# By the Numbers

by **Tonya Amen,** *American Angus Association*

## Genetic trends

*From continued improvements in genomic tests for inclusion in genomic-enhanced expected progeny differences (GE-EPDs) to enhancements to the features provided for MaternalPlus® participants and adoption and use of GeneMax™ in high-percentage-Angus cattle, many exciting things are happening with Angus genetics.*

### Valuable database

It's no secret that the dedication of Angus breeders to collect performance data over the years has allowed for the development of powerful genetic selection tools. This data collection, along with your ready adoption of technologies like ultrasound and genomics, has allowed for the formation of a database that is the envy of the beef industry. All of this allows for continued development of new and exciting selection tools for Angus breeders and commercial users of Angus genetics. Over the years, developing these tools has allowed you to make genetic directional change in traits of economic importance.

It's important to note that selecting for change in one trait does not occur in a vacuum, and is often accompanied by change in other genetically correlated traits. Sometimes this change is desirable and sometimes it is not. Regardless, it can be tracked by looking at the genetic trend over time in the various traits of importance. Genetic trend is simply computing the average EPD by animal birth year. This allows us to follow the trend over time, which can be presented in a table or depicted graphically.

The various weight traits for which the American Angus Association publishes EPDs are always of keen interest to cattlemen, and you'll see the genetic trend for several of them in Fig. 1. From birth weight to mature cow weight, all of the weight traits have moderate to high genetic correlations (ranging from 0.39 for birth weight and mature cow weight to 0.74 for weaning weight and mature cow weight). This means that selection for increased weaning weights should be accompanied by increased weights at every other stage as well. In the case of cattlemen operating in environments with limited feed resources, the high correlation between weaning weight and mature cow weight may be undesirable due to the resources required to support larger mature cows.

**It's important to note that selecting for change in one trait does not occur in a vacuum, and is often accompanied by change in other genetically correlated traits.**

Closer scrutiny of the genetic trend table reveals that the line representing mature weight is not as steep as those for weaning and yearling weights, which indicates that selection pressure has been placed against mature weight while simultaneously selecting for increased weaning and yearling weights. Even though there is a strong positive genetic correlation between weaning weight and mature weight, Angus producers have been able to identify unique animals that combine high growth and moderate mature size.

Likewise, in spite of a positive genetic correlation between birth weight and the other weight traits, we've actually seen a decrease in birth weight since the early 1990s, while continuing to increase weaning and yearling weights. Again, genetic selection tools have allowed Angus breeders to identify and propagate animals with unique genetics for low birth weight, but rapid growth through weaning and the postweaning phase.

It's your dedication to capturing phenotypic information that has allowed creation of the genetic selection tools that identify these unique animals. Plus, the ready adoption by Angus breeders of technologies like artificial insemination (AI) has allowed these unique genetic combinations to be propagated and put to use by registered-Angus breeders and commercial cattlemen alike. All of this has made Angus genetics a tremendous asset to beef production worldwide.

**EMAIL:** tamen@angus.org

**Editor's Note:** *"By The Numbers" is a column by Association performance programs staff to share insights about data collection and interpretation, National Cattle Evaluation (NCE), genetic selection and relevant technology and industry issues. Tonya Amen is director of genetic services for the American Angus Association. If you have questions or would like to suggest a topic for a future column, contact the Association at 816-383-5100.*

**Table 1: Genetic trends for growth traits**