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CLAYTON LIVESTOCK RESEARCH CENTER

PROGRESS REPORT

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Effects of Prespense and Dietary Supplemental Protein Source on Performance of Newly Weaned Beef Steers¹

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Previous research at the Clayton Livestock Research Center (Progress Report No. 71) indicated that a 2:1 mixture of blood meal and soybean meal as the supplemental protein in a 65% concentrate receiving diet tended to increase daily gain and reduce morbidity of newly received, southeastern calves. Similarly, arrival vaccination with a *Pasteurella haemolytica* toxoid (Prespense - Cyanamid, Wayne, NJ) reduced morbidity and tended to increase daily gain by southeastern calves during a 28-day receiving period (Progress Report No. 70). The following study was conducted to evaluate the response of newly weaned, native New Mexico calves to supplemental blood meal and/or injection with Prespense.

One hundred eight (Angus x Hereford and Angus x Hereford x Longhorn) calves were transported to the Research Center (approximately 50 miles); transit shrink was 1.67%. Calves were housed in holding pens with access to large, round bales of sorghum sudangrass hay and water until processing the next day. Treatments were arranged in a 2 x 2 factorial and consisted of: 1) no Prespense and a receiving diet in which soybean meal supplied supplemental protein; 2) no Prespense and a receiving diet in which a 2:1 mixture of blood meal and soybean meal supplied supplemental protein; 3) vaccination with Prespense and the soybean meal diet; and 4) vaccination with Prespense and the blood meal diet.

At processing, each calf was weighed, branded, injected with Synanthic wormer (Syntex Anim. Health, Inc.), treated down the back line with Tiguvon Pour-on (Cutter Anim. Health, Mobay Corp.), vaccinated with Bovishield 4 (Nordén Labs, Inc.), vaccinated with a clostridial 7-way (Coopers Anim. Health), and injected with Rocaviv A and D₃ solution (Hoffmann-LaRoche, Inc.). Calves assigned to receive Prespense were given an intramuscular injection of Prespense. After processing, calves were moved to feedlot pens (three pens of nine calves each per treatment) and offered their assigned treatment diets plus small bales of sorghum sudangrass hay. Fresh supplies of baled of hay were fed only during the first week of the trial. Each calf was weighed on days 14 and 28, and calves that had previously received Prespense were revaccinated on day 14.

The 65% concentrate diets (Table 1) were sampled weekly to determine dry matter content. Chemically analyzed values for crude protein, acid detergent fiber, calcium and phosphorus were 13.2, 15.9, .7 and .36%, respectively for the average of the blood meal and soybean meal diets.

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Table 1. Composition of the two receiving diets fed to newly weaned beef steers treated with or without Prespense

Ingredient	Soybean meal diet	Blood meal diet
	— % Dry matter basis —	
Sudangrass hay	17.80	17.80
Alfalfa hay	17.95	17.95
Whole corn	10.10	10.50
Steam-flaked corn	39.12	40.72
Soybean meal	5.05	1.01
Blood meal	-	2.05
Molasses	5.11	5.11
Limestone	1.05	1.04
Dicalcium phosphate	.67	.67
Salt	.52	.52
Urea	.26	.26
Ammonium sulfate	.27	.27
Premix ^a	2.10	2.10

^aHominy feed-based premix supplied trace mineral mixture (.1% of diet), Rumensin (20 g/ton), Tylan (10 g/ton), vitamin A (1,134 IU/lb of diet) and vitamin E (45 IU/lb of diet). Trace mineral composition: 4.4% Mn, 12% Zn, 6.6% Fe, 1.3% Cu, .30% I, .20% Co and 20% Mg.

Throughout the trial, calves were evaluated for signs of bovine respiratory disease. Individual sick pen records were not statistically analyzed because only three steers were treated during the experiment. Two calves died during the course of the experiment as a result of causes not related to treatment.

Treatments did not affect daily gain (Table 2) at any period of the experiment. Our previous research indicated an increase in daily gain (1.6 vs 1.79 pounds/day) when Prespense was given to stressed calves shipped from Kentucky. These southeastern calves not only gained much less than those in the present study, but > 35% of the calves were treated for symptoms of bovine respiratory disease. Reduced incidence of disease, and the overall greater performance by calves in the present study, may have contributed to the contrasting effects of Prespense on daily gain. The 6.6% increase in daily gain with blood meal vs soybean meal as the supplemental protein agrees with our earlier report, in which daily gain by calves shipped from Kentucky was increased by 5% when 2% blood meal was added to the receiving diet.

Intake of the 65% concentrate receiving diet, as well as total intake (hay plus concentrate) during days 0 to 14 of the experiment was affected by an interaction ($P < .05$) of Presponse by dietary protein source. Calves that received Presponse and were fed a diet containing blood meal ate less concentrate and total dry matter during days 0 to 14 than calves in the other three treatment groups. Reasons for this interaction are unknown, and this effect was not apparent from days 14 to 28 of the experiment. Feed intake for the entire 28 days was not affected by treatments.

Feed-to-gain ratio was not affected by treatments during any period of the experiment, but calves fed blood meal-containing diets tended to be more efficient than those fed soybean meal-based diets. This finding agrees with results of our previous experiment with southeastern calves.

Based on previous research, arrival vaccination with Presponse may benefit highly stressed calves that experience a high morbidity rate from bovine respiratory disease. In the present trial, with low morbidity, Presponse did not show positive benefits. Calves in the present experiment were shipped only a short distance, and were penned in common with herd mates. Research is needed to test the efficacy of Presponse when native New Mexico calves are mixed with calves at high risk to morbidity from bovine respiratory disease.

Addition of 2% blood meal to a 65% concentrate receiving diet for newly weaned steers tended to increase daily gain and to improve feed efficiency. Similar findings with highly stressed southeastern calves suggests the need for further research on ruminal escape protein sources in the diet of newly received beef cattle.


Table 2. Effects of arrival vaccination with Presponse (*Pasteurella haemolytica* toxoid) and supplemental protein source on performance by newly weaned, native beef steers during a 28-d receiving period

Item	Treatment ^a				SE ^b
	No Presponse + BM	No Presponse + SBM	Presponse + BM	Presponse + SBM	
No. of steers/pens	27/3	27/3	27/3	25/3	-
Initial BW, lb	486	486	463	504	16
Final BW, lb	557	554	528	565	16
Daily gain, lb					
Days 0 to 14	2.69	2.49	2.15	2.24	.34
Days 14 to 28	2.35	2.37	2.49	1.99	.25
Days 0 to 28	2.52	2.43	2.32	2.12	.21
Dry matter intake, lb/steer daily					
Days 0 to 14					
Concentrate	7.19 ^c	6.88 ^c	6.15 ^d	6.92 ^c	.14
Hay	1.75	1.81	1.81	1.81	.09
Total	8.94 ^c	8.69 ^c	7.96 ^d	8.73 ^c	.22
Days 14 to 28	11.87	11.10	11.35	11.74	.43
Days 0 to 28	10.41	9.89	9.66	10.23	.28
Feed-to-gain ratio					
Days 0 to 14	3.34	3.67	3.78	4.35	.63
Days 14 to 28	5.27	4.74	4.60	5.97	.46
Days 0 to 28	4.16	4.08	4.17	5.03	.36

^aPresponse = *Pasteurella haemolytica* toxoid (Cyanamid) administered on arrival and at day 14; BM = supplemental protein was a 2:1 ratio of blood meal and soybean meal; SBM = all supplemental protein was soybean meal.

^bStandard error of treatment means, $n = 3$ pens per treatment.

^{cd}Row means that do not have a common superscript differ ($P < .05$).


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