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Evaluation of Excede® Given at Either Initial Processing or Revaccination on Bovine Respiratory Disease and Pasture vs. Feedlot Receiving Systems

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Summary

An experiment (Exp. 1) was conducted to determine the effect of Excede® at arrival or at revaccination on morbidity, mortality, and gain in both feedlot and pasture receiving systems. A second experiment (Exp. 2) was conducted to determine the effect of feedlot and pasture receiving systems on animal health. In Exp. 1, no treatment differences were observed for initial or final BW, or ADG. In Exp. 1, initial BW, treatment, receiving system (pasture or feedlot); and buyer of cattle explained the cumulative incidence of bovine respiratory disease (BRD). The incidence of BRD in this study was 4.7%, 11.0%, and 13.8% for arrival, control, and revaccination treatments respectively. The arrival medication effectively reduced BRD incidence. BRD was less (P= 0.02) for pasture receiving than feedlot receiving, averaging 7.4% and 11.0% respectively. In Exp. 2 BRD was less for pasture receiving than feedlot receiving with 23% and 53% treated for BRD respectively.

Introduction

As a general trend, the percentage of feedlot cattle fed as "calf-feds" relative to yearlings has increased in recent years. The increased trend of calf feeding can be a health management challenge for many feedlots. Administration of appropriate antibiotics to control BRD in cattle that are at high risk of developing BRD may be an important management option for producers. Often feedlots observe their greatest health challenges 10 to 14 days after receiving.

In addition, calves transitioning from a pasture based ranch system to a feedlot can experience multiple stressors that weaken immune function. Receiving calves with a system like their previous ranch environment should reduce calf receiving stress. Therefore, receiving calves with a pasture based system has the potential to be a less stressful system than feedlot pen receiving.

The objective of Exp. 1 was to determine the effect of Excede® at arrival or at revaccination (16-27 days post arrival) on morbidity, mortality, and gain of calves in both feedlot and pasture receiving systems. The objective of Exp. 2 was to determine the effect of pasture vs. feedlot receiving on morbidity and growth performance of freshly weaned calves.

Procedure

Exp. 1 - Three treatments were evaluated within a pasture receiving system and feedlot receiving system: 1) control (no medication; CON), 2) Excede® (Pfizer Animal Health, New York, NY) on arrival (ARR), or 3) Excede at revaccination (median 18 days post arrival; range 16-27 days; REVAC). A total of 2,264 freshly weaned steer calves received at the University of Nebraska Agricultural Research and Development Center (Mead, Neb.) between Oct. 13 and Oct. 22 were used in this experiment. Steers were procured from three buyers representing northern Nebraska, central Nebraska, and western Nebraska from a mixture of "ranch-direct" and "sale barn" sources. Steers were penned by treatment group to minimize environmental or "herd-immunity" effects. The trial had a total of 12 replications for each treatment. Twenty-one feedlot pens housed 20 head/pen (388 ft2/head; 420 head total) to supply seven replications per treatment in a feedlot receiving system. The treatment groups were assigned randomly to one of 21 pens. Fifteen pastures housed 123 head/ 14-acre pasture (1,844 head total) for five reps per treatment. The treatment groups were assigned randomly to one of 15 pastures. Steers housed in the feedlot received ad libitum intake of a typical feedlot receiving ration containing (DM basis) 33% dry rolled corn, 33% wet corn gluten feed, 33% alfalfa, and 1% mineral supplement containing 135 mg/steer daily Deccox® (Alpharma Inc., Fort Lee, NJ) and 200 mg/ steer daily Rumensin® (Elanco, Greenfield, IN). Steers on one pasture replication received only limited hay supplementation and 16 oz Corid® (Merial, Atlanta, Ga.) per 100 gallons twice for coccidiosis prevention. Pasture location, adequate pasture forage, and management did not require this replication to receive concentrate supplementation. Steers on all other pastures were provided 3 lb/head steer daily of wet corn gluten feed plus mineral supplement containing 135 mg/steer Decox and 200 mg/steer Rumensin daily and cool-season grass. In addition, cattle on these pastures received ad libitum hay supplementation.

Steers were assigned to treatments based on processing order within buyer at arrival, with every third animal assigned to each treatment. Steers' panel ID tags were notched to identify treatment assignment. Calves were processed at arrival by receiving three separate tags for individual identification including

an electronic ID, panel tag, and metal clip tag. Calves were weighed and vaccinated with Bovi-Shield Gold 5®, and Somubac® (Pfizer Animal Health). Calves also received a weight dependant dose of Dectomax Injectable® (Pfizer Animal Health) anthelmintic. Any calves having horns were dehorned and cauterized. Bull calves (51 head) were identified for banding upon completion of the study. Calves were revaccinated at 18 days (range 16-27 days) post arrival. They received vaccinations of Bovi-Shield Gold 5, Somubac and Ultrachoice 7® (Pfizer Animal Health). Individual animal BWs were collected. All pasture calves also received a dose of pinkeye vaccine (Schering-Plough, Kenilworth, N.J. Calves were individually weighed off trial after 31 days (range 26-39 days).

All pens and pastures were evaluated by the same pen riders within day to provide equal pull evaluation across antibiotic treatments. A post treatment interval (PTI) was not in effect for the calves after receiving Excede as pen riders were blind as to which cattle had received Excede to prevent preferential pulling of untreated calves. Calves that were categorized as respiratory pulls by the cattle crew, based on individual animal observation each day, were pulled, symptoms assessed, and treated with Draxxin® (Pfizer Animal Health, New York, N.Y.). When a sick calf was treated, panel ID tag was notched to prevent receiving Excede at revaccination (REVAC treatment only). Animals were returned to home housing units as soon as possible after treatment. Any animals receiving Draxxin were subject to a seven-day PTI before any secondary medication was administered.

Initial, revaccination, and final BW were recorded for each animal. Average daily gain and respiratory disease incidence data were recorded for each animal. In addition, morbidity outcomes and causes were recorded. Body weights, ADG, and mortality data using the individual animal as the observation were compared using the Proc MIXED procedure of SAS to analyze for treatment effects. The Proc GENMOD procedure of SAS was used to analyze respiratory disease morbidity outcomes. An animal was determined to be a confirmed respiratory disease observation for the trial if the animal was treated for respiratory disease by the animal health personnel or if the animal died and was confirmed a respiratory disease dead.

Exp. 2 – In the fall of 1997 1,172 head of freshly weaned ranch direct and sale barn sourced calves were received at the University of Nebraska Research Feedlot. The calves were randomly assigned to either feedlot pens or the same pastures used for Exp 1. Calves were managed similar to Exp. 1 except none of the calves were treated with preventative medication.

Results

Exp. 1 - No significant differences ($P>0.05$) of initial BW (575 ± 10 lb), revaccination BW (615 ± 12 lb), final BW (633 ± 14 lb), or ADG (1.85 ± 0.21 lb/day) were observed due to medication treatment. The number of respiratory disease caused mortalities did not differ ($P> 0.05$) among treatments, albeit low. The number of respiratory disease caused mortalities was 1, 1, and 2 for ARR, CON, and REVAC treatments respectively. The variables of the GENMOD model that explained the incidence of respiratory diseases were initial BW, preventative antibiotic treatment, receiving system and buyer of cattle. Interactions of these variables were not significant ($P> 0.05$).

Initial BW, accounting for medication treatment; affected ($P<0.01$) animal respiratory disease outcome with lighter calves being more likely to be treated for respiratory disease. Excede treatment at arrival affected ($P<0.01$) animal respiratory disease outcome. The respiratory disease cumulative incidence for this trial was 4.7%, 11.0%, and 13.8% for ARR, CON, and REVAC treatments, respectively. The ARR treatment reduced respiratory disease cumulative incidence of this trial ($P<0.01$) compared to CON. The REVAC treatment did not reduce respiratory disease cumulative incidence.

Table 1. Exp. 1 differences in BW of pasture and feedlot received calves. Revac BW = Revaccination BW.

Item	Pasture	Feedlot
Initial BW, lb	585	589
Revac BW, lb	621	635
Final BW, lb	627	661
Trial ADG, lb	1.26	2.36

The BW and ADG differences of pasture and feedlot received steers are presented in Table 1. Receiving steers in a pasture based system compared to a feedlot system significantly reduced ($P= 0.02$) cumulative BRD incidence from 11.0% to 7.4%.

No difference of BW change due to preventative medication treatment is presumably due to the short window of study length (26 – 39 days on trial). The ineffectiveness of the REVAC treatment relative to the ARR can be explained by animals experiencing respiratory disease challenge and individual animal treatment prior to revaccination on days 16 – 27 (Figure 1). The shorter bars of the ARR treatment indicate decreased incidence of BRD relative to the CON treatment. The ARR treatment significantly ($P<0.01$) improved animal health status by reducing BRD incidence from initial processing to revaccination. The decrease in CON and REVAC BRD incidence after day 15 is due to the natural incidence cycle of BRD and not revaccination which occurred on average at day 18.

Exp. 2 pasture and feedlot daily gain from arrival weight to 28 or 42 days post receiving was similar. The percentage of calves treated for BRD in the feedlot receiving system was significantly greater than for the pasture receiving system with 53% and 23% treated within feedlot and pasture receiving, respectively.

In conclusion, preventative medication administered at arrival effectively reduced the incidence of respiratory disease by reducing

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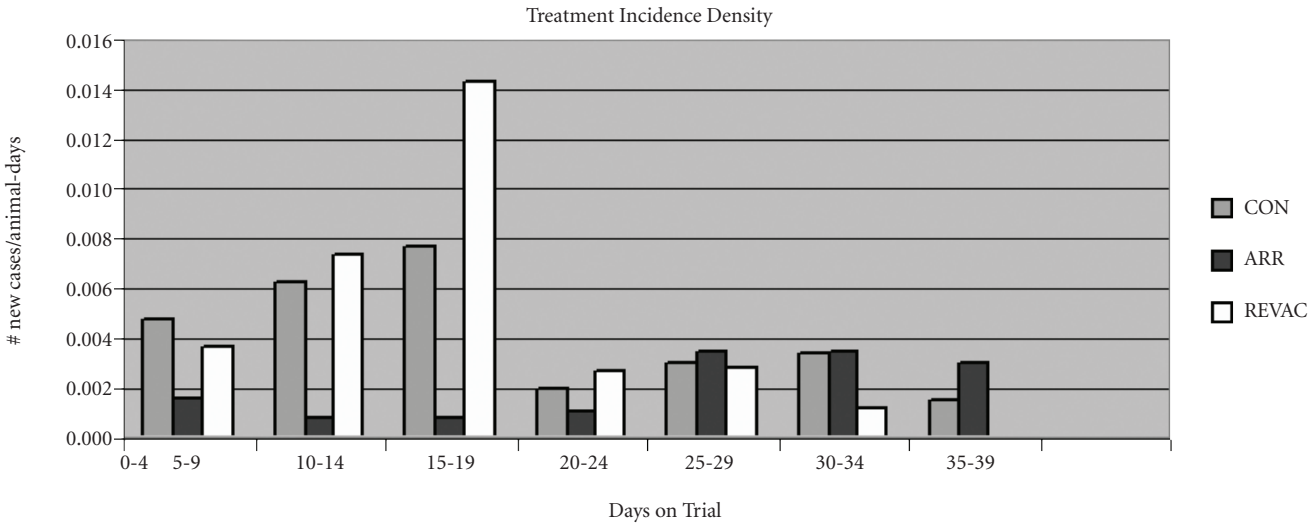

Figure 1. Treatment Incidence Density. CON = no preventative medication, ARR = preventative at initial processing, and REVAC = preventative at revaccination.

BRD during the first 15 days of arrival. Administering preventative medication at revaccination (median day 18) in Exp. 1 was not a feasible option for BRD control due to animals experiencing BRD prior to preventative medication administration. The low incidence of BRD (11% of controls) in Exp. 1 did not maximize the potential value of preventative medication that is possible with calves at higher risk of BRD. However, part of the low incidence of BRD was due to pasture receiving as feedlot received control steer actual incidence of BRD was 21.4%. The calves from this study will be followed to slaughter for lung tissue damage analysis, feedlot ADG calculation, and economic analysis. The data will be published in a future Nebraska Beef Cattle Report.

Pasture receiving effectively improved animal health status by reducing BRD incidence over feedlot receiving.

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