ISWAVLD 2023
International Symposium of the World Association of Veterinary Laboratory Diagnosticians
29 JUNE-1 JULY 2023
Congress Centre Lyon
Towards the veterinary diagnostics of the future

Main topic : Animal Health

A new Classical Swine Fever indirect ELISA for herd profiling and vaccination monitoring

OLAGNON L. [1], SÉVÉNIÉ G. [1], LIMOZIN A. [1], COMTET L. [1], POURQUIER P. [1]

[1] Innovative Diagnostics, Grabels, France

Introduction.
Classical swine fever (CSF) is a highly contagious swine disease caused by the CSF virus (CSFV, genus Pestivirus), closely related to the ruminant pestiviruses which cause Bovine Viral Diarrhea and Border Disease.
In its acute form, the disease is characterized by fever, depression, superficial and internal hemorrhages, high morbidity and mortality. In its chronic form, the clinical signs are less severe, and recovery is occasionally seen in mature animals. Transplacental infection with low virulence viral strains often results in persistently infected piglets, responsible for virus dissemination.
Serological tests such as serum neutralization or enzyme-linked immunosorbent assay (ELISA) are commonly used for CSFV antibodies monitoring. IDvet already offers a competitive ELISA (cELISA), the ID Screen® CSF Competition ELISA for anti-CSFV E2-glycoprotein antibody detection. In this study, we describe a new kit, the ID Screen® Classical Swine Fever E2 Indirect ELISA (iELISA) which will allow to assess the anti-CSFV E2-glycoprotein antibodies titer in swine serum or plasma, better quantifying the E2 response after vaccination or natural infection.

Methods.
Diagnostic specificity was evaluated on 247 swine samples from CSFV-free herds in France, without history of CSFV vaccination or infection.
Diagnostic sensitivity was assessed using 179 swine sera samples from vaccinated herds in Asian countries. Out of the 179 samples, 92 were tested in parallel using the iELISA, the cELISA and Kit A, an indirect commercially available ELISA.
Two serum samples from vaccinated pigs, one with a C-strain vaccine and one with a recombinant E2 subunit vaccine, were serially diluted and tested in parallel with all ELISAs.

Results.
Measured specificity was 98.4% (CI95%: 95.9% - 99.4%), n=247. Measured sensitivity was 99.4% (CI95%: 96.8% - 99.9%), n=179. Out of the 92 vaccinated samples, 90, 89 and 60 samples were found positive with the cELISA, the iELISA, and Kit A, respectively.
The C-strain vaccinated sample were found positive until dilution 1:32 with the 3 ELISAs. The recombinant E2 subunit vaccinated sample were found positive until dilution 1:256, 1:128 and 1:32 with the cELISA, the iELISA and Kit A, respectively.

Conclusions.
The ID Screen® CSF indirect ELISA demonstrates good specificity, efficiently detects anti-CSFV E2 antibodies and shows high analytical sensitivity, delivering improved results compared to Kit A.
The new iELISA is a reliable tool for the detection of pig antibodies directed against CSFV. Further work is now ongoing to finalize a quantitative approach allowing antibody titer determination. Any collaboration welcomed!