphalt preparations, brick, cement and slag were used, with varying results.

All of these experiments are fully described, with results produced in each case, and a report on experiments formerly made, in Circular 93 of the Office of Public Roads, U. S. Department of Agriculture.

Manure for Hay Land.

Wheat, corn and other crops are no more improved by rotation than hay. The Minnesota Experiment Station shows that a plot continuously cut for hay the past fifteen years has given an average yield of 1.73 tons per acre, while on a plot under a three-years' rotation of wheat, clover and corn, hay has yielded the past ten years, an average of 2.9 tons per acre. In a five-year rotation of wheat, timothy and clover, pasture, oats and corn, the hay has yielded an average of 3.9 tons per acre, since 1900. Eight tons of manure per acre were applied once in five years on the five-year rotation plots. There is money in manure.