



WOAH ASF Reference Laboratories Network

Background

Prior to 2007, African swine fever (ASF) was confined to most sub-Saharan African countries and Italy (Sardinia). However, introductions of the disease into Caucasian regions have highlighted the continual threat it poses to pig production globally. It is now also considered to be endemic areas within the Trans-Caucasus region and Russian Federation to which it was introduced in 2007. The disease has since spread rapidly and its introduction to China and Southeast Asia has had a significant impact on the global agricultural markets.

In Africa and elsewhere, changes in the epidemiology of the disease have recently been observed, related to newly emerging strains of ASFV, emphasising the serious threat this disease represents to the growing pig farming sector. Different platforms, such as the Global African Swine Fever Research Alliance (GARA) and the STAR-IDAZ International Research Consortium on Animal Health (IRC), exist to address some of the pressing knowledge gaps. However, rapid and accurate diagnosis remain a critical component of ASF control programmes. The speed at which the virus has spread emphasises the need for cross-border cooperation to fight this disease. Collaboration between reference laboratories to update and harmonise existing assays and develop new diagnostic tools should be encouraged.

It is in light of this that the Scientific Commission of WOAH endeavoured to establish a Reference Laboratories Network for ASF. The aim of the networks would be to facilitate collaboration between the WOAH Reference Laboratories, national reference laboratories and experts from laboratories in low- and middle-income countries that are actively involved in efforts to control or eradicate ASF in affected regions.

The key objectives of the Network are:

- To harmonize, standardize and validate ASF diagnostic assays, including assays that are not currently described in the WOAH Manual.
 - To make available and facilitate the exchange reference material to be used for internal verification of ASF diagnostic assays.
 - To contribute to a worldwide data bank on ASFV genomic data, including the curation of complete genome sequences.
 - To provide expertise and training to WOAH and WOAH Members in relation to ASF diagnosis, surveillance and control.
 - To support national reference laboratories in relation to ASFV diagnostics by providing scientific and technical expertise.
 - To collect, analyse and disseminate epidemiological data on ASF global occurrence and spread, as well as ASF genetic characterization.
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Coordination

The secretariat of the WOAAH ASF Network will be under the responsibility of a rotating management of each WOAAH Reference Laboratory for a period of three years, to foster responsibility for each laboratory and activities in the different regions. Its role includes the organization of periodical meetings and the general coordination of network.

The goal is to bring together as many experts as possible at the ASF Network meetings. The secretariat will coordinate the periodical meetings with other platforms such as the GARA, which already brings together ASF experts, representatives from FAO and WOAAH World Reference Laboratories, and research institutes. It is important to note that it is the intention of the ASF Reference Laboratories Network to strengthen global efforts to control the disease by complimenting other ongoing initiatives. It is essential that the Network collaborate closely with partners such as the Food and Agriculture Organization of the United Nations (FAO), GARA, STAR-IDAZ, the European Reference Laboratory Network for ASF and the European Virus Archive, to avoid unnecessary duplication of activities.

Each network secretariat should provide the WOAAH Director General with an annual report of its activities on achievements, obstacles, and future initiatives.

Key Technical Criteria for Membership

In order to become a member of the ASF Reference Laboratories Network a laboratory should meet the following criteria:

- Be officially recognised as an WOAAH Reference Laboratory, Regional Reference Laboratory or a National Reference Laboratory
- Be actively conducting 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 WOAAH Standard for Management and Technical Requirements for Laboratories Conducting Tests for Infectious Disease

Provision should be made for laboratories that do not meet the technical requirement to participate in the activities of the Network at the explicit invitations of the secretariat. This will include laboratories servicing regions that are not directly affected by the disease, but for which a significant risk of introduction has been identified, to ensure that the Network benefits geographic regions that may currently be free of the disease.

Areas of activities and outcomes

Activity	Sub-activity	Objectives	Outcomes
<p>Ensuring availability of high quality laboratory tests and their use, and maintaining a high quality performance by reference laboratories.</p>	<p><u>Sub-activity 1.1</u> Distribution of Standard Operating Procedures (SOPs) for ASF diagnostic methods</p>	<p>Distribution of Standard Operating Procedures (SOPs) and technical support to labs to ensure harmonization of the diagnostic methods used in the Community.</p> <p>Distribution through website or electronic correspondence of SOPs of frequently used methods:</p> <p>c-ELISA</p> <p>RT-PCR amplification</p> <p>Capture ELISA</p> <p>Virus Isolation</p>	<p>SOPs for ASF diagnostic methods available to all laboratories conducting laboratory testing for ASF.</p>
	<p><u>Sub-activity 1.2</u> Production and exchange of reference materials</p>	<p>Produce, maintain and distribute biological materials available for internal verification of ASF diagnostic assays.</p> <p>Reference standards will include infections and non-infectious material.</p> <p>Non-infectious reference viruses of the three different virus lineages</p> <p>Expand the scope of Reference standards to include ASF strains representative of all four epidemiological cycles, with specific emphasis on the sylvatic present in Africa.</p>	<p>All members of the network to have access to verified and standardised reference material.</p> <p>Distribution of reference material will be subject to all compliance with all legal and regulatory requirements</p>

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	<p><u>Sub-activity 1.3</u> To foster participation to Proficiency Testing for ASFV diagnostic methods organized by WOAHA ref labs</p>	<p>To maintain appropriate level of proficiency testing ensuring efficiency of control analysis methods.</p> <p>To establish regional proficiency and inter-laboratory comparison testing scheme to encourage broader participation in such schemes.</p> <p>Members of the ASF Reference laboratories Network will be required to participate in recognised annual Proficiency Testing on ELISA, and/or PCR/Q-PCR methods for ASF.</p> <p>Information on proficiency testing will be presented at the annual Workshop.</p>	<p>Greater access to ASF proficiency testing.</p> <p>Appropriate level of competence maintained by all Reference Laboratories.</p>
	<p><u>Sub-activity 1.4</u> Sharing knowledge on development of new ASFV diagnostic tools</p>	<p>Information on development of new techniques is shared in the network through presentations during the annual meeting and provision of access to associated publications.</p> <p>Assess and validate newly developed diagnostic tools.</p>	<p>Verified information on the performance of diagnostic assays used by Reference laboratories.</p>
<p>Providing information on the genetic diversity of ASFV strains.</p>	<p><u>Sub-activity 2.1:</u> Providing standardised protocols for the genetic characterisation of ASFV</p>	<p>In collaboration with the European Virus Archive, coordinate the access to ASF virus collections held by the various reference laboratories.</p> <p>Distribution of Standard Operating Procedures (SOPs) for the genetic</p>	<p>Global coordination of efforts to genetic characterise ASFV</p> <p>SOPs for the genetic characterisation of ASFV</p>

Activity	Sub-activity	Objectives	Outcomes
		<p>characterisation of ASFV using Multi-locus sequence typing.</p> <p>Distribution of Standard Operating Procedures (SOPs) for the generation of complete genome sequences of characterisation of ASFV using Next Generation Sequencing.</p>	
	<p><u>Sub-activity 2.1:</u> Providing access to sequence data for comparative genomics and phylogenetic analysis.</p>	<p>Establishment of a centralised sequence repository of ASFV.</p> <p>Define a set of reference sequences to be used in comparative genomics and phylogenetic analysis.</p>	<p>All members of the network to have access to sequence data for comparative genomics and phylogenetic analysis.</p>
<p>Providing support national reference laboratories</p>	<p><u>Sub-activity 3.1.</u> Providing confirmatory diagnostics when suspicions of ASF emergence.</p>	<p>Labs in the network can share the burden of diagnostic when WOAAH member countries with poor lab capacity are in need of urgent confirmation.</p>	<p>Swift confirmation of ASFV suspicion.</p>
	<p><u>Sub-activity 3.2</u> Availability of experts to provide training on ASFV diagnosis, surveillance and control.</p>	<p>Maintain a list of ASF expert that are available to provide training on ASF diagnosis, surveillance and control at a regional level.</p> <p>Establish Regional Laboratory Networks to promote coordination of between different national laboratories.</p>	<p>Annually updated list of experts available from the different labs in the network is provided to the WOAAH.</p> <p>Increase number of laboratories involved in the Reference Laboratories Network for ASF.</p>