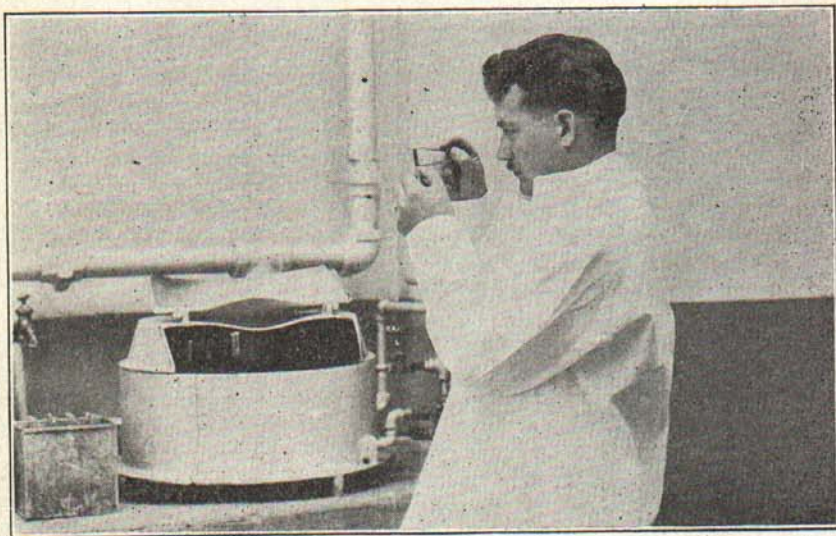


WHY MILK TESTS VARY

By G. MALCOLM TROUT

Dairymen delivering milk to milk plants complain quite frequently of variations occurring in the milk tests. These variations often lead to dissatisfaction on the part of the seller. Too often they are responsible for a lack of confidence in the buyer and a change in patronage results.

It is the purpose of this bulletin to explain the causes for some of the variations in the fat test of milk.



1. The Breed.

There is a distinct difference in the fat content of milk from animals of different breeds. The average fat test of Jersey milk is higher than that of any other breed. Milk from the Guernsey, the Ayrshire, the Brown Swiss, the Shorthorn, and the Holstein breeds rank in their

Michigan State College

Extension Division

R. J. Baldwin, Director, East Lansing

Printed and distributed in furtherance of the purposes of the co-operative agricultural extension work provided for in the Act of Congress, May 8, 1914. Michigan State College and U. S. Department of Agriculture co-operating.

fat content about as in the order given. Milk from herds composed largely of Jerseys or Guernseys will test higher than that from herds composed largely of Holsteins.

2. Individuality of Animal.

Milk from individual cows within a breed varies more in its fat percentage than the average milk from the different breeds. When the herd is composed of a large number of low testing cows, the average fat test of the herd milk will be low, and when it is composed chiefly of high testing animals, the average fat test of the milk will be correspondingly high. The introduction of a high fat testing cow into a small herd of low fat testing cows will slightly increase the average fat test of the herd.

However, the addition of only one cow of high fat test to a herd of ten or more low testing cows will have little appreciable influence upon the average fat test of the herd.

3. Condition of Cow at Time of Calving.

The fatter the cow at time of calving the richer will be the milk for a short time. During the early part of the lactation period the excess body fat will be milked off and the fat percentage in the milk will return to normal. Even when the cow is in poor flesh at freshening, the fat test of the milk will be slightly higher than normal. This high fat test however will not continue as long as if the cow were in high condition. If the majority of the cows freshen at about the same time, and are in good condition, the average test of the herd will be higher than normal for a few weeks.

4. Stage of Lactation.

The fat test of milk varies with the stage of lactation. This variation may be as low as five-tenths of one per cent or even more than one per cent. During a normal lactation period, the milk tests lower in the middle period than at the beginning or at the end of lactation. After about the fourth or fifth month the fat percentage increases as the lactation progresses. Milk from a herd composed largely of strip-pers will test higher than that from the same herd earlier in the lactation period.

5. Season of the Year.

There is a decrease in fat content during the warmer months of the year and an increase during the colder months. The tests are generally lowest in June and July and highest in December and January. A low fat percentage in the spring and early summer is thought to be due to a combination of the higher temperature and the higher humidity rather than to the turning of the cows out to pasture. The variation in fat content due to seasonal changes is more pronounced when the cows freshen in early spring. This is true because the cows will be in their lowest testing period of lactation when the depression due to the high heat and high humidity of summer arrives.

6. **Completeness of Milking.**

The percentage of fat will vary to a marked extent if the udder is not milked completely dry.

The first portion of milk drawn is considerably lower in fat than the last portion. Since the last few strippings contain a high percentage of fat, they exert a marked influence upon the fat test of the entire milking.

7. **Manner of Milking.**

When the milking is done carelessly, or in a manner irritating to the cow, the maximum flow of milk is not secured. This decreased milk yield usually results in a lower fat test. The use of a milking machine would seem to have no appreciable effect upon the fat test of the milk. Hurrying through the milking process results in a lower fat test; chiefly because of incomplete milking.

8. **Interval Between Milkings.**

The shorter the interval between milking, the richer will be the milk. Evening's milk tests higher than morning's milk, even when the time between the milkings is the same.

9. **Feeds and Feeding.**

Any change in feed, or in feeding practice, causes the fat test to vary. If the cow is in good condition, underfeeding will increase the fat percentage temporarily. Overfeeding does not appreciably affect the fat test. Watery feeds, such as beets, grass, or silage, have little or no permanent effect upon the fat content of milk. Neither the kind of feed nor the manner of feeding seems to affect the fat percentage permanently.

10. **Weather.**

When the cows are exposed to extreme weather conditions the fat test will vary. When the temperature rises, the fat content tends to decrease and conversely, when the temperature declines, the fat content tends to increase. During cool, clear, weather the fat test is more uniform. Storms have no effect upon the fat content of milk when the cows are well sheltered.

11. **Excitement.**

Any exciting influence, such as ill-treatment, fright, or the presence of dogs, results in a lowering of both the quantity of milk and of the fat content.

12. **Exercise.**

Cows that are allowed to exercise moderately after having been stabled for a long period usually produce milk testing slightly higher in fat, but the quantity of milk is not so great. Violent exercise, such as is brought about by chasing the cows in from pasture results in a lowering of the milk yield with a slight increase in the percentage of fat.

13. **Health.**

If a cow is in poor health there will be a decrease in both milk flow and fat content. When the udder is infected with mammitis, or "garget," the milk secreted is generally quite low in fat.

14. **"Heat" Period.**

During the normal heat period of a healthy cow, the percentage of fat is not affected in the case of some cows, while with others there seems to be an increase in the percentage of fat.

15. **Age.**

The age of the animal has very little effect upon the fat content of the milk. The fat percentage of milk from aged cows is very slightly lower than that of milk obtained when the cows were in their first few periods of lactation. The tendency is for a decrease in the fat content of the milk after the fourth or fifth lactation periods.

16. **Variations due to Unknown Causes.**

The fat test of milk from individual cows may vary considerably from day to day. Likewise, the fat test of milk from herds will show variations approximately in indirect proportion to the size of the herd. These frequent variations may be caused by any one, or by a combination of the factors previously mentioned.

17. **Condition of Milk.**

The condition of the milk, when sampled, may affect the fat test. If the milk is slightly sour or slightly churned, it will be difficult to secure an accurate sample, because of the presence of fine curd particles or butter granules.

Since the fat rises to the top, the milk should not be allowed to stand, but should be stirred vigorously before sampling.

Summary

Variations in the fat percentages of milk are the rule rather than the exception. When too wide a variation is encountered, the possible causes should be studied and corrected. It is obvious from the wide variety of factors which affect the milk test that such variations are more likely to result from some existing condition on the farm rather than because of incorrect testing. Before questioning the accuracy of the milk test, it would be well to check up on the factors which have been pointed out in this discussion.