

PERSOPORC™

The Next Generation PRRS Modified Live Vaccine

EFFICACY

SAFETY



Safe Protection



Low risk of
reversion to
virulence.



High
efficacy on
Genotype 2.



Cross protection
against other
lineage strains.



PERSOPORC™ is a **modified live vaccine** against **Porcine Reproductive and Respiratory Syndrome Virus Type 2 (PRRSV2/NA)**.

Using cutting edge genetic engineering technologies, including **SAVE*** and **CPD****, PERSOPORC sets a new standard in PRRSV2 protection.

PERSOPORC™

Breakthrough CPD Technology:

The **Codon Pair Deoptimization (CPD) technology** specifically targets the **NSP1 protein**, a key driver of viral replication and immune system evasion. By slowing the virus's ability to replicate, CPD enables the immune system to **recognize, respond, and neutralize PRRSV2 more effectively**.



Key Benefits

- » **Reduced viral replication**
- » **Enhanced immune response**
- » **Lower viremia levels**
- » **Decreased viral shedding**

CPD by Save technology significantly **reduces the risks associated with PRRSV2**, leading to:

**CPD
SAVE**



Lower mortality rates
Reduced clinical signs

- » **Weight loss**
- » **Lung lesions**

* Synthetic Attenuated Virus Engineering

** Codon Pair Deoptimization

SAVE technology ensures that
PERSOPORC™^{2,3,4}

» **Replicates slower than an average PRRS MLV vaccine.**

Very high attenuation (not harmful to the host)

Very high safety against

Shedding

Reversion
to virulence

Risk of
recombination

» **Increases immune response,
increases specific INF- γ secreting cells* and
conserves epitopes useful for protection.**

High immune stimulation

Strong protection and cross protection

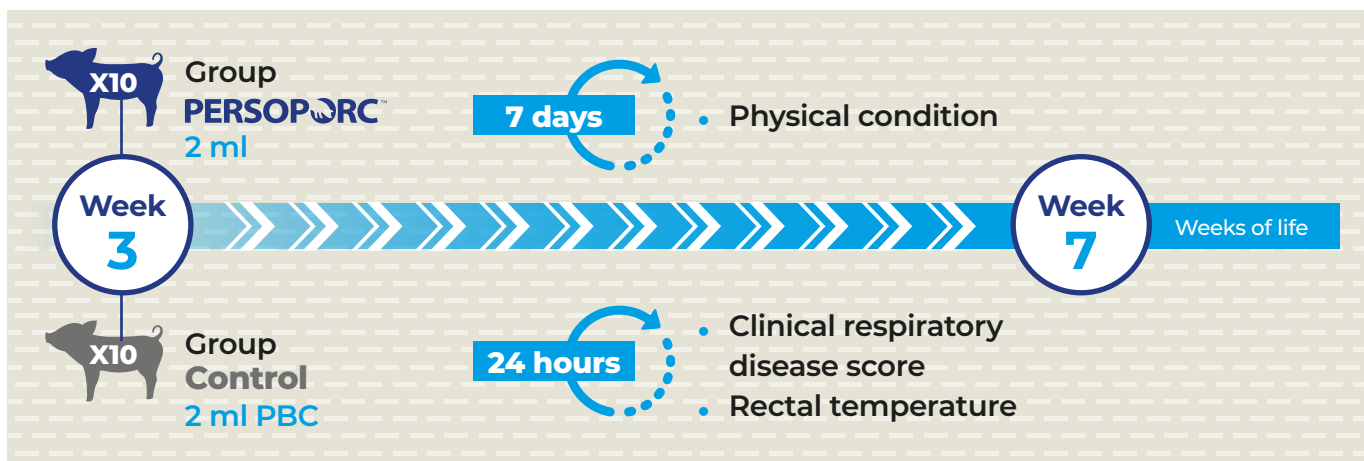


* Cell mediated immunity, ie. CMI

PERSOPORC™

Is safe and not harmful to the host²

3-week-old pigs allocated by 10 per group were inoculated intranasally by 2 mL of either **PERSOPORC™** vaccine strain or PBS (controls). The pigs were monitored weekly to test their physical conditions and scored daily for rectal temperature, and respiratory clinical signs, until termination of study at 28 days post inoculation (dpi).



Results and conclusion

1

No clinical signs.

3

No macroscopic or microscopic changes post inoculation.

2

No induction of fever.

4

No impact on growth, appetite and well-being.

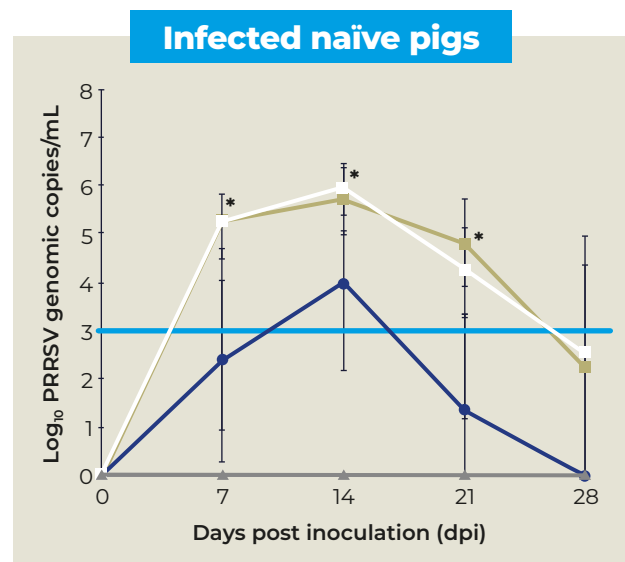
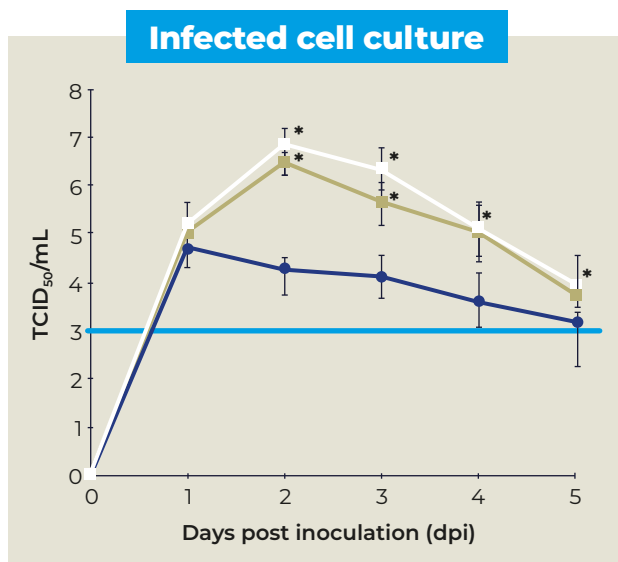
Full safety with no negative impact of the PERSOPORC™ vaccine strain.

PERSOP_{ORC}TM

Replicates slower than an average PRRS MLV vaccine^{1,2}

Comparative capability of replication between the PERSOP_{ORC}TM strain and the original LMY and BP2017 strains by inoculation in cell culture³ and naïve 3-week-old piglets².

CPD-attenuation compared to the original virulent field strains



Substantially reduced replication speed
≥ 1000 times AUC reduction in replication capacity

Substantially reduced viremia
≥ 1000 times AUC reduction of viremia

—●— PERSOP_{ORC}TM strain —■— LMY original —□— BP2017 original —▲— Negative control (piglets only)

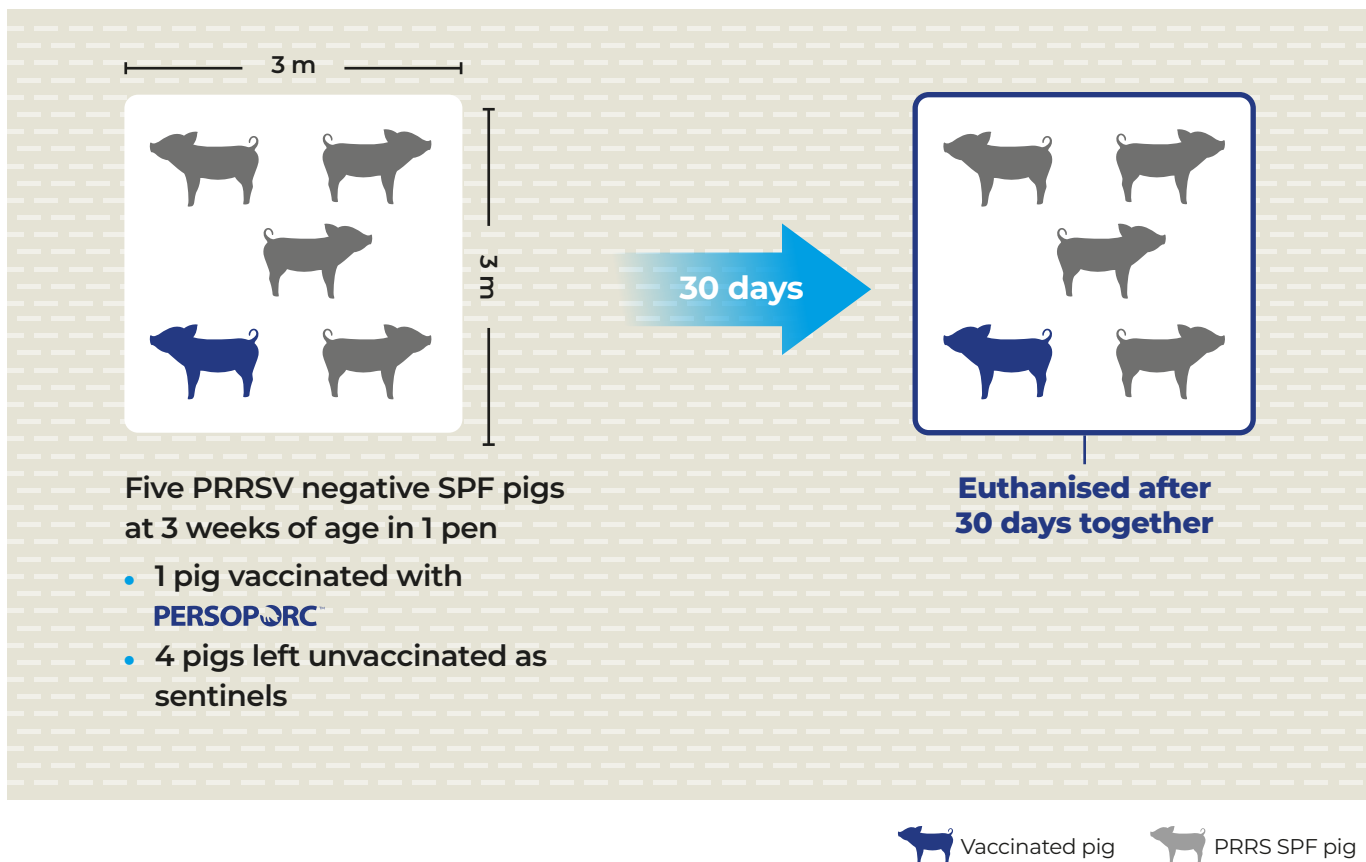
PRRSV replication and viremia evaluated for the full time of comparison, expressed by area under curve (AUC) values.



PERSOPORC™

Does not spread in the herd: **LOW SHEDDING**^{5,6}

Experimental trial with controlled conditions



Results

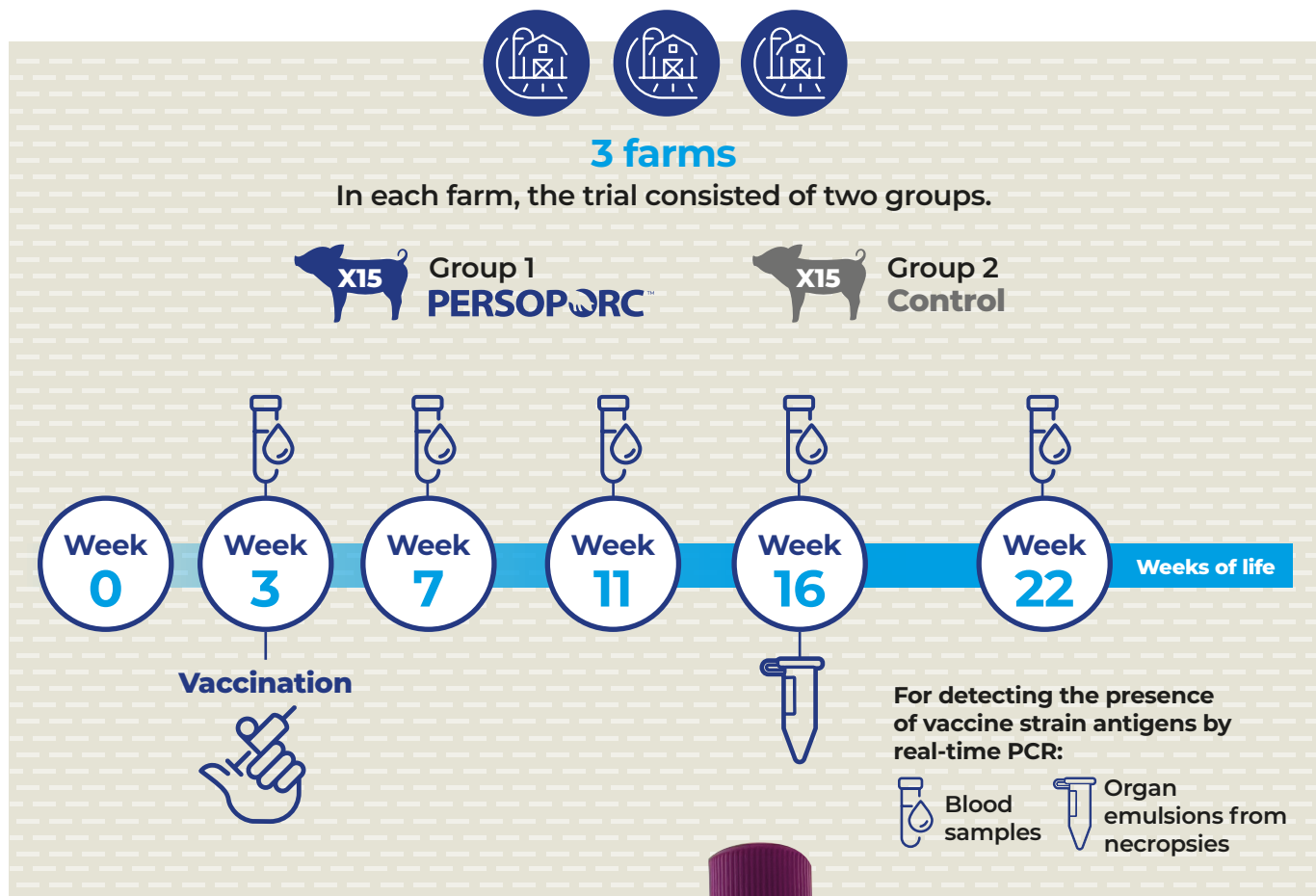
Sentinels remained negative to PERSOPORC™ vaccine virus:

- » Negative PRRSV-serology on serum, for post infection antibody titers.
- » Negative PCR on serum, lymph nodes, tonsil, and lung tissue.

PERSOPORC™

Has a contained period of replication in the pigs, and clears from around 4 weeks post vaccination⁷

Field trial



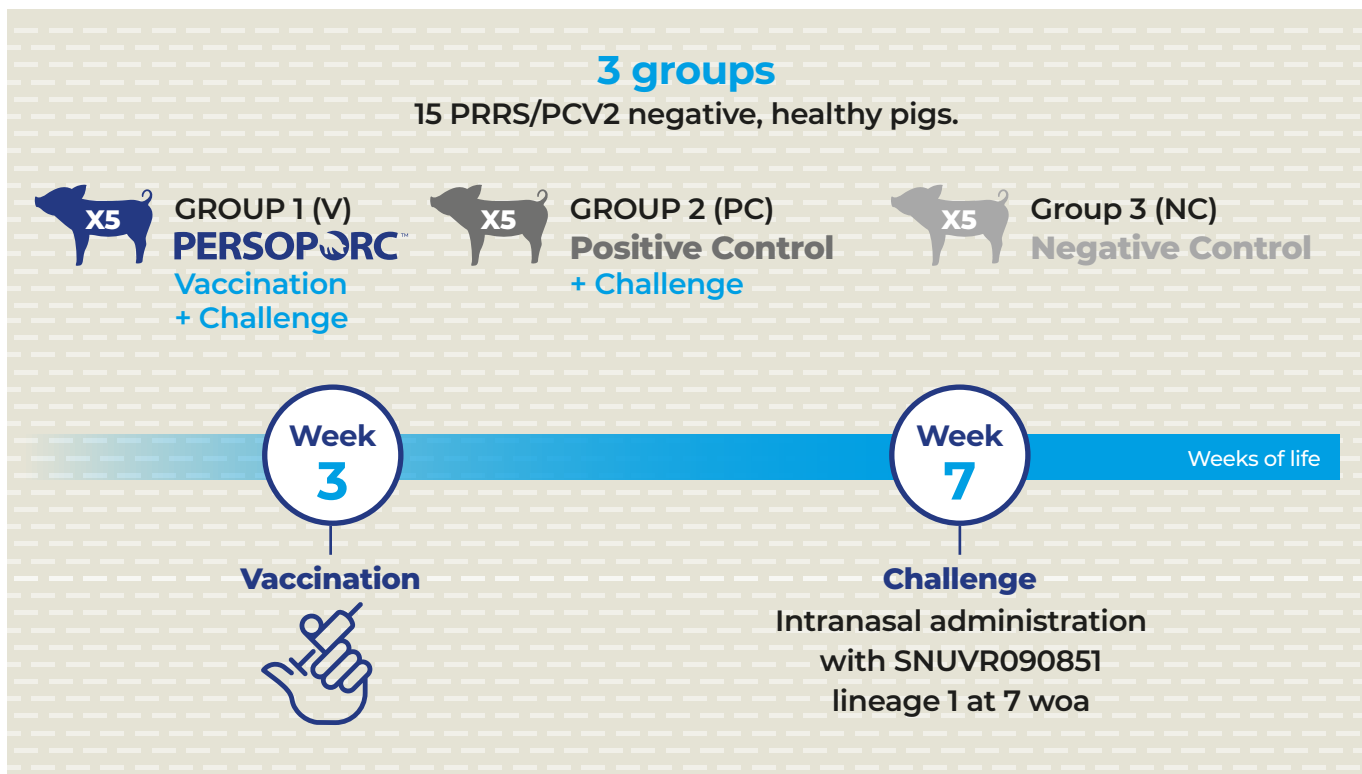
Results

PERSOPORC™ virus strain was not detected in any serum from 4-18 weeks post vaccination or tissue emulsions from pigs investigated at 13 weeks post vaccination, in the three farms.

PERSOPORC™

Stimulates humoral and cell mediated immunity and provides cross protection against PRRSV2 lineage 1^{2,7}

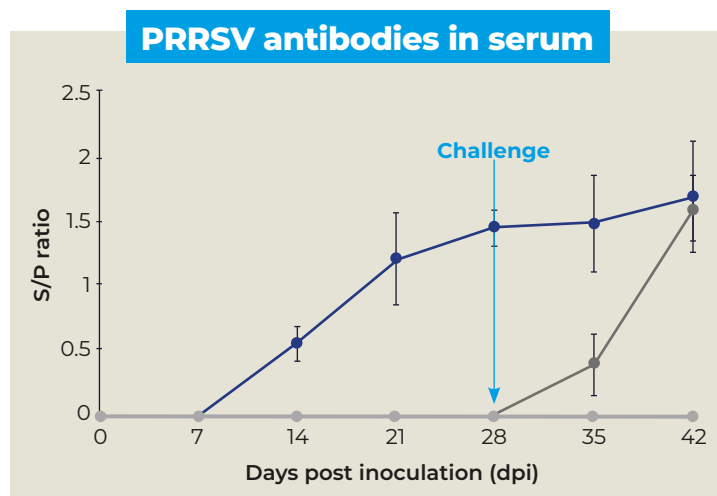
Heterologous virulent PRRSV2 lineage 1 challenge



Results

- » Measured as ELISA S/P ratio.
- » PRRS specific antibodies were found in **PERSOPORC™** group from 7 days post inoculation, and increased at 7 days post challenge compared to the PC group.

- V group
- PC group
- NC group

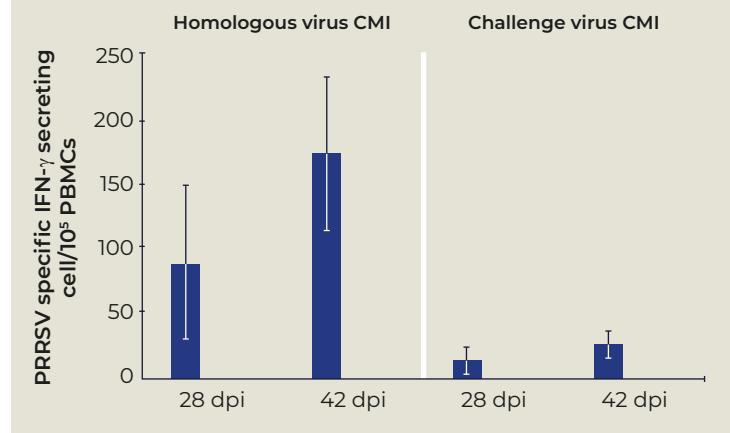


■ V group ■ PC group ■ NC group

PRRSV-specific IFN- γ secretory cells are indicators of cell-mediated immunity (CMI).

» **PERSOPORC**™ (V group) was able to induce specific IFN- γ secretory cells against both the challenge virus and a homologous strain.

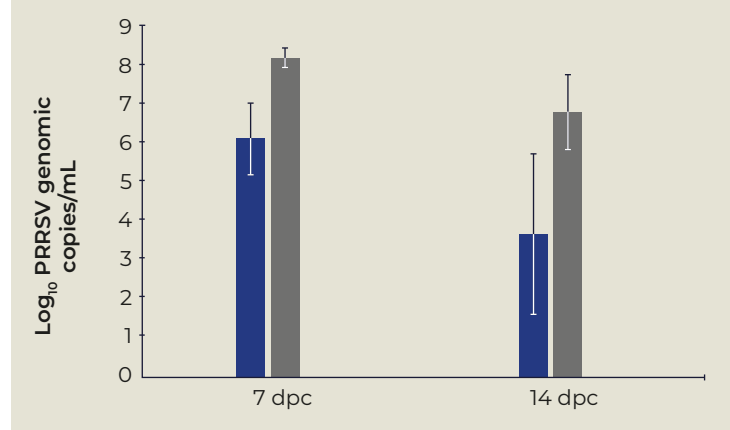
Measurement of IFN- γ secretory cell



» The antigen load of PRRSV in serum was significantly reduced in the **PERSOPORC**™ protected pigs (V group) compared to the PC group at 7 and 14 days after challenge.

» Virus load in serum of the vaccine group was reduced by an average of 83-182 times compared to the PC group.

Challenge virus antigen in serum

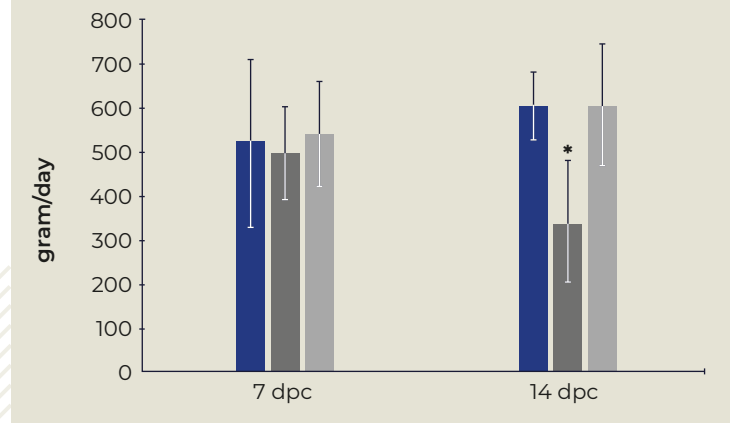


» No reduction in ADWG during challenge period in the **PERSOPORC**™ protected pigs.

» Fully maintained appetite and wellbeing in the **PERSOPORC**™ group compared to the NC group.

» Significant reduction of ADWG, appetite, and wellbeing was observed in the PC group.

Average daily weight gain (ADWG)



PERSOPORC™

Controlled mortality reduction in a field trial⁶

2-site Korean swine production



Farrow-to-nursery
PRRS negative

260 pigs
PERSOPORC™
vaccinated at
10 weeks of age



Grow-to-nursery
PRRS positive

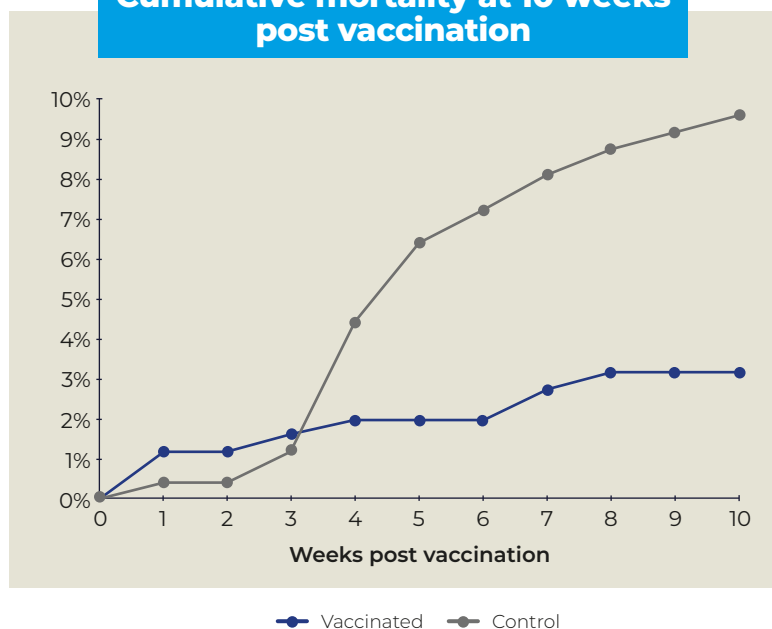
250
non-vaccinated
control pigs



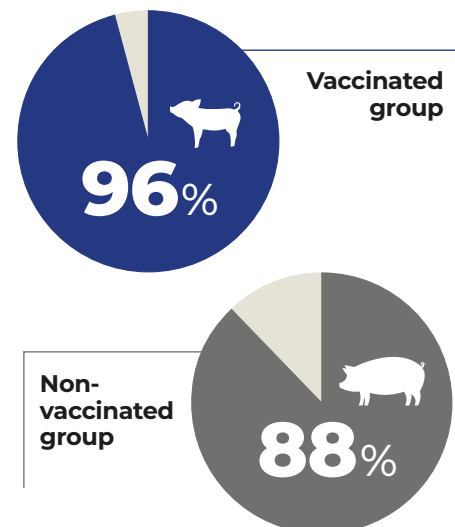
Results

Mortality was reduced significantly by **PERSOPORC™**

Cumulative mortality at 10 weeks post vaccination



Survival rate at the time of slaughter



PERSOPORC™

A safe vaccine virus strain

» **Solid safety and excellent clinical performance**

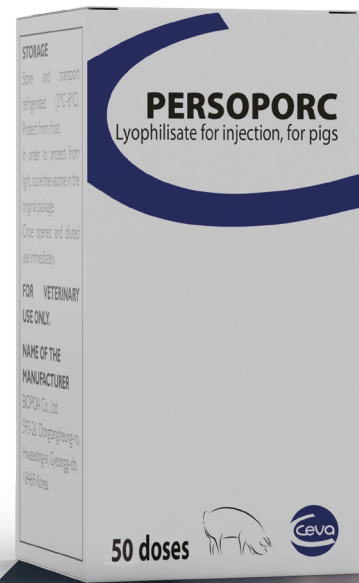
No post-vaccination clinical impact on the host demonstrated

» **Much less likely to revert to virulence**

Full genetic stability demonstrated in comprehensive testing

» **Much less likely to recombine with other viruses**

>1000 times less replication and viremia



PERSOPORC™

Highly efficacious vaccine

» **Strong cross-protection**

Protection against lineage 1 strain demonstrated

» **Strong protection against clinical signs**

No fever or loss of daily growth

» **Significantly reduced mortality**



PERSOPORC™



Low risk of reversion to virulence.



High efficacy on Genotype 2.



Cross protection against other lineage strains.

Bibliography

1. Park *et al.* (2020) Field porcine reproductive and respiratory syndrome viruses (PRRSV) attenuated by codon pair deoptimization (CPD) in NSP1 protected pigs from heterologous challenge. *Virology*.
2. Park *et al.* (2021) Intradermal co-inoculation of codon pair deoptimization (CPD)-attenuated chimeric porcine reproductive and respiratory syndrome virus (PRRSV) with Toll like receptors (TLR) agonists enhanced the protective effects in pigs against heterologous challenge. *Veterinary Microbiology*.
3. Coleman *et al.* (2008) Virus attenuation by genome-scale changes in codon pair bias. *Science*.
4. Zhang *et al.* (2023) Variations in NSP1 of Porcine Reproductive and Respiratory Syndrome Virus Isolated in China from 1996 to 2022. *Genes*.
5. PersoporC™ dossier. *Safety documentation*.
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7. PersoporC™ dossier. *Efficacy documentation*.

