Kansas Agricultural Experiment Station Research Reports

Volume 0
Issue 1 *Cattleman's Day (1993-2014)*

Article 37

2013

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Dosing High-Risk Calves at Processing with Lactipro Decreases the Number of Calves Treated For Bovine Respiratory Disease

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Introduction

Bovine respiratory disease is the leading cause of cattle mortalities in U.S. feedlots. In addition to costs associated with death loss and medical treatments, cattle affected by respiratory disease typically have suboptimal performance. Lightweight calves coming into the feedlot are at high risk for respiratory disease due to the stress associated with weaning, transportation, feed and water deprivation, commingling, castration, and other factors. Calves often have no experience eating from feed bunks and may be unfamiliar with the types of feeds used in feedlots. At the same time, the cattle are susceptible to acidosis due to the concentrate-based diets that are fed, which also can have unfavorable effects on feed intake and performance. Moreover, symptoms of acute acidosis, which include poor appetite, increased respiration rate, lethargy, depression, loss of muscle tone, nasal and ocular discharge, and diarrhea, can be difficult to distinguish from clinical symptoms of respiratory disease. Therapies designed to address respiratory disease are generally ineffective for treating acidosis, inevitably leading to the perception that antibiotic treatments have only limited efficacy. Moreover, acidosis can increase susceptibility of cattle to respiratory disease. Acidosis is most logically dealt with through preventive measures. We hypothesized that Lactipro (MS Biotec; Wamego, KS), a source of the lactate-utilizing bacterium *Megasphaera elsdenii*, could decrease the incidence of feedlot acidosis in newly arrived feedlot calves. By preventing acidosis, we speculated that clinical symptoms similar to those associated with respiratory disease would be less prevalent, thus decreasing the number of animals inappropriately diagnosed and treated for respiratory disease. Our objective was to determine if dosing cattle with Lactipro at processing would decrease morbidity and mortality in lightweight calves after arrival at the feedlot.

Experimental Procedures

Crossbred calves (504 bulls, 141 steers; initial body weight = 443 ± 11 lb) were received from Texas over a 2-week period in January (two loads per day on the January 14, 19, and 26). Cattle were given brome hay on arrival, and within 24 hours were weighed, vaccinated against common viral and clostridial diseases; dewormed, castrated (banded), treated with Micotil (Elanco Animal Health, Greenfield, IN), and given uniquely numbered ear tags. Cattle were randomly assigned to 1 of 2 treatments based on order through the processing chute. Our experimental treatments consisted of a negative control group (Control) and a group given a 100-mL oral dose of Lactipro at processing (Lactipro). Cattle were blocked by arrival date and randomly assigned to 24 pens with 25 to 30 calves per pen. All calves received a common diet throughout the 64-day receiving period (Table 1). Cattle were monitored daily for clinical signs of illness, and animals determined to be sick were removed from their pen, taken to the processing area, and treated according to Kansas State University Beef Cattle Research Center standard operating procedures. Calves were categorized as sick if they exhib-

ited signs of depression, decreased appetite, increased respiration rate, nasal and ocular discharge, and diarrhea. Therapuetic treatments for respiratory disease included Micotil for first-time antibiotic therapy, Baytril (Bayer Animal Health, Shawnee Mission, KS) for second-time antibiotic therapy, and LA-200 (Pfizer Animal Health, Whitehouse Station, NJ) for third-time antibiotic therapy.

Results and Discussion

Health and performance are summarized in Table 2. Dosing calves with Lactipro at processing reduced the incidence of first-time antibiotic therapy by 31% ($P = 0.02$) and reduced the number of calves that required a second antibiotic therapy by 34% ($P = 0.03$). The number of animals requiring a third antibiotic therapy for bovine respiratory disease did not differ between control and Lactipro groups ($P = 0.36$). Death loss also did not differ ($P = 0.50$) between treatments but was numerically lower for calves that received Lactipro. The decrease in antibiotic usage associated with Lactipro usage resulted in a 13.4% reduction ($P = 0.01$) in the cost of therapeutic treatments compared with the Control calves. Dosing calves with Lactipro improved dry matter intake ($P = 0.01$), average daily gain ($P = 0.02$), and feed efficiency ($P = 0.05$).

Our contention is that the decreased incidence of respiratory disease associated with use of Lactipro likely is the result of avoiding ruminal acidosis, which can present clinical signs that are difficult to distinguish from bovine respiratory disease. As a result, misdiagnosis and unnecessary therapeutic treatments with antibiotics are less likely to occur. In addition, one of the important contributing causes of respiratory disease (i.e., acidosis) is less severe and less prevalent, ultimately decreasing the incidence of respiratory disease. Improved feed consumption in calves given Lactipro also may support greater immune function, thus allowing calves to cope with disease challenges more effectively. In this study, Lactipro provided an effective means of reducing the number of animals that required antibiotic treatment. We view this as positive, given the increased scrutiny relative to use of antibiotics in livestock production.

Implications

A single oral dose of Lactipro at initial processing was an effective means of improving performance of high-risk calves as well as decreasing the number of calves that were treated for bovine respiratory disease after introduction into the feedlot.

Table 1. Composition of diet on a 100% dry matter basis

Ingredient, % of dry matter	Receiving diet
Steam-flaked corn	36.32
Corn silage	45.00
Wet corn gluten feed	15.00
Supplement[1]	2.24
Feed additive premix[2]	1.44
Nutrient composition, %	
Dry matter	53.5
Crude protein	12.0
Neutral detergent fiber	23.8
Calcium	0.70
Phosphorus	0.38

[1] Formulated to provide 0.3% salt, 0.1 ppm Co, 10 ppm copper, 0.6 ppm iodine, 60 ppm manganese, 0.25 ppm selenium, 60 ppm zinc, 1,000 IU/lb vitamin A, and 10 IU/lb vitamin E in the total diet on a 100% dry matter basis.
[2] Formulated to provide 200 mg Rumensin (Elanco Animal Health, Greenfield, IN) per animal daily.

Table 2. Receiving performance and health of high-risk calves orally drenched with Lactipro[1] at initial processing

Item	Control	Lactipro	SEM	*P*-value
Initial weight, lb	440	446	10.8	0.23
Final weight, lb	557.5	579.1	9.3	<0.01
Average daily gain, lb	1.42	1.76	0.16	0.02
Dry matter intake, lb/day	9.53	10.16	0.37	0.01
Feed:gain, lb/lb	6.80	5.75	0.59	0.05
Total morbidity, % of cattle	37.7	26.4	4.81	0.02
Treatment for bovine respiratory disease, % of cattle				
First-time treatment (Micotil[2])	32.0	22.0	4.13	0.02
Second-time treatment (Baytril[3])	17.4	11.5	2.09	0.03
Third-time treatment (LA-200[4])	5.9	4.4	1.22	0.36
Death loss, %	4.9	3.8	1.13	0.50
Medication cost, $/calf	19.70	17.06	0.98	0.01

[1] MS Biotec, Wamego, KS.
[2] Elanco Animal Health, Greenfield, IN.
[3] Bayer Animal Health, Shawnee Mission, KS.
[4] Pfizer Animal Health, Whitehouse Station, NJ.