BEEF CATTLE RESEARCH UPDATE

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Effects of Frequency of Protein Supplementation on Performance by Beef Calves Grazing Dormant Native Range

The labor and transportation expenses associated with supplement feeding contribute significantly to the fixed cost of cattle operations. Therefore, feeding supplements on alternate days or three times weekly (eliminate Sunday feeding) instead of daily is a common strategy to decrease cost of production. A 2000 research review of supplementation programs for beef cattle fed forage-based diets concluded that supplementing cattle with high protein supplements (cottonseed meal) three times or once weekly usually gives similar performance compared to daily feeding.[1] In this review, supplementation frequency was most often studied in beef cows consuming low-quality hay or grazing dormant range. However, this practice has met with variable success when used with growing beef cattle.

In University of Nebraska research (2009), crossbred heifers (426 lb initial weight) fed grass hay ad libitum and supplemented with a dried distillers grain plus solubles based supplement (DDGS, 34.1% crude protein, DM basis) 6 days per week had greater daily gains than heifers supplemented three days/week (1.74 vs. 1.59 lb/day; P = 0.01)).[2] In another trial in this study, crossbred steers (469 lb initial weight) grazing winter range and supplemented with a DDGS based supplement (32% crude protein, DM basis) 6 days per week had greater daily gains than steers supplemented 3 days per week (1.81 vs. 1.43 lb/day; (P < 0.05).

Therefore Kansa State University researchers recently evaluated the performance of young, lightweight weaned stocker calves (408 lb) grazing dormant, native tallgrass pastures and supplemented protein either daily or 3 times per week throughout the winter (October 3 thru March 9, 157 days).[3] In this study, the calves were supplemented with pelleted sunflower meal (SFM; 32.1% crude protein, DM basis) at a rate of 15.4 lb DM weekly in concrete bunks. Calves assigned to both treatments grazed a single native tallgrass pasture. Calves were gathered daily at 7 a.m. and sorted into two pens by treatment. Calves supplemented daily were group-fed 2.2 lb SFM per calf. Calves supplemented 3 times weekly were penned and sorted daily, but group-fed 5.13 lb SFM per calf on Monday, Wednesday, and Friday only. The calves were individually weighed following a 24-hour period without access to feed at 28-day intervals throughout the study.

The effects of supplementation frequency on growth performance of the calves is shown in Table 1. Calf body weight (BW) did not differ (P ≥ 0.31) between treatments at any time during the study. Similarly, calf BW change (P = 0.49) over the duration of the study and average daily gain (ADG) over the entire 157 day trial were not different (P = 0.48) between treatments. In this study, the feed delivery cost was estimated to be $0.25 per calf per delivery. Thus, the total delivery cost for daily supplemented calves was $39.25 per calf (157 days × $0.25/calf), whereas feed delivery cost for calves supplemented 3 times weekly was only $16.25 per calf for the 157 day period (65 days × $0.25/calf).

Table 1. Growth performance of calves supplemented with sunflower meal (SFM) either daily or 3 times weekly.

Item	7X[1]	3X[2]	P-value
Weaning BW, lb	404	410	0.42
157 day BW, lb	465	467	0.68
Weight change, lb	59.5	56.5	0.49
ADG, lb	0.37	0.35	0.48
Delivery cost/calf/week	$1.75	$0.75	
Total delivery cost/calf	$39.25	$16.25	

[1]Calves were supplemented with 2.2 lb SFM (DM basis) daily for 157 days.
[2]Calves were supplemented with 5.13 lb SFM (DM basis) 3 times weekly for 157 days.
Adapted from Preedy et al., 2017

These researchers concluded that daily protein supplementation did not improve growth performance relative to 3 times weekly when weekly protein delivery was held constant between treatments. Supplementing stocker calves 3 times weekly saved 59% ($23.00/calf) in feed delivery cost throughout the winter compared with daily supplementation.

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[1] Kunkle, W. E., J. T. Johns, M. H. Poore, and D. B. Herd. 2000. Designing supplementation programs for beef cattle fed forage-based diets. J. Anim. Sci. 77 (E-Suppl.): 1-11.

[2] Stalker, L. A., D. C. Adams, and T. J. Klopfenstein. 2009. Influence of Distillers Dried Grain Supplementation Frequency on Forage Digestibility and Growth Performance of Beef Cattle. Prof. Anim. Sci. 25: 289-295.

[3] Preedy, G. W., J. R. Jaeger, J. W. Waggoner, and K. C. Olson. 2017. Effects of frequency of protein supplementation on performance by beef calves grazing dormant native range. Proc. West. Sec. Am. Soc. Anim. Soc. 68: 261-264.