

Use EPDs for Calving

Maintain calving ease and later performance by using maternal EPDs.

by Kasey Brown, associate editor

Dead calves don't grow very fast. Long the argument for emphasizing low-birth-weight herd sires, some in the industry are wondering if we've taken the mantra too far.

The Angus breed is known for its maternal traits and for its calving ease. To help breeders select bulls for easy calving, the American Angus Association offers three related expected progeny differences (EPDs) — calving ease direct (CED), calving ease maternal (CEM) and birth weight (BW).

However, is the industry placing too much emphasis on selecting against birth weight?

David Gazda, American Angus Association regional manager, says many of his commercial producers using Angus genetics have an issue with small calf sizes. The calves are born extremely small and light at birth, struggle to nurse and never catch up with their contemporaries from a growth standpoint. Generally, after some detective work, he finds that these producers select primarily for low-BW-EPD bulls with little consideration for other traits.

This single-trait selection may needlessly sacrifice additional pounds at weaning, he says.

Larry Kuehn, USDA Agricultural Research Services, U.S. Meat Animal Research Center (USMARC) grants that genetic trend lines show selection for growth can happen while holding down birth weight.

Still, to have pounds at weaning, the calf must first be born alive — so let's take a closer look at these EPDs.

The difference in EPDs

Why are there three calving-ease-centered EPDs in the first place? They measure different things, says Sally Northcutt, director of genetic research at the American Angus Association.

The birth weight EPD, expressed in pounds (lb.), is the traditional genetic tool predicting a sire's ability to transmit birth weight to his progeny compared to that of other sires. The birth weight EPD doesn't tell you what the calves will weigh, but rather sorts out the relative genetic ranking for birth weight genetics. Compared to a bull with a BW EPD of 2.1, a bull with a BW EPD of 4.1



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would be expected to sire calves on average 2 lb. heavier at birth if the bulls were randomly mated to comparable females and exposed to the same environmental conditions.

A lower BW EPD is generally considered favorable. However, Northcutt grants, producers must establish a reasonable range for BW EPDs.

The BW EPD is a linear trait and it is normally distributed, Northcutt says, which means if plotted on a graph, actual progeny birth weights will fall in a bell-shape curve (see Fig. 1), with most of the actual calf birth weights falling close to the average weight, but some falling a ways away. This means that all sires will have a distribution of calves varying in birth weight, but the EPD measures the average genetic differences.

It is possible for a heavy-birth-weight calf to be born to a low-birth-weight parent, and vice versa, because these are predictions and variation can never be completely eliminated in the trait. The Association's possible-change value table on the website helps better clarify

the potential changes in EPDs in lower-accuracy animals.

"We (the Association) still receive many questions about *actual* birth weight. We discourage the use of actual birth weights as selection criteria. Over time we've tried to move breeders away from selecting based on a birth weight phenotype and to use the birth weight EPDs. Now they have the CED EPD, which is an even better resource to improve calving ease in first-calf heifers," says Northcutt.

Birth weight is an indicator, but calving ease is the true economically relevant trait of interest for beef breeders, she says. Calving ease EPDs are a tool to improve the probability of unassisted births in first-calf heifers. They are presented in units of percent unassisted births and appear as CED and CEM.

"With our vast and dynamic database, we have the opportunity to fine-tune the selection decisions for first-calf heifers by providing calving ease direct and calving

Ease Selection

ease maternal EPDs," she says. CED is most closely associated with the traditional usage of the BW EPD. The CEM is geared toward selection of future daughters that calve with a higher probability of unassisted births.

The calving ease direct EPD predicts the average genetic difference in percent unassisted births when the sire is bred to first-calf heifers. For example, let's say Sire A has a CED of +10 and Sire B has a CED of +3. The difference between the two sires is 7. This means that if you breed both sires to 100 comparable heifers each, she explains, then you would expect 7 more unassisted calves out of 100 for Sire A than Sire B. If there is no difficulty in heifers calving in a particular herd, then this percentage difference in unassisted births would not be measurable.

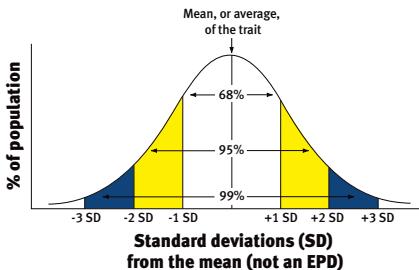
With CED, the higher value is the more favorable, since it represents percentage of unassisted births. Northcutt emphasizes that this tool can be used to choose sires to use on first-calf heifers, as they have the most need to prevent assisted births to avoid economic loss.

She adds that this is a threshold trait. The phenotypic calving scores are reported as a numerical score from 1-5, with 1 indicating no assistance, 2 indicating some assistance, 3 indicating mechanical assistance, 4 indicating a cesarean section (C-section), and 5 indicating an abnormal delivery.

The last of the three options is calving ease maternal. This is a genetic tool to use when choosing bulls to sire replacement heifers that will calve easily, increasing the percentage of unassisted births among first-calf daughters.

Again, the higher value is more favorable. It predicts the average ease with which the sire's daughters can calve compared to those of other sires.

Fig. 1: Bell-shaped curve showing normal distribution of a linear trait



Use the right EPD

Scott Greiner, professor of animal science and extension beef specialist at Virginia Tech and educational advisor to the Virginia Beef Cattle Improvement Association's (BCIA) Southwest Performance Bull Test and Culpeper Bull Test for 15 years, says single-trait selection can be detrimental to any breeding program.

The Angus breed has research data that establishes the breed as a leader in calving ease, Greiner says.

Northcutt explains that Angus have the strength of calving ease genetics, with 99% of Angus cows calving unassisted, according to calving scores turned in to the Association's database (see Fig. 2). Comparatively, the same data reported for heifers showed that 91% of heifers calve unassisted.

It is important to understand your females, Greiner says. Selecting a bull for heifers or cows can have a different selection emphasis. Most mature cows calve unassisted, so they don't need the same level of emphasis for calving ease that a first-calf heifer might.

Selection for a bull to use on cows can be more lenient, or at least less prioritized

toward calving ease. Priority can be given to other traits, like growth and carcass traits, he explains.

His experience with the Virginia BCIA bull tests has shown that buyers penalize heavier-birth-weight bulls, sometimes unnecessarily. He presented research at the 2012 Beef Improvement Federation symposium that analyzed 10 years' worth of bull test and sale data that showed the relationship between sale price and EPDs in Angus bulls. The data showed higher prices and more value associated with higher CED, weaning weight (WW), yearling weight (YW) and Milk EPDs and lower BW EPDs.

"If you're not breeding the bull to heifers, then calving ease doesn't have to be as high a priority. A lot of good bulls are overlooked because of calving ease or birth weight. They are not heifer bulls, but would work on mature cows just fine," Greiner asserts.

It is important for breeders to select for economically relevant traits and to keep a balance. Calving ease is a more economically relevant trait for first-calf heifers instead of selecting solely on the indicator trait of birth weight.

"I think the emphasis on birth weight trend is changing, I've noticed it in recent years. The majority of producers are paying attention to calving ease instead," Greiner says.

Northcutt assures that the Angus breed doesn't need selection for more growth as a whole, because Kuehn's USMARC data shows that the Angus breed has a lot of growth and still excels in calving ease genetic opportunities. Selection for calving ease, rather than actual birth weights, will yield the desired results of growth.

Fig. 2: Distribution of calving scores in Angus, %

