The American Angus Association (AAA) utilizes the Angus Herd Improvement Records (AHIR) system as a way of determining the genetic merit of breeding animals. New advances in genotyping have created a way to more accurately determine a breeding animal’s EPDs (Estimated Progeny Differences), which will help the producer improve production traits through selection. We examined the rate of improvement in accuracy of EPDs from Angus Genomic testing vs. performance data submitted to the AAA. After utilizing the Angus GS test, accuracy of EPD values were found to be significant whereas EPD values themselves were not significant. In addition, researchers contributed to the advancement of the Angus breed by scoring 39 of MTSU’s Angus cows for foot angle and claw set.

### Objective

The objective of this project was to examine the rate of improvement of accuracy for performance data in Angus cows using Angus Genomic testing vs. performance data submitted to the AAA. Additionally, researchers contributed to the advancement of Angus breed improvement through claw set and foot score submissions.

### Methodology

We selected 16 cows from the herd for the comparison of traditional EPDs versus genomic-enhanced EPDs on March 4, 2020. For the comparison of control cows (n = 8) and genomic cows (n = 8) we selected four animals from the following birth years: 2013, 2015, 2016, and 2017. We skipped 2014 because there were not enough females in the herd from that year. We randomly assigned these cows to either the control or genomic group. Eight Angus GS tests were ordered through AAA for the animals being genetically tested. Blood was collected from each cow and transferred to blood cards. This was done by wiping the animal’s ear clean and pricking the ear vein with a sterile needle. Then we touched the circle on the DNA card to the blood site on the ear and filled the circle with blood. Cards were dried away from direct sunlight for at least 24 hours prior to mailing. The blood cards were sent to Angus Genetics Inc. Upon return of the samples, the accuracy of the performance data for the 8 genetically tested cows was compared to the accuracy of the AHIR submission data for those 8 cows who did not receive the GS tests.

All animals in the Angus herd (39) were foot scored on a scale of 1-9 and scored for claw set 1-9 (being ideal for both) and the data was submitted to the AAA through the AHIR. Visual chart for foot scores are included in Figure 1 and 2. Cows were scored in the holding pen where they were on a flat, solid surface. Two people collected foot scores and the scores were averaged.

### Results

We focused our attention on the following EPDs for comparison: production traits Calving Ease Direct (CED), Birth Weight (BW), Weaning Weight (WW), Yearling Weight (YW) and Docility (DOC) as well as the maternal trait of Maternal Milk (Milk). Average EPDs for the control and genomic groups are included in Table 1. There were no significant differences in EPDs (P > 0.05) although the milk EPD showed a trend (P = 0.09) with cows in the control group having a higher milk EPD than cows in the genomic group. We used a small sample size due to budget limits for this project. With a larger sample size we would expect to see more significant differences in EPDs. Using the Angus GS genomic testing, there was a significant increase in accuracy (Table 2) for all EPDs evaluated. CED, BW and WW accuracy improvement were most significant (p < 0.001). Using the Angus GS genomic test, the accuracy for YW increased by 58% and the accuracy for DOC increased by 72%.

### References


### Acknowledgements

- Undergraduate Research Experience on Campus (URECA)
- Middle Tennessee State University School of Agriculture
- Dr. Jessica Carter