

# WOAH Reference Laboratory Reports Activities 2024

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## LABORATORY INFORMATION

<b>*Name of disease (or topic) for which you are a designated WOA Reference Laboratory:</b>	Paratuberculosis
<b>*Address of laboratory:</b>	Via Strada della Faggiola, 1
<b>*Tel:</b>	+390523523491
<b>*E-mail address:</b>	matteo.ricchi@izsler.it
<b>Website:</b>	www.izsler.it
<b>*Name (including Title) of Head of Laboratory (Responsible Official):</b>	Dr. Varisco Giorgio, General Director
<b>*Name (including Title and Position) of WOA Reference Expert:</b>	Dr. Ricchi Matteo, Professional Executive
<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 WOA Manual (Yes/No)	Total number of test performed last year	
Indirect diagnostic tests		Nationally	Internationally
ELISA test	Yes	204066	5087
Direct diagnostic tests		Nationally	Internationally
PCR targeting IS900	Yes	4187	0
Cultural assay (double incubation method)	Yes	19	0

## 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?

No

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.)
Digital PCR for the direct quantification of MAP in faeces	Russo S, Cortimiglia C, Filippi A , Palladini G, Garbarino C, Massella E, Ricchi M. Validation of digital PCR assay for the quantification of Mycobacterium avium subsp. paratuberculosis in bovine faeces according to the ISO 20395:2019. J Microbiol Methods. 2023 Oct;213:106825. doi: 10.1016/j.mimet.2023.106825. Epub 2023 Sep 20. PMID: 37739126.

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

No

## TOR4: DIAGNOSTIC TESTING FACILITIES

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

Yes

Name of WOA?H 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
CROATIA	2024-01-01	ELISA	5087	0

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

13. In exercising your activities, have you identified any regulatory research needs\* relevant for WOAH?

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:

Data about the diffusion of the disease on red deer and whole genome sequencing surveillance about the source of infection of this red deer population

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:

Please refer to the points dedicated to the published scientific papers or participation to meetings

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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1: Turco S, Russo S, Pietrucci D, Filippi A, Milanesi M, Luzzago C, Garbarino C, Palladini G, Chillemi G, Ricchi M. High clonality of *Mycobacterium avium* subsp. *paratuberculosis* field isolates from red deer revealed by two different methodological approaches of comparative genomic analysis. *Front Vet i.* 2024 Feb 6;11:1301667. PMID: 38332752; PMCID: PMC10876796.

2: Filippi A, Garbarino C, Nava M, Russo S, Soares Filipe JF, Bianchi A, Corlatti L, Gugiatti A, Buccheri Pederzoli C, Pigoli C, Pedrotti L, Arrigoni N, Ricchi M, Bertolotti I, Luzzago C. Active surveillance of paratuberculosis in Alpine-dwelling red deer (*Cervus elaphus*). *Front Vet Sci.* 2024 Jan 25;11:1303096. doi: 10.3389/fvets.2024.1303096. PMID: 38332752; PMCID: PMC10850319.

b) International conferences:

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1. Ricchi M. "Omics and Diagnostic". 16th International Colloquium on of Paratuberculosis (ICP.2024), Virndavan, Uttar Pradesh, India, 21-

25 October 2024, (invited lecture).

2. Lamontanara A., Orru L., Garbarino C., Filippi A., Russo S. and Ricchi M. "Signature of selection in *Mycobacterium avium* subsp. *paratuberculosis* reveal candidate genes for host preferences". 16th International Colloquium on of Paratuberculosis (ICP.2024), Virndavan, Uttar Pradesh, India, 21-25 October 2024, (oral communication).

3. Garbarino C., Nava M., Filipe J., Bianchi A., Corlatti L., Gugiatti A., Pedrotti L., Ricchi M., Bertolotti I., Luzzago C., Filippi A. "Surveillance of paratuberculosis in Alpine-dwelling red deer (*Cervus elaphus*) in the Stelvio National Park (Northern Italy)". 16th International Colloquium on of Paratuberculosis (ICP.2024), Virndavan, Uttar Pradesh, India, 21-25 October 2024, (poster).

4. Garbarino C., Filippi A., Ventura G., Boldini M., Ostanello F., Giuliani A., Russo S., Ricchi M. "Digital PCR (dPCR) to quantify the load of *Mycobacterium avium* subsp. *paratuberculosis* (MAP) present in feces as a "tool" to define priorities of interventions in an infected cattle herd. 16th International Colloquium on of Paratuberculosis (ICP.2024), Virndavan, Uttar Pradesh, India, 21-25 October 2024, (poster).

5. Torricelli M., Sebastiani C., Fratto A., Madeo L., Petrucci L., Ciullo M., Biagetti M., Ricchi M., Garbarino C., Mazzone P. "miRNA in stool as Paratuberculosis prognostic biomarkers in beef cattle: extraction methods comparison". 16th International Colloquium on of Paratuberculosis (ICP.2024), Virndavan, Uttar Pradesh, India, 21-25 October 2024, (poster).

6. Filippi A., Barsi F., Prosperi A., Russo S., Ricchi M., Garbarino C. "Minisatellites analysis of MAP field isolates from goats in Northern Italy". Annual Acta of ECSRH Conference, Turin, Italy, 4-5 July 2024, (poster)

7. Filippi A., Garbarino C., Ventura G., Gradassi M., Frontoni R., Tuccia E., Giuliani A., Russo S., Luppi A., Ricchi M. "Digital PCR (dPCR) to quantify the load of *Mycobacterium avium* subsp. *paratuberculosis* (MAP) present in feces as a "tool" to define priorities of interventions in an infected cattle herd.". 7th Congress of the European Association of Veterinary Laboratory Diagnosticians (EAVLD), Padova, 21-23 ottobre 2024.

c) National conferences:

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 WOA 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)	
17025	Certificate	508908.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body

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ELISA in blood and milk	Accredia
qPCR targeting IS900 sequence in faeces, milk and tissue	Accredia
Cultural assay (double incubation method) in faeces and milk	Accredia
Molecular assay for the identification of Mycobacterium avium subsp. paratuberculosis by field isolates amplifying the F57 sequence	Accredia

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

Yes

The laboratory works according to the Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, Chapter 1.1.4 and WHO Laboratory biosafety manual.

## TOR9: SCIENTIFIC MEETINGS

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

No

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

No

## TOR10: NETWORK WITH WOA REFERENCE LABORATORIES

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

Yes

24. Do you network (collaborate or share information) with other WOA Reference Laboratories designated for the same pathogen?

Yes

NETWORK/DISEASE	ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC)	NO. PARTICIPANTS	PARTICIPATING WOA REF. LABS
Paratuberculosis	Material transfer agreement with the other two WOA reference laboratories for paratuberculosis. A panel of sera (bovine, ovine and caprine), part of a ring test already sent only to the Italian laboratories, was sent to the	3	1. Material Transfer Agreement (Start 19.06.2023; End 18.06.2028) with National Service of Animal Health and Agrifood Quality, Buenos Aires, Argentina. Principal Investigator: Dr. Bernardo Alonso, WOA Expert at the WOA Reference Laboratory for Paratuberculosis. The main scope of this MTA is the exchange of materials (sera, faeces or field isolates) for the improvement and validation of diagnostic methods for the detection of paratuberculosis. 2. Material Transfer Agreement (Start 12.06.2023; End 11.06.2028) with Agencie Nationale de

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	other two WOA reference laboratories for harmonisation and optimisation of ELISA tests for diagnostic purposes.	Securité Sanitaire de l'Alimentation, de l'Environnement et du Travail - Laboratoire de Ploufragan-Plouzanet-Niorte, France. Principal investigator: Dr Virginie Poisson, WOA Expert at the WOA Reference Laboratory for Paratuberculosis. The main scope of this MTA is the exchange of materials (sera, faeces or field isolates) for the improvement and validation of diagnostic methods for the detection of paratuberculosis.
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25. Did you organise or participate in inter-laboratory proficiency tests with WOA Reference Laboratories designated for the same pathogen during the past 2 years?

No

*We are going to create a network among the three WOA reference laboratories in order to fill this gap*

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?

No

## 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 during the past 2 years?

Yes

Purpose for inter-laboratory test comparisons <sup>1</sup>	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Name of the test	WOAH Member Countries
Antibody detection in serum	Partecipant	45	2024 International proficiency testing scheme (PTS) for Mycobacterium avium subsp. paratuberculosis antibody detection in serum by Royal GD, Deventer the Netherland	AUSTRIA, BELGIUM, CZECH REPUBLIC, DENMARK, FRANCE, GERMANY, GREECE, IRELAND, ITALY, SOUTH AFRICA, SPAIN, SWEDEN, SWITZERLAND, THE NETHERLANDS, UNITED KINGDOM,
			2024 International	BELGIUM, DENMARK,

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Antibody detection in serum	Participant	31	proficiency testing scheme (PTS) for Mycobacterium avium subsp. paratuberculosis antibody detection in milk by Royal GD, Deventer the Netherlands	FRANCE, GERMANY, IRELAND, ISRAEL, ITALY, NEW ZEALAND, SOUTH AFRICA, SPAIN, SWEDEN, SWITZERLAND, THE NETHERLANDS, UNITED KINGDOM,
Direct detection of Mycobacterium avium subsp. paratuberculosis in faecal specimens	Participant	6	15692/BA PT 0127 Mycobacterium avium subsp. paratuberculosis (Johnes) Culture by Animal and Plant Health Agency. Used also for detection of DNA of Mycobacterium avium subsp. paratuberculosis by qPCR	ITALY, UNITED KINGDOM,
National evaluation test for paratuberculosis: indirect detection (ELISA)	Organiser	33	Prova valutativa (Proficiency test) paratuberculosis: diagnosi serologica (ELISA) by National Reference Centre for Paratuberculosis (Italy)	ITALY,

## TOR12: EXPERT CONSULTANTS

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

No

29. Additional comments regarding your report:

Yes

On 04.03.2024, a CME course for veterinarians was organized in collaboration with the Association of Veterinarians of Piacenza (Italy), entitled: "Paratuberculosis. The disease and guidelines for adopting control plans and assigning health status to cattle herds" - 1st Edition.

The same CME course was repeated in a second edition on 03/21/2024, again for veterinary doctors, in collaboration with the Reggio Emilia Order of Veterinary Doctors.

As part of the two editions of the course, three talks were given by the WOA laboratory staff entitled:

- "Paratuberculosis in cattle pathogenetic and clinico-pathological aspects" (A. Luppi).
- "Paratuberculosis: let's not let our guard down!" (C. Garbarino)
- "MAP and food safety" (M. Ricchi).

In addition, following the material transfer agreement signed with the other two WOA reference laboratories for paratuberculosis, a panel of sera (bovine, ovine and caprine), part of a ring test already sent only to the Italian laboratories, was sent to the other two WOA reference laboratories for harmonisation and optimisation of ELISA tests for diagnostic purposes.