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Performance and Carcass Characteristics of Finishing Steers Fed Low-Fat and Normal-Fat Wet Distillers Grains

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Summary

Wet distillers grains plus solubles (WDGS) varying in fat content (6.7 vs. 12.9 %) were fed at 35% of the diet DM to compare fat level from WDGS on cattle performance and carcass characteristics. Final BW, hot carcass weight, and ADG were increased for steers fed 12.9% fat WDGS compared to steers fed corn or 6.7% fat WDGS. Steers fed 6.7% fat WDGS or corn control diets had identical DMI, ADG, and F:G.

Introduction

Wet distillers grains plus solubles (WDGS) is produced by combining the distillers grains and distillers solubles fractions, which can be variable from plant to plant, changing the fat content of the final product. Fat content of WDGS also can be decreased as ethanol plants are evaluating methods to remove a portion of the oil. The objective of this study was to determine the feeding performance and carcass characteristics of feedlot steers fed a normal-fat WDGS diet compared to a low-fat WDGS diet.

Procedure

Ninety-six crossbred yearling steers (879 ± 114 lb) were stratified and blocked by BW and assigned randomly to pens within block and strata, and pens assigned randomly to one of three treatments. Treatments included a corn control with no distillers grains (CON), low-fat WDGS (LFAT), and normal-fat WDGS (NFAT). Twelve pens were used to provide 4 replications per treatment.

A 1:1 ratio of dry-rolled corn (DRC), and high-moisture corn (HMC) was replaced when WDGS was added at 35% of the diet DM (Table 1). All diets contained 10% sorghum silage and 5% supplement (DM basis). The CON diet was formulated to provide 12.5% CP by including 0.75% urea in the diet provided in the supplement. Soypass® also was included in the CON diet at 1.0% of diet DM for the first 40 days to meet the metabolizable protein requirement of the steers. Thiamine was provided through the supplement in the treatments with WDGS at 150 mg/head/day. All diets were formulated to provide 30 g/ton (DM) Rumensin and 90 mg/head/day Tylan.

Composite feed ingredient samples were analyzed for DM, CP, sulfur,

Table 1. Diet composition and nutrient analysis of finishing diets fed to yearling steers, expressed as percentage of diet DM.

Ingredients	Control	Low-fat WDGS	Normal-fat WDGS
DRC	42.5	25.0	25.0
HMC	42.5	25.0	25.0
WDGS	—	35.0	35.0
Sorghum silage	10.0	10.0	10.0
Supplement	5.0	5.0	5.0
Fine ground corn	1.22	3.09	3.09
Limestone	1.43	1.38	1.38
Urea	0.75	—	—
Soypass[1]	1.0	—	—
Tallow	0.125	0.125	0.125
Salt	0.3	0.3	0.3
Trace mineral premix	0.05	0.05	0.05
Rumensin premix	0.019	0.019	0.019
Vitamin premix	0.015	0.015	0.015
Tylan premix	0.008	0.008	0.008
Thiamine	—	0.0139	0.0139
CP, %	13.6	17.9	17.8
Fat, %	3.64	4.72	6.91
Sulfur, %	0.12	0.37	0.41

[1]Soypass® included at 1.0% of diet DM during the first 40 days, then replaced with fine ground corn.

Table 2. Yearling steer finishing feedlot performance when fed a control, low-fat WDGS, and normal-fat WDGS diet.

	Treatments				
	Control	Low-Fat WDGS	Normal-Fat WDGS	SEM	*P*-value
Performance					
Initial BW, lb	889	886	886	1.6	0.38
Final BW[1], lb	1295	1294	1331	9.42	0.04
DMI, lb/day	24.4	24.4	24.4	0.55	0.99
ADG, lb	3.41	3.41	3.71	0.07	0.02
F:G[2]	7.19	7.19	6.58	—	0.12
Carcass Characteristics					
HCW, lb	816	815	839	5.78	0.04
Marbling score[3]	614	591	617	0.29	0.61
12th rib fat, in	0.47	0.52	0.53	0.03	0.25
LM area, in^2	13.4	12.9	13.1	0.34	0.62

[1]Calculated from HCW, adjusted to a 63% yield.
[2]Calculated and analyzed from G:F, which is the reciprocal of F:G.
[3]450=Slight50, 500=Small0.

and fat. The low-fat WDGS contained 34.8% CP, 6.7% fat, and 0.85% sulfur. The normal-fat WDGS contained 34.5% CP, 12.9% fat, and 0.94% sulfur. Steers were slaughtered at a commercial abattoir (Greater Omaha Pack, Omaha, Neb.) in two weight blocks, heavy and light, at either 102 or 131 days on feed. Hot carcass weights (HCW) and liver scores were collected on the day of slaughter. After a 48-hour chill, marbling score, 12th rib fat thickness, and LM area data were collected. Final carcass adjusted BW, ADG and F:G were calculated by dividing HCW by a common dressing percentage of 63%.

Cattle performance and carcass characteristics were analyzed using the MIXED procedure of SAS. Pen was considered the experimental unit, and treatments were analyzed as a randomized complete block design.

Results

Performance and carcass characteristics are presented in Table 2. Carcass adjusted final BW and HCW were greater, by 36 and 23 pounds, respectively, for the NFAT treatment compared to the CON and LFAT treatments ($P < 0.03$). Average daily gain was 0.3 lb/day greater for the NFAT treatment compared to the CON and LFAT treatments ($P = 0.02$). No differences were observed across treatments for LM area, 12th rib fat thickness, marbling, or DMI ($P > 0.25$). A tendency for a decrease in F:G ($P > 0.12$) was observed for the NFAT treatment. Interestingly, the carcass adjusted final BW, HCW, and ADG for the CON and LFAT treatments were identical.

This study indicates that cattle performance and carcass characteristics when feeding low-fat WDGS are comparable to feeding a corn-based diet. Low-fat WDGS has a lower energy value than normal fat WDGS due to the lower fat content, which decreases gain and weights, and likely increases F:G.

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