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Effects of late-summer protein supplementation on stocker cattle performance, feedlot gain, and carcass traits

Abstract

A 2-year trial was conducted to study the effects of feeding an Arsoy™-based, 32% crude protein supplement to stocker cattle grazing late-summer native pastures. During about 90 days of late-summer/fall grazing, the steers efficiently converted the Arsoy supplement (5.3:1, as fed basis) into significantly greater weight gains (55 lb) relative to nonsupplemented contemporaries. Both groups of steers then were finished and slaughtered in commercial facilities to determine if the supplementation program had any carryover effects. Late-summer supplementation did not influence steers' feedlot gain or carcass traits including ribeye area, fat thickness, and quality grade. However, average hot carcass weight and yield grade of pasture-supplemented steers were significantly greater than those of controls. Our study demonstrates that Arsoy makes an excellent protein supplement for growing cattle on maturing native grass pastures. In addition, the added stocker gains did not influence feedlot performance and had minimal effects on carcass traits.

Keywords

Cattlemen's Day, 2000; Kansas Agricultural Experiment Station contribution; no. 00-287-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 850; Beef; Stocker cattle; Protein; Supplementation

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**EFFECTS OF LATE-SUMMER PROTEIN
SUPPLEMENTATION ON STOCKER CATTLE
PERFORMANCE, FEEDLOT GAIN,
AND CARCASS TRAITS¹**

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Summary

A 2-year trial was conducted to study the effects of feeding an Arsoy™-based, 32% crude protein supplement to stocker cattle grazing late-summer native pastures. During about 90 days of late-summer/fall grazing, the steers efficiently converted the Arsoy supplement (5.3:1, as fed basis) into significantly greater weight gains (55 lb) relative to non-supplemented contemporaries. Both groups of steers then were finished and slaughtered in commercial facilities to determine if the supplementation program had any carryover effects. Late-summer supplementation did not influence steers' feedlot gain or carcass traits including ribeye area, fat thickness, and quality grade. However, average hot carcass weight and yield grade of pasture-supplemented steers were significantly greater than those of controls. Our study demonstrates that Arsoy makes an excellent protein supplement for growing cattle on maturing native grass pastures. In addition, the added stocker gains did not influence feedlot performance and had minimal effects on carcass traits.

(Key Words: Stocker Cattle, Protein, Supplementation.)

Introduction

During late summer, the crude protein content and energy digestibility of native grass declines, resulting in reduced performance of stocker cattle in season-long grazing programs. With the supplementation of about .5 to 1.0 lb

of crude protein per day, researchers have reported dramatic increases of nearly 30% in intake of low-quality forage and digestion improvements of 5 to 10%. However, producers are unsure if the added stocker performance would influence subsequent feedlot performance and(or) carcass traits. This experiment was conducted to evaluate the response of grazing stocker cattle to late-summer protein supplementation and to determine if carryover effects on subsequent feedlot performance or carcass traits exist.

Experimental Procedures

A 2-year grazing trial was conducted using 149 crossbred steers (507 lb initial weight) and two native range pastures in Clark County, Kansas. Steers were allotted randomly to the pastures, and treatments were assigned randomly to the pastures in year 1. To reduce the effect of pastures, treatments were rotated between pastures in the second year. Treatments consisted of control (no protein supplement) and Arsoy, a soybean by-product protein supplement hand-fed at 3.2 lb/head/day. Supplementation began in mid to late July and ended in October each year. Both groups had access to a free-choice mineral supplement.

Steers were tagged, processed, weighed, and transported to their pastures to commence the trial each year. Supplements were grouped in bunks after all animals were

¹Appreciation is extended to ADM Protein Specialties Division, Decatur, IL, for support of this study.

²Clark County Extension Office.

called to the feeding facilities to minimize differences in supplement consumption. At the end of the grazing period each year, steers were gathered, transported to a commercial feeding facility, weighed, processed, and placed in a single drylot pen. In the feedlot, steers were fed step-up and finishing diets until the average of the pen was deemed ready for slaughter. Final live slaughter weight was calculated by dividing hot carcass weight by the average dressing percentage of the pen. Carcass data were collected following a 24-hour chill.

Results and Discussion

Late-summer stocker gains were enhanced 54.6 lb per head by feeding the Arsoy supplement ($P < .01$). Average daily gain improved dramatically from year 1 to year 2 (1.92 vs. 2.65 lb/day; $P < .01$). The difference between years is probably a reflection of weather, pasture conditions, and cattle type. Concurrently, a greater Arsoy supplementation response ($P < .01$) was recorded in year 2 (.76 lb/day) than year 1 (.38 lb/day). The overall conversion of supplemental feed to

extra weight gain was calculated to be about 5.3:1. These results indicate that the Arsoy supplement is an attractive management tool for stocker operators wishing to increase grazing performance of growing cattle.

Steer feedlot gains were unaffected by previous pasture supplementation treatment ($P > .32$). About 80% of the additional gain achieved through supplementation apparently was retained through the feedlot. Feedlot gains were greater for year 1 than year 2 (3.05 vs 2.45 lb/day; $P < .01$), which was inversely related to pasture gains. Because steers from both treatments were fed in the same feedlot pen, feed efficiency differences during the finishing phase could not be determined. Corresponding to the heavier live weights, the Arsoy-supplemented steers had greater hot carcass weights and yield grades ($P < .01$). Marbling score and percentage of carcasses grading USDA Choice or higher were not influenced by summer supplementation ($P > .59$). Our data indicate that late-summer supplementation does not hinder feedlot performance and has minimal effects on carcass parameters.

Table 1. Effects of Grazing Supplementation Program on Steer Performance

| Item | No Supplement | Arsoy Supplement | P-Value |
|-----------------------|---------------|------------------|---------|
| No. steers | 72 | 77 | |
| Starting wt, lb | 503 | 511 | |
| Off-pasture wt, lb | 694 | 741 | |
| Slaughter wt, lb | 1174 | 1214 | |
| Pasture Performance | | | |
| Daily gain, lb: | | | |
| Year 1 | 1.72 | 2.11 | .01 |
| Year 2 | 2.28 | 3.04 | .01 |
| Overall | 2.00 | 2.58 | .01 |
| Supplement efficiency | -- | 5.3:1 | |
| Feedlot Performance | | | |
| Daily gain, lb: | | | |
| Year 1 | 3.10 | 3.01 | .40 |
| Year 2 | 2.47 | 2.44 | .84 |
| Overall | 2.78 | 2.73 | .48 |

Table 2. Effects of Late-Summer Stocker Supplementation on Carcass Trait

| Item | No Supplement | Arsoy Supplement | P-Value |
|-------------------------|---------------|------------------|---------|
| Hot carcass wt, lb | 734 | 761 | .01 |
| Fat thickness, in. | .35 | .36 | .75 |
| Ribeye area, sq in. | 13.8 | 14.1 | .29 |
| KPH, % | 2.3 | 2.4 | .26 |
| USDA yield grade | 1.3 | 1.7 | .01 |
| USDA marbling score | Slight 76 | Slight 81 | .59 |
| % USDA Choice or better | 33 | 35 | .92 |