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Department of Animal and Range Sciences

CLAYTON LIVESTOCK RESEARCH CENTER

PROGRESS REPORT

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Effects of Arrival Medication Programs on Health and Performance of Newly Received Beef Steers[1]

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Administration of therapeutic antibiotics to newly received beef calves can potentially reduce the incidence of bovine respiratory disease (BRD). Previous research at this Center (Lofgreen et al.; Progress Reports 20 and 30) indicated that administration of long-acting oxytetracycline and sufadimethoxine boluses at the time of initial processing reduced morbidity of both native calves and calves transported to the Center from the southeastern U.S. Several drugs are now available to beef cattle producers that would offer convenient, single-dose therapy. Our objective was to evaluate the effects of three different arrival medication programs on health and performance of newly received calves.

One hundred fifteen mixed breed (English and Continental breed crosses) calves were shipped from Tennessee to the Center. The calves were approximately 23 hours in transit and experienced a 9.3% shrink from a pay weight of 411 pounds; they arrived at the Center at approximately 10:30 AM on September 14, 1992, and were processed immediately after arrival. Processing included branding, ear tagging, vaccination with Bovishield 4 (Norden Labs), vaccination with a seven-way clostridial (Cutter Animal Health, Anchor or Beecham Labs), treatment with Synanthic (Syntex Animal Health) and Tiguvon (Cutter Animal Health) and injection with vitamins A and D (AgriLabs). Castration (55% bulls) and horn tipping were done as needed. Treatments were assigned randomly based on processing order and included: 1) no arrival medication, 2) subcutaneous injection at processing with long-acting penicillin (BP-48, Pfizer Animal Health, 18 mL per calf), 3) intramuscular injection (neck) with long-acting oxytetracycline (LA-200; Pfizer Animal Health; 4.5 mL/100 pounds of body weight) or 4) subcutaneous injection with tilmicosin phosphate (Micotil; Elanco Products Co.; 1.5 mL/100 pounds of body weight; Micotil is available by veterinary prescription only). Within treatment, calves were assigned randomly to one of three feedlot pens.

After processing and assignment to pens, calves were allowed free-choice access to a 65% concentrate receiving diet that contained (dry matter basis): 17.84% sudangrass hay, 16.94% alfalfa hay, 10.36% whole corn, 40.12% steam-flaked milo, 5.02% soybean meal, 5.1% molasses, 1.01% limestone, .64% dicalcium phosphate, .5% salt, .25% urea, .25% ammonium sulfate and 1.97% premix (premix supplied vitamins A and E, trace minerals, Rumensin and Tylan). In addition to the concentrate diet, small bales of wheat hay were available in the feed bunk of each pen during the first 2 weeks of the trial (fresh supplies of hay were provided during the 1st week only). Calves were weighed and revaccinated with Bovishield 4 on day 14 of the trial. Each calf was weighed on the last day of the trial (day 28) and implanted with Synovex S. Samples of the receiving diet and hay were collected routinely throughout the trial for determination of dry matter content and later chemical analyses.

On the day after processing, calves were evaluated visually in their pens for symptoms of BRD (nasal and ocular discharge, depression, anorexia). Suspect calves were pulled for evaluation of rectal temperature, and calves with a rectal temperature of 103^0F or greater were given (alternately within arrival treatment) one of two therapeutic regimens: 1) intramuscular injection of Naxcel (Upjohn; ceftiofur sodium; 1 mL/100 pounds of body weight; Naxcel is a prescription drug) for 3 days or 2) subcutaneous injection with Micotil (1.5 mL/100 pounds of body weight). Calves treated with Micotil were brought in for an additional 2 days to evaluate their rectal temperature. Calves that needed to be pulled a second time were typically treated with erythromycin and Tylan 200 for 2 to 3 days.

Performance data were analyzed statistically with pen as the experimental unit. Morbidity data were analyzed by non-parametric procedures with individual calf as the experimental unit.

Calves that were treated on arrival with BP-48 gained less over the 28-day period ($P < .05$) than those treated with Micotil and control calves; daily gain by calves treated with LA-200 did not differ from gain by calves in the other three treatment groups (Table 1). Dry matter intake was less throughout the trial for calves treated with BP-48, but differences were not significant ($P > .10$). For the 28-day period, feed-to-gain ratio followed a pattern similar to daily gain ($P < .05$), with Micotil and control calves being more efficient than BP-48 calves, and intermediate efficiency by LA-200 calves. The most striking feature of the results was the complete absence of BRD symptoms in calves that received Micotil on arrival. Among the other three treatment groups, morbidity rate varied from 31% with LA-200 to 46% for control calves. The greater proportion of repulls in the BP-48 group probably accounted for the lower gain and efficiency noted with that treatment.

Among morbid calves, seven of 18 calves treated with Naxcel were repulls, whereas only two of 17 calves were repulls in the Micotil group. Because the number of repulls was low in both groups, a valid statistical

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comparison of the results was not possible. Average days treated per sick calf was 4.22 and 1.53 for those receiving Naxcel and Micotil, respectively. The difference in average days treated was largely a reflection of the treatment protocol, which required a minimum of 3 days with Naxcel and a only 1 day with Micotil.

These results suggest that Micotil was highly effective as an arrival medication for newly received calves. In agreement with previous research at this Center, arrival treatment with LA-200 reduced morbidity from BRD. Under our conditions, arrival treatment with BP-48 was not an effective preventive medication program. Producers who consider using arrival medication programs should evaluate the potential cost:benefit ratio before deciding what type of program would be best for their situation.

Table 1. Effects of arrival medication programs on performance and health of newly received calves

Item	Arrival medication[a]				SE[b]
	None	BP-48	LA-200	Micotil	
No. of calves (pens)	28 (3)	29 (3)	29 (3)	29 (3)	
Initial BW, lb	377.8	379.1	383.6	372.8	4.67
Daily gain, lb					
Days 0 to 14	1.65	.50	1.12	2.23	.45
Days 14 to 28	3.45	3.08	3.50	3.40	.19
Days 0 to 28	2.55[c]	1.93[d]	2.31[cd]	2.82[c]	.18
Daily DMI, lb/steer					
Days 0 to 14					
Concentrate	3.89	3.43	3.87	4.54	.47
Hay	1.81	1.56	1.74	1.64	.17
Days 14 to 28	9.91	9.36	9.85	10.97	.57
Days 0 to 28	7.81	7.17	7.73	8.58	.52
Feed-to-gain ratio					
Days 0 to 14	3.51	5.17	5.72	2.80	3.07
Days 14 to 28	2.88	3.10	2.83	3.23	.25
Days 0 to 28	3.07[c]	3.80[d]	3.35[cd]	3.04[c]	.16
No. of calves treated for BRD[e]	13	13	9	0	-
No. of repulls	2	6	1	0	-
Avg. days treated per sick calf	2.23	3.62	2.89	0	-
No. of dead or off-trial calves[f]	0	3	1	0	-

[a]BP-48 = long-acting penicillin; LA-200 = long-acting oxytetracycline; Micotil = tilmicosin phosphate.

[b]Standard error of treatment means; n = three pens/treatment.

[c,d]Row means that do not have common superscripts differ (P<.05).

[e]Distribution of calves treated differs among treatments (P<.05).

[f]One calf in the BP-48 group was taken off trial because of severe anorexia; the other three calves noted in the table died.

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