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Ability of ELISAs to detect antibodies against porcine respiratory and reproductive syndrome virus in serum of pigs after inactivated vaccination and subsequent challenge

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Abstract

Background: In this study, six enzyme-linked immunosorbent assays (ELISA), intended for routine porcine reproductive and respiratory syndrome virus (PRRSV) herd monitoring, are tested for their ability to detect PRRSV specific antibodies in the serum of pigs after vaccination with an inactivated PRRSV type 1 vaccine and subsequent infection with a highly pathogenic (HP) PRRSV field strain. For this reason, ten piglets (group V) from a PRRSV negative herd were vaccinated twice at the age of 2 and 4 weeks with an inactivated PRRSV vaccine. Ten additional piglets (group N) from the same herd remained unvaccinated. Three weeks after second vaccination, each of the piglets received an intradermal application of an HP PRRSV field strain. Serum samples were taken before first vaccination as well as before and 3, 7, 10 and 14 days after HP PRRSV application. All serum samples were tested for PRRSV RNA by reverse transcriptase quantitative polymerase chain reaction (RT-qPCR) as well as for PRRSV antibodies with all six study ELISAs.

Results: At the beginning of the study (before vaccination), all of the piglets were PRRSV antibody negative with all study ELISAs. They also tested negative for PRRSV RNA measured by RT-qPCR. From day 3 after HP PRRSV application until the end of the study, a viremia was detected by RT-qPCR in all of the piglets. On day 0 (day of HP PRRSV application), nine out of ten piglets of the pre-vaccinated group tested PRRSV antibody positive with one of the tested ELISAs, although with lower S/P values than after infection. On day 10 after HP PRRSV application, all study ELISAs except one had significantly higher S/P or OD values, respectively more positive samples, in group V than in group N.

Conclusions: Only one of the tested ELISAs was able to detect reliably PRRSV antibodies in pigs vaccinated with an inactivated PRRSV vaccine. With most of the tested ELISAs, higher S/P values respectively more positive samples after PRRSV infection were seen in the pre-vaccinated group than in the non-vaccinated.

Keywords: Swine, ELISA, PRRSV, Inactivated vaccine

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