

Genomically Enhanced EPD

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The most effective tool available for comparing the genetic merit of a single trait between individuals is expected progeny differences (EPD). These values are estimates of the genetic potential that parents will pass on to progeny. The EPD value of an animal estimates the expected difference in progeny performance due to additive (direct) effects for specific traits (weight, gain, marbling, etc.).

An EPD uses all available information tied to the genetics of a trait including an animal's own performance data, performance data on relatives, and progeny data. It's important to remember that EPD continue to get more accurate and are subject to change as more information is reported.

Genomically Enhanced Expected Progeny Differences (GE-EPD) are a game-changer for commercial, seedstock, and all beef producers in between. Including genomic information collected from a simple DNA sample in the calculation of EPD evaluates the animal's genetic makeup and provides more information to the story we otherwise wouldn't know. Genomic testing does not replace performance data reporting, but rather complements the extensive database of phenotypic and pedigree information.

The American Simmental Association currently offers two different genomic panels to match your goals: the GGPuLD or the GGP100K. In the case of the GGP100k, the panel evaluates the molecular makeup of approximately 100,000 specific locations on the animal's genome, some of which have influence on various traits we predict (growth, carcass, stay, etc). After an animal is tested, the results feed into the weekly genetic evaluation that is powered by International Genetic Solutions.

The difference between GE-EPD and standard EPD is mostly seen in the form of increased prediction accuracy. Animals that have GE-EPD have significantly improved accuracy for all EPD as young animals. With genomics, young animals' EPD can reach levels of accuracy that wouldn't otherwise be possible until many progeny records were reported later in life. This allows producers to make more accurate selection decisions earlier. The way this improvement in prediction accuracy can be measured is by reflecting any improvement in a progeny equivalent. A progeny equivalent is the number of progeny an animal would have to have born, measured for a trait, and reported to the ASA to receive the same increase in accuracy from a genomic panel.

In the case of most of the growth traits, it would take ~25 progeny before a non-genotyped animal would receive the same prediction accuracy as a genotyped animal.

Genomics also enables animals to be parent-verified; meaning their parents are confirmed to be correct on their pedigree. By confirming an animal's sire and dam, genomics help correct pedigree errors that occasionally

occur. Accurate parentage improves the prediction accuracy of EPD and the reliability of the entire genetic evaluation.

Ultimately, GE-EPD reduce the risk associated with your selection decisions, whether that is a bull purchase, replacement female selection, or culling decision. More reliable information earlier allows producers to make better decisions sooner, leading to faster genetic progress.

Important GE-EPD distinctions:

- A genomic panel is not guaranteed to move EPD in a favorable direction. In fact, all animals have equal opportunity to have EPD move in a favorable or unfavorable direction after a test.
- The real value in performing a genomic panel on groups of young animals is increasing accuracy of the prediction. This allows potential purchasers to have more confidence in the predictions, as well as increasing the rate of genetic progress in their herds.
- You must allow at least one and up to two weeks from the date a genomic sample finishes at the lab for those results to be incorporated into the genetic evaluation.
- Phenotypes are still needed to continue to predict traits with accuracy. A genomic test will improve the accuracy of low- to medium-accuracy animals, but genomics alone can never replace the need for phenotypic measurements.

While genomic tests of a DNA sample add accuracy to low-accuracy animals, they can never replace reporting phenotypic performance data. For genomics to continue to have value, it is vital that breeders continue to submit quality phenotypic data. 