

Pig vaccination as an essential part of a comprehensive PRRS control program

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Introduction

Porcine reproductive and respiratory syndrome (PRRS) in growing pigs is estimated to cost \$5.60 - \$7.60 per pig sold.¹ Experimental studies have demonstrated that modified-live PRRS virus (PRRSv) vaccines stimulate a protective immune response against heterologous PRRSv challenge in growing pigs resulting in a significant reduction of PRRS-associated lung lesions, clinical disease, and a significant improvement in average daily weight gain.^{2,3,4} The present field study evaluated the impact of a modified-live PRRSv vaccine (Ingelvac[®] PRRS ATP, Boehringer Ingelheim Vetmedica, Inc., St Joseph, MO) for control of naturally occurring heterologous PRRSv infection in nursery pigs as part of a comprehensive PRRS management strategy which also included improvement in needle management, transportation and biosecurity procedures.

Materials and methods

The study was conducted in a large North American commercial swine production system utilizing three-site pig flow. The breeding herds have a mixed PRRS status including negative/naïve, positive-stable, and positive-unstable breeding herds. PRRS vaccination was not being utilized in the breeding herds; however live, site-specific PRRSv (serum) inoculation and temporary herd closure was utilized when breeding herds became unstable.

Weaned pigs from PRRS-positive (stable and unstable) breeding herds were flowed to PRRS-positive nurseries. PRRS infection and seroconversion consistently occurred in the mid-late nursery phase along with PRRS-associated disease and reduction in performance. Weaned pigs from PRRS-naïve/negative breeding herds were flowed to separate PRRS-negative nursery facilities. Performance at these sites met production targets. Pigs sourced from PRRS positive breeding herds and commingled into PRRS positive nursery flows often had mixed PRRS status upon entry to the nursery. Weaning groups periodically had PRRS PCR-positive piglets upon nursery entry, compromising the goal of scheduling vaccination at least 3-4 weeks prior to field

virus exposure to ensure adequate opportunity for onset of vaccinal immunity prior to such exposure. If pigs were vaccinated upon nursery entry with traditional needle technology, spread of field virus could have been inadvertently accelerated by use of field virus-contaminated multiple use needles⁵, further compromising the opportunity for onset of vaccinal immunity prior to field virus exposure. The decision was made to vaccinate pigs upon nursery entry with needle-less syringe technology to minimize the risk of accelerating the spread of field virus. This approach maximized the proportion of pigs provided the opportunity to develop a protective vaccinal immune response prior to natural exposure to field virus. Vaccination with a 2 ml dose of Ingelvac PRRS ATP was implemented beginning in February/March 2005 in 3-week old weaned pigs at entry to PRRS-positive nursery sites. No PRRS vaccination was used in piglets at the PRRS-negative nursery sites at that time.

Performance of PRRS vaccinated/PRRS-positive nursery sites was continuously monitored and compared to historical pre-PRRS vaccination performance at these same sites, and to the performance of PRRS-negative nursery sites to the end of the year 2005. Based upon the favorable 2005 vaccination results, the production system elected to vaccinate all nursery flows (including PRRS-negative flows) beginning in January 2006. This allowed commingling of flows, shorter nursery filling times, narrow age spreads within nurseries, and greater overall pig flow flexibility.

Sow site-specific weaned pig trailers were incorporated into the weaned pig transportation process, along with washing and thermal assisted drying to reduce PRRSv transmission during transportation. New standard operating procedures were written and implemented across all sow and nursery sites.

Results

Vaccination for PRRS at entry to PRRS-positive nurseries, along with the other described changes in management, reduced nursery mortality from > 9%

pre-vaccination to < 3% post-vaccination (Figure 1). Vaccinated PRRS-positive nursery sites performed equally to PRRS-negative nursery sites (Table 1). Improved post-vaccination nursery performance initially achieved in 2005 has been sustained through September 2007 (Table 2).

Conclusions

Vaccination with a modified-live PRRS virus vaccine prior to field virus exposure, in addition to improvements in needle management, transportation and biosecurity procedures, dramatically reduced mortality and improved performance of nursery pigs in PRRS-positive nurseries. Vaccinated pigs in PRRS-positive nurseries performed equally to unvaccinated pigs reared in PRRS-negative nurseries during 2005. Subsequent implementation of vaccination across all nursery flows in 2006; both PRRS-positive and PRRS-negative, has maintained targeted nursery performance through September 2007 while allowing commingling flows and adding valuable flexibility and functionality to nursery

pig flow management. Consistently inducing uniform population immunity among vaccinated groups of pigs is believed to be a key to the success of this comprehensive approach to PRRS control.

References

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Figure 1: PRRS positive nursery mortality pre- and post- vaccination.

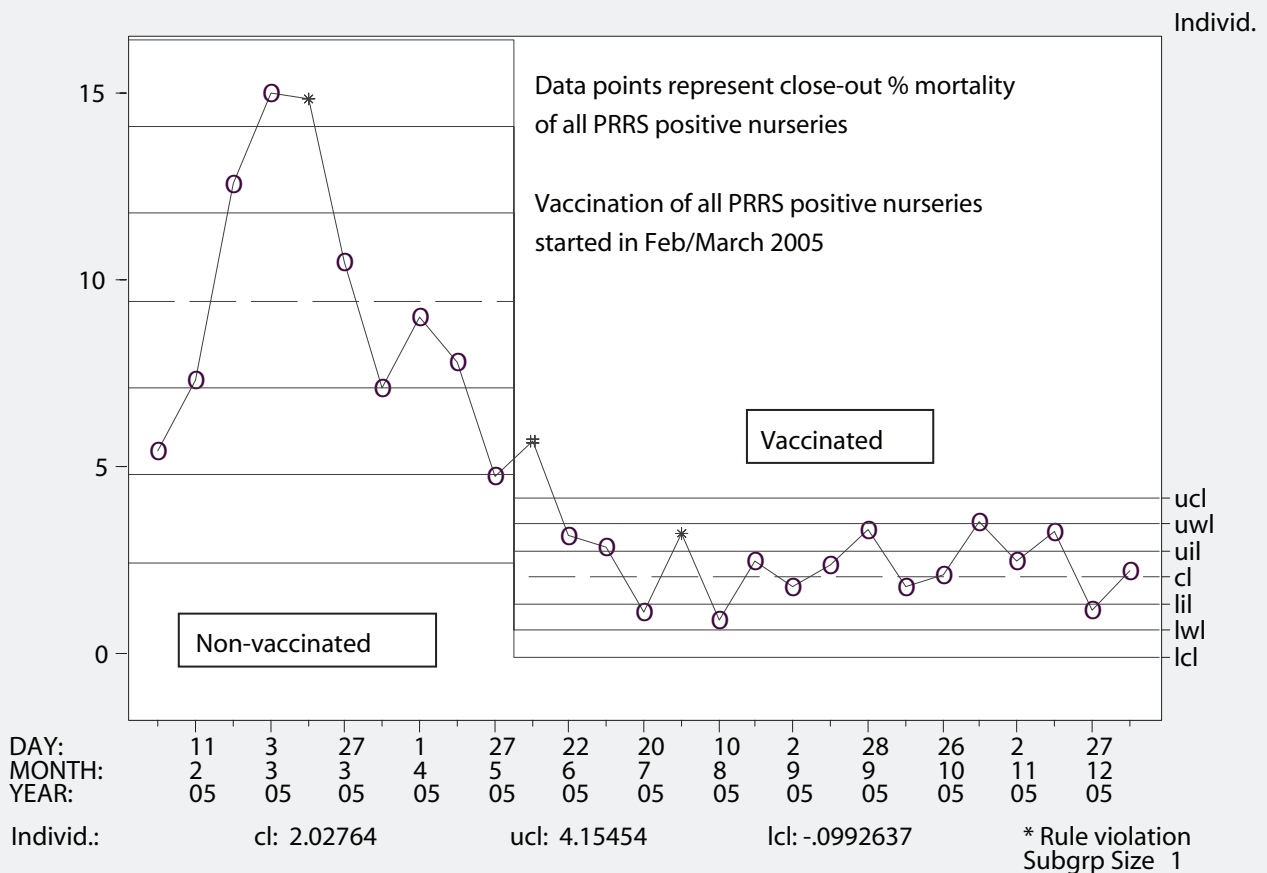


Table 1: Performance of PRRS positive vaccinated nurseries versus PRRS negative non-vaccinated nurseries (annualized 2005 data).

	Total pigs out	Mortality, %	ADG, lbs	FE
PRRS positive – vaccinated	331,462	2.65	0.89	1.56
PRRS negative – non-vaccinated	337,810	3.04	0.88	1.62

Table 2: Sustained performance of all nursery flows, both PRRS positive and negative, all vaccinated (January 2006 – September 2007 inclusive).

	Total pigs out	Mortality, %	ADG, lbs	FE
All vaccinated flows	904,143	1.96	0.85	1.66



