



Department of Animal and Range Sciences
CLAYTON LIVESTOCK RESEARCH CENTER

PROGRESS REPORT

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Effects of Mass Medication or Arrival Temperature-Based Medication with Micotil on the Performance and Health of Newly Received Beef Calves¹

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Our previous research (Progress Report No. 82) indicated that Micotil (Elanco Animal Health) markedly decreased the incidence of bovine respiratory disease (BRD) when used in an arrival mass medication program for newly received calves shipped to the Center from the southeastern United States. Fifty to 70% of such calves typically remain healthy and presumably do not benefit from mass medication. If high-risk calves can be identified and only those calves treated, the cost of arrival medication programs might be greatly decreased. The present experiment was conducted to determine whether the rectal temperature of calves at the time of arrival processing could be used as a basis for treatment with Micotil.

One hundred eighty-three crossbred (British x Continental) calves were shipped in two separate loads from Tennessee to the Center. Load 1 consisted of 95 steer calves (23 h in transit; 6.13% shrink from a pay weight of 534 lb) and Load 2 consisted of 79 steer and 9 bull calves (21 h in transit; 6.47% shrink from a pay weight of 554 lb). Calves in each load were processed immediately after arrival at the Center (individual weight and ear tag, vaccination with Bovishield 4 and a seven-way clostridial, treatment with Synanthic and Tiguvon, and injection with Vitamin A/D₃). In addition, the rectal temperature of each calf was determined with a digital thermometer. Calves were assigned randomly to one of three treatments based on processing order: 1) Control - no mass medication, 2) Mass - mass medication with 450 mg of Micotil/100 lb of body weight (BW), and 3) Temp - treatment with 450 mg of Micotil/100 lb of BW if the rectal temperature was $\geq 103.5^\circ\text{F}$. Calves were placed in their assigned pens (two pens of 14 to 16 calves per load for each treatment) and given ad libitum access to a 65% concentrate receiving diet (Table 1). Small bales of wheat hay also were fed during the first week after arrival. Each calf was weighed, revaccinated with Bovishield 4, and implanted with Synovex S on day 14 after arrival, and final weights for the receiving period were obtained 28 days after arrival. Feed bunks in each pen were swept, and unconsumed feed was weighed on days 14 and 28 after arrival. Bunk samples were obtained at weekly intervals for analysis of dry matter content.

Calves were evaluated daily for symptoms of BRD. Calves with a rectal temperature of $\geq 103^\circ\text{F}$ were treated with Micotil (450 mg/100 lb of BW) if they had not received Micotil at processing. Calves that had received Micotil at processing were treated for 3 days with Naxcel (Upjohn; 1 mL/100 of BW) plus long-acting penicillin (BP-48; Pfizer Animal Health; 20 mL/calf) on day 1 of treatment. Two calves from Load 2 died during the 28-day receiving period.

Immediately after the receiving phase, calves were stepped up to a 75% concentrate diet (Table 1). After approximately 1 week, calves were stepped up to an 85% concentrate diet (Table 1) and fed this diet for the remainder of the 28-day

Table 1. Composition of diets fed during the receiving and post-receiving phases

Ingredient	% Concentrate		
	65	75	85
	% of dry matter		
Sudangrass hay	17.40	10.05	5.05
Alfalfa hay	17.67	15.15	10.03
Whole corn	10.22	12.39	14.05
Steam-flaked corn	40.12	-	-
Steam-flaked milo	-	48.28	55.64
Soybean meal	5.00	2.50	3.50
Molasses	5.00	5.14	5.12
Fat	-	2.02	2.02
Limestone	1.02	.75	.75
Dicalcium phosphate	.65	.50	.50
Salt	.50	.35	.35
Urea	.24	.50	.50
Ammonium sulfate	.26	.51	.51
Premix ^a	1.92	1.86	1.98

^aHominy feed-based premix supplied trace mineral mixture (.12% of diet), Rumensin (20 g/ton in the 65% concentrate and 28 g/ton in the 75 and 85% concentrate diets), Tylan (10 g/ton), Vitamin A (1,134 IU/lb of diet), and Vitamin E (45 IU/lb of diet in the 65% concentrate and 6.8 IU/lb in the 75 and 85% concentrate diets). Trace mineral composition: 4.17% Mn, 10% Zn, 5.8% Fe, .83% Cu, .17% I, .17% Co, and 16.67% Mg.

post-receiving phase. All calves were weighed on day 56.

Calves given Micotil at arrival processing, whether as a mass treatment or based on rectal temperature, gained more rapidly ($P < .04$) than Control calves from arrival to day 14 (Table 2). Control calves compensated somewhat during the subsequent 14 days, but for the overall 28-day receiving period, Mass and Temp calves gained approximately .7 lb more per day ($P < .01$) than Control calves. No differences were noted in gain for days 29 to 56 of the post-receiving phase, but for the 56-day experiment, Mass and Temp calves gained approximately .3 lb more per day ($P < .07$) than Control calves. No differences were noted in gain between Mass and Temp calves.

Dry matter intake was generally greater by Mass and Temp calves than by Control calves (Table 2). Differences in feed intake were significant between Control and medicated calves ($P < .09$) for days 15 to 28, 0 to 28, and 0 to 56, but no differences were noted in feed intake between the two medication treatments. Feed-to-gain ratio was improved by arrival medication (Table 2). Both Mass and Temp calves had lower ($P < .03$) feed-to-gain ratios than Control calves for days 0 to 28 and 0 to 56, but no differences were evident between the two medicated groups.

¹We thank Elanco for supplying Rumensin and Tylan, Syntex Animal Health for supplying Synanthic and Synovex S, and Potter and Potter (Dalhart, TX) for cooperating in this research.

A greater percentage ($P < .01$) of Control calves (43.6%) were treated for BRD than of either Mass (11.9%) or Temp (12.9%) calves. Of Temp calves, 54.8% received Micotil at processing. Among Control calves, 56.5% had a rectal temperature of $\geq 103.5^{\circ}\text{F}$, as did 55.9% of Mass calves.

These results support our previous findings (Progress Report No. 82) with the use of Micotil as an arrival medication program for highly stressed calves received from the southeastern United States. Moreover, our present findings suggest that Micotil administered to such calves on the basis of rectal temperature at the time of arrival processing is as effective as mass medication. Obviously, temperature-

based-medication could result in a substantial decrease in use of Micotil and a resultant savings in the cost of arrival medication. If rectal temperature is used as a basis for treatment of calves, care should be taken to avoid an artificial increase in rectal temperature caused by crowding calves at the time of processing. Whether such medication programs would be appropriate for native calves that undergo less marketing/transport stress than calves shipped from the southeastern United States needs to be evaluated.

Table 2. Performance and health of newly received beef calves as influenced by arrival medication programs

Item	Treatment ^a			SE ^b	Contrast ^c	
	Control	Mass	Temp		Mass	Med
No. of cattle (pens)	62 (4)	59 (4)	62 (4)	-	-	-
Body weight, lb						
Initial	517.6	508.3	506.5	3.0	-	-
Day 28	601.5	610.5	610.7	3.9	-	-
Day 56	693.6	702.2	698.8	5.2	-	-
Average daily gain, lb						
Days 0-14	2.07	3.40	2.79	.17	.04	NS
Days 15-28	3.93	3.91	4.50	.21	NS	NS
Days 0-28	3.00	3.66	3.71	.03	.01	NS
Days 29-56	3.29	3.28	3.15	.11	NS	NS
Days 0-56	3.14	3.47	3.43	.07	.07	NS
Daily dry matter intake, lb/steer						
Days 0-14						
Concentrate	6.14	6.67	6.70	.21	NS	NS
Wheat hay	1.55	1.70	1.54	.09	NS	NS
Days 15-28	11.81	12.73	12.73	.09	.02	NS
Days 0-28	9.75	10.54	10.49	.19	.09	NS
Days 29-56	14.32	14.26	14.39	.31	NS	NS
Days 0-56	12.03	12.40	12.44	.07	.05	NS
Feed/gain						
Days 0-14	4.14	2.50	3.06	.47	NS	NS
Days 15-28	3.01	3.30	2.85	.18	NS	NS
Days 0-28	3.29	2.92	2.87	.06	.03	NS
Days 29-56	4.40	4.48	4.67	.13	NS	NS
Days 0-56	3.87	3.63	3.69	.03	.03	NS
Calves treated for BRD, %	43.6	11.9	12.9	-	.01	NS

^aControl = no mass medication; Mass = mass medication with Micotil at arrival processing; Temp = medication with Micotil if the rectal temperature at arrival processing was $\geq 103.5^{\circ}\text{F}$.

^bPooled standard error of treatment means, $n = 4$ pens per treatment.

^cObserved significance level of contrasts: Mass = Control vs Mass and Temp; Med = Mass vs Temp. NS = $P > .10$.

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