# COMPARISON OF 3 COMMERCIAL ELISA TESTS AND THE IMMUNOPEROXIDASE MONOLAYER ASSAY (IPMA) TO DETECT ANTIBODIES AGAINST PORCINE CIRCOVIRUS TYPE 2

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## Introduction and Objectives

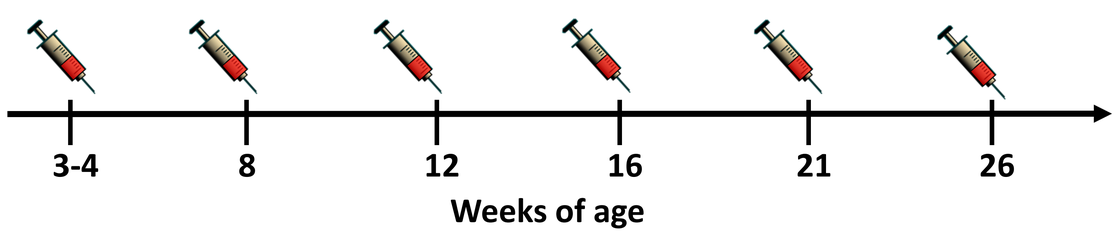
Serological studies at the farm level are useful to monitor porcine circovirus type 2 (PCV2) infection dynamics as well as vaccination. Moreover, antibody detection can be useful to evaluate the optimal timing of vaccination. Immunoperoxidase monolayer assay (IPMA) has traditionally been one of the most useful methods to detect PCV2 antibodies, since the obtained titre can be interpreted in a biological sense (1). However, the replacement of IPMA for alternative automatizable serological tests such as ELISA is desirable.

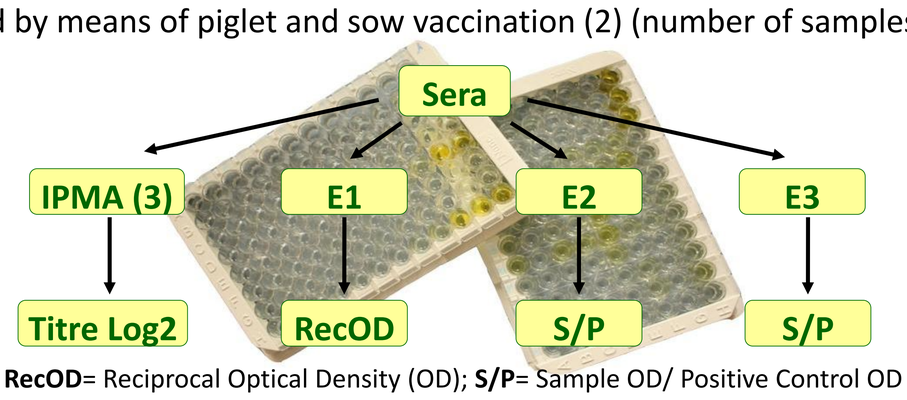
**The objective of this study was to compare and correlate the antibody titres obtained by IPMA with the results obtained by three commercial ELISA tests (*).**

(*) E1= Serelisa®PCV2 Ab Mono Blocking, Synbiotics® ; E2= INGEZIM CIRCO IgG® 11.PCV.K1, Ingenasa; E3= PCV2 ELISA® SK105, BioChek

## Materials and Methods

Sera used in this study came from a previous work in which a factorial 2x2 study was designed by means of piglet and sow vaccination (2) (number of samples= 1248). Additional 22 sera proceeding from CDCD pigs were also tested.



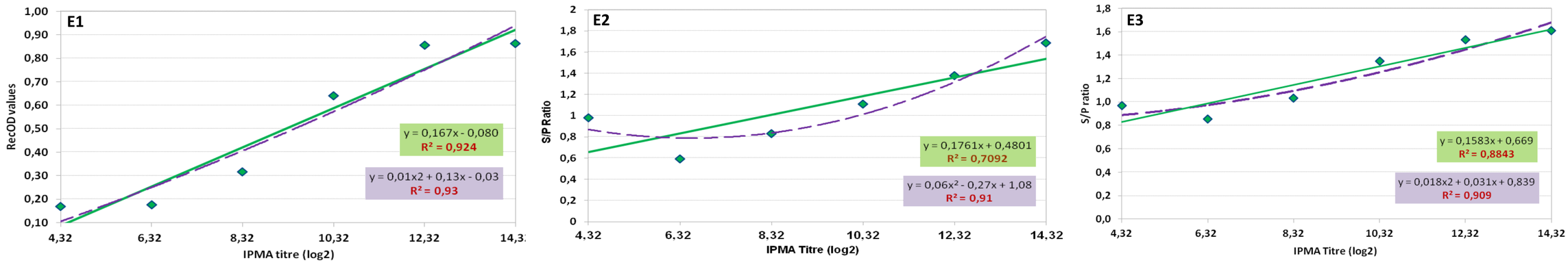




**RecOD**= Reciprocal Optical Density (OD); **S/P**= Sample OD/ Positive Control OD

Pearson (r) and Determination ($R^2$) coefficients were calculated to determine the correlation between IPMA and ELISA results at the different sampling times and as a whole. An equation line that represented these relationships was also adjusted. The grade of agreement among ELISAs techniques and the Kappa coefficient (κ) were calculated for paired tests considering the qualitative results obtained from 368 samples of the study. Sensitivity (Se) and Specificity (Sp) of each ELISA test were also calculated using IPMA result s as reference (samples with IPMA titres < 4.32 were considered negative).
Serological profiles of PCV2 antibodies at different age weeks were compared between techniques (Mann–Whitney U test).

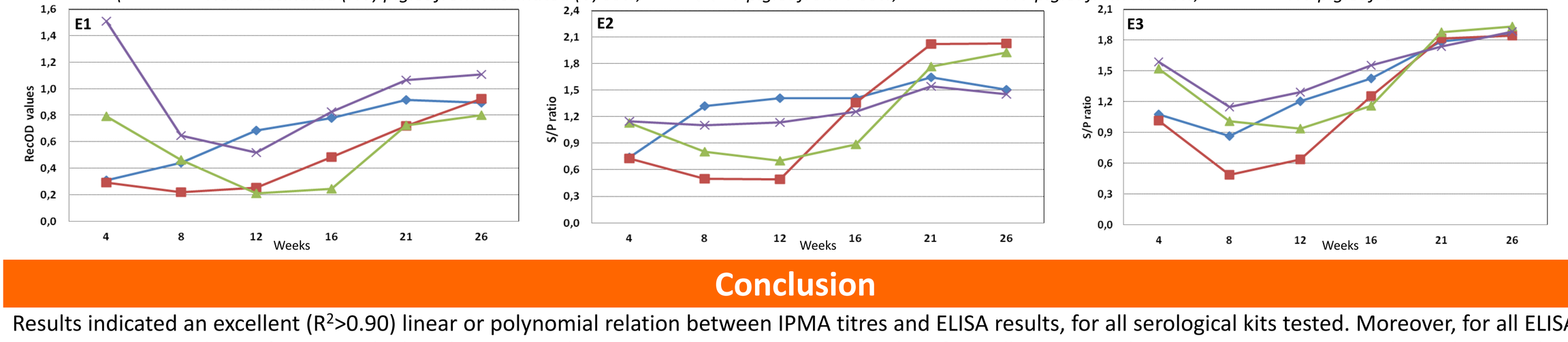
## Results

***Figure 1**: Correlation between IPMA and ELISAs results; (* —— *Lineal equation;* - - - - *Polynomial equation)*




The higher percentage of coincident results among ELISA techniques was detected between E2 and E3 (84%) followed for E1-E3 (82%) and E1-E2 (78%). A moderate agreement among all ELISA kits was observed, being the κ value included between 0.41 and 0.6 for the three ELISA kits. Compared with IPMA technique the E2 was the ELISA assay that presented the higher sensitivity (Se= 87.77%) followed for the E3 with a Se= 80.98% and E1 with a Se= 70.92%. Specificity was equal to 100% for all ELISA tests. When serological profiles of PCV2 antibodies were compared, the E2 was the most suitable to detect significant differences between treatment groups, followed by the E1 and E3 (Fig. 2)

***Figure 2**: Serological profiles of the different treatment groups obtained by E1, E2 and E3.*
*(NV-V Non-vaccinated (NV) piglet from vaccinated (V) sow; V-V V piglet from V sow; NV-NV NV piglet from NV sow; V-NV NV piglet from V sow.*




## Conclusion

Results indicated an excellent ($R^2$>0.90) linear or polynomial relation between IPMA titres and ELISA results, for all serological kits tested. Moreover, for all ELISA tests, sensitivity and specificity were higher than or equal to 70% and 100% respectively. Therefore, all commercial ELISA tests seem to provide predictive values similar to that offered by the IPMA, and represent reliable potential substitutes of IPMA to monitor antibody responses to PCV2 infection and/or vaccination in quantitative terms.

## References

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