

WOAH Reference Laboratory Reports Activities 2024

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LABORATORY INFORMATION

*Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:	African swine fever
*Address of laboratory:	1015, Arlington Street, Winnipeg, MB R3E 3M4, Canada
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Website:	https://inspection.canada.ca/science-and-research/our-laboratories/ncfad- winnipeg/eng/1549576575939/1549576643836
*Name (including Title) of Head of Laboratory (Responsible Official):	Kathleen Hooper-Mcgrevy
*Name (including Title and Position) of WOAH Reference Expert:	Dr. Aruna Ambagala - Research Scientist
*Which of the following defines your laboratory? Check all that apply:	Governmental

TOR1: DIAGNOSTIC METHODS

1. Did your laboratory perform diagnostic tests for the specified disease/topic for purposes such as disease diagnosis, screening of animals for export, surveillance, etc.? (Not for quality control, proficiency testing or staff training)

Yes			
Diagnostic Test	Indicated in WOAH Manual (Yes/No)	Total number of test	performed last year
Indirect diagnostic tests		Nationally	Internationally
ELISA	Yes	17	0



Direct diagnostic tests		Nationally	Internationally
RT-PCR	Yes	575	198
Virus isolation	Yes	0	10

TOR2: REFERENCE MATERIAL

2. Did your laboratory produce or supply imported standard reference reagents officially recognised by WOAH?

No

3. Did your laboratory supply standard reference reagents (nonWOAH-approved) and/or other diagnostic reagents to WOAH Members? Yes

Type of reagent available	Related diagnostic test	Produced/ provide	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	No. of recipient WOAH Member Countries	Country of recipients
Serum	ELISA	NCFAD	15 mL	0	1	CANADA,
Baculovirus expressed ASFV antigens	ELISA	NCFAD	0	4.75 mL	1	UNITED STATES OF AMERICA,
ASF plasmid (positive control)	RT-PCR	NCFAD	0	1.1 mL	1	SAINT LUCIA,
Baculovirus expressed ASFV antigens	Portable assay development	NCFAD	16.35 mL	0	1	CANADA,
Serum	Peptide array analysis	NCFAD	10 mL	0	1	CANADA,

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOAH Members?

No

TOR3: NEW PROCEDURES

6. Did your laboratory develop new diagnostic methods for the designated pathogen or disease?

Yes

7. Did your laboratory validate diagnostic methods according to WOAH Standards for the designated pathogen or disease?

Yes

Name of the new test or diagnostic method developed	Description and References (Publication, website, etc.)
Blocking and Indirect ASF ELISA	Full validation using domestic, field, and experimental samples. Publication: https://pubmed.ncbi.nlm.nih.gov/39599534/

8. Did your laboratory develop new vaccines for the designated pathogen or disease?

No



9. Did your laboratory validate vaccines according to WOAH Standards for the designated pathogen or disease? No

TOR4: DIAGNOSTIC TESTING FACILITIES

10. Did your laboratory carry out diagnostic testing for other WOAH Members?

Yes

Yes

Name of WOAH Member Country seeking assistance	Date	Which diagnostic test used	No. samples received for provision of diagnostic support	No. samples received for provision of confirmatory diagnoses
SRI LANKA	2024-11-13	RT-PCR, Virus Isolation, Sequencing	25	25
BAHAMAS	2024-05-09	RT-PCR	13	0
TRINIDAD AND TOBAGO	2024-06-23	RT-PCR	86	0

11. Did your laboratory provide expert advice in technical consultancies on the request of an WOAH Member?

Name of the WOAH Member Country receiving a technical How the advice was provided Purpose consultancy SRI LANKA Diagnostic support Virtually MEXICO Research collaboration Virtually VIETNAM Research collaboration Virtually ZAMBIA Research collaboration Virtually BRAZIL **Diagnostic support** Virtually ECUADOR **Diagnostic support** Virtually BAHAMAS **Diagnostic support** Virtually TRINIDAD AND TOBAGO Virtually **Diagnostic support** COSTA RICA **Diagnostic support** Virtually SAINT LUCIA **Diagnostic support** Virtually

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

12. Did your laboratory participate in international scientific studies in collaboration with WOAH Members other than the own? Yes

Title of the study	Duration	Purpose of the study	Partners (Institutions)	WOAH Member Countries involved other than your country
Molecular Characterization of African Swine Fever Virus in Vietnam	8 years and ongoing	Molecular and pathological characterization of ASFV strains in Vietnam	Vietnam National University of Agriculture, Institute of Veterinary Science and Technology (IVST), Hanoi, Vietnam	VIETNAM
Surveillance of ASFV in		Characterization of ASFV	Department of Veterinary	



Zambia	2 years and ongoing	from ticks in Zambia	Services, Ministry of Fisheries and Livestock	ZAMBIA
Mexico	1 year and ongoing	Development of ASF ELISA	Mexico's National Institute for Forestry, Agriculture and Livestock Research (INIFAP)	MEXICO
Ghana	8 years and ongoing	Characterization of ASFV from Ghana samples	Accra Veterinary Laboratory, Veterinary Services Directorate, Off Ring Road East Near La General Hospital, Post Office Box M 161, Accra - Ghana	GHANA

13. In exercising your activities, have you identified any regulatory research needs* relevant for WOAH?

No

TOR6: EPIZOOLOGICAL DATA

14. Did your Laboratory collect epidemiological data relevant to international disease control?

Yes

If the answer is yes, please provide details of the data collected:

Sequencing and meta data were collected from our collaborative work with Zambia, Vietnam, and Sri Lanka.

15. Did your laboratory disseminate epidemiological data that had been processed and analysed?

Yes

If the answer is yes, please provide details of the data collected:

Some data collected were published and uploaded to GenBank

16. What method of dissemination of information is most often used by your laboratory? (Indicate in the appropriate box the number by category and list the details in the box)

a) Articles published in peer-reviewed journals:

8

1. Detection of Recombinant African Swine Fever Virus Strains of p72 Genotypes I and II in Domestic Pigs, Vietnam, 2023. Le VP, Nguyen VT, Le TB, Mai NTA, Nguyen VD, Than TT, Lai TNH, Cho KH, Hong SK, Kim YH, Bui TAD, Nguyen TL, Song D, Ambagala A.Emerg Infect Dis. 2024 May;30(5):991-994. doi: 10.3201/eid3005.231775.PMID: 38666642

2. Characterization of an African Swine Fever Virus Field Isolate from Vietnam with Deletions in the Left Variable Multigene Family Region.



Ambagala A, Goonewardene K, Kanoa IE, Than TT, Nguyen VT, Lai TNH, Nguyen TL, Erdelyan CNG, Robert E, Tailor N, Onyilagha C, Lamboo L, Handel K, Nebroski M, Vernygora O, Lung O, Le VP.Viruses. 2024 Apr 7;16(4):571. doi: 10.3390/v16040571.PMID: 38675912

3. Molecular characterization of emerging recombinant African swine fever virus of genotype I and II in Vietnam, 2023. Lee K, Vu TTH, Yeom M, Nguyen VD, Than TT, Nguyen VT, Jeong DG, Ambagala A, Le VP, Song D.Emerg Microbes Infect. 2024 Dec; 13(1):2404156. doi: 10.1080/22221751.2024.2404156. Epub 2024 Sep 22.PMID: 39258419

4. Spleen Swabs for Sensitive and High-Throughput Detection of African Swine Fever Virus by Real-Time PCR. Cafariello C, Goonewardene K, Chung CJ, Ambagala A.Viruses. 2024 Aug 18;16(8):1316. doi: 10.3390/v16081316.PMID: 39205290

5. Development and Validation of an Indirect and Blocking ELISA for the Serological Diagnosis of African Swine Fever. Onyilagha C, Quizon K, Zhmendak D, El Kanoa I, Truong T, Ambagala T, Clavijo A, Le VP, Babiuk S, Ambagala A.Pathogens. 2024 Nov 8;13(11):981. doi: 10.3390/pathogens13110981.PMID: 39599534

6. Genotype II Live-Attenuated ASFV Vaccine Strains Unable to Completely Protect Pigs against the Emerging Recombinant ASFV Genotype I/II Strain in Vietnam.

Diep NV, Duc NV, Ngoc NT, Dang VX, Tiep TN, Nguyen VD, Than TT, Maydaniuk D, Goonewardene K, Ambagala A, Le VP.Vaccines (Basel). 2024 Sep 28;12(10):1114. doi: 10.3390/vaccines12101114.PMID: 39460281

7. A Retrospective Analysis Reveals That the 2021 Outbreaks of African Swine Fever Virus in Ghana Were Caused by Two Distinct Genotypes.

Rai A, Spinard E, Osei-Bonsu J, Meyers A, Dinhobl M, O'Donnell V, Ababio PT, Tawiah-Yingar D, Arthur D, Baah D, Ramirez-Medina E, Espinoza N, Valladares A, Faburay B, Ambagala A, Odoom T, Borca MV, Gladue DP.Viruses. 2024 Aug 7;16(8):1265. doi: 10.3390/v16081265.PMID: 39205239

8. A Standardized Pipeline for Assembly and Annotation of African Swine Fever Virus Genome. Spinard E, Dinhobl M, Erdelyan CNG, O'Dwyer J, Fenster J, Birtley H, Tesler N, Calvelage S, Leijon M, Steinaa L, O'Donnell V, Blome S, Bastos A, Ramirez-Medina E, Lacasta A, Ståhl K, Qiu H, Nilubol D, Tennakoon C, Maesembe C, Faburay B, Ambagala A, Williams D, Ribeca P, Borca MV, Gladue DP.Viruses. 2024 Aug 13;16(8):1293. doi: 10.3390/v16081293.PMID: 39205267

b) International conferences:

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1. United States Swine Health Improvement Plan (USSHIP) House of Delegates Meeting. Bloomington MN USA, September 4, 2024. Oral Presentation. Title: Potential Utility of Aggregate Sample Types in ASF & CSF Diagnostics Applications: From Our Experience. Presenter: Kalhari Goonewardene.

2. PROCINORTE Animal Health Task Force, Hybrid North American gap analysis workshop on priority animal diseases 2024: Emerging and Zoonotic Influenza Viruses, African swine fever, and bovine tuberculosis. Mexico City, Mexico, June 11, 2024. Oral Presentation. Title: Novel diagnostic tools for early detection of ASF. Presenter: Kalhari Goonewardene. Oral Presentation. Title: Characterization of an ASFV Field Isolate from Vietnam with Deletions in the MGF Region. Presenter: Aruna Ambagala.

3. The Cutting Edge of African Swine Fever Research Symposium Tsukuba, Ibaraki, Japan. 17-18 October 2024. Oral Presentation. The Changing Landscape of African Swine Fever: Challenges & Solutions. Presenter : Aruna Ambagala.

c) National conferences:



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1. 2024 Canadian Animal Health Laboratorians Network (CAHLN) Annual Meeting. Title: Development and validation of an indirect and a blocking ELISA for serological diagnosis of African swine fever. (Chukwunonso Onyilagha).

d) Other (Provide website address or link to appropriate information):

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Shared information at the;

1. Canadian Science Centre for Human and Animal Health - Community Liaison Committee (CLC) Meeting . 2024.-03-19, Oral presentation. Presentation Title: Rope Fluid for the Early Detection of African & Classical Swine Fevers. Presenter: Aruna Ambagala.

2. Webinar Organized by the Sri Lankan Veterinary Association. 2024-10-26 Presentation Title: African Swine Fever: Epidemiology, Diagnostics and Disease Control. Presenter: Aruna Ambagala.

3. Workshop on African Swine Fever in the Americas. February 27- 29, 2024. Presentation Titles: 1. African Swine Fever - An Update. 2. WOAH Reference Laboratory for ASF and CSF at the NCFAD - Past & Ongoing Activities. 3. ASF Diagnostics & Research at the National Centre for Foreign Animal Disease. Presenter: 4. ASF Diagnostic Capabilities in the Latin America and Caribbean. Aruna Ambagala.

Participated in the ASF Preparedness Course for Canada as ASF experts organized by the FAO Virtual Learning Centers. February 14-March 20, 2024. Participants: Aruna Ambagala and Kalhari Goonewardene

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOAH Members?

Yes

a) Technical visit : 1

b) Seminars : 0

c) Hands-on training courses: 0

d) Internships (>1 month) 0

Type of technical training provided (a, b, c or d)	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
A	GHANA	1

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
ISO17025	See attached	ASB_CTF_15579-CFIA-Certificate.pdf



19. Is your quality management system accredited?

Test for which your laboratory is accredited	Accreditation body
RT-PCR	Standards Council of Canada
Conventional PCR	Standards Council of Canada
Sequencing	Standards Council of Canada
ELISA	Standards Council of Canada
Virus isolations	Standards Council of Canada
IPT	Standards Council of Canada

20. Does your laboratory maintain a "biorisk management system" for the pathogen and the disease concerned? Yes

The Government of Canada's Canadian Biosafety Standard (CBS) requires that a biosecurity plan be in place for facilities that handle infectious agents. This plan details the aspects the facility has in place for the prevention of theft, misuse or intentional release of pathogens. The National Centre for Foreign Animal Disease (NCFAD) Biosecurity Plan addresses the requirements that are outlined in Section 4.1.8 of the CBS 3rd Edition, and security requirements detailed in Public Health Agency Canada (PHAC)'s Physical Security Standard for the NCFAD at the Canadian Science Centre for Human and Animal Health (CSCHAH) The NCFAD Biosecurity Plan deals with all biological pathogens, including Risk Group 2, but its focus is on those in Risk Groups 3 and 4, which pose the greatest biosecurity risk. This plan includes details on the risk assessment of biological agents, physical protection of the facility, personnel suitability/reliability, information management, pathogen accountability and inventory, and incident and emergency response measures. Work areas covered include diagnostic and research laboratory spaces in Containment Level 3 (CL3), a large animal CL3-Ag zone including post mortem suite, and higher containment laboratories, namely restricted zoonotic CL3 and CL4 labs. CL4 space includes a CL4 large animal zone. The NCFAD Biosecurity Plan will be reviewed biennially by the Director and/or Laboratory Executive Director (LED). Ad hoc review will take place in response to incident review outcomes and related document updates such as the Biosecurity Risk Assessment or Threat Risk Assessment.

TOR9: SCIENTIFIC MEETINGS

21. Did your laboratory organise scientific meetings related to the pathogen in question on behalf of WOAH?

No

Yes

22. Did your laboratory participate in scientific meetings related to the pathogen in question on behalf of WOAH?

No

TOR10: NETWORK WITH WOAH REFERENCE LABORATORIES

23. Did your laboratory exchange information with other WOAH Reference Laboratories designated for the same pathogen or disease? No

24. Do you network (collaborate or share information) with other WOAH Reference Laboratories designated for the same pathogen? Yes



NETWORK/DISEASE	ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC)	NO. PARTICIPANTS	PARTICIPATING WOAH REF. LABS
Africans swine fever Reference Laboratory Network	Participant	7	CSIRO Australian Centre for Disease Preparedness, Geelong, Australia; National Surveillance and Research Center for Exotic Animal Diseases, Qingdao, China; Onderstepoort Veterinary Institute, Onderstepoort, South Africa; Centro de Vigilancia Sanitaria Veterinaria (VISAVET), Madrid, Spain; Pirbright Institute, Pirbright, UK National Veterinary Services Laboratories; USDA, APHIS, New York, USA

25. Did you organise or participate in inter-laboratory proficiency tests with WOAH Reference Laboratories designated for the same pathogen during the past 2 years?

No

In 2024, NCFAD could not obtain an ASF inter-laboratory proficiency panel from a WOAH Reference Laboratory

26. Did your laboratory collaborate with other WOAH Reference Laboratories for the same disease on scientific research projects for the diagnosis or control of the pathogen of interest?

No

Yes

TOR11: OTHER INTERLABORATORY PROFICIENCY TESTING

27. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than WOAH Reference Laboratories for the same pathogen during the past 2 years?

Purpose for inter- laboratory test comparisons1	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Name of the test	WOAH Member Countries
Inter-laboratory Proficiency Testing	Organizer	17	ELISA RT-PCR	BELIZE, BRAZIL, CHILE, COSTA RICA, DOMINICAN (REP.), EL SALVADOR, GUATEMALA, JAPAN, MEXICO, NICARAGUA, PANAMA, PERU,

TOR12: EXPERT CONSULTANTS

28. Did your laboratory place expert consultants at the disposal of WOAH?

Yes



Kind of consultancy	Location	Subject (facultative)	
Technical Review	Virtual	WOAH Terrestrial Manual - ASF Chapter - ASF vaccine standards/guidelines section	
Virtual meeting	Virtual	African swine fever virus vaccines and vaccination	
Ad Hoc Working group	Virtual	WOAH support to Vietnam's ASF control with focus on ASF vaccination	
Group Meeting	Virtual	ASF Ref Lab Network meeting	

29. Additional comments regarding your report:

Yes

In 2024, NCFAD could not obtain an ASF inter-laboratory proficiency panel due to logistical challenges.