

## Zelnate on Arrival Could Decrease the Likelihood of Subsequent Pulls in Suspect Bovine Respiratory Disease Complex Cases

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### Introduction

Antimicrobial metaphylaxis is an important tool used for the prevention of Bovine Respiratory Disease Complex; a disease with a large economic impact that typically affects newly-weaned beef calves that are marketed and transported a distance from their origin.

There are questions involving the potential benefit of Zelnate, a novel non-antibiotic technology designed to activate an animal's natural immunity to fight Bovine Respiratory Disease Complex, being used either solely or in combination with metaphylaxis at the time of initial processing of high risk calves. More knowledge is also needed regarding the possible effects of repeated use of Zelnate when subsequent therapy is required in individual Bovine Respiratory Disease Complex cases. The objective of this study was to evaluate the effectiveness of Zelnate when used as part of an antimicrobial metaphylaxis treatment or when used in combination with an antibiotic when a calf is diagnosed with Bovine Respiratory Disease Complex.

Key words: Zelnate, high risk, bovine respiratory disease

### Experimental Procedures

During a four-day period (October 6-9, 2015) three semi-loads containing 283 head of high-risk cross-bred heifers ( $520 \pm 39$  lb) were purchased from sale barns in Tennessee and Alabama, assembled at a Dickson, Tennessee order buyer facility, and shipped to the Kansas State University Beef Stocker Unit. After initial processing the animals were placed in temporary pens with each truck representing six pens with free access to native grass hay and water through automatic waterers. The morning after arrival, calves were vaccinated for common clostridial and viral diseases (Pyramid 5 + Presponse, Vetmedica, St. Joseph, MO; Excede, Zoetis, Parsippany, NJ; Vison 7 with Somnus, Merck Animal Health, Madison, NJ); dewormed (Safeguard, Merck Animal Health, Madison, NJ); treated for flies (Permethrin CDS; Bayer, Shawnee Mission, KS); and implanted with a mild growth implant (Revalor IH, Merck Animal Health, Madison,

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NJ). One half of the calves also received 2 ml intramuscular of Zelnate (Bayer Healthcare, Animal Health Division, Shawnee Mission, KS) at this time. Calves were blocked by load and initially assigned to six pens based on arrival weight. To maintain similar weights between initial treatments (receiving Zelnate or not at arrival), after animals were sorted by weight, the heaviest animal in the pen was assigned group no Zelnate and the next heaviest group received Zelnate at initial processing. This procedure was replicated through each pen to standardize weights between arrival groups. A second population of treatments was generated based on rectal temperature as the animals were visually pulled for illness. Calves that had a rectal temperature of greater than or equal to 104°F at first pull received Baytril 100 (Bayer Healthcare, Animal Health Division, Shawnee Mission, KS) (Bovine Respiratory Disease, no Zelnate at pull) or Baytril 100 and Zelnate (Bovine Respiratory Disease, Zelnate at pull). Similarly, calves that did not have a rectal temperature of 104°F were either not treated at all (respiratory observed, no Zelnate) or administered only Zelnate (respiratory observed, Zelnate). The combination of treatment group on arrival and treatment at first pull for illness yielded eight possible treatments for cattle that were pulled and two for cattle that were never pulled. All animals enrolled in the study were fed an identical diet once daily at approximately 7:00 a.m. (Table 1). Feed bunks were checked once daily and adjustments made in delivery to ensure feed bunks were slick at the next feeding. All calves were checked at least once daily to assess animal health. Performance data were analyzed using standard T-test for mean comparison and ANOVA in StatPlus (Version 6; AnalystSoft Inc.). Health data were analyzed using proportion comparisons of morbidity in Stata 12 (StataCorp., 2011).

## Results and Discussion

The results from the study are below in Tables 2, 3, 4, and 5. The administration of Zelnate upon arrival had no statistical effect on initial pull ( $P=0.92$ ) or average daily gain ( $P=0.34$ ). Although there were no statistical differences in morbidity 2 (second pull) between any of the treatments, calves that received Zelnate on arrival but not at first treatment for suspect cases of Bovine Respiratory Disease Complex (Zelnate at arrival, respiratory observed, no Zelnate at pull) appeared to be less likely to experience subsequent pulls compared to those animals receiving Zelnate only at treatment for Bovine Respiratory Disease Complex (no Zelnate at arrival, respiratory observed, Zelnate at pull) ( $P=0.06$ ). Furthermore, average daily gain of calves that received Zelnate on arrival and not as a component of Bovine Respiratory Disease Complex therapy (Zelnate at arrival, no Zelnate at pull) appeared to be higher; however, the difference was not statistically significant ( $P=0.8$ ).

## Implications

These results suggest that Zelnate used only in combination with metaphylaxis on arrival and not as a component of Bovine Respiratory Disease Complex treatment could decrease the likelihood of additional pulls in suspect Bovine Respiratory Disease Complex cases. Additional research opportunities may exist in addressing the effectiveness of Zelnate used as pre-shipment treatment, particularly as calves are loaded on trucks at the order buyer/auction market facilities prior to transportation.

**Table 1. Experimental diet fed**

Experimental diet	% of dry matter
<b>Ingredient</b>	
Dry rolled corn	28.13
Control supplement	5.63
Steep	10.00
Alfalfa hay	17.50
Prairie hay	17.50
Corn germ meal	11.25
Distillers dried grains	10.00
Total	100.00
<b>Calculated nutrient content</b>	
Dry matter, %	81.8
Protein, %	16.92
Calcium, %	0.80
Phosphorus, %	0.52
Salt, %	0.28
Potassium, %	1.20
Magnesium, %	0.25
Fat, %	3.40
Acid detergent fiber, %	18.22
Net energy gain, Mcal/cwt	48.68

**Table 2. Proportion of calves initially pulled for illness from each treatment**

Arrival treatment	1st pull rate	P-value
No Zelnate	39%	0.92
Received Zelnate at initial processing	39%	

**Table 3. Healthy cattle performance**

Arrival treatment	Final average daily gain, lb	P-value
No Zelnate	3.23	0.34
Received Zelnate at initial processing	3.27	

**Table 4. Proportion of calves pulled twice from each treatment combination**

Bovine Respiratory Disease cases	2nd pull rate
No Zelnate at arrival / no Zelnate at first pull	35%
No Zelnate at arrival / Zelnate given at first pull	54%
Zelnate at arrival / no Zelnate at first pull	44%
Zelnate at arrival / Zelnate given at first pull	33%
Respiratory observed, no fever cases	2nd pull rate
No Zelnate at arrival / no Zelnate at first pull	44% <sup>ab</sup>
No Zelnate at arrival / Zelnate given at first pull	50% <sup>a</sup>
Zelnate at arrival / no Zelnate at first pull	11% <sup>b</sup>
Zelnate at arrival / Zelnate given at first pull	36% <sup>ab</sup>

<sup>ab</sup> Means in a column with uncommon superscripts differ.

**Table 5. Morbid cattle performance**

Arrival treatment/pull treatment	Final average daily gain, lb	P-value
No Zelnate at arrival / no Zelnate at first pull	2.73	0.80
No Zelnate at arrival / Zelnate given at first pull	2.46	
Zelnate at arrival / no Zelnate at first pull	2.86	
Zelnate at arrival / Zelnate given at first pull	2.71	