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ONLINE: [Single-step genetic evaluation common questions](#)

Angus Moves to Single Step July 7

At the leading edge of beef cattle genetic progress, American Angus Association unveils enhancements to its weekly national cattle evaluation.

Driven by the rise of genomic technology and uptake by the nation's Angus breeders, the American Angus Association and Angus Genetics Inc. (AGI) announce monumental changes to the breed's weekly genetic evaluation.

Beginning Friday, July 7, the organization will become the first major U.S. beef breed to incorporate single-step methodology to calculate, on a weekly basis, all of its expected progeny differences (EPDs) and dollar-value indexes (\$Values). The move is the result of years of dedicated research and development to equip Angus breeders with the industry's most sophisticated, accurate and reliable performance data and genetic selection tools.

"This is a new era for genetic evaluations," says Stephen Miller, AGI director of genetic research. "Angus breeders have been anticipating single step, and we believe they will greatly benefit from the methodology's increased precision.

"We've also incorporated several major enhancements to the evaluation," he continues. "It's new and improved in a number of ways."

The change to single step has allowed AGI to simplify the calculation models used within the weekly national cattle evaluation (NCE). As the name implies, single-step methodology incorporates all genotype, pedigree, performance and progeny data simultaneously in one step to derive genomic-enhanced EPDs (GE-EPDs).

"In a genetic evaluation, the more traits you put in, the more complicated it is to solve," he says. "Now with single step, we don't have to fit in all the molecular breeding values (MBVs), so we can incorporate more focused traits within the models, and weaning weight is one of them."

The need for routine calibration, a necessary function with the multi-step process as the number of Angus genotyped cattle continues to grow, will be eliminated through the use of single step.

New and improved

Enhancements to the carcass model are among the most immediate benefits of single step, Miller says. They've streamlined the process to analyze the most important traits of interest, including carcass weight, marbling and ribeye area, and will also begin including weaning weight (to offset selection bias) and yearling fat (an indicator of maturity) into the carcass model.

One of the things producers will see is a stronger relationship between growth and carcass weight, Miller says.

Additional July 7 updates to the NCE include updated genetic parameters.

Heritabilities and genetic correlations have been re-estimated to best reflect the American Angus Association's current data. It's a routine practice for any genetic evaluation, Miller says, that occurs every five to 10 years. As a result, breeders may see slight changes in heritability estimates for some traits.

Each year in July, the Association releases updates to its economic assumptions, which are assigned to EPD components to calculate \$Values that represent both costs and revenues affecting the production system. The economic assumptions are based on a three-year rolling average and reflect the current beef industry price cycle.

“When we look at the genetic trends for weaned calf value (\$W) and beef value (\$B), they are pretty much the same for the last number of years,” Miller says. “Even with the new economic assumptions and improved overall evaluation, the \$B trend will be similar to what we’ve seen prior to July 7.”

Another major factor within the improved Angus evaluation is simply the volume of genotypes being added to the database. Since AGI began calculating GE-EPDs in 2010, the wealth of genomic information has increased sharply with each passing year.

Currently, about one-third of the cattle registered through the American Angus Association are being genotyped. In fiscal year 2016, AGI added 110,000 genomic profiles — and that number will continue to rise.

On July 7, the genomic predictions will be based on more than 300,000 animals with genotypes now in the NCE. The last calibration released in April 2016 was based on 108,000 genotypes.

With single step, genomic information will have a much more immediate affect on animal data. The weekly NCE release will better reflect all available information, including all genomic, performance and progeny data.

“We’re basically tripling the size of the genotypic database that’s behind the evaluation on July 7,” Miller says. “As we receive more and more data, we’ll be able to do more with it, making even more accurate tools and GE-EPDs for Angus breeders.”

What to expect

When Angus breeders access their performance data Friday, July 7, there will be noticeable changes. An animal’s EPDs have the potential to adjust following the evaluation’s enhancements.

Think of this as one last calibration that will effect animals across the entire population, Miller says.

When studying the data, he suggests breeders consider that although traits are the same, the scale is slightly different. If there’s change in a certain animal’s numbers, he recommends looking at the EPD percentile ranks. That should add clarity to where animals fall within the scale of the new evaluation.

“If you compare the standard deviation in the previous *Sire Evaluation Report* to what goes out July 7, you can see some changes, such as a reduction for marbling,” Miller says. “That’s going to give us a little less spread, from top to bottom, than we’re used to.”

Because of adjustments in the carcass model, breeders will likely notice the most change within carcass trait EPDs. The dry-matter intake (DMI) and heifer pregnancy (HP) EPDs will also experience some change, as well as milk EPDs.

Models for growth, including correlations between birth weight and growth traits, were also enhanced as part of the new genetic evaluation. Breeders can expect to see minimal changes in re-ranking of sires that recorded the most progeny registrations in the last fiscal year (Top 200 registration sires).

However, young animals that do not have birth weights recorded in the evaluation, but do have weaning and yearling weights reported — especially those with high growth — may experience greater change, on average, for birth weight EPDs across the board.

Again, when dissecting these EPD changes from the old versus new evaluation, producers are encouraged to pay attention to the changes in EPD percentile ranks.

Angus breeders should also note that the single-step evaluation requires a change in the cut-off date for data to be included in the weekly NCE. Historically, information received on Tuesday would be incorporated into the week's Friday release.

Due to an extended processing time associated with single step, data cut-off will be moved to the Friday before. Information received by the Association by close of business on Friday will be reported in the next week's NCE, the following Friday.

The July 7 release will be published in the fall *Sire Evaluation Report*, and breeders should submit data by June 30 to be included in that print publication and to receive the most current information from the improved genetic evaluation.

New overall genetic trend charts for the Angus breed will also be released in the next edition of the *Sire Evaluation Report*.

Tested and proven

The single-step method has been running in tandem with the Association's current genetic evaluation for the past eight months to evaluate its speed and stability. Several internal checks and third-party verifications have shown the single-step-generated data to be superior to existing methods, Miller says, and Angus breeders can rest assured in the accuracy of the information.

The computer software driving single step is the result of collaboration among the University of Georgia-Athens, AGI and the American Angus Association. The U.S. Meat Animal Research Center (USMARC) also provided validation to the single-step EPDs and their analysis has proven the strength of the new method over prior evaluation models.

"Research done within our own database, coupled with that from USMARC, shows us that the move to single step, coupled with our improved models, is a significant improvement," Miller says. "It's our mission and top priority to ensure that Angus members receive the most accurate, weekly EPD updates that they've come to expect and trust."

Additional resources on the single-step evaluation are [available on the AGI website](#). Visit www.angus.org to learn more or contact AGI at 816-383-5100 with any questions.

— *Written by Jena McRell, Angus Media*

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