

# CLINICAL EFFICACY OF A NEW INTRADERMAL VACCINE AGAINST *Mycoplasma hyopneumoniae* AND PCV2 IN THE CONTROL OF *MHYO*-LIKE LUNG LESIONS AND PCV2 VIRAEMIA UNDER FIELD CONDITIONS

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## BACKGROUND & OBJECTIVES

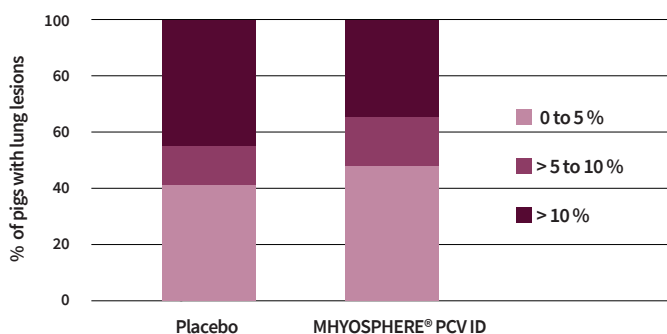
MHYOSPHERE® PCV ID is a new, all-in-one intradermal vaccine against *M. hyopneumoniae* (*Mhyo*) and PCV2. The aim of this study was to assess its efficacy in the reduction of *Mhyo*-like lung lesions and PCV2 viraemia under field conditions.

## MATERIALS AND METHODS

Seven commercial farms with *Mhyo* and PCV2 circulation were included in a multicentre, randomized, negative-controlled and blinded field trial. In total, 2,507 healthy 3-week-old piglets were distributed into two groups. One group (n = 1,253) was vaccinated with MHYOSPHERE® PCV ID, whilst the other group (n = 1,254) received a placebo. A single dose of 0.2 ml was administered intradermally to both groups using a needle-free device (Hiperdermic®) and they were then monitored up to slaughter. The primary efficacy variables were *Mhyo*-like lung lesions at slaughter, evaluated in all the animals as described in the *Ph. Eur.*<sup>1</sup>, and PCV2 viraemia, evaluated by qPCR (VetMAX™ PCV2 Quant Kit, Thermo) in 30 animals/group/farm periodically sampled over the study. PCV2 genotyping was performed by PCR<sup>2</sup>.

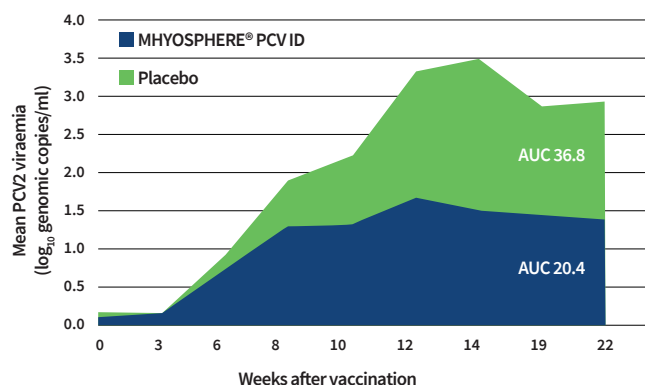
## RESULTS

The mean percentage of lung surface affected by *Mhyo* lesions at slaughter was significantly lower in the group vaccinated with MHYOSPHERE® PCV ID than in the Placebo group (10.94 % vs 13.52 %, respectively;  $p < 0.0001$ , Mann-Whitney U test), corresponding to a 19.1 % reduction. In addition, the incidence of pigs with at least one *Mhyo*-like lung lesion was also significantly lower in the vaccinated group ( $p < 0.01$ , Chi-square test). The distribution of the severity of lung lesions is shown in Figure 1.



**Figure 1.** Distribution of the severity of *Mhyo* lesions at slaughter  $p < 0.0001$  for >10 % of affected lung, Chi-square test).

The PCV2 virus load was lower in the vaccinated group from weaning to slaughter (Figure 2). The genotyping results indicated that one out of seven farms was positive for PCV2a, three for PCV2b and two for PCV2d. A single genotype was found on each farm. The remaining farm had very low PCV2 circulation and genotyping was not possible. When grouping the farms by genotype, the Area Under the Curve (AUC) was statistically lower ( $p < 0.001$ , Linear Mixed Model) in the vaccinated pigs compared to the controls: 40.03 vs 54.06 for PCV2a; 11.61 vs 31.76 for PCV2b and 33.84 vs 53.87 for PCV2d.



**Figure 2.** PCV2 viraemia. The Area Under the Curve (AUC) was lower in the vaccinated group ( $p < 0.001$ , Linear Mixed Model).

## DISCUSSION & CONCLUSIONS

The novel intradermal vaccine MHYOSPHERE® PCV ID is efficacious in reducing the incidence and severity of *Mhyo* lesions and controlling PCV2 viraemia, eliciting long-lasting protection against *Mhyo* and PCV2-related diseases. Moreover, PCV2 genotype cross-protection was demonstrated under field conditions.

## ACKNOWLEDGMENTS

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## REFERENCES

- <sup>1</sup>Pharmacopoeia Europaea. Monograph 04/2013:2448. Porcine enzootic pneumonia vaccine (inactivated).
- <sup>2</sup>Kwon, T.; Lee, D.; Yoo, S.; Je, S.; Shin, J. and Lyoo, Y. (2017). *Virus Res.* 228:24-29.