

**TITLE**

**INTERACTION OF SWINE INFLUENZA A VIRUS INFECTION WITH PRRS MLV VACCINATION IN PIGLETS**

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**CONTENT**

**Background**

Swine influenza A virus (swIAV) is a major respiratory pathogen frequently circulating after weaning, a period commonly used to implement PRRS MLV vaccination in piglets. SwIAV infection was previously shown to induce a strong IFN $\gamma$  response. A recent study also showed that IFN $\gamma$  could abrogate the replication of a PRRSV-2 MLV and the inherent immune response.

**Objectives**

The objectives of this study were to evaluate in piglets the impact of swIAV infection on (i) the replication of a PRRSV-1 MLV (MLV-1), (ii) the post-vaccinal immune response and (iii) the post-challenge vaccine efficacy, both at systemic and pulmonary levels.

**Material & Methods**

Groups of 6 SPF piglets were either infected with a swIAV and vaccinated with a MLV-1 6h later (SIVAC group), or vaccinated with a MLV-1 (VAC group), or not vaccinated (UNVAC group). Four weeks after vaccination, all groups were challenged with a PRRSV-1 field strain. An unvaccinated/unchallenged control group was also included. During both post-vaccinal and post-challenge periods, PRRSV genomic load (RT-qPCR), specific anti-PRRSV humoral (ELISA) and cellular immune responses (ELISPOT) were followed in blood and bronchoalveolar lavage (BAL).

**Results**

In blood, vaccine viremia and seroconversion were delayed in SIVAC group compared to VAC group. In contrast, MLV-1 genomic load and antibodies were earlier detected in BAL from SIVAC. In SIVAC, the cellular response was also enhanced at both systemic and lung levels. The vaccine efficacy towards the PRRSV challenge was similar in both VAC and SIVAC groups.

**Conclusion**

In this study, swIAV infection was shown to interact with MLV-1 vaccination, delaying and decreasing MLV-1 replication in blood but stimulating PRRSV specific cellular immunity, without any impact on protective efficacy. Further studies are needed to better understand these interactions and the potential impact of swIAV infection on PRRSV MLV vaccination in the field.