

WOAH Reference Laboratory Reports Activities 2022

Activities in 2022

This report has been submitted : 24 avril 2023 17:26

Laboratory Information

Name of disease (or topic) for which you are a designated WOA Reference Laboratory:	African Horse Sickness
Address of laboratory:	No. 100 Old Soutpan Road (M35), Onderstepoort
Tel.:	(+2712) 529 - 9233/9117/9465
E-mail address:	Lubisia@arc.agric.za
Website:	https://www.arc.agric.za
Name (including Title) of Head of Laboratory (Responsible Official):	Dr. Misheck Mulumba
Name (including Title and Position) of WOA Reference Expert:	Dr. Baratang Alison Lubisi
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 WOA Manual (Yes/No)	Total number of test performed last year	
Indirect diagnostic tests		Nationally	Internationally
Indirect ELISA	Yes	837	0
VNT	Yes	117	0
Direct diagnostic tests		Nationally	Internationally
Real Time RT-PCR	Yes	289	0

TOR2: REFERENCE MATERIAL

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

No

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

No

4. Did your laboratory produce vaccines?

Not applicable

5. Did your laboratory supply vaccines to WOA?H Members?

Not applicable

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 WOA?H 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 WOA?H Standards for the designated pathogen or disease?

No

TOR4: DIAGNOSTIC TESTING FACILITIES

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

No

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

No

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

12. Did your laboratory participate in international scientific studies in collaboration with WOA?H 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
African Horse Sickness diagnosis differences among reference	6 months		Centro de Vigilancia Sanitaria Veterinaria (VISAVET) Facultad de VeterinariaHCV Planta sótanoUniversidad Complutense de Madrid	SPAIN UNITED KINGDOM

laboratories			(UCM), Laboratorio Central de Sanidad Animal (LCV-Algete), and Pirbright Institute	
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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:

Laboratory tests were performed for AHS surveillance in the AHS control area of the Western Cape Province of South Africa.

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:

Laboratory tests were performed for diagnostic, surveillance and trade movement purposes, and results sent to relevant stakeholders, including regulatory authorities.

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

Faber, E., Tshilwane, S.I., Van Kleef, M., & Pretorius, A. (2022a). Apoptosis versus survival of African horse sickness virus serotype 4-infected horse peripheral blood mononuclear cells. *Virus Res.*, Jan 2;307:198609. <https://www.doi.org/10.1016/j.virusres.2021.198609>.

Faber, E., Tshilwane, S.I., Van Kleef, M., & Pretorius, A. (2022b). The impact of *Escherichia coli* contamination products present in recombinant African horse sickness virus serotype 4 proteins on the innate and humoral immune responses. *Mol Immunol.*, 152:1-13. <https://www.doi.org/10.1016/j.molimm.2022.09.013>.

b) International conferences:

0

c) National conferences:

0

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

0

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOAAH 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)	
ISO17025	PDF	V0001-06-2022 signed.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Indirect antibody ELISA	SANAS
Real Time RT-PCR	SANAS

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

Yes

The ARC-OVR has a Biosafety and Biosecurity Committee which manages all biological risks on, or which may potentially affect operations on campus. Personnel also attend refresher courses on an annual basis. Dr. Lubisi attended ABSA International's 2nd Biosecurity Hybrid Symposium which was held between 01 and 08 May 2022, at the Renaissance Minneapolis Hotel, The Depot, 225 Third Avenue South, Minneapolis, MN 55401, United States of America. Whilst there, she attended a development course on the 3rd of May 2022 titled: Biosecurity for uncertain situations: Challenges and solutions. The course used case studies and guided exercises to assess security risks and describe challenges, lessons learned and opportunities for protecting biological materials, especially in situations where information, resources and support are scarce.

TOR9: SCIENTIFIC MEETINGS

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

No

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

Yes

Title of event	Date (mm/yy)	Location	Role (speaker, presenting poster, short communications)	Title of the work presented
Discussion of inconsistencies among OIE Reference				There were no formal

Laboratories in results obtained using the real-time RT-PCR for African horse sickness	2022-01-19	On-line	Participant	presentations. The meeting was interactive.
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TOR10: NETWORK WITH WOAHP REFERENCE LABORATORIES

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

Yes

24. Are you a member of a network of WOAHP Reference Laboratories designated for the same pathogen?

Yes

PURPOSE OF THE PROFICIENCY TESTS: 1	ROLE OF YOUR REFERENCE LABORATORY (ORGANISER/ PARTICIPANT)	NO. PARTICIPANTS	PARTICIPATING WOAHP REF. LABS/ ORGANISING WOAHP REF. LAB.
Not a proficiency test. The laboratories shared information on AHS diagnostic tests they had conducted in order to determine if inconsistencies resulted when testing identical samples.	Participant	4	Pirbright Institute (UK), Centro de Vigilancia Sanitaria Veterinaria (VISAVET) Facultad de Veterinaria HCV Planta sótano Universidad Complutense de Madrid (UCM) (Spain), and Laboratorio Central de Sanidad Animal (Spain)

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

Yes

PURPOSE OF THE PROFICIENCY TESTS: 1	ROLE OF YOUR REFERENCE LABORATORY (ORGANISER/ PARTICIPANT)	NO. PARTICIPANTS	PARTICIPATING WOAHP REF. LABS/ ORGANISING WOAHP REF. LAB.
Quality Assurance	Participant	+ 10	EU Reference Laboratory for African Horse Sickness and Bluetongue in Algete, Spain

26. Did your laboratory collaborate with other WOAHP 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 WOAHP REFERENCE LABORATORIES
Inconsistencies among OIE Reference Laboratories in results obtained using the real-time RT-PCR for African horse sickness	To determine if there are AHS virus (AHSV) serotypes that are not picked up by the Aguero et al., 2008 real time RT-PCR method for the diagnosis of AHSV	Pirbright Institute (UK), Centro de Vigilancia Sanitaria Veterinaria (VISAVET) Facultad de Veterinaria HCV Planta sótano Universidad Complutense de Madrid (UCM) (Spain), and Laboratorio Central de Sanidad Animal (Spain)

TOR11: OTHER INTERLABORATORY PROFICIENCY TESTING

27. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than WOAHP 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:

1. Development of an AHS ELISA

A new antigen was prepared by expression of a domain of the AHSV-VP7 expressed in bacteria. The antigen is stable for up to nine months on pre-coated plates with both Stabilcoat and Superblock as stabiliser/blocker. The use of this antigen in an indirect ELISA is being evaluated to potentially replace the baculovirus expressed antigen that is currently used to coat ELISA plates at ARC-OVR. In addition, an inhibition ELISA, incorporating an AHSV mouse monoclonal antibody has been developed and still need further optimisation.

2. Technical report issued

A technical report on findings of preliminary work conducted to investigate inconsistencies in real time RT-PCR results obtained by AHS Reference laboratories was compiled and issued to the EU Reference Laboratory for African Horse Sickness.

Briefly, Drs. Romito and Van Schalkwyk received blood (n =10) from the Western Cape Provincial Veterinary Laboratory (WCPVL) from AHS cases of 2021. The samples were designated PS3224 - 1 to 10, and RT-PCR tests and sequencing were performed on them by the two researchers respectively. The infecting AHS virus (AHSV) could be typed as serotype 9 and sequencing of the partial VP2 gene showed a close similarity to a serotype 9 reference virus (Chad, 1961) that was not related to any recent field viruses. Using the Aguero et al., 2008 primers and probe, our assay didn't detect all, except one sample which gave a very low amplitude positive result. However, positive results were detected using our older hemi-nested RT-PCR. Amplification using VP3-based primers could also not be obtained but amplification of the complete segment-7 was achieved. The amplicons were submitted for sequencing and two single nucleotide polymorphisms (SNP) were detected in the probe and one in the reverse primers. Further comparison of 190 AHSV segment-7 sequences, excluding the aforementioned PS3224, were compared in relation to the primer/probe binding site. Results indicated that the probe might not be binding efficiently to the AHSV sequences examined.

3. Networking

3.1 Dr. Lubisi attended the 11th Regional Steering Committee meeting of the GF-TADs for Africa which was held in Nairobi, Kenya and online, from 21 to 23 June 2022. She presented a talk of African Horse Sickness, and used the opportunity to highlight the activities undertaken and services provided at the WOA Reference Laboratories at ARC-OVR. She requested that samples be sent to her institution for diagnostic purposes, and asked for collaboration on several diseases, including twining on AHS.

3.2 Dr. Lubisi attended the 2nd Consultative meeting: World Organisation for Animal Health (WOAH) SADC Reference Centers which was held online on 26 July 2022. She gave a status update on activities of the WOA Reference Laboratories for AHS, Bluetongue and Rift Valley Fever at ARC-OVR. The opportunity was also utilised to the Reference Laboratories' willingness to enter into various collaborations with laboratories in the region.

3.3 The University of North-West's microbiology department visited the ARC-OVR on 31 August 2022. Presentations were made by researchers across the research programmes and the lecturers were encouraged and invited to enter into collaborative research with ARC-OVR staff members on various controlled animal diseases, including those the institution is WOA Reference Laboratory for.

3.4 The National Biosecurity Hub, an initiative of the Department of Science and Innovation's (DSI) Agricultural Bioeconomy Innovation Partnership Programme, was launched on 11 October 2022 at the University of Pretoria's Future Africa campus. Its aim is to facilitate collaborative efforts to support the prevention, reduction and management of crop and animal disease and other matters related to food safety in South Africa. The ARC is a proud partner of the initiative and Dr.Lubisi formed part of the organisation's public relations exhibition crew, where she highlighted activities of the ARC-OVR campus, including its WOA Reference Laboratories to the national and international delegates who attended.

The event was preceded by the filming of a video on 28 September 2022 in which Dr. Lubisi emphasized the ARC-OVR's role, including its WOAHP Reference laboratories, in animal disease control in South Africa and the region.