EFFECT OF GRAIN TYPE IN SUPPLEMENTS AND SUPPLEMENTATION FREQUENCY ON THE PERFORMANCE OF BEEF COWS GRAZING WINTER RANGE [1]

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Summary

One hundred twenty, pregnant, Angus × Hereford cows (1111 lb) grazing dormant bluestem range were used to evaluate whether the effect of altered frequency of supplementation on cow performance depended on the grain type in the supplement. Two supplementation frequencies (daily and three times weekly) and two grain types in the supplements (sorghum grain or corn) were evaluated. Both supplements contained 21% CP and were fed to provide 32.6 lb DM/week. Interactions were not significant. Winter weight loss through calving was greater ($P \leq .02$) for the cows supplemented three times weekly, although the magnitude of the effect was not large. Use of different grain types in the supplements did not significantly affect most performance variables.

(Key Words: Beef Cattle, Frequency, Supplements.)

Introduction

Feeding supplements with relatively high crude protein (CP) concentrations has improved the performance of beef cows grazing winter range. However, feeding supplements daily can require considerable labor and equipment under range conditions. If one could reduce supplementation frequency without negatively affecting livestock performance, reduced labor and equipment demands might result.

Many studies conclude that high-protein supplements can be fed infrequently without significantly harming cow performance. However, few studies have evaluated the impact of altering supplementation frequency when supplements contain low to moderate concentrations of protein.

Some research suggests that alternate-day supplementation with low- to moderate-protein supplements (i.e., grain-based supplements with 10 to 25% CP) degrades performance compared with daily supplementation.

In contrast, a recent experiment at Kansas State University suggests that the effect of altering the frequency of supplementation is similar, regardless of the supplement's protein concentration (range from 10% to 40% CP). One explanation for that contradiction may be the grain type used in the supplements. Kansas State's experiment used supplements based on sorghum grain, which is a slowly fermented grain. Other research used supplements based on corn, which is rapidly fermented. Therefore, our objective was to monitor changes in gain and condition of cows grazing winter range and receiving supplements based on corn or sorghum grain either daily or three times weekly.

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Experimental Procedures

One hundred and twenty pregnant, Angus × Hereford, beef cows (avg. initial BW = 1111 lb; avg. initial condition score = 5.4) were used in a 2 × 2 factorial design comparing supplementation frequency (daily = 7X, or three times weekly = 3X) and grain type in the supplement (corn or sorghum grain). Both supplements were formulated to contain 20% CP (dry basis). Actual CP was 21% for both supplements. Each supplement contained approximately 74% grain, 23% SBM, and 3% molasses.

All treatment groups were fed 32.6 lb dry matter per week. The 7X group received 14.65 lb DM/feeding; the 3X group, 10.86 lb. Body weight and condition were measured on days 0, 28, 56, and 84 and at calving (avg = day 111). Cows grazed four bluestem-range pastures (approximately 305 acres each) throughout the trial.

Each feeding-frequency treatment was assigned to two pastures, with cows receiving corn- and sorghum grain-based supplements equally represented within each pasture. The 7X cows were gathered daily, whereas the 3X cows were gathered only on Mondays, Wednesdays, and Fridays. Following gathering, cows were sorted and group-fed their supplement in a bunk. The feeding area was located in the center of the four pastures. To monitor effects on cow behavior, an area within .25 miles of the central feeding area within each pasture was marked with painted metal posts. Cattle presence or absence within this area before gathering for feeding was recorded daily. Supplements were fed from November 30, 1992 until calving.

Results and Discussion

The response to frequency of supplementation did not depend on the grain type in the supplements. Calving date was similar (P>.10) among treatments, averaging March 16, 1993 (day 111). Calf birth weights were also similar ($P \geq .17$) among treatments (avg. birth wt. = 83 lb).

Although cumulative and period changes in body weight (Table 1) were not significantly altered by grain type in the supplement, a trend (P = .07) was observed for those fed the corn-based supplement to lose slightly less condition through calving.

Although cows on the 3X treatment lost more (P = .02) weight by calving time than the 7X group, the difference (approximately 24 lb) was not great from a biological standpoint. That was corroborated by the lack of effect (P = .47) on cumulative body condition change during the same time period. Cows in the 3X group were more likely (P<.01; 18.1% vs 37.5% for the 7X and 3X groups, respectively) to be found close to the feeding area before the morning supplementation period.

Although cow performance and behavior was favored by daily supplementation, the magnitude of the changes were so small that three-times-weekly supplementation appears to be a viable way to reduce labor and equipment costs. The results of the current experiment were similar to those from previous research at Kansas State University, adding further support to our previous conclusion that response to altered supplementation frequency does not depend on the protein concentration in the supplement.

Although infrequent supplementation appears to be feasible with low- to moderate-protein supplements, an adequate balance must exist between supplemental protein and energy in order to ensure acceptable cow performance and efficient use of low-quality forage.

Table 1. Influence of Frequency of Supplementation and Grain Type in Supplement on Cumulative and Period Weight and Body Condition Changes in Beef Cows Grazing Dormant Bluestem Range

	Grain Type				Frequency [a]			
Item	Corn	Sorghum Grain	SEM	P value	7X	3X	SEM	P value
Initial wt, lb	1111.7	1111.2	11.4	.97	1112.6	1110.4	.97	.23
Cumulative wt. change, lb								
d 1-28	-39.2	-44.3	3.31	.39	-44.7	-38.8	5.88	.55
d 1-56	-35.5	-42.1	2.47	.20	-26.7	-50.9	5.91	.10
d 1-84	-43.6	-56.2	7.40	.36	-30.2	-69.6	2.31	<.01
d 1-111	-180.3	-189.8	4.74	.30	-174.6	-195.5	4.03	.02
Period wt change, lb								
d 1-28	-39.2	-44.3	3.31	.39	-44.7	-38.8	5.88	.55
d 28-56	3.7	2.2	2.36	.71	18.1	-12.1	4.01	.03
d 56-84	-8.4	-12.8	4.96	.58	-3.5	-17.6	6.17	.25
d 84-111	-138.6	-136.0	4.73	.73	-147.2	-123.0	3.70	.06
Initial body condition [b]	5.4	5.4	.01	.81	5.4	5.4	.003	.10
Cumulative body condition change								
d 1-28	-.10	-.21	.041	.20	-.11	-.21	.008	.01
d 1-56	-.36	-.50	.037	.12	-.40	-.46	.011	.08
d 1-84	-.75	-.91	.059	.18	-.85	-.81	.040	.49
d 1-111	-1.11	-1.26	.031	.07	-1.16	-1.21	.044	.47
Period body condition change								
d 1-28	-.10	-.21	.041	.20	-.11	-.21	.008	.01
d 28-56	-.26	-.29	.031	.58	-.29	-.25	.019	.22
d 56-84	-.39	-.43	.024	.41	-.46	-.36	.048	.26
d 84-111	-.36	-.37	.025	.94	-.31	-.42	.020	.06

[a]Frequency of supplementation: 7X=daily; 3X=three times weekly.
[b]Body condition scored on a 1-9 scale, 1 = emaciated and 9 = extremely obese.