TECHNICAL BRIEF

PRRSGard®

Evaluation of the response to a unique 1.0-mL MLV PRRS vaccine

Porcine reproductive and respiratory syndrome (PRRS) costs the US pork industry $664 million annually ($1.8 million/day) in production-related losses.[1] Modified-live virus vaccines remain a major tool in reducing clinical signs of disease and the associated economic losses.

The vaccine associated performance drag, characterization of the immune response and transmission were evaluated for a unique 1.0-mL modified-live virus (MLV) PRRS vaccine in growing pigs vaccinated at 21 days of age.

Experiment Design

Weaned pigs approximately 21 days old and known to be PRRS naïve were blocked by sow farm source and randomly assigned to three different trials.

- **Trial 1:** Twenty-eight total pens were selected. Fourteen pens were vaccinated with 1.0-mL PRRSGard®, 14 pens were placebo-vaccinated with vaccine diluent. All pigs were individually weighed at weaning and 48 days post-vaccination. Average daily gain (ADG) and survivability were estimated.
- **Trial 2:** One pen containing 24 pigs was vaccinated with 1.0-mL PRRSGard®. Serum samples were collected on day 0, 7, 14, 21, 28, 35 and 41 days post vaccination. Samples were tested by a PRRSGard® specific reverse transcription polymerase chain reaction (RT-PCR) and commercial enzyme-linked immunosorbent assay (ELISA).
- **Trial 3:** Six pens containing 144 pigs total were selected and individuals were assigned to vaccinate or placebo-vaccinate control groups. Each pen was composed of 50% vaccinated and 50% control pigs. The vaccinated group received 1.0-mL PRRSGard® and the placebo-vaccinated group received vaccine diluent. Serum samples were collected on day 0 and day 41 and tested by a PRRSGard® specific RT-PCR and commercial ELISA.

Results

Trial 1: There was not enough evidence of difference in average daily weight gain or survivability between vaccinated and non-vaccinated pigs (Table 1).

Table 1
PRRSGard® Performance Summary

Group	No. Pigs	ADG (Lb./Day)	95% Confidence Interval	Survivability %	95% Confidence Interval
PRRSGard®	345	1.17	1.19-1.19	96.70	94.10-98.10
Control	339	1.19	1.17-1.21	96.50	93.80-98.00
Difference	—	0.02	—	0.20	—
P-Value	—	0.14	—	0.87	—

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Trial 2: Viremia was detected in sera of 19/25, 22/25, 19/23, 21/23, 20/23 and 19/23 at 7, 14, 21, 28, 35, and 41 days post-vaccination, respectively. The mean RT-PCR cycle threshold (ct) values over time are illustrated in Figure 1. As expected, ELISA results were negative until the second sampling event (14 days post-vaccination) with a marked increase in the percentage of positives in subsequent sampling events. The ELISA results are summarized in Figure 2.

Figure 2
PRRSGard® Viremia Over Time

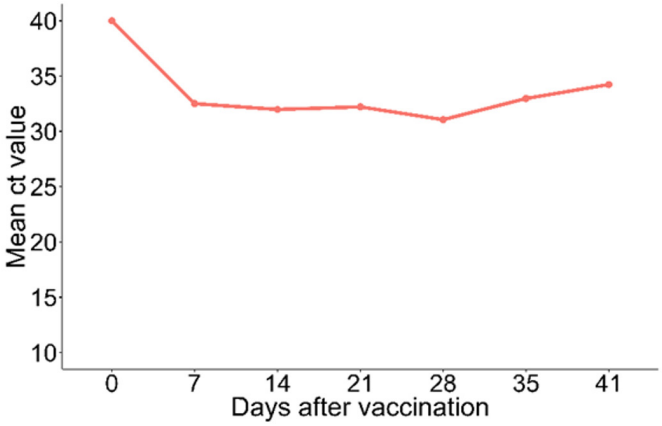
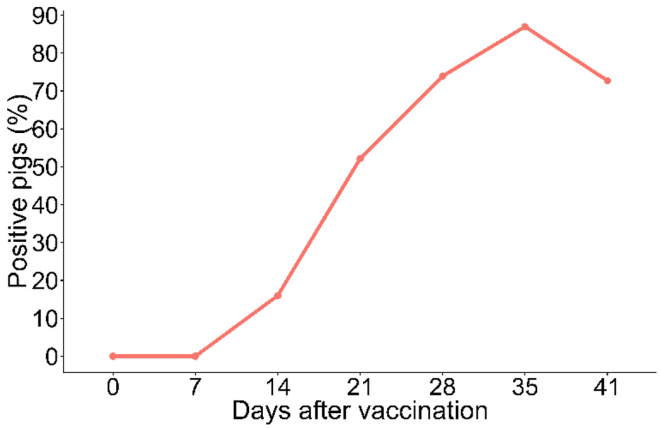


Figure 3
ELISA Positive Pigs Over Time



Trial 3: At 41 days post-vaccination, 57/71 (80%) of the non-vaccinated pigs tested PRRSGard® RT-PCR negative. Only one of the non-vaccinated pigs tested ELISA-positive with an S/P ratio of 0.454 (Table 2).

Table 2
PRRSGard® Spread Over Time

	Vaccinated Pigs	Commingled Controls	Duration (Weeks)	Controls RT-PCR Negative	% RT-PCR Negative	ELISA Negative	% ELISA Negative
Trial 3	72	72	6	57/71	80%	70/71	99%

Conclusion

PRRSGard® did not result in reduction of performance as measured by average daily weight gain and survivability when compared to placebo-vaccinated pigs. Additionally, PRRSGard® induced high levels of replication seven days post-vaccination and a subsequent immune response two weeks later. Finally, PRRSGard® spreads slowly within naïve populations with direct contact and following vaccination of 50% of the animals.

Data on file.

1. Holtkamp D. et al. Assessment of the economic impact of porcine reproductive and respiratory syndrome virus on the United States pork producers. Swine Health and Production. 2013. 21:72-84

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