BEEF CATTLE RESEARCH UPDATE

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Effect of Length of Weaning Period and Timing of Vaccination on Performance and Health of Newly-Received Ranch-Direct Feedlot Calves

Recent Kansas State University research evaluated the effects of the length of the weaning period and timing of vaccination against bovine respiratory diseases (BRD) on the health and performance of fall-weaned, ranch-direct beef calves during a 60-day feedlot receiving period.[1] In this study, 437 Angus x Hereford calves (average initial weight = 458 lb) were weaned 45, 15, or 0 days before shipment to a feedlot. At the time of weaning, calves were 175 to 220 days of age. Within each weaning period treatment, the calves were randomly assigned to one of two vaccination treatments. One group was vaccinated 14 days before maternal separation and again at weaning. The second group was vaccinated on the day of arrival at the feedlot and again 14 days later. During the weaning period, the calves were fed a 58% concentrate diet (42% alfalfa, 15.3% crude protein and 0.39 Mcal/lb of NEg, dry matter basis) to achieve gains of 2.0 lb/day at a dry matter intake of 2.5% of body weight. At the time of shipment, the calves were transported to a commercial auction barn (4 hours in transit) where they were commingled and held for 12 hours before shipment to the feedlot (5 miles). The purpose of this commingling period was to simulate the pathogen exposure typically encountered by market-ready calves. Upon arrival at the feedlot, the calves were adapted to a 74.5% concentrate receiving ration (25.5% sorghum silage, 15.9% crude protein and 0.51 Mcal/lb of NEg, dry matter basis) and performance was monitored during a 60-day receiving period.

It was reported that calf daily gain during the 60-day receiving period was similar (P = 0.62) between calves weaned for 45 or 15 days before shipment; however both groups tended to gain faster than calves (P < 0.07) shipped directly to the feedlot after weaning (Figure 1). It was also reported that dry matter intake during the receiving period increased (P < 0.03) successively with the length of the weaning period (Figure 2). Apparently, more experience consuming dry diets from a feedbunk before shipping translated to greater feed intake and greater average daily gain during the receiving period. Feed efficiency was not influenced (P = 0.30) by the length of the weaning period. Similarly, the length of the weaning period had no affect (P = 0.73) on the incidence of BRD.

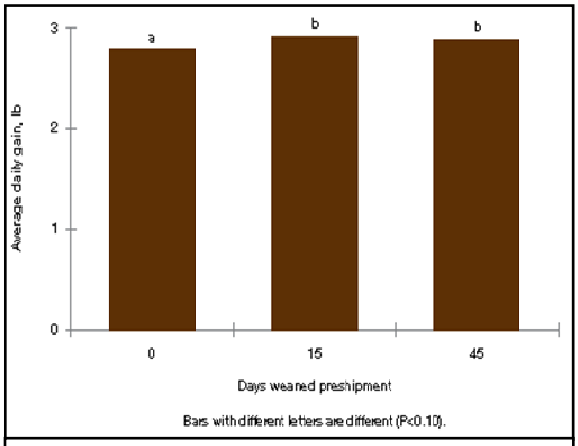

Figure 1. Effect of length of weaning period at the ranch of origin on average daily gain of calves during a 60-day feedlot receiving period. Source: Macek et al., 2010

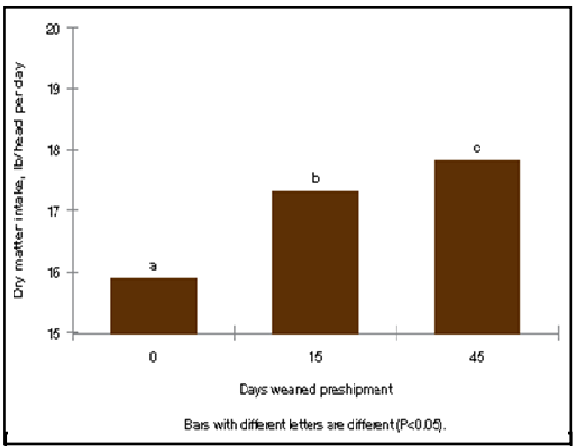

Figure 2. Effect of length of weaning period at the ranch of origin on dry matter intake of calves during a 60-day feedlot receiving period. Source: Macek et al., 2010

Timing of vaccination did not affect calf performance or the incidence of BRD during the receiving period. It was noted that only 4 of the 437 calves were treated during this period. The response to the timing of vaccination might have been different with typical market-sourced cattle that have had greater pathogen exposure then these ranch-direct calves.

These researchers concluded that weaning periods longer than 15 days at the ranch of origin do not improve health or performance of ranch-direct calves when they enter the feedlot. These results are supported by

previous Kansas research.[2,3,4] This study also suggested that pre-shipment vaccination may not improve health or performance of ranch-direct cattle relative to vaccination that is deferred until feedlot arrival.

Evaluation of High-Intensity and Low-intensity Preconditioning Systems

Recent joint research between Texas A&M University and New Mexico State University evaluated the impacts of high-intensity vs. low-intensity preconditioning management systems on performance and profitability to the cow-calf producer.[5] Fall weaned steer calves (345 head) were used to evaluate three different 56-day preconditioning systems in each of two years (2008 and 2009). The systems consisted of ad libitum access to a self-fed 65% concentrate, ground-milo based diet in drylot (SF-DL), ad libitum access to the same self-fed diet while grazing dormant warm season pasture (SF-PAS), and hand-fed 20% crude protein cubes three times per week to average 2.0 lb/day while grazing dormant warm season pasture (HF-PAS). An economic analysis was run each year based on current local prices for cattle and inputs. Morbidity and mortality were similar among treatments. In 2008, 183 calves initially weighing 558 lb were used and in 2009, 162 calves initially weighing 531 lb were used. It was reported that across years, that average daily gains were significantly lower in ($P < 0.01$) HF-PAS steers (0.31 lb/day) as compared to the other two groups (1.87 and 1.94 lb/day, respectively for SF-DL and SF-PAS). In 2008, daily feed intake was similar among SF-DL and SF-PAS groups (19.9 vs. 22.1 lb/day, $P = 0.17$). In 2009, intake was greater for SF-DL than SF-PAS groups (22.3 vs. 18.3 lb/day, $P = 0.04$). The economic analyses for each year are reported in Table 1. Preconditioning costs were significantly greater for the two ad libitum fed groups as compared to the cube fed steers due to greater feed costs. All three systems resulted in net income losses in both years. In 2008, the SF-DL calves lost the least ($51.78), whereas, in 2009, the cube fed calves lost the least ($26.94). Price premiums of $13.58, 10.29, and 8.09 per cwt in 2008 and $5.51, 13.76, and 11.06 per cwt in 2009 would be required for HF-PAS, SF-PAS, and SF-DL to be par with sale at weaning.

Table 1. Preconditioning Financial Analysis

Item	HF-PAS	SF-PAS	SF-DL	P-value
2008				
Total expenses, $	89.72[a]	173.51[b]	160.19[b]	<0.01
Net income, $	-74.11	-66.18	-51.78	0.05
Premium required, $/cwt	13.58[a]	10.29[b]	8.09[b]	0.01
2009				
Total expenses, $	52.17[a]	151.31[b]	140.27[b]	<0.01
Net income, $	-26.94	-78.59	-63.14	0.18
Premium required, $/cwt	5.51	13.76	11.06	0.26

[a,b] Means with different superscripts differ.

Source: Orsak et al., 2010

These researchers concluded that pasture based preconditioning systems may reduce input cost of gain but not improve profitability. In addition, these results suggest that preconditioning may not be an economically viable practice for cow-calf producers unless a significant price premium is received.

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[1] Macek, M. J., J. W. Iliff, K. Olson, J. R. Jaeger, T. B. Schmidt, D. U. Thomson, and L. A. Pacheco. 2010. Length of weaning period but not timing of vaccination affects feedlot receiving performance and health of fall-weaned, ranch-direct beef calves. Kansas State Univ. Beef Cattle Research Report of Progress 1029:15-21.

[2] Bolte, J. W., K. C. Olson, J. R. Jaeger, D. U. Thomson, B. J. White, R. L. Larson, G. A. Milliken, N. A. Sproul, and M. D. Thomas. 2008. Length of the weaning period does not affect post-weaning growth or health of lightweight summer-weaned beef calves. Kansas State Univ. Beef Cattle Research 2008 Report of Progress 995:49-54.

[3] Bolte, J. W., K. C. Olson, J. R. Jaeger, T. B. Schmidt, D. U. Thomson, B. J. White, R. L. Larson, N. A. Sproul, L. A. Pacheco, and M. D. Thomas. 2009. Length of the weaning period affects postweaning growth, health, and carcass merit of ranch-direct beef calves weaned during the fall. Kansas State Univ. Beef Cattle Research 2009 Report of Progress 1010:1-10.

[4] Bolte, J. W., K. C. Olson, J. R. Jaeger, T. B. Schmidt, D. U. Thomson, B. J. White, R. L. Larson, G. A. Milliken, N. A. Sproul, L. A. Pacheco, and M. D. Thomas. 2009. Length of the ranch-of-origin weaning period does not affect post-receiving growth or carcass merit of ranch-direct, early-weaned beef calves. Kansas State Univ. Beef Cattle Research 2009 Report of Progress 1010:11-17.

[5] Orsak, A. N., J. D. Sugg, J. S. Horn, T. A. Wickersham, C. P. Mathis, C. A. Loest, and J. E. Sawyer. 2010. Evaluation of high-intensity and low-intensity preconditioning systems. Page 111 (Abstr.) in Plains Nutrition Council Spring Conference, San Antonio, TX.