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Why Cream Tests Vary
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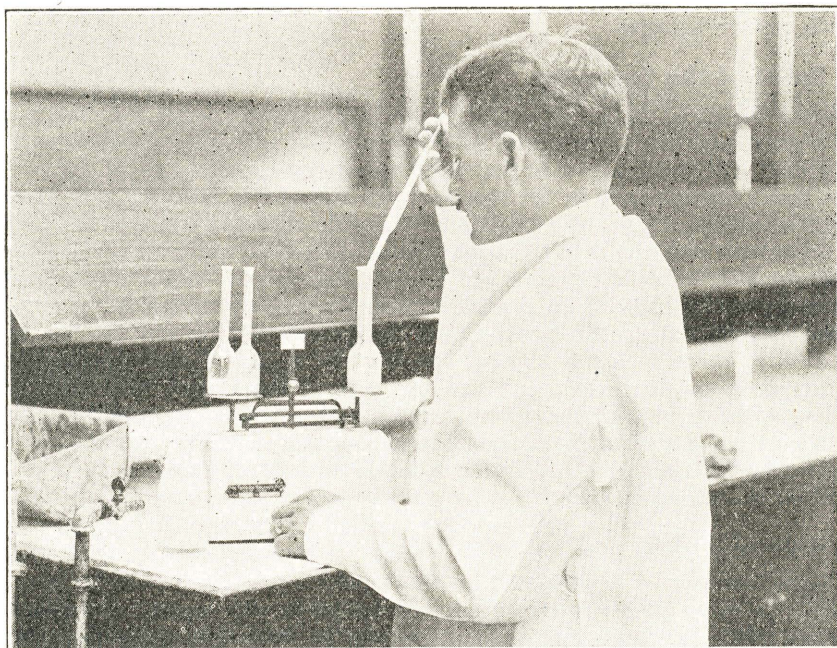
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WHY CREAM TESTS VARY

By G. MALCOLM TROUT

Variations in the fat content of cream, as revealed by the Babcock test, even when all conditions appear to be normal, are the rule rather than the exception. Since the causes of such variation in the fat content are not fully appreciated, dissatisfaction often exists between the patron and organ-



ization purchasing the cream. Frequently, this dissatisfaction results in a change of patronage, which proves costly both to the producer and to the creameryman. This bulletin presents in a concise manner, a discussion of the factors which are responsible for some of the variations in the cream test.

Michigan State College

Extension Division

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VARIATIONS CAUSED BY FACTORS INVOLVING THE SEPARATOR

1. Position of the Cream or Skim Milk Screw.

The cream or skim milk screw is a device located on the bowl of all modern centrifugal separators for the purpose of regulating the proportion of cream to skim milk. This screw is part of a delicate device, requiring careful adjustment. When the cream screw is turned inward, the cream becomes richer, and when it is turned outward, the cream becomes thinner. Even though the cream screw is set to yield a high testing cream, the cream secured from different separations will not always test correspondingly for the regulation of the cream screw is but one of several factors, which cause the percentage of fat in the cream to fluctuate. A 35 to 40 per cent cream is most desired by the buttermaker and is the most economical "richness" to produce. *Once the cream screw has been adjusted to yield a desired richness of cream, it should not be changed.*

2. Speed of the Separator.

When the speed of the separator is increased above normal the cream will test higher, and when the speed of the separator is decreased below normal the cream will test lower. A decreased speed results in a loss of fat in the skim milk. Irregularity in the speed of the machine is probably the greatest factor in causing cream test variations. Usually different individuals operate the separator with the result that the speed is neither uniform nor constant. A timing device should be employed to check the speed. When the separator is factory equipped with an electric motor, the pulleys and gearing are designed to give the proper speed at the designated electric current. Should the electric current be too high or too low the speed of the separator will be increased or decreased, and the fat test of the cream will vary accordingly. In equipping the separator with motor power, be sure the pulleys are of proper diameter to insure proper bowl speed. *Best results are obtained when the separator operates smoothly and steadily at the speed designated by the manufacturer.*

3. Rate of Inflow.

The inflow of milk is regulated by a float which permits the proper amount of milk to enter the bowl only when the faucet is wide open. Overfeeding the separator, by removing the float, results in inefficient separation and a thinner cream. Underfeeding, by partly closing the faucet, yields a richer cream.

The faucet of the milk tank should be centered above the bowl so that the float may regulate the flow of milk into the bowl without hindrance. *Always use the float and always have the faucet wide open when the separator is in operation.*

4. Unclean Separator.

When the separator bowl is dirty, the flow of milk is retarded. Some of the openings between the discs become clogged so that more skim milk flows through the cream outlet. A clogged separator bowl always delivers a thinner cream. The quality of the cream is lowered also. *Wash and dry thoroughly all the separator parts after each separation.*

5. **Vibration of Separator.**

When the bowl vibrates while the milk is being separated, there occurs a remixing of the cream and skim milk in the bowl, which results in inefficient skimming and a thinner cream. A vibrating bowl is often caused by starting the separator too quickly, by the separator not setting level, by water in the oil, or by worn bushings. *Always start the separator slowly, applying the power gradually. Keep the machine well oiled with a good separator oil and have the machine level so the bowl balance will be maintained.*

6. **Amount of Flush Water.**

The greater the amount of water or skim milk used to flush the bowl, the thinner will be the cream. The flushing of the bowl itself is not as largely responsible for a wide fat variation in the cream as the practice of allowing the watery discharge to flow into the cream. *Flush the bowl gradually by using the same amount of warm water or skim milk after each separation.*

VARIATIONS CAUSED BY FACTORS OTHER THAN THOSE INVOLVING THE SEPARATOR

1. **Temperature of the Milk.**

Warm milk is skimmed more efficiently than cold milk. The cream obtained by skimming warm milk is always thinner than that obtained from similar milk when cold. Milk below 70° F. in temperature should be heated before being skimmed. *The ideal temperature at which to skim milk is 90° to 95° F., or about the temperature of the milk as it comes from the cow.*

2. **Richness of the Milk.**

When the position of the cream screw remains unchanged and other factors are constant, the richer the milk the richer will be the cream. If a 4.0 per cent milk is skimmed and a 40.0 per cent cream is secured, a fluctuation of one-half of one per cent in the richness of the milk will increase or decrease the richness of the cream by 5.0 per cent.

The milk from small herds may vary to quite a marked extent in fat content, due to the addition of fresh cows to the herd, or to a lesser degree to turning the cows out to pasture, or to a number of other factors. Even a small fluctuation in the fat content of the milk will cause a marked variation in the fat test of the cream. *The fat test of the milk must always remain the same or the cream test will vary accordingly.*

3. **Richness of Cream.**

Excessively rich or very thin cream may be responsible for a variation in the test because of the difficulty in securing an accurate, representative sample. Thin cream becomes curdy and lumpy upon souring, while very rich cream is thick and buttery. Samples taken of such cream often lack uniformity and must be weighed with extreme care if accurate tests are to be secured. Selling thin cream is less economical than rich cream because of the greater transportation charges and the removal from the farm of skim milk which can be used advantageously for poultry and livestock feeding. *Adjust the cream screw to deliver a thirty-five to forty per cent cream.*

4. Evaporation of Water.

When cream is held for a long time in an open can, a certain amount of evaporation takes place. Such cream will test slightly higher, but the pounds of butterfat will remain the same. The surface layer of cream exposed to the air for a long time becomes leathery. It is hard to secure a representative sample of such cream. Cream also deteriorates very rapidly when held at high temperatures. *Always hold the cream at a temperature below 50° F. and when thoroughly cooled, keep the cans closed.*

5. Combination of Causes.

Many factors operating singly or in combination, cause the cream test to vary. Rusted discs, warped discs, a dented bowl, a worn spindle and an improperly seated bowl cover, affect the efficiency and uniformity of separation and cause variation in the cream test. So many single factors or combinations of factors affect the richness of the cream that it is extremely difficult to bring them under control sufficiently to produce a cream of uniform richness.

The cream producer should check the reliability of his cream buyer by keeping a record of the number of pounds of milk required to yield a definite number of pounds of fat, rather than by judging it according to the fat test of the cream.