

EPDs and Accuracy

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Expected Progeny Differences (EPDs) are reported by most major breed associations and are a means of estimating an individual's genetic value as a parent for a particular trait. The EPD is a means of predicting differences between progeny performance in a particular trait between prospective animals. EPDs are calculated for a number of different traits and reported in the same unit of measurement as the trait. An EPD value can be either a positive or negative value depending on the calculated genetic value of the individual in relationship to its breed.

Along with the calculated EPD is an accuracy value which is a measure of the reliability of the calculated EPD and reflective of the amount of information available used in the calculation. It is a relationship between the calculated EPD of the animal and the true EPD of the animal. Unlike the EPD, accuracy values range from 0 to 1.0 with 1.0 never being attained. Most yearling bulls have accuracies from .05 to .35 for growth traits since the calculation of his EPD is based on his own performance record and pedigree information. Older bulls with progeny information records used in the calculation of their EPD will have higher accuracy values. Accuracy is primarily a function of the amount of information available on an individual. As more information becomes available (progeny records), an animal's calculated EPD for a trait will change. It can increase or decrease in value. The best way to evaluate accuracy is to estimate how much the calculated EPD can change as more information is obtained on an animal and used in the estimation of his EPD. That change in an animal's EPD is called "Possible Change". Those breed associations which publish a sire summary will have a table with possible change in a trait associated with different accuracy levels. The following Table is from the Angus 2007 Sire Evaluation Report and shows the amount of "possible change" in a birth weight EPD with a particular accuracy.

	BW EPD	Accuracy	Possible Change	True EPD Range
Bull A	1.8	.20	+ or - 2.1	-0.3 to 3.9
Bull B	1.8	.85	+ or - .39	1.4 to 2.19

We would expect that the true EPD for Birth Weight of Bull A would have a 67% chance of being between a - **0.3** ($1.8 - 2.1 = -0.3$) and + **3.9** ($1.8 + 2.1 = 3.9$). Bull B true EPD for Birth Weight would have a 67% chance of being between +1.41 and +2.19. We never know the true EPD of any trait for any animal, although EPDs for high accuracy bulls closely approach the true value.

Accuracy values are a tool for risk management in a breeding program. There would be less risk in using Bull B in breeding heifers due to his higher accuracy for Birth Weight EPD. This illustrates the a primary advantage of using high accuracy bulls through AI on heifers.

Regardless of accuracy, EPDs are the most powerful tool to make genetic change in cattle. They are several times more valuable than adjusted weight records or ratios or even visual appraisal.