

Final report PT-01: Td 2/2026

PT-01: Artificial digestion to detect *Trichinella* larvae in meat samples

Design

Purpose	Evaluation of laboratories competence to detect <i>Trichinella</i> spp. larvae in meat	
Timetable	Invitation mail: 27/01/2026 Website updates: 31/01/2026 Registration deadline: 20/02/2026 PT items production: 16/03/2026 Shipping: 16/03/2026 Results submission deadline: 23/03/2026 Publication of the Final PT Report: within 29/05/2026	
Participants	National Reference Laboratories for Parasites, public and private, national and international institution	
Number of participants	Depending on requests	
PT items	Matrix	<input type="checkbox"/> Swine meat <input type="checkbox"/> horse meat
	Item	<i>Trichinella</i> live larvae
	Number of PT items	3 per each participant
	Panel composition	1 positive PT item (5 larvae) and 2 negatives PT items
	Number of surplus items	n.a.
Activities provided by external providers	Shipping	
Provider name	DHL	
Results evaluation	Qualitative evaluation, as stated in ISO 18743:2015/Am1:2023	

Implementation

PT staff: Tartarelli I., Tonanzi D., Marucci G.

Compliance with planned timelines: YES

Participant number and type: 35 public institutions

Matrix and analyte acquisition: swine and horse meat were purchased from qualified suppliers on the same day as the preparation of the PT items (16/03/2026). *Trichinella* larvae were obtained from the digestion of an infected SWISS CD1 mouse provided by the International Trichinella Reference Center (ISS), sacrificed on the same day as the preparation of the PT items.

Production of PT items: the PT scheme provides for the distribution of three PT items to each participating laboratory. Each PT item consists of minced swine or horse meat, either contaminated or not with *Trichinella spiralis* muscle larvae.

Activities provided by external providers: the PT provider entrusts the shipment of PT items to a qualified transport company. The company providing the shipping service was DHL.

PT Provider
 Unit of Foodborne and Neglected Parasitic Diseases
 Istituto Superiore di Sanità

viale Regina Elena, 299 – 00161 Rome, Italy



00629

Person in charge of PT: Dr. Gianluca Marucci
 e-mail: gianluca.marucci@iss.it;
 tel: +39 0649902310

Homogeneity and stability of PT items: homogeneity is ensured by counting the number of parasites under a stereomicroscope by two operators. PT items are considered stable for a period of five days from the date of preparation (which coincides with the shipping date) when naked larvae are used to spike the items, or up to 20 days when encapsulated larvae are used. Stability was assessed by the PTP through ad hoc experiments.

Distribution of PT items: PT items were shipped on 16/03/2026, and the deadline for submission of results was set for 23/03/2026. Each set of PT items sent to participants consisted of a vacuum-sealed bag labeled with the participant's identification code. Inside were three smaller bags, each containing a meatball (35 or 100 g) of the type selected by the participant (swine or horse). Each small bag was vacuum-sealed and identified with the code assigned by the PTP to the PT item. Packaging consisted of a polystyrene and cardboard container with enough refrigerant packs to ensure a temperature between 4°C and 15°C inside the package.

Instructions for participants: participants were informed of the shipping date of the PT items and the deadline for submitting results via a web app. Instructions for participants were made available on the PTP website starting from 31/01/2026. These instructions also include procedures for submitting feedback information and results.

Data analysis: feedback information and participants' results were collected via the web app. The tables in this document were prepared, based on the data submitted by participants, using Excel software.

Assigned value: the assigned value is determined by the expertise of the proficiency test manager and the technical staff involved in preparing the PT items, as well as by parasite counting carried out by at least two operators.

Criteria for results evaluation: for each PT item, the result was evaluated by comparing the participant's reported result with the expected value. As required by ISO 18743:2015/Amd1:2023, the result of the analysis of meat intended for human consumption by artificial peptic digestion must be expressed as "Positive" in the presence of *Trichinella* larvae and "Negative" in their absence. Therefore, regardless of the number of larvae detected, the result is considered correct if positive and negative PT items are correctly identified. The overall evaluation of the PT is based exclusively on the qualitative result, with the test considered passed only if the participant correctly identifies all positive and all negative PT items.

Confidentiality of results: the confidentiality of the data contained in this report is ensured using a unique code guaranteeing participant anonymity. The identity of participants in a PT scheme is kept confidential and subject to official secrecy. The PT provider reserves the right to provide participant PT results to competent authority and accreditation body, upon request. Participants will be notified in writing if a competent legislative authority requests access to their PT results.

Results provided by participants and performance EVALUATION

Participant code	Type of PT items	Applied method	PT item code	Result	Assigned value	Outcome	Final evaluation
NRL63	Swine 100g	ISO 18743:2015/Amd1:2023	3220	0	0	Correct	Positive
			5539	0	0	Correct	
			2167	5	5	Correct	
NRL64	Swine 100g	ISO 18743:2015/Amd1:2023	4291	0	0	Correct	Positive
			9370	0	0	Correct	
			8025	6	6*	Correct	

PT Provider
 Unit of Foodborne and Neglected Parasitic Diseases
 Istituto Superiore di Sanità

viale Regina Elena, 299 – 00161 Rome, Italy



00629

Person in charge of PT: Dr. Gianluca Marucci
 e-mail: gianluca.marucci@iss.it;
 tel: +39 0649902310

Participant code	Type of PT items	Applied method	PT item code	Result	Assigned value	Outcome	Final evaluation
NRL67	Swine 100g	ISO 18743:2015/Amd1:2023	9716	0	0	Correct	Positive
			8147	0	0	Correct	
			6573	3	5	Correct	
NRL68	Swine 100g	ISO 18743:2015/Amd1:2023	3939	0	0	Correct	Positive
			4703	0	0	Correct	
			3717	4	5	Correct	
NRL74	Swine 100g	ISO 18743:2015/Amd1:2023	9158	0	0	Correct	Positive
			4352	0	0	Correct	
			1106	5	5	Correct	
NRL78	Swine 100g	ISO 18743:2015/Amd1:2023	3219	0	0	Correct	Positive
			5698	0	0	Correct	
			1756	3	5	Correct	
NRL61	Swine 100g	ISO 18743:2015/Amd1:2023	2529	0	0	Correct	Positive
			1755	0	0	Correct	
			9183	5	5	Correct	
NRL56	Swine 100g	ISO 18743:2015/Amd1:2023	9123	0	0	Correct	Positive
			4056	0	0	Correct	
			5905	5	5	Correct	
NRL55	Swine 100g	ISO 18743:2015/Amd1:2023	4708	0	0	Correct	Positive
			7518	0	0	Correct	
			8943	5	5	Correct	
NRL57	Swine 100g	ISO 18743:2015/Amd1:2023	8935	0	0	Correct	Positive
			7539	0	0	Correct	
			9590	5	5	Correct	
NRL76	Swine 100g	ISO 18743:2015/Amd1:2023	5359	0	0	Correct	Positive
			1636	0	0	Correct	
			5125	3	5	Correct	
NRL52	Swine 100g	ISO 18743:2015/Amd1:2023	2503	0	0	Correct	Positive
			6376	0	0	Correct	
			9815	5	5	Correct	
NRL65	Swine 100g	ISO 18743:2015/Amd1:2023	6437	0	0	Correct	Positive
			3221	0	0	Correct	
			4055	3	5	Correct	

PT Provider
Unit of Foodborne and Neglected Parasitic Diseases
Istituto Superiore di Sanità

viale Regina Elena, 299 – 00161 Rome, Italy



00629

Person in charge of PT: Dr. Gianluca Marucci
e-mail: gianluca.marucci@iss.it;
tel: +39 0649902310

Participant code	Type of PT items	Applied method	PT item code	Result	Assigned value	Outcome	Final evaluation
NRL66	Swine 100g	ISO 18743:2015/Amd1:2023	2681	0	0	Correct	Positive
			6849	0	0	Correct	
			1457	4	5	Correct	
NRL70	Swine 100g	ISO 18743:2015/Amd1:2023	7666	0	0	Correct	Positive
			9448	0	0	Correct	
			9800	5	5	Correct	
NRL75	Swine 100g	ISO 18743:2015/Amd1:2023	4151	0	0	Correct	Positive
			4758	0	0	Correct	
			4757	4	5	Correct	
NRL80	Horse 100g	ISO 18743:2015/Amd1:2023	2561	0	0	Correct	Positive
			5564	0	0	Correct	
			2989	4	5	Correct	
NRL72	Swine 100g	ISO 18743:2015/Amd1:2023	5785	0	0	Correct	Positive
			6099	0	0	Correct	
			8510	4	5	Correct	
NRL73	Swine 100g	ISO 18743:2015/Amd1:2023	9345	0	0	Correct	Positive
			2041	0	0	Correct	
			2997	5	5	Correct	
NRL62	Horse 100g	ISO 18743:2015/Amd1:2023	8422	0	0	Correct	Positive
			6436	0	0	Correct	
			3406	5	5	Correct	
NRL79	Swine 100g	ISO 18743:2015/Amd1:2023	7494	0	0	Correct	Positive
			3571	0	0	Correct	
			6578	5	5	Correct	
NRL58	Swine 100g	ISO 18743:2015/Amd1:2023	4232	0	0	Correct	Positive
			5417	0	0	Correct	
			2363	4	5	Correct	
NRL53	Swine 100g	ISO 18743:2015/Amd1:2023	3938	0	0	Correct	Positive
			7764	0	0	Correct	
			9759	4	5	Correct	
NRL50	Swine 100g	ISO 18743:2015/Amd1:2023	1152	0	0	Correct	Positive
			3606	0	0	Correct	

PT Provider
Unit of Foodborne and Neglected Parasitic Diseases
Istituto Superiore di Sanità

viale Regina Elena, 299 – 00161 Rome, Italy



00629

Person in charge of PT: Dr. Gianluca Marucci
e-mail: gianluca.marucci@iss.it;
tel: +39 0649902310

			3543	5	5	Correct	
--	--	--	------	---	---	---------	--

Participant code	Type of PT items	Applied method	PT item code	Result	Assigned value	Outcome	Final evaluation
NRL69	Swine 100g	ISO 18743:2015/Amd1:2023	6770	0	0	Correct	Positive
			6323	0	0	Correct	
			1909	5	5	Correct	
NRL60	Swine 100g	ISO 18743:2015/Amd1:2023	5309	0	0	Correct	Positive
			9116	0	0	Correct	
			4063	5	5	Correct	
NRL59	Swine 100g	ISO 18743:2015/Amd1:2023	2590	0	0	Correct	Positive
			4609	0	0	Correct	
			5017	5	5	Correct	
NRL82	Swine 100g	ISO 18743:2015/Amd1:2023	8241	0	0	Correct	Positive
			9682	0	0	Correct	
			4003	4	5	Correct	
NRL83	Swine 100g	ISO 18743:2015/Amd1:2023	7384	0	0	Correct	Positive
			5165	0	0	Correct	
			2429	5	5	Correct	
NRL71	Swine 100g	ISO 18743:2015/Amd1:2023	3004	0	0	Correct	Positive
			8669	0	0	Correct	
			4655	4	5	Correct	
TLE32	Swine 100g	ISO 18743:2015/Amd1:2023	2265	0	0	Correct	Positive
			6242	0	0	Correct	
			3002	2	5	Correct	
NRL77	Swine 35g	ISO 18743:2015/Amd1:2023	9919	0	0	Correct	Positive
			2188	0	0	Correct	
			7042	4	5	Correct	
NRL84	Swine 100g	ISO 18743:2015/Amd1:2023	7769	0	0	Correct	Positive
			2119	0	0	Correct	
			8886	3	5	Correct	
NRL51	Swine 100g	ISO 18743:2015/Amd1:2023	2721	0	0	Correct	Positive
			8323	0	0	Correct	
			9248	5	5	Correct	
NRL85	Swine	ISO	001	4	5	Correct	Positive

PT Provider
 Unit of Foodborne and Neglected Parasitic Diseases
 Istituto Superiore di Sanità



Person in charge of PT: Dr. Gianluca Marucci
 e-mail: gianluca.marucci@iss.it;
 tel: +39 0649902310

viale Regina Elena, 299 – 00161 Rome, Italy

00629

	100g	18743:2015/Amd1:2023	002	0	0	Correct	
			003	0	0	Correct	

* One extra larva was accidentally spiked into the PT item during preparation.

Summary of results:

Number of participant laboratories	35
Number of participants that passed the PT	35
Number of participants that failed the PT	0

Overtime comparison of results

Laboratory code	2021	2022	2023	2024	2025	2026
NRL56	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL80	Pos E-100	Pos S-100	Pos E-100	Pos E-100	Pos E-100	Pos E-100
NRL76	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos E-100	Pos S-100
NRL70	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL64	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL61	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL65	Pos S-100	Pos S-100	Pos S-100	Pos S-35	Pos S-100	Pos S-100
NRL58	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL66	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL74	Pos S-35	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL50	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL53	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos E-100	Pos S-100
NRL62	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos E-100
NRL82	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL79	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
TLE32	NP	NP	Pos S-100	Neg S-100	Neg S-100	Pos S-100
NRL83	Pos S-35	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL51	Pos E-100	Pos S-100	Pos E-100	Pos S-100	Pos E-100	Pos S-100
NRL68	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL84	NP	NP	NP	Pos S-100	Pos S-100	Pos S-100
NRL63	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL67	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL55	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL72	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL60	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL57	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL69	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL78	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL73	Pos E-100	Pos S-100	Pos S-100	Pos S-100	Pos E-100	Pos S-100
NRL71	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL59	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL52	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100	Pos S-100
NRL77	Pos S-35	Pos S-100	Pos S-35	Pos S-35	Pos S-35	Pos S-35
NRL75	Pos E-100	Pos S-100	Pos E-100	Pos S-100	Pos S-100	Pos S-100

PT Provider
Unit of Foodborne and Neglected Parasitic Diseases
Istituto Superiore di Sanità

viale Regina Elena, 299 – 00161 Rome, Italy



00629

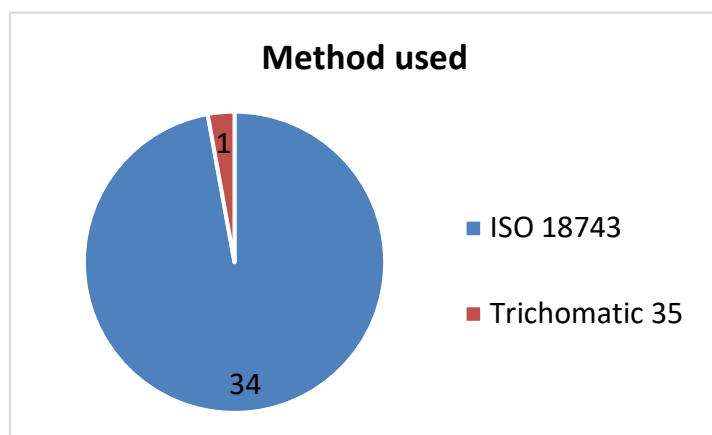
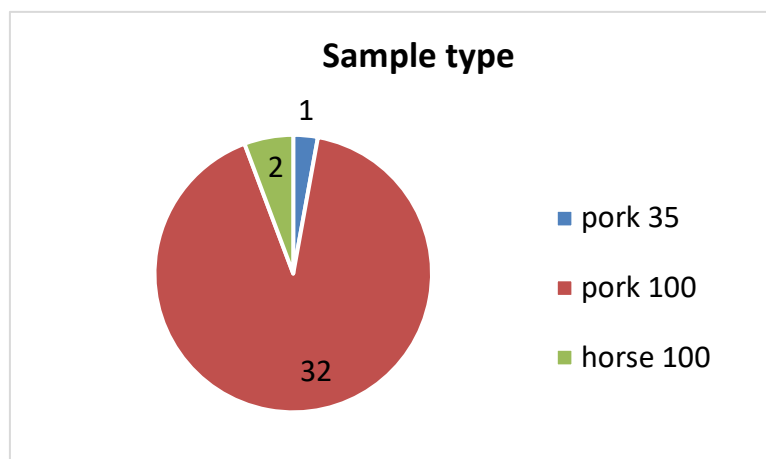
Person in charge of PT: Dr. Gianluca Marucci
e-mail: gianluca.marucci@iss.it;
tel: +39 0649902310

NRL85	NP	NP	NP	NP	NP	Pos S-100
-------	----	----	----	----	----	-----------

Legend: NP = no participation; POS = positive; NEG = negative; NA = not applicable.

Note: Information on the type of PT items analyzed is reported according to the following codes:
 S-100 (swine 100 g), S-35 (swine 35 g), E-100 (horse 100 g), E-35 (horse 35 g).

Comments on participants' performance: all PT item panels were correctly identified.
 All participants, except one, analyzed the samples using ISO 18743:2023; the remaining participant used the automatic digestion method (Trichomatic 35).



Performance evaluation when different methods are applied: all methods used are considered equivalent in accordance with current regulations; therefore, they are evaluated in the same way.

Comments and recommendations based on the outcomes of PT: Despite the use of different analytical methods, all participants obtained the same positive result, demonstrating comparable performance of the methods employed.

General recommendations:

A negative result in a positive sample may depend on several factors, such as:

PT Provider
 Unit of Foodborne and Neglected Parasitic Diseases
 Istituto Superiore di Sanità

viale Regina Elena, 299 – 00161 Rome, Italy



00629

Person in charge of PT: Dr. Gianluca Marucci
 e-mail: gianluca.marucci@iss.it;
 tel: +39 0649902310

- Mix-up of PT items during the analysis phase.
- Destruction of larvae during the mechanical homogenization step. PT samples consist of minced meat, which does not protect larvae from damage caused by blender blades; therefore, they should be homogenized manually using a spatula in a beaker containing a small amount of digestion fluid.
- Incomplete digestion of the sample, indicated by a large amount of undigested residue on the sieve. This may in turn depend on unsuitable reagents (e.g., expired pepsin or pepsin with reduced activity) or inadequate digestion time and temperature.
- Insufficient rinsing of the equipment used for artificial digestion (blender cup, beaker, sieve), which may lead to loss of larvae.
- Insufficient sedimentation time for larvae in the separatory funnel or cylinder.
- Failure of the operator to recognize the larvae.

Written and elaborated by
PTP person in charge

Dr. G. Marucci



Verified and issued by
The Director

Dr. A. Casulli



Date 11/05/2026

Notes:

1. Personal data are processed in compliance with the regulatory provisions referred to in EU Regulation 2016/679 and Privacy Code, as reported in Legislative Decree no. 101/2018. The data controller of personal data is the Istituto Superiore di Sanità with registered office in Viale Regina Elena n. 299 - 00161 Rome, in the person of its President. In addition, the ISS has appointed its own Data Protection Officer (D.P.O.), e-mail address: responsabile.protezionedati@iss.it. Data are processed exclusively for carrying out the PT activities, for this purpose adequate physical, technical and organizational security measures have been set up to prevent and avoid their destruction and/or loss of integrity, as well as their illicit or incorrect use. Data is accessible only to authorized personnel who has their own credentials and their own operating station. The participant has the rights referred to in art. 15 GDPR et seq., more precisely right of access, right of rectification, right of treatment limitation, right to data portability, right of opposition, as well as the right to lodge a complaint with the Guarantor Authority (art. 77 GDPR and 141 Privacy Code, as reported by Legislative Decree 101/2018). The ISS, in its capacity as Data Controller, undertakes to keep the records of processing activities correctly pursuant to art. 30 GDPR.
2. The original raw data and a copy of Final PT Report are kept for 10 years at the PTP site.
3. Participants may use this report to support their skills to the accreditation body and other interested parties.
4. The accreditation, according to the ISO/IEC 17043 international standard, is regulated by a specific agreement and recognizes the technical competence of the PTP to organize PT schemes. The accreditation body, ACCREDIA (www.accredia.it), does not take any responsibility for the activities related to production of PT items and participants results evaluation.

End of the report

PT Provider
Unit of Foodborne and Neglected Parasitic Diseases
Istituto Superiore di Sanità

viale Regina Elena, 299 – 00161 Rome, Italy



00629

Person in charge of PT: Dr. Gianluca Marucci
e-mail: gianluca.marucci@iss.it;
tel: +39 0649902310