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The decay of maternally derived humoral antibody against *Erysipelothrix rhusiopathiae*

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Introduction

Erysipelothrix rhusiopathiae is the causative agent of swine erysipelas. Erysipelas, first recognized as an important disease of swine during the 1940s, continues to have a clinical and economic impact on the US swine industry.¹ Vaccination can be an effective tool against erysipelas, however the response is variable when administered in the presence of maternal antibodies.^{2,3} There has been little published work on the decay of maternally derived antibodies. Serologic profiling could be valuable in determining the optimum age to vaccinate. The purpose of this study is to describe maternally derived antibody decay in newly weaned pigs from seropositive dams.

Materials and Methods

A 2500 sow farrow to wean source farm of conventional commercial genetics was selected. Sows and gilts were vaccinated at three weeks pre-farrow with a commercial erysipelas bacterin. Gilts received an initial dose of the same vaccine two weeks earlier at five weeks pre-farrow. Pigs were weaned at 17-21 days of age to off site nursery and finishing facilities.

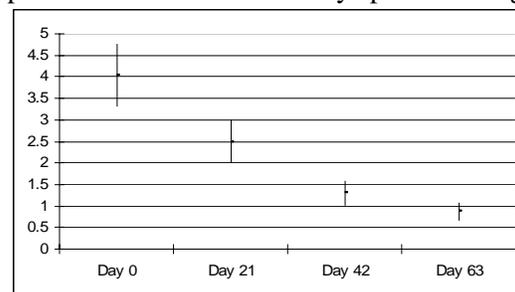
A total of 72 pigs from 31 sows (12 P0, 7 P1-2, and 12 P3+) were individually tagged and sera were collected on day 0 (weaning), day 21, day 42, and day 63. The sera were stored at -70°C and the retained samples were concurrently tested on an *Erysipelothrix rhusiopathiae* ELISA. The ELISA used in this study was a antibody sandwich ELISA comprised of a polyclonal antibody and a partially purified *Erysipelothrix rhusiopathiae* antigen that contains the 64-66 Kd protein. It has been previously shown that this protein is important for protective immunity to *Erysipelothrix rhusiopathiae*.⁴ Results were reported as sample to positive (S/P) ratios.

Results

Erysipelothrix rhusiopathiae maternally derived mean antibody S/P ratios were highest on Day 0 and declined thereafter (Figure 1). There was a

significant reduction in S/P ratios from Day 0 to Day 21 and from Day 21 to Day 42 ($p < 0.05$). There was no difference between S/P ratios on Day 42 and Day 63. The standard deviation in S/P ratio was largest on Day 0, suggesting more variation in antibody levels at weaning compared to later test periods.

Figure 1. Mean and 95% confidence intervals for *Erysipelothrix rhusiopathiae* sample to positive ratios on various days post weaning



Discussion

These results suggest a steady decline in maternally derived antibodies to *Erysipelothrix rhusiopathiae* from weaning to 6 weeks post-weaning. Previous reports based upon challenge studies recommend vaccinating pigs for *Erysipelothrix rhusiopathiae* at 8 weeks of age or older³. Data from this set of pigs corroborates those recommendations as maternal immunity appeared to decline until 6 weeks post-weaning, or 8-9 weeks of age.

Additional vaccination-challenge studies with ELISA S/P data should be conducted to correlate these serologic findings with the ability to actively immunize pigs. This study indicates that serologic profiling of maternally derived immune status could be a valuable tool in defining the optimum time to vaccinate against Erysipelas in specific production systems.

¹ Opriessnig T et al. 2004. J Vet Diag Invest.

² Ritzmann M et al. 2000. Proc IPVS.

³ Newby TJ et al. 2002. Proc AASV.

⁴ Groshup MH et al. 1991. Epidemiol Infect.