

Forage Research in Texas

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Influence of Monensin on Gain of Stocker Calves Grazing Cool-Season Annual Grasses

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SUMMARY

A group of 60 calves, consisting of 20 heifers and 40 steers, was divided equally into two treatment groups: rye-ryegrass pasture only; rye-ryegrass pasture plus 200 mg monensin per head per day supplied in 2 pounds ground corn per head per day. Average initial weight of the February-born 1/2 Simmental 1/4 Brahman 1/4 Hereford calves was 495 pounds for heifers and 565 pounds for steers. The monensin-corn fed calves had an average daily gain (ADG) of 2.11 pounds from November 18 to May 7 (170 days); whereas, the pasture only calves had an ADG of 1.73 pounds during the same period. Steers gained .36 pounds per day more than their heifer mates (2.03 vs. 1.67). With the exception of one 28-day period, consumption of the monensin-corn ration was approximately 90% of that offered.

Introduction

Monensin is one of several compounds used to promote animal performance. Previous studies have shown that monensin increases feed efficiency and/or weight gains of growing cattle. When used with small quantities of feed carrier (2 lbs/hd/da) and bermudagrass pastures, monensin fed at 200 mg/hd/da does not normally present a palatability problem. However, when used in combination with annual winter pastures such as small grains-ryegrass, monensin has been reported to be unpalatable, and thereby, limits total feed-monensin intake. The primary objectives of this trial therefore were to: (1) determine the acceptability of supplemental feed containing monensin when fed to calves grazing an 'Elbon' rye-'Gulf' ryegrass pasture; (2) determine the influence of monensin on animal performance; and (3) measure forage availability and estimate forage disappearance for calculating forage:gain ratios.

Procedures

Pasture. 'Elbon' rye was drilled into a prepared seedbed at the rate of 100 pounds of seed per acre and 'Gulf' ryegrass was planted at the rate of 20 pounds per acre on September 25. Six pastures were used with size of each ranging from 5.5 to 7.5 acres. Total fertilizer application during the growing period was 225-75-75 pounds per acre of $N-P_2O_5-K_2O$. Available forage was harvested at 28-day intervals throughout the trial. Forage was hand-clipped inside and outside of wire cages to provide an estimate of forage disappearance. Protein and in vitro digestible dry matter (IVDDM) analyses were also conducted on the forage samples.

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Animals. All calves used were the progeny of purebred Simmental bulls and F-1 (Brahman x Hereford) cows. Calves were weaned, given a multi-way blackleg vaccine, and allowed to graze bermudagrass until the winter pastures were ready to be grazed. Ten heifers and 20 steers were allotted according to weight and condition to both the control group and the monensin group. The steers were then separated into two groups of 10 head each for each treatment group to provide 3 replicates of 10 head each per treatment. All calves were provided with 2 lbs/hd/da of a ground corn creep feed one week prior to initiation of the trial. The 30 calves in the monensin group received 100 mg monensin/hd/da (1 lb of treated feed and 1 lb of untreated feed) during the first five days pre-trial. Thereafter, 200 mg monensin/hd/da was provided via 2 lbs feed. Feed refusals (orts) were recorded daily and discarded on a weekly basis. All calves were weighed twice at initiation and termination of the 170-day trial, and at 28-day intervals during the grazing period. Minerals were provided free choice to each of the six groups.

Results

Average daily gain (ADG) for each of the animal groups is shown for each weigh period in Table 1. Calves which were fed 2 lbs ground corn/hd/da plus 200 mg monensin gained considerably more during the first 56-day period than the non-fed groups. This may be due to the dry matter contribution of the ground corn, or a combination of both the feed and the 200 mg/da monensin. Regardless of the primary agent responsible, the most significant point is that during this first 56 days, the corn + monensin fed calves gained 1.0 lbs/hd/da more than the non-fed groups (1.33 lbs/da vs 0.34 lbs/da).

Table 2 shows group ADG summaries for both a 141-day and 170-day period. Because of the excellent growing conditions for Elbon rye during the winter period and the warm, early spring which promoted rapid maturation during March, the Gulf ryegrass was restricted somewhat in its normal growth patterns during March and April. Thus, the decline in animal performance from 4-8 to 5-7 was due primarily to forage conditions. Even so, the monensin-fed calves gained nearly .4 lb/hd/da more than the non-fed calves. The gain advantage of steers vs heifers was nearly identical to that of the treatment groups.

Feed refusals are summarized by animal weigh periods in Table 3. With the exception of the 2-11 to 3-10 period, about 90% of the monensin-supplemented ground corn was consumed. From 2-11 to 3-10, there were 5 frequencies of measurable rainfall. This may have influenced consumption, but does not satisfactorily explain the extreme refusals in Group III.

Forage dry matter available for grazing is shown in Table 4. Since this type pasture has a moisture content of 70 to 85% during this test period, there was more than adequate forage available on all paddocks. Although there was considerable fluctuation in available forage between paddocks and between periods, forage availability did not restrict animal intake. There was always an abundance of this high quality forage available for maximum intake under grazing conditions.

Table 5 presents an estimate of forage:gain ratios which were obtained via cage-difference technique in each paddock. The ratios were surprisingly similar and showed a slight numerical advantage for the monensin-fed calves. Forage:gain ratios, however, ranged from about 10:1 to 13:1 which were superior to those previously reported for monensin-bermudagrass trials.

Percent protein and in vitro digestible dry matter of available forage are presented in Table 6. These data further substantiate the equality of the paddocks and also show a decline in quality of the Elbon rye with advancing chronological and morphological age. The rapid decrease in calf ADG (Table 1) during the last 28-day period may be explained in part by the forage quality, but was also related to the physical nature of the maturing rye and the overall condition of the calves.

AT COLLECT	287	1.33	7.04	1.31	3.83	3.36
A MONENSIN	280	1.14	5.32	3.20	3.30	3.86
IA COLLECT	264	1.04	7.20	3.34	3.86	3.43
II MONENSIN	213	1.14	7.00	3.83	3.00	3.34
II MONENSIN	430	1.32	8.24	3.30	3.44	3.03
I COLLECT	404	1.32	1.20	1.34	3.32	3.65
CHUB	(lbs)	13-10	7-12	5-10	3-10	4-8
	Weight	10	20	40	40	40
	10/1/57	11-0	13-10	7-13	5-10	3-10

Table 6. Percent protein and in vitro digestible dry matter of available forage

Table 1. Monthly average daily gain of calves grazing rye-ryegrass pastures (lbs/day).

GROUP	Initial Weight (lbs)	11-8 to 12-16		12-16 to 1-13		1-13 to 2-10		2-10 to 3-10		3-10 to 4-8		4-8 to 5-7		11-8 to 5-7	
I Control	494	-.75		.50		1.64		2.75		2.62		1.28		1.36	
II Monensin	496	.25		2.54		2.29		2.54		3.03		1.28		2.14	
III Monensin	573	1.14		1.96		2.82		3.00		3.24		1.90		2.44	
IV Control	567	-.04		1.57		2.07		2.86		3.48		1.41		2.00	
V Monensin	569	-.14		2.25		2.50		3.36		2.86		1.03		2.17	
VI Control	551	-.29		1.07		1.93		3.93		3.24		1.66		1.98	

Table 2. Group summaries of average daily gain.

Groups	Average Daily Gain (lbs)	
	11-18- to 4-8 (141 days)	11-18 to 5-7 (170 days)
Monensin	2.25	2.11
Control	1.78	1.73
Heifers	1.75	1.67
Steers	2.15	2.02

Table 4. Forage availability during winter grazing period.

DATE	GROUP					X
	I CONTROL (heifers)	II MONENSIN (heifers)	III MONENSIN (steers)	IV CONTROL (steers)	V MONENSIN (steers)	VI CONTROL (steers)
	-----lbs/acre-----					
11-17-80	1872	1564	1564	2282	2410	2308
12-17-80	2052	2820	1974	2821	2385	1795
1-22-81	2411	2821	2641	2180	2128	2718
2-20-81	1385	1051	2539	1513	2359	1692
3-16-81	2231	2205	4154	2154	2744	4513
4-14-81	2539	3103	3025	1846	3179	2308
AVG	2082	2261	2650	2133	2534	2556

Table 5. Estimated forage:gain ratios of treatment groups.

GROUP	ADG	GAIN/ACRE	FORAGE DISAPPEARANCE	FORAGE:GAIN RATIO
	(11-8 to 5-7)	(lbs)	(lbs/acre)	(lbs:lbs)
I Control	1.35	416	5279	12.7:1
II Monensin	1.99	615	6770	11.0:1
III Monensin	2.35	589	6282	10.7:1
IV Control	1.90	525	6692	12.8:1
V Monensin	1.98	728	7744	10.6:1
VI Control	1.93	609	7127	11.7:1

Table 6. Percent protein (Pro) and in vitro digestible dry matter (DDM) of winter pasture.

Date	GROUP					
	I CONTROL (heifers)		II MONENSIN (heifers)		III MONENSIN (steers)	
	Pro	DDM	Pro	DDM	Pro	DDM
11-17-80	25.8	85.2	29.4	85.7	21.9	88.5
12-17-80	20.4	87.9	19.7	85.5	17.1	88.9
1-22-81	18.3	88.8	21.9	88.8	17.1	85.3
2-20-81	22.5	82.3	23.5	81.7	21.2	80.5
3-16-81	17.2	81.0	20.4	82.4	16.9	82.7
4-14-81	16.3	73.0	18.1	71.9	13.6	64.0
					19.1	73.8
					17.8	77.3
					16.0	67.7
					23.8	81.7
					17.5	77.1
					19.3	79.5
					26.5	85.4
					21.9	84.6
					22.9	86.2
					25.9	83.0
					22.5	84.1
					22.7	86.0
					21.9	88.9
					19.0	82.1
					23.7	80.6
					21.0	84.3
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