Effect of Monensin on Reproductive Performance and Winter Weight Change of Fall-Calving, First-Calf Heifers

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Story in Brief

The effect of feeding monensin on reproductive performance and winter weight change of fall-calving, 2-year-old Hereford x Angus heifers was studied. Heifers grazed native range during the 415-day trial and were fed daily supplement containing either 0 or 200 mg monensin.

Monensin had no appreciable effect on conception rate, calving difficulty, birth weight, calf mortality or post-calving winter weight change.

Introduction

It is well documented that the feed additive monensin (Rumensin[1]) improves feed efficiency in feedlot cattle and increases weight gain in stocker cattle. Although not yet cleared by FDA for breeding animals, monensin has the potential to increase gain and/or improve feed utilization in replacement heifers and cows. However, the effect of monensin on reproductive performance has not been clearly established. Moseley *et al.*, 1977, reported that monensin decreased age at puberty in beef heifers fed in drylot, and Turner *et al.*, 1977, found that monensin reduced the interval from calving to first estrus of cows wintered on meadow hay.

The objective of this study was to evaluate the effect of monensin on reproductive performance and weight change of fall-calving, 2-year-old heifers.

Material and Methods

One hundred Hereford x Angus heifers were randomly allotted to either a control (no monensin) or monensin (200 mg/head/day) treatment group. The 415-day trial began January 30, 1978, shortly after the heifers entered breeding pastures, and continued through the second breeding season which ended March 21, 1979.

Heifers grazed native range throughout the trial, and cattle on both treatments were group-fed supplement daily. During periods of dormant forage, monensin was fed in a high-protein supplement. When lush pasture was available, monensin was fed in a

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

Table 1. Feeding schedule.

Period	Daily Feed[1]
January 30 - May 5, 1978	4 lb, 30% supplement
May 6 - September 15, 1978	1 lb, corn carrier
September 16 - October 13, 1978	No monensin
October 14 - November 26, 1978	2 lb, 30% supplement
November 27, 1978 - March 21, 1979	4 lb, 20% supplement

[1]Composition of supplements presented in Table 2.

Table 2. Composition of supplements[1].

Type of supplement	Ingredient	% in supplement
30% protein	Cottonseed meal	31.0
	Wheat	28.0
	Alfalfa	10.0
	Milo	20.0
	Defluorinated phosphate	5.0
	Molasses	5.0
	Potassium chloride	1.0
20% protein	Milo	30.35
	Soybean meal, 44%	60.05
	Dehydrated alfalfa meal	5.00
	Dicalcium phosphate	2.85
	Masonex	1.25
	Salt	.50
Corn carrier	Corn	85.0
	Dehydrated alfalfa meal	10.0
	Molasses	5.0

[1]Monensin was incorporated to obtain a daily intake of 200 mg.

corn-based carrier. The feeding schedule, including kind and amount of supplement, is outlined in Table 1. Composition of supplements is shown in Table 2.

During the first breeding season, heifers were exposed to Hereford bulls for a 90-day period which began January 10, 1978. On September 15, 1978, heifers were examined for pregnancy, and open females were removed from the trial. During the calving season (October 13, 1978, to January 5, 1979), heifers were scored for calving difficulty, and calves were weighed at birth.

Heifers with calves were exposed to Charolais bulls during a 90-day breeding season beginning December 15, 1978. Sixty days after the breeding season, cows were palpated for pregnancy. Fetal age was estimated and used as the basis for determining breeding dates and post-partum intervals.

During the trial, heifers were weighed and rotated between pastures at approximately 28-day intervals. Post-partum weight change was calculated from about one month post-calving to the end of the trial.

Results and Discussion

Differences in reproductive performance of control and monensin-supplemented heifers were small (Table 3). Of the control heifers exposed at first breeding, 68 percent (34 of 50) calved, compared to 76 percent (38 of 50) for monensin heifers. Calf mortality was similar, with control and monensin heifers losing two and four calves, respectively; from calving to weaning. Differences in rebreeding performance were also small. Twenty-five of 32 (78 percent) of the control heifers became pregnant, compared to 28 of 34 (82 percent) of the monensin heifers.

Calving difficulty scores and birth weights for control and monensin heifers are presented in Table 4. Male calves from control heifers had significantly heavier birth weights and higher calving difficulty scores than male calves from monensin heifers. Although these differences were statistically significant, they are probably not monensin-related responses. Birth weights and calving scores of female calves were not different between control and monensin heifers.

Table 3. Conception rate and calf mortality.

Item	Treatment[1]	
	Control	Monensin
No. heifers exposed, first breeding	50	50
No. calving	34	38
No. weaning a calf	32	34
No. of heifers exposed, second breeding	32	34
No. rebreeding	25	28

[1]Trial was initiated 20 days after the beginning of the first breeding season.

Table 4. Calving difficulty and birth weight.

Treatment	Sex of calf	Trait		
		No. calves	Calving difficulty[1]	Birth wt, lb
Control	Male	12	1.55[b]	76.2[b]
	Female	19	1.16[a]	67.3[a]
Monensin	Male	14	1.14[a]	70.1[a]
	Female	20	1.20[a]	67.9[a]

[1]Score: 1-unassisted, 2-easy pull, 3-hard pull or 4-cesarean.
[a,b]Means in same column not sharing a common superscript differ significantly ($P<.05$).

Interval from calving to rebreeding based on palpation from pregnancy is presented in Table 5. Although post-partum intervals of control and monensin heifers did not differ significantly, there was a tendency for monensin heifers to have shorter intervals. Monensin heifers with male calves had an interval that was 10 days shorter than control heifers with male calves. A similar trend was noted for heifers with female calves, where a difference of 5 days existed between treatments.

Weight change patterns of heifers prior to calving have previously been reported by Crosthwait *et al.*, 1979. Post-calving weight loss was not affected by monensin (Table 6).

Literature Cited

Crosthwait, G. L. 1979. Res. Rep. MP-104:87. Okla. Agr. Exp. Sta.
Moseley, W. M. 1977. J. Anim. Sci. 45:961.
Turner, H. A. 1977. J. Anim. Sci. 44:3.

Table 5. Post-partum interval.

Treatment	Sex of calf	No. calves	Post-partum interval[1], days
Control	Male	8	69.2[ab]
	Female	14	71.9[a]
Monensin	Male	10	59.4[b]
	Female	16	66.9[a]

[1]Interval from calving to rebreeding was based on palpation for pregnancy and estimated age of fetus.
[a,b]Means not sharing a common superscript differ significantly ($P<.05$).

Table 6. Post-calving weight change.

Item	Treatment	
	Control	Monensin
No. heifers	22	28
Post-calving weight[1], lb	843	844
Final wt[2], lb	783	783
Wt change, lb	−60	−61

[1]Weight approximately one month post calving.
[2]Weight on March 21, 1979.