Performance Matters

A Case for Change

by ***Shane Bedwell***

Change does not mean a method is wrong.

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I vividly remember early summer mornings raking hay in our open-cab 1030 J. I. Case tractor. I was only 10 years old, but I still recall how big I felt driving it through our fields. It only had one working headlight, but if there was a full moon, I was in business. We had bigger tractors with cabs used for more extensive farming reasons, but the ol' 1030 was the perfect fit for the rake and a beginner like me.

I now think back to how impressive that tractor must have looked when it was brand-new and the joy my grandad must have felt when he bought it in the late '60s. At the time it was a significant upgrade from the tractors he owned and was a stark difference from the team of horses used beforehand. We have since upgraded to more sophisticated and efficient equipment but still use the 1030 Case on occasion. That tough and dependable machine has stood the test of time, and its core mechanics are really no different from those of the modern tractors we use now.

Parallel tracks

A lot of parallels can be drawn between my family's 1030 Case and the American Hereford Association's (AHA) performance program. Close to when the 1030 came home to our ranch, the 1964 initiation of performance recordkeeping marked the beginning of documenting essential traits breeders use to track cattle and to improve the breed. Over time those basic principles helped in the evolution of expected progeny differences (EPDs) to hone in on phenotypes and to allow for trait comparisons across the breed as opposed to in-herd comparisons. Then came the formal program we utilize today — Whole Herd Total Performance Records (TPR™) — which mandates complete calf crop reporting to ensure bias is taken out of the equation. You see, even though the performance program has evolved, its core principles still apply to our current genetic evaluation to combine pedigree, performance and genomic data to predict genetic merit.

So, what drives change? Whether in the tractor business or the genetic evaluation arena, whether for efficiency or competition, all change revolves around receiving more information more quickly to advance effectively. Technology allows us to evolve, to stay competitive in the marketplace and to meet the standards of receiving information instantly.

Genomic technology

In December 2017, the AHA made use of advanced genetic evaluation technology to run and report weekly EPD analyses, which include the most current phenotype and genomic data. Along with this change, the marker effects model (MEM) was implemented utilizing biometric open language tools (BOLT) technology to include genomic information directly into an EPD, rather than to blend reported observations and genomic information.

Making genomic predictions with DNA for genetic evaluations was not possible prior to 2012 because of limited technology to run complex computations. I feel most people agree incorporating DNA into the AHA's performance program has been a great step forward, especially when considering the ability for parentage verification. Furthermore, increased accuracies provide more confidence in each EPD with genomic information. Finally, realizing exactly what an animal inherited from its parents relative to traits of interest is invaluable, as we know it is not a perfect 50/50 split from sire and dam. No doubt, these genetic evaluation advancements have been great tools to improve the industry.

During the 2017 genetic evaluation update, the MEM, or genomic component, was not incorporated into the sustained cow fertility (SCF), calving ease maternal (CEM) and milk (M) EPDs. At the time genomic information could not be added to those maternal traits because of the limited number of female genotypes submitted. As a result the AHA initiated the Whole Cow Herd DNA Project so breeders could submit female genotypes on their entire herd to gain valuable information for their herd and to contribute to research to better understand the genomic component for maternal traits.

Cutting-edge improvements

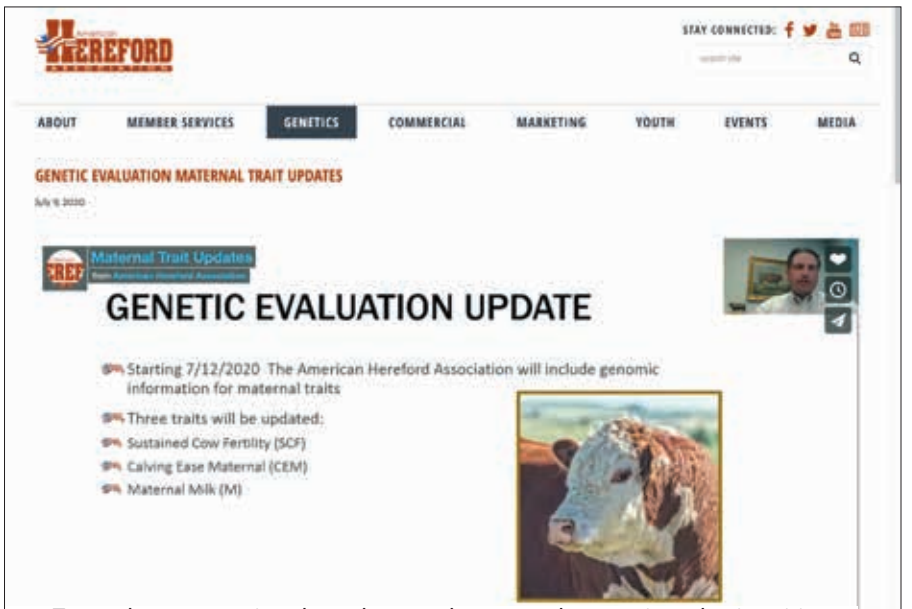
I am proud to say the cow herd DNA project netted over 10,000 genotypes, and along with the female genotypes already on hand, genomic information has been added to the AHA's maternal traits. Starting July 12, 2020, the SCF, CEM and M EPDs of genotyped animals will reflect information from their DNA. There will be some changes to these specific EPDs, particularly those of nonparent animals without production data for maternal traits. Adding the genomic component to SCF, CEM and M helps to accurately determine a sire's maternal contributions earlier in his lifetime, as opposed to waiting for results until he has multiple daughters in production. In fact, genotyping a nonparent animal for maternal EPDs provides the equivalent accuracy of a sire with 15 daughters already in production.

In regard to the SCF model specifically, how the contemporary groups are compared has been restructured in addition to adding the genomic component. Currently, a sire's daughters are compared across the breed to one another. In the new SCF model, the herd will be fit for comparison, and, consequently, the new analysis will factor in environment more suitably.

This improvement may result in changes to SCF values for proven sires, although the correlation to the current and new SCF models is 0.70. Given SCF is a significant driver for the baldy maternal index and the Brahman influence index, some animals will move ranks in their respective indices.

In regard to the CEM and M models, the addition of the genomic component will result in minimal changes. In fact, the overall correlation is 0.98 when comparing the current production run to the new run, which includes the genomic component.

All in all, technology allows for great advancements to our genetic evaluation. Just like the mechanics in that 1030 Case tractor paved the way to modern equipment, the core principles of recordkeeping have evolved to include genetic information. Change does not mean previous tools and methods are wrong; it means we enhanced our operations to allow for continued progress. **HW**



To watch a presentation about the new changes to the genetic evaluation visit *Hereford.org/2020/07/american-hereford-association-genetic-evaluation-updates/.*