

New Body Size Composite

An improved way to estimate body weight

ANOTHER STEP TOWARDS HIGHER EFFICIENCY

A key component to improving feed efficiency is being able to accurately estimate the body weight of our cows, and a good tool for that is linear classification. As a part of the USDA multi-state research project on feed efficiency, Holstein Association USA classifiers scored 1,920 cows with weekly body weight and feed intake data, at seven different locations throughout the United States. Meanwhile, a similar study was conducted in the Netherlands on another 1,665 cows. This cooperative effort has led to more accurate predictors of body weight in both countries.

Results from the 2016 Feed Efficiency study indicate that an accurate prediction of body weight needs to include a measure of both body size, i.e., the dimensions of the cow, and dairy form. By including dairy form, we now take into account how hard that cow is working, and account for an excess or lack of body fat. A distinctive feature of our modern-day dairy cow is its ability to convert large amounts of roughage and feed into milk. Bigger cows have greater mass or volume and tend to be heavier. But, they also tend to eat more and produce more milk. When estimating the body weight of a cow, or the progeny of a bull, breeders need to take into account their frame, as well as their strength and dairyness.

Dairy form measures how hard a cow is likely to work. High dairy form indicates a high level of production, where she'll be carrying less body fat throughout most of her lactation. She's more angular, open ribbed, and thinner. A cow with low dairy form is one who's thicker through the neck, shoulders and ribs; is lower producing with higher body condition; and is heavier than her frame would indicate.

The new Body Size Composite (BSC) is more complete and accurate by looking at both the size of the cow and how heavy she's milking (how much extra condition she carries). A bull with an old BSC of +1.0 would be expected to sire offspring that were +24 pounds heavier than breed average; a bull with a new BSC of +1.0 is expected to sire offspring that are +40 pounds heavier.

2016 Body Size Composite (BSC)

$$\text{BSC} = (.23 \times \text{Stature}) + (.72 \times \text{Strength}) + (.08 \times \text{Body Depth}) + (.17 \times \text{Rump Width}) - (.47 \times \text{Dairy Form})$$

Every 1.0 STA increase in body size correlates with a 40 pound predicted increase in mature body weight. For example, daughters of bulls that sire heavier cows (large positive evaluation for BSC, +3.00) are predicted to weigh 240 lbs. more than those bulls that sire lighter weight cows (large negative evaluation for BSC, -3.00).

Impact on Feed Efficiency

The Feed Efficiency Index has also been adjusted to reflect the change in Body Size Composite. Where we previously had a \$7.44 deduction, that now changes to a \$12.40 deduction, for each 1 unit increase in BSC.

2016 Feed Efficiency (FE)

$$\text{FE} = (-0.0248 \times \text{PTA Milk}) + (1.16 \times \text{PTA Fat}) + (2.18 \times \text{PTA Protein}) - (12.4 \times \text{Body Size Composite})$$



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