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AN ASSESSMENT OF PRRSV CONCENTRATION AND SHEDDING PATTERNS IN 25 KG AND 120 KG PIGS

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Introduction and Objectives

Several studies have investigated the possibility of porcine reproductive and respiratory syndrome virus (PRRSV) transmission through aerosols (1), but little data are available regarding the concentration and shedding patterns of PRRSV by individual animals via the aerosol route.

Therefore, the objectives of this study are to:

1). Collect, calculate and describe the shedding patterns of PRRSV in individual pig aerosols using 25-kg and 120-kg pigs

2). Create a dual infection using PRRSV and *Mycoplasma hyopneumoniae* to assess the concentration and shedding patterns of PRRSV in 25-kg and 120-kg pigs when paired with a secondary bacterial infection.

Materials and Methods

Three groups of PRRSV-naïve pig were used in this experiment: 6 120-kg pigs, 6 25-kg pigs and 5 25-kg pigs. Of each group, one pig was randomly assigned into a negative control group and housed in a separate room at the University of Minnesota isolation barn.

Five of the 6 120-kg pigs and 5/6 25-kg pigs were intranasally inoculated with 2 ml of a field isolate of PRRSV (MN 30-100) at a concentration of $2x10^4$ $TCID_{50}$ on day 0 (2). Every other day from day 1 to day 21 PI, all pigs in the experimental group were anesthetized using 8.0 mg/kg of telazol and 1.5 mg/kg of xylazine IM. Individual aerosols were collected using a tight-fitting conical mask. The mask was attached to a plastic bag and a breathing valve was manually operated to allow for the intake of fresh air and to minimize re-breathing of expelled air. The bag was periodically flushed with sterile saline to collect aerosolized particles. A standardized count of 1000 breaths was applied to all samples. Blood samples and nasal and oropharyngeal swabs were also collected on each sample day.

Four of the 5 25-kg pigs were anesthetized using 8.0 mg/kg telazol and 1.5 mg/kg xylazine and inoculated intratrachially with 3 ml of *Mycoplasma hyopneumoniae* 232 obtained from Iowa State University. Twenty-one days post-*Mycoplasma* infection, the four pigs were intranasally inoculated with 2 ml of a field isolate of PRRSV (MN 30-100) at a concentration of $2x10^4$ $TCID_{50}$ (2). All other sampling and collection methods remain the same as previously mentioned.

All samples were tested for PRRSV using TaqMan quantitative PCR. All pigs were necropsied at 21 days post-PRRSV infection and samples of lung, tonsil and selected lymph nodes were collected from each pig and tested for PRRSV RNA as described. The negative control pigs were tested on days 1,7,15 and 21 PI in the same manner.

Results and Discussion

This is the first attempt to evaluate the shedding patterns and concentrations of PRRSV present in individual pig aerosols and body fluids. Results from all studies indicate that concentrations of PRRSV RNA in the aerosols of individual 25-kg +/- *Mycoplasma hyopneumoniae* infected pigs and 120-kg pigs remained low (0.1-1.0 $TCID_{50}$/ml) despite considerable shedding of virus in all other body fluids. Frequency of shedding in aerosols varied in all trials. Preliminary data on the 25-kg PRRSV MN 30-100 and *Mycoplasma hyopneumoniae* infected pigs suggest that a secondary bacterial infection does not increase the concentration of PRRSV RNA excreted in aerosols. Trials involving 120-kg PRRSV MN 30-100 and *Mycoplasma hyopneumoniae* infected pigs are currently underway. Statistical analyses of all data are in process. Additional information will be presented at the Leman Conference.

References

1. Torremorell M, et al. 1997. Am J Vet Res 58: 828-832.

2. Bierk MD, et al. 2001. Vet Rec 148: 687-690.