

Project Summary

Effects of Supplementing Dried Distillers Grains with Solubles to Heavy, Yearling Stocker Cattle during the Last 90 days of Grazing to Improve Carcass Characteristics when Utilizing a Short Feeding Protocol

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Background

With high energy prices and a smaller national cow herd, a greater number of stocker cattle are being fed on grass to heavier weights before being placed into the feedyard. If we assume that these heavier cattle could also exit the feedlot with less days on feed due to high cost of gain then a decrease in beef quality could result. Research has shown that cattle placed on feed for brief finishing periods were less tender and had lower marbling scores, lower carcass weights and smaller ribeye area compared with longer, more traditional feeding periods. Additionally, low crude protein in late summer grasses limits the amount of nutrients which can be utilized by the calf for muscle and fat deposition. This lack of nutrients could potentially reduce carcass weight as well as the amount of marbling needed for an acceptable quality grade. On the other hand, when targeting a constant finish weight, it has been shown that supplementation of stocker cattle while grazing forage can decrease the number of days on feed during the finishing period. In order to effectively supplement grazing stocker cattle to improve average daily gain under conditions of decreasing forage quality there needs to be a feed available that is both high in protein and energy. Dried distillers grains with solubles (DDGS) are relatively high in both protein and energy and are readily available to most beef producers due to the rapid expansion of the ethanol industry.

Methodology

144 crossbred steers were randomly assigned to one of twelve pastures. The treatment groups included no supplementation and supplementation with DDGS at 1% body weight while grazing native pasture for a period of 90 days. The grazing treatments started in the middle of August 2009 and concluded in the middle of November 2009. The pastures utilized for the project were native grass pastures located in the Flint Hills of Northeast Kansas at the Kansas State University Cow Calf Unit. After the 90 day grazing period was completed, the 12 pasture groups were transported to the Kansas State University Beef Research Unit and placed on a high concentrate feedlot diet. Three slaughter day treatments representing an additional 75, 100 and 125 days in the feedyard were randomly assigned to the each of the grazing treatments. After 75, 100 and 125 days of feeding, the pre-selected pens were harvested at a commercial harvest facility. Carcass data was collected 24 to 48 hours after slaughter and the wholesale rib section of six carcasses from each pen were collected at the plant and transported back to the Kansas State University Meat Laboratory for analysis. The wholesale rib sections were evaluated for total fat, total protein, color, tenderness, juiciness, flavor and fatty acid profile.

Findings

Steers supplemented with DDGS during grazing gained more weight over the entire experimental period as evidenced by heavier hot carcass weights compared with controls (Table 1). This increase in weight was not simply a function of increasing fat deposition as DDGS supplemented cattle had larger ribeye areas and similar USDA yield grades when compared with controls. As expected, increasing days on feed from 75 to 125 days increased hot carcass weight, fat thickness, ribeye area and USDA marbling score. Increasing days on feed also resulted in a greater amount of whiter, less

yellow external fat covering and increased total fat and fatty acid content. Tenderness, juiciness and flavor were not affected by either DDGS supplementation or feeding length between 75 and 125 days.

Table 1. Mean values for carcass characteristics due to grazing supplementation and days on feed.

Trait	Treatments						
	Grazing Supplementation			Days On Feed			
	Control	DDGS	SEM ¹	75	100	125	SEM
Hot carcass weight, kg	330.4 ^a	362.5 ^b	3.272	319.3 ^a	348.2 ^b	371.9 ^c	8.85
Dressing percentage, %	61.1	61.7	0.003	60.5	61.7	62.0	0.004
USDA Yield grade	2.1	2.2	0.08	2.1	2.1	2.4	0.10
Fat thickness, mm	7.0	8.1	0.46	6.8 ^a	7.0 ^{ab}	8.9 ^b	0.56
Ribeye area, cm ²	85.4 ^a	90.4 ^b	1.15	84.2 ^a	88.5 ^{ab}	91.1 ^b	1.40
USDA Marbling Score ²	387.6	399.6	9.080	363.6 ^a	407.1 ^b	409.5 ^b	11.12

^{a-b}Means within a row under a common main effect with different superscripts differ ($P < 0.05$).

¹Standard error of the mean.

²Marbling score: small = 400 to 499; slight = 300 to 399.

Implications

This research demonstrates that steers can be supplemented dried distillers grains with solubles during the grazing phase to increase average daily gains, hot carcass weights and ribeye areas with no effects on product quality. Additionally, steers can be fed for shortened lengths of time with minimal impacts on sensory characteristics when cattle are fed a high concentrate diet for at least 75 days immediately prior to slaughter. However, producers should be mindful that shortened finishing periods do alter external fat color and the amount of marbling deposited in the ribeye.

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