Project Update: The effect of passive immunity to *Mycoplasma hyopneumoniae* and an extended lactation period on piglet immune development

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Funded in part by the Minnesota Pork Board and Pork Checkoff

Background

- *M. hyopneumoniae* is a proven model of maternal immune transfer in swine (Bandrick et al., 2008)
- Farrowing room management practices, such as cross-fostering affect passive transfer (Bandrick et al., 2011)
- Piglet vaccination for *M. hyopneumoniae* is usually performed in the farrowing rooms
- Vaccination protocols vary: Early days of life – Weaning day
- Research data suggests that increasing weaning age increases the economic value of weaned pigs (Main et al., 2005)
- However, little information exists on the impact of extended lactation length (>21 days) on the immune status of pigs

Objective

To determine the optimal time to vaccinate pre-weaning pigs in the face of an extended lactation period of 25 days

Experimental Groups

<table>
<thead>
<tr>
<th>Unvaccinated gilts</th>
<th>Vaccinated gilts</th>
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<tbody>
<tr>
<td>Gilt 1</td>
<td>Gilt 1</td>
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<tr>
<td>Piglets vaccinated at 14 days</td>
<td>Piglets vaccinated at 14 days</td>
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<tr>
<td>Piglets vaccinated at 21 days</td>
<td>Piglets vaccinated at 21 days</td>
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<tr>
<td>Piglets vaccinated at 28 days</td>
<td>Piglets vaccinated at 28 days</td>
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</tbody>
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Materials and Methods

Humoral and cellular immune response specific to *M. hyopneumoniae* was evaluated in gilts and piglets by means of:

- Enzyme-linked immunosorbant assay—ELISA (Herd Check, IDEXX)
- Delayed-type hypersensitivity—DTH as described by Bandrick et al 2008

Groups compared using non-parametric statistical analysis
Results

Antibody detection in piglets:
Pre-suckling and 3 weeks post-treatment

Antibody detection in piglets:
12 weeks of age

Born to Unvaccinated Gilts  Born to Vaccinated Gilts  Born to Unvaccinated Gilts  Born to Vaccinated Gilts

DTH Responses in piglets: 3 weeks post-treatment

Born to Unvaccinated/Vaccinated Gilts

Conclusions

- The magnitude of humoral and cellular immune response was not significantly different when examined by age of vaccination.
- In piglets born to vaccinated gilts, pre-existing antibodies interfered with active immunity at all 3 ages at vaccination.
- Overall, vaccination status of the mother was more important than vaccination age of the offspring, at least at the vaccination times selected for this study.

Implications

- Piglet immune response is similar in piglets vaccinated with M. hyopneumoniae at different ages during the lactation period.
- Humoral immune response to M. hyopneumoniae in the piglet is strongly influenced by the passive immunity acquired from the mother.
- The significance of humoral and cellular immune response for M. hyopneumoniae protection has not yet been elucidated.