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ESPHM 2026

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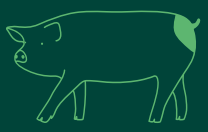
PRRS

Sampling of *Lawsonia intracellularis* in slaughterhouse as a tool for comparative evaluation of two vaccine administration routes



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Background and objectives

Porcine Proliferative Enteropathy (PPE), caused by *Lawsonia intracellularis* (L.i.), is one of the most prevalent enteric diseases in European countries (1) with a major impact on pig performance. Pigs are usually infected sub-clinically and therefore it is often difficult for producers to asses the impact of the disease and the economic return of control programs.
Sampling at slaughterhouses for qPCR testing has been proposed as a good method for diagnosing the disease, so the aim of this study is to investigate whether there are different results in slaughterhouse sampling in animals vaccinated with different vaccination schedules.

Material and Methods

This study was conducted in a 3,000-place fattening unit housing two consecutive groups of pigs raised under the same conditions. Pigs at fattening were suffering from clinical Ileitis confirmed by qPCR in fecal samples. The first group (group A) was intramuscularly vaccinated at 3 weeks of age with an inactivated intramuscular L.i. vaccine, Porcilis Lawsonia and the second group (group B) was vaccinated with a modified live L.i. vaccine, Enterisol® Ileitis by drinking water at 8 weeks of age,. In both cases, following the manufacturer's instructions. A total of 50 ilea were collected per group, 20 per group were sent to laboratory A and 30 per group to laboratory B to run qPCR. Fisher's exact test was used to compare the results.

Results

Results are summarized in Table 1.
None of the ileums from pigs in group B were positive, while 16 % ($p < 0.05$) (5 % in laboratory A and 23.30 % in laboratory B $p < 0.05$) of the ileums from pigs in group A were positive with ct values between 26.05 and 38.22.

Table 1: % of Positive Ilea in group A and group B

		Group A	Group B	
Lab A	Samples	20	20	
	Positive PCR	**1**	**0**	
	%	5%	0%	
	Negative PCR	**19**	**20**	
	%	95%	100%	
Lab B	Samples	30	30	
	Positive PCR	**7**	**0**	
	%	23.30%	0%	
	Negative PCR	**23**	**30**	p<0.05
	%	76.66%	100%	
Total	Samples	50	50	
	Positive PCR	**8**	**0**	
	%	16.00%	0%	
	Negative PCR	**42**	**50**	p<0.05
	%	84.00%	100%	

Discussions and Conclusions

Slaughterhouse sampling for Lausonia intracellularis qPCR testing of ilea appears to be a good method for comparing different control programmes for porcine proliferative enteropathy. Under the conditions of this study, oral vaccination is a more effective method of controlling *Lawsonia intracellularis* excretion until the final stages of pig growth.
Under the conditions of this study, the group of animals vaccinated orally performed better than the animals vaccinated intramuscularly.

References

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Life forward

Optimizing PCV2 vaccination timing in sow herds: implications for piglet growth and health

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Background and Objectives

Porcine circovirus type 2 (PCV2) is a globally prevalent virus that negatively affects swine health. It can infect piglets during fetal development via placental transmission. Piglet vaccination around weaning is a common practice in swine herds and it has proven effective in reducing viral load and improving productivity. Recent studies suggest additional benefits when sows are vaccinated reducing viral vertical transmission[1,2]. This study aimed to evaluate piglet performance based on different intervals between sow vaccination and farrowing, to identify an optimal vaccination protocol.

Materials and Methods

A multi-site Hungarian farm with 1,600 sows and a 3-week batch farrowing system was selected. The farm transitioned from biannual mass vaccination with Ingelvac CircoFLEX® to per-cycle sow vaccination one week before weaning. PCV2 circulation had previously been confirmed via PCR in fetal tongue tips. Production batches were grouped by the interval between sow vaccination and farrowing: long (24–27 weeks), medium (12–21 weeks), and short (3–9 weeks). Key performance indicators were statistically analyzed with Minitab®.

Results

A total of 86 nursery and 60 fattener batches were evaluated. In the nursery phase, piglets from the medium interval group showed a trend toward lower nursery mortality (2.2% 95% CI 1.78–2.65) compared to the long (2.48% 95% CI 1.83–3.1) and short (2.8% 95% CI 2.21–3.4) groups (p-value = 0.1). Average daily weight gain was numerically higher in the medium-interval group (400 g/day), compared to the short (374 g/day) and long (394 g/day) intervals. In the fattener phase there were no statistically significant differences found among groups in respects to productivity parameters.

Discussion and Conclusion

Maintaining high immunity in sows during gestation is crucial to minimizing vertical transmission of PCV2. While piglet vaccination is standard, sow vaccination adds protection by reducing in utero exposure. The medium interval group (12–21 weeks) showed trends toward improved nursery performance, suggesting this timing may be optimal. Shorter intervals may not allow full protection during gestation, while longer intervals risk waning immunity. A per-cycle sow vaccination protocol before weaning together with the piglets appears practical and effective, ensuring a medium interval (~18 weeks) between vaccination and farrowing. These findings highlight the importance of optimizing sow vaccination timing.

References

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2. Lopez-Moreno G. Evaluation of sow vaccination timing against PCV2 and its impact on piglet performance. Poster presented at: 16th European Symposium of Porcine Health Management (ESPHM); 2025 May 21–23; Bern, Switzerland. In: Proceedings of ESPHM 2025. Available from: https://www.esphm.org/sites/esphm2023.medicalcongress.online/files/medias/documents/ESPHM%202025_Proceedings.pdf

Table 1. Average mortality in Nursery phase by interval between sow vaccination and farrowing

Interval vaccines*	N+	Mean	StDev	95% CI
Long	20	2.478	1.524	(1.832, 3.124)
Medium	44	2.220	1.410	(1.784, 2.656)
Short	23	2.809	1.476	(2.206, 3.412)

*Long (24–27 weeks), medium (12–21 weeks), and short (3–9 weeks) *Pooled StDev = 1.45380*
+Number of production batches

Figure 1: Average mortality in Nursery phase by interval between sow vaccination and farrowing

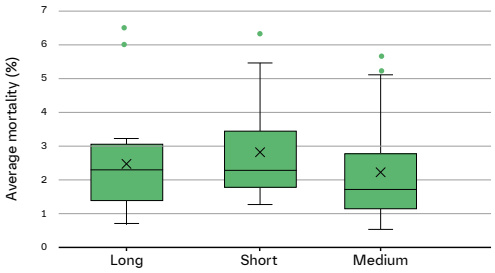
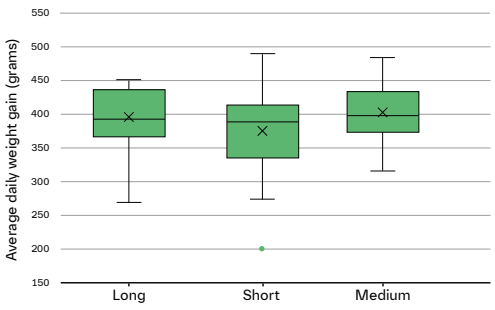


Table 2: Average daily weigh gain in Nursery phase by interval between sow vaccination and farrowing

Interval vaccines*	N+	Mean	StDev	95% CI
Long	20	394.37	43.77	(372.24, 416.50)
Medium	44	400.06	43.06	(385.13, 414.98)
Short	23	374.9	64.6	(354.3, 395.5)

*Long (24–27 weeks), medium (12–21 weeks), and short (3–9 weeks) *Pooled StDev = 49.7703*
+Number of production batches

Figure 2: Average daily weigh gain in Nursery phase by interval between sow vaccination and farrowing



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Life forward

Case Report: Impact of Mass Sow Vaccination Against *Mycoplasma hyopneumoniae* on Piglet Colonization at Weaning

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Background

This study was conducted in a commercial herd of 1,500 sows that had previously experienced a Porcine Respiratory Disease Complex (PRDC) outbreak. The objective was to assess whether vaccinating sows, following specific veterinarian advice, could reduce the transmission of *Mycoplasma hyopneumoniae* (M. hyo) to piglets.
Historically, the farm received gilts from a source infected with M. hyo. However, for the past 18 months, gilts have been sourced from a multiplication farm free of M. hyo, which also supplies other farms that routinely practice mass vaccination of breeding animals against this pathogen. During a veterinary visit, it was discovered that sow vaccination had been **discontinued on this farm, creating an opportunity to compare outcomes between vaccinated and unvaccinated systems**.

Material and Methods

The vaccination program used **Ingelvac MycoFLEX®** for both sows and piglets. Deep tracheal swabs were collected from piglets at weaning after reintroducing sow vaccination and compared with samples from other vaccinated herds supplied by the same multiplier. PCR testing was performed to detect the presence of M. hyo.

Results

All piglet samples from the farm following mass sow vaccination tested negative for M. hyo, as did samples from other vaccinated herds (Table 1). Additionally, respiratory issues during the fattening phase were no longer observed. These findings confirm that sow vaccination effectively prevents piglet colonization at weaning, reducing the prevalence of PCR-positive animals. As illustrated in Figure 1, the antibiotic treatments were also dramatically reduced after the arrival of the piglets born from re-vaccinated sows.

Conclusions

Mass vaccination of sows against M. hyo is a reliable strategy to limit pathogen transmission in modern swine production.[1–5] By preventing early colonization, this approach improves respiratory health and lowers the risk of future outbreaks. The study also underscores the importance of compliance with veterinary recommendations and monitoring piglets at weaning to ensure disease control, even in the absence of clinical signs.

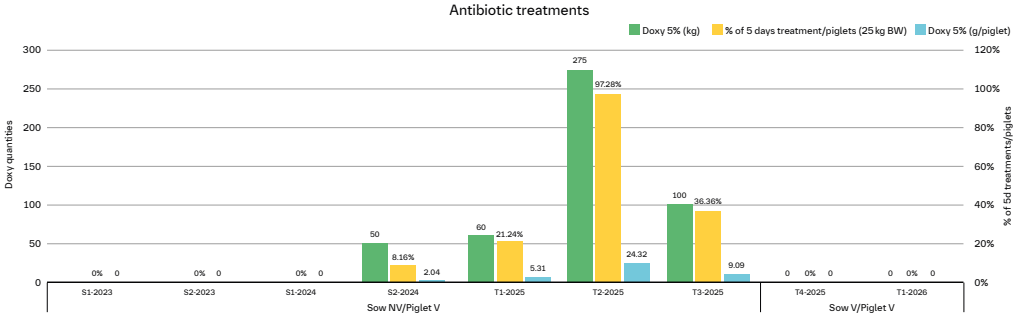

Figure 1: Histogram of total doxycycline (kg), percentage of treated piglets, and % of 5 day treatments overtime (S=Semester; T=Trimester) for the study farm

Table 1: Summary of PCR results for M.hyo deep tracheal swabs

M hyo vaccination status	Farms populated from the same M Hyo negative multiplier	Date	PCR results (pool of 6 samples)	% of positive results
Sow Non Vacc & piglet Vacc	Negative control before mass vaccination	2025-06-15	6 positives / 6	100%
Sow Vacc & piglet Vacc	Negative control 7 months after mass vaccination	2026-02-12	12 negative / 12	0%
Sow Vacc & piglet Vacc	Positive control farm 1	2025-11-01	10 negative 10	0%
Sow Vacc & piglet Vacc	Positive control farm 2	2025-10-03	10 negative / 10	0%
Sow Vacc & piglet Vacc	Positive control farm 3	2025-09-30	5 negative / 5	0%
Sow Vacc & piglet Vacc	Positive control farm 4	2025-09-13	12 negative / 12	0%

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Life forward

Comparative evaluation of two vaccination protocols for *Mesomycoplasma hyopneumoniae* under field conditions

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Introduction and Objectives

Despite the availability of vaccines and the knowledge in the industry for the control of *Mesomycoplasma hyopneumoniae* (M. hyo), this pathogen remains key in the porcine respiratory complex (CRP). **SoundTalks® (ST**) is a sound-based monitoring tool that provides the ReHS (Respiratory Health Status) metric that has shown to detect disease early (up to 5 days before the start of an outbreak)[1] and correlate with very sensitive sampling techniques (tracheobronchial scrapings)[2]. The objective of this study was to evaluate two vaccination strategies against M. hyo in fattening pigs by comparing mortality rate and respiratory clinical signs provided by STs - ReHS.

Materials and Methods

The study included 8160 PRRSV and M. hyo positive pigs (distributed in 8 lots of 1020 animals) corresponding to 16 weeks of production from a single sow farm. Pigs were housed in 4 parallel barns sound-monitored with 12 ST devices (3 monitors/barn) and followed for 2 consecutive batches. All pigs were vaccinated for M. hyo at weaning (21 days) with a commercial M. hyo vaccine and 50% booster vaccinated at the beginning of fattening (63 days), while the others remained as a negative control. Allocation to treatment was at a barn level and alternated between batches. Batch mortality was recorded, and respiratory health was analyzed based on ReHS and % of green days. ReHS is a value between 0 and 100 that is associated with a color scale: green (100 – 61), yellow (60 – 41), and red (40 – 0). When the graph leaves the green stripe (ReHS < 60) it is considered a respiratory alarm. The statistical analysis was performed with Minitab®21.

Results and Discussion

Results from this study demonstrated a significant improvement in both the respiratory health index (ReHS) **(Figure 1)** and the total percentage of days in alarm (ReHS < 60) between the boosted-vaccinated animals (b) (average ReHS 58 and 55% of days in alarm) and the control group not revaccinated (a) (average ReHS 31 and 96% of days in alarm). The effect of the booster dose of M. hyo resulted in a 35% reduction in mortality (6.6% in control groups vs 4.3% in revaccinated pigs) **(Table 1)**. The differences in mortality were consistent throughout the months, which was directly related to an improvement in overall respiratory health demonstrated by the dynamics of ST. ReHS graph of revaccinated batches was above (healthier) controls on 70% of days (105 / 150).

Conclusions

These results demonstrate not only the impact of a booster vaccination dosis for Mhyo to control respiratory clinical signs and production parameters under field conditions but also the potential of sound-based monitoring technologies as objective tool. Under the conditions of the present study, the investment of a M.hyo. boost dose translated to a return on investment **(ROI)** of 1:10 only considering the reduction of mortality that it made possible.

References

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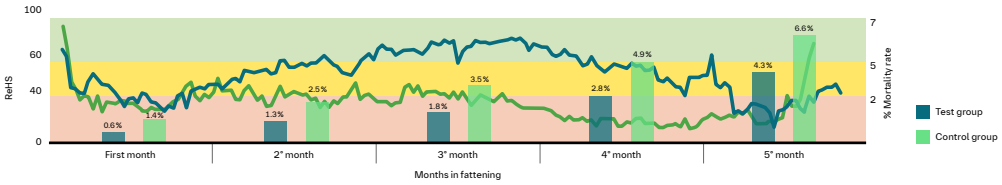

Figure 1: Respiratory health status (ReHS) in lines and cumulative mortality rates (bars) by months on fattening (control group vs. test group – revaccinated with M. Hyo)

Table 1: Results for control group vs. test group. Different letters indicate statistically significant differences between parameters.

Parameters	Control Single dose M.hyo vaccination	Test Double M.hyo vaccination	P-value
Entered pigs	4080	4080	
ReHS average	31[a]	58[b]	**<0.0001***
% days in Green	4%[a]	45%[b]	**<0.0001***
% Alarm days	96%[a]	55%[b]	
Mortality	**6.6%[a]**	**4.3%[b]**	**0.0007***

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Life forward

Does a booster vaccination at the start of the fattening period improve control of *Mycoplasma hyopneumoniae* infection in pigs?

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INTRODUCTION

- *Mycoplasma hyopneumoniae* remains a major health concern in swine despite widespread vaccination.
- Most protocols involve vaccination between one and three weeks of age to protect pigs throughout the wean-to-finish phase.
- Disease may still occur during the fattening period in some herds, highlighting the need to assess whether a booster vaccination can extend protection until slaughter.

OBJECTIVE

This study aimed to evaluate the effect of a booster dose of the *M. hyopneumoniae* vaccine at the start of the finishing period in pigs exposed to natural infection.

MATERIALS & METHODS

- Three hundred pigs from the same batch of a *M. hyopneumoniae*-positive farm were allocated to two groups: (1) booster group (n = 150), vaccinated with Ingelvac MycoFLEX® at weaning and again at the start of fattening; and (2) one-dose group (n = 150), vaccinated with the same vaccine only at weaning (Fig.1).
- Tracheal catheter and blood samples were collected at entry into fattening, and at 60 and 90 days afterwards.
- Tracheal catheter samples were analysed by real-time PCR, while serum samples were tested by ELISA.
- Body weight was recorded at the same sampling time points.

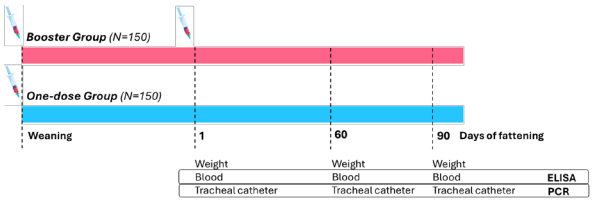

Figure 1. Experimental design.

RESULTS

- At 60 days of fattening, the number of seropositive animals was significantly higher in the Booster group compared with the One-dose group ($p < 0.0001$; Fig. 2).
- At 90 days of fattening, the number of *M. hyopneumoniae* PCR-positive animals was significantly higher in the One-dose group than in the Booster group ($p < 0.0001$; Fig. 3).
- At 90 days of fattening, pigs in the Booster group ($\bar{x}$ = 89.22 Kg) were significantly heavier than One-dose pigs ($\bar{x}$ = 85.16 Kg; $p < 0.05$).
- Average daily weight gain (ADWG) was significantly higher in the Booster group than in the One-dose group ($p < 0.05$; Fig. 4).
- Carcass weight was also higher in the Booster group, with a mean difference of +4.9 kg compared with the One-dose group ($p < 0.0001$).

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RESULTS

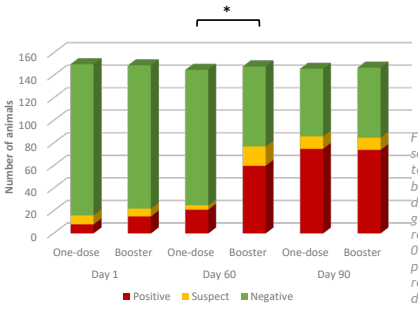

Figure 2. Number of seropositive animals to M. hyopneumoniae by ELISA in the One-dose vs. Booster group. Chi-square test results were p = 0.187, p < 0.0001, and p = 0.949 for the respective sampling dates.

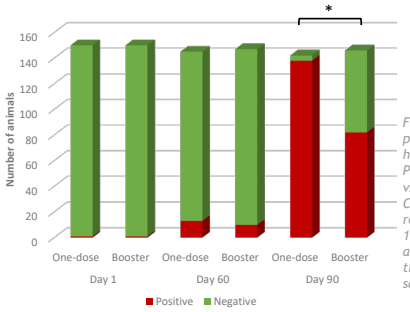

Figure 3. Number of positive animals to M. hyopneumoniae by PCR in the One-dose vs. Booster group. Chi-square test results were p = 1.000, p = 0.63927, and p < 0.00001 for the respective sampling dates.

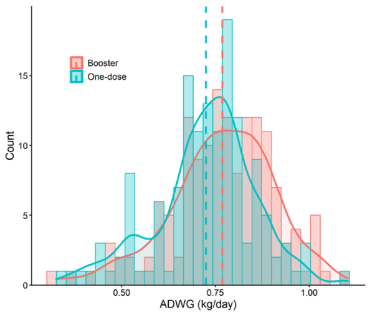

Figure 4. Histogram showing the distribution of average daily weight gain (ADWG) for pigs in the One-dose and Booster groups. Dashed lines denote the mean ADWG of each group. Differences between groups were assessed using the Wilcoxon rank-sum test (p = 0.004816).

DISCUSSION & CONCLUSIONS

- **A boost vaccination against *M. hyopneumoniae* reduced infection pressure, as evidenced by fewer PCR-positive animals towards the end of the fattening period.**
- **Seropositivity increased significantly after booster vaccination, although absence of seroconversion does not necessarily indicate lack of protection.**
- **Pigs that were boost vaccinated showed improved productive performance, with higher ADWG, greater live weight, and carcass weight.**

Reduction in *Mesomycoplasma hyopneumoniae* colonisation in pigs following mass vaccination of sows

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Background and Objectives

Mesomycoplasma hyopneumoniae (M. hyo) is the primary pathogen of enzootic pneumonia (EP). Despite the availability of vaccines, the pathogen remains a major contributor to the porcine respiratory disease complex (PRDC) which causes significant economic losses to the pig industry[1]. It has been demonstrated that prepartum vaccination of sows can reduce colonisation of piglets[2]; however, vaccination of gestating sows against M. hyo is not frequently practised under field conditions[3]. The objective of this field trial was to evaluate the impact of sow mass vaccination against M. hyo on reducing colonisation in their offspring.

Material and Methods

The trial was conducted in a commercial pig herd located in north-eastern Spain. EP was diagnosed in the finishers based on clinical signs and detection of M. hyo by PCR in deep tracheobronquial swabs, despite the piglets having been vaccinated against M. hyo at weaning (3 weeks of age). Following the detection of M. hyo in fattening pigs, the sows received a double mass vaccination (4 weeks apart). 60 pigs were ear-tagged and deep tracheobronquial swabs were taken at 15, 20 and 25 weeks of age (woa) before sow mass vaccination (control group) and other 120 pigs after the sow vaccination. Individual PCR for M. hyo was performed on all samples. The data were statistically analysed in Minitab using the T-test.

Results

In the group of piglets born to vaccinated sows, the proportion of RT-PCR-positive pigs decreased significantly at 15 weeks of age (42 % versus 19 %, p = 0.002) and at 20 weeks (88 % versus 38 %, p < 0.001), with no significant differences at 25 weeks (78 % versus 70 %, p = 0.314) **(Table 1)**. Survival analysis **(Figure 1)** confirmed a higher probability of remaining RT-PCR negative in pigs after sow mass vaccination up to 20 weeks of age.
Mean CT values were also higher in the sow vaccination group, indicating a lower pathogen load, with significant increases at 15 weeks (36.6 versus 38.2, p = 0.002) and at 20 weeks (31.46 versus 37.10, p < 0.001). At 25 weeks, CT values did not differ significantly (33.58 vs 34.45, p = 0.219), consistent with similar PCR positivity rates at this age **(Table 2 and Figure 2)**.

Discussion and Conclusion

Under the conditions of this study, sow mass vaccination effectively reduced early M. hyo infection in growing pigs, as evidenced by lower PCR-positivity and higher CT values up to 20 weeks of age. These findings indicate reduced pathogen transmission and a lower bacterial load during the early finishing period. However, no significant differences were observed at 25 weeks, suggesting that the protective effect diminishes later in production or that cross-contamination occurs. Sow vaccination can therefore be a valuable tool to delay and reduce M. hyo circulation, but additional measures may be needed to maintain control through the end of finishing. Further research is required to determine the impact of this strategy on performance parameters and overall productivity.

Table 1: Percentage of pigs testing positive in RT-PCR at different ages before and after their mothers were vaccinated.

	Before sow mass vaccination	After sow mass vaccination	P-value
15 WOA	42 %	19 %	**p = 0.002***
20 WOA	88 %	38 %	**p < 0.001***
25 WOA	78 %	70 %	p = 0.314

Table 2: Average CT values of R-PCR M. hyo in pigs before and after mass vaccination of sows.

	Before sow mass vaccination	After sow mass vaccination	P - value
15 WOA	36.6	38.2	**p = 0.002***
20 WOA	31.46	37.10	**p < 0.001***
25 WOA	33.58	34.45	p = 0.219

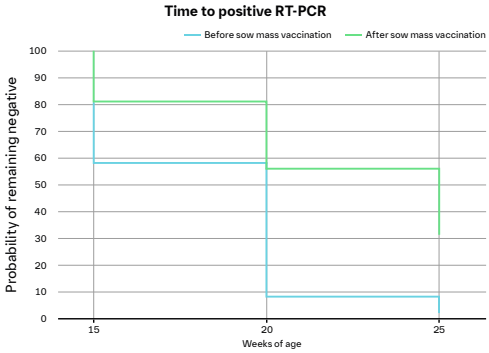

Figure 1: Kaplan-Meier survival curve. Probability of remaining negative by group and age (Pigs before sow mass vaccination vs pigs after sow mass vaccination)

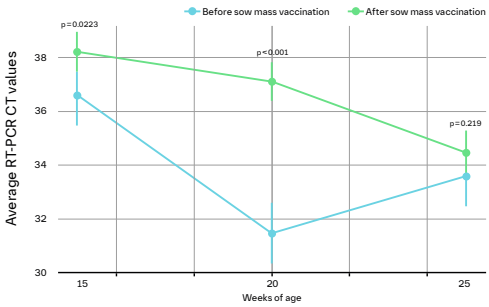

Figure 2: Average CT values of M. hyo RT-PCR (Pigs before sow mass vaccination vs pigs after sow mass vaccination)

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Boehringer Ingelheim

Life forward

Effects on acute phase proteins in piglets of two different PCV-2 and *Mycoplasma hyopneumoniae* vaccination protocols

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Introduction

Porcine circovirus 2 (PCV-2) and co-infection with *Mycoplasma hyopneumoniae* (Mhyo) plays a primary role in the porcine respiratory disease complex, which continues to have a great economic impact on the global pork industry[1]. Acute Phase Proteins (APPs) have been proposed as suitable biomarkers to monitor welfare[2] and inflammatory response[3]. In addition, C-reactive protein (CRP) has recently been postulated as a potential biomarker use for vaccine safety studies[4] and the measurement of haptoglobin (Hp) may be an indicator of average daily weight gain (ADWG) in pig farms[5].

The aim of this study was to evaluate the response of wean piglets to vaccination with two different PCV-2 and *Mycoplasma hyopneumoniae* vaccine combinations based on Hp, CRP and rectal temperature.

Material and Methods

In total, 40 commercial piglets from the same flow were divided into two groups and vaccinated intramuscularly at 28 days of age. The first group (A, n=20) received a fresh mixture of Ingelvac CircoFLEX® and Ingelvac MycoFLEX® in a single injection of 2 ml (FLEXcombo®; Boehringer Ingelheim). The second group (B, n=20) was vaccinated with 2 ml of a ready-to-use (RTU) product, Cirbloc Mhyo® (Ceva Santé Animale).

Blood samples were taken just before vaccination and at 24 h and 48 h after vaccination. Rectal temperatures were taken just before vaccination and at 6 h after vaccination.

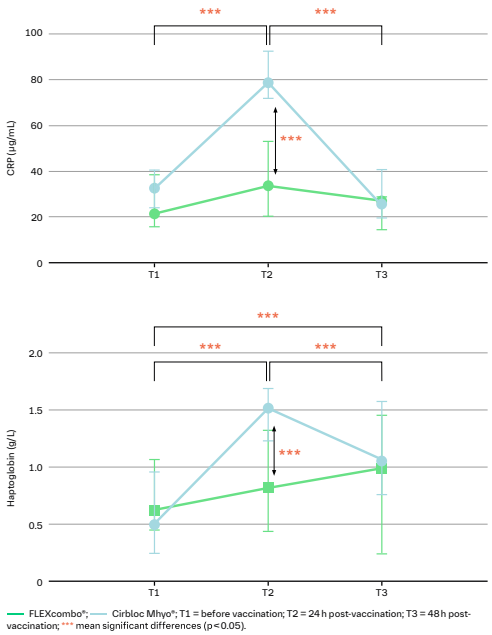
Results

As shown in figure 1, the administration of both protocols increased CRP and HP serum concentration in comparison to the basal level of the respective group. This increase was significantly higher ($p<0.05$) in group B at 24 hours post-vaccination. Hp and CRP concentrations were significantly higher in group B compared to group A.

The average rectal temperature (figure 2) in pigs vaccinated with the treatment A increased slightly but not significantly (+0.4 °C above basal levels) in the next 6 hours after vaccination. On the other hand, the average rectal temperature of group B presented a significant increase ($p<0.05$) in the next 6 hours after vaccination (+1.3 °C above basal levels). The rectal temperature of piglets from the group B was significantly higher ($p<0.05$) than those from the group A.

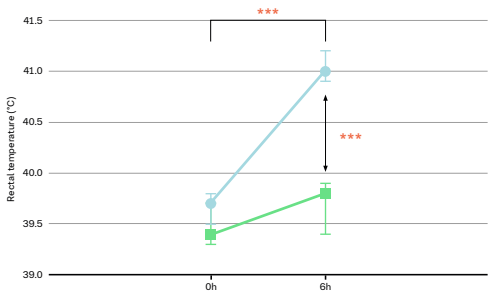
Conclusions

According to our results, the release of APPs was significantly higher in piglets vaccinated with the protocol B (Cirbloc Mhyo®). Furthermore, a significant increase of rectal temperature was observed in group B pigs. These results could be explained by the different design of the vaccines (adjuvant and/or antigens composition). As described in other studies[6], vaccination with FLEXcombo® has a minor negative effect on well-being parameters and induces less stress, compared to other vaccines such us RTUs, which is important for intestine integrity and growth performance during the nursery period.



FLEXcombo®; Cirbloc Mhyo®; T1 = before vaccination; T2 = 24 h post-vaccination; T3 = 48 h post-vaccination; *** mean significant differences ($p<0.05$).

Figure 1: Haptoglobin and C-reactive protein serum concentrations after vaccination with 2 protocols (A: green line, B: blue line).



FLEXcombo®; Cirbloc Mhyo®; 0 = before vaccination; 0 h and 6 h post-vaccination; *** mean significant differences within and between groups ($p<0.05$).

Figure 2: Rectal temperature after vaccination with 2 protocols.

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Life forward

Case study: Accumulation of PRRSV-1 in mixed groups of piglets at the end of nursery

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VARKENSARTSENZUID

Introduction

In the Netherlands PRRSV-1 is considered endemic. Estimates are that more than 90% of sow herds are PRRS vaccinated. 40% of the nurseries in the Netherlands are PRRS PCR positive (Beek 2024). Usually, at 8–10 weeks of age, nursery piglets are selected for transport to the finishing barn. Standard procedure in the Netherlands is to move the piglets that don't meet the minimum weight requirement at this age to the next (younger) batch of nursery piglets. By doing this, rooms are created where piglets of different age groups are housed. The objective of this field study was to gain insights on the PRRSV dynamics in these 'mixed groups' versus 'intact groups' at the end of nursery in PRRSV endemic farms.

Material and Methods

Oral fluid samples were collected every four weeks at the end of nursery in two farrow-to-feeder herds (average 1100 sows) over 15 and 4 consecutive periods, respectively. 'Intact' rooms housed piglets of a single age, while 'mix' rooms included piglets of multiple ages due to selection for underweight. Oral fluids from three non-adjacent pens per room were pooled and tested for PRRSV by PCR at a commercial laboratory (VLG, Epe, Netherlands). Data was analyzed using Chi-square and Mann-Whitney U tests.

Results

Positive PRRS PCR results in the group 'intact' were found in 10/ 19 samplings. Positive PRRS PCR results in the group 'mix' were found in 15/ 19 samplings. ($X2$ (1, N = 38) = 2.9231, p = 0.087321)
In the group 'intact' (n = 19) the PRRS PCR Ct average was 35.81. In the group 'mix' (n = 19) the PRRS PCR Ct average was 33.33, (p = 0.039, Mann-Whitney U)

Table 1: 2x2 table of the type of group versus the oral fluid PRRS PCR results ($X2$ (1, N = 38) = 2.9231, p = 0.087321)

		PRRS PCR	
		positive	negative
Group type	mix	15	4
	intact	10	9

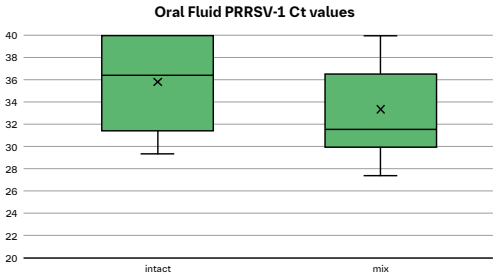

Figure 1: Oral fluid PRRSV-1 Ct values per category (intact groups and mix groups), (n = 38, p = 0.039, Mann-Whitney U). The boxplot whiskers indicating the maximum and minimum values, the horizontal line is the median and X is the average value.

Discussion and Conclusion

With the goal to control PRRSV in a farrow-to-feeder herd it is crucial to avoid accumulation of PRRSV in individual groups. These groups can pose a threat for horizontal transmission of virus to other rooms and batches within the nursery and/or back into the sow herd. This way, creating viral recirculation in the population. As suggested by Calderon (Calderon 2017).
When comparing the PRRS PCR results of the intact groups against the mix groups, a trend towards more PRRSV positivity was found in the mix groups. For one farm individually, that trend could also be found. The other farm lacked a trend of significance due to a low number of submissions.
A significant difference in Ct-values was calculated. PCR Ct-values are generally used as a proxy for viral load and in this case study it can be concluded that mixing piglets of different age groups end of nursery leads to accumulation of PRRSV in these rooms. This way, posing a risk for recirculation of PRRSV to other groups of pigs in the farm. Using this information, both farms have adopted their protocols accordingly.

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Acknowledgement

Acknowledgement to PH Rathkjen for bringing up the original idea of PRRSV accumulation in mix groups end of nursery.

Boehringer Ingelheim

Life forward

Impact of Sample Material and Diagnostic Laboratory on Neonatal PRRS PCR Monitoring Results

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LINTJESHOF
Farm health solutions

Introduction

Effective control of Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) in swine production requires early detection of infection in neonatal piglets (Steenaert 2024). Various sample matrices – processing fluids (Vilalta 2019), tongue fluids (Baliellas 2018), and umbilical cord (Martin-Valls 2018) fluids – are utilized for PRRSV PCR monitoring, but the comparability of results across sample types and diagnostic laboratories remains unclear. The objective of this study was to evaluate whether qualitative (positive/negative) and quantitative (Ct value) PRRSV-1 PCR results from neonatal piglet samples are comparable across different sample materials and commercial diagnostic laboratories.

Material and Methods

From 2024 to 2025, neonatal piglets from 152 PRRSV-1 infected sow herds in the Netherlands were sampled at the farrowing batch level. Farm staff, following practitioner instruction, collected processing fluids (PF), tongue fluids (TF), or umbilical cord fluids (UC), which were pooled (max. 60 litters per pool) and submitted to one of two commercial accredited laboratories. PCR testing was performed, and results were analyzed for both qualitative and quantitative comparability.

Results

A total of 2,680 samples were analyzed. The proportion of PCR-positive samples were not statistically different between laboratories (Merefelt: 21.3%; VLG: 24.2%, p-value > 0.05 with X2 test). However, significant differences in mean Ct values for positive samples were observed between laboratories, Merefelt mean of 27.2 ± 3.9; VLG of 29.9 ± 4.5, p-value < 0.05 with the Wilcoxon test after normality was rejected.
Across sample materials, the percentage of PCR-positive pools and the corresponding Ct values varied, although qualitative results (positive/negative) remained consistent across laboratories. An exception was the UC samples, which were only processed at the Merefelt laboratory. Merefelt analyzed 1,076 PF samples (21.7% positive) and 300 TF samples (16.7% positive), with no statistically significant differences between sample types (Fisher's test, p > 0.05). Similarly, VLG received 825 PF samples (25.2% positive) and 247 TF samples (20.6% positive), again without statistically significant differences (Fisher's test, p > 0.05). However, quantitative Ct values were not directly comparable between laboratories due to inter-laboratory variability.

Table 1: Overview of samples per lab and sample material, plus the percentage of positive PCRs and the corresponding Ct values (mean and stdev) (PF = Processing Fluids, TF = Tongue Fluids, UC = Umbilical Cord fluids)

Laboratory	Farms (n)	PCR (n)	PCR (%)	Ct mean	Ct stdev
Merefelt	**87**	**1608**	**21.3%**	**27.2**	**3.9**
PF	50	1076			
positive	23	234	21.7%	27.76	3.77
TF	25	300			
positive	13	50	16.7%	26.26	4.05
UC	18	232			
positive	11	58	25,0%	26.05	4.38
VLG	**65**	**1072**	**24.2%**	**29.9**	**4.5**
PF	46	825			
positive	28	208	25.2%	29.93	4.68
TF	25	247			
positive	14	51	20,6%	30.20	3.70

Discussion and Conclusion

The results of this study showed a similar level of positivity rate in pooled neonatal piglet samples in both sample materials and diagnostic laboratories. However, comparison of quantitative Ct values between laboratories is not as straight forward. These findings support the use of diverse sample matrices and laboratories for qualitative PRRSV-1 monitoring in field conditions, while highlighting the need for caution when interpreting quantitative PCR data across different diagnostic settings.

Acknowledgements

Lola Pailler Garcia and Carles Vilalta from the epidemiology department of IRTA-CReSA

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Implementation of biosecurity measures on PRRS on a selection of farms in the Netherlands

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Introduction

Porcine Reproductive and Respiratory Syndrome (PRRS) is a complex disease. Modified Live Vaccines are the primary immunological tool for its control, but a more holistic approach should be implemented to achieve sustainable results. Implementation of biosecurity measures on swine farms is an important tool to improve the PRRS status of swine farms. To assess the status of implemented biosecurity measures, and to be able to measure the effectiveness of interventions, a systematic approach should be implemented as well[1]. Several tools have been developed to aid in this. In this overview results of COMBAT biosecurity tool from Boehringer Ingelheim[2] on farms in the Netherlands are described.

Material and Methods

The free COMBAT biosecurity audit from Boehringer Ingelheim helps pig farms assess risk factors for the introduction and spread of the PRRS virus. Through up to 98 questions in five categories (General, External Biosecurity, Transport, Internal Biosecurity, and Management), the biosecurity situation is mapped out. In the period 2022 – 2025 the audit was conducted in 43 sow herds, 2 of which were audited twice. Seventeen of the sow herds were part of farrow-to-finish farms, twenty-three had no finishing pigs. The audits were performed by on site interviews by one of two field vets from Boehringer Ingelheim to get the results as consistent as possible.

Results

Of the audited farms, 5 had fewer than 500 sows, 29 had 500 – 2000 sows, and 7 had over 2000 sows.

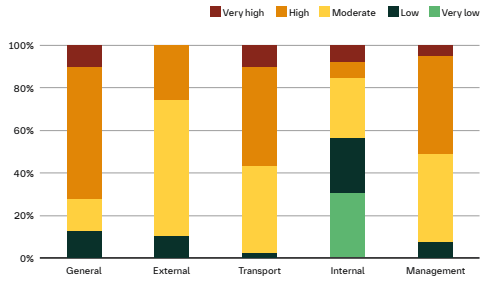

Figure 1: Biosecurity risk overview of 39 of the 43 sow herds. Each stacked column consists of the risk distribution as categorized in the COMBAT biosecurity tool.

General
For 72 % of the farms, the distance to the closest neighboring pig farm was less than 500 meters. On only 16 % of the farms farms the closest neighboring farm was more than 1 kilometer away, 1/43 farms had no neighboring pig farms within 5 kilometers. PRRS status of these neighboring pig farms was unknown for 81 % of the farms in this survey.

External biosecurity
Gilts were purchased externally in 49 % of the farms, with most (86 introducing new gilts every 1 – 3 months. Only 10 farms (23 %) tested gilts before adding them to the sow herd. Quarantine period for replacement gilts lasted 1 – 4 weeks on 9 % of farms, 5 – 8 weeks on 18 %, and 12+ weeks on 29 %, while 27 % used no quarantine.

Transport
Transport trucks are used on multiple farms, with cleaning protocols present but not strictly enforced. About half the farms allow truck drivers into the clean areas.

Internal biosecurity
A vaccination protocol with MLV PRRSv was in place on 88 % of the farms. 40 % used a mass vaccination (of which 5 % less then 3x/year). 23 farms did not vaccinate piglets, 58 % vaccinated the piglets always, 5 sometimes.

Management
Cross fostering within the same farrowing batch/week group took place on 63 % of farms, with over half doing so after three days also. At weaning, 49 of farms moved piglets to a younger week group, while 26 % kept litters together as much as possible.

Discussion and Conclusion

This study involved a relatively small number of sow herds in the Netherlands. The farms are considered a representation of average sow herds in the Netherlands. By conducting the biosecurity audits with two persons only, we regard the audit results consistent and comparable. A part of the farms in this study was also sampled for PRRSV PCR on neonatal piglets and at 10 weeks of age (see Poster VVD-PP-46 on this congress), so it can be assumed that these farms are more aware about PRRSV-infections at their farms then average. We found that several key elements in preventing PRRSV circulation in sow herds in the Netherlands were not always accurate (e.g. quarantine of gilts, testing animals before introduction, access to farm of truck drivers, mixing of different ages of piglets).

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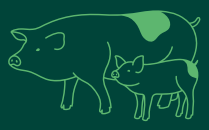
Identifying Sources of Porcine Reproductive and Respiratory Syndrome Virus Instability in Sow Herds Through Parity-Based Neonatal Monitoring



Karien Koenders[1], Elisa De Conti[2], Daniel Linhares[2], Marius Kunze[3], Martijn Steenaert[4]

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Introduction and Objectives

In sow herds affected by Porcine Reproductive and Respiratory Syndrome Virus (PRRSV), pinpointing the source of (re)infection is crucial for reducing virus prevalence in neonatal piglets. This study evaluated a monitoring approach that compares PRRSV polymerase chain reaction (PCR) results between first parity (P1) and older parity (P2+) sows to identify instability sources (The Guilty Gilt Guide, 2023).

Materials and Methods

A prospective cohort study was conducted in 41 Dutch farms from 2023 to 2025, focusing on periods of PRRSV instability. Neonatal samples (processing fluids, tongue fluids, or umbilical cords) were collected by farm staff, pooled by parity, and tested for PRRSV by PCR at one of two commercial laboratories (Laboratories). Inclusion required at least 12 samples per case and a minimum of ≥25% PCR positivity. The analysis compared positivity rates and cycle threshold (Ct) values between P1 and P2+ groups using matched herd-week pairs (111 pairs met criteria).

Results and Discussion

Thirteen cases from nine farms fulfilled all inclusion criteria. P1 versus P2+ samples had:
- in 4/13 cases ≥20% higher PCR positivity;
- in 1/13 cases ≥20% lower average Ct values;
- in 3/13 cases ≥20% lower minimum Ct values.

Conversely P2+ versus P1 samples had:
- in 9/13 cases ≥20% higher PCR positivity;
- in 0/13 cases Ct values were ≥20% lower.

Statistical analysis showed P2+ litters had 1.54 times higher odds of testing positive than P1 litters, though this was not statistically significant (p=0.18). Estimated positivity was 37% for P1 and 48% for P2+, with substantial variation between pairs. No significant difference in Ct values was observed (p=0.87).

Table 1: Cases that fulfilled the inclusion criteria. Red indicates a >20% difference

		PCR		%posPCR		Ct_average		Ct_minimum	
case	year-quarter	number	%pos	P1	P2+	P1	P2+	P1	P2+
A1	2024-2	18	39%	33%	44%	28,2	33,5	22,5	29,7
A2	2024-4	13	77%	100%	50%	26,8	27,5	23,9	26,9
B	2024-1	23	30%	25%	36%	32,0	35,6	30,5	33,5
C	2025-2	14	57%	71%	43%	25,0	33,0	19,9	27,8
D	2024-4	14	50%	57%	71%	25,5	27,2	23,6	25,1
E1	2025-1	26	65%	17%	36%	25,1	29,4	21,6	22,1
E2	2025-2	22	50%	27%	45%	28,7	32,4	26,8	23,6
F	2025-2	18	44%	22%	67%	21,8	26,4	20,8	22,5
G	2025-2	20	35%	30%	40%	24,8	26,0	21,9	21,3
H1	2024-4	22	36%	27%	45%	20,9	25,8	19,6	23,3
H2	2025-1	28	82%	64%	100%	26,4	28,5	19,5	24,7
H3	2025-2	24	29%	42%	17%	29,8	25,9	27,4	24,6
I	2024-3	16	50%	63%	38%	28,5	28,7	21,6	24,3

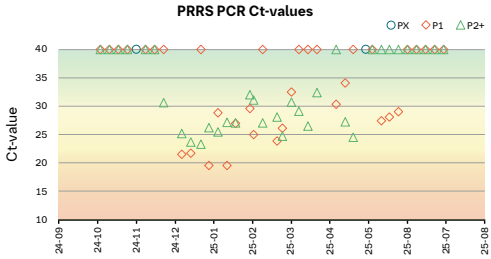

Figure 1: Example of a farm scatterbox showing PRRSV PCR results per parity group over time (Px = mixed samples, P1 = first-parity sample, P2+ = parity 2 and older sample)

Conclusion

In conclusion, parity-based PCR monitoring can help identify instability sources and inform vaccination and biosecurity strategies. While not scientifically validated, this approach proved useful for guiding field interventions. Continuous monitoring and strict sampling protocols are recommended to minimize cross-contamination and improve accuracy.

Learnings:
- When using PF for the separated sampling there is a risk of testing mixed samples when piglets are cross fostered between parities. Using TF in stillborn piglets, or UC, reduces the risk of mixing up samples with different parities.
- To avoid cross contamination good hygiene sampling procedures need to be followed.
- Collecting TF in P1 stillborn in smaller number farrowing batches (<50 farrowings) may result in too small volume of fluid for testing. Corrective options are to additionally sample the piglets that died before cross fostering and to take out more tongue tissue per dead piglet.
- Early in outbreaks the differences in P1 versus P2+ results are more outspoken. As outbreaks occur unannounced continuous monitoring of every batch is advised.
- Visualizing the P1 versus P2+ results in a scatterbox (fig.1) added positively to the discussion in the farms.

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Boehringer Ingelheim

Life forward

Monitoring PRRSV: Three Years of PCR Surveillance in Neonatal Piglets in the Netherlands

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Boehringer Ingelheim Netherlands Animal Health B.V.

Introduction

Effective control of Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) in swine production relies on ensuring piglets are born free of infection. Monitoring PRRSV in neonatal piglets provides an early indication of sow herd status (Steenaert 2024). The Dutch National PRRS Plan (Nationaal PRRS Plan), initiated in 2021, aims to improve PRRSV control. This study evaluates the industry wide spin-off impact of the plan on PRRSV status in Dutch neonatal piglets over a three-year period.

Material and Methods

From July 2022 to October 2025, samples were collected from neonatal piglets in a representative selection of Dutch sow herds. Each quarter, an average of 30.6 farms submitted 271 pooled samples, including processing fluids (Vilalta 2019), tongue fluids (Baliellas 2021), and umbilical cord fluids (Martin-Valls 2018). Samples were tested by PCR in one of three Dutch commercial laboratories; qualitative results were considered comparable (Koenders 2026). A batch or farm was classified as positive if at least one sample had a Ct value below 40.

Results

- PRRSV was consistently detected in approximately 55% of farms per quarter.
- The ratio of positive batches to positive farms decreased over time, suggesting gradual improvement in PRRSV control.
- Seasonal variation was observed, with higher positivity rates in the first half of the year.

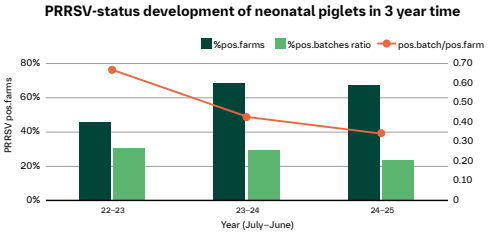

Figure 1: PRRSV-status over time (%, left axis) and ratio of positive batch to positive farms (right axis)

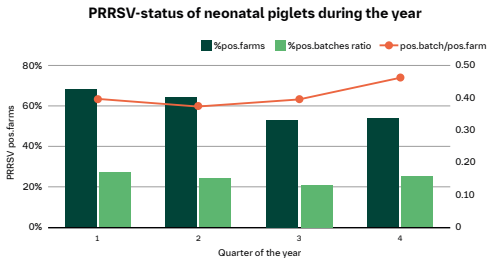

Figure 2: PRRSV-status per quarter of the year (July 2022 – October 2025) (%, left axis) and ratio of positive batch to positive farms (right axis)

Discussion and Conclusion

Pooled sample PCR testing in neonatal piglets is a cost-effective and practical method for sow herd PRRSV monitoring (Vilalta 2019). The study reflects field conditions, with sample collection and storage potentially influencing results. Depending on the PRRS MLV vaccine used in sows, the PCR-positive results can be considered as field strain infections (Lebret 2023), reducing the need for additional typing. Despite the mentioned limitations, findings indicate PRRSV remains endemic in the Netherlands, though control measures are gradually improving herd status.

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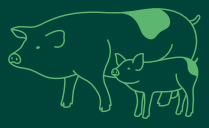
Life forward

Neonatal batch PRRS-status affects production results in the farrowing room



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Introduction

In the Netherlands PRRSV-1 is considered endemic. Estimates are that more than 90% of sow herds are PRRS vaccinated and monitoring data shows that per quarter of the year about 55% of sow herds have one or more farrowing batches that are PRRS PCR positive (Steenaert 2026). Studies show that opportunity costs to slaughter in PRRSV endemic farms in Germany are median 255 euro per sow per year (Renken 2021). Still, it is our experience that a lot of farmers have little awareness about the negative PRRSV impact on the production results already in the farrowing room. In this retrospective study we analyzed farrowing room production data versus the PRRSV-status of the farrowing batches.

Material and Methods

Over time 4 conventional sow herds (average 1500 sows per herd) monitored neonatal piglets by PRRS PCR. The materials used were either processing fluids (Vilalta 2019) or tongue fluids from neonatal dead piglets (Baliellas 2018). A portion of the samples was collected separate as 'first parity sows' (P1) or 'second parity and older sows' (P2+). Mixed parity samples were marked X. In Excel (Microsoft) we matched the farrowing batches with farrowing production data available in the farm management systems (Pig Expert, Agrovision, Netherlands) Statistical tests used Chi-square and Wilcoxon signed rank test.

Results

In total 323 farrowing batch parameters could be included. Of the batches 22.3% tested PRRSV positive. PRRSV positives per parity group were: P1 25.6% and P2+ 15.2% (X^2 (1, N = 174) = 2.914, p = .087811)

Table 1: Parameter differences per farm of neonatal PRRSV-positive batches versus PRRSV-negative batches

PRRSV+ batches	A	B	C	D
farrowing rate (%)	0,2%	-2,7%	-4,2%	3,7%
live born/litter	-0,33	-0,25	-0,53	0,49
weaned/litter	-0,03	-0,18	-0,82	-0,42

Table 2: Parameter differences per parity group across farms of neonatal PRRSV+ versus PRRS- status (*p<.005, Wilcoxon signed rank test)

PRRSV+ groups	X	P1	P2
farrowing rate (%)	-3,9%	-5,2%*	1,8%
live born / litter	-0,41	-0,29	-0,35*
weaned / litter	-0,54		

Discussion and Conclusion

In discussions about PRRS-control about 65% of the farmers have a lack of awareness considering the negative impact of PRRSV (Hendrickx 2024). Insights into field data production parameters in comparable peer farms may create more awareness.

There was some variation in the farrowing room parameters per farm. This may not only be related to the neonatal PRRSV-status. In previous studies significant economic variations per farm were found in endemic PRRSV situations (Renken 2021).

Per parity the weaned per litter parameter is likely influenced by cross-fostering management. Therefore, we only considered this parameter per batch. From the results it can be calculated that PRRSV+ batches wean on average 1.1 piglet per litter less. Assuming the found 22.3% prevalence, 2.3 cycles per year, 2% mortality in the nursery and a 1000 head sow herd that is annually 571 less piglets ready for marketing at 10 weeks of age. With the local 2025 price levels that is about 30,000 euro per farm per year. (Please do consider that there is a lot of variation around the average!)

From the results we conclude that the negative impact of PRRSV around farrowing should not be neglected. First parity sows are more likely to farrow PRRSV positive piglets, especially affecting the farrowing rate. This should trigger the discussion about gilt acclimatization.

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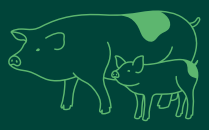
No significant associations between porcine reproductive and respiratory syndrome virus prevalence and weather, manure transport, or pig prices in dutch sow herds



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LINTJESHOF
Farm health solutions

Introduction and Objectives

Porcine reproductive and respiratory syndrome virus (PRRSV) remains endemic in the Netherlands, with over 90% of sow herds vaccinated. Despite extensive monitoring, the factors influencing variation in neonatal PCR positivity rates are unclear. This study aimed to identify correlations between PRRSV prevalence in neonatal piglets and external variables such as weather conditions, manure transport, and pig prices.

Materials and Methods

From 2022 to 2025, 176 sow herds participated in weekly monitoring. Neonatal piglets were sampled using processing fluids, tongue fluids, or umbilical cords, and pooled samples were tested by PCR. Only PRRSV-positive farms were included. Monthly PRRSV positivity rates were compared to pig prices, weather data, and manure transport records using correlation matrices. Correlation strengths were categorized as very weak (0 – 0.19), weak (0.20 – 0.39), moderate (0.40 – 0.59), strong (0.60 – 0.79), and very strong (0.80 – 1.0) *(BMJ)*.

Results and Discussion

Serafini 2025 related manure processing to PRRSV-outbreaks. We hypothesized that manure transport would be a useful proxy for manure processing. However, no strong or consistent correlations were found between PRRSV prevalence and manure transport, or pig prices, or weather. Correlation values for manure transport and pig prices were very weak to weak (-0.04 to 0.35). Weather showed a moderate correlation only with average wind speed per day (0.40 to 0.45), independent from the season and likely to reflect barn climate effects rather than direct causation. Other weather conditions like temperature, wind speed, hours of sunshine, air pressure, relative humidity and precipitation variables had weak correlations (-0.25 to 0.38).

Study limitations included incomplete sequence data and above all the lack of continuous monitoring, creating a rotating subsample of farms over time. Also, in PRRSV endemic farms, outbreaks are more difficult to identify.

Table 1: Monthly farm and batch neonatal prrsv-positivity correlation (R-value)

Variables, per month	% farms PRRS+	% batches PRRS+
Number of pig manure transports	0.02	0.03
Volume of pig manure transport	0.01	-0.01
Number of cow manure transports	-0.04	-0.04
Volume of cow manure transport	0.25	0.10
Piglet price at 25 KG	0.25	0.27
Pork meat price per KG	0.15	0.35
Daily average wind speed	0.45	0.40
Maximum wind gust	0.37	0.38
Daily average temperature	-0.24	-0.06
Daily sunshine duration	-0.18	-0.05
Daily precipitation duration	0.26	0.23
Daily sum of precipitation	0.09	0.18
Daily mean sea level pressure	0.00	-0.11
Daily mean relative atmospheric humidity	0.06	-0.04

Conclusion

No strong correlations between PRRSV-outbreaks in Dutch sow herds and several variables could be identified. Continuous monitoring is recommended to better identify outbreak patterns and optimize sampling for sequencing.

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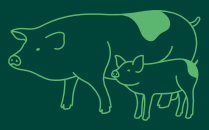
Life forward

Study to search for associations between biosecurity measures and PRRS status of sow herds in the Netherlands



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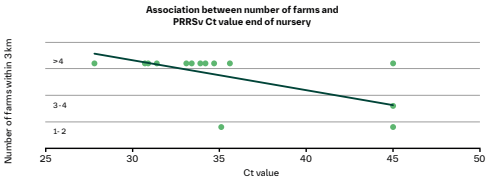
Introduction

Porcine Reproductive and Respiratory Syndrome (PRRS) is a major challenge for swine production in the Netherlands. The Dutch pig sector has taken up the challenge to be free of PRRSv in 2040[1]. To realize this, a clear relation between biosecurity measures and PRRS status would be helpful. Good biosecurity is associated with a lower frequency of PRRSv-outbreaks[2]. This study investigates the association between biosecurity practices and PRRS status (as indicated by Ct values) in Dutch sow herds from 3 different vet practices.

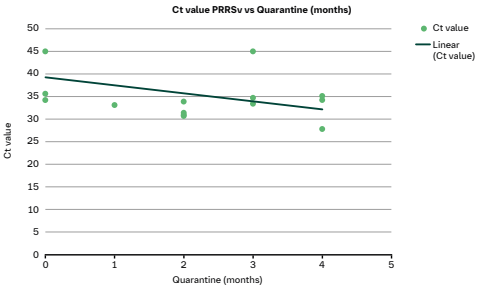
Materials and Methods

A cross-sectional biosecurity survey was conducted among 19 sow farms in the Netherlands using Combat®[3]. Farms were enrolled because they experienced a recent PRRS outbreak, or because they would like to control PRRS on their farms. Data was collected on internal and external biosecurity measures during a farm visit by 1 of the 2 swine vets of Boehringer Ingelheim Animal Health, the Netherlands. PRRS status was determined by PCR Ct values on samples of neonatal piglets, piglets just after weaning and piglets at the end of nursery in a period of 8 weeks around the time of the biosecurity audit. Farms were categorized into low (Ct < 30.9), medium (31 < Ct < 35), and high (Ct > 35) Ct groups. Possible assocations were demonstrated using the Pearson correlation coefficient (r).

Results



- A strong negative correlation was found between the number of farms within 3 km and the Ct value end of nursery on a farm (r=-0,6488, p=0,0089). Farms with medium to high Ct values tended to be located further from the nearest pig farm (3–8 km).
- All farms introduced gilts, but only one routinely tested them for PRRS prior to introduction.



- A weak negative correlation was found between the length of the quarantine period on the farms and the Ct value end of nursery. (r=-0,3934, P=0,1469)

Discussion

The findings suggest that greater distance to other pig farms and longer quarantine periods are associated with higher Ct values. However, many biosecurity practices were inconsistently applied across farms. This study could only assess associations, not causality. It remains a chicken and egg scenario: do farms adopt more biosecurity due to recent PRRS outbreaks or do those without outbreaks reduce measures. Future research should prioritize standardizing biosecurity protocols to enhance herd health.
In all farms the planned discussion on results created more awareness. In many cases biosecurity action points were formulated.

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Life forward

PRRS Vaccination Protocols and Neonatal PRRSV Status in the Netherlands: A Descriptive Field Study

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Introduction

Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) remains a significant challenge in swine production. Despite >90% of sow herds being vaccinated, monitoring shows that approximately 55% of herds have at least one PRRSV PCR-positive farrowing batch per quarter. (Steenaert 2026). Vaccination protocols used in farms vary widely for sows and piglets. Monitoring neonatal piglets provides an early indication of herd status. This study gives a retrospective overview of PRRSV vaccination strategies that are used and explores associations with neonatal PRRSV prevalence.

Material and Methods

Between February 2023 and October 2025, neonatal samples were collected from 27 Dutch sow herds (average 1,165 sows/herd). Farms submitted ≥6 sample batches within three months under their specific vaccination protocols. PRRSV detection was performed by PCR in one of three accredited laboratories; qualitative results were considered comparable (Koenders 2026). Vaccination protocols and PCR outcomes were analyzed descriptively.

Results

Batch vaccination = vaccination at specific moments in the sow cycle.
Mass vaccination = whole herd vaccination 3 or more times a year

- 37% of farms had 0% PRRSV-positive neonatal batches.
- **Sow vaccination:**

Batch vaccination (52% of farms):	29% average PRRSV-positive batches
Mass vaccination (41%):	25% average
Killed vaccine (KV, 11%):	51% average
Modified live vaccine (MLV, 59%):	22% average
MLV + KV (26%):	33% average

- **Piglet vaccination (MLV only):**

No piglet vaccination (33%):	23% average
Vaccination in 1st week (15%):	61% average*
Vaccination in 3rd week (48%):	18% average

*All these farms used KV or MLV + KV in sows.

Discussion and Conclusion

Causal relationships cannot be inferred from this dataset. In sows all mass-vaccinated herds used MLV, while KV was limited to batch protocols. Early piglet vaccination (1st week) correlated with higher neonatal PRRSV prevalence. It is worth noting that timely immunity from vaccination may not be achieved when neonatal prevalence is high. Our conclusion is that stabilizing sow herds should be prioritized before piglet vaccination strategies to control PRRSV effectively.

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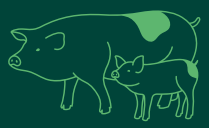
Life forward

Differences in PRRSV detection capacity according to sample type and time since exposure of gilts



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Cincaporc

Background and Objetives

Effective surveillance of PRRSV plays an important role in understanding transmission patterns and improving disease control strategies on commercial farms. The detection rate of PRRSV varies between different sample types over time[1]. PRRSV can persist in the tonsils for up to 150 days after infection[2]. The aim of this study was to compare the detection rate of PRRSV by RT-PCR in serum, tracheobronchial swabs, and tonsil-oral-scrubbings in gilts at different times after PRRSV exposure.

Material and Methods

Samples were collected from 30 gilts in the gilt development unit (GDU) of the same sow farm. At the start of the study, the animals were at least 20 weeks old. All animals were sampled using three different methods: sera, deep tracheobronchial swabs (DTBS), and tonsil-oral-scrubbings (TOS). Samples were collected at 5, 10, 15, and 20 weeks post-PRRSV exposure (previously detected by individual RT-PCR in serum). All samples were processed individually using the same extraction kit and analysed using the VetMAX PRRSV EU NA 2.0 Kit (Thermofisher). CT values and detection capability were analysed using Minitab®22.0 statistical software.

Results

at 5 weeks after exposure (WAE), all matrices (serum, DTBS, TOS) showed 100% PCR positivity, although TOS presented notably lower CT values (27.0) than serum (31.0) or DTBS (31.5). By 10 WAE, TOS remained the most sensitive method, with significantly higher positivity (56%) compared with serum (10%, $p = 0.00025$, Fisher's test) and DTBS (20%, $p = 0.00727$, Fisher's test), and markedly lower CT values (36.1 vs. 39.4 and 38.5, respectively; ANOVA $p < 0.0001$, with pairwise t-tests confirming significant differences). At 15 WAE, TOS still showed higher numerical detection (30% vs. 10% for serum and DTBS), although these differences were no longer statistically significant. CT values followed the same pattern, with a borderline statistical difference (ANOVA $p = 0.045$) and only TOS vs. serum showing a modest pairwise effect. By 20 WAE, only TOS retained detectable positivity (10%), with all matrices approaching the assay's detection limit (CT ~40) and no significant differences.

Discussion and Conclusion

Tonsil – oral scrubbings consistently demonstrated superior diagnostic performance for PRRSV detection across all sampling times. This matrix not only identified a greater proportion of positive animals but also yielded markedly lower CT values – particularly at 10 WAE – indicating higher detectable viral loads and a stronger ability to capture ongoing infection. In contrast, serum and deep tracheobronchial swabs showed reduced sensitivity as time progressed, failing to detect a substantial number of persistently infected animals. Overall, the prolonged detection window and higher analytical sensitivity of tonsil – oral scrubbings highlight this sampling method as a valuable tool for monitoring PRRSV-exposed replacement animals. Its implementation in gilt development units, especially in the final stages prior to entry into the breeding herd, can significantly enhance the effectiveness of PRRSV control programs by improving identification of animals with residual virus.

Table 1: Comparative positivity (%) between sampling type (serum, DTBS and TOS) and time (weeks after PRRSV exposure)

Time point	Serum (%)	DTBS (%)	TOS (%)	p (Serum vs DTBS)	p (Serum vs TOS)	p (DTS vs TOS)
5 WAE	100%	100%	100%	1.000	1.000	1.000
10 WAE	10%	20%	56%	0.4716	0.00025*	0.00727*
15 WAE	10%	10%	30%	1.000	0.1042	0.1042
20 WAE	0%	0%	10%	1.000	0.2373	0.2373

Table 2: Average PRRS RT-PCR CT values (%) between sampling type (serum, DTBS and TOS) and time (weeks after PRRSV exposure)

Time point	Serum CT (mean)	DTBS CT (mean)	TOS CT (mean)	ANOVA p-value	Significant pairwise differences
5 WAE	31.0	31.5	**27.0**	**<0.0001***	**TOS < Serum, TOS < DTBS**
10 WAE	39.4	38.5	**36.1**	**<0.0001***	**TOS < Serum, TOS < DTBS**
15 WAE	39.6	39.2	**38.5**	0.045	TOS < Serum (borderline)
20 WAE	40.0	40.0	**39.4**	0.18	No significant pairwise differences

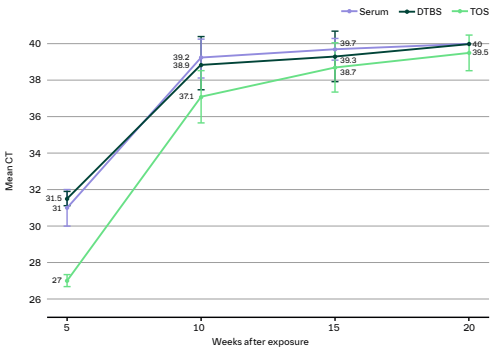

Figure 1: Average PRRS RT-PCR CT values (%) between sampling type (serum, DTBS and TOS) and time (weeks after PRRSV exposure)

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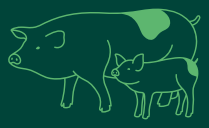
Life forward

Efficacy of a Commercial PRRS MLV Vaccine in Reducing the Impact of a Virulent PRRSV-1 Rosalía Challenge



C. Vilalta[1], G. Guevara[1], E. Cano[1], J. Huang[1], G. Abella[2], T. Coll[2], M. Kunze[2], O. Duran[2]
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Background and Objectives

In 2020, a highly virulent Porcine Reproductive and Respiratory Syndrome Virus type 1 (PRRSV-1) strain emerged in Spain and has became predominant across the northeastern region.

The disease caused severe reproductive losses, increased sow mortality, and nursery pig mortality exceeding 20%.

This study aimed to assess the efficacy of a modified-live virus (MLV) PRRS vaccine against experimental challenge with one of these highly virulent isolates (*Rosalía* strain).

Material and Methods

Fifty four-weeks-old PRRSV-naive pigs were assigned to three groups: T1 (vaccinated and challenged, n=20), T2 (non-vaccinated and challenged, n=20), and T3 (non-challenged controls, n=10). After one week of acclimation, group T1 was vaccinated intramuscularly with Ingelvac PRRSFLEX® EU (Boehringer Ingelheim), while T2 and T3 received PBS. Four weeks later, groups T1 and T2 were intranasally challenged with a highly virulent PRRSV-1 (strain UC Lleida N5) ($\geq 10^{4,8}$ $TCID_{50}$/ml, 1 ml per nostril). Animals were monitored for clinical signs, rectal temperature, and growth performance (average daily gain [ADG]). Blood, nasal swabs, and air samples were collected to assess viremia, viral shedding, and air transmission. The lung weight: body weight ratio was calculated at necropsy as an indicator for lung inflammation.

Results

All challenged pigs became infected. Non-vaccinated infected animals had, on average, more prolonged rectal temperatures (>40 °C) (25 days vs 14.15 days). At 14 days post-challenge, vaccinated pigs had significantly less lung inflammation (LW/BW=1.31±0.24% vs 1.69±0.49%, T-test; p<0.05) (Figure 1).

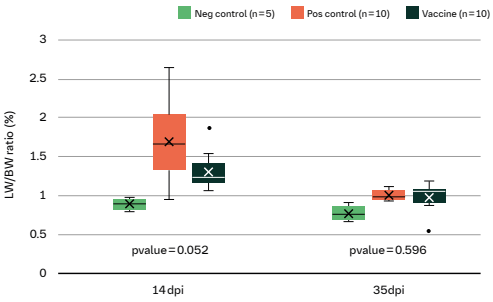

Figure 1. Lung weight (LW)/ Body weight (BW) ratio comparison at 14 and 35 days post infection (dpi)

Vaccinated pigs had a ten-fold lower viremia area under the curve from the first 35 days after infection (6.39±0.41 vs 7.14±0.37 log RNA copies/ml, T-test; p<0.05) (Figure 2).

Vaccination also reduced nasal shedding and improved average daily weight gain (505.7±126.9 g vs 334.6±140.6 g,T-test; p<0.05) (Figure 3).

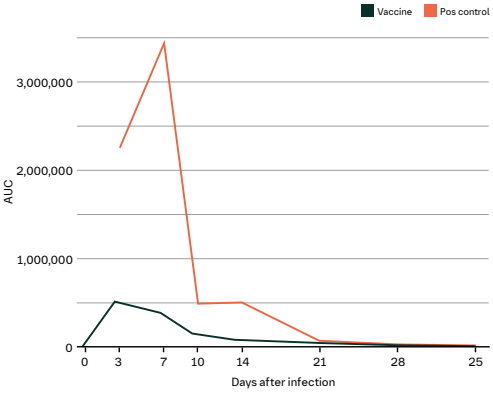

Figure 2. Viremia mean area under de curve (AUC) in vaccinated (green line) and positive control (red line) groups

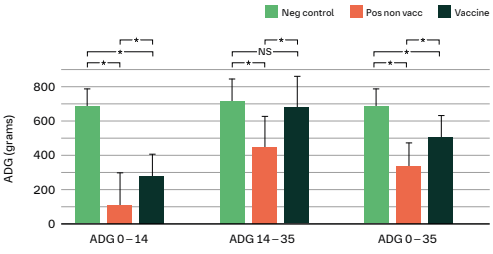

Figure 3. Average daily weight gain (ADG) comparison between the vaccinated, positive control and negative control groups.

*Significant differences

Discussion and Conclusion

Intramuscular administration of the MLV PRRS vaccine provided significant clinical, pathological, virological, and productive protection against the challenge with the highly virulent PRRSV-1 *Rosalía* strain.

Environmental PRRSV surveillance in sow herds: An innovative monitoring alternative

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Background and Objectives

Due to the importance of understanding the dynamics of PRRS infection in sow herds, different diagnostic methods have been developed[1]. These mainly involve sampling serum, familiar oral fluids, processing fluids and tongue fluids[2,3]. Producers are interested in developing sampling methods that provide accurate information at a reasonable labor and economic cost, enabling them to monitor the evolution of the disease in any production system[4].

The objective of this study was to determine whether surface sampling can be a reliable alternative method to existing ones, to monitor PRRSV infection dynamic on farms.

Materials and Methods

The study was conducted between June 2025 and November 2025 on a commercial herd producing 20 kg piglets with 2,200 Iberian sows. An outbreak of PRRSV occurred two months earlier and 10 surface samples were taken by a swabbing method.

Eight surface samples were taken monthly in the farrowing room: four from the mat, two from the room fans, one from the worker's clothing, one from the worker's boots, one from the processing trolley, and one from the treatment needle. Simultaneously, 15 serum samples were taken and analyzed in pools of 5 and 2 weekly tongue pools, expanding to 7 tongue pools from September.

All the samples were individually tested using VetMAX™ PRRS EU/NA 3.0 kit (Termofisher)

Results

Results are shown in table 1.

In June, all serum and tongue samples were positive, as were all environmental samples except for the syringe.

In August, tongue samples were positive with higher ct values, and all environmental samples except for one extractor, the processing trolley, and the syringe were positive. In September, all serum samples and 2 of 7 tongue samples were negative, and only 2 samples from the farrowing pen and the employee's boots were positive.

In September, all serum and tongue samples were negative, and only 3 mats were positive. From November onwards, all samples were negative.

Discussions and Conclusions

The performance of surface samples compared to serum (gold standard) and tongue samples was very similar, therefore, considering the ease of sampling, which reduces labor costs and the non-impact on animal welfare, environmental surveillance can be considered as a good tool to assess the dynamics of PRRSV infection. Further studies are needed to compare this method with those currently in use.

Table 1: PRRS PCR Results

Enviromental samples	July	August	September	October	November
Mat 1	30.43	37.86		39.81	
Mat 2	32.79	37.84	34.19	38.78	
Mat 3	35.35	34.37	38.81	33.97	
Mat 4	31.25	37.69			
Fan 1	34.97				
Fan 2	35.56	36.49			
Clothes	35.75	37.66			
Boots	30.34	36.8	37.94		
Processing cart	28.08				
Syringe					
Pool Serum Samples 1	19				
Pool Serum Samples 2	29				
Pool Serum Samples 3	20				
Tongue Tips 1	24	25	24		
Tongue Tips 2	20	31	21		
Tongue Tips 3			22		
Tongue Tips 4					
Tongue Tips 5			35		
Tongue Tips 6			20		
Tongue Tips 7					

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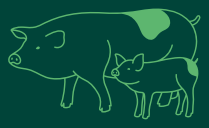
Oral Presentation

Evaluation of dose-dependent virulence of PRRSV-1 “Rosalía” in weaned piglets and the modulating role of maternal antibodies



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Background & Objectives

The highly virulent PRRSV-1 Rosalía strain has caused unprecedented clinical impact in Spain since 2020, highlighting the need for robust challenge models to assess vaccine efficacy. Determining how different challenge doses interact with pre-existing maternal antibodies is particularly relevant in weaned piglets, as maternally derived immunity can substantially shape early infection dynamics. This study evaluated three intranasal challenge doses of PRRSV-1 Rosalía and examined the extent to which maternal antibodies modulate viral replication, clinical expression, and pathological outcomes.

Material & Methods

Twenty-seven piglets were assigned to three infected groups (10^4, 10^5, or 10^6 $TCID_{50}$) and one control group. Pre-challenge ELISA status (maternal antibody–positive vs. negative) was used as a stratifying variable. Animals were monitored for 14 days for clinical signs, temperature, growth, viremia, nasal shedding, seroconversion, and lung pathology. Viral RNA was quantified via qPCR; antibodies were measured using IDEXX PRRS X3 ELISA.

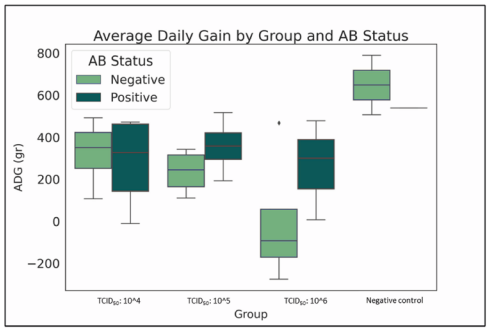

Figure 1. Average daily gain in all tested animals by treatment group (infectious dose TCID 10^4, 10^5, 10^6 and the negative control group) and by antibody status (negative [blue] or positive [red])

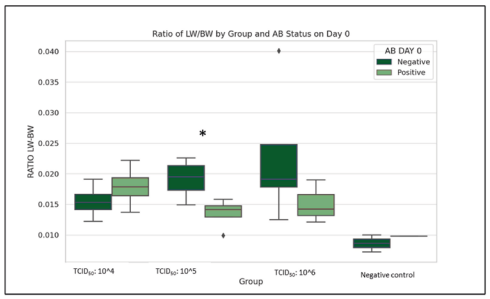

Figure 2. Ratio of lung weight (LW) / body weight (BW) in all tested animals by treatment group (infectious dose TCID 10^4, 10^5, 10^6 and the negative control group) and by antibody status (negative [blue] or positive [red])

Results

All challenge doses established infection, with serum viral loads peaking at day 7. Differences between challenge doses were modest; however, maternal antibody status produced consistent and biologically meaningful contrasts. Antibody-negative piglets showed lower Ct values (higher viral load) at peak viremia – particularly in the 10^6 $TCID_{50}$ group – and exhibited accelerated seroconversion kinetics. Clinical expression was also modulated by maternal immunity: although fever patterns were similar, growth suppression was markedly greater in antibody-negative animals, again, most evident under high-dose challenge (Figure 1). Lung-to-body weight ratios and histopathology confirmed a dose-dependent inflammatory response, but maternal antibody – positive pigs consistently showed milder lesions (Figures 2 and 3)

Discussion & Conclusion

These findings suggest that maternal antibodies blunt early viral replication and reduce downstream inflammation, even when facing a highly virulent PRRSV-1 strain. Importantly, high-dose challenge amplified these contrasts, increasing the sensitivity of detecting immunity-associated differences.

Maternal antibodies significantly modulate infection outcomes under PRRSV-1 Rosalía challenge, reducing viral load, lung inflammation, and growth loss. High-dose challenge (10^6 $TCID_{50}$) most reliably differentiates immune-status groups and is recommended for PRRSV vaccine efficacy studies in weaned piglets.

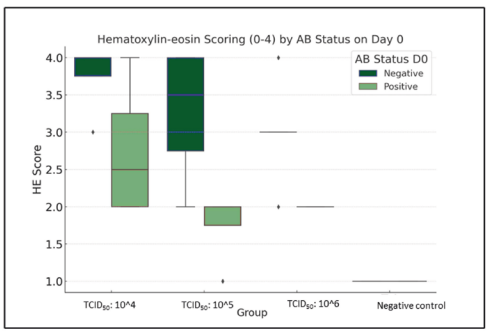

Figure 3. Histopathology scoring (Halbur et al. (1996) System [0–4 Scale]) in all tested animals by treatment group (infectious dose TCID 10^4, 10^5, 10^6 and the negative control group) and by antibody status (negative [blue] or positive [red]). Scoring values: 0: absence of lesions, 1: mild interstitial pneumonia, 2: moderate multifocal interstitial pneumonia, 3: moderate diffuse interstitial pneumonia, and 4: sever interstitial pneumonia.

Improved performance and uniformity in a PRRS unstable commercial farm using different vaccination protocols

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Background and Objectives

Effective control of key swine diseases such as *Mycoplasma hyopneumoniae* (Mhyo), Porcine Reproductive and Respiratory Syndrome (PRRS), Porcine Circovirus type 2 (PCV2), and ileitis is essential to maintain herd health and optimize production efficiency.[1] Vaccination remains a cornerstone for disease control; however, differences in vaccine technology platforms – including antigen composition and adjuvant – can influence immune response and ultimately impact individual animals' outcomes.[2,3] The objective of this study was to compare performance data (weight) over time from groups with two different vaccination programs.

Material and Methods

The study was conducted in a 350-sow farm (farrow to finish), located in the North East of Spain. The sow farm was PRRS unstable (II-B) and Mhyo positive. A total of 980 piglets were included in the study. Animals of both groups were weigh-balanced at the start and assigned randomly to Group 1 or 2. Both groups were vaccinated at weaning, from 28 to 33 days of age (doa). Group 1 (480 animals, Boehringer Ingelheim) received Ingelvac FLEXcombo®, Ingelvac PRRSFLEX® and Enterisol® Ileitis, whereas Group 2 (500 animals, MSD) received Porcilis PCV MHyo, Porcilis PRRS, Porcilis Ileitis. Weight gain was measured at 28 – 33 doa, 95 – 96 doa and at 182 – 191 doa.

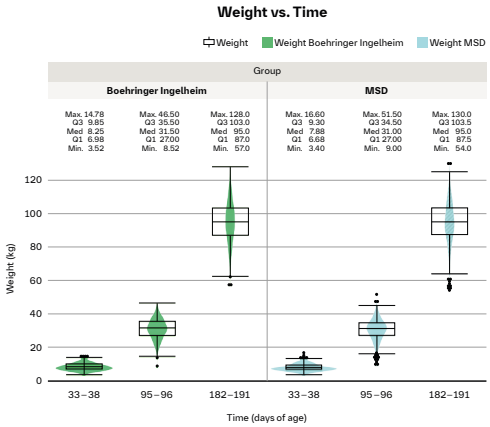

Figure 1. Individual body weight distribution over time in pigs vaccinated with two different vaccination programs. Violin plots illustrate weight distribution. Median and interquartile ranges are shown.

Results

Pigs in Group 1 had a significantly lower mortality (11.6 %) than those in Group 2 (16.1 %) ($p \leq 0.05$) (Table 1). Both groups had similar weights at the three timepoints providing evidence that both vaccination programs were efficacious (Figure 1).

Table 1: Total animals included in the analysis. Mortality comparison between groups.

Group	Total animals	Dead (% mortality)	Final number of animals
1. Boehringer Ingelheim	547	67 (11.6 %)	480
2. MSD	596	96 (16.1 %)	500

$p \leq 0.05$

However, in Group 1 there were distinctly less outliers than in Group 2 on the 95 – 96 doa and 182 – 191 doa, providing evidence for a more consistent growth over time.

Discussion and Conclusion

Greater uniformity is a key production parameter, as it facilitates management, optimizes barn flow, improves slaughter logistics, and may reduce economic losses associated with lightweight or delayed pigs.

Group 1 demonstrated improved growth uniformity, with fewer outliers at mid and late production stages.

Reduced mortality and enhanced uniformity suggest a more consistent population response to vaccination under challenging health conditions. Further studies are needed to confirm this finding, and evaluate the impact on carcass quality.

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