

AHA Releases Heifer Calving Rate EPDs

by Dan Moser

As part of a research project conducted by Kansas State University, the American Hereford Association (AHA) has released its first heifer calving rate (HCR) expected progeny differences (EPDs). Using Whole Herd TPR data submitted by AHA members since 2001, these values show genetic differences in Hereford sires for the likelihood of their daughters to calve as heifers. A list of sires and HCR EPDs is available on the AHA Web site, Hereford.org.

While AHA and other beef breed associations have produced growth and carcass trait genetic evaluations for many years, HCR represents one of the first evaluations for reproductive traits. Studies have shown that reproduction traits like calving rate are some of the most economically important to commercial cow-calf operations. Yet, because collecting large amounts of data on reproductive traits is more difficult and because these traits tend to be less heritable, they have been the last to be incorporated into genetic evaluation programs.

The AHA HCR evaluation is made possible by Hereford breeders' participation in Whole Herd Total Performance Records (TPR™), a program where producers report the reproductive status of every female every year. These records indicate which heifers are exposed for breeding and which ones produce a calf. By combining these data with pedigree information, EPDs are calculated that allow comparisons of Hereford sires for HCR.

The current evaluation is a research prototype and will change somewhat as more data is collected and enhancements are made to the

analysis. For computational efficiency, a sire model has been used in this prototype which only produces EPDs on sires, not females. Future plans are to conduct the evaluation semi-annually using an animal model that will provide HCR EPD on all Hereford cattle, male and female.

The units for an HCR EPD are percentages of daughters calving, somewhat similar to the units for calving ease EPDs. Higher values indicate greater likelihood of a sire's daughter producing a calf, given that she was retained as a replacement. To use these values, breeders should compare two or more sires and consider the difference/differences between or among them.

For example, if sire A has an HCR EPD of +3.0% and Sire B has an HCR EPD of -2.0%, the difference between the sires is 5.0%. If daughters of both sires are developed and bred in the same environment, you would expect sire A's daughters to have a 5% higher calving rate. Sires can also be compared to the breed average, currently +1.5%. The range in HCR EPD in the current analysis is from +23.9% to -25.3%.

One of the interesting findings in this research study was that HCR is more heritable than expected. The estimate of heritability from the study for HCR was 0.267, compared to most reproductive traits that range from 0.05 to 0.15. The higher estimate of heritability could be due to the limited amount of data collected

so far but could also be due to the high quality of the data that AHA members have submitted. With a higher than expected heritability estimate, Hereford breeders should be able to use the HCR EPD to make significant genetic improvement for this trait.

In the current prototype evaluation, HCR EPDs were calculated on 12,714 Hereford sires. Like any genetic evaluation, most of the sires have low levels of accuracy. Of those sires, 534 sires had an accuracy value of 0.30 or above. As more data is collected, more sires will have HCR EPDs and accuracy values will rise.

The HCR evaluation is another step toward providing a comprehensive genetic evaluation of Hereford cattle for as many economically important traits as is practical.

The research on HCR will continue in the upcoming year. Scrotal circumference and calving date will be considered as correlated traits, providing information which could potentially add greater accuracy to HCR EPDs. The potential to use an animal model to produce HCR EPD on dams as well as sires and the calculation of non-parent and interim EPDs will be studied. Other researchers will evaluate incorporating HCR into current AHA economic indexes.

The HCR evaluation is another step toward providing a comprehensive genetic evaluation of Hereford cattle for as many economically important traits as is practical. Combined with information on calving ease, growth, maternal and carcass traits, HCR EPDs provide even greater opportunity for Hereford breeders to identify and propagate the most profitable genetics for their commercial bull customers. **HW**