



By the Numbers

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EPDs predict differences

It may seem redundant to say that an expected progeny difference (EPD) predicts 'differences' in how future progeny are expected to perform, yet a common question received by the Performance Programs Department regarding EPDs is, "What will the calves weigh?"

By definition

By definition, an EPD is the expected difference in future progeny performance between one animal relative to another individual(s). The EPDs are to be used in comparison with each other.

As an example for two sires, EPDs are a prediction of how future offspring of one sire will compare with progeny from another sire. Specifically, if Bull A has a birth weight EPD of +5 and Bull B has a birth weight EPD of 0, then on the average one would expect the future calves sired by Bull A to be 5 pounds (lb.) heavier at birth than the calves sired by Bull B.

Example 1

Bull A	+5.0 lb.
Bull B	0.0 lb.
Difference	5.0 lb.

At no point have we predicted the weight of any one calf or the weights of a group of calves. EPDs predict performance differences and not actual performance.

Performance differences

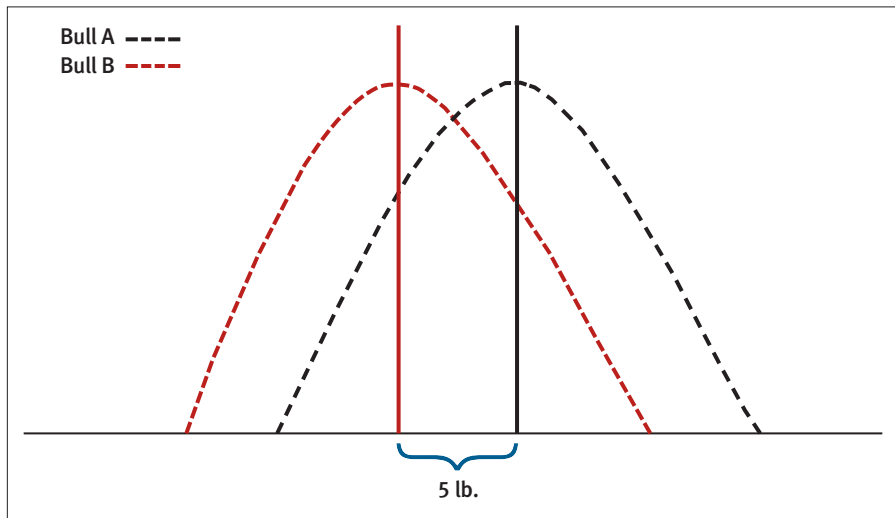
Fig. 1 depicts the hypothetical distributions of calf birth weights for Bull A and Bull B described in Example 1. Since birth weight is a continuous trait with a normal distribution of the property of a bell-

shaped curve, a variety of calf birth weights are produced from the use of these two bulls. Fig. 1 illustrates that not all calves will weigh the same, but on the average the differing genetics of the two bulls (as described by their EPD predictions) produces an average 5-lb. difference in future progeny performance.

Practical points to remember

- EPDs do not predict actual performance. The numbers describe genetic differences between animals within the Angus breed.
- EPDs are expressed in units of measure for the trait.
- Each trait has a breed average EPD for various classes of animals (e.g., current sires, nonparent bulls).
- Breed average EPD for a trait is not necessarily zero. Be aware of breed averages for Angus EPDs, as they are not directly comparable to EPDs printed for other cattle breeds. You can access current Angus-breed-average EPDs at www.angus.org/sireeval/breed_avg_epd.html.
- The higher the accuracy of an EPD, the less we expect it to change. For more about accuracies and associated possible change values, see "By the Numbers" on page 106 of the June 2005 *Angus Journal* or refer to www.angus.org/sireeval/accuracy.htm.

Fig. 1: Average expected progeny difference between Bull A and Bull B



So, the answer to that common question on what calves will weigh out of a bull with a certain EPD is easy. We don't know! The genetics and age of the females mated to the bull, the season of year, herd management, nutrition levels, and other factors all have an effect on the actual birth weight of the calves.

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References

Angus breed averages:

- www.angus.org/sireeval/breed_avg_epd.html

EPD accuracy and associated possible change:

- www.angus.org/sireeval/accuracy.htm
- June 2005 *Angus Journal* "By the Numbers" column (page 106)

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.