Weaning Weight Trends in the U.S. Beef Cattle Industry

Calf weaning weight (WW) is an indicator of productivity in cow-calf operations and represents a large portion of gross income for producers that sell at weaning. Management modifications coupled with selection for increased WW throughout the U.S. beef cattle industry has resulted in dramatic increases in WW over the past 44 years.

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National Cattle Evaluation (NCE) genetic trends suggest the rate of selection for increased WW has been steady in most breeds since about 1980 (Kuehn and Thallman, 2016). Breed association records document increases in WW adjusted for calf age, age of dam and sex. For example, WW of Angus bulls and heifers have increased 39% and 40%, respectively, from 1972 to 2016 (American Angus Association, 2018).

Although reporting of performance records has increased in seedstock operations, few large data sets are available to characterize the trend over time in the commercial cow-calf industry. In this study, we evaluated the change over time in average calf WW or projected sale weight at the time of weaning using six different data sources.

Methods

Four time-series data sets contained summaries from enterprise analysis and production performance record systems for the years of 1991 through 2015. The FMA, SPA and FINBIN data were actual weights recorded at the time of weaning or at the same time of sale which occurred simultaneously with weaning. Therefore, WW reported in these three record systems were not adjusted for age of calf, age of dam or sex.

Forecasted delivery weight of sale lots of beef calves identified as "non-weaned" and sold through Superior Livestock Auction (SLA) from 1995 to 2016 were evaluated. Data from two regions were analyzed: North Central/Rocky Mountain region (NC) and South Central region (SC). Only data associated with sale dates and projected delivery dates representing spring-calving operations were included. Finally, sale lots that were identified as "implanted" were analyzed separately from sale lots identified as "non-implanted."

The final commercial data set included actual and adjusted WW of commercial cow-calf operations participating in the Alabama Beef Cattle Improvement Association (BCIA) from 1983 to 2017. Data sets included in the analysis as well as number of herds participating in each data set are included in Figure 1 and Figure 2.

Adjusted annual average WW reported by the American Angus Association and American International Charolais Association were used to evaluate trend over time for Angus and Charolais bull calves from 1995 to 2016.

Results

Among the four enterprise analysis record systems, only one had a significant increase in WW during this period of time (Figure 1). Records from the KFMA indicated an average increase in weight of calves sold at weaning of just over 1 pound (lb.) per year from 1991 to 2015. There was no significant change over time in the other three programs.

Projected delivery weight of non-implanted SLA calves increased from 1995 through 2007 and plateaued at 550 lb. Similarly, projected delivery weights for SLA implanted calves increased until 2006 before plateauing at 592 lb. On average, commercial cow-calf producers from the North Central and Rocky Mountain region of the U.S. do not anticipate increased delivery BW of non-weaned beef calves and have not since about 2007.

It should be noted that the difference in projected delivery weight of implanted and non-implanted calves is substantially greater than differences reported in studies designed to measure

WW differences due to implants administered at branding time. This greater difference suggests that other management and (or) genetic factors (beyond implants) contributed to increased projected delivery weight.

In Alabama, actual and adjusted WW increased until about 1998, where they plateaued at 555 lb.

With several indications of stabilizing commercial weaning weights over time, we decided to look at the trend in seedstock operations' phenotypic trend to determine if the pattern was similar. Figure 3 shows the adjusted WW for Charolais and Angus bull calves from 1995 through 2016. This data suggests that while adjusted WW are still increasing in these two beef cattle breeds, the rate of progress in this trait is slowing.

Summary

Overall, these results indicate that trends for WW in commercial cow-calf operations vary substantially by region of the country. However, there is considerable evidence that progress in WW may be limited by the production environment in commercial cow-calf operations.

Perhaps one of the most important takeaways from this study is that commercial cow-calf producers need to keep good records in order to monitor progress in WW and enterprise cost of production over time.

Assuming a lack of significant progress in calf WW, efforts to enhance profitability should focus on reducing cost of production and/or capturing value of genetic potential for post-weaning performance and carcass value. AJ

Editor's note: Contributing authors and researchers include Claire Andresen, Carla Goad, Lisa Kriese-Anderson, Michael King and Ken Odde. Full publication is in the Journal of Applied Animal Science.

Figure 1: ***Weaning or marketing BW of beef calves at weaning***

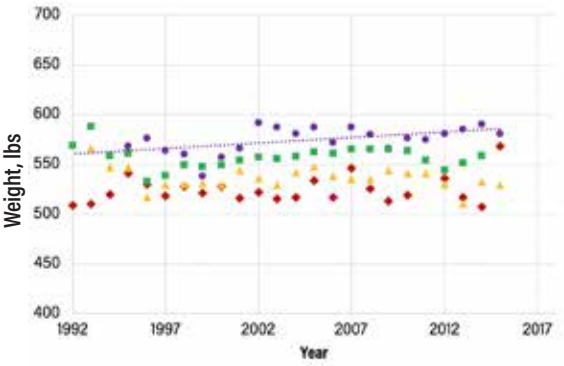

Figure. 1. Weaning or marketing BW of beef calves at weaning in four cow/calf enterprise record analyses programs (SPA = Standardized Performance Analysis (♦); KFMA = Kansas Farm Management Association (●); CHAPS = Cowherd Appraisal Performance Software (■); FINBIN (▲)). The linear slope (1.10 lbs; $P < 0.05$) for the KFMA data is shown. Change over time in weaning BW did not significantly differ from 0 in the other programs ($P > 0.25$).

Figure 2: ***Mean forecasted delivery weight***

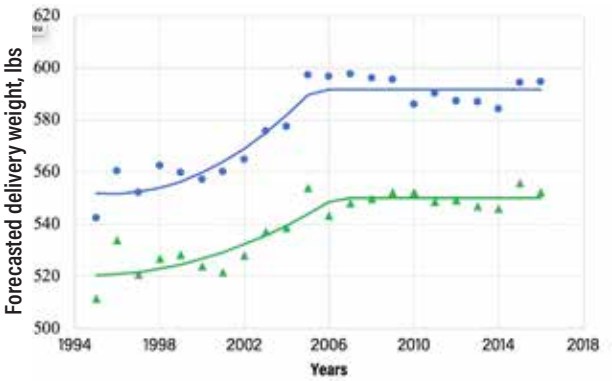

Figure 2. Mean forecasted delivery weight of implanted (●) and non-implanted (▲), non-weaned beef calves originating from the North Central region offered for sale through Superior Livestock video auctions. States in this region were Colorado, Iowa, Minnesota, Montana, Nebraska, North Dakota, South Dakota, Wisconsin, and Wyoming. Data were restricted to calves offered for sale during the months of June, July, August, and forecasted to be delivered in October or November of the same year: 1995 through 2016. The breakpoint for NC non-implanted calves occurred in 2007 with a plateau of 550 lbs. The breakpoint for NC implanted calves occurred in 2006 with a plateau of 592 lbs.

Figure 3: ***Phenotypic trends for adjusted weaning BW***

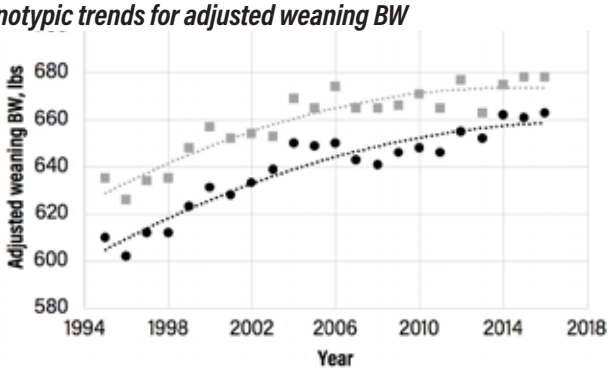

Figure 3. Phenotypic trends for adjusted weaning BW in Charolais (■) and Angus (●) bull calves: 1995 through 2016. All model parameters are significant at $P < 0.01$.