

# Field experiences with PCV2 and M. hyo vaccines in Belgium – part II

Porcine Circovirus type 2 (PCV2) and *Mycoplasma hyopneumoniae* (M. hyo) are two swine pathogens implicated in porcine respiratory disease complex (PRDC). Respiratory disease negatively impacts pig performance during the fattening period, particularly on average daily weight gain and feed conversion rate.

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In the first part of this article (published in International Pig Topics Volume 32 Number 2), we described the results from a Belgian field study that compared the effect of a ready to use PCV2 and M. hyo vaccine against vaccination against M. hyo only.

In this second article, we present the results of the combined vaccination compared against other traditional PCV2 vaccination programs in seven Belgian pig farms.

Briefly, piglet vaccination with Porcilis PCV M Hyo at three weeks of age was compared to PCV2 only vaccination (n=1), M. hyo and PCV2 as separate injections (n=2) or no vaccination (n=4).

In each herd, fattening pigs of both study groups were housed separately but in the same location. The presence of clinical signs (dry

$$\text{ROI (\%)} = \frac{(\text{benefit} - \text{cost of Porcilis PCV M Hyo vaccination})}{\text{Cost of Porcilis PCV M Hyo vaccination}} \times 100\%$$

Fig. 1. The formula for calculating ROI.

cough, lung lesions at slaughter, heterogeneity and wasting) was recorded in the traditional vaccination group but not in the Porcilis PCV M Hyo group.

Average daily weight gain (ADWG) and feed conversion rate (FCR) data were collected in the fattening period as previously described. Upon completion of the study, the ROI (%) was calculated based on the formula in Fig. 1.

The key figures in the yearly Dutch swine industry report published by Livestock Research (Wageningen UR) were used to estimate the profit based on ADWG and FCR in groups vaccinated with Porcilis PCV M Hyo. Differences in mortality rate were not included in the profit calculation because the mortality recorded during the study period was frequently associated with other disease causing pathogens.

The benefit of Porcilis PCV M Hyo vaccination was thus calculated based on €0.025 per +1 g/pig/day in ADWG and €0.23 per -0.01 in FCR. A weighted average profit was calculated based on the number of pigs per herd.

Other improvements, such as fewer condemned lungs at slaughter, were not included in the calcu-

lation but tend to also contribute to a higher ROI on these farms.

## Effect of combined vaccination against PCV2 and M. hyo versus non-vaccinated controls

Four farms in this study did not routinely vaccinate piglets against M. hyo or PCV2. They justified that decision by either not having clinical problems caused by these two pathogens or by not believing that vaccination would result in a positive return-on-investment in their farm.

Following initiation of vaccination with Porcilis PCV M Hyo, performance, especially feed conversion rate, improved compared to the non-vaccinated controls.

The improvements in ADWG and FCR per farm are illustrated in Fig. 2 and 3. Average mortality rate was similar in both groups (2.4% and 2.2%).

The cost of investment for combined vaccination (vaccine + labour) was estimated as €1.90 per pig extra compared to no vaccination.

The four farms that were monitored for ADWG and FCR achieved

on average +19g/pig/day in ADWG and -0.13 in FCR following Porcilis PCV M Hyo vaccination.

Concordantly, the average ROI (%) of Porcilis PCV M Hyo was:  $[(3.47 - 1.90) / 1.90] \times 100\% = 83\%$ .

The effect of vaccination on technical performance varied greatly between farms. Positive profit margins were recorded in herds with clinical signs in the traditional vaccination group (Table 1), while two herds had a negative profit as a result of a minor ADWG and FCR improvement, which was not enough to cover extra vaccination cost. This might be explained by a low PCV2 and M. hyo infectious pressure and/or the presence of other infections in these herds.

For example, farm C did not have PCV2 or M. hyo related clinical signs and had a low prevalence of M. hyo-like lesions at slaughter in both treatment groups (9-10%).

However, there was a high prevalence of severe pleuritis in slaughterpigs indicative of *Actinobacillus pleuropneumoniae* infections.

Serological investigation confirmed this as fatteners seroconverted to Apx toxins.

## Effect of additional M. hyo vaccination

One farm (farm E) routinely vaccinated against PCV2 at 24 days of age. During the study period two

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Fig. 2. Average daily weight gain ADWG (g/pig/day) between 10 weeks of age and slaughter after Porcilis PCV M Hyo vaccination versus no vaccination.

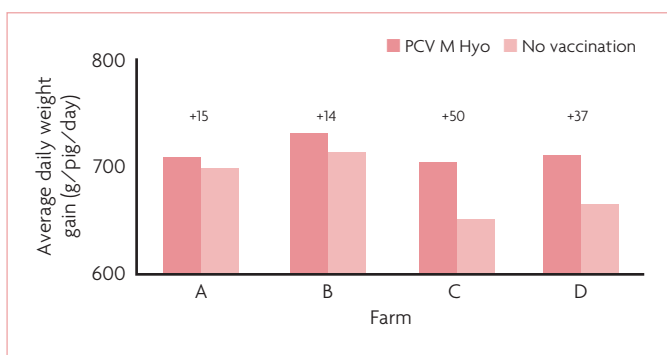
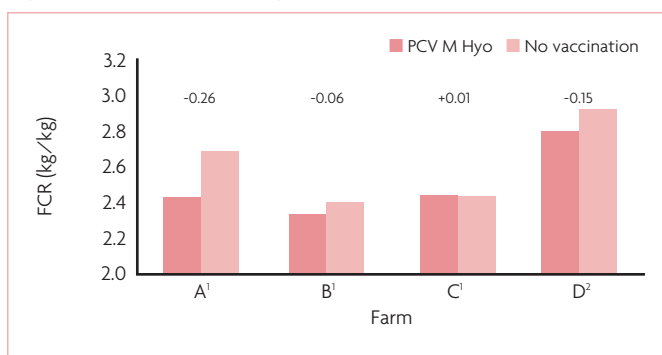


Fig. 3. Average feed conversion rate (FCR) between 10 weeks of age and slaughter after Porcilis PCV M Hyo vaccination versus no vaccination. Figures represent net FCR<sup>1</sup> or gross FCR<sup>2</sup>.



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groups of 650 piglets were vaccinated with Porcilis PCV M Hyo at weaning and their performance parameters were compared with two subsequent groups vaccinated according to the traditional vaccination program.

Compared to PCV2 vaccination only, average improvement following combined PCV2 and M. hyo vaccination was:

- ADWG +23g/pig/day = (747 vs. 724g/pig/day).
- Feed conversion rate -0.03 = (2.63 vs. 2.66).
- Mortality -0.3% = (1.65% vs. 1.95%).

The cost of vaccination with Porcilis PCV M Hyo (vaccine + labour) was estimated at €0.85 extra per pig compared to PCV vaccination only. The benefit of the combined vaccination was €1.27 taking into account ADWG and FCR.

The ROI of also vaccinating against M. hyo by using the combination vaccine was 49% for this herd.

### Effect of combined vaccination instead of two separate vaccinations

In two farms included in this field study, piglets were vaccinated against M. hyo at 3-5 days of age and against PCV2 at weaning. No respiratory disease was observed and post-weaning mortality was <4%. These farms were asked to evaluate the new PCV2 and M. hyo combination vaccine against monovalent PCV2 and M. hyo vaccines, which are generally acknowledged as providing excellent efficacy.

In farm F, vaccination with Porcilis PCV M Hyo consistently improved ADWG (Table 2). Mortality rate was comparable, while feed conversion rate could not be monitored.

The farmer decided during the study period to continue with the

Group	Number of pigs	Date of slaughter	Average carcass weight (kg)	Days in fattening unit	ADWG (g/pig/day)	ADWG (g/pig/day) group
Control 1	227	15/7/2015	119	128	745	658
	220	16/7/2015	121	129	755	
	550	24/7/2015	106	137	601	
	179	27/7/2015	108	140	602	
Control 2	200	5/8/2015	124	120	823	710
	200	14/8/2015	117	129	710	
	444	19/8/2015	118	134	692	
	352	21/8/2015	116	136	667	
Control 3	239	4/9/2015	120	121	778	673
	457	14/9/2015	110	131	642	
	542	15/9/2015	112	132	652	
	PCV M Hyo 1	207	30/09/2015	123	120	823
227		7/10/2015	122	127	769	
639		19/10/2015	121	139	696	
82		19/10/2015	116	139	660	
PCV M Hyo 2	442	5/11/2015	126	128	796	735
	216	16/11/2015	126	139	733	
	329	16/11/2015	120	139	690	
PCV M Hyo 3	312	13/11/2015	119	136	698	788
	229	2/12/2015	135	127	887	
	777	11/12/2015	127	136	769	
	206	15/12/2015	127	140	747	

Table 2. Technical results of Farm F during the study period.

combination vaccine because of labour savings. A few months later, a decrease in the prevalence of pneumonia in his slaughter pigs further supported his decision. In 2016, he decided to also vaccinate his piglets against PRRSv at four weeks.

The two changes in the vaccination program resulted in a very strong decrease in M. hyo-like lung lesion prevalence from 28% in September 2015 (control group 3, batch of 04/09/2015) to 2.6% in September 2016 and <2% prevalence in March 2017.

In farm G, ADWG remained similar

(+4/pig/day) and mortality was reduced (-0.9%) following the introduction of the combination vaccine.

Feed conversion rate increased with 0.07 without a clear reason, which resulted in a negative impact on the profit calculation result.

Prevalences of M. hyo-like lung lesions at slaughter were low with 2.0% in the Porcilis PCV M Hyo group and 6.7% in the control.

The extra cost of vaccination with Porcilis PCV M Hyo compared to two separate vaccines was estimated at €0. However, the combination vaccine did offer the advantage of needing only one injection instead of two. Profit and ROI on farm level are shown in Table 1.

### Conclusion

The overall results of this study confirm that the ready-to-use PCV and M. hyo combination vaccine improved important production parameters such as ADWG and FCR as well as lung health of fattening pigs in the face of PCV2 and M. hyo infections. The benefit of this combination vaccine was also evident in a farm that had successfully vaccinated for several years with monovalent M. hyo and PCV2 vaccines.

A ready-to-use PCV M. hyo combination vaccine can therefore be considered an effective and user friendly vaccine with a significant impact on health status and production parameters. ■

Table 1. Average profit and return-on-investment (ROI) of Porcilis PCV M Hyo vaccination in comparison with the traditional vaccination program (+ value = improvement; - value = Porcilis PCV M Hyo benefit was not enough to cover extra cost). \*Clinical signs of heterogeneity and/or wasting were recorded in the control group. †Dry cough and/or lung lesions were recorded in the control group. nc: not calculated; the estimated cost of Porcilis PCV M hyo vaccination was €0 which gives an invalid result in the ROI formula.

Vaccination in control	Herd	Average profit (€)	ROI (%)
No vaccination	A* <sup>x</sup>	4.45	234
	B	-0.17	-8.9
	C	-0.87	-46
	D <sup>#</sup>	2.49	131
PCV2	E <sup>#</sup>	0.42	49
PCV2 and M. hyo	F <sup>#</sup>	1.83	nc
	G <sup>#</sup>	-1.46	nc

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