World Organisation for Animal Health

Elodie Rousset - - FRANCE

WOAH Reference Laboratory Reports Activities 2024

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LABORATORY INFORMATION

***Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:**	Q fever
***Address of laboratory:**	Laboratoire de Sophia, UFQa, Les Templiers, 105 Route des Chappes
***Tel:**	+33-4 92.94.37.00
***E-mail address:**	elodie.rousset@anses.fr
Website:	https://www.anses.fr/fr/portails/1807/content/150751; ; https://www.anses.fr/en/content/q-fever-disease-ruminants-humans
***Name (including Title) of Head of Laboratory (Responsible Official):**	Richard THIERY
***Name (including Title and Position) of WOAH Reference Expert:**	Elodie ROUSSET
***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
ELISA (ruminant serum)	Yes	695	82

ELISA (multi-species serum)	No	0	2
Direct diagnostic tests		Nationally	Internationally
Quantitative real time PCR (Ruminants and environment)	Yes	353	1

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
Calibrated ELISA serum	ELISA serology (ruminant serum)	Produced and provided	26.4 ml (66 x 0.4 ml)	3.6 ml (9 x 0.4 ml)	3	PHILIPPINES, POLAND,
Genomic DNA standard for quantification (PCR)	PCR and molecular biology	Produced and provided	0.15 ml (3 x 50 µL)	0 ml	1	FRANCE,
Bacterial suspension (PCR)	PCR and molecular biology	Produced and provided	40 ml (40 x 1 ml)	3 ml (3 x 1 ml)	4	FRANCE, PHILIPPINES,

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?

Yes

Name of the new test or diagnostic method developed	Description and References (Publication, website, etc.)
Digital PCR for manure	MethaRisk project, funded by the French Ministry of Agriculture and the French Livestock Health Association (GDS France)
Digital PCR for agricultural biogas digestates	MethaRisk project, funded by the French Ministry of Agriculture and the French Livestock Health Association (GDS France)

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?

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

Yes

Name of the WOAH Member Country receiving a technical consultancy	Purpose	How the advice was provided
PHILIPPINES	Support for the establishment of diagnostic and surveillance capacities for Q fever, including guidance on sampling strategies, diagnostic methods (ELISA, PCR), and environmental sample management. Recommendations on biosafety measures and risk assessment related to the first confirmed cases of Q fever in imported goats.	Remote technical assistance via emails and written recommendations. Responses to multiple inquiries from the Bureau of Animal Industry (DA-BAI), including diagnostic protocol clarification and interpretation of test results.
PERU	Support for the organization of Q fever ELISA testing requests	Remote technical assistance via emails, providing clarifications on the role of serological testing for Q fever, the limitations of using ELISA for import control, and the importance of interpreting results cautiously. Guidance was also provided on alternative accredited laboratories capable of conducting routine diagnostic analyses.

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:

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Ramilien, E., P. Cayre, X. Fourt, E. Rousset et E. Jourdain. 2024. "Q fever as an anthropological prism for revealing how farmers live with microbes." Agriculture and Human Values. https://doi.org/10.1007/s10460-024-10640-w.
Couesnon, A., E. Rousset, A. Ciervo. 2024. "Q Fever." Chap. 4, pp. 169-176 in The European Union One Health 2023 Zoonoses Report, EFSA & ECDC. EFSA Journal 22(12): e9106. https://doi.org/10.2903/j.efsa.2024.9106.
Rousset, E., A. Couesnon. 2024. "Q Fever." EFSA Story Map, December 10, 2024. https://storymaps.arcgis.com/stories/7f9d9bc1eeee4b838eaaa0d2576ee0c0.

b) International conferences:

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Lurier, T., F. Ayral, C. Sala, K. Gache, M. L. Delignette-Muller, E. Jourdain et E. Rousset. 2024. "Coxiella burnetii within-and between-herd true seroprevalence assessment in domestic ruminants in France accounting for diagnostic uncertainty with latent class." SBED Conference 2024: Insights in Action, 30 January - 2 February 2024, Brussels, Belgium.
Lurier, T., E. Rousset, P. Gasqui, C. Sala, E. Morignat, C. Claustre, D. Abrial, P. Dufour, R. De Crémoux, K. Gache, M. L. Delignette-Muller, F. Ayral et E. Jourdain. 2024. "Evaluation using latent class models of the diagnostic performances of three ELISA tests commercialized for the serological diagnosis of Coxiella burnetii infection in domestic ruminants." SBED Conference 2024: Insights in Action, 30 January - 2 February 2024, Brussels, Belgium.
Rivière, L., E. Rousset, E. Jourdain, M. L. Delignette-Muller et T. Lurier. 2024. "Harmonisation of the diagnostic performances of ELISA tests for C. burnetii antibodies in ruminants: optimal positivity thresholds and performance reassessment." SBED Conference 2024: Insights in Action, 30 January - 2 February 2024, Brussels, Belgium.

c) National conferences:

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Jourdain, E., E. Ramilien, E. Rousset, P. Cayre et X. Fourt. 2024. "Un « jeu sérieux » pour la concertation dans l'élaboration de scénarios de prévention et de gestion des zoonoses : Exploration d'une méthodologie innovante de collaboration sur l'exemple de la fièvre Q avec le projet ZOOJEU." 27èmes Rencontres autour des Recherches sur les Ruminants - 3R, INRAE, December 2024, Paris, France.
Jourdain, E., A. Sudre, A. Boissy, E. Wimmer-Bonneau, E. Zanchi, E. Rousset, A. Michaud, E. Ramilien, P. Cayre et X. Fourt. 2024. "Approche collective de la santé : regard et implications des éleveurs et des autres acteurs de la santé humaine et de la santé animale. L'exemple de la fièvre Q." Neuvièmes Journées Techniques Caprines, 26-28 March 2024, Dienné, France.
Jourdain, E., A. Sudre, A. Boissy, E. Wimmer-Bonneau, E. Zanchi, E. Rousset, A. Michaud, E. Ramilien, P. Cayre et X. Fourt. 2024. "La démarche ZOOJEU - Transition ZOOJEU : faire avec les microbes entre menaces, santé et bien-être." Neuvièmes Journées Techniques Caprines, 26-28 March 2024, Dienné, France.

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

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EFSA Story Map on Q Fever, developed by Elodie Rousset and Aurelie Couesnon with EFSA: https://storymaps.arcgis.com/stories/7f9d9bc1eeee4b838eaaa0d2576ee0c0
ANSES page on Q Fever – Disease in Ruminants and Humans: https://www.anses.fr/en/content/q-fever-disease-ruminants-humans

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	Cofrac__Notification accréditation_2024.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
ELISA, PCRq	COFRAC

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

Yes

BSL3

TOR9: SCIENTIFIC MEETINGS

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

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

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. Do you network (collaborate or share information) with other 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 during the past 2 years?

Yes

Purpose of the proficiency test:	Role of your Reference Laboratory (organiser/ participant)	No. participating Laboratories	Participating WOAH Ref. Labs/ organising WOAH Ref Lab
PCR 2024	Organiser	50	20
ELISA 2023	Organiser	81	18

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?

No

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 during the past 2 years?

No

The WOAH Reference Laboratory at PIWET does not organise inter-laboratory proficiency tests for this pathogen.

A dedicated webpage on the WOAH website listing available inter-laboratory proficiency tests (ILPT) would be useful.

TOR12: EXPERT CONSULTANTS

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

No

29. Additional comments regarding your report:

No

- As a WOAH expert, I am frequently consulted for various scientific and technical support requests. I always ensure that my responses are based on collaboration with my team and other Q fever experts to provide the most accurate and relevant expertise. I strive to promote collective expertise, and I believe this approach could be further strengthened at the WOAH level.

To enhance global expertise, WOAH could designate additional experts, ensuring broader representation of countries and a more transdisciplinary approach. This would improve knowledge sharing and the development of harmonized recommendations.

- Centralizing information on reference materials (MRs) and interlaboratory proficiency tests (ILPTs)
It would be beneficial to centralize information regarding available MRs and ILPTs on a dedicated WOAH webpage, while clearly distinguishing services that comply with WOAH standards from others for transparency. This would improve accessibility and streamline the dissemination of key resources.

- Contributions to EFSA
>Within our team, two experts actively contribute to EFSA:
We work on improving the reporting and quality of animal health data submitted by European countries for the annual European Zoonoses Report.
We participate in data analysis and the drafting of the Q fever chapter, ensuring consistency with other sections.

Since 2021, we (with Aurélie Couesnon) have introduced several key improvements:
Incorporation of herd-level data alongside individual animal-level data.
Distinction between pooled samples (e.g., bulk tank milk) and individual samples.
Clearer differentiation between direct detection methods and serological results.
However, major gaps remain, limiting the reliability of epidemiological analyses:

No standardized protocol definitions exist for Q fever surveillance.
Surveillance systems are not harmonized across countries, leading to highly heterogeneous data.
Variability in country representativeness affects data comparability and trend analysis.

> Open-access contributions

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Our EFSA work has also contributed to open-access resources:
EFSA Story Map on Q Fever, developed by Élodie Rousset & Aurélie Couesnon in collaboration with EFSA: EFSA Story Map on Q Fever.