EFFECT OF A MONENSIN RUMINAL DELIVERY DEVICE ON WEIGHT GAINS OF GROWING STEERS ON WHEAT PASTURE

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Story in Brief

The effect of a monensin ruminal delivery device on weight gains of wheat pasture stockers was evaluated using 60 fall-weaned Hereford and Hereford x Angus steer calves during each of two years. Treatments were monensin device versus no device (control). The monensin ruminal delivery device increased weight gains by .20 to .24 lb/day during the 112-day trials, which is similar to effects of feeding monensin to stocker cattle grazing wheat pasture.

(Key Words: Monensin, Bolus, Wheat Pasture, Stocker Cattle.)

Introduction

Consumption of supplements by cattle grazing pastures is highly variable among animals. Wheat forage is a high-quality, highly palatable forage, and achieving desired levels of supplement consumption by cattle grazing wheat pasture is sometimes particularly difficult. Additionally, many wheat pasture stocker operations are fairly extensive; and some producers are not willing, or cannot for practical reasons, feed supplements. Rumensin (monensin) is a feed additive that increases rate of weight gain of wheat pasture stocker cattle by about 0.2 lb/day (Horn et al., 1981; Wagner et al., 1984). Administration of monensin to cattle as a ruminal bolus would be advantageous by resulting in a more consistent daily dosage of monensin, and would eliminate labor and equipment cost of supplementation programs. The objective of this trial was to evaluate the effect of a monensin ruminal delivery device (MRDD) on weight gains of wheat pasture stocker cattle.

Materials and Methods

Sixty fall-weaned Hereford and Hereford x Angus steer calves were used in each of two years. The calves were from a common cow herd from the OSU Animal Science Range Cow Research Center. After a weaning and receiving period of approximately 28 days, the calves were weighed and randomly assigned, within breed and three initial weight groups, to two treatments (i.e., MRDD versus no device). The MRDDs contained a core of 16.5 g monensin incorporated into a controlled release polymer and were prepared by Lilly Research Laboratories, Greenfield, Indiana. Expected rate of release of monensin from the devices was 100 mg/day.

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The calves were vaccinated for IBR, BVD, PI_3, 7-way clostridium and 5-way Lepto during the receiving period, and the MRDDs were administered to the calves 11 days prior to placing the calves on wheat pasture in year 1 and immediately prior to wheat pasture in year 2. All calves were implanted with Compudose in year 1 but not in year 2. Fecal grab samples were collected from half the steers in year 1, during the initial weighing prior to being placed on wheat pasture in order to estimate coccidia oocysts. Levels of fecal oocysts were minimal and were not monitored in year 2.

The steers grazed a single wheat pasture of 115 acres at the Forage and Livestock Laboratory (El Reno, Oklahoma) for about 112 days each year, and had free choice access to water and a commercial mineral mixture[6] throughout the trial.

Live weights of the steers were measured (dates indicated in table 1) after overnight shrinks of about 16 hours in drylot without feed and water. Individual weights of the steers at the beginning and end of grazing wheat pasture were measured twice. The steers were observed daily for signs of bloat throughout the wheat pasture grazing period.

Data of each year were analyzed separately by analysis of variance using the General Linear Models procedure of the Statistical Analysis System.

Results and Discussion

Data of six steers (2 control and 4 MRDD) were deleted in year 1. Two steers were deleted because of chronic health problems and four were deleted because an implant could not be detected by palpation at the end of the trial. Two "control" steers were deleted in year 2. One was removed from the trial because of acute coccidiosis and another because of a broken leg.

Least square means of initial and final weights, daily gains during the three periods of the trials and for the entire grazing period of each trial are shown in Table 1. In year 1, the MRDD increased ($P<.005$) gains of steers during period I and the total trial by .44 and .20 lb/day, respectively. The treatment by initial weight group interaction for the overall daily gains of the steers tended to be significant ($P = .12$), and an explanation for the interaction is not apparent. Daily weight gains of steers of initial weight groups 1 (354 lb), 2 (419 lb) and 3 (467 lb) for the total trial were increased, respectively, .35, .02 and .23 lb by the MRDD. Therefore, there was no indication that the effectiveness of the MRDD decreased as initial weight of the steers increased.

Weight gains were exceptionally good during period II of year 1, and were attributed to the fairly slow gain seen during period I and to the very mild and open winter. Hay was fed only four days of the trial (i.e., 12/13, 2/8, 2/10 and 2/12) because of light snow cover of wheat pasture. About 10 lb/head of old world bluestem hay was fed on each of these 4 days. In total, the 1985-86 wheat pasture year was very mild and weight gains of stocker cattle were exceptionally good.

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[6]Wheat Gainer Mineral No. 2. Farmland Industries. Guaranteed analysis: CA 15-17%, Mg 10.0%, P 4.0%, salt 19-21%, I .0002%, Vitamin A, 100,000 USP Units/lb.

Table 1. Effects of monensin ruminal delivery device on performance of growing cattle on wheat pasture.

Item	Year 1 (1985-86)		Year 2 (1986-87)	
	Control	MRDD[a]	Control	MRDD[a]
Number of steers	28	26	28	30
Initial wt., lb	409	417	423	429
Final wt., lb	699	729	546	578
Grazing period[b]	--------- Daily gain, lb ---------			
Period I, 11/18-12/19/85, 31 (35)[c] days	1.35	1.79[d]	.14	.80[e]
Period II, 12/19-1/30/86, 42 (43) days	3.51	3.68	1.75	1.84
Period III, 1/30-3/11/86, 40 (34) days	2.52	2.55	1.25	1.23
Overall, 11/18-3/11/86, 113 (112) days	2.56	2.76[d]	1.09	1.33[e]

[a]Monensin ruminal delivery device.
[b]Dates are actual dates of year 1. Corresponding days of each month of year 2 differed from these by 1 to 7 days.
[c]Parenthetical numbers are actual days of each grazing period in year 2.
[d]Different from control (P<.005).
[e]Different from control (P<.001).

Although weight gains of the cattle in year 2 were much lower than the previous year, similar effects of the MRDD were observed. The MRDD increased (P<.001) daily weight gains during period I and the total trial by .66 and .24 lb, respectively. Mean initial weights of steers of the three initial weight groups were 375, 411 and 479 lb. The treatment by initial weight group interaction for weight gains during all three periods and the entire trial was not significant (P>.18), and indicates that the effectiveness of the MRDD was not dependent on initial weight of the cattle used in the trial.

Weight gains of the steers in year 2 were very poor compared with year 1, and reflect the tremendous influence that weather has on performance of wheat pasture stocker cattle. The 1986-87 wheat pasture year was very wet and cold. About 8 lb/head/day of old world bluestem hay was fed to the cattle during the 21-day period, January 16 to February 5. Record amounts of rainfall were received in February, and the cattle were in mud for much of the grazing period on wheat.

The two years of data provide good contrast with regard to the impact of weather on cattle performance, and should be kept in mind when projecting the performance of stocker cattle on wheat pasture. In year 1, the steers gained about 300 total lb or about 2.7 lb/day. During the 1986-87 wheat pasture year, the steers gained only about 140 total lb or 1.2 lb/day. These two years likely represent extremes with regard to the average performance of about 1.8 lb/day for similar cattle on this pasture during previous years.

The incidence of bloat was very low during both years of the study, and effects of the MRDD on the incidence and severity of bloat could not be evaluated.

Watson and Laby (1978) and File et al. (1980) reported significant ($P<.05$) live weight gain responses of growing steers or heifers to an intraruminal continuous release capsule that provided monensin. The capsules were reported to provide 114 to 180 mg monensin per day, and the cattle grazed ryegrass and subterranean clover or spring and autumn white clover, fescue and phalaris pastures.

The MRDD containing 16.5 g monensin that was used in this trial was effective in increasing live weight gains of growing cattle on wheat pasture. Weight gains of steers that weighed about 350 to 470 lb at the start of the 112-day grazing period on wheat pasture were increased .20 to .24 lb/day by the MRDD.

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