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Economic Favorability of Feeding Distillers Dried Grains with Solubles and Round-Bale Silage to Stocker Cattle[1]

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ABSTRACT

It is common for stocker operators to buy calves in the spring and sell them as feeder cattle in the fall. Economic favorability of various stocker systems based on animal response is largely untested. A systems grazing study was conducted to compare net returns of 2 different forage management practices with a control. A spring group and a fall group of steers were stocked in each of 3 treatments for 2 yr. All 3 treatments [control, distillers dried grains with solubles (DDGS), and silage] were rotationally stocked with equivalent stocking density and number of paddocks. The control treatment was rotationally stocked only, with no additional feed or forage management. The DDGS treatment was the same as the control treatment except that DDGS was fed to steers based on forage nutritive value. The silage treatment had excess spring-produced forage removed, stored, and fed back to steers as round-bale silage. Both the DDGS and silage treatments had positive returns above the control for both the spring and fall groups. The spring group returned US $0.18 and $0.08 per steer/d above the control group for the silage and DDGS treatments, respectively. The fall silage group returned US $0.28 per steer/d above the control group, whereas the DDGS group returned US $0.49 per steer/d above the control. In each case, and based on a range of costs associated with the silage and DDGS treatments, it is economically beneficial to increase management above rotationally stocking only of stocker cattle from spring to fall.

Key words: distillers dried grains with solubles, net return, round-bale silage, stocker, tall fescue

INTRODUCTION

The lowest cost of BW gain for growing cattle generally occurs when they are stocked on actively growing forage. In the lower Midwest, tall fescue growth can be expected from April to November, with the exception of a mid-summer dormancy period. Unless the mid-summer shortage of forage production is addressed, BW gain of stocker cattle becomes unacceptable over the course of the stocking period (Gerrish, 2001). Paramount to the profitability of a stocker enterprise is the ability to maintain economical BW gains of cattle through the mid-summer months. In a rotationally stocked system with moderate stocking densities, excess forage produced during spring can be carried over for summer grazing. However, the forage carried over (not grazed) until summer will invariably have low nutritive value and typically will result in unacceptable stocker calf growth rates (Anderson, 2006).

To mitigate the decline in ADG, stocker operators have 2 reasonable options short of destocking pastures: remove excess spring forage as silage and feed it back to the calves as needed during the summer, or offer a supplemental feed to offset the low nutritive value of the forage in summer. Removal of excess forage for the purpose of producing silage results in forage regrowth of higher quality than would otherwise occur (Smith et al., 1986; Harrison et al., 1994). Additional costs involved in making silage include mowing, raking, baling, wrapping, and hauling of the harvested forage, whereas the additional cost involved in offering a

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supplemental feed is mainly the cost of the feed itself. To be economically feasible, the value of additional BW gain of the calves for either option must exceed expenses. The additional resources required for either system should be considered when evaluating budget analyses. The objective of this study was to determine which system would be most economically favorable compared with a control system that shared core characteristics.

MATERIALS AND METHODS

Study Design

A 2-yr [2006 (yr 1) and 2007 (yr 2)] grazing study was conducted at the University of Missouri South Farm (38°53′25″ N, 92°15′52″ W) located near Columbia. One hundred forty-four Angus crossbred steers were rotationally stocked in 1 of 3 treatments, each replicated 3 times. All steers were purchased from a local sale barn and were received and processed in a manner typical of this segment of the industry. For each year, 2 separate groups of calves were purchased and stocked. The spring group of steers was purchased 3 to 5 wk before turnout in April, and the fall group of steers was purchased 3 to 5 wk before turnout in July. Each main group of steers was randomly divided into 9 smaller groups of 4 steers, each based on BW, and assigned to 1 of 3 treatments. Both groups of steers were stocked on the same pasture within a treatment. The first group of steers (229 ± 11 kg at turnout) was stocked from the second week of April to the second week of August, and the second group of steers (248 ± 18 kg at turnout) was stocked from early July to November.

The 3 treatments were 1) a control, 2) distillers dried grains with solubles (**DDGS**), and 3) silage. Steers in all 3 treatments were rotationally stocked (6 paddocks) on tall fescue/red and white clover pastures. The endophyte infection level of the tall fescue averaged 26% across all study pastures. No nitrogen fertilizer was applied to any of the study pastures. The control treatment consisted of rotating the steers to a fresh paddock as forage in the occupied paddock was grazed to approximately 7.5 cm. The DDGS treatment was managed the same as the control, with the exception that DDGS was offered to the steers based on forage nutritive value. The DDGS was fed for 90 d for the yr 1 spring group and for 91 d for the yr 2 spring group. The fall group of steers was fed DDGS for 120 d in yr 1 and for 115 d in yr 2. In the silage treatment, pastures were managed the same as the control except that excess spring-produced forage was harvested, stored, and fed back to the steers as round-bale silage as forage availability became limiting in summer. All round-bale silage produced within the silage treatment was fed back to the steers. Round-bale silage feeding began with placement of fall steers on pasture.

The pastures were initially stocked at 567 kg of BW/ha, which is typical of the region (Gerrish, 2000). This stocking rate results in forage accumulation during spring, with a subsequent decline in nutritive value if the excess forage is not removed. The only treatment that had excess forage harvested was the silage treatment. The anticipated ADG of the steers in the silage treatment was 0.9 kg. This anticipated ADG set the target BW gain for the steers in the DDGS treatment. As the forage nutritive value declined, the amount of DDGS fed to the steers in the DDGS treatment was adjusted upward in an attempt to maintain 0.9 kg/d. Distillers dried grains with solubles for the DDGS treatment and loose minerals with lasalocid for all treatments were offered on alternate days. Forage nutritive value and the amount of available forage were assessed weekly. Further details on the materials and methods can be found in Bailey and Kallenbach (2010). All animal management procedures were approved by the University of Missouri Animal Use and Care Committee.

Economic Analysis

Economic returns for each system were analyzed using partial budgeting. Partial net returns were calculated by subtracting the input cost from additional gross returns for each respective treatment beyond the cost and gross return of the control treatment. Gross returns were determined by multiplying the approximate value of contemporary BW gain (US $2.00/kg) by the additional BW gain of steers in the silage and DDGS treatments over control steers.

Additional costs for the DDGS and silage treatments were considered when they were beyond normal procedures of the control treatment. The harvest cost for round-bale silage was based on the report of Lazarus (2008). The costs per hectare were US $31.44, $13.51, and $17.44 for mowing and conditioning, raking, and baling. An additional US $26.61/ha was added for wrapping bales with plastic and storage. Costs included labor, fuel, lubricants, repairs, depreciation, and overhead (Lazarus, 2008). The total additional costs for the silage treatment were evenly divided among total days on test (202) for steers in the silage treatment. Spreading the costs over the total number of days allowed for daily net return comparisons with the control treatment. An additional cost associated with the DDGS treatment was the total amount of DDGS fed multiplied by the cost of DDGS delivered (US $0.22/kg). No additional labor cost for the DDGS treatment was included because it was not considered significantly greater than the daily labor necessary to conduct the control treatment.

Mowing, raking, and baling occurred only once on any given area within the silage treatment. Potassium and phosphorus replacement costs were not considered in this analysis because all silage was fed back within the system.