WOAH Reference Laboratory Reports Activities 2022

Activities in 2022

This report has been submitted : 25 avril 2023 14:58

Laboratory Information

<table>
<thead>
<tr>
<th>Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:</th>
<th>Avian influenza</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address of laboratory:</td>
<td>National Veterinary Services Laboratories USDA, APHIS, Veterinary Services 1920 Dayton Ave Ames, IA 50010 UNITED STATES OF AMERICA</td>
</tr>
<tr>
<td>Tel.:</td>
<td>15153377301</td>
</tr>
<tr>
<td>E-mail address:</td>
<td><a href="mailto:mia.kim.torchetti@usda.gov">mia.kim.torchetti@usda.gov</a></td>
</tr>
<tr>
<td>Website:</td>
<td><a href="http://www.aphis.usda.gov/nvsl">www.aphis.usda.gov/nvsl</a></td>
</tr>
<tr>
<td>Name (including Title) of Head of Laboratory (Responsible Official):</td>
<td>Dr. Suelee Robbe-Austerman, Director, National Veterinary Services Laboratories</td>
</tr>
<tr>
<td>Name (including Title and Position) of WOAH Reference Expert:</td>
<td>Mia Kim Torchetti, Director, Diagnostic Virology Laboratory, NVSL</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>Indirect diagnostic tests</td>
<td></td>
<td>Nationally</td>
</tr>
<tr>
<td>Agar gel immunodiffusion (AGID)</td>
<td>YES</td>
<td>236</td>
</tr>
</tbody>
</table>
### Hemagglutination-inhibition (HI) antibody subtype identification (H1-16)

<table>
<thead>
<tr>
<th>Method</th>
<th>YES</th>
<th>Nationally</th>
<th>Internationally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemagglutination-inhibition (HI)</td>
<td>YES</td>
<td>3359</td>
<td>174</td>
</tr>
</tbody>
</table>

### Direct diagnostic tests

<table>
<thead>
<tr>
<th>Method</th>
<th>YES</th>
<th>Nationally</th>
<th>Internationally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real-time RT-PCR (IAV, subtyping)</td>
<td>YES</td>
<td>18255</td>
<td>117</td>
</tr>
<tr>
<td>Virus Isolation (positive/total samples)</td>
<td>YES</td>
<td>306/4238</td>
<td>6/1418</td>
</tr>
<tr>
<td>Molecular pathotype (Sanger)</td>
<td>YES</td>
<td>1120</td>
<td>0</td>
</tr>
<tr>
<td>In vivo pathotype (IVPI)</td>
<td>YES</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>Whole genome sequencing</td>
<td>YES</td>
<td>9588</td>
<td>6</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 (nonWOAH-approved) and/or other diagnostic reagents to WOAH Members?

Yes

<table>
<thead>
<tr>
<th>TYPE OF REAGENT AVAILABLE</th>
<th>RELATED DIAGNOSTIC TEST</th>
<th>PRODUCED/PROVIDE</th>
<th>AMOUNT SUPPLIED NATIONALLY (ML, MG)</th>
<th>AMOUNT SUPPLIED INTERNATIONALLY (ML, MG)</th>
<th>NO. OF RECIPIENT WOAH MEMBER COUNTRIES</th>
<th>COUNTRY OF RECIPIENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference antigen/antisera</td>
<td>HI H1-H16</td>
<td>BOTH</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AGID reagents</td>
<td>AGID</td>
<td>BOTH</td>
<td>57607</td>
<td>2421</td>
<td>7</td>
<td>America</td>
</tr>
<tr>
<td>Positive amplification controls</td>
<td>rRT-PCR (matrix, H5,H7)</td>
<td>BOTH</td>
<td>9 (180 aliquots)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Extraction controls</td>
<td>rRT-PCR</td>
<td>BOTH</td>
<td>294</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Proficiency test panels (avian and swine)</td>
<td>rRT-PCR</td>
<td>BOTH</td>
<td>2740</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Proficiency test panels (12 samples 1 ml each)</td>
<td>AGID</td>
<td>BOTH</td>
<td>732</td>
<td>36</td>
<td>3</td>
<td>America Asia and Pacific</td>
</tr>
</tbody>
</table>

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?

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

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?
    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:

    "NVSL works with another unit within USDA for distribution of analyzed data.

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:

    "NVSL works with another unit within USDA for distribution of analyzed data.

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

Outbreak of Highly Pathogenic Avian Influenza HSN1 in New England Seals
https://www.biorxiv.org/content/10.1101/2022.07.29.501155.abstract

Intercontinental movement of H5 2.3. 4.4 Highly Pathogenic Avian Influenza A (H5N1) to the United States, 2021
https://www.biorxiv.org/content/10.1101/2022.02.11.479922.abstract

Intercontinental movement of highly pathogenic avian influenza A (H5N1) clade 2.3. 4.4 virus to the United States, 2021

Pandemic lineage 2009 H1N1 influenza A virus infection in farmed mink in Utah
https://journals.sagepub.com/doi/pdf/10.1177/10406387211052966

Evaluation of PCR-based hemagglutinin subtyping as a tool to aid in surveillance of avian influenza viruses in migratory wild birds

Evolution of the North American Lineage H7 Avian Influenza Viruses in Association with H7 Virus's Introduction to Poultry


Rapid evolution of A (HSN1) influenza viruses after intercontinental spread to North America

b) International conferences:

4

c) National conferences:

1

February 2022: VIRTUAL Live Bird Market Working Group Meeting
October 2022: United States Animal Health Association and American Association of Veterinary Laboratory Diagnosticians Annual Meeting
June 2022: National Poultry Improvement Program Biennial General Conference Committee Meeting
Aug 2022: NPIP Diagnostic Workshop in Georgia
Animal Influenza Viruses Gap Analysis Workshop
Aug 2022: AVMA American Association of Avian Pathologist Conference
AAVLD June 2022: High pathogenic avian influenza virus infection of raptors in the upper Midwest
Nov 2022: American College of Veterinary Pathologists

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

3

"Under the Microscope
Protecting Chickens from Highly Pathogenic Avian Influenza"
ACVM: HPAI Update: https://www.acvm.us/
HPAI sequencing and genetics at the monthly NASAHO call
Avian Influenza panel at Iowa Egg Producers meeting
Advanced Virus Detection Technologies Interest Group (AVDTIG) Subgroup AB meeting related to sample preparation for whole genome sequencing and detection of adventitious agents
Participated with international regionalization evaluations for avian influenza and Newcastle disease in two countries
**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>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>American Association for Laboratory Accreditation (A2LA)</td>
<td>pdf</td>
<td>2526-01 - Biological Field of Testing A2LA certificate - Ames valid through 2023 (1).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>AGID, HI/NI, Real time RT-PCR, Virus Isolation, In vivo pathogenicity (IVPI)</td>
<td>ISO 17025 Biological Testing</td>
</tr>
</tbody>
</table>

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

Biosafety, Security and Incident Response Plan and Biological Risk Assessments: NVSL-MAN-0018 and NVSL-WI-1207

**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?
No

**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>
</table>

25. Did you organise or participate in inter-laboratory proficiency tests with WOAH Reference Laboratories designated for the same pathogen?
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>Studies in Poultry Transmission, Airborne Spread and Mitigation Tools for Avian Influenza and Newcastle Disease in the USA</td>
<td>Interagency agreement</td>
<td>USDA ARS National Poultry Center Southeast Poultry Research Laboratory</td>
</tr>
<tr>
<td>Genetic characteristics of zoonotic influenza viruses</td>
<td>Data contributions to OFFLU for the twice yearly WHO Vaccine Composition Consultations</td>
<td>WOAH Reference Laboratories for Animal Influenza</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?

Yes

<table>
<thead>
<tr>
<th>Purpose for inter-laboratory test comparisons1</th>
<th>Role of your reference laboratory (organizer/participant)</th>
<th>No. participating laboratories</th>
<th>Region(s) of participating WOAH Member Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administered by NVSL and required to conduct official testing in the U.S.; shipped internationally by request</td>
<td>Administered by NVSL and required to conduct official testing in the U.S.</td>
<td>55</td>
<td></td>
</tr>
</tbody>
</table>

**TOR12: EXPERT CONSULTANTS**

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

No

29. Additional comments regarding your report:

Some testing and activities have been impacted by the ongoing H5 2.3.4.4 HPAI outbreak affecting wild birds and poultry with sporadic spillovers into mammals; and the ongoing vigilance for SARS-CoV-2 in animals. The IAV viruses characterized from U.S. poultry during 2022 were predominantly Eurasian lineage goose/Guangdong HSN1 clade 2.3.4.4b.