

# BY THE NUMBERS

by Kelli Retallick, Angus Genetics Inc.

## The Cow Size Debate

*Cattlemen have debated cow size and efficiency for many years.  
Everybody wants cow efficiency, but what really is it?*

In most cases, cow efficiency is tackled from a biological efficiency standpoint, for instance, calves weaned per cow exposed. In most cases cow efficiency components include attributes of fertility, cow intake, and longevity along with calf survivability, growth and intake.

### Evidence from the field

A recent study by the USDA Meat Animal Research Center (USMARC) in Clay Center, Neb., in conjunction with their Germ-Plasm Evaluation (GPE) project aimed to model weaning to mature growth patterns to predict mature cow weights that then explain breed differences. For years, the GPE project from USMARC has shown how Angus continuously gains ground and now excels all British and Continental breeds in terms of weaning, yearling and carcass weight growth genetics.

However, the decisions made to increase output traits like calf weight have also affected correlated traits like mature cow size. In this project, more than 5,000 cows involved in the GPE project from 18 breeds were sampled. Cows were weighed three times a year to get an accurate assessment of body weight with predicted weight at 6 years of age being defined as mature cow size.

The study concluded in this GPE population, Angus females

were the heaviest at 6 years of age when compared to the other breeds included in the study.

### Keeping mature size in check

Luckily Angus breeders had the foresight over three decades ago to start collecting the data. Mature weight, height and body condition scores were first collected in Angus herds in the fall of 1988 for the American Angus Association's then Structured Sire Evaluation.

Then in the spring 1994 edition of the Sire Evaluation Report, the first mature weight (MW) and mature height (MH) expected progeny differences (EPDs) were published with an update to these models happening around 2005. Much like in the USMARC study previously mentioned, these mature cow size EPDs aim to predict weight and height differences of cows at age 6.

Overtime, while we have increased early growth in our young-stock in the Angus population, it has been found that mature cow size is also increasing. However, even though cow sizes have increased, it could be argued that these females are producing more, hence maintaining a level of cow efficiency.

Figure 1 shows the genetic trend of weaning and yearling weight EPDs compared to MW. Even though, the genetic trend for mature weight has

climbed over the years, the trend for WW and YW EPDs has risen more quickly. Although this is a sign of improvement within the breed for fast-growing cattle that don't result in large cows, the USMARC results do indicate a cause for alarm. With Angus cows now being the largest of all breeds, including the continentals, there is cause for concern.

One of the reasons the mature weight trend in Angus may not be tracking the actual change in cow weight is due to the amount of data being recorded. From a recent weekly National Cattle Evaluation (NCE), there were more than 9.4 million animals with records in growth to yearling, but only 217,000 cows with mature weight records. There are more records on docility (287,000) than mature cow weight.

If every female retained with a yearling weight was also recorded for mature weight, the genetic trend for mature weight in the Angus data may be closer to what is reflected in the trend for yearling weight. To best capture the genetic differences for mature weight in Angus cows, the data needs to be collected.

It is most efficient from an analysis standpoint to measure mature cow size within +/- 45 days of weaning. This allows for the most consistent measurement of mature cow size across individual populations.

When taking mature cow size measurements, producers should also record and report a body condition score (BCS) on each animal.

Having these measurements in hand not only allows, producers to have more accurate MW and MH EPDs within the herd, but these measurements also give them something to base their goals off of. If the average actual mature size is larger than desired, decisions about MW and MH EPDs can be better made when selecting bulls for breeding purposes.

Moderate to high heritability estimates have been reported for both weight ( $h^2 = 0.37$ ) and height ( $h^2 = 0.62$ ), so genetic selection can take place for these traits. Like any EPD, mature weight and height should be

used to assist in making directional change in the traits in a well-balanced breeding program, and the optimal cow may vary from different regions in the country.

## The next challenge

Angus producers have done an exceptional job using the available tools to bend the growth curve at the start, breeding animals who are born light and grow fast.

Perhaps the next challenge producers focus on is changing the growth curve on the other end. Find those animals that grow exceptionally well from birth to yearling then level off more quickly in their growth patterns maintaining an average mature cow size, more similar to that of yearling weight.

This bend at the other end is only possible with cow weight measures.

Bending a growth curve is like bending a piece of pipe. You cannot bend a pipe by holding onto one end only. To bend yearling weight and cow weight, you cannot do it with yearling weights alone. **AJ**

*Kelli Retallick*

[kretallick@angus.org](mailto:kretallick@angus.org)

*Editors note: The Association has worked to make participation in whole-herd reporting as simple as possible. If you have questions, contact the office at 816-383-5100.*

**Figure 1: Genetic EPD Trends for Weaning Weight (WW), Yearling Weight (YW) and Mature Weight (MW) from 1993 - 2017.**

