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Dried Distillers Grains as Creep Feed for Yearling Beef Cattle Grazing Sandhill Range

Richard N. Funston
University of Nebraska-Lincoln, rfunston2@unl.edu

Don C. Adams
University of Nebraska-Lincoln, dadams1@unl.edu

Matt Stockton
University of Nebraska-Lincoln

Roger K. Wilson
rwilson6@unl.edu, rwilson6@unl.edu

Rex Davis
University of Nebraska-Lincoln, rdavis1@unl.edu

See next page for additional authors

Authors
Richard N. Funston, Don C. Adams, Matt Stockton, Roger K. Wilson, Rex Davis, and James R. Teichert

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Rick N. Funston
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Rex L. Davis
Jim R. Teichert[1]

Summary

Seventy-nine crossbred summer and fall-born steers and heifers were stratified by weight, calving group, and sex and assigned to treatment or control. Yearlings in the treatment group (TRT; n = 40) grazed native summer Sandhill range and had access to ad libitum dried distillers grains (DDG) pellet in a creep feeder for 54 days of a 63-day grazing period. Control (CON; n = 39) yearlings grazed in an adjacent pasture without DDG. Immediately after the grazing period, yearlings were placed in a feedlot and fed to a similar backfat endpoint. Individual forage and DDG intake estimates and animal ADG and carcass characteristics were used to determine the value of DDG to TRT yearlings at the end of the grazing period and at harvest. Intake of DDG averaged 11 lb/d DM. Summer ADG was greater (P<0.01) for TRT (2.8 lb/day) than CON (1.9 lb/day). Yearlings previously allowed access to DDG gained more (P<0.01) during the first 30 days in the feedlot (2.9 vs. 2.4 lb/d for TRT and CON, respectively). Yearlings allowed access to DDG were harvested 14 days before CON (138 DOF). Final weight, ADG, and carcass characteristics were similar between TRT and CON. There was a tendency (P=0.15) for TRT cattle to have a higher percentage grading choice, (67 vs. 51% for TRT and CON, respectively). The value of DDG to yearlings grazing Sandhill range was greater than the estimated cost at both the grazing and harvest endpoints.

Introduction

Prices of grazed forage continue to rise in many areas throughout the United States, including Nebraska. Dried distillers grains (DDG) is typically priced relative to the price of corn. Because of its unique feed characteristics, this co-product of the ethanol industry may prove to be an economical replacement for a portion of the grazed forage in cow-calf or backgrounding operations. Economic trends and environmental incentives favoring the production of ethanol are likely to continue. Previous research has demonstrated improved performance of yearling heifers grazing smooth bromegrass pastures and yearling steers grazing Sandhill range when individually supplemented differing levels of distillers grains. Objectives of this study were to determine intake and ADG of yearling cattle offered DDG ad libitum while grazing Sandhill range. Subsequent feedlot and carcass characteristics were used to make an economic evaluation of utilizing DDG as a free choice supplement in yearling cattle.

Procedure

Experimental Procedure

Fifty-three crossbred (5/8 Red Angus, 3/8 Continental) June-born steers and 26 August-born steers and heifers were stratified by weight, calving group, and sex and assigned to one of two treatments. Yearlings in the treatment group (TRT; n = 40) grazed native summer Sandhill range and had access to ad libitum DDG pellet in a creep feeder for 54 days of a 63-day grazing period. The analysis for the pellet was 88% DM, 28% CP and 11.2% ether extract (DM). Control (CON; n = 39) yearlings grazed in an adjacent pasture without DDG. Two consecutive weights were taken before and at the end of the grazing period prior to starting on a finishing diet. Yearlings were placed in a feedlot at the University of Nebraska West Central Research and Extension Center in North Platte, where they were fed in two pens. Cattle were fed step-up diets for 21 days, then switched to the final finishing diet (Table 1). Steers were given a single implant (Revalor S®;Intervet, Millsboro, Del.) 30 days after arrival in the feedlot; heifers were given a Revalor H® (Intervet, Millsboro, Del.) at the same time. Weights were collected at implant time, approximately 50 days later, and at harvest. Harvest date was determined by weight upon entry into feedlot, past cattle performance of similar genetics, and intermediate weight gain to optimize marketing grid value. Final weights

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Table 1. Finishing diet, ingredient composition, and total amount fed (DM) per animal previously allowed access to ad libitum dried distillers grains (TRT) or not (CON)

Item	DM (%)	TRT (lb)	CON (lb)
Corn	48	2987	3331
Corn Gluten Feed	40	2606	2881
Alfalfa	7	626	650
Supplement	5	326	359
Supplement Ingredients			
Corn	58.25		
Limestone	29.60		
Salt	5.60		
Ammonium Chloride	4.65		
Trace Mineral	0.930		
Rumensin-80	0.349		
Tylan-40	0.250		
Thiamine	0.238		
Vitamin Premix	0.214		

were calculated using hot carcass weight adjusted to a common dressing percentage (63). This adjusted final weight was also used to calculate ADG. Cattle were harvested at a commercial packing plant and carcass characteristics were determined following a 24-hour chill. Carcass measurements included hot carcass weight, marbling score, KPH fat, 12th rib fat thickness, and ribeye area.

Economic Analysis

The value of DDG was calculated when the cattle were taken off grass in early August and at harvest in December.

For the August analysis, cattle were valued using Cattle-Fax (2005) prices which ranged from $108.97/cwt for 750 lb steers, to $135.70/cwt for 450 lb steers. Price differences for heifers ranged from -$9.00/cwt for a 750 lb heifer, to -$12.50/cwt for a 450 lb heifer.

Actual carcass prices received for the TRT group were used in the harvest analysis (Table 2). Weighted averages were used to calculate the group revenues used in the analysis.

Grazing costs were calculated using a rate of $28.30 per animal unit month (AUM) An AUM was defined as 680 lb of dry matter. Forage intake for non-creep fed animals was estimated using the calf equation from the National Research Council's Nutrient Requirements of Beef Cattle.

Individual DDG intakes for creep fed animals were estimated using the following formula, which was derived using the National Research Council's Nutrient Requirements of Beef Cattle (1996).

Table 2. Carcass grid price, using $153.08[a] per cwt as base price.

Item	Adjustment
Prime-Choice Price Spread	+17.50
Choice-Select Price Spread	-9.95
Yield Grade 1	+6.50
Yield Grade 2	+2.50
Heavy Carcasses (>1000 lb)	all yield grades priced at 137.65
Heifer	-0.07

[a]Adjustments from Choice Yield Grade 3 Steer.

Table 3. Effect of ad libitum access to dried distillers grains while grazing pasture (TRT) and season of birth on grazing BW change and subsequent feedlot gain and carcass characteristics.

	TRT	Control	*P* - value	June steer	August steer	August heifer	*P* - value
n	40	39		53	15	11	
Initial Wt. (lb)	648	644	.71	683[a]	642[b]	613[b]	<0.01
Final Wt. (lb)	825[a]	765[b]	<0.01	849[a]	798[b]	739[c]	<0.01
Grazing ADG (lb)	2.80[a]	1.94[b]	<0.01	2.62[a]	2.49[a]	2.01[b]	<0.01
1st 30 d ADG (lb)	2.91[a]	2.43[b]	<0.01	2.95	2.47	2.58	.07
Final Weight (lb)	1246	1243	.97	1354[a]	1257[b]	1124[c]	<0.01
ADG (Feedlot) (lb)	3.40	3.44	.67	3.86[a]	3.48[b]	2.82[c]	<0.01
Hot Carcass Wt. (lb)	785	783	.97	851[a]	791[b]	708[c]	<0.01
Marbling Score[d]	518	503	.43	506	476	551	.07
Choice (%)	67	51	.15	57	39	81	.10
Back Fat (in)	.35	.34	.73	.34	.31	.38	.21
Ribeye Area (in^2)	14.49	14.87	.30	15.14	14.74	14.15	.16
Yield Grade	2.21	2.07	.29	2.24	2.07	2.11	.54

[abc]Means without a common superscript differ ($P<0.01$).
[d]500=small 0

$$\text{Individual DDG} = \left(\frac{\text{Individual Calf Weight}}{\text{Average Calf Weight}}\right)^{.75} * \text{Average DDG}$$

Estimates of forage savings by TRT animals were calculated by reducing the amount of forage dry matter intake by one half pound for every pound of DDG consumed based on previous estimates of forage replacement by DDG (*2005 Nebraska Beef Report,* p. 18). It should be noted that the maximum amount of DDG supplementation was 6 lbs per head per day approximately one half the DDG consumed in the current study.

Individual feed costs during the finishing period were also estimated using the following formula, derived from NRC (1996).

$$\text{Individual Feed Cost} = \left(\frac{\text{Individual Calf Weight}}{\text{Average Calf Weight}}\right)^{.75} * \text{Average Feed Cost}$$

The value of DDG for the feeder cattle was determined by adding the value of the replaced forage and the difference between average revenues of TRT and CON groups. The value of DDG for feedlot cattle also accounted for differences in finishing costs between the two groups to a similar BF endpoint.

Results

Average beginning weight was 646 lb and did not differ between treatments. Intake of DDG averaged 11 lb/d DM. Summer ADG was greater ($P<0.01$) for TRT (2.8 lb/d) than CON (1.9 lb/d) as was BW at the end of the grazing period, 825 and 765 lb for TRT and CON, respectively. June-born steers were heavier ($P<0.01$) at the beginning and end of the grazing period than either August-born steers or heifers (Table 3). June-born steers also had greater ADG during the grazing period than August-born heifers. August-born steers gained more than August-born heifers and weighed more at the end of the grazing period. Yearlings previously allowed access to DDG gained more ($P<0.01$) during the first 30 days in the feedlot (2.9 vs. 2.4 lb/day for TRT and CON, respectively). Yearlings with previous access to DDG were harvested 14 days before the CON group, 124 and 138 DOF, respectively. Total feedstuff amounts for TRT and CON are presented in Table 1. Final weight, ADG, and carcass characteristics were similar between TRT and CON (Table 3). There was a tendency ($P=0.15$) for TRT cattle to have a higher percentage grading Choice, (67 vs. 51 for TRT and CON, respectively) even though TRT cattle were on a finishing diet for a shorter period. Final weight, feedlot ADG, and hot carcass weight was greatest ($P<0.01$) for June steers followed by August steers and August heifers (Table 3). August-born heifers tended ($P=0.10$) to have a higher percentage Choice than steers born

in June or August (Table 3). It was a challenge to feed cattle differing in age and sex together to an optimum end point for the entire group. In evaluating backfat and yield grade data it appears both groups could have been fed longer. However, carcass weights were reaching upper limits in June steer calves, as there was a June steer in each group with a carcass weight in excess of 1,000 lb. Total feed and yardage costs were $16.76/head greater for CON to reach a similar carcass weight and backfat endpoint.

Economic Analysis. The overall value of DDG for the TRT cattle through the grazing period was $146.86, and $154.37/ton for animals retained to harvest. This indicates DDG had a value in excess of its estimated cost. Using these forage costs and cattle prices it appears DDG is an economically viable feed source for yearling cattle grazing Sandhill range.

It was estimated the TRT yearlings consumed 30% less forage than the CON yearlings. Assuming this reduced forage consumption, the area of pasture required to support a single CON yearling would support approximately 1.4 TRT yearlings. If pasture is limiting, the carrying capacity of a given area may be extended with ad libitum use of DDG. In this study, the value of DDG as a pasture supplement for yearling cattle was dependent on length of ownership, initial BW on pasture, and sale price.

Implications

As ethanol production expands in the Midwest, additional distillers grains will be available to beef cattle producers. Feedlots are using much of this product at the present time; however, feeding DDG to yearling cattle grazing summer Sandhill range may be profitable depending on pasture and DDG prices and feeder and fed cattle market prices.

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[1]Rick Funston, assistant professor; Don Adams, professor; Matt Stockton, assistant professor; Roger Wilson, research technician; Rex Davis; and Jim Teichert, beef unit, West Central Research and Extension Center, North Platte.