WOAH Reference Laboratory Reports Activities 2022

Activities in 2022

This report has been submitted : 26 avril 2023 11:53

Laboratory Information

Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:	Bovine spongiform encephalopathy
Address of laboratory:	P.O. Box 640 Township Road 9-1 Lethbridge Alberta T1J 3Z4 CANADA
Tel.:	+1-403 3825505
E-mail address:	waqas.tahir@inspection.gc.ca
Website:	https://www.inspection.gc.ca/eng/1297964599443/1297965645317
Name (including Title) of Head of Laboratory (Responsible Official):	Dr. Kingsley Amoako, Director, Canadian Food Inspection Agency National Centre for Animal Diseases, Lethbridge Laboratory.
Name (including Title and Position) of WOAH Reference Expert:	Dr. Waqas Tahir, Research Scientist and Head, Canadian National BSE Reference Laboratory CFIA-NCAD Lethbridge Laboratory
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 WOAH Manual (Yes/No)	Total number of test performed last year

Indirect diagnostic tests		Nationally	Internationally
0	no	0	0
Direct diagnostic tests		**Nationally**	**Internationally**
Prionics-Check PrioStrip	YES	2040	0
BioRad TeSeE ELISA	YES	2102	0
Prionics Check Western/Hybrid Western Blot	YES	0	0
OIE Immunoblot	YES	0	0
BSE IHC	YES	0	0

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

TYPE OF REAGENT AVAILABLE	RELATED DIAGNOSTIC TEST	PRODUCED/ PROVIDE	AMOUNT SUPPLIED NATIONALLY (ML, MG)	AMOUNT SUPPLIED INTERNATIONALLY (ML, MG)	NO. OF RECIPIENT WOAH MEMBER COUNTRIES	COUNTRY OF RECIPIENTS
FFPE BSE positive bovine brain tissue blocks	Histology/IHC	1 block	0	1 block	1	America
Frozen BSE positive	BioRad TeSeE ELISA	3g Frozen tissue 1 tube homogenate	0	3g Frozen tissue 1 tube homogenate	1	America

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOAH Members?

No

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

Title of the study	Duration	PURPOSE OF THE STUDY	PARTNERS (INSTITUTIONS)	WOAH MEMBER COUNTRIES INVOLVED OTHER THAN YOUR COUNTRY
Peroral intraspecies transmission of atypical BSE	12 Years	Risk assessment & improved understanding of pathogenesis	Friedrich-Loeffler Institute	GERMANY
Intracranial species transmission of 2 unusual BSE cases	5 Years	Risk assessment	Vetsuisse, University of Berne	SWITZERLAND
Identifying genetic factors affecting BSE incubation and presentation in cattle	3 Years	Improved understanding of pathogenesis	Friedrich-Loeffler Institute, Animal & Plant Health Agency UK	GERMANY UNITED KINGDOM

TOR6: EPIZOOLOGICAL DATA

14. Did your Laboratory collect epidemiological data relevant to international disease control?

No

15. Did your laboratory disseminate epidemiological data that had been processed and analysed?

No

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:

Articles Published: 1 Title: Biodegradation of bovine spongiform encephalopathy prions in compost. Authors: Shanwei Xu, Sujeema Abeysekara, Sandor Dudas, Stefanie Czub, Antanas Staskevicius, Gordon Mitchell, Kingsley K Amoako and Tim A McAllister. Journal Details: Scientific Reports. 2022; 12: 22233; DOI: 10.1038/s41598-022-26201-2.
To reduce the transmission risk of bovine spongiform encephalopathy prions (PrPBSE), specified risk materials (SRM) that can harbour PrPBSE are prevented from entering the feed and food chains. As composting is one approach to disposing of SRM, we investigated the inactivation of PrPBSE in lab-scale composters over 28 days and in bin composters over 106-120 days. Lab-scale composting was conducted using 45 kg of feedlot manure with and without chicken feathers. Based on protein misfolding cyclic amplification (PMCA), after 28 days of composting, PrPBSE seeding activity was reduced by 3-4 log10 with feathers and 3 log10 without. Bin composters were constructed using ~ 2200 kg feedlot manure and repeated in 2017 and 2018. PMCA results showed that seeding activity of PrPBSE was reduced by 1-2 log10 in the centre, but only by 1 log10 in the bottom of bin composters. Subsequent assessment by transgenic (Tgbov XV)

mouse bioassay confirmed a similar reduction in PrPBSE infectivity. Enrichment for proteolytic microorganisms through the addition of feathers to compost could enhance PrPBSE degradation. In addition to temperature, other factors including varying concentrations of PrPBSE and the nature of proteolytic microbial populations may be responsible for differential degradation of PrPBSE during composting.

b) International conferences:

International Conferences:1 Title: Successful Oral Transmission of Atypical BSE in Cattle (Poster) Authors: Sandor Dudas, Kristina Santiago-Mateo, Renee Anderson, John Gray, Stefanie Czub, Waqas Tahir Conference Details: Pion 2022, Goettingen, Germany.
The results in this project confirm that infectious prions from H and L type BSE can be taken up by the gut and eventually found in the brains of orally challenged BSE steers indicating the transmission potential of atypical BSE.

c) National conferences:

National Conferences: 1 Title: CFIA NCAD Lethbridge Livestock TSE Research (Oral presentation) Presenting Author: Sandor Dudas
Conference Details: APRI Annual Scientific Meeting (virtual), February 15, 2022
Updates on various ongoing TSE research projects

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

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
ISO 17025	PDF	2022-05-16 ASB_Scope of Accreditation_15366_v5.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Bio Rad TeSeE ELISA	Standard Councils of Canada (SCC)
SAF/OIE Immunoblot	Standard Councils of Canada (SCC)
BSE Immunohistochemistry	Standard Councils of Canada (SCC)
BSE hemotoxylin and eosin (H&E)	Standard Councils of Canada (SCC)
Hybrid Western Blot	Standard Councils of Canada (SCC)
Prionic Check Priostrip	Standard Councils of Canada (SCC)

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

Yes

Our lab is certified under license # L-R2-51780-21-BX-00 from Public Health Agency of Canada (PHAC), to work with the pathogen and the disease concerned.

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?

No

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

Yes

PURPOSE OF THE PROFICIENCY TESTS: 1	ROLE OF YOUR REFERENCE LABORATORY (ORGANISER/ PARTICIPANT)	NO. PARTICIPANTS	PARTICIPATING WOAH REF. LABS/ ORGANISING WOAH REF. LAB.
Verify technicians and lab proficiency: BSE IHC	organizer	2	none other than the Canadian BSE Reference Laboratory
Verify technicians and lab proficiency: BSE Rapid Tests	participant	unknown	Friedrich-Loeffler Institute
Verify technicians and lab proficiency: BSE IHC	participant	unknown	Friedrich-Loeffler Institute

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

TITLE OF THE PROJECT OR CONTRACT	SCOPE	NAME(S) OF RELEVANT WOAH REFERENCE LABORATORIES
Intraspecies transmission of unusual BSE cases	risk assessment and improved understanding of pathogenesis	Vetsuisse, University of Berne, Switzerland

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

Purpose for inter-laboratory test comparisons1	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Region(s) of participating WOAH Member Countries
Validation of laboratory proficiency and diagnostic assays for the detection of BSE	organizer	13	America Asia and Pacific Europe

TOR12: EXPERT CONSULTANTS

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

No

29. Additional comments regarding your report:

Yes

Dr. Waqas Tahir has been hired to supervise the Canadian BSE Reference Laboratory and to be the new reference laboratory lead.