

WOAH Reference Laboratory Reports Activities 2022

Activities in 2022

This report has been submitted : 7 mars 2023 20:44

Laboratory Information

| | |
|--|--|
| Name of disease (or topic) for which you are a designated WOA Reference Laboratory: | Escherichia coli |
| Address of laboratory: | 3200 Sicotte, Saint-Hyacinthe, Québec, J2S 2M2, CANADA |
| Tel.: | 1-450-773-8521 |
| E-mail address: | john.morris.fairbrother@umontreal.ca |
| Website: | www.ecl-lab.ca; www.apzec.ca |
| Name (including Title) of Head of Laboratory (Responsible Official): | John Morris Fairbrother, BVsc, PhD, Professor |
| Name (including Title and Position) of WOA Reference Expert: | John Morris Fairbrother, BVsc, PhD, Professor |
| Which of the following defines your laboratory? Check all that apply: | Academic institution |

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 |
| | | | |
| Direct diagnostic tests | | Nationally | Internationally |
| Conventional PCR for pathogenic E. coli (up to 10 | Yes | 5195 | 1106 |

| | | | |
|--|-----|-----|-----|
| virulence genes) | | | |
| Antimicrobial resistance by minimal inhibition concentration, disk diffusion, PCR or gene sequencing | Yes | 45 | 366 |
| Whole Genome Sequencing | Yes | 195 | 65 |

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?

Yes

| TYPE OF REAGENT AVAILABLE | RELATED DIAGNOSTIC TEST | PRODUCED/ PROVIDE | AMOUNT SUPPLIED NATIONALLY (ML, MG) | AMOUNT SUPPLIED INTERNATIONALLY (ML, MG) | NO. OF RECIPIENT WOA?H MEMBER COUNTRIES | COUNTRY OF RECIPIENTS |
|---------------------------|---|-----------------------|-------------------------------------|--|---|-----------------------|
| E. coli reference strains | Conventional PCR for pathogenic E. coli | produced and provided | 10 ml | 9 ml | 3 | America |

4. Did your laboratory produce vaccines?

No

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

No

TOR3: NEW PROCEDURES

6. Did your laboratory develop new diagnostic methods for the designated pathogen or disease?

Yes

| NAME OF THE NEW TEST OR DIAGNOSTIC METHOD DEVELOPED | DESCRIPTION AND REFERENCES (PUBLICATION, WEBSITE, ETC.) |
|---|--|
| Whole genome sequencing (WGS) of E. coli isolates | We are offering rapid WGS testing of E. coli isolates for O:H serotyping, MLST, cg MLST, and detection of virulence genes and prediction of antimicrobial resistance based on the presence of antimicrobial resistance genes and chromosomal point mutations using Illumina Nextera XT or DNA Prep preparation kits and Illumina iSeq100/Miseq sequencing platforms and in-house in silico analysis. |
| Conventional PCR for pathogenic E. coli | We are developing conventional PCR tests for porcine and avian pathogenic E. coli using virulence markers based on our WGS results from strains isolated from diseased or healthy animals. |

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 WOAHS Standards for the designated pathogen or disease?

No

TOR4: DIAGNOSTIC TESTING FACILITIES

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

Yes

| NAME OF WOAHS 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 |
|---|------------|---|--|--|
| FRANCE | 2022-03-01 | Whole genome sequencing | 25 | 0 |
| UNITED STATES OF AMERICA | 2022-02-01 | Conventional PCR for pathogenic E. coli | 7 | 0 |

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

No

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

12. Did your laboratory participate in international scientific studies in collaboration with WOAHS Members other than the own?

Yes

| Title of the study | Duration | PURPOSE OF THE STUDY | PARTNERS (INSTITUTIONS) | WOAHS MEMBER COUNTRIES INVOLVED OTHER THAN YOUR COUNTRY |
|---|----------|---|--|---|
| Antimicrobial resistance and interrelatedness of extra-intestinal pathogenic Escherichia coli in human, poultry, companion animals and environment: a One Health approach | 1 year | Characterization of E. coli strains isolated from human urine, animal (birds and dogs) fecal samples and environmental samples in Nigeria | Federal University of Agriculture, Abeokuta (FUNAAB) | NIGERIA |

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?

Yes

IF THE ANSWER IS YES, PLEASE PROVIDE DETAILS OF THE DATA COLLECTED:

Quarterly and annual reports on surveillance of pathoviruses and antimicrobial resistance of E. coli in diseased pigs in Québec.

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

Impact of a Regulation Restricting Critical Antimicrobial Usage on Prevalence of Antimicrobial Resistance in Escherichia coli Isolates From Fecal and Manure Pit Samples on Dairy Farms in Québec, Canada.

de Lagarde M, Fairbrother JM, Archambault M, Dufour S, Francoz D, Massé J, Lardé H, Aenishaenslin C, Paradis MÈ, Roy JP.

Front Vet Sci. 2022 Feb 17;9:838498. doi: 10.3389/fvets.2022.838498. eCollection 2022.

PMID: 35252426

b) International conferences:

2

-John M. Fairbrother, What more can genomic characterization tell us about pathogenic Escherichia coli in pigs? IPVS2022, 26th Internal Pig Veterinary Society Congress, Brazil, June 2022.

-John M. Fairbrother, How whole genome sequencing can help to understand the changing face of pathogenic Escherichia coli in pigs?, 2022 Allen D. Leman Swine Conference, USA, September 2022.

c) National conferences:

0

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

5

www.ecl-lab.ca/en (Our window for dissemination of information on our OIE related activities.)

www.apzec.ca (Our online database)

Reports

-Four 2022 quarterly reports on surveillance of pathovirotypes and antimicrobial resistance of Escherichia coli in diseased pigs, MAPAQ (Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec), RAIZO (Réseau d'alerte de d'information zoosanitaire) porcin, Québec, Canada, March, June, September, and December 2022.

-2021 annual report on surveillance of pathovirotypes and antimicrobial resistance of Escherichia coli in diseased pigs, MAPAQ (Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec), RAIZO (Réseau d'alerte de d'information zoosanitaire) porcin, Québec, Canada, March 2022.

Book Chapter

Fairbrother, J.M., C. Gyles. Escherichia coli. In Pathogenesis of Bacterial Infections in Animals, 5th edition. Prescott, J. F., MacInnes, J. I., Van Immerseel, F., Boyce, J. D., Rycroft, A. N, Vázquez-Boland, J. (eds). Wiley-Blackwell, 2023.

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOA H Members?

Yes

a) Technical visit :

b) Seminars :

c) Hands-on training courses:

d) Internships (> 1 month) 1

| Type of technical training provided (a, b, c or d) | Country of origin of the expert(s) provided with training | No. participants from the corresponding country |
|--|---|---|
| D | Nigeria | 1 |

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

| Quality management system adopted | Certificate scan (PDF, JPG, PNG format) | |
|--|---|---------------------|
| American Association of Veterinary Laboratory Diagnosticians (AAVLD) | | 2022.AAVLD_CERT.pdf |

19. Is your quality management system accredited?

Yes

| Test for which your laboratory is accredited | Accreditation body |
|--|--|
| Please, see: https://aavld.memberclicks.net/accreditation-requirements-page | American Association of Veterinary Laboratory Diagnosticians (AAVLD) |

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

Yes

TOR9: SCIENTIFIC MEETINGS

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

No

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

No

TOR10: NETWORK WITH WOA H REFERENCE LABORATORIES

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

Not applicable (only WOA H Reference Laboratory designated for the disease)

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

Not applicable (Only WOA H Reference Laboratory designated for the disease)

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

Not applicable (Only WOA Reference Laboratory designated for the disease)

26. Did your laboratory collaborate with other WOA Reference Laboratories for the same disease on scientific research projects for the diagnosis or control of the pathogen of interest?

Not applicable (Only WOA Reference Laboratory designated for the disease)

TOR11: OTHER INTERLABORATORY PROFICIENCY TESTING

27. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than WOA Reference Laboratories for the same pathogen?

Yes

| Purpose for inter-laboratory test comparisons ¹ | Role of your reference laboratory (organizer/participant) | No. participating laboratories | Region(s) of participating WOA Member Countries |
|--|---|--------------------------------|---|
| 11th External Quality Assessment Scheme for Shiga toxinproducing Escherichia coli (STEC), 2021-2022 Covering the following: • Serotyping (O group and H type) • Virulence gene determination (aaic, aggR, eae, stx1, stx2 and subtyping) • Cluster analysis (WGS derived data) Organized by Statens Serum Institut (SSI). | Participant | 30 | America Europe |

TOR12: EXPERT CONSULTANTS

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

No

29. Additional comments regarding your report:

No