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SDEC Partners Research Update

Project Update: Characterizing the colonization patterns of *Mycoplasma hyosynoviae* in pigs

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Background

- *M. hyosynoviae* is recognized as an arthritis inducer agent and in recent years it has been increasingly associated with lameness
- *M. hyosynoviae* may be present in joints without observation of clinical illness and pigs can recover with no further consequences
- Information describing the epidemiology of *M. hyosynoviae* is sparse and conditions for systemic spread are not fully understood

Objective

To characterize the colonization pattern of *Mycoplasma hyosynoviae* in a cohort of pigs and to evaluate its association with lameness

Material and methods

- A sow farm and a wean-to-finish barn from a production system with lameness history were enrolled in this study
- Sixty (60) pigs from 29 sows were randomly selected and individually identified at 3 days of age
- Tonsillar swabs were collected from dams of various parities and from piglets at 1 and 3 weeks post farrowing
- At weaning, pigs were randomly distributed in pens at the wean-to-finish barn along with other pigs of the same origin
- Tonsillar swab collection and individual lameness score (0 to 4 scale; Nielsen et al., 2001) were performed in all study pigs at weeks 5, 7, 10, 13, 16, 19 and 22 of age
- Oral fluids and pen based lameness scores were collected/measured on the same weeks when individual samplings were performed
- Tonsillar swabs and oral fluid samples were tested by species specific *M. hyosynoviae* real time (RT)-PCR
- Study pigs that died or were euthanized had hind legs collected at necropsy and submitted to the UMN VDL for *M. hyosynoviae* detection and histopathology evaluation. Joint fluid samples were also tested for detection of *Erysipelothrix rhusiopathiae*, *Haemophilus parasuis* and *M. hyorhinis*.



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Results

- ⇒ At the sow farm, 55% of sows tested positive for *M. hyosynoviae* in tonsillar swabs at week 1, and 48.3% at week 3 post-farrowing. No piglets tested positive for *M. hyosynoviae* at weeks 1 and 3 (Fig. 1). Thirty five percent of sows tested positive on both weeks, 21% of sows tested positive on week 1 only, and 14% on week 2 only. No association between detection of *M. hyosynoviae* and parity was observed.
- ⇒ At the wean-to-finish barn, onset of *M. hyosynoviae* spread was observed at week 10 with approximately 50% of pigs testing positive in tonsillar swabs and more than 70% of pens detected positive in oral fluids. These results were significantly higher than in week 7 ($p < 0.05$) (Fig. 2). However, no association was observed between lameness and positive detection of *M. hyosynoviae* in tonsillar swabs or oral fluids at any week of sampling.
- ⇒ There was no evidence of gross or microscopic lesions in joint samples, although *M. hyosynoviae* genetic material could be detected. In joint fluid samples there was no detection of *Erysipelothrix rhusipathiae*, *Haemophilus parvus* or *M. hyorhinis* by PCR.

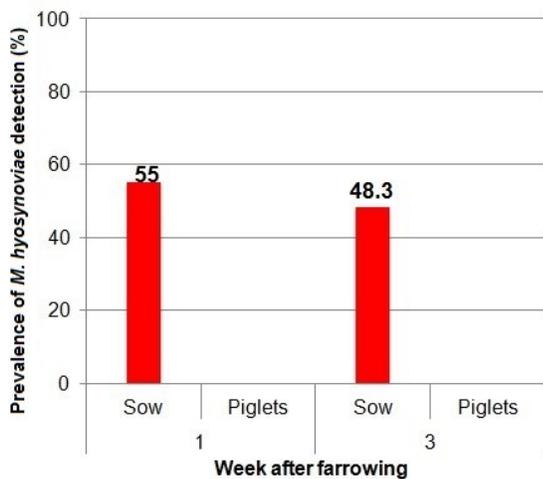


Figure 1. Prevalence of *M. hyosynoviae* real time PCR detection in sow and piglet tonsillar swabs at 1 and 3 weeks post-farrowing.

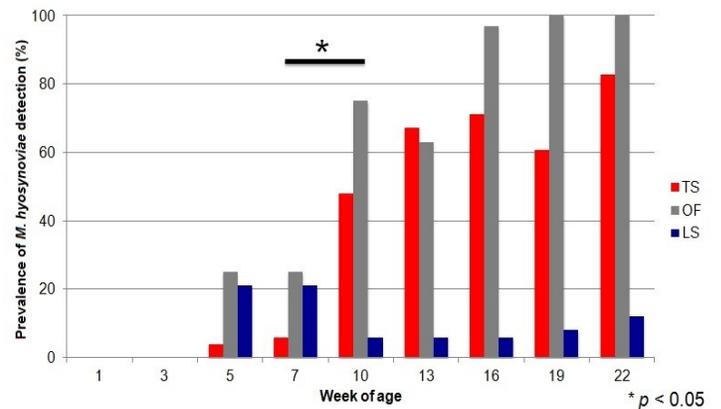


Figure 2. Prevalence of *M. hyosynoviae* real time PCR detection in tonsillar swabs and oral fluids, and prevalence of lameness score (1 or greater) in piglets 1 - 22 weeks of age. Red bars represent tonsillar swabs (TS), grey bars represent oral fluids (OF) and blue bars represent lameness (LS).

Conclusions

- Approximately 50% of dams were colonized with *M. hyosynoviae* during the lactation period, yet no positive detection was observed in piglets before weaning.
- Week 10 of age was identified as the onset of *M. hyosynoviae* spread at the wean-to-finish barn.
- The observed lameness at the wean-to-finish barn was lenient and weakly associated with positive detection of *M. hyosynoviae* in tonsillar swabs and oral fluids.
- *M. hyosynoviae* was detected in joint fluids even though there were no lesions, and there were no other major bacterial pathogens detected.