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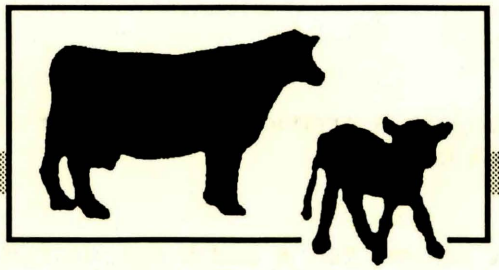

Fat-Corrected Milk

B. G. Cassell, Extension Dairy Scientist, Genetics and Management
Virginia Tech

All milk is not created equal. Dairy farmers have long recognized differences between animals in both milk and fat yields. Fat-corrected milk (FCM) is one method of standardizing milk production for comparisons between cows.

FCM can be standardized to any fat percentage. Many FCM conversions use 4.0% fat as a basis, but 3.5% or any other reasonable fat test is equally useful. All that FCM adjustments do is combine actual milk and fat yields into one number that represents the volume of milk at the specified fat percentage which contains calories equal to the original milk produced. Since calories produced by the cow are constant, her rank relative to other cows will not change as the fat percentage basis for FCM changes. She ranks the same on 3.5 or 4.0% FCM, as long as all cows are compared on the same FCM basis.

How to use FCM adjusted yields:

Use FCM to compare cows. You can adjust actual yields, standardized (mature equivalent) yields, Estimated Relative Producing Abilities, or Cow Indexes using FCM factors. Interpret your answer as you would the original numbers; i.e. cow indexes measure genetic merit, but actual yields measure effects of environment and genetic ability. FCM adjustments do not alter the nature of the original measurements.

How to adjust yields:

The formula for FCM is simple.
FCM = ("a" factor times milk yield) + ("b" factor times fat yield)

The values for a and b can be read from the following table or calculated as explained in the appendix.

Table 1. Factors for correcting milk and fat yields to different fat percentages.

Base fat percent	a	b
2.5	0.5161	19.3548
3.0	0.4706	17.6471
3.5	0.4324	16.2162
4.0	0.4	15.0000
4.5	0.3721	13.9535

Suppose you wish to adjust a production record of 18,000 lbs milk, 3.5% fat, and 630 lbs fat to a 4% FCM basis.

Use the following steps:

1. Select the correct values for a and b for 4% FCM. The value of a is 0.4 and the value of b is 15.
2. Multiply milk yield by 0.4 and add the result to 15 times fat yield.

4% FCM = 0.4 (18,000) + 15 (630)
= 7200 + 9450
= 16,650

In other words, 16,650 lbs of 4% milk is equivalent in energy to 18,000 lbs of 3.5% milk.

Had the adjustment been to a 3.5% fat standard, the following calculations would have been appropriate:

3.5% FCM = 0.4324 (18,000) + 16.2162 (630)
= 7783 + 10,216
= 17,999

This is the same value (within rounding) as the actual yield of the cow (18,000 lbs), which is what we expect since she tested the same as the standard (3.5% fat).

APPENDIX

The factors in Table 1 contain most of the base fat percentages you would likely need. If you need factors for a different base fat percentage, use these equations to determine "a" and "b". X is the base fat percent expressed in decimal form.

$$a = \frac{1}{(1 + 37.5\ X)} \qquad b = \frac{37.5}{(1 + 37.5\ X)}$$

For example, use X = 0.04 (4% FCM)

$$a = \frac{1}{(1 + 37.5\ (0.04))} \qquad b = \frac{37.5}{(1 + 37.5\ (0.04))}$$

$$= \frac{1}{(1 + 1.5)} \qquad = \frac{37.5}{(1 + 1.5)}$$

$$= \frac{1}{2.5} \qquad = \frac{37.5}{2.5}$$

$$= 0.04 \qquad = 15$$