



Effects of Low-Stress Weaning on Calf Growth Performance and Carcass Characteristics

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Objectives

The objective of this study was to compare the influence of two low stress weaning methods with conventional weaning on post-weaning performance and carcass characteristics of beef steers.

Materials and Methods

Angus × Simmental crossbred steer calves ($n = 90$) from a single source were stratified by body weight and dam age into three groups; one treatment was randomly assigned to each group: ABRUPT (calves isolated from dams on the day of weaning), FENCE (calves separated from dams via a barbed wire fence for 7 d prior to completely weaning), and NOSE (nose-flap inserted and calves remained with dams for 7 d prior to completely weaning). At d +7 post-weaning calves were transported to a commercial feedlot where they received standard step-up and finishing rations typical for a Northern Plains feedlot. To understand the influence of each weaning method on haptoglobin (an acute-phase protein), blood samples were collected via coccygeal venipuncture at d -7 (PreTreat), 0 (Weaning), and +7 (PostWean) from a subsample of calves ($n = 10$ per treatment) and analyzed using a bovine haptoglobin ELISA kit. Body weights (BW) were recorded on study d -34 (PreWean), -7 (PreTreat), 0 (Weaning), 7 (PostWean), 32 (Receiving), 175 (Ultrasound), and 253 (Final) and average daily gains (ADG) were calculated between each time period. On d 175 post-weaning BW were recorded, and ultrasound fat thickness and intramuscular fat were determined and utilized to project marketing dates. Carcass measurements were recorded at the time of harvest and included hot carcass weight, 12th rib backfat, ribeye area, USDA Yield Grade and Quality Grade, and marbling score. Haptoglobin, BW, and ADG data were analyzed as repeated measures using the ante-dependence covariance

structure in the MIXED procedure of SAS (SAS Inst. Inc., Cary, NC) for effects of weaning treatment, day, and their interaction; birth weight was included as a covariate for ADG and BW. Carcass traits were analyzed for the effect of weaning treatment using the MIXED procedure. Separation of least-squares means was performed using LSD with a Tukey's adjustment and assuming an α level of 0.05.

Results

Weaning method interacted ($P < 0.0001$) with time period for ADG and BW. Calf BW increased in all treatments until the PostWean period, wherein BW decreased ($P < 0.0001$) in ABRUPT and NOSE and was maintained ($P > 0.05$) in FENCE. From the Receiving to Final time periods BW increased similarly ($P > 0.05$) for all treatments. Calf ADG was greater ($P < 0.01$) in calves in the NOSE treatment at Weaning than ABRUPT or FENCE. In the PostWean period, the FENCE calves had ADG that was not different ($P > 0.05$) than zero but was greater ($P < 0.0001$) than the negative ADG of ABRUPT and NOSE calves. During the Receiving period ADG was greater ($P < 0.05$) for ABRUPT compared to NOSE and FENCE. Time influenced ($P < 0.001$) haptoglobin concentration. No difference in haptoglobin was observed between the PreTreat and Weaning or PostWean periods; however, haptoglobin concentration was greater ($P < 0.001$) at PostWean compared to Weaning. Weaning method did not influence ($P > 0.05$) carcass measurements.

Conclusion

Collectively these data suggest low stress weaning methods do not significantly improve post-weaning growth performance or carcass merit compared to calves weaned using conventional methods.