

What to Expect with Multi-breed Genetic Evaluation powered by BOLT

By IGS Genetic Evaluation Team and Consultants

Change can be a scary concept to some yet sought after by others. Many breeders wonder about the changes on the horizon once the new evaluation, Multi-breed Genetic Evaluation powered by BOLT, is fully implemented. That change may be nerve-racking but in reality, things should change. Why invest in new and improved methods if you get the same answers? Here are key changes to expect with the new genetic evaluation:

- 1. Movement of EPDs and reranking.** EPDs will change especially in younger, lower accuracy cattle. Members should expect movement in lower accuracy cattle, as seen in the existing evaluations, because they may have new progeny data reported. Some cattle will move in a favorable direction while others will do the opposite. Keep in mind even if the EPDs get worse, the prediction of them is more accurate. With Multi-breed Genetic Evaluation powered by BOLT, we will have more accurate EPDs earlier in an animal's life.
- 2. More accurate accuracy.** This idea takes a little time to sink in. The accuracy reported for each EPD will be more directly calculated and thus closer to the "real" accuracy. The methods to solve accuracy directly are extremely difficult and take a lot of computer power. With the previous Cornell software it was not possible to solve for accuracy directly so an approximation method was used to estimate accuracy for each EPD. There were inherent flaws with approximating the accuracy with the previous method. Now with BOLT software, the accuracy reported with the EPD will be more reliable.
- 3. Reported accuracies will tend to be lower.** One of the inherent flaws in the approximation methods used to find accuracy in the previous evaluation, and in all evaluations not produced through BOLT, was they frequently overestimated accuracy, especially for younger animals. This was known for a long time, but there was no way to calculate the accuracies directly. With BOLT, having accuracy more directly solved results in a more reliable accuracy but that accuracy will often be numerically lower than the previous evaluation would predict. However, the new reported accuracies with BOLT should better represent the possible changes for the EPDs.
- 4. DNA testing will have a larger impact.** With the switch to BOLT software, IGS will use Single-step genomic evaluation on all EPDs (currently using Single Step for Stayability EPDs). Single-step uses the DNA markers, pedigree information, and phenotypic data simultaneously in the prediction of the EPDs. Previously molecular breeding values (MBVs) were calculated from the genomic information and those MBVs were blended separately into the EPD prediction. The Single-step method squeezes more information from the DNA markers than the previous approach allowed. Also, there are biases inherent in the blending process that aren't a problem with the Single-step approach. Additionally, with Single-step, the genomic information will not only enhance EPDs for the genotyped animal but also will be used in the EPD estimates of relatives.
- 5. Weekly genetic evaluation runs.** With the horsepower behind BOLT, IGS can run genetic evaluations weekly. This has many benefits. It allows members to get more immediate feedback after submitting their records. If members miss a deadline, they can catch the next evaluation run the following week. It allows for more accurate EPDs throughout the year and faster incorporation of the genomics. This also means the EPDs put in print will quickly be outdated.

Genetic evaluation is not stagnant. There will always be improvements as new research in animal breeding, genomics, and statistics advance. BOLT software is revolutionary in the innate flexibility, the computational power, and the statistical methods made possible using this software. Multi-breed Genetic Evaluation powered by BOLT promises more accurate EPDs, accuracies, and better use of genomics all delivered to you on a weekly basis. ♦