Effect of Feeding More Than 70% Wet Distillers Grains Plus Solubles On Feedlot Cattle Performance

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Summary

A finishing trial evaluated effects of feeding greater than 70% wet distillers grains plus solubles (WDGS) on feedlot cattle performance. The WDGS was fed at 40, 70, 77, and 85% of diet dry matter (DM), while roughage levels ranged from 5 to 25% across treatments. Larger ADG and G:F were observed with 40% WDGS and 5% roughage. Higher levels of WDGS were successfully fed with levels of roughage above 8% but the diets were less profitable than the 40% WDGS diet.

Introduction

Replacing corn up to 50% of diet DM as WDGS resulted in superior performance compared to cattle fed 0% WDGS (2010 Nebraska Beef Cattle Report, pp. 61-62). The feeding value was consistently greater for WDGS up to 50% of diet DM, compared to corn. Incidences of polioencephalomalacia (polio) increased slightly when cattle were fed diets above 0.46% sulfur and dramatically increased when greater than 0.56% with roughages at 5-7% (2009, Nebraska Beef Report, pp. 79-80; 2010 Nebraska Beef Cattle Report, pp. 68-69). Polio risk is decreased when roughage level is maintained or increased in the ration. Another trial (2009, Nebraska Beef Cattle Report, pp. 76-78) determined effects of feeding WDGS with or without corn on feedlot performance. The objectives of our study were to evaluate the effects of feeding increased amounts of WDGS with typical or increasing levels of roughage on feedlot cattle performance and economics.

Procedure

A finishing study was conducted using 336 crossbred steers (BW = 741 ± 20 lb) that were assigned randomly (8 steers/pen) in a randomized complete block design. Two consecutive day individual weights were collected for initial BW. Cattle were stratified by BW within respective weight block and assigned randomly to 42 pens. Seven treatments included: 1) control (CON) of 85% dry-rolled corn (DRC), 4.7% wheat straw, and 5.0% molasses; 2) (40-5) 40% WDGS, 50.3% DRC, and 4.7% wheat straw; 3) (70-8) 70% WDGS, 16.8% DRC, and 8.2% wheat straw; 4) (77-9) 77.5% WDGS, 8.4% DRC, and 9.1% wheat straw; 5) (85-10) 85% WDGS and 10% wheat straw; 6) (77-17) 77.5% WDGS and 17.5% wheat straw; 7) (70-25) 70% WDGS and 25% wheat straw all on a DM basis. Table 1 provides DM, fat, CP, and S of WDGS used in this trial. All diets contained a supplement at 5.0%, which was to keep the Ca:P ratio at a minimum of 1.2 to 1. Supplements also were formulated to provide Rumensin at 30 g/ton DM, Tylan at 90 mg/steer/day, and thiamine at 130 mg/steer/day.

An adaptation period of 21 days was utilized and steers received Revelor-XS on day 1 of the feeding trial. Steers on treatments CON, 40-5, 70-8, and 77-17 were fed for 183 days, from November to May, and steers on treatments 85-10, 77-17, and 70-25 were fed for 225 days, from November to June, to achieve similar final BW. Steers were harvested at a commercial abattoir (Greater OmahPack, Omaha, Neb.). Hot carcass weights (HCW) and liver scores were collected on the day of slaughter. After a 48-hour chill, LM area, 12th rib fat thickness, and USDA marbling scores were recorded. USDA yield grade (YG) was calculated from HCW, fat depth, LM area and an assumed 2.5% kidney, pelvic, and heart fat (KPH). A common dressing percentage (63%) was used to calculate carcass adjusted performance of final BW, ADG, and feed efficiency.

Weekly feed samples were taken for DM analysis using a 60 forced air oven for 48-hours. Composite samples for each ingredient over the feeding period were analyzed for CP, fat, and sulfur (S).

Finishing Economics

Budgets were created for all seven diets using the average 2008 five-area yearly weighted direct slaughter steer live price from USDA Market News Service ($93.13/cwt). Initial steer price was calculated as the average initial BW of pens multiplied by $126.39/cwt to make the CON steers profit equal zero. The price of corn was set at $3.50/bu, WDGS price was constant at 85% the price of corn, and wheat straw was constant at $72.70/DM ton (delivered and processed). Yardage was charged at $0.40 per steer daily with health and processing costs of $20 per steer and a death loss of 1.5%. Interest was estimated as 8.0% for feed costs and initial steer cost. Total production costs included total feed costs with interest; all health, processing, and death loss costs; and initial

(Continued on next page)

Table 1. Composition of diets.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Corn</th>
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<tr>
<td></td>
<td>CON</td>
<td>40-5</td>
</tr>
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<td>WDGS1</td>
<td>—</td>
<td>49</td>
</tr>
<tr>
<td>DRC2</td>
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<td>% Sulfur</td>
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<td>0.41</td>
</tr>
<tr>
<td>% Fat</td>
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<td>7.23</td>
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</tbody>
</table>

1WDGS = wet distillers grains plus soluble.
2DRC = dry-rolled corn.
steer cost with interest. Cost of gain (COG) was calculated by dividing total finishing cost by average gain per pen. Slaughter break-even (BE) was calculated by dividing the total cost of production by the carcass-adjusted final BW. Profit or loss (P/L) was calculated by subtracting the total cost of production from the final steer value.

Statistical Analysis

All data were analyzed using MIXED procedures of SAS as a randomized complete block design with pen as the experimental unit. The effects of treatment and block were included in the model. Treatment means were compared using a protected F-test and means separation when the F-test statistic was significant.

Results

Performance Results

Two steers were pulled from the trial for respiratory illness, and no steers were diagnosed with polio. Cattle performance data are summarized in Table 2. Treatments CON, 40-5, 70-8, and 77-9 were fed for a total of 225 days to achieve similar final BW, while treatments 85-10, 77-17, and 70-25 were fed for a total of 228 days to achieve similar final BW. Profit or loss (P/L) was calculated by subtracting the total cost of production by the carcass-adjusted final BW. The 40-5 treatment has the least COG, followed by the 85-10, 77-17 and 77-9, which were similar, and lastly CON with a COG at $101.20. The 40-5 treatment had the least COG, followed by the 85-10, 77-17 due to these treatments having lower final BW and extended DOF. The blend of WDGS and some inclusion of corn (70-8, 77-9) had greater en prices than the treatments with no inclusion of corn (40-5, 70-25) were similar, and lastly CON with a COG at $101.20. The 40-5 treatment has the least COG, followed by the 85-10, 77-17 due to these treatments having lower final BW and extended DOF.

Economic Results

When corn is priced at $3.50/bu and WDGS is 85% the price of corn, the greatest profit is observed with the 70-25 treatment at -$93.04/head followed by 85-10, and the blend of WDGS and some inclusion of corn (70-8, 77-9) had greater en prices than the treatments with no inclusion of corn (85-10, 77-17, 70-25) or the CON treatment.

Likewise, COG was greatest for the 70-25 treatment, followed by the 85-10, and 77-17 due to these treatments having lower final BW and extended DOF. The 40-5 treatment has the least COG, followed by the 70-8 and 77-9, which were similar, and lastly CON with a COG at $64.00/cwt. Treatments with the blend of WDGS and some inclusion of corn (70-8, 77-9) had greater profit, lower COG, and lower break-even prices than the treatments with no corn (85-10, 77-17, 70-25) or the CON treatment.

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