

me is very difficult, as it is one which admits of much discussion.

First, I am going to view this subject from the standpoint of the unbeliever. There are dairymen who think their tests should not vary, as it is held by many that the test of a cow or herd of cows should remain the same, that is a four per cent cow always, a five per cent cow is a five per cent cow, and so on, and should so remain. There are others who if they do not hold this extreme view just advanced cannot see why the poorly wintered cow which freshens in the spring with barely strength enough to bring forth her young should not give just as high testing milk as the same animal, slick and fat on the matured grasses of fall and much advanced in lactation, or if they can see this fact so patent, they maintain that the test should be just the same at any season of the year as it was the corresponding season of the previous year, and they come to the creameryman and say something like this: "I have the same cows and they are on just the same feed as they were at this time last year, then my test was 4.6, now it is only 4.0. How can that be?" Now, if the herd is just the same and on exactly the same feed as during the same season of the previous year, the reason for this difference in tests even then is not far to seek. But I propose to explain all these matters when I take up the other side of this subject.

There are others who cannot see why they should not have just as high a test as their neighbors, as they know they have just as good cows, and take just as good care of them.

Show me the creameryman who has not heard these and many complaints of like nature, all of which might just as well remain unsaid, should the dairyman only stop to think and use, what shall I say—horse sense or cow sense.

These and a number of like absurdities should not enter this paper were it not that in order to see the right it is often necessary first to point out the wrong.

Now I shall touch briefly on the cream test, as there are those that hold that cream is cream, and should at all times test the same. There are others while they admit that the cream test will vary, cannot see how it can be so if they do not change their machine. To those I would say that a greater speed will make a thicker cream, and a lighter feed will give the same results. Also a low temperature will give a thicker cream than a higher one, all other conditions being the same.

These are some of the principal causes, which will change your cream test without your touching the cream screw, but there are also other causes in addition to these.

Many dairymen seem to hold the view, that if from the same number of pounds of milk you get a greater number of pounds of cream one day than the following, the test on the one day should be the same as on the other. This, if you will but stop and think, you will see is impossible, the fat content of the milk being the same for both days.

Now in the light of advanced dairy thought let us together seek the views of experts, who have made these lines a special study, and who may therefore speak with authority. They maintain that the test does vary and from an infinite variety of causes, some of which at this time are not thoroughly understood, hence it gives rise to much discussion, and this variation in the test is the bug-bear of the milk producer and the bane of the creameryman. Let us now follow up some of these causes of variation.

It is a fact proven beyond the per-

adventure of a doubt that as a cow shrinks in quantity of milk, as she advances in lactation, there is an increase in quality, this increased richness is slight during the first few months after calving, but becomes quite pronounced just before the cow goes dry. By some authorities it is claimed that a cow which is farrow and remains so is an exception to this rule, as the shrinkage in quantity is accompanied by almost no change in quality.

Now let us see the influence of feed on the fat content of milk, and I quote you from an eminent authority as follows: "In the case of long-continued, scantily, and poorly balanced feeding, it seems to be clearly established that the fat content of the milk may be materially reduced below the normal. This is illustrated by observation upon cows in Norrland. During the period from January to May, Norrland cows are in general fed only a meager allowance of marsh hay and are therefore in a very poor condition when turned out to pasture in June. The results of about 2,000 analyses for these periods of feeding show that on rich pasturage their milk carried from 2.65 to 5.8 per cent with an average of 4 per cent of butter fat, and that on scant stable feeding the milk carried from 1.10 to 4.6 per cent, with an average of 3.25 per cent of butter fat." The same authority concludes that the fat content of milk cannot be increased at will by increasing normal ration, but on the other hand, that it can be greatly decreased by scant and poor rations. If a change is made from a deficient to a normal ration, the fat content of the milk will again be raised to the limit determined by the inherent qualities of the individual cow." It seems then that the fat in the milk may be made from the fat in the food or the body fat, and in cases when it is not present in either, the cow of necessity must give a very low quality of milk. For this reason I think we can account for many of our very weak tests during the early spring.

Now let us go to the other extreme and take the cow which is in prime condition. By repeated experiments it is proven that it is impossible to feed butter fat into her milk, that is to say, if a cow is giving 4 per cent milk, it is impossible to so feed her that she will give 5 per cent milk, as this has been tried in many experiments by feeding tallow and various fatty oils to her with other food, with the result that while there may be a temporary increase in the fat content the milk would invariably after a time return to normal.

As Gov. Hoard aptly puts it, "If this were not so, don't you see, I would be very easy to take a Holstein and make a Jersey of it."

Now let us see the relation of the nervous system to the variability of the test, and we can find many examples wherein a cow's nervous condition has caused a marked variation in her test. A change of milker for instance, manner of milking and change of environment all exert more or less decided influence, temporary at least, on the quantity and quality of milk produced, the fat being as a general rule more sensitive to such changes than the other ingredients. It is also noted that richer milk was produced and more of it when the cows were milked fast than when they were milked slowly. Heavy exercise or fatigue has also a marked influence on both quantity and quality of milk.

In experiments upon the effect of warming water used for cows it was found there was an increase of 5 to 8 per cent in yield of milk and butter fat, with water at 70 degrees F. and that at 32 degrees F. On the average more warm water was drank.

It is an interesting fact that a cow in full flow of milk requires from one-fourth to one-third more water than when she is not giving milk, and a cow giving a large quantity of milk requires more than one not giving so much. Cows not giving milk require from 70 to 80 pounds daily upon dry feed, and from 100 to 120 pounds daily when giving milk.

It is observed that there seems to be a general tendency of the quality of milk to become richer in fat content when the temperature is falling, and less rich during the rising temperature.

The time for milking should be regular, for the difference of an hour will frequently make a difference of ten per cent in the amount secreted, and if the irregularities are frequent a diminished flow will result. Babcock has found that certain milkers, not only get more milk than others from the same cow, but that it is richer.

Now before passing let me say, regarding those things which affect the nervous condition of a cow, all things tend to this conclusion, that the composition of a cow's milk is determined by the individuality of the cow, and

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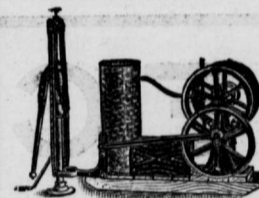
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