# Charolais Genetic Evaluation UPDATE:

## Improving the Use of Genomic Data in AICA EPDs

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The Spring 2018 National Cattle Evaluation released in late December incorporated the use of single-step genomic evaluation methodology provided by the AICA genetic evaluation service provider, Angus Genetics Inc (AGI). This was the initial release of EPDs that were generated using proven technology allowing the most accurate and complete combination of the pedigree, performance and genotype SNP data generated by breeders and housed by the AICA.

### *Favorable Comparisons between Single-Step and Previous Evaluation*

A comparison of the released Spring 2018 single-step results to the Fall 2017 North American Charolais Genetic Evaluation yielded impressive results. While some breeds' transitions to the single-step methodology have created re-ranking of animal EPDs in certain traits, the Charolais animal EPD rankings between the two evaluation methodologies were very similar. This result was typical to previously published evaluation comparisons when new animals and performance records were added to past updates. The conservative weighting of the previously used molecular breeding values in the correlated trait model helped to moderate the EPD changes as the improved, single-step methodology was implemented.

In general, the rank correlations for the growth trait, scrotal, maternal milk, and calving ease EPDs were .99 between the Fall 2017 and the Spring 2018 evaluations. An unchanged rank of animals would have a correlation of 1.00. The correlations for the carcass trait suite were in the .98 to .99 range. Also, keep in mind that genomic results were previously fit as a correlated trait and the molecular breeding values were only incorporated into the CED, BW, WW, YW, Milk, REA, Marbling, and SC EPDs. The single-step methodology now also includes genotypes for the CEM, CW and Fat EPDs.

Again, the molecular breeding values previously used as a correlated trait were removed from the single-step approach, in which the genotypes were fit directly into the national cattle evaluation. With single-step, no calibration or updates of training populations are necessary.

Like any evaluation update involving a methodology change, some of the actual EPDs may shift in magnitude within the population, and there will be some individual animals with EPD changes. It is always important to consider the EPD percentile ranks on an animal from one evaluation to the next. The percentile rank tables are updated with each AICA national cattle evaluation release, and consideration of these tables is especially important as the new single-step methodology is implemented. Of course, like any evaluation update, the inclusion of new data from progeny or ancestors can also cause individual animal EPDs to change.

### *Interim EPD Procedural Changes*

With the shift to the single-step genetic evaluation, there will no longer be interim EPDs calculated using the genomic data in the time in-between the three, national cattle evaluation runs per year. Newly tested animals will have the genomic results incorporated into their EPDs only when processed through one of these national cattle evaluation runs. That said, pedigree estimates, as well as interims based on phenotypic records (e.g., weights, scans) in proper contemporary groups submitted by AICA members, will continue to generate interim EPDs prior an upcoming national cattle evaluation.

Moving forward, breeders will need to plan ahead for their potential DNA testing to ensure that the genotyping results are completed at the lab and received by the AICA office prior to the national cattle evaluation data cutoff in order to be included as part of the evaluation results. Again, animals with performance data submitted in proper contemporary groups and passing edits will continue to receive interim EPDs as they have in the past.

### *New Technology at a Lower Price*

Charolais breeders will be able to access a new genomic test option at a lower price that allows wider use of genomic testing across the herd. Through the cooperation of the AICA genomic service provider, Neogen/GeneSeek, the GGP BOV50K option will be available for purchase, with the results incorporated into the genetic evaluation. The cost on the new test to be advertised by the AICA office includes parent verification.

### *Modernizing the AICA Genetic Evaluation System*

The single-step methodology for genetic evaluations is a modern, proven technology used not only in the beef industry, but widely accepted in other species such as dairy, swine and poultry. In addition, at Method Genetics, we have worked with single-step genetic evaluations in commercial cattle populations since 2014. We have found this methodology to provide accurate, robust use of both the DNA results, pedigree, and existing performance data to create dependable genetic selection tools.

The improvements in the AICA genetic evaluation system by moving to single-step methodology will allow breeders to aggressively select for traits of economic relevance with more confidence. This is an exciting step in ensuring that Charolais breeders and their commercial customers have improved genetic selection tools that will reliably characterize Charolais genetics moving forward.

***Single-step genetic evaluation is an exciting milestone in ensuring that Charolais breeders and their commercial customers have improved genetic selection tools that will reliably characterize Charolais genetics moving forward.***