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VARIATIONS IN CREAM TESTS.

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One of the most common causes for dissatisfaction in selling cream is the variation in the test. A farmer naturally thinks when the cream is from the same cows, fed the same ration, milked by the same man, and when the same separator is used, that the test, or per cent of fat in the cream should remain the same. When sudden variations occur in the test he feels that the test is incorrect. It is true errors are often made in making the test, especially in taking the samples, but variations constantly occur in cream tests that are not due to this cause but to the conditions under which the milk is separated. It is impossible to run a separator under farm conditions without having variations in the test of the cream occur and in fact if the cream buyer should always give the same cream test, it would be more suspicious of dishonesty than when it varies slightly. Our experiments indicate the following to be the common causes of these variations:

1. Variations in the speed of the separator.
2. Variation in temperature of milk separated.
3. Rate the milk flows into the machine.
4. Amount of water or skim milk used in flushing out the bowl.
5. Change in the richness of the milk separated.
6. Adjustment of the cream screw.

Speed.—Change in the speed of the separator is the most common cause of variations in the per cent of fat in cream. The greater the speed of the separator, the smaller the amount of cream and the higher the per cent of fat. A separator when run at three-quarters of the regular speed may deliver cream testing as much as ten per cent less in fat than when the same machine is run at the regular speed. When run at the lower speed, a larger quantity of cream is secured and it always tests lower. A variation in speed has a much greater effect upon some machines than upon others. Speed also makes a much greater variation in the test of the cream when the separator is set to deliver thick cream than is found when thin cream is separated. If the separator is adjusted to deliver cream testing 25 per cent at regular speed, the test will perhaps not be more than 2 per cent less if the machine be run only three-quarters speed of the regular speed, while if the cream screw be so adjusted that the machine run at full speed delivers cream testing 40 per cent, at the three-quarter speed the test may be from 7 to 8 per cent less. This variation due to speed is not caused by a difference in the amount of fat remaining in the skim milk but by the proportion of the whole that is taken out as cream and as skim milk. In other words, at a lower speed more skim milk goes into the cream.

Variation in Temperature of the Milk Separated.—The temperature of the milk separated varies on the farm to some extent from day to day. While there is a great deal of difference with different makes of separators in regard to the effect of temperature on the test the rule is that the colder the milk, the smaller the amount of cream and the higher the test. Variations due to temperature of the milk undoubtedly are not as great as the variation due to the speed. If cream tests 30 per cent when the milk is separated at 90 degrees, it may from some machines test as high as 40 per cent when separated at 70 degrees. Under average conditions, however, on the farm cream will not vary more than 3 or 4 per cent of fat due to the changes of temperature that are apt to be found. Separating the milk too cold also results in a loss of cream in the skim milk but this is not the cause of the variations in the per cent of fat in the cream.

Rate the Milk Flows into the Machine.—Ordinarily the rate of inflow into the hand separator is regulated by a float and does not vary to any great extent. Occasionally, however, the faucet is not fully opened and the inflow is, for this reason, less than usual. At times the supply can is kept nearly full during most of the time the machine is running and at other times allowed to be nearly empty. This may cause a small variation in the test. When the supply can

is kept nearly full there is more pressure and more milk flows into the bowl. If less than the regular quantity flows into the bowl, the tendency is to increase the per cent of fat in the cream. A difference may be made of from 1 to 2 per cent with most separators by changing the level of the milk in the supply can.

Richness of Milk Separated.—The per cent of fat in the milk separated has a marked effect on the per cent of fat in the cream. It is a common impression that more cream is obtained from milk rich in fat than from that poor in fat, but such is not the case. The richness of the milk separated affects the quality but not the quantity of cream and practically the same amount is obtained whether the milk has a high or low per cent of fat. It is a well known fact that the milk of an entire herd may vary in butter fat from one day to another due to weather or excitement, and as the cow advances in the period of lactation the richness of the milk increases. A number of fresh cows almost always means a lower cream test. These variations in the richness of the milk alone are sufficient to cause variations in the test of cream that will attract attention. The per cent of fat in milk in general is highest in autumn and early winter, and lowest in the spring and early summer. As a result of this, the cream test is generally highest during the fall and winter and drops to the lowest point in the spring and early summer. This is a change that is almost certain to be experienced by all cream sellers. If the milk of a herd of cows whose average test is 4 per cent is separated so that the cream tests 40 per cent, and the milk suddenly drops to 3.5 per cent of fat, as will often occur, the cream will then test only 35 per cent. The amount of fat lost in the skim milk is not affected to any appreciable extent by the richness of the milk separated.

Amount of Water or Skim Milk Used for Flushing the Bowl.—One of the most common causes of variation in the test of cream from the farm separator is a variation in the amount of water or skim milk used for flushing out the cream at the end of the run. It is apparent, that especially where a small quantity of cream is separated, a marked difference in the richness of the cream may be made by a change in the amount of water or skim milk added. It is an easy matter to vary a pint or more in the water or skim milk used and this alone may easily change the per cent of fat in the cream from 2 to 5 per cent.

Adjustment of Cream Screw.—The per cent of fat in the cream may be readily changed, as is well known, by adjusting the cream screw. The cream screw, however, is not changed very frequently and it is not the common cause of the variations in the test which

constantly occur and which causes so much friction between the buyer and seller of cream.

Testing Cream on the Farm.—While the farmer selling cream must expect to experience reasonable variations in the per cent of fat in the cream sold, he is also entitled to have his cream tested accurately and carefully by a man who thoroughly understands how it should be done and who has the proper appliances at hand. The cream buyer to comply with the laws of the State must weigh out the sample taken for testing. Any farmer selling cream is justified in demanding that this be done and to object to selling cream on tests made by measuring out samples with a pipette. There is no reason why the farmer should not satisfy himself regarding his test. It is an easy matter for any farmer to test cream approximately correctly, while it would not be easy for him to make a test sufficiently accurate to serve as a basis for buying or selling without purchasing a small scale which might be a greater expense than he would care to bear. The farmer, by use of an ordinary Babcock testing machine and by measuring the sample of cream into the test bottle with the same pipette as is used for measuring milk can make a test of his cream that will serve to satisfy him regarding the accuracy of the test he is receiving from the cream buyer.

Feed Does Not Affect Test of Cream.—It seems reasonable to expect that the richness of milk could be influenced by the character of the feed given the animal. However, it has been thoroughly proved that for all practical purposes it is impossible. The richness of a cow's milk depends upon inheritance and can no more be changed permanently by the feed than can the color of her hair. If the milk cannot be changed in richness by the feed it is clearly impossible for cream to be influenced in this way.

