Beef Business

Matt Woolfolk | director of performance programs

A Series of Numbers: Carcass EPDs

Welcome to the first of three articles discussing the relationship between EPDs and the data points that drive the calculations. In our Shorthorn genetic evaluation, there are 16 EPDs and selection indexes available for you to use in your breeding and selection decisions. There are some that are familiar to most breeders, like Birth Weight, Weaning Weight, and Yearling Weight. Discussing them at length would seem redundant. Last year in the January to March 2019 issues, I covered the selection indexes ($Calving Ease, $Feedlot, and $British Maternal) at length, so there's not much need to re-hash those. Instead, I will focus on the "lesser known" EPDs. For this series, first I will highlight the suite of carcass EPDs we have available, followed by a discussion of the maternally-oriented traits in September. The series will close with some thoughts on performance data, genomics, and the relationship between them when it comes to genetic evaluation calculations.

In the Shorthorn breed, there are five traits focused on carcass quality that have calculated EPDs. They include carcass weight, yield grade, ribeye area, marbling/intramuscular fat, and fat thickness. What makes the carcass EPDs unique is that they are fueled by two different sets of data to achieve the genetic predictions. Carcass traits can be influenced by actual carcass data collected by harvesting feeder cattle, as well as the use of carcass ultrasound scanning. Carcass data from a harvested carcass has a larger influence on a sire's EPD movement than ultrasound data, since it is an actual measurement of the traits of interest. While scanning breeding stock for carcass measurements is a valuable and accurate tool, it is an indicator of what actual quality might be. Currently, there are about 4,600 actual carcass measurements in our database, with an additional 10,600 records of carcass ultrasound data to support it.

Carcass weight (CW in Digital Beef) is used to measure the differences in weight of a beef carcass and is measured in pounds. There are a lot of sires in the database without any progeny carcass records. For these cattle, CW follows closely the trend of the other growth traits. The cattle that rank higher for WW and YW typically do the same for CW. Once actual carcass weight data is supplied on a sire, that information will start to influence the movement of the EPD.

The yield grade of a carcass is an estimate of the percent retail yield of the four primal cuts of beef (the chuck, rib, loin and round). In layman's terms, it measures the cutability of the carcass. The USDA scoring system for yield grade is on a 1 to 5 scale, with 1 being the highest cutability carcass. The Yield Grade EPD (YG) is expressed in terms of units of that scoring system. The lower (more negative) a YG EPD, the better progeny are expected to perform on the USDA Yield Grade scale. This trait is like Birth Weight in that the lower numbers are generally considered more desirable.

The next three traits are those that are influenced by both carcass data collection, as well as ultrasound data. Ribeye area (REA) is simply the measurement of the size of the longissimus muscle between the 12th and 13th rib. It is measured in square inches, and the EPD is expressed in that same unit. Larger REA EPDs indicate progeny who will likely have larger ribeye areas when scanned or harvested. There is a trend that many high REA EPD bulls are also high growth (WW and YW) bulls, as the traits are correlated to each other. Realistically, REA is a growth trait itself. It just measures the growth of one muscle in the animal rather than the growth of the entire beast.

Intramuscular fat, better known around the industry as IMF or marbling, is the measurement of how much fat is deposited within the area of the ribeye. The trait is measured on a percentage basis, with a higher percentage meaning there is more fat deposited within that muscle. We all know about the importance of marbling when it comes to the grading quality of beef. The marbling EPD (MB) is pretty important, too! The MB EPD is expressed in terms of the percentage of IMF found in the ribeye. The higher the MB EPD, the more likely it is that progeny will have higher marbling. When studying MB's relation to REA, it is difficult to find animals that rank in the breed's elite for both. Typically, if one of these traits increases, the other will decrease. While you can find a few outliers to this relationship, biology makes it difficult.

The final trait measured by both actual carcass data and ultrasound, fat thickness is measuring the backfat on an animal where the ribeye area measurement is taken. In our database, the EPD for backfat thickness is indicated by the FT abbreviation. The trait is measured in inches, and the EPD is expressed in that unit as well. Like the YG EPD, the lower (more negative) a FT EPD is, the less backfat we would expect to see on the progeny of that animal, both from carcass and ultrasound data.

Actual carcass data on feeder cattle can be submitted to ASA for input into the database. If you have some data that has been collected but never submitted, send me an email (matt@shorthorn.org) and I will be glad to send you the template that we use to upload data. All ultrasound data on breeding stock is submitted to ASA via one of three ultrasound image processing labs. After your scan technician leaves your farm, they submit their images to one of these labs for interpretation and submission to the breed association. We then upload the data we receive from the image processing lab and provide you with a report on all the animals that you scanned.

Hopefully, the dive into carcass EPDs won't scare you off from this series. Next month, maternal traits and the data that drives their EPDs will be the focus.