

# FARM AND DAIRY & RURAL HOME



We Welcome Practical Progressive Ideas.

Trade increases the wealth and glory of a country; but its real strength and stamina are to be looked for among the cultivators of the land.—Lord Chatham.

VOL. XXXV.

PETERBORO, ONT., JANUARY 27, 1916

No. 4

## Paying for Milk at Cheese Factories

There are Three Good Systems and One Bad One: The Latter is Most Common

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TO divide the proceeds from the sale of cheese accurately among the patrons of a cheese factory, each patron's milk would have to be made up into cheese separately. This, of course, is not practicable. It is, therefore, necessary to adopt some other method of dividing the money. In the early days of cheesemaking, there was no practical method of testing the milk from different herds to ascertain its cheesemaking value; a hundred pounds of milk from one herd was considered equally as good for making cheese as that from any other, so the method of paying each patron the same price per hundred pounds of milk was adopted.

The introduction of the Babcock test, however, gave a simple and practical method of determining the percentage of butter-fat in the milk; and it was found from experiments and regular factory work that when the fat in the milk increased, the yield of cheese increased also. Although it is now over 95 years since the Babcock test was introduced, and we have known all that time that one hundred pounds of four per cent. milk will make more cheese than one hundred pounds of three per cent. milk, we still find a large majority of the cheese factories in Canada paying the patrons the same price per hundred pounds of milk. No small amount of experimental work bearing on this subject has been carried out at the Agricultural Colleges and Experimental Stations in both the United States and Canada, and it was with a view to emphasize what has already been done rather than with the expectation of throwing new light on the subject that the Dairy Division attempted some further work along this line.

In 1913 the staff of the Dairy Division at the Finch Station, after considerable testing of milk with the Hart casein tester, found that it was difficult to get reliable results under ordinary factory conditions. A continuation of the work in 1914 gave the same results.

The Walker casein tester was tried with better success, and it was used in making tests for casein in the experiments made in 1914 and 1915.

In 1914 the milk from individual herds was made into cheese in small vats, the quantities varying from 350 to 800 pounds in each vat. The fat in the milk varied from 3.1 to 4 per cent.

The yield of cheese from 100 pounds of milk varied from 8.59 pounds to 10.75 pounds, or nearly 2.5 pounds more cheese from 100 pounds of 4 per cent. milk than from 100 pounds of 3.1 per cent. milk.

The yield of cheese per pound fat varied from 2.55 pounds to 2.81 pounds, just about one-quarter of a pound.

The yield of cheese per pound casein varied from 3.47 pounds to 4.63 pounds, almost 1¼ pound.

The yield of cheese per pound fat and casein, added together, varied from 1.47 to 1.73 pounds,

cents over and 3.5 cents under, a variation of 9.3 cents.

Fat + Calculated Casein Basis (the Babcock test with a sum added as recommended by Prof. Van Slyke) paid 5.7 cents over and 3.1 cents under, a variation of 8.8 cents, the latter being the nearest to the actual cheese made.

The work was continued in 1915 when the patrons of the Finch Dairy Station were divided into two groups. The high testing milk was put into one vat and the low testing milk into another and the cheese made as carefully as possible, our object being to make a comparison

between making the cheese in large vats and the work of 1914 when the milk from the individual patrons was used. I am pleased to say there is very little difference in the result. The variations from the large vats are not quite so great as in the small vats.

The table adjoining shows the value of 100 pounds of milk containing different percentages of fat and casein from the actual cheese made in 1915 and five different methods of paying for cheese milk.

Summary of the Two Years' Work: The pounds of cheese per 100 pounds of milk increases as the per cent of fat increases in the milk,

although not always in the same proportion.

The pounds of cheese per pound of fat tends to decrease as the fat in the milk increases.

The pounds of cheese per pound of fat and casein tends to increase as the per cent. of fat increases in the milk.

The surprising thing about this work is that dividing the money according to the fat and casein tests does not get any nearer to the actual cheese made from the milk than some of the other methods of payment, and it would appear as if there is not much to be gained by testing the milk for casein. We may, therefore, consider only the other four methods.

In making the cheese in the small vats in 1914, the fat plus calculated casein basis of payment came the nearest to the actual cheese made, straight fat, second, fat plus 2, third, and pooling, fourth. In 1915 when the cheese were made in the large vats, we find again that the fat plus calculated casein basis of payment came the nearest.

(Concluded on page 17.)

Value of Milk for Cheesemaking, Cheese at 15 Cents per Pound

Lbs. Fat in Milk.	St. Casein in Milk.	Value of 100 lbs. of Milk.										Difference between Cheese made Pooling Basis.													
		Lbs. Cheese per 100 Lbs. Milk.	Actual made.	Casein and Butter.	Fat + Casein.	Fat + Pooling.	Fat + Casein + Pooling.	Casein + Pooling.	Casein + Pooling + Butter.	Casein + Pooling + Butter.	Casein + Pooling + Butter.														
3.40	2.30	8.95	1.94	1.26	1.31	1.94	1.32	1.39																	
3.50	2.00	9.02	1.35	1.31	1.35	1.36	1.35	1.39																+5 cts.	
3.50	2.90	9.19	1.35	1.36	1.35	1.36	1.35	1.39																+4 cts.	
3.60	3.10	9.00	1.35	1.36	1.38	1.39	1.38	1.39																+1 ct.	
3.70	2.90	9.73	1.41	1.41	1.42	1.42	1.42	1.39																+4 cts.	
3.70	2.35	9.64	1.45	1.44	1.42	1.41	1.42	1.39																-2 cts.	
3.80	2.00	9.67	1.45	1.39	1.46	1.44	1.45	1.39																-7 cts.	
4.00	2.30	9.83	1.47	1.50	1.54	1.49	1.51	1.39																-6 cts.	
4.10	2.10	10.17	1.52	1.48	1.58	1.51	1.54	1.39																-8 cts.	
Greatest variation with actual cheese made—			+3c	+7c	+4c	+4c	+5c																		-13 cts.
37,071 lbs. milk used.			-4c	-3c	-6c	-4c	-13c																		

or exactly the same variation as in the pounds of cheese per pound of fat.

Taking the actual cheese made as the correct basis for paying patrons, we compared this with five different methods of paying for cheese milk and found the following variations in the price of 100 pounds of milk testing from 3.1 to 4 per cent.

Pooling Basis (dividing the total money among the patrons at the same rate per 100 pounds of milk) paid 10.6 cents over and 14 cents under that paid from the actual cheese made, a variation of 24.6 cents.

Fat and Casein Basis (the actual amount of fat and casein in the milk as shown by the Babcock test and Walker casein test) paid 8.1 cents over and 6.8 cents under, a variation of 14.9 cents.

Fat + 9 Basis (the factor 2 added to the reading of the Babcock test) paid 6.2 cents over and 4.1 cents under, a variation of 10.3 cents.

Straight Fat Basis (the fat test only) paid 5.8