

# 14<sup>th</sup> PROFICIENCY TESTING on:

Detection of *Echinococcus* spp. worms  
in the intestinal mucosa of the definitive host

XVIII Workshop of National Reference Laboratories for Parasites  
Rome, 16<sup>th</sup>-17<sup>th</sup> November 2023



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ISTITUTO SUPERIORE DI SANITÀ (Rome, Italy)



# PT on *Echinococcus* spp. in the intestinal mucosa is accredited in a quality system according to ISO 17043 standard

**Aim:** to test the competence of the appointed NRLs detection of worms of *Echinococcus* sp. in a matrix made by intestinal mucosa

**PT panel:** consists in three tubes filled with homogenized intestinal mucosa spiked or not with worms of *Echinococcus* sp.

## TIMING:

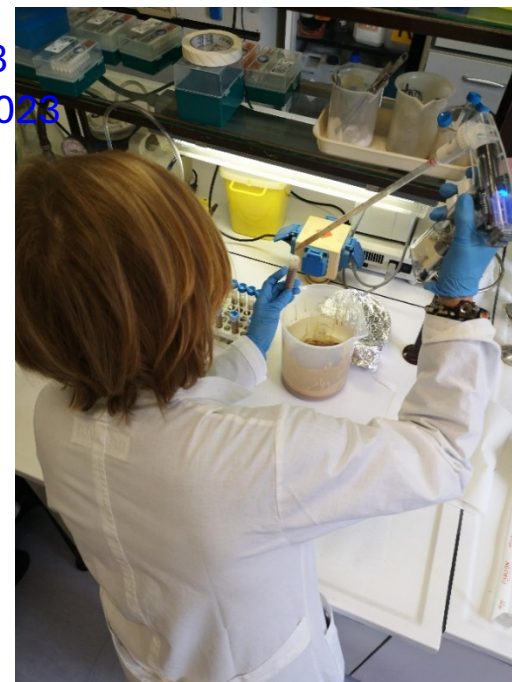
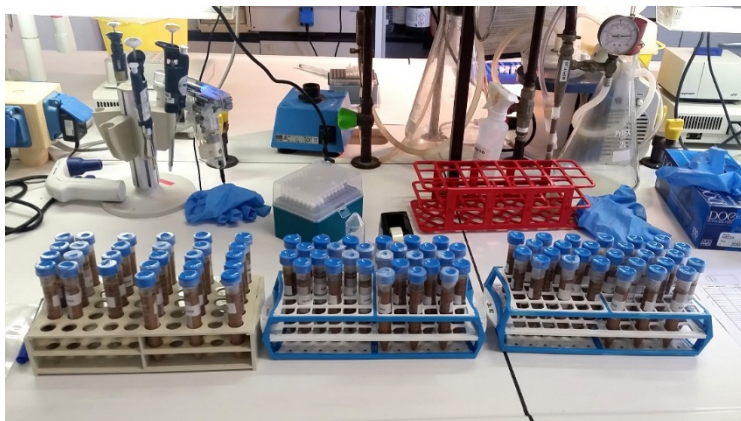
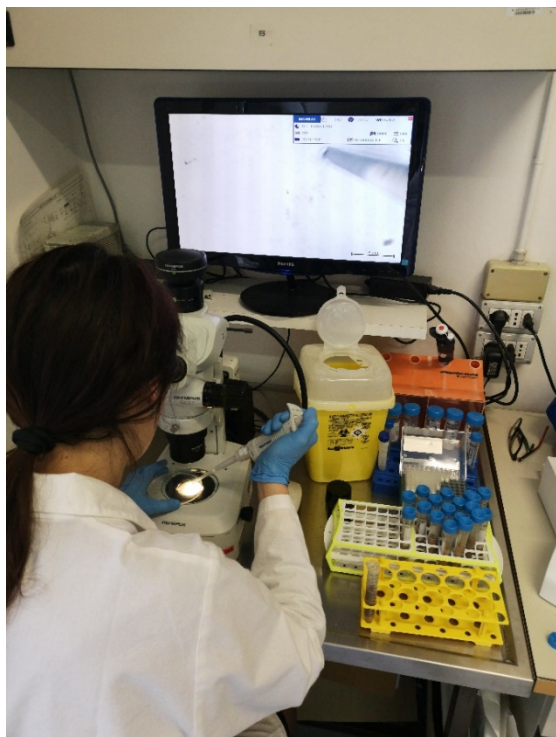
PTs announced: 10th Jan 2023

Deadline participation form: 24th Feb 2023

PTs dispatched to participants: 13th Mar 2023

Reporting deadline: 24th Mar 2023

Individual PT reports: 10th Apr 2023



# Preparation of samples

- Fox **intestines** are collected and stored **frozen** at -80°C for one week.
- Faecal content is analysed by qPCR to exclude *E. multilocularis* infection.
- The **mucosa** of the small intestine of foxes is collected, cleaned and **sent to ISS**.
- Mucosa is **homogenised** (with **70% ethanol**; ratio 2:1), aliquoted, and spiked (double check).

**PT** panel:



## Acknowledgements:

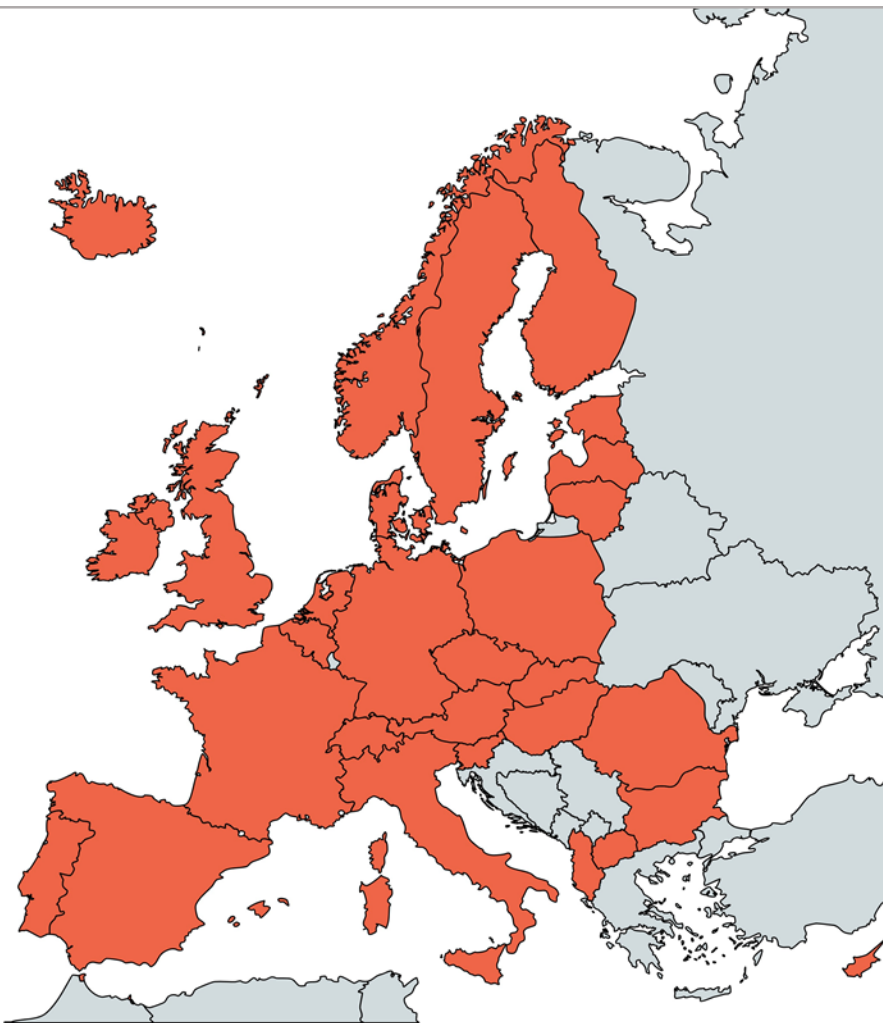
NRL of Finland  
NRL of France

NRL of Germany  
NRL of Poland





# Participants (N=30)



**Albania**, Institute of Public Health

**Austria NRLP**, Austrian agency for health and food safety

**Belgium NRLP**, Institute of Tropical Medicine

**Bulgaria NRLP**, National Diagnostic and Research Veterinary Institute

**Cyprus NRLP**, Veterinary Services

**Czech Republic NRLP**, State Veterinary Institute

**Denmark NRLP**, Statens Serum Institut, laboratory of parasitology, SSI

**Estonia NRLP**, Animal Health, Veterinary and Food Laboratory

**Finland NRLP**, Oulu, Finnish Food Authority, Ruokavirasto (ex Evira)

**France NRL Echinococcus**, ANSES, LRFS Nancy

**Germany NRL Echinococcus**, Friedrich-Loeffler-Institut für Epidemiologie

**Hungary NRLP** National Food Chain Safety Office, Laboratory of Parasitology, Fish and Bee Diseases

**Iceland NRLP**, Institute for Experimental Pathology Keldur

**Ireland NRLP**, Parasit section, Bact/Paras Division, Backweston Campus, Celbridge Kildare

**Italy NRL Echinococcus**, IZS Istituto Zooprofilattico Sperimentale della Sardegna

**Latvia NRLP**, Institute of food safety, animal health and environment, BIOR

**Lithuanian NRLP**, National Food and Veterinary Risk Assessment Institute

**Netherlands NRLP**, Institute for Public Health and Environment

**Norway NRLP**, Norwegian Veterinary Institute

**Poland NRLP**, National Veterinary Research Institute, Department of Parasitology and Invasive Diseases

**Portugal NRLP**, Instituto nacional de investigacao agraria e veterinaria

**Republic of North Macedonia**, Faculty of Veterinary Medicine, Skopje

**Romania NRLP**, Institute for diagnosis and animal health

**Slovakia NRLP**, Veterinary and Food Institute in Bratislava

**Slovenia NRLP**, University of Ljubljana, Veterinary Faculty

**Spain NRLP**, Laboratorio Central de Sanidad Animal

**Sweden NRLP**, National Veterinary Institute, SVA

**UK NRL for Trichinella and Echinococcus**, Animal and Plant Health Agency, York

**UK (Northern Ireland)** AgriFood and Biosciences Institute (AFBI), Coneywarren, Omagh

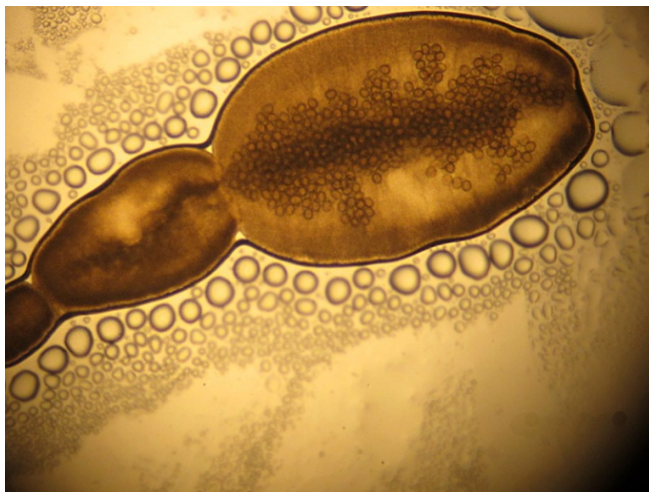
**Switzerland**, Institute of Parasitology Vetsuisse Faculty University of Bern

# Criteria for the **qualitative** evaluation

- For each PT item the evaluation is **CORRECT** if participant detected one or more *Echinococcus* spp. worms in spiked samples OR no worms in not spiked samples...

...OR **INCORRECT** (false positive or false negative results), irrespective of the number of worms in the samples.

- The **FINAL EVALUATION** is only based on qualitative evaluation and is expressed as “**POSITIVE**” if the results of all samples are correct OR “**NEGATIVE**” if at least one result is incorrect.



# SUMMARY of RESULTS (**Qualitative** evaluation)

Number of participant laboratories submitting results	30
Number of participants that <b>passed</b> the PT	29
Number of participants that <b>failed</b> the PT	1

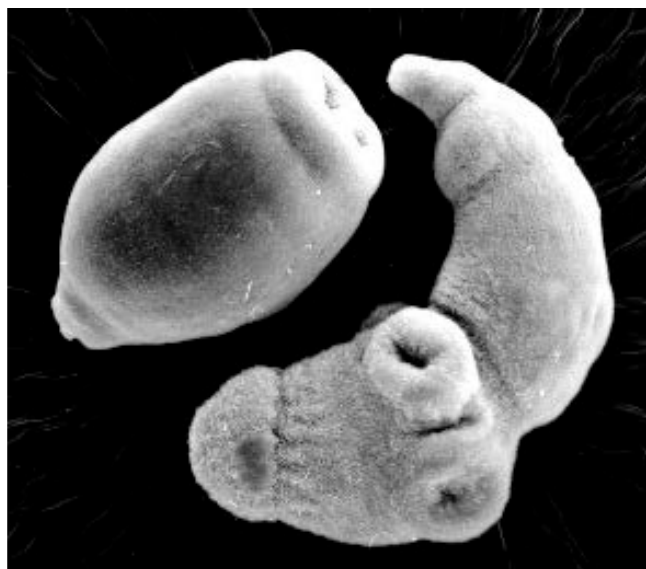


Photo courtesy of Andrew Hemphill

Laboratory code	N° of items correctly identified	N° of items NOT correctly identified	Kind of error	Final evaluation
Em10	3	0		POSITIVE
Em19	3	0		POSITIVE
Em3	3	0		POSITIVE
Em7	3	0		POSITIVE
Em14	3	0		POSITIVE
Em20	3	0		POSITIVE
Em22	3	0		POSITIVE
Em18	3	0		POSITIVE
Em24	3	0		POSITIVE
Em6	3	0		POSITIVE
Em1	3	0		POSITIVE
Em13	3	0		POSITIVE
Em8	3	0		POSITIVE
Em21	3	0		POSITIVE
Em17	3	0		POSITIVE
Em25	3	0		POSITIVE
Em9	3	0		POSITIVE
Em5	3	0		POSITIVE
Em15	3	0		POSITIVE
Em27	3	0		POSITIVE
Em29	3	0		POSITIVE
Em4	3	0		POSITIVE
Em23	3	0		POSITIVE
Em28	3	0		POSITIVE
Em11	3	0		POSITIVE
Em26	3	0		POSITIVE
Em12	3	0		POSITIVE
Em16	3	0		POSITIVE
Em30	3	0		POSITIVE
Em2	2	1	FALSE NEGATIVE	NEGATIVE

# RESULTS (Qualitative evaluation)



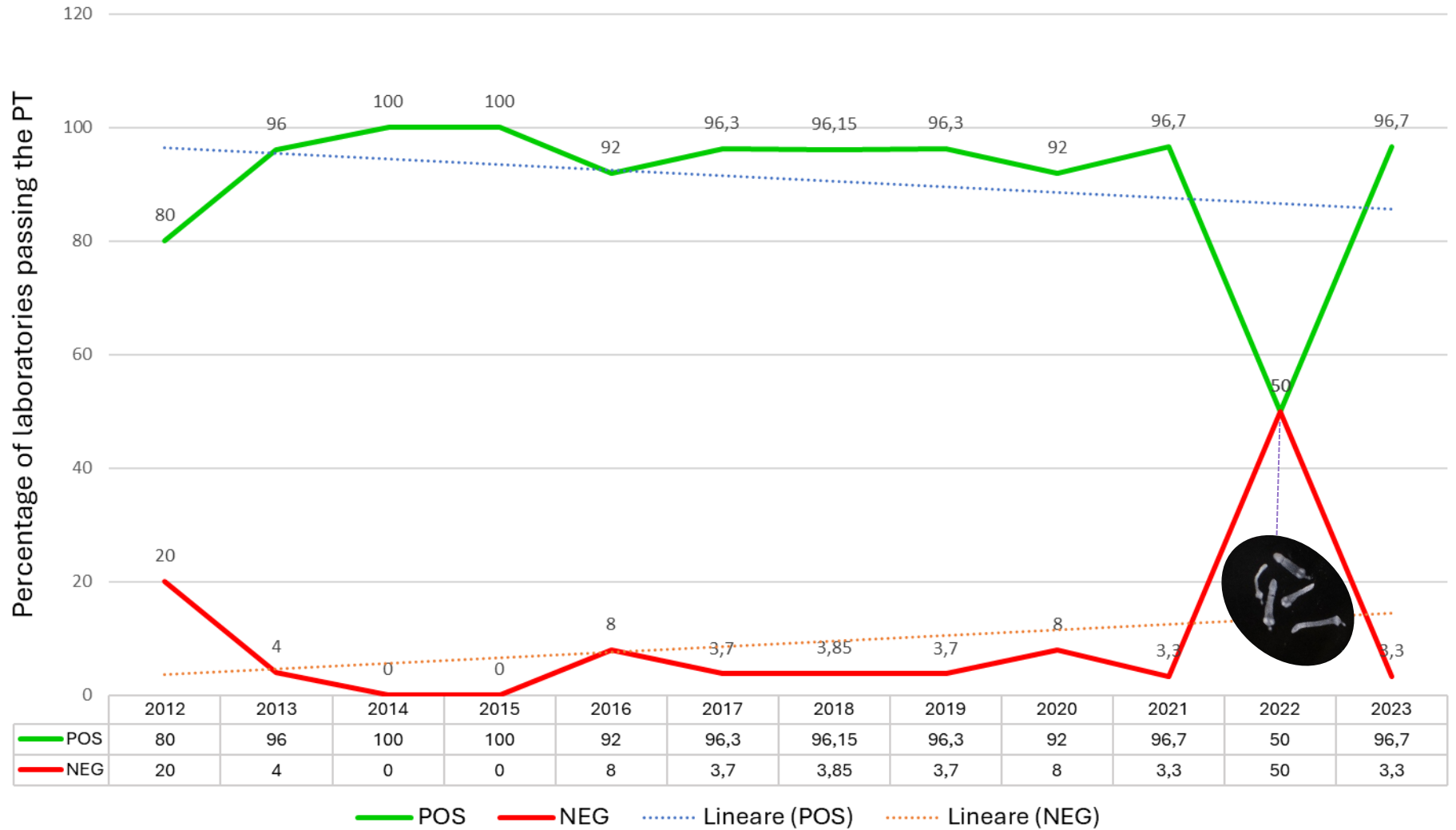
## QUALITATIVE evaluation:

- **Sample 1** (negative sample): 30 laboratories (**100%**) out of 30 correctly identified the item.
- **Sample 2** (negative sample): 30 laboratories (**100%**) out of 30 correctly identified the item.
- **Sample 3** (30 worms): 29 laboratories (**96,7%**) out of 30 correctly identified the item.



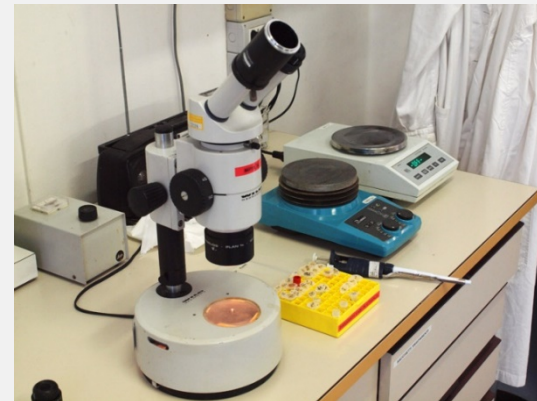
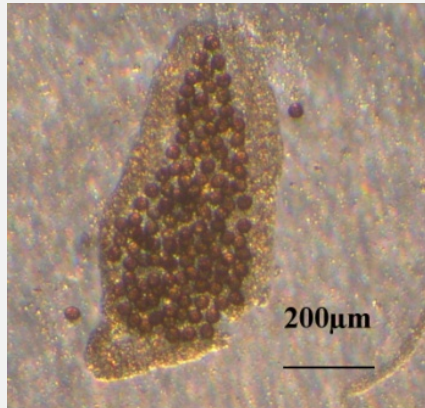


# TREND: **QUALITATIVE** EVALUATION (2012-2022)



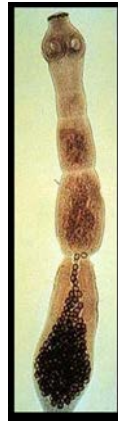
# Outcomes from 2023....

The same trend maintained from 2012-2021, is confirmed in 2023, with the most of the participating laboratories passing the PT, thus showing that the personnel is skilled to accomplish the purpose of this proficiency test.



# ACKNOWLEDGMENTS:

- Simona Cherchi (“worming” the samples / packing PTs)
- Alessia Possenti (supervising Echino\_PTs & quality system)
- Federica Santolamazza (preparation molecular & SCT PTs / data managing / packing PTs)



Thanks for the attention!