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The ABCs of an EPD

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Expected Progeny Difference (EPD): What does this mean?

When selecting herd sires, consideration is often given to color, soundness, structure, and genetics. Expected progeny difference (EPDs) is the genetic description of a bull derived from data not only from its calves, but also from its ancestors and full and half siblings. Although EPDs provide an excellent genetic description of a bull, many producers have difficulty understanding what they mean and how to use them.

Traits reported by a breed association may vary in number with new traits added periodically. In a typical EPD, growth traits such as birth weight (BW), weaning weight (WW), yearling weight (YW) and Milk are often reported. Additional traits relating to carcass and ultrasound data may also be included in an EPD depending on breed.

EPD values provide a description of how a bull has performed genetically for each trait. These values are compared to the breed average to determine if they are high or low compared to the average bull in that breed. Breed associations usually report updated breed averages in six-month intervals.

Photo 1. Brangus bull

As additional calves are registered each year, EPD values for a bull are adjusted and the accuracy value increases. The breed average also adjusts as each bull in the breed is more accurately defined and values for each breed may differ from one another.

The accuracy value is reported numerically between zero and one. When a large number of progeny have been reported to a breed association, the accuracy values will move closer to one. These values can be viewed as a percentage. For example, a value of 0.39 could be seen as 39% accurate while a 0.98 could be viewed as 98% accurate. A low accuracy value indicates that a sire may be young or that few calves have been reported to the breed association. As the EPD value is adjusted to more accurately define the capabilities of the bull, the accuracy values increase. When evaluating young bulls with low accuracy values, it is important to include EPD information from their sire, dam and grand sire in your decision-making process.

If the EPDs listed in Table 1 for Bull A were for an Angus bull, how would he compare to his breed average (Table 2, values in this example are not current) for birth weight (BW)? He has a BW EPD of 2.1 with 0.98 (98%) accuracy. When comparing the BW EPD of 2.1 to the breed average of 2.6, Bull A would be expected to produce calves with lower birth weights than the average bull in the Angus breed (2.1 – 2.6 = -0.5 or 0.5 lbs lower than the breed average). It is important to consider the accuracy value for BW EPDs, especially when selecting a sire that will breed heifers. Since Bull A has an accuracy value of 0.98 or 98%, it can be expected that this bull will have birth weights close to the value being reported.

Table 1. Bull A

Trait	BW	WW	YW	Milk
EPD	2.1	55	69	13
Acc	0.98	0.98	0.97	0.88

If Bull A was Charolais rather than Angus, the results would differ from those in the first example. Using the same 2.1 BW EPD, this value is more than the Charolais breed average of 1.4 which would result in calves from Bull A weighing 0.7 lbs more than the average bull in the Charolais breed (2.1 – 1.4 = +0.7 lbs).

Table 2. Breed Averages *(values listed in this example are not current)*

	BW	WW	YW	Milk
Angus	2.6	36	66	18

	BW	WW	YW	Milk
Charolais	1.4	20	34	6

Simple mistakes using EPDs can disrupt overall production goals. Selecting for one trait without evaluating others is referred to as single trait selection. This type of selection may improve one area of production while negatively affecting another. For example, selecting a bull with a low BW EPD without considering EPD information on other traits could result in calves with reduced birth weights but also yield lower sale weights.

Multi-trait selection used in conjunction with visual appraisal can help prevent disasters before they occur. When using EPDs to select sires for a specific trait, buyers should consider all data that is available to help assist them in reaching market end points.

Producers often use crossbreeding to take advantage of heterosis, the increased vigor of offspring, otherwise known as "hybrid vigor." To do this, bulls of different breeds are evaluated and compared. In the past, it has not been possible to compare breeds based on EPDs. However; research, reported by the Meat Animal Research Center in Clay Center, Neb., reports adjustment factors for across-breed EPD comparisons. These adjustment factors may enable producers to more accurately compare bulls from different breeds in a cross-breeding program.

Industry acceptance of across-breed EPD adjustment factors has been limited since the adjustment factors were determined at a single location and not throughout the country. A National Beef Cattle Evaluation Consortium has been established to address this area of research. Some breed associations have accepted offers to participate in this consortium while others have not. In time, regardless of where they are derived, if across breed adjustment factors are proven to be accurate, they may serve as a valuable tool for the commercial cattlemen.

In summary, EPDs are an excellent means to evaluate the expected genetic potential of a sire. Producers who use EPDs must consider that they are designed to predict expected and not actual performance. Multiple trait selection helps prevent negative traits from impacting overall herd performance. Although structural soundness and breeding soundness has not been discussed in this article, they should not be excluded in the sire selection process.

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