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Cellular immune response in piglets following sow vaccination with *Mycoplasma hyopneumoniae*

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Justification: *Mycoplasma hyopneumoniae* (M. *hyopneumoniae)*, the causative agent of enzootic pneumonia, affects up to 80% of swine herds worldwide.[1] Antibodies are induced following M. *hyopneumoniae* infection and vaccination, however, the role of antibodies or cell mediated immunity in protecting from infection and disease is not clear.[2] Measuring antigen specific activity of lymphocytes from vaccinated or non-vaccinated pigs in addition to delayed type hypersensitivity (DTH) testing will clarify the cellular immune response to *M. hyopneumoniae*. In addition, whether T cells are transferred and if maternal antigen-specific lymphocytes possess effector ability in young pigs is unknown. By performing DTH tests in piglets, the presence and functional ability of colostral cells to respond to *M. hyopneumoniae* in otherwise naïve animals will be investigated. This study was conducted to evaluate passive transfer of maternal cellular immunity to *M hyopneumoniae* in piglets and the effect of maternal immunity on piglet response to vaccination.

Animals: Sows were randomly assigned to vaccinated (VS) and non-vaccinated (NVS) groups. Colostrum was collected from 5 sows per group at parturition; blood was collected from 20 non-cross fostered piglets per group at 0 and 24 hr. DTH testing was performed on 15 piglets per group at 4 days. **Lymphocyte Stimulation**: Colostral and peripheral lymphocytes were isolated by Ficoll density centrifugation and plated in duplicate. Cells were stimulated with *M. hyopneumoniae* antigen as described.[3] Antigen specific proliferation and IFN-γ production were analyzed by flow cytometry. **DTH testing:** Concentrated *M. hyopneumoniae* antigen was injected intradermally into the left inguinal area. Skin fold thickness was measured 24-36 hours later with calipers. PHA was used as a control.

Preliminary Results and Conclusions: *M. hyopneumoniae* specific DTH responses were evident only in offspring of vaccinated sows (Fig. 1). Since a DTH response predicates a secondary immune response, it can be concluded that the DTH resulted from responding maternal cells. It should be noted that all animals responded to the nonspecific mitogen PHA. The antigen specific DTH response was confirmed by in vitro proliferation (Fig. 2). Colostral lymphocytes from VS sows demonstrated *M. hyopneumoniae* specific proliferation and this response was mimicked in offspring of vaccinated sows. Antigen specific proliferation was not observed of lymphocytes from vaccinated sows or their offspring.

Figure 1

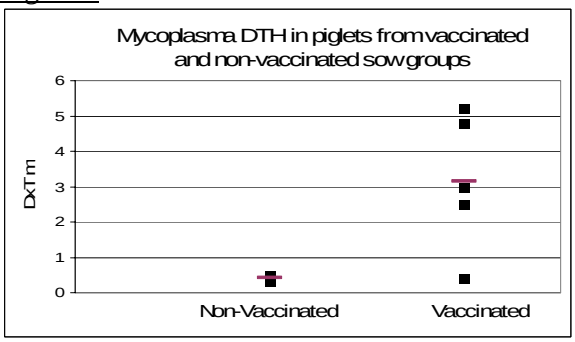
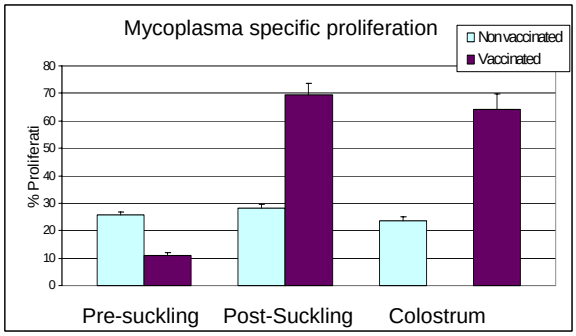


Figure 2



Variation is expressed as standard error.

A challenge study will be conducted to evaluate whether transferred colostral lymphocytes offer protection from disease.

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1. Ross et al, 1999, Diseases of Swine, 495-510
2. Hodgins et al, 2004, J Swine Health and Prod. 12:10-16
3. Thacker et al., 2000, Am J Vet Res. 61:1384-1389