

# Practical observations on the use of intradermal *Lawsonia* vaccination

**L**awsonia influences animal health and performance of fattening pigs. In three fattening farms in northwest Germany, improved feed conversions were observed in fattening batches vaccinated intradermally with Porcilis *Lawsonia* ID which meant financial benefits ranged from -€0.80 to -€6.60 per animal (excluding vaccination costs).

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## Literature

*Lawsonia intracellularis* (L.i.) is common in swine worldwide and, in Europe, it can be detected in more than 90% faecal samples of the fattening farms. Increasing levels of L.i. in the faeces correlates with the presence and severity of intestinal lesions and thus negatively affects animal growth.

Transmission is faecal-oral, with successful dissemination of the pathogen. Moreover, rats and mice are reservoirs and can excrete *Lawsonia* in relevant amounts

Farm	Farm 1		Farm 2		Farm 3	
Clinical expression to date	Diarrhoea directly after stalling, sporadic PHE at end of fattening		Diarrhoea directly after stalling		Diarrhoea to 50-60kg, non-homogeneous growth	
	CG	VG	CG	VG	CG	VG
Number of animals	581	528	530	530	600	600
Date of stalling	29.01.21	10.06.21	20.01.21	16.06.21	15.01.21	05.21.&28.21
Date of examination	05.02.21	15.06.21	-	28.06.21	19.01.21	02.06.21
Serology L.i.	2/10 pos. 1/10 questionable 7/10 neg.	-	-	-	2/10 questionable 8/10 neg.	-
PCR L.i. from faeces	3/3 pos.	1/3 pos.	-	3/3 pos.	3/3 pos.	0/3 pos.
Highest value L.i. (log GE/g faeces)	6.23	4,25	-	Ct 20	8.22	-
PCR B.p. from faeces	-	2/3 pos.	-	-	3/3 pos.	-

**Table 1. Diagnostic results of the three fattening farms from the unvaccinated comparison group (CG) and the group vaccinated with Porcilis *Lawsonia* ID (VG). L.i.= *Lawsonia intracellularis*; B.p. = *Brachyspira pilosicoli*; ct = cycle threshold. Serologically tested blood samples are scored as negative (inhibitory percentage <20), questionable (20-29), and positive (≥30). No examination was performed in empty fields.**

between 14-21 days. Different clinical pictures are described including the acute form (PHE; Proliferative Haemorrhagic Enteropathy), clinically characterised by bloody diarrhoea and high mortality. Porcilis *Lawsonia* (an inactivated vaccine for intramuscular administration)

improved daily gains with reduced clinical signs, pathogen excretion and intestinal lesions.

Since 2021, it has also been available as Porcilis *Lawsonia* ID with high efficacy and safety and major benefits due to reduced pathogen transmission and increased animal welfare.

period, and non-homogeneous growth (Fig. 1). PHE also occurred in Farm 1.

For the diagnostics, problem-oriented samples were taken by the veterinarian (Table 1).

In all three farms, VG piglets were vaccinated intradermally using IDAL 2G or 3G with Porcilis *Lawsonia* ID by the veterinarian promptly after stalling. The vaccine dose (0.2ml ± 10%) is hereby 'jetstreamed' using a needle-free multi-dose applicator (IDAL device; Fig. 2).

**Fig. 1. Non-homogeneous group of animals from Farm 3 (Nieberding).**



## Materials and methods

The aim of this study is to investigate the effects of intradermal vaccination with Porcilis *Lawsonia* ID on animal health and performance directly after the start of fattening on three northwest German fattening farms (Farms 1, 2 and 3) where a vaccinated fattening batch (VG) from the second half of 2021 and a previous unvaccinated fattening batch (CG) from the first half of 2021 are compared.

The three farms enter pigs of approximately 25-30kg from different Danish farms and the veterinarian described diarrhoea, especially in the pre-fattening

## Biology and economy

For both the VG and the previous CG, fattening duration, stall-in and stall-out weights, feed consumption, and losses were recorded.

Using this data, the following performance parameters were calculated for the individual batches: growth, daily gains and feed conversion (FCR).

In order to compare the actual biological performance of the

*Continued on page 13*



**Fig. 2. IDAL device 3G with Jetstream (MSD Animal Health).**



**Fig. 3. Reddened and thickened intestinal mucosa after dissection on Farm 2 (Nieberding).**

Continued from page 11  
 batches and not to weight highly variable parameters (piglet price, stall-in and stall-out weight and feed price) an average of the two batches (CG and VG) was calculated per farm for these parameters. With the help of the collected data, the costs for the production of one pig can be calculated for each farm:

- Individual cost items for animal purchase, feed, losses and veterinarians' bills were added up.
- Costs for lost usages or premature sales and, assuming that they remained the same, other operating costs were not considered.

**Results**

In all three fattening farms, when comparing VG with CG, changes in clinical situation and biological performance parameters were observed.

A special situation had already presented in Farm 2: a severe acute diarrhoea in the first days (Fig. 3). While in Farms 1 and 3 the costs for antibiotic and anti-inflammatory agents were reduced in the VG, in Farm 2 the acutely ill pigs had to undergo treatment at the beginning of fattening (Fig. 4).

Animal losses documented also reflect clinical events (Fig. 5):

- Farm 2: 9/12 losses in the VG occurred in the first four weeks.
  - Farm 3: documentation shows fewer pigs with 'diarrhoea' or 'scabbing' as cause of loss in the VG.
- Table 2 shows an overview from both groups: FCR improved significantly in all three farms (most pronounced at Farm 2; Fig. 6) in the on-farm comparison.
- The farm-specific economic calculation (Table 3) highlighted that:
- In Farm 2, although the costs for treatments (+€0.30) and losses (+€0.44) were higher in the VG due to early disease onset, the total production cost is significantly lower (-€6.60) due to the improved FCR.
  - If feed prices of €40/dt are used, the influence of an improved FCR on the reduction of the total production costs becomes clear.

**Discussion**

When interpreting the observations and performance parameters of both groups, it must be taken into account that this is a field observation.

Numerous study results comparing intradermal to intramuscular application show a visible and significant reduction of pain and stress with the needle-free

intradermal method measured by different behavioural parameters.

An elaborate loading trial shows that simultaneous intradermal application of the vaccines against the four relevant swine pathogens is as effective as single application.

In Farm 2, acute clinical events in the VG began 2-3 days after delivery. Such a positive Lawsonia status is regularly described and is in agreement with recent studies of Lawsonian loads in Europe.

The use of antibiotic and anti-inflammatory agents was reduced in two of the three farms in the VG compared to the CG. This is consistent with recently published practice case reports in which antibiotics were also reduced after intramuscular Lawsonia vaccination.

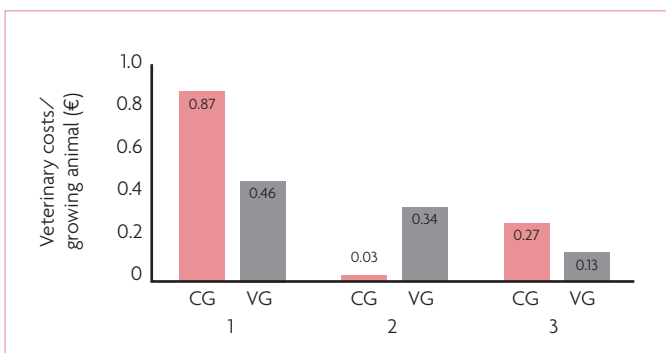
The antibiotic groups of macrolides and pleuromutilins, which are considered to be particularly effective against

Continued on page 14

	Farm 1		Farm 2		Farm 3	
	CG (n=581)	VG (n=528)	CG (n=530)	VG (n=530)	CG (n=600)	VG (n=600)
Fattening batch						
Average stall-in weight (kg)	26.3	25.9	30.0	26.5	28.4	33.3
Average stall-out weight (kg)	128.40	131.10	124.25	127.23	125.10	126.20
Losses (%)	1.38	0.57	1.32	2.26	1.67	1.67
Average fattening days	91.6	97.3	107.5	109.6	92.6	96.7
Mean daily weight gain (g)	1106.1	1079.5	865.0	899.1	1,031.2	948.6
Feed conversion 1:	2.64	2.58	2.84	2.57	2.89	2.86
Veterinary costs/pig (€)	0.87	0.46	0.03	0.34	0.27	0.13

**Table 2. Overview of the results of the fattening batches of the comparison (CG) and vaccination group (VG) in the three evaluated fattening farms.**

**Fig. 4. Comparative presentation of treatment costs (antibiotic and anti-inflammatory agents) in the three farms between the comparison (CG) and the Porcilis Lawsonia ID vaccination groups (VG). Not included are the costs for the Lawsonia vaccination.**



**Fig. 5. Comparative presentation of animal losses (%) in the fattening farms in the comparison group (CG) and the Porcilis Lawsonia ID vaccination group (VG).**



	Farm 1		Farm 2		Farm 3	
With an average feed price of (€/dt)	26.20	40	27.66	40	28.88	40
Feed costs	-1.53	-2.33	-7.35	-10.62	-0.82	-1.14
Antibiotic treatments (excluding vaccination costs)	-0.41	-0.41	+0.30	+0.30	-0.13	-0.13
Losses (%)	-0.45	-0.45	+0.44	+0.44	+0.15	+0.15
Overall balance sheet for individual farms	-2.38	-3.19	-6.60	-9.88	-0.80	-1.12

**Table 3. Balance sheet of the farm-specific economic evaluation, showing the difference between production costs per growing animal (Farm 1) or per fattening pig sold (Farms 2 and 3). Calculations were made using the farm-specific average feed prices in 2021 (light blue column) and current feed prices of €40/dt.**

Continued from page 13

Lawsonia, have been at a constant, and even increasing, level in Germany since 2015.

However, the example of Farm 2 also shows that a few days after vaccination with Porcilis Lawsonia ID, no robust immunity can yet be expected.

Average FCR from the 20/21 marketing year are given by Erzeugerring Westfalen as 2.76 and by Schweinespezialberatung Schleswig-Holstein e.V. as 2.80. Decisive factors for the FCR are,

besides the actual amount of feed consumed by the animals, possible feed losses, the ration composition, animal health and genetics.

For this reason, only internal comparisons between groups were made.

The economic advantage achieved through reduced production costs in the VG is at different levels in the three farms: While the total benefit in Farm 1 is composed of the different cost items considered, in Farms 2 (€-6.60) and 3 (€-0.80) it is mainly achieved by a reduction of

feed costs due to the improved FCR. Overall, Farm 1 drew a positive conclusion after vaccination: Particularly obvious for the farmer in the stall were the reduced final fattening losses, the more homogeneous growth (also described in Farm 3) and, above all, the lower treatment frequency.

However, in Farm 2, after the end of the observation, it became apparent how difficult it is to visualise the success of the Lawsonia vaccination.

In this case, it was only possible to make the decisive cost factor of feed visible by means of careful data documentation and evaluation.

### Take home messages

Depending on the clinical course, vaccination with Porcilis Lawsonia ID at the start of the fattening period can be an effective control measure. Vaccinated fattening batches showed an improved FCR of between 0.03 to 0.27.

In cases of early infection and clinical abnormality at the beginning of fattening, antibiotic therapy should be considered, in addition to vaccination, until a sufficient immune response is developed. ■

References are available from the author on request

**Fig. 6. Comparative representation of feed conversion in the fattening farms in the comparison group (CG) and the Porcilis Lawsonia ID vaccination group (VG).**

