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DEHYDRATED ALFALFA PELLETS AND SOYBEAN MEAL/GRAIN SORGHUM IN STEP-UP WINTER SUPPLEMENTATION PROGRAMS FOR SPRING-CALVING BEEF COWS[1]

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Summary

The performance response to a stepwise increase in the level of supplement fed to cows across the winter supplementation period was studied by feeding 112 Hereford × Angus cows the following treatments: dehydrated alfalfa pellets (DEHY) or soybean meal/grain sorghum (SS), each either level-fed (constant daily amount from December 1 to calving) or fed in a step-up program (low level from December 1 to 30; moderate level from December 31 to January 29; high level from January 30 to calving; avg = amount fed with level-feeding). Cow weight and condition changes and calf performance were favored by the step-up supplementation program when SS was fed. When DEHY was fed, cow weight and condition changes favored level-feeding. Weight and condition changes generally favored the DEHY group over the SS group. No effects were found for the reproductive characteristics measured. These results indicate that potential benefits of step-up winter supplementation programs depend on the type of supplement being fed. All of the supplementation programs appeared adequate to support desirable levels of reproductive performance.

(Key Words: Beef Cows, Protein Supplement, Dehydrated Alfalfa Pellets, Winter Range.)

Introduction

Both dehydrated alfalfa pellets (DEHY) and soybean meal/grain sorghum (SS; at least 20% CP) supplements fed to supply 1 lb of CP per head daily will provide adequate nutrition to spring-calving beef cows grazing winter range (KAES Report of Progress 567). These winter supplements might be more efficiently utilized, if the amount fed was more closely matched to the cow's immediate requirements. Earlier (KAES Report of Progress 592), we evaluated a step-up supplementation program in which an average of 4 lb DEHY per head daily (avg .8 lb CP/head daily) was fed to cows, such that they received less feed in early winter and more in late winter, closer to parturition. In that research, we found no advantage to step-up feeding. However, it is possible that when feeding greater amounts or different types of supplements, step-up feeding may offer benefits. The present experiment was conducted to determine the impact of step-up feeding on the utilization of DEHY and SS supplements when fed to provide an average of about 1.0 lb CP/head daily during the winter supplementation period.

Experimental Procedures

One hundred twelve, pregnant, Hereford × Angus cows (avg initial wt = 1103 lb; avg initial body condition = 5.5) were assigned to four supplement treatments: 1) DEHY (17.9% CP) fed at 5.8 lb dry matter (DM)/head daily (1.04 lb CP/d) from December 1 to calving; 2) DEHY fed at the same total amount across the

[1]The authors would like to thank Gary Ritter, Wayne Adolph, Buck Root, and Preston Hickman for their invaluable assistance in conducting this experiment.

winter (actual avg intake = 5.7 lb/head daily) but stepped up at monthly intervals: 2.9 lb/head daily from December 1 to 30, 4.4 lb/head daily from December 31 to January 29, and 8.9 lb/head daily from January 30 to calving; 3) SS (26.8% CP) fed at 4.3 lb DM/head daily (1.15 lb CP/d) from December 1 to calving; and 4) SS fed at same total amount across the winter (actual avg intake = 4.2 lb/head daily) but stepped up at monthly intervals: 2.1 lb/head daily from December 1 to 30, 3.2 lb/head daily from December 31 to January 29, and 6.5 lb/head daily from January 30 to calving. Treatment ended after calving (avg calving date = March 8) and all cows received 10 lb/head alfalfa hay daily until sufficient new grass was available. The animals grazed pastures that were predominantly big bluestem (*Andropogon gerardii*), indiangrass (*Sorghastrum nutans*), and little bluestem (*Andropogon scoparius*).

On days 0, 85, 100 (within 48 h postpartum), 168, and 365, the cows were weighed and scored for body condition (scale: 1 = extremely thin, 9 = extremely obese) following an overnight stand without access to feed or water. Calves were weighed within 48 h after birth and at average ages of 68 and 224 d (weaning). The number of cows cycling before the breeding season was determined from blood progesterone. Cows were pasture-mated as a single herd to a group of four Angus bulls during a 60-d breeding season. Pregnancy and fetal ages (for estimating conception dates and calving intervals) were determined by rectal palpation (August 29).

Results and Discussion

By d 85, DEHY cows had gained more ($P < .10$) weight than SS cows, and level-fed cows had gained more ($P < .10$) than the step-fed cows (Table 1). By d 100 (within 48 h after calving), supplementation method had no effect on cumulative weight loss, but DEHY cows had lost less weight ($P < .10$) than SS cows. By the beginning of the breeding season, differences between DEHY and SS were confined to the level-fed group ($P < .10$). One year after starting the experiment, DEHY cows on the step-up program had smaller cumulative weight gains ($P < .10$) than either the level-fed DEHY cows or the step-up SS cows.

Treatments had no effect on cumulative body condition changes by d 85. By d 100, level-fed SS cows had lost more ($P < .10$) body condition than the step-fed SS cows. By the beginning of the breeding season, level-fed DEHY cows had lost less condition than either their step-up DEHY or their level-fed SS counterparts. However, by 365 d after the experiment started, all treatment differences in body condition had disappeared.

Calf birth weights and weaning weights were unaffected ($P > .10$) by supplemental treatments. In general, calf gains followed cow weight and condition changes; step-up feeding was favored within the SS group, whereas level-feeding was favored within the DEHY group.

Neither supplement type nor method affected the reproductive characteristics we measured ($P > .10$). Pregnancy rates averaged 97%, with 72% cycling at the beginning of the breeding season and 64, 30, and 6% bred in successive thirds of the breeding season. The calving interval averaged 366 d.

Table 1. Effect of Type and Method of Winter Protein Supplementation on Cumulative Weight Changes and Body Condition Changes in Beef Cows and Calf Weights and Gains

	Dehydrated Alfalfa Pellets		Soybean meal/Grain sorghum			
Item	Level-fed	Step-up	Level-fed	Step-up	SE	Effects[a]
No. cows	28	28	28	28		
			Cow Weights, lb			
Starting Weight	1095	1117	1097	1104	21	
Changes						
d 85	43	21	8	2	7	T,M
d 100 (calving)	-104	-109	-161	-155	7	T
d 168 (breeding)	-139[c]	-157[cd]	-167[d]	-157[cd]	7	I
d 365	36[c]	3[d]	31[c]	50[c]	10	I
			Condition Scores (CS)[b]			
Starting CS	5.6	5.5	5.6	5.5	.1	
Changes						
d 85	-.1	-.2	-.1	-.2	.1	
d 100 (calving)	-.2[c]	-.3[c]	-.5[d]	-.2[c]	.1	I
d 168 (breeding)	-.1[c]	-.3[d]	-.4[d]	-.3[d]	.1	I
d 365	0	-.1	0	.1	.1	
			Calf Performance			
Birth wt, lb	86	90	84	87	2	
68-d ADG, lb	2.0[c]	1.9[cd]	1.8[d]	2.0[c]	.1	I
224-d ADG, lb	2.2[cd]	2.1[c]	2.1[c]	2.3[d]	.1	I
Weaning wt, lb	581	565	561	594	14	

[a]T = Supplement type effect ($P < .01$); M = Supplementation method effect ($P = .08$); I = Supplement type × method interaction ($P < .10$).
[b]Body condition score on a scale of 1 - 9.
[cd]Means within a row without common superscripts differ ($P < .10$).