World Organisation for Animal Health

Istvan Szabo - - GERMANY

WOAH Reference Laboratory Reports Activities 2025

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LABORATORY INFORMATION

***Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:**	Salmonellosis
***Address of laboratory:**	Diedersdorfer Weg 1 D-12277 Berlin
***Tel:**	+49-30 184 12 74221
***E-mail address:**	istvan.szabo@bfr.bund.de
Website:	www. bfr.bund.de
***Name (including Title) of Head of Laboratory (Responsible Official):**	Dr. Istvan Szabo
***Name (including Title and Position) of WOAH Reference Expert:**	Dr. Istvan Szabo
***Which of the following defines your laboratory? Check all that apply:**	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	
Indirect diagnostic tests		Nationally	Internationally
Direct diagnostic tests		Nationally	Internationally
Serotyping of Salmonella	Yes	3094	21
Real-time PCR (conformation of Salmonella spp)	No	235	0
PCR (conformation of d- Tartrat+S. Paratyphi B)	No	56	0
Antimicrobial susceptibility test (MIC) of Salmonella strains	No	774	0
S. Typhimurium, monophasic (conformation PCR)	No	294	0
Test Salmonella Enteritidis Vaccine Strains	No	36	0
Next Generation Sequencing of Salmonella	No	1582	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?

No

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOAH Members?

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?

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

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
SENEGAL	2025-11-17	Serotyping, Antibiotic resistance testing and Sequencing	15	15
NIGERIA	2025-11-17	Serotyping, Antibiotic resistance testing and Sequencing	6	6

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
CONGO (DEM. REP. OF THE) ETHIOPIA GHANA NIGERIA SENEGAL SUDAN UGANDA	Serotyping of Salmonella spp.	Hands on Workshop

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
Loss of immuno-reactive O-chain in Salmonella enterica	3 years	WGS-based characterization and in silico prediction of Salmonella with rough phenotype	U.S. Food and Drug Administration, Center for Food Safety and Applied Nutrition,	UNITED STATES OF AMERICA
Occurrence of polyphyletic Salmonella Enteritidis lineages	2-3 years	Occurrence of polyphyletic Salmonella Enteritidis lineages and their WGS-based detection and typing to assess their relevance for the implementation of Salmonella control programs	Department of Global Health, Institut Pasteur, France; Dutch National Institute for Public Health and the Environment	FRANCE GERMANY THE NETHERLANDS
From farm to fork: epidemiological study, genetic Istvan Szabo - Salmonellosis - GERMANY WOAH Reference Laboratory Reports Activities 2023 3 characterization and plasmid identification of antibiotic resistant Salmonella strains isolated along the food	4 years	Analysis of antibiotic resistance determinants in Salmonella	University of Urbino, Italy Department of Biomolecular Sciences	GERMANY ITALY

chain in Marche Region				
African One Health Network for Disease Prevention: Building Capacity for Sustainable Antimicrobial Stewardship Across sub-Saharan Africa (ADAPT)	5 years	Building Capacity for Sustainable Antimicrobial Stewardship Across sub-Saharan Africa	Centre for Innovative Drug Development & Therapeutic Trials for Africa (CDT-Africa) Kumasi Centre for Collaborative Research in Tropical Medicine (KCCR) University of Ibadan (UI) Institut National de Recherche Biomédicale (INRB) Institut Pasteur de Dakar (IPD) University of Khartoum (UofK) Makerere University, College of Veterinary Medicine, Animal Resources and Biosecurity	CONGO (DEM. REP. OF THE) ETHIOPIA GHANA NIGERIA SENEGAL SUDAN UGANDA

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 is collected in frame of the following programs: - national (General Administrative Provision, AVV) and European Salmonella monitoring programs - national control programs for Salmonella (Directive 2003/99/EC and Regulation (EC) No 2160/2003) in breeding flocks of Gallus gallus (Commission Regulation (EU) No 200/2010), in laying hens of Gallus gallus (Commission regulation (EU) No 517/2011), in flocks of broilers (Commission regulation (EU) No 200/2012) and in flocks of turkeys (Commission regulation (EU) No 1190/2012) The collected data is an important part of the national and international human outbreak investigations. It is also the base for the investigation of different epidemiological issues on the level of primary production.

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:

Salmonella Data is part of the national zoonoses report "Pathogens of zoonoses in Germany" on the epidemiological situation in the food chain, which appears as a BfR science booklet and is available for download. The data used to compile this national zoonoses report are also used for reporting zoonoses to the European Food Safety Authority (EFSA).

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:

3

J. Fischer, M. Borowiak, H. Frentzel, B. Baumann, A. Groger, C. Deneke, I. Szabo and M. C. Lamparter. Complete and draft genome sequences of Salmonella Wandsworth and Salmonella Stanley isolated from insect-based food products, Microbiology Resource Announcements. 2025, e01019-24, 10.1128/mra.01019-24 10.1128/mra.01019-24

L. F. Forth, B. Malorny, M. Bönn, E. Brinks, G. Denay, C. Deneke, H. El-Adawy, J. Fischer, J. Fuchs, E. Hiller, N. Bretschneider, S. Kleta, S. Lüth, T. Schultze, H. Petersen, M. Projahn, C. Schäfers, K. Stingl, A. J. Stroehlein, L. Uelze, K. Szabo, A. Wöhlke and J. Linde. An inter-laboratory study characterizes the impact of bioinformatic approaches on genome-based cluster detection for foodborne bacterial pathogens, Frontiers in Microbiology. 2025, 1629731, 10.3389/fmicb.2025.1629731

V. Brait, L. Böff, N. M. Zmarlak-Feher, N. Jourdan-Da Silva, S. Mazzilli, M. Pardos de la Gandara, A. Moura, J. Mossong, C. Ernst, C. Ragimbeau, R. Pijnacker, M. Lanzl, L. T. Brandal, H. Lange, R. Stephan, M. Biggel, M. Raess, O. Daniel, M. Spačková, C. Clarke, M. Cormican, A. Colgan, P. Garvey, P. Mckeown, R. Dryselius, N. Karamehmedovic, E. Grilc, M. Trkov, M. Pirš, D. Brown, L. Browning, A. Hoban, G. Godbole, A. Painset, M. A. Chattaway, A. Vainio, R. Rimhanen-Finne, J. Fischer, M. C. Lamparter, W. Mattheus, F.

Commans, A. G. Grginić, I. Mlinarić, I. Pem-Novosel, S. Kurečić Filipović, I. Ferencak, D. Jurić, T. Niskanen, C. Jernberg, V. Rizzi, E. Sarno, C. Kornschober, A. Wolfsbauer, D. Werber, S. Simon, P. Gymoese, S. Ethelberg, L. Müller, S. Maritschnik, A. Meinen and M. Pietsch Insights into recurring multi-country outbreaks of Salmonella Strathcona associated with tomatoes, Europe, 2011 to 2024, Eurosurveillance : bulletin européen sur les maladies transmissibles / Commission des Communautés Européennes. 2025, 1560-7917, 10.2807/1560-7917.Es.2025.30.41.2500224

b) International conferences:

14

J. Fischer. WGS challenges and opportunities in bacteriological diagnostics. 7th International Conference of the European College of Veterinary Microbiology 2025-09-10/2025-09-12, Berlin, Germany

I. Szabo. Vaccines in Veterinary Medicine: History, Types, and Practical Insigh. Workshop of the 7th International Conference of the European College of Veterinary Microbiology (ECVM) 2025-09-10/2025-09-12 Berlin, Germany

M. C. Lamparter Vaccines against Salmonella Focus Poultry in Germany. Workshop of the 7th International Conference of the European College of Veterinary Microbiology (ECVM) 2025-09-10/2025-09-12 Berlin, Germany.

J. Fischer. Salmonella vaccine strains and their molecular background –WGS meets real time PCR. Workshop of the 7th International Conference of the European College of Veterinary Microbiology (ECVM) 2025-09-10/2025-09-12 Berlin, Germany.

J. L. Bartsch, M. Borowiak, H. M. Hamid, M. C. Lampartner, M. Pietsch, C. Deneke, B. Malorny, S. Simon, I. Szabo and J. Fischer WGS based in-depth characterisation of Salmonella Muenchen among diverse sources in Germany, 2025-06-23/2025-06-25, Saint Malo, France

L. Bortolami, L. Alban, P. Antonelli, M. Chemaly, F. Martinelli, I. Szabo, L. Bonifait and L. Barco Updating the DISCONTOOLS database: addressing research gaps in salmonellosis for better disease control, International Symposium on Salmonella and Salmonellosis, 2025-06-23/2025-06-25, Saint-Malo, France

L. Bortolami, L. Alban, A. Pietro, M. Chemaly, M. Francesca, I. Szabo, L. Bonifait and L. Barco Updating DISCONTOOLS for salmonellosis: identifying research gaps and future priorities in pig health, Safe Pork Conference 2025-10-06/2025-10-08, Rennes, France

M. C. Lamparter, M. Borowiak, M. Pietsch, C. Deneke, A. J. Stroehlein, I. Szabo, S. Simon and J. Fischer Salmonella serovars found in sesame-based products in Germany from 2020 to 2024: Characterization of isolates and sequences from the NRL for Salmonella Conference, Name 2025-04-01/2025-04-03, Berlin, Germany, Organisationseinheit: 42, 4NSZ, Interne BfR-Projektnummer: 60-0201-05#0000, EndNote-ID: openagrar_mods_00107194

M. C. Lamparter, S. Simon, M. Pietsch, I. Szabo, A. Irrgang, J. Fischer and M. Borowiak Salmonella Paratyphi B: Update on the Salmonella serovar from non-human sample surveillance in Germany, International Symposium on Salmonella and Salmonellosis, 2025-06-23/2025-06-25, Saint-Malo, France

J. Wenderlein, A. Stroehlein, L. Uelze, M. Hoffmann, J. Zheng, J. Pettengill, I. Szabo, M. C. Lamparter, B. Marlorny and J. Fischer Light in the dark: Deciphering rough Salmonella with WGS, International Symposium on Salmonella and Salmonellosis 2025-06-23/2025-06-25 Saint-Malo, France

S. Simon, A. Meinen, M. Lamparter and J. Fischer Multi-serotype Salmonella outbreak associated with sesame-based products in Germany, 2019 – 2023 International Symposium on Salmonella and Salmonellosis, 2025-06-23/2025-06-25, Saint-Malo, France

B. Rosner and J. Fischer Cross-border collaboration essential during an international Salmonella Umbilo outbreak related to rocket salad and baby spinach, Europe, 2024 International Symposium on Salmonella and Salmonellosis. 2025-06-23/2025-06-25. Saint-Malo, France

C. Deneke, J. Fischer, A. Irrgang, S. Lüth, M. Projahn, K. Stingl, B. Malorny and M. Borowiak Follow us Towards a new sequencing era - Oxford Nanopore Technologies Sequencing as a method for bacterial characterization and outbreak investigation?! 14th edition of the International Meeting on Microbial Epidemiological Markers (IMMEM XIV). 2025-09-17/2025-09-20, Porto, Portugal

L. Giese, M. Pietsch, S. Simon, E. Trost, J. Fischer, M. C. Lampartner, G. Falkenhorst and A. Meinen Opportunities and challenges of Integrated Genomic Surveillance based on Salmonella surveillance data from 2020 to 2023 in Germany. International Symposium on Salmonella and Salmonellosis. 2025-06-23/2025-06-25, Saint-Malo, France

c) National conferences:

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I. Szabo. Neues aus dem NRL für Salmonella. Wissenschaftliches Symposium der mikrobiologischen Nationalen Referenzlabore, Konsiliar- und Speziallabore 2025-06-26/2025-06-27 Berlin, Germany

M. Borowiak, J. Fischer, A. Irrgang, S. Lüth, M. Projahn, K. Stingl, B. Malorny and C. Deneke Towards a new sequencing era – Oxford Nanopore Technologies Sequencing as a

method for bacterial characterisation and outbreak investigation?! DGHM Lebensmittelmikrobiologie Workshop. 2025-04-01/2025-04-03, Berlin, Germany

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

2
J. Fischer. Ausbruchsaufklärung in Zeiten des Umbruchs - Ein Praxisbeispiel - Salmonella Umbilo aus Lebensmittel-, Veterinär-, Futtermittel- und Umweltproben, Kolloquium Abteilung 4, 2025-01-14 Berlin, Germany

M.C. Lamparter. Salmonella - A zoonotic agent and foodborne pathogen from farm to fork to outbreaks. Workshop: Simulation exercise on food-borne outbreaks. 05.12.2025 in Republic of Moldovau as part of a project funded by the United Nations Industrial Development Organization (UNIDO).

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOAH Members?

Yes

a) Technical visit : 0

b) Seminars : 0

c) Hands-on training courses: 1

d) Internships (>1 month) 0

Type of technical training provided (a, b, c or d)	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
C	GHANA	6

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	Certificate of Accreditation	PL_18583_02_00_2025_U1_27102025.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Serotyping of Salmonella spp.	German National Accreditation Body
Detection of Salmonella spp. (ISO 6579-1)	German National Accreditation Body
Detection of Salmonella spp. with PCR and real-time PCR	German National Accreditation Body
Identification of Salmonella Enteritidis with real-time PCR	German National Accreditation Body
Conformation of d-Tartrat fermentation in Salmonella spp. with PCR	German National Accreditation Body
Identification of S. Enteritidis Vaccine Strains with real-time PCR	German National Accreditation Body
Identification of mono- and bipasich S. Typhimurium with realtime PCR	German National Accreditation Body

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

Yes

In accordance with § 6 German Ordinance on Hazardous Substances (GefStoffV) a risk assessment for the Hazardous Substances used in laboratory (including pathogens) has to be carried out and measures/countermeasures against biodocumented risk needs to be identified. Furthermore, the laboratory rooms in laboratory area are approved as L2 or S2 laboratories by the competent authotity, that requires biorisk measures.

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 during the past 2 years?

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 during the past 2 years?

Yes

Purpose for inter-laboratory test comparisons1	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Name of the test	WOAH Member Countries
EURL-Salmonella proficiency test: Salmonella detection in food, 2025	paricipant	31	Detection of Salmonella spp. ISO 6579-1	GERMANY, ITALY,
EURL-Salmonella proficiency test: Salmonella detection in feed, 2025	paricipant	31	Detection of Salmonella spp. ISO 6579-1	GERMANY, ITALY,
EURL-Salmonella proficiency test: Salmonella detection in primary production stage, 2025	paricipant	37	Detection of Salmonella spp. ISO 6579-1	GERMANY, ITALY,
EURL-Salmonella proficiency test: Salmonella Serotyping, 2025	paricipant	32	Serotyping of Salmonella spp. ISO 6579-3	GERMANY, ITALY,

TOR12: EXPERT CONSULTANTS

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

No

29. Additional comments regarding your report:

Yes

Question 17 - Country of origin of the expert(s) provided with training: Ghana, Nigeria, Republic of the Congo (DRC), Senegal, Sudan, Uganda.

Question 27 - WOAH Member Countries: all EU memberstates