

# WOAH Reference Laboratory Reports Activities

## 2022

### Activities in 2022

This report has been submitted : 8 mars 2023 09:38

#### Laboratory Information

<b>Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:</b>	Coxiella burnetii infection (Q fever)
<b>Address of laboratory:</b>	Laboratoire de Sophia, UFQa, Les Templiers, 105 Route des Chappes
<b>Tel.:</b>	+33620460053
<b>E-mail address:</b>	elodie.rousset@anses.fr
<b>Website:</b>	<a href="https://www.anses.fr/fr/portails/1807/content/150751">https://www.anses.fr/fr/portails/1807/content/150751</a>
<b>Name (including Title) of Head of Laboratory (Responsible Official):</b>	Richard THIERY
<b>Name (including Title and Position) of WOAH Reference Expert:</b>	Elodie ROUSSET
<b>Which of the following defines your laboratory? Check all that apply:</b>	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	
		Nationally	Internationally
Indirect diagnostic tests			
ELISA (ruminant serum)	YES	647	7
ELISA (mult-species serum)	NO	110	0
Direct diagnostic tests		Nationally	Internationally

Quantitative real time PCR	YES	449	0
Strain isolation (cultural cell)	NO	1	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
Calibration serum standard (0.4 mL unit)	ELISA (serology)	Produced	23.2	4	2	Europe
Quantified genomic DNA standard (0.05 mL unit)	qPCR, Genotyping	Produced	1.25	0	0	Europe
Quantified inactivated purified bacteria (1 mL unit)	qPCR, dPCR	Produced	18	0	0	Europe

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?

Yes

NAME OF WOAH 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
PERU	2020-10-10	ELISA serology		7 samples of bovine serum

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
PERU	Limits of the individual diagnostic requested for 7 cattle are in a quarantine location	Several mails for explanations, with attached documents and web links.
UNITED KINGDOM	Request for positive Q fever semen for performing a PCR method validation on this biological matrix	mail with attached document (2022/06/23)
UNITED KINGDOM	Request on semen matrix knowledge : whether <i>C. burnetii</i> is able to internalise the sperm cell or bacteria are more likely to be found free floating in the seminal fluid	mail with bibliography (2022/07/22)
HUNGARY	Source(s) from where we can purchase <i>Coxiella CFT</i> reagents	mails, bibliography and web links (2022/06/10)
SPAIN	Guidance for MLVA and MST methods for molecular characterization of <i>Coxiella burnetii</i>	mail, web links, other contacts (2022/06/03)
THE NETHERLANDS - ARUBA	Request on solutions (Antigen, Ring Trial) as the CFT is still required for export to some countries outside Europe (stop with the CFT, participate to ELISA ring trial, apply for ISO 17025 accreditation)	mails mail by adding WOAH experts (Poland) and bibliography (2022/10/10)(2022/07/19)
SPAIN	Support for setting up a Q fever surveillance network in Catalonia. Some specific questions about diagnostic techniques.	mails, pdf, links, bibliography (4/03/2022)
SWITZERLAND	Guidance for implementation cut-offs for PCR (publications which describe/evaluate the cut-offs (cattle, sheep, goat)). Procedure on how to validate commercial tests kits for <i>Coxiella</i>	mail, power point presentation, bibliography (2022/10/04)
	Request for some positive	

URUGUAY	material (maybe DNA from a reference C. burnetii strain) to run MLVA from clinical samples for genotyping. Recommandations.	mail by adding WOAH experts (Poland, Australia) (2022/10/25)
FRANCE	Question on surface disinfectants in the autopsy room	mail (2022/01/03)
FRANCE	Advice on choosing ELISA kits for serology	mail, biblio (2022/02/07)
FRANCE	Question about the persistence of antibodies (interpretation of results in a farm)	mail (2022/04/07)
FRANCE	Explanations on the interpretation threshold for Q fever analyzes in molecular biology in the context of abortion	mail, links, power point (2022/05/09)
FRANCE	Need for a panel of samples of known status in the absence of an organized PT (kit validated for this matrix but questionable diagnostic interpretation) as part of an accreditation for a PCR method on feces	mails (2022/09/01)
FRANCE	Support on a PCR tracer stability problem	mail (2022.09/07)
FRANCE	Support on a PCR tracer quantification bias problem	mail (2022/11/22)
FRANCE	Question on the age from which it is possible to screen for Q fever in serology	mail (2022/11/28)
FRANCE	Information on sample storage conditions (transport and laboratory)	mail (2022/11/28)

## 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
			Istituto Zooprofilattico Sperimentale dell' Abruzzo e del Molise "G. Caporale" - IZSAM Istituto Superiore di Sanità – ISS	

EUOHZ (EU One Health Zoonoses report)	4 years	Improvements of the EUOHZ : data monitoring, validation, analyses, and preparation of the annual report - Reference OC/EFSA/BIOCONTAM/2020/03	Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna "Bruno Umbertini" – IZSLER Istituto Zooprofilattico Sperimentale delle Venezie – IZSVE Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail - ANSES	ITALY
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## 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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*European Food Safety Authority, and European Centre for Disease Prevention Control (dont E. Rousset et A. Couesnon). 2022. "The European Union One Health 2021 Zoonoses Report." EFSA Journal 20 (12). <https://doi.org/10.2903/j.efsa.2022.7666>.*

*Mioni, M. de Souza Ribeiro, L. Cleber Henker, W. Sirley Reis Teixeira, M. P. Lorenzett, M. Bahia Labruna, S. Petinatti Pavarini, D. Driemeier, E. Rousset, K. Sidi-Boumedine, R. Thiéry et J. Megid. 2022. "Molecular detection of Coxiella burnetii in aborted bovine fetuses in Brazil." Acta Tropica 227: 106258. <https://doi.org/10.1016/j.actatropica.2021.106258>. URL: <https://www.sciencedirect.com/science/article/pii/S0001706X21004368?Rf.HAL:anses-03625929>*

*Rita, A. A., M. Million, J Delerce, H. Anani, A. Diop, A. Caputo, R. Zgheib, E. Rousset, K. Sidi-Boumedine, D. Raoult et P. E. Fournier. 2022. "Pangenomic analysis of C. burnetii unveils new traits in genome architecture." Frontiers in Microbiology. <https://doi.org/10.3389/fmicb.2022.1022356>.*

*Lurier, T, E. Jourdain, F. Ayral, A. Couesnon et E. Rousset. 2022. "Performances des méthodes diagnostiques de la fièvre Q chez les ruminants domestiques : état de l'art et intérêt de l'activité de référence du LNR. Journées Nationales des Groupements Techniques Vétérinaires." Bulletin des GTV: 615-632. Réf. HAL: hal-03771047v3*

b) International conferences:

11

*Jourdain, E., X. Lafarge, P. E. Fournier, M. Perroquin, D. Abrial, S. Barry, I. Lebert, R. Ceniceros, R. Pouget, M. Robert, J. Vialard, M. Massot, M. Treilles, B. Amphoux, L. Luciani et E. Rousset. 2022. "Seroprevalence of Q fever among blood donors and screening for Coxiella burnetii DNA in environmental dust in a French conurbation recently confronted to clustered human cases." Joint ESCCAR International Congress*

on *Rickettsiae* and Ninth Meeting of the European Society for Chlamydia Research (ESCR). Lausanne, Suisse, 23-26 août. URL: <https://www.meeting-com.ch/congres-evenements/details-evenement/events/international-intracellular-bacteria-meeting-2022/> Réf. HAL: 03757385.

Jourdain, E., F. Schelcher, M. N. Lucas, M. Poivre, J. Lafon, S. Barry, R. Thiéry, A. Couesnon et E. Rousset. 2022. "Post-mortem detection of *Coxiella burnetii* in eight ewes from a flock recently confronted with Q fever clustered human cases sampled 89 to 229 days post-lambing." Joint ESCCAR International Congress on *Rickettsiae* and Ninth Meeting of the European Society for Chlamydia Research (ESCR). Lausanne, Suisse, 23-26 août. URL: <https://www.meeting-com.ch/congres-evenements/details-evenement/events/international-intracellular-bacteria-meeting-2022/> Réf. HAL: 03758047.

Keliet, A., X. Bailly, A. Joulié, A. Fourcot, S. Barry, S. Masseglia, P. Gasqui, A. Leblond, R. Thiéry, K. Sidi Boumedine, E. Rousset et E. Jourdain. 2022. "qPCR- and genomic-based determination of the number of IS1111 elements suggests an impact of *C. burnetii* genotypic diversity on the diagnosis of Q fever in ruminants." Joint ESCCAR International Congress on *Rickettsiae* and Ninth Meeting of the European Society for Chlamydia Research (ESCR). Lausanne, Suisse, 23-26 août. URL: <https://www.meeting-com.ch/congres-evenements/details-evenement/events/international-intracellular-bacteria-meeting-2022/> Réf. HAL: 03758053.

Keliet, A., A., K. Sidi-Boumedine, E. Jourdain, R. Thiéry, E. Rousset et X. Bailly. 2022. "Characterization of the gene content of *Coxiella burnetii* from different line ages in Europe. Caractérisation du contenu en gènes de l'espèce bactérienne *Coxiella burnetii* issue de différentes lignées en Europe." Journées d'Animation Scientifique du Département Santé Animale. Anglet, France, 18 octobre 2022. URL: <https://jas2022.journees.inrae.fr/>. Réf. HAL: 03845604.

Lurier, T., M. L. Delignette-Muller, F. Ayral, Jourdain, E. et E. Rousset. 2022. "Interpretation of the results of Q fever ELISA tests in domestic ruminants: a user-friendly Shiny application based on latent class models in a Bayesian framework." Joint ESCCAR International congress on *Rickettsiae* and Ninth Meeting of the European Society for Chlamydia Research (ESCR). Lausanne, Suisse, 23-26 août. URL: <https://www.wbc-madrid2022.com/>. Réf. HAL: 03838512.

Lurier, T., E. Rousset, P. Gasqui, C. Sala, C. Claustre, D. Abrial, P. Dufour, R. de Crémoux, K. Gache, M. L. Delignette-Muller, F. Ayral et E. Jourdain. 2022. "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." 31st World Buiatrics Congress (WBC). Madrid, 4-8 septembre. URL: <https://www.wbc-madrid2022.com/>. Réf. HAL: hal-03838465.

Lurier, T., M. L. Delignette-Muller, F. Ayral, E. Jourdain et E. Rousset. 2022. "Interpretation of the results of Q fever ELISA tests in domestic ruminants: a userfriendly Shiny application based on latent class models in a Bayesian framework." 31st World Buiatrics Congress (WBC). Madrid, 4-8 septembre.

Lurier, T., E. Rousset, P. Gasqui, C. Sala, C. Claustre, D. Abrial, P. Dufour, R. de Crémoux, K. Gache, M. L. Delignette-Muller, F. Ayral et E. Jourdain. 2022. "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." Joint ESCCAR International Congress on *Rickettsiae* and Ninth Meeting of the European Society for Chlamydia Research (ESCR). Lausanne, Suisse, 23-26 août. pp#231, URL: <https://www.meeting-com.ch/congres-evenements/details-evenement/events/international-intracellular-bacteria-meeting-2022/> Réf. Hal: hal-03757978.

Lurier, T., E. Rousset, C. Sala, K. Gache, M. L. Delignette-Muller, E. Jourdain et F. Ayral. 2022. "Coxiella burnetii within and between-herd true seroprevalence assessment in domestic ruminants in France accounting for diagnostic uncertainty with latent class models." Joint ESCCAR International congress on *Rickettsiae* and Ninth Meeting of the European Society for Chlamydia Research (ESCR)." Lausanne, Suisse, 23-26 août. pp#232, URL: <https://www.meeting-com.ch/congres-evenements/details-evenement/events/international-intracellular-bacteria-meeting-2022/> Réf. HAL: hal-03757842.

Rousset, E., A. Raptopoulos, M. Poivre, J. Lafon, R. Thiéry, A. Couesnon, E. Jourdain et K. Gache. 2022. "Epidemiological investigation on a dairy sheep farm in a professional agricultural high school following an alert of Q fever clustered human cases." Joint ESCCAR International Congress on *Rickettsiae* and Ninth Meeting of the European Society for Chlamydia Reserch (ESCR). Lausanne, Suisse., 23-26 août. pp# 171, URL : <https://www.meeting-com.ch/congres-evenements/details-evenement/events/international-intracellular-bacteria-meeting-2022/> Réf. HAL: hal-03758001.

Saout, M., T. Lurier, L. Epelboin, X. Baudrimont, L. Laghoe, D. Blanchet, E. Rousset et M. Demar. 2022. "First serological evidence of Q fever circulation in ruminant herds in French Guiana." Joint ESCCAR International Congress on Rickettsiae and Ninth Meeting of the European Society for Chlamydia Research (ESCR). Lausanne, Suisse, 23-26 août. Réf. HAL: anses-03768003.

c) National conferences:

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Keliet, A., K. Sidi Boumedine, E. Jourdain, R. Thiéry, E. Rousset et X. Bailly. 2022. "Caractérisation du contenu en gènes de la bactérie *Coxiella burnetii* issus de différentes lignées en Europe. Les Journées Ouvertes en Biologie, Informatique et Mathématiques (JOBIM). Université de Rennes 1." Rennes, France, 5-8 juillet. URL: <https://jobim2022.sciencesconf.org/>. Réf. HAL: hal-03767741.

Lurier, T., M. L. Delignette-Muller, F. Ayral, Jourdain, E. et E. Rousset. Diagnostic sérologique de la fièvre Q chez les petits ruminants : faut-il et comment prendre en compte l'imperfection des tests ? Webinaire, coanimé par l'UMT PSR « Pilotage de la Santé des Ruminants » et l'OMACAP « Observatoire des Maladies Caprines ». 12 janvier 2022.

Massot, M., E. Jourdain, M. Treilles, E. Rousset et S. Barry. 2022. "Retour d'expérience sur la Droplet Digital PCR, Plateforme Génome Transcriptome de Bordeaux. Séminaire UMR Eco&Sol sur les méthodes moléculaires de quantification de gènes." Bordeaux, France, 6 avril, 2022. <https://www.umr-ecosols.fr/> <https://pgtb.cgfb.u-bordeaux.fr/fr>

Ramillien, E., P. Cayre, X. Fourt, E. Rousset et E. Jourdain. 2022. "Les réalités du monde microbien chez les éleveurs de petits ruminants : enquêtes anthropologiques partant de l'exemple de la fièvre Q. Epidémiologie et santé animale. Journées scientifiques de l'AEEMA, Association pour l'Etude de l'Epidémiologie des Maladies Animales." Maisons-Alfort, France, 12-13 mai, 2022. Réf. HAL: hal-03667161.

Saout, M., Lurier, T., L. Epelboin, X. Baudrimont, D. Blanchet, M. Demar et E. Rousset. 2022. "Evidence sérologique de la circulation de la fièvre Q dans les élevages de ruminants en Guyane de 2015 à 2017." 5ème journée des travaux scientifiques des jeunes soignant-e-s de Guyane. Cayenne, France, 19-20 mai, 2022.

Jourdain, E., M. Tabouret, M. Treilles, P. Cayre, R. Lamothe, K. Sommier, R. Ceniceros, R. Pouget, X. Lafarge, P.-E. Fournier, E. Ramillien, X. Fourt, S. Barry, D. Abrial, I. Lebert, X. Bailly et E. Rousset. EXPAIRCOX, un projet visant à l'Amélioration des connaissances sur l'EXPosition Aérienne des professionnels agRicoles et de la population générale à *COxiella burnetii*. Webinaire, coanimé par l'UMT PSR « Pilotage de la Santé des Ruminants » et l'OMACAP « Observatoire des Maladies Caprines ». 12 janvier 2022

Lurier, T., E. Jourdain, F. Ayral, A. Couesnon et E. Rousset. 2022. "Performances des méthodes diagnostiques de la fièvre Q chez les ruminants domestiques : Etat de l'art et intérêt de l'activité de référence du LNR. Journées nationales des GTV." Nantes, France, 18-20 mai 2022. Réf. HAL: 03927430.

Rousset, E. 2022. "PCR Fièvre Q : seuil 10e4, les fondements de la démarche et perspectives d'évolution". Groupe de suivi OSCAR. Paris, France, 1er juillet 2022.

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

1

European Food Safety Authority, and European Centre for Disease Prevention and Control (Q fever Chapter (EFSA part) : E. Rousset et A. Couesnon). 2022. "The European Union One Health 2021 Zoonoses Report." EFSA Journal 20 (12). <https://doi.org/10.2903/j.efsa.2022.7666>.

<https://www.efsa.europa.eu/en/efsajournal/pub/7666>

## 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		2.Attestation 1-2249 révision 12.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
ELISA on serum : IDEXX Q Feber Ab Test (IDEXX)	COFRAC
ELISA on serum : ID Screen® Q fever indirect (Innovative Diagnostics)	COFRAC
ELISA on serum : PrioCHECK™ Ruminant Q Fever Ab Plate Kit (ThermoFischerscientific)	COFRAC
qPCR on vaginal swab (house method)	COFRAC

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

Yes

For work in BSL3 facility. See Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, Chapter 1.1.4 "Biosafety and biosecurity: Standard for managing biological risk in the veterinary laboratory and animal facilities"

## 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?

No

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?

Yes

Purpose for inter-laboratory test comparisons <sup>1</sup>	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Region(s) of participating WOAH Member Countries
Qualitative PCR proficiency	PARTICIPANT	6	Europe
Quantitative PCR proficiency (bilateral test)	ORGANIZER	1	Europe

## **TOR12: EXPERT CONSULTANTS**

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

Yes

KIND OF CONSULTANCY	Location	SUBJECT (FACULTATIVE)
specific technical queries from WOAH		

29. Additional comments regarding your report:

No