



UK Health  
Security  
Agency

# 2023 to 2024 report of UK National Reference Laboratory for food microbiology

Activities for *Listeria monocytogenes*, coagulase-positive staphylococci, *Escherichia coli* (including STEC), *Campylobacter*, *Salmonella* and antimicrobial resistance

April 2023 to March 2024

# Contents

Executive summary .....	4
Abbreviation list.....	6
Introduction .....	8
Core Function 1. Secretariat services .....	11
Dissemination of information from international organisations .....	11
Production of NRL quarterly newsletters .....	12
Co-ordination of the 2023 OL User Day .....	13
2019 Audit: official laboratories' capabilities and requirements .....	14
2023 Audit: official laboratories' capabilities and requirements .....	14
Review content of the UK Food Examiner register .....	15
Liaise with APHA regarding mutual NRL activities ( <i>Campylobacter</i> , <i>Salmonella</i> and antimicrobial resistance).....	15
Liaise with CEFAS for overlapping NRL activities .....	15
Liaise with Campden BRI to discuss and implement challenge testing activities .....	16
Provide regular updates to Food Standards Agency .....	16
NRL web content.....	16
Core Function 2. Advice and representation within the UK and internationally .....	17
Provide impartial advice to FSA, OLs and other UK laboratories .....	17
Representation at relevant international meetings and preparing meeting reports.....	18
Attend training workshops at international organisations.....	19
Liaise with FSA concerning testing capabilities post EU Exit .....	20
Keep abreast of methodology developments .....	20
Participation in the BSI AW9 microbiology committee and other working groups.....	21
Core Function 3. Research and development, production of standard operating procedures, codes of practice and guidance documents .....	22
Update food methods archive on NRL webpage .....	22
Monitoring performance protocol to evaluate OLs.....	23
Report of multi-year OL performance in the EFL scheme .....	23
Core Function 4. Compliance assessment via audits and ring trials .....	24
OL participation in the European Food Microbiology Legislation Proficiency Testing Scheme ....	24
Participate as UK-NRL in EURL ring trials and other initiatives .....	29
Organise teams or classroom-based workshops for UK OLs .....	33

Organise a practical workshop for UK OLS.....	33
Core Function 5. Co-ordination within the UK of international initiatives .....	35
Support food aspect of the EU-wide AR monitoring (Decision EU 2020/1729) .....	35
Participate in EURL activities relating to whole genome sequencing .....	35
Core Function 6. Communication of results and data use.....	37
Core Function 7. Incident management .....	37
Discussion of specific areas.....	37
EU relations .....	37
Summary and forward look to proposed UKHSA NRL Activities, April 2024 to March 2025 .....	39
Core Function 1. Secretariat services.....	39
Core Function 2. Advice and representation within the UK and internationally .....	39
Core Function 3. Research and development, including production of standard operating procedures, codes of practice and guidance documents.....	40
Core Function 4. Compliance assessment via audits and ring trials.....	40
Core Function 5. Co-ordination within the UK of international initiatives .....	40
Core Function 6. Communication of results and data use .....	41
Core Function 7. Incident management.....	41
Annexe. Documents produced from NRL activities .....	45
About the UK Health Security Agency .....	48

## Executive summary

UK Health Security Agency (UKHSA) provides the service as the UK's National Reference Laboratory (NRL) for food microbiology for the Food Standards Agency (FSA) and Food Standards Scotland (FSS). This is to comply with the UK Statutory Instrument 2019 No. 665, which retained the Assimilated (EU) Law 2017/625 for Official Control Regulations (OCRs) for food safety. This annual report details the NRL's activities between April 2023 and March 2024 related to *Listeria monocytogenes*, coagulase-positive staphylococci, *Escherichia coli* (including Shiga toxin-producing *E. coli* (STEC)), *Campylobacter*, *Salmonella* and antimicrobial resistance (AMR).

The NRL continues to liaise with the European Union Reference Laboratories (EURLs) despite some restrictions post EU Exit and have maintained participation in offered EURL activities. In addition, the NRL regularly acquires information from other relevant organisations, to ensure the NRL is kept abreast of emerging issues, developments and research related to the 6 responsibilities. Information is disseminated to the Official Laboratory (OL) network, the FSA and other stakeholders via NRL quarterly newsletters and relevant EURL and EU information. The Annual User Day was held as a hybrid arrangement for OLs and other stakeholders, either in-person or via a Teams link. The [third OL audit report](#) has been completed and findings are published online. The fourth OL audit has commenced where all OLs have responded and analysis of the data is ongoing.

The UK NRL gave impartial advice to FSA, OLs and other stakeholders and liaised with FSA concerning UK laboratory capabilities, including responding to extensive queries. There has been a drop in the UK NRL being invited to the EURL meetings; however, the NRL attended 2 EURL meetings remotely, but only where the Proficiency Testing (PT) activity was covered. The NRL were invited to take part in some STEC EURL training, including WGS bioinformatic and detection of STEC in food. FSA requested the NRL to perform a literature review on 'AMR in *Listeria monocytogenes* and other *Listeria spp.* in food' and is being drafted. Other relevant webinars, seminars and training were attended by the NRL to keep abreast of methodology developments. The NRL has continued to be a member of the European Committee for Standardization (CEN) WG2 expert working group for the revision of the ISO TS 13136 (polymerase chain reaction (PCR) detection of Shiga toxin-producing *Escherichia coli*) and has been active in the British Standards Institute (BSI) AW9 food microbiology committee.

The NRL have changed the accessibility of the national methods on GOV.UK, and there are now [15 relevant methods](#) listed that can be provided upon request. In addition, the NRL performs impact assessments on relevant ISO standards and other reference methods to identify any significant changes that may impact on these methods.

The UK NRL supports OLs to participate in the European Food Microbiology Legislation (EFL) PT scheme. All 14 OLs registered to participate in at least one of the 4 distributions available from the 2023 to 2024 EFL scheme. However, the NRL started to see a drop in performance,

and consequently improved the trend and bias analysis of the EFL data and made active the 'Monitoring Performance Protocol'. A number of OLS were followed up and with NRL support, the NRL has now seen an overall improvement in OLS's submission of EFL results. The NRL will continue to monitor trends and bias of the EFL scheme. The NRL participated in 9 EURL PTs; one PT was cancelled, and performance was either satisfactory or good for 6 PTs. The UK NRL is awaiting performance evaluation results for the remaining 2 EURL PTs.

An STEC detection practical workshop was organised by the NRL and 9 delegates from 7 OLS attended. Held over 2 days with additional scope for others to attend the theoretical session, feedback indicated it was well-received and useful to OLS.

Details of the proposed NRL activities for 2024 to 2025, and a timeline to achieve these complete this report.

## Abbreviation list

Abbreviation	Meaning
AFBI	Agri-Food and Biosciences Institute (Northern Ireland)
APHA	Animal and Plant Health Agency
AR/AMR	antimicrobial resistance
BSI	British Standards Institute
BTOM	Border Target Operating Model
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CEN	European Committee for Standardization
CPS	coagulase-positive Staphylococci
Defra	Department for Environment, Food and Rural Affairs
ECDC	European Centre for Disease Prevention and Control
EFL	European Food Microbiology Legislation (scheme)
EFSA	European Food Safety Authority
EPIS	Epidemic Intelligence Information System
EQA	External Quality Assurance
EURL	European Union Reference Laboratory
FAO	(UN) Food and Agriculture Organization
FEPTU	Food and Environmental Proficiency Testing Unit
FSA	Food Standards Agency
FSS	Food Standards Scotland
FW&E	Food, Water and Environment
FWEMS	Food, Water and Environment Microbiology Service
GBRU	Gastrointestinal Bacteria Reference Unit
ISO	International Standards Organisation
MU	measurement uncertainty
NRL	National Reference Laboratory
OL	Official Laboratory (previously OCL, Official Control Laboratory)
OCR	Official Control Regulations
PCR	polymerase chain reaction
PT	proficiency test
SOP	standard operating procedure
STEC	Shiga toxin-producing <i>E. coli</i>

<b>Abbreviation</b>	<b>Meaning</b>
UKHSA	UK Health Security Agency
WGS	whole genome sequencing
WHO	World Health Organization

## Introduction

The UK's National Reference Laboratory (NRL) service for food microbiology has been provided by the UK Health Security Agency (UKHSA) from April 2023 to March 2024. This service is to comply with the Assimilated (EU) Law 2017/625 for Official Controls, which was transferred as a UK Statutory Instrument when the UK left the EU on 31 December 2020. Under a contract with the UK's Central Competent Authority for food microbiology, the Food Standards Agency (FSA), the NRL has specific responsibilities in the 6 following areas: *Listeria monocytogenes*, coagulase-positive staphylococci, *Escherichia coli* (including Shiga toxin-producing *Escherichia coli*, STEC), *Campylobacter*, *Salmonella* and antimicrobial resistance (AMR). UKHSA has been the NRL for these activities for FSA since 2011 and will continue for a further 3 years, until March 2027.

This report describes the secretariat services, advice and representation within the UK and internationally, research and development and production of documents, co-ordination and participation in audits, ring trials, the awareness of European Union Reference Laboratories (EURLs) initiatives, communication of results and data and incident management between April 2023 and March 2024. Table 1 lists the NRL core functions, and the activities described in this annual report.

**Table 1. UKHSA NRL Core Functions, April 2023 to March 2024**

Core function	Description
1	Secretariat services
1.a	Disseminate information or advice from international organisations to FSA, OLs and other UK laboratories in a timely and effective manner
1.a	Produce and circulate quarterly newsletters to FSA, OLs and other UK laboratories
1.a	Co-ordinate the OL User Day to update UK OLs and other relevant UK laboratories of the NRL core functions
1.b	Prepare and carry out an audit regarding the OL's capabilities and requirements
1.b	Review content of the UK Food Examiner Register
1.b	Continue liaison meetings with APHA for AMR, <i>Campylobacter</i> and <i>Salmonella</i>
1.c	Liaise with CEFAS for <i>E.coli</i> and <i>Salmonella</i> in shellfish activities
1.c	Liaise with Campden BRI to discuss and implement challenge testing activities
1.d	Provide regular updates to the FSA on NRL activities by producing monthly reports



<b>Core function</b>	<b>Description</b>
1.d	Produce and submit annual report to the FSA on NRL activities for 2023 to 2024
1.e	Arrange quarterly meetings with FSA and FSS
1.f	Maintain and update the NRL web content on the UKHSA website
2	Advice and representation within the UK and internationally
2.a	Provide impartial expert advice to FSA, OLs and other UK laboratories, upon request
2.b	Represent the UK at relevant international meetings and working groups; consult FSA prior to meetings and submit an internal report after attendance of meetings
2.c	Attend training workshop at international organisations, where relevant and after successful applications
2.d	Liaise with FSA in matters concerning testing capabilities post EU Exit
2.e	Keep abreast of methodology developments and advise FSA and OLs (for example, Service Level Agreement for CPS toxin testing)
2.g	Participate in the BSI AW9 microbiology committee
2.g	Participate in Working Group to revise the ISO/TS 13136:2012 (PCR detection of STEC) and other working groups where appropriate
3	Research and development, including production of standard operating procedures, codes of practice and guidance documents
3.a	Update food methods archive on NRL website
3.a	Produce a poor performance protocol for OL participation in the EFL proficiency test scheme
3.a	Draft a manuscript for peer-review summarising multiple-year of OL performance of the EFL PT scheme
4	Compliance assessment via audits and ring trials
4.a	Ensure consistency and quality of testing approach applied by UK OLs and support where necessary
4.b	Liaise with FEPTU and monitor OL's comparative testing performance and assist OLs in the implementation of corrective measures
4.b	Evaluate OL's performance using trend analysis and report appropriately to the FSA
4.c	Co-ordinate the participation of OLs in international method validation studies and other initiatives and report to FSA

<b>Core function</b>	<b>Description</b>
4.d	Participate as UK-NRL in proficiency tests and method validation studies organised by the EURL (where available) and report to FSA
4.e	Organise Teams or classroom-based workshops for UK OLs, dependent on the 2019 audit (1.b) and OL needs
4.e	Organise a practical workshop for UK OLs, dependent on the 2019 audit (1.b) and OL needs
5	Co-ordination within the UK of international initiatives
5.a	Support the food aspect of the EU-wide AR monitoring (Decision (EU) 2020/1729), liaising with FSA, OLs, relevant Reference Laboratories and APHA.
5.a	Provide information regarding Whole Genome Sequencing when requested from the EURLs, and participate in any related workshops, proficiency testing, training and guidance documentation, where necessary
5.a	Participate in training opportunities provided by international organisations
6	Communication of results and data use
6	Communicate with FSA of results and data use, when required
7	Incident management
7	Perform defined work when requested by FSA for incident management, with joint agreement and where appropriate

## Core Function 1. Secretariat services

### Dissemination of information from international organisations

Information related to the NRL activities are sourced from the 6 EURLs and other international organisations, such as the EU Commission, World Health Organization, CODEX, European Food Safety Authority (EFSA) and European Centre for Disease Prevention and Control (ECDC), either via direct communication or through frequent monitoring of their websites. These are then cascaded to the appropriate personnel and stakeholders, for example, OLs, FSA, FSS, UKHSA Epidemiology and Reference Units, Scottish Reference Laboratories, Animal and Plant Health Agency (APHA), Agri-Food and Biosciences Institute (AFBI) and Centre for Environment, Fisheries and Aquaculture Science (CEFAS), with any additional information or advice on further steps to be taken. These communications are summarised below by work activity, with links to the EURLs' websites in the [Annexe](#). Information concerning meetings, training, proficiency tests (PTs) and ISO standards are incorporated into the relevant sections of this report. The *E. coli* and AMR EURLs' work programmes have been communicated, whilst the other 4 EURLs have not been available.

In addition, the NRL receives the FSA stakeholder updates, FSA Smarter Communications and PATH-SAFE newsletters, where information, such as import control data, consultations on legislation and research and development reports, is received and, where relevant, disseminated to other colleagues. The NRL also attended stakeholder calls for the Border Target Operating Model (BTOM) in April and August 2023 and disseminated regular updates regarding this to OLs throughout the year. The UKHSA Health Protection Report is also received monthly and relevant information is cascaded to OLs and relevant NRL colleagues.

#### General information disseminated

The NRL received 5 CODEX newsletters from DEFRA in this reporting year, which were reviewed and circulated to relevant colleagues where necessary. To note, papers of interest include the Guidelines for the control of Shiga toxin-producing *E. coli* in raw beef, fresh leafy vegetables, raw milk and raw milk cheeses, and sprouts; and 'Guidelines for the safe use and re-use of water in food production'. New work was also approved by CODEX to revise 'Guidelines for the Control of *Campylobacter* and *Salmonella* in chicken meat' and 'Guidelines on the application of general principles of food hygiene to the control of *Listeria monocytogenes* in foods'.

A meeting report from FAO and WHO entitled 'Prevention and control of microbiological hazards in fresh fruits and vegetables – Part 3: Sprout' was circulated to the OLs in January 2024.

## STEC/*E.coli*

The EURL shared a notification concerning a EHEC O26 alert in raw fermented milk in France in May 2023 and this was distributed to relevant UK colleagues. In December 2023, the EURL sent an overview of the planned activities for 2024, which the NRL logged.

## *Campylobacter*

In May 2023, the EURL notified all NRLs of a possible multi-national outbreak of *C. jejuni* ST-464 and requested information from European countries on sequence and meta-data of any ST-464 strains from 2020 onwards for investigation. The NRL forwarded this to relevant colleagues, and a summary report was produced by the EURL in November 2023.

The UK NRL updated contact details on the EURL website at the request of the EURL.

## *Salmonella*

The EURL sent 4 quarterly newsletters by email, informing NRLs of their activities, such as workshop preparation, working group participation, proficiency tests, and literature searches of relevant *Salmonella* scientific papers. These were forwarded to the FSA, the OLs and other relevant laboratories in the UK. The EURL newsletters can be found in the [Annexe](#).

## Antimicrobial resistance

The EURL's planned activities for 2023 to 2024 were received in May 2023, which were logged by the NRL. In August 2023, the NRL received a product warning from the EURL regarding contamination in Sensititre broth and this was forwarded on to relevant colleagues using this product. Three new publications were distributed by the EURL; validation of laboratory procedures for ESBL-, AmpC- and carbapenemase-producing *E. coli* surveillance, the 2020 genomic PT data and EURLs supporting NRLs to roll out WGS.

In December 2023, the EURL sent their annual newsletter (see [Annexe](#)), which included the EC's latest AMR recommendations, an AMR baseline study in aquaculture animals and the CarbaCamp project which aims to provide an overview of *Campylobacter* EU wildtype distribution and help identify ECOFF values for carbapenemase.

Related to core functions: 1.a, 1.c, 2.d, 2.e, 2.f.

## Production of NRL quarterly newsletters

The NRL also disseminates information to OLs and other stakeholders using quarterly newsletters, which detail NRL activities and aspects of food microbiology that may affect them. The newsletters' main contents are summarised below and these are available in the [Annexe](#):

1. June 2023 included the new NRL contract with FSA, the BTOM, the EFL FEPTU PT scheme and a brief document update.
2. September 2023 comprised the NRL User Day, the BTOM, the Science meets Policy conference and practical learning resources.
3. December 2023 described the forthcoming 2023 OL capability audit and the PCR detection of STEC workshop, an STEC public health update, the EU One Health 2022 Zoonotic report summary, the Monitoring Performance protocol for the European Food Law (EFL) proficiency testing scheme and a document update.
4. March 2024 reported on the NRLs' PCR detection of STEC workshop, preliminary results of the 2023 OL audit, a document and methods update and useful dates for the calendar.

Related to core functions: 1.a, 2.d, 2.e, 2.f

## Co-ordination of the 2023 OL User Day

On 11 September 2023, the NRL held their 11th User Day as a hybrid event using Microsoft Teams. The event comprised a full day programme (see [Annexe](#)), starting off with welcomes and a look back to what activities were performed by the NRL over the past year. The meeting included presentations from the FSA, the 2021 EU One Health Zoonotic report and EURL activities and the 2022 to 2023 EFL proficiency testing scheme summary. Three other talks focused on antimicrobial resistance (AR) in food and animals and the work currently performed in the UK, describing the tools employed to investigate AR in food pathogens.

Over 40 delegates attended from 11 OLs, UKHSA's Gastrointestinal Bacteria Reference Unit (GBRU), and Food and Environmental Proficiency Testing Unit (FEPTU), FSA and FSS, Centre for Environment Fisheries and Aquaculture Science (CEFAS), and Animal and Plant Health Agency (APHA).

A feedback form was sent to attendees to help ensure the User Day is appropriate and to identify whether improvements could be made. Most found the content, slides, speakers and length of meeting was very good or excellent, with an overall rating at or above very good from 77% of respondents. All respondents reported they would recommend the User Day to their colleagues and some stated that they would like it to return as a face-to-face meeting. Other suggested improvements include a presentation from an OL and a review of a reference method. Presentations were also distributed and are available on request.

Related to core functions: 1.a, 1.b, 1.c, 2.a, 2.d, 2.e, 2.f, 6.l

## 2019 Audit: official laboratories' capabilities and requirements

Since 2013, OL capability audits have helped identify training and educational gaps, which the NRL has addressed and organised training and other resources for the OLs. A third audit was undertaken in 2019 to ascertain the official laboratories' capabilities in England, Scotland, Wales and Northern Ireland. Questions focused on the microbiological testing for food and whether the OLs required further support from the NRL; additional questions were sent in 2022 to evaluate which OL services changed during the COVID-19 pandemic and after EU exit, and how the OLs resolved any issues in disruption to their laboratory activities.

The [audit findings](#) were published as a report in July 2023 on the NRL page.

Related to core functions: 1.b, 2.d, 2.e, 4.g.

## 2023 Audit: official laboratories' capabilities and requirements

As part of the new contract with FSA and to continue to monitor and support the UK OLs' capabilities, the NRL launched a fourth audit in November 2023 to all UK OLs. As for previous audits, the NRL used SelectSurvey to gather the OL's responses and the questions were similar to previous audits, to directly compare past responses and evaluate change. Preliminary analysis has revealed the following:

- all 14 OLs responded; 6 in England, 4 in Scotland, 3 in Wales and 1 in Northern Ireland
- testing is performed for local government (by 93% of responding OLs), port health authorities (64%), Food Business Operators (FBOs) (100%), surveillance purposes (86%) and for other purposes (29%)
- there are between zero and 7 food examiners in each OL
- the one OL that doesn't have a Food Examiner does have public analysts to supervise microbiological testing
- 7 OLs perform challenge or shelf-life testing for FBOs or other customers, which remains the same since the 2019 audit
- 2 OLs can test for AMR bacteria
- most OLs want to introduce real-time PCR to their testing repertoire:
  - examples include screening from enrichment broths for the presence of pathogens
- 13 OLs perform trend analysis on their PT or IQA enumeration results to monitor trends and bias

A full analysis of the audit is being performed and results are expected to be published later in 2024.

Related to core functions: 1.b, 2.d, 2.e, 4.g.

## Review content of the UK Food Examiner register

Since 2014, a Food Examiner register has been established and maintained by the NRL to assist FSA to rapidly contact the OLs for appropriate local support with incidents and investigations. As part of the 2023 OL capability audit, the relevant information was requested from the OLs in November 2023. The register was then updated, and this is performed annually to reflect the current number and distribution of FEs in the UK. Compared to 2022, there has been a decline in FEs, down from 49 to 40 in 2023. This is largely due to the acknowledgement of Public Analysts not holding FE status but acting as a FE when overseeing Official Controls for microbiological testing.

Related to core functions: 1.b, 4.g.

## Liaise with APHA regarding mutual NRL activities (*Campylobacter*, *Salmonella* and antimicrobial resistance)

The responsibilities for *Salmonella*, *Campylobacter* and antimicrobial resistance (AMR) are mutual activities for the UK NRL for Food Microbiology (UKHSA) and the UK NRL for animal microbiology (APHA). Therefore, regular liaison meetings are held to help strengthen relations, and activities organised by the EURLs have been discussed and agreed upon. EU Exit has impacted on these mutual activities and therefore participation in these meetings has expanded to include AFBI for Northern Ireland. Twice yearly meetings were held remotely in May and November 2023.

Related to core functions: 1.b, 4.c, 5.a.

## Liaise with CEFAS for overlapping NRL activities

CEFAS became the UK NRL for foodborne viruses and bacteriological contaminants of shellfish in January 2019 and liaises with the *E. coli* and *Salmonella* EURLs. They share mutual activities with the UKHSA and APHA NRLs, especially related to PT participation and meeting attendance. Liaison meetings between CEFAS and UKHSA colleagues are held regularly to share information and collaborate.

Related to core functions: 1.a, 1.c, 4.c, 5.a.

## Liaise with Campden BRI to discuss and implement challenge testing activities

Campden BRI are active on working groups for relevant ISO Standards as experts in a wide variety of challenge testing approaches. Therefore, yearly meetings are arranged and in May 2023, a Teams meeting was held, where the ISO Standard 20976 series on challenge tests in food was discussed, along with EURL documents on shelf-life determination, participation in PTs and other relevant guidance. Since the UK left the EU, Campden BRI have been unable to attend the *Listeria* EURL working group meetings but have participated in the challenge testing proficiency test schemes offered by the EURL.

Related to core functions: 1.c, 2.e, 4.c, 5.a.

## Provide regular updates to Food Standards Agency

Quarterly meetings were held between NRL representatives and FSA colleagues via Microsoft Teams (8 June 2023, 26 September 2023, 11 December 2023, 7 March 2024) to discuss progress made, difficulties met, and future or new activities (see [Annexe](#) for minutes). In addition, monthly reports listing NRL activities have been submitted electronically to the FSA (see [Annexe](#)). A comprehensive annual report published on the NRL page of the GOV.UK website (this report) provides a summary of all the NRL activities within the 12-month period.

Related to core function 1.d, 6.a, 6.d, 6.k.

## NRL web content

There is unrestricted access to [NRL annual reports](#) and completed OL audits on the GOV.UK website. [General information about the NRL](#), expert witness information and contact details are also on the web page. The NRL changed the accessibility of the UKHSA standard methods in November 2023, and these are now presented as a list on the website. The NRL can be contacted by OLs and other relevant laboratories to obtain these methods when required and this change will enable the NRL to understand the users' needs and provide the most current versions available. The NRL has received 4 separate requests for 11 methods and has sent them to the requestor within 5 days of receipt.

For ease of access, OLs and other stakeholders are advised to use a search engine and type 'fwe nrl', as the NRL web page is normally the top search result.

Related to core functions: 1.a, 1.f, 3.a.



## Core Function 2. Advice and representation within the UK and internationally

### Provide impartial advice to FSA, OLs and other UK laboratories

The NRL receives requests for expert advice from stakeholders ranging from small business organisations to FSA and European institutes. Requests received between April 2023 and March 2024 are categorised below:

#### General

- a query from a health protection team regarding *Clostridium* spp result from meat, which the NRL passed to relevant colleagues
- a EURAMET survey, capturing the priority analytical areas to support food safety and sustainability, for which the NRL submitted a response
- queries from OLs regarding the publication of the RTE guidelines
- 3 requests from FBOs for either shelf-life and/or nutritional value testing, which the NRL advised to contact their local authority
- A local authority requesting sampling advice, which was forwarded to the most appropriate OL
- an OL seeking advice on the use of PCR assays for which a response was provided by the project lead
- 6 requests to microbiologically test food or water, which were forwarded to the relevant laboratories
- an OL enquiry into the Food Examiner assessment process, which the NRL provided advice on
- a request for a method from a member of the public which became a Freedom of Information enquiry and was responded to indirectly by the NRL
- a request from Ethiopia to collaborate on MDR *E. coli* from animals and the environment, which was forward to APHA, as the most relevant institution to collaborate
- inquiry regarding a career opportunity from a BSc graduate from Nigeria, for which the NRL passed on details to relevant colleagues
- shipping advice given to a reference laboratory at UKHSA
- query regarding Measurement Uncertainty (MU) in water was received from an OL
- requests for National methods from food laboratories in St Helena and the Falkland Islands, and from a PhD student studying alternative growing media
- FSA correspondence regarding:
  - ideas for R&D projects for method development from the Scientific Sampling and Laboratory Policy team
  - testing for *E. coli* in unwashed micro greens

- the feasibility of adapting AMR methods to different food matrices
- testing *Vibrio* in imported seafood
- increasing the sample size to test minced meat for *Salmonella*
- norovirus clinical samples related to a specific food source
- detection of STEC using alternative method
- to attend and present at the 2024 Food and Feed Laboratory workshop
- commenting on the draft National Monitoring Plan for POAO and FNAO for 2024 to 2025
- a post-implementation review of the 2013 Sampling and Qualifications (England) Regulations
- clarification on work for national monitoring programs for meat and meat products

## *Listeria*

- queries from health protection teams regarding *Listeria* results, which the NRL passed to relevant colleagues

## *Salmonella*

- 2 laboratories requesting to send a *Salmonella* isolate for typing, for which the NRL provided advice
- an OL querying a *Salmonella* typing result, which the NRL passed to reference laboratory colleagues

Related to core functions: 2.a, 2.d.

# Representation at relevant international meetings and preparing meeting reports

The UK NRL has continued to experience restrictions concerning attendance to EURL meetings since leaving the EU. EURLs are only permitted to allow the UK to participate in proficiency testing aspects of their function. This meant the EURLs, at their discretion, could allow the UK NRL to attend only the PT sections of the network annual meetings. Therefore, the UK NRL was only able to remotely attend the antimicrobial resistance and *Escherichia coli* (incl. STEC) EURL meetings. There has been a drop in UK invitation; however, the UK NRL has produced reports for the *Salmonella* and *Campylobacter* meetings, as presentations have been made available on the EURL websites (see Table 2). Some EURLs also produce a meeting report, and these are in the [Annexe](#). Presentations from the *Listeria* and coagulase positive staphylococci EURL meetings are held on restricted access webpages, which the UK NRL is no longer able to access.

Where available, agendas for the meetings were forwarded to the FSA as they were received (see [Annexe](#)). Notes were consolidated from attendance and individual meeting reports were submitted to FSA and relevant expert colleagues (see [Annexe](#)).

**Table 2. List of international meetings, April 2023 to March 2024**

EURL Meeting	Date from	Date to	Location	Attendance
<i>Salmonella</i>	22 May 2023	23 May 2023	Virtual	Unable to attend
Antimicrobial resistance	23 May 2023	24 May 2023	Virtual	Attended
<i>Campylobacter</i>	26 September 2023	27 September 2023	Sigtuna, Sweden and virtual	Unable to attend
<i>E. coli</i>	5 October 2023	6 October 2023	Rome, Italy and virtual	Attended
Coagulase-positive staphylococci	24 October 2023	26 October 2023	Paris, France	Unable to attend
<i>Listeria monocytogenes</i>	4 December 2023	6 December 2023	Paris, France	Unable to attend

Related to core functions: 1.a, 2.b.

## Attend training workshops at international organisations

The UK NRL was invited by the STEC EURL in early 2023 to submit Expressions of Interest for training sessions offered in 2023. The NRL submitted 4 applications, and all were accepted by the EURL.

One applicant attended a two-day online course on 'Bioinformatics for NGS data mining for typing pathogenic *E. coli*' in July 2023 and their feedback was very positive, with knowledge and practical experience gained in some of the bioinformatic tools the EURL use to analyse WGS data. An awareness of which quality parameters to consider was also gained and this will be brought to any future WGS analyses performed.

Three participants attended the 5-day 'Detection of STEC in food matrices according to the ISO TS 13136:2012 and the characterization of the isolated STEC strains' training in Rome, Italy at the STEC EURL in November 2023. They experienced the whole procedure, from using spiked food (rocket) samples to subtyping *stx* genes and found it a "great learning experience" from experienced EURL staff who had a good understanding of STEC and the virulence factors. Applicants reported that they would recommend the courses they attended. In February 2024, the EURL circulated an Expression of Interest request for training in 2024. The NRL submitted 2

applications, and both were accepted by the EURL: one to attend training on the detection of STEC in food matrices in April 2024 and the other to attend a session on characterisation of the different groups of pathogenic *E. coli* in September 2024.

Related to core functions: 2.c, 2.e, 5.a.

## Liaise with FSA concerning testing capabilities post EU exit

Correspondence concerning testing capabilities, including method development queries and commenting on the National Monitoring Plan was mentioned above, under 'Provide impartial advice to FSA, OLs and other UK laboratories. Provisional results from the 2023 audit were also shared and discussed with FSA, which included testing capabilities (under '2023 Audit: official laboratories' capabilities and requirements').

Related to core functions: 2.d.

## Keep abreast of methodology developments

The NRL has been involved with the production of FW&E methods, training and quality working groups to advise, support and facilitate relevant implementation from international method changes and training events. The NRL participation in international meetings, proficiency trials and external working groups equips the team with information to keep abreast of methodology. In addition, the NRL has advised on improvements to the design of the European Food Legislation (EFL) proficiency scheme based on a continual assessment of OL performance data.

International organisations' websites, such as the EURLs, CODEX and ISO are reviewed periodically for any new methods or developments, and these are shared to relevant colleagues to evaluate whether they should be integrated into the UK microbiology testing portfolio.

The FSA requested the NRL to perform a literature review on 'AMR in *Listeria monocytogenes* and other *Listeria spp.* in food' in January 2023. An initial literature search and draft of the review was produced by the NRL, and further clarifications were made by the FSA for scope and inclusion criteria. A final draft is underway.

External webinars were attended by the NRL to gain further knowledge of emerging issues and developments for food microbiology. This included 'Proficiency Tests on Next Generation Sequencing: approaches in use at the EURLs' in September 2023, where 5 EURLs presented how they organise PTs for WGS to their NRL networks, and it was noted that there were differences, but these are dependent on the organism investigated, the comparison typing method used and the ability to harmonise across the networks.

Another webinar to note was 'Listeria – where are we?' which was organised by experts from South Africa and was held in February 2024. Topics included managing *Listeria* in the food production environment, *L. monocytogenes* genetic diversity from the fish industry and the proposed change of the EU microbiological criteria Regulation, EC 2073/2005. Individual reports of these 2 events were prepared and can be found in the [Annexe](#).

Related to core functions: 2.e, 2.f.

## Participation in the BSI AW9 microbiology committee and other working groups

The BSI AW9 committee arranged 2 meetings in the reporting period, in May and October 2023, which the UK NRL attended remotely. The related ISO Standards' status were reviewed at these meetings. Draft and final draft ISOs (for example, NP, DIS and FDIS) are obtained by the NRL representative from the BSI AW9 portal throughout the year. Consequently, the NRL submitted comments for the following draft standards:

- ISO 6579-4 (Identification of monophasic *Salmonella* Typhimurium by PCR)
- ISO 6887-1 amendment (use of larger portion size)
- ISO 16140-4 amendment (single-laboratory validation of identification methods)
- ISO 7218 (General requirements for microbiological examinations)

In addition, there was a call for data concerning matrices routinely analysed with ISO 10272-2 (*Campylobacter* enumeration) in December and the NRL responded by the February deadline with data.

A representative of the UK NRL is an active member of the CEN/TC 463/WG2 expert working group for the revision of the ISO TS 13136 standard (PCR detection of Shiga toxin-producing *Escherichia coli*) and participated in meetings in August and October 2023.

Related to core functions: 2.e, 2.f, 2.g.

## Core Function 3. Research and development, production of standard operating procedures, codes of practice and guidance documents

### Update food methods archive on NRL webpage

As reported above, in 'NRL web content', the accessibility of the Standard Methods has changed. There is now a list of the methods and guidance documents along with NRL contact details for individuals to request the documents. This allows audit of the methods and ensures the most up-to-date versions are given. The list of methods and guidance have expanded from 11 to 15 and are in Table 3. These methods are based on UKHSA in-house procedures and ISO standards and assist OLs to comply with the requirements of the EU Microbiological Criteria Regulations, which has been assimilated into UK legislation. In addition, other UKHSA standard operating procedures (SOPs) are available to OLs upon request.

**Table 3. List of standard methods archived on the NRL website, March 2024**

Document number	Title
FNES63	Determination of pH in food and water samples
FNES67	Determination of water activity in food
FNES8 [F12]	Enumeration of coagulase positive staphylococci ( <i>Staphylococcus aureus</i> and other species)
FNES26 [F2]	Preparation of samples and dilutions, plating and sub-culture
FNES3 [F8]	Enumeration of $\beta$ -glucuronidase positive <i>Escherichia coli</i> : Pour plate method
FNES22 [F19]	Detection and enumeration of <i>Listeria monocytogenes</i> and other <i>Listeria</i> species
FNES131	Enumeration of $\beta$ -glucuronidase positive <i>Escherichia coli</i> – TEMPO most probable number technique
FNES16 [F13]	Detection of <i>Salmonella</i> species
FNES15 [F21]	Detection and enumeration of <i>Campylobacter</i> species
FNES4 [E1]	Detection and enumeration of bacteria in swabs and other environmental samples
FNES18 [Q4]	Guidance on Public Health response: involvement of UKHSA Food Water and Environmental Microbiology laboratory staff in the investigation of outbreaks of food or waterborne disease

Document number	Title
FNES61	Verification and validation of methods
FNES66	Measurement of uncertainty in testing
FNES144	Detection and isolation of Shiga toxin-producing <i>E. coli</i>
FNES45	Preparation of positive control DNA for use in real-time PCR assays for foodborne pathogens

The UK NRL is responsible for the authorship and review of 2 general methods for the Food, Water and Environment Microbiology Service (FWEMS); Verification and Validation of Methods (FNES61) and Measurement Uncertainty in Testing (FNES66). In addition, the NRL reviews the above methods and other relevant FWEMS methods and external documents when they are being updated. Furthermore, 2 impact assessments were performed by the NRL on ISO 6888-1 and 2:2021 +A1:2023 (enumeration of coagulase-positive staphylococci) and ISO 16654:2001+A2:2023 (performance testing of media for detection of *E. coli* O157) alongside previous editions of the respective ISO Standards and the FWEMS methods, to identify whether any significant changes were necessary to UKHSA SOPs; there were no major impacts identified through either of the impact assessments.

Related to core functions: 1.a, 1.e, 3.a, 4.a.

## Monitoring performance protocol to evaluate OLs

As required under the Official Control Regulations (EU 2017/625, Article 101, 1(c)), the NRL is to monitor the OLs' PT performance and ensure appropriate follow-up is carried out. To ensure a consistent approach is followed, a 'Poor Performance' Protocol was drafted and sent to all OLs and FSA in September 2023. This included the types of incorrect results or deviations that participants may generate using the EFL PT scheme, and the staged processes and actions that the NRL would do to support the OL through these anomalous results.

After consulting the OLs and FSA, a redraft of the protocol was performed and was circulated to OLs and FSA in January 2024 as the 'Monitoring Performance Protocol'.

Related to core functions: 2.a, 2.d, 3.a, 4.a, 4.b.

## Report of multi-year OL performance in the EFL scheme

This activity has been delayed due to other work priorities and NRL staff changes (see 'Discussion of specific areas' in this report).

Related to core functions: 3.a, 4.b.



## Core Function 4. Compliance assessment via audits and ring trials

### OL participation in the European Food Microbiology Legislation Proficiency Testing Scheme

The NRL is required by the Assimilated (EU) Law 2017/625 to organise and assess performance of official laboratories through relevant comparative testing such as interlaboratory studies. The European Food Microbiology Legislation (EFL) External Quality Assessment Scheme is provided by the UKHSA Food and Environmental Proficiency Testing Unit (FEPTU) and is based on the requirements of Commission Regulation (EC) 2073/2005 (as amended) for the microbiological criteria for foodstuffs. The scheme enables a performance assessment to be made for the identification and examination of appropriate microbiological parameters and interpretation of microbiological results for samples tested against these legislative criteria. A full scheme comprises 12 coded samples from 4 distributions based on food categories within the regulation and results are submitted on a web-based form. Further details on the [food legislation scheme](#) can be found on GOV.UK.

The NRL supports OL participation of this scheme, which allows direct performance comparison across the OL network, whilst acting independently from the scheme organisers. Results are anonymised, and reports do not disclose the identity of any laboratory. However, the NRL does monitor the performance of each laboratory (see [Annexe](#) for distribution reports) and invite laboratories to seek assistance from the NRL when experiencing difficulties.

#### 2023 to 2024 EFL Scheme analysis

In February 2023, the UK OLs for food microbiology were invited to register for the 2023 to 2024 EFL scheme. The NRL received registrations from all 14 OLs to receive samples for at least one distribution, with 13 laboratories registering to receive all 4 distributions, and participation has increased since 2020. This year is the first time that the NRL has observed the participation in the EFL scheme by all 14 OLs. Table 4 summarises the samples for 2023 to 2024 and the performance of laboratories that carried out the examinations.

Simulated food samples with a product description were distributed between July 2023 and January 2024 and participating OLs decided which food category(ies) from the process hygiene and food safety criteria the food is tested under, resulting in a score. Scores for the EFL scheme are also based on examination required, number of samples from a batch required for compliance, microbiological results and conclusion. Laboratories are awarded marks where entries are made and can achieve a maximum of 8 marks. Analysis has revealed the average laboratory score from the submitting OLs for each distribution to be 79.4%, 86.6%, 86.5% and 76.5% respectively. Therefore, for all distributions in the reporting period, the average performance was above the 70% threshold that the NRL and FEPTU have for follow-up action.



**Table 4. Overview of performance of the 2023 to 2024 European Food Microbiology Legislation Scheme**

Sample code	Brief sample details	Required examinations	OLs achieving >70% of the maximum possible score [note 1]
<b>Distribution EFL63 Meat foods</b>			
EFL187	Vacuum packed beef tartare made with mixed with spices, sampled from the fridge of a local delicatessen.	<i>L. monocytogenes</i> enumeration <i>Salmonella</i> spp.	9/11 10/11
EFL188	Lamb minced meat sampled at the end of the manufacturing process.	Aerobic colony count <i>Escherichia coli</i> enumeration	10/11 10/11
EFL189	Uncooked sausages made from pork and herb seasoning, sampled at shelf-life (at market).	<i>Salmonella</i> spp.	11/11
<b>Distribution EFL64 Dairy foods</b>			
EFL190	Cream made from raw cows' milk that has undergone thermisation. Sampled whilst product on the market.	<i>L. monocytogenes</i> enumeration <i>Salmonella</i> spp.	13/13 13/13
EFL191	Roquefort cheese made from unpasteurised raw sheep milk, sampled during the ripening process at the food producer's premises.	<i>L. monocytogenes</i> detection Coagulase-positive staphylococci	12/13 11/13
EFL192	Ready to eat omelette, sampled at the end of the manufacturing process.	<i>L. monocytogenes</i> detection <i>Enterobacteriaceae</i>	11/13 12/13
<b>Distribution EFL65 Ready-to-Eat foods</b>			
EFL193	Liquid food intended for weight control in hospital patients but also available for sale in pharmacists,	<i>L. monocytogenes</i> detection	12/14

	sampled during the shelf-life whilst on the market.		
EFL194	Sprouted mung bean salad with shelf-life of one week, sample taken whilst on the market from a food health shop.	<i>L. monocytogenes</i> enumeration <i>Salmonella</i> spp. Shiga toxin-producing <i>Escherichia coli</i>	14/14 13/14 4/14 [note 2]
EFL195	Ready to eat pre-cut tropical fruit salad with no additives and shelf-life of 5 days (pH 5), product sampled during the manufacturing process.	<i>L. monocytogenes</i> detection <i>Escherichia coli</i>	12/14 13/14
<b>Distribution EFL66 Miscellaneous foods</b>			
EFL196	Vanilla ice-cream made from raw cows' milk, product sampled from the high street shop whilst on the market.	<i>L. monocytogenes</i> enumeration <i>Salmonella</i> spp.	14/14 14/14
EFL197	Dried infant formula for infants below 6 months, sampled at the end of the manufacturing process.	Enterobacteriaceae (detection) <i>Cronobacter</i> spp. Presumptive <i>Bacillus cereus</i>	8/14 [note 3] 1/14 [note 4] 10/14
EFL198	Cooked and peeled prawns made with herbs and butter, sampled at the end of the manufacturing process.	<i>L. monocytogenes</i> detection <i>Escherichia coli</i> (most probable number) Coagulase-positive staphylococci	9/14 12/14 14/14

Note 1: Number of laboratories achieving >70% compared to the total laboratories participating in the examination of the sample. A maximum possible score is 8 marks per examination. Those that did not return any data or did not examine samples were not included in this table.

Note 2: Thirteen laboratories correctly identified the requirement to examine Shiga toxin-producing *Escherichia coli* for compliance with the legislation for this sample.

Note 3: Twelve laboratories correctly identified the requirement to examine *Enterobacteriaceae* for compliance with the legislation for this sample.

Note 4: Eight laboratories correctly identified the requirement to examine *Cronobacter* spp. for compliance with the legislation for this sample.

The UK's OLs continue to demonstrate good proficiency in determining compliance with the legislation for a range of sample types. The NRL analysed the number of OLs that correctly identified all examinations that were required for each sample. Of the 12 samples distributed, 4 samples had all their examinations identified for compliance by 100% of laboratories participating. Of the remaining 8 samples, demonstration of compliance remained good, with 90% or above identifying all examinations correctly for 4 samples, 80% for 2 samples, 64% for one sample and 36% for one sample.

There were 6 samples where participating OLs had not correctly identified the need for examination for *Listeria monocytogenes* (samples EFL191, EFL192, EFL193, EFL195, EFL196, EFL198) and the testing requirements for *L. monocytogenes* under the (EC) 2073/2005 legislation continue to be a topic for discussion amongst Food Examiners within the laboratories. For these samples, *L. monocytogenes* had either been omitted as a requirement by the OLs, or one of the 3 food safety categories (1.1, 1.2 or 1.3) for this organism was incorrectly chosen.

Vanilla ice-cream made from raw cows' milk and sampled from a high street shop whilst on the market (sample EFL196) required examination for *L. monocytogenes* against food safety criterion 1.3 (for foods that are unable to support growth of *L. monocytogenes*). Five out of 14 OLs reported that this food sample would be tested for *L. monocytogenes* as part of food category 1.2. The organisers of the scheme stated that this category is incorrect because ice cream is sold frozen and remains frozen until consumption; therefore, it is unable to support the growth of *L. monocytogenes*.

A sample of cooked and peeled prawns made with herbs and butter, sampled at the end of the manufacturing process (EFL198) also required examination for *L. monocytogenes*, but this time as part of food category 1.2 (for foods able to support growth of *L. monocytogenes*). Ten OLs correctly identified this requirement, but 4 OLs did not identify the need for examination of *L. monocytogenes*.

There were fewer incidents of incomplete examinations observed this year, where an OL would participate in an examination for a sample but not enter all information where marks are allocated (7 examinations this year compared to 17 examinations in 2022 to 2023). Where this was seen, these were for methods that are known to be performed less frequently or by fewer labs such as STEC, *Cronobacter* spp., *Enterobacteriaceae* detection and *E. coli* MPN. Compared to last year, more common examinations had missing entries such as *L. monocytogenes* (detection and enumeration), *Salmonella* spp., aerobic colony counts and *E. coli* enumeration by pour plate or surface spread, in addition to the lesser performed examinations.

To gain all available marks for an examination and improve assessment and evaluation of performance, it is important for laboratories to make themselves aware of the marking scheme when completing the form and check through entries to confirm their selections and ensure scored fields are not overlooked.

Sample EFL197 was a dried infant formula for infants below 6 months sampled at the end of manufacture (Table 4), and contained *Cronobacter* spp. Of the 14 OLs participating in this sample, 2 omitted to identify the need for *Enterobacteriaceae* and *Cronobacter* spp. examination. Although correctly indicating food category 2.2.9 for *Enterobacteriaceae*, 4 OLs did not perform the examination of this organism as a detection test. Footnote 9 of food category 2.2.9 requires parallel testing of *Enterobacteriaceae* and *Cronobacter* spp.; 8 OLs correctly identified the need for both organisms for compliance for this sample type. One OL performed examination of *Cronobacter* spp., compared to 2 OLs last year when this examination was indicated in a similar sample type.

The footnote also states '*If Enterobacteriaceae are detected in any of the product samples tested... the batch must be tested for Cronobacter spp.*' Three laboratories reported a positive *Enterobacteriaceae* result but failed to indicate *Cronobacter* spp., as a further test for compliance to the legislation.

## Monitoring of overall performance, trend and bias for EFL results

Last year, the NRL had started to observe an increase in the number of OLs registering to receive samples but subsequently not submitting results for one or more of the scheme's distributions. Eight EFL schemes have been offered to OLs with NRL support annually between 2014 and 2022 and on average, 3 laboratories per year have registered but did not submit results. This number increased to 5 OLs for the 2022 to 2023 scheme year and one laboratory did not submit a microbiological result for 5 distributions in a row, spanning into 2 scheme years. The NRL has since drafted a performance monitoring protocol as a decision-making aid, to support laboratories that show a decline in performance over time. Within this protocol, a nil return for a distribution is one of the outcomes that would be considered to be a deviation requiring follow-up. Consequently, for the 2023 to 2024 scheme year, the NRL observed an encouraging decline in the number of OLs not returning a result for an entire distribution to 2 laboratories and the NRL continues to monitor performance of the OLs.

This year, the NRL has seen initial results from trend and bias analysis work. These are being captured per OL for both enumeration and presence or absence (detection) tests and for all organisms expected to be examined within the scheme. Initial results have been good for most parameters for the scheme. However, some revealed trends requiring investigation and the performance monitoring protocol includes guidance for this scenario. Trends have also been observed in laboratories not performing examinations for some parameters that are expected to be performed by OLs. For example, one OL had not submitted a result for coagulase-positive staphylococci on 5 consecutive occasions that this parameter was required. Another OL was found to have omitted a *L. monocytogenes* (detection) examination result for the third consecutive distribution containing this parameter; both OLs were contacted by the NRL.

Analysis has also revealed some trends in the microbiological results of the laboratories. According to the NRL's performance monitoring protocol, an OL may be contacted when their results are indicative of a positive or negative trend in bacterial counts over a two-year

timeframe or a minimum of 5 distributions for any individual parameter. The OL is informed of the observed trend and requested to produce a root cause analysis of their results. Both positive and negative trends have been observed for a range of parameters including aerobic colony counts, *E. coli*, *L. monocytogenes* (detection and enumeration tests) and coagulase-positive staphylococci. The NRL is continuing trend analyses and monitoring any trends or bias of concern.

Where appropriate and in accordance with the NRL's performance monitoring protocol for deviating results, laboratories have been informed and assistance has been offered. All those laboratories that have been contacted have responded, with some cases requiring monitoring over a period of time following initial identification of issues. The NRL has been satisfied with the responses received and the follow up actions taken by the laboratories.

Samples processed from the European Food Microbiology Legislation Scheme allow participating laboratories to maintain their knowledge of microbiological criteria and how these can be interpreted and applied to foods at manufacture and on the market. The scheme not only provides a single suitable platform to assess microbiological proficiency, but also enables the demonstration of laboratory understanding to show compliance against legislative requirements, as laboratories test a variety of samples for official control. Decisions on testing should be based on fact, not assumption and laboratories should refer to the FEPTU guide to scoring for more information. OLs are also reminded that the NRL continues to offer its support when experiencing any difficulties with testing, and both the NRL and the scheme organisers are available for assistance.

The NRL will continue to assess laboratory performance through proficiency testing and has invited all UK OLs to register for the 2024 to 2025 distributions of the EFL scheme. All OLs are obliged to participate on request by the NRL and to adhere to the assimilated OCRs (EU 2017/625). Participation provides overall assurance of laboratory competence, identify areas of weakness and the need for further training as well as demonstrating compliance with laboratory quality standards and accreditation. OLs will also continue to have access to expert advice and support from FEPTU and/or the NRL.

Related to core functions: 4.a, 4.b, 4.c.

## Participate as UK-NRL in EURL ring trials and other initiatives

Since the UK left the EU as a Member State, the EU has allowed the UK to participate in proficiency testing, at the discretion of the individual EURLs. Invitations to participate in EURL PTs have been accepted, as the NRL is obliged to take part in external quality assessments made by international organisations since the EU regulation (EC) 625/2017 has been assimilated into UK law (UK SI 2019 No. 665). The UK NRL experienced a slight dip in

participation to EURL proficiency tests (PTs) in this reporting period, but this is possibly due to the type of PTs offered by the EURLs.

The EURL PTs provide the only way to obtain direct comparison with EU NRLs and can provide assurance that the UK's microbiological capabilities are comparable to the EU. This is a key factor when ensuring good biosecurity and facilitating trade both in and outside the EU.

The UK NRL received 9 distributions from all 6 EURLs, which includes tests for detection, enumeration, DNA sequencing and culture strain typing, and subsequent analyses and interpretation. Table 5 lists these activities and a summary of performance (see [Annexe](#) for EURL PT reports, where available).

In March 2023, the UK NRL participated in the *Campylobacter* enumeration from chicken skin and received an acceptable performance. When comparing with the other NRLs, the UK's 10 enumeration results were generally lower than expected, including 2 samples that were over a log lower than the median value and another one sample that was approximately 0.5 log lower. Root cause analysis identified a possible issue with reconstituting the samples, which has been addressed by performing training in this area. However, the UK NRL results matched 100% with the correct identifications, which included *Campylobacter jejuni*, *C. coli* and *C. lari*.

The UK NRL scored well for the detection of *Salmonella* in flax seeds, where detection was found in 4/4 high level samples (50 cfu/sample), 5/6 low level samples (10 cfu/sample) and 4/4 negative for the blank samples. This compares with a further 15 laboratories detecting 5/6 low level samples from a total of 50 laboratories, and the UK NRL was ranked as demonstrating 'good performance'. The UKHSA NRL received a panel of pure isolates via APHA for the serotyping and cluster analysis PT from the *Salmonella* EURL, as they registered on behalf of the UK. Interim serotyping results indicate that the UKHSA NRL matched 95% with the intended results of 19/20 *Salmonella* strains, where a further 4 laboratories also named a serovar incorrectly; overall the NRL achieved a 'good' performance.

In 2023, the *Listeria* EURL organised a PT which used the same samples for both enumeration and detection of *Listeria monocytogenes*. Six coffee-flavoured milk samples were analysed, and results were submitted. A deviation form was received for a few issues and the EURL accepted the cause analysis and corrective actions. However, the UK NRL is unable to fully evaluate the performance, as intended results have not been provided by the EURL.

The CPS enumeration PT was distributed in September 2023, but due to the courier not adhering to transport conditions, the EURL notified the participants that it would cancel the PT and re-arrange in 2024.

The AR EURL organised the PT for typing and characterisation for antimicrobial resistance in *Campylobacter*, *Salmonella* and *Escherichia coli* this year. The NRL submitted data for the *Campylobacter* and *Salmonella* panels as UKHSA performs the broth micro-dilution method stipulated in the EU legislation and PT participation allows assurance and harmonisation of

antimicrobial data. The PT generates hundreds of data points from several dilutions against 6 and 25 antibiotics for 8 strains each of *Campylobacter* and *Salmonella*, respectively. The interpretation for each antibiotic (sensitive or resistant) and the ESBL categorisation for each strain was also reported. Interpreting the EURL draft report alongside the UK NRL results, the UK NRL attained a 17.9% deviation for *Campylobacter* (chloramphenicol interpretation was not submitted, otherwise would generate 0%) and only 1.1% deviation for *Salmonella*.

**Table 5. NRL participation in EURL ring trials, March 2023 to February 2024**

Month received	Organism – test [note 1]	Matrix or pure culture	Comments [note 2]
March 2023	<i>Campylobacter</i> : enumeration and voluntary species identification	Chicken skin	Acceptable performance for enumeration Excellent rating for species identification
March 2023	<i>Salmonella</i> : detection	Seeds	Good performance (93% samples matched with intended)
April 2023	<i>Listeria monocytogenes</i> : detection and enumeration	Coffee-flavoured milk	Corrective actions on deviations accepted, but no intended results received
September 2023	CPS: enumeration	Shrimps	PT cancelled due to courier not adhering to transport conditions
September 2023	AMR AST for: <i>Campylobacter</i> <i>Salmonella</i>	pure cultures	17.9% deviation [chloramphenicol interpretation not recorded; otherwise 0% deviation] 1.1% deviation, satisfactory results
October 2023	STEC: detection and identification	Sprouts	Able to identify and isolate a contaminating STEC strain from both the spiked samples
October 2023	STEC: typing and WGS cluster analysis	Pure cultures	Preliminary results: 100% match with intended results; awaiting cluster analysis report
November 2023	WGS for: <i>E. coli</i> <i>Salmonella</i> <i>Staphylococcus aureus</i>	DNA extracts and pure cultures	Awaiting report from EURL
November 2023	<i>Salmonella</i> : serotyping	Pure cultures	Interim serotyping results indicate 95% match with intended results – a good performance

Note 1: STEC = Shiga toxin-producing *Escherichia coli*; CPS = coagulase positive staphylococci.

Note 2: Performance grading taken directly from EURL reporting.



The STEC EURL organised a detection and identification PT in this reporting year; PT37 in sprouts. The UK NRL detected the STEC strain using the screening and isolation steps but received penalty points as the PCR does not allow to discriminate between *stx1* and *stx2* genes. Despite this, the EURL was assured that the UK NRL could identify and isolate a contaminating STEC strain from both the spiked samples. The UK NRL participated in the STEC identification and typing distribution (PT38) and preliminary analysis from the EURL indicates that the UK NRL matched 100% with the intended results from the 8 strains sent.

The National Food Institute (DTU) in Denmark organises the global Genomic PTs and the UK participated in 2/3 parts in 2023 (*E. coli* and *Salmonella*, but not *Staphylococcus aureus*). The UK NRL submitted detailed meta data, including methodology, quality parameters, and predicted antimicrobial phenotype. Two DNA samples and 2 corresponding bacterial pure culture strains were sent for each organism. At the time of writing, the UK NRL are awaiting the report from the EURL to ascertain performance.

Referrals to detect staphylococcal enterotoxins in milk and cheese samples have remained very low in the UK, with on average one request for testing made every 3 years and therefore the need to maintain capability is unjustified for the UK NRL. Therefore, with agreement from the FSA, the NRL maintains a testing ability by sub-contracting the service to a designated OL in the EURL network, who regularly participates in the EURL proficiency testing.

Related to core functions: 1.a, 4.c, 4.d.

## Organise teams or classroom-based workshops for UK OLs

The last classroom-based workshop was held in March 2023 for the 'Interpretation of the Microbiological Criteria and the European Microbiology Legislation Scheme' by the UK NRL. As the NRL arranged a laboratory-based workshop in this reporting period, a classroom-based workshop was not organised. In 2024 to 2025, the UK NRL will plan to have a classroom-based workshop, dependent on the OLs' needs.

Related to core functions: 2.a, 3.a, 4.e.

## Organise a practical workshop for UK OLs

The UK NRL held a two-day practical training workshop on STEC detection at Porton, Wiltshire in March 2024. The objective was to inform participants of both theoretical and practical aspects of PCR and how to isolate STEC after a PCR-positive screen. The hybrid event combined practical sessions at the new Porton teaching laboratory with classroom-based presentations using MS Teams to allow online participation (see [Annexe](#) for agenda).

All UK official laboratories (OLs) were invited, and 9 delegates attended at Porton from 7 OLs. The first day commenced with an introduction to PCR and its applications, and advice on gaining UKAS accreditation for PCR methods and a further 5 OLs attended online. On-site delegates then gained hands-on experience of DNA extraction, preparation of PCR assays and using the PCR machine in the dedicated teaching laboratory. On day 2, delegates were able to analyse their results, go through some troubleshooting exercises and perform colony picks from samples screened as PCR positive. The course ended with a session on how to interpret and report the results, and 3 OLs attended online.



Throughout the course, the delegates and organisers were able to exchange experiences, gain knowledge through in-depth discussions and ask questions, and being able to interact in person aided this very well. Feedback analysis indicates that this was a well-received session. Presentations of the workshop were circulated to participants and can be sent upon request.



Related to core functions: 2.a, 3.a, 4.e.

## Core Function 5. Co-ordination within the UK of international initiatives

### Support food aspect of the EU-wide AR monitoring (Decision EU 2020/1729)

Since 1 January 2015, EU-wide AR monitoring has been in place under the above EU Decision, where fresh meat at retail and animals at slaughterhouse have been sampled and tested in the UK by the APHA. For 2023, AMR monitoring was carried out in fattening pigs, bovine animals under one year of age, pig meat and bovine meat sampled at slaughterhouses, retail and Border Control Posts. However, since leaving the EU, the UK does not submit data to the EU but does sample and test according to the EU Decision (EU 2020/1729), to ensure a consistent comparison with the EU. The NRL has been available for support and advice for this work to the APHA and FSA.

Additional information regarding APHA liaison and AMR work can be found above in Core Function 1. Liaise with APHA regarding mutual NRL activities.

Related to core functions: 1.b, 2.a, 5.a.

### Participate in EURL activities relating to whole genome sequencing

A European Commission mandate to EFSA and ECDC initiated a joint EURL activity in 2019, to expand the molecular typing data collection to WGS data. A technical report published in 2022 described guidelines to submit WGS data to the EFSA One Health System for non-human isolates of *Salmonella* Enterica, *Listeria monocytogenes* and STEC, to allow for molecular surveillance and continuous monitoring.

The UK participated in a number of initiatives related to this activity before the UK left the EU. Although UK participation is now restricted to these EU WGS activities, the UK still has access to information. For example, in order to harmonise WGS, a series of methods are available on several EURL websites and access is unrestricted, which the NRL regularly checks, downloads and disseminates to relevant colleagues in the UK.

The UK NRL was also invited to the second 'Science meets Policy' conference, which took place as a two-day hybrid meeting in September 2023. The main objective was the 'EU initiatives towards the large-scale use of Next-Generation Sequencing to tackle foodborne threats' and speakers from the EU, EURLs and the USA presented the EU database system, legal issues in sharing data and their own countries' experiences in using WGS. It concluded

with an awareness that although the technical ability of WGS is in an advanced state, the challenge of data sharing, risk management and gaining the private sector's trust requires further consideration. More information can be found [here](#).

Related to core functions: 1.a, 2.e, 5.a.

## Core Function 6. Communication of results and data use

In June 2023, the NRL Scientist went on maternity leave for 9 months and the position was filled by secondment of an internal applicant who covered and progressed with the NRL activities. This was communicated to the FSA in advance and none of the NRL activities were negatively affected by this staff change, in terms of deliverables. The NRL Scientist returned from maternity leave in April 2024.

The FSA requested to visit a UKHSA laboratory in July 2023, and the NRL helped organise and attend a visit to the FWE Laboratory in Porton in October 2023. Six FSA colleagues attended, and the visit included presentations on conventional and molecular processes to examine the microbiology of food samples as well as tours of the laboratories.

Related to core functions: 6.b, 6.k.

## Core Function 7. Incident management

Representatives of the FW&E Microbiology Service participated in many health protection s throughout the year, and key findings and lessons learnt were shared with the NRL, FSA and other colleagues as appropriate.

Examples are described in the following health protection reports:

- Listeriosis linked to smoked salmon: [HPR volume 17 issue 9: news \(28 July and 1 August 2023\)](#)
- STEC O145 linked to cheese: [HPR volume 18 issue 2: news \(7 March 2024\)](#)

## Discussion of specific areas

### EU relations

Since leaving the EU on 31 January 2020, the UK NRL has experienced a reduced level of communications with the EURLs. This is due to the limited activities that the EURLs are now permitted to offer to the UK, predominantly only allowing UK NRL participation in proficiency tests. Therefore, the UK NRL now regularly checks the EURL websites for new information which may be useful for the UK and produces reports based on presentations given at the EURL meetings.

The UK NRL has sought clarification and consent from FSA for specific activities where the UK NRL felt it was appropriate and mutually beneficial to respond and engage with the EURLs and EU. In addition, to ensure information is transparent and current, the NRL has liaised with FSA, DEFRA, and UKHSA EU Exit departments. The UK NRL also liaised with the UKHSA Four Nations, EU and Europe department in relation to the Memorandum of Understanding between UKHSA and ECDC. This MoU will aid the reopening of communication and shared learning regarding public health threats through testing, surveillance and preparedness.

EU law continues to apply to Northern Ireland post EU Exit in respect of the Official Control Regulations (EU) 2017/625. Therefore, NI have NRLs based in the EU which have been designated by FSA to fulfil this obligation. The UK NRL continues to support the NI OL and have liaised with the NI NRLs to ensure activities are not too burdensome on the NI OL and to reduce overlap in activities.

Despite these challenges, the NRL has managed to continue to communicate with the EURLs and successfully participate in all of the relevant activities that the EURLs have offered, including attending meetings, participating in proficiency testing and receiving technical training.



# Summary and forward look to proposed UKHSA NRL Activities, April 2024 to March 2025

## Core Function 1. Secretariat services

- 1.a Disseminate information or advice from international organisations to FSA, OLs and other UK laboratories in a timely and effective manner.
- 1.a Produce and circulate quarterly newsletters to FSA, OLs and other UK laboratories.
- 1.a Co-ordinate the OL User Day to update UK OLs and other relevant UK laboratories of the NRL core functions.
- 1.b Prepare and carry out an audit regarding the OL's accreditation status on the UKAS register.
- 1.b Review content of the UK Food Examiner Register.
- 1.c Continue liaison meetings with APHA for AMR, *Campylobacter* and *Salmonella*.
- 1.c Liaise with CEFAS for *E.coli* and *Salmonella* in shellfish activities.
- 1.c Liaise with Campden BRI to discuss and implement challenge testing activities
- 1.d Produce and submit annual report to the FSA on NRL activities for 2024 to 2025.
- 1.d Provide regular updates to the FSA on NRL activities by producing monthly reports.
- 1.e Arrange quarterly meetings with FSA and FSS.
- 1.f Maintain and update the NRL web content on the UKHSA website.

## Core Function 2. Advice and representation within the UK and internationally

- 2.a. Provide impartial expert advice to FSA, OLs and other UK laboratories, upon request.
- 2.b. Represent the UK at relevant international meetings and working groups; consult FSA prior to meetings and submit an internal report after attendance of meetings.
- 2.c. Attend training workshops at international organisations, where relevant and after successful applications.
- 2.d. Liaise with FSA in matters UK's concerning testing capabilities.
- 2.e. Keep abreast of methodology developments and advise FSA and OLs (for example AMR in *Listeria* spp from food literature review).
- 2.g. Participate in the BSI AW9 microbiology committee.
- 2.g. Participate in Working Group to revise the ISO/TS 13136:2012 (PCR detection of STEC) and other working groups where appropriate.

## Core Function 3. Research and development, including production of standard operating procedures, codes of practice and guidance documents

- 3.a. Maintain UK food method list on NRL website.
- 3.a. Produce an SOP for detection of AMR in food.
- 3.a. Draft a manuscript for peer-review summarising multiple-year OL performance in the EFL PT scheme.

## Core Function 4. Compliance assessment via audits and ring trials

- 4.a. Ensure consistency and quality of testing approached applied by UK OLs and support where necessary.
- 4.b. Liaise with FEPTU and monitor OL's comparative testing performance and assist OLs in the implementation of corrective measures.
- 4.b. Evaluate OL's performance using trend analysis and report appropriately to the FSA.
- 4.c. Co-ordinate the participation of OLs in international method validation studies and other initiatives and report to FSA.
- 4.d. Participate as UK-NRL in proficiency tests and method validation studies organised by the EURL (where available) and report to FSA.
- 4.e. Organise Teams or classroom-based workshops for UK OLs, dependent on the 2023 audit (1.b) and OL needs.
- 4.e. Organise a practical workshop for UK OLs, dependent on the 2023 audit (1.b) and OL needs.
- 4.g. Analysis and publication of the 2023 OL capability and capacity audit

## Core Function 5. Co-ordination within the UK of international initiatives

- 5.a. Support the food aspect of the EU-wide AR monitoring (Decision (EU) 2020/1729), liaising with FSA, OLs, relevant Reference Laboratories and APHA.
- 5.a. Provide information regarding Whole Genome Sequencing when requested from the EURLs, and participate in any related workshops, proficiency testing, training and guidance documentation, where necessary.
- 5.a. Participate in training opportunities provided by international organisations.



## Core Function 6. Communication of results and data use

6. Communicate with FSA on results and data use, when required.

## Core Function 7. Incident management

7. Perform defined work when requested by FSA for incident management, with joint agreement and where appropriate.

**Summary of NRL activities for April 2024 to March 2025**

Activities	Function	Core	0	1	2	3	4	5	6	7	8	9	10	11	12
			March 2024	April	May	June	July	Aug	Sep	Oct	Nov	Dec	January 2025	February	March
Disseminate information from external organisations to FSA	Disseminate information	1.a													
Produce and circulate quarterly newsletter to FSA, OLs and other labs	Disseminate information	1.a, 1.c													
OL User Day meeting at NRL/hybrid, TBC	Meeting	1.a, 1.c													
Perform an audit on OL's accreditation status on UKAS website	Secretariat	1.b													
Review content of UK Food Examiner register	Secretariat	1.b													
Continue liaison meetings with APHA <i>Salmonella</i> , <i>Campylobacter</i> and AMR NRLs	Secretariat	1.c													
Liaise with CEFAS for <i>E.coli</i> and <i>Salmonella</i> in shellfish NRL activities	Secretariat	1.c													
Liaise with Campden BRI for challenge testing activities	Secretariat	1.c.													
2023 to 2024 Annual report to FSA	Co-ordination	1.d													
Monthly reporting to FSA	Co-ordination	1.d													
Arrange quarterly meetings with FSA	Co-ordination	1.e													
Maintain and update NRL web content on UKHSA website	Website	1.f													
Provide advice to FSA, OLs, and other UK labs on request	Advice	2.a, 2.d, 2.e													
<i>Salmonella</i> Workshop in Leiden, NL, 27 to 29 May	EURL Workshop	2.b													
<i>Listeria</i> 17th Workshop, TBC, 23 to 25 September	EURL Workshop	2.b													
<i>E. coli</i> 19th Workshop in Rome, 30 September to 1 October	EURL Workshop	2.b													
<i>Campylobacter</i> 19th Workshop in Uppsala, SE, 21 to 23 October	EURL Workshop	2.b													
Antimicrobial Resistance 18th Workshop in Kings Lyngby, DK, 8 to 9 October	EURL Workshop	2.b													
Coagulase positive Staphylococci 18th Workshop, Q3, TBC	EURL Workshop	2.b													
Attend STEC training workshops	EURL training	2.c.													
Liaise with FSA in matters concerning UK's testing capabilities	Capability	2.d													

Activities	Function	Core	0	1	2	3	4	5	6	7	8	9	10	11	12
			March 2024	April	May	June	July	Aug	Sep	Oct	Nov	Dec	January 2025	February	March
AMR in <i>Listeria</i> spp from the food chain – literature review	Horizon scanning	2.e													
Liaising with FSA concerning EU relations	Advice and communication	2.f													
Participation in WG for revised ISO 13136 (STEC)	Advice and representation	2.g, 5.a													
Participation in BSI AW9 microbiology committee	Advice and representation	2.g													
Produce OL performance review of 4 years' participation of EFL scheme	Peer-reviewed manuscript	3.a, 4.b													
Revise and maintain UK SOP list on website	Maintain SOPs	3.a													
AMR SOP for shellfish and leafy greens	Method development	3.a													
Focussed testing and method development for FSA, upon request and joint agreement	R&D	3.b, 3.c, 3.d													
Monitor OL performance; provide support to OLs and update FSA where appropriate	UK PT	4.a													
Liaise with FEPTU for OL participation to EFL Scheme and monitor OL's testing of EFL scheme	UK PT	4.b, 4.f													
<i>Campylobacter</i> enumeration in chicken meat PT from EURL (PT36)	EURL PT	4.d													
<i>Campylobacter</i> WGS and cluster analysis (PT 38)	EURL PT	4.d													
MRSA PCR confirmation and typing from AR EURL	EURL PT	4.d													
Detection of STEC in cheese from EURL (PT 39)	EURL PT	4.c													
Coag+ Staph enumeration PT in shrimps from EURL	EURL PT	4.d													
AMR <i>E.coli</i> , <i>Salmonella</i> and <i>Campylobacter</i> PT from EURL	EURL PT	4.d													
<i>Salmonella</i> detection in PPS/food matrix PT from EURL	EURL PT	4.d													
<i>Listeria monocytogenes</i> challenge testing PT from EURL	EURL PT	4.d													
STEC detection in spent irrigation water from EURL (PT 40)	EURL PT	4.d													
DTU Genomic WGS of <i>E.coli</i> , <i>Enterococcus faecium/faecalis</i> , <i>Campylobacter coli/jejuni</i> PT	International PT	4.d													
<i>E. coli</i> and STEC id and typing and WGS PT from EURL (PT 41)	EURL PT	4.d													

Activities	Function	Core	0	1	2	3	4	5	6	7	8	9	10	11	12
			March 2024	April	May	June	July	Aug	Sep	Oct	Nov	Dec	January 2025	February	March
AMR selective isolation of <i>E. coli</i> in meat or caecal sample PT from EURL	EURL PT	4.d													
<i>Salmonella</i> typing PT from EURL	EURL PT	4.d													
<i>Listeria</i> detection and enumeration PT from EURL, TBC	EURL PT	4.d													
Organise PCR detection workshop for UK OLs	Workshop	4.e													
Assessing OL capability and capacity for the UK via an audit	Audit	4.g													
Organise hybrid workshop for UK OLs, TBC	Workshop	4.e													
Support food aspect of EU-wide AR monitoring (Decision 2013/652/EU), if required	EU monitoring	5.a													
Provide information regarding WGS processes to EURLs and other international organisations, when contacted	EURL initiative	5.a													
Communicate with FSA of results and data use, when required	Communication	6													
Perform defined work when requested by FSA for incident management, with joint agreement and where appropriate	Incident management	7													
Disseminate EPIS and other alerts to FSA	Disseminate information	7													

# Annexe. Documents produced from NRL activities

## Core Function 1. Secretariat services

<p>EURL Websites</p>	<p><a href="#"><u>Listeria monocytogenes</u></a>  <a href="#"><u>Coagulase-positive staphylococci</u></a>  <a href="#"><u>STEC - ISS</u></a>  <a href="#"><u>Campylobacter</u></a>  <a href="#"><u>Salmonella</u></a>  <a href="#"><u>Antimicrobial resistance</u></a></p>
<p>Dissemination of information from the EURLs                  Related to core functions: 1.a, 1.c, 2.d, 2.e, 2.f</p>	<p>EURL-Salmonella Newsletter June 2023                  EURL-Salmonella Newsletter September 2023                  EURL-Salmonella Newsletter December 2023                  EURL-Salmonella Newsletter March 2024                  704_2023-eurl-ar-newsletter-no17</p>
<p>Quarterly newsletters                  Related to core functions; 1.a, 2.d, 2.e, 2.f</p>	<p>NRL newsletter Q1 2023-4_final                  NRL newsletter Q2 2023-4_Final                  NRL newsletter Q3 2023-4_Final                  NRL newsletter Q4 2023-4_final</p>
<p>Co-ordination of 2023 OL User Day                  Related to core functions: 1.a, 1.b, 1.c, 2.a, 2.d, 2.e, 2.f, 6.l</p>	<p>User day 11sep2023 agenda_draft_00.05 (002)</p>
<p>Provide regular updates to FSA                  Related to core functions: 1.d, 6.a, 6.d, 6.k</p>	<p>FSA NRL Meeting 08June2023 minutes _ Final                  Draft_KL_SNedits2 CW (002) (002)                  FSA NRL Meeting 26Sept2023 minutes _                  Draft_KL_SN_CW_KA_edits                  FSA NRL Meeting 11Dec2023 minutes _ Final                  Draft_KL_KA_SNedits_CW00.02                  FSA NRL Meeting 07Mar2024 minutes _ Final                  Draft_KL_SN_AVedits_v2</p>

	<p>UK NRL Monthly Log for Apr23_Final</p> <p>UK NRL Monthly Log for May_Final_SN_AVedits1</p> <p>UK NRL Monthly Log for Jun23_Final</p> <p>UK NRL Monthly Log for July23_Final</p> <p>UK NRL Monthly Log for Aug23_Final</p> <p>UK NRL Monthly Log for Sept23_Final</p> <p>UK NRL Monthly Log for Oct23_Final</p> <p>UK NRL Monthly Log for Nov23_Final</p> <p>UK NRL Monthly Log for Dec23_final</p> <p>UK NRL Monthly Log for Jan24_Final</p> <p>UK NRL Monthly Log for Feb24_Final</p> <p>UK NRL Monthly Log for Mar24_final</p>
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**Core Function 2. Advice and representation within the UK/EU**

<p>Representation at relevant EURL meetings and prepare meeting reports</p> <p>Related to core functions: 1.a, 2.b</p>	<p>2023-0341 EURL Salmonella Report of 2023 Workshop</p> <p>Individual Report on the 28th Salmonella EURL Workshop 2023 Final v2_SNedits</p> <p>EURL-AR WS 2023 Agenda</p> <p>Internal report of EURL-AR meeting 2023_final</p> <p>Campylobacter EURL 2023 Workshop Agenda</p> <p>Summary of the 18th Campylobacter EURL Workshop 2023 Agenda_2023_PT_session</p> <p>Internal report of EURL meeting_E.coli 2023_Full meeting_circulated</p> <p>Listeria EURL workshop 2023 - topics covered but unable to access presentations</p>
<p>Keep abreast of methodology developments</p> <p>Related to core functions: 2.e, 2.f</p>	<p>Internal report of EURL approaches to WGS PTs webinar_29Sep2023_final</p> <p>Listeria Seminar 21feb24</p>

**Core Function 3. Production of standard operating procedures, codes of practice and guidance documents**

<p>Update food methods archive on NRL website</p>	<p><a href="https://www.uknrl.gov.uk/">UK national reference laboratory for food microbiology</a></p>
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Related to core functions: 1.a, 1.e, 3.a, 4.a	
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**Core Function 4. Compliance assessment via audits and ring trials**

<p>OL participation in the European Food Microbiology Legislation Proficiency Testing Scheme</p> <p>Related to core functions: 4.a, 4.b, 4.c</p>	<p>EFL63 OL Summary_NRL_FSA_Final</p> <p>EFL64 OL Summary NRL FSA Final</p> <p>EFL65 OL Summary</p> <p>EFL66 OL Summary_FSA_draft</p>
<p>Participate in EURL ring trials</p> <p>Related to core functions: 1.a, 4.c, 4.d</p>	<p>EURL-Campylobacter_PT34-report</p> <p>2023-0340 EURL-Salmonella PT Food-Feed 2023</p> <p>Anses_LSAI_23_03_EURL_individual_report_labX</p> <p>EURL-AR-EQAS_EC_Salm_Camp-2023_draft_ForReview</p> <p>Report PT37_Extra-EU_04032024</p> <p>Report_PT38_extra_EU_v2 23.05.24</p> <p>Interim summary report EURL-Salmonella PT Serotyping 2023</p>
<p>Organise a practical workshop for UK OLs</p> <p>Related to core functions: 2.a, 3.a, 4.e</p>	<p>PCR 2024 Workshop Programme_Final</p>

# About the UK Health Security Agency

UKHSA is responsible for protecting every member of every community from the impact of infectious diseases, chemical, biological, radiological and nuclear incidents and other health threats. We provide intellectual, scientific and operational leadership at national and local level, as well as on the global stage, to make the nation health secure.

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Prepared by: Caroline Willis, Shona Neal, Amisha Vibhakar and Kieran Allen.  
For queries relating to this document, please contact: [fwe.nrl@ukhsa.gov.uk](mailto:fwe.nrl@ukhsa.gov.uk)

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