



Department of Animal and Range Sciences  
CLAYTON LIVESTOCK RESEARCH CENTER

PROGRESS REPORT

Route 1 Box 109

Clayton, New Mexico 88415

505-374-2566

Progress Report No. 101 (June, 1998)

**Effects of Pre-shipment Versus Arrival Medication with Tilmicosin Phosphate (Micotil<sup>®</sup>) on Health and Performance of Newly Received Beef Steers<sup>1</sup>**

G. C. Duff, D. A. Walker, K. J. Malcolm-Callis, and M. W. Wiseman

Previous research conducted at the Clayton Livestock Research Center (Galyean et al., 1995) concluded that tilmicosin phosphate (Micotil<sup>®</sup>) offered a highly effective means of decreasing bovine respiratory disease (BRD) in highly-stressed beef cattle from the southeastern United States. Moreover, tilmicosin phosphate has been approved for control of respiratory disease in cattle at high risk. It may be advantageous to administer antibiotics prior to shipping to obtain optimum health and performance. However, data are limited evaluating the effects of prophylactic medication with tilmicosin phosphate before shipping versus on arrival on health and performance.

Ninety five beef steers were purchased from an order buyer in Mississippi. Steers calves were purchased at an auction barn on a Monday and held at the order buyer's facility until pre-shipment processing and shipment. Pre-shipment processing procedures included individual identification, and 33% of the cattle received a pre-shipment treatment with Micotil<sup>®</sup> (7.5 mL). Treatments were assigned based on processing order using random numbers of three. Cattle left Mississippi at approximately 3:30 pm (CST) on a Tuesday and arrived at Clayton at approximately 2:30 MST on Wednesday. Cattle experienced a 5.2% shrink from a pay weight of 520 pounds. Cattle were processed immediately upon arrival including individual weight, branded, dehorned as needed (35.4%), vaccinated with a clostridial antigen (Ultrabac-7; SmithKline Beecham Animal Health; West Chester, PA), treated for internal (oxfendazole; Synanthic; Ft Dodge Animal Health; Overland Park, KS) and external (fenthion; Tiguvon; Bayer Animal Health; Shawnee Mission, KS) parasites, and injected with vitamin A/D<sub>3</sub> (AgriLabs, St. Joseph, MO). On day 7, all cattle received an IBR-PI<sub>3</sub>-BRD-BRSV vaccine (Pyramid-4; Ft Dodge Animal Health; Overland Park, KS). Treatments included: 1) control, no Micotil<sup>®</sup>, 2) pre-shipment Micotil<sup>®</sup> (7.5 mL), and 3) arrival Micotil<sup>®</sup> (7.5 mL). Pens were assigned randomly to treatments (3 pens per treatment). After processing, steers were placed in their respective pens, offered sorghum-sudangrass hay (first week only) and a 70% concentrate diet

Table 1. Ingredient composition of 70% concentrate diet fed to steers receiving tilmicosin phosphate

Ingredient/Item	%, dry matter basis
Sorghum sudangrass hay	14.57
Whole corn	14.89
Steam-flaked corn	9.91
Soybean meal	36.02
Molasses	14.71
Fat (yellow grease)	5.23
Limestone	1.95
Dicalcium phosphate	.73
Salt	.49
Urea	.30
Ammonium sulfate	.24
Premix <sup>a</sup>	.96

<sup>a</sup>Premix contained (DM basis): wheat midds (83.11%), vitamin A - 30,000 IU/g (.66%), vitamin E - 500 IU/g (1.98%), Rumensin-80 (1.125%), Tylan-40 (1.125%), and trace mineral package (12%). Trace mineral package contained (DM basis): calcium iodate (.269%), cobalt carbonate (.362%), copper sulfate (3.268%), ferrous sulfate (19.445%), magnesium oxide (29.762%), manganous oxide (6.944%), zinc sulfate (28.169%), wheat midds (7.831%), and mineral oil (3.95%).

(Table 1) in quantities sufficient for ad libitum consumption throughout the receiving period. Cattle were monitored daily for symptoms of BRD. Symptoms included nasal or ocular discharge, labored breathing, lethargy and/or emaciated body condition. Cattle displaying symptoms were removed from their pens, taken to a processing facility and rectal temperature measured. Cattle with elevated rectal temperature (> 103.5° F) received medical treatments. Medical treatments included Micotil<sup>®</sup> and penicillin. After medical treatments, the cattle were returned to their respective feedlot pen. Cattle were weighed on days 7, 21, and 35. On days 7, 21, and 35, feed bunks were swept and any feed remaining was weighed and sampled for DM determination. Bunk samples were obtained on weekly intervals during the study and dried at 100°C for approximately 22 hours. In addition, dietary ingredient samples were obtained every 2 weeks for DM determination.

<sup>1</sup>We thank Elanco Anim. Health, Fort Dodge Anim. Health, Roche Anim. Health, and Phizer Anim. Health for product support.

Performance data were analyzed using GLM procedures of SAS (1987). Pen was considered the experimental unit. For average daily gain, daily DM intake and the feed:gain ratio the model included effects for treatment and pen within treatment. Orthogonal contrasts were used to separate treatment means. Contrasts were: 1) control versus the average of pre-shipment and arrival medication with Micotil<sup>®</sup> and 2) pre-shipment versus arrival medication with Micotil<sup>®</sup>. Morbidity data were analyzed using the CATMOD procedure of SAS (1987) with individual calves as the experimental unit. Contrasts were used to separate morbidity and repulls treatment means. Contrasts were: 1) control versus the average of pre-shipment and arrival medication with Micotil<sup>®</sup> and 2) pre-shipment versus arrival medication with Micotil<sup>®</sup>.

Performance data are presented in Table 2. No differences ( $P > .10$ ) were noted among treatments for daily gain for any of the periods or the overall experiment. Daily DM intake of concentrate ( $P < .10$ ) and total DM intake ( $P < .05$ ) was greater during days 0 to 7, and greater ( $P < .05$ ) for days 7 to 21 for the average of Micotil treatments compared with controls. However, no differences ( $P > .10$ ) were noted for DM intake during days 21 to 35 or for days 0 to 35. Likewise, no differences ( $P > .10$ ) were observed for the feed:gain ratio for any of the periods or for the overall experiment among treatments. The percentage of steers treated for BRD was decreased ( $P < .05$ ) for the average of the Micotil<sup>®</sup> treatments compared with controls. Likewise, chi-square analysis revealed that the week the steers were treated for

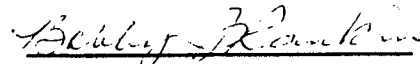
BRD differed ( $P < .10$ ) among treatments. No differences ( $P > .10$ ) were noted for the number of cattle treated more than once for BRD (repulls).

Results suggest that there may be an advantage to administering Micotil<sup>®</sup> before shipping to reduce the percentage of cattle treated for bovine respiratory disease during the first week after arrival. Likewise, numerically, the percentage of cattle requiring more than one treatment was decreased for Micotil<sup>®</sup> steers compared with controls. Further research is required to determine the effects and possible interactions of feed-grade antibiotics in addition to injectable antibiotics on health and performance of newly received beef cattle.

#### Literature Cited

Galyean, M. L., S. A. Gunter, and K. J. Malcolm-Callis. 1995. Effects of arrival medication with tilmicosin phosphate on health and performance of newly received beef cattle. *J. Anim. Sci.* 73:1219-1226.

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Department Head  
Animal and Range Sciences  
New Mexico State University