

WOAH Reference Laboratory Reports Activities 2025

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LABORATORY INFORMATION

*Name of disease (or topic) for which you are a designated WOA Reference Laboratory:	Echinococcosis (Echinococcus granulosus and E. multilocularis)
*Address of laboratory:	Istituto Zooprofilattico Sperimentale (IZS) of Sardinia, National Reference Laboratories for Cystic Echinococcosis (CE) - Via Duca degli Abruzzi, 8 (Administration) - Via Vienna 2 (Laboratories) 07100 - Sassari, Italy
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Website:	https://www.izs-sardegna.it/
*Name (including Title) of Head of Laboratory (Responsible Official):	Dr Giovanna Masala, DVM
*Name (including Title and Position) of WOA Reference Expert:	Dr Giovanna Masala, DVM
*Which of the following defines your laboratory? Check all that apply:	Ministerial and Regional Institute of Health Governmental Research agency

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	
		Nationally	Internationally
Indirect diagnostic tests			
ELISA anti IgG of E.g. and E.m. for Human serum/plasma (CeNRE 08)	No	48	0
Immunoblotting anti IgG of E.g. and E.M. for Human serum/plasma (CeNRE 07)	No	28	0
Immunochromatographic test anti IgG of E.g. for Human serum/plasma (CeNRE 15)	No	28	0
Direct diagnostic tests			
Sequencing analysis (CeNRE 03)	No	5	0
E.g., E.m. and Tenia identification by PCR on Cestode eggs (CeNRE 04)	Yes	41	0
Canine intestinal scraping or "Shankimg in a vessel" techniques (CeNRE 05)	Yes	0	0
Sedimentation counting techniques of canine faeces and microscopic examination (CeNRE 06)	Yes	3	0
Identification of E.g. s.s. by PCR for gene CAL (CeNRE 09)	No	48	0
Tecnica della sedimentazione e flottazione per la diagnosi parassitologica di uova di cestodi in feci di cani (CeNRE 10)	Yes	0	0

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Copro-parasitological analysis (CeNRE 11)	Yes	0	0
Identification of E.g. cysts in organs of different species (CeNRE 01/12)	Yes	18	0
Identification of E.g. cysts in human organs (CeNRE 13)	No	3	0
Copro PCR per la ricerca di sequenze geniche specifiche di E. granulosus s. l. (CeNRE/14)	Yes	0	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?

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
K+ DNA E.g.s.s	Identification of E.g. s.s. by PCR for gene CAL (CeNRE 09)	Produced	20 aliquots of 50 µl	0	13	ITALY,

4. Did your laboratory produce vaccines?

No

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

TOR3: NEW PROCEDURES

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

Yes

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

Yes

Name of the new test or diagnostic method developed	Description and References (Publication, website, etc.)
Real time for E. granulosus s.l. (CeNRE 16)	Publication on the website

8. Did your laboratory develop new vaccines for the designated pathogen or disease?

9. Did your laboratory validate vaccines according to WOA?H Standards for the designated pathogen or disease?

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
ITALY	2025-12-31	Identification of E.g. cysts in organs of different species (CeNRE 01)	13	13
ITALY	2025-12-31	Sequencing analysis (CeNRE 03)	2	2
ITALY	2025-12-31	Identification of E.g. s.s. by PCR for gene CAL (CeNRE 09)	2	2
ITALY	2025-12-31	Identification of Echinococcus granulosus sensu stricto by Real Time PCR (CeNRE 16)	2	2
ITALY	2025-12-31	Immunoblotting anti IgG of E.g. and E.M. for Human serum/plasma (CeNRE	32	32

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ITALY	2025-12-31	ELISA anti IgG of E.g. and E.m. for Human serum/plasma (CeNRE 08)	32	32
ITALY	2025-12-31	Immunochematographic test anti IgG of E.g. for Human serum/plasma (CeNRE 15)	32	32

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

Yes

Name of the WOAHA Member	Country receiving a technical consultancy	Purpose	How the advice was provided
	IRAN	Research project	email, telephone, whats up, zoom
	PAKISTAN	Research project	email, telephone, whats up, zoom
	NIGERIA	Research project: "Epidemiological investigation of E. granulosus in definitive and intermediate hosts in Nigeria"	email, telephone, whats up, zoom
	TUNISIA	Research project: "Study of genes involved in the reproductive and productive activity of the dromedary and the study of some dromedary pathologies in the Tataouine Governorate (Tunisia)"	email, telephone, whats up, zoom
	ITALY	Research project	email, telephone, whats up, zoom
	ALGERIA	Research project "Molecular characterization of E. granulosus infecting domestic and wild carnivores in Algeria"	email, telephone, whats up, zoom

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

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

Yes

Title of the study	Duration	Purpose of the study	Partners (Institutions)	WOAHA Member Countries involved other than your country
Diagnosis and determination of the prevalence of E. granulosus on samples from Algeria	3 years	Detect the real prevalence of Echinococcosis and molecular investigation in Algeria	Dr. Houssef Samari	ALGERIA
Diagnosis and determination of the prevalence of E. granulosus on samples from Tunisia	3 years	Detect the real prevalence of Echinococcosis and molecular investigation in Tunisia	Dr. Ben Smida Boubaker	TUNISIA
Cystic echinococcosis: clinical, immunological and biomolecular investigations on patients from Sardinia	5 years	Detect the real prevalence of Echinococcosis and molecular investigation in humans from Sardinia	Prof. Porcu Alberto, Masala Salvatore, Mastrandrea Scilla, Prof. Cossu antonio, Hospital network of Sardinia	ITALY
Development of new methods for C.E. diagnostic.	3 years	Development of ne diagnostic methods for C.E.	Dr Adriano Casulli, Dr Azzurra Santoro, Dr Federica Santolamazza, Istituto Superiore di Sanità, ISS	ITALY
Set up diagnostic methods on copro diagnosis	2 years	Standardization of methods and evaluation and comparison of results for interlab reproducibility	Dr Jacek Karamon DVM, PhD, Department of Parasitology and Invasive Diseases, National Veterinary Research Institute, Pulawy	POLAND
Study of Echinococcus granulosus on environment, intermediate and definitive host from various matrix	3 years	Improve knowledge on Echinococcus granulosus in Nigeria, Africa	Dr Emmanuel Jolaoluwa Awosanya, Department of Veterinary Public Health and Preventive Medicine, University of Ibadan, Ibadan 200005.	NIGERIA

Giovanna Masala - - ITALY

Set up diagnostic methods on copro diagnosis	2 years	Standardization of methods and evaluation and comparison of results for interlab reproducibility	Dr. Pavlo Maksimov, Institut für Epidemiologie, Friedrich-Loeffler-Institut, Federal Research Institute for Animal Health, Südufer, Greifswald.	GERMANY
Improvement and Evaluation of the Performance of Nanotechnological Tools for CE Diagnosis	4 years	Development of Nanotechnological Tools for CE Diagnosis	Prof. Mansour Bayat and Dr. Ashkan Hajjafari, Science and Research Branch (SRBIAU), Department of Pathobiology, Islamic Azad University, Faculty of Veterinary Medicine, Tehran.	IRAN
Improvement and Evaluation of the Performance of Nanotechnological Tools for CE Diagnosis	4 years	Development of Nanotechnological Tools for CE Diagnosis	Prof. Hassan Borji and Dr. Soheil Sadr Department of Pathobiology, Faculty of Veterinary Medicine, Ferdowsi University of Mashhad (FUM), University campus, Mashhad	IRAN

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

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:

Our Laboratories are designed to supervise data for monitoring, surveillance and control programmes system in the ambitus of the National Informative System of Zoonosis (SINZOO).

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:

All data related to zoonoses have been collected according to Directive 2003/99/CE and have been sent to EFSA Member State through a specific Web Site. Later, data related to animals have been managed by EFSA and Zoonoses Collaboration Center (ZCC) for preparation of a report, whereas, data related to humans have been managed by Center for Disease Prevention and Control (ECDC).

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:

6

• Sadr S, Hajjafari A, Sazmand A, Santucci C, Masala G, Soroushianfar M, Nazemian S, Rahdar A, Pandey S, Guettari M, Borji H. Nanobiosensors for revolutionizing parasitic infections diagnosis: a critical review to improve global health with an update on future challenges prospect. *Eur J Med Res.* 2025 Jun 16;30(1):484. doi: 10.1186/s40001-025-02685-2. PMID: 40524269; PMCID: PMC12168311.

• Soleymani N, Sadr S, Santucci C, Rahdar A, Masala G, Borji H. Investigating the Therapeutic Effects of Albendazole, Mebendazole, and Praziquantel Nanocapsules in Hydatid Cyst-Infected Mice. *Pathogens.* 2025 Mar 1;14(3):240. doi: 10.3390/pathogens14030240. PMID: 40137725; PMCID: PMC11944628.

• Santucci C, Hajjafari A, Sadr S, Mastrandrea S, Rettaroli C, Simbula L, Scaglione M, Masala S, Peruzzi A, Masala G. Unusual cholesterol crystal formation in a rare clinical case report of splenic echinococcal cyst in a patient from Sardinia, Italy. *Front Parasitol.* 2025 Jan 10;3:1498099. doi: 10.3389/fpara.2024.1498099. PMID: 39868363; PMCID: PMC11759282.

- Umhang G, Bastien F, Cartet A, Ahmad H, van der Ark K, Berg R, Bonelli P, Davidson RK, Deplazes P, Deksne G, Gargate MJ, Van der Giessen J, Jamil N, Jokelainen P, Karamon J, M'Rad S, Maksimov P, Oudni-M'Rad M, Muchaamba G, Oksanen A, Pepe P, Poulle ML, Rinaldi L, Samorek-Pieróg M, Santolamazza F, Santoro A, Santucci C, Saarma U, Schnyder M, Villena I, Wassermann M, Casulli A, Boué F. Detection of *Echinococcus* spp. and other taeniid species in lettuces and berries: Two international multicenter studies from the MEmE project. *Int J Food Microbiol.* 2025 Feb 16;430:111059. doi: 10.1016/j.ijfoodmicro.2025.111059. Epub 2025 Jan 6. PMID: 39787752.
- Awosanya EJ, Olagbaju A, Peruzzu A, Masu G, Masala G, Bonelli P. Detection of *Echinococcus granulosus sensu lato* in Environmental Samples from Ibadan, Oyo State, South West Nigeria. *Vet Sci.* 2022 Dec 7;9(12):679. doi: 10.3390/vetsci9120679. PMID: 36548840; PMCID: PMC9784236.
- Huma K, Piero B, Angela P, Francesca F, Giovanna M, Haroon A, Cinzia S. Cystic echinococcosis in Pakistan: Identification and genotyping of *Echinococcus Granulosus Sensu Stricto* in human cyst isolates. *Parasitol Int.* 2025 Oct;108:103056. doi: 10.1016/j.parint.2025.103056. Epub 2025 Mar 5. PMID: 40054521.

b) International conferences:

- 2
- XX Annual Meeting NRL Parasites 2025 - 28-29 October, Roma
poster: Development of an ELISA Assay for Cystic Echinococcosis Serodiagnosis in Sheep
Authors: Piero Bonelli, Angela Peruzzu, Gabriella Masu, Matilde Senes, Giovanna Masala, Cinzia Santucci
 - XX Annual Meeting NRL Parasites 2025- 28-29 October, Roma
Oral presentation: Retrospective analysis of Hospital Discharge Records for Geographic, Demographic and Economic Burden Evaluation of Human Cystic Echinococcosis in Italy
Author: Cinzia Santucci

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)	
UNI CEI EN ISO/IEC 17025:2005	PDF	Quality System Certification exp 29.04.2027.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Identification of E.g. cysts in organs of ovines (CeNRE 01)	ACCREDITIA
Identification of E.g. s.s. by PCR for gene CAL (CeNRE 09)	ACCREDITIA
ELISA Anti IgG of E.g. and E.m. for Humans (CeNRE 08)	ACCREDITIA

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

Yes

According to Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, thirteenth edition 2024, Chapter 1.1.4: "Biosafety and biosecurity: Standard for managing biological risk in the veterinary laboratory and animal facilities (version adopted in May 2015)"

TOR9: SCIENTIFIC MEETINGS

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

No

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

Yes

Title of event	Date	location	Role (speaker, presenting poster, short communications)	Title of the work presented
20th Workshop of the National Reference Laboratories for Parasites	2025-10-27	Roma, Italy	speaker	Retrospective analysis of Hospital Discharge Records for Geographic, Demographic and Economic Burden Evaluation of Human Cystic Echinococcosis in Italy (2015-2022)
20th Workshop of the National Reference Laboratories for Parasites	2025-10-27	Roma, Italy	poster	Development of an ELISA Assay for Cystic Echinococcosis Serodiagnosis in Sheep

TOR10: NETWORK WITH WOAHP REFERENCE LABORATORIES

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

Not applicable (only WOAHP Reference Laboratory designated for the disease)

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

Not applicable (only WOAHP Reference Laboratory designated for the disease)

25. Did you organise or participate in inter-laboratory proficiency tests with WOAHP Reference Laboratories designated for the same pathogen during the past 2 years?

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

During the past 2 years any WOAHP Reference Laboratories for the same pathogen has been designated.

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

Not applicable (only WOAHP 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 WOAHP Reference Laboratories for the same pathogen during the past 2 years?

Yes

Purpose for inter-laboratory test comparisons ¹	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Name of the test	WOAHP Member Countries
"Molecular identification of E.g.s.s."	organizer	12	Identification of E.g. s.s. by PCR for gene CAL (CeNRE 09)	ITALY,
National Proficiency test on "Detection of Echinococcus spp. worms in the intestinal mucosa of definitive host"	PARTICIPANT	31	Detection of Echinococcus spp. worms in the intestinal mucosa of definitive host	ITALY,
National Proficiency test on "Molecular identification of Echinococcus at the	PARTICIPANT	22	Molecular identification of Echinococcus at the species level	ITALY,

species level”

TOR12: EXPERT CONSULTANTS

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

Yes

Kind of consultancy	Location	Subject (facultative)
Comment on SINZOO Echinococcosi	Online	Covepi-Ministero della SalutePlanning, Information, and Risk Analysis (COVEPI)
Comment on the Italian data	Online	National Reference Center for Veterinary Epidemiology, Planning, Information, and Risk Analysis (COVEPI)
Health education for stakeholders	Italy	Public schools

29. Additional comments regarding your report:

No