

EVALUATION OF 2 ELISA TESTS FOR ANTIBODIES TO CLASSICAL SWINE FEVER

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Introduction

Commercial Enzyme Linked Immunosorbent Assay (ELISA) test kits for classical swine fever (CSF) serology have advantages over serum neutralization (SN) tests because they are inexpensive, easy to use and do not require complex laboratory facilities. In the absence of reliable data correlating SN and ELISA test results, interpretation can be difficult especially when applied to the detection of post vaccination antibody titres. This study aims to evaluate two ELISA test kits for antibodies to CSF.

Materials and methods

A 1200-sow herd known to be free of CSF practicing routine vaccination of sows twice a year and piglets prior to weaning was used. Thirty one, 20 and 40 serum samples from sows, 4-week-old piglets and 20-week-old finishers respectively were tested using 2 commercial ELISA test kits - CIVTEST™ suis HC/PPC (ELISA A) and IDEXX Herdcheck CSFV Ab (ELISA B) and by the Serum Neutralization Test, the latter was performed according to a method previously described (1).

The dataset was first tested for their conformance to normality. Non-normally distributed values were either mathematically transformed, or analyzed using a distribution-free (non-parametric) technique. The ELISA methods were compared for their conformance and bias using the non-parametric Passing-Bablok regression method, using OD (optical density) values from ELISA A & ELISA B. The Mountain Plot method was then used to determine which ELISA test kit was a better estimator of Ig SN titres. All statistical procedures were performed at 95 % confidence level.

Results and discussion

The ELISA data were not normally distributed ($P < 0.05$) and thus the Passing-Bablok regression was appropriate (Figure 1). The analysis result indicated that the two methods were comparable to each other with a positive bias of 0.221. The Passing-Bablok regression equation for ELISA A versus ELISA B is $Y = 0.8033X + 0.221$ (Figure 1). (0.8033, 95 % CI 0.6212 to 1.000; 0.2210, 95 % CI 0.1300 to 0.2879). The sensitivity of the ELISA A and ELISA B was found to be 96% and 67% respectively to the SN test. Analysis of results based on the Mountain plot method (Figure 2) shows that the ELISA A was found to be a better estimator of the SN titre. The median difference

from the Ig SN titre for ELISA A was 1.370 (95 % CI 0.120 – 0.292). Conversely, ELISA B had larger median difference from the Ig SN titre at 1.515 (95 % CI 0.120 – 3.220).

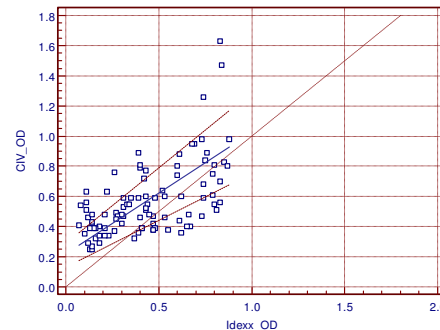


FIGURE 1 : Passing-Bablok Regression Between CIV and Idexx ELISA kits (Solid line indicate the regression line, defined by $Y = 0.8033X + 0.221$, dotted lines indicate the 95 % confidence limits).

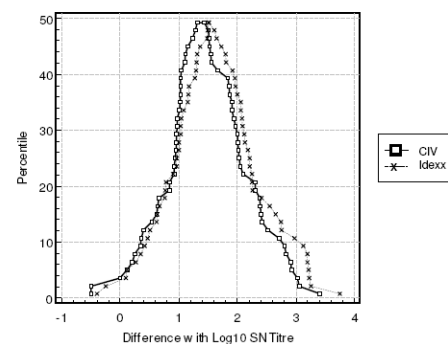


Figure 2: Mountain plot demonstrating how well Idexx and CIV ELISA kits at approximating the actual log₁₀ SN titre.

The difference in sensitivity of these two ELISA tests may be because the ELISA B detects CSFV specific antibodies whereas ELISA A is meant for detection of total antibodies against porcine pestiviruses. Indeed, there are differences in ELISAs in detecting antibodies to different glycoproteins in CSFV (2).

References

1. Vandeputte *et al.*, (2001). Am J Vet Res. 62(11):1805
2. Langedijk *et al.*, (2001) J. Clin Microbiol. 39(3) 906-912

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