



UNIVERSITY OF MINNESOTA

Swine Disease Eradication Center

SDEC Partners Research Update

Project Update: Intra-farm risk factors for *Mycoplasma hyopneumoniae* colonization at weaning age

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Background

- *Mycoplasma hyopneumoniae* causes chronic respiratory disease in swine and results in significant economic losses in production systems.
- Colonization of piglets can occur as early as the first week of age, with a suggested sow-to-piglet source of transmission during the lactation period.
- Studies have observed a correlation between the proportion of colonized piglets at weaning and the probability of *M. hyopneumoniae* in growing-finishing groups. However, variability in colonization observed in weaning groups is still unclear.
- Assessing intra-farm risks factors for *M. hyopneumoniae* during the lactation period could provide further insight on the colonization variability in different weaning groups.

Objective

Evaluate intra-farm risk factors for *M. hyopneumoniae* colonization at weaning age in terms of dam's PCR status, piglet serological status, and local climatic conditions.

Methods

- Three farrow-to-wean farms were used in the study that fit the following inclusion criteria: (1) nursery/finisher pigs originating from these farms exhibited *M. hyopneumoniae* clinical signs, (2) herd size greater than 2000 sows, and (3) no medication or vaccination against *M. hyopneumoniae* administered to lactating sows or piglets prior to sampling.
- Sampling events for all farms occurred during a nine month period. During this period several groups of piglets and dams were sampled to assess the prevalence of *M. hyopneumoniae* by PCR at weaning.
- Blood samples were collected and tested by ELISA for *M. hyopneumoniae* antibodies.
- Climatologic data was also collected and analyzed from portable weather stations at each farm.



Results

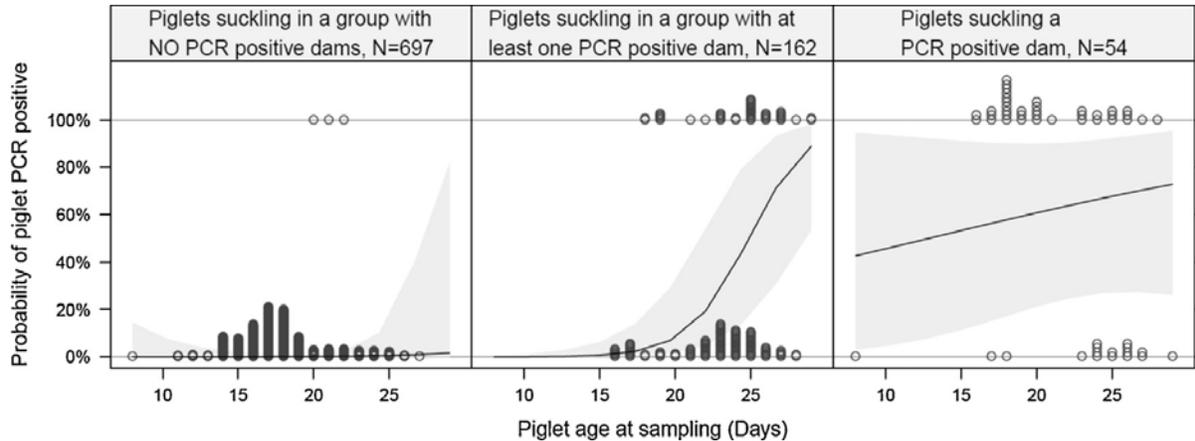


Fig. 1 . Piglet probability of being positive to *M. hyopneumoniae* PCR given the dam PCR status. Piglet probability of being positive by PCR in nasal swabs at weaning age and its CI is presented in each panel based on dam PCR status. Each circle represents one piglet. 0%: PCR negative piglets. 100%: PCR positive piglets. Left panel: Piglet PCR status when no dam was detected PCR positive in the sampling event. Center panel: Piglet PCR status when at least one dam in the group was PCR

- The estimated odds ratio for a piglet being PCR positive at weaning when another dam in the room was positive vs. no dams positive was 37.5 (95% CI: 1.45, 968) and for piglets' dam positive vs. another dam positive, it was 31.2 (95% CI: 3.83, 201) (Fig 1).
- Age was only significant when another dam in the group was positive, but not the piglet's dam; for each day increase in age, the odds ratio was 1.65 (95% CI: 1.36, 1.99). For piglets' whose dam was positive, the odds also increased with age, but were not statistically significant with an odds ratio of 1.06 (95% CI: 0.89, 1.28) (Fig 1).
- The climatic factors also analyzed in the study (humidity, radiation, wind speed and direction and outside temperature) had no significant effect on the level of *M. hyopneumoniae* colonization in piglets at weaning age ($p > 0.05$).

Conclusions

- Dam *M. hyopneumoniae* PCR status, piglet weaning age, and their interaction, were found to have a statistically significant effect on piglets being PCR positive at weaning age ($P < 0.001$ for all). Dam parity, cross-fostering, and piglet gender and weight were not statistically significant ($p > 0.005$).
- Dam PCR status at lactation had a strong effect on piglet nose colonization at weaning age. Moreover, the probability of a piglet to be colonized increased with age in weaning groups where at least one dam was detected as positive to *M. hyopneumoniae*.

Implications

- Identifying risk factors for colonization at weaning helps to better understand the epidemiology of *M. hyopneumoniae* and to design control strategies for infections.
- Continued research on the role of sow-to-piglet colonization during lactation will be of importance to further mitigate its economic impact on the industry.