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Influence of early weaning and winter protein supplementation on weight and condition score of spring-calving beef cows grazing native tallgrass prairie

Abstract

Ninety-two pregnant, mature, spring-calving cows grazing low-quality tallgrass-prairie were used to determine if early weaning of calves reduces the supplementation cost during the subsequent winter. Calves were weaned on June 23, 2003, (early weaning) or October 15, 2003, (fall weaning). Cows were assigned to winter feeding groups and fed one of two amounts of a common soybean meal-milo supplement (45% crude protein; dry matter basis). The two supplementation amounts were fed three times weekly and were prorated to 4 lb/day and 2.8 lb/day. The four treatment groups were: 1) early weaning - 4 lb/day supplement, 2) early weaning - 2.8 lb/day supplement, 3) fall weaning - 4 lb/day supplement, and 4) fall weaning - 2.8 lb/day supplement. Cows were supplemented from November 14, 2003, through calving in early March 2004. Cows with calves weaned early were initially heavier and had higher initial body condition scores than did cows that were weaned in the fall. Although losses of body weight and body condition through the winter were greater for early-weaning cows than for fall-weaning cows, final body weights and body condition scores were still greater for the early-weaning cows than for the fall-weaning cows. Supplementation with 4 lb/day led to less body weight loss over the winter and heavier final body weights than did supplementation with 2.8 lb/day, but final body condition score and body condition score loss over the winter were not affected by the amount of winter supplementation. Cow-calf producers can balance responses to early weaning and to winter supplementation to target appropriate cow weights and body condition scores at calving.

Keywords

Cattlemen's Day, 2005; Kansas Agricultural Experiment Station contribution; no. 05-144-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 943; Beef; Early weaning; Winter protein; condition score; Native tallgrass

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**INFLUENCE OF EARLY WEANING AND WINTER PROTEIN SUPPLEMENTATION
ON WEIGHT AND CONDITION SCORE OF SPRING-CALVING BEEF COWS
GRAZING NATIVE TALLGRASS PRAIRIE**

K. W. Harborth, D. A. Llewellyn, and T. T. Marston

Summary

Ninety-two pregnant, mature, spring-calving cows grazing low-quality tallgrass-prairie were used to determine if early weaning of calves reduces the supplementation cost during the subsequent winter. Calves were weaned on June 23, 2003, (early weaning) or October 15, 2003, (fall weaning). Cows were assigned to winter feeding groups and fed one of two amounts of a common soybean meal-milo supplement (45% crude protein; dry matter basis). The two supplementation amounts were fed three times weekly and were prorated to 4 lb/day and 2.8 lb/day. The four treatment groups were: 1) early weaning – 4 lb/day supplement, 2) early weaning – 2.8 lb/day supplement, 3) fall weaning – 4 lb/day supplement, and 4) fall weaning – 2.8 lb/day supplement. Cows were supplemented from November 14, 2003, through calving in early March 2004. Cows with calves weaned early were initially heavier and had higher initial body condition scores than did cows that were weaned in the fall. Although losses of body weight and body condition through the winter were greater for early-weaning cows than for fall-weaning cows, final body weights and body condition scores were still greater for the early-weaning cows than for the fall-weaning cows. Supplementation with 4 lb/day led to less body weight loss over the winter and heavier final body weights than did supplementation with 2.8 lb/day, but final body condition score and body condition score loss over the winter were not affected by the amount of winter supplementation. Cow-calf producers can balance responses to early

weaning and to winter supplementation to target appropriate cow weights and body condition scores at calving.

Introduction

Investigations over the last two decades have demonstrated that early weaning of spring-born calves may result in production advantages. Although many facets of early weaning have been studied, the long-term effects on cow performance are worthy of further investigation. Significant summer gains in body condition score are possible by the dams of early-weaned calves, and this may represent an opportunity for cow-calf producers to increase body condition scores before the cows enter the rigors of the winter grazing period. Previous investigations have noted the relationship between body condition and reproductive performance. Likewise, the summer and fall increases in body weight and body condition scores may have the potential to moderate the herd's dependence on winter protein supplementation while grazing the typically low-quality forage of tallgrass prairie. In doing so, significant reductions in winter feed costs may be realized. This study was to evaluate the effects of weaning calves early on the response of their dams to supplemental protein during the subsequent winter.

Procedures

Ninety-two mature, pregnant, spring-calving, crossbred beef cows, previously used in a study evaluating the effect of weaning time, were blocked by winter grazing group

(i.e. pastures of 300 acres), stratified by body weight and body condition, and randomly assigned to one of two grazing groups within each previous treatment (i.e., early weaning on June 23, 2003, or fall weaning on October 15, 2003). Two winter supplementation amounts were randomly assigned to the feeding groups: 4 lb/day or 2.8 lb/day of a common soybean meal-milo supplement (45% crude protein; dry matter basis), which was bunk fed three times weekly (Monday, Wednesday, and Friday) and prorated to the daily amounts. The four treatment groups were: 1) early weaning – 4 lb/day supplement, 2) early weaning – 2.8 lb/day supplement, 3) fall weaning – 4 lb/day supplement, and 4) fall weaning – 2.8 lb/day supplement. Supplementation commenced on Nov. 14, 2003, and continued until calving, at which time all cows were handled similarly. Cow body weights and body condition scores were recorded on Nov. 14, Jan. 7, Feb. 13, and within 48 hours of calving. A commercial mineral supplement was provided throughout the experiment.

Results and Discussion

There were no significant interactions between weaning time and supplementation amount. Cows with calves weaned in June were heavier (Table 1) and had higher condition scores (Table 2) at the beginning and end of the trial. These cows also lost more body weight during the length of the study

($P=0.02$). The advantage in initial weight and condition can be accounted for by the longer time available for them to recover from the stresses of lactation.

When comparing the two supplementation rates, cows receiving 4 lb/day of the supplement gained more weight from November 14 to January 7, as well as during the entire trial period, than did cows fed 2.8 lb/day, but there were no significant differences in body condition due to supplementation amount. The greater weight gains of cows receiving 4 lb/day of the supplement may have been due to a greater gut fill because they received more of the supplement. It is also possible that true differences existed due to supplementation amount, but the differences were too small to detect in our experiment.

From our results, it seems that cow-calf producers can balance responses to early weaning and to winter supplementation to target appropriate cow weights and body condition scores at calving. For example, the final body weights of early-weaning cows receiving 2.8 lb/day of the supplement were similar to those of fall-weaning cows receiving 4 lb/day. Thus, if a producer could benefit from weaning calves early, dams could be provided with less winter supplement, and they still could maintain an acceptable body weight at calving.

Table 1. Influence of Early Weaning and Supplementation Amount on Cow Body Weight

Item	Early Weaning ^a		Fall Weaning ^a		SEM ^b	Statistical Comparison (P-value)		
	Supplementation Amount, lb/day ^a					Early vs. Fall Wean	4.0 vs. 2.8 lb/day	Interaction
	4.0	2.8	4.0	2.8				
No. of cows	23	22	24	23				
Initial weight, lb	1355	1270	1237	1224	23.2	<0.01	0.06	0.16
Weight changes, lb								
Nov. 14 - Jan. 7	30	18	37	22	3.9	0.21	0.02	0.70
Jan. 7 - Feb. 13	33	36	46	43	6.4	0.16	0.88	0.76
Feb. 13 - Calving ^c	-159	-172	-155	-169	9.4	0.66	0.21	0.97
Nov. 14 - Calving ^c	-97	-117	-73	-99	9.2	0.02	0.02	0.57
Final weight, lb	1258	1153	1164	1125	22.8	<0.01	<0.01	0.26

^aEarly weaning = June 23; Fall weaning = October 15. Supplement was a soybean meal-milo supplement (45% crude protein; dry matter basis) fed three times weekly.

^bSEM = standard error of the mean.

^cAverage calving date = mid March.

Table 2. Influence of Early Weaning and Supplementation Amount on Cow Body Condition Scores^a (BCS)

Item	Early Weaning ^a		Fall Weaning ^a		SEM ^b	Statistical Comparison (P-value)		
	Supplementation Amount, lb/day ^a					Early vs. Fall Wean	4.0 vs. 2.8 lb/day	Interaction
	4.0	2.8	4.0	2.8				
No. of cows	23	22	24	23				
Initial BCS	5.9	6.0	5.1	5.1	0.10	<0.01	0.74	0.46
BCS changes								
Nov. 14 - Jan. 7	-0.13	-0.20	-0.09	-0.16	0.06	0.59	0.22	0.99
Jan. 7 - Feb. 13	-0.04	-0.13	0.02	-0.09	0.08	0.39	0.28	0.96
Feb. 13 - Calving ^d	-0.43	-0.30	-0.11	-0.08	0.10	0.02	0.44	0.68
Nov. 14 - Calving ^d	-0.61	-0.63	-0.19	-0.32	0.09	<0.01	0.49	0.51
Final BCS	5.25	5.34	4.92	4.75	0.10	<0.01	0.74	0.22

^aBody condition score: 1 = emaciated; 9 = obese.

^bEarly weaning = June 23; Fall weaning = October 15. Supplement was a soybean meal-milo supplement (45% crude protein; dry matter basis) fed three times weekly.

^cSEM = standard error of the mean.

^dAverage calving date = mid-March.