COMPARISON OF MORBIDITY AND PERFORMANCE AMONG STRESSED FEEDER CALVES FOLLOWING VACCINATION WITH PYRAMID™ MLV 4 OR PYRAMID™ 4+PRESPONSE® SQ

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Summary

A study was conducted to compare performance, morbidity, retreatment percent, and mortality in stressed heifer calves during the receiving and growing phases after receiving either Pyramid™ MLV 4 or Pyramid™ 4+Presponse® SQ on arrival at a feedlot research facility. Vaccination with Pyramid 4+Presponse SQ (a 4-way viral modified live vaccine with a *Pasteurella haemolytica* bacterin-toxoid) tended to reduce the incidence of bovine respiratory disease (P=.2) and reduced retreatment rate (P<.06).

Introduction

Respiratory disease has major economic significance for the beef industry, with estimated losses approaching $600 million annually. Efforts to reduce the incidence of respiratory disease have not resulted in major declines in losses from this disease complex. The production and marketing systems employed in the beef industry can have a significant influence on susceptibility to disease in confinement feeding operations. Viral vaccines are essential to reducing the morbidity that occurs in calves soon after arrival in feedlots. Protecting against this viral challenge should result in fewer pulls, less mortality, and improved performance in the first 28 days.

Pasteurella haemolytica serotype A1 is the most commonly identified bacterial pathogen involved in bovine respiratory disease early in the receiving period. Vaccination might abate this challenge, thereby improving feed intake, rate of gain and feed efficiency, while decreasing the risk of death loss. The present study was conducted to evaluate feed intake, weight gain, feed efficiency, morbidity, retreatment percentage, and mortality of heifers vaccinated using each of two modified live vaccines, one of which contained the *Pasteurella haemolytica* bacterin-toxoid. Performance during the postreceiving period also was evaluated.

Experimental Procedures

This study was conducted at the KSU Beef Cattle Research Center in Manhattan, Kansas, and was initiated on September 4, 1997. The receiving period was 28 days and was followed by a growing period of 102 days.

Three hundred twenty four weaned heifer calves (avg wt 500 lb) were purchased from sale barns in Arkansas and trucked to Manhattan. Upon arrival at the feedlot, each load was placed into a large pen and offered ad libitum access to clean water and long-stem prairie hay. Approximately 24 hours after arrival, weight and rectal temperature were recorded for each heifer. Heifers were worked through the processing facility at random and uniquely identified with numbered ear tags during initial processing. Each heifer was implanted with Synovex®-H and treated for internal and external parasites using Synanthic® oral drench and CyLence® pour-on. Additionally, heifers were vaccinated against common clostridial diseases using a subcutaneous injection of Fortress®-7. Experimental treatments consisted of subcutaneous injections of Pyramid MLV 4 (4-way viral vaccine) or Pyramid 4+Presponse SQ (4-way viral plus *Pasteurella* toxoid). During processing, heifers were sorted by their respective treatments into groups of six head,

with a total of 27 pens per vaccination treatment. Groups were placed into partially covered, concrete surface pens (14' × 28') where they were fed throughout the 28-day receiving period and subsequent growing period.

Heifers were fed a common starter ration during the receiving period. Bunks were read at approximately 6:00 a.m., at which time the amount of feed to be offered at the next feeding was determined. Heifers were fed once daily.

Heifers that exhibited clinical signs of respiratory disease, including depression, lethargy, anorexia, coughing, rapid breathing, and nasal and (or) ocular discharge, were identified each morning. Morbid heifers received a subcutaneous injection of tilmicosin (Micotil®) at a dosage of 1.5 ml/cwt and were returned to their original pen. When necessary, this treatment was repeated after 48 hours. Therapy for third-time treatments was a combination of Biomycin™ 200 and Tylosin™ 200, administered intramuscularly at 6 and 5 ml/cwt, respectively.

Upon completion of the 28-day receiving period, chronically ill and (or) lame animals were removed from the experiment. The remaining calves were allotted, on a pen basis, to each of nine dietary treatments in the subsequent growing period. Nutritional regimens were applied uniformly across vaccination treatments, thus making it possible to monitor growing performance of the two vaccination treatments.

Results and Discussion

Performance and health data of the heifers during the receiving and growing periods are summarized in Table 1. Average dry matter intake was similar (P=.28) for calves vaccinated with Pyramid and Pyramid+Presponse. Likewise, feed efficiency and daily gain were similar (P>.8) for the two groups. The percentage pulled and treated for respiratory disease tended (P=.2) to be less when heifers were vaccinated with Pyramid+Presponse compared to Pyramid alone. Fewer animals required retreatment if vaccinated with Pyramid+Presponse (P=.06). The percentage of animals classified as chronically ill (i.e., three or more therapeutic treatments) was not significantly different for the two vaccine treatments (P=.22). Mortality rate (<2%) was not different for the two vaccine treatments. Vaccine treatment also had no carryover effects on gain during the subsequent growing period.

Figure 1 illustrates the epidemic curve for respiratory disease in heifers during the 28-day receiving period. The peak prevalence occurred approximately 3 to 6 days after arrival in the feedlot and followed a similar pattern for Pyramid and Pyramid+Presponse groups. Figure 2 shows the cumulative respiratory morbidity percentage over the 28-day receiving period. The Pyramid+ Presponse heifers had fewer pulls, especially earlier in the receiving period (P<.1), but the responses converged until day 23, at which time no statistical difference was found for the two treatments (P=.2). Figure 3 illustrates the cumulative retreatments for the two vaccine regimens. By day 13 of the study, a significant divergence of the two treatments had occurred, with the Pyramid+Presponse heifers needing fewer retreatments.

Although the Pyramid+Presponse treatment tended to reduce morbidity and to statistically improve retreatment percentage, performance was not altered (Table 1). We speculate that performance and health responses to the two vaccines might be different, if they were used in stressed heifers that do not break with disease until later in the receiving period.

Table 1. Performance of Stressed Heifer Calves during the Receiving and Growing Periods as Affected by Vaccine [a]

Item	Pyramid @ MLV-4	Pyramid@-4 + Presponse	SEM
Pens (head/pen)	27 (6)	27 (6)	
Initial weight, lb	496.3	495.2	2.8
Dry matter intake, lb/day	9.2	9.5	.2
Feed efficiency	6.15	5.84	.94
Gain, lb/day	1.60	1.66	.24
Gain, lb/day (deads out)	2.07	2.03	.12
Pulls, %	46.3	37.0	4.7
Retreats, %[b]	10.5	4.3	2.3
Chronics, %	4.3	1.85	1.4
Deads, %	1.85	1.85	1.1
Growing gain, lb/day (deads & chronics removed)	1.60	1.57	.04

[a] Least-squares means.
[b] Pyramid different than Pyramid +Presponse, P<.06.

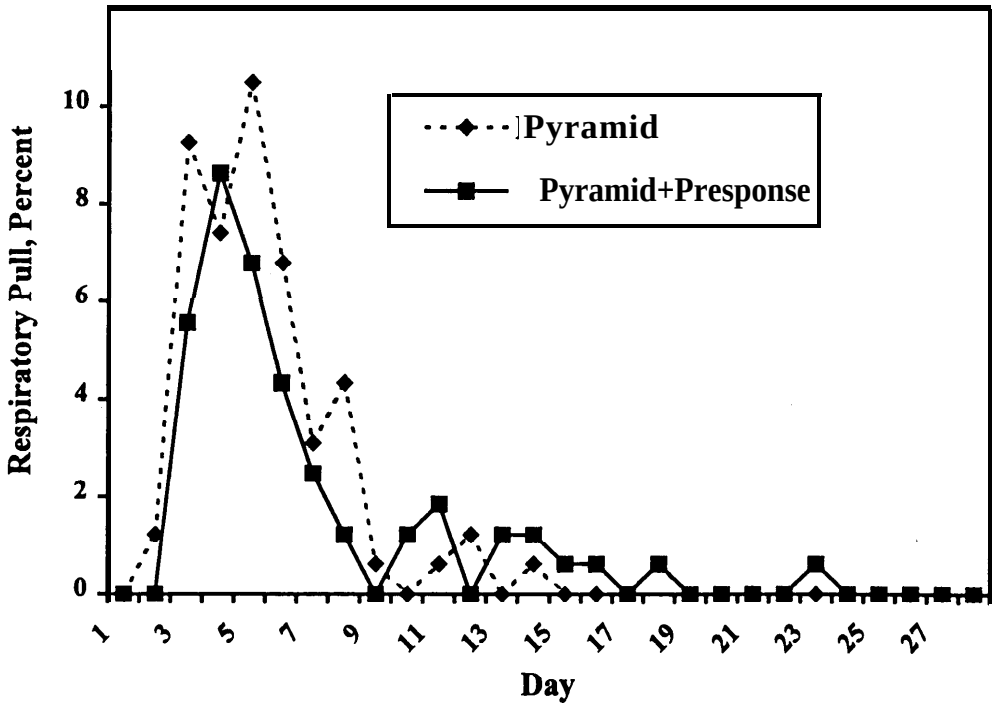

Figure 1. Animals Pulled for Respiratory Disease vs. Days after Arrival.

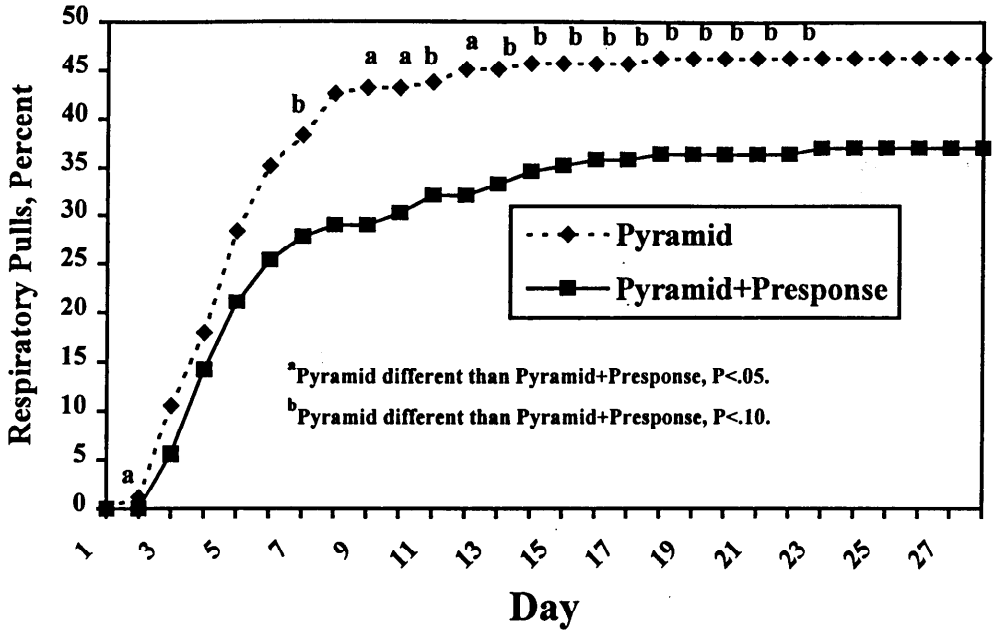

Figure 2. Cumulative Percent of Animals Pulled for Respiratory Disease vs. Days after Arrival.

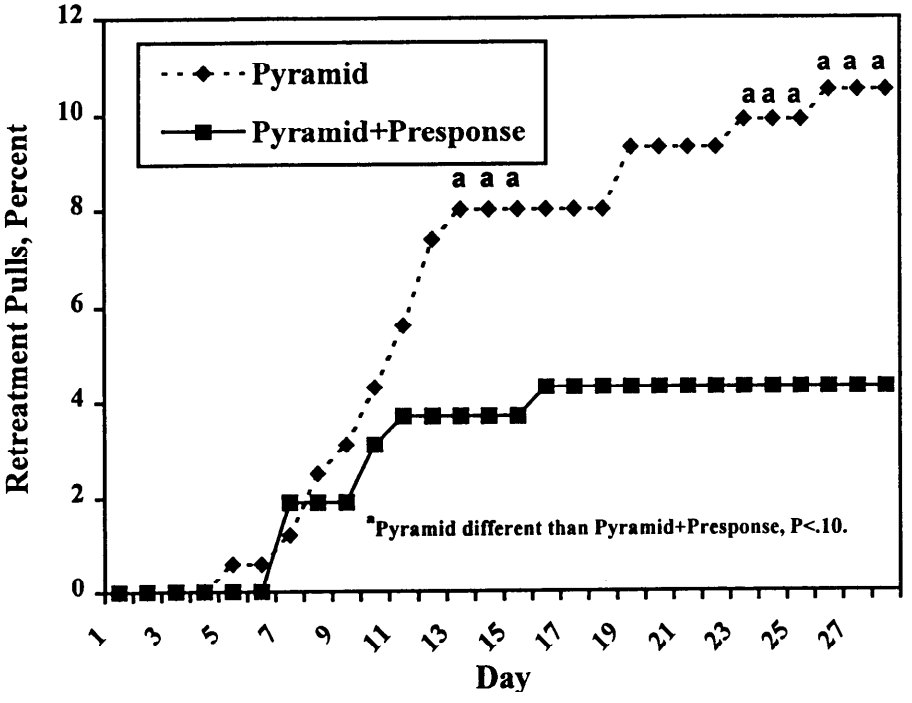

Figure 3. Cumulative Retreatment Percentage.