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## A farm creaming experiment

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# A FARM CREAMING EXPERIMENT.

F. A. LEIGHTON.

H. C. WALLACE.

A short time ago we were asked whether any injustice would result to either creamery-man or patron, if the latter should set his evening's milk, skim it in the morning, mix the cream with the morning's milk and send the mixture to the creamery instead of sending the milk of both evening and morning, as is the usual custom. The most satisfactory way to answer all such queries is by practical demonstrations, and it was determined to conduct an experiment bearing on the point in question.

Milk was taken immediately after milking and set in Cooley cans, in water at a temperature of 42°. The temperature of the milk was 98°. The milk set from seven in the evening until 7:45 the next morning, or nearly thirteen hours, when it was skimmed. At that time the temperature of the water was 40°, the ice used having reduced the temperature two degrees. The skim milk was drawn off by means of the syphons provided for that purpose at the bottom of the cans. The first one and one-fourth inches of milk immediately below the cream line were left with the cream. This cream was then well mixed with the morning's milk from the same cows, and weighed and tested. The following table shows the weights of the evening milk, morning milk, skim milk and the mixture of cream and morning's milk, the per cent fat and the number of pounds of butter fat in each lot of milk.

	WEIGHT.	PER CENT FAT.	POUNDS FAT.
Evening's milk.....	67	3.20	2.14
Skim milk.....	52	.20	.10
Morning's milk.....	68	3.30	2.24
Mixture of cream and morning's milk...	83	5.20	4.31

In this table the fat in the skim milk plus the fat in mixture should equal the fat in the evening milk plus

the fat in the morning's milk. It will be noticed that there is a difference of .03 pounds, but with ordinary test bottles the per cent cannot be read close enough to avoid such a small error.

A composite sample of the evening and morning milk tested 3.25 per cent fat. Where creameries are conducted on the separator system the general custom among the patrons is to take in both evening and morning milk and haul back the skim milk. In this case there would have been 135 pounds of milk to be taken to the creamery, testing 3.25 per cent fat as above noted. For this 4.38 pounds of butter fat, at 20 cents per pound, the patron would have received 87.6 cents. By skimming the evening milk and mixing the cream with the morning milk there were 83 pounds of the mixture which, as shown in the above table, yielded 4.31 pounds fat; at 20 cents per pound this would be 86.2 cents. That is to say the creamery man would lose nothing if the cream and morning milk was delivered instead of the milk of both evening and morning, and the patron's loss would be only the amount of fat he left in the skim milk.

Whether this loss would be small or great would of course depend on the efficiency of creaming, and this in turn would be governed mainly by the methods employed in handling the milk. In the above experiment the conditions were all favorable for obtaining the maximum amount of fat. As stated, the milk was set in ice water immediately after milking. This is important as numerous experiments show that the longer the delay in setting the milk the greater the loss of fat in the skim milk, and several experiments conducted at the Minnesota station indicate that the warmer the water in which the milk is set the less efficient is the creaming. It is also known that milk from some cows creams with more difficulty than that from others, and that as the period of lactation becomes longer more fat is left in the skim milk when creaming by the gravity process is practiced.

Another thing to be remembered is that some of the skim milk must be taken off with the cream in order to secure the greatest possible amount of butter fat. If the conditions are unfavorable for creaming, much of the fat will be left in the upper three or four inches of skim milk. Under the condi-

tions in this experiment we found that by skimming the upper inch and one-half of milk with the cream we secured about all the butter fat possible, in creaming by the gravii system, but it is quite likely that under less favorable conditions it would be necessary to take more of the milk with the cream when the milk is set only twelve hours.

Whether it will pay patrons to set the evening's milk, skim it and send in the cream with the morning's milk is something that each must determine for himself. The advantages of the plan are obvious. It would save hauling a large quantity of milk, and the skim milk being always sweet, would certainly be better for the calves than when the whole milk is taken several miles, run through the separator and hauled back through the hot sun, often souring before it can be fed. To know just what loss he would sustain by following this method it would be necessary for each patron to experiment as we have outlined above and test the skim milk, multiplying the number of pounds of milk by the per cent fat shown by the test. This will give the number of pounds of butter fat lost each day. It is hardly correct, however, to speak of the fat in the skim milk as being *lost*; the calves or pigs get the benefit of it.

The experiment was repeated six different times, with practically the same results in each case.