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## Limit versus full creep-feeding of a high protein supplement to calves grazing late summer bluestem

### Abstract

Limit creep-feeding a 36% protein supplement (avg. salt concentration = 7.9%) was compared with unlimited consumption of the same supplement without salt (full creep-feeding) and with no supplementation. Average daily gain of steer calves was increased ( $P \leq .06$ ) by .19 (limit creep-feeding) and .38 (full creep-feeding) lb per day compared with non-supplemented calves. Average daily gain of heifer calves was not increased by creep feeding. Efficiency with which creep was converted to extra gain was poor for both limit and full creep-feeding groups. Little difference was observed in postweaning average daily gains; however, the calves given ad libitum access to creep feed tended ( $P = .12$ ) to have greater daily gains (1.9 lbs) than non creep-feeding calves (1.6 lbs). Limit creep-fed calves had average daily gains of 1.7 lbs. Feed conversion during the post-weaning period was slightly improved ( $P = .09$ ) in calves that had been given ad libitum access to creep feed.

### Keywords

Cattlemen's Day, 1989; Kansas Agricultural Experiment Station contribution; no. 89-567-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 567; Beef; Limit vs. full creep-feeding; Bluesteam; Protein; Calves

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## LIMIT VERSUS FULL CREEP-FEEDING OF A HIGH PROTEIN SUPPLEMENT TO CALVES GRAZING LATE SUMMER BLUESTEM

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### Summary

Limit creep-feeding a 36% protein supplement (avg. salt concentration = 7.9%) was compared with unlimited consumption of the same supplement without salt (full creep-feeding) and with no supplementation. Average daily gain of steer calves was increased ( $P \leq .06$ ) by .19 (limit creep-feeding) and .38 (full creep-feeding) lb per day compared with non-supplemented calves. Average daily gain of heifer calves was not increased by creep feeding. Efficiency with which creep was converted to extra gain was poor for both limit and full creep-feeding groups. Little difference was observed in postweaning average daily gains; however, the calves given ad libitum access to creep feed tended ( $P = .12$ ) to have greater daily gains (1.9 lbs) than non creep-feeding calves (1.6 lbs). Limit creep-fed calves had average daily gains of 1.7 lbs. Feed conversion during the post-weaning period was slightly improved ( $P = .09$ ) in calves that had been given ad libitum access to creep feed.

### Introduction

Previous research at Kansas State University has compared limit and full creep-feeding of a 16% crude protein (CP) supplement to suckling calves grazing late-summer, Flint Hills range. Conversion efficiencies (lb creep per lb extra gain) in that study were relatively poor, with no benefit observed from limit creep-feeding. Since digestibility and intake of poor quality forage can be negatively affected by supplements containing a low (8 to 14%) concentration of crude protein, use of a high protein creep supplement might alter the response to limit vs. full creep-feeding. Therefore, the objective of our study was to compare limit and full creep-feeding of a high protein (36% CP) supplement to no supplementation for suckling calves grazing late-summer bluestem. We also determined the effect creep feeding has on subsequent postweaning gain and feed conversion.

### Experimental Procedures

Eighty-four Angus x Hereford calves were randomly assigned to three treatments: 1) limit creep-feeding with salt used to limit consumption of a soybean meal + milo supplement available free choice in a creep feeder; 2) full creep-feeding the same soybean meal + milo supplement without salt, offered free choice in a creep feeder; and 3) control, no supplementation. The supplement was approximately 65% soybean meal and 35% rolled

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<sup>1</sup>Appreciation is expressed to Mr. Gary Ritter and Mr. Wayne Adolph for their expert assistance during the data collection.

sorghum grain. Supplement consumption by the limit creep-fed group was held at 1.8 lb/day (excluding salt). An average of 7.8% salt was required to maintain the calves at this level of consumption. Both supplemented groups were initially exposed to the basal supplement without salt for 2 to 3 days.

Treatment groups were randomly assigned to separate bluestem pastures and, subsequently, were rotated among pastures so that all treatments were exposed to each pasture during the course of the study. Stocking rates were similar among treatment groups. Calves were weighed at the beginning (Aug. 11, 1988) and end (Oct. 19, 1988) of the creep period. Before each weigh day, cow/calf pairs were held overnight without feed or water; however, calves were allowed to suckle their dams. The calves were weaned on October 19, 1988, and shipped to the KSU Beef Research Unit for a 43-day growing trial. During this period, the calves were fed an average of 2.5 lb of a 36% protein supplement, .5 lb of milo, and a full-feed of grain sorghum and forage sorghum silages. Final calf weights were taken on December 1, after an overnight stand without feed.

### Results and Discussion

Influence of creep-feeding on average daily gain was dependent ( $P=.07$ ) on calf sex (Figure 8.1). Average daily gain of heifer calves was not significantly increased by limit (2.14 lb/day) or full creep-fed (2.17 lb/day) compared with no supplementation (2.08 lb/day). In contrast, average daily gain for steer calves within the limit and full creep-fed groups was increased ( $P\leq.06$ ) compared with non-supplemented controls (2.32, 2.51, and 2.13 lb/day, respectively). Gains of steer calves in the limit creep-feeding group were less ( $P=.05$ ) than those observed for the full creep-feeding group. The lack of gain response for heifers could have been due to differences in intake. However, since creep intake was not available on an individual basis, verification was not possible. An alternative explanation might be that steers, which would have a slightly greater growth potential, may have been able to use creep feed more efficiently to promote extra gain when faced with the less-than-adequate nutrient supply on late-summer pasture.

The efficiency with which creep feed was converted to extra gain (i.e., gain above the control group) was relatively poor for both groups. However, the conversion efficiency for the limit creep-feeding group (13.8 lbs creep/lb extra gain) was considerably better than that of the full creep-feeding group (23.2 lbs creep/lb extra gain). Daily intake of creep was 1.8 and 5.1 lbs for the limit- and full-creep groups, respectively. Conversion efficiency for the limit-creep group was similar to that observed in a previous trial (13 lbs creep/lb extra gain), in which calves consumed 1.5 lbs/day of a 16% CP supplement.

Postweaning performance is illustrated in Table 8.1. Calves previously on the full-creep treatment gained 0.3 lb per day more than non-creep-fed calves ( $P=.12$ ) in the 43-day feeding period. Limit-creep feeding did not increase postweaning average daily gains. Average dry matter intake varied only slightly among creep treatments and, therefore, the full-creep calves tended ( $P=.09$ ) to be more efficient in feed conversion than non creep-fed calves, 6.5 and 8.3 lb gain per lb feed, respectively. Feed conversion of the limit-creep calves was intermediate (7.8) compared with the other two treatments.

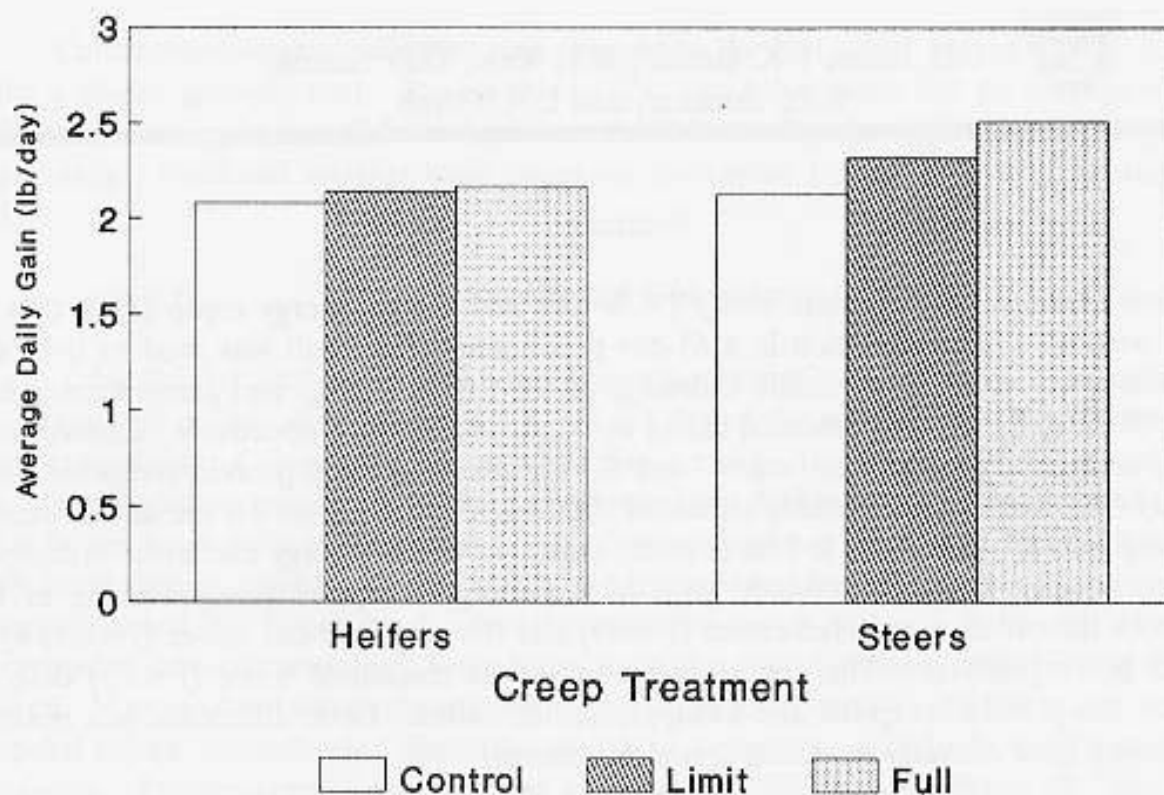


Figure 8.1. Influence of Creep-feeding Treatment on the Average Daily Gain of Steers and Heifers Grazing Late-summer Bluestem (standard error = .06).

Table 8.1. Influence of Creep Feeding on 43-day Postweaning Performance

Item	No Creep	Limit Creep	Full Creep	Standard Error
Number of Calves	29	29	29	
Final Weight, lb	622	643	632	
43-day Postwean Gain, lb	70.3 <sup>a</sup>	73.3 <sup>ab</sup>	83.0 <sup>b</sup>	5.0
Average Daily Gain, lb	1.6 <sup>a</sup>	1.7 <sup>ab</sup>	1.9 <sup>b</sup>	.12
Daily Dry Matter Intake, lb	13.5 <sup>a</sup>	13.1 <sup>a</sup>	12.5 <sup>a</sup>	.49
Feed/Gain	8.3 <sup>a</sup>	7.8 <sup>ab</sup>	6.5 <sup>b</sup>	.61

<sup>ab</sup>Means in a row not sharing the same superscript tend to differ ( $P < .12$ ).