

WOAH Reference Laboratory Reports Activities 2024

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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, Onderstepoort, 0110, Gauteng Province, South Africa
*Tel:	+27-12 529 9338
*E-mail address:	lubisia@arc.agric.za
Website:	https://www.arc.agric.za/
*Name (including Title) of Head of Laboratory (Responsible Official):	Dr. Baratang Alison Lubisi - Acting Senior Manager Research: Animal Health and Protection
*Name (including Title and Position) of WOA Reference Expert:	Dr. Baratang Alison Lubisi - Research Team Manager: Diagnostic Services
*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
ELISA	Yes	169	0
Direct diagnostic tests		Nationally	Internationally
Real time RT-PCR	Yes	319	59

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?

Yes

Name of WOA?H 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
MAURITIUS	2024-05-27	PCR	0	23
NAMIBIA	2024-07-02	PCR	0	1
NAMIBIA	2024-07-03	PCR	0	1
MAURITIUS	2024-07-09	PCR	0	6
ZAMBIA	2024-08-23	PCR	0	3
NAMIBIA	2024-09-13	PCR	0	25

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?

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No

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

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:

The laboratory performed diagnostic tests and submitted reports. The results contained therein provides epidemiological information on the disease for the countries submitting the samples.

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:

Our laboratory was part of a PhD study done through the University of Warwick, UK< where we provided Culicoides data from our Culicoides database which she used to build epidemiological models for AHS and BT.

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

DE KLERK, J., TILDESLEY, M., LABUSCHAGNE, K. GORSICH, E. 2024. Modelling bluetongue and African horse sickness vector (*Culicoides* spp.) distribution in the Western Cape in South Africa using random forest machine learning. *Parasites Vectors* 17, 354 (2024). <https://doi.org/10.1186/s13071-024-06446-8> Published: August 21, 2024

There are 3 scientific articles drafted and intended for submission in the first and 2nd quarter of the 2025/2026 financial year.

b) International conferences:

1

Tshabalala, T., Ndouvhada, P.N., Lekala, A., Thwasha, N. & Lubisi, B.A. 2024. Seroprevalence of African Horse Sickness in Different Mammalian Species of South Africa: An Eleven Year Cross sectional Study. 39th World Veterinary Association Congress, Cape Town, South Africa, 16 – 19 April 2024 (Poster)

c) National conferences:

0

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

The ARC-OVR has a WOAHP Twinning project titled "Capacity development towards Lumpy Skin Disease (LSD) detection and control in China". Our scientists visited the National Diagnostic Center for Exotic Animal Disease, China Animal Health and Epidemiology Center (CAHEC), in Qingdao, from 11 – 18 October 2024 as part of fulfilment of the project activities.
In addition to LSD, presentations on sequencing of African Horse Sickness Viruses, and Diagnostic services at ARC-OVR were made.

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOAHP 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	The laboratory subscribes to ISO17025 and is accredited by SANAS	V0001-06-2022 signed.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
ELISA	South African National Accreditation System (SANAS)
Real time RT-PCR	South African National Accreditation System (SANAS)

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

Yes

The laboratory subscribes to ISO 35001 standard.

TOR9: SCIENTIFIC MEETINGS

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

No

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

No

TOR10: NETWORK WITH WOAHP REFERENCE LABORATORIES

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

No

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

No

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

No

The laboratory participates in VETQAS and proficiency tests organised by the EU Reference Laboratory for African horse sickness and Bluetongue.

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?

No

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 during the past 2 years?

Yes

Purpose for inter-laboratory test comparisons ¹	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Name of the test	WOAHP Member Countries
Method harmonisation	Participant	40	ELISA	FRANCE, GERMANY, ITALY, SOUTH AFRICA, SPAIN, UNITED KINGDOM,
Method harmonisation	Participant	15	PCR	FRANCE, GERMANY, ITALY, SOUTH AFRICA, SPAIN,

TOR12: EXPERT CONSULTANTS

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

Yes

Kind of consultancy	Location	Subject (facultative)
Chapter review	On-line	Review of the AHS Chapter in the Terrestrial Manual of Diagnostic Tests and Vaccines

29. Additional comments regarding your report:

I. Test development and method validation

1. Indirect ELISA:

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The laboratory has been using a baculovirus expressed recombinant VP7 protein as antigen for its indirect ELISA. This antigen production method is however cumbersome. A new antigen was prepared by expression of a domain of the AHSV-VP7 in bacteria. The stability of the antigen, stored as stocks and as coated antigen was established before for the inhibition assay. The researchers determined how to scale up the purification of the protein. The next step is to determine the optimal coating concentration to obtain signals of similar strength as the previous antigen.

Inhibition ELISA:

An inhibition ELISA, incorporating an AHS mouse monoclonal was previously developed. A panel of 300 positive sera and 1000 negative sera were tested. Final analysis still to be completed.

II. Research

1. Identification of biological markers for the development of new generation African horse sickness (AHS) vaccines and antiviral treatments.

The project aims to identify biological markers (biomarkers) for African horse sickness virus (AHSV) vaccination, virulent virus immune evasion strategies and immunopathology in naïve horse peripheral blood mononuclear cells (PBMC) and endothelial colony forming cells (ECFCs). The identification of biomarkers in AHSV target cells may greatly improve the design of new generation AHS vaccines and contribute to the development of antiviral treatments via immunotherapy.

2. Sequencing of field AHSV

The project aims to elucidate the epidemiology of AHS in South Africa and determine the extent of reassortment of viral genome segments between field and vaccine- viruses, and implication for disease control.

3. Vector culicoides midges studies are on-going

III. Contribution to information dissemination

Our researchers reviewed the following articles:

1. The potential of plant-produced virus-like particle vaccines for equine orbiviruses - Pathogens journal

2. Investigation of the Frequency of Detection of Common Respiratory Pathogens in Nasal Secretions and Environment of Healthy Sport Horses Attending a Multi-Week Show Event during the Summer Months - Viruses journal