Influence of Fat Supplementation Before and After Calving on Performance of Spring Calving Cows Grazing Native Range

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Story in Brief

Seventy multiparous Angus x Hereford cows grazing dormant native grass were used to evaluate the effect of supplementation with fat on cow and calf performance. Cows were fed supplemental protein and fat from November 22 until April 10, and the average calving date was March 2. Control cows were fed 3.3 lb per day of 30% CP range cube. High fat cows were fed isonitrogenous cubes (3.3 lb per day) that contained a greater amount of fat from FuzZpellet. After calving, control cows received 5 lb per day of the same supplement and high fat cows were fed 5 lb per day of the high fat ration. All cows grazed a common tall grass native range pasture and were fed in individual covered stalls at 0800. Throughout supplemental feeding, body weights and BCS of cows were similar (P>0.10) for both treatment groups. Based on the fat analyses, cows on the high fat supplement received 87 g/d more fat prepartum and 132 g/d more fat post partum than control cows. Weight of calves at birth and weaning weights were not influenced by treatment. Pregnancy rate of cows was not influenced (P>0.20) by the supplement treatments. We conclude that the amount of additional fat in the high fat isonitrogenous supplement that was fed to gestating and lactating cows grazing dormant dry grass did not influence performance or reproduction.

Key Words: Beef Cows, Cotton By-Product, Gestation, Supplementation

Introduction

Adequate body energy reserves (body condition; BCS) at calving are essential for good reproductive performance of beef cows (Richards et al., 1986; Selk et al., 1988). Severe changes in energy intake before and after calving can affect reproductive efficiency (Spitzer et al., 1995). Pregnancy rates can be improved by feeding greater amounts of supplemental energy prepartum (Marston et al., 1995). Supplemental fats have a high energy density and can often come from low-priced feedstuffs. Possible mechanisms by which supplemental fat may influence reproductive performance of cows has been reviewed (Williams and Stano, 1999; Mattos et al., 2000). The effect of fat supplementation on reproductive performance of beef cows has been inconsistent (Wehrman et al., 1991; Carr et al., 1994; Lammoglia et al., 1996; De Fries et al., 1998; Bellows et al., 1999; Filley et al., 2000). Reproductive response to dietary fat may be influenced by body fat reserves (Funston and Filley, 2000). Performance of cows that calve with a BCS equal to or less than 5 may be increased by feeding greater amounts of dietary fat.

The objective of this study was to determine the effect of feeding a supplement containing a greater amount of fat from FuzZpellet™ (Buckeye Technologies, Memphis, TN), a cotton seed product, on weight and BCS of cows before and after calving, growth rate of calves, and pregnancy rate of cows.

Materials and Methods

Seventy multiparous Angus x Hereford cows were blocked by age, weight, and BCS in November and randomly allotted to treatments. The average calving date was March 2. Cows were fed supplement from November 22 until April 10, when native range pasture had adequate green forage. To insure that cows had a BCS of less than or equal to 5 at calving, control cows were fed 3.3 lb per day of a 30% CP range cube. High fat cows were fed isonitrogenous cubes (3.3 lb per day) that contained a greater amount of fat from FuzZpellet (Table 1). The composition of the supplements and of the FuzZpellet product used is in Table 2. After calving, control cows received 5 lb per day of the same supplement and high fat cows were fed 5 lb per day of the high fat ration. Supplement amounts were prorated for 4 d/wk individual feeding before calving and 5 d/wk feeding after calving. All cows grazed a common tall grass native range pasture and were fed in individual covered stalls at 0800. Cows had free access to a salt/mineral mixture with added chlortetracycline and water at all times.

All cow weights and BCS were recorded after removal from feed and water for 16 h. These measurements were taken at monthly intervals from November 14 until April 11. Additionally, cow weights were recorded at weaning on October 9. Cows were exposed to fertile bulls commencing on April 28 until July 31, and were examined for pregnancy via rectal palpation in October. Calves were weighed within 48 h of birth, at the end of supplementation, and at weaning.

Weaning weights were adjusted to 205 d. Data were analyzed as a randomized design using the GLM procedure of SAS.

Results and Discussion

Body condition score of cows at the initiation of winter feeding of supplement and throughout pre- and postpartum feeding were ideal to evaluate the value of supplemental feed. Average BCS was 4.85 on November 21, and was relatively constant, averaging 4.68 at calving (Table 3). Cows with this BCS should respond to additional energy in the form of fat.

Throughout supplemental feeding (November 22 to April 10) body weights and BCS of cows were similar ($P>0.10$) for both treatment groups. Based on the average fat analyses by three laboratories (Table 2), the high fat supplement contained approximately 8.9% fat and the control supplement contained 3.1% fat. Cows on the high fat supplement received 87 g/d more fat prepartum and 132 g/d more fat post partum than control cows.

Weight of calves at birth was not influenced by the supplement fed to cows before calving. As expected, bull calves were heavier than heifers at birth and at weaning. Adjusted 205 d weaning weights were not influenced by the type of supplemental fed to cows during the winter.

Pregnancy rate of cows was not influenced ($P>0.20$) by the supplement treatments. Eighty-seven percent of the control cows and 94% of the cows fed the high fat supplement were pregnant. Cows were exposed to bulls until an average of 150 d after calving and the cow that calved last was 81 d after calving at the end of the breeding season.

We conclude that the amount of additional fat in the high fat isonitrogenous supplement that was fed to gestating and lactating cows grazing dormant dry grass did not influence performance or reproduction.

Table 1. Composition of supplements (as-fed basis).

	Supplement	
Ingredient[a]	Control	High fat
FuzZ pellet	--	934
Wheat middlings	780	--
Cottonseed meal	1089	940
Molasses	100	100
Limestone	30	25
Vit A 30	1.0	1.0
Manganous oxide	--	.18
Zinc sulfate	--	.14
Total	2000	2000
[a]Pounds of ingredient		

Table 2. Analyses of samples of supplements and FuzZpellet taken on January 11, 2003.				
	Treatment			
Laboratory	Constituent	Control	High Fat	Fuzz pellet
A	DM, %	85.9	88.5	--
	CP, %	33.9	42.6	--
	Fat, %	3.9	11.4	
B	DM, %	86.1	88.0	--
	CP, %	34.3	36.5	
	Fat, %	4.0	8.7	
C	DM, %	90.0	91.2	95.1
	Fat, % (as-fed)	1.3	6.7	15.4

Table 3. Influence of fat supplementation before and after calving on performance of spring calving cows grazing dormant native range pasture.				
		Treatment		
Characteristic	N	Control	High Fat	Prob.
Calving date, average		March 2	March 3	
Body weight, lb				
Prepartum				
November 17	72	1172	1174	.93
December 17	71	1194	1181	.69
January 14	71	1191	1180	.73
February 13	64	1201	1197	.86
Postpartum				
March 13	49	1085	1093	.82

April 11	62	1037	1048	.67
October 9	65	1123	1118	.89
Body condition score (1-9 scale)				
October 30	65	4.78	4.74	.72
November 21	65	4.88	4.82	.64
December 17	64	4.94	4.89	.73
January 14	65	5.07	4.9	.19
February 13	65	4.76	4.61	.12
March 13	63	4.55	4.44	.28
April 11	65	4.26	4.17	.41
October 9	40	4.78	4.70	.62
Calf weights, lb.				
Birth, steers[a]	35	84.9	83.5	.81
heifers	34	77.2	77.6	.81
205 d adj. wt, steers[b]	34	544.0	539.5	.65
heifers	31	465.1	480.1	.65
Pregnancy, %	64	87.1	93.9	.40

[a]Sex effect P<0.003.

[b]Sex effect P<0.001.

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