

10 lbs. per head would be about 80,000,000 lbs., this would take the place of about 160,000,000 lbs. meat and still leave 40,000,000 lbs. meat for those who prefer corpse to cheese. The 50 million pounds of meat saved would cost about 32 million dollars, the saving, by using cheese instead of so much meat would be 16 million dollars annually.

As a solution of the problem of inducing the Canadian people to eat more Canadian Cheddar cheese Prof. Dean thinks it should be advertised, as to its food value, from one end of Canada to the other until every buyer of food for human consumption knows the economic value of cheese, and until the cooks know how to prepare cheese in appetizing ways such as they do meats at present. Prof. Dean believes that there should be an attractive advertisement in every paper and magazine published in Canada, telling the people of the value of our Canadian cheese. The funds should be provided partly by Governments, Federal and Provincial, and partly by those engaged in the business, producers, manufacturers, and sellers of cheese. Let a certain proportion of the funds received be set aside for advertising purposes similar to the plan adopted by mercantile and business corporations. The dairy business must be kept in the mind of the public else it will fall behind. A suggestion was made that a campaign of advertising Canadian cheese should be undertaken by the Canadian Government, such as that which was done for the apple in 1914. This should be supplemented by advertising done by those interested in the business on whom must rest the burden of continuing the campaign. Besides, the advertising must be accompanied by practical demonstration of the value of the goods which are advertised. In order to ensure a uniform good quality of cheese sold to Canadian consumers it would seem advisable to adopt some system of grading or branding. Why cannot Canadians work out some plan whereby cheese and butter (bearing a national or provincial brand shall be a guarantee that the goods are of the finest quality? As a standard, Prof. Dean, suggests that cheese and butter which scores 93 points and above should be worthy of the national brand, and that other brands or grades be adopted for lower class goods, but not more than three grades, say a score of 90 to 92 for second grade, and below 90 third grade.

To make this plan practicable the co-operation and hearty support of farmers, manufacturers and merchants is required. Each class must work for the good of the dairy industry as a whole, in this particular case for the good of the cheese business. The farmer or milk producer has been the great burden bearer in the past, but the farmer is waking up, and we may as well recognize the fact that if milk nets him less than \$1.00 per hundred pounds for cheese making he is going out of the business. If the farmer stops producing milk where will the cheese manufacturers and cheese merchants land in a short time? On the other hand it is true that in a number of instances men have put their all into a cheese factory, but when an opportunity came for the farmer to make more out of his milk elsewhere the patrons have left the manufacturer in the lurch. This was unfair to the man who trusted the farmer to patronize his business, and yet who can blame the farmer to try and get all he can for his milk, as the margin of profit in any case is narrow?

Prof. Dean's paper concluded with these words, "The Canadian farmer having tasted the sweets of high prices for cheese during the latter part of the season of 1914 cannot be induced to accept low prices with good grace in the future, hence, strenuous efforts should be made to maintain the present high level of cheese prices. One of the means to accomplish this is to develop the home market by advertising the great food value of cheese to Canadian consumers, and by supplying none but first-class cheese in as many varieties and styles as the consuming public demands, although the staple cheese will always be Canadian Cheddar, than which no better is made. For the price no other concentrated food is cheaper or more nutritious. Let everybody eat more cheese during 1915, and thus reduce the high cost of living."

THE MILKING MACHINE.

An address which was listened to with a great deal of interest was that given by Prof. E. S. Archibald, of the Ottawa Experimental Farm, whose subject was, "The Modern Dairy Barn and the Use of Milking Machines," but whose address was confined almost entirely to milking machines. The difficulty in getting suitable labor on the farm has made the subject of milking machines a pertinent one. The daily routine work with a dairy herd must go on at regular hours, early and late every day of the month and every month of the year. This is one of the greatest drawbacks which the dairy farmer has to meet, and one not so severely felt by farmers handling other classes of live stock. The mechanical milker is looked forward to as a solution of this problem, and is expected to assist the dairy farmer in exactly the same way as his other implements and

modern machinery have helped him over similar difficulties. Clean milk is also in greater demand throughout Canada each year, and if the labor problem continues to be so pressing it will become necessary for a large number of farmers either to limit their operations or to use one of the better machines with sufficient equipments to thoroughly clean and sterilize the same.

In a successful milking machine there are six requirements—simplicity, cheapness, durability, ease in cleansing, minimum of manual labor and minimum cost to operate and minimum power for operation. In the opinion of Prof. Archibald many of the machines on the market are too complicated and costly for the average small farmer to purchase. From his experience he emphasized the fact that with these more complicated machines a more intelligent class of labor is necessary than in the old style dairying. The milking machine has been making headway in England, Scotland, Australis, New Zealand and in some countries of Continental Europe. For the benefit of dairymen in Canada the Experimental Farm at Ottawa have decided to give this subject careful experimentation.

During the past forty years over 200 patents representing different types of milking machines have been taken out. From the type that used an inserted milk tube in the teats and which frequently caused permanent injury to the udder to milking by giving pressure only to the base of the teat, and this pressure following downwards, the type which was intended to approximate hand on through to the type which is more modern and a resemblance to the calf method of milking, namely of suction, and of mechanical pressure, milking machines have gone. Prof. Archibald classified modern milking machines as follows: (a) those having intermittent suction, no squeeze to the teat and no vacuum in the can; (b) those having suction, pulsation and squeeze to the teat; (c) those having suction, pulsation and downward squeeze with squeeze caused by the vacuum; (d) Those having suction, pulsation and no squeeze to the teat. From experimental work at the Central Experimental Farm the conclusion has been reached that there is rarely much time lost by having two cows milked into the same pail at once. Special pails may be purchased from the companies with a division in the centre, thus allowing each cow's milk to be kept separate and records made of the same. The two-cow units cost about the same and in some cases less than the single-cow unit, which means a saving of capital expenditure. However, this is still an open question. Prof. Archibald explained the classification by discussing the different machines of each class at some length.

The great essential of a milking machine is the economy of it. A certain machine was in use at the Experimental Farm for a year and it saved on labor between 45% and 50%, that is the labor of milking; but on the other hand it largely increased the labor in washing and sterilizing of dairy utensils, this latter, however, is not so pressing as to time, and it must be remembered that extra precaution is taken at the C. E. F. to put up a milk approximating certified milk. This is not done on the average farm. Thorough washing and sterilizing twice per day of the milking machine is imperative in order to produce a low bacterial count in the milk. The average farmer, he believed, with a herd of twenty cows or more might install the two-unit machine and milk the whole herd very comfortably with at least 50% less labor than by hand milking.

Prof. Archibald produced tables showing tests of hand milking against that done by the milking machine, which were in no case indicative of a falling-off in milk flow with the machine as compared with the hand milking. This was found in trials lasting for several weeks and throughout the entire year. Twenty cows during a year of hand milking as compared with the same cows during a year, nearly all of which was machine milking, gave approximately the same milk flow, but it must be remembered that amongst the number were several which were two-year-olds the year of hand milking and which were three-year-olds when the machine did the work; but Prof. Archibald stated that so far nothing had been proven against the machine as a milker. The cows did not materially decrease in their flow under the influence of the milking machine. All cows were stripped after the machine, and this was found to be generally necessary. The quantity of milk taken as "strippings" after the milking machine amounted to from $\frac{1}{2}$ to $1\frac{1}{2}$ pounds, the average strippings reaching from $\frac{1}{2}$ to 1 pound per cow per milking.

Some of the difficulties experienced were that cows which are inclined to be nervous sometimes kick off the teat cup which may fall to the floor and suck in dust, bedding or some other filth with detriment to the milk. These accidents are rare. Pulsators sometimes stick becoming slow. Careful supervision by the herdsman is required to keep pulsators thoroughly cleaned and oiled. Absolute gentleness in the introduction of the machine to the cows is necessary in order not to

antagonize any of the animals permanently against the machine, and the absolute cleansing of the machine is necessary in order to keep down bacterial count.

During the first six months of the test it was found that the milk produced by the milking machine contained on an average 3 to 10 times as many bacteria as that of scrupulously careful hand milking, the counts ranging from 5,000 to 70,000 bacteria per cc., as all precautions were being taken to produce the equivalent of certified milk. During the succeeding three months of the test improved methods of washing, sterilizing of the machine and cold weather coming on gave better results, but still hand-produced milk contained as a rule less than 1-3 the total number of bacteria found in milking-machine milk. When the rubber tubing was new and comparatively smooth the bacteria count could be easily kept down.

In either hand or machine milking the purity of the milk is dependent upon the following factors, first, the cleanliness of the cows; second, the purity of the air in the barn; third, careful milking to eliminate contamination; fourth, thorough washing and sterilizing of the utensils which come in contact with the milk at any period of its handling to the consumer. Roughly speaking rinsing the machine with cold and afterward with luke-warm water will produce a bacterial count in the milk from 200 to 500 times as great as good, careful, hand milking, whereas the careful rinsing in cold and then hot water containing a good washing soda and this followed by thorough cleansing with the brushes, provided the steam sterilizing of all parts and the sterilizing of all rubber parts in a 10% salt solution, 5% lime water solution, or 2½% formalin solution, will give far more satisfactory results, and if other precautions are taken the bacterial count should not range above 5 or 6 times that of hand milking.

No ill effects, whatever, on the cow's teats resulted from the use of the milking machine. If there is any disease amongst the cows, especially a contagious disease like contagious garget, it is rather more difficult to eradicate than where an intelligent hand milker does the work.

At present five machines are being used at the farm, and Prof. Archibald hopes to have some good data on this subject in a year or two.

A number of correspondents who have written in reply to questions sent out by the Department indicate that they are having fair success with their machines, and altogether the outlook is fairly bright for the milking machine, provided small improvements are made, and the whole kept in good running order and operated by an intelligent, careful man.

THE DAIRY HERD COMPETITION.

As is usually the case the dairy herd competition created a great deal of interest. Owing to lack of funds the Association was unable to donate the usual cash prizes, and two sections arranged for in previous years were dispensed with. There were seven entries in class one for patrons of cheese factories, but no entries in class two. The following is a list of the winners in class one. Mr. Van Slyke wins the cup for the second time in succession, and now becomes a permanent possessor of this cup.

1, Jno. Van Slyke, Dunboyne—Dunboyne Cheese Factory—100 acres in farm—11 Holstein grade cows—87,158 total lbs. milk—7,923 lbs. of milk per cow; 2, J. C. Harkes, Listowel—Molesworth Cheese Factory—100 acres in farm—8 Holstein cows (2 P. B., 6, grade)—59,059 total lbs. milk—7,382 lbs. of milk per cow; 3, D. Campbell, Komoka—Gold Creek Cheese Factory—100 acres in farm—13 pure-bred Holstein cows—89,272 total lbs. of milk—6,867 lbs. of milk per cow; 4, Frank Strobidge, Ingersoll—Banner Cheese Factory—50 acres in farm—10 Holstein cows—67,375 lbs. total milk—6,737 lbs. of milk per cow; 5, Wm. Arthur, Sparta—Sparta Cheese Factory—100 acres in farm—10 Holstein and Short-horn cows—61,751 lbs. total milk—6,175 lbs. of milk per cow; 6, H. W. Duncan, Atwood—Silver Corners Cheese Factory—100 acres in farm—10 grade Holstein cows—58,095 total lbs. of milk—5,809 lbs. of milk per cow; 7, Willis Johnston, Listowel—Elma & Mornington Cheese Factory—148 acres in farm—12 Holstein grade cows—67,235 total lbs. of milk—5,603 lbs. of milk per cow.

HOW THE WINNING HERD WAS FED.

Readers will no doubt be interested to know how Mr. Van Slyke managed his herd. The following letter will give some idea of how the cup has been won twice in succession by this man.

Twelve years ago my herd consisted of grade Shorthorns, fairly good milkers selected from good milking strains. I determined to try the much-talked-of Holsteins and accordingly purchased a pure-bred Holstein bull, intending him to be the sire of a new herd. The heifer calves were raised well and given good care. I always try to have heifers freshen when two years old and take care to treat them kindly and to milk them throughout the entire twelve months of their first year of milk production. If any fail to come up to