

# Efficacy of vaccines

## against PRRSV and PCV2b co-infection

### Protection against disease caused by PRRS virus

PRIME PAC PRRS

Prime Pac® PRRS is a type 2 PRRSV modified live vaccine for use in both young pigs and breeding age female pigs administered either intramuscularly or intradermally.

### Protection against disease caused by porcine circovirus type 2 and *Mycoplasma hyopneumoniae*

PORCILIS PCV ID

PORCILIS M Hyo ID ONCE

Porcilis PCV M Hyo

Porcilis® PCV ID and Porcilis® M Hyo ID ONCE are intradermal vaccines specially formulated to be administered without a needle using the IDAL® (IntraDermal Application of Liquids) system.

Porcilis® PCV M Hyo is a ready-to-use, single-injection combination vaccine administered intramuscularly.

### Should we worry about PRRSV and PCV2 co-infection?

The co-infection of swine with PRRSV and PCV2 is common in clinical conditions and contributes to a range of polymicrobial disease syndromes.

#### 01 Synergistic effects occur during PRRSV and PCV2 co-infection:

- Clinical signs and lesions in co-infected pigs are more severe than in PCV2 or PRRSV singularly infected pigs.
- Mutation rates of PRRSV may increase during PRRSV/PCV2 co-infection.

### Are Prime Pac PRRS, Porcilis PCV M Hyo and Porcilis PCV ID + Porcilis M Hyo ID ONCE effective against PRRSV and PCV2 co-infection?

## Study design

### 7 groups of 9 PRRSV-free, 3-week-old pigs

Each group vaccinated with a different vaccination protocol (Table 1), including:

#### Different vaccine products

PRIME PAC PRRS

PORCILIS PCV ID

PORCILIS M Hyo ID ONCE

Porcilis PCV M Hyo

#### Different vaccine products

IM vs ID

Table 1

Treatment groups	No. of pigs	Vaccination	Vaccines/route of administration/ Dosage/day of vaccination				Challenge (Mixed)	
			PRRSV MLV <sup>a</sup>	PCV2 <sup>b</sup>	M. Hyo <sup>c</sup>	HP-PRRSV-2 <sup>d</sup>	PCV2b	
IMPP0/PCMVH7	9	Yes	IM / 0.1 ml / 0 DPV	IM / 2 ml / 7 DPV	-	-	Yes	Yes
IDPP0/PCVVH7	9	Yes	ID / 0.2 ml / 0 DPV	-	ID / 0.2 ml / 7 DPV	ID / 0.2 ml / 7 DPV	Yes	Yes
IMPP0/PCMVH0	9	Yes	IM / 1 ml / 0 DPV	IM / 2 ml / 0 DPV	-	-	Yes	Yes
IDPP0/PCVVH0	9	Yes	ID / 0.2 ml / 0 DPV	-	ID / 0.2 ml / 0 DPV	ID / 0.2 ml / 0 DPV	Yes	Yes
IM/TRF0	9	Yes	IM / 2 ml / 0 DPV	-	-	-	Yes	Yes
NV/CH	9	No	-	-	-	-	Yes	Yes
NV/NC	9	No	-	-	-	-	No	No

IM: Intramuscular; ID: Intradermal; DPV: Days post-vaccination

Group IM/TRF0 vaccinated intramuscularly with a commercially available vaccine that contains PRRSV, PCV2 and *M. hyopneumoniae* antigens.

## Study design

### At 28 DPV, all groups but the negative control were intranasally co-challenged with a mixed inoculum of PRRSV2 and PCV2b.

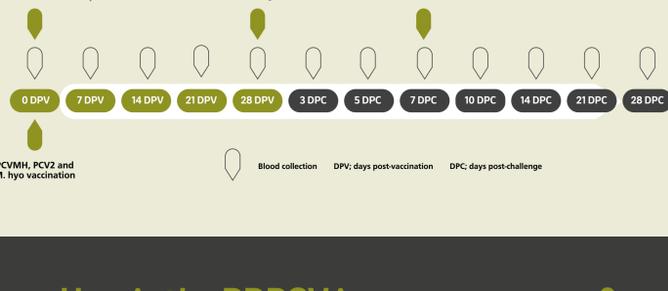
### Blood samples were collected at 0, 7, 14, 21 and 28 DPV, and at 3, 5, 7, 10, 14, 21, and 28 DPC

#### PRRSV humoral immune response

#### PRRSV cellular immune response: IFN-γ-secreting cells

#### PRRSV and PCV2 viremia post-challenge

### At 7 DPC, 3 pigs of each group were necropsied, and macroscopic lung lesions evaluated.

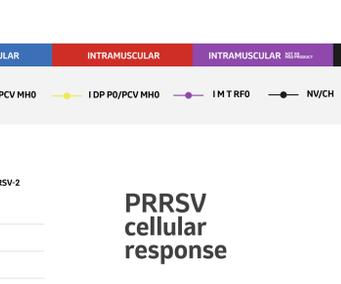


## How is the PRRSV immune response?

### PRRSV humoral response

Prime Pac PRRS, administered either by the IM or ID route, induces PRRSV-specific antibody response.

PRRSV - SPECIFIC ANTIBODY RESPONSE MEASURED BY ELISA



INTRADERMAL INTRADERMAL INTRAMUSCULAR INTRAMUSCULAR INTRAMUSCULAR NON-VACCINATED

IM PP0/PCV MH7 ID PP0/PCV MH7 IM PP0/PCV MH0 ID PP0/PCV MH0 IM TRF0 NV/CH NV/NC

PRRSV - SPECIFIC IFN-γ-SC AFTER HOMOLOGOUS PRRSV-2 MLV VIRUS (VACCINE VIRUSES) SIMULOUS



### PRRSV cellular response

Prime Pac PRRS, administered either by the IM or ID route, induces PRRSV-specific IFN-γ-secreting cells as early as 21 DPV.

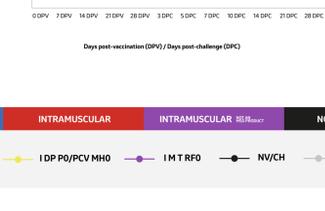
Significantly higher IFN-γ-secreting cells are observed at 28 DPV in groups vaccinated via ID.

## How is the PRRSV viremia post-challenge?

### PRRSV viremia is developed as early as 7 DPV with Prime Pac PRRS, administered either by the IM or ID route.

Prime Pac PRRS reduces PRRSV viremia post-challenge, either administered by the IM or ID route.

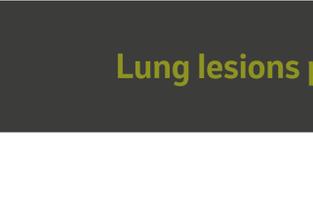
PCV2 DNA IN BLOOD



INTRADERMAL INTRADERMAL INTRAMUSCULAR INTRAMUSCULAR INTRAMUSCULAR NON-VACCINATED

IM PP0/PCV MH7 ID PP0/PCV MH7 IM PP0/PCV MH0 ID PP0/PCV MH0 IM TRF0 NV/CH NV/NC

PCV2 DNA IN BLOOD



Both Porcilis PCV ID and Porcilis PCV M Hyo reduce PCV2 viremia post-challenge.

Significantly lower mean viral loads in blood are observed in pigs vaccinated with Porcilis PCV ID at 14 DPC.

## Lung lesions post-challenge

### MACROSCOPIC LUNG LESION SCORE AT 7 DAYS POST-CHALLENGE (DPC)

The protocol including Prime Pac PRRS intramuscular + Porcilis PCV M Hyo seven days afterwards (IMPP0/PCMVH7) shows a significantly lower lung lesion score.



IM PP0/PCV MH7 ID PP0/PCV MH7 IM PP0/PCV MH0 ID PP0/PCV MH0 IM TRF0 NV/CH NV/NC

## Keypoints

### Prime Pac PRRS in combination with Porcilis PCV M Hyo or Porcilis PCV ID + Porcilis M Hyo ID ONCE is a key tool to protect against PRRSV and PCV2 co-infection.

01 Prime Pac PRRS generates strong humoral and cellular immune responses against PRRSV, either administer via intradermal or intramuscular.

02 Both PRRSV and PCV2 viremia post-challenge are greatly reduced in vaccinated pigs.

03 Lung lesion scores are significantly lower in vaccinated pigs.

