Effect of Weaning Date (Normal vs. Late) on Performance of Young and Mature Beef Cows and Their Progeny in a Fall Calving System in the Southern Great Plains

Hudson et al., 2010, Oklahoma State University

Data from 158 predominantly Angus fall-calving beef cows were used in four consecutive years to determine the effects of weaning date and cow age class on cow and calf performance. Treatments were arranged in a 2 x 2 factorial with 2 weaning dates and 2 age classes (young cows ≤ 3 yr and mature cows ≥ 4 yr). Weaning dates were 1) normal weaning in mid-April at 210 d of age (NW) and 2) late weaning in mid-July at 300 d of age (LW).

- Mature cows were heavier than young cows throughout the trial, although body condition scores were similar among cow age classes.
- Cow body weight and body condition scores were similar among weaning treatments at normal weaning; however, at the beginning of the calving season, normal-weaning cows were heavier (1,290 lb vs. 1,239 lb) and had greater body condition scores (6.6 vs. 6.0) than late-weaning cows.
- Postpartum body weight and body condition score losses were greater for normal-weaning cows, resulting in similar body weight and body condition scores at the beginning of the breeding season and until April.
- Progeny of normal-weaning cows were 5 lb heavier at birth and grew faster before the April weaning date, resulting in increased body weight (18 lb) at the time of normal weaning. This increase in body weight gain may be partially explained by the increased milk production of normal-weaning cows.
- Although normal-weaning calves had increased body weight in April, late-weaning calves were heavier in July because of increased average daily gain during the weaning interval (2.49 lb vs. 1.76 lb).
- A cow age class x weaning date interaction was detected for pregnancy rate. Pregnancy rates were greater for late-weaning mature cows (96.7%) and normal-weaning young cows (98.4%) than for late-weaning young cows (89.3%).
- However, pregnancy rate of normal-weaning mature cows (90.2%) did not differ from that of late-weaning mature or late-weaning young cows, but was less than that of normal-weaning young cows.

These findings indicate that producers may benefit from matching weaning date to cow age class. It appears more advantageous to delay weaning of calves born to dams 4 years or older while maintaining normal weaning for dams 3 years or younger at the time of calving. Late weaning had no detrimental effects on the performance of mature cows.
Evaluation of Fixed Sources of Variation and Estimation of Genetic Parameters for Incidence of Bovine Respiratory Disease in Preweaned Calves and Feedlot Cattle

Schneider et al., 2010, Iowa State University

The primary objective of this study was to estimate variance components and heritability of bovine respiratory disease (BRD) incidence in beef calves before weaning and during the finishing phase. The second objective was to investigate the impact of BRD incidence and treatment frequency on performance and carcass traits. Bovine respiratory disease is the biggest and most costly health challenge facing the cattle industry. The two populations used consisted of 1,519 preweaned calves and 3,277 head of feedlot cattle.

- The incidence rate of BRD in preweaned calves was 11.4%, and among treated cattle, 82.1% were treated once, 13.9% were treated twice and 4.0% were treated three or more times.
- The incidence of BRD and the number of treatments had no significant effect on weaning body weight.
- Heritability estimates of the entire preweaned population for BRD resistance and number of treatments were 0.11 ± 0.06 and 0.08 ± 0.05, respectively.
- The observed BRD incidence rate for feedlot cattle was 9.4%. Incidence of BRD significantly decreased overall and acclimation average daily gain by 0.13 ± 0.02 lb/d and 0.62 ± 0.07 lb/d, respectively.
- Carcass traits were also significantly affected by BRD incidence; untreated cattle had a 20.1 ± 3.75 lb heavier hot carcass weight.
- The heritability estimate of BRD incidence and the number of treatments were 0.07 ± 0.04 and 0.02 ± 0.03, respectively.
- Estimates of genetic correlations of BRD incidence with production traits were -0.63 ± 0.22 for acclimation ADG, -0.04 ± 0.23 for on-test ADG, -0.31 ± 0.21 for overall ADG, -0.39 ± 0.21 for final BW, -0.22 ± 0.22 for HCW, -0.03 ± 0.22 for LM area, 0.24 ± 0.25 for fat and -0.43 ± 0.20 for marbling score. Similar results for the number of treatments and production traits were -1.00 ± 0.68 for acclimation ADG, -0.04 ± 0.39 for on-test ADG, -0.47 ± 0.41 for overall ADG, -0.66 ± 0.40 for final BW, -0.58 ± 0.45 for HCW, -0.12 ± 0.38 for LM area, 0.42 ± 0.50 for fat and -0.32 ± 0.37 for marbling score.

Because of the high economic cost associated with BRD incidence, even these modest estimates for heritability of BRD resistance should be considered for incorporation into beef cattle breeding programs.

Efficacy of Endo-Fighter for Reducing Severity of Tall Fescue Toxicosis in Beef Cattle

Norman et al., 2010, University of Tennessee

A field trial and two grazing experiments were conducted to determine the efficacy of Endo-Fighter (ADM Alliance Nutrition, Inc., Quincy, IL), a product designed for cattle grazing wild-type endophyte-infected tall fescue (Lolium arundinaceum). A 126-d (June 1 to October 5) field trial with beef (Bos taurus) steers (body weight = 606 lb) had 2 treatments: a control (n = 53; MasterGain mineral, ADM Alliance Nutrition Inc.) and Endo-Fighter (n = 67; MasterGain mineral with Endo-Fighter).

- There was no difference in body weight gain between the control and Endo-Fighter treatments.
- During midday, more steers receiving Endo-Fighter were observed grazing than control steers.

Two 84-d grazing experiments were conducted in yr 1 (August 24 to November 17) with crossbred heifers (n = 60; body weight = 717 lb) and in yr 2 (June 14 to September 7) with crossbred steers (n = 60; body weight = 589 lb). Fifteen ‘Jesp’ wild-type endophyte-infected tall fescue pastures were used in each experiment. Mineral treatments were as follows: 1) MasterGain (control); 2) Endo-Fighter and 3) a prototype (ADM Alliance Nutrition, Inc.). Mineral consumption and grazing behavior were determined at 14-d intervals. Animals were weighed to determine average daily gain. Blood serum prolactin was measured at each weighing day.

- Animal performance and prolactin concentration were not affected by feeding Endo-Fighter or the prototype in either grazing experiment.

Consumption of Endo-Fighter altered animal grazing behavior but did not affect the body weight gain of cattle consuming wild-type endophyte-infected tall fescue.
Performance and Serum Metabolites of Fall-Weaned Beef Steers Strip-Grazing on Nonstockpiled Tall Fescue
Boland et al., 2010, Virginia Polytechnic Institute and State University

Seventy-two spring-born beef calves were evaluated in two consecutive years (36 calves/yr) during a 42-d backgrounding period to determine the effects of weaning and endophyte infection of tall fescue on performance, apparent dry matter intake, percent forage utilization and serum metabolite concentrations. In each year, four calves were assigned to each pasture (n = 3 pastures/treatment) and grazed endophyte-free, toxic endophyte-infected or non-ergot alkaloid-producing endophyte-infected tall fescue.

- No effect of tall fescue type (wild-type Kentucky-31, E+ Kentucky 31 and Quantum AR542 novel NE tall fescue) was detected on apparent dry matter intake, average daily gain or serum concentrations of blood urea nitrogen, creatine kinase, glucose and nonesterified fatty acids.
- Postgrazing forage mass tended to be greater for endophyte-infected pastures, and percent forage utilization differed among tall fescue types, being lowest for endophyte-infected tall fescue (31.2%).
- All 3 tall fescue types provided enough forage mass and nutritive value to support body weight gains in excess of 2.2 lb/day in newly weaned beef calves.

Factors Influencing Price of North Dakota, South Dakota and Montana Feeder Calves
Leupp et al., 2009, North Dakota State University

Our objective was to determine factors influencing the sale price of feeder calves from North Dakota, South Dakota and Montana auction markets. Data were collected at three auction markets in North Dakota and two auction markets each in South Dakota and Montana in fall 2007 (59,855 calves; 531 pounds of average weight; three sales per market) and winter 2008 (39,454 calves; 625 pounds of average weight; three sales per market). Data were collected during the same weeks in each state to reduce confounding effects of fluctuations in market patterns. The following data were collected for each lot of calves sold: lot size, sex, weight, breed description, vaccination history, implant status and natural program qualification.

- In the fall, producers who sold calves in lot sizes of 21 or more head received greater prices when compared with producers who sold calves in lots of 20 or fewer head. Calves sold in lot sizes of 11 to 20 were priced greater than calves sold in lot sizes of 10 or fewer. Lot sizes of six to 10 received greater prices than lot sizes of five or fewer head.
- The price for steers was $9.68/cwt greater than for heifers.
- The price for black cattle was greater than for all other colors of cattle. Mixed and red cattle were priced similarly but greater than white cattle.
- Mixed-color and red cattle were priced similarly; however, mixed-color cattle tended to sell for greater prices than white cattle.
- Red and white cattle were priced similarly.
- Calves sold with a seven-way clostridial, four-way viral and Pasteurella vaccines were priced greater than calves vaccinated with a four-way viral vaccine only or no vaccination history.
- Price received for calves vaccinated with a four-way viral vaccine was greater than for calves with no vaccination history.
- No differences in price were observed for implant status or natural program-qualified calves.
- In winter, the price received for lot sizes of 21 or more and 11 to 20 was similar but was greater than for lots of 10 or fewer head. Lot sizes of six to 10 were priced greater than lots of five or fewer head.
- The price for steers was $8.99/cwt greater than for heifers.
- The price for black cattle was greater than for all other colors of cattle. Mixed and red cattle were priced similarly but greater than white cattle.
- Vaccinated calves brought a greater price than calves with no vaccination history.
- No differences in price were observed for implant status or natural program-qualified calves.

Data suggest feeder calf price is dependent on multiple factors. Selling calves in larger lot sizes with vaccinations is economically advantageous.
Effect of Weaning and Production Management Strategies on Calf Growth and Carcass Traits
Thompson et al., 2009, North Dakota State University

The effect of shifting calf-weaning age on profiles of energy status (body weight, body condition score and rib and rump fat) and reproductive performance of beef cows was evaluated in a 3-yr study. Pregnant and lactating crossbred beef cows (n = 408), mainly of Angus and Hereford breeding, were assigned into two treatments: weaning at approximately 180 days (early weaning) and normal weaning 45 days later (control). Cows were managed together on native range pastures and supplemented with harvested forage during the winter months. Cow body weight, body condition score, rib fat and rump fat were measured periodically from early weaning through the next breeding. Reproductive performance was evaluated by calving intervals, days from initiation of breeding to calving, retention in the herd and adjusted 205-d weaning BW of the subsequent calf.

- Early-weaned cows had greater body weight at normal weaning than control cows, but the overall pattern of cow body weight did not differ among treatments.
- Body condition scores were greater at each period in early weaned than in control cows and in cows ≥ 5 years old than in younger cows.
- Mean calving intervals (372.4 ± 2.1 days) and breeding to calving (299.7 ± 1.9 days) were not affected by treatment but varied with age of the cow. The intervals were longer in primiparous cows than in older cows.
- Early weaning decreased risk of culling in cows and thereby increased overall persistence by 11% over control cows.
- Earlier weaning of cows in the previous year increased weaning weight of the subsequent calf by 19 lb per cow per year.

Shifting weaning time increased storage of consumed energy, as evidenced by increased rump fat, for use later during high-energy demand, ultimately improving overall productivity of the cow-calf system.

Effects of Mineral Supplementation and Inorganic vs. Organic Mineral Sources on Liver and Blood Serum Levels and Performance of Beef Cows and Their Calves
Anderson et al., 2009, North Dakota State University

Mature beef cows (n = 68) were allotted to one of three treatments to evaluate mineral supplementation strategies. After a nine-month period in which no minerals were fed, mature crossbred beef cows were allotted to a control (no mineral), inorganic or organic mineral supplement from post-calving until weaning.

- Copper was the only mineral observed to be depleted to near deficiency, but either inorganic or organic mineral treatments increased copper stores in the liver.
- No differences in cow or calf performance were observed due to mineral treatments; however, long-term production may be affected without proper mineral nutrition.
- Mineral nutrition research is difficult at best, with subtle changes in animals and long-term response. The data suggests that stores of several minerals in this herd were adequate to cover the depletion phase with the possible exception of copper. While we did not observe differences in animal performance, one should be careful not to draw conclusions that mineral supplementation is not required because feeding programs, water and mineral stores can differ widely from site to site. Longer-term studies evaluating herd health and mineral status under different production scenarios would be of interest but require significant resources. Consistent, high-quality mineral nutrition supports healthy animals with nutrients supplied by grazing, stored feeds, water or supplementation.

Tom R. Troxel
Professor and Associate Department Head - Animal Science

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