

HETEROLOGOUS PROTECTION OF A COMMERCIAL PORCINE REPRODUCTIVE AND RESPIRATORY SYNDROME VIRUS (PRRSV1) VACCINE AGAINST PRRSV2 UNDER FIELD CONDITIONS IN TAIWAN

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INTRODUCTION

Porcine Reproductive and Respiratory Syndrome virus (PRRSV) is ubiquitous in most swine producing countries around the world. Therefore, breeding herd stability, defined as the absence of vertical transmission of virus thereby producing PCR PRRSV-negative weaned piglets is the initial goal of a control program (1). Various Modified Live Virus (MLV) vaccines are commercially available, and several studies have shown not only good efficacy of MLV vaccines against challenge with homologous strains, but also partial protection against challenge with heterologous strains, whereas others have found poor cross-protection (2).

The purpose of this study was to evaluate the cross-protection efficacy of a commercial PRRS MLV vaccine containing PRRSV1 strain on a Taiwanese swine farm endemically infected with PRRSV2.

MATERIALS AND METHODS

A 700-sow commercial farrow-to-finish farm in the south of Taiwan was unstably PRRSV2-infected. After whole herd vaccination (Table 1) with PRRSV2 vaccine for 6 months, the sow herd was still unstable, as detected by quantitative PCR (104.58 copies/ μ l) in weaned piglets. Meanwhile, nursery pigs showed poor growth performance with a 66.5% survival rate. In August 2018, the PRRS vaccine was changed to a PRRSV1 vaccine (UNISTRRAIN[®] PRRS, HIPRA).

	Period	Vaccine B	Piglet
PRRSV2 vaccine	Feb-Aug 2018	Mass vaccination 4 times/year	7-10 days old
UNISTRRAIN [®] PRRS	Aug 2018 - Aug 2019		

Table 1. Whole herd vaccination program for PRRS.

Based on the ORF5 sequencing, the wild virus circulating on this farm was 16% and 49.4% different respectively between the PRRSV2 and PRRSV1 vaccine. Phylogenetic tree showed the difference between the wild strain and the vaccine strains (Fig. 1). Vaccine efficacy was evaluated based on the stability of the sow herd, the growth performance and the viremia status during the nursery period. For this reason, the average survival rate in the nursery period was recorded and blood samples were taken from weaned piglets (3-4 weeks of age, WOA) and nursery pigs (6-7 WOA), quarterly in each case.

RESULTS

Sow herd PRRS stability was achieved after 3 months of PRRSV1 mass vaccination, maintaining a PCR-negative weaned piglet flow until the end of the study. In the nursery period, the rate of viraemic piglets decreased from 100% to 66%, with a decrease in the viral load from 104.31 to 102.16 from Aug. 2018 to Aug. 2019. Growth performance also improved during this phase, showing a decrease in the mortality rate from 34% to 5% (Fig. 2).

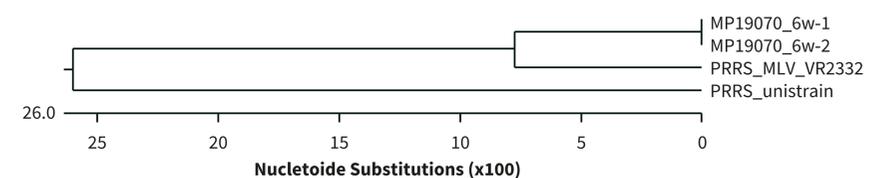


Figure 1. Phylogenetic tree for wild virus isolates and the 2 commercial PRRSV vaccines used in the study.

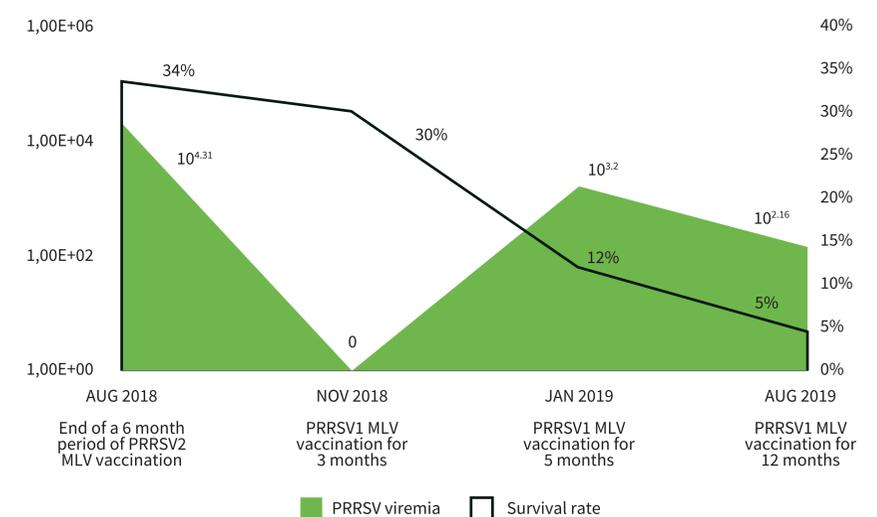


Figure 2. Yellow area: PRRSV viremia in nursery pigs (6-7 WOA). Black line: mortality rate during the nursery period (4-12 WOA).

CONCLUSIONS AND DISCUSSION

Heterologous protection conferred by UNISTRRAIN[®] PRRS (PRRSV1 vaccine) against a field PRRSV2 infection was effective based on the outcome achieved, showing an improvement in productivity as a result of a reduction of the mortality rate during the nursery period, as well as keeping the sow herd PRRS-stable (PCR-negative weaned piglet flow until the end of the study).

REFERENCES

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