

# Simplifying sampling for African swine fever surveillance: Assessment of antibody and pathogen detection from blood swabs

J. Carlson<sup>1</sup> | L. Zani<sup>1</sup> | T. Schwaiger<sup>1</sup> | I. Nurmoja<sup>2,3</sup> | A. Viltrop<sup>3</sup> | A. Vilem<sup>2</sup> | M. Beer<sup>1</sup>  | S. Blome<sup>1</sup> 

<sup>1</sup>Institute of Diagnostic Virology, Friedrich-Loeffler-Institut, Greifswald - Insel Riems, Germany

<sup>2</sup>Estonian Veterinary and Food Laboratory, Tartu, Estonia

<sup>3</sup>Institute of Veterinary Medicine and Animal Sciences, Estonian University of Life Sciences, Tartu, Estonia

## Correspondence

S. Blome, Friedrich-Loeffler-Institut, Greifswald – Insel Riems, Germany.  
Email: Sandra.Blome@fli.de

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## Summary

African swine fever (ASF) is a notifiable disease with serious socio-economic consequences that has been present in wild boar in the Baltic States and Poland since 2014. An introduction of ASF is usually accompanied by increased mortality, making fallen wild boar and hunted animals with signs of disease the main target for early warning and passive surveillance. It is difficult, however, to encourage hunters and foresters to report and take samples from these cases. A pragmatic and easy sampling approach with quick-drying swabs could facilitate this. In this study, we further evaluated the use of dry blood swabs for the detection of ASFV antibody and genome with samples from animal trials and diagnostic submissions (blood, bone and organs) from Estonia. Compared to serum samples, dried blood swabs yielded 93.1% (95% confidence interval: [83.3, 98.1]) sensitivity and 100% [95.9, 100.0] specificity in a commercial ASFV antibody ELISA. Similarly, the swabs gave a sensitivity of 98.9% [93.4, 100.0] and a specificity of 98.1% [90.1, 100.0] for genome detection by a standard ASFV p72 qPCR when compared to EDTA blood. The same swabs were tested in a VP72-antibody lateral flow device, with a sensitivity of 94.7% [85.4, 98.9] and specificity of 96.1% [89.0, 99.2] compared to the serum ELISA. When GenoTube samples tested in ELISA and LFD were compared, the sensitivity was 96.3% [87.3, 99.5] and the specificity was 93.8% [86.0, 97.9]. This study demonstrates reliable detection of ASFV antibody and genome from swabs. A field test of the swabs with decomposed wild boar carcasses in an endemic area in Estonia also gave promising results. Thus, this technique is a practical approach for surveillance of ASF in both free and endemic areas.

## KEYWORDS

African swine fever, antibody detection, diagnostics, early warning, forensic swab, genome detection, passive surveillance

## 1 | INTRODUCTION

African swine fever (ASF) is an often fatal haemorrhagic disease of domestic swine, feral swine and wild boar (all *Sus scrofa*) caused by a

double-stranded DNA virus, ASF virus (ASFV). African swine fever affects swine of all ages producing a wide range of clinical signs. Since 2007, ASF has spread to the Caucasus region, the Russian Federation and neighbouring Eastern European countries such as