

# Bovine Biologicals Technical Bulletin

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Reproductive

## Effect of Micotil Alone or in Combination with Presponse SQ (Administered at Initial Feedlot Processing) on Morbidity and Mortality of Light-weight, High-risk calves<sup>1</sup>

T.C. Bryant<sup>2</sup>, J.R. Nichols<sup>3</sup>, J.R. Adams<sup>4</sup>, T.D. Farmer<sup>5</sup> and D.G. Miles<sup>6</sup>

FRR0401 (BV-157-2006)

### Summary

To compare the effects of metaphylactic treatment with Micotil® alone or in combination with PRESPONSE® SQ (at feedyard arrival) on health parameters and economic return in a commercial feedlot production setting, 3,996 head of light-weight, high-risk steers were utilized. The Micotil + PRESPONSE SQ cattle had a 17 percent lower incidence of first pulls ( $P = 0.0002$ ) than the Micotil-alone cattle and a 19 percent lower incidence of relapses ( $P = 0.003$ ). Additionally, the Micotil + PRESPONSE SQ cattle had a 22 percent lower mortality incidence ( $P = 0.03$ ) than the Micotil-alone cattle. The Micotil + PRESPONSE SQ cattle had lower therapy and mortality costs by \$1.37/hd ( $P < 0.0001$ ) and \$13.14/hd ( $P = 0.03$ ), respectively, than the Micotil-alone treatment cattle. Altogether, the total combined processing, therapy, railer and mortality costs of Micotil + PRESPONSE SQ cattle were \$14.77/hd lower ( $P = 0.01$ ) than the Micotil-alone treatment group.

### Introduction

Due to their susceptibility to Bovine Respiratory Disease (BRD), high-risk cattle provide one of the biggest challenges to feedyard animal health crews. If not managed correctly, cattle in this risk category can become financial disasters and can affect the morale and focus of the feedyard. There are many strategies utilized by feedyard personnel, nutritionists and veterinarians to maximize response from high-risk, light-weight calves including metaphylactic treatment with antibiotics such as Micotil. It has been hypothesized that supplementing an antibiotic mass treatment with a *Mannheimia (Pasteurella)* vaccine may provide additional immunocompetency. The purpose of this study was to compare the effects of metaphylactic treatment of high-risk, light-weight calves with Micotil alone or in combination with the *Mannheimia (Pasteurella) haemolytica* vaccine PRESPONSE SQ (at initial feedlot processing) on morbidity and mortality in a commercial feedlot setting.

## Materials and Methods

### Cattle

To evaluate the effects of Micotil alone or in combination with PRESPONSE SQ on the health of high-risk calves, 3,996 head of light-weight steers were utilized. Cattle were purchased and delivered to Colorado Beef (Lamar, CO) from July 13 to August 30, 2004. To qualify for inclusion in the trial, the groups had to be classified as high-risk (calves and/or auction market derived). The cattle were English and Continental crosses originating from Kentucky, Oklahoma, Kansas, Missouri, California, Tennessee, Arizona and Texas. Cattle that met the qualifications were assigned to the trial and were randomized within each purchase group to one of the two treatments (Micotil-alone or Micotil + PRESPONSE SQ). A total of 22 lots were assembled for the trial.

### Processing

Upon arrival, cattle remained separated by truckload and source and were placed in receiving pens. Hay and water were provided ad libitum. Steers were generally processed within 36 hours of arrival. At initial processing, cattle were administered the following items:

- Sequentially-numbered ear tag (used as individual animal number),
- Lot tag,
- Respective treatment (Micotil-alone or Micotil + PRESPONSE SQ)
  - Micotil (1.5 mL/100 lbs; subcutaneous; right neck),
  - PRESPONSE SQ (2 mL; subcutaneous; right neck),
- Bovi-Shield GOLD® IBR-BVD (2 mL; intramuscularly; left neck), and
- Dectomax® (5 mL; subcutaneous; left neck).

Steers were implanted according to weight. Two lots received a Component® EC as their initial implant followed by a Revalor®-IS at first reimplant and Revalor-S as a terminal implant. Two lots received a Revalor-S as the initial implant and were not reimplanted. The other 18 lots received a Revalor-IS at arrival followed by Revalor-S as the terminal implant. All cattle received Titanium® 3 as a revaccination at each reimplant time. Additionally, 16 of the 22 lots were revaccinated an additional time prior to any reimplant.

Cattle were fed three times daily, and diet and bunk management strategies were similar for all pens on the trial. Rumensin® and Tylan® were fed for the entire feeding period.

### Treatment Assignment

As the sequentially-numbered tags were administered at processing, treatments were assigned within lot by the flip of a coin according to whether the sequential number was even or odd. Within lot, this resulted in treatment assignment in an every-other-animal fashion. Treatment cattle were commingled within lot into a total of 22 pens. As a result, each pen and hence each treatment had similar backgrounds, ages and average arrival weights. Across all pens, average pen payweights ranged from 492 to 758 pounds. Pen riders and animal health technicians were blinded to treatment and randomization schedule. Regardless of treatment assignment, all cattle followed the same disease therapy regimen based on diagnosis and feedyard standard operating procedures (e.g. first- and second-line antibiotic).

### Marketing and Economics

All cattle within each pen were marketed at constant days-on-feed according to visual appraisal and intake patterns routinely used by the feedyard. All steers were harvested from January 13 to May 5, 2005. Individual carcass data were not collected.

All economic data were standardized to common market conditions: \$54/cwt live railer salvage value price, \$110/cwt equivalent feeder price with a \$5/cwt slide, and current medicine costs. Treatment costs were calculated based on current actual medicine costs. Railer cost was determined as the net loss of a realized animal after the net proceeds were calculated by taking the salvage value of the railed animal minus the initial cost. The salvage value of the animal was calculated as \$54/cwt multiplied by the average inweight and the percent of animals that were railed. The initial cost was calculated using a standardized market value of \$110/cwt with a \$5/cwt slide to a 750-pound equivalent weight multiplied by the percentage of each treatment that was railed. Dead costs were calculated as the value of the animal at arrival using a standardized market value of \$110/cwt with a \$5/cwt slide to a 750-pound equivalent weight multiplied by the percentage of each treatment that died.

### Statistical Analyses

All categorical data, such as morbidity and mortality, were analyzed using a Chi-Square analysis in SAS with animal as the experimental unit.

## Results and Discussion

Health and economic data are presented in Tables 1 and 2, respectively, and cumulative incidence of BRD-related first pulls and BRD-related mortality are shown in Charts 1 and 2, respectively. Although initial individual weights were not taken, it is assumed initial weight did not differ among treatments since cattle were randomized in an alternating fashion within pen. Across the pens, average pen payweights averaged 630 pounds. Cattle were fed for an average of 230 days.

Looking at health parameters, the temperature at first pull averaged 104.7° F for the Micotil-alone cattle and 104.5° F for the Micotil + PRESPONSE SQ cattle (P = 0.03). Days at first pull averaged 19 and 22 for the Micotil-alone and Micotil + PRESPONSE SQ treatments, respectively (P = 0.01).

The Micotil + PRESPONSE SQ cattle had a 17 percent lower incidence of first pulls (P = 0.0002) than the Micotil-alone cattle. Additionally, the Micotil + PRESPONSE SQ cattle had a 19 percent lower relapse incidence (P = 0.003) than the Micotil-alone cattle. Although not statistically different (P = 0.19), the Micotil + PRESPONSE SQ cattle had a numerically lower railer incidence (1.50 percent) relative to the Micotil-alone treatment (2.05 percent). Lastly, the Micotil + PRESPONSE SQ cattle had a 22 percent lower mortality incidence (P = 0.03) than the Micotil-alone treatment. It is also worth noting the response to the addition of PRESPONSE SQ may have

been even greater if the two study treatments had not been commingled within pen. In theory, the presence of both treatments within each pen reduced the health risk to the Micotil-alone cattle, and increased this factor for the Micotil + PRESPONSE SQ cattle.

When looking at the economic consequences associated with PRESPONSE SQ in concert with the metaphylactic treatment of Micotil, the Micotil + PRESPONSE SQ cattle had significantly lower therapy costs (P < 0.0001) than the Micotil-alone cattle by \$1.37/hd. Similarly, the Micotil + PRESPONSE SQ cattle had significantly lower mortality costs (P = 0.03) than the Micotil-alone cattle by \$13.14/hd. Although not significant (P = 0.19), railer costs associated with the Micotil + PRESPONSE SQ treatment were numerically lower than the Micotil-alone treatment by \$2.11/hd. Altogether, the Micotil + PRESPONSE SQ cattle had significantly lower (P = 0.01) overall combined processing, therapy, railer and mortality costs by \$14.77/hd.

## Implications

The addition of PRESPONSE SQ to a metaphylactic administration of antibiotic at arrival was beneficial in reducing first pulls, relapses and mortality. As a result, high-risk cattle administered PRESPONSE SQ + Micotil at arrival returned \$14.77 more per head than those given Micotil alone.

**Table 1 Effects of PRESPONSE SQ vaccine on health parameters (LS Means)**

Item	Micotil + PRESPONSE		P-Value <sup>c</sup>
	Micotil	SQ	
Head on Treatment	1,999	1,997	
First Pull <sup>a</sup> , %	33.2	27.7	0.0002
Relapse <sup>b</sup> , %	17.7	14.3	0.003
Railer, %	2.05	1.50	0.19
Mortality, %	8.15	6.36	0.03

<sup>a</sup> Cattle pulled and treated for the first time.

<sup>b</sup> Cattle pulled and treated again regardless of location after already being treated. An animal that relapsed more than one time was only counted once.

<sup>c</sup> Treatment means were considered statistically different at a P-value of 0.10 or less.

**Table 2 Effects of PRESPONSE SQ vaccine on economic parameters<sup>a</sup> (LS Means)**

Item	Micotil + PRESPONSE		
	Micotil	SQ	P-Value <sup>f</sup>
Processing Costs, \$/hd	\$15.03	\$16.88	<0.0001
Therapy Costs <sup>b</sup> , \$/hd	\$6.79	\$5.42	<0.0001
Railer Costs <sup>c</sup> , \$/hd	\$7.86	\$5.75	0.19
Mortality Costs <sup>d</sup> , \$/hd	\$55.91	\$42.77	0.03
All Costs <sup>e</sup> , \$/hd	\$85.59	\$70.82	0.01

<sup>a</sup> All costs are calculated as a per-head basis across the entire treatment.

<sup>b</sup> Only includes medicine costs and does not include a chute charge.

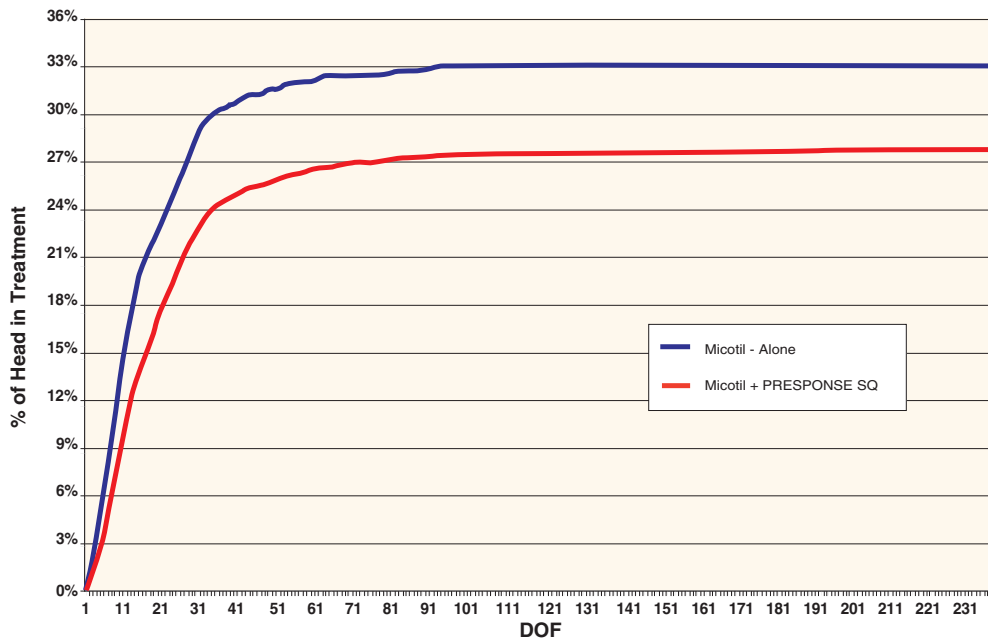
<sup>c</sup> Calculated as the net cost from the initial animal cost minus the potential salvage value multiplied by the percent that were railed.

<sup>d</sup> Calculated as the initial cost of the animals multiplied by the percent that died.

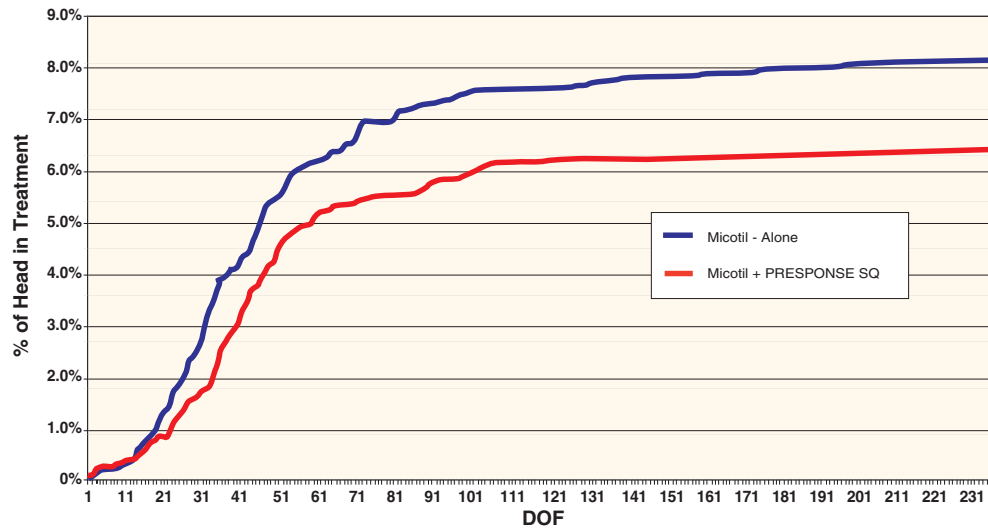
<sup>e</sup> All costs including processing, therapy, railer and mortality. All values are calculated as a per-head basis across the entire treatment.

<sup>f</sup> Treatment means were considered statistically different at a P-value of 0.10 or less.

**Chart 1. Cumulative First Pull Incidence**



**Chart 2. Cumulative Mortality Incidence**



<sup>1</sup> Submitted to Fort Dodge Animal Health October 6, 2006.  
<sup>2</sup> Manager of Beef Programs, Operations Analysis, and Research, Five Rivers Cattle Feeding, Loveland, CO.  
<sup>3</sup> Assistant General Manager, Colorado Beef, Lamar, CO.  
<sup>4</sup> Supervisor of Environmental Affairs (previously Data Manager), Five Rivers Cattle Feeding, Lamar, CO.  
<sup>5</sup> General Manager, Colorado Beef, Lamar, CO.  
<sup>6</sup> Veterinary Research and Consulting Services, Greeley, CO.  
<sup>7</sup> Tilmicosin, Elanco Animal Health, Greenfield, IN.  
<sup>8</sup> *Mannheimia (Pasteurella) haemolytica* vaccine, Fort Dodge Animal Health, Overland Park, KS.  
<sup>9</sup> Bovine Rhinotracheitis (IBR)-Virus Diarrhea (BVD 1 & 2) Vaccine, Pfizer Animal Health, New York, NY.  
<sup>10</sup> Doramectin, Pfizer Animal Health, New York, NY.  
<sup>11</sup> 100 mg progesterone and 10 mg estradiol benzoate. VetLife, West Des Moines, IA.  
<sup>12</sup> 80 mg trenbolone acetate and 16 mg estradiol, Intervet Inc, Millsboro, DE.  
<sup>13</sup> 120 mg trenbolone acetate and 24 mg estradiol, Intervet Inc, Millsboro, DE.  
<sup>14</sup> Bovine Rhinotracheitis (IBR)-Virus Diarrhea (BVD 1 & 2) Vaccine, Agrilabs, St. Joseph, MO.  
<sup>15</sup> Monensin, Elanco Animal Health, Greenfield, IN.  
<sup>16</sup> Tylosin, Elanco Animal Health, Greenfield, IN.

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