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AHA Releases New Fertility Traits

Jack Ward

The American Hereford Association (AHA) is in its 15th year of Whole Herd Reporting. Recently, this program allowed for the development of two new fertility traits, Heifer Calving Rate (HCR) and Sustained Cow Fertility (SCF), which have been released as a research analysis on the AHA website at *Hereford.org*.

These two traits will become part of the full evaluation in the near future and will be added to the $ Indexes. But today they are just reported as research with no correlation to any other traits and have no genomic component. These are the two new fertility expected progeny differences (EPDs).

Heifer Calving Rate

The Heifer Calving Rate EPDs are produced from an animal model genetic evaluation for 293,313 animals encompassing a six-generation pedigree. Heifer calving records were analyzed as a categorical trait in which more than 98,000 records were used in the binary analysis as calved and not calved, based on recorded calf birth date.

The contemporary groups were defined as herd, first-calf heifer yearling contemporary group, calf birth year and season. A restriction of age at first calving between 600-800 days was used as part of edits along with checks for contemporary group variation. Heifer calving rate for the dataset was 73%, under the criterion that the heifers calved by 800 days of age. The heritability for heifer calving rate is .15, which is consistent with the magnitude of estimates for lowly heritable reproductive traits but still allows for genetic progress.

The following example depicts a comparison between two sires for their HCR EPDs to describe genetic differences in future daughter calving rate. Note that a higher

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Bedwell named COO and director of breed improvement

Shane Bedwell

Shane Bedwell, Ft. Collins, Colo., has been named chief operating officer (COO) and director of breed improvement of the American Hereford Association (AHA).

In this role, Shane will lead the AHA performance department and oversee the National Reference Sire Program (NRSP) and Whole Herd Total Performance Records (TPR™) program.

"I feel very humbled and honored to take the job as director of breed improvement and COO for the American Hereford Association," Shane says. "I look forward to serving the membership and working for a first-class organization. I believe that because of AHA's outstanding leadership, the breed is currently positioned very well in the industry, and I envision continued growth for the years to come."

Prior to joining the AHA staff, Shane coached the livestock judging team at Colorado State University. In that role since August 2007, he has led many successful and championship teams. He also was an instructor for two livestock selection classes, as well as co-taught animal nutrition while serving as advisor for CSU's Block & Bridle club.

A Kansas State University graduate, Shane was a member of the 2003 Reserve National Champion Judging Team. Shane earned a master's degree in beef cattle nutrition from the University of Illinois in 2007.

Shane was raised on a cow-calf and stocker ranch near Medicine Lodge, Kan., and continues to help manage his family's 350 head cow-calf operation, which consists of a rotational cross of Hereford, Angus and Red Angus.

Shane has had the opportunity to judge cattle in 30 states including the National Western Stock Show, American Royal, North American, Fort Worth Stock Show, San Antonio Livestock Show and the Houston Livestock and Rodeo. He says he enjoys youth events and working with students who are focused on pursuing a career in the livestock industry.

"We are excited to have Shane join our Hereford team," Jack says. "He brings a wealth of commercial industry knowledge to our organization as well as a unique ability to communicate technology and science in beef-producer terms. He will lead our research projects as we continue to document and prove the Hereford advantage."

Shane and his wife, Lacey, have a 4-year-old daughter, Cealy Rose, and a 1-year-old son, Chisum. The family will relocate to the Kansas City area. Shane will begin his duties in the AHA office in late December. HW

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value is associated with favorable genetic potential for calving rate in daughters. As with other EPDs, the difference between individuals is the best approach to using the HCR EPDs. With the economic impact of reproductive rate in beef cattle operations, the appeal of HCR EPDs is always top of mind. In the future, these EPDs will provide the opportunity to include genetic evaluation results associated with reproduction to directly enhance the benefits of existing AHA selection indexes.

Example: HCR EPD (%)
Sire A: HCR EPD = 8%
Sire B: HCR EPD = 2%
Difference: 6%

Six percent more daughters of Sire A are expected to calve as heifers compared with daughters of Sire B.

Sustained Cow Fertility

The Sustained Cow Fertility evaluation is conducted using software developed especially to implement genetic evaluation for time-to-event data. For the sustained cow fertility genetic evaluation, the event of interest occurs when a female no longer calves annually after having calved as a two-year-old. This survival analysis utilizes Whole Herd Total Performance Records (TPR™) records in a sire evaluation model that includes extended pedigree for the sires' parents, resulting in over 63,000 breeding values.

The yearling contemporary group initiates the analysis. Essentially the SCF dataset is an extension of the data edited for the Heifer Calving Rate genetic evaluation. After the initial yearling group for SCF, dynamic contemporary groups are used where females exposed together make up a contemporary group. Censoring of females as appropriate takes place to not penalize them for certain lifetime events, such as young females, females sold or females becoming donors.

The calculated age at calving for each parity and inter-calving period is used to establish "success." The success for a producing female in the herd continues each production cycle until the inter-calving period is less than the gestation length or the dam produces an embryo transfer (ET) calf or the dam is transferred. In addition, the analysis accounts for milk and total maternal calving ease EPDs. Heritability for the current analysis is .20.

The SCF results, reported in percentage units, are oriented so that larger breeding values reflect sires whose daughters calve annually for more years. For example, if Bull A has a SCF = 110 and Bull B has a SCF of +95, Sire A's daughters are at 15% less risk of being open after a 60-day breeding season than Sire B's daughters.

Example: SCF EPD(%)
Sire A: SCF = 110%
Sire B: SCF = 95%
Difference: 15%

Sire breeding values are associated with more success in future daughters remaining in the herd when SCF is above 100 and are associated with more risk (less success) when SCF values are below 100.

Dry Matter Intake

In addition to the fertility traits, a new trait has been released for Dry Matter Intake (DMI). This trait has been developed by using the individual feed intake collected at young sire test programs and research projects and by AHA members testing groups of females, bulls and steers. This trait is also just in the research release stage and has no genomic component or correlation to other traits. However, this one will be used in the $ Index update.

The DMI EPDs are generated from a multi-trait animal model genetic evaluation for 15,027 animals. Traits represented, in addition to an edited 3,022 individual standardized feed-intake records, include contemporary weaning and yearling growth measures. Weaning weights are included for weaning contemporaries to the intake calves to account for selection bias. Feed-intake heritability is .40, indicating that genetic selection for this trait can be effective.

The following example depicts a comparison between two sires for their DMI EPDs. Note that a lower value is associated with the genetic potential for less intake in future progeny. As with other EPDs, the difference between individuals is the best approach in understanding the DMI EPDs.

In this example, the progeny of Sire A are expected to consume 0.75 lb. less feed per day compared with the progeny of Sire B. This example assumes that all progeny are exposed to the same postweaning feeding management and environment. Care should be taken in the interpretation and application of DMI EPDs, with the best approach being the future use of these genetic values in AHA selection indexes.

Example: DMI EPD (lb. per day)
Sire A: DMI EPD = -0.50 lb./d
Sire B: DMI EPD = +0.25 lb./d
Difference: -0.75 lb./d

Progeny of Sire A, on the average, are expected to consume .75 lb. less feed per day when compared with progeny of Sire B.

As with all traits, these can be very useful for genetic improvement, but a balanced approach for selection is always important. These new traits, associated with economic relevance for the beef industry, show the commitment that the Hereford breed and its members have to the commercial industry. **HW**