

WOAH Reference Laboratory Reports Activities 2023

Activities in 2023

This report has been submitted : 24 juin 2024 09:29

Laboratory Information

Name of disease (or topic) for which you are a designated WOA Reference Laboratory:	Foot and Mouth Disease Virus
Address of laboratory:	Plot 6385/90 Lejara Road, Broadhurst Industrial, Gaborone Botswana
Tel.:	+2673912711
E-mail address:	jhyera@bvi.co.bw
Website:	www.bvi-bw.com
Name (including Title) of Head of Laboratory (Responsible Official):	Dr Joseph Hyera
Name (including Title and Position) of WOA Reference Expert:	Dr Joseph Hyera, Laboratory Manager
Which of the following defines your laboratory? Check all that apply:	Parastatal 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 WOA Manual (Yes/No)	Total number of test performed last year	
		Nationally	Internationally
Indirect diagnostic tests			
NSP ELISA		7592	214
VNT		258	0
Direct diagnostic tests			
Virus Isolation in Cell culture		21	34
Genome Detection (RT-PCR and Sequencing)		21	34

TOR2: REFERENCE MATERIAL

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

No

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

Yes

TYPE OF REAGENT AVAILABLE	RELATED DIAGNOSTIC TEST	PRODUCED/ PROVIDE	AMOUNT SUPPLIED NATIONALLY (ML, MG)	AMOUNT SUPPLIED INTERNATIONALLY (ML, MG)	NO. OF RECIPIENT WOA MEMBER COUNTRIES	COUNTRY OF RECIPIENTS
FMD virus antigens (SAT1, SAT2, SAT3, TYPE O)	Liquid Phase Blocking ELISA (LPBE)	Produced	No	200 ml per each serotype	1	NAMIBIA,
FMD antisera(rabbit) SAT1, SAT2, SAT3, TYPE	LPBE	Produced	No	50 ml per each serotype	1	NAMIBIA,

O						
FMD anti sera (guinea pig) SAT1, SAT2, SAT3, TYPE O	LPBE	Produced	No	50 ml per each serotype	1	NAMIBIA,
FMD positive bovine serum (SAT1, SAT2, SAT3, TYPE O)	LPBE	Produced	No	50 ml per each serotype	1	NAMIBIA,
FMD negative bovine serum	LPBE	Produced	No	20 ml	1	NAMIBIA,

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOAHA 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 WOAHA Standards for the designated pathogen or disease?

Yes

NAME OF THE NEW TEST OR DIAGNOSTIC METHOD DEVELOPED	DESCRIPTION AND REFERENCES (PUBLICATION, WEBSITE, ETC.)
Validation of commercial 3ABC ELISA Kit (IDEXX) for detection of antibodies to NSPs of FMDV in cattle sera from southern Africa. Validation continues in 2024 to cover cattle, goat, sheep and pig sera. Final results will be published in peer reviewed journal.	Validation Report submitted to Mr. Thabang Radira, IDEXX Medical Representative in Botswana; contact: thabang@visibilitymarketing.co.bw
A TagMan-based RT-PCR assay for serotyping SAT2 strains of FMD virus	BMC Res. Notes, 16(1): https://doi.org/10.1186/10/1186/s13104-023-06586-7 .

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

Yes

NAME OF THE NEW VACCINE DEVELOPED	DESCRIPTION AND REFERENCES (PUBLICATION, WEBSITE, ETC.)
Engineering an epitope-based vaccine for control of FMD associated with SATs of FMD virus in southern Africa	A thesis (PhD) concluded last year by one of the Staff members. The Thesis has been submitted to the University of Botswana (UB) and was supervised jointly by myself (Joseph Hyera) and Professor S.W. Mpoloka of the Department of Biological Science, UB. The whole research work was conducted at this laboratory. Contact: mpoloka@UB.AC.BW

9. Did your laboratory validate vaccines according to WOAHA Standards for the designated pathogen or disease?

No

TOR4: DIAGNOSTIC TESTING FACILITIES

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

Yes

NAME OF WOAHA 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
BOTSWANA	2023-03-31	NSP ELISA, RT-PCR and Sequencing	94	1
BOTSWANA	2023-04-30	NSP	3	0
BOTSWANA	2023-08-31	NSP	533	0
BOTSWANA	2023-09-30	NSP, RT-PCR and sequencing	20	20
BOTSWANA	2023-10-31	NSP, VNT	1296	0
BOTSWANA	2023-11-30	NSP, VNT	5196	0

BOTSWANA	2023-12-31	NSP, VNT	431	0
ETHIOPIA	2023-07-06	RT-PCR and sequencing	0	27
LESOTHO	2023-09-21	NSP	200	0
MALAWI	2023-06-24	NSP, RT-PCR and sequencing	28	7

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

No

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

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

No

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

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:

Bovine epithelial tissues samples collected from Ethiopia and Malawi and buffalo probang samples collected from Botswana were tested and FMD virus was detected in these samples. The circulating FMDv serotypes were identified which include SAT 2 from Malawi, serotype A and O from Ethiopia and SAT 1 from Botswana samples. Serological samples (n=200) were received for FMD surveillance from Lesotho which is FMD free/green zone. All the 200 samples tested negative for FMDv antibodies indicating that Lesotho is maintaining its status of being FMD free.

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:

The data was collected from analysed test results and disseminated in the form of test reports. Four FMDv serotypes were detected and identified in samples from three countries; serotype A and O were identified from Ethiopia samples, SAT 2 identified from Malawi samples and SAT 1 from Botswana samples. The serological samples collected from Lesotho (FMD free country) tested negative for FMDv antibodies indicating absence of FMD.

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:

2

Kabelo, T.I., Fana, E.M., Hyera J.M. and Lebani, K. [2023]. A review of foot-and-mouth disease status and control measures in Botswana. *Trop. Anim. Health Prod*, 55 (4); Article No. 278. <https://doi.org/10.1007/s11250-023-03674-5>.

Kabelo, T.I., Fana, E., Kesamang, M., Hyera J. and Lebani, K. [2023]. A TaqMan-Based RTqPCR Assay for Serotyping of Southern African Territories (SAT2) Strains of Foot-and-Mouth Disease Virus (FMDV) in Southern Africa. *BMC Res Note*, <https://doi.org/10.1186/s13104-023-06586-7>

b) International conferences:

1

Hyera, J.M. and Fana, M.E. [2023]. Foot-and-mouth disease virus circulation in the regional pools: Pools 4-6. 18th WOAHA/FAO FMD Reference Laboratories Network Annual Meeting, 10th October – 12th October 2023. Hosted by: The Canadian Food Inspectorate Agency's (CFIA) National Centre for Foreign Animal Diseases (NCFAD), Winnipeg, Canada.

c) National conferences:

2

Mokopasetso, M., Fana, E. and Hyera, J.M. [2023]. Occurrence of FMD in Africa with special reference to incursion of FMD virus serotype O into Southern Africa. Presentation to the 25th Conference of the WOAHA Regional Commission for Africa held in Gaborone, Botswana 20 – 24 February 2023.

Mokopasetso, M., Hyera, J., Mazwiduma, M., Madeswi, A., Seoke, L. and Fana, M. [2023]. Botswana Vaccine Institute's contribution towards Foot-and-Mouth Disease (FMD) control in Sub-Saharan Africa with special reference to incursion of FMD virus serotype O in Southern Africa. Presentation to the 20th Congress of the Southern African Society of Veterinary Epidemiology and Preventive Medicine (SASVEPM) held at the Avani Resort in Gaborone, Botswana, 23 – 25 August 2023.

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

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TOR7: SCIENTIFIC AND TECHNICAL TRAINING

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

No

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
ISO 17025	PDF (Attached)	SADCAS Certificate of Accreditation(BNVL-BVI).pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
FMD virus isolation in primary lamb kidney cell culture	SANAS & SADCAS
FMD virus serotype identification by antigen ELISA	SANAS & SADCAS
FMD virus genome detection and sequencing	SANAS & SADCAS

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

Yes

We have several Standard operating procedures (SOPs) which guide on the biorisk management. The documents are: (i) SHEB 0001 Virus Leak/spill Containment and clean-up: It clearly outlines the steps to be taken should the FMD virus leak or spill, posing a potential breach of containment. (ii) SHEB 0013 Autoclaving SOP: The document spells out the removal of utensils and autoclavable equipment out of a Biosafety level 3 laboratory, where the virus pathogen is inactivated through heat. (iii) SHEB 0014 Waste disposal SOP: All laboratory waste undergoes decontamination before being removed from the BSL 3 facility to prevent any potential environmental risks. Once removed from the contaminated area, the waste is further incinerated within the compound. (iv) SHEB 0015 Procedure for entry and exit of visitors at BVI: Entry and exit of personnel into the BSL3 laboratory are controlled to minimize the risk of spreading the virus to the environment personnel interact with. (v) SHEB 0028 Organisation of Movement: A movement grid has been implemented to further minimize contamination of virus-free areas by personnel and equipment exiting the BSL3 laboratories. (vi) SHEB 0029 Decontamination Procedure: Utilizing the Safety Airlock System, the procedure further decontaminates materials that cannot be autoclaved.

TOR9: SCIENTIFIC MEETINGS

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

No

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

No

TOR10: NETWORK WITH WOAHA REFERENCE LABORATORIES

23. Did your laboratory exchange information with other WOAHA Reference Laboratories designated for the same pathogen or disease?

Yes

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

Yes

NETWORK/DISEASE	ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC)	NO. PARTICIPANTS	PARTICIPATING WOA REF. LABS
Foot and mouth disease	Participant	2	W All labs designated for Foot and Mouth

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

Yes

PURPOSE OF THE PROFICIENCY TESTS: 1	ROLE OF YOUR REFERENCE LABORATORY (ORGANISER/ PARTICIPANT)	NO. PARTICIPANTS	PARTICIPATING WOA REF. LABS/ ORGANISING WOA REF. LAB.
Assurance of Test results	Organiser	3	Pirbright Institute, CFIA, CORDA CEVA

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

No

TOR11: OTHER INTERLABORATORY PROFICIENCY TESTING

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

No

TOR12: EXPERT CONSULTANTS

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

No

29. Additional comments regarding your report:

No