


Diagnostic specificity of the African swine fever virus antibody detection enzyme-linked immunosorbent assay in feral and domestic pigs in the United States

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Summary

African swine fever (ASF) is a highly contagious haemorrhagic disease of pigs that has the potential to cause mortality nearing 100% in naïve animals. While an outbreak of ASF in the United States' pig population (domestic and feral) has never been reported, an introduction of the disease has the potential to cause devastation to the pork industry and food security. During the recovery phase of an outbreak, an antibody detection diagnostic assay would be required to prove freedom of disease within the previously infected zone and eventually nationwide. Animals surviving an ASF infection would be considered carriers and could be identified through the persistence of ASF viral antibodies. These antibodies would demonstrate exposure to the disease and not vaccination, as there is no ASF vaccine available. A well-established commercial enzyme-linked immunosorbent assay (ELISA) detects antibodies against ASF virus (ASFV), but the diagnostic specificity of the assay had not been determined using serum samples from the pig population of the United States. This study describes an evaluation of the World Organization for Animal Health (OIE)-recommended Ingezim PPA COMPAC ELISA using a comprehensive cohort ($n = 1791$) of samples collected in the United States. The diagnostic specificity of the assay was determined to be 99.4% (95% confidence interval (CI): [98.9, 99.7]). The result of this study fills a gap in understanding the performance of the Ingezim PPA COMPAC ELISA in the ASF naïve pig population of the United States.

KEYWORDS

African swine fever, diagnostic specificity, ELISA

1 | INTRODUCTION

African swine fever (ASF) is a disease of pigs caused by the African swine fever virus (ASFV), a double-stranded DNA virus and the only member in the *Asfarviridae* family. The clinical presentation and gross pathologic findings are similar to classical swine fever (CSF) and various endemic diseases of pigs which require diagnostic laboratory testing for differentiation (OIE, 2012). Animals may

exhibit clinical signs, which include high fever, depression, anorexia, diarrhoea, vomiting, epistaxis and hematochezia (Blome, Gabriel, & Beer, 2013; Gallardo et al., 2013). ASFV is considered endemic in many regions of Africa (Penrith, Vosloo, Jori, & Bastos, 2013), and from 2007 forward has caused localized disease outbreaks in Eastern Europe and Russia (Gallardo et al., 2015). These more recent occurrences have raised concerns about ASFV in pig herds, especially where critical naïve populations exist. If an infection with the