Summary of: Assessment of the Impact of the Recombinant Porcine Reproductive and Respiratory Syndrome Virus Horsens Strain on the Reproductive Performance in Pregnant Sows

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In this article, the authors discuss that there are currently at least 18 commercially licensed modified live vaccines (MLVs) for the control of PRRS in the global market and because these vaccines are live viruses, precautions need to be followed in order to maintain their safety. None of these MLVs are labeled for use in PRRSV-negative or naïve herds due to residual reproductive virulence in naïve sows late in pregnancy. Recombination is the process by which related segments of genetic material may be exchanged between related organisms. This process occurs naturally and is believed to be important for the evolution of species. Evidence that homologous recombination occurs at high frequency in PRRS virus genomes was reported more than two decades ago. Recombinant PRRSV-1 strain derived from two MLV vaccines was reported in France (did not show significant clinical signs, although the recombinant strain demonstrated increased excretion and transmission capabilities compared to parental vaccine strains) and in Denmark (caused severe disease in infected herds and a high level of viral replication).

This study assessed the impact of a PRRSV recombinant strain on the reproductive performance of naïve pregnant sows in the last third of gestation. The strain assessed is also known as the Horsens strain, which resulted from the recombination of 2 modified-live vaccines. Fifteen PRRSv naïve pregnant sows were included in the study: four negative reproductive controls (NTX-Not Infected Group), five sows were infected with a PRRSV-1 field strain (Olot/91, Treatment 1), and six sows were infected with the recombinant PRRSV-1 strain (Horsens strain, Treatment 2). Reproductive performance was the primary variable. In sows, viremia and nasal shedding (T1 and T2 groups), and, in piglets, viral load in blood and in lungs, as well as macroscopic lung lesions (T1 and T2 groups), were the secondary variables. There was only one experimental unit per treatment. Thus, descriptive but not analytical statistics were performed.

Neither abortions nor mummies were observed. The reproductive performance results were numerically different between the two challenged groups (Table 1). Moreover, viral loads in blood were $1.83 \times 10^6 \pm 9.05 \times 10^6$ copies/mL at farrowing, $1.05 \times 10^7 \pm 2.21 \times 10^7$ copies/mL at weaning from piglets born from T01 animals and $1.64 \times 10^3 \pm 7.62 \times 10^3$ copies/mL at farrowing, $1.95 \times 10^3 \pm 1.17 \times 10^4$ copies/mL at weaning from piglets born from T02 sows. Overall, 68.8% of T01 piglets and 38.1% of T02 piglets presented mild lung lesions.

Table 1. Back-transformed mean (±SD) and range of different reproductive parameters by treatment.

	Treatment					
	NTX		T01		T02	
	Mean ± SD	Range	Mean ± SD	Range	Mean ± SD	Range
At farrowing, %						
Abortion	0		0		0	
Born alive	89.7 ± 14.03	73.91 to 100	36.0 ± 13.50	21.05 to 55.56	49.9 ± 18.55	27.27 to 71.43
Born healthy	78.0 ± 12.20	69.57 to 98.28	27.1 ± 28.81	0 to 55.56	41.7 ± 18.39	27.27 to 71.43
Low-viability	8.8 ± 5.37	4.35 to 17.65	0.9 ± 4.04	0 to 21.05	2.9 ± 8.97	0 to 28.57
Stillborn	10.3 ± 14.03	0 to 26.09	64.0 ± 13.50	44.44 to 78.95	50.1 ± 18.55	28.57 to 72.73
Mummies	0		0		0	
Weaned, %	89.8 ± 14.16	73.33 to 100	49.0 ± 47.97	0 to 80	53.2 ± 72.28	0 to 100

NTX: not infcted; T01: Olot/91; T02: Horsens strain. SD: standard error.

The authors conclude that the Horsens virus behaved similarly, from a reproductive point of view, to the field strain (Olot/91) and that reports of exacerbated virulence and viral load reported by some Danish farmers were not confirmed under these experimental conditions. They highlight the intrinsic risk of recombination and that the use of multiple live PRRS vaccines in a pig flow should be avoided to limit the occurrence of recombination between vaccine strains, as well as allowing time to reduce the occurrence of the first vaccine strain before introducing the second one.

The full article can be found at https://www.mdpi.com/2076-0817/9/9/772