IMPACTS OF QUARTERLY SOW MASS VACCINATION AGAINST PORCINE REPRODUCTIVE AND RESPIRATORY SYNDROME VIRUS TYPE 1 IN TWO HERDS

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Background

Modified live virus (MLV) vaccines may persist in animals after vaccination or even revert to virulence. Furthermore, vaccination of pregnant and lactating sows with MLV vaccine entails a risk of vertical or horizontal transmission to the fetus and/or piglets and sows. Lastly, repeated exposure to the same antigen may lead to an "anergy state", where lymphocytes do not react to a foreign substance or if immunoglobulins have reduced affinity maturation. The potential risks of SMV have therefore raised concerns among veterinarians and scientists.

Objective

The aim of this study was to investigate the impact of quarterly SMV on PRRSV viremia and antibody levels in sows before and after sow mass vaccination (SMV).

Materials and Methods

The study was performed as an observational prospective cohort of 120 sows in each of two commercial herds in a paired design. Blood samples, oral fluid and/or udder wipes were taken from sows and nursery pigs before and after SMV with a commercially available PRRSV-1 MLV vaccine . Samples were tested for PRRSV-1 RNA by RT-PCR, and the level of antibodies was measured by two different assays. Serum negative in both assays were tested by virus neutralisation test (VNT). Virus positive samples were sequenced.

Results

PRRS virus was not detected in the sow herds, but the vaccine virus strain was detected in the nursery pigs. The prevalence of seronegative sows was 6-15% before vaccination and 1-4% after vaccination. Four sows tested negative for PRRSV-1 antibodies in both assays after vaccination, and three of these also tested negative for PRRSV-1 antibodies before SMV. One of the four seronegative samples after vaccination tested positive in VNT. The detected PRRSV-1 shared a high level (99.67%) of genetic similarity in ORF5 to the Porcilis PRRS vaccine strain 'DV'.

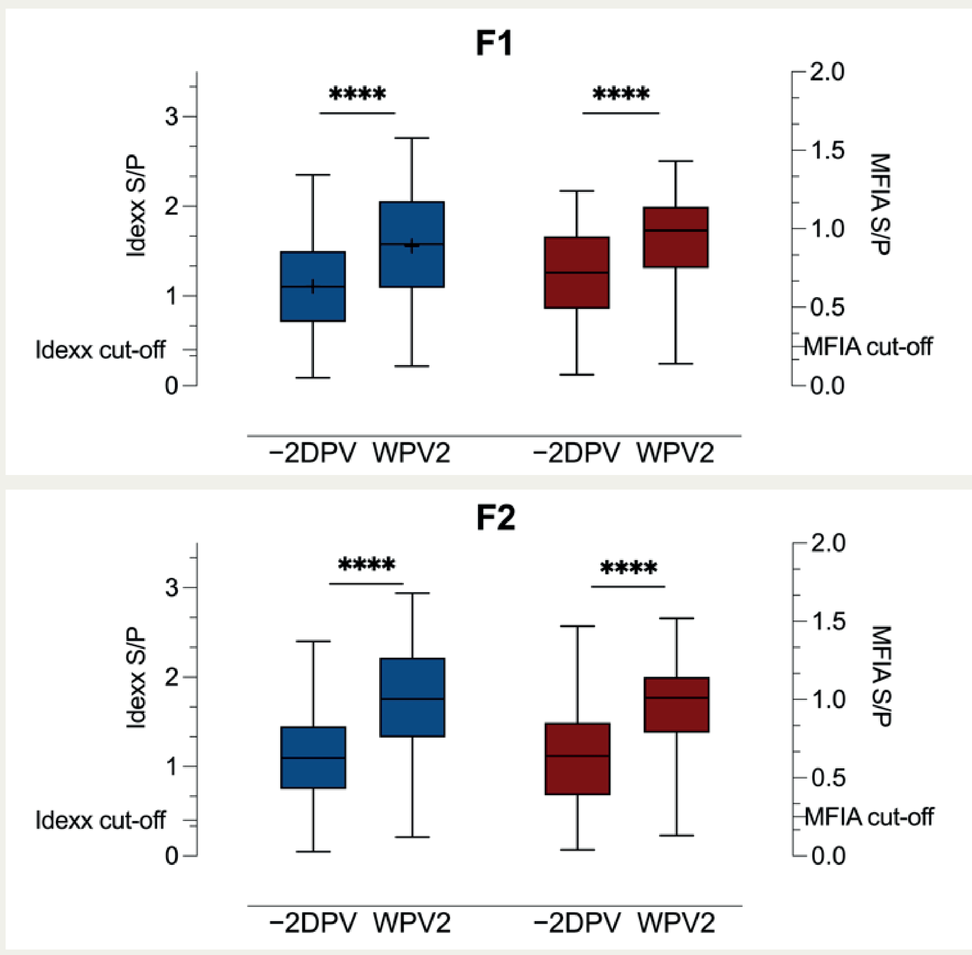

FIGURE 1 Boxplots (min., MED., max. and quartiles of 25, 50, 75) showing S/P results of Idexx ELISA (blue) on the first y-axis and MFIA (red) on the second y-axis for farms 1 (F1) and 2 (F2), before (−2DPV) and after (WPV2) SMV. "+" indicates mean. **** is $p < 0.0001$ as result of the comparison of results −2DPV and WPV2for each analysis.

Discussion

One and four percent of the sows were antibody negative after vaccination despite repeated prior vaccinations. The explanation for this could be that they were mistakenly not vaccinated, false-negative test results or that they failed to respond to vaccination. The impact of these antibody negative animals for the control of PRRSV in herds remain speculative, but the presence of PRRS virus positive nursery pigs indicate that SMV did not result in virus-free nursery units. However, this may in part be explained by lack of compliance with basic rules for effective PRRSV control in the two herds.

RT-PCR				
Time	**Herd**	***n* of stables/ approx pigs tested**	***n* of stables with positive samples**	
			PRRSV-1	PRRSV-2
-2DPV	N1 N2	10/2000 10/2000	1 0	2 1
WPV2	N1 N2	13/2600 8/1600	0 0	0 1
WPV12	N1 N2	13/2600 5/1000	0 2	4 0

CONCLUSION

The results of this study revealed that to achieve the full advantage of PRRSV sow mass vaccination, i.e., to obtain PRRS virus-free nursery units, compliance towards the basic rules for effective PRRSV control is required.

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