SIMMENTAL
Canadian Simmental Association

Canadian Simmental Association
#13 - 4101 - 19th St. NE
Calgary, Alberta Canada
T2E 7C4
Phone: (403) 250-7979
Fax: (403) 250-5121
Toll Free: 1-866-860-6051
cansim@simmental.com

SIMMENTAL
Innovations

CANADIAN SIMMENTAL ASSOCIATION
Putting DNA Technology to Work for Beef Producers

SIMMENTAL
Canadian Simmental Association

The Canadian Simmental Association has been involved in several beef improvement projects that focus on traits such as feed efficiency, fertility and carcass and meat quality traits. These research projects were supported by the CSA and it's Foundation's resources as well as several funding partners including Agriculture & Agri-Food Canada's Canadian Agricultural Adaptation Program (CAAP) & Agri-Innovation Program (AIP), Genome Alberta, Genome Canada, Alberta Livestock & Meat Agency and Saskatchewan's Agriculture Development Fund.

Within the Simmental Innovations projects, the CSA has genotyped over 15,000 registered Simmental cattle. This is a significant achievement and is one of the largest beef genomic repositories in North America.

Figure 1. Progeny Equivalents

Trait	
Calving Ease (CE)	5
Birth Weight	7
Weaning Weight	8
Yearling Weight	9
Milk	8
Maternal CE	2
Carcass Weight	8
Marbling	8
Ribeye Area	2
Fat	1

Source: Dr. Wade Schafer (ASA)

The ability to predict accurately the genetic value of a young animal is increased equivalent to combining several progeny with the animal's own performance record. The amount of progeny equivalents varies depending on the correlation/heritability of the trait. Figure 1 below provides the estimated progeny equivalents for some of the key selection traits.

Figure 2. Impact on Accuracy
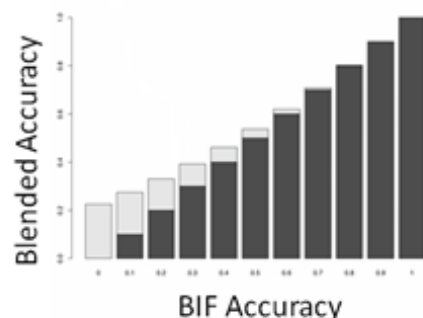
Source: Dr. Matt Spangler

For a mature bull with many calves on the ground, the increase in accuracy will be less than that realized in a younger animal. Young bulls, heifers and mature cows will see the largest increase in accuracy of EPDs with the addition of genotypic information. Figure 2 illustrates how the addition of genotypic data can increase accuracy.

When a molecular breeding value (MBV) is derived from genotypic data on an animal and is then blended with the pre-existing EPD, it creates a Genomically Enhanced EPD (GE-EPD). The fewer performance records an animal has, the greater the increase in accuracy when a genotype is added to the animals records.

Why a GE-EPD?
Genotyping results are best presented as a GE-EPD because the genotype predicts only a portion of the genetic potential, while a GE-EPD blends both genotypic and phenotypic information which predicts a much larger portion of the genetic potential of the animal.

Presenting the genotype results separate from the existing EPD would provide the genotypic report but would require producers to then merge the two sets of information. A GE-EPD does just that and presents the two sets of information in one familiar and easily understood form of reporting for producers.

Carcass and Meat Quality
CSA worked with major packing plants across Canada to harvest rib samples from over 2500 commercial Simmental cattle.

Once the ribs were delivered to the meat labs from the packing plant, they were tested over a 28 day period for composition (meat, fat, bone), flavour, colour and tenderness. These animals were also genotyped to be able to link each of the above listed traits to the DNA makeup of the animals with the purpose of identifying genetics with superior carcass and meat quality characteristics.

Feed Efficiency and Fertility
Almost 1100 head of commercial Simmental cattle were also tested for relative feed efficiency at the University of Guelph. This data will assist in selection of more feed efficient genetics within the Simmental breed. As feed is a major cost of production for the beef cattle industry, identifying more feed efficient bloodlines will be essential going forward.

Measures for stayability and fertility were also analyzed from within the historical dataset of the CSA and work continues to improve and incorporate a predictor for stayability on Canadian Simmental cattle.

What Can You Do Moving Forward
The incorporation of genomic information into breeding selection of beef cattle is still in its infancy and Canadian Simmental is a leader in these efforts. There is tremendous value for producers to conduct DNA tests on influential animals within their herds and this information will add greatly to the selection tools available for you and your customers. In order to start the process on a whole herd approach all you need to do is pull hair on all animals of the highest influence in your herd and contact the CSA office for the testing procedure. It is also a good idea to keep a well identified sample for future testing on all other animals. Genomics is enhancing the process of beef cattle selection and its our responsibility to understand the science as well as the benefits it provides.