Enhancements to Carcass Trait EPDs

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With the release of the fall 2008 Hereford genetic evaluation this month, breeders may note some new features in the carcass trait evaluation. Emphasizing the economically relevant traits affecting quality and yield grade, these changes simplify the use of carcass expected progeny differences (EPDs) for Hereford breeders and their commercial bull customers. These changes will also make the format of Hereford carcass EPDs more similar to that used by all other major beef breeds, raising the comfort level of commercial cattlemen buying Hereford genetics for the first time.

History of Hereford carcass EPDs

Carcass EPDs have been calculated for Hereford cattle in the U.S. since 1998. Originally, those EPDs were calculated solely from ultrasound measures of breeding bulls and heifers. Like the current evaluation, the traits for the evaluation were fat thickness, ribeye area and percent intramuscular fat (IMF), all expressed on a yearling breeding animal basis.

In other words, the differences between two sires for any particular carcass trait EPD reflected the bulls' genetic ability to sire leaner, heavier-muscled or higher intramuscular fat (IMF) yearling bulls or heifers. The assumption was that similar results would be seen in fed steer and heifer progeny when harvested. That original evaluation ignored the carcass data breeders had collected on Hereford-sired progeny.

In 2004 the American Hereford Association (AHA) was one of the first U.S. beef breeds to enhance its carcass trait evaluation models by including both ultrasound data and true carcass data. Research conducted by Kansas State University and later by the animal breeding and genetics unit at the University of New England showed that the genetic correlations between ultrasound and carcass traits (i.e. yearling bull IMF with steer marbling score) were very favorable.

By that time, considerable carcass data had been collected in programs such as the AHA National Reference Sire Program (NRSP) as well as by individual breeders. The new models calculate both the ultrasound EPDs, currently printed, as well as true carcass EPDs, which have not been printed to this point.

The current ultrasound EPDs reflect both ultrasound data and carcass data, so if a sire in the AHA NRSP has progeny with superior ribeye area (measured in the cooler), his ultrasound ribeye EPD will reflect that. However, since Hereford breeders were used to working with ultrasound trait EPDs, AHA continued to print carcass trait EPDs on the ultrasound scale, not the carcass scale.

Changes on the horizon

At the 2007 Beef Improvement Federation (BIF) annual meeting, the following BIF guidelines revision was approved by the genetic prediction committee and the BIF board of directors:

> *"Whenever possible, carcass data from harvested fed cattle and ultrasound measurements from yearling breeding bulls and heifers should be jointly analyzed with multiple trait models. Such an evaluation would provide genetic predictions for both carcass and ultrasound measurements, but since the carcass measurements are the economically relevant traits, the carcass trait predictions and their associated accuracy values should be published for use in selection. Both carcass and ultrasound measurements should be evaluated on an age-constant basis."*

By 2007 nearly all U.S. beef breeds had combined carcass and ultrasound data into a single carcass trait genetic evaluation. Most elected to publish EPDs on the carcass scale, rather than the ultrasound scale. At the same time, the U.S. Meat Animal Research Center in Clay Center, Neb., began investigating across-breed EPD adjustments for carcass traits.

That same year the American Angus Association began moving toward converting its genetic evaluations from an ultrasound basis to a carcass trait basis. In order to make Hereford carcass trait EPDs as useful and user-friendly as possible for commercial cattle producers, the AHA board decided in 2008 to start publishing carcass trait EPDs on the carcass scale, beginning in July 2008 with the fall genetic evaluation.

How are the new carcass EPDs different?

Likely the biggest change Hereford breeders will notice in the evaluation is the renaming of IMF EPD as marbling EPD. Since marbling is measured in the carcass as units of marbling score, the new marbling EPD will be expressed in those units.

If a sire has a marbling EPD that is 0.4 units higher than another sire, his steer progeny would be expected to have U.S. Department of Agriculture (USDA) marbling scores the same amount higher, which would be 40% of the difference between the minimum marbling for the Select grade and the mimimum for Choice. Since fat and ribeye are measured in the same units both with ultrasound and in the cooler, the units for the new carcass EPDs will be the same for those traits.

With any new EPD release, the breed averages and distribution of EPDs change when new data is added to the database. The distributions and average values for marbling, ribeye and fat EPDs will likely change to a greater degree with this evaluation because of the shift from ultrasound to carcass traits.

While the averages should be fairly similar, the highest and lowest values across the breed may decrease or increase. This is a one-time change only, and later evaluations should

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change in a similar manner to growth trait evaluations and past ultrasound evaluations, again as a result of new data. Since Hereford dollar indexes are calculated from all EPDs, including carcass EPDs, some sires may change slightly in their index values in the next evaluation due to the conversion from ultrasound EPDs to carcass EPDs.

Most sires will rank similarly in the new evaluation, compared to how they did in previous years. Some sires, especially those with significant amounts of carcass progeny in the database, will change to a greater degree, and those sires will be more accurately evaluated for true value differences than in previous years.

New carcass EPDs, expressed on the carcass scale, are not directly comparable to old ultrasound EPDs for Hereford cattle. Many sires will show a slight decrease in the accuracy values of their EPDs, but this should not be interpreted by breeders as meaning the carcass EPDs are less reliable. In fact, the new EPDs are better predictions of true carcass merit than the old, because they predict differences in fed cattle, not breeding cattle.

Ultrasound measurements indirectly predict carcass merit, but carcass measurements reflect true carcass merit. So a carcass EPD, even with a lower accuracy value, is a more precise prediction of a sire's genetics for carcass merit.

Ultrasound data as important as ever

It's important for Hereford breeders to recognize that the new analyses in no way decrease the importance of collecting ultrasound data on yearling bulls and heifers. For a vast majority of Hereford cattle, the carcass EPDs will be almost solely calculated from ultrasound scans of themselves, their siblings and other relatives, and their progeny. Sires whose progeny show superior IMF or ribeye area scan data will have more favorable marbling or ribeye area EPDs, respectively.

In summary, the new carcass trait EPDs are an even more powerful tool to enhance the carcass merit of Hereford cattle. By balancing selection for carcass traits with calving ease, growth, maternal traits and other measures of economic value, Hereford breeders are well-equipped to create the most useful Hereford genetics the commercial beef industry has ever seen. **HW**