USE OF A COMMERCIAL INDIRECT ELISA TEST FOR PORCINE CIRCOVIRUS TYPE 2 (PCV2) TO INFER IMMUNOPEROXIDASE MONOLAYER ASSAY (IPMA) PCV2 SEROLOGICAL TITRES

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Introduction and Objectives

Serology is frequently used to determine antibody presence or absence or even amount of antibodies against a given pathogen. Moreover, it allows determining infection dynamics and optimal timing of vaccination/medication of such agent.

Immunoperoxidase monolayer assay (IPMA) and immunofluorescent antibody assay (IFA) have been often used as serological tools for porcine circovirus type 2 (PCV2) (1):

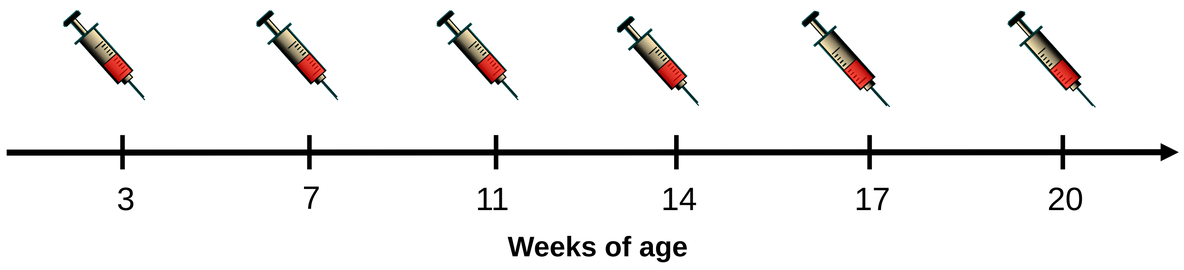
- **Advantage:** feasibility of titration, so, a biological titre-dependent interpretation can be established
- **Disadvantages:** expensive, time-consuming and there is a need for cell culture and virological expertise

Therefore, the subsequent development of ELISA techniques solved part of these problems, allowing the possibility of working with high number of samples in an easy-to-apply platform. However, ELISA techniques are not usually used for titration but for a qualitative result.

The present work was aimed to interpret PCV2 serological values of a commercial ELISA as a quantitative technique by means of comparison with IPMA.

Material and Methods

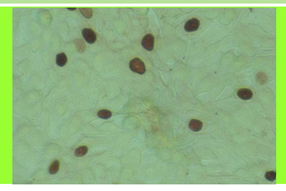
A total of 645 pig sera taken from different age-groups from a previous study (2). All sera came from pigs from a 2-site, 2500 sow-farm:



645 sera

Indirect ELISA
Dilution 1:200, optical density (OD) value

IPMA (3)
Dilutions 1:20 to 1:20,480 (4x) – titration



Statistics:

- Mean ELISA values for each IPMA titre were calculated, and corresponding linear and polynomial equations were adjusted.
- 95% confidence intervals (CI) of the ELISA OD values per each IPMA titre were computed.
- Finally, IPMA titres were inferred based on results of ELISA OD values.

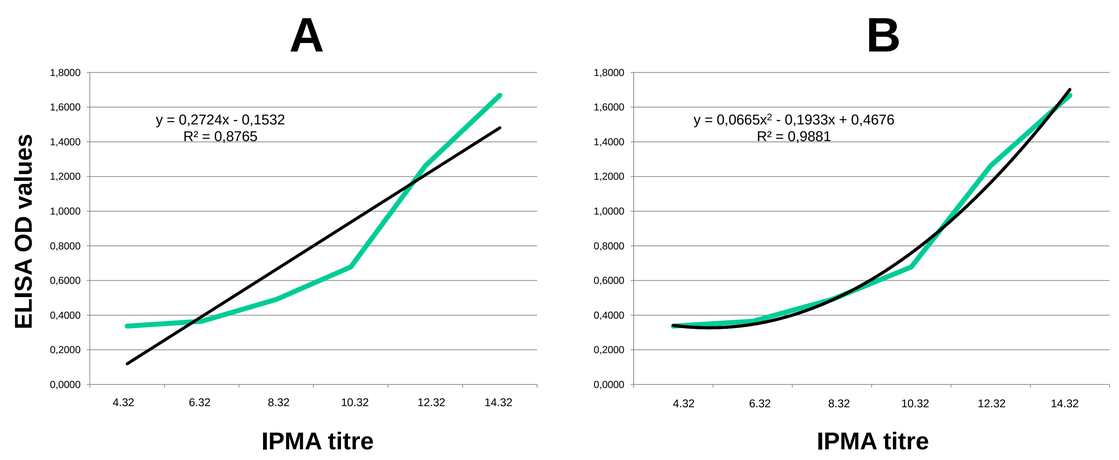
Results

A summary of PCV2 IPMA titres and the mean ELISA OD values plus 95% CI are given in Table 1. Correlation of both values was high when considered it as linear (R^2=0.88) (figure 1a) and very high when considered as polynomial (R^2=0.99) (figure 1b).

Table 1. Log2 PCV2 IPMA titres and corresponding ELISA OD values with confidence intervals (CI)

n	Log2 IPMA titres	ELISA OD values	CI
58	4.32	0.3366	±0.0599
160	6.32	0.3650	±0.0330
123	8.32	0.4948	±0.0526
73	19.32	0.6719	±0.0743
75	12.32	1.2698	±0.0830
156	14.32	1.6981	±0.0760

Figure 1. Log2 PCV2 IPMA titres correspondence with ELISA OD values (series 1) and their linear (A) and polynomial (B) correlations.



Conclusions

1. The present study supports the notion of using an indirect ELISA technique to predict IPMA titres with high degree of correlation.
2. In consequence, and especially important for field veterinarians using serology for PCV2, this indirect ELISA can be applied for monitoring PCV2 infection and vaccination under field conditions and be interpreted as a quantitative technique in a similar manner than IPMA.

References

1. Fort et al. (2009). Vaccine. 27, 4031-4037.
2. Fraile et al. (2010). Proc. IPVS, Vancouver, P.136.
3. Rodríguez-Arrioja et al. (2000). Vet Rec. 146, 762-764.

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