



**African Swine Fever
Reference Laboratory Network**



World Organisation
for Animal Health
Founded as OIE

WOAH Reference Laboratories Network for African swine fever

Challenges and opportunities

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Mission

To provide scientific support for Veterinary Services in effective risk management for quality of life for all in South Africa.

- ▶ OVI promotes animal health and welfare by providing effective veterinary diagnostic and research services.
- ▶ WOAHA Reference Laboratory / FAO Collaborating center for African Swine Fever



ASF Diagnostic Capacity

Clinical Diagnosis

Clinical signs
Lesions
Sampling and shipment

Molecular Testing

Polymerase Chain Reaction (PCR)
Sequencing
Phylogenetic analysis

Antibody Detection

Competitive ELISA
Immunoblot Assay
Pen-side Antibody test

Virus Isolation

Hemabsorbtion
Cytopathic Effect

Biobanks

Reference material
Virus Repository
Serum Bank

ISO 17025 Accredited





Diagnostic Challenges

- ▶ Lack of diagnostic testing facilities and capacity at regional and national level.
- ▶ Lack of harmonization of diagnostic methods and quality assurance, biosafety and biosecurity systems.
- ▶ Lack of reference material and Diagnostic reagents.
- ▶ Lack of epidemiological information pertaining to outbreaks.



Diagnostic Support

- ▶ The reference laboratory provides diagnostic testing to member countries where national and region capacity does not exist .
- ▶ Primary or Confirmatory testing is done at no cost to the sender.
- ▶ The laboratory can assist with passive and active surveillance, but the sender will be charged for the tests conducted.
- ▶ Shipment of samples are often difficult, but the reference laboratory can assist with the logistics and authorization.
- ▶ An ASF proficiency testing scheme will be launched in 2023.



Capacity building and Training

► Regional support and training

Namibia (FMD and ASF)

Mauritius (FMD and ASF)

Botswana (FMD)

Malawi (FMD, ASF, PPR)

Uganda (FMD)

Nigeria (FMD, ASF, PPR)

Mozambique (FMD and ASF)

Zimbabwe (FMD and ASF)

SADC training courses (Diagnostics and disease surveillance)





Reference Laboratories Network

Aim

To facilitate collaboration between the WOAHA Reference Laboratories, national reference laboratories and laboratories in low- and middle-income countries that are actively involved in efforts to control or eradicate ASF.

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Reference Laboratories Network

Key Objectives

- ▶ To harmonize, standardize and validate ASF diagnostic assays, including assays that are not currently describe in the WOAHP Manual.
- ▶ To facilitate the exchange reference material to be used for internal verification of ASF diagnostic assays.
- ▶ To provide expertise and training to WOAHP and WOAHP Member Countries in relation to ASF diagnosis, surveillance and control.
- ▶ To support national reference laboratories in relation to ASFV diagnostics by providing scientific and technical expertise.



Reference Laboratories Network

Key Objectives

- ▶ To collect, analyse and disseminate epidemiological on ASF global occurrence and spread, ASF genetic characterization.
- ▶ To contributing to a worldwide data bank on ASFV genomic data, including the curation of complete genome sequences.
- ▶ To monitor and evaluate the performance of national laboratories through the provision of proficiency testing schemes.



Key Criteria for Membership

- ▶ WOAH Reference Laboratory, Regional Reference Laboratory or a National Reference Laboratory.
- ▶ Laboratories should actively conduct ASF diagnostics for one or more of the following purposes:
 - ▶ Confirmation of suspected cases of ASF,
 - ▶ ASF surveillance (active or passive),
 - ▶ ASF Control.
 - ▶ Export Certification for trade in animals or animal products
- ▶ Comply with the WOAH Standard for laboratories conducting tests for infectious diseases.



Reference Laboratories Network

Proposed Members

Geographical region	Country	Laboratory
Africa	South Africa	OIE reference laboratory for ASF Onderstepoort Veterinary Research, Agricultural Research
	Nigeria	National Veterinary Research Institute
	Côte d'Ivoire	Lanada- Central Laboraotry for Animal diseases
	Kenya	International Livestock Research Institute
	Ghana	Central Veterinary Laboratory



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Key Activities

- ▶ Laboratory diagnosis and surveillance of African swine fever virus: addressing novel emergent variants
 - ▶ Develop and Harmonize diagnostic assays for the detection of novel variants.
 - ▶ Update case definitions to accommodate changes in the epidemiology of ASFV due to the possible emergence variants with reduced virulence /vaccines.
 - ▶ Develop and Harmonize diagnostic assays to detect the use of illegal vaccines



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Key Activities

- ▶ Establishment of an Open Access Information Sharing Platform for the dissemination ASF epidemiological and sequence information.
 - ▶ Collate the most complete repository of high-quality ASFV genetic data;
 - ▶ Facilitate the rapid sharing of virus information during ongoing outbreaks;
 - ▶ Provide a set of harmonized sequencing and bioinformatics workflows for assembly and annotation of whole-genome sequences;
 - ▶ Support the identification and tracking of natural and vaccine-derived variants.



Reference Laboratories Network

Key Outputs

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Protecting animals, preserving our future

The OIE ASF Reference Laboratory Network's overview of African swine fever diagnostic tests for field application

February 2022

Free download

FAO Food and Agriculture Organization of the United Nations

Addressing African swine fever

Laboratory protocols and algorithms

INTRODUCTION

The Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (OIE) including other partners have been working in countries affected or at risk of incursion by African swine fever (ASF). This document was generated as guidance in response to the emergence of ASF in China, Southeast Asia, and the Pacific.

FAO has provided support for laboratory diagnosis of ASF following OIE recommendations, specifically using Polymerase Chain Reaction (PCR) in detecting ASF virus. PCR is a highly sensitive and specific method for the molecular detecting ASF virus for a wide range of purposes, including confirmation of clinical cases and confirmation of freedom from infection before movement. The [Australian Centre for Disease Preparedness \(ACDP, formerly the Australian Animal Health Laboratories\)](#) has developed a diagnostic algorithm based on OIE recommendations and in consultation with the Association of Southeast Asian Nations (ASEAN) regional animal health laboratory network.

This document describes a validated real time reverse transcription-polymerase chain reaction (RT-PCR) protocol (the "ring assay"), which targets the 69461 gene, encoding the ASF virus structural protein p72. This assay has been produced in kit form by the ACDP and provided to various veterinary diagnostic laboratories in Southeast Asia by the FAO and OIE. This document also provides links to other reference documents. FAO has provided three categories of guidance for the laboratory testing of pig samples for the presence of ASF virus:

1. Overview of primers and probes
2. PCR protocols
3. Surveillance laboratory flow chart

1. Overview of primers and probes

Table 1. Primers and probes for the detection of ASF VIRUS in real-time PCR assays

ASF Assay	Forward Primer [5' → 3']	Reverse Primer [3' → 5']	Probe [5' → 3']	Dye	Quencher
Ring	CTCTCATGTTATGACTCTATGSA	GATACGACGATGTRGCGCP	CGACGSSBAGATACACCCGATG	FAO1	TAMRA
UPL	CCGAGSAGATATATATGACTG	CAGTCTCTCTCTCCACGATG	GGCCAGAGV	FAO1	DAPI
USA	CTGTGAGAGAGGCTTATGAC	GGAAACTGCTGTCGAGATGCTT	CGATGAGAGCTTAT	FAO1	SYBR
Northern	GTGTATGAGAGGAGGAG	CGCTCTCTCTGAGAGAGAA	CTGAAATCTCTCGAT	FAO1	EvaGreen
Tigra	TGCTATGATGATGATCTCTATG	CGATGAGGATGATGATGCT	TTCATGAAATGATGATGCT	FAO1	TAMRA
FAO/EP	GATGATGATGATGATGATG	TCTCTCTCTCTCTCTCTCTCT	CGACGSSBAGATACACCCGATG	CFP	DOQB
Agreer ^{1,2}	AGTATGAGAGAGGAGGAGG	CGCTGATGATGATGATG	NA	NA	NA

¹ Recommended tests by the OIE
² UPL/US2 probe: Bvde file No. 0484490001. If the UPL/US2 probe is not available, it can be substituted by the following reverse probe 3'-[FAM]-TCTCTGCGACGACAGTCTCT-(HQ)-3' (OIE, 2019)
³ Assay can be replaced by Classical swine fever virus detection
⁴ Conventional PCR

Update coming soon



Reference Laboratories

- ▶ Cross-border has spread emphasized the need for global cooperation to fight this disease.
- ▶ Rapid and accurate diagnosis remain a critical component of ASF control programmes.
- ▶ Collaboration between reference laboratories and national laboratories are encouraged.

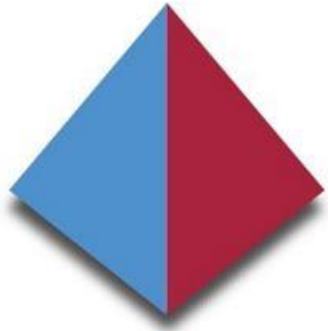
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GF-TADs

GLOBAL FRAMEWORK FOR THE
PROGRESSIVE CONTROL OF
TRANSBOUNDARY ANIMAL DISEASES

Africa



Food and Agriculture
Organization of the
United Nations

