Effect of Monensin on Weight Gain and Forage Intake by Replacement Heifers on Native Range

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Story in Brief

A trial consisting of a grazing period on dormant native range for 96 days and on lush forage for 133 days was conducted to evaluate the effect of monensin on weight gain and forage intake by Angus x Hereford replacement heifers. During the dormant forage portion of the trial, heifers were fed a 30 percent crude protein soybean meal supplement with 0 or 200 mg of monensin/hd/day. During the lush forage portion of the trial, heifers were fed 1 lb/hd/day of a carrier containing 0 or 200 mg/lb monensin. Relative forage intake was measured in both portions of the trial.

Weight gains and forage intakes were similar when 200 mg monensin was fed as compared to the controls.

Introduction

Rumensin[1] (monensin sodium) is a feed additive marketed to improve feed efficiency of feedlot cattle. Feeding rumensin to feedlot cattle has little effect on weight gain; however, rumensin is reported to increase weight gains of stocker cattle and has been cleared by the FDA for feeding to stockers weighing in excess of 400 lb.

The objective of this study was to determine the effect of monensin on (1) weight gain (2) forage intake and (3) reproductive performance of heifers grazed on native range forage.

Materials and Methods

One hundred Angus x Hereford heifers were randomly allotted to either a control (0 monensin) or monensin (200 mg/hd daily) treatment group.

The trial consisted of two phases. The first phase of the trial involved a 96-day period (January 30 - May 5) during which the heifers were maintained on dormant native range forage. The second phase of the trial involved 133 days (May 5- September 15) during which the heifers were maintained on lush growing native range forage.

During the dormant forage phase of the experiment, heifers were group fed 4 lb/hd/day of a 30 percent all natural crude protein supplement (Table 1). Monensin was incorporated into the supplement and group fed to heifers on a daily basis.

During the lush forage phase of the experiment, heifers received 1 lb/hd/day of a corn-based carrier (Table 2) containing either 0 or 200 mg/lb of mononsin.

The heifers were pasture mated to Hereford bulls during a 90-day breeding season which began January 10.

Heifers were weighed at approximately 28-day intervals and at that time pastures and bulls were rotated to minimize pasture, location and sire effects.

Relative forage intake by heifers was estimated in March and May using chromic oxide (16 gm/hd/day) as an external indicator. Chromic oxide was individually fed with one-half the daily allocation of supplement at 8 a.m. and 4 p.m. during the seven-day preliminary and five-day fecal collection periods. Fecal grab samples were dried at 60C and analyzed for chromium content.

[1]Elanco, Division of Eli Lilly and Company, Indianapolis, Indiana.

Table 1. Composition of protein supplement fed during the dormant forage period.[1]

Item	%
Cottonseed meal	31.0
Wheat	28.0
Alfalfa	10.0
Milo	20.0
Deflourinated phosphate	5.0
Molasses	5.0
Potassuim chloride	1.0

[1]Monensin was incorporated at the rate of 50 mg/lb in the supplement fed to monensin treated heifers.

Table 2. Composition of carrier supplement fed during the lush forage period.[1]

Item	%
Corn, yellow	85
Dehydrated alfalfa meal	10
Molasses	5

[1]Monensin was incorporated at the rate of 200 mg/lb in the supplement fed to monensin treated heifers.

On July 20, heifers received their respective supplements and were allowed to graze for approximately three hrs. Rumen contents were then sampled for VFA analysis from ten heifers randomly selected from each treatment group.

Heart girth and height measurements were taken at the beginning and end of the trial as further indicators of growth. Heart girth was measured directly. Height was defined as the distance from the hip to the floor and was estimated from measurements of a 2 x 2 slide taken of each heifer behind a grid.

Since the heifers had not completed calving at the time of preparation of this report, percent calf crop, birth weight, calving difficulty scores and postpartum intervals are not reported. These data will be reported at a later date.

Results and Discussion

Performance by heifers grazing dormant winter forage is shown in Table 3. Average daily supplement fed was equal for the two treatment groups. Initial weights were 573 and 568 lb for the control and monensin groups, respectively. During the dormant forage period, weight gains were quite similar for the control and monensin treatment groups (90 and 97 lb, respectively).

Relative forage intake by heifers grazing dormant forage and receiving monensin was about 89 percent of the control group. Although forage intake estimates were quite variable and differences were not statistically significant, this trend was consistent with data previously reported from this station.

Performance by heifers during the lush forage period is shown in Table 4. Initial weights were again quite similar for control and monensin treatment groups (663 and 665 lb, respectively). Weight gain during the lush forage growth period was not significantly influenced by monensin feeding. The average daily gain by heifers during this period was about 1.69 lb/hd/day. Although weight gain responses to monensin feeding have been quite variable in forage grazing trials, the general trend has been toward smaller responses when the level of performance was high such as in this trial.

Table 3. Performance and relative forage intake by heifers during winter supplementation on dormant forage.

Item	Monensin, mg/hd/day	
	0	200
Heifers, number	50	50
Daily supplement, lb	4.0	4.0
Initial wt, lb	573	568
Final wt, lb	663	665
Wt change, lb	+90	+97
Forage intake, %	100%	89%

Table 4. Performance and relative forage intake by heifers during spring and summer on lush forage.

Item	Monensin, Mg/hd/day	
	0	200
Heifers, number	46	47
Daily carrier, lb	1.0	1.0
Initial wt, lb	663	665
Final wt, lb	885	892
Wt change, lb	+222	+227
Forage intake 100%	100	116.2

Table 5. Total and molar percentages of volatile fatty acids in rumen fluid.

Item	Monensin, mg/hd/day	
	0	200
Acetate, molar %	77.13	75.93
Propionate, molar %	14.55	16.39
Butyrate, molar %	8.33	7.63
Total, M/l	59.34	47.13

Table 6. Skeletal measurements of heifers fed 0 vs 200 mg/hd/day of monensin.

Item	Monensin, mg/hd/day	
	0	200
Initial heart girth, in	58.8	58.6
Increase in heart girth, in	9.2	9.1
Initial height, in	42.0	42.2
Increase in height, in	3.5	3.2

Relative forage intake by heifers grazing lush forage and receiving monensin was 116.5 percent of the control group. Again, estimates of forage intake were quite variable and this difference was not statistically significant.

Total and molar percentages of volatile fatty acids are shown in Table 5. Rumen fluid from heifers fed monensin tended to have less acetate and butyrate and more propionate than that from control heifers. This is a characteristic response to monensin feeding.

Skeletal measurements for the trial are summarized in Table 6. Growth in heart girth circumference and height was quite similar for heifers receiving control and monensin treatments. These observations are in agreement with weight response data.

As previously indicated, data relative to reproductive performance for these heifers will be reported at a later date.

Twenty-Four vs 30-Month-Old Calving with Hereford Heifers

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Story in Brief

Twenty-nine Hereford heifers born in the spring of 1976 and 36 born in the fall of 1975 were managed alike following weaning and were bred in the spring of 1977 to calve at 24- or 30-months of age. Thirty-month-old first calving heifers had 13 percent ($P<.18$) higher conception rates at first breeding and 40 percent higher ($P<.001$) conception rates at rebreeding after calving. Calving difficulty and calf mortality were similar for both groups.

The older heifers were larger at calving but had heavier calves than the younger heifers. Calves of 30-month-old heifers were 45 lb heavier ($P<.001$) at weaning than calves of 24-month-old heifers. Thirty-month old heifers had approximately a 120 lb weight advantage ($P<.001$) at first breeding and maintained that advantage through the weaning of the first calf.

Introduction

Much research has compared the merits of calving heifers for the first time at 24- or 36-months of age. In general, the data have shown that 36-month-old heifers wean heavier calves and rebreed more successfully than two-year-old heifers. Two-year-old heifers will usually require more assistance at delivery but calf losses will be similar since three-year-old heifers will have larger calves than two-year-olds.

In many respects, neither two-year-old nor three-year-old first calving is a feasible alternative for the producer. Many find it very difficult to develop heifers adequately for breeding at 15 months of age and as a result encounter low conception rates at both first breeding and at rebreeding after first calving. Developing heifers for 36-month-old calving is easy but the advanced age at first calving wastes a significant portion of the heifers productive life.

An alternative for those producers calving in both fall and spring would be to breed for first calving at 30 months of age. A great saving in terms of rebreeding rate, productive lifespan and feed could result if an additional six months of development could overcome many of the problems of calving at 24 months of age.

The objectives of this work was to compare the growth and reproductive performance of 24- and 30-month-old first calving heifers and the performance of their calves.

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