

# WOAH Reference Laboratory Reports Activities 2022

## Activities in 2022

This report has been submitted : 25 avril 2023 16:46

### Laboratory Information

<b>Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:</b>	Salmonellosis
<b>Address of laboratory:</b>	Woodham Lane, New Haw, Addestone, Surrey, KT15 3NB, United Kingdom
<b>Tel.:</b>	02080269630
<b>E-mail address:</b>	Francesca.martelli@apha.gov.uk
<b>Website:</b>	www.apha.gov.uk
<b>Name (including Title) of Head of Laboratory (Responsible Official):</b>	Prof Ian Brown, APHA Director of Scientific Services
<b>Name (including Title and Position) of WOAH Reference Expert:</b>	Dr Francesca Martelli
<b>Which of the following defines your laboratory? Check all that apply:</b>	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 WOAH Manual (Yes/No)	Total number of test performed last year	
Indirect diagnostic tests		Nationally	Internationally
SAT (S. Pullorum/Gallinarum)	yes	85	7
RSA (S. Pullorum/Gallinarum)	yes	0	0
SAT (S. Typhimurium)	yes	294	

			7
SAT (S. Abortusequi)	yes	12	0
SAT (S. Dublin)	yes	414	14
Direct diagnostic tests		Nationally	Internationally
Serotyping	yes	7325	200
Phagotyping	yes	853	0
Antimicrobial susceptibility testing	yes	5976	200
Tests for live Salmonella vaccines	yes	499	0
Monophasic STm PCR tests	yes	22	0
Salmonella isolation culture	yes	8920	0
Whole Genome Sequencing	yes	1149	100

## 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
Salmonella typing sera	Serotyping	2,3618ml	18,705ml	NK	commercially sensitive information	
S. Pullorum control serum	SAT	0 ml	21.75ml	NK	Commercially sensitive information	
S. Pullorum antigen	SAT and RS	13,330ml	3225ml	2275ml	Commercially sensitive information	

4. Did your laboratory produce vaccines?

No

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

Not applicable

## 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 WOAHS Standards for the designated pathogen or disease?

No

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

No

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

No

## TOR4: DIAGNOSTIC TESTING FACILITIES

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

No

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

Yes

NAME OF THE WOAHS MEMBER COUNTRY RECEIVING A TECHNICAL CONSULTANCY	PURPOSE	HOW THE ADVICE WAS PROVIDED
GEORGIA	advice on integrating Salmonella testing methods to EU standards	Email
FRANCE	advice on the use of live vaccines in poultry	Email
BELGIUM	advice on a Salmonella outbreak	Email

## TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

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

Yes

Title of the study	Duration	PURPOSE OF THE STUDY	PARTNERS (INSTITUTIONS)	WOAHS MEMBER COUNTRIES INVOLVED OTHER THAN YOUR COUNTRY
BIOPIGEE	3 years	To obtain better knowledge on how to combat Salmonella and HEV in biofilms/surface microlayers by disinfection in pig farms, to help develop common biosecurity protocol	Several European Institutions	AUSTRIA
COMPARE	5 years	Microevolution study of the highly clonal monophasic Salmonella Typhimurium	Several European Institutions	DENMARK
EJP: DiSCoVeR	2.5 years	Critical assessment/improvement of existing and development of new source attribution models. Source attribution by phylogeny	Several European Institutions	SWEDEN
		Data identification/preparing data inventories of Salmonella	Several European	

EJP: ADONIS	2.5 years	Enteritidis isolates from 2008-2019 and on farm control of S. Enteritidis.	Institutions	FRANCE
EJP: BeONE and ORION	EJP: BeONE and ORION	BeONE is developing an integrated surveillance dashboard in which molecular and epidemiological data for foodborne pathogens can be interactively analysed, visualised and interpreted by the relevant experts across disciplines and sectors. DK, Germany, Portugal, Denmark, NL, Norway, NL and strengthening general surveillance capability	Several European Institutions	NORWAY
UK FAO Reference Centre for AMR supported study 1	3 years	Characterisation of Salmonella isolates from livestock	National Veterinary Research Institute	NIGERIA
UK FAO Reference Centre for AMR supported study 2	3 years	Collection and characterisation of Salmonella isolates from livestock	Several Nigerian institutions	NIGERIA
UK FAO Reference Centre for AMR supported study 3	3 years	Characterisation of Salmonella isolates from wildlife	Bangladesh Livestock Research Institute	BANGLADESH
UK FAO Reference Centre for AMR supported study 4	3 years	Characterisation of Salmonella isolates from retail sources	University of Ghana	

## 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:

Salmonella and related AMR data for the EFSA/ECDC annual One Health reports, 2021

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:

The 2021 edition of Salmonella in Animals and feed in GB: Salmonella in animals and feed in Great Britain - GOV.UK (www.gov.uk)

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:

14

Jones H; Gilson D; Gosling RJ; Oastler C; Davies RH; Smith RP (2022). *The effectiveness of short-duration in-feed organic acid use in finisher pigs for Salmonella control at slaughter. Preventive Veterinary Medicine* 209, 105772.  
<https://doi.org/10.1016/j.prevetmed.2022.105772>

Storey N; CAWTHRAW S; TURNER O; Rambaldi M; LEMMA F; HORTON R; RANDALL L; DUGGETT NA; ABUOUN M; MARTELLI F; ANJUM MF (2022)

*Use of genomics to explore AMR persistence in an outdoor pig farm with low antimicrobial usage. Microbial Genomics* 8 (3) 000782.

Wales A; TAYLOR E; DAVIES R (2022) *Review of food grade disinfectants that are permitted for use in egg packing centres. World's Poultry Science Journal* 78 (1) 231-260.

Alikhan N-F; Moreno LZ; Castellanos LR; Chattaway MA; McLauchlin J; Lodge M; O'Grady J; Zamudio R; Doughty E; PETROVSKA L; Cunha MPV; Knobl T; Moreno AM; Mather AE (2022) *Dynamics of Salmonella enterica and antimicrobial resistance in the Brazilian poultry industry and global impacts on public health. Plos Genetics* 18 (6) e1010174.

GOSLING R; OASTLER C; NICHOLS C; Jackson G; Wales A; DAVIES RH (2022) *Investigations into Salmonella contamination in feed mills producing rations for the broiler industry in Great Britain. Veterinary Sciences* 9 (7) 307.

OASTLER CE; NICHOLS C; NEWTON K; CAWTHRAW S; GOSLING RJ; MARTELLI F; Wales AD; DAVIES RH (2022) *Observations on the distribution and control of Salmonella in commercial broiler hatcheries in Great Britain. Zoonoses and Public Health* 69 (5) 487-498.

Mellor K C; Blackwell G A; CAWTHRAW S A; MENSAH N E; Reid S W J; Thomson N R; PETROVSKA L; Mather A E (2022) *Contrasting long-term dynamics of antimicrobial resistance and virulence plasmids in Salmonella typhimurium from animals. Microbial Genomics* 8 (8) 000826.

Oliver J Charity; Luke Acton; Matt Bawn; Eleonora Tassinari; Gaetan Thilliez; Marie A Chattaway; Timothy J Dallman; LILJANA PETROVSKA; Robert A Kingsley *Increased phage resistance through lysogenic conversion accompanying emergence of monophasic Salmonella Typhimurium ST34 pandemic strain Microbial Genomics Manuscript number: MGEN-D-22-00152R1*

Perrin-Guyomard A; Granier S A; Slettemeas J S; ANJUM M; RANDALL L; ABUOUN M; Pauly N; Irrgang A; Hammerl J A; Kjeldgaard J S; Hammerum A; Franco A; Skarzynska M; Kaminska E; Wasyl D; Dierikx C; Borjesson S; Geurts Y; Haenni M; Veldman K (2022) *Multicentre evaluation of a selective isolation protocol for detection of mcr-positive E. coli and Salmonella spp. in food-producing animals and meat. Letters in Applied Microbiology* 75 (2) 224-233.

Chutikarn Sukjoi, Songphon Buddhasiri, Arishabhas Tantibhadrasapa, Thattawan Kaewsakhorn, Preeda Phothaworn, Janet Yakubu Nale, ANGELA V LOPEZ-GARCIA, MANAL ABUOUN, MUNA ANJUM, Danish Javed Malik, Edouard Galyov, Martha Rebecca Jane Clokie, Sunee Korbsrisate, Parameth Thiennimitr (2022) *Therapeutic Effects of Oral Administration of Lytic Salmonella Phages in a Mouse Model of Non-Typhoidal Salmonellosis Front. Microbiol., 10 October 2022 Sec. Food Microbiology*

Jones H; Gilson D; GOSLING R J; OASTLER C; DAVIES R H; Smith R P (2022) *The effectiveness of short-duration in-feed organic acid use in finisher pigs for Salmonella control at slaughter. Preventive Veterinary Medicine* 209, 105772.

Montagnin C; CAWTHRAW S; RING I; Ostanello F; Smith R P; DAVIES R; MARTELLI F (2022) *Efficacy of five disinfectant products commonly used in pig herds against a panel of bacteria sensitive and resistant to selected antimicrobials. Animals* 12 (20) 2780.

Charity O J; Acton L; Bawn M; Tassinari E; Thilliez G; Chattaway M A; Dallman T J; PETROVSKA L; Kingsley R A (2022) *Increased phage*

resistance through lysogenic conversion accompanying emergence of monophasic *Salmonella* Typhimurium ST34 pandemic strain. *Microbial Genomics* 8 (11) 000897.

b) International conferences:

8

Ane M. Osland, Claire Oastler, Emma Brook, Becky Gosling, Mardjan Arvand, Anja Richter, Katharina Konrat, Basma Asal, Lene Vestby - Effect of Glutaraldehyde on biofilm-associated wild type *Salmonella* – EuroBiofilms2022 – poster presentation

C. Oastler; R. La Ragione; M. Chambers; R. Gosling; F. Martelli; R. Davies – Development of an in vitro model for studying biofilms in broiler drinking water systems - EuroBiofilms2022 – poster presentation

J. Guzinski, Y. Tang, E. Litrup T. Hald, and L. Petrovska - Improved machine learning model for source attribution of *Salmonella enterica* subsp. *enterica* serovar Typhimurium and monophasic variants, using whole genome MLST loci - , iS3 International Symposium *Salmonella and Salmonellosis* June 2022, St.Malo, France-oral presentation.

L. Petrovska, J. Guzinski, Y. Tang, J. Potter, A. Fishman, S. Evans and R. Davies- Validated and fully automated bioinformatics pipeline for molecular in silico typing of *Salmonella* using Whole Genome Sequencing (WGS) data of veterinary isolates- iS3 International Symposium *Salmonella and Salmonellosis* June 2022, St.Malo, France – poster presentation.

135 International Symposium on *Salmonella and Salmonellosis*, St Malo, France June '22 (poster presentations)

In vitro survival of live *Salmonella* Enteritidis and *S. Typhimurium* vaccine strains on matrices relevant to poultry house environments. SA Cawthraw, J. Tiwana, L. Chiverton, R. H. Davies and D. Mueller-Doblies.

Efficacy of biocidal feed additives in reducing *Salmonella* contamination of poultry feed. SA Cawthraw, T Huby and RH Davies

Enhancing cleaning and disinfection strategies to better control *Salmonella*. I. Ring, SA Cawthraw, R La Ragione, G Lo Iacono, RH Davies, F. Martelli.

c) National conferences:

2

J. Guzinski, J. Potter, Y. Tang, R. Davies, C. Teale and L. Petrovska - Geographical and temporal distribution of multidrug-resistant *Salmonella* *Infantis* in Europe and the Americas- Microbiology Society Annual Conference Belfast, 4-7 April 2022- poster presentation.

CEVA UK LAYER 2022 (1 day event organised by CEVA for the GB poultry industry). *Salmonella* in the layer industry. Is it still a problem and how do we detect an outbreak? Shaun Cawthraw

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

6

EFSA Panel on Biological Hazards (BIOHAZ); Koutsoumanis K; Allende A; Bolton D; Bover-Cid S; Chemaly M; DAVIES R; De Cesare A; Herman L; Hilbert F; Lindqvist R; Nauta M; Peixe L; Ru G; Simmons M; Skandamis P; Suffredini E; Bottari B; Cummins E; Ylivaino K; Guajardo IM; Ortiz-Pelaez A; Alvarez-Ordóñez A (2022) Inactivation of indicator microorganisms and biological hazards by standard and/or alternative processing methods in Category 2 and 3 animal by-products and derived products to be used as organic fertilisers and/or soil improvers. *EFSA Journal* 19 (12) e06932.

EFSA Panel on Biological Hazards (BIOHAZ); Koutsoumanis K; Allende A; Alvarez-Ordóñez A; Bolton D; Bover-Cid S; Chemaly M; DAVIES R; De Cesare A; Herman L; Hilbert F; Lindqvist R; Nauta M; Ru G; Simmons M; Skandamis P; Suffredini E; Arguello H; Berendonk T;

Cavaco LM; Gaze W; Schmitt H; Topp E; Guerra B; Liebana E; Stella P; Peixe L (2021) Role played by the environment in the emergence and spread of antimicrobial resistance (AMR) through the food chain. *EFSA Journal* 19 (6) e06651

EFSA Panel on Biological Hazards (BIOHAZ); Koutsoumanis K; Alvarez-Ordóñez A; Bolton D; Bover-Cid S; Chemaly M; DAVIES R; De Cesare A; Herman L; Hilbert F; Lindqvist R; Nauta M; Peixe L; Ru G; Simmons M; Skandamis P; Suffredini E; Castle L; Crotta M; Grob K; Milana MR; Petersen A; Sagues AXR; Silva FV; Barthelemy E; Christodoulidou A; Messens W; Allende A (2022) The efficacy and safety of high-pressure processing of food. *EFSA Journal* 20 (3) e07128

EFSA Panel on Biological Hazards (BIOHAZ); Koutsoumanis K; Allende A; Alvarez-Ordóñez A; Bolton D; Bover-Cid S; Chemaly M; DAVIES R; De Cesare A; Hilbert F; Lindqvist R; Nauta M; Peixe L; Ru G; Simmons M; Skandamis P; Suffredini E; Cocconcelli PS; Escamez PSF; Prieto-Maradona M; Querol A; Sijtsma L; Suarez JE; Sundh I; Vlak J; Barizzone F; Hempen M; Herman L (2021) Update of the list of QPS-recommended biological agents intentionally added to food or feed as notified to EFSA 14: suitability of taxonomic units notified to EFSA until March 2021. *EFSA Journal* 19 (7) e06689.

EFSA Panel on Biological Hazards (BIOHAZ); Koutsoumanis K; Allende A; Alvarez-Ordóñez A; Bolton D; Bover-Cid S; Chemaly M; DAVIES R; De Cesare A; Hilbert F; Lindqvist R; Nauta M; Peixe L; Ru G; Simmons M; Skandamis P; Suffredini E; Cocconcelli PS; Escamez PSF; Prieto-Maradona M; Querol A; Sijtsma L; Suarez JE; Sundh I; Vlak J; Barizzone F; Barizzone F; Hempen M; Herman L (2022) Update of the list of QPS-recommended biological agents intentionally added to food or feed as notified to EFSA 15: suitability of taxonomic units notified to EFSA until September 2021. *EFSA Journal* 20 (1) e07045.

The 2021 edition of *Salmonella in Animals and feed in GB: Salmonella in animals and feed in Great Britain* - GOV.UK ([www.gov.uk](http://www.gov.uk))

## TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOAHA 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)	
ISO17025:2017		17025 certificate.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Various Salmonella surveillance and diagnostic tests	UKAS ISO:17025:2017
Various serological and AMR tests	UKAS ISO:17025:2017
Various research methodologies	BV ISO9001:2015

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

Yes

APHA complies with HSE working standards (<https://www.hse.gov.uk/>) and all staff are committed to promote health and safety and comply with current regulations and internal procedures.

## 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. Are you a member of a network of WOA Reference Laboratories designated for the same pathogen?

No

25. Did you organise or participate in inter-laboratory proficiency tests with WOA Reference Laboratories designated for the same pathogen?

Yes

PURPOSE OF THE PROFICIENCY TESTS: 1	ROLE OF YOUR REFERENCE LABORATORY (ORGANISER/ PARTICIPANT)	NO. PARTICIPANTS	PARTICIPATING WOA REF. LABS/ ORGANISING WOA REF. LAB.
Assess laboratory capability to conduct isolation and identification of <i>Salmonella</i> species to help maintain accreditation. Animal and Plant Health Agency Vetqas PT scheme PT0087 <i>Salmonella</i> in Animal Feed	participant	19	UK
Assess laboratory capability to conduct isolation and identification of <i>Salmonella</i> species to help maintain accreditation. Animal and Plant Health Agency Vetqas PT scheme PT0088 <i>Salmonella</i> in Poultry	participant	153	UK, Canada, Germany, Republic of Korea
Assess laboratory capability to conduct isolation and identification of <i>Salmonella</i> species to help maintain accreditation. Animal and Plant Health Agency Vetqas PT scheme PT0090 Control of <i>Salmonella</i> in Poultry Order (run for Defra for UK labs only)	participant	21	UK
Assess laboratory capability to conduct isolation and identification of <i>Salmonella</i> species to help maintain	participant	40	UK, Germany



accreditation. Animal and Plant Health Agency Vetqas PT scheme PT0084 Salmonella serotyping and culture

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?

Yes

TITLE OF THE PROJECT OR CONTRACT	SCOPE	NAME(S) OF RELEVANT WOA REFERENCE LABORATORIES
BIOPIGEE	To obtain better knowledge on how to combat Salmonella and HEV in biofilms/surface microlayers by disinfection in pig farms, to help develop common biosecurity protocol	Germany
Discover	EJP: DiSCoVeR – Discovering the sources of Salmonella, Campylobacter, VTEC and antimicrobial resistance	Germany

## 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?

Yes

Purpose for inter-laboratory test comparisons <sup>1</sup>	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Region(s) of participating WOA Member Countries
Assess laboratory capability to conduct isolation and identification of Salmonella species to help maintain accreditation. Animal and Plant Health Agency Vetqas PT scheme PT0087 Salmonella in Animal Feed	participant	19	Europe
Assess laboratory capability to conduct isolation and identification of Salmonella species to help maintain accreditation. Animal and Plant Health Agency Vetqas PT scheme PT0088 Salmonella in Poultry	participant	153	America Asia and Pacific
Assess laboratory capability to conduct isolation and identification of Salmonella species to help maintain accreditation. Animal and Plant Health Agency Vetqas PT scheme PT0090 Control of Salmonella in Poultry Order (run for Defra for UK labs only)	participant	21	Europe
Assess laboratory capability to conduct isolation and identification of Salmonella species to help maintain accreditation. Animal and Plant Health Agency Vetqas PT scheme PT0084 Salmonella serotyping and	participant	40	Europe

culture

Salmonella detection and serotyping EU-RL ring  
trials,

participant

78

America  
Asia and Pacific

## ***TOR12: EXPERT CONSULTANTS***

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

No

29. Additional comments regarding your report:

No