An evaluation of genetic trends over 10 year period from data collected from the ABBA carcass evaluation program

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Background

The American Brahman Breeders Association began the national carcass evaluation project in 2001 as a method to evaluate Brahman carcass merit including yield, marbling and tenderness. The ABBA has set a series of guidelines that producers must follow in order to participate in the carcass evaluation project. All steers must be weaned and adhere to a specific health program suggested by the ABBA 45-60 days prior to delivery at Graham Land and Cattle Company in Gonzalez, TX. Upon arrival at the feedyard steers are individually identified, weighed, given a frame & muscle score and put on a starter ration. After approximately 90 days on feed the steers are re-implanted and sorted into expected outcome groups based upon re-implant weight and put on a finishing ration. After a period of time in the feed yard, steers are deemed ready for harvest when the pen has reached an average weight and condition regarded as acceptable by the beef cattle industry (approximately 1500 pounds and 0.3 inch back fat thickness).

Since 2001 Dr. Joe Paschal from Texas A&M University has collected carcass data for the carcass evaluation project after the Brahman steers had completed the finishing phase of the carcass evaluation program. Carcass data was collected within 48 hours of delivery to the processor. This information that has been collected from the national carcass evaluation program has served as a tool for Brahman producers to evaluate feedlot performance, feedlot efficiency, and ultimately to improve carcass quality and composition characteristics of the Brahman breed. The program further allows producers a method to visualize how their breeding decisions or bull selection has influenced the final carcass product that is produced. A collaborative effort between the ABBA and Louisiana State University AgCenter was established to analyze the increase or
decrease in performance for feedlot performance and carcass characteristics over the past ten years of data collection.

**Methods**

A total of 595 steers that had been enrolled in the ABBA National Carcass Evaluation Program from 2004 to 2013 were evaluated in the current study. The feedlot traits that were evaluated in the current study included initial test weight, feedlot average daily gain, and harvest weight. The carcass traits that were evaluated in the current study included hot carcass weight, dressing percent, rib eye area, marbling score, quality grade, yield grade and Warner-Bratzler tenderness score. Simple regression analyses were conducted to evaluate the rate of positive or negative change in each trait per year, and overall test means were calculated to report the average for each trait after all years of testing.

**Results**

Analyses of the feedlot traits revealed that average daily gain and harvest weight had exhibited an increase every year, whereas initial weight has actually been decreasing over that last 10 years. Specifically, average daily gain has increased 0.04 pounds per year, and harvest weight has increased at a rate of 17.21 pounds per year, indicating an increased level of efficiency and performance in the feedlot. While the previous two traits showed an increase in performance, initial test weight was one of two traits evaluated in the current study that had a decreasing trend. Initial test weight decreased at a rate of 1.68 pounds per year indicating that cattle are actually entering the carcass evaluation program at lighter weights in recent years.

Analyses of carcass traits were in agreement with the previously described feedlot traits and revealed an improvement in the vast majority of the traits evaluated. Analyses of carcass yield traits indicated a 12.6 pound per year increase for hot carcass weight, an increase in yield grade (0.07 units per year; 2.45 average over ten years) and a 0.16 percent increase in dressing percentage per year. These increases in carcass yield indicate that changes have in fact been made in Brahman carcass merit from 2004-2013.

Analyses of carcass quality traits revealed a per year increase in performance for all the traits evaluated with the exception of the Warner-Bratzler tenderness test. Specifically, the traits that exhibited a per year increase included rib eye area (0.10 inches per year), marbling score (0.9 units per year), and quality grade (0.07 units per year), thus indicating a good amount of
progress has been made in improving the quality of Brahman carcasses. While increases in the previously mentioned carcass quality traits were observed, the Warner-Bratzler tenderness test showed a decrease in performance. A decrease in tenderness over the ten year period was reflective of the increase in force needed (0.27 lbs/year) to determine tenderness in Brahman steaks.

**Summary**

The ABBA carcass evaluation program and Brahman producers have made significant improvement in production, efficiency and carcass traits in a relatively short period of time. The fact that virtually all traits have seen a positive per year increase in performance indicates that Brahman producers are making a concerted effort to improve traits deemed valuable by the beef industry in Brahman cattle. After ten years of evaluation, Brahman cattle in the program are entering the test lighter but are gaining faster, and being harvested at higher weights than in 2004. Furthermore, steers are not only yielding larger carcasses, they are yielding much higher quality and more valuable carcasses than when the test was first initiated as indicated by the increasing marbling and quality grade scores. The lone disappointment in the ten year evaluation is the fact that tenderness has decreased as a whole over the ten year period as indicated by an increase per year of the Warner-Bratzler tenderness test measurement. However, Warner-Bratzler measurements have been decreasing since 2009 indicating a concerted effort by Brahman producers to improve tenderness. In summary, the ABBA Carcass Evaluation Program has been a success. The program has not only made great strides in Brahman performance and efficiency in the feedlot, but has also shown that Brahman producers are capable of making the Brahman breed competitive with other breeds when it comes to carcass quality and merit.
Initial Weight
Slope = -1.68 lbs/yr
Overall mean = 558.25 ± 5.1

Average Daily Gain
Slope = 0.04 lbs/yr
Overall mean = 2.73 ± 0.02

Harvest Weight
Slope = 17.21 lbs/yr
Overall mean = 1235.62 ± 6.38
Hot Carcass Weight

Slope = 12.60 lbs/yr
Overall mean = 757.17 ± 4.27

Yield Grade

Slope = 0.07 units/year
Overall mean = 2.45 ± 0.03

Dressing Percent

Slope = 0.16 percent/year
Overall mean = 63.88 ± 0.09
Rib Eye Area

Slope = 0.10 inches/yr
Overall mean = 13.16 ± 0.06

Marbling Score

Slope = 0.9 units/year
Overall mean = 374.04 ± 2.66

Quality Grade

Slope = 0.07 units/year
Overall mean = 660.43 ± 2.10
Slope = 0.27 lbs/year
Overall mean = 8.07 ± 0.09