Effect of High vs Low Cow Winter Nutrition and Calf Creep Feeding on Productivity of Fall Calving Cows and Their Calves

S.J. Mayo, D.L. Lalman, G.E. Selk, R.P. Wettemann, and D.S. Buchanan

Story in Brief

Fifty-six mature beef cows were used in a 2 x 2 factorial design to identify effects of level of cow supplementation and creep feeding on cow and calf performance. Angus and Hereford x Angus cows calved during September and October and grazed abundant tall grass prairie throughout the experiment. Cow/calf pairs were assigned to one of eight pastures based on treatment and calving date block. Treatments were: 1) 2 lb of 40% CP supplement with no creep feed (LN); 2) 6 lb of 20% CP supplement with no creep feed (HN); 3) 6 lb of 20% CP supplement with calves having ad libitum access to creep feed (HC); and 4) 2 lb of 40% CP supplement with creep feed (LC). Treatments were initiated on January 7, after the breeding season had ended, and continued through April 14. There were no significant cow nutrition x creep feed interactions. Supplement treatments did not influence cow weight or body condition score (BCS) change during winter or spring. Calf weight gain from January to April (while receiving creep) was increased due to creep feeding (125 vs 180 lb). Creep feeding fall-born calves had no effect on cow weight and BCS change. Sixty-two percent of the additional weight gain from winter creep feeding was retained through weaning. Creep fed calves from low nutrition level cows had enough additional weaning weight to offset the additional feed costs and return an additional $6.30 per calf. Non creep fed calves from the high nutrition cows tended to wean at heavier weights.

Key Words: Beef, Creep Feeding, Cow Performance, Fall Calving

Introduction

Fall calving beef production systems continue to grow in popularity in the Oklahoma beef industry. Factors leading to this gradual change from spring-calving in a portion of the industry include: high pregnancy rate and tight calving seasons because cows generally calve in body condition scores of 6 to 7; reduced disease and death loss because calving occurs primarily during September and October; calves remain on cows through the spring high quality forage period resulting in 600 lb and heavier weaning weights; and larger calves make efficient use of excessive forage production during spring and early summer. Considerable research suggests that feeding supplemental energy, beyond that provided by 3 to 4 lb of protein supplement, may slightly increase calf weight gains but does little to improve nutritional status and body condition of lactating cows (Lusby and Wettemann, 1988; Ovenell et al., 1989; Cox et al., 1989; Ovenell et al., 1990). Restricted cow nutrition from January (end of breeding) through April could reduce cow costs, but might result in lower calf weaning and eventually carcass weight. Profitable creep feeding systems need to be developed for fall calving beef production systems when cows graze native range. It may be more beneficial to feed the calf during winter than it is to feed higher levels of expensive supplements to the cows. This report includes data from the first year of a 2-yr experiment. The objective of this experiment is to determine the influence level of cow

supplementation and creep feeding from end of breeding through early spring, on cow and calf performance.

The cow and calf performance data (up to weaning) will be summarized in this report. Calf feedlot and carcass performance results will be presented in a companion paper in this publication.

Materials and Methods

The study was conducted at the Range Cow Research Center located west of Stillwater, Oklahoma. Fifty-six fall-calving cows were used in a 2 x 2 factorial design. From calving (late August through mid-October) through breeding (Jan. 7), cows were managed as a single contemporary group and supplemented to achieve average body condition score of 5.0 by the end of breeding. Cows were assigned to one of four treatments with two replications of each treatment; therefore eight pasture groups were the experimental units. Treatments consisted of high and low winter cow nutrition, applied from the end of breeding through forage green-up (April 14), and creep or no creep applied at the same time. The four high nutrition groups received the equivalent of 6 lb/d of 20% protein cubes prorated for 4 d/wk feeding. The four low nutrition groups received 2 lb/d of 40% protein cubes prorated for 4 d/wk feeding. Hay was not fed at any time throughout this experiment. Treatment groups were rotated through the pastures every 2 /wk to reduce the possibility of pasture effects on animal performance.

Treatment combination summary:

H C: 6 lb of 20's with creep feed

H N: 6 lb of 20's with no creep feed

L C: 2 lb of 40's with creep feed

L N: 2 lb of 40's with no creep feed.

Creep feed contained 20% CP (DM basis) and included: 25% SBM, 25% cracked corn, 25% wheat middlings, 18.25% soybean hulls, 5% salt, and 1.75% calcium carbonate. Cows and calves were weighed and condition scored prior to the initiation of the study and at 28-d intervals through weaning. All weights were recorded after a 16-h removal from feed and water.

For the economic analysis, creep feed was valued at $160 per ton. The high energy 20% range cubes supplement fed to cows was also valued at $160 per ton, whereas the 40% high protein supplement was priced at $225 per ton. Each additional pound of calf weight gain was assigned a value of $.55 /lb.

Data were analyzed using analysis of variance with cow nutrition treatment, calf creep feed treatment, calf sex, cow age, treatment replication and all significant interactions as sources of variation. Weight changes of cows and calves in the winter (January to April), weight changes of cows and calves in the spring (April to July), and total weight changes from January to July

were analyzed. Other variables examined include body condition score changes of cows in the winter, spring, and January to July.

Results and Discussion

The winter of 2000 was one of the mildest in recent history. Standing, dormant native forage was abundant and not covered by snow or ice. No hay feeding was necessary during the duration of this trial. There was no significant interaction between cow supplement treatment and calf creep feed treatments. Therefore, the means for the main effects of cow supplement level and creep feeding are presented.

Cow weight change during the winter, spring, or overall was not affected by level of supplement or by creep feeding of the calves. Likewise body condition score change was not significantly influenced by supplement protocol or by creep feeding of the calves (Table 1). The mildness of the winter may have been a contributing factor to the small differences in weight change and body condition score change of cows. A more severe winter may produce very different results. Often cow calf producers believe that creep feeding of calves would result in less body condition loss by the cows being nursed by creep fed calves. These data suggest that creep feeding does not influence cow condition or weight change during a mild winter. Calves nursing cows with the high level of supplement tended to gain more weight during winter (P=.16) and to maintain this weight advantage through weaning (P=.15).

Table 1. Effects of cow supplement on cow and calf performance

	Cow treatment			
Item	Low supplement	High supplement	SEM	P
Cow weight change (lb)				
Jan to Apr	-84.5	-62.0	8.5	.11
Apr to July	221.3	237.7	7.0	.39
Jan to July	136.8	175.7	7.3	.24
Cow condition score change (BCS)				
Jan to Apr	-.62	-.44	.08	.58
Apr to July	1.18	1.27	.10	.64
Jan to July	.56	.83	.11	.20
Calf weight change (lb)				
Jan to Apr	142.6	161.8	4.2	.16
Apr to	227.5	230.3	4.9	.68

July				
Jan to July	370.1	392.1	7.2	.15
Weaning weight	647.6	662.7	11.7	.15

Creep feeding increased (P=.01) calf weight gain during the winter months. Creep fed calves gained 179.7 lb during January through mid April compared to 124.7 lb for non-creep fed calves (Table 2). Some of this weight advantage was lost between April and July as non-creep fed calves had a slight compensatory gain (22.4 lb). The creep fed calves gained 397.7 lb from January to July compared to 364.8 lb for the non-creep fed calves. In this study, 62% of the weight gain due to creep feeding in the winter was maintained until weaning in July.

Table 2. Effects of creep feeding on cow and calf performance

	Creep feed treatment			
Item	No creep	Creep fed	SEM	P
Cow weight change (lb)				
Jan - Apr	-65.7	-80.7	8.5	.43
Apr - July	221.8	237.1	7.0	.26
Jan - July	156.1	156.4	7.3	.96
Cow condition score change (BCS)				
Jan to Apr	-.52	-.54	.08	.92
Apr to July	1.21	1.23	.10	.94
Jan to July	.69	.69	.11	1.0
Calf weight change (lb)				
Jan to Apr	124.7	179.7	4.2	.01
Apr to July	240.1	217.7	4.9	.28
Jan to July	364.8	397.4	7.2	.18
Weaning weight	635.7	674.5	11.7	.18

To examine the economic returns from the increased supplement cost and creep feeding cost, all four treatment protocols must be examined. Table 3 contains the supplement costs for each of the four treatment groups as well as the added weaning weight that was available for sale. The low nutrition no creep group (LN) was utilized as the low cost standard to which each of the other treatments was evaluated for potential additional profits. The value of added weaning weight was less than the additional feed cost for the high nutrition no creep (HN), and for the

high nutrition with creep group (HC). Only the low nutrition with creep group (LC) produced enough pounds of additional weaning weight to offset the additional feed costs.

Table 3. Cost of cow supplements and creep feed vs value of added weaning weight ($ per head)

	LN	HN	HC	LC
Cow supplement cost	22.15	47.04	47.04	22.15
Calf creep cost	--	--	22.32	27.20
Total treatment cost	22.15	47.04	69.36	49.35
Cost above LN	--	24.89	47.21	27.2
Added weaning wt	--	42	64	61
Value added gain	--	23.1	35.2	33.55

Creep feeding calves that are nursing fall-calving cows on a marginal nutritional status may be profitable during a mild winter.

Literature Cited

Cox, D.A. et al. 1989. Okla. Agr. Exp. Sta. Res. Rep. MP-127:41.

Lusby, K.S. and R.P. Wettemann. 1988. Okla. Agr. Exp. Sta. Res. Rep. MP-125:69.

Ovenell, K.H. et al. 1989. Okla. Agr. Exp. Sta. Res. Rep. MP-127:46.

Ovenell, K.H. et al. 1990. Okla. Agr. Exp. Sta. Res. Rep. MP-129:44.
