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Supplementing DDGS to Steers Grazing Smooth Bromegrass Pastures

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Summary

Five years of data were summarized to evaluate cattle and pasture performance when smooth bromegrass pastures were fertilized or cattle were supplemented daily with dried distillers grains with solubles (DDGS) on nonfertilized pastures. Cattle were supplemented at 0.6% of BW for an average of 158 days. Supplemented cattle gained 0.59 lb/day more than unsupplemented cattle. As forage quality declined over the grazing season, ADG also declined but the cattle's response to DDGS supplementation increased. Each 1 lb of DDGS supplement replaced approximately 1 lb of forage intake. Pastures with supplemented cattle had increased forage production compared to control pastures but less forage production than fertilized pastures.

Introduction

Supplementing with DDGS has been shown to increase ADG while decreasing forage intakes in cattle (*2005 Nebraska Beef Cattle Report*, pp. 18-20). Cattle supplemented with DDGS will have excess N in their diet, which will be excreted on the pastures in the form of urea in the urine. This urea is quickly broken down in the soil and utilized by plants to increase production. Rotating the cattle between paddocks during the growing season will ensure a more even application of this excess N from the urine onto the pastures. The objective of this trial was to compare the effects of different grazing and supplementation strategies on both pasture and cattle performance by evaluating pasture production, cattle intake, and weight gain.

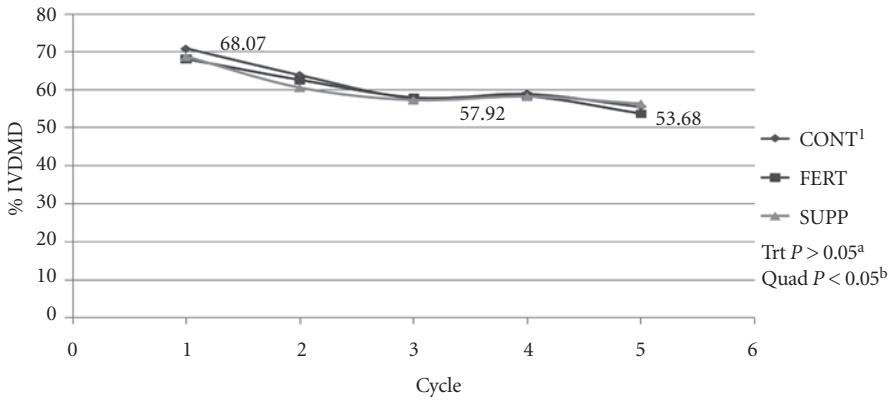
Table 1. Pasture performance of steers grazing smooth bromegrass.

	CON	FERT	SUPP	SEM	*P*-value
Days		158	158	158	
Initial BW, lb	718	716	713	12.78	0.96
End BW, lb	959[a]	954[a]	1046[b]	15.4	<0.01
ADG, lb/day	1.53[a]	1.51[a]	2.11[b]	.07	<0.01

[a,b] Means in a row without a common superscript differ ($P < 0.01$).

Procedure

Two hundred and twenty-five yearling steers (716 ± 13 lb) were used in a randomized complete block design over the course of five years on smooth bromegrass pastures at the University of Nebraska–Lincoln Agricultural Research and Development Center near Mead, Neb. Treatments consisted of pastures fertilized in the spring with 80 lb N/ac (FERT) and stocked at 4 AUM/ac, pastures stocked with cattle that received 0.6% of BW or 4.2 to 6.2 lb of DM/steer daily as DDGS (SUPP), and nonfertilized pastures that were stocked at 69% of the other two treatments (CON). Pasture was the experimental unit and was replicated three times. Pastures were divided equally into six paddocks that were rotationally grazed. The grazing season lasted from late April through September each year and was divided into 5 cycles with cycles 1 and 5 being 24 days in length and cycles 2, 3, and 4 being 36 days in length. Put-and-take yearling steers were used to maintain similar grazing pressure among treatments. Beginning and ending BW were measured on three consecutive days after a five-day limit fed period to reduce fill effects. Weights also were collected after each cycle and were shrunk 4% to account for rumen fill. Ruminally fistulated steers were used to collect diet samples from each treatment during each cycle. These samples were then evaluated for forage DM, CP, and IVDMD. This information was then used to estimate forage intakes using the NRC (1996) beef cattle model.



[a]No statistical differences between treatments over time.
[b]Quadratic relationship between IVDMD and time of grazing.
[1]Pastures were either nonfertilized (CONT), fertilized with N at 80 lb/ac (FERT), or nonfertilized and steers were supplemented with 0.6% of BW of DDGS daily for the entire grazing period (SUPP).

Figure 1. *In vitro* dry matter digestibility of smooth bromegrass over the grazing season.

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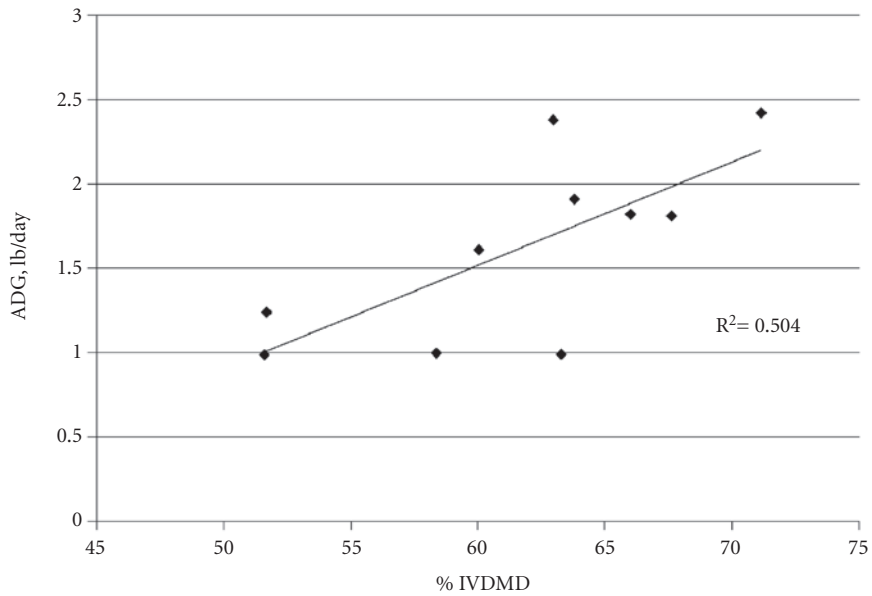

Figure 2. ADG of unsupplemented cattle in relation to IVDMD of smooth bromegrass over the grazing season.

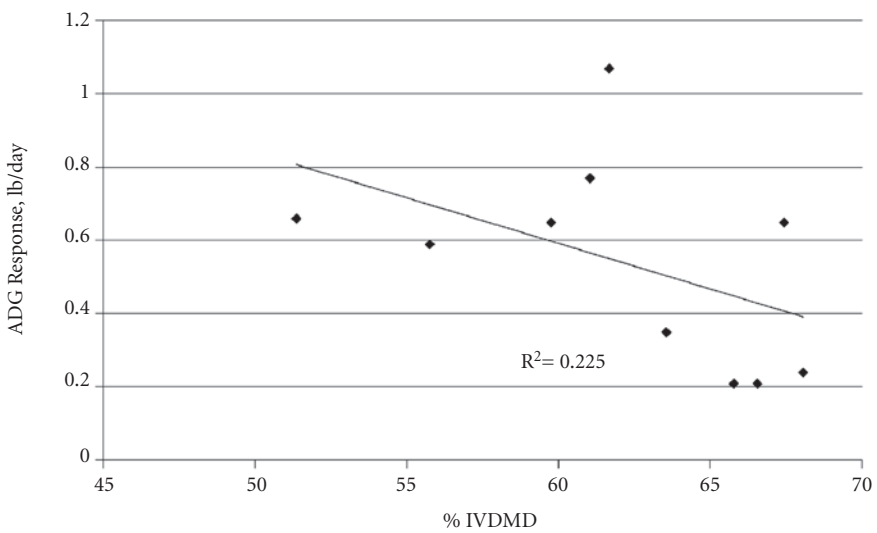

Figure 3. ADG response of supplemented cattle in relation to IVDMD of smooth bromegrass over the grazing season.

Results

Average daily gain was different between treatments ($P < 0.01$; Table 1), with supplemented steers gaining 0.59 lb/day more than steers on either of the unsupplemented treatments. This resulted in supplemented cattle weighing 90 lb more than unsupplmented cattle at the end of the grazing season. Pasture IVDMD did not differ between treatments ($P > 0.05$; Figure 1) so the increased gain of the SUPP steers can be attributed to the energy from fat and undegradable intake protein of the DDGS (*2006 Nebraska Beef Cattle Report*, pp. 27-29). Interim weights between cycles show increased response to the DDGS is not equal throughout the season. Pasture IVDMD also was not constant across the grazing season, with higher quality forage in cycles 1 and 2 and a decline in IVDMD through cycles 3, 4, and 5 (Figure 1). As IVDMD declined through the grazing season, ADG of the cattle also declined (Figure 2). The response of the SUPP cattle to the DDGS was defined as their increased gain over the gain of the unsupplemented cattle. As IVDMD and ADG of the cattle declined, the cattle's response to the DDGS actually increased (Figure 3). In cycles 1 and 2, the supplemented steers' ADG response was 0.33 lb/day. In cycles 3, 4, and 5, IVDMD of the smooth bromegrass declined and ADG response increased to 0.75 lb/day. This suggests that supplementing grazing cattle at key points in the grazing season may be beneficial. Forage production showed a quadratic response for all treatments, with peak production reached in cycle 2. The FERT pastures had the largest forage production per acre overall, while CON pastures had the least growth, and SUPP pastures were intermediate in forage production. Because the CON cattle had 45% more area than the other two treatments, forage availability per animal was similar among all treatments. The NRC model predicts that CON steers had an intake of 18.9 lb/day of bromegrass. Assuming DDGS has a TDN value of 108%, SUPP steers had an intake of 12.8 lb/day of bromegrass plus 5.1 lb/day of DDGS. The CON cattle were stocked at 69% of SUPP cattle, and SUPP steers had 68% of the forage intake of CON steers. Daily supplementation of DDGS to steers grazing smooth bromegrass pastures improved both cattle and pasture performance compared to the control.

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