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Evaluation of a 25-Week Duration of Immunity of RespiSure One®
In Mycoplasma Hyopneumoniae Seronegative and Seropositive Pigs

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Introduction and Objectives
Mycoplasma hyopneumoniae is the primary causative agent of enzootic pneumonia, which is a chronic and highly prevalent swine disease that has been estimated to cost the swine industry up to 1 billion dollars annually. One or two dose vaccines with various durations of immunity are used to control mycoplasm pneumonia in pigs. As sows can also be vaccinated, concerns exist that maternally derived antibodies can reduce vaccine efficacy in pigs vaccinated at a younger age (1).

Pigs from seronegative (Study 1) or seropositive (Study 2) dams were vaccinated with RespiSure ONE® at one week of age and challenged 25 weeks later to evaluate duration of immunity and impact of maternal antibody.

Materials and Methods
For Study 1, 52 pigs from M. hyopneumoniae seronegative sows or gilts were randomly assigned by litter into placebo and vaccinate groups. All pigs were seronegative at the start of the study (ELISA OD< 0.5, Veterinary Diagnostic Laboratory, Iowa State University, Ames, IA, USA). For Study 2, 52 pigs from M. hyopneumoniae seropositive sows or gilts were randomly assigned by litter into placebo and vaccinate groups. Study 2 pigs were M. hyopneumoniae seropositive at the start of the study (ELISA OD > 0.5). At 1 week of age, pigs in the vaccinated group (Day 0) were administered 2 ml of RespiSure ONE®, intramuscularly in the neck, while pigs in the placebo group received 2 ml of PBS. Blood samples for M. hyopneumoniae serology were collected at key time points.

Twenty-five weeks following vaccination, all pigs were anesthetized and intranasally challenged on three consecutive days. Challenge material was a lung tissue homogenate containing a derivative of M. hyopneumoniae strain 11 at a dilution of 1:25 in 5 mL (106 – 107 CCU/ml) of mycoplasmal Friis medium (E. Thacker, ISU, Ames, IA, USA)(2). Pigs were euthanized 4 weeks following the first challenge. Lungs samples for M. hyopneumoniae serology were collected at key time points.

Results and Discussion
Lung lesion scores and serology results for both studies are summarized in Tables 1 and 2, respectively.

In Study 1, lung tissue was M. hyopneumoniae positive in 23/24 placebo pigs and 18/20 vaccinated pigs. In Study 2, lung tissue was M. hyopneumoniae positive in 8/26 placebo pigs and 8/22 vaccinated pigs.

One-week-old, sero-negative or sero-positive pigs, vaccinated once with RespiSure ONE®, had significantly fewer lung lesions than placebo pigs following an experimental challenge with M. hyopneumoniae 25 weeks later. In both studies, vaccination did not have any effect on the number of pigs with M. hyopneumoniae positive (PCR) lung tissue. Lastly, a clinically significant M. hyopneumoniae immune response was only measured 4 weeks following challenge and was more prominent in vaccinated than placebo pigs.

References