UNDERSTANDING AND USING EPDs AND GENOMIC TECHNOLOGY

WHAT ARE EPDs?

Expected progeny differences (EPDs) are genetic selection tools that provide producers a measure of an animal's genetic merit for traits that are economically relevant to their operation. Basically, EPDs are a measure of how an animal's progeny can be expected to perform, on average.

An animal's genetics will contribute in part to how it performs. A portion of that performance is also dictated by the environment provided to that animal. The environment includes weather, disease, feed, stress, handling, vaccination protocols, maternal environment, housing, and the animal group dynamics. The environment differs for each herd as geography and producer management plays a large role in environment. EPDs remove the environment from all traits measured and provide producers with an estimate of the genetics that contribute towards each trait.

EPDs are:

- A prediction of how an animal's progeny will perform

- A genetic selection tool

- Used to compare animals across different environments

Genomics are:

- Used to parent verify animals for guaranteed pedigrees

- Used to calculate EPDs for animals that don't have a phenotype for a particular trait

- Used to calculate more accurate EPDs, especially for younger animals

- Used to calculate EPDs for new and expensive to measure traits, like High Immune Response

Canadian Angus

HOW ARE EPDs CALCULATED?

EPDs describe how the progeny of an animal will perform for a specific trait. EPDs are calculated using pedigree information, individual performance information, progeny performance information, and genomic information.

The Canadian Angus Performance Program is based on whole herd reporting. Participants on the program are required to report complete cow herd inventory information (a calf or a fate or cull code for each cow in your inventory), and a birth weight and weaning weight on every calf. Complete contemporary group information is vital for the calculation of accurate EPDs. In addition, accurate management group recording is vital for the calculation of accurate EPDs. Members should place all calves that were managed the same way, and given the same opportunity to develop the trait being reported in one management group. Any calves treated differently, for example, any calves fed extra or calves that were sick should be placed in separate management groups.

WHY IS EPD ACCURACY IMPORTANT?

EPDs should always be published with an estimate of accuracy. This informs producers of the amount of information available with which to calculate the EPD. P or P+ EPDs or estimates are low in accuracy. As more information becomes available, EPD accuracy will grow from 0 to 100%.

USING EPDs

EPDs are comparative numbers. This means that the easiest way to use EPDs is to compare a bull's EPDs to another bull's EPDs. For example:

Bull A has a Yearling Weight EPD = 150 lbs
Bull B has a Yearling Weight EPD = 100 lbs

On average Bull A's calves will weigh 50 lbs heavier than the average of Bull B's calves given the same cow herd and environment. Another way to use EPDs is to compare to the breed average. This is useful to producers who know the breed and what to expect in terms of performance from the breed. For example, the average calving ease for Canadian Angus genetics is very different from the average calving ease of other breeds. In Angus the average is a lot of calving ease!

WHAT IS ANGUS GS?

Angus GS is a newer version of the Bovine 50K panel that we used to use. It's specifically designed for Angus genetics. It has all the same SNP markers that the 50K panel has on it, and more. There is a lot of value on genomic technology, specifically the Angus GS test. Angus GS includes:

- SNP Parentage Verification
- Genetic condition test results are available for reduced fees than doing the test(s) individually
- Genomic percentile ranks
- GEPDs (more accurate genomically enhanced EPDs)

WHAT ROLE DOES GENOMICS, AND THE ANGUS GS PANEL PLAY?

Genomic technology has been used to make EPDs more accurate. The genomic data increases the accuracy with which we relate animals to each other, verifying pedigree information, and allowing us to apply phenotypes of related animals to non-phenotyped animals.

Genotyping animals has led to more accurate EPDs for younger animals. Below are the progeny equivalents that come from the Angus GS panel. This means that doing the Angus GS test on an animal gives you as much information as having 23 calves with birth weights recorded and as many as 12 calves tested for individual feed intake.

Trait	Progeny Equivalent	Trait	Progeny Equivalent
Calving Ease	26	Claw	10
Birth Weight	23	Fertility	17
Weaning Weight	27	MILK	36
Yearling Weight	23	Mature Weight	15
Dry Matter Intake	12	Marbling	11
Docility	12	Rib Eye Area	14
Feet	10	Teat and Udder	12

EPDs: are a universal way of describing the genetic potential of progeny from breeding stock

EPDs: are a genetic selection tool that can help producers reach a breeding selection goal for their herd

EPDs: can help you maintain the traits that you want to keep in your herd

EPDs: can help you avoid traits that you might not wish to use on your cow herd and introduce into your herd

EPDs: are a great way to describe the high quality Canadian Angus genetics that you raise to your customers

EPDs: are the only fair way to compare breeding stock across herds and different environments