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Dakota Gold®-brand dried distiller's grains with solubles: effects on finishing performance and carcass characteristics

Abstract

A 153-day trial was conducted using 345 heifers to determine optimal level of Dakota Gold® dried distiller's grains with solubles (DDGS) in finishing diets based on steam-flaked corn. Diets contained six levels of DDGS: 0%, 15%, 30%, 45%, 60%, and 75%. DDGS affected average daily gain, final weight and hot carcass weight, all of which increased with 15% DDGS and then decreased as additional DDGS was added. Growth performance of heifers fed 30% DDGS was similar to those fed no DDGS. In general, heifers were overfinished, with 61% being Yield Grade 3 or greater and 83% grading Choice or Prime. Backfat tended to decrease with addition of DDGS, and kidney, pelvic, and heart fat and marbling scores tended to be greatest for intermediate levels of DDGS. Percentage of carcasses grading Choice or Prime tended to be lower for heifers fed 60 or 75% DDGS.

Keywords

Cattlemen's Day, 2002; Kansas Agricultural Experiment Station contribution; no. 02-318-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 890; Beef; Dried distiller's grains with solubles; Finishing cattle; Performance

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**DAKOTA GOLD[®]-BRAND DRIED DISTILLER'S GRAINS
WITH SOLUBLES: EFFECTS ON FINISHING
PERFORMANCE AND CARCASS CHARACTERISTICS**

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Summary

A 153-day trial was conducted using 345 heifers to determine optimal level of Dakota Gold[®] dried distiller's grains with solubles (DDGS) in finishing diets based on steam-flaked corn. Diets contained six levels of DDGS: 0%, 15%, 30%, 45%, 60%, and 75%. DDGS affected average daily gain, final weight and hot carcass weight, all of which increased with 15% DDGS and then decreased as additional DDGS was added. Growth performance of heifers fed 30% DDGS was similar to those fed no DDGS. In general, heifers were overfinished, with 61% being Yield Grade 3 or greater and 83% grading Choice or Prime. Backfat tended to decrease with addition of DDGS, and kidney, pelvic, and heart fat and marbling scores tended to be greatest for intermediate levels of DDGS. Percentage of carcasses grading Choice or Prime tended to be lower for heifers fed 60 or 75% DDGS.

(Key Words: Dried Distiller's Grains with Solubles, Finishing Cattle, Performance.)

Introduction

Dakota Gold DDGS is a by-product of alcohol fermentation and can be made from corn, rye, or barley. The product is similar to corn gluten feed, except with DDGS, the remaining kernel fraction contains less gluten and more protein and oil. Distiller's

grains can be fed either wet or dry, but the dried version is easier to handle. DDGS is an alternative to typical cereal grains in finishing cattle diets and in some cases may decrease acidosis and increase performance. DDGS is higher in fiber (43% NDF on a dry matter basis) than cereal grains, which can stabilize rumen pH and make cattle less prone to acidosis. We hypothesized that DDGS could be a good source of both energy and fiber in a finishing diet. This study was designed to identify the level of dietary inclusion that would optimize performance of cattle fed diets based on steam-flaked corn.

Experimental Procedures

Three hundred and forty-five crossbred heifers were used in a 153-day finishing trial. They were stratified by previous receiving treatment and randomly allocated to the six levels of DDGS (54 total pens with 9 pens per diet, 6 to 7 head per pen). Diets (Table 1) consisted of six levels (0%, 15%, 30%, 45%, 60%, and 75%) of Dakota Gold-brand distiller's dried grains with solubles.

Heifers were implanted with Component T-H[®] on day 1, and fed ad libitum amounts of their respective diet once daily. Finishing diets provided 300 mg Rumensin[®], 90 mg Tylosin[®], and 0.5 mg of melengesterol acetate per heifer daily.

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Results and Discussion

Feedlot performance and carcass characteristics are shown in Table 2. Heifers started at a similar weight on all treatments, but DDGS affected final weight, hot carcass weight, and average daily gain ($P < 0.05$). Cattle fed 0% or 30% DDGS gained at similar rates, and finished at similar weights. Heifers fed 15% DDGS had the best growth performance and addition of higher levels of DDGS to diets led to decreased performance. However, 12th rib fat thickness decreased as DDGS was added to the diet. Heifers in this experiment were overfinished, as evident in the large proportion of carcasses with a Yield Grade of 4 and 5, and with a USDA

grade of Choice or Prime. Overall, 83% of the carcasses graded Choice or Prime. There was a tendency for heifers fed 60% or 75% DDGS to have a lower percentage of high-grading carcasses. Increasing level of DDGS did not affect the number of liver abscesses or the percent dark cutters.

Heifers on diets containing 15% DDGS finished at a heavier final weight and hot carcass weight, gained more weight per day, were more efficient, and had a higher percentage of cattle grading Prime. Growth of heifers fed 30% DDGS was similar to those fed no DDGS. Including DDGS at 45% or more tended to reduce performance and carcass grade.

Table 1. Diet Compositions (% of Dry Matter)

Item	Dried Distiller's Grains with Solubles ^a					
	0%	15%	30%	45%	60%	75%
DDGS ^a	-	15	30	45	60	75
Flaked corn	76.62	62.98	49.06	33.89	18.72	3.56
Ground corn	0.00	0.40	1.06	1.38	1.69	2.00
Alfalfa hay	10	10	10	10	10	10
Cane molasses	5	5	5	5	5	5
Dehulled soybean meal	3.01	1.43	0	0	0	0
Urea	1.21	1.06	0.79	0.67	0.55	0.43
Limestone	1.32	1.29	1.25	1.23	1.21	1.19
Salt	0.09	0.09	0.08	0.08	0.08	0.07
Medicated premix ^b	2.45	2.45	2.45	2.45	2.45	2.45
Vitamin/mineral premix ^c						
Crude protein	14.0	14.1	15.0	16.6	18.1	19.7

^aDakota Gold-brand dried distillers grains with solubles.

^bProvided 300 mg monensin, 90 mg tylosin and 0.5 mg melengesterol acetate per heifer daily.

^cProvided 1,200 IU/lb vitamin A, 0.05 ppm cobalt, 10 ppm copper, 0.62 ppm iodine, 60 ppm manganese, 0.30 ppm selenium, 10 ppm thiamin, and 60 ppm zinc.

Table 2. Carcass and Performance Data

Item	Dried Distiller's Grains with Solubles ^a						SEM
	0%	15%	30%	45%	60%	75%	
No. of heifers	58	57	59	58	60	55	
Initial weight, lb	733	729	728	730	731	732	10.6
Dry matter intake, lb/day	16.40	17.03	16.74	16.51	16.36	15.45	0.12
Final weight, lb ^{b,c}	1063	1087	1063	1045	1042	1009	9.72
Carcass adjusted gain, lb/day ^{b,c}	2.19	2.37	2.21	2.10	2.05	1.85	0.19
Gain:feed ^b	0.134	0.138	0.132	0.127	0.125	0.121	0.037
Hot carcass weight, lb ^{b,c}	680	695	680	669	667	646	6.16
Dressing percentage	63.96	63.69	63.73	64.13	64.15	64.00	0.31
Ribeye area, in ²	11.4	11.7	11.8	11.7	11.2	11.5	0.27
Kidney, pelvic, & heart fat, % ^c	2.11	2.14	2.26	2.24	2.39	2.10	0.07
12th rib fat thickness, in	0.58	0.52	0.48	0.48	0.50	0.46	0.04
USDA Yield Grade							
Yield Grade 1, %	3	9	8	12	3	7	3.9
Yield Grade 2, %	34	30	32	31	29	36	6.4
Yield Grade 3, %	52	39	38	36	44	40	5.1
Yield Grade 4 & 5, %	10	22	22	21	24	18	7.2
Marbling Score ^{1,c}	Mt ¹⁸	Mt ⁶⁹	Mt ²³	Mt ⁷⁸	Mt ²¹	Sm ⁵²	30.5
USDA quality grade							
Prime, %`	15	29	13	23	20	8	5.3
Choice, %	73	61	79	58	55	63	6.2
Select, % ^a	9	10	7	20	25	26	6.0
Dark cutters, %	0.0	0.0	0.0	1.7	1.7	0.0	0.4
Liver abscesses, %	1.7	1.8	1.7	0.0	0.0	0.0	0.3

^aDakota Gold-brand dried distillers grains with solubles.

^bLinear effect of diet (P<0.05).

^cQuadratic effect of diet (P<0.05).

¹Mt = Modest Sm = Small.