EVALUATION OF METAPHYLACTIC MEDICATION IN A BACKROUNDING OPERATION

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Story in Brief

Effects of metaphylactic tilmicosin medication upon morbidity and mortality during the first 30 days in a backrounding operation were evaluated. There was no significant difference in morbidity between cattle that received tilmicosin and those that did not receive tilmicosin at initial processing. Mortality was reduced in those calves receiving tilmicosin at initial processing.

(Key Words: Bovine Respiratory Disease, Metaphylaxis, Tilmicosin, Mass-Medication.)

Introduction

The Bovine Respiratory Disease Complex (BRD) is a major health problem in backrounding operations. The objective of this trial was to determine the effects of metaphylactic medication with tilmicosin on the morbidity and mortality of calves placed in a 30 d backrounding program prior to being turned onto winter-wheat pasture.

Material and Methods

One hundred seventy-three mixed beef bull calves weighing an average of 400 lb each were purchased in various livestock auctions in Tennessee and Kentucky, assembled in Providence, KY and transported by truck to western Oklahoma. The cattle were in transit for approximately 20 h. The cattle arrived late in the evening of November 23, 1994. Because of the Thanksgiving holiday, the cattle were processed on the afternoon of November 25, 1994.

The cattle were assigned to two groups using a computer generated random number table. The treatment [1]group (82 cattle) received tilmicosin (Micotil) at label dosage in addition to routine processing procedures. The control group (91 cattle) received routine processing without tilmicosin. All cattle were individually identified with two unique ear tags with identical numbers. Routine processing procedures were as follows: castration, oral deworming with oxfendazole (Synanthic), implantation with zeranol (Ralgro), oral neomycin, injectable vitamins A and D, 7-way clostridial vaccination, Pasteurella hemolytica/Hemophilus somnus bacterin (Poly-Bac/Somnus), IBR

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(Tandem IBR plus) and topical permethrin (Delice). Feedlot personnel were blinded to the identity of the treatment and control groups. Following processing, cattle were checked daily by feedlot personnel for signs of any illness. Calves showing signs of nasal discharge, labored breathing, difficulty in locomotion, or depression were clinically diagnosed as having BRD and treated with tilmicosin at the label dose.

Result and Discussion

By November 28, seven calves had died, and feedlot personnel had evaluated the remaining cattle and concluded that over 50% of the calves were showing signs of BRD. Management decided to mass-medicate all cattle with tilmicosin. At the time of mass-medication, a veterinary assistant observed the cattle as they entered the processing chute, recorded a calf's ear tag number, and classified the calf as ill or healthy. The following criteria were used in classifying a calf as sick: nasal discharge, labored breathing, difficulty in locomotion, or depression. The assistant did not know which receiving treatment the calves received. Feedlot personnel used the same criteria to determine morbidity during the trial.

Two of the dead calves were necropsied less than 12 h after death. Gross lesions associated with BRD were observed. Upon gross examination, over 50% of the lung fields were consolidated following an anteroventral pattern. The lungs were very firm to the touch. Large areas of pleural adhesions were noticed. Serofibrinous exudate was visible on the cut surface. Based on gross appearance of the lungs, it was estimated the animals had been ill for at least five days. Lung tissue samples were sent to The Texas Veterinary Medical Diagnostic Laboratory (TVMDL) at Amarillo, TX for pathogen isolation, antibiotic sensitivity and histological aging of lesions.

TVMDL isolated Pasteurella hemolytica, which was sensitive to the following antibiotics: spectinomycin, trimethoprim/sulfa, sulfachlorpyridazine, ceftiofur and tilmicosin. Age of lung lesions was estimated to be 2 to 4 d, suggesting that the calves were clinically ill upon arrival.

At 30 d post arrival, 157 out of 173 individual records were recovered from feedlot personnel. Sixteen individual records were not found. The following data were collected:

Treatment group: 72 total. 26 healthy, 46 ill, 4 dead.

Control group: 85 total. 30 healthy, 55 ill, 15 dead.

Using a statistical computer program (Epiinfo 6), 2 x 2 tables were constructed and Mantel-Haenzel p-values were calculated. Treatment did not influence morbidity (p=.915). The difference in crude mortality rate between the treatment and control groups favored the mass-medicated group (p=.015). The difference in case fatality rates (the percentage of those becoming ill that

died) between the two groups favored the mass-medicated group (p=.018). Relative risks calculated for crude mortality rate showed that a calf in the control group was 3.18 times more likely to die of BRD during the first 30 d post-arrival compared to a calf in the treatment group. Relative risks calculated for the case fatality rates between the two groups showed that a calf in the control group was 3.14 times more likely to die during the same period compared with a calf in the treatment group.

The effect of metaphylactic antibiotics on the health and performance of newly received stocker and feeder calves has been reviewed. In most studies, metaphylactic antibiotics significantly reduced morbidity rates for BRD. In one study, BRD morbidity, mortality, and case fatality rates were significantly lowered following the use of metaphylactic tilmicosin use (Smith, 1994; Young, 1995).

A reduction in morbidity was not observed in this trial. The high incidence of early morbidity and mortality and the pathologist's estimation of illness duration suggest that a high percentage of these calves were clinically ill upon arrival. The protocol developed by feedyard management before the trial was conducted did not allow for any attempt at identifying morbid animals at initial processing.

It is often difficult to statistically measure differences in mortality due to BRD (Smith, 1994). The extremely high mortality rate among controls in this study resulted in a statistically significant difference. The difference in mortality rates, especially the case fatality rate, suggests that tilmicosin is an effective antibiotic for initial treatment of BRD.

Smith (1994) states that with most groups of calves it is difficult to justify giving prophylactic antibiotics to all calves solely for morbidity and mortality reduction. Improved weight gain and feed conversion are necessary to economically justify this procedure, and this frequently occurs. Metaphylactic medication can also be justified in overcoming deficiencies in facilities and(or) personnel.

Since close-out data were not available 30 d post arrival, another method was used to evaluate the cost effectiveness of metaphylactic tilmicosin medication. A BRD mortality overhead formula was developed to show the additional cost surviving calves incur due to BRD mortality. The formula is: Treatment group: (No. dead calves x cost per calf) + (cost of tilmicosin used)/No. surviving calves; Control group: (No. dead calves x cost per calf)/ No. surviving calves. This formula does not account for differences in treatment cost of morbid animals, since both groups had similar morbidity rates. The following assumptions were used in calculations: 400 lb calves at $90.00/cwt and the cost of tilmicosin was $7.00/calf. The calculations show that BRDC cost the treatment group $28.58/calf. BRD cost the control group $77.14/calf. This suggests that when threatened with high mortality rates,

metaphylactic tilmicosin can be cost effective before performance differences are considered.

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