

Sponsors

University of Minnesota

College of Veterinary Medicine

College of Agricultural, Food and Environmental Sciences

Extension Service

Swine Center

Evaluation of the Variability of *Mycoplasma hyopneumoniae* Circulating Antibodies in an Endemically Infected Non-Vaccinated Sow Herd and Subsequent Passive Maternal Antibodies in Piglets as Detected by Tween 20 ELISA

Jeff Blythe¹, Tamara Boettcher², Dave Striegel³, Ron White⁴

¹ Orange City Veterinary Clinic, ² Iowa State University, ³ Sac City Veterinary Clinic,

⁴ Fort Dodge Animal Health

Introduction *Mycoplasma pneumoniae* of swine (MPS) is one of the most important causes of disease-related losses in swine production.¹ MPS which occurs in all major hog-producing regions of the world, has been shown to reduce growth performance, increase feed conversion, and add to variability in body weight.

Recent trends of adapting newer management techniques such as medicated early weaning (MEW)², all-in, all-out (AI-AO)³, rearing and segregated early weaning (SEW)⁴, the disease was thought to be on the decrease and possibly eliminated from some herds. In actuality, *Mycoplasma hyopneumoniae* (Mhp) has become a major etiological agent in the porcine respiratory disease complex (PRDC), observed all too frequently in commercial production systems. Thus the need for use of serology, and strategic vaccination programs coordinated with proper use of SEW technology are necessary for controlling Mhp and related diseases.

The persistence of passively acquired antibodies have been shown to linger from 14 to 72 days dependent upon the dose of maternal antibody received from the sow. The half life of the Mhp passive antibodies is estimated to be 15.8 days.⁵ It has been demonstrated that maternal antibodies may interfere with active immunization for 2 to 8 weeks. By hyper-immunizing the sow herd through exposure or vaccination and / or mis-timing the vaccination of piglets, producers may be contributing to the problem of sub-populations of naive animals.

General information An observational study was designed to : 1. Evaluate the naturally occurring level of Mhp circulating antibodies in a non-vaccinated breeding herd pre-farrow as measured by ELISA. 2. To investigate the correlation of pre-farrow sow titers to levels of passive antibodies in piglets as measured by ELISA. 3. To evaluate the existence of naive subpopulations of sows and piglets for Mhp as detected by ELISA.

Study Thirty sows consisting of six parity 1, 2, 3, 4, and 5 or greater were randomly selected for the study. All sows were 0-14 days pre-farrow at the time of blood testing. The animal with the lowest and highest Mhp titer from each parity group was selected for participation in the study (range neg.- 1.3).. Serum from each sow was analyzed for Mhp, PRRS, PRCV, PRCV, App, SIV, and PRV.

The piglets from each sow were divided into three subgroups within the low and high titer group. The subgroups consisted of non-vaccinated controls, early vaccination, and late vaccination. Blood samples were drawn on days 14, 28, 42, 56, 86, 116, and 146 and analyzed for Mhp. Samples from days 28 and 86 were also evaluated for PRRS, SIV, PRCV, and App. All samples were allowed to clot and were centrifuged. All samples were frozen until completion of the study. Serum samples for each pig were tested on the same day utilizing a Tween 20 ELISA.

Implications The level of Mhp circulating antibody in the breeding herd is variable within

each parity as well as between parities. There does not appear to be a direct correlation of level of pre-farrow Mhp circulating antibodies to the level of circulating antibodies in the piglet. The results indicate that sub-populations of negative breeding animals exist in a herd. However, it is critical to remember that negative does not mean the animal is naive.

Summary Serology for Mhp provides some useful information that may allow farms to determine when maternal antibody is depleted. However, sow antibody levels pre-farrow are not a direct correlation to when it will occur.

References: 1. Ross, R.F. Mycoplasmal disease. Leman, A.S., Straw, B.E., Mengling, W.L., D'Allaie, S.D., Taylor, D.J., et al (eds):

Diseases of Swine, 7th edition, Ames, IA., Iowa State University Press, 1992, 537-551. 2. Alexander, T.J.L., Thornton, K., Boon, G., Lysons, R.J., and Gush, A.F. (1980) Medicated early weaning to obtain pigs free from pathogens endemic in the herd of origin. *Veterinary Record*, 106, 114-119. 3. Clark, L.K., Scheidt, A.B., and Armstrong, C.H., Knox, K.E., and Mayrose, V.B., (1991) The effect of all-in/all-out management on pigs from a herd enzootic pneumonia. *Veterinary Medicine*, 86, 946-951. 4. Clark, L.K., et al, (1994). An evaluation of the components of medicated early weaning. *Swine Health and Production*, 2 (3), 5-11. 5. Morris, C. et al, *Prev Vet Med*, 1994; 21:29-41. Iowa State University Newsletter #408-V757, November 1994.