By the Numbers

►by **Sally Northcutt,** *director of genetic research, American Angus Association*

What does an Angus cow weigh?

Amid all the technical questions about expected progeny differences (EPDs), interims and new selection tools, a frequent question comes to our office: What does an average Angus cow weigh? Some of the interest stems from the Association's publication of mature size EPDs and the use of these genetic values in the weaned calf ($W) and cow energy ($EN) bioeconomic indexes. In an effort to answer the popular question, let's examine the phenotypic database on hand in Angus Herd Improvement Records (AHIR®).

Fig. 1: Average Angus phenotypic cow weight, by age group

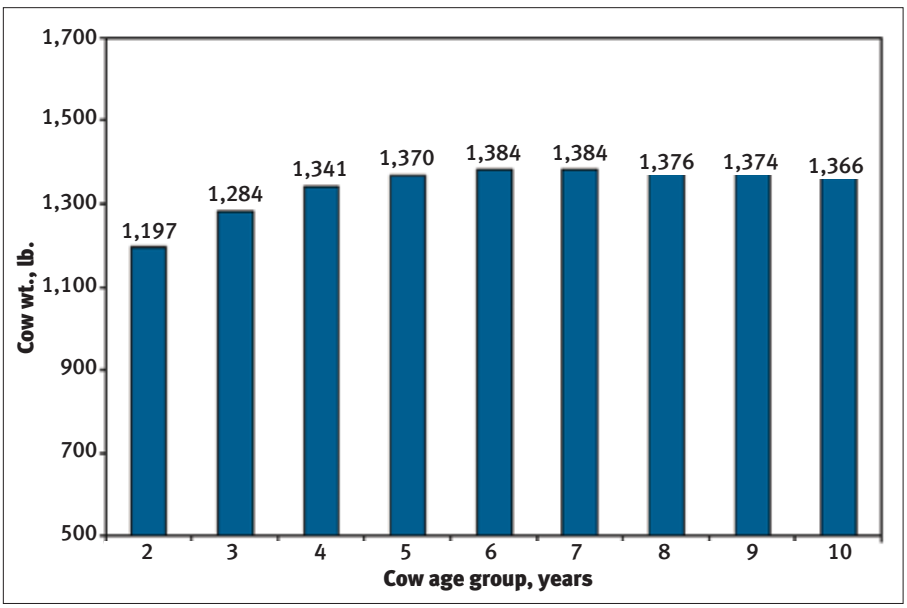
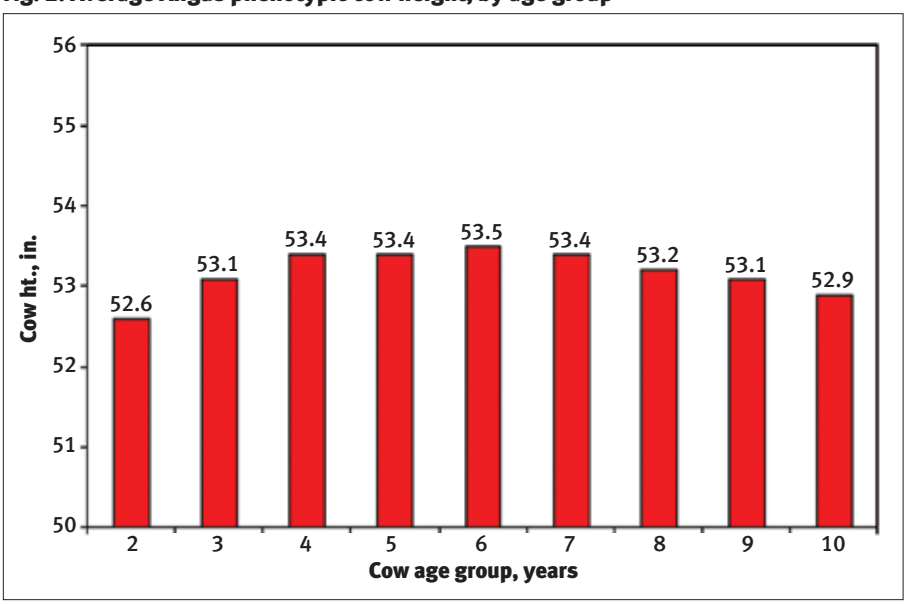


Fig. 2: Average Angus phenotypic cow height, by age group



Cow weight, height measures

Using a database of phenotypic measures on cows taken at various ages, a summary of average weight and height by cow age group is presented in Figs. 1 and 2. The data set includes 217,365 females from 2 to 10 years of age.

Note that in Fig. 1, cow weight levels off at about 5 to 7 years of age. Cows tend to reach their mature weight about this time.

Cow mature height is reached at an earlier age (see Fig. 2). Granted, these trends are illustrated with phenotypic measures, where phenotype is simply the weight or height that is submitted to AHIR, or that observable measure taken by the breeder. Also, to assess these measures by cow age group independent of body condition differences, the cow weights were adjusted to a body condition score (BCS) 6.

Beyond weights and heights

Beyond satisfying our curiosity for what a cow weighs, we can utilize these data points on cows at various ages in the Angus breed in the calculation of mature size EPDs. Both cow weight and height are highly heritable (0.55 and 0.82, respectively), indicating that selection for these traits can be effective in a breeding program.

Weight and height are also genetically correlated (+0.80) in a positive direction, so many of the genes that control weight also control height in the same direction. Thus, heavier animals tend to be taller, although this is not a perfect correlation of 1.0.

To examine the genetic change in cow weight over time, Fig. 3 depicts the average mature cow EPD by birth year. In the Fall 2008 National Cattle Evaluation (NCE), weights and heights were used in an animal model for 127,110 Angus females to generate 300,748 EPDs.

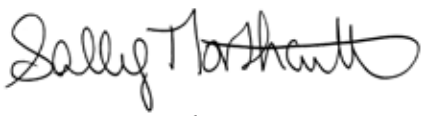
The red line in Fig. 3 illustrates the genetic trend, or average EPD by year, for cow weight up to 2003. The trend is not as rapid as that shown for yearling weight (blue line).

As additional data are submitted on cows of various ages, it will be interesting to see if the mature cow weight trend climbs or stays relatively flat. Note the birth weight has stayed relatively flat even when selection pressure was placed on other weight traits.

The mature weight EPDs are the most meaningful approach to assessing cow weight

from a genetic standpoint. These EPDs account for relationships among animals and have been corrected for environmental differences. Also, the mature size EPDs are used as genetic components of the bioeconomic indexes for $W and $EN.

To read more about the Angus $Values go to *www.angus.org/sireeval/valueindex.html.*



E-MAIL: snorthcutt@angus.org

Editor's Note: *"By the Numbers" is a column by Association performance programs staff to share insights with Angus members about data collection and interpretation, the NCE, genetic selection, and relevant technology and industry issues. If you have questions or would like to suggest a topic for a future column, contact Sally Northcutt, director of genetic research, or Bill Bowman, director of performance programs, at 816-383-5100.*

Fig. 3: Average genetic trend, by birth year for birth, yearling and mature weights