

Strategies for DDGS Supplementation Frequency to Grazing Yearling Steers

Sydney T. Vanderhoff
Rebecca L. Sjostrand
Mitchell M. Norman
Isaque F. Vicci
Jim C. MacDonald
Mary E. Drewnoski

Summary with Implications

Infrequent supplementation saves labor and may reduce animal performance, but recent research with reduced fat distillers grains has provided inconsistent results. This experiment evaluated the effects of daily and three times a week supplementation of dried distillers grains on yearling steer performance grazing smooth bromegrass pastures from May to August. Daily supplemented steers received 5.6 pounds of dry matter per steer of dried distillers grains with solubles 7 days/week. The three times a week supplemented steers received 13.0 pounds of dry matter per steer of dried distillers grains with solubles three days/week (Monday, Wednesday, Friday). A control treatment received no supplementation. Providing distillers grains supplement increased gain by 0.89 pounds per day compared to non-supplemented cattle. Daily supplementation of dried distillers grains increases gain by 0.31 pounds per day compared to three times a week supplementation and a non-supplemented control. Supplementing distillers gains three times per week may reduce ADG by 10% compared to daily supplementation.

Introduction

Supplemental rumen undegradable protein and energy may be provided in a forage-based production system during periods of limited forage quantity and/or quality. Supplementation can increase animal weight gain to meet desired performance but can also increase labor requirements. However, the labor needs for sup-

plementation may be mitigated by reducing frequency of supplementation. A common supplement choice for grazing cattle is dried distillers grains (DDGS). Previous work done at the University of Nebraska observed that infrequent supplementation of DDGS reduced steer average daily gain (ADG) by 10% (2003 *Nebraska Beef Cattle Report*, pp 8–10). More recent work done at the University of Nebraska observed no differences in animal performance with daily vs. infrequent supplementation of DDGS (2022 *Nebraska Beef Cattle Report*, pp 26–27). Thus, infrequent supplementation may reduce labor costs but its impact on steer performance is unclear. Therefore, the objective of the study was to evaluate the performance of yearling steers grazing smooth bromegrass pastures supplemented dried distillers grains plus solubles (DDGS) either daily or three times per week.

Procedure

One hundred forty-four crossbred yearling steers (698 lb; SD = 2.75) were randomly assigned to one of twenty-four paddocks in a randomized generalized block design with three treatments. The blocking factor was pasture location. There were four pasture blocks, each containing six paddocks and two treatment replicates. Steers were weighed on three consecutive days after limit feeding a common diet of 50% alfalfa and 50% Sweet Bran at 2% of BW for ten days to minimize gut fill at the initiation and end of the grazing period. Steers were stratified by body weight and randomly assigned to paddock within pasture block.

The three treatments included a control treatment (CON) received no supplement, a daily treatment (DAILY) which received 5.59 lbs/steer (dry matter) of DDGS 7 days a week, and a three times per week treatment (ALT) which received 12.99 lbs/steer (dry matter) of DDGS Monday, Wednesday, and Friday. The DAILY treatment received 0.8% BW of supplement per day of initial

BW and ALT received 1.86% of BW of supplement per day of initial BW. At the end of the week ALT received the same amount of supplement as DAILY. Limestone was included in the supplement at 2.25% diet DM. Supplement was delivered into a feed bunk to minimize waste. All steers were implanted with 40 mg trenbolone acetate and 8 mg estradiol (Rev-G; Merck Animal Health, De Soto, KS) at trial initiation. Paddocks were divided equally into three strips and rotationally grazed. Grazing was initiated May 4th & 5th with cattle removed from pastures August 8th, for a total of 97 grazing days. Put-and-take steers were utilized to match stocking rate with forage growth. One steer was added to each paddock and was removed on June 30. The performance of these steers was not included in the statistical analysis. Each treatment group rotated through three 2.00-acre strips per pasture. Pre-graze and post-graze biomass were measured in duplicate at ground level from each paddock at each rotation. Pre-graze biomass samples were used to determine forage availability.

Data were analyzed with MIXED procedure of SAS with paddock as experimental unit and treatment and block as fixed effects. Biomass was analyzed with repeated measures model of SAS with block and treatment measures repeated over Julian dates. Significance was declared at $P \leq 0.05$.

Results

The control calves gained 1.86 lb/d. Both DDGS treatments increased ADG compared to the control ($P < 0.01$; Table 1), with DAILY supplementation gaining 2.75 lb/d and ALT gaining 2.45 lb/d. However, the ADG was decreased ($P < 0.01$) with ALT compared to DAILY supplementation. The differences in ADG were reflected in similar differences in ending BW. The ending BW of both DDG treatments (DAILY = 961 lb, ALT = 933 lb) was greater ($P < 0.01$) than the CON treatment (878 lb). Accordingly, the ending BW of DAILY steers was greater

Table 1. Effect of daily or 3x weekly distillers grains supplementation on performance of grazing steers

Performance	Treatments ¹			SEM	P-value
	DAILY	ALT	CONTROL		
Initial BW, lb	698	699	700	2.75	0.96
Ending BW, lb	961 ^a	933 ^b	878 ^c	6.23	<0.01
ADG, lb	2.75 ^a	2.45 ^b	1.86 ^c	0.06	<0.01

¹Treatments included daily (DAILY) DDGS supplementation fed at 5.6 lb DM per steer, alternate (ALT) DDGS supplementation fed 3x per week at 13.0 lb DM per steer, and a non-supplemented control (CONTROL).

^{a,b,c} Means within a row with different superscripts differ ($P < 0.05$)

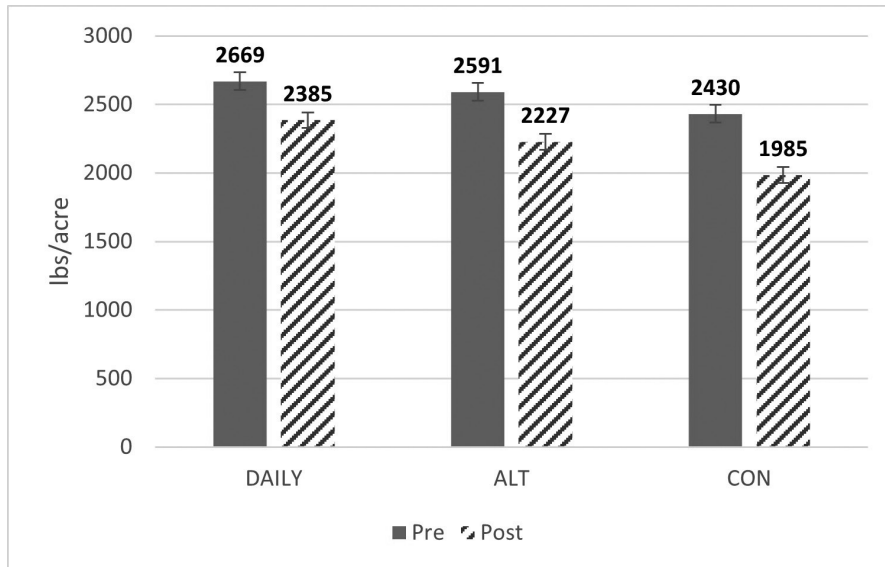


Figure 1. Pre and post graze biomass availability from 3 DDGS supplementation strategies of steers grazing Smooth Bromegrass paddocks¹.

than ALT steers ($P < 0.01$). Therefore, daily supplementation of DDGS resulted in greater ADG and greater final BW when compared to three times a week supplementation and the non-supplemented control for steers grazing smooth bromegrass pastures. These results agree with past research (2003 Nebraska Beef Cattle Report, pp 8–10) with ALT supplementation of DDGS to heifers reducing ADG by 10.5% compared to DAILY. In the current study, pre-biomass of CON was lower when compared to DAILY ($P < 0.01$; Figure 1). Similarly, post biomass was reduced in control treatments compared to the supplemented treatments ($P < 0.01$; Figure 1) thus CON treatment may have consumed more forage than the supplemented treatments.

Conclusion

Providing supplemental DDGS increases ADG compared to non-supplemented steers, while infrequent supplementation reduces gain compared to daily supplementation by approximately 10%. Forage intake of supplemented steers is likely reduced compared to non-supplemented steers which may allow producers to increase the stocking rate of a pasture system. The economic and logistical viability of daily supplementation depends on the cost and availability of labor required to provide the supplement.

Sydney T. Vanderhoff, graduate student.
 Rebecca L. Sjostrand, research technician.
 Mitchell M. Norman, research technician.
 Isaque Vicci De-Araujo, graduate student.
 Mary E. Drewnoski, associate professor.
 Jim C. MacDonald, professor, Department of Animal Science, University of Nebraska-Lincoln.

NOTES

1. Treatments included daily DDGS supplementation fed daily 5.6 lb DM per steer, alternate DDGS supplementation fed 3x per week 13.0 lb DM per steer, and a non-supplemented control

Pre: ALT vs CON $P = 0.07$, ALT vs DAILY $P = 0.36$, CON vs DAILY $P < 0.01$

Post: ALT vs CON $P = 0.003$, ALT vs DAILY $P = 0.042$, CON vs DAILY $P < 0.01$