



# Controlled, blinded and randomised field efficacy, and return-on-investment study of a next-generation porcine reproductive and respiratory syndrome virus type 2 (PRRSV2) modified live virus (MLV) vaccine

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## Background and Objectives

PRRSV is one of the economically most important pathogens in the swine industry worldwide. A next-generation PRRSV2 MLV vaccine has been developed by Synthetic Attenuated Virus Engineering<sup>1</sup>. Via targeted attenuation by codon pair deoptimization, a significantly reduced speed of NSP1 translation is achieved. The subsequent reduced viral replication and immune deviation is indicated to provide very high efficacy<sup>2</sup>, cross-protective capacity<sup>2</sup>, and safety<sup>2</sup>. The aim of this field study was to demonstrate the PRRSV2 protective efficacy including, reduction of mortality, morbidity and antimicrobial use (AMU), and estimated return-on-investment of this new next-generation PRRSV2 MLV-vaccine.

## Materials and methods

A South-Korean 1800-sow two-site farm was selected on being a "PRRSV2-only endemic, stable sow herd not vaccinating pig(lets)". Sows already vaccinated with another PRRSV2-MLV.

Pigs weaned at 25-29 days-of-age (T1) from site1 followed till slaughter (~115kg) at site2, were enrolled. Five hundred newly weaned piglets were ear tagged, weighed, randomly distributed by 250 into one of two groups, and injected with either 2ml of saline, "Ctrl", or 2ml of Persopor<sup>TM</sup> (Ceva, France), "Vac". They were monitored on mortality and individual treatment for respiratory disease until slaughter.

All pigs were weighed out before first slaughter (T2). On all parameters, group averages were calculated, and with the use of Gompertz standardisation,

feed consumption and days till slaughter were calculated, for return-on-investment estimation based on local prices. Levels of significance was set  $p < 0.05$ . Statistics by: Wilcoxon Mann-Whitney U-test\* or paired t-test\*\*, all with ANOVA two-tailed.

## Results

Live weight and growth (G): T1 7.188kg vs 7.194kg, T2 95.39kg vs 94.06kg, and G 88.20kg vs 86.87kg ( $p = 0.0343^*$ ), Mortality wean-slaughter: 14/250 = 5.6% vs 24/250 = 9.6% ( $p = 0.0212^{**}$ ), and animals receiving individual treatment: 56/250 = 22.4% vs 106/250 = 42.4% ( $p = 0.0001706^{**}$ ) in "Vac" and "Ctrl", respectively. Return-on-investment, excluding vaccine costs (ROI): 7.4€/€. (Table 1)

## Discussion and Conclusion

The next-generation PRRSV2-MLV vaccine provided a substantial, highly significant reduction of PRRSV2-induced respiratory disease, and AMU, a significant reduction of mortality, and increase of slaughter weight, and a return-on-investment of 7.4:1. This indicates a strong PRRSV2-protective efficacy, improving health, welfare, profitability, and OneHealth perspectives.

## References

1. Coleman et al. 2008. Sci, 320, 1784
2. Park et al. 2021. Vet Microbiol, 256, 109048

Group	Mortality		Morbidity & AMU		Growth w-s		ROI
	rate	p-value	rate	p-value	kg	p-value	
Vac	5.6%	0.0343	22.4%	0.0001706	88.20	0.0212	7.4€/€
Ctrl	9.6%		42.4%		86.87		

**Table 1** Improvements and profits following piglet vaccination with the next-generation PRRSV2 vaccine followed wean-slaughter. In pigs from a PRRSV2 endemic, two-site stable herd with PRRS impact considered very light and not worthy of piglet PRRSV vaccination, the next generation PRRSV2 MLV provided substantial, significant improvements of mortality, respiratory morbidity, antimicrobial use (AMU), pig growth, and profits, providing a return of investment excluding vaccine costs (ROI) of 7.4:1.