World Organisation for Animal Health

Charles Nfon - - CANADA

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:**	Foot and mouth disease
***Address of laboratory:**	1015 Arlington Street, Winnipeg, MB, Canada, R3E 3M4
***Tel:**	+1-204 789.20.23
***E-mail address:**	Charles.nfon@inspection.gc.ca
Website:	
***Name (including Title) of Head of Laboratory (Responsible Official):**	Charles Nfon, Laboratory Network Director
***Name (including Title and Position) of WOAH Reference Expert:**	Charles Nfon, Laboratory Network Director
***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
FMD-NS 3ABC bELISA	Yes	174	0
Direct diagnostic tests		Nationally	Internationally
FMDV isolation	Yes	38	0
FMD Real-time RT-PCR	Yes	477	0

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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
Recombinant FMDV 3ABC antigen	FMD NS cELISA	Produced/provided	76 pre-coated plates	0	1	CANADA,
anti-FMD 3B monoclonal antibody	FMD NS cELISA	Produced/ provided	0.4 mL	0	1	CANADA,
Positive control bovine sera for 3ABC ELISA strong POS (Q1), weak POS (Q2) and NEGATIVE (Q3)	FMD NS cELISA	Produced/ provided	6.9 mL each control (23 sets of controls)	0	1	CANADA,
HRP conjugated commercially produced polyclonal goat anti-mouse IgG	FMD NS cELISA	Provided	1.82mL	0	1	CANADA,
ELISA panels	FMD NS cELISA	Produced/ provided	9 panels	0	1	CANADA,
PCR panels	FMDV RRT-PCR	Produced/ provided	28 panels	0	1	CANADA,
PCR controls	FMDV RRT-PCR & beta-actin	Produced/ provided	113 control vials (both FMD & beta-actin), 0.1mL/vial	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?

No

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

Yes

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Name of the new test or diagnostic method developed	Description and References (Publication, website, etc.)
Serotype specific bELISA for FMD O, A, ASIA and SAT2	Kashem MA, Sroga P, Salazar V, Amjad H, Hole K, Koziuk J, Yang M, Nfon C, Babiuk S. Development and Validation of Serotype-Specific Blocking ELISA for the Detection of Anti-FMDV O/A/Asia1/SAT2 Antibodies. Viruses. 2024 Sep 10;16(9):1438. doi: 10.3390/v16091438. PMID: 39339914; PMCID: PMC11437413.
P1 sequencing with MINIon	Publication is in process, in the process of completing limit of detection data with newest chemistry.

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)
FMD mRNA vaccines – O Manisa	In process of evaluating an mRNA vaccine to FMD O Manisa developed by EMAI (Australia)

TOR4: DIAGNOSTIC TESTING FACILITIES

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

No

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
BOTSWANA	Expert advice on field validation of FMD strip tests	Virtual

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

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

No

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?

No

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:
Sequence data for FMD O and A serotypes circulating in Nigeria in 2020 were submitted 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:

1
Kashem MA, Sroga P, Salazar V, Amjad H, Hole K, Koziuk J, Yang M, Nfon C, Babiuk S. Development and Validation of Serotype-Specific Blocking ELISA for the Detection of Anti-FMDV O/A/Asia1/SAT2 Antibodies. Viruses. 2024 Sep 10;16(9):1438. doi: 10.3390/v16091438. PMID: 39339914; PMCID: PMC11437413.

b) International conferences:

2
Global FMD Research Alliance and EuFMD Open Session

c) National conferences:

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

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 : 0

b) Seminars : 1

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
B	CANADA	20

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
ISO17025	PDF	ASB_CTF_15579-CFIA-Certificate_v1_2021-04-27.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
FMDV-isolation	Standards Council of Canada (SCC)
FMD real-time RT-PCR	SCC
FMD DAS ELISA	SCC
FMD NS 3ABC bELISA	SCC
FMD-VNT	SCC
FMD-serotype cELISA	SCC

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

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

Yes

Title of event	Date	location	Role (speaker, presenting poster, short communications)	Title of the work presented

WOAH/FAO FMD Reference Laboratory Network	2024-09-25	Rome, Italy	speaker	Laboratory update from Canada
EUFMD	2024-10-29	Alcalá de Henares, Spain	Presenting poster	Rapid sequence identification of foot-and-mouth disease virus utilizing the Oxford nanopore technology (ONT) minion portable sequencer
EUFMD	2024-10-29	Alcalá de Henares, Spain	Team member of an oral presentation	Development of mRNA vaccines for use in livestock

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?

Yes

NETWORK/DISEASE	ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC)	NO. PARTICIPANTS	PARTICIPATING WOAH REF. LABS
WOAH/FAO FMD Reference Laboratory Network	Participant	30	FMD Reference Labs

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?

Yes

Purpose of the proficiency test:	Role of your Reference Laboratory (organiser/ participant)	No. participating Laboratories	Participating WOAH Ref. Labs/ organising WOAH Ref Lab
FMD ELISA interlaboratory comparison	participant	NA	PANAFTOSA, Brazil
Pirbright FMD proficiency panel	Participant	NA	WRLFMD Pirbright

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
Zip Diagnostics, penside test project	To evaluate the FMD penside test from ZiP Diagnostics (Australia)	WRLFMD Pirbright

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?

No

NA

TOR12: EXPERT CONSULTANTS

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

Yes

Kind of consultancy	Location	Subject (facultative)
Scientific advice	Virtual	Updates to Terrestrial Manual (FMD chapter)
Scientific advice	virtual	Possible BSC recommendations to amend the Code as a consequence of updates to the Manual

29. Additional comments regarding your report:

Yes

The NCFAD has agreements in place and hopes to provide more diagnostic support for FMD endemic countries in the coming years and by so doing, generate epidemiological data. Furthermore, Canada is in the process of establishing a FMD Vaccine Bank and the subject matter experts at the NCFAD are members of the steering and technical committees. In addition, most of the quality assurance testing and related research will be done at the NCFAD.