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Displacement of PRRS wild-type virus from a large nursery production system

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Introduction and Objectives

Porcine Reproductive and Respiratory Syndrome virus (PRRSv) has a wide impact on breeding herd and growing pig performance.[1] Vaccination has been demonstrated to be a safe and efficacious tool in the reduction of disease associated with PRRSV.[2] In addition, the creation of a non-infectious population has been achieved following the protocol of mass vaccination and unidirectional pig flow.[3] The objective of this study was to displace wild-type PRRSv from the nursery complexes of a large production system using modified live PRRS vaccine.

Materials and Methods

A large multi-site pig production system experienced disease attributable to PRRSv in the sow herds, nurseries and finishers. Four different dendogram PRRS virus clusters had been detected. Control of PRRS virus began in the first quarter of 2009, including sow herd closure and mass vaccination (Ingelvac® PRRS MLV, Boehringer Ingelheim Vetmedica, Inc., St Joseph, MO), two times four weeks apart. In addition, following weaning all pigs entering the nursery complexes were vaccinated twice, four weeks apart with the first dose applied two weeks post-weaning, as defined by the growing pig vaccination protocol. The nursery system consists of five different sites with a total capacity of 70,000 spaces. All nurseries receive pigs from multiple sources and commingle at the site level utilizing continuous flow, filling by room, and when possible, by building.

Sampling protocol and tests

Blood samples from 20 pigs (95% confidence of detection with an estimated prevalence of 15%)[4], targeting hospital pens, were taken two months after implementation of vaccination to the growing pigs and continued bi-monthly for two periods, then monthly starting the fall of 2009. PCR testing was conducted on pools of five sera. Positive samples were characterized via genomic ORF5 sequence and a dendogram created.

Additional sampling

The nursery through which replacement females flow (24,000 spaces) warranted more aggressive sampling to ensure the absence of wild-type PRRSv with greater confidence. Six pens were sampled using ropes for oral fluid PCR (90% confidence of detection with 2% prevalence)[5] and 18 blood samples were collected for serum PCR (approximately 95% confidence of detection with 15% estimated prevalence) were collected for every age group.

Results

Initial sequence results revealed the presence of two cluster related wild-type viruses in two different nurseries. Vaccine-like virus was detected in the rest of the nurseries. After 8 additional sampling periods in all nurseries, no evidence of wild-type virus could be detected. Furthermore, the additional testing detected only vaccine virus in the nursery that houses the replacement females.

Discussion and Conclusions

Based on rigorous sampling and diagnostic testing for over one year following implementation of the vaccination protocol, it appears that wild type PRRS virus isolates have been displaced from the population. Strategic use of modified live PRRS vaccine may play an important role in PRRS control and potentially elimination of wild-type PRRS virus in large production systems.

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