

EPD Success

Using Expected Progeny Differences to Select Your Next Beefmaster Herd Sire

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Although EPDs have been around for many years, I still field questions on their proper use. What does an EPD tell us? How does a +5.0 EPD for weaning weight equate to my calf crop's weaning weight average? Can I compare my neighbor's Angus bull EPDs to my Beefmaster bull's EPDs? Can you tell me what my calves will weigh? Do EPDs really work? How can my bull have a -2.0 Milk EPD and his daughters always wean heavy calves?

These are all good questions which will hopefully be answered in the following paragraphs. Producers should first select minimum (or optimum) EPD values of choice and then identify the strengths and weaknesses of the operation. I suggest Beefmaster breeders use EPDs as a selection tool for improving calving ease, overall growth, maternal and fertility that matches their environment.

An EPD, calculated using Best Linear Unbiased Prediction (BLUP) theory, is the difference in expected performance of future progeny of an individual. In other words, an EPD value predicts the genetic transmitting ability of an animal as a parent.

An EPD estimate on an animal incorporates the animal's records and its parent records, progeny records and sibling records. The EPD accounts for the animal's genetic ability and the environment in which the animal was raised. Although the genetic makeup of an animal never changes, the amount of information we know about that animal is constantly changing. Additional information on relatives can change our predictions about that animal as a parent.

EPDs can be used to compare all cattle within the breed and are calculated for traits relative to growth and reproduction. They are measured in the same units as the trait itself (e.g. weaning weight EPD is measured in pounds and Scrotal Circumference EPD is measured in centimeters).

It is important to note that EPDs separate genetic ability from environmental influence. Producers must supply accurate information about the environment in which animals are raised within a proper contemporary group. A contemporary group is defined as a group of animals, of the same sex, born and raised together under the same management conditions. Producers separate cattle into contemporary groups by determining which same sex calves were raised in similar conditions and grouping them together.

Proper contemporary grouping allows the environment to become a common denominator so that performance can be compared equally among calves in the group. If contemporary groups are incorrectly defined, the environment portion of the record is not accurately calculated, thus causing incorrect estimation of EPD values, which can cause incorrect rankings of individuals and incorrect selection decisions.

Correct use of EPDs as a bull buying selection tool is of utmost importance. They should be used to compare and contrast two or more bulls within the same breed. Table 1 can be used as an example for interpreting weaning weight EPD information on three possible herd sires. One should choose Bull "C" to improve overall weaning weight because he should sire calves (when bred to the same set of cows) that weigh 9 lbs. (13 minus 4) more, on average, than calves produced by Bull "B" and 17 lbs. (13 minus -4) more, on average, than Bull "A." One must also assume that all three bulls meet the PHENOTYPE desired by the breeder using the EPDs. (Refer to Table 1.)

Table 1. Comparing EPD's on three potential herd bulls.

Beefmaster Herd Sire Prospect	Weaning Weight EPD	Acc.	Yearling Weight EPD	Acc.
Bull A	- 4	0.23	+ 3	.05
Bull B	+ 4	0.45	+ 9	.37
Bull C	+ 13	0.40	+ 18	.28

You should never make selection of a herd sire based solely on one trait as in the example above. I would certainly make sure that the calving ease and/or birth weight EPDs were acceptable on Bull C before making that decision. One has to realize that as you make progress to improve one trait you often lose ground in another trait. For example, when selecting for increased growth (as it generally increases gross income), you may be inadvertently increasing the mature size and maintenance costs of the cowherd through retaining replacement heifers.

One should also consider the accuracy values attached to an EPD when making bull selections using EPDs. The accuracy value increases as the number of records increase in the EPD calculation. Low accuracy values, as shown in Table 1, have an easy chance of changing (good or bad) over time as more records are turned into the breed association. Consider Bull D and Bull E in Table 2. (Refer to page 22.) They have really high accuracy values for all EPDs and should not change much over time. You can make herd sire selections more confidently with really high accuracy values.

Table 2. Comparing EPD's on two potential herd bulls.

Beefmaster Herd Sire Prospect	Weaning Weight EPD	Acc.	Yearling Weight EPD	Acc.
Bull D	+ 10	0.99	+ 18	.98
Bull E	+ 6	0.98	+ 10	.97

One must also remember that an animal's individual EPD values will change each time additional performance data (individual and/or relatives of the individual) is included in the analysis. Hence, each new sire summary should be used for the most up-to-date EPDs on an individual animal.

Producers must find a balance between growth, reproduction and body composition. Research has shown antagonisms to exist between many traits that you select for. It is important that you evaluate these traits in your current herd and determine where you want to be going with them. Try to formulate breeding goals that help maximize income to the operation.

As a producer, you must consider how you market your product (local sale barn vs. retained ownership; purchase replacement females vs. produce replacement heifers; carcass grid marketing vs. yield only) before determining the best balance of the three main areas of EPDs.

I suggest that producers set minimum EPD values for all traits of importance when making that final bull selection. Try not to select for a maximum EPD value in any one trait without holding a minimum (or optimum) EPD value for all other traits of economic importance. Avoid selecting the most extreme bull in the breed for any one trait.

It is important to determine the breed averages when setting minimum/optimum EPD selection criteria levels. Although the breed averages are "zero" when including all animals in the data base, one should consider using the breed averages for the current sires in the breed database.

Breed averages for the current sires and dams, shown in Table 3, could be used to set your selection criteria levels for any potential herd sires. For example, I might set EPD selection levels of -0.10 or less for Birth Weight (BW), +11 or greater for Weaning Weight (WW), +18 or greater for Yearling Weight (YW) and +5 or greater for Milk. One might also consider evaluating the percentile ranking within the breed for various traits for final selection. For example, you might only select sires that rank in the top 25 percent for BW, WW, YW and Milk based on the above selection EPD levels.

Table 3. Beefmaster Breed Average EPD's from the 2008 Fall Sire Summary.

	BW	WW	YW	SC	Milk
Current Active Sires	+0.48	+8.0	+13	+.07	+2.0
Current Young Sires	+0.51	+9.0	+16	+.12	+3.0
All Cattle Born in 2006	+0.46	+7.0	+12	+.10	+3.0

Conclusions

The main reason for analyzing EPDs before purchasing a bull is the expected performance of his calves. If replacement females will be retained then this evaluation should be quite thorough, because the impact will be long lasting. Selecting between bulls should be based on performance by using the Expected Progeny Differences (EPDs). The bull must pheno-typically meet industry demands, but don't compromise EPD selection just because the bull looks the part.

There is no such thing as a "Perfect Bull," so each individual producer must make that determination based on 1) where their operation is today genetically (and phenotypically); 2) where they want to move genetically (e.g. lower birth weights and higher weaning weights); and 3) what your market is for the offspring produced (become more commercially- and consumer-focused).

Bull selection has a long-term economical impact on your herd; therefore, selecting the right bull for your operation is a decision that includes setting production goals, analyzing your resources and management, and purchasing the bull that best fits your environment and management style. If done correctly, this process will take time and effort on your part, but the returns can be exciting and financially rewarding.