



By the Numbers

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Calving ease EPDs

Genetic tools for reducing difficult births in first-calf heifers have been readily embraced by the beef cattle industry. Angus breeders are becoming more familiar with the use of calving ease expected progeny differences (EPDs) as a helpful selection tool for use in first-calf heifers.

EPD descriptions

The calving ease EPDs are designed to improve the probability or chance of unassisted births in first-calf heifers. Calving ease EPDs are presented in units of percent unassisted births and appear as calving ease direct (CED) and calving ease maternal (CEM) EPDs. The CED EPD is most closely associated with the traditional birth weight (BW) EPD. Fig. 1 illustrates the commonly used CED EPD.

Calving ease direct (CED). CED EPDs between Sire A and Sire B predict the average difference in percent unassisted births of 7%, favoring Sire A (Fig. 1). A more practical way to view the difference would be as follows:

The difference between the CED EPDs for the two sires equals 7. If you bred Sire A and Sire B each to 100 heifers then you would expect 7 more unassisted calves (CE score = 1) out of the 100 born to sire A when compared with Sire B.

With calving ease EPDs, a higher value is the more favorable direction since the units are percentage unassisted births. This tool can be used to select sires for use on heifers to improve the chance of easier calving through unassisted births. Since calving ease is a threshold trait, if there is no difficulty in heifers calving in a particular herd, then this percentage difference in unassisted births will not be realized or measurable.

While birth weight is the indicator trait, calving ease is the true trait of interest to breeders. The genetic correlation between calving score and birth weight is 0.69, which is high. This correlation tells us that many of the genes that control birth weight also control the calving score reported by breeders. By knowing this genetic relationship, the birth weight and calving score traits can be analyzed together.

Using BW EPDs is a good indirect measurement of calving ease. However, we know there are examples of the low-

Fig. 1: Calving ease direct (CED)

| | CED-EPD |
|------------|---------|
| Sire A | +10% |
| Sire B | +3% |
| Difference | +7% |

- Higher EPDs are more favorable.
- Use as a tool in choosing sires mated to first-calf heifers.
- Increase the chance of easier calving.

BW EPD bull that is harder-calving than expected, or the higher-birth-EPD bull that consistently produces calves born unassisted to first-calf heifers. The large database of calving scores at the American Angus Association allows more of a direct prediction of calving ease.

Calving ease maternal (CEM). Along a similar line, the CEM EPD is a genetic tool for use in choosing sires for replacement heifers. The CEM EPDs are designed to improve the percentage of unassisted births in first-calf daughters of sires. A higher value is the more favorable direction.

Key points

Next are a few points to keep in mind regarding the analysis to arrive at calving ease EPDs. These items are many of the commonly asked questions regarding calculation of the calving ease selection tools.

- Birth weight is the indicator trait. Calving ease is the true trait of interest.
- Calving ease EPDs are designed as a genetic tool directed toward heifers. The incidence of calving difficulty among cows is very low, and heifers are the primary focus.
- Birth weights on all calves from the Angus Herd Improvement Records

(AHIR®) database and calving scores on just the first-calf heifers are used in the genetic evaluation.

- Heavier-birth-weight calves tend to be associated with potentially higher calving score values (score 1 = unassisted, score 4 = C-section).
- Abnormal presentations are excluded from the evaluation.
- The genetic correlation between birth weight and calving scores is high (+0.69). However, since the genetic correlation is not equal to 1.0, the relationship is not perfect.
- Interim CED and CEM EPDs are pedigree estimates only (ACC = 0.05). The BW EPD may be more informative in this case, so review the associated accuracies.
- Bulls with more favorable CED EPDs tend to have favorable CEM EPDs also, although the relationship is not perfect. CED and CEM EPDs have a positive genetic correlation (+0.42).

What does it all mean?

Producers need to understand and evaluate calving ease EPDs to develop a comfort level in the genetic selection for their herd. BW EPDs have served the Angus breed well to identify genetics to reduce calving difficulty, but the calving ease EPDs now allow a further refinement of that selection. Remember, calving ease is still the relevant trait we are trying to measure and calving ease EPDs will continue to be more widely accepted and requested by the commercial user of Angus genetics.

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Editor's Note: "By the Numbers" is a column by Association performance programs staff to share insights with Angus members about data collection and interpretation, the National Cattle Evaluation (NCE), genetic selection, and relevant technology and industry issues. If you have questions or would like to suggest a topic for a future column, contact Sally Northcutt, director of genetic research, or Bill Bowman, director of performance programs, at 816-383-5100.