



EXTENSION
BEEF CATTLE RESEARCH UPDATE
Britt Hicks, Ph.D., PAS
Area Extension Livestock Specialist

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

Beef calves are traditionally weaned by abrupt remote separation from their dams. Weaning is one of the most stressful events in a calf's life. Minimizing weaning stress should improve calf health and weight gain. Therefore, alternative weaning strategies aim to reduce stress at weaning. Low-stress weaning strategies divide the weaning process into two stages: 1) physical separation from dams and 2) separation from milk as a nutritional source. Two low-stress strategies that have been utilized in the beef industry include fence-line weaning and the application of anti-suckling devices. Fence-line weaning involves the separation of calves from their dams via a fence such that they reside in adjacent pens or pastures allowing social interaction while preventing suckling (nutritional separation). Anti-suckling devices are inserted into a calf's nose to prevent suckling but allow contact between the calf and the dam.

Research has evaluated the influence of low-stress weaning methods on calf physiology, performance, and health for a short period (days to a few weeks) during and immediately after the weaning process. In general, this research has shown that low-stress weaning results in less stress on calves following weaning compared with the traditional abrupt separation of the calves from their mothers which may minimize reductions in weight gain often associated with weaning.^{1, 2, 3, 4} However, studies investigating the impact of low-stress weaning methods on long-term feedlot performance and carcass characteristics of beef cattle are limited.

South Dakota State University researchers conducted a case study to compare the influence of two low-stress weaning methods with conventional weaning on post-weaning performance and carcass characteristics of beef steers.⁵ In this study, 89 single-sourced steer calves were stratified by body weight and dam age into three groups in a completely randomized design: ABRUPT (calves isolated from dams on the day of weaning), FENCE (calves separated from dams via a fence for 7 days prior to completely weaning), and NOSE (nose-flap inserted and calves remained with dams for 7 days prior to completely weaning). At 7 days post-weaning, the calves were transported to a commercial feedlot where they received standard step-up and finishing rations typical for a Northern Plains feedlot. Body weights were recorded in the study on day -7 (PreTreat), 0 (Weaning), 7 (PostWean), 26 (Receiving), 175 (Ultrasound – used to project marketing dates), and 238 or 268 (Final), and average daily gains (ADG) were calculated for each time period.

This research showed that weaning method interacted ($P < 0.01$) with the time period for ADG and body weight. ADG was greater ($P < 0.01$) for calves in the NOSE treatment during the PreTreat to Wean period than for calves in ABRUPT and FENCE, while ABRUPT and FENCE calves had similar ($P > 0.05$) ADG (Figure 1). During the Weaning to PostWean period, the FENCE calves had greater ($P < 0.01$) ADG than ABRUPT and NOSE. During the Postwean to Receiving period ADG was greater ($P < 0.04$) for ABRUPT compared to FENCE and NOSE. For the remainder of the feeding period, gains were similar among treatments. In addition, weaning method did not influence ($P > 0.05$) hot carcass weight, ribeye area, 12th rib fat thickness, yield grade, or marbling score.

These authors concluded that this case study suggest “low-stress weaning methods reduce performance during the weaning stress period, but they do not significantly influence overall post-weaning growth performance or carcass characteristics compared to calves weaned using conventional methods”. Thus, “it may be efficacious for producers to take into consideration and implement low-stress weaning methods for improved performance at weaning or during early backgrounding phases if calves are to be marketed during those time periods. Alternatively, if calves will not be marketed during or immediately after weaning, these data suggest producers can expect overall performance and economic returns to be unaffected by weaning method.”

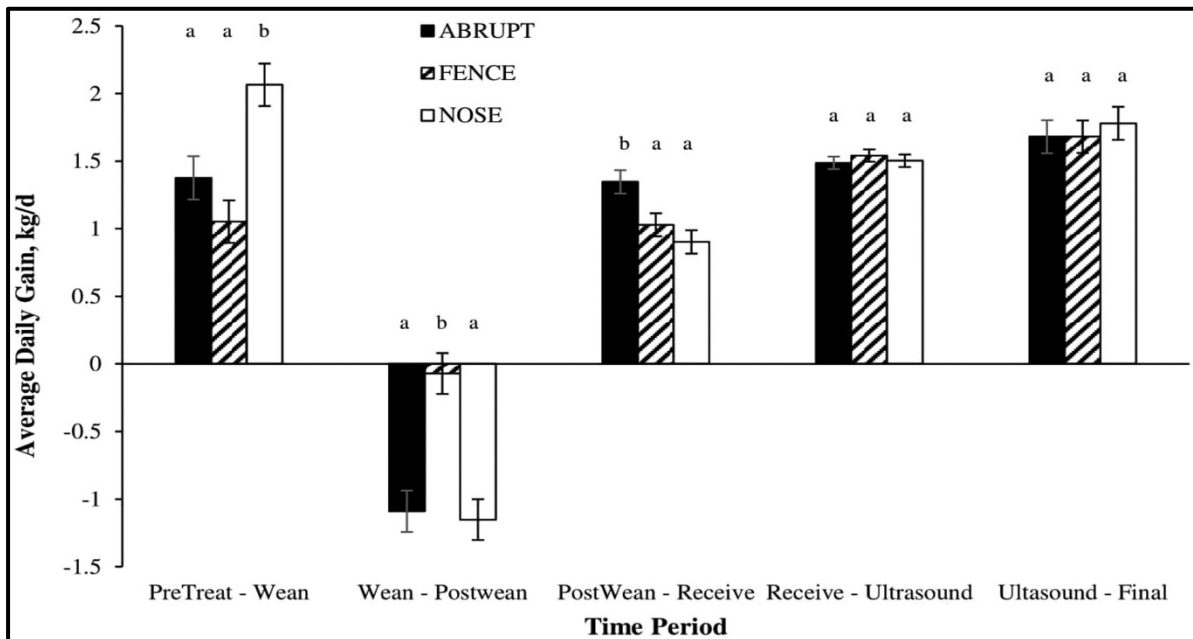


Figure 1. Least squares means for the interaction of weaning treatment by time period¹ on average daily gain².

¹ABRUPT: calves isolated from dams on the day of weaning), FENCE: calves separated from dams via a barbed wire fence for 7 days prior to complete weaning), and NOSE: nose-flap inserted and calves remained with dams for 7 days prior to complete weaning).

²Average daily gains were calculated for each time period among BWs recorded on study day -7 (PreTreat), 0 (Weaning), 7 (PostWean), 26 (Receiving), 175 (Ultrasound), and 238 or 268 (Final).

^{ab}Bars within each time period lacking a common superscript differ ($P \leq 0.05$).

- ¹ Price, E. O., J. E. Harris, R. E. Borgwardt, M. L. Sween, and J. M. Connor. 2003. Fenceline contact of beef calves with their dams at weaning reduces the negative effects of separation on behavior and growth rate. *J. Anim. Sci.* 2003: 116-121.
- ² Boland, H. T., G. Scaglia, W. S. Swecker Jr., and N. C. Burke. 2008. Effects of alternate weaning methods on behavior, blood metabolites, and performance of beef calves. *Prof. Anim. Sci.* 24: 539-551.
- ³ Campistol, C., H. G. Kattesh, J. C. Waller, E. L. Rawls, J. D. Arthington, T. E. Engle, J. A. Carroll, G. M. Pighetti, and A. M. Saxton. 2013. Effects of 2-stage and total versus fenceline weaning on the physiology and performance of beef steers. *Prof. Anim. Sci.* 29:501–507.
- ⁴ Lippolis, K. D., J. K. Ahola, C. E. Mayo, M. C. Fischer, and R. J. Callan. 2016a. Effects of two-stage weaning with nose flap devices applied to calves on cow body condition, calf performance, and calf humoral immune response. *J. Anim. Sci.* 94:816–823.
- ⁵ Gubbels, E. R., J. R. Jaeger, R. R. Salverson, K. M. Cammack, J. K. Grubbs, K. R. Underwood, K. C. Olson and A. D. Blair. 2023. Case study: effects of low-stress weaning on calf growth performance and carcass characteristics. *Transl. Anim. Sci.* 7. Available: <https://doi.org/10.1093/tas/txad015>.