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Aerosol transmission of PRRSV: Application to the field

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Due to the fact that manuscript preparation is underway, only an overview of the project and a brief summary of its results can be discussed at this time.

Introduction

Eradication of Porcine Reproductive and Respiratory Syndrome (PRRS) on an individual farm basis is possible. However, many farms have become re-infected following area spread of unrelated isolates of the PRRS virus (PRRSV). Aerosol transmission of PRRSV is thought to be a potential route of spread of the virus between farms. Therefore, the objective of this study was to develop a model of a swine production region that is endemically infected with PRRSV and to evaluate routes of transmission and protocols of biosecurity.

Materials and methods

This study incorporated four different facilities to represent four different farms in an endemically PRRSV infected region. The infected population was located in the middle of the region with the three other “farms” of different biosecurity levels; high (95% DOP @ 0.3 micron air filtration system, along with insect, fomite, personnel and transport protocols),¹ medium (matching protocols except for filtration) and low (no intervention), surrounding it at equal distances of 120 meters. The study ran for one year and had 26 replicates each of 2 weeks in duration. Approximately 1500 pigs were utilized. The infected population housed 300 age-staggered finishing pigs (continuous flow) and the high, medium and low facilities each housed 20 nursery pigs (all in-all out flow). PRRSV MN- 184, an isolate known to be shed and transmitted via aerosols was used to inoculate 100/300 pigs in the finisher on day 0 to simulate one of the four naïve farms becoming infected.² In the high, medium and low facilities, intensive monitoring protocols based on PCR testing were established to monitor the presence or absence of PRRSV on personnel, fomites, insects, trucks, facilities

and aerosols that enter the farm and buildings. Serum was collected from all pigs in the high, medium and low facilities on the 5 designated sampling days per replicate to monitor the PRRSV status of each population. Finally, to assess the potential role of season on area spread, daily weather data were collected.

Results and discussion

The study was completed on May 25, 2007 and data analysis is currently in progress. Aerosol, insect and fomite transmission of PRRSV were observed to be routes of spread in this model. PRRSV-contaminated aerosols and insects were recovered up to 120 meters from the source population. Furthermore, the use of air filtration eliminated the risk of aerosol transmission. In contrast, airborne spread and infection of susceptible pig populations was observed in non-filtered facilities.

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