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Strain-specific serological response after simultaneous vaccination with PRRS MLV against PRRSV types 1 and 2: Impact on interpretation of surveillance data

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Both type 1 (subtype 1) and type 2 PRRSV are currently circulating in Denmark. In some double infected herds, the pigs are simultaneously vaccinated with PRRSV modified live vaccines (MLV) against both genotypes. There is a lack of data on the impact on serological response following simultaneous administration of PRRSV MLVs against both type 1 and type 2 PRRSV. The objective of this experimental study was to compare the level of serological response of single-vaccinated pigs with responses of double-vaccinated pigs and to compare the serological response of the two vaccination strategies following challenge with homologous and heterologous virus strains.
Sixty-six four-week-old PRRSV-negative pigs were included in the study. The pigs were purchased from a specific pathogen-free herd and tested free of a range of pathogens including PRRSV by serology at the beginning and end of the study. The pigs were housed at the experimental animal facilities at the National Veterinary Institute under appropriate biosecurity conditions. On arrival (week 0), the pigs were randomly distributed into four groups (1-4). Each group was housed in a separate room. One week after arrival (week 1), the pigs in groups 1-3 were vaccinated with either Porcilis® PRRS VET or Ingelvac® PRRS VET, or both. The last group was kept as a non-vaccinated control. Nine weeks after vaccination, all pigs were divided into three new groups and were then challenged with PRRSV type 1 (DK strain 18794), PRRSV type 2 (DK strain 19407b) or PRRSV atypical strain (strain BOR59) by the intranasal route. Blood samples were collected daily from all pigs during the first week after vaccination and challenge. In the remaining periods, samples were taken once a week from all pigs. The level of antibodies against PRRS virus was measured by type-specific ELISA and IPMA.

All pigs developed antibodies against PRRSV two to three weeks after vaccination as measured by ELISA and IPMA. The onset and level of antibodies developing in response to single and double vaccination were equal. Similarly, the development of type-specific antibodies in pigs vaccinated with the type 2 vaccine was comparable to that in pigs vaccinated with the type 1 vaccine. The profile of antibody responses following challenge with the atypical PRRSV type 1 strain BOR59 was identical to the responses of the animals challenged with the subtype 1 strain. These results indicated that simultaneously vaccination with two different PRRSV vaccines is feasible, although they also revealed
that standard serological assays cannot distinguish between infections with the different type 1 subtypes. This emphasises the fact that viral detection and genomic characterisation are required for adequate surveillance of circulating PRRSV type 1 strains in Europe.

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