WOAH Reference Laboratory Reports Activities 2022

Activities in 2022

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

**Laboratory Information**

<table>
<thead>
<tr>
<th>Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:</th>
<th>African Horse Sickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address of laboratory:</td>
<td>No. 100 Old Soutpan Road (M35), Onderstepoort</td>
</tr>
<tr>
<td>Tel.:</td>
<td>(+2712) 529 - 9233/9117/9465</td>
</tr>
<tr>
<td>E-mail address:</td>
<td><a href="mailto:Lubisia@arc.agric.za">Lubisia@arc.agric.za</a></td>
</tr>
<tr>
<td>Website:</td>
<td><a href="https://www.arc.agric.za">https://www.arc.agric.za</a></td>
</tr>
<tr>
<td>Name (including Title) of Head of Laboratory (Responsible Official):</td>
<td>Dr. Misheck Mulumba</td>
</tr>
<tr>
<td>Name (including Title and Position) of WOAH Reference Expert:</td>
<td>Dr. Baratang Alison Lubisi</td>
</tr>
<tr>
<td>Which of the following defines your laboratory? Check all that apply:</td>
<td>Governmental</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Diagnostic Test</th>
<th>Indicated in WOAH Manual (Yes/No)</th>
<th>Total number of test performed last year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nationally</td>
<td>Internationally</td>
</tr>
<tr>
<td>Indirect diagnostic tests</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indirect ELISA</td>
<td>Yes</td>
<td>837</td>
</tr>
<tr>
<td>VNT</td>
<td>Yes</td>
<td>117</td>
</tr>
<tr>
<td>Direct diagnostic tests</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real Time RT-PCR</td>
<td>Yes</td>
<td>289</td>
</tr>
</tbody>
</table>
**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 (non-WOAH-approved) and/or other diagnostic reagents to WOAH Members?  
   No

4. Did your laboratory produce vaccines?  
   Not applicable

5. Did your laboratory supply vaccines to WOAH 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 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?  
   No

**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?  
    No

**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

<table>
<thead>
<tr>
<th>Title of the study</th>
<th>Duration</th>
<th>PURPOSE OF THE STUDY</th>
<th>PARTNERS (INSTITUTIONS)</th>
<th>WOAH MEMBER COUNTRIES INVOLVED OTHER THAN YOUR COUNTRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>African Horse Sickness diagnosis differences among reference</td>
<td>6 months</td>
<td></td>
<td>Centro de Vigilancia Sanitaria Veterinaria (VISAVENT) Facultad de VeterinariaHCV Planta sótanoUniversidad Complutense de Madrid</td>
<td>SPAIN UNITED KINGDOM</td>
</tr>
</tbody>
</table>
**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


b) International conferences:

0

c) National conferences:

0

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?

No

**TOR8: QUALITY ASSURANCE**

18. Does your laboratory have a Quality Management System?

Yes

<table>
<thead>
<tr>
<th>Quality management system adopted</th>
<th>Certificate scan (PDF, JPG, PNG format)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO17025</td>
<td>PDF</td>
</tr>
<tr>
<td></td>
<td>V0001-06-2022 signed.pdf</td>
</tr>
</tbody>
</table>

19. Is your quality management system accredited?

Yes

<table>
<thead>
<tr>
<th>Test for which your laboratory is accredited</th>
<th>Accreditation body</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirect antibody ELISA</td>
<td>SANAS</td>
</tr>
<tr>
<td>Real Time RT-PCR</td>
<td>SANAS</td>
</tr>
</tbody>
</table>

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 WOAH?

No

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

Yes

<table>
<thead>
<tr>
<th>Title of event</th>
<th>Date (mm/yy)</th>
<th>Location</th>
<th>Role (speaker, presenting poster, short communications)</th>
<th>Title of the work presented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion of inconsistencies among OIE Reference</td>
<td></td>
<td></td>
<td></td>
<td>There were no formal</td>
</tr>
</tbody>
</table>
### 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. Are you a member of a network of WOAH Reference Laboratories designated for the same pathogen?  
Yes

<table>
<thead>
<tr>
<th>PURPOSE OF THE PROFICIENCY TESTS: 1</th>
<th>ROLE OF YOUR REFERENCE LABORATORY (ORGANISER/PARTICIPANT)</th>
<th>NO. PARTICIPANTS</th>
<th>PARTICIPATING WOAH REF. LABS/ ORGANISING WOAH REF. LAB.</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>Participant</td>
<td>4</td>
<td>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)</td>
</tr>
</tbody>
</table>

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

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

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

<table>
<thead>
<tr>
<th>TITLE OF THE PROJECT OR CONTRACT</th>
<th>SCOPE</th>
<th>NAME(S) OF RELEVANT WOAH REFERENCE LABORATORIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inconsistencies among OIE Reference Laboratories in results obtained using the real-time RT-PCR for African horse sickness</td>
<td>To determine if there are AHSV serotypes that are not picked up by the Aguero et al., 2008 real time RT-PCR method for the diagnosis of AHSV</td>
<td>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)</td>
</tr>
</tbody>
</table>

### 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?
No

**TOR12: EXPERT CONSULTANTS**

28. Did your laboratory place expert consultants at the disposal of WOAH?
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 WOAH 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 WOAH 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 WOAH 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 WOAH 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 WOAH Reference laboratories, in animal disease control in South Africa and the region.