

# Reduction of *Lawsonia intracellularis* shedding, improvement of carcass quality and partial prevention of tail biting after intradermal vaccination against this bacterium

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## Background and Objectives

Ileitis is an enteric disease caused by *Lawsonia intracellularis*. This infection leads to a retardation in growth and subsequent reduction in performance. Therefore, its economic impact is of paramount importance nowadays in swine production. Vaccination of pigs in clinically affected farms has been shown as an excellent tool to reduce clinical and performance losses. However, subclinically infected pigs, despite not showing any clinical sign, are still colonized by a moderate number of bacteria and develop microscopic ileitis lesions in the gut, making the disease invisible to the eyes of the producer, but still negatively affecting the economic performance of the farm. Today it is unknown whether vaccination of those populations of subclinically infected pigs could positively impact performance. The aim of this study was to assess the efficacy of an intradermal vaccination against *Lawsonia intracellularis* on a herd with a subclinical infection.

## Material and Methods

A randomized, controlled, blind, side-by-side trial was performed in a herd with a history of subclinical ileitis. At 4 weeks of age (woa), 240 piglets were allocated to Vaccination (V; n=120; vaccinated with Porcilis®*Lawsonia* ID mixed with Porcilis®PCV ID and concurrent with Porcilis®M Hyo ID Once; administered with IDAL® Twin) or Control (C; n=120; same PCV2 and *Mycoplasma hyopneumoniae* vaccines) group. Faecal samples (n=30/group) were taken (4, 7, 10, 13, 16, 19woa) from the same individual pigs directly from the anus. Bacterial load in faeces was assessed by qPCR (Ingenetix®). Ileitis-associated mortality %, treatment incidences, scour incidences and tail biting % were registered. At slaughter, carcass quality was assessed by recording carcass weight, back fat level (at P2 level; cm) and Lean Meat % (LM%). Kruskal-Wallis was performed to evaluate bacterial shedding and carcass characteristics analyzed using the mixed linear model procedure. Mortality, antibiotic treatment, signs of scour, or tail bitten animals were assessed by Chi-square analysis.

## Results

No bacterial shedding was detected before 13 and 16woa for controls and vaccinated pigs, respectively. A significant lower bacterial load (log<sub>10</sub> copies/μl) was detected at 16wk in vaccinated pigs (V:1.70±0.66; C:3.31±1.65; P<0.05). Average AUC (bacterial shedding log<sub>10</sub> copies/μl) from 4-22woa was significantly lower for vaccinates (20.72±25.93) compared to controls (40.23±39.10) (P<0.05) (Fig.1). Vaccinated pigs had a significantly lower prevalence of tail biting (31.67%) compared to control pigs (54.17%) (P<0.05) (Fig.2). Vaccinated pigs had less back fat (10.5 vs 10.9 ±0.14 mm; P<0.1) and greater LM% (62.7 vs 62.1 ±0.12%; P<0.05) when compared to non-vaccinated pigs (Table 1). No significant differences were seen for the other parameters.

Figure 1. Average *Lawsonia intracellularis* shedding in faeces in pigs vaccinated (green; n=30) and control (black; n=30) pigs (P<0.05).

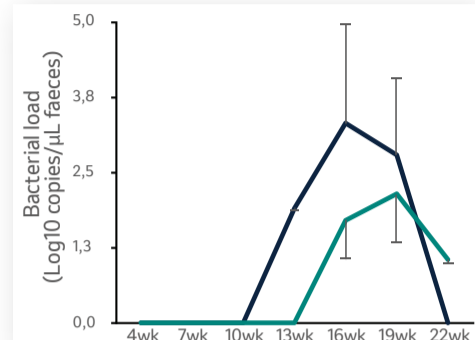


Figure 2. Prevalence of tail biting in vaccinated and control pigs (P<0.05).

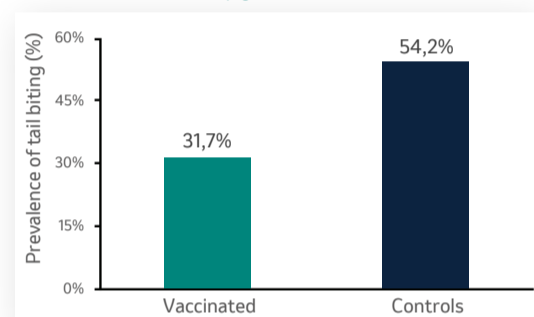


Table 1. Clinical parameters and Carcass Quality in Vaccinated and Control pigs.

	Vaccinated	Controls	Difference
Mortality %	0	0.8	NA
Treatment incidences	43	39	NA
Scour incidences	22	15	NA
Tail biting %	31.7% <sup>A</sup>	54.2% <sup>B</sup>	-22.5
Carcass weight (kg)	115.6	113.7	NA
Back fat (mm)	10.5 <sup>A</sup>	10.9 <sup>B</sup>	-0.4mm
Lean Meat %	62.7% <sup>A</sup>	62.1% <sup>B</sup>	+0.6

A, B - Different superscripts within the same row, represent statistical differences. NA - Not applicable, when no statistical differences were found.

## Discussion and conclusion

In this study, a significant reduction of bacterial shedding and increase of carcass Lean Meat % was demonstrated after intradermal vaccination against *L. intracellularis*. This is the first scientific study that reports a partial prevention of tail biting after vaccination against *L. intracellularis*. Further research is needed to elucidate this finding.