PHOTO BY KEN COLEMAN

Fighting FAKE NEWS about EPDs

Genomics are redefining producers' understanding of expected progeny differences (EPDs).

by ***Bridget Beran***

As the cattle industry continues to expand the amount of data available, the information swirling around expected progeny differences (EPDs) expands, as well. More and more cattle producers are confused by EPDs or have been given false information about the methods behind developing EPDs. To combat the fake news surrounding EPDs, the National Cattlemen's Beef Association (NCBA), in partnership with the Beef Improvement Federation (BIF) and several universities, hosted a "Fake News: EPDs Don't Work" webinar.

Alison Van Eenennaam, Ph.D., cooperative Extension specialist at the University of California-Davis, and Matt Spangler, Ph.D., Extension beef genetics specialist at the University of Nebraska-Lincoln, lent their expertise to explain the nuances of EPD development and how cattle producers can utilize them.

"An EPD has considered the animal's pedigree, the animal's performance, and possibly progeny — if it's an older animal that has progeny performance," Van Eenennaam explains.

While the majority of viewers knew otherwise, 35% of viewers didn't think an animal's pedigree was used to generate EPDs. This information gap can lead people to conclude EPDs are less accurate than index performance or ratios on younger animals. However, selection based on EPDs is five to nine times more accurate than selection based on index performance or ratios alone.

"EPDs are the best estimate we have of how a bull's or cow's future progeny will perform on average, compared to another animal or the breed average for a given trait," Van Eenennaam notes. "Many producers mistakenly place emphasis on raw measurements or adjusted phenotypes rather than the EPD."

Using EPDs

The first step for producers is to understand what each EPD numerical value means. For example, calving ease direct

(CED) as a +4 indicates an animal is likely to produce 4% more unassisted births. However, a +4 birth weight (BW) translates to a 4 lb. increase on the calf compared to the breed average.

"While birth weight is an indicator of calving ease, it really doesn't tell the whole story," Van Eenennaan explains. "Calving ease is the economically relevant trait."

Van Eenennaam says milk (MM) is another often misunderstood EPD. A +6 MM indicates daughters should produce calves that are 6 lb. heavier at weaning — not attributed to genetic growth. An extensive breakdown of each EPD can be found at *Ebeef.org*, the site used in cooperation with the webinar.

After producers understand how their EPDs work, the next step is to understand how the accuracy of an animal fits in. A very low accuracy bull could have enough shift within some EPDs to change his score completely. Accuracy is improved based on the amount of data collected within the animal's pedigree and the progeny of the animal.

Regardless, if phenotypic data have been collected, an EPD can still be produced. According to Spangler, the pedigree and addition of genetic markers, the sharing of information between related animals, can help produce increasingly accurate EPDs. However, as the relationship decreases between animals, so does the amount of information they share.

"These relationships allow phenotypes that may be collected on one animal to help inform the genetic value or the EPD on another animal," Spangler explains.

Another method of sharing information to improve the accuracy of EPDs is to look at traits with strong correlations. For instance, yearling weight can be easily predicted if a producer has already collected birth and weaning weights.

Assuring accuracy

Accuracy can make a big difference in which animal actually stands as the superior choice at the end of the day. To find areas to improve, Van Eenennaam says to consider percentile rank tables.

"[Percentile rank tables] can give you some sort of a feel for where an animal you're looking at lies relative to the breed average," she explains, "and depending upon what you're selecting for and what your current battery of bulls are, it may be that you want to put a lot of selection emphasis on improving a particular EPD."

The best method to ensure accuracy, however, is still to have a large amount of records on progeny. Pedigree relationships are a strong indicator of base EPDs, with a calf having a .25 relationship with its grandparent.

Spangler notes, "Genomics are refining our understanding of the relationships between animals."

Yet, while two flushmates may start with identical EPDs, when genotyping comes into play, the differences between animals begin to show. Much like two children may look different because they take after a different parent or grandparent, EPDs may shift depending on which parts of the pedigree an animal takes after. Because of this fact, EPDs aren't guaranteed to go up after a 50K genotype test. But that doesn't mean producers shouldn't do the testing.

What producers gain from a 50K genotype test is a vast increase in accuracy over standard EPDs. Without a high accuracy, some EPDs will appear much better or much worse than they actually are. The beef industry uses an accuracy established by BIF, and in December 2017, the American Hereford Association was one of the first to implement single-step evaluations with Biometric Open Language Tools (BOLT) software. BOLT includes accuracy values on the BIF scale that are lower because they are now truly calculated instead of approximated.

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>
> **— Matt Spangler**

EPD accuracy can make a big difference in which bull stands as the superior choice for breeding season.

The last step to understanding how to use EPDs, according to Spangler, is to know the difference between accuracy and precision. While a bull with high accuracy will determine how closely related the EPD and the true progeny difference are to each other, without precision, a producer can't guarantee uniform offspring. Mating, by its very nature, gives rise to variation. While variation isn't always a bad thing, if uniformity is the goal of the producer, precision is necessary.

"The best way to increase uniformity is to select those bulls to be very similar in terms of the EPDs for the traits you're interested in," Spangler says.

Above all else, Spangler reminds producers that EPDs are just one tool in the toolbox. For further information, producers can visit *Ebeef.org*. HW