

4/ **FOOD SCIENCE AND INDUSTRIES NO.3**

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Uniformly high butterfat production per cow is a most important requirement for successful dairying. Cows bred for high fat production must be handled properly to encourage production up to their capacity. Many factors are related to fat output. Unless precautions are taken to control these factors, costly fat variations may occur.

Daily Variations In Test Of Individual Cows-- Research has shown that butterfat tests vary considerably from day to day. Differences of 1.1 to 2.0 percent are common. Only one-fourth to one-third of most cows produce fairly uniform tests varying less than 1 percent. Some cows have shown daily differences of 5.1 to 6.0 percent.

In one disputed case an official testing agency noted a maximum of 1.2 percent change in fat test and 331 pounds in milk production by one herd on 2 consecutive days. Good herd management is essential to minimize daily variations in both fat test and production!

Breed Differences--Individual cows within a breed may vary greatly in butterfat output. In general, the fat content of milk of individual breeds increases in this order: Holstein, Ayrshire, Brown Swiss, Guernsey, Jersey.

Stage of Lactation--Fat test decreases over the first 2 or 3 months after freshening and gradually increases during the remainder of lactation.

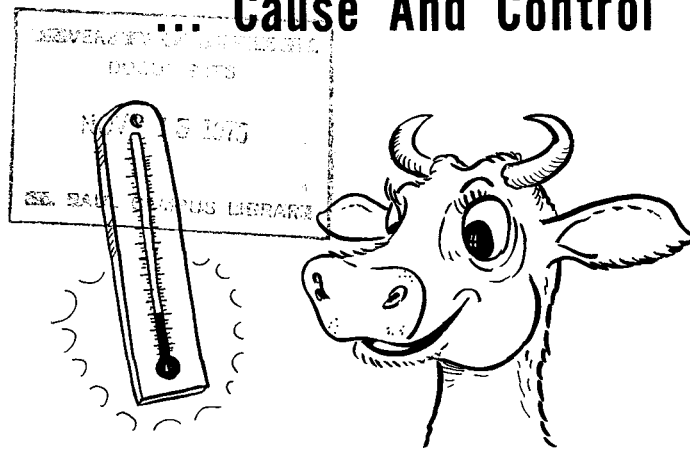
Cows calving in good flesh tend to produce milk of higher test than do cows calving in poor condition.

Greatest differences between the lowest and highest test during any one lactation period will be observed in cows averaging the highest test.

Season of the Year--Fat tests tend to increase during fall and winter and decrease during summer. Cows producing highest tests show greatest seasonal variations.

Seasonal differences occur due to changes in temperature. An increase of 0.1 to 0.3 percent in test may occur with each 10° F. decrease in tem-

## Variations In Butterfat Test Cause And Control



perature and vice versa. This depends entirely on the possible influence of any other factor or factors which cause tests to vary. Production of milk tends to follow a similar pattern.

Milking Interval and Time of Day--In general, shorter milking intervals result in higher fat test and lower total yield of milk. For this reason, evening milk usually tests higher than morning milk.

Exercise--Moderate exercise (compared with no exercise) tends to increase fat content of milk.

Feeding--Cows must be fed adequate amounts of good quality feed if they are to produce to capacity. If cows are fed grain at levels yielding efficient production, feeding additional grain seldom changes butterfat test but may increase total milk production. Even good feeding practices will not guarantee higher tests because of influence of factors such as inheritance and milking practices.

Only accurate production records on cows can provide you with the necessary information for breeding to advantage.

Feeding finely ground hay in substantial quantities or drastically reducing forage intake may lower the test.

Turning cows out on immature spring pasture will increase the volume of milk but lower fat tests. Making hay available at this time often will prevent extreme decreases in test.

Feeding cod liver oil may cause as much as 25-percent reduction in fat test.

Using large amounts of high-fat feeds will not substantially, or necessarily, increase tests.

For more information the reader is referred to the review: "Fat Variations in Milk" I. A. Gould and R. E. Stout, Milk Plant Monthly, March 1949.

Age of Cow--Fat tests tend to decrease gradually as a cow grows older, but over a lifetime this decrease may be no more than 0.2 percent.

Illness--Mastitis usually causes a temporary decrease in test. Other illnesses may cause a drop in volume and increase in test.

Milking Management--Milking management is by far the most important consideration in maintaining uniformly high fat and production figures.

- \* Don't frighten or excite cows. Milk and fat yield will suffer.
- \* Practice uniform milking procedures.
- \* Prepare cows for milk letdown by washing udders in warm sanitizer solution. This step alone can save you up to 1 minute per cow in stripping time.
- \* After preparing cows for milk letdown, attach milking machines without delay. (Delay of more than 1 to 2 minutes can cause both milk volume and fat to decrease.)
- \* Complete milking within 3 to 5 minutes. This will help prevent mastitis.

Fat Test During Milking--As milking progresses the fat test increases sharply. "First milk" tests about 1 percent fat. This means you don't throw away much fat if you check for mastitis with a strip cup. And if you catch a mastitic condition early, you'll save many dollars by quick treatment.

Fat tests in stripper milk are high, usually ranging from 7 to 10 percent.

Other Farm Losses--Removal of topmilk for home consumption results in drastic decreases in test. One quart of cream testing 25-percent fat taken from a 10-gallon can of 4.0-percent milk lowers the test to 3.4 percent. . . . a six point drop.

Though it is obvious, calf and animal feeding must be considered as volume losses. Disputes between plant and farmer have occurred when this fact was forgotten.

"Heat" period may cause milk volume to decrease and fat test to go up.

Relation Between Weight of Milk Delivered and Test--There is no consistent relationship between weight of milk delivered and the butterfat test of that milk. As one case in question, four consecutive deliveries of Jersey milk showed:

Day	Weight of milk pounds	Fat test percent
1	412	4.2
2	513	4.4
3	500	4.3
4	495	5.7

DHIA Versus Plant Tests--DHIA testers are under direct order not to use results or take samples for check-testing plant tests. This practice can only result in misunderstanding and mutual distrust of those involved. In some cases the two tests will agree fairly well. In many they will not for one or more of the following reasons:

\* Plant results are obtained on composite samples prepared from all milk delivered. DHIA test is for 1 day's production only. Tests on composite samples may be slightly lower than tests on fresh milk. Use of the most accurate methods for determining fat levels indicates that Babcock test fat measurements are slightly high. Whether a fresh or composite sample is analyzed, results can be expected to range from 0.03 to 0.08 percent above actual fat test when the Babcock procedure is used.

\* Milking may be conducted with maximum efficiency and completeness on DHIA testing day. Cows may be milked out drier.

\* DHIA tests are not made on milk from cows that have been fresh less than 7 days.

\* Home use, calf feeding, and spillage will significantly vary DHIA versus plant test.

\* Maximum values are reported by DHIA; subsequent handling of milk will most likely lower the test.

\* DHIA testers report results for test day and calculate production for the month. Plant tests are made on composites of all deliveries.

Any one of the above factors causing fat variations may influence the test on DHIA sampling day and cause discrepancies between DHIA and plant test results.

Babcock Test--The Babcock test for butterfat, which your DHIA supervisor and dairy plant use, is accurate to plus or minus 0.1 percent (one point). Mismanagement of cows can cause decreases in test of 1.0 percent, 2.0 percent (10-20 points), or more.