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the milk. I find the cart a great convenience, but intend putting on lighter wheels, as it will be much easier to handle; one man can handle more milk on this cart than ten men could in pails in the same time. The cream is kept in cream vats, made on the same plan as the factory vats, so that the cream can be surrounded with hot or cold water as desired. We have two vats, so while the cream is ripening in one it is kept sweet in the other. By means of cold water one can control the temperature, which is very important in the making of butter. Get a good thermometer, and use it, and you will have no witches in the cream.

The churning and working I will leave to others. If you have never used a barrel churn, get one this year, and try washing and salting the butter in the churn; also have a worker. If the dairy won't pay for tools to work with, try something that will. At present we are trying to find a market for all our make, put up in pound bricks. The butter is put in parchment paper, printed with name of farm and address, then put in folding paper box. This makes it much easier to handle the butter without injuring the bricks, and adds very much to the outward appearance of the package. No matter whether tub, box, or paper wrapping, if it is not clean and attractive in appearance the butter will not find so ready a sale, and anything that adds to the outward appearance of good butter adds to the profit of the dairyman. These boxes can be got from Mace, Wilson & Co., Montreal, at \$3.85 per 1000 in 5000 lots, and will cost laid down here a half cent each. The parchment paper will cost, with printing, in 1000 lots, \$2.40, making in all less than it will cost to put it in tubs. Some say it is too much work to put the butter in bricks. Well, if you have a worker, after a little experience you will find it is not so hard to do as it might seem. Some say, why go to all this bother and expense—one will get no more for the butter? I say to such, put yourself in a position to demand a better price and you will get it, or keep right on in the old way and you will get the old price and nothing more.

Shortly after we got the separator I got a second-hand tread power that we used till last fall. Had it been a good power I think it would have been all right, but it was not, so I have bought a 2 H. P. gasoline engine. This is more power than is needed to run the churn and separator, but as I wanted enough power to saw wood I got this size. This, I think, is the best kind of power for the farmer. However, I can't say much about it yet. We have not used it to run the separator yet, but have run the wood saw, churn, and washing machine. This washing machine is another great labor-saver. Once the power is got many things can be run by power other than wife power, and much cheaper than hiring the work done. The machine is always at home, and never talks back, and is the most satisfactory kind of help.

Now, in conclusion, I will say, don't get the separator thinking you can raise as good calves on the warm skim milk as you could on whole milk or milk that contained a part of the butter-fat; still, the calves will live on it, and other food can be supplied that is cheaper than butter-fat, which is too expensive feed for calves. If you patronize a creamery the hand separator might do, but if you have a farm dairy by all means have a power. I notice one of your correspondents, in a January issue, says the farmer has so much money invested in machinery that lies idle most of the year. Yes, just so; and the same men will be very slow to put a little money in a machine to be used the year round. This is the kind of work where labor-saving machinery is most needed.

A. N. LECAIN & SONS.

Sunnyside Dairy Farm, Eastern Assa.

Convention of Cheese and Butter Makers.

(Continued from page 93.)

The Growth of Dairying.—Prof. H. H. Dean pointed out that co-operative dairying commenced in Canada in 1864, and it stands as one of the leading industries of the country. This wonderful growth has been due to energy, enterprise and favorable conditions. Since competition has become keen, we need to put in new life in order to hold our past reputation. It is necessary to study the wants of the future in order that growth may continue. The patrons, makers, salesmen, and consumers, each have their parts to play to insure continued success. Better cows better cared for, with cheaper and better feed, better care of milk, better factories, and improved selling and shipping facilities, are needed all along the way. In order to show the difference in cows of the same breed, the Professor gave the profits in milk over food consumed of several members of the Agricultural College herd. Two cows of each of three breeds were referred to, which gave in the case of the first two, profits of \$59 and \$17 in one year on the same kind of food; of the second breed, \$44 and \$20, and of the third breed, \$26 and \$12. Unless a dairyman determines accurately what his individual cows are doing, he is as liable to be feeding \$12 cows as those that give profits of \$44 or \$59.

With regard to the curing of cheese, the Professor foreshadowed the coming of a system of curing the cheese of several factories in large central curing-rooms, when all the conditions for doing first-class work are as they should be. Many of the points treated in our convention reports of the Eastern and Western Cheese and Butter Associations were touched upon. A new idea, however, was expressed with regard to the value of steam pipes

being used to surround the curing-room in order to heat it with steam from the boiler room. These pipes can also be used for cooling purposes in the hot weather by running cold water through them. He strongly advised putting the curing-rooms into shape that the temperature in them can be controlled. The sub-earth duct was recommended, and it was claimed that \$200 would properly insulate an ordinary curing-room and put in the duct. It was shown that a 100-ton factory would get the entire outlay returned them the first season by reason of the better price and less shrinkage of cheese. The Professor claimed that all salesmen should know good cheese and butter, that they may be able to cope with the shrewd buyers.

Separators.—Mr. Mark Sprague, Ameliasburg, explained the principle of separation of cream from milk by centrifugal motion, and gave much good advice to operators upon their work. He pointed out the importance of running the machine at the speed found to be best by testing the skim milk. Correct temperature is also important.

Economy in Fuel.—Perhaps the most highly appreciated paper given at the convention was that by Mr. E. Agur, of Bowmanville, on how to economize fuel in the factory steam boiler. Mr. Agur estimated that at the least calculation twenty-five per cent. of fuel in most factories is wasted through faulty fire boxes and lack of proper attention. To get the full heat from the fuel burned, the boiler and engine should be kept in perfect repair, inside and out. The flues should be cleaned regularly twice a week. Only dry wood should be used, cut in two-foot lengths. The drafts should never be more than half open, and should be closed except when starting the fire or steam is wanted. A brick smoke-stack is preferable, and it should be connected with the boiler by means of an elbow. The smoke-stack should have a door at the bottom by which the draft can be controlled. All pipes and joints should be tight, that no steam may escape. The brickwork should come in touch with the boiler at high-water mark. It should be absolutely free from cracks. Mr. Agur's brickwork is thirteen inches thick, and the top is covered with several inches of sand. Mr. Agur has fired for a week in a very large factory on a cord of soft, short wood. He keeps the water about ten inches above the tubes, which are eighteen inches from top of boiler.



BARN ON THE FIFTY-ACRE FARM OF MR. J. W. CRAIG, LONDON, CANADA.

A fairly large fireplace was recommended, but the grate should not be larger than three feet, so that cold air would not escape back of the fire into the tubes.

Cheesemaking.—Mr. G. G. Pablo, Cheese Instructor at the Kingston Dairy School, in an address advised all cheesemakers to spend a few weeks each winter at one or other of the dairy schools. The best men pick up some helpful hints. This address dealt with methods of overcoming such faults as bad flavors, acid cheese, weak body, etc. It was advised to have two curing-rooms, one at 70° Fahr., in which the cheese should be placed for a few days, and the other at 60, in which the curing should be completed. Milk should be ripened that the whey may be drawn in from two and a-half to three hours, according to the richness of the milk. Cut the curd in two and one-half times the time it took the milk to thicken to the consistency of syrup. Cutting should be very carefully done with a sharp knife, that loss of fat may be at a minimum. Stir thoroughly for a considerable time before applying steam. A good agitator does satisfactory work. Raise the temperature slowly—one to two degrees in five minutes is fast enough at first—till 96 degrees is reached. If acid develops too fast, heat faster and run off some of the whey. All the whey should be drawn off when one-eighth of an inch of acid is shown on the hot iron. If acid is developing too fast on racks, stir the curd drier. A sweet, nutty flavor cannot be secured from curd with too much acid. After the curd is allowed to mat, if it is stiff and acid is slow, it should be piled deeper and turned frequently to insure even cooking till 1½ inches of acid shows. Mill the curd fine and uniform. Stir it on the racks about one hour, or as long as flavor is improving. When the curd remains in a lump when squeezed it should be salted. Put on salt at four applications with hair sieve at sufficient intervals to allow each application to dissolve before the next is added. Weigh the curd into the hoops, and do not press too hard at first. Pack the center of the hoop most firmly when filling to guard against open body. Press for two days, if possible, but examine sufficiently while pressing to have a well-finished cheese. See that bandages are put on square. Do not put a cheese on the shelf while a fault can be found with it. A very lively

discussion followed, which we cannot give space to, except to point out that washing bad-flavored or gassy curds with pure water at 110 degrees in the vat was strongly recommended. It requires about a barrel of water, which should remain on the curds about half an hour. Mr. Pablo has treated curd made from sour milk in this way at the Dairy School and secured a good quality of cheese.

Winter Buttermaking.—Mr. J. F. Millar, St. George, reviewed his system of making butter in the winter season, referring to each step in the process from the taking in of the milk to the shipping of the butter in 56-pound boxes to the British market. He advised quick ripening by the use of 10 to 12 per cent. of starter. He believes in washing the butter in granular form until the water comes away as clear as when it went into the churn. He also recommended the use of sacks to cover the butter packages in order to keep them perfectly clean while in transportation. An interesting discussion followed the reading of the paper, when it was brought out that butter should stand four to five hours in the workroom after it is made before placing it in the cold room. This gives the salt ample chance to dissolve and thus prevents mottles. Regarding starters, Mr. T. C. Rodgers, buttermaker at the O. A. C. Dairy School, recommended 15 to 20 pounds of nice starter to the cream from 1,000 pounds of separated milk. A thick cream requires more starter than that which is thinner, since it is the skim milk that contains the milk-sugar upon which the ferment acts. A good starter should present a smooth, glossy surface, without whey or water on the top. The Dairy School is now using a starter that has been propagated from day to day for five months. Mr. Arch. Smith, Thamesford, recommended the use of commercial pure lactic ferments.

Pasteurization.—Mr. T. C. Rodgers addressed the convention on the subject of pasteurizing milk and cream. In 1868 Pasteur discovered that fermentation was due to vegetable organisms, which could be destroyed by heat. This principle was soon introduced into the manufacture of wine and beer in France. In 1890 another scientist introduced pasteurization into the creameries of Denmark, and to the sterilized cream added pure cultures to reseed the cream with a species of organism that would cause a definite known desirable fermentation. Since that time a large proportion of Danish butter has been made under this system, with the result that it sells in the best markets in the world at the topmost figures.

Many of the taints of milk are due to organisms which by pasteurization are prevented from propagation, so that even rather badly-flavored milk can be used for buttermaking with good results if pasteurized and ripened with a pure-flavored starter. Mr. Rodgers did not, however, recommend using milk in which an objectionable flavor could be detected; but in some cases the bad flavors are not apparent until the process of ripening has commenced. One great advantage of pasteurizing cream and introducing a pure culture is that a uniform quality and flavor of butter is made from day to day and from week to week, provided other things are equal. Butter from pasteurized cream also has good keeping qualities. The proper temperature to employ is 150 to 165 degrees Fahr. A higher temperature causes a scorched or cooked flavor. The Dairy School uses two pasteurizing machines, Reid's and Lister's, either of which gives excellent satisfaction. For a small or moderate sized creamery Mr. Rodgers recommended pasteurizing cream in a shotgun milk can, by placing it in a tank or barrel of water at 185 degrees and stirring thoroughly till 100 degrees is reached in the cream. The cream should stand at this temperature for 20 minutes and then be cooled down quickly to about 95 degrees, and add the starter. Continue the cooling to about 70 degrees, at which the ripening should be done. The cream should be cooled as soon as thick enough to be churned. During the discussion it came out that pasteurizing cannot be done in gathered creamery practice because cream commencing to sour cannot be pasteurized successfully for buttermaking.

Ice Box for Cheese-Curing Room.—Mr. A. T. Bell, of Tavistock, by means of a chart described his ice box which gave him control of the temperature in his curing-room during the hot weather of last summer. For a description of it see report of Western Ontario Cheese and Butter Association in the FARMER'S ADVOCATE of Feb. 1st, 1899.

Handling Gassy Curds and Curing Cheese were the subjects of two instructive papers by Messrs. Geo. McDonald, Bluevale, and W. A. Edgar, Culloden, which lack of space prevents us publishing here.

Feeding Cows for Tests.

To the Editor FARMER'S ADVOCATE:

SIR,—I think it would be of great interest to dairymen generally if Mr. Rice and others, through your paper, would give an account of feed fed to their cows in those public and private tests.

"DAIRYMAN."

Dominion Grange Officers.

At the 21st annual meeting of the Dominion Grange, held recently in Toronto, the following officers were elected: Worthy Master, Jabel Robinson, Middlemarch; Overseer, Thos. McMurphy, Thornbury; Secretary-Treasurer, Robert Wilkie, Blenheim; Chaplain, Wm. Oke, Whitby; Steward, C. Shrigley, Painswick; Assistant Steward, D. W. Lennox, Churchill; Gatekeeper, Lyman Henry, Sombra; Executive Committee, J. Robinson, R. Wilkie, H. Glendinning, G. Fisher; Auditors, Edwin Peart and John McDougall. The next annual meeting will be held in London.