VALUE OF WHEAT MIDDLINGS AS A WINTER SUPPLEMENT FOR FALL CALVING BEEF COWS

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Story in Brief

Forty two fall calving beef cows wintered on native range were fed Negative Control (.8 to 1.25 lb/day of soybean meal), Positive Control (2.0 to 3.0 lb/day of soybean meal) or wheat middlings (5.0 to 7.6 lb/day) fed at a level to supply the same daily protein as the Positive Control. Cows fed the Negative Control lost significantly more weight and condition than Positive Control cows. Cows fed wheat middlings tended to lose less weight and body condition than cows fed the Positive Control although differences were small. Pregnancy rates reflected differences in weight and condition loss. Only 73 percent of Negative Control cows became pregnant compared to a 93 percent pregnancy rate for Positive Control and wheat middlings cows ($P<.08$). Calves of Negative Control cows gained less ($P<.01$) weight throughout the study than calves of cows on the other two treatments. As with cow weight and condition changes, calves of wheat middlings cows tended to gain more weight than calves of Positive Control cows. Cows fed the additional energy from wheat middlings apparently gave slightly more milk as evidenced by heavier calf weights. However, cows of the Positive Control were able to meet their protein and energy requirements from the level of soybean meal fed.

(Key Words: Beef cows, Soybean meal, Wheat middlings, Winter, Native range)

Introduction

Wheat middlings are the offal of the wheat kernel after the milling process for removal of flour. About 140,000 tons of wheat middlings are available per year in Oklahoma, and are frequently used in cattle supplements. Middlings contain about 16 percent crude protein but are discounted for their relatively high (8 percent) crude fiber content. In spite of the large amount of middlings fed annually to cattle in Oklahoma, little research has been conducted to establish the nutritional value of the protein and energy in wheat middlings for beef cattle. The objective of this study was to compare winter performance of lactating, fall calving beef cows and their calves when supplemented with soybean meal or wheat middlings fed at a rate to supply the same amount of daily protein.

Materials and Methods

Forty two mature fall calving Hereford and Hereford x Angus cows were allotted to three supplemental feed treatments based on breed and weight. All calves were born from Sept. 5 to Nov. 7. Treatments were (1) soybean meal fed at 40 percent of the typically recommended level (negative control), (2) soybean meal fed at the recommended level

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Table 1. Composition of supplements (% as fed).

	Treatments		
	Negative Control	Positive Control	Wheat Middlings
Ingredients,			
Soybean meal	88.8	96.3	
Wheat middlings			98.2
Dicalcium phosphate	9.4	3.7	
Limestone			1.8
Potassium chloride	1.8		
Crude protein, actual %	41.6	44.4	17.6
Feeding levels, lbs./day:			
11/11 to 12/09	.8	2.0	5.0
12/09 to 3/31	1.25	3.0	7.6

(positive control), and (3) wheat middlings fed at a level to supply the same daily protein as the positive control. Composition of supplements and amounts that were fed daily are shown in Table 1.

All cows grazed in a single pasture of dormant tallgrass native range and were gathered 6 days each week for supplement feeding in individual covered stalls. Cows and their calves were weighed at 28 day intervals after overnight withdrawal from feed and water. Supplement feeding began on Nov. 11, 1986 and ended on March 31, 1987. Prairie hay was fed only on a few days in January when snow covered the forage. One cow from the Negative Control group was removed from the study in December after she developed cancer eye. Cows were exposed by natural service to Hereford bulls from Dec. 1, 1986 to Feb 2, 1987. Pregnancy was determined by rectal palpation on April 14.

Results and Discussion

As expected, cow weight and condition losses over the total trial period were greater ($P<.01$) for the Negative Control than for the Positive Control treatment, demonstrating that a protein deficiency existed (Table 2). Cows fed wheat middlings tended to lose less weight (9 lbs., $P<.20$) and body condition (.3 units, $P<.08$) than Positive Control cows from November to the end of the study.

Pregnancy rates reflected differences in body weight and condition losses of the cows. Only 73 percent of Negative Control cows became pregnant compared to 93 percent for Positive Control and wheat middlings cows ($P<.08$)

Calves of Negative Control cows gained less ($P<.01$) weight throughout the study than calves of the other two treatments. As with cow weight and condition changes, calves of cows supplemented with wheat middlings tended to gain more weight (14 lbs.) than calves of Positive Control cows.

These results indicate that additional energy supplied by the wheat middlings did not appreciably improve cow or calf performance during the winter period. Forage supply was adequate for the entire

Table 2. Effects of supplement treatments on cow and calf performance.

	Treatments				
	Negative Control (1)	Positive Control (2)	Wheat Middlings (3)	Comparison[a] 1 vs 2,3	2 vs 3
Number of cows	13	14	14		
Initial wt, 11/11/86	1008	1012	1010		
Cow weight changes, lbs.					
11/11 to 12/09	-32	4	-1	.01	NS
12/09 to 1/7	-7	-6	-1	NS	NS
1/7 to 2/3	-53	-42	-27	.02	.08
2/3 to 3/3	-42	-31	-34	NS	NS
3/3 to 3/31	-10	14	11	.01	NS
Total 11/11 to 3/31	-144	-62	-53	.01	NS
Cow condition change[b]					
11/11 to 3/31	-1.3	-.8	-.5	.01	.08
Cows pregnant, %	73	93	93	.08	NS
Calf weight gains					
11/11 to 12/09	43	44	43	NS	NS
12/09 to 1/7	12	22	23	.01	NS
1/7 to 2/3	5	7	11	NS	NS
2/3 to 3/3	17	24	30	.01	NS
3/3 to 3/31	15	21	26	.03	NS
Total 11/11 to 3/31	92	119	133	.01	NS

[a]Orthogonal Contrasts; NS = nonsignificant (P>.20)
[b]9 point scale

trial period. Cows fed the additional energy lost slightly less weight and apparently gave slightly more milk as evidenced by heavier calf weights. However, under the conditions of this study, cows were able to meet their protein and energy requirements from the level of soybean meal fed to the Positive Control. Based on the amount of wheat middlings fed and the slight improvements in cow and calf weight changes, one would predict that forage intake was lower for cows supplemented with wheat middlings than for adequate amounts of soybean meal.

These results suggest that wheat middlings can be used to replace soybean meal when the cost per pound of protein is less. When adequate forage is available, the additional energy apparently does not enhance weight changes of lactating cows. This may not be the case, however, with non-lactating cows as demonstrated in a similar study described in this publication.