A Cow for More Than One Purpose?

BY JOHN TAYLOR, JR.

Yes! you may have a cow for more purposes than one, but will it pay? I think not. The profit made in one department will be eaten up by the loss of the other. A cow may be paying as a beef raiser and be running the owner into debt every day as a milk producer.

In your December issue, page 471, your correspondent, "A Stock Breeder," ridicules the idea of a special purpose cow. In the first part of his letter he appears to be very impartial, and speaks as though he were not especially interested in any of the several breeds, and winds up by giving a lot of figures to prove that the Shorthorns are "the cows." So much for his figures as far as they go; they would prove that if it is bulk of milk you want, regardless of cost, the Shorthorn has the advantage. Because a big Shorthorn cow gives more milk or butter than the little Jersey or Ayrshire is no proof that she is the most profitable. If you can keep three Jerseys on the food consumed by two Shorthorns, and each Jersey gives as much milk or butter as a Shorthorn, which breed will pay best? Men differ in strength, and the strongest man may be the smallest consumer of food. The same holds good in milk production. The New Jersey station has been conducting tests to find out the actual profit derived from each of the several breeds as butter producers. They found that the Gurnsey group earned in one month $67; the Jerseys, $66.75; the Holsteins, $60, and the Ayrshires, $47, and that the actual profit from the Gurnsey and Jersey groups was $22 each, and that the Holsteins and Ayrshires had less than $5 to their credit when the food was paid for. This test was for butter. It will be seen that the Ayrshire earnings were the lowest as a butter producer; the Holsteins and Ayrshires might have made a better showing as milk or cheese producers.

This goes to show that we must not be led away with the idea that because a cow milks well she is profitable. No; I believe in special farming. Let every man consider his individual situation as to which line of farming he is prepared to follow, and go into it and make a specialty of it. If he is so situated that he can make butter or cheese profitably, he should have ambition enough to excel in this line. If his situation is better for beef production, let his aim be to own a herd of good beef cattle. I hold that if it is butter or cheese he is after, to make the most out of it he must keep a special dairy breed, and aim to have the very best as milk or butter producers—not a cow whose tendency is always on the side of beef. Take the Shorthorns, Herefords and Galloways generally, they will not continue the flow of milk long enough to be profitable; you may feed them heavy, and they will lay on the beef—it is their nature.

"Stock Breeder" says that "the dairy cow must be fed before her carcass will be moderately presentable when hung up in the shambles." Well, I never saw the cow yet that had not to be fed before she would be good beef.

"Beef will be wanted as long as the world lasts." Are the people going to stop eating butter and cheese? Not by any means. The beef-producing territory is enlarging as the prairies open up. This large extent of territory is to-day very extensively engaged in ranching, and is producing vast quantities of beef, and overstocking the market, and keeping down the prices. Not so with butter and cheese. There is a good demand to-day for a *good article*, and there is no danger of Texas and some other prairies over-stocking the market with butter and cheese.

"The special beef cow must give a little milk at certain periods, and in such quantities as will not pay to throw it away." No, it will not pay to throw it away; the less she gives, the more expensive milk it is.

I have found from experience that the cow for more purposes than one, or the cow that would raise good beef, would soon eat her head off, compared with the special dairy cow as a milk producer. I do not think that beef and butter or cheese can be profitably produced together; the profits (if any) you will make out of the one will be more than eaten up by the loss on the other. I think that the farmers of the older sections ought, as far as possible to raise butter or cheese in place of beef. Beef can be produced cheaper in the West than we can raise it. We have a good climate for dairying, and there is no danger of the ranches overstocking the markets with cheese and butter. The good article will always be in demand. We should make nothing but the best; it costs no more to manufacture good than a poor article.

Roll the Snow.

After a heavy snow storm the roads can be made passable by rolling them with a land roller. If there are "pitch holes," or if the surface is uneven, harrowing will be found of service. In Quebec the above has been the practice for many years.

DAIRY.

Elaboration of Milk.

BY H. H. DEAN, ONTARIO AGRICULTURAL COLLEGE, GUELPH.

All organized bodies are an aggregation of cells. A cell is the smallest particle into which a plant or animal may be divided. "Cells possess the properties of nutrition, reproduction, growth, development, and, in many cases, their contents are capable of motion and manifesting irritability." The udder of the cow is a gland made up of numerous vesicles (cantics) which consist of a membrane lined with epithelial cells. These cells are the secreting organs or the seat of the changes by which milk is produced. A number of these vesicles gathered together form what is known as a lobule, and lobules united form a lobe which is surrounded by connective tissue, having a common outlet into the milk cistern situated at the upper portion of the teat.

Besides cells, the mammary glands consist of fat, blood, nerves and muscles. There are two glands which lie alongside each other, separated by a fibrous partition. It will be noticed that the cow's udder is divided lengthwise, not across the udder. Each gland has two outlets (on the side), and sometimes three. The whole is covered by the outer skin of the animal.

Exactly how milk is secreted or elaborated we do not know. There are two theories put forth in explanation of the process. The first one, known as the "Transudation Theory", assumes a simple filtering of the constituents of the milk from the blood through the gland, and a turning of them into milk by this process. The objections to this theory are put thus by Aunsby:—"The milk is not simply secreted from the blood, like the urine in the kidneys, or the digestive juices in the stomach and intestines, but is formed in the mi k glands from the cells of the gland itself—it is the liquefied organ. This is shown even by the composition of its ash, which, like that of all tissues, contains much potash and phosphate of lime, while the fluids of the animal body are poor in these substances and rich in chloride of sodium (common salt); the ash of milk contains three to five times as much potash as soda, while the ash of blood, on the other hand, contains three to five times as much soda as potash. Was the milk simply a transudate from the blood, it would have a similar composition, and could not serve as the exclusive food of the young animal, since it would not contain all the elements necessary for growth; but since it is a liquefied organ, it is exactly adapted to build up other organs."

The second theory, known as the "Metamorphic" (change of formal shape), assumes that the milk is formed in the gland by the decomposition of the cells of that organ. Professor Sheldon says that a combination of the two will probably give the most satisfactory explanation, and this is more apparent when we consider the sources of the various constituents of milk. Neither casein or milk-sugar are found in the blood, consequently they could not be filtered from it, but are probably the result of a special cell activity. Fat, though found in the blood, is not there in sufficient quantity to supply the fat of the milk. "The milk-sugar, casein, and fats are all formed by the direct activity of the epithelial cells as a result of the decomposition of their protoplasimc (first formed) contents or their action on the food constituents in the blood. The other constituents of the milk, the water and salts, evidently result from a direct process of transudation from the blood, with the exception that without doubt, a certain percentage of the potassium salts, and phosphates, like the specific milk constituents, originate in the metamorphoris (change) of the protoplasm (first matter) of the secretory cells."

From the preceding we would judge that the character of the gland has considerable influence on the quantity and quality of milk produced by a cow. Other things, such as food, surroundings, method of handling, period of lactation, frequency and regularity of milking, are all supposed to contribute somewhat towards the quantity and quality of milk. As to the effects of food upon milk, see Bulletin 80, Dept. Agr., Ont. Two experiments are here reported, showing the effect of frequent milking (three times a day) and milking each gland by itself. That is, instead of milking the two front teats together, and then the two hind teats, which is milking a teat of each gland, the cows were milked two side teats at a time, or a front and a hind teat at once.

MILKING THREE TIMES A DAY.

To see what effect milking three times a day would have, we selected two of our largest milkers and milked them at 5 a. m., 11 a. m., and 5 p. m. of each day for two weeks, beginning June 23rd. Previously each cow had been getting one pound of bran and two pounds of barley meal a day, in addition to good pasture; but when we began milking three times a day their daily meal ration was increased to 2 lbs. cottonseed meal, 2 lbs. pea meal, 2 lbs. bran, fed one-third morning, noon and evening. The yield of the two cows for the two weeks previous was: Artis, 819 lbs. milk; 2.93 per cent. fat; 24 lbs. fat. No. 13, 531 lbs. milk; 3.50 per cent. fat; 18.59 lbs. fat. When milked three times a day their record for two weeks was:

Time.	No. 13. Lbs. milk.	No. 13. Av. p.c. fat	Artis. Lbs. milk.	Artis. Av. p.c. ft
Morning	263.5	3.27	357.5	2.70
Noon	141.5	4.18	180.0	3.42
Evening	144.0	4.16	172.5	2.96
	549.0	3.87	710	3.03

The total fat given by No. 13 in the two weeks was 20.27 lbs., and by Artis 20.80 lbs.

For the two weeks following July 6th, when the milking three times daily ceased, these two cows were fed the same quantity of meal twice a day as they had been previously getting three times a day, and were milked twice a day—at 5 o'clock morning and evening. Their record was:

Time.	No. 13. Lbs. milk.	No. 13. Av. p.c. fat.	Artis. Lbs. milk.	Artis. Av. p.c. fat.
Morning	250	3.47	308	2.72
Evening	239	3.62	299	2.80
	489	3.55	607	2.76

The total fat given by No. 13 was 17.06 lbs., and by Artis 17.87 lbs.

It may be interesting in this connection to note what difference there is between the total amount of fat credited to our cows by testing them two days in the week, and the actual amount of fat produced, as shown by testing them every day. In our regular dairy work the per cent. of fat in each cow's milk is determined on Monday evening and Tuesday morning, and Friday evening and Saturday morning, which tests represent the quality of milk produced during the week. Taking the tests of these two cows on the days mentioned, from July 7th to 20th, No. 13 would have been credited with 18.39 lbs. fat—actual yield 17.06 lbs.—and Artis 17.85 lbs. fat—actual yield 17.87. In the case of the one cow it gives almost exactly her yield, and the other would have been credited with .79 lbs. more than her yield.

SUMMARY.

By taking the average total pounds of milk and fat given during the two weeks previous to and after the milking three times a day, we should have a fair basis on which to compare the results of milking twice and three times. No. 13 gave 510 lbs. milk and 17.83 lbs. fat as the average of the periods preceding and succeeding the experiment. During the experiment she gave, in the same length of time, 549 lbs. milk and 20.47 lbs. fat—an increase of 39 lbs milk add 2.44 lbs. fat. Artis gave 713 lbs. milk and 20.44 lbs. fat, as the average of the two periods, when milked twice a day, and when milked three times a day she gave 710 lbs. milk and 20.80 lbs. fat—a decrease of 3 lbs. milk, and an increase of .36 lbs. fat; in other words, her yield was about the same when milked three times a day as when milked twice.

This experiment would seem to indicate:

1. Frequent milking increases the percentage of fat, as both cows gave a higher percentage in their milk at noon and evening than in their morning milk. The average of these two, and also of the three milkings per day, was higher than their general average when milked twice a day. The effect on the total fat or butter was to increase it in the case of one cow, while it remained about the same in the other.

2. One cow gave more milk when milked three times a day, and the other gave less, presuming that the extra meal balanced the failing pasture.

3. It would not pay to continue milking these cows three times a day for any length of time, as the cow soon regulates herself to normal production. It may pay for a short time by keeping the cow at high pressure.

MILKING EACH GLAND BY ITSELF, OR THE TWO SIDE TEATS AT ONCE, INSTEAD OF A FRONT AND A HIND TEAT.

The two cows used in this experiment, which commenced Nov. 14th and continued two weeks, had been milking for some time. One calved April 15th, and, consequently, had been milking about seven months, and the other calved March 27th, and had been milking about eight months. We should naturally expect these cows to decrease in their milk, owing to the advanced period of lactation. During the two weeks previous to the experiment Cherry gave 267 lbs. milk, containing 4.67 per cent. fat, or 12.47 lbs. fat (about 13½ lbs. butter). For the same length of time, during which gland milking was practised, she gave 266 lbs. milk and 4.56 per cent. fat. This would be 12.13 lbs. fat, or about 13½ lbs. of butter—practically the same as for the two weeks previous. Dairy Queen gave, previous to the experiment, 250 lbs. milk, with 4.62 per cent. fat—11.55 lbs. fat; about 13 lbs. butter in two weeks. When gland milking was done for two weeks she gave 228 lbs. milk, 4.07 per cent. fat, 9.27 lbs. fat; about 10¼ lbs. butter. The effect of milking eight months showed itself markedly on this cow. Some might say, "You should teach your cows to milk ten or eleven months." In reply I would say that we do not care if a cow milks but four months if she will give us from 6,000 to 9,000 lbs. of milk in that time, and make from 250 to 400 lbs. of butter. A cow that will give 8,000 lbs. of milk in six months is more valuable, other things being equal, than a cow that gives 8,000 lbs. of milk in ten months, because she would save four months' stripping, and time is money. As a matter of fact, we generally find that the cow which milks for the longest periods, say nine to eleven months, give the most milk in a year.