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.

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 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 calculation 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] x 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

Fig. 1. The formula for calculating ROI.

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\text{ROI (\%)} = \frac{\text{Benefit} - \text{Cost of Porcilis PCV M Hyo vaccination}}{\text{Cost of Porcilis PCV M Hyo vaccination}} \times 100\%
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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 or gross FCR.

In the traditional piglet vaccination programs in these herds, the use of combined PCV2 and M. hyo vaccine against M. hyo only resulted in positive technical and economic return-on-investment in all farms. Positive return-on-investment in one farm could be explained by a higher ADWG and FCR improvement compared to no vaccination. Although these results are promising, the use of combined PCV2 and M. hyo vaccine against M. hyo only did not result in an additional benefit compared to no vaccination.

In the second and third farms, M. hyo and PCV2 were used as separate injections. These farms 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.

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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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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 1-3 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 mono-valent 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 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 the Porcilis PCV M Hyo group and 6.7% in the control.

In farm G, ADWG remained similar (+4g/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 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 0.07 without a clear reason, which resulted in a negative impact on the profit calculation result.

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 mono-valent 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.