WOAH Reference Laboratory Reports Activities 2023

Activities in 2023

This report has been submitted : 11 juin 2024 23:05

Laboratory Information

Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:	Highly Pathogenic Avian Influenza
Address of laboratory:	1015 Arlington Street Winnipeg, Manitoba R3E 3M4
Tel.:	+1-204 789 20 03
E-mail address:	yohannes.berhane@inspection.gc.ca
Website:	https://merlin.cfia-acia.inspection.gc.ca/eng/1461783104818/1461783214246
Name (including Title) of Head of Laboratory (Responsible Official):	Yohannes Berhane
Name (including Title and Position) of WOAH Reference Expert:	Head Of Avian Disease Unit
Which of the following defines your laboratory? Check all that apply:	Governmental

TOR3: NEW PROCEDURES

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

No

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

No

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?

Yes

NAME OF THE NEW VACCINE DEVELOPED	DESCRIPTION AND REFERENCES (PUBLICATION, WEBSITE, ETC.)
Avian Influenza Vaccine, H5N2 (2.3.4.4b), Killed Virus; Material and/or Zoetis	Conducted vaccine effficacey testing in Pekin ducks

TOR4: DIAGNOSTIC TESTING FACILITIES

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

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
GHANA	2023-05-05	PCR, isolation and WGS	1010	0
GHANA	2023-11-29	qPCR detection & subtyping (H5, H7 & H9), WGS	0	30

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

Yes

NAME OF THE WOAH MEMBER COUNTRY RECEIVING A TECHNICAL CONSULTANCY	PURPOSE	HOW THE ADVICE WAS PROVIDED
GUATEMALA	Support on molecular diagnosis	Zoom sessions & SOPs (standard operating procedures)

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
Incursions of HPAI A (H5N1) viruses by long distance migratory birds to Canada	2022-2023	To identify the routes of HPAI virus incursions into Canada and identify intermediate avian hosts playing roles in virus diffusion	Animal and Plant Health Agency (APHA- Weybridge), UK	UNITED KINGDOM
Evolution and pathogenicity of HPAI A(H5N1) viruses in ferrets	2022-2023	To understand the phenotypic evolution of clade 2.3.4.4b A(H5N1) viruses	Department of Infectious Diseases, St. Jude Children's Research Hospital, USA	UNITED STATES OF AMERICA
HPAI A(H5N5) virus incursions and pathogenicity in mammals	2023-2024	To understand the genetic and phenotypic evolution of clade 2.3.4.4b A(H5N5) viruses	Department of Infectious Diseases, St. Jude Children's Research Hospital, USA	UNITED STATES OF AMERICA
HPAI A(H5Nx) virus pathogenicity and transmission in aquatic wild birds	2023-2024	To understand the phenotypic evolution of clade 2.3.4.4b A(H5N5) viruses	Friedrich-Loeffler-Institut, Insel Riems,	GERMANY

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:
We conducted surveillance of influenza A viruses in domestic poultry and live bird markets in Ghana

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

No

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:

4

1. Characterization of neurotropic HPAI H5N1 viruses with novel genome constellations and mammalian adaptive mutations in free-living mesocarnivores in Canada.
Alkie TN, Cox S, Embury-Hyatt C, Stevens B, Pople N, Pybus MJ, Xu W, Hisanaga T, Suderman M, Koziuk J, Kruczkiewicz P, Nguyen HH, Fisher M, Lung O, Erdelyan CNG, Hochman O, Ojkic D, Yason C, Bravo-Araya M, Bourque L, Bollinger TK, Soos C, Giacinti J, Provencher J, Ogilvie S, Clark A, MacPhee R, Parsons GJ, Eaglesome H, Gilbert S, Saboraki K, Davis R, Jerao A, Ginn M, Jones MEB, Berhane Y.
Emerg Microbes Infect. 2023 Dec;12(1):2186608. doi: 10.1080/22221751.2023.2186608.
PMID: 36880345 Free PMC article.

2. Recurring Trans-Atlantic Incursion of Clade 2.3.4.4b H5N1 Viruses by Long Distance Migratory Birds from Northern Europe to Canada in 2022/2023.
Alkie TN, Byrne AMP, Jones MEB, Mollett BC, Bourque L, Lung O, James J, Yason C, Banyard AC, Sullivan D, Signore AV, Lang AS, Baker M, Dawe B, Brown IH, Berhane Y.
Viruses. 2023 Aug 30;15(9):1836. doi: 10.3390/v15091836.
PMID: 37766243 Free PMC article.

3. Rapid evolution of A(H5N1) influenza viruses after intercontinental spread to North America.

Kandeil A, Patton C, Jones JC, Jeevan T, Harrington WN, Trifkovic S, Seiler JP, Fabrizio T, Woodard K, Turner JC, Crumpton JC, Miller L, Rubrum A, DeBeauchamp J, Russell CJ, Govorkova EA, Vogel P, Kim-Torchetti M, Berhane Y, Stallknecht D, Poulson R, Kercher L, Webby RJ.
Nat Commun. 2023 May 29;14(1):3082. doi: 10.1038/s41467-023-38415-7.
PMID: 37248261

4. Influenza A(H5N1) Virus Infections in 2 Free-Ranging Black Bears (Ursus americanus), Quebec, Canada.
Jakobek BT, Berhane Y, Nadeau MS, Embury-Hyatt C, Lung O, Xu W, Lair S.
Emerg Infect Dis. 2023 Oct;29(10):2145-2149. doi: 10.3201/eid2910.230548.
PMID: 37735770 Free PMC article.

b) International conferences:

2
1. Signore, AV. Evolutionary dynamics of HPAI H5N1 clade 2.3.4.4b in Canada. PROCINORTE Animal Health Task Force Annual Conference. Mexico City, Mexico. June, 2023.
2. Alkie, TN. HPAI H5N1: pathogenicity & transmission. PROCINORTE Animal Health Task Force Annual Conference. Mexico City, Mexico. June, 2023.

c) National conferences:

4
1. Signore, AV. Evolutionary dynamics of highly pathogenic H5N1 avian influenza following its incursion to North America. One Health HPAI Webinar. Canada. September, 2023
2. Signore, AV. A phylogeographic reconstruction of the emergence, diversification, host dynamics and spread of highly pathogenic H5N1 avian influenza in Canada. CFIA Research and Development Symposium. Ottawa, Canada. November 2023.
3. Alkie TN. Pathogenesis & transmission of HPAI H5Nx viruses in waterfowl & poultry. Procinorte CAHSN labs, Canada, September, 2023.
4. Alkie (2023). Pathogenesis & transmission of HPAI H5Nx viruses in waterfowl & poultry. One Health HPAI Webinar, Canada. September, 2023.

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

1
1. Alkie TN. Pathogenicity and transmissibility of clade 2.3.4.4b HPAI H5N1 viruses from 2021/2022. NCFAD scientific session, Canada, June 09, 2023

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 : 2

c) Hands-on training courses: 1

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	9
C	GHANA	10
B	GUATEMALA	21

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
ISO17025	SCC Accreditation certificate.pdf	SCC Accreditation certificate.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body

ELISA	Standard Council of Canada
Hemagglutination assay	Standard Council of Canada
Hemagglutination inhibition assay	Standard Council of Canada
Real time RT-PCR	Standard Council of Canada
PCR	Standard Council of Canada
IVPI	Standard Council of Canada
AGID	Standard Council of Canada
Virus isolation	Standard Council of Canada
Molecular pathotyping/sequencing	Standard Council of Canada

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

Yes

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

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?

Yes

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

Not applicable (Only WOAH Reference Laboratory designated for the disease)

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

Yes

PURPOSE OF THE PROFICIENCY TESTS: 1	ROLE OF YOUR REFERENCE LABORATORY (ORGANISER/ PARTICIPANT)	NO. PARTICIPANTS	PARTICIPATING WOAH REF. LABS/ ORGANISING WOAH REF. LAB.
OFFLU 2023 – Avian disease PCR	Participant	15-20	AAHL (Australia)

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?

Yes

TITLE OF THE PROJECT OR CONTRACT	SCOPE	NAME(S) OF RELEVANT WOAH REFERENCE LABORATORIES
Kappa Flu (Project with EU countires)	Understanding the connectivity and dynamics of avian influenza in wild birds, poultry and environment	Friedrich-Loeffler-Institut, Insel Riems, Istituto Zooprofilattico Sperimentale delle Venezie, St. Jude Childrens Research Hospital, Animal and Plant Health Agency, Weybridge

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?

Yes

Purpose for inter-laboratory test comparisons1	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Name of the Test	WOAH Member Countries
IAV PCR panels	Organiser	1	IAV - matrix, H5, H7 and H9	GHANA,
Serological panels	Organiser	1	AGID, ELISA	GHANA,
Virus characterisation	Organiser	1	HA & HI	GHANA,

TOR12: EXPERT CONSULTANTS

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

No

29. Additional comments regarding your report:

Yes

For most of the questions that we answered as "no" we were never asked to provide the services.