USE OF MONENSIN SODIUM IN RATIONS FED TO REPLACEMENT HEIFER CALVES DURING THE WINTERING PERIOD

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The North Dakota Agricultural Statistics Bulletin Number 52 for 1983 indicates there were 133,000 replacement beef heifers in the state. Management and feeding of these heifers so they will grow and mature into useful productive cows is of prime concern to North Dakota cattlemen. Since feed makes up a large percentage of the cost of raising replacement heifers, anything that will reduce the feed cost without reducing or impairing reproductive performance should be incorporated into the overall management system.

The feed additive, Monensin Sodium, has been shown to be effective in reducing feed intake by 6-10% without affecting gains under feedlot conditions. With a six month wintering period, and heifers consuming approximately 17 pounds of feed per day, an 8% saving in feed would amount to some 245 pounds. At four cents per pound of feed this would amount to $9.79 per heifer wintered, or approximately 1.2 million dollars in feed savings across the state.

Steer feeding trials reported in the 28th and 29th Annual Livestock Research Roundup indicate a feed savings and cost advantage when Monensin was fed at levels of from 150-300 mg per head per day.

Numerous research reports from across the United States have shown both a feed savings and a cost advantage when Monensin is fed. However, information on how Monensin might affect reproductive performance in heifers is rather limited.

In December, 1981, a trial was started to study the effects of feeding 150-250 mg of Monensin Sodium to replacement quality beef heifers kept for breeding. The trial was designed to monitor feed intake, feed efficiency, weight gain, time of first estrus and overall reproductive efficiency.

In 1982-83 the trial was repeated using good quality Angus X Hereford crossbred heifer calves weighing 550 pounds. In January, all heifers were vaccinated for Brucellosis, given a booster vaccination of 7-way vaccine, wormed with Nematel^{R} (Morantel Tartrate), branded and ear tagged. The heifers were then weighed and allotted, 12 heifers per pen, to either a control ration or a similar ration containing Monensin Sodium. There were two control lots and two treatment lots. Each lot had a slotted board fence on the north and west sides for wind protection, a mounded area with straw bedding for resting and heated automatic watering fountains. Both ration types were fed as complete mixed rations in bunk line feeders designed so that the heifers were actually self-fed. The rations were formulated to promote gains of 1.5 to 1.7 pounds per head per day. The drug, Monensin Sodium, was added to the ration in a carrier called GTA Beef Mix 600^{R} so that each heifer would receive between 150-250 mg per head per day. All heifers were checked daily and were weighed every 28 days.

On March 11, 1983, sterilized detector yearling bulls were added to each group of heifers to help identify estrus activity. The bulls wore Chin-Ball^{R} marking halters and were with the heifers continuously until the trial ended on May 9, a period of 59 days. A daily breeding record was kept of all heifers showing estrus. In June, the heifers were synchronized and artificially inseminated to Milking Shorthorn bulls. Following the A.I. period, fertile Milking Shorthorn bulls were used for clean-up breeding. The bulls were removed on July 28, 1983, giving a 47-day breeding period. All heifers were palpated for pregnancy in September, 1983.

The ration formulation fed in 1983 is shown in Table 1.

Table 2 shows the results of the 1983 winter feeding period.

Table 3 shows the estrus detection records.

Table 4 shows the pregnancy test data.

Table 5 shows the calving record of the heifers bred in 1982.

Discussion:

In 1983, heifers fed rations containing Monensin Sodium gained an average of 230 pounds while control heifers gained 242 pounds during the 115-day feeding period. The mild weather conditions allowed the heifers to make excellent gains averaging about 0.3# per day more than predicted. The Monensin fed heifers consumed 6.5% less feed (19.38 vs. 20.72) than control heifers. However, due to the cost of the carrier feed, the actual feed cost per heifer was $1.56 higher than the control.

There did not appear to be any difference in time of first estrus between groups. Approximately 37% of the heifers showed estrus in March and another 46% cycled in April in both groups.

Based on actual calving records of heifers fed Monensin Sodium in 1982 and calving in 1983, it appears that the treatment heifers calved about six days earlier (March 18th vs. March 24th) than did control heifers.

The estimated stage of pregnancy, gathered on September 14, 1983, indicates no advantage in early pregnancy rates were obtained by feeding Monensin Sodium, since about 12% more control heifers were 85 or more days pregnant.

In summary, it appears that including Monensin Sodium in rations for wintering replacement heifers at levels of 150-250 mg/hd./day has improved feed efficiency from 2.6% in 1982 to 6.4% in 1983. However, this improvement in feed efficiency failed to improve weight gains or overall economics in 1983. Winter feed costs averaged $1.56 higher ($95.80 vs. $94.24) for the Monensin Sodium fed heifers over the controls.

Feeding Monensin Sodium did not appear to change the number of heifers that conceived early in the breeding season. However, the treatment heifers fed Monensin Sodium in 1982 actually calved an average of six days earlier in 1983. More years' data will be necessary to see if the trend toward earlier calving will become reality.

The trial will continue for several more years.

Table 1. Ration Formulation – 1983 Trial

	Lots 1 – 3 Monensin	Lots 2 – 4 Control
Initial Ration:		
Mixed Hay, lbs.	600	600
Alfalfa, lbs.	93	93
Barley, lbs.	265	300
Beef Mix RM 600, lbs.	35[1/]	--
TM Salt, lbs.	5	5
Di-Calcium Phosphate, lbs.	2	2
Total	1,000	1,000
[1/] Contains 10.5 mg Monensin per pound of complete feed, fed at 16 lbs/hd./day. Monensin consumed per hd./day = 168 mg.		
2nd Ration – Jan. 25, 1983:		
Mixed Hay, lbs.	400	400
Alfalfa, lbs.	93	93
Barley, lbs.	450	500
Beef Mix RM 600, lbs.	50[1/]	--
TM Salt, lbs.	5	5
Di-Calcium Phosphate, lbs.	2	2
Total	1,000	1,000
[1/] Contains 15 mg Monensin per pound of complete feed, fed at 16.5 lbs/hd./day. Monensin consumed per hd./day = 247.5 mg.		
3rd Ration – March 28, 1983:		
Mixed Hay, lbs.	400	400
Alfalfa, lbs.	93	93
Oats, lbs.	460	500
Beef Mix RM 600, lbs.	40[1/]	--
TM Salt, lbs.	5	5
Di-Calcium Phosphate, lbs.	2	2
Total	1,000	1,000
[1/] Contains 12 mg Monensin per pound of complete feed, fed at 20.3 lbs/hd./day. Monensin consumed per hd./day = 240 mg.		

Table 2. Results of the 1983 Trial When Monensin Sodium is Added to Wintering Rations for Replacement Heifer Calves

	Rumensin	Control	Rumensin	Control
Lot Number	1	2	3	4
No. of Heifers	12[1/]	12[1/]	12[1/]	12[1/]
Initial Wt., lbs:				
Jan. 14	6,555	6,565	6,605	6,625
Avg./Hd.	546.3	547.1	550.4	552.1
Final Wt., lbs.:				
May 9	9,292	9,495	9,385	9,510
Avg./Hd.	774.6	791.3	782.1	792.5
Days Fed	115	115	115	115
Gain/Lot	2,740	2,930	2,780	2,885
Gain/Hd.	228.3	244.2	231.7	240.4
Avg. Daily Gain	1.985	2.123	2.014	2.091
Feed Fed/Lot, lbs:				
Barley	7,450	9,477	7,834	9,118
Oats	4,370	4,962	4,800	5,358
Mixed Hay	11,260	12,367	11,958	12,398
Alfalfa	2,511	2,770	2,675	2,777
Di-Cal	54	60	58	60
Trace Mineral Salt	135	149	144	149
Beef Mix RM 600	1,220	----	1,300	----
Total	27,000	29,785	28,769	29,860
Animal Days	1,439	1,439	1,439	1,439
Feed/hd./day, lbs.:				
Barley	5.18	6.59	5.44	6.34
Oats	3.04	3.45	3.34	3.72
Mixed Hay	7.82	8.59	8.31	8.62
Alfalfa	1.74	1.92	1.86	1.93
Di-Cal	.04	.04	.04	.04
Trace Mineral Salt	.09	.10	.10	.10
Beef Mix RM 600	.85	----	.90	----
Total lbs/day	18.76	20.69	19.99	20.75
% Savings	9.3		3.6	
Feed Cost/Lot, $:				
Barley	232.81	296.16	244.81	284.94
Oats	150.22	170.57	165.00	184.18
Mixed Hay	255.20	247.34	239.16	247.96
Alfalfa	52.78	69.25	66.88	69.43
Di-Cal	11.34	12.60	12.18	12.60
Trace Mineral Salt	8.10	8.94	8.64	8.94
Beef Mix RM 600	132.37	----	141.05	----
Grinding	337.50	372.31	359.61	373.25
Total Cost/Lot	1,160.32	1,177.17	1,237.33	1,181.30
Cost/hd./day	.8063	.8180	.8598	.8209
Cost/hd.	92.72	94.07	98.88	94.41
Cost/Cwt. Gain	42.34	40.17	44.50	40.94

[1/] Gomer bulls (1 per lot) placed with heifers on March 11, 1983 to aid in detection of estrus. Their weight change not included in total lot gain.

Table 3. Time of First Estrus for Replacement Heifers in Monensin Sodium Trial

	Rumensin		Control	
Time of Detection	Number Head	%	Number Head	%
March	9	37.5	9	37.5
April	11	45.8	11	45.8
May	3	12.5	2	8.33
Not Detected	1	4.2	2	8.33
Total	24	100.0	24	100.0

Table 4. Pregnancy Data Based on Rectal Palpations Made on September 14, 1983

	Rumensin		Control	
Estimated Days Pregnant	Number Head	%	Number Head	%
85+	5	20.8	8	33.3
65+	16	66.7	11	45.8
45+	1	4.2	2	8.3
Open	2	8.3	3	12.6
Total Head	24	100.0	24	100.0

Table 5. Calving Data on Heifers Fed in 1982, Calved in 1983

	Rumensin	Control
Total Head	34	34
No. Heifers Calving	27	28
No. Heifers Open-Sold	7	5
Aborted	0	1
No. A.I. Sired Calves	20	20
No. Natural Sired Calves	7	8
Average Date of Birth	77.4	83.0
	(March 18)	(March 24)