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Comparison of Feeding Dry Distillers Grains in a Bunk or on the Ground to Cattle Grazing Subirrigated Meadow

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Summary

The objective of this study was to compare feeding dry distillers grains with solubles (DDGS) in a bunk or on the ground to cattle grazing subirrigated meadow. Steers fed in a bunk had greater ADG than steers fed on the ground (1.19 vs. 0.92 lb). The NRC (1996) was used to retrospectively calculate the DDGS intake difference between treatments. For steers fed in a bunk, a reduction in DDGS intake between 0.8 and 0.9 lb/day would have resulted in a 0.27 lb/day reduction in ADG, which means 36-41% of the DDGS fed on the ground was wasted. At $200 (DMB) per ton for DDGS, the cost of the wasted distillers grains was between $0.08 and $0.09 per day.

Introduction

In a summary of 14 grazing trials, DDGS increased ending BW and ADG. In addition, DDGS supplementation decreased forage intake; however, total intake for cattle fed supplement increased with increased DDGS levels (2009 *Nebraska Beef Cattle Report*, pp. 37-39). Feeding DDGS on the ground may result in higher waste levels when compared to feeding it in a bunk, but may increase its use in practical grazing situations and increase profitability. Therefore, the objective of this study was to compare feeding DDGS in a bunk or on the ground to grazing cattle.

Procedure

One hundred fourteen, March-born steer calves (615 ± 64 lb BW) were assigned to one of two feeding treatments: DDGS fed in a bunk or on the ground. Six pastures were used and pasture served as the experimental unit. Steers were fed the daily equivalent of 2.0 lb/steer (DM) and supplement was delivered three days/week.

The experiment was conducted at the University of Nebraska–Lincoln (UNL), Gudmundsen Sandhills Laboratory near Whitman, Neb., according to protocol approved by the UNL Animal Care and Use Committee. Calves grazed subirrigated meadow dominated by cool-season grasses, sedges, and rushes. The study site had been hayed the previous summer so cattle grazed regrowth.

The experiment was conducted for 72 days from March 10 to May 20, 2010. Steers continuously grazed the same pasture throughout the experiment. Steer BW was recorded on two consecutive days at the initiation and completion of the feeding period. Steers were not limit fed prior to weighing.

After completion of the feeding period, soil samples were collected from three sites where DDGS was fed on the ground and three control sites. Soil sample cores represented the top 8 inches of soil which is the standard sampling depth used by agronomists. At each site, six samples were collected and composited into one. Samples were analyzed for pH, OM, nitrate, phosphorus, sulfate, and potassium.

Results

No differences were seen in soil components between DDGS and control sites ($P > 0.3$), (Table 1). A visible difference between fed and control areas was apparent. Grass was slightly greener in fed areas compared to control areas. Samples included soil from a depth of 8 inches, this may have diluted the soil components compared to those present at a shallower depth.

Steers fed in a bunk had greater ADG than steers fed on the ground (1.19 vs. 0.92 lb; $P < 0.001$), (Table 2). The NRC (1996) was used to retrospectively calculate the DDGS intake difference between treatments. For steers fed in a bunk, a reduction in DDGS intake between 0.8 and 0.9 lb/day would have resulted in a 0.27 lb/day reduction in ADG. This is the equivalent of 36-41% waste. At $200 (DM) per ton for DDGS, the cost of the wasted DDGS was between $0.08 and $0.09/day. In comparison, steers fed wet distillers grains with solubles (WDGS) on the ground were reported to have a 13% waste over those fed in a bunk (2010 *Nebraska Beef Cattle Report*, pp. 19-20). Part of this difference might be explained through ground conditions. The WDGS were fed on upland range from October to December, whereas the current study was conducted on subirrigated meadow from March to May. Subirrigated meadow is characterized by dense plant growth. DDGS particles are small, so those particles in contact with the ground may have become unavailable to the animal because of the density of plant growth.

The most profitable choice of DDGS feeding method depends on the production goal of the feeding period. If least cost to achieve a specified rate of gain is the production goal, then feeding on the ground would have been the most profitable choice. An example situation where least cost of gain would be desirable is if a contract had been made to deliver cattle of a specified weight at a specified time, or if a relatively low ADG was desired during a backgrounding phase in order to take advantage of compensatory gain on summer pasture. In our experiment we estimated the cost associated with feeding in a bunk, which includes bunk purchase and delivery and a three year bunk life span, to be $0.16/(steer · day). The value of the wasted DDGS was

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about $0.09, so if about 40% additional DDGS was fed on the ground, the cost to gain 1.1 lb/day would be $0.07 less than feeding in a bunk. This strategy would be appropriate if a set ADG was desired and BW gain above that rate was of no value. On the other hand, if the goal is to maximize profitability of the DDGS feeding period, and ownership of the cattle would not be retained beyond that period, then feeding in a bunk would have been the most profitable. If the cost of gain is less than the breakeven price, profitability is maximized when gain is maximized. If additional DDGS is fed, less waste would occur if fed in a bunk; therefore, more weight would be gained by the animal and as long as the cost of feeding in a bunk ($0.16/d) doesn't increase, the cost of gain above the breakeven price profitability at any given level of DDGS feeding would be greater if fed in a bunk. In this experiment, the cost of gain when DDGS was fed in a bunk was less than the breakeven price of the steers and therefore profit was greater in steers fed in a bunk.

Table 1. Soil nutrient characteristics (0-8 in) on sites following feeding of DDGS and on adjacent control sites.

	Ground	Bunk	SE	P-value
pH	7.6	7.7	0.3	0.82
OM	3.0	3.1	0.2	0.86
Nitrate-N (ppm)	5.2	3.5	1.3	0.41
Nitrate-N (lb/ac)	12.3	8.7	3.1	0.45
P Bicarb (ppm)	7.0	5.7	0.8	0.33
P Bicarb (lb/ac)	14.0	11.3	1.7	0.33
Sulfate-S (ppm)	23.3	24.0	7.6	0.95
K (ppm)	87.7	83.3	8.7	0.74

Table 2. Performance of steers fed DDGS on the ground or in a bunk.

	Bunk	Ground	SE	P-value
Initial BW (lb)	615	615	7.9	0.89
Ending BW (lb)	701	681	9.0	0.12
ADG (lb/d)	1.19	0.92	0.04	<0.001

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