Striking Genetic Harmony

Balancing progress with genomically enhanced EPDs and selection indexes.

by Elizabeth Rosson, editorial intern

As cattlemen strive to optimize herd performance and profitability, the integration of expected progeny differences (EPDs) and selection indexes allows for fast-paced genetic improvement. Industry leaders gathered at the 2023 Cattlemen's Conference in Stillwater, Okla., to collaborate on refining the use of available reproductive tools.

The genomic edge

Excellence and quality are foundational principles in the industry. Today, producers are constantly honing breeding strategies to meet their goals and satisfy customer demands, an effort that is a balancing act between new technology and traditional methods.

"When we DNA test animals as a precursor to the genomic enhanced EPDs, we do straighten out a fair number of pedigrees," said Kent Anderson, Zoetis. "Where that gets to be important is we make sure that the right performance measures get attached to the right animals, the right parents, and the right grandparents, and so forth."

Genomics boost the accuracy of EPDs, creating a more effective animal evaluation process, he added. They become especially important, Anderson said, when trying to predict those "hard to measure" traits in the herd.

Dry-matter intake data, for example, is costly and time-consuming to collect. Genomics allow producers to genetically compare their cattle to other animals with known dry-matter phenotypes.

Anderson also emphasized the value of genomics in multi-trait predictions. The ability to allow for comprehensive evaluations is practically beneficial when considering factors that affect profitability, Anderson said, as animals are now more accurately ranked in the dollar value indexes ($Values).

While there's plenty of potential for genomics to make breeding season simpler, Kelli Retallick-Riley, president of Angus Genetics Inc. (AGI), said the tool's strength is dependent on the amount of phenotypic data submitted by breeders.

"We start to slow the genetic trend when we decrease the number of phenotypes inside of that genetic evaluation. In order to make sure we continue to inform those genetic predictions and to increase that individual bull's accuracies, we are going to need those actual phenotypes." — Kelli Retallick-Riley

evaluation," she explained. "In order to make sure we continue to inform those genetic predictions and to increase that individual bull's accuracies, we are going to need those actual phenotypes."

Genomic testing helps improve the evaluation's accuracy by adding more information to the database and provides a substantial amount of information for the individual tested. Retallick-Riley said that added genotype adds the equivalent to a whole calf crop's worth of information on a young non-parent animal.

"Even though genomics gets a lot of fanfare at the end of the day, there are a lot of other important decisions that myself and others out there running national cattle evaluations have to make in order to ensure we have predictive EPDs and genetic tools for breeders like you," Retallick-Riley said.

Like most new technologies, the use of genomics is going to come with a trickle-down effect. As progressive seedstock breeders put this tool to use, the benefits of genetic progress can become widespread. Purchasing genomically tested bulls has already become a standard practice for many commercial producers, but Retallick-Riley said a seedstock breeder's objectives play a large role in how they can incorporate DNA and genomic testing into their programs. Individual goals and preferences on pace of progress affect the decision-making process on the farm or ranch.

Profitable genetics

While cattlemen place selection pressure on specific traits, maintaining balance remains important when using selection indexes in breeding programs.

Bill Bowman, Method Genetics, said the use of selection indexes allows for positive directional changes in multiple traits simultaneously, even when some traits have an antagonistic relationship. These indexes consider correlations between traits and account for additional expenses associated with certain traits that generate higher revenue.

For seedstock producer Mark Gardiner, using indexes at Gardiner Angus Ranch is all about optimizing the balance between input costs and output sales.

"Knowledge is power," he said, "so if I can label these cattle and have that real world … it translates to real money."

Jarold Callahan, Express Ranches, says the selection pressure provided by these indexes also helps his operation reach its goals and prioritize progress. Successful use of these tools depends on the producer's ability to identify which traits go into each index.

If cattlemen take the time to learn about the indexes and apply them to their operations geared toward their specific market and goals, they can maximize their possibilities, Gardiner explained.

"When I think of the opportunities that we have, we truly are living in the greatest time, at least in my lifetime, in the history of the beef industry with the opportunities available," he added.

Callahan sees potential for the accuracy of these indexes to increase as databases continue to grow.

"The real gold mine is mining all the data from the commercial cow herds, particularly now with DNA and all the bulls that we've sold that are identifiable now in the population through DNA," he said. "Data is what drives the accuracy. It's what drives the information. And if we can mine that data, then I think we can come up with something very meaningful."

As the industry continues to prioritize gathering maternal data for traits with lower heritability, such as fertility and productive life, producers face the challenge of remaining diligent about collecting data throughout a cow's lifetime.

Efforts can pay off in the future, as records kept today by breeders have the potential to generate revenue for both seedstock operations and their commercial customers. AJ