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Evaluation of potential sources of PRRS virus infection in negative herds

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Introduction

Traditionally, replacement animals and semen have been considered to be the most important source for virus introduction. However, new research directed at evaluating other potential sources of infection has shown that transport, fomites and insects can also play a significant role. The objective of this study was to provide information on potential sources for PRRSV (porcine reproductive and respiratory syndrome virus) breaks in negative systems where the source of replacement animals and semen is negative and to illustrate the ease with which lateral infections occur.

Materials and Methods

Thirty-five PRRSV outbreaks were investigated during a four-year period. Herds under study were either commercial herds, boar studs or herds supplying breeding stock animals, which were located in 7 states of the USA. Thirty-two investigations had been completed at the time of writing this abstract. Of the outbreaks, twenty-one occurred in site 1 (sow) herds, six in finishing sites (but not in the sow herds supplying the pigs), and eight in boar studs. Nineteen of the herds had been stocked PRRSV negative and fourteen had undergone a successful PRRSV elimination project. Five herds had two separate outbreaks caused by newly identified viruses each time.

Upon suspicion of an infection, blood samples were collected and tested by serology and PCR. Positive PCR samples were further characterized by sequencing the ORF-5 region. Sequences were compared to those available from neighboring systems, and to historical isolates kept in the systems' databanks or a diagnostic laboratory. Attempts were made to determine whether the newly identified sequences had been previously identified, and whether an epidemiological relationship existed between the infected systems and the suspected sources of infection. Attempts were made to determine the source of "lateral" infection (those not caused by either introduced pigs or semen) and to determine whether the infection could be attributed to area spread. Area spread was considered to have been possible when there was proximity to other herds with closely related viral sequences (neighboring herds or

within production systems), or when internal short distance pig movements could also be involved. External transport was also evaluated, with special attention to removal of cull sows and slaughter pigs. Other potential sources of infection included mechanical vectors, insects, people, and suspected biosecurity breaches. Month of the year when infection occurred was also recorded.

Results

Sixty-five percent (65%) of new PRRSV sequences were considered genetically closely related to other sequences that existed in the database. From all cases investigated, 83% were considered lateral (non-pig and non-semen) and only 17% were attributed to pigs or semen (3% were due to pigs and 14% to semen).

When studying lateral infections, area spread was considered to have happened in 52% of the cases. Transport due to the removal of cull sows, boars or slaughter and feeder pigs, was strongly suspected in 17% of the lateral infections.

Therefore, location was considered the most important risk factor for lateral infections to occur, followed by transport. Infection caused by insects was considered likely in only 1 case. Breaches in biosecurity due to lack of personnel compliance was strongly suspected in 2 cases, but this may well be underestimated. In 7 instances an infection source could not be determined, or the investigations were still in progress. In addition, the majority of the lateral infections (68%) occurred during the cold season (Oct – March).

Discussion

This study provides insight into the investigation of PRRSV breaks in negative herds. In systems where replacement animals and semen are negative, lateral infections are more evident and as this strongly shows, they represent the majority of the infections we see currently in the USA.

Location of the herds, transport procedures and the implementation of biosecurity measures are critical in preventing PRRSV lateral infections. In addition, the fact that the majority of the infections happen in cold season illustrates the easiness of this virus to survive in cold and wet conditions.