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Effect of Excede® Administered to Calves at Arrival in the Feedlot on Performance and Respiratory Disease

Joshua R. Benton
University of Nebraska-Lincoln, jbenton2@unl.edu

Galen E. Erickson
University of Nebraska-Lincoln, gerickson4@unl.edu

Terry J. Klopfenstein
University of Nebraska-Lincoln, tklopfenstein1@unl.edu

Matt K. Luebbe
University of Nebraska - Lincoln, mluebbe2@unl.edu

David R. Smith
University of Nebraska-Lincoln, dsmith@cvm.msstate.edu

See next page for additional authors

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Terry J. Klopfenstein
David R. Smith
Matt K. Luebbe
Gary E. Sides
Lonty Bryant[1]

Summary

In a clinical trial where cattle were either given Excede® or not on arrival, ADG increased and F:G was numerically improved for cattle that received Excede compared to control cattle. There were no differences between initial or final BW, or DMI observed during the receiving period due to the administration of Excede. The incidence of bovine respiratory disease (BRD) for the 32 days of the study was 4.4% for cattle that received Excede at arrival and was different compared to the control cattle which was 12.2%. The correlation (-0.157) between DMI and morbidity observed in this study was not significant. Metaphylactic treatment with Excede improved ADG and effectively reduced the cumulative incidence of BRD during the study.

Introduction

Controlling BRD among incoming calves using metaphylaxis (mass medication of cattle with antibiotics at feedyard arrival) may be an important management option for veterinarians and cattle producers. A previous study evaluated the effect of administration of a long-acting formulation of ceftiofur crystalline free acid (Excede® Sterile Suspension, Pfizer Animal Health, New York, N.Y.) at arrival, or at revaccination (16 to 27 days after arrival) on morbidity, mortality, and BW gain of calves (*2007 Nebraska Beef Report*, pp. 68-70). In this study, calf morbidity from BRD was predominantly within the first 10 to 14 days. Excede administered at arrival significantly reduced ($P<0.01$) the incidence of BRD compared to treatment at revaccination. A -0.22 correlation ($P < 0.01$) was observed between the proportions of steers pulled for BRD treatment and daily DM offered. However, DMI was restricted initially with ad libitum intakes after day 10.

The objective of the current study was to determine the effect of administering Excede at feedlot arrival on morbidity, mortality, BW gain, and the correlation of DMI to pen morbidity rates during the first 30 to 35 days of the feedlot receiving period.

Procedure

Two treatments were evaluated within the feedlot receiving system: 1) control (no arrival treatment) with no post treatment interval (PTI) observed (CONTROL), or 2) Excede® Sterile Suspension on arrival using the base of the ear as the injection site with a PTI of 7 days observed (EXCEDE). A total of 842 steer calves received at the University of Nebraska Agricultural Research and Development Center between Oct. 17 and Oct. 29, 2006, were used in this experiment. Steers were a mixture of "ranch-direct" and "auction market" sources. Steers were housed by treatment group and pens sharing a water tank were assigned to the same treatment in order to minimize environmental cross-exposure, or cross-protection. Fifty-two feedlot pens housed between 12 and 20 head/pen to supply 26 replications per treatment. Pens were blocked by arrival day (6 blocks). Steers received ad libitum intake of a typical feedlot receiving diet containing (DM basis) 27% dry rolled corn, 35% alfalfa hay, 35% wet corn gluten feed, and 3% supplement containing 135 mg/steer daily Deccox® (Alpharma Inc., Fort Lee, N.J.) and 200 mg/steer daily Rumensin (Elanco Animal Health, Greenfield, Ind.). Steers also received long-stem grass hay (3.4 lb/head/day, DM basis), which was removed after day 2.

Steers were assigned to treatment based on processing order on arrival, with every other animal assigned to each treatment. Only calves that were large framed and weighed more than 550 lb were assigned on this experiment as all of these calves were designated as "calf-feds." Steers' ID tags were notched to identify treatment assignment. Calves were processed on 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 the following at feedlot arrival: BoviShield™ Gold 5, Somubac®, and Dectomax® Injectable (Pfizer Animal Health). All calves with horns were dehorned or tipped as needed. Intact bull calves were excluded from this study. Calves were weighed and revaccinated at 10-14 days after arrival which included vaccination with Somubac/Ultrabac® 7 and a second dose of BoviShield Gold 5. Calves were individually weighed off trial after 32 days (range 30-35 days) following a 5-day limit-fed period to minimize variation due to gut fill.

All pens were evaluated by the same animal health personnel within the same day to provide equivalent evaluation across treatments. Calves categorized as sick by the cattle crew were pulled, symptoms assessed, rectal temperature recorded, and BRD cases treated with Draxxin® Injectable Solution (Pfizer Animal Health, New York, N.Y.). When sick calves were treated, their panel ID tag was marked to prevent retreating. Animals were returned to home pens as soon as possible after treatment. A PTI of 7 days was honored after treatment with Draxxin before another treatment could occur. Any animals that were pulled for reasons other than respiratory disease were treated according to UNL feedlot SOPs.

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Initial BW, revaccination BW, final BW, ADG, DMI, feed:gain ratio, morbidity and mortality were measured. Initial BW was based on BW recorded at arrival and was assumed to be a shrunk weight. Final BW was based on the average of 2-day consecutive weights recorded at the end of the trial after a 5-day limit-feeding period to minimize variation due to gut fill. Body weight, ADG, DMI, F:G, and pull rate data using pen as the experimental unit were analyzed using the Proc MIXED procedure of SAS (Version 9.1, SAS Inc., Cary, N.C.) with arrival (and source) as a blocking criteria and antibiotic treatment as a fixed effect. The Proc CORR procedure of SAS (Version 9.1, SAS Inc.) was used to correlate DMI and morbidity. The Proc GENMOD procedure of SAS (Version 9.1, SAS Inc.) was used to analyze binary respiratory disease morbidity outcomes in a generalized estimating equations model using the logit link and accounting for correlation of animals within pen. An animal was classified as a respiratory disease observation for the trial if the animal was treated for respiratory disease by the animal health personnel.

Results

There were no significant differences ($P > 0.05$) between initial BW (612 ± 4 lb), revaccination BW (661 ± 5 lb), final BW (687 ± 5 lb), or DMI (13.9 lb/day) observed in this study due to administration of Excede (Table 1). ADG over the study period was 8% higher for cattle that received Excede on arrival than for those that did not. Cattle that received Excede on arrival had a greater ($P = 0.02$) ADG and a numerically improved ($P = 0.07$) F:G ratio compared with CONTROL cattle. A total of 71 animals were treated for BRD in this study, 19 from EXCEDE and 52 in CONTROL. Also, there were not any animals in this study that had to be retreated or that died. With treated animals removed from the dataset, EXCEDE cattle continued to have significantly greater ($P < 0.01$) ADG and significantly improved ($P = 0.02$) F:G

Table 1. Effects of administration of Excede at arrival on performance during the 32-day receiving period.

	CONTROL	EXCEDE	SEM	P-Value
Results for All Animals Using Pen as the Experimental Unit				
Initial BW, lb	614	610	4	0.32
Revac BW, lb[a]	659	663	5	0.51
Final BW, lb	686	687	5	0.75
DMI, lb/day	13.7	14.0	0.2	0.13
ADG, lb	2.20	2.37	0.07	0.02
F:G[b]	6.21	5.88		0.07
Results Excluding 71 Animals Treated for BRD				
Initial BW, lb	615	610	4	0.22
Revac BW, lb[a]	660	663	5	0.58
Final BW, lb	686	688	5	0.77
DMI, lb/day	13.7	14.0	0.2	0.13
ADG, lb	2.19	2.40	0.08	<0.01
F:G[b]	6.25	5.81		0.02

[a]Revac BW = Revaccination BW.
[b]Analyzed as gain:feed, reciprocal of feed conversion.

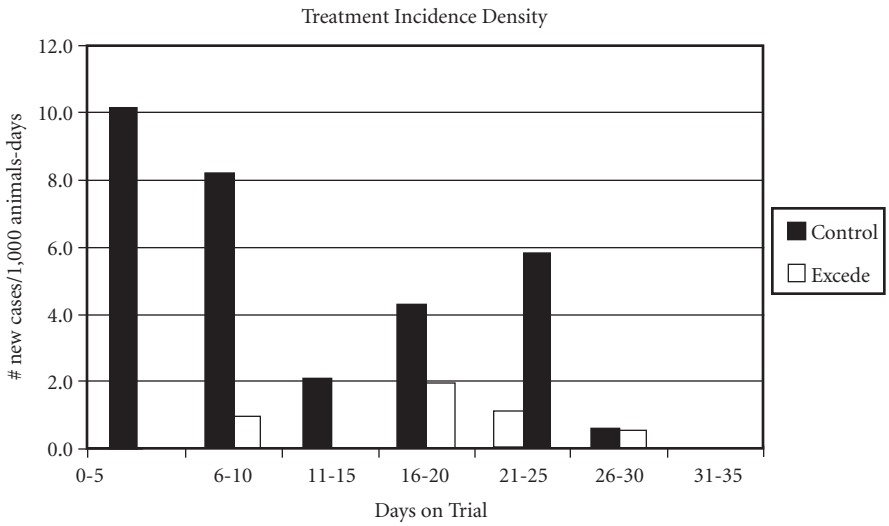

Figure 1. Incidence density of first pulls for BRD by treatment and days on trial.

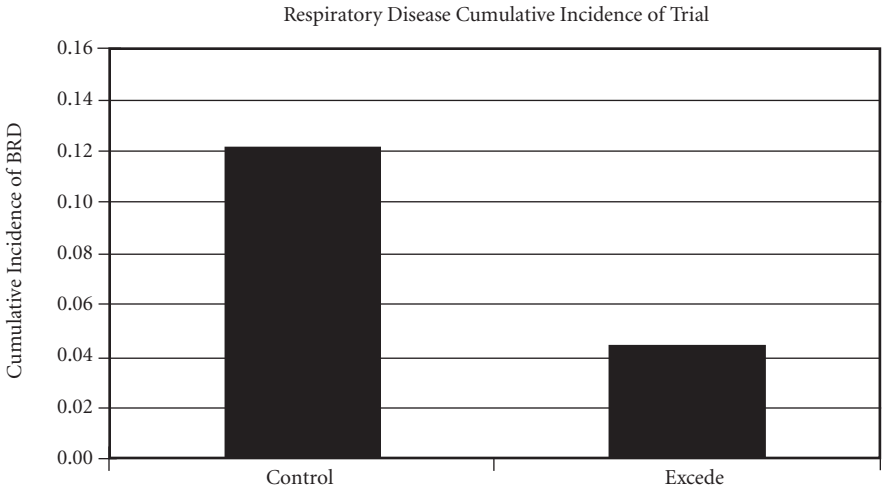

Figure 2. Cumulative incidence of BRD for the study period by treatment.

ratio compared to CONTROL cattle. There were no differences observed for BW or DMI. The correlation (-0.157) between DMI and pen-level incidence of BRD morbidity for the study period was not significant ($P = 0.27$).

CONTROL and EXCEDE cattle were first pulled for BRD at different periods of time after receiving (Figure 1). CONTROL cattle had a higher incidence of BRD at the beginning of the study, mainly between day 0 and day 10; however, EXCEDE cattle were not eligible for BRD treatment until 8 days after enrollment into the study. The incidence of BRD for cattle treated with Excede peaked between days 21-25. The only variable that significantly explained the incidence of BRD was metaphylactic treatment with Excede (odds ratio = 0.33, $P < 0.01$). Cumulative incidence of BRD for the study period was 4.4% for cattle that received Excede at arrival and 12.5% for CONTROL cattle. Cattle that received metaphylactic treatment were 64% less likely to be treated for BRD than CONTROL cattle.

In conclusion, metaphylatic treatment with Excede at arrival in the feedlot effectively reduced the incidence of BRD by 64%, and also improved ADG 8% during the receiving period compared to no metaphylaxis.

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[1]Joshua R. Benton, research technician; Galen E. Erickson, associate professor; Terry J. Klopfenstein, professor; and Matt K. Luebbe, research technician, Animal Science, Lincoln. David R. Smith, professor, Veterinary and Biomedical Sciences, Lincoln. Gary E. Sides and Lonty Bryant, Pfizer Animal Health, New York, N.Y.