Comparing dry, wet, or modified distillers grains plus solubles on feedlot cattle performance and metabolism characteristics

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Introduction

Feeding Value relative to DRC

- WDGS (32% DM): 131 - 148%
- MDGS (46% DM): 117 - 128%
- DDGS (90% DM): 107 - 112%

The UNL pen meta analyses utilized over 4500 steers in a combined 25 trials. However, these three DGS products have not been directly compared to one another in the same trial. Also the corn control diet was not consistent across experiments.


Objective

Evaluate the effect of drying distillers grains on the energy value in feedlot diets and metabolism characteristics.

Methods

- Ruminally fistulated steers
- BW = 990 lb
- Measurements:
  - DMI
  - Continuous pH (every min; 7 d)
  - Total tract digestibility (Cr₂O₃)
- RBCD (3 blocks)
  - 3 x 3 + 1 Factorial
  - 4 diets x 6 steers (21 d periods)
  - 14 d adaptation / 7 d collection
  - 3 types of distillers grains (40% of diet DM)
  - WDGS
  - MDGS
  - DDGS
  - Negative corn control
  - DGS replaced corn
  - Basal Ingredients:
    - 60:40 HMC:DRC
    - 15.0% Corn Silage
    - 5.0% Supplement
- Drying WDGS has a negative impact on the feeding value of DGS. However, including distillers grains up to 40% of the diet improves animal performance compared to a corn based diet.

Results

Table 1. Main effects of level on cattle performance and carcass characteristics.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>WDSG</th>
<th>MDGS</th>
<th>DDGS</th>
<th>SEM</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance1</td>
<td>Initial BW, lb</td>
<td>767</td>
<td>767</td>
<td>768</td>
<td>1</td>
</tr>
<tr>
<td>Final BW, lb</td>
<td>1400</td>
<td>1409</td>
<td>1392</td>
<td>10</td>
<td>0.51</td>
</tr>
<tr>
<td>DMI, lb</td>
<td>24.9</td>
<td>26.4</td>
<td>27.7</td>
<td>0.07</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>ADG, lb</td>
<td>4.1</td>
<td>4.1</td>
<td>4.0</td>
<td>0.3</td>
<td>0.30</td>
</tr>
<tr>
<td>G:F</td>
<td>0.165</td>
<td>0.158</td>
<td>0.150</td>
<td>0.002</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

Carcass Characteristics1

- HCW, lb | 697 | 677 | 697 | 6 |
- 12% rib fat, lb | 0.63 | 0.64 | 0.60 | 0.1 | 0.15 |
- Marbling Score | 610 | 599 | 602 | 9 | 0.69 |
- LM area, in² | 13.3 | 13.2 | 13.4 | 0.15 | 0.50 |

Exp. 1 Materials and Methods

- RBCD (3 blocks)
  - 3 x 3 + 1 Factorial
  - 4 diets x 6 steers (21 d periods)
  - 14 d adaptation / 7 d collection
  - 3 types of distillers grains (40% of diet DM)
  - WDGS
  - MDGS
  - DDGS
  - Negative corn control
  - DGS replaced corn
  - Basal Ingredients:
    - 60:40 HMC:DRC
    - 15.0% Corn Silage
    - 5.0% Supplement

Exp. 2 Materials and Methods

- 440 short yearling steers (778 ± 42 lb)
- 55 pens (8 strs/pen)
- 11 Treatments, 5 reps
- 154 DOF
- WDGS - 0.8% S, 11.9% fat, 34% NDF
- MDGS - 0.7% S, 12.4% fat, 34% NDF
- DDGS - 0.7% S, 11.9% fat, 32% NDF

Exp. 1 Results

- ADG = 21.5, 20.6, 22.1, 21.8 vs. WDGS, MDGS, DDGS
- G:F = 12.3, 12.2, 12.5, 12.4 vs. WDGS, MDGS, DDGS

Exp. 2 Results

- ADG = 21.5, 20.6, 22.1, 21.8 vs. WDGS, MDGS, DDGS
- G:F = 12.3, 12.2, 12.5, 12.4 vs. WDGS, MDGS, DDGS

Conclusions

- ADG was not different for WDGS, MDGS, or DDGS
- G:F was greater for steers consuming WDGS compared to MDGS or DDGS
- WDGS was 35.4 and 17.8% greater than DDGS and MDGS, respectively

Summary

Drying WDGS has a negative impact on the feeding value of DGS. However, including distillers grains up to 40% of the diet improves animal performance compared to a corn based diet.