RESTRICTED FEEDING IMPROVES PERFORMANCE OF GROWING STEERS DURING SUBSEQUENT GRAZING ON NATIVE FLINT HILLS PASTURE

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Introduction

Beef stocker operators are margin-operators, and rising feed costs force them to consider alternative feeding strategies to reduce production costs. Limit-feeding is a management technique that has positive implications for cost control. In this experiment, we restricted dry matter intake to determine if steers could compensate for a period of dietary restriction during intensive early grazing. This study illustrated that limit-feeding could reduce feed costs for stocker and background operators.

Experimental Procedures

Three loads of highly stressed, crossbred calves (n = 329; body weight = 420 lbs) were weighed and tagged on arrival at the Kansas State University Beef Stocker Unit. Calves were given a metaphylactic antibiotic (Draxxin[1]), vaccinated for clostridial and viral diseases, and de-wormed; bulls were castrated, and all animals were fed the Base 1 ration (Table 1). Following processing, steers from each load were placed in a row of eight pens divided into two blocks with four pens in each block. Steers were randomly assigned to pens and treatments within a block. Treatments consisted of a control group (full-fed) and steers restricted to dry matter intakes of 2.50, 2.25, or 2.00% of body weight. Steers were fed the same diet two times daily. Two step-up rations, Base 1 and 2 (Table 1), were fed for 18 days before treatments began. Steers were weighed at 14 day intervals, and intakes of restricted treatments were adjusted according to body weight on days 30, 45, and 62. Final weights with common gut-fill were measured on day 67.

On day 67, steers were de-wormed, implanted with Ralgro[2], and allotted by weight and treatment to burned, native tallgrass pastures with equal stocking densities. Each treatment group was evenly distributed in each pasture. Steer weights were measured 45 and 90 days after turn out. Steers were placed in the previous pens for five days and fed Base 1 at 2.00% of body weight (Table 1) to equalize gut-fill.

Results and Discussion

Average daily gain (ADG) of steers fed free choice was 28, 32, and 51% higher than steers fed 2.50, 2.25, and 2.00% of body weight, respectively. The ADG of steers fed 2.50 and 2.25% of body weight was similar ($P>0.05$) at the conclusion of the drylot phase. When compared with all other treatments, steers fed 2.00% of body weight had the lowest gains during the drylot period. Feed:Gain

[1]Draxxin is a registered trademark of Pfizer Inc., New York, NY.
[2]Ralgro is a registered trademark of Schering-Plough Animal Health, Summit, NJ.

was more desirable for steers restricted to 2.50 or 2.25% of body weight compared with steers fed free choice or at 2.00% of body weight. Steers fed at 2.00% of body weight had poorer feed conversion efficiency than steers in any other treatment. Overall, steers fed free-choice cost 25% more ($P<0.01$) than steers that were limit-fed (Table 2).

Steers fed free choice had the poorest gains during the first 45 days of grazing; those fed at 2.00% body weight had the greatest gains ($P<0.05$). Animal performance tends to suffer during the second 45 days of grazing due to declining forage quality. Daily gains for all treatments were numerically lower during this period. Steers fed free-choice had the poorest daily gains overall during grazing. Final weights for steers fed free-choice, 2.50, and 2.25% body weight after grazing were not different ($P>0.05$); however, steers fed 2.00% body weight still had the smallest final weights of all treatments.

Implications

Limit-feeding in the drylot phase of stocker or background operations can decrease feed costs and increase performance of steers during subsequent grazing compared with full-feeding in the drylot phase.

Table 1. Drylot Ration Ingredients (% dry matter)

	Base 1[1]	Base 2[2]	Base 3[3]
Dry rolled corn	30.00	30.67	36.76
Wet corn gluten feed	28.00	35.96	36.76
Alfalfa hay	23.00	15.49	15.01
Prairie hay	16.00	15.19	8.47
Mineral supp.	3.00	2.70	3.00
Ration costs, $/ton	107.56	107.83	111.53

[1]Base 1 fed for 9 days following arrival of steers.
[2]Base 2 fed for 6 days following Base 1.
[3]Base 3 fed for remainder of feeding trial.

Table 2. Steer Performance by Treatment in Drylot

	Receiving Treatments[1]			
	Free-choice	2.50% BW	2.25% BW	2.00% BW
No. head	83	81	81	82
Initial body weight, lbs	420	418	420	420
Final body weight, lbs	587[a]	561[b]	557[b]	530[c]
Overall body weight gain, lbs	167	143	139	110
ADG, lbs	3.12[a]	2.29[b]	2.13[b]	1.61[c]
Feed:Gain	5.67	5.34	5.25	5.76
Cost[2] $/hd/trt/day	1.03[a]	0.79[b]	0.78[b]	0.74[c]

[1]Receiving treatments:
Free-choice: steers fed at free choice managed on slick-bunk; 2.50% BW: steers fed at 2.50% of BW; 2.25% BW: steers fed at 2.25% BW; 2.00% BW: steers fed at 2.00% BW.
[2]Costs/ton of DRC: $152; WCGF: $60; Alfalfa: $140; Prairie Hay: $80; Mineral Suppl.: $180
[abc]Means within a row without a common superscript letter differ (P<0.05).

Table 3. Steer Performance by Treatment During Grazing

	Receiving Treatments[1]			
	Free-choice	2.50% BW	2.25% BW	2.00% BW
Turn out weight, lbs[2]	587	561	557	530
Mid-grazing body weight, lbs[3]	693	671	671	645
Final-grazed body weight, lbs[4]	781[a]	770[a]	770[ab]	745[b]
Overall body weight gain, lbs	196	207	211	216
Grazing period 1 ADG, lbs/day	2.33[a]	2.42[b]	2.51[b]	2.57[c]
Grazing period 2 ADG, lbs/day	1.87	2.05	2.05	2.07
Overall ADG, lbs/day	2.09	2.24	2.29	2.31

[1]Receiving Treatments:
Free-choice: steers fed free choice managed on slick bunk; 2.50% BW: steers fed at 2.50% BW; 2.25% BW: steers fed at 2.25% BW; 2.00% BW: steers fed at 2.00% BW.
[2]Turn out May 1.
[3]Mid-grazing weight measured June 15.
[4]Final-grazed weight measured July 27.
[abc]Means within a row without a common superscript letter differ (P<0.05).