By the Numbers

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Angus genomic-enhanced EPDs

In October 2009, the American Angus Association released National Cattle Evaluation (NCE) genomic-enhanced expected progeny differences (EPDs) for carcass traits. Since that time, Angus breeders have become accustomed to the rapid feedback of this new endeavor. Updated weekly carcass EPDs have become the norm, providing timely selection tools beyond the classic interim EPD concept.

What's the same about EPDs?

EPDs are a beef cattle selection tool for cow-calf and seedstock producers to use to rank or compare the relative genetic merit of animals. Typically, this tool is used to select sires for economically important traits that will leave future progeny meeting the desired characteristics for the producer's breeding program. EPDs are reported in units of measure for the trait, such as pounds of carcass weight, marbling score or square inches of carcass ribeye area.

Sire search tools are available online at *www.angus.org/Nce/SireEvaluationDefault.aspx*. Angus breeders use EPDs heavily throughout their herd selections on both the male and female side and capitalize on the online tools available through AAA Login.

EPDs incorporate varying sources of information on an individual animal and relatives, such as pedigree and the Association's weights or measures database for the trait of interest. Supporting percentile rank and breed average tables are available electronically through *www.angus.org* to allow breeders to compare animals directly against the breed population and chart their course for making genetic improvement.

What does the beef industry recommend?

The Beef Improvement Federation (BIF) commission on DNA markers released "Guidelines for Combining Molecular and Quantitative Approaches in Genetic Evaluation" in December 2009 with the following statements regarding the reporting of DNA test results:

"It is important the DNA test results be reported to [the] beef industry in a consistent, understandable format. Further, the format should be compatible with NCE methods."

"BIF recommends that DNA test results be reported in the form of an EPD, in the units of the trait, on a continuous scale, and with a corresponding BIF accuracy."

"Guiding Philosophy. BIF believes that information from DNA tests only has value in selection when incorporated with all other available forms of performance information for economically important traits in NCE, and when communicated in the form of an EPD with a corresponding BIF accuracy. For some economically important traits, information other than DNA tests may not be available. Selection tools based on these tests should still be expressed as EPD within the normal parameters of NCE."

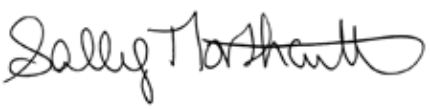
What makes genomic-enhanced EPDs better?

With the inclusion of genomic results, the carcass evaluation has an additional piece of information added to the genetic system. The weekly genetic predictions for carcass merit will encompass carcass, ultrasound and genomic databases. These EPDs come from the combined analysis — or integrated evaluation — resulting in a single EPD for carcass weight, marbling score, ribeye area and fat thickness. The units of measure remain in carcass trait format. Ultrasound, carcass, genomic and pedigree databases are boiled down into one seamless set of genomic-enhanced carcass EPDs for Angus breeding programs. Every Friday morning, the genomic-enhanced NCE EPDs are available at *www.angus.org*.

Genomic-enhanced carcass EPDs provided on a weekly basis have some key benefits:

- ►NCE EPDs are the best genetic predictions for carcass traits — surpassing ratios, interim EPDs, and profile scores as selection tools.
- ►Pedigree-estimated interim EPDs for young nonparent animals are short-lived or bypassed to provide the more informative NCE EPDs each week.
- ►Carcass NCE EPDs are available on Angus cattle in a rapid time frame.
- ►Ultrasound, carcass and genomic databases with a four-generation pedigree are used simultaneously each week.
- ►Carcass genomic profile results are incorporated into EPDs without a six-month wait for biannual evaluations.
- ►Ultrasound-scanned animals receive an NCE EPD within a week of the scan results being processed by the Association, for a comprehensive prediction beyond interims.
- ►On calves with ultrasound or genomic profiles, dams that had no carcass EPDs in the past now receive weekly NCE EPDs without the time lag of a biannual evaluation.
- ►Calves with genomic profile results have calculated NCE EPDs using all data contributing to the comprehensive EPD system.
- ►The carcass dollar values ($Values) are updated with the change of associated carcass trait EPDs.

The continued evolution of selection tools available for producers utilizing Angus genetics relies on a consistent and simplified method to characterize these genetics. Using the language of EPDs and the associated accuracies allows us to use the established "language" of the industry, without a significant re-education process. The improved accuracy of EPDs on the economically relevant traits provides Angus breeders a continued edge to create genetics that will favorably affect the beef industry.



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Editor's Note: *"By the Numbers" is a column by Association performance programs staff to share insights about data collection and interpretation, the NCE, genetic selection, and relevant technology and industry issues.*