

# Supplementing Dried Distillers Grains with Solubles to Heavy Yearling Stocker Cattle Grazing Native Tallgrass Pastures During Late Summer and Fall Improves Animal Performance and Carcass Characteristics<sup>1</sup>

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## Introduction

Grazing stocker cattle on low-quality forages is a common practice in Kansas; however, animal performance typically is modest. Due to the increasing availability of ethanol co-products, producers may be able to use dried distillers grains with solubles (DDGS) as a protein source to help increase body weight of stocker cattle grazing native tallgrass pastures during the late summer and fall. Therefore, the purpose of this research was to investigate the impact of feeding DDGS to heavy stocker cattle during late summer and fall and to document its effects on animal performance and subsequent carcass characteristics.

## Experimental Procedures

The experimental design was a randomized complete block design with a 2 x 3 factorial treatment arrangement. Factors consisted of DDGS supplementation during grazing (0 or 1% of body weight with DDGS on a dry matter basis) and, subsequently, the number of days on a finishing diet (75, 100, or 125 days). Supplementation during the grazing period did not influence animal response to number of days on a finishing diet; therefore, main effects of DDGS supplementation and days on a finishing diet were reported.

Crossbred steers ( $n = 144$ ; initial body weight =  $808 \pm 40$  lb) were stratified by weight and randomly assigned to 1 of 12 pastures. Supplemented cattle were fed DDGS at 1% of their body weight (dry matter basis) once daily while grazing mature, dormant (2.62% crude protein) native pastures for 90 days. Grazing took place from mid-August to mid-November of 2009 at the Kansas State University Commercial Cow-Calf Unit. Animal performance measurements taken during the grazing portion of the experiment included average daily gain from 0 to 45 days, 45 to 90 days, and 0 to 90 days.

After the grazing portion of the experiment was completed, steers were placed in uncovered, concrete-surfaced feedlot pens at the Kansas State University Beef Cattle Research Center and fed a high-concentrate diet for 75, 100, or 125 days. Cattle were fed once daily and had access to fresh, clean water. Animal performance measurements taken during the finishing phase included average daily gain, dry matter intake, and feed efficiency.

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After the finishing phase was completed, two paired groups of control- and DDGS-fed cattle were harvested at a commercial slaughter facility on three separate days. Hot carcass weights were measured immediately after harvest. Following a 24- to 48-hour chill, the percentage of kidney, pelvic, and heart fat; 12th rib fat thickness; ribeye area; and USDA marbling scores were determined. Yield grade was calculated based on the USDA yield grade equation. Dressing percentage was calculated as hot carcass weight divided by shrunk final body weight.

## Results and Discussion

### *Live Animal Grazing Performance*

The performance of heavy stocker cattle supplemented with DDGS during late summer and fall grazing is displayed in Table 1. Supplementing DDGS to steers grazing native pasture increased ( $P < 0.05$ ) average daily gain from 0 to 45 days, 45 to 90 days, and for the entire grazing period, resulting in a greater total weight gain after 90 days compared to control steers.

### *Live Animal Feedlot Performance*

Feedlot performance of heavy stocker cattle supplemented with DDGS during grazing is shown in Table 2. Control cattle had greater ( $P < 0.01$ ) feedlot average daily gain than supplemented cattle. Dry matter intake ( $P = 0.91$ ) was similar between treatments over the entire finishing period. For this reason, efficiency of control cattle during the finishing period was greater ( $P = 0.02$ ) than that of cattle supplemented with DDGS.

### *Carcass Characteristics*

The carcass characteristics of heavy stocker cattle supplemented with DDGS during grazing are shown in Table 3. Cattle supplemented with DDGS during grazing had heavier ( $P < 0.01$ ) hot carcass weights and larger ( $P = 0.02$ ) ribeye areas than unsupplemented cattle, but there were no differences in dressing percentage, USDA yield grade, fat thickness, marbling score, or kidney, pelvic, and heart fat percentage. We interpret these data to indicate that supplementing DDGS to heavy stocker cattle grazing native tallgrass pastures in late summer and fall can improve red meat yield without sacrificing quality grade.

## Implications

Stocker operators can supplement DDGS while grazing late-season native tallgrass pastures to increase weight gain and improve carcass red meat yield without affecting quality or yield grade. Feedlot operators should be aware that supplemented stocker cattle will be slightly less efficient than non-supplemented stocker cattle during the finishing phase.

**Table 1. Pasture performance of heavy stocker cattle supplemented with DDGS<sup>1</sup> during grazing**

| Trait                                 | Treatment          |                    | SEM   |
|---------------------------------------|--------------------|--------------------|-------|
|                                       | Control            | DDGS               |       |
| Average daily gain, 0 to 45 days, lb  | 2.02 <sup>a</sup>  | 3.39 <sup>b</sup>  | 0.153 |
| Average daily gain, 45 to 90 days, lb | -0.58 <sup>a</sup> | 1.44 <sup>b</sup>  | 0.134 |
| Average daily gain, 0 to 90 days, lb  | 0.76 <sup>a</sup>  | 2.45 <sup>b</sup>  | 0.116 |
| Total gain, lb                        | 68.5 <sup>a</sup>  | 220.7 <sup>b</sup> | 10.47 |

<sup>1</sup> DDGS = Dried distillers grains with solubles supplemented at 1% of body weight on a dry matter basis.

<sup>ab</sup> Means within a row with different superscripts differ ( $P < 0.05$ ).

**Table 2. Feedlot performance of heavy stocker cattle supplemented with DDGS<sup>1</sup> during grazing**

| Trait                               | Treatment          |                    | SEM   |
|-------------------------------------|--------------------|--------------------|-------|
|                                     | Control            | DDGS               |       |
| Average daily gain, lb              | 3.68 <sup>b</sup>  | 3.20 <sup>a</sup>  | 0.090 |
| Average daily dry matter intake, lb | 27.6               | 27.6               | 0.384 |
| Feed:gain                           | 7.50 <sup>a</sup>  | 8.63 <sup>b</sup>  | 0.34  |
| Total gain, lb                      | 367.0 <sup>b</sup> | 320.4 <sup>a</sup> | 9.2   |

<sup>1</sup> DDGS = Dried distillers grains with solubles supplemented at 1% of body weight on a dry matter basis.

<sup>ab</sup> Means within a row with different superscripts differ ( $P < 0.05$ ).

**Table 3. Carcass characteristics of heavy stocker cattle supplemented with DDGS<sup>1</sup> during grazing**

| Trait                                     | Treatment          |                    | SEM  |
|---|--------------------|--------------------|------|
|   | Control            | DDGS               |      |
| Hot carcass weight, lb                    | 729.3 <sup>a</sup> | 800.1 <sup>b</sup> | 7.2  |
| Dressing percentage                       | 61.1               | 61.7               | 0.3  |
| USDA yield grade                          | 2.1                | 2.2                | 0.08 |
| 12th rib fat thickness, in.               | 0.27               | 0.32               | 0.18 |
| Longissimus muscle area, in. <sup>2</sup> | 13.2 <sup>a</sup>  | 14.0 <sup>b</sup>  | 0.18 |
| Marbling score <sup>2</sup>               | 387.6              | 399.6              | 9.1  |
| Kidney, pelvic, and heart fat, %          | 1.86               | 1.96               | 0.03 |

<sup>1</sup> DDGS = Dried distillers grains with solubles supplemented at 1% of body weight (dry basis).

<sup>2</sup> Marbling score: small = 400 to 499; slight = 300 to 399.

<sup>ab</sup> Means within a row under a common main effect with different superscripts differ ( $P < 0.05$ ).