

# Why is it important to control PCV2 virus infection?

by Alex A. S. Eggen, Intervet/Schering-Plough International, Boxmeer, The Netherlands.

For a long time the clinical relevance of PCV2 virus infections in piglets presented difficulties for both swine veterinarians and researchers. PCV2 virus could be detected in apparently healthy as well as in sick animals. However, most tests were only qualitative, merely indicating the presence of PCV2 virus, rather than quantitative, providing information on the amount of PCV2 virus actually present. Olvera (2004) and Krakowka (2005) showed very clearly that there is a relationship between PCV2 viral load and the occurrence of disease (see Fig. 1).

However, this analysis still presented a very much black and white picture, because the focus was on mortality and on PMWS, which is induced by high levels of PCV2 virus. We now know that even low levels of PCV2 virus can also be significant.

We will discuss the individual vertical groups shown in Fig. 1, beginning at the right hand end.

The introduction of the PCV2 vaccines, and especially their enormous success in controlling the high mortality caused by the disease in countries such as Canada and Japan, completely stopped any discussion of the involvement of PCV2 virus in PMWS and related clinical conditions; hence the change in name to PCVD or PCVAD. So the validity of the PMWS column in Fig. 1 was rapidly accepted by all parties, simply because of the excellent results from field studies with the piglet vaccines. The efficacy of these vaccines against PMWS was impossible to demonstrate under laboratory conditions, because we cannot reproduce PMWS in the laboratory, but it was extremely easy to prove how effective the vaccines were against PMWS under field conditions.

The second group from the right, the group of piglets which, basically, show no overt clinical signs, was also quickly identified as a candidate for PCV2 virus control through vaccination. In this case, farmers and veterinarians simply tried vaccination and

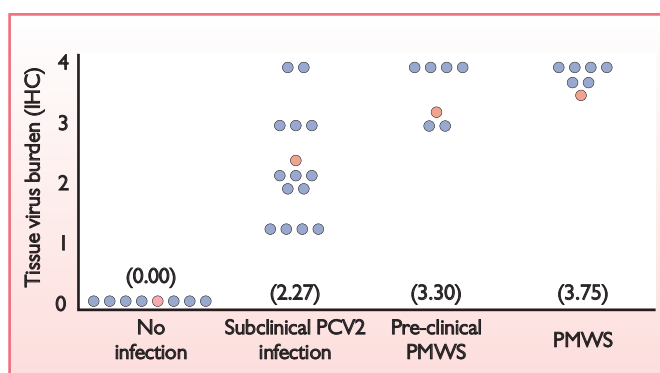


Fig. 1. Relationship between viral load and PMWS (Krakowka, 2005).

found it gave good results in respect of average daily gain (ADG), days to slaughter and other parameters of economic importance.

Fig. 2 below, for example, is taken from trial work undertaken by Sandra Bähler in Switzerland as part of the registration process of Porcilis PCV in Switzerland and was the subject of her doctoral thesis, which was presented in May of 2009.

This study will also be published at the forthcoming APVS 2009 Congress in Japan. The objective was to compare piglets vaccinated with Porcilis PCV at either one or three weeks of age with an unvaccinated control group with respect to economic parameters such as, for

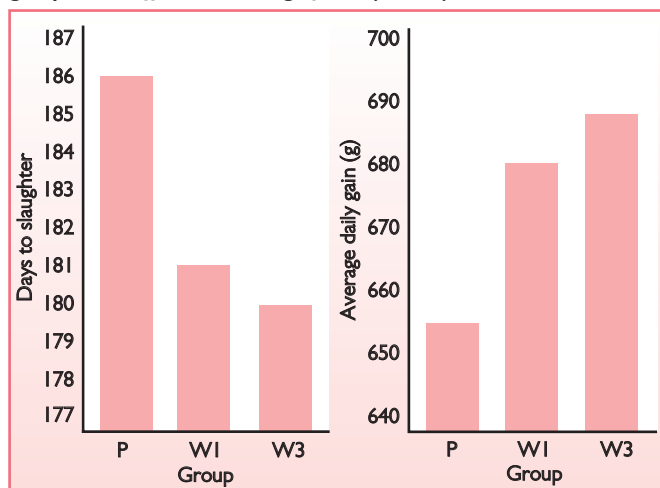
example, ADG (from weaning to slaughter) and days to slaughter.

Clear and significant differences were seen between the vaccinated groups and the controls. Although a beneficial effect was seen in both vaccinated groups, the conclusion from the study was it was preferable to vaccinate at three weeks of age due to the better results across all the parameters measured, some of which are not presented here.

This leaves the sub-clinically PCV-2 infected group in Fig. 1. Is it also important to control this level of infection?

We must first establish what is meant by sub-clinical. Generally speaking a sub-clinical infection is

Fig. 2. Days to slaughter and average daily gain for the three different groups. The differences are significant ( $P < 0.05$ ).



one in which the changes in the animal (if any) induced by that pathogen remain unobserved or undetected. Of course this is problematic, because it depends very much on the skill of the farmer or veterinarian in detecting clinical signs that, by definition, are not very obvious. Not only that, but there will be many differences between farms in the recording of economic and disease-related parameters.

'Recording is knowing' is a common enough expression, and the converse – not recording – may well mean simply being unaware of what is going on.

At the Leman 2009 Conference and the APVS 2009 Congress, data will be presented to show the relationship between low levels of PCV2 viraemia and ADG, as has also been reported by other researchers.

The duration of viraemia also appears to be important: The longer the viraemia lasts, the more pronounced the negative effect on ADG.

These differences have all become noticeable because of the different characteristics of the currently available vaccines. Several publications describe the levels of viraemia to be expected after challenging vaccinated piglets (for example, see Fort et al, Vaccine 2009).

For the moment, we can only speculate on how low levels of PCV2 virus cause problems in piglets. Certainly the immune modulation of the PCV2 virus as described, for instance, by McCullough (AASV 2007), or by Kekarainen (2008), is important, as well as the energy expended in fighting the disease, as described by Colditz (2002), may play a role.

In conclusion, even low levels of PCV2 virus in piglets can cause economically important losses, mainly due to the lower ADG in piglets suffering from a PCV2 viraemia. This implies that low levels of PCV2 virus infections are expensive.

And that is why it is important to control PCV2 virus infections. ■

References are available from the author upon request alex.eggen@sp.intervet.com