

Calving Ease EPD

By now most members have had a chance to review the new CSA genetic evaluation. While many of the EPD are very similar, several breeders have commented on significant changes in the Calving Ease and Maternal Calving Ease numbers on their Simmental cattle.

A contemporary group is defined as a group of 2 or more animals of the same sex and similar age, raised in the same environment and like all genetic evaluations the calving ease evaluation is based on differences between calves within a given contemporary group. For example, a group of 3 bull calves with reported birth weights of 80, 100 and 120 could be described as -20, 0 and +20 in relation to their contemporary group average. It is important to understand that calves are never directly compared with other calves that are outside of their contemporary group. As well, groups with no variation for either birth weight or calving ease are edited out as they are not “informative”. In other words, if there is no variation in performance, then there is no way to determine the component of genetic variation between animals.

The new Canadian evaluation of calving ease contains several key differences from the previous evaluation.

1. Canadian data only

Only data reported in the Canadian Simmental Association database is included in the genetic evaluation. This includes pedigree data, but also calving ease and birthweight information submitted by THE herds. This has the largest effect on cattle with limited information in Canada. Good examples include outcross US based genetics with limited pedigree ties in Canada and no (or very few) calves reported. Because the calving ease evaluation does not use external EPD as priors, this means that parent stock must build their EPD based on reported progeny records.

2. Calving ease on first calf heifers, birth weight on all animals

The evaluation uses birthweight information on all available animals however it only includes calving ease records from first calvers. The Canadian data has very little variation in calving ease on mature cows. In other words, because most cows calve without assistance, they don't tell us much about difficulties in calving. Because the model looks directly at each record, including the sire and dam it provides more information from the data than the previous evaluation.

3. Multi-trait animal model

The animal model approach is superior to the previous sire/maternal grandsire approach, largely because it accounts for differences in calving ease of service sires, as well as the contribution of the dam to the calving ease of the calf. This includes her direct genetic contribution to calving ease, as well as her effect on the environment. A good example of this type of maternal effect would be a female who has a short gestation length. This is referred to as the Birth Weight Maternal (BWM) for the purposes of the model. The sire/MGS model used a cut down pedigree and in essence predicted pedigree estimate EPD for females in the evaluation. The animal model uses the female record and pedigree directly in the evaluation, thus developing a lot more information out of each piece of data.

The animal model represents the favoured approach to evaluating calving ease and is currently the model used by most major breed associations in North America.

4. Genetic Parameters

Because of the change in the way the model uses the records, new genetic parameter estimates were used. As before birth weight has a significant association with calving ease. Because we are now able to directly include the dam in the evaluation, the maternal influence on birth weight has a significant effect on Maternal Calving Ease. The other relationship that is worth noting is the negative association between CE and MCE. In other words, genetics for direct calving ease will on average have a slight association with reduced levels of maternal calving ease.

Genetic Parameters: Birth Weight, Birth Weight Maternal, Calving Ease and Maternal Calving Ease				
	BW	BWM	CE	MCE
BW	0.47	-0.30	0.76	0.00
BWM		0.12	0.00	0.50
CE			0.18	-0.16
MCE				0.12
1. Units are imperial (lbs) and CE score units (1 – 5) 2. Heritability on diagonal, correlations on off diagonal				

Comparing Results

While the base for the CSA EPD is set so that it looks similar to the old EPD, it is not possible to directly equate CSA and ASA EPD. Vast differences in the dataset and significant model changes mean that the results of the two evaluations are quite different. In terms of comparing percentile rankings, the comparison populations are also quite different, with the Canadian population containing a higher proportion of fullbloods than the US.

CE, MCE, BW Breed Average EPD			
	CE	MCE	BW
Top 25%	7.4	1.5	1.5
Average	2.7	-0.4	3.0
Top 75%	-1.6	-2.0	4.5

The Canadian EPDs accurately reflect the available data in the CSA dataset and better account for the genetic variation within the Canadian Simmental population. It is important to understand that not all sires need to be in the top percentages of the breed for CE and MCE. The use of a sire should determine the optimal

level of calving ease genetics that are required. The CE and MCE EPDs are useful tools to make genetic change in a well thought out program and to match Simmental cattle to situations where they are positioned to excel.

Note: What Animal Records Tell Us

Records must be submitted in a valid contemporary group. This means 2 or more calves that are the same sex, of a similar age, with some difference expressed between them. Larger groups with ties to the general population (eg: 1 or more AI sires) and more pedigrees represented, provide more information as more comparisons can be made.

Birth weight records provide information about

- the sire’s direct contribution to birthweight genetics
- the dam’s direct contribution to birthweight genetics
- the dam’s contribution to pre-calving environment affecting birth weight
- indirect effects on calving ease (eg: heavier birth weights tend to increase calving difficulty)

- indirect effects on maternal calving ease (eg: shorter gestation females tend to have lighter calves)

Calving ease records provide information about

- the sire's contribution to calving ease genetics
- the dam's direct contribution to calving ease genetics
- the dam's contribution to pre-calving environment affecting calving ease
- direct effects on calving ease
- direct effects on maternal calving ease

The CE and MCE EPD are based on these types of records in the CSA database. A calving ease and/or birth weight record from a valid contemporary group informs us about the sire and dam's calving ease genetics and the maternal grandsire and granddam's maternal calving ease genetics (dam's maternal contribution).