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Soybean meal+sorghum grain, alfalfa hay, and dehydrated alfalfa pellets as protein supplements for beef cows grazing dormant, tallgrass-prairie

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Abstract

Eighty-six pregnant. Hereford x Angus cows were randomly assigned to one of three winter supplement treatments: 1) soybean meal+sorghum grain, 2) alfalfa hay, or 3) dehydrated alfalfa pellets. Cows supplemented with dehydrated alfalfa pellets gained more (P<.05) weight during gestation and lost the least (P<.05) weight at calving. However, no differences (P>.10) were detected in cow body condition change. reproductive efficiency, or calf growth.

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; Soybean meal; Sorghum grain; Alfalfa hay; Dehydrated alfalfa pellets; Protein; Dormant, tallgrass-prairie

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SOYBEAN MEAL+SORGHUM GRAIN, ALFALFA HAY, AND DEHYDRATED ALFALFA PELLETS AS PROTEIN SUPPLEMENTS FOR BEEF COWS GRAZING DORMANT, TALLGRASS-PRAIRIE[1]

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Summary

Eighty-six pregnant, Hereford x Angus cows were randomly assigned to one of three winter supplement treatments: 1) soybean meal+sorghum grain, 2) alfalfa hay, or 3) dehydrated alfalfa pellets. Cows supplemented with dehydrated alfalfa pellets gained more ($P<.05$) weight during gestation and lost the least ($P<.05$) weight at calving. However, no differences ($P>.10$) were detected in cow body condition change, reproductive efficiency, or calf growth.

Introduction

Previous research at Kansas State University has indicated that moderate (26%) and high (39%) crude protein (CP) levels in winter supplements increase dormant, tallgrass-prairie forage intake and utilization. In addition, mature cows supplemented with moderate to high CP levels during the winter grazing period lost less weight and body condition than cows supplemented with a low (13%) CP supplement. High levels of supplemental protein appear to be particularly beneficial during the last trimester of gestation and early lactation. Although there is little doubt about the benefit of supplemental protein during the winter grazing period, there is little information regarding various forms of available supplemental protein. The objective of our study, therefore, was to compare SBM+sorghum grain, alfalfa hay, and dehydrated alfalfa pellets as supplemental protein sources for beef cattle grazing dormant, tallgrass-prairie forage.

Experimental Procedures

Eighty-six pregnant, Hereford x Angus cows averaging 1078 lbs were randomly assigned to one of three supplement treatments: 1) 4.7 lbs SBM+sorghum grain, 2) 6.8 lbs alfalfa hay, or 3) 6.7 lbs dehydrated alfalfa pellets per head per day (dry matter basis). The quantity of supplements fed and formulation of the SBM+sorghum grain mixture were designed to equalize daily supplemental protein and metabolizable energy. Supplements provided 69% of the CP requirement for 1100 lb nonlactating pregnant mature cows in the last third of gestation. The tallgrass vegetation consisted of big bluestem (*Andropogon gerardii*), little bluestem (*Andropogon scoparius*), indiangrass (*Sorghastrum nutans*), and numerous other grasses and forbs. Cattle were gathered each morning, separated into treatment groups, and bunk fed their respective supplements. Supplementation began in mid-November and continued until calving. The average calving date across all treatment groups was March 21, 127 days after the beginning of the trial. After calving, all cows were placed in one pasture and fed 10 lbs of alfalfa hay per head per day until the beginning of the breeding period in mid-May.

Cows were weighed following an overnight shrink on days 0, 28, 56, 84, 127 (within 48 hours postpartum), 183, and 265. All cows were scored for body condition using a 9-point scale

[1] Appreciation is expressed to Gary Ritter, Wayne Adolph, and Tammi DelCurto for their expert assistance in data collection during this study.

(1 = extremely thin, 9 = extremely fat). Pregnancy status was determined by rectal palpation prior to the initiation of the experiment. Cows that lost calves at birth were removed from the trial. Calf average daily gain (ADG) was calculated as weight minus the birth weight, divided by the number of days since birth. Calf weights were taken within 48 hours postpartum, and on days 55 and 140 postpartum.

Results and Discussion

Cows supplemented with dehydrated alfalfa pellets gained more weight (P<.05) during the first 84 days than cows supplemented with SBM+sorghum grain or alfalfa hay (Figure 18.1). By day 84, cows supplemented with dehydrated alfalfa pellets had gained 41 lbs, whereas SBM+sorghum grain and alfalfa hay supplemented cows had lost 7 lbs and gained 5 lbs, respectively. In addition, dehydrated alfalfa-supplemented cows lost the least weight (P<.05) at calving (day 127) and just prior to breeding (day 183). By mid-August (day 265), however, all treatment groups had regained the body weight lost during the winter grazing period. In contrast, cow body condition was unaffected (P>.10) by supplemental treatments (Figure 18.2). Numerical trends, however, parallelled the differences in weight change. Calf birth weights and gains were unaffected (P>.10) by their dam's previous supplemental treatment (Table 18.1). Pregnancy rate did not differ (P>.10), averaging 94% across all treatment groups. Likewise, calving interval was similar (P>.10), averaging 361 days.

All three supplements appeared adequate, because the relative magnitude of body weight and condition loss, given the initial status of the cows in this experiment, were acceptable for cows grazing winter forage. The dehydrated alfalfa pellet supplement appeared to perform best in terms of cow weight changes, but further research is required to determine if the observed response is reproducible. Also, approximately 40% more alfalfa product was needed in order to feed an equal amount of protein and energy compared to the SBM+sorghum grain supplement.

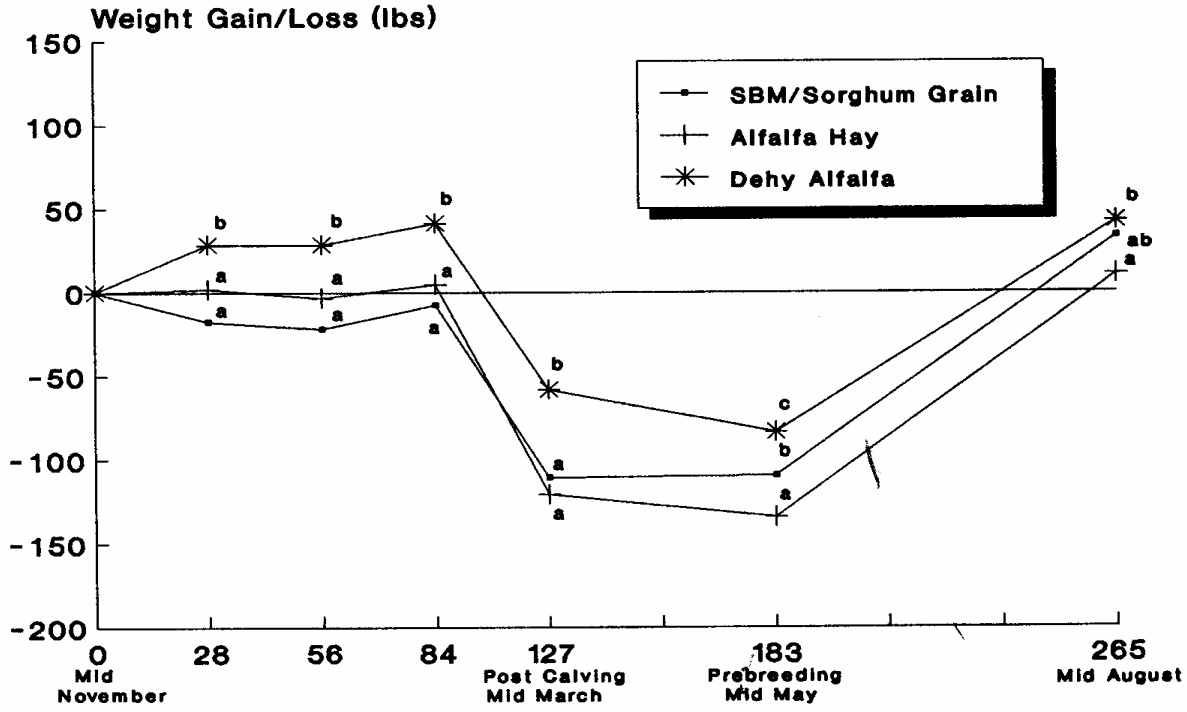

Figure 18.1. Influence of Winter Supplementation of SBM + Sorghum Grain, Alfalfa Hay, or Dehy. Alfalfa Pellets on Cow Weight Change. Differences (P<.10) among treatments within time periods are denoted by superscripts (a, b, c).

Table 18.1. Influence of Winter Supplementation with SBM+Sorghum Grain, Alfalfa Hay or Dehydrated Alfalfa Pellets on Subsequent Cow Reproduction and Calf Growth

Item	Soybean meal + Sorghum Grain	Alfalfa Hay	Dehydrated Alfalfa	SE[1]
No. cows	29	29	28	--
Calf birth wt, lbs	88.7	88.0	83.5	2.3
0 to 55-day calf ADG[2], lb	2.20	2.07	2.23	.05
0 to 140-day calf ADG[2], lb	2.29	2.24	2.27	.03
Pregnancy rate, %[3]	89.4	96.2	95.7	5.5
Calving interval[4]	361.5	360.9	362.0	2.3

[1]Pooled standard error of the means.
[2]ADG = average daily gain.
[3]No. of cows diagnosed pregnant by rectal palpation divided by the number of cows exposed.
[4]Length of time (days) from calving to calving the following year (based on estimated fetal age).

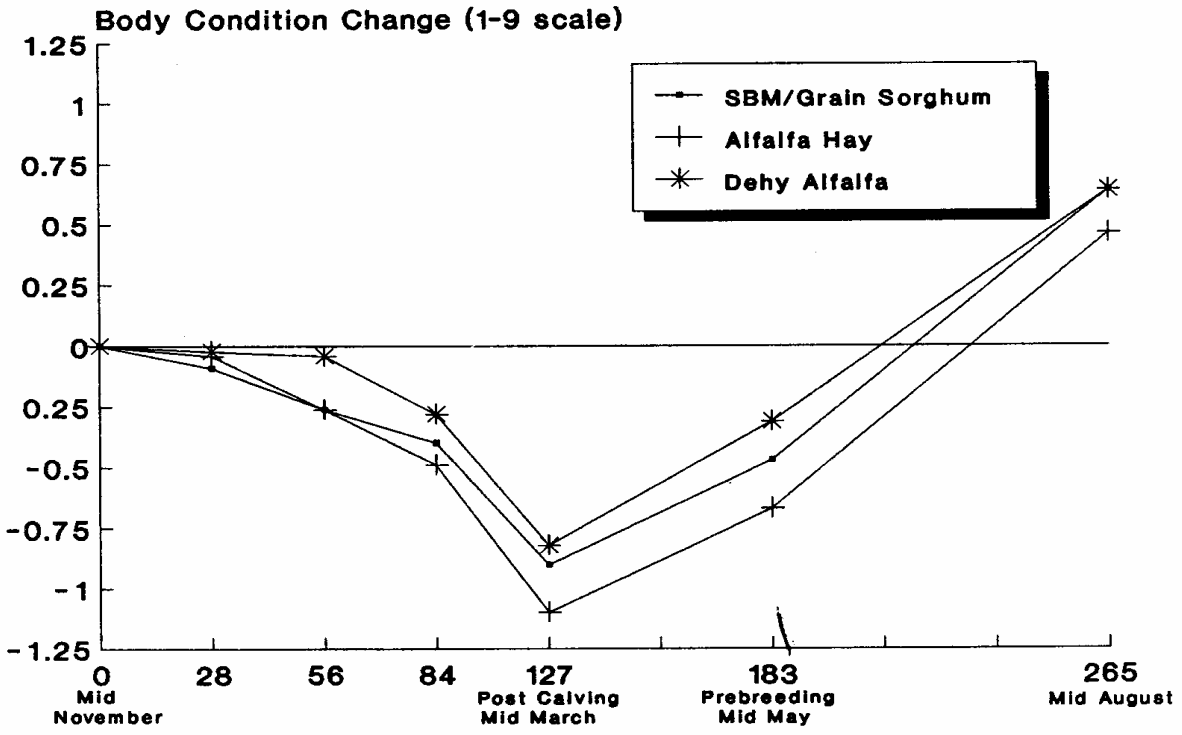

Figure 18.2. Influence of Winter Supplementation of SBM + Sorghum Grain, Alfalfa Hay, or Dehydrated Alfalfa Pellets on Cow Body Condition Change.