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Clayton Livestock Research Center

PROGRESS REPORT

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EFFECTS OF MONENSIN RUMINAL DELIVERY DEVICE ON PERFORMANCE, FORAGE INTAKE AND RUMINAL FERMENTATION IN STEERS GRAZING IRRIGATED WINTER WHEAT PASTURE

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Previous reports (No. 35 and 51) from this station have indicated increased performance and reduced incidence and severity of frothy bloat in wheat pasture stocker cattle by providing a low level of grain supplement containing monensin. However, because of the time and labor required to manually supplement large numbers of cattle on daily basis, alternative methods of providing supplemental monensin are needed. A monensin ruminal delivery device (MRDD) may be one method of providing a daily dose of monensin without hand feeding a supplement. The MRDD used in the trial was formulated to provide approximately 100 mg/d of monensin throughout the 150-day expected lifetime of the bolus. The MRDD were administered to cattle approximately 10 to 14 days before initiation of the trials.

Two trials were conducted during 1986 and 1987 to study the efficacy of a MRDD for improving weight gains in stocker cattle grazing irrigated winter wheat pasture. In Trial 1 (December 10, 1985 to April 1, 1986) and Trial 2 (November 12, 1986 to March 5, 1987), 60 steers were assigned equally to receive either a MRDD or no MRDD (control). In both trials, all steers grazed a common 60-acre wheat pasture for 112 days.

During February, March and April, 1987, three sampling periods also were conducted using eight ruminally fistulated steers (four/treatment) to study the effects of MRDD on forage intake and ruminal fermentation (Trial 3). In Trial 1 (Table 1), average daily gain (ADG) was increased ($P < .05$) in steers treated with MRDD during the 112-day trial. However, the greatest differences in ADG between treatment groups occurred during the first 84 days of the trial. Average daily gain during the final 28 days of the trial was less for MRDD-treated steers compared with controls, probably as a result of a depletion of monensin from the matrix of the MRDD.

Although ADG was much less than in Trial 1, steers with MRDD in Trial 2 gained more weight ($P < .11$) than control steers (Table 1). In this trial, the MRDD had been reformulated to ensure a continual release of the proper dosage of monensin throughout the 112-day trial. Lower daily gains observed in Trial 2 also may be attributable to more adverse weather conditions encountered during this trial compared with Trial 1. In Trial 3, MRDD were weighed at the beginning and end of the trial and on this basis monensin release was calculated to be 105 mg/day,

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which was similar to the manufacturer's estimated release rate of 100 mg/day. In trials 1 and 2, steers were not scored for incidence and severity of bloat so the effects of MRDD on bloat could not be evaluated.

In Trial 3, daily intake of wheat forage, averaged across sampling periods, was not affected by treatment (Table 2). Likewise, ruminal pH and ammonia concentrations were not affected by treatment. Overall, ruminal proportions of acetate and total concentration of ruminal volatile fatty acids were not affected by treatment; however, overall ruminal concentrations of propionate averaged over the three sampling periods were increased ($P < .05$) by MRDD.

Results of this project suggest that the MRDD could be a promising method of administering monensin to cattle grazing winter wheat pasture for improving weight gains with a minimum of expenditure of time and labor.

The use of this product, however, will depend upon its future commercial availability.

Table 1. Influence of a Monensin Ruminal Delivery Device on Weight Gain in Steers Grazing Irrigated Winter Wheat Pasture

Item	Treatment	
	Control	MRDD
	----------Trial 1----------	
Number of Steers	30	30
Initial wt., lbs	557	557
Final wt., lbs	818	839
ADG, lb/d	2.36[a]	2.49[b]
	----------Trial 2----------	
Number of Steers	29	30
Initial wt., lbs	524	526
Final wt., lbs.	618	635
ADG, lb/d	.84[c]	.97[d]

[a,b]Row means with different superscripts differ, (P<.05)
[c,d]Row means with different superscripts differ, (P<.11)

Table 2. Influence of a Monensin Ruminal Delivery Device on Forage Intake and Ruminal Fermentation in Steers Grazing Irrigated Winter Wheat Pasture

Item	Treatment[a]		SE[b]
	Control	MRDD	
Intake, lb. of dry matter/d	11.0	11.9	1.1
Ruminal pH	6.2	6.1	.1
Ruminal ammonia, mg/dl	13.6	15.1	1.0
	----------mol/100 mol----------		
Ruminal acetate	62.1	61.5[d]	.5
Ruminal propionate	19.2[c]	20.3[d]	.3
Ruminal total VFA, mM	105	115	4

[a]Mean values averaged over three sampling periods conducted in early February, March and April.
[b]Standard error of mean with n = 12 for intake and n = 48 for pH, ammonia, acetae, propionate and total VFA.
[c,d]Row means with different superscripts differ (P<.05).

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