

# Antibiotic Administration and Vaccination with Modified Live *Pasteurella haemolytica* and *multocida* Vaccine in Calves

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## Introduction, Materials and Methods

The objective of this study was to determine the effects of simultaneous administration of a modified avirulent live *Pasteurella haemolytica* and *multocida* vaccine (Once PMH®: Bayer Corporation) and tilmicosin phosphate (Micotil®: Elanco Animal Health) on the antibody responses to the immunogens.

Twenty-five Hereford and/or Angus X Hereford calves of mixed sex (steers and heifers) were used in the study. These calves were post-weaning and had received prior viral immunizations. Calves were divided into 3 treatment groups. Group 1): 10 calves received vaccine only; Group 2): 10 calves received Micotil and Once PMH; Group 3): 5 calves served as non-medicated, non-vaccinated controls. A 2ml dose of the vaccine, Once PMH, was administered at day 0 by intramuscular injection in the left hip (Groups 1 & 2). Micotil was administered subcutaneously in the right neck region at recommended label dose (1.5 ml/100 lbs body weight) to the Group 2 calves. Calves were maintained and observed daily in the bovine respiratory disease pens at the College of Veterinary Medicine, Oklahoma State University. Blood samples were obtained on days 0, 7, 14, 21 and 28 post-treatment via jugular venipuncture. The sera were collected and stored at -68°F (-20°C) until assayed for antibodies.

The sera were assayed for the following antibodies: 1) *P. haemolytica* (whole cell) ELISA; 2) *P. haemolytica* (leukotoxin) ELISA; 3) *P. multocida* (outer membrane protein) ELISA. Geometric mean titers for each group at the respective bleeding were determined. The experimental design was completely randomized with repeated measures. Data were analyzed using PROC MIXED in SAS (Version 6.11). The group-by-day interaction was significant, so the SLICE option was

utilized in an LSMEANS statement to assess the simple effects of Group and the simple effects of Day. Least significant difference multiple comparisons were performed using  $p = 0.05$ .

## Results and Conclusion

Analysis for the whole cell ELISA to *P. haemolytica* demonstrated no significant difference ( $p = 0.05$ ) between Groups 1 (vaccine only) and 2 (vaccine and Micotil) at any collection day. Group 3 (controls) had high antibody levels at the onset, but there was no change throughout the study. The vaccinated calves (Groups 1 and 2) did develop increased antibodies in subsequent bleedings compared to day 0.

There was no significant difference ( $p = 0.05$  or  $p = 0.10$ ) in the *P. haemolytica* leukotoxin between Groups 1 and 2 at any collection day. The control calves in Group 3 did have high antibody levels at day 0, but there was no increase in subsequent weeks. The vaccinated calves (Groups 1 and 2) did develop increased antibodies ( $p = 0.05$ ) in subsequent bleedings compared to day 0.

Similarly there was no significant difference ( $p = 0.05$  or  $p = 0.10$ ) in the antibodies to *P. multocida* between Groups 1, 2, or 3 at any collection day. There was no significant rise ( $p = 0.05$ ) in antibodies in either vaccinated group (1 or 2) on collection days after vaccination. However, there was a significant ( $p = 0.10$ ) rise in collections after vaccination compared to day 0 for vaccinated calves in Groups 1 and 2.

Simultaneous administration of a labeled dose of Micotil and a modified avirulent live *Pasteurella haemolytica* and *multocida* vaccine (Once PMH) produced no adverse effects on antibody production by calves up to 28 days post-vaccination to *P. haemolytica* and *P. multocida* immunogens.