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MEASUREMENT OF THE SERUM ANTIBODY RESPONSE TO A ONE-DOSE MYCOPLASMA HYOPNEUMONIAE VACCINE AND DISEASE CHALLENGE IN GROWING PIGS USING A TWEEN 20 AND COMPETITIVE ELISA ASSAY

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Mycoplasma hyopneumoniae causes an economically important chronic respiratory disease in growing pigs. Effective control of enzootic pneumonia can be achieved through the use of commercially available vaccines. When evaluating the effectiveness of vaccination programs, it is useful to evaluate compliance to expected vaccination, as well as the nature of natural disease circulation in populations of pigs at risk for suffering the negative consequences of enzootic pneumonia.

One objective of this study was to determine the nature of the serologic antibody response to both vaccination with a one-dose commercial vaccine (Ingelvac®-M. hyo) and challenge with virulent *M. hyopneumoniae* for two different antibody ELISA assays (Tween 20 ELISA, competitive ELISA).

Materials and Methods

The data originated from two duration-of-immunity (DOI) studies for a commercially available one dose *M. hyopneumoniae* vaccine (Ingelvac®-M. hyo). Study 1 and Study 2 were designed to evaluate a 90 day and a 120 day DOI period, respectively.

The sera from both DOI studies were evaluated by a Tween-20 ELISA (T20 ELISA) and a competitive ELISA (cELISA) to generate antibody response curves following the vaccination and/or challenge of *M. hyopneumoniae* negative animals.

Three to four week old pigs were vaccinated with a single dose on study day 0 for the vaccinated groups. Blood samples from all pigs groups were obtained on days 0, 35, 63, 90, 118, and 148 for the serological evaluation. All pigs were challenged on study day 90 and study day 120 with 1 x 10^6 ccu and 2 x 10^6 ccu, respectively, of a crude lung homogenate containing virulent *M. hyopneumoniae* via intratracheal inoculation. Twenty-nine days following challenge, animals were necropsied and the lungs evaluated for lesions typical of *M. hyopneumoniae*. Sera from these two studies were obtained and tested by both a T20 ELISA and cELISA assays.

Results & Discussion

Vaccination on Day 0 with Ingelvac® M. hyo elicited a mean peak antibody response on Day 35 for both assays. An anemnestic response was demonstrated with the mean post-challenge antibody titer being higher than the peak mean vaccine response. Peak values achieved on Day 35 for the cELISA were 26% and 35% RPT (reverse percent titer) for the 90 DOI and 120 DOI groups, respectively. Post-challenge values attained were 75% and 70% RPT. Peak values for the T20 ELISA on Day 35 were 20 and 23 OD%. Post-challenge values were 61 and 54 OD% for the 90 DOI and 120 DOI groups, respectively. The antibody response detected in the non-vaccinated animals after challenge was similar to the response to the vaccine in the vaccinated-challenge groups on both assays. When comparing the mean antibody titer values, a significant statistical difference was evident between vaccinated and non-vaccinated groups for both assays.

When compared qualitatively, the T20 ELISA will detect more animals positive earlier in the response curve. The mean Tween-20 titers were above the individual animal positive cut-off value for the assay (25 OD%) for all bleed points post-vaccination. Only after challenge, did the mean cELISA titers increase to above the positive cut-off value for the cELISA (50% RPT) in the vaccinated animals.

Summary

Efficacy for the Ingelvac® M.hyo vaccine has been demonstrated for 90 and 120 days post-vaccination with a virulent challenge. The associated vaccine antibody response described by cELISA and T20 ELISA assays can be utilized to evaluate exposure status of pigs to the vaccine and virulent challenge. The assays demonstrate an expected antibody response curve with an anemnestic response to challenge. The main difference between the assays is that qualitatively, the T20 ELISA detects positive animals earlier in the vaccine response than does the cELISA. However, both assays are equally capable of detecting significant increases in mean group titers post-vaccination.