

Distillers Dried Grains Supplementation of Fall-Calving Cows or Calves Grazing Stockpiled Forage during Winter

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Summary and Implications

Six 10-acre pastures containing Fawn endophyte-free tall fescue were each strip-grazed by four pregnant fall-calving cows with calves from mid-November through March. The following three treatments were applied to the cows in the six pastures: minimal supplementation for cows and calves (Minimal), minimal supplementation for cows and supplementation of the calves with a distillers dried grains(DDG)-soy hull creep feed (Creep), and DDG supplementation to cows and minimal supplementation to calves (DDG). Cow and calf weights and cow body condition were measured over the grazing season. Calves in the Creep groups had higher ADG (3.2 lb/day) than those in the DDG (2.7 lb/day) or Minimal (2.0 lb/day) groups. Cows in the DDG group had less seasonal BW loss than cows in the other two groups. There were no differences in the composition and mass of pasture forage between treatments over the winter grazing season. Supplementation of DDG to cows or a DDG-based creep feed to calves increases weight gains of fall calves while reducing loss of body condition in cows, but did not affect the rate for forage utilization.

Introduction

Feed costs are the most expensive input for cattle operations, and as such they play an important role in determining the profitability of an operation. Thus, decreasing the amount of harvested and stored forages fed to cows can increase enterprise profitability. Extending the grazing season in the fall and winter by using stockpiled forages can help accomplish this goal. However, grazing of stockpiled forages increases the cost of land needed per cow-calf unit.

Profitability of an operation may also be increased by increasing the output per unit of land by providing nutritional supplementation from inexpensive feed sources. With the recent and expected growth of the ethanol industry, there is an increasing supply of co-products that may be economical to feed. However, while there has been a significant amount of research done to validate co-product use in finishing type rations, less research has focused on the potential of feeding co-products to grazing beef cows.

Fall-calving has the advantages of less fly and mud problems during calving and requires less feed to maintain calves over winter prior to grazing in the subsequent summer. Furthermore, when combined with a spring-calving herd, fall-calving results in more efficient use of bulls and labor.

In a previous project, fall-calving cows that grazed stockpiled forage with minimal supplementation maintained adequate condition for rebreeding with significant reductions in the amounts of hay supplementation. However, calves of these cows had lower weaning weights than spring calves of cows grazing the same pastures as the fall-calving cows during the summer. Energy supplementation of fall-calving cows grazing stockpiled forages may increase their milk production and, therefore, weaning weights of their calves. However, energy supplementation directly to the calves as creep feed may be more efficient than supplementing cows.

The objective of this research was to evaluate the effects of supplementing fall-calving cows or calves grazing stockpiled forages with DDG-based supplements on cow body weight and condition score, calf ADG, and stockpiled forage utilization during the winter grazing.

Materials and Methods

At the ISU Beef Nutrition Farm near Ames, Iowa, 60 acres containing Fawn endophyte-free tall fescue were divided into six 10-acre pastures. Forage from the pastures was harvested as hay in two cuttings. After the second hay harvest in August, pastures were fertilized with 40 lb N/acre. Forages were stockpiled and divided into 8 paddocks in preparation for winter grazing after two cuttings of hay harvested during the summer. On November 17, 2005, 24 Simmental x Angus fall-calving cows (initial body weight (BW), 1493 lb; initial body condition score (BCS), 5.98) with calves (initial weight, 283 lb) were allotted to the six pastures to strip-graze. Each pasture was assigned to one of three supplementation treatments: 1) Minimal supplementation, 2) Creep, and 3) DDG. In the Minimal supplementation treatment, cows received DDG only for risk management, and calves received no supplement. In the Creep treatment, cows received DDG only for risk management, and calves had ad lib access to a pelleted creep feed (45% DDG, 45% soybean hulls, 5% molasses, and 5% vitamin-mineral premix). In the DDG treatment, cows received DDG to maintain a body condition score (BCS) of 5 on a 9-point scale (as estimated by the Cornell Net Carbohydrate and Protein System) and calves received no supplement. Body weights were measured every 28 d for both cows and calves, and BCS were

estimated bi-weekly for the cows until weaning of the calves on March 23, 2006.

Pastures were sampled every 28 d at two locations in each grazed and ungrazed paddock of the pastures. Grazed or ungrazed samples were composited by pasture, weighed, dried at 140° F for 48 hours, ground, and analyzed for NDF, ADF, CP, and ADIN.

Results and Discussion

Cows in pastures with the DDG treatment required 863 lb DDG/cow to maintain a BCS of 5 over the winter. Because of a large amount of snow followed by cold temperatures in December, cows in pastures with the Minimal supplementation or Creep treatments were fed an average of 112 lb DDG/cow over a period of 18 d. Calves in pastures with the Creep treatment consumed 914 lb creep feed/calf over the winter. Inasmuch as the costs of the DDG and creep feed were \$113.36 and \$168.40 /ton, the costs of the supplements for both cows and calves in the Minimal supplementation, Creep and DDG treatments were \$6.35, \$83.31, and \$48.89/cow-calf pair.

There were no significant differences between treatments for cow BW and BCS at the beginning of winter grazing. But by the end of the grazing season, DDG cows had higher BW ($P=0.053$ and 0.062 , respectively) than cows in the Minimal and Creep treatments. The difference in BCS at the end of the grazing season was also significant with DDG groups being the highest, followed by the Creep and Minimal groups. Because BCS of cows in the Creep treatment were higher than those in the Minimal treatment, feeding creep feed to calves may have reduced cow energy

needs. The Minimal and Creep groups received some DDG supplementation due to weather, not as a result of BCS falling below 4.33. Even with this supplementation due to weather, the differences in BW and BCS were significant.

Average daily gains of calves from the Minimal, Creep, and DDG treatments were 2.0, 3.2, and 2.6 lb/d ($P < 0.01$), resulting in BW changes of 263, 413, and 330 lb over the 129-day winter grazing period. As a result of these BW gains, unadjusted weaning weights were 538, 700, and 615 lb for calves from the Minimal, Creep, and DDG treatments on March 23, 2006. Costs of the extra calf BW gain over that of calves in the Minimal supplementation treatment were \$0.51 and \$0.64/lb for the Creep and DDG treatments, respectively.

There were no significant differences in the initial mass (3,633.8 lbs/acre) or the concentrations of CP (9.2%), NDF (55.1%), ADF (35.8%), or ADIN (17.0% of N) in the forage of the stockpiled pastures between the treatments. The rate of forage quality change for each of these components also did not differ between treatments over grazing.

While supplementation of cows with DDG or calves with a DDG-based creep feed increased calf ADG, cow weight, and BCS, it appears to have had no effect on grazing efficiency. This result seems to imply that either the substitution of DDG for forage was not large or that any effects of DDG supplementation on forage use were masked by weather losses of the forage. Due to the differences in ADG, cow BW, and BCS, it is apparent that the additional energy from DDG was utilized to maintain cow condition and was also passed along to the calf in the form of increased milk quality or volume.

Table 1. Initial and seasonal changes in body weight and condition scores of cows and daily gains of calves from cows in the Minimal supplementation, Creep, and DDG treatments.

	Cow					
	BW, lb		BCS		Calf BW, lb	
	Initial ^a	Seasonal Change	Initial	Seasonal Change	Initial	ADG
Minimal	1505	-126 ^b	6.06	-1.6	275	2.04 ^b
Creep	1503	-119 ^b	5.75	-1.0	287	3.20 ^c
DDG	1471	-23 ^c	6.13	-1.2	285	2.55 ^d

^aDifferences for Initial BW, Initial BCS, and BCS seasonal change were not significant.

^{bcd}Difference in columns with different superscripts are significant, $P < 0.05$.

Table 2. Forage mass and composition from grazed and ungrazed paddocks in pastures grazed by cows in the Minimal supplementation, Creep, and DDG treatments.

	Daily Change		
	Initial	Grazed	Ungrazed
Forage mass, lb DM/acre	3633.8	-18.04	-5.73
<u>% of DM</u>			
CP	9.2	0.006	0.006
NDF	55.1	0.16 ^a	0.17
ADF	35.8	0.092	0.092
<u>% of total N</u>			
ADIN	17.0	0.036	0.036

^aP=0.085