Distillers Dried Grains (DDG) feeding and impacts on meat quality for grazing steers

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Does this system, using DDG feedings, produce satisfactory animal performance? Additionally, since the animals were fed very limited starch, were CLA levels similar to grass-only finished cattle?

Results showed that this system is a potential alternative to high-grain conventional beef finishing production in feedlots.

**Background**

Due to rising costs of conventional feedstuffs, more focus has been put on feeding by-products, especially dried distiller grains (DDG) from ethanol production or further processing of grains. In July 2010, there were 28 ethanol refineries in Iowa and an additional 71 refineries in neighboring states; so this potential feedstuff is readily available to producers. The effects of using these feedstuffs on live animal performance, carcass traits and the economic benefits are still under investigation.

Conjugated linoleic acid (CLA) has been shown to have many health benefits, including anticancer properties in animals. Because of this discovery, more attention has been paid to the CLA content of food products, especially meat and milk, which are major sources of daily CLA intake. Studies have shown that CLA levels of meat can increase when cattle are supplemented with DDG by-products.

The objective of this study was to investigate the effects of finishing yearling cattle on pasture utilizing combinations of self-fed DDG by-products and corn grain on growth and carcass traits and investigating the fatty acid profiles, especially CLA content of beef raised in this type of feeding system.

**Approach and methods**

Over a two-year period (2007 and 2008), beef steers were finished with self-fed by-products on cool-season grass pastures. At the ISU Neely-Kinyon Farm in southwest Iowa, yearling steers were continuously grazed on cool season grasses that were predominantly fescue at a stocking density of 2.25 head/acre. Half of the cattle were implanted (with Synovex®-S) and half were not. Cattle received a diet of either soyhulls-dried distillers grain with solubles (DDGS) or ground corn-dried distillers grains with solubles that was offered through self-feeders. The rations were mixed at a 1:1 ratio with an added mineral balancer, which included Rumensin®.

Cattle were weighed approximately every six weeks throughout the finishing period. Body condition (BCS) and disposition scores were recorded at the initial sort, the
second weighing and the final weighing. Final live measurements (average daily gain, feed: gain) were recorded on the day that cattle were shipped. Cattle were harvested at Tyson in Denison when all had reached a BCS of 6.5 or greater. Twenty-four hours post-harvest carcass measurements (hot carcass weight, ribeye area, 12th rib fat thickness, kidney, pelvic and heart fat, marbling score) were recorded.

**Results and discussion**

Live cattle performance and carcass traits were not affected by diet. Implanted cattle outgained non-implanted animals over the entire finishing period (3.52 lbs/d vs. 3.17 lbs/d). This led to implanted cattle coming off test heavier (1324 lbs vs. 1277 lbs) with larger carcasses (826 lbs vs. 800 lbs). Ribeye areas were greater for implanted cattle; which was probably due to the heavier carcass weights. Non-implanted cattle had superior quality grades (55 percent vs. 40 percent) of low choice or better.

Fatty acid profiles from the first year were analyzed and showed that raw beef samples from cattle on the soyhulls diet had higher C18:2 conjugated linoleic acid levels.

Yearly differences in quality grade (1023 vs. 985 in 2007 and 2008, respectively) were observed. This difference was attributed to factors that include genetic makeup of cattle, initial weights of cattle, time of year when cattle were harvested and grading technology. The grazing season length is limited, so if producers start with cattle that are too light in the spring (initial weight), they may not finish before the grazing season ends.

**Conclusions**

This study investigated the feasibility of finishing market beef cattle on pasture with supplemented self-fed by-products and the effects on fatty acid profiles in the meat. Feeding self-fed DDGS and soyhulls to market beef cattle on pasture produces excellent performance and carcass traits and results in higher CLA fatty acid levels in the beef than would be expected from conventionally-fed beef cattle. It is worth noting that this method produces high-quality beef without feeding corn. The feeder should give some careful consideration to time of year when marketing cattle and the cattle’s genetics. This system is a potential alternative to high-grain conventional beef finishing production in feedlots.

**Impact of results**

Results from this study show that including soyhulls and DDGS in a cattle diet could possibly produce a healthier beef product. Further research is merited to determine the potential human health benefits of feeding cattle these soyhull/DDG by-products and the effect on fatty acid profiles. The investigators were hoping to produce beef with high CLA levels, but also high animal performance.
Education and outreach

The study was highlighted at field days in 2006, 2007 and 2008 at the ISU Neely-Kinyon Research Farm near Greenfield. Information was shared in several Animal Industry Reports available from ISU Extension.

Updates on the project appeared in the Armstrong/Neely-Kinyon Research Farm Progress Report in 2005, 2006, and 2008. For details, see

1. www.ag.iastate.edu/farms/05reports/arm/FinishingBeefCattle.pdf,
2. www.ag.iastate.edu/farms/06reports/arm/FinishingBeefCattle.pdf and
3. www.ag.iastate.edu/farms/08reports/Armstrong/PerformanceCarcassTraits.pdf

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