



Fera NRL Annual Report 2019 to 2020

Report to the Food Standards Agency



1. Annual Report

**Annual Report on Operation of National Reference Laboratories
(Chemical Safety in Food and Feed)
Fera Science Ltd.**

April 2019 – March 2020

Title	National Reference Laboratory for Food Contaminants
Competent Authority	Food Standards Agency
FSA Project Officers	Chelvi Leonard, Valerie McFarlane, Misty Gilbert
Specification References	FS616030 to FS616034

Report Number	Fera/NRL/2019/12
Fera Project Number	FR/001420
Project Manager	Susan MacDonald

Principal Workers	Susan MacDonald, Mike Walls, Frankie Smith, Sean Panton, Emma Bradley, Claire McKillen, Irene Leon
-------------------	--

Compiled by	Irene Leon
-------------	------------

Authorised by	Susan MacDonald
---------------	-----------------

Note: Whilst care has been taken to ensure that the web links contained in this report are correct at the time of issue, changes may occur.

This report has been prepared by Fera after exercise of all reasonable care and skill but is provided without liability in its application and use. This report may not be reproduced except in full, without the written approval of Fera.

Copyright © Fera Science Ltd. (Fera) 2020

2. Fera Science Ltd. (Fera)

Fera is a national and international centre of excellence for interdisciplinary investigation and problem solving across plant and bee health, crop protection, sustainable agriculture, food and feed quality and chemical safety in the environment.

Fera Science Ltd. (Fera)

National Agri-Food Innovation Campus,
Sand Hutton,
York,
YO41 1LZ,
United Kingdom.

+44 (0)300 100 0321

<https://www.fera.co.uk/>

Follow us on social:

Twitter @FeraScience

YouTube <https://www.youtube.com/user/FeraUK1>

Linkedin <https://www.linkedin.com/company/fera-science>

LabTube <https://www.labtube.tv/channel/ferascienceltd>

3. Contents

1. Annual Report	...	...	...	...	...	...	...	...	...	...	2
2. Fera Science Ltd. (Fera)	...	...	...	...	...	...	...	...	...	...	3
3. Contents	...	...	...	...	...	...	...	...	...	...	4
4. Executive summary	...	...	...	...	...	...	...	...	...	...	5
5. List of abbreviations	...	...	...	...	...	...	...	...	...	...	7
6. Introduction	...	...	...	...	...	...	...	...	...	...	9
7. Role and scope of the NRL	...	...	...	...	...	...	...	...	...	...	10
8. Core functions	...	...	...	...	...	...	...	...	...	...	11
9. Core function 1 - Secretariat services	...	...	...	...	...	...	...	...	...	...	13
10. Core function 2 - Advice and representation within the UK and internationally	...	...	...	...	...	...	...	...	...	...	21
11. Core function 3 - Production of SOPs, codes of practice and guidance documents	...	...	...	...	...	...	...	...	...	...	34
12. Core function 4 - Compliance assessment via audits and ring trials	...	...	...	...	...	...	...	...	...	...	39
13. Core function 5 - Co-ordination within the UK of international initiatives	...	...	...	...	...	...	...	...	...	...	52
14. Core function 6 - Communication of results and data use	...	...	...	...	...	...	...	...	...	...	54
15. Summary	...	...	...	...	...	...	...	...	...	...	55
Annexes	...	...	...	...	...	...	...	...	...	...	56
Annex 1: NRL Mycotoxins and Plant Toxins in Feed and Food	...	...	...	...	...	...	...	...	...	...	57
Annex 2: NRL Heavy Metals and Nitrogenous Compounds in Feed and Food...	...	...	...	...	...	...	...	...	...	...	58
Annex 3: NRL Halogenated POPs in Feed and Food	...	...	...	...	...	...	...	...	...	...	59
Annex 4: NRL Processing Contaminants	...	...	...	...	...	...	...	...	...	...	60
Annex 5: NRL Materials and Articles in Contact with Food...	...	...	...	...	...	...	...	...	...	...	61
Appendices											
Appendix 1: References	...	...	...	...	...	...	...	...	...	...	62
Appendix 2: EURLs	...	...	...	...	...	...	...	...	...	...	67
Appendix 3: Fera NRLs...	...	...	...	...	...	...	...	...	...	...	69

4. Executive summary

Fera Science Ltd (Fera) acts as National Reference Laboratory (NRL) under Regulation (EU) 2017/625⁽¹⁾ on official controls and was appointed by the Food Standards Agency (FSA) to provide five Chemical Safety in Food and Feed UK NRLs:

- NRL-MP** NRL Mycotoxins and Plant Toxins in Feed and Food
- NRL-MN** NRL Metals and Nitrogenous Compounds in Feed and Food
- NRL-PC** NRL Processing Contaminants
- NRL-POPs** NRL Halogenated Persistent Organic Pollutants (POPs) in Feed and Food
- NRL-FCM** NRL Materials and Articles in Contact with Food

This Annual Report summarises the activities of the NRLs from 1st April 2019 to 31st March 2020.

The NRLs provided impartial advice to the FSA, Official Control Laboratories (OCLs) and other NRLs throughout the period. Information from the European Union Reference Laboratories (EURLs) was disseminated including EURL Work Programmes, where provided. The NRLs also planned Work Programmes. Working relationships are well established with the EURLs ensuring efficient communication. EURL-MN newsletters were forwarded to the FSA. Regular updates were provided to the FSA on NRL activities. The NRL provided an open website for OCLs and a dedicated NRL email address is regularly monitored. An up to date list of OCLs and contact details was maintained. The NRL represented the UK at EURL Workshops and Core Working Groups, Task Forces and AdHoc committees and provided Meeting Notes, official reports and documents and where available, presentations to the FSA.

NRL staff participated in a number of international scientific conferences as speakers and delegates. The NRL-POPs participated in EURL Core Working Groups (CWGs) for Brominated Flame Retardants (BFRs), Per- and Polyfluoroalkyl Substances (PFAS) and Chlorinated Paraffins (CPs). Advice on capability to analyse samples within current legislated limits for metals analysis was provided by NRL-MN to the FSA. EURL training was attended by NRL-PC for 'Furans' analysis. Following central government advice provided by the Cabinet Office, to not attend EURL meetings on behalf of the FSA, or on behalf of the UK Government as a result of status as an FSA appointed NRL, no EURL hosted events were attended from October 2019. After this time, documents relating to each EURL Workshop were requested by the respective NRL and, if provided, were sent to the FSA. The UK left the EU on 31st January 2020. There is now a transition period until the end of 2020 while the UK and European Union (EU) negotiate arrangements. There was three-way communication between the FSA, NRLs and the relevant EURLs via the NRL concerning EU Exit.

The NRL-MP and NRL-MN are involved with European Committee for Standardization (CEN) activities. NRL-MP is a member of CEN TC275 WG5 and CEN TC327 WG5 and provided Meeting Notes from its attendance at CEN Working Groups and provided active assistance to the FSA in reviewing, commenting and voting on documents from CEN/ British Standards Institution (BSI). NRL-MN received CEN Technical Board (BT) voting documents for review and comment. NRL-POPs was involved in an addendum to a Guidance document on LOD/LOQs. Two publications in "Science of the Total Environment" were co-authored by

the NRL-POPs and the FSA. The NRL-FCM was involved with the task force reviewing the “Guidelines on Testing Conditions for Articles In Contact With Foodstuffs (With A Focus on Kitchenware)”. The NRL-FCM continues to be active in a task force to discuss approaches to multi-analyte methods. NRL-FCM was also involved in a roundtable Workshop on the determination of mineral oil aromatic hydrocarbons (MOAH) in infant formula where a consensus approach was agreed. Advice and methodology were provided to OCLs where requested.

During 2019-2020, the NRLs were involved in twenty seven Proficiency Tests (PTs) run by the EURLs and other providers (not including FAPAS® PTs). Six PTs were carried over from the previous year and finalised. The majority of PT results were satisfactory. Where required, for a small number of tests related to two methods, non-conforming work was investigated following ISO17025 procedures and corrective measures put in place; follow up analyses gave satisfactory results confirming the identified issues had been resolved. EU Exit had an impact on participation on one EURL PT where the NRL-FCM was not invited to participate. The COVID-19 pandemic impacted on PT deadlines for 2020. Currently, nine PTs have been delayed as a result of COVID-19, with delayed despatch of samples and altered deadlines provided by the relevant PT provider.

The annual NRL Network Meeting held at Fera, York in June 2019 was an effective way for the FSA, Food Standards Scotland (FSS), NRL and OCL network to communicate, with all UK OCLs represented. Information on training, visits, developments in sampling and testing was exchanged and information from the respective EURLs on methodology, updates and developments was disseminated to all UK OCLs. Where applicable, OCLs were invited to participate in EURL PTs. The NRLs sought feedback on questions or issues from OCLs to raise with the EURL.

The NRLs provided the FSA with monthly NRL Activity Logs which are a timely summary of ongoing activities. NRL Annual Reports are published annually on the NRL website.

5. List of abbreviations

APA	- Association of Public Analysts
BfR	- Bundesinstitut für Risikobewertung
BFR(s)	- Brominated Flame Retardants
CA	- Competent Authority
CEN	- European Committee for Standardization
CP(s)	- Chlorinated paraffins
CWG	- Core Working Group
EC	- European Commission
EFSA	- European Food Safety Authority
EU	- European Union
EURL	- European Union Reference Laboratory
EURL-FCM	- EURL Food Contact Materials
EURL-MN	- EURL Metals and Nitrogenous Compounds
EURL-MP	- EURL Mycotoxins and Plant Toxins
EURL-PC	- EURL Processing Contaminants
EURL-POPs	- EURL Halogenated Persistent Organic Pollutants (POPs) in Feed and Food
Fapas [®]	- Food Analysis Performance Assessment Scheme
FCM	- Food Contact Materials
Fera	- Fera Science Ltd.
FSA	- Food Standards Agency
FSS	- Food Standards Scotland
GC-MS	- Gas Chromatography – Mass Spectrometry
HBCDDs	- Hexabromocyclododecanes
ILC	- Interlaboratory comparison exercise
LCCP	- long-chain chlorinated paraffins (C _{>17})
MANCP	- Multi Annual National Control Plan
MCCP	- medium-chain chlorinated paraffins (C _{14–17})
MOAH	- mineral oil aromatic hydrocarbons
MOSH	- mineral oil saturated hydrocarbons
MVS	- Method validation study
NRL	- National Reference Laboratory

NRL-FCM	- NRL for Materials and Articles in Contact with Food
NRL-MN	- NRL Metals and Nitrogenous Compounds in Feed and Food
NRL-MP	- NRL Mycotoxins and Plant Toxins in Feed and Food
NRL-PC	- NRL Processing Contaminants
NRL-POPs	- NRL for Halogenated Persistent Organic Pollutants (POPs) in Feed and Food
OCL	- Official Control Laboratory
OCR	Official Controls Regulation (EU) 2017/625 ⁽¹⁾
PAHs	- Polycyclic Aromatic Hydrocarbons
PBDEs	- Polybrominated diphenyl ethers
PC	- Processing Contaminants
PCBs	- Polychlorinated biphenyls
PCDDs	- Polychlorinated dibenzo-p-dioxins
PCDFs	- Polychlorinated dibenzofurans
PCDD/Fs	- collectively referred to as dioxins
PFAS	- Per- and Polyfluoroalkyl Substances
PFOA	- Perfluorooctanoic acid
PFOS	- Perfluorooctanesulfonic acid
POPs	- Persistent organic pollutants
PT(s)	- Proficiency test(s)
RASFF	- Rapid Alert System for Food and Feed
SCCP	- short-chain chlorinated paraffins (C ₁₀₋₁₃)
SOPs	- Standard Operating Procedures

6. Introduction

Regulation (EU) 2017/625⁽¹⁾ of the European Parliament and of the Council of 15 March 2017 on official controls and other official activities performed to ensure the application of food and feed law, rules on animal health and welfare, plant health and plant protection products, also known as The Official Controls Regulation (EU) 2017/625⁽¹⁾ (OCR), repeals and replaces Regulation (EC) 882/2004⁽²⁾ on official controls. It entered into force on 27 April 2017 and the majority of its rules started to apply in all EU Member States on 14 December 2019.

The OCR includes a common set of rules applicable to all official laboratories, carrying out analysis, test or diagnosis within the framework of official controls or of other official activities. More specifically, requirements on sampling, analysis, tests and diagnosis, accreditation and obligations of official laboratories have been better specified compared to the previous rules of Regulation (EC) 882/2004⁽²⁾.

The European Commission (EC) created a network of laboratories at EU and Member State levels. This network of laboratories is responsible for setting up EU-wide standards for routine procedures and reliable testing methods in the areas of feed, food and animal health. European Union Reference Laboratories (EURLs) are appointed by the Commission through Regulation (EU) No 2017/625⁽¹⁾. EURLs provide scientific and technical assistance to the Commission, especially in cases where Member States contest the results of analyses. Information for the five EURLs pertinent to this report are given in Appendix 1.

In the UK, responsibility for official feed and food controls is held at central Government level. Responsibilities are devolved; the Competent Authorities (CAs) are the Food Standards Agency (FSA) in England, Wales and Northern Ireland and Food Standards Scotland (FSS). Domestic legislation in England, Northern Ireland, Scotland and Wales enact the EU Official Controls legislation in the four UK nations⁽³⁾⁻⁽¹⁰⁾. Competent authorities designate official laboratories for the purposes of chemical analysis or microbiological examination of feed or food samples taken by enforcement practitioners. In the UK these official laboratories are known as Official Control Laboratories (OCLs). In the UK CAs also appoint National Reference Laboratories (NRLs).

This establishes a network between EURLs, NRLs, OCLs and the competent authority. The overall objective of the EURLs and NRLs is to improve the quality, accuracy and comparability of the results of OCLs.

The UK left the EU on 31st January 2020. There is now a transition period until the end of 2020 while the UK and EU negotiate arrangements. There was three-way communication between the FSA, NRLs and the relevant EURLs via the NRL concerning EU Exit.

The global coronavirus disease (COVID-19) pandemic spread to the UK and by March 2020 the government imposed a lockdown in the UK.

Fera is the UK National Reference Laboratory (NRL) for five areas of Chemical Safety in Food and Feed. This Annual Report covers NRL activities from 1st April 2019 to 31st March 2020.

7. Role and scope of the NRL

In summary, it is a requirement of Regulation (EU) No 625/2017⁽¹⁾ in Article 101 that NRLs in their area of competence:

- a) collaborate with the EURL and participate in training courses and inter-laboratory comparative tests
- b) coordinate the activities of official laboratories with a view of harmonising and improving the methods of laboratory analysis, test or diagnosis and their use
- c) where appropriate, organise inter-laboratory comparative tests between the official laboratories and ensure an appropriate follow-up of such comparative testing and inform the competent authorities of the results and follow-up
- d) ensure the dissemination to the competent authority and official laboratories of information that the EURL supplies
- e) provide scientific and technical assistance to the competent authority for the implementation of MANCPs referred to in Article 109 and of coordinated control programmes adopted in accordance with Article 112
- f) where relevant, validate reagents, establish and maintain up-to-date lists of available reference substances and reagents and manufacturers and suppliers
- g) where necessary, conduct training courses for the staff of official laboratories designated under Article 37
- h) assist actively the Member State having designated them in the diagnosis of outbreaks of foodborne diseases and in case of non-compliance of consignments by carrying out confirmatory characterisation

Fera acts as the UK NRL in the following five areas:

- NRL Mycotoxins and Plant Toxins in Feed and Food
- NRL Heavy Metals and Nitrogenous Compounds in Feed and Food
- NRL Halogenated Persistent Organic Pollutants (POPs) in Feed and Food
- NRL Processing Contaminants
- NRL Materials and Articles in Contact with Food

Fera may also be called upon to offer advice to the FSA relating to the impact of EU Exit on food controls.

8. Core functions

The duties of the NRLs are grouped according to its core functions:

8.1. Core function 1 - Secretariat services

1(a) disseminating information/advice from engagement with international organisations to the FSA, OCLs and other relevant laboratories in a timely and effective manner;

1(b) co-ordinating the activities of OCLs and other relevant laboratories in food in relation to the core functions described below;

1(c) creating and maintaining an efficient two-way channel of communication with OCLs and relevant laboratories and international organisations, including information on analytical methods and relevant legislation;

1(d) providing regular updates to the FSA on NRL activities, and up-to-date information on UK OCLs and other relevant laboratories to the FSA as requested;

1(e) creation and maintenance of a dedicated website for communication of the work of the NRL including provision of advice and support to OCLs, information on methods of analyses, SOPs, latest developments and other background information.

8.2. Core function 2 - Advice and representation within the UK and internationally

2(a) providing impartial expert advice as requested to the FSA, OCLs and other relevant laboratories on analytical methodology in the context of Official Controls;

2(b) representing the UK at relevant international meetings, and working groups, consulting the FSA on objectives and requirements before each meeting and providing the FSA with an internal report of the meeting within two weeks of each meeting;

2(c) participating in activities organised by international organisations and contributing to the scientific input at international meetings and in a manner which supports UK policy based on best available scientific knowledge;

2(d) advising the FSA, OCLs and other relevant laboratories on best scientific practice in testing for Official Controls and undertaking activities in consultation with the FSA that facilitate and promote their application in the UK within the policy aims of the FSA;

2(e) keeping abreast of and advising the FSA, OCLs and other relevant laboratories of developments for the sampling, testing and detection;

2(f) identifying and informing the FSA, OCLs and other relevant laboratories of emerging analytical issues or developments at a national, European or international level and recommending action to address them;

2(g) where appropriate, partake and/or keep abreast of standardisation activities (e.g. CEN, ISO, etc.) relevant to the work area.

8.3. Core function 3 - Production of standard operating procedures, codes of practice and guidance documents

3(a) contributing to the development of standardised operating procedures, relevant codes of practice and guidance documents for use by OCLs and other relevant laboratories, as requested by the FSA.

8.4. Core function 4 - Compliance assessment via audits and ring trials

4(a) ensuring consistency and quality of testing approaches applied by UK OCLs and other relevant laboratories, including advising on corrective action following adverse reports on OCLs from UKAS;

4(b) planning proficiency tests for UK OCLs and other relevant laboratories as appropriate (taking into account the number of relevant laboratories), analysing and evaluating the outcome, informing the FSA and OCLs of the results and advising on further action;

4(c) coordinating the participation of UK OCLs and other relevant laboratories in international method validation studies and other initiatives, informing the FSA and OCLs of the results and advising on further action;

4(d) where relevant, participating in proficiency tests and method validation studies organised by international organisations, informing the FSA of the results and implementing any corrective measures required;

4(e) co-ordinating training exercises to promote best laboratory practice in respect of analysis.

8.5. Core function 5 - Co-ordination within the UK of international initiatives

5(a) where appropriate, co-ordinating the recommendations of international organisations related to the standardisation of testing methods.

8.6. Core function 6 - Communication of results and data use, the NRLs shall

6(a) ensure that the FSA receives regular updates of any developments related to the core functions of the NRL;

6(b) notify the FSA immediately by email of any deviations which may affect the cost, specifications and timing of the annual work programme;

6(c) notify the FSA immediately by email of any unusual occurrences resulting from any of the core functions of the NRL;

6(d) if requested, provide interim reports during the annual work programme;

6(e) not communicate any results or reports arising from the work of the NRL to any external parties without the written permission of the FSA;

6(f) not use the data for presentations and/or papers without written permission of the FSA;

6(g) maintain records for a period of 3 years from the end of the contract;

6(h) meet specified deadlines for other work related to the core functions of the NRL;

6(i) if necessary transfer all information and data gained from, and required for, NRL function to the FSA. This will include assisting with transfer of archived reference materials;

6(j) provide an internal report of meetings with other organisations within 10 working days.

9. Core function 1 - Secretariat services

9.1. Core function 1(a) disseminating information/advice from engagement with international organisations to the FSA, OCLs and other relevant laboratories in a timely and effective manner;

The NRL provides documents received from EURLs within two weeks of receipt. These documents are sent to the FSA. Publicly available documents or links are added to the Fera NRL website.

9.1.1. NRL Network Meeting

The annual NRL Network Meeting was held on 26th June 2019 at Fera, York to disseminate information from all five NRLs, the respective EURLs and the FSA.

9.1.2. NRL-MP

- The EURL Work Programme was downloaded from the EURL website.
- The FSA attended the NRL Network Meeting in June 2019 and gave a comprehensive overview of ongoing discussions on legislation for mycotoxins.
- A meeting was held with the FSA to discuss voting for two methods for mycotoxins that were circulated for CEN enquiry before adoption as CEN standards. Both methods had been developed through Mandate M520 and reviewed thoroughly by CEN TC275 WG5. A request for the UK (BSI) to return a positive vote was sent to BSI.
- In September 2019, the agenda of the EURL Workshop was sent to the FSA for information and to ask if there was anything in particular of interest to the FSA.
- The FSA sent additional information about discussions on methods for pyrrolizidine alkaloids (PAs), and other items for discussion at the EURL Workshop. A report was sent to the FSA after the meeting.
- A copy of the possible projects for CEN TC327 Standardisation Request was sent to the FSA.
- Colleagues from the FSA contaminants team and FSS were met at the WMF/IUPAC conference on mycotoxins in Belfast on 14th to 16th October 2019.
- FSA and FSS colleagues were met at the APA conference 31st October to 1st November 2019, in Glasgow.
- Four FSA colleagues from imported foods team and FSA Wales attended the Imported Food Sampling training course on 22nd to 23rd October 2019 as observers (non NRL contract).
- The EURL-MP sent an email in January 2020 stating they had been informed by the European Commission that 'the EURL must associate with the UK NRL until the end of the transition period, 31/12/2020'. The EURL stated that they were very pleased with this outcome and were looking forward to continued working with the UK NRL-

MP. This was followed by a further email with a copy of the letter from the Commission attached which was forwarded to the FSA in January 2020.

- The EURLPT-MP01-Follow up report PT for DON and related compounds was forwarded to FSA colleagues in March 2020.
- The EURL distributed two documents to the NRL network for consultation, these are documents developed in collaboration with NRL-AQC Working Group. They are the revision to performance criteria Commission Regulation (EC) No 401/2006⁽¹¹⁾ and a guidance document to accompany the new regulation. The initial deadline for responses of 3rd April 2020 was extended until 17th April 2020 due to the COVID-19 situation.

9.1.3. NRL-MN

- On 26th June 2019 NRL-MN attended and presented information at the NRL Network Meeting held at Fera, York. The FSA were also in attendance and gave an update on relevant EU discussions.
- In August 2019, preliminary reports for EURL-MN PT-2019-01 and PT-2019-03 were copied to the FSA.
- The NRL-MN emailed the FSA in September 2019 to inform them of forthcoming attendance at the EURL-MN Workshop in Copenhagen and to ask if anything needed to be raised.
- In November 2019 there was correspondence with the FSA regarding NRL and OCL capabilities for the ability to analyse samples within current legislated limits. Current levels are well within the NRLs capabilities. Reference to a recent review of OCL capabilities undertaken by Fera for the FSA was provided.
- In December 2019, NRL-MN emailed the FSA with general information on the inorganic arsenic method used at Fera.
- On 6th December 2019, NRL-MN provided an email response to the request from the FSA for views on proposed maximum levels of lead in baby food and food for infants and young children, with particular regard to achievability and whether NRL-MN or any of the OCLs were likely to find these proposed limits challenging.
- In February 2020, NRL-MN emailed a copy of the EURL-MN newsletter to the FSA and to verify post EU Exit policy regarding the NRL.
- The EURL-MN newsletter received on 30th March 2020 was copied to the FSA for information.

9.1.4. NRL-POPs

- The final version of the technical report from the EURL/NRL workshop held in October 2018, received in April 2019, was forwarded to the FSA.
- An EURL/NRL network meeting/workshop was held in Riga, Latvia, in May 2019. Two delegates attended from the UK NRL-POPs and meeting notes were sent to the FSA.
- In May 2019, after discussion at the EURL/NRL workshop in Riga, the EURL-POPs sent out a draft version of an addendum to a Guidance document on LOD/LOQs. This

was forwarded to the FSA with a request for feedback, which was then sent on to the EURL-POPs.

- The NRL-POPs attended and presented at the NRL Network Meeting held at Fera on 26th June 2019.
- In July 2019, two research papers (both of which were co-authored by employees of Fera and the FSA) were distributed by the EURL-POPs to the NRL network. These were forwarded to the FSA.
- Meetings of the CWGs for PFASs (June 2019), Brominated Contaminants (September 2019) and Chlorinated Paraffins (September 2019) were held and attended by a representative of the UK NRL-POPs. Notes from each meeting were sent to the FSA.
- A second EURL/NRL network meeting/workshop was held in Freiburg, Germany, in November 2019. No delegates from the UK NRL-POPs attended as per UK FSA guidance, and as a result, no meeting notes were received.
- In December 2019, the EURL sent a guidance document on analytical parameters for the determination of organobromine contaminants in food and feed which was forwarded to the FSA in January 2020.
- EFSA published a draft of its scientific opinion on the risks to human health related to the presence of perfluoroalkyl substances in food for Public Consultation in February (EFSA, 2020, comments required by 20th April 2020)⁽¹²⁾. This information was promptly emailed to the FSA.
- In March 2020, the EURL-POPs informed Fera that EFSA had published a revised version of its opinion on chlorinated paraffins (EFSA, 2020a)⁽¹³⁾ as well as the technical report (EFSA, 2020b)⁽¹⁴⁾ answering all comments from public consultation and provided links to the documents. These web-links were forwarded to the FSA.
- In March 2020, NRL-POPs forwarded a link to the FSA (which had been distributed by the EURL-POPs) to a scientific publication regarding PFAS analysis, method development and data generation which had been co-authored by a member of the EURL/NRL network.

9.1.5. NRL-PC

- A representative for the NRL-PC attended and presented information at the NRL Network Meeting held at Fera on 26th June 2019. Members of the FSA were also present and updated on European discussions on processing contaminants.
- Representatives from the EURL-PC attended RAFA (Recent advances in food analysis) 2019 (Fera staff also attended) and ISPAC (International symposium on polyaromatic compounds) 2019. The EURL-PC provided summaries, abstracts and posters.

9.1.6. NRL-FCM

- All documents provided by the EURL-FCM before and after the October 2019 plenary meeting were shared with the FSA. UK government guidance prevented participation in the meeting and to date no minutes have been received. The agenda included:

- Overview of 2019 network and NRL activities
 - News from DG SANTE on food and FCM legislations and news from other FCM international fora
 - PT presentation and discussion
 - NRL project presentations
 - Updates / information exchange on multi-analyte methods, kitchen and bakeware guidelines, plastic recycling, representative sampling of FCM and accreditation
 - PTs and training for 2020 and proposals for 2021
 - Operation of Task Forces
 - Planning of new guidelines
- The documents provided by the EURL-FCM before and after the kitchenware test conditions task force meetings (held in May 2019 and October 2019 – attended by telecon) were shared with the FSA. OCLs were invited to comment on the consultation on the updated guidelines. OCLs were requested to reply directly to the EURL-FCM and copy any comments to the NRL-FCM. No responses/ comments were received. The updated guidance for plastics was published in “Testing conditions for kitchenware articles in contact with foodstuffs- Part 1: Plastics” in 2019: https://ec.europa.eu/jrc/sites/jrcsh/files/beldi_jrc116750_jrc116750_kitchenware-conditions.pdf
 - Work continues on metal kitchenware products. The EURL-FCM meeting note on the Roundtable Workshop on the Determination of MOAH in Infant Formula held in December 2019 was sent to the FSA. The aim of the event was to derive a consensus approach to the determination of MOAH in infant formula. Those involved in the testing of MOAH described the methodologies followed in their laboratories and a consensus approach was agreed. The FSA also attended this workshop. The workshop was held following publication of the report “International test of various canned baby milk products for their content of mineral oil hydrocarbons (MOSH/MOAH)” https://www.foodwatch.org/fileadmin/-INT/mineral_oil/documents/2019-10-24_Projectreport_babymilk_FINAL.pdf and one industry members response questioning the applicability of the methodology used: <https://www.nestle.com/ask-nestle/health-nutrition/answers/food-watch-report-mineral-oils-infant-formula>
 - A presentation delivered at China FCM conference was provided to the FSA (covered the outputs of the biobased FCM literature reported to the FSA earlier in the year).
 - The NRL-FCM attended and presented at the NRL Network Meeting held at Fera on 26th June 2019. FSA also gave an update on current discussions about FCM legislation in Europe.

9.2. Core function 1(b) co-ordinating the activities of OCLs and other relevant laboratories in food in relation to the core functions described below;

The NRL Network Meeting is used as one way to manage the operation of the NRLs. The Meeting acts to ensure effective communication between OCLs and the NRLs and as a vehicle for feedback by OCLs on NRL performance. This has already proved to be a valuable platform for the exchange of information and includes the FSA and FSS as well as the OCLs and the five Fera Contaminants NRLs. It is used to define the training activities required for the next period as well as visits and other support required and to disseminate EURL and FSA information.

An NRL Network Meeting was held on 26th June 2019 at Fera, York. The date for the NRL Network Meeting was set by consensus. Representatives from all five Fera NRLs, Food Standards Scotland (FSS) and the FSA attended. A representative from all UK OCLs was present for part or all of the meeting, in person or via teleconference. Positive verbal feedback was received by the NRL on the day about holding these meetings.

An NRL Network Meeting Note was prepared and circulated to all OCLs, the FSA and FSS. The presentations given at the Meeting by the five NRL areas were also distributed along with two FSA Updates (Contaminants and FCM).

The frequency and timing of future NRL Network Meetings was discussed with the FSA. It was agreed the meetings should occur at least annually, and early summer is a suitable time. Depending on consensus, it is likely future meetings will be held at Fera, York as the most workable option.

9.3. Core function 1(c) creating and maintaining an efficient two-way channel of communication with OCLs and relevant laboratories and international organisations, including information on analytical methods and relevant legislation;

Fera experts regularly scan different scientific literature (peer reviewed and grey literature) relevant to each area for emerging food and feed safety topics, and includes ResearchGate, HorizonScan and Rapid Alert System for Food and Feed (RASFF). There are also established links with the EURL Network. Relevant information on current and new methods and Legislation is highlighted on the Fera NRL website.

The NRLs seek feedback on questions or issues from the OCLs to raise with the EURLs or the other NRLs with whom they already have a dialogue and established working relationship thus ensuring effective two-way communication.

- An up to date list of OCLs and contact details was maintained.
- A dedicated NRL email address is regularly monitored: nrl@fera.co.uk
- The FSA, EURLs and OCLs are able to individually email the named lead person for each NRL.
- The NRLs seek feedback on questions or issues from the OCLs to raise with the EURL. Working relationships are well established with the EURLs so this ensures efficient communication.
- In April 2019, an OCL asked for the current list of contacts held by the NRL for their OCL and this was provided.

- In May 2019 Fera provided information to the FSA as a result of an enquiry from the imported foods team about the use of Scanning Electron Microscope (SEM) technology reported in a RASFF alert.
- Fera provided information summarised from HorizonScan to FSA imported food team in response to a request for information about possible high risk foods that may need to be included in National Monitoring Plan (NMP) sampling priorities.
- There was contact with the Association of Public Analysts (APA) throughout the year. The APA is an independent, professional association whose members are appointed Public Analysts. Members of the NRL are associate members of the APA.
- In April 2019, the head of the NRL visited an OCL and had useful discussions with the head of laboratory and OCL staff. Topics discussed included methods for PAHs, mycotoxins, including ochratoxin A, ergot alkaloids, other processing contaminants, e.g. MCPD esters and glycidyl esters. The NRL invited the OCL staff to visit Fera for training. The APA annual conference in Glasgow in October 2019 was also discussed and the head of the NRL was invited to give a presentation.
- In August 2019, information on the circulation and contact list used for the Phase 1 Laboratory Review of Official Control Laboratories was sent to the FSA.
- The head of the NRL gave a presentation on natural toxins at the APA annual conference in Glasgow in October 2019. There was good contact with several of the OCLs at the conference and some discussions about future training were held. Colleagues from the FSA Laboratory Policy team and FSS also attended and discussions were held.
- The FSA sought clarification on Fera NRL contacts and this was provided in January 2020. Fera NRL also requested confirmation of the FSA contacts or an organigram for the various policy areas so an up to date list of names and areas of responsibilities could be maintained.

9.3.1. NRL Network Meeting

The NRL Network Meeting held on 26th June 2019 at Fera, York is a very effective way for the FSA-FSS-NRL-OCL network to communicate (see Section 1 (a)).

9.3.2. NRL-MP

- The lead for the NRL-MP is also the head of the Fera NRLs. There have been numerous occasions for interaction both within the FSA-NRL-OCL network and wider. The NRL Network Meeting was chaired by the Head of the NRL-MP.
- A presentation on Natural Toxins was given at the APA Annual Conference.
- A presentation was due to be given at the MChemA training course but this was postponed due to COVID-19. Alternative methods of delivering this training, e.g. via web-based resources are being investigated.
- The WMF/IUPAC conference was attended where a number of organisations were represented.

9.3.3. NRL-MN

- The NRL-MN attended and presented information at the NRL Network Meeting on 26th June 2019.
- In July 2019, as a follow up to the NRL Network Meeting held in June, the NRL-MN received some information on geographical variations on the concentration of cadmium in cocoa beans from a report generated by an OCL.
- In August 2019, an email was received from the EURL-MN informing of the dispatch of EURL-MN-PT-2019-02: Cd, Pb and nitrate in vegetable-based baby food. Clarification was requested from EURL-MN clarification of how to report the results (per ml of the re-constituted material or per g of dry material?). EURL-MN replied advising that the data should be reported in mg/kg of dried material.
- Updated NRL-MN contact information was sent to the EURL-MN to ensure their records were up to date.
- A Newsletter was received from the EURL-MN in February 2020 detailing Metals and Nitrogenous compounds PT rounds for 2020. The Newsletter also contained dates for the 2020 EURL-MN Workshop to be held in Copenhagen 28th and 29th October 2020. Training was offered by the EURL-MN in nitrite and nitrate determination with the training due to take place at DTU 17th to 18th June 2020. A further Newsletter was received in March 2020 with revisions to the proposed dates for the forthcoming PT samples due to COVID-19.
- The NRL-MN contacted the EURL-MN in February 2020 requesting the Minutes of the 2019 Workshop that they had not been able to attend; the EURL-MN supplied the minutes.

9.3.4. NRL-POPs

- A representative from NRL-POPs attended and presented at the NRL Network Meeting held at Fera 26th June 2019.
- On 30th July 2019 an email was received informing the EURL-NRL network that the head of the EURL for halogenated POPs, Rainer Malisch, was retiring from his role at the end of the year. Alexander Schächtele was selected by the State of Baden-Württemberg to succeed as head of the EURL with immediate effect. The email was forwarded to the FSA.

9.3.5. NRL-PC

- A representative for the NRL-PC attended and presented information at the NRL Network Meeting held at Fera on 26th June 2019.
- None of the OCLs are routinely analysing for PAHs and process contaminants, although there has been dialogue about possible training for one OCL.

9.3.6. NRL-FCM

A representative for the NRL-FCM attended and presented information at the NRL Network Meeting held at Fera on 26th June 2019.

- Received a request to update the information exchange file on the EURL-NRL-FCM network analytical capabilities and get an overview of the accreditation scopes of the NRLs and OCLs for FCM. No response was required from the UK.
- Received a request for proposals for training to be offered by the EURL-FCM in 2021. No response was required from the UK. It was also confirmed that EURL-FCM will organise training on the identification of polymers in 2020.
- Accreditation status / methods information exchange was received from the EURL-FCM.
- A presentation was due to be given at the MChemA training course but this was postponed due to COVID-19. Alternative methods of delivering this training, e.g. via web-based resources are being investigated.

9.4. Core function 1(d) providing regular updates to the FSA on NRL activities, and up-to-date information on UK OCLs and other relevant laboratories to the FSA as requested;

A monthly NRL Activity Log is prepared and submitted to the FSA. All work is then summarised in an Annual Report. Specific topics, or items arising, are dealt with individually in a timely manner.

- The NRL received notification that Worcester Scientific Services Laboratory (an OCL) would close on 31st December 2019. This information was forwarded to the FSA.
- The NRL received notification that West Yorkshire Joint Services food testing laboratory would close on 31st March 2020. The closure information was forwarded to the FSA. This lab was no longer an OCL, but several OCLs used it as a subcontractor for some analyses.

9.5. Core function 1(e) creation and maintenance of a dedicated website for communication of the work of the NRL including provision of advice and support to OCLs, information on methods of analyses, SOPs, latest developments and other background information.

The NRL has a long standing fully accessible dedicated NRL website. This provides information on legislation, analysis and resources. OCL feedback is that it meets their needs.

- The NRL website has a landing page:
<https://www.fera.co.uk/national-reference-laboratory>
- Individual webpages are maintained for each of the NRLs:

NRL-MP

<https://www.fera.co.uk/about-us/national-reference-laboratory/mycotoxins>

NRL-MN

<https://www.fera.co.uk/about-us/national-reference-laboratory/heavy-metals>

NRL-POPs

<https://www.fera.co.uk/about-us/national-reference-laboratory/dioxins-pcbs>

NRL-PC

<https://www.fera.co.uk/about-us/national-reference-laboratory/pahs>

NRL-FCM

<https://www.fera.co.uk/about-us/national-reference-laboratory/food-contact>

10. Core function 2 - Advice and representation within the UK and internationally

10.1. Core function 2(a) providing impartial expert advice as requested to the FSA, OCLs and other relevant laboratories on analytical methodology in the context of Official Controls;

All advice provided by Fera staff is impartial and is based on our heritage as an official government laboratory. Fera scientists have maintained their experience in evaluation of analytical methods when considering the suitability of data for inclusion in exposure assessments, e.g. via participation in EFSA working groups.

Fera staff are experienced in method development and validation and have developed methods that are used in Official Controls in the UK. This is complemented by in-depth knowledge of the performance requirements of sampling and analytical methods used in Official Controls.

Fera NRL outcomes:

- In April 2019, the head of the NRL visited an OCL and had useful discussions with the head of laboratory and OCL staff. Topics discussed included methods for PAHs, mycotoxins, including ochratoxin A, ergot alkaloids, other processing contaminants, e.g. MCPD esters and glycidyl esters. The NRL invited OCL staff to visit Fera for training. Training for sampling officers was also discussed.
- One OCL enquired in June 2019 about the NRL providing analytical support as they had encountered a cyber security breach and had reduced capacity. Information on costs was provided, in the event no samples were sent to the NRL, but samples were sent to other OCLs for analysis.
- In August 2019, there was contact with one OCL about training at Fera for mycotoxins and processing contaminants.
- The head of the NRL gave a presentation on natural toxins at the APA annual conference in Glasgow in October 2019.

10.1.1. NRL-MP

- There was contact with the EURL-MP to ask about UK-NRL future participation in Workshops and PT rounds. The EURL has made it clear that the NRL-MP is still welcome to participate in meetings and PTs.
- NRL-MP emailed the EURL-MP to ask for information about methods of analysis (specifically LC-MS/MS) for tetrahydrocannabinol (THC) compounds and cannabinoids. A reply was received, but this will be followed up as more information is required.
- In June 2019, the NRL-MP replied to a questionnaire from the EURL-MP about training requests. EURL-MP training offered was for ergot alkaloids or pyrrolizidine alkaloids (PAs) (this to be a repeat of the training Fera received last year as it was oversubscribed). They also asked for suggestions for other topics for training. NRL-MP suggested training on hydrocyanic acid and cannabinoids.

- In June 2019, the FSA requested information about the heterogeneity of ergot alkaloids in cereal products. Information and advice were provided.
- In July 2019, NRL-MP received a questionnaire from the EURL-MP about method performance data / criteria; this was completed and returned to the EURL-MP.
- In August 2019, the EURL-MP circulated a consultation to NRLs requesting information about methods for mycotoxins (ergot alkaloids and alternaria toxins) and alkaloids (tropane and pyrrolizidine). In particular the EURL-MP wanted to know if laboratories current methods could achieve the target performance criteria and LOQs. A reply was sent with the information requested.
- The FSA requested copies of some of the presentations from the 2018 EURL-MP Workshop meeting, these and copies of the PT reports from 2018 were sent in June 2019, followed by other items, e.g. on method performance for pyrrolizidine alkaloids (PAs) in September 2019.
- A method for ergot alkaloid analysis by LC-MS was sent to an OCL. Some analytical standards were also requested, but these were not sent in order to comply with Precursor Drug licence restrictions.
- In January 2020, an OCL enquired about storage conditions for ergot alkaloids standards. Advice on storage, expiry dates and checking standards was provided by email. Training was also offered at the same time.
- Advice was given to the Italian NRL (ISS) to help them with the amendments to a draft version of a CEN standard that they were preparing.

10.1.2. NRL-MN

- The NRL-MN emailed the FSA in September 2019 to inform them of forthcoming attendance at the EURL-MN Workshop in Copenhagen and to ask FSA would like anything raised at the meeting.
- In November 2019 there was correspondence with the FSA regarding NRL-MN and OCL capabilities for the ability to analyse samples within current legislated limits. Current levels are well within the NRL-MN's capabilities. Reference to a recent review of OCL capabilities undertaken by Fera for the FSA was provided.
- In December 2019, NRL-MN emailed the FSA with general information on the inorganic arsenic method used at Fera.
- On 6th December 2019, NRL-MN provided an email response to a request from the FSA for views on proposed maximum levels of lead in baby food and food for infants and young children, with particular regard to achievability and whether NRL-MN or any of the OCLs were likely to find these proposed limits challenging.
- In February 2020, NRL-MN emailed a copy of the EURL-MN newsletter to the FSA and to verify post EU Exit policy regarding the NRL. The FSA replied that attending EURL meetings as representatives of the UK government or the FSA was still proscribed till further notice.
- The EURL-MN newsletter received on 30th March 2020 was copied to the FSA.

10.1.3. NRL-POPs

- Received and responded to an email request on the 18th February 2020 from the Finnish NRL to provide advice and potentially to provide analytical service to them for the analysis of brominated dioxins in the future.

10.1.4. NRL-PC

- A representative from the NRL visited an OCL and discussed PAH analysis with their scientists.
- A request was received from the National Aquatic Resources Research and Development Agency, Sri Lanka for advice on analysis of PAHs in smoked fish; a response was sent.
- An email was received in August 2019 from the EURL-PC requesting information on QuEChERS method for PAHs analysis so a protocol for a PAH method trial could be prepared.
- In February 2020 the FSA requested information on the extent to which organic contaminants absorbed onto microplastics are taken into account during analysis of foods using current extraction methods and a reply was emailed.

10.1.5. NRL-FCM

- Responded to an OCL query on microbeads.
- Responded to an EURL-FCM request for information on the availability of in-house multi-methods for selected substances.
- Provided the EURL-FCM with information on UK laboratories accredited for the determination of MOSH and MOAH.
- Responded to a request from NRL-Estonia looking for a laboratory that could conduct analysis to determine the composition of a bioplastic material.
- Responded to a query from NRL-Cyprus on the interpretation of the ceramics Directive.
- Had contact with NRL-Slovenia regarding testing benzophenone and 4-methylbenzophenone migration.
- Had contact with NRL-Germany to better understand methodology and worst-case extraction conditions for MCPD from paper and board products.
- Responded to a request received from Swedish Food Agency for analysis of mineral oils in infant formula.
- Shared FCM training content from 2016 (presentation given to MChemA delegates) with NRL-Sweden.
- The NRL liaised with the EURL-FCM to understand the status of the Certified Reference Material (CRM) for fatty contact. JRC-Geel passed the material on to JRC-Ispra, however the results suggested that the fluorescent dye levels have decreased. This is consistent with work carried out at Fera in which we proposed isomerisation of the DPBD resulted in reduced levels (the response in the fluorescence detector for the isomer is less than the isomer incorporated into the film).

10.2. Core function 2(b) representing the UK at relevant international meetings, and working-groups, consulting the FSA on objectives and requirements before each meeting and providing the FSA with an internal report of the meeting within two weeks of each meeting;

Agendas received in advance of EURL meetings were forwarded to the FSA and information was exchanged either by telecon or by email to ensure that the Fera member of staff attending the meeting was aware of any particular FSA interests or requirements. Any points highlighted were raised in the meeting and the discussions documented and included in the meeting note provided to the FSA.

The FSA sent an email in late September 2019 asking that NRLs do not attend EURL Workshops on behalf of the FSA following a decision from government that UK officials should not attend EU meetings. Fera replied that several EURL Workshops would be held in October 2019 and that registration and travel bookings had already been. Subsequently all were cancelled except the EURL-MP Workshop which took place on 1st to 2nd October 2019. The NRL-MP attended as Fera and not as a UK NRL representative. No EU meetings have been attended since.

10.2.1. NRL-MP

- The EURL-MP Workshop was held on 1st to 2nd October 2019. The FSA advised that Fera could not attend as a UK or NRL representative, therefore two staff attended as Fera delegates. There were presentations about a variety of topics including identification of foreign matter/ seeds etc in feed, pyrrolizidine alkaloid analysis, citrinin analysis, EURL PTs, an update on EU legislation for mycotoxins and plant toxins, an update on CEN activities, as well as updates on a couple of EU H2020 Research projects. On the second day there was a workshop session of Quality Control Practices - the delegates were split into 5 groups each led by a member of the QC Working Group. A series of questions were discussed, led by the Working Group member. A summary of the discussions of each group was fed back to the whole Workshop; Fera led one of the groups.
- The provisional dates for the next EURL-NRL workshop are 6th -7th October 2020, although we have been informed by the FSA that until further notice UK NRL cannot participate in EU meetings.
- WMFmeetsIUPAC 2019 is the joint meeting of The World Mycotoxin Forum® and the IUPAC International Symposium on Mycotoxins. The head of the NRL met colleagues from the FSA contaminants team and FSS at the conference in Belfast on 14th to 16th October 2019.

10.2.1.1. EURL-MP Working Group on method performance criteria for mycotoxins and plant toxins

In April 2019, the EURL invited NRL-MP to be a member of an EURL Working Group on criteria for methods of analysis for mycotoxins and plant toxins. A meeting was set for 3rd May 2019, the NRL-MP could not attend so a call was arranged between NRL-MP and the EURL-MP Head (Hans Mol), to discuss the topics from the agenda of the Working Group meeting. These included the use of recovery correction, LOD/LOQ, measurement

uncertainty, performance parameters and calculation of PT results. The points covered in the discussion fed into the Working Group meeting

At the EURL-MP Workshop in October 2019 a session was planned on method QC criteria led by members of the EURL Working Group on this topic. As a member of this group, NRL-MP was asked in September to complete a document outlining procedures used in Fera, this covered topics such as LOD/LOQ, measurement uncertainty, recovery correction etc. The document was returned to the EURL-MP and was used as a basis for discussion at the Workshop.

The documents on criteria and the amendment to Commission Regulation (EC) No 401/2006⁽¹¹⁾ that had been discussed at the EURL-NRL Workshop were distributed with a request for comments/ replies by 20th December 2019. NRL-MP commented on the documents and sent a response to the EURL-MP, shared with the other members of the Working Group (NRLs for Germany, Italy, Croatia and The Netherlands). The EURL-MP used this feedback to further improve the documents so they could be circulated among the whole EURL-NRL network for comment.

The EURL-MP circulated the two draft documents to the whole network for comments by end April 2020.

10.2.2. NRL-MN

- In April 2019 there was information that the annual EURL-MN Workshop would be held in Copenhagen on 23rd to 24th October 2019 and an online registration was submitted. In October, attendance was cancelled due to government policy on participation in EU meetings during EU Exit negotiations. Copies of the presentations made at the Workshop were received with a summary of the outcome of group discussion on nitrate analysis and a list of participants from the EURL-MN. These were forwarded on to the FSA.
- The 3rd annual EURL-MN Workshop will be held in Copenhagen, 28th to 29th October 2020. Invitations and further information will be sent in June. Current expectation is that NRL-MN will not attend.

10.2.3. NRL-POPs

- On 16th April 2019 the technical report was received for the EURL/NRL workshop held in Freiburg in October 2019, which was forwarded to the FSA.
- At the end of April 2019, a draft program was received for the upcoming EURL-POPs Workshop in Riga in May 2019 which was forwarded to the FSA.
- The first annual halogenated POPs EURL/NRL network meeting was held in Riga, Latvia on 14th and 15th May 2019. This was attended by the NRL-POPs. The draft technical report of the Workshop was received in July and forwarded to the FSA. The Final Technical Report was received in October 2019 and also emailed to the FSA.
- In July 2019 an invitation to the second Workshop of 2019 in Freiburg on 26th to 27th November 2019 was received and this notification was forwarded to the FSA.

On the 7th October 2019 the NRL-POPs contacted the EURL requesting permission to attend the Network Meeting on 26th to 27th November 2019 as a Fera employee

and not as an official UK representative (with costs covered by Fera as agreed with the FSA). The initial response was positive so a registration to attend was completed. However, on the 30th October, the EURL-POPs informed Fera that the EU Commission had vetoed Fera representatives from attending the meeting in a capacity other than as the official NRL representative. As the EU Exit deadline was extended beyond 31st October, advice was sought from the FSA as to whether the block on meeting attendance remained. The advice was that the current position of no EU meeting attendance will extend until further notice. The EURL-POPs was contacted on the 31st October to explain that Fera was therefore unable to send any representative and so registration was cancelled.

- On 31st January 2020 the schedule was received for the EURL/NRL workshop meetings, CWG meetings and training activities for 2020. An invitation and registration details were received to the first annual EURL/NRL Workshop to be held in Freiburg on 19th to 20th May 2020. The second Workshop is timetabled for the 17th and 18th of November 2020 and will be held in Berlin, Germany.
- The EURL was emailed on 26th February 2020 to inform them that, until further notice, Fera was not permitted to send a delegate acting as a representative of the UK NRL-POPs to the EURL/NRL workshops or Core Working Group meetings as a result of the FSAs position remaining in line with central government advice provided by the Cabinet Office.
- On 16th March 2020 – a message was received from the EURL-POPs announcing that it was unlikely that the next EURL/NRL Workshop (Freiburg, 19th to 20th May) would be able to go ahead due to the global COVID-19 situation. This did not directly affect the Fera NRL-POPs as attendance was not planned due to UK government directive not to attend EURL/NRL network meetings.

10.2.3.1. Core Working Group (CWG): Brominated Flame Retardants (BFRs)

In May 2019 an invitation to attend the CWG meeting for BFRs in Wageningen (Netherlands) on 24th September 2019 was received. The Draft Program followed in August and was forwarded to the FSA. The NRL-POPs attended the Meeting. The EURL-POPs technical notes resulting from this meeting were forwarded to the FSA in October 2019 and additionally an NRL-POPs Meeting Note was provided.

Guidance document (v1.1) was received on the analytical parameters for the determination of organobromine contaminants in food and feed, in particular for PBDEs and HBCDDs in December 2019. Also received was the technical report from the last BFR CWG meeting held in Wageningen in September 2019 and a proposed short list for emerging brominated contaminants. The EURL-POPs technical meeting notes and the updated Analytical Recommendations from the CWG for BFRs were sent to the FSA. There will be a meeting of the BFR CWG on the 18th to 19th November 2020 in Berlin (directly following the second annual EURL/NRL workshop).

10.2.3.2. Core Working Group: PFAS

The agenda and questionnaire for the meeting to be held in mid-June 2019 were sent to the FSA. The NRL-POPs was represented at the meeting Orebro, Sweden on the 18th to 19th June 2019. Meeting Notes were sent to the FSA. The attachments also included an excerpt

from the report (at that time not finalised) from the UNEP 4th Interlaboratory Assessment on Persistent Organic Pollutants (including PFAS).

The draft technical report for the Meeting was received in August 2019 and forwarded to the FSA. In October, the EURL-POPs' technical report from the Core Working Group for PFAS was sent to the FSA. In January 2020 it was noted that there will be two CWG meetings for PFAS both in Freiburg, on the 16th to 17th June and the 14th October 2020.

In March 2020 details and registration form were received for the June CWG Meeting in Freiburg and these were sent to the FSA. The NRL-POPs will not send a representative due to UK government restrictions.

Also received in March 2020 was an invitation from the EURL-POPs to participate in an extra PT for PFAS with results to be discussed at the next CWG. The NRL-POPs confirmed interest in taking part in the additional PT. The EURL-POPs then acknowledged that it was unlikely that the CWG meeting would be able to go ahead as planned due to COVID-19 but that the PT would still be run.

At the end of March 2020, the EURL-POPs sent a link to a publication "Trace level analyses of selected perfluoroalkyl acids in food" which was co-authored by one of the members of the PFAS working group (Heidlore Fiedler). The link was forwarded to the FSA.

10.2.3.3. Core Working Group: Chlorinated Paraffins (CPs)

The NRL-POPs was represented at the CWG meeting for CPs on 25th September 2019 at Wageningen, Netherlands. The Meeting Notes from the Core Working Group for CPs were forwarded to the FSA. The Draft Report was received from the EURL-POPs in December 2019 and this was forwarded to the FSA. In January 2020 the FSA were sent the EURL-POPs technical meeting notes. In March 2020 the Technical Report was sent to the FSA. There was also notification that there will be a CWG for CPs on the 13th October 2020 in Freiburg.

10.2.4. NRL-PC

- Dates were confirmed for the EURL-PC Workshop held at DTU on 10th to 11th October 2019. Topics for discussion were: Results and discussion of PTs, Underperformance in PTs and Presentations from NRLs. An email was sent to the FSA to request if there were items to be raised at the Workshop. Two representatives from NRL-PC were registered for the Workshop. Attendance at the EURL-PC Workshop was subsequently cancelled due to government policy on participation in EU meetings during EU-Exit negotiations.
- On 7th January 2020, the EURL sent an email that they would like to set up Core Working Groups on LOD/LOQ and method performance criteria. NRL-PC replied that we would like to take an active part in these working groups but were unsure as to our position with respect to EU-Exit. The EURL-PC said they would contact the Commission to get clarification. An email was sent to the FSA on 15th January 2020 asking if the NRL-PC could take part in the core working groups. The FSA were checking with the EU Exit policy team and sought clarification if the NRL-PC was leading the work, if it was an EU28 meeting and whether non-Member States had also been invited. By the end of January, clarification from the Commission via the

EURL had not been received. The deadline for expression of interest was 28th January 2020.

- Dates for next the EURL-PC Workshop are 30th September to 1st October 2020 in Copenhagen, Denmark.

10.2.5. NRL-FCM

- The NRL-FCM accepted an invitation to join the printing inks working group of the Committee for Food Contact Materials and Articles (CD-P-MCA).
- The NRL-FCM joined the AdHoc working group on printing ink's teleconference in June 2019. The focus of the meeting was the peer reviewed multianalyte method, Printing Inks Working Group 'MCA PEER 001 study' - Ultra high performance liquid chromatography and gas chromatographic method for the determination of photo-initiators and plasticisers in simulants and dry foods. The purpose of the meeting was to discuss results from the analysis of the 'familiarisation sample' (which Fera NRL-FCM was not involved in) and to plan further steps of the peer-review. The main conclusion was that the chromatographic conditions and detection / quantitation ions described were acceptable and a uniform method for determining and expressing the LOD should be agreed. Fera NRL-FCM agreed to participate in the next stage of the peer-review. Minutes of the meeting were circulated for review/ comment.
- An invitation was received to attend the Bakeware Stakeholder Meeting in June 2019 in Geel, Belgium. However, as this clashed with the FSA Science Advisory Committee Discovery Day it was not possible for Fera NRL-FCM to attend.
- A roundtable Workshop on the determination of mineral oil aromatic hydrocarbons (MOAH) in infant formula was held in Brussels in December 2019. The FSA also attended the Workshop. The aim of the event was to derive a consensus approach to the determination of MOAH in infant formula. Those involved in the testing of MOAH described the methodologies followed in their laboratories and a consensus approach was agreed. A meeting note was provided for the FSA.

10.3. Core function 2(c) participating in activities organised by international organisations and contributing to the scientific input at international meetings and in a manner which supports UK policy based on best available scientific knowledge;

Fera staff continue to be trained in new and emerging areas, including by attending as permitted the respective annual EURL Workshop, EURL training events and relevant conferences to maintain expert knowledge.

Fera staff participated in a number of international scientific conferences, as speakers and delegates, e.g. A presentation delivered at China FCM conference, attendance and participation at RAFA (posters), and attendance at WMF meets IUPAC Mycotoxin Conference.

10.4. Core function 2(d) advising the FSA, OCLs and other relevant laboratories on best scientific practice in testing for Official Controls and undertaking activities in consultation with the FSA that facilitate and promote their application in the UK within the policy aims of the FSA;

Maintaining an up-to-date website, providing feedback from EURL-NRL network meetings in a timely manner and offering practical training to OCLs, ensure that this task is met.

Fera outcomes:

- Advice was provided to OCLs and NRLs and FSA
- Feedback was provided by Fera on method suitability criteria and other good practice relating to Official Controls on the Clarification document “Official laboratories requirements – Articles 34 to 42 of Regulation (EU) 2017/625⁽¹⁾ on official controls and other official activities (OCR)” received from Defra/FSA.

10.4.1. NRL Network Meeting

All OCLs were informed at the NRL Network Meeting of the NRLs intention to visit as many OCLs as possible in the lifetime of the current contract (by end March 2021). Laboratories were asked to volunteer for preferred dates and topics they would particularly like to discuss. An OCL fed back that they had found their recent visit very useful. Subsequently an OCL registered an interest to send a member of staff to the NRL-MP for training in the ergot alkaloids method. Currently, no visits can be undertaken due to COVID-19.

10.4.2. APA annual conference

The APA annual conference was held in Glasgow in October 2019. The head of the NRL gave a presentation on natural toxins. There was good contact with several of the OCLs, the FSA Laboratory Policy team and FSS.

10.4.3. MChemA

The Mastership in Chemical Analysis (MChemA) is the statutory qualification for practice as a Public Analyst and Agriculture Analyst in the UK. Fera staff continue to contribute to the MChemA training course with presentations given and supporting information. In November 2019, the NRL-MP and NRL-FCM were invited by the Association of Public Analysts (APA) to present at the MChemA training course at Reading University in April 2020. This event was postponed due to the current COVID-19 pandemic, however alternative methods to deliver the training material, i.e. via the web-based applications, are being investigated.

10.4.4. NRL-MP

- NRL-MP visited an OCL and discussed various method issues. Two staff will visit Fera in the future for training.
- A request for training on ergot alkaloids from an OCL was received and will be followed.

10.4.5. NRL-FCM

- Advice was given to an OCL regarding testing for recycled content in PET bottles.
- An opinion was provided to an OCL on the inclusion of the handle in the rim test for ceramic articles intended for contact with food.
- Responded to an EURL-FCM request regarding whether Fera had experience in the testing of rPET.
- Provided advice to an OCL on the testing of glazed and un-glazed articles in accordance with the Directive for ceramics.
- Provided advice to an OCL for testing contamination of meat from old whisky barrels used as chippings on a barbecue.
- Provided advice to an OCL on testing beeswax coated materials for FCM compliance, on two separate occasions.
- Responded to a request received from the Swedish Food Agency for analysis of mineral oils in infant formula.

10.5. Core function 2(e) keeping abreast of and advising the FSA, OCLs and other relevant laboratories of developments for sampling, testing and detection;

10.5.1. NRL Network Meeting

Developments in sampling and testing were discussed at the NRL Network Meeting on 26th June 2019 at Fera, York.

10.5.2. NRL-MP

- The EURL-MP sent an email with suggestions for future training options. These were 1. Analysis of ergot alkaloids using LC-MS/MS; 2. Analysis of pyrrolizidine alkaloids by LC-MS/MS (same as 2018 training); 3. A request for other items for training. Fera replied to request training for methods for determination of hydrocyanic acid in apricot products and/or methods for cannabinoids (THC, CBD etc.) in foods.
- The EURL-MP Training for 2019 will be a repeat of the training held in 2018 (Pyrrolizidine alkaloids). Fera attended in 2018, so will not participate.
- The EURL-MP informed NRLs that all places on the planned training course for EURLTR-MP05 (Analysis of deoxynivalenol and related conjugates; 12th and 13th May 2020) had been filled. Fera did not apply for this training as we have extensive experience in this analysis. This training will be rescheduled due to COVID-19.
- The EURL-MP informed NRLs that all places on the planned training EURLTR-MP06 (Method validation and quality control; 7th and 8th October 2020) had been filled. The NRL-MP had not applied for a place on this training.

10.5.3. NRL-MN

- In February 2020, the EURL-MN invited NRLs from EU member states to a training course on the determination of nitrite and nitrate in feed and food. Many of the NRLs have no experience of this analysis. Fera did not apply as we already hold ISO17025

accreditation for the method. The training was planned for 17th to 18th June 2020 at DTU, Lyngby, Denmark. In March this was put on hold due to COVID-19.

10.5.4. NRL-POPs

- A Questionnaire was received on 2nd April 2019 from the EURL-POPs regarding capabilities of NRLs to ensure each member state had an NRL for each area that the EURL for halogenated POPs covers; the deadline for completion was 27th April. The form was completed with updated contact details and returned before the deadline.
- An invitation was received in August 2019 from the EURL-POPs to register for a training course on PFAS determination to be held on 27th to 28th November 2019, immediately after the next network meeting. However, as places were limited, priority would be given to those who do not already have methods available. Fera is one of the NRLs that already have a method in place, so did not register.
- In January 2020, notification was received from the EURL-POPs that there would be a training course on PBDEs and HBCDDs in Freiburg on 3rd to 4th November 2020. If places are limited, Fera would be unlikely to ask to register as we already have methods established for these analyses.

10.5.5. NRL-PC

- Analysis of 'Furans' training took place on 26th to 27th March 2019 at the EURL (DTU) in Copenhagen. A representative for NRL-PC attended for "hands on" training.
- The EURL-PC announced a Training Workshop for 'Analysis of 3-MCPD and glycidyl fatty acid ester's' on 10th to 11th September 2019 at the EURL (DTU) in Copenhagen. The training was limited to eight participants. An additional Training Workshop was announced for 10th to 11th March 2020. The NRL-PC was offered a place on this training course, however the course was postponed due to COVID-19.
- NRL-PC contacted the EURL-PC to request information on the availability of reference materials for higher alkylated (>C₂) furans in December 2019. The EURL-PC replied that very few laboratories were analysing such furans and to their knowledge no reference materials were available.

10.5.6. NRL-FCM

10.5.6.1. Kitchenware Test Conditions Guidelines

To ensure comparability of results the EURL-FCM, with support from a small number of NRLs (including the UK), developed "Guidelines on Testing Conditions for Articles In Contact With Foodstuffs (With A Focus on Kitchenware)". These were published in 2009. Fera participated in the task force set up to review these guidelines. OCLs were invited to comment on the consultation on the updated guidelines. OCLs were requested to reply directly to the EURL-FCM and copy any comments to the NRL-FCM. No responses/comments were received. The updated guidance for plastics was published in "Testing conditions for kitchenware articles in contact with foodstuffs- Part 1: Plastics" in 2019:

https://ec.europa.eu/jrc/sites/jrcsh/files/beldi_jrc116750_jrc116750_kitchenware-conditions.pdf

10.5.6.2. Multi-analyte methods

A task force meeting was held at JRC-Ispra to discuss approaches to multi-analyte methods. NRL-FCM gave a presentation on the multi-analyte methods developed in previous FSA surveys on printing ink substances and on plastic monomer migration (the output of which was a multi-analyte headspace GC-MS method which was being progressed through CEN prior to the CEN activity ceasing). The strategy for multi-methods was discussed and both method and analyte type strategies were discussed and are being progressed. NRL-FCM will continue to be active in this task force as the headspace GC-MS approach will be taken forward.

10.5.6.3. MOAH in infant formula

A roundtable Workshop on the determination of mineral oil aromatic hydrocarbons (MOAH) in infant formula was held in Brussels in December 2019. The aim of the event was to derive a consensus approach to the determination of MOAH in infant formula. Those involved in the testing of MOAH described the methodologies followed in their laboratories and a consensus approach was agreed. The workshop was held following publication of the report “International test of various canned baby milk products for their content of mineral oil hydrocarbons (MOSH/MOAH)”

https://www.foodwatch.org/fileadmin/-INT/mineral_oil/documents/2019-10-24_Projectreport_babymilk_FINAL.pdf

[and one industry members response questioning the applicability of the methodology used:](#)

<https://www.nestle.com/ask-nestle/health-nutrition/answers/food-watch-report-mineral-oils-infant-formula>

10.6. Core function 2(f) identifying and informing the FSA, OCLs and other relevant laboratories of emerging analytical issues or developments at a national, European or international level and recommending action to address them;

The NRL website is updated to contain this information. Specific emergent issues will be communicated directly if required and a list of contacts for OCLs is maintained to ensure that this can be achieved promptly. Information from the EURL-NRL network is used as a useful means of information exchange on this topic.

Fera outcomes:

- NRL-MP gave a presentation on natural toxins at the APA annual conference.
- Emerging analytical issues and developments were discussed with the FSA and OCLs at the NRL Network Meeting on 26th June 2019 at Fera, York.
- Information from EURL Workshops and Working Groups was shared with FSA.

10.7. Core function 2(g) where appropriate, partake and/or keep abreast of standardisation activities (e.g. CEN, ISO, etc.) relevant to the work area.

10.7.1. NRL-MP

10.7.1.1. CEN TC275 WG5

NRL-MP is project leader for two draft standard methods. The methods for ergot alkaloids and aflatoxins in spices were developed and funded as separate projects under Mandate M520. Both methods were sent for formal CEN enquiry and comments from the CEN enquiries were addressed, they will be published as standards later in 2020.

There was an update on the results of the *Alternaria* toxins study by LC-MSMS. The data is much improved compared to the first method validation study and will be used as the basis for a standard. A meeting in September 2019 dealt with comments made about the draft standard and it will be amended and submitted for full CEN enquiry.

In June 2019, two documents prepared by the committee (methods for *Fusarium* toxins - DON, ZON, T-2 HT-2, and the Multi-toxin screening method) were circulated by BSI for voting. A meeting was held with the FSA to discuss these and a positive vote was put forward for both methods.

The draft method proposed by Nestle, a multi-mycotoxin LC-MS/MS method for a range of matrices including baby food was also discussed and it was agreed it would be proposed to CEN as a work item for WG5.

In January 2020, several CEN methods for mycotoxins were undergoing systematic review. Votes were cast for the retention of the following methods via the BSI portal:

BS EN 15850:2010 Zearalenone in food and infant food;

BS EN 15891:2010 Deoxynivalenol in food and infant food;

BS EN 14352:2004 Fumonisin in foods;

BS EN 14132:2009 Determination of ochratoxin A in barley and roasted coffee.

10.7.1.2. CEN TC327 WG5

A CEN TC327 WG5 teleconference in March 2019 discussed a document about setting criteria for methods of analysis for mycotoxins in animal feed. The final version was circulated after the meeting.

Documents from a Meeting in May 2019 were reviewed and comments fed back to the FSA.

In July 2019, several draft CEN methods for mycotoxins and plant toxins were circulated by BSI/CEN for comment and voting for adoption as final CEN standards.

A list of topics for a new Standardisation Request (SR) under WG5 was published by CEN/TC327/WG5 in August 2019 for ranking by members. THC content in animal feed, and DON related compounds were identified as two of the main priorities.

10.7.2. NRL-MN

In November 2019, correspondence was received containing two European Committee for Standardization (CEN) Technical Board (BT) voting documents. These arrived with a very short deadline so unfortunately a response could not be sent in time.

11. Core function 3 - Production of standard operating procedures, codes of practice and guidance documents

11.1. Core function 3(a) contributing to the development of standardised operating procedures, relevant codes of practice and guidance documents for use by OCLs and other relevant laboratories, as requested by the FSA.

The NRL continues to share appropriately, SOPs generated by Fera when requested by OCLs. Any new (non-confidential) SOPs, codes of practice and guidance obtained from the relevant EURL will be shared. Fera works closely with each respective EURL to contribute to these developments and to ensure that OCLs and other relevant laboratories are kept up to date.

11.1.1. NRL-MP

11.1.1.1. CEN TC275 WG5

NRL-MP attended several meetings of CENTC275 WG5 in person and via telecon during the year. The two methods (for ergot alkaloids in cereals and aflatoxins in spices) that had been developed under other projects were reviewed and amended during and after these meetings. Both methods were sent for formal CEN enquiry.

In June 2019, two documents prepared by the committee (methods for Fusarium toxins - DON, ZON, T-2 HT-2, and the Multi-toxin screening method) were circulated by BSI for voting. A meeting was held with the FSA to discuss these and a positive vote was put forward for both methods.

Several draft CEN methods for mycotoxins were circulated by BSI/CEN for comment and voting for adoption as final CEN standards in July 2019.

A method for Alternaria toxins by LC-MSMS was validated by an MVS organised by JRC-Geel. A telephone meeting was held on 24th September 2019 to discuss the comments received from the National Standardisation Bodies. The comments were handled, the draft standard amended, and it will be submitted for full CEN enquiry.

In January 2020, several CEN methods for mycotoxins were undergoing systematic review. Votes were cast for the retention of the following methods via the BSI portal: BS EN 15850:2010 Zearalenone in food and infant food; BS EN 15891:2010 Deoxynivalenol in food and infant food; BS EN 14352:2004 Fumonisin in foods; BS EN 14132:2009 Determination of ochratoxin A in barley and roasted coffee.

11.1.1.2. CEN TC327 WG5

As a member of CEN TC327 WG5, NRL-MP participated in meetings throughout the year. The document about setting criteria for methods of analysis for mycotoxins in animal feed was amended during meeting discussions. This document was published as Technical Specification CEN/TR 17421:2019.

In July 2019, several draft CEN methods for mycotoxins and plant toxins were circulated by BSI/CEN for comment and voting for adoption as final CEN standards. NRL-MP voted on these via the on-line portal in consultation with the FSA.

To facilitate the prioritisation of the topics on the draft list for a new Standardisation Request (SR) (formerly called Mandate) on animal feeding stuffs, a list of proposed projects was circulated to WG5 members. NRL-MP sent a copy of this to the FSA and FSS asking for any feedback. WG5 Members were asked to rank the projects by high, medium and low priority. NRL-MP responded and expressed an interest in becoming project leader for some of the natural toxins items.

A telephone meeting was held on 25th October 2019 to discuss the topics proposed for the new Standardisation Request due for submission to the Commission. The topics had been ranked using responses received from the Working Group members. The items ranked with the highest priorities for consideration by the TC327 were (for WG5) Item 13 Methods for evaluating mycotoxins binders; Item 14 THC in animal feed and Item 16 Mycotoxins extension of scope (conjugates and emerging toxins and emerging feed materials). These were presented at the TC 327 Plenary meeting on 14th November 2019 where representatives from EC, CEN-CENELEC Management Centre (CCMC) and all the WG convenors were present.

A new document classifying the proposed items and requesting more information about them was uploaded to the committee portal with a request for responses by 31st January 2020. A web meeting to discuss priorities for ranking new items for standardisation was held in February 2020 to prioritise which methods to include, THC content in animal feed, and DON related compounds were identified as two of the main priorities.

11.1.2. NRL-MN

Documentation for the extension to scope under ISO17025 accreditation for a methyl mercury (MeHg) method of analysis has been prepared in consultation with Fera quality staff. UKAS advice was sought and documentation and data were assembled to present to UKAS for a desk-based extension to scope application. The next stage requires a practical demonstration of the procedure to be audited by the Fera quality team to facilitate a final revision of the method prior to submitting it to UKAS for assessment. The COVID-19 pandemic and restrictions, has resulted in the practical demonstration being put on hold for the foreseeable future.

This method has been identified for future roll out to OCLs via training and dissemination activities.

11.1.3. NRL-POPs

11.1.3.1. Core Working Group (CWG): Brominated Flame Retardants (BFRs)

A CWG Meeting was held in September 2019 and the NRL-POPs attended.

Guidance document (v1.1) was received on the analytical parameters for the determination of organobromine contaminants in food and feed, in particular for PBDEs and HBCDDs in December 2019.

The technical report from the last BFR CWG meeting held in Wageningen in September 2019 and a proposed short list for emerging brominated contaminants was also received. The EURL-POPs technical meeting notes and the updated Analytical Recommendations from the CWG for BFRs were sent to the FSA.

An NRL-POPs Meeting Note and was forwarded to the FSA.

11.1.3.2. Core Working Group: PFAS

The NRL-POPs was represented at the meeting Orebro, Sweden on the 18th to 19th June 2019. Meeting Notes were sent to the FSA. The attachments also included an excerpt from the report (at that time not finalised) from the UNEP 4th Interlaboratory Assessment on Persistent Organic Pollutants (including PFAS). The draft technical report for the Meeting was received in August 2019 and forwarded to the FSA. In October, the EURL-POPs' technical report from the Core Working Group for PFAS was sent to the FSA. At the end of March 2020, the EURL-POPs sent a link to a publication "Trace level analyses of selected perfluoroalkyl acids in food" which was co-authored by one of the members of the PFAS working group (Heidelore Fiedler). The link was forwarded to the FSA on the same day.

11.1.3.3. Core Working Group: Chlorinated Paraffins (CPs)

The NRL-POPs was represented at the CWG meeting for CPs on 25th September 2019 at Wageningen, Netherlands. The Meeting Notes from the Core Working Group for CPs were forwarded to the FSA. The Draft Report was received in December 2019 from the EURL-POPs and this was forwarded to the FSA. In January 2020 the FSA were sent the EURL-POPs technical meeting notes and in March 2020 the Technical Report was sent to the FSA.

11.1.3.4. EFSA Public Consultation on its draft scientific opinion on the risks to human health related to the presence of perfluoroalkyl substances in food

In February 2020, the European Food Safety Authority (EFSA) announced it had launched a Public Consultation⁽¹²⁾ on its draft scientific opinion on the risks to human health related to the presence of perfluoroalkyl substances in food that it had published. This was emailed to the FSA to alert them to this release:

<https://www.efsa.europa.eu/en/consultations/call/public-consultation-draft-scientific-opinion-risks-human-health>).

The EURL-POPs also sent an email to inform the NRL-POPs of the announcement.

11.1.3.5. Guidance document LOD/LOQ - draft of addendum

"Guidance document LOD/LOQ - draft of addendum" was received from the EURL-POPs on 17th May 2019 requesting feedback. This was forwarded to the FSA and feedback was received which was passed to the EURL-POPs by the deadline.

11.1.3.6. Revised EFSA Opinion on Chlorinated Paraffins

On 10th March 2020 a notification was received from the EURL-POPs that EFSA had published a revised version of its Opinion on Chlorinated Paraffins. The FSA were informed.

Opinion: <http://www.efsa.europa.eu/en/efsajournal/pub/5991> ⁽¹³⁾

Technical report: <http://www.efsa.europa.eu/en/supporting/pub/en-1815> ⁽¹⁴⁾

11.1.3.7. Publications

An email was received on 1st July 2019 from the EURL-POPs with two publications attached (which were co-authored by members of staff from Fera and from the FSA). The email was distributing the publications across the NRL network. They were both published in "Science of the Total Environment", and titled "Recently listed Stockholm convention POPs: Analytical methodology, occurrence in food and dietary exposure" (A.R. Fernandes, D. Mortimer, M. Rose, F. Smith, Z. Steel, S. Panton)⁽¹⁶⁾ and "The potential of recycled materials used in agriculture to contaminate food through uptake by livestock" (A.R. Fernandes, I.R. Lake, A. Dowding, M. Rose, N.R. Jones, R. Petch, F. Smith, S. Panton)⁽¹⁷⁾. These were forwarded to the FSA.

11.1.4. NRL-PC

- The EURL-PC issued the document "Determination of acrylamide in foods and drinks by GC-MS" in June 2019.
- The EURL-PC issued the document "Guidance document on the analyses of acrylamide in food including analyses in the low concentration range" in June 2019.
- The EURL-PC issued the document "Analysis of 2- and 3-MCPD esters, and glycidyl esters in oils/fats, infant formula, and baby food" in June 2019.

11.1.5. NRL-FCM

11.1.5.1. Kitchenware Test Conditions Guidelines

To ensure comparability of results the EURL-FCM, with support from a small number of NRLs (including the UK), developed "Guidelines on Testing Conditions for Articles In Contact With Foodstuffs (With A Focus on Kitchenware)" that were published in 2009. Fera participated in the task force set up to review these guidelines. OCLs were invited to comment on the consultation on the updated guidelines. OCLs were requested to reply directly to the EURL-FCM and copy any comments to the NRL-FCM. No responses/comments were received. The updated guidance for plastics was published in "Testing conditions for kitchenware articles in contact with foodstuffs- Part 1: Plastics" in 2019:

https://ec.europa.eu/jrc/sites/jrcsh/files/beldi_jrc116750_jrc116750_kitchenware-conditions.pdf

11.1.5.2. Multi-analyte methods

A task force meeting was held at JRC-Ispra to discuss approaches to multi-analyte methods. NRL-FCM gave a presentation on the multi-analyte methods developed during FSA surveys on printing ink substances and on plastic monomer migration (the output of which was a multi-analyte headspace GC-MS method which was being progressed through CEN prior to the CEN activity ceasing). The strategy for multi-methods was discussed and both method and analyte type strategies were discussed and are being progressed. NRL-FCM will continue to be active in this task force as the Fera headspace GC-MS approach will be taken forward.

11.1.5.3. MOAH in infant formula

A roundtable Workshop on the determination of mineral oil aromatic hydrocarbons (MOAH) in infant formula was held in Brussels in December 2019. The aim of the event was to derive a consensus approach to the determination of MOAH in infant formula. Those involved in the testing of MOAH described the methodologies followed in their laboratories and a consensus approach was agreed.

12. Core function 4 - Compliance assessment via audits and ring trials

12.1. Core function 4(a) ensuring consistency and quality of testing approaches applied by UK OCLs and other relevant laboratories, including advising on corrective action following adverse reports on OCLs from UKAS;

This is addressed by ensuring that OCLs are familiar with the best practices and methodology support is provided with any known difficulties in application explained. Training is offered to OCLs that have little experience in a method.

Performance of the OCLs in PTs is compiled and training offered in any areas for which performance is either questionable or unsatisfactory; root cause analysis outcomes and corrective measures are requested.

With the agreement of the FSA, Fera will continue to participate in the EURL organised inter-laboratory comparison exercises and method development/ method evaluation/ method validation studies where permitted.

12.2. Core function 4(b) planning proficiency tests for UK OCLs and other relevant laboratories as appropriate (taking into account the number of relevant laboratories), analysing and evaluating the outcome, informing the FSA and OCLs of the results and advising on further action;

Fera NRLs have supported OCL participation in EURL PTs historically and where a need has been identified, participation in other PTs has also been encouraged. Alternatively, where there has been insufficient OCL participants to run a bespoke NRL run PT, OCLs have been registered within a Fapas® PT round. By participating in PT rounds in this way the OCLs give their permission for their performance to be shared with the NRL. Participation has often involved the APA Training Committee and further activities of this type could be undertaken with the agreement of the FSA and where there was an identified need. The NRL follows up on OCL performance.

12.2.1. NRL-MP

12.2.1.1. EURLPT-MP03 Ergot alkaloids in cereals

An invitation to register was received in September 2019. The invitation was also open to OCLs, so it was forwarded inviting them to participate and stating the NRL would cover registration costs. One OCL showed interest but did not register, so no UK OCLs participated.

12.2.2. NRL-MN

12.2.2.1. EURL-MN PT-2020-02: Cd, Pb, Ni, Al (optional) and Cu (optional) in cocoa powder

In 2018, the EURL-MN provided information that PTs would be for NRLs only but future rounds may be open to OCLs in certain cases. The EURL PT invitation for 'EURL-MN PT-

2020-02: Cd, Pb, Ni, Al (optional) and Cu (optional) in cocoa powder' invited NRLs to participate as a duty under Regulation (EU) No 2017/625⁽¹⁾. The invitation did not invite OCLs to participate or mention a fee for their participation.

12.2.3. NRL-POPs

12.2.3.1. EURL PT - PCDD/Fs, PCBs, BFRs, PFASs and CPs in Fish fillet 2020

In January 2020, the invitation to participate in the EURL PT on halogenated POPs in fish fillet was forwarded to UK OCLs. The invitation specified that laboratories would not be required to complete analysis for all analyte suites included in the PT if they registered. Only one OCL response was received by the deadline, and that was to decline the invitation.

12.2.4. NRL-PC

12.2.4.1. EURL-PC PT-2020-04 for 3-MCPD esters and glycidyl esters in powder infant formula

Official Food Laboratories (OfL), which in the UK would be OCLs, were offered participation in this PT for a fee of €250. However, when offered participation in Fapas® PT 2654 last year, two OCLs registered but did not submit results due to (i) having methodology for a different analysis, free 3-MCPD and (ii) instrument problems. None of the OCLs are routinely analysing for these process contaminants.

12.2.5. NRL-FCM

12.2.5.1. EURL-FCM-19/01 PT 'Determination of PBT cyclic oligomers in and migrated from food contact materials

Details were circulated to the OCLs for participation. No UK OCLs registered to participate.

12.2.5.2. FCM-20/01 - 'Determination of MOSH/MOAH in paperboard and muesli.

An invitation to participate in this PT was received and extended to OCLs as requested in the invitation. No UK OCLs registered to participate. Only one response was received stating that they have no experience of this so would not be participating.

12.3. Core function 4(c) coordinating the participation of UK OCLs and other relevant laboratories in international method validation studies and other initiatives, informing the FSA and OCLs of the results and advising on further action;

12.3.1. NRL-MP

NRL-MP has participated in a number of method validation studies (MVS). The results of these studies are communicated to the OCLs at the annual NRL Network Meeting. Methods are supplied on request. OCLs would be invited to participate where there were sufficient places.

12.3.2. NRL-FCM

An invitation was received from the JRC to participate in a ring trial to support harmonisation of the method for determination of MOSH/MOAH in infant formula. Details were sent to the OCLs such that they could register to participate. No UK OCLs registered to participate. Only one response was received stating that they did not have the staff resources to be able to participate in this.

12.4. Core function 4(d) where relevant, participating in proficiency tests and method validation studies organised by international organisations, informing the FSA of the results and implementing any corrective measures required;

Fera has participated in EURL organised ILCs/PTs per function annually plus additional schemes such as Fapas[®]. Fera has procedures to investigate and to rectify unsatisfactory performance in PT schemes as part of its ISO 17025 accreditation, these include 'root cause analysis' and improvement plans. Trend analysis of all z-scores to look for systematic bias or drift is also performed. Several of the EURLs also regularly carry out method validation studies and Fera participates where appropriate.

12.4.1. NRL-MP

12.4.1.1. EURL PT 2018 DON compounds

Draft results were received from the EURL on 29th April 2019. The report was available on the EURL-MP website. A copy was sent to the FSA.

All participants submitted results for DON, all except two laboratories, obtained satisfactory z-scores.

Acetyl DONs and DON-3G were reported by 44% and 32% of the participating laboratories respectively. NRL-MP reported results for all analytes. Satisfactory z-scores for DON were obtained by 96 - 98% of participants. For the other analytes satisfactory results were reported by between 20 - 42% of participants. Bearing in mind most participants were NRLs, this highlights the relatively poor coverage for analysis of compounds related to DON throughout Europe.

In March 2020, the EURLPT-MP01-Follow up report PT for DON and related compounds was received from the EURL-MP. This gave information about the laboratories that did not achieve satisfactory performance in the PT. The training EURLTR-MP05 has been offered as part of the remedial action for this PT. This report was sent to Fera for information only as NRL-MP was one of only five laboratories to achieve 100% satisfactory performance in this PT.

12.4.1.2. EURL PT 2019 MP01 Pyrrolizidine alkaloids in food and feed matrices

Fera registered to participate in the EURL-MP PT for pyrrolizidine alkaloids in food and feed in April 2019. Test samples were received in May 2019 with a reporting deadline of 24th June 2019. The EURL-MP supplied a link to an updated version of an SOP for determination of PAs in herbal products on their website (Library EURL MP Methods from 2018 / EURL-MP-Method_002 Pyrrolizidine alkaloids by LC-MSMS v2). This is an updated version of the

method used during the training that Fera attended in November 2018. Eight further substances have been included in the SOP. Results for the PT were submitted in June 2019. No feedback or preliminary results have been received for this PT.

12.4.1.3. EURLPT-MP03 Ergot alkaloids in cereals

An invitation to register was received in September 2019 and NRL-MP registered. The invitation was also open to OCLs, so it was forwarded to the UK OCLs, although none registered. Samples were received on 15th October 2019. The deadline for reporting results was 25th November 2019 and results were submitted for this PT via the online portal.

12.4.1.4. Other PT: WFSR PT for Cyanogenic glycosides (hydrogen cyanide, HCN) in food and feed

An invitation to participate in a PT for hydrocyanic acid was received from WFSR (formerly RIKILT) PT scheme in September 2019. This is a commercial PT scheme, all NRL network laboratories were invited to participate. NRL-MP registered to participate.

Issues were encountered with steam distillation equipment which is an integral part of the method requiring further work. WFSR were informed of the delay.

12.4.1.5. Method Validation Studies (MVS): MVS RIKILT Gossypol in animal feed

NRL-MP participated in this repeat MVS in 2018. The method is being developed as a Draft Standard with CEN TC327 WG5. Overall, the method has been successfully validated. The draft method document has been updated and submitted for CEN enquiry. The method is applicable to the range 69 to 5950 mg/kg in feed and cotton seed products. The lowest level tested in the validation study (17.4 mg/kg) did not give satisfactory repeatability and reproducibility values.

12.4.1.6. MVS Alternaria

The results were presented at the CENTC275 WG5 meeting on 2nd April 2019. The report of the study was prepared. Overall the method performance was much improved compared to the initial study. NRL-MP had participated in the MVS in 2018.

12.4.1.7. MVS (BfR) Pyrrolizidine alkaloids (PAs) in animal feed

Samples were received in December 2018. The deadline for reporting results was 1st March 2019; an extension was granted by the German Federal Institute for Risk Assessment (BfR). Analysis was complete for this study, which was in two parts. Method 1 - PAs by LC-MS/MS, data was completed, reviewed and reported. Method 2 - conversion of N-oxides to parent PAs, samples were run and data reviewed and reported. BfR had not completed data evaluation or reported to the CEN TC327 WG5 in October 2019 and there is no feedback on the method performance yet.

12.4.1.8. MVS Multi-toxin using IAC and LC-MS/MS (Nestle)

NRL-MP participated the MVS for multi-toxins organised by Nestle, via CEN TC275 WG5. Samples were received in June 2019. The deadline for results was 26th July 2019 but this was extended to the end of August due to European holidays. The method covered a range of matrices including infant food, cereals, nuts, dried fruit and spices. Results were submitted to the co-ordinator and the study results were returned in September 2019. Overall the MVS results were very good, with very low values obtained for the precision parameters. The method will be drafted as a CEN standard and submitted to CEN TC275 WG5 for official adoption as a work item so it can be developed as a full CEN standard. An Open Access paper describing the MVS and the results has been published in Toxins (a pdf version is available on request):

<https://www.mdpi.com/2072-6651/11/11/658>

12.4.2. NRL-MN

12.4.2.1. EURL-MN PT-2019-01 As, iAs, Cd, Pb, Hg and I (optional) in seaweed meal

Registration to take part was completed in May 2019 and the sample was received. Results were reported in June and the preliminary report was received and forwarded to the FSA. The Final Report was received on 11th December 2019 and subsequently forwarded to the FSA.

12.4.2.2. EURL-MN PT-2019-02 Cd, Pb and NO₃ in vegetable based baby food

Registration took place in July 2019. In August 2019, the EURL announced sample dispatch. The NRL-MN emailed the EURL requesting clarification of how to report the results (per ml of the re-constituted material or per g of dry material). They replied advising that the data should be reported in mg/kg of dried material. Analysis was completed and the results were reported via the online portal. All work was completed within the specified deadline in September. The preliminary report was received in October 2019. NRL-MN performance was satisfactory. Due to large variation in the nitrate results reported, the evaluation of the data was still in progress and no preliminary nitrate data was reported at the time. The Final Report was received in December 2019 and subsequently emailed to the FSA.

12.4.2.3. EURL-MN PT-2019-03 Cd, Pb, Hg, Cu and Ni in offal

The NRL-MN registered for the PT in May 2019 and the sample was received later that month. Results were submitted in June. The Preliminary Report was received in July and forwarded to the FSA. The Final Report arrived in December 2019 and this was sent to the FSA.

12.4.2.4. EURL-MN PT-2020-01, Fresh frozen fish for As, Cd, Pb, Hg and optional iAs, MeHg

Registration opens on 15th June 2020 with a Registration deadline of 6th July 2020. Samples are due to be shipped 24th August 2020 and results are to be submitted by 24th September 2020.

12.4.2.5. EURL-MN PT-2020-02 Cocoa product for Cd, Pb, Ni, Al*, Cu*

(*denotes analyte is optional)

In March 2020, the NRL-MN was notified of 'EURL-MN PT-2020-02, Cocoa product for Cd, Pb, Ni, Al*, Cu* (*denotes analyte is optional). The Registration deadline is 6th May 2020 with samples due to shipped 2nd June 2020 and results to be submitted by 2nd July 2020.

12.4.2.6. EURL-MN PT-2020-03, Fish meal feed for As, inorganic As, Cd, Pb, Hg, Methyl mercury*, NO₂⁻ and NO₃^{-*}

(*denotes analyte is optional)

Notice of 'EURL-MN PT-2020-03, Fish meal feed for As, inorganic As, Cd, Pb, Hg, Methyl mercury*, (nitrite and nitrate) NO₂⁻ and NO₃^{-*} (*denotes analyte is optional)' was received in February 2020. Registration has a deadline of 6th July 2020 with samples due to be shipped on 24th August and the deadline for submission of results is 24th September 2020.

12.4.3. NRL-POPs

12.4.3.1. EURL PTs

12.4.3.1.1. EURL PT on Beef: Dioxins, PCBs, PBDEs and HBCDDs

The Certificate of (successful) participation for the PT from the second half of 2018 was received in May 2019.

12.4.3.1.2. EURL PT Dioxins, PCBs, PBDEs and HBCDDs in Grass 2019

[EURL-PT-DPB_1901-GR]

The extraction and analysis of this PT material was mostly performed before this reporting period, but the deadline for reporting fell within it. The NRL-POPs submitted results before the deadline and a preliminary report was received in April 2019. An invitation to complete a survey requesting feedback on the PT was completed and returned. The z-scores for individual congeners were mostly within acceptable range, but there was a general negative bias resulting in a poor z-score for the sum Toxic Equivalent (TEQ). The low bias in measurement was identified as an instrumentation fault, the cause of which could not be determined, but which could be rectified. Fera's standard operating procedures for all analyses using this type of instrumentation were modified to reduce the possibility of a similar issue occurring in the future. The FSA was kept informed. The final report (and revision) of the EURL PT was received in July and forwarded to the FSA. A certificate of participation was received in August 2019. Analysis of the sample was repeated after the fault had been rectified, and the results obtained were acceptable and would have returned z-scores within acceptable range.

12.4.3.1.3. EURL PT Determination of Perfluoroalkyl Substances in Wheat Flour 2019

[EURL-PT-PF_1903-WF]

The extraction and analysis of this PT material was also mostly performed before this reporting period, but the deadline for reporting fell within it. The NRL-POPs submitted results

for this PT before the deadline. The preliminary report was received in April 2019 and was forwarded to the FSA. As z-scores were not as expected, an investigation was instigated internally to look at the poor performance. Fresh analytical standards were ordered to assess stocks. The investigation tested many aspects of the procedure, and eventually it was determined that the problem was due to the analysis of this material being performed in a laboratory which was under negative pressure rather than in a laboratory under positive pressure (it is suspected that the routine floor cleaning, polishing and coating of the corridors immediately outside the laboratory were the cause of the contamination). A negative pressure laboratory has the advantage of keeping contaminants within the laboratory, but it can also draw in contaminants from outside (i.e. from the access corridor). When the samples for the PT were re-analysed in a positive pressure laboratory, the results were found to be in good agreement with the consensus values derived from the PT. The FSA was kept informed. The final report was received for this PT in September and subsequently forwarded to the FSA.

12.4.3.1.4. EURL PT PCDD/Fs, PCBs, PBDEs and HBCDDs in Egg yolk powder 2019 [EURL-PT-DPB_1902-EY]

Registration to take part in the EURL-POPs proficiency test took place in July 2019. In September 2019, the instructions, sample and lab-code for the PT were received. The sample was extracted for dioxins/PCBs/PBDEs followed by HBCDDs. New report forms were sent to the NRL-POPs (and all other participants) due to a change of IT protocol at the EURL-POPs no longer allowing receipt of emails containing attachments with old MS Office formats. Analysis of the dioxins and PCBs in the test sample was completed and results submitted by the October deadline. The deadline for the submission of results for PBDEs and HBCDDs was in November 2019. Results were also submitted for the BFRs in November before the deadline.

A preliminary results report for the dioxin and PCB segment was received in November from the EURL-POPs and the preliminary report for the PBDEs and HBCDDs followed. Both reports were forwarded to the FSA. Performance was good and NRL-POPs received an invitation to participate in an anonymous online survey related to the PT. In March 2020, the final report for this PT was received and forwarded to the FSA. A Certificate of Participation was received.

12.4.3.1.5. EURL PT - PCDD/Fs, PCBs, BFRs, PFASs and CPs in Fish fillet 2020

In December 2019, an announcement and registration deadline were received and the NRL-POPs registered to take part.

The NRL-POPs sent an email to the FSA on 19th December 2019 requesting guidance as to whether the NRL-POPs should register to participate in the next EURL PT on halogenated POPs and also whether the UK OCLs should also be invited to participate, given that the scheme would be performed after the EU Exit deadline of 31st January 2020. The FSA replied that the NRL should go ahead and register as normal.

Instructions were received from the EURL-POPs in February 2020 and an addendum to the instructions followed soon after specifically relating to the analysis of PFAS. The sample was received and receipt confirmed; a lab code was also received. In March 2020 NRL-POPs requested an extra aliquot of the test material as the amount sent was small

considering the number of analyses required and the EURL-POPs confirmed that they would ship an extra aliquot.

On 20th March 2020 EURL-POPs notified NRLs that the PT deadline for the PCDD/Fs, PCBs, PBDEs, HBCDDs and PFAS would be extended for at least a month due to the COVID-19 situation, and that any further changes would be announced as soon as possible.

12.4.3.2. EURL Interlaboratory Comparison exercises (ILCs)

12.4.3.2.1. EURL Interlaboratory study on the determination of chlorinated paraffins (CPs) in lard

The Preliminary Report was received in April 2019 and forwarded to the FSA. The Final Report was received in June 2019.

12.4.3.2.2. Interlaboratory Comparisons (ILC) - CPs in Solvent Standard Test Solution and Pork Sausage Meat

An invitation was received from the EURL-POPs to take part in two interlaboratory studies on analysis of chlorinated paraffins (CPs) in (i) a test solution and (ii) in pork sausage matrix to be performed between September and November 2019. The NRL-POPs registered to take part.

The FSA was contacted in August 2019 regarding the invitation to take part in the ILC on chlorinated paraffins for which deadlines were beyond the then current target EU Exit deadline of 31st October 2019. Confirmation was received from the FSA to register for these studies as planned.

Instructions, lab-code and samples/solutions were received for this exercise in September 2019. Clarification was sought from the EURL-POPs as two aliquots of pork sausage were received; the EURL-POPs confirmed they were one sample and could be blended together. An incorrect link to the report forms was highlighted to the EURL-POPs and resolved.

In October 2019, trial experiments to assess fractionation of SCCP from MCCP were performed. Fractionation was inconsistent with previous years and possibly due to a change of reagent specifications (unavoidable circumstances). Initial attempts to fractionate an unknown mix of short and medium chain CPs in a standard solution were unsuccessful. A general extension for the second part of the ILC (which includes extraction from pork sausage material) was agreed for all laboratories with the EURL-POPs into December 2019 as there had been some import difficulties for some countries.

In November 2019, results of the measurements of the Known Chlorinated Paraffin mix and the Unknown Chloroparaffin mix sent by the EURL-POPs were submitted, although fractionation experiments were unsuccessful. Preliminary indications are that Fera NRL-POPs successfully determined the total concentration of chlorinated paraffins (short chained and medium chained) and were one of the most accurate laboratories of those that submitted results. The second part of the ILC (analysis of sausage meat) was extended into December 2019. Experiments to try and improve the fractionation to separate the SCCPs and MCCPs continued.

A preliminary report was received for the ILC on CPs in solvent standard mixes in January 2020 and feedback was requested. Some of NRL-POPs' results were mistakenly omitted

from the report by the organisers; they will be included in the final report. The report was forwarded to the FSA.

Results were submitted for the EURL-POPs ILC on CPs in sausage meat in December 2019. The report for determination of CPs in pork sausage meat was to follow, although it was not expected to contain any z-scores as there was no consensus.

In March 2020, the final report for the study of chlorinated paraffins in a standard solution was received and the preliminary report for the analysis of chlorinated paraffins in pork sausage. The reports were forwarded to the FSA.

12.4.3.3. Other PTs

12.4.3.3.1. 2019 NIPH Interlaboratory Comparison exercise for halogenated POPs (including PFAS)

In April 2019, results were submitted for the PBDEs, HBCDDs and PFAS before the deadline. Due to technical instrument problems (the preliminary results from the EURL-POPs PT on grass had been received shortly before the deadline for this PT), Fera requested a short extension to the deadline for the dioxins analysis, which was granted. Unfortunately, the technical issue was not resolved to meet the extended deadline although the issue has since been resolved. The z-scores for PBDEs and HBCDDs were acceptable, but unfortunately the PFAS analysis had been measured concurrently with the EURL PT for wheat flour, and so returned unacceptable results. Again, once the cause of the poor z-scores had been determined, Fera re-analysed the sample and achieved results that were in good agreement with the consensus values.

A link was received via email in August 2019 to the Draft Report for the 20th round of the Interlaboratory Comparison on POPs in Food which Fera took part in earlier in 2019. This was forwarded to the FSA.

12.4.3.3.2. 2020 NIPH POPs In Food

This is the 21st Round of the Interlaboratory Comparison of POPs in Food, organized by the Section of Environmental Exposure and Epidemiology at the Norwegian Institute of Public Health (NIPH), Oslo, Norway. An invitation to participate in this PT was received in January 2020. A correction to the pricing (the currency originally stated euros, when it should have been in Norwegian krone) was received. A completed registration form was sent to the organisers in February 2020 and confirmation of registration was received. In March 2020, an email about test sample shipping was received but when the sample did not arrive the organisers were emailed; samples were eventually received. The receipt form was returned with a request for an extension to cover the delay. The laboratory code for this PT was received with an informal notification that the deadline would be extended due to COVID-19 which was followed by official notification that the deadline would be extended until the 1st July 2020 (the original deadline had been 1st May 2020).

12.4.3.3.3. IL2018-POP - UNEP Stockholm Convention GMP context

Results for the 4th Round of Interlaboratory assessment of POPs were received in May 2019. As with other concurrent PTs, some z-scores for Fera were poor. We believe the reason for the poor z-scores was the same (technical instrument issues for dioxins and positive

pressure laboratory usage for PFAS), however, for the analysis of human milk an incorrect assumption was made over the fat content concerning wet weight and dried weight (as is normal for most samples) due to the small amount of sample received. As a consequence, procedures were reviewed. Appendix 2 and 3 of the PT report were received and sent to the FSA in June 2019 followed by the results section of the report received.

For Information: Following the technical instrument issues for dioxins and implementation of corrective measures, two Fapas PT® schemes were participated in during the year; Fapas® is an externally assessed PT scheme. Each PT was for one test material with the first of these falling between the first and second EURL PTs and had a closing date of 8th August 2019. The second PT was later in the year with a deadline of 5th December 2019. Participation results in the two Fapas® rounds were acceptable. This also demonstrates that the problem was resolved and that the corrective measures were effective.

12.4.4. NRL-PC

12.4.4.1. EURL-PC PT-2019-02 PAH in food supplements

The NRL-PC registered for 'EURL-PC PT-2019-02 PAH in food supplements' in April 2019. Results were submitted in June 2019. The preliminary results were received in July with a request for comments by August; a copy of the preliminary report was emailed to the FSA. The final results were received in October 2019 and a copy was sent to the FSA.

12.4.4.2. EURL-PC PT-2019-03 Acrylamide in coffee and EURL-PC PT-2019-03 Furan, 2-methylfuran and 3-methylfuran in coffee

In April 2019 the NRL-PC was notified by the EURL that 'EURL PT 2019 Furans and acrylamide in coffee' would open for registration in May 2019. When registering, this was a combination of two PTs: 'EURL-PC PT-2019-03 Acrylamide in coffee' and 'EURL-PC PT-2019-03 Furan, 2-methylfuran and 3-methylfuran in coffee'. Samples were received and results were submitted by the deadline in June 2019. The final report was received in February 2020 and this was forwarded to the FSA.

12.4.4.3. EURL-PC PT-2020-04 3-MCPD and glycidyl esters in powder infant formula

In February 2020, an announcement was received from the EURL for 'EURL-PC PT-2020-04 3-MCPD and glycidyl esters in powder infant formula'. OCLs were also invited to participate for a fee. In March 2020, an email was received from the EURL-PC with an official letter, more information and dates affecting EURL-PC PT-2020-04. Due to the COVID-19 crisis, the dates for EURL-PC PT-2020-04 were changed. The deadline for registration is now 29th April 2020, with samples due to be sent to participants in May. The deadline for results is 30th July 2020 with the Final Report (tentative) due at the end of October 2020. The EURL-PC will follow the situation in Europe and might have to postpone the proficiency test further.

12.4.4.4. EURL-PC PT-2020-05 Furans and acrylamide in baby food

In March 2020, an email was received from the EURL-PC with an official letter, more information and dates affecting 'EURL-PC PT-2020-05 Furans and acrylamide in baby food'. Due to the COVID-19 crisis, EURL-PC PT-2020-05 was postponed; a later date will be determined.

12.4.5. NRL-FCM

Two Inter-Laboratory Comparison (ILC) exercises were scheduled by the EURL-FCM for completion in 2019. They were:

- EURL-FCM-19/01 PT 'Determination of PBT cyclic oligomers in and migrated from food contact materials'
- EURL-FCM-19/02 PT 'Determination of phthalates in food simulant A solution'

12.4.5.1. EURL-FCM-19/01 PT 'Determination of PBT cyclic oligomers in and migrated from food contact materials

NRL-FCM registered to participate in this proficiency test. Samples were received and the analysis started but results were not submitted due to technical issues and insufficient sample to repeat the study.

Many laboratories reported issues and the report summary states:

"The extraction and migration experiments indicate that further studies are needed before one could demonstrate the ability of NRLs in monitoring PBT oligomers in the frame of Commission Regulation (EU) No 10/2011."

The NRL-FCM has requested that the EURL keeps them updated on any follow up activity they might have planned to overcome the unsatisfactory performance of many of the participating laboratories.

The final report can be found at:

https://ec.europa.eu/jrc/sites/jrcsh/files/tsochatzis_jrc118572_jrc118572_fcm_19-01-report_final.pdf

[A copy \(as received following the October 2019 Plenary Meeting\) was also forwarded to the FSA.](#)

The findings were published in Food Packaging and Shelf-life in 2020:

<https://www.sciencedirect.com/science/article/pii/S2214289419304867?via%3Dihub>

12.4.5.2. EURL-FCM-19/02 PT Determination of phthalates in food simulant A solution

Fera was not invited to participate in this proficiency test as at the time it was expected that the UK would leave the EU.

The final report states:

"The overall performance of the participants (63% satisfactory performance) may indicate that some improvements are needed in the determination of this substance in

order to demonstrate the measurement capability of NRLs in monitoring the selected phthalate in the frame of Regulation (EC) 10/2011.”

The NRL-FCM has requested that the EURL keeps them updated on any follow up activity they might have planned to overcome the unsatisfactory performance of 37% of the participating laboratories.

The final report can be found at:

https://ec.europa.eu/jrc/sites/jrcsh/files/cordeiro_jrc118487_jrc118487_-_fcm_19-02_report_r.pdf

[A copy \(as received following the October 2019 Plenary Meeting\) was also forwarded to the FSA.](#)

12.4.5.3. FCM-20/01 - Determination of MOSH/MOAH in paperboard and muesli

The NRL-FCM has not registered to participate as NRL-FCM does not have this capability.

12.4.5.4. FCM-20/02 - Determination of the mass fractions of i) Cd and Pb migrated from ceramics and of ii) As, Cd, Cr, Pb, Eu, La, Gd, Hg and Tb in food simulant B solution

NRL-FCM has registered to participate in this. Test materials were due to be dispatched 30th to 31st March 2020 (with a reporting deadline of 17th May), but this has been postponed due to COVID-19. Data reporting would fall outside the timeframe of this Annual Report.

12.4.5.5. Planning for 2021 ILC's

The EURL-FCM asked all NRLs to provide comments on the ILCs/PTs proposed for 2021. These included:

(a) Migration of primary aromatic amines (PAAs) from coloured paper into cold water extract; aim to check performance at proposed limit of 0.002 mg/kg for each individual PAA.

(b) Migration of all metals (Ba, Co, Cu, Fe, Li, Mn, Zn, Ni, Al, lanthanides, etc.) from plastics into 3 % acetic acid.

(c) Migration of BPA, other bisphenols and cyclo-badger from coatings into food simulant and determination in food, both in the range of 0.010 and 0.050 mg/kg.

(d) Migration of BPA, BPF and BPS from paperboard into food simulant E.

(e) Migration of DEHA, benzophenone and phenol,2,2-methylenebis[6-(1,1-dimethylethyl)-4-ethyl from paperboard into food simulant E.

(f) Overall migration from plastics containers using test media iso-octane and 95% ethanol

(g) Follow up phthalates: migration.

(h) Migration of formaldehyde and melamine from "bamboo" product into acetic acid.

(i) Migration from PLA: lactic acid and oleamide (+ others: lactide, propanoic acid ethyl esters, alcohols).

NRL-FCM responded to the EURL-FCM regarding preferences for 2021 PT rounds stating that methods that increased the scope of the capability of the NRLs would be preferred however given that the UK would not be in the EU in 2021, comment was not required.

12.4.5.6. Microplastics proficiency test

A request was received from the JRC (not the EURL-FCM) for laboratories to participate in proficiency tests on specific microplastics in drinking and bottled water and polyethylene in sediments. NRL-FCM did not register to participate as we do not have this capability.

12.4.5.7. Printing Inks Working Group 'MCA PEER 001 study' - Ultra high performance liquid chromatography and gas chromatographic method for the determination of photo-initiators and plasticisers in simulants and dry foods.

NRL-FCM participated in the peer review/ practical assessment of this methodology. Samples were received, analysed and results submitted via the European Directorate for the Quality of Medicines (EDQM) on-line Active Collaboration Tool (ACT) platform. The report of this study has not yet been received.

12.4.5.8. MOSH/MOAH in Infant Formula

An invitation was received from the JRC to participate in a ring trial round to support harmonisation of the method for determination of MOSH/MOAH in infant formula. NRL-FCM did not register to participate as we do not have this capability but details were sent to the OCLs such that they could register to participate.

12.5. Core function 4(e) co-ordinating training exercises to promote best laboratory practice in respect of analysis.

Training is on offer to be carried out on request, either at Fera or in the individual OCL laboratories. Training at Fera allows many OCLs to be trained at the same time giving economies of scale and the opportunity for interaction.

- Training for sampling officers was discussed with an OCL in April 2019 during a visit, and they were willing to support this training and provide a venue for a regional training course if needed.
- A second OCL offered to host a regional training course for sampling officers, this was postponed due to COVID-19.
- Four FSA colleagues from the imported foods team and FSA Wales attended the Sampling Training Course on 22nd to 23rd October 2019 at Fera, York as observers.
- An open invitation for training and visits was re-iterated to the OCLs at the NRL Network Meeting in June 2019.

12.5.1. MChemA training course

The Mastership in Chemical Analysis (MChemA) is the statutory qualification for practice as a Public Analyst and Agriculture Analyst in the UK and is awarded by the Royal Society of Chemistry (RSC).

Fera staff continue to contribute to the MChemA training course and presentations given and supporting information are made available.

In November 2019, the NRL-MP and NRL-FCM were invited by the Association of Public Analysts (APA) to present at the MChemA training course at Reading University in April 2020. This event was disrupted by the current COVID-19 pandemic. The organiser is using this as an opportunity to explore options to develop online or digital training materials for the course, but at the moment there is no timeline for this.

12.5.2. APA annual conference

The head of the NRL gave a presentation to OCLs, the FSA and FSS on natural toxins at the APA annual conference in Glasgow in October 2019.

13. Core function 5 - Co-ordination within the UK of international initiatives

13.1. Core function 5(a) where appropriate, co-ordinating the recommendations of international organisations related to the standardisation of testing methods.

Information and documentation received from the EURL was provided to the FSA, to the OCLs and where appropriate other relevant laboratories. Any EURL recommendations have been fed back promptly to the FSA, OCLs and other relevant laboratories and any specific issues would be disseminated by e-mail to the OCL distribution list.

13.1.1. NRL-MP

13.1.1.1. EURLPT-MP03 Ergot alkaloids in cereals

An invitation to register was received in September 2019. The invitation was also open to OCLs, so it was forwarded inviting them to participate and stating the NRL would cover registration costs. Whilst one OCL showed interest none registered to participate.

13.1.2. NRL-MN

13.1.2.1. EURL PT 'EURL-MN PT-2020-02: Cd, Pb, Ni, Al (optional) and Cu (optional) in cocoa powder

In 2018, the EURL-MN provided information that PTs would be for NRLs only but that future rounds may be open. The EURL PT 'EURL-MN PT-2020-02: Cd, Pb, Ni, Al (optional) and Cu (optional) in cocoa powder' did not invite OCLs to participate or mention a fee for their participation.

13.1.3. NRL-POPs

13.1.3.1. EURL PT - PCDD/Fs, PCBs, BFRs, PFASs and CPs in Fish fillet 2020

The invitation to participate in the EURL PT on halogenated POPs in fish fillet was forwarded to UK OCLs. One OCL response was received by the deadline declining to participate.

13.1.4. NRL-PC

13.1.4.1. EURL-PC PT-2020-04 for 3-MCPD esters and glycidyl esters in powder infant formula

OCLs could participate for a fee however previously for a different PT, two OCLs registered but did not submit results due to methodology for a different analyte (free 3-MCPD) and instrument problems.

13.1.5. NRL-FCM

13.1.5.1. Regulation (EU) 2015/2283⁽¹⁵⁾

A call for declaration of interest addressed to Member State control laboratories to participate in training and capacity building in the area of identification and characterisation of engineered nanomaterials meeting the Regulation (EU) 2015/2283⁽¹⁵⁾ was received on 3rd December 2019 from JRC-EURL-FCM and forwarded to the OCLs. Only one response was received stating that they did not have the required instrumentation.

13.1.5.2. EURL-FCM-19/01 PT 'Determination of PBT cyclic oligomers in and migrated from food contact materials'

OCLs were invited to participate but no UK OCLs registered.

13.1.5.3. JRC ring trial - MOSH/MOAH in infant formula

An invitation was received from the JRC to participate in a ring trial to support harmonisation of the method for determination of MOSH/MOAH in infant formula. Details were sent to the OCLs to allow them to register to participate if they were interested. No UK OCLs registered to participate. Only one response was received stating that they did not have the staff resources to be able to participate in this.

13.1.5.4. FCM-20/01 - 'Determination of MOSH/MOAH in paperboard and muesli.'

An invitation to participate in this ILC was received and extended to OCLs as requested in the invitation. No UK OCLs registered to participate. Only one response was received stating that they have no experience of this so would not be participating.

14. Core function 6 - Communication of results and data use

In the reporting period:

14.1. NRL Activity Logs were sent monthly to the FSA providing updates relating to developments in core functions. Timely emails were sent to the relevant FSA contact in each policy area and the FSA manager for Contaminants NRLs as items arose in the intervening periods.

Core function 6 (a), (j)

14.2. Costs, specifications and timings were tracked and the FSA was kept updated. No deviations were encountered.

Core function 6 (b)

14.3. No unusual occurrences were encountered.

Core function 6 (c)

14.4. No additional interim reports were requested.

Core function 6 (d)

14.5. Fera NRLs uphold confidentiality with work for all customers including the FSA. No results or reports were communicated and no data was presented without permission of the FSA.

Core functions 6 (e and f)

14.6. Fera has systems in place to maintain records for the required period. Reports and information were sent regularly to the FSA, to agreed deadlines for core functions. If required all information can be transferred as necessary at the end of a contract period.

Core functions 6 (g, h, i and j)

15. Summary

Under Regulation (EU) 2017/625⁽¹⁾ on official controls Fera Science Ltd. (Fera) is designated by FSA as UK NRL for the following areas:

- NRL-MP** NRL Mycotoxins and Plant Toxins in Feed and Food
- NRL-MN** NRL Metals and Nitrogenous Compounds in Feed and Food
- NRL-PC** NRL Processing Contaminants
- NRL-POPs** NRL Halogenated Persistent Organic Pollutants (POPs) in Feed and Food
- NRL-FCM** NRL Materials and Articles in Contact with Food.

This Annual Report describes the activities of these NRLs from 1st April 2019 to 31st March 2020 and demonstrates how the requirements of Regulation (EU) 2017/625⁽¹⁾ (Article 101) have been met.

To assist with communication, a dedicated fully accessible website (<https://www.fera.co.uk/national-reference-laboratory>) and a shared NRL email address that is regularly monitored (nrl@fera.co.uk) are available. This Annual Report is published on the Fera NRL website and is available to all, thereby meeting the FSA openness and transparency commitments.

All five NRLs provided the FSA with monthly NRL Activity Logs. Impartial advice was provided to the FSA, FSS, UK Official Control Laboratories (OCLs) and other NRLs throughout the period. EURL information was disseminated to the FSA.

A joint NRL Network Meeting was held on 26th June 2019 at Fera, York, which was attended by all UK OCLs, the FSA and Food Standards Scotland (FSS). Advice and methodology were provided to OCLs where requested.

Where provided by the EURL, Work Programmes were forwarded to the FSA. The NRLs also planned Work Programmes. EURL training was attended by NRL-PC for 'Furans' analysis.

For the EURL Workshops and Core Working Groups, Task Forces and AdHoc committees that the NRLs attended, NRL Meeting Notes, official reports and documents and where available, presentations were sent to the FSA. Following central government advice, attendance at EU meetings was discontinued from October 2019. After this date no further EURL hosted events were attended. Where attendance had not been possible, documents from these meetings were requested by the respective NRL, and if provided, sent to the FSA.

The NRLs participated in 27 Proficiency Tests (PTs); EURL PTs and PTs from other providers (this does not include FAPAS® PT participation which Fera also takes part in). As well as the current year, six PTs carried over from the previous year and were finalised. EU Exit had an impact on participation in one EURL PT where the NRL-FCM was not invited to participate. Most results were satisfactory, however in a small number of cases related to two methods, non-conforming work was investigated and corrective measures put in place in accordance with ISO17025 quality procedures. Follow up analyses confirmed these measures had rectified the identified issues.

Annexes

Annex 1: NRL Mycotoxins and Plant Toxins in Food and Feed

Annex 2: NRL Heavy Metals and Nitrogenous Compounds in Food and Feed

Annex 3: NRL Halogenated POPs in Food and Feed

Annex 4: NRL Processing Contaminants

Annex 5: NRL Materials and Articles in Contact with Food

Annex 1:

NRL Mycotoxins and Plant Toxins in Feed and Food

Mycotoxins are secondary metabolites produced by some moulds that can occur in a wide range of foods, often with no visible signs of mould spoilage to the food. They have a wide range of chemical properties and toxicities to humans and food-producing animals. Exposure to some mycotoxins is controlled through European and National Legislation. The Contaminants in Food (England) Regulations 2013⁽³⁾, provide for the enforcement of European Commission Regulation (EC) No 1881/2006⁽¹⁸⁾, setting maximum levels for certain contaminants in foodstuffs. There are similar domestic Regulations for Scotland, Wales and Northern Ireland⁽⁴⁻⁶⁾. Methods to be used for sampling and analysis for enforcement purposes are prescribed in Commission Regulation (EC) No 401/2006⁽¹¹⁾ and its subsequent amendments Commission Regulation (EU) No 178/2010⁽¹⁹⁾ and Commission Regulation (EU) No 519/2014⁽²⁰⁾. Directive 2002/32/EC⁽²¹⁾ (amended⁽²⁰⁾) establishes the maximum levels of contaminants, including aflatoxins, permitted in feed. Commission Recommendation 2006/576/EC⁽²³⁾ sets Guidance Values for a range of other mycotoxins.

Plant toxins or phytotoxins are toxic chemicals produced by plants, whose main function is to act as defensive agents against predators. Most examples of plant toxins are members of various classes of secondary metabolites, including alkaloids, terpenes, and phenolics. Plant toxins may also be toxic to humans and animals. Maximum limits have been set for several plant toxins through European food and feed regulations, Commission Regulation (EC) No 1881/2006⁽¹⁸⁾ (as amended) and Directive 2002/32/EC⁽²¹⁾ on undesirable substances in animal feed (as amended⁽²⁰⁾). These include erucic acid, theobromine, gossypol, tropane alkaloids and hydrocyanic acid. EU Monitoring Recommendations are in place for tropane alkaloids (Commission Recommendation (EU) 2015/976⁽²⁴⁾) and tetrahydrocannabinol (THC) and its precursors (Commission Recommendation (EU) 2016/2115⁽²⁵⁾). Discussions are ongoing at an EU level about setting maximum levels for pyrrolizidine alkaloids in several foods including teas, herbal teas, plant-based food supplements, culinary herbs and honey and for tropane alkaloids in foods other than infant food.

From 1st April 2017, the scope of the Mycotoxin NRL was expanded to also include plant toxins under Commission Regulation (EU) 2018/192⁽²⁴⁾.

EURL-MP

The EURL for mycotoxins and plant toxins aims to facilitate the implementation of European legislation related to monitoring of mycotoxins and plant toxins in food of plant origin and animal feed.

Wageningen Food Safety Research (part of Wageningen University & Research) is the EURL for mycotoxins and plant toxins in feed and food.

Annex 2:

NRL Heavy Metals and Nitrogenous Compounds in Feed and Food

Contaminants such as heavy metals are substances that have not been intentionally added to food. These substances may be present in food as a result of the various stages of its production, packaging, transport or holding. They might also result from environmental contamination. Since contamination generally has a negative impact on the quality of food and may imply a risk to human health, European legislation lays down maximum levels in foodstuffs. EU regulations cover the following heavy metals: cadmium, lead, mercury, arsenic and inorganic tin.

Commission Regulation (EC) No 1881/2006⁽¹⁸⁾ sets maximum levels for certain contaminants in foodstuffs. It is amended by Commission Regulations (EU) No 2015/1005⁽²⁷⁾ for Lead, (EU) No 488/2014⁽²⁸⁾ for Cadmium and (EU) No 2015/1006⁽²⁹⁾ for inorganic arsenic. Commission Regulation (EU) No 1258/2011⁽³⁰⁾ for nitrates in foodstuffs and Commission Regulation (EU) No 594/2012⁽³¹⁾ adds maximum levels for melamine in foodstuffs. Undesirable substances in feed, including nitrite and melamine, are covered by Directive 2002/32/EC⁽²¹⁾, amended by Commission Regulation (EU) No 574/2011⁽²²⁾. Sampling methods and the methods of analysis for the official control of the levels are given in Commission Regulation (EC) No 333/2007⁽³²⁾ and Commission Regulation (EU) 2016/582⁽³³⁾ for lead, cadmium, mercury, inorganic tin and inorganic arsenic and in Commission Regulation (EC) No 1882/2006⁽³⁴⁾ for nitrates.

In alignment with the EURL changes under Commission Regulation (EU) 2018/192⁽²⁴⁾, the NRL scope was extended from 1st April 2017 to include metals such as aluminium and nickel as well as heavy metals and nitrogenous compounds (nitrate, nitrite and melamine). The 2019 EURL Workshop featured discussions relating to the expanded scope of metals analysis including speciation. Nickel in feed was highlighted as a potential source of chronic exposure from food of animal origin.

The increasing trend in seaweed products for human consumption highlights the fact that no levels are currently set for seaweed as a food. Under Commission Recommendation (EU) 2018/464⁽³⁵⁾ of 19 March 2018 on the monitoring of metals and iodine in seaweed, halophytes and products based on seaweed, monitoring is to run from 2018 to 2020 covering arsenic, cadmium, iodine, lead and mercury (methylmercury and total mercury). Levels set for feed may also require review.

EURL-MN

Since 1st January 2018, the EURL for metals and nitrogenous compounds (EURL-MN) has been hosted by the National Food Institute at the Technical University of Denmark (DTU).

Annex 3:

NRL Halogenated Persistent Organic Pollutants (POPs) in Feed and Food

Halogenated persistent organic pollutants (POPs) are toxic, organic compounds containing chlorine, bromine and/or fluorine. Some are (or have been) produced intentionally, others are unwanted by-products in the production of other chemicals or created through industrial processes such as incineration. Many are listed in the Stockholm Convention (UN Environment Programme, 2019) which aims to eliminate (Annex A) or restrict (Annex B) the production and use of some chemicals and to reduce the unintentional release (Annex C) of others. Information on the Stockholm Convention can be found at www.pops.int ⁽³⁶⁾

The Stockholm Convention Annexes themselves can be found at

<http://www.pops.int/TheConvention/ThePOPs/AllPOPs/tabid/2509/Default.aspx>

Links within the website also lead to lists of chemicals being proposed for future inclusion in the Convention.

Some examples of halogenated POPs are:

Polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and polychlorinated biphenyls (PCBs); their effects on human health include dermal toxicity, immunotoxicity, reproductive effects and teratogenicity, endocrine disrupting effects and carcinogenicity.

Brominated flame retardants (BFRs); commonly used to reduce flammability in a variety of products. Certain BFRs have been banned or restricted in the EU but they persist in the environment where they enter the food chain and are potentially harmful. Polybrominated diphenyl ethers (PBDEs) are additive flame retardants and are environmentally ubiquitous. Hexabromocyclododecanes (HBCDDs) are also additive flame retardants.

Perfluoroalkyl Substances (PFAS); a range of synthetic chemical compounds used across a range of industries for their water proofing, grease proofing and stain repellent properties. The widespread use of PFOS, PFOA and their precursors, together with their persistency, has resulted in widespread environmental contamination.

Chlorinated paraffins (CPs); are a complex mixture of polychlorinated n-alkanes with a variable degree of chlorination. They are categorised based on their carbon chain length: short-chain CPs (SCCPs, C₁₀₋₁₃), medium-chain CPs (MCCPs, C₁₄₋₁₇) and long-chain CPs (LCCPs, C_{>17}). They have various uses such as temperature moderators for machining/drilling processes, flame retardants and plasticisers. SCCPs are listed in the Stockholm Convention⁽³⁶⁾ in Annex A (elimination) due to their toxicity. MCCPs are also toxic and persistent but are not listed in the Stockholm Convention so emphasis on production has moved away from SCCPs to medium-chain (MCCPs) and long-chain chlorinated paraffins (LCCPs).

EURL-Halogenated POPs

The EURL for Halogenated POPs in Feed and Food aims to facilitate the implementation of European legislation related to monitoring of halogenated POPs in food and feed and is hosted by the State Institute for Chemical and Veterinary Analysis (CVUA Freiburg).

Annex 4:

NRL Processing Contaminants

Process contaminants are formed during food processing or heat treatment and will be dependent on the conditions used and the foodstuff.

Since 1st April 2017, food processing contaminants including furans, monochloropropanediols (MCPD) and their esters, glycidyl esters and acrylamide were included as part of the polycyclic aromatic hydrocarbons (PAHs) NRL responsibilities, and the EURL role renamed as Processing Contaminants (EURL-PC) under Commission Regulation (EU) 2018/192⁽²⁶⁾.

PAHs are organic compounds containing two or more fused aromatic rings made up of carbon and hydrogen atoms. PAHs may be formed and released during incomplete combustion or pyrolysis of organic matter, during industrial processes and by natural processes, such as carbonisation. In food, PAHs may be formed during industrial and domestic food preparation, such as smoking, drying, roasting, baking, frying or grilling. Since some PAHs are carcinogenic, their presence in food is controlled by European Commission Regulation (EC) No 1881/2006⁽¹⁶⁾, setting maximum levels for benzo[a]pyrene, benzo[a]anthracene, benzo[b]fluoranthene and chrysene in certain food stuffs.

Acrylamide is generated during the heat treatment of carbohydrate rich foods and based on animal studies potentially increases the risk of developing cancer for consumers in all age groups (EFSA, 2015⁽³⁷⁾). Commission Regulation (EU) 2017/2158⁽³⁸⁾ is intended to help reduce consumer exposure to acrylamide and establishes best practice and benchmark levels for the reduction of the presence of acrylamide in food.

EFSA published a scientific opinion in October 2017 concluding exposure to furan in food is a potential human health concern (EFSA, 2017⁽³⁹⁾).

Based on animal studies, liver damage and liver cancer are the most critical health effects. Furans, and related compounds 2- and 3- methyl furan, are found in a variety of foods including coffee and food stored in cans, jars, packets and pouches.

3-MCPD is created in foods during protein hydrolysis when hydrochloric acid is added at high temperature to speed up the breakdown of proteins into amino acids. MCPD esters and glycidyl esters are formed when refining vegetable oils at high temperatures (>200°C). Glycidyl fatty acid esters are hydrolysed into glycidol, a genotoxic and carcinogenic compound, in the gastrointestinal tract. Glycidyl fatty acid esters expressed as glycidol in vegetable oils, vegetable fats and infant formula are also included in Commission Regulation (EU) 2018/290⁽⁴⁰⁾. There is a stricter maximum level for vegetable oils and fats destined for baby food production and processed cereal-based food for infants and young children. The maximum level in infant formulae is set to decrease over time to allow food businesses time to adapt their production processes.

EURL-PC

The EURL Processing Contaminants has been hosted at DTU, Denmark since 1st January 2018.

Annex 5:

NRL Materials and Articles in Contact with Food

The term 'materials and articles in contact with food' describes any materials or article intended to come into direct contact with food (and beverages), such as packaging, kitchenware, tableware and cutlery. It also includes materials and articles used in production and processing equipment that will have indirect contact with food (and beverages), as well as transport and storage containers.

These materials and articles can be made from plastics, paper and board, rubber, metal, glass or ceramics etc. and any chemical constituents present in them have the potential to transfer into the foods (and beverages) with which they come into contact. In addition, the chemicals present in any adhesives, coatings or printing inks applied to these substrates also have the potential to transfer. This is known as chemical migration (defined as 'the mass transfer from an external source into food by sub-microscopic processes').

European Union (EU) legislation (Regulation (EC) No 1935/2004⁽⁴¹⁾) is implemented in the United Kingdom and this specifies that materials and articles in contact with food should not transfer their constituents to food (and beverages) at unsafe levels so as to endanger health or adversely affect the nature or quality of the food (or beverage).

EURL-FCM

The Joint Research Centre (JRC) located in Ispra, Italy is the European Union Reference Laboratory for Food Contact Materials (EURL-FCM). It is supported by colleagues from the JRC located in Geel, Belgium who provide expertise in trace elements, method validation and proficiency testing.

Supported by the Network of NRLs, they:

- Provide scientific and technical assistance to the EU and the Member States.
- Organise inter-laboratory comparison exercises.
- Conduct training courses for the benefit of NRLs and of experts from developing countries.
- Develop guidance documents to support official controls.

Appendix 1: References

- (1) Regulation (EU) 2017/625 of the European Parliament and of the Council of 15 March 2017 on official controls and other official activities performed to ensure the application of food and feed law, rules on animal health and welfare, plant health and plant protection products, amending Regulations (EC) No 999/2001, (EC) No 396/2005, (EC) No 1069/2009, (EC) No 1107/2009, (EU) No 1151/2012, (EU) No 652/2014, (EU) 2016/429 and (EU) 2016/2031 of the European Parliament and of the Council, Council Regulations (EC) No 1/2005 and (EC) No 1099/2009 and Council Directives 98/58/EC, 1999/74/EC, 2007/43/EC, 2008/119/EC and 2008/120/EC, and repealing Regulations (EC) No 854/2004 and (EC) No 882/2004 of the European Parliament and of the Council, Council Directives 89/608/EEC, 89/662/EEC, 90/425/EEC, 91/496/EEC, 96/23/EC, 96/93/EC and 97/78/EC and Council Decision 92/438/EEC (Official Controls Regulation)Text with EEA relevance. OJ L 95, 7.4.2017, p. 1–142. ELI: <http://data.europa.eu/eli/reg/2017/625/oj>
- (2) Regulation (EC) No 882/2004 of the European Parliament and of the Council of 29 April 2004 on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules. OJ L 165, 30.4.2004, p. 1–141. ELI: <http://data.europa.eu/eli/reg/2004/882/oj>
- (3) The Contaminants in Food (England) Regulations 2013. UK Statutory Instruments. 2013 No. 2196. <http://www.legislation.gov.uk/uksi/2013/2196/contents/made>
- (4) The Contaminants in Food (Wales) Regulations 2013. Wales Statutory Instruments 2013 No. 2493 (W. 242). <http://www.legislation.gov.uk/wsi/2013/2493/contents/made>
- (5) The Contaminants in Food (Scotland) Regulations 2013. Scottish Statutory Instruments 2013 No.217. <http://www.legislation.gov.uk/ssi/2013/217/introduction/made>
- (6) The Contaminants in Food Regulations (Northern Ireland) 2013. Northern Ireland Statutory Rules 2013 No. 229. <http://www.legislation.gov.uk/nisr/2013/229/contents/made>
- (7) The Official Feed and Food Controls (England) (Miscellaneous Amendments) Regulations 2019. UK Statutory Instruments 2019 No. 1476. <http://www.legislation.gov.uk/uksi/2019/1476/contents/made>
- (8) The Official Feed and Food Controls (Wales) (Miscellaneous Amendments) Regulations 2019. Wales Statutory Instruments 2019 No. 1482 (W. 266). <http://www.legislation.gov.uk/wsi/2019/1482/contents/made>
- (9) The Official Feed and Food Controls (Miscellaneous Amendments) (Scotland) Regulations 2019. Scottish Statutory Instruments 2019 No. 407. <http://www.legislation.gov.uk/ssi/2019/407/contents/made>

- (10) The Official Feed and Food Controls (Miscellaneous Amendments) Regulations (Northern Ireland) 2019. Northern Ireland Statutory Rules 2019 No. 218. <http://www.legislation.gov.uk/nisr/2019/218/made>
- (11) Commission Regulation (EC) No 401/2006 of 23 February 2006 laying down the methods of sampling and analysis for the official control of the levels of mycotoxins in foodstuffs. OJ L 70, 9.3.2006, p. 12–34. ELI: <http://data.europa.eu/eli/reg/2006/401/oj>
- (12) EFSA, 2020. Public consultation on the draft scientific opinion on the risks to human health related to the presence of perfluoroalkyl substances in food. <https://www.efsa.europa.eu/en/consultations/call/public-consultation-draft-scientific-opinion-risks-human-health>
- (13) EFSA, 2020a. EFSA CONTAM Panel (EFSA Panel on Contaminants in the Food Chain), Schrenk, D., Bignami, M., Bodin, L., Chipman, J.K., del Mazo, J., Grasl-Kraupp, B., Hogstrand, C., Hoogenboom, L.R., Leblanc, J.-C., Nebbia, C.S., Ntzani, E., Petersen, A., Sand, S., Schwerdtle, T., Vleminckx, C., Wallace, H., Bruschweiler, B., Leonards, P., Rose, M., Binaglia, M., Horvath, Z., Bordajandi, L.R. and Nielsen, E., 2020. Scientific Opinion – Risk assessment of chlorinated paraffins in feed and food. EFSA Journal 2020;18 (3):5991, 220 pp. <https://doi.org/10.2903/j.efsa.2020.5991> ISSN: 1831-4732
- (14) EFSA, 2020b. Outcome of a public consultation on the draft risk assessment of chlorinated paraffins in feed and food. Technical report: <http://www.efsa.europa.eu/en/supporting/pub/en-1815>
- (15) Regulation (EU) 2015/2283 of the European Parliament and of the Council of 25 November 2015 on novel foods, amending Regulation (EU) No 1169/2011 of the European Parliament and of the Council and repealing Regulation (EC) No 258/97 of the European Parliament and of the Council and Commission Regulation (EC) No 1852/2001. <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32015R2283>
- (16) Fernandes, AR, Mortimer, D, Rose, M, Smith, F, Steel, Z & Panton, S 2019, 'Recently listed Stockholm convention POPs: Analytical methodology, occurrence in food and dietary exposure', Science of the Total Environment, vol. 678, pp. 793-800. <https://doi.org/10.1016/j.scitotenv.2019.04.433>
- (17) Fernandes, Alwyn, Lake, Iain, Dowding, Alan, Rose, Martin, Jones, Natalia, Petch, R., Smith, Frankie and Panton, Sean (2019) *The potential of recycled materials used in agriculture to contaminate food through uptake by livestock*. Science of the Total Environment, 667. pp. 359-370. ISSN 0048-9697
- (18) Commission Regulation (EC) No 1881/2006 of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs. OJ L 364, 20.12.2006, p. 5–24. ELI: <http://data.europa.eu/eli/reg/2006/1881/oj>
- (19) Commission Regulation (EU) No 178/2010 of 2 March 2010 amending Regulation (EC) No 401/2006 as regards groundnuts (peanuts), other oilseeds, tree nuts, apricot

kernels, liquorice and vegetable oil. OJ L 52, 3.3.2010, p. 32–43. ELI: <http://data.europa.eu/eli/reg/2010/178/oj>

- (20) Commission Regulation (EU) No 519/2014 of 16 May 2014 amending Regulation (EC) No 401/2006 as regards methods of sampling of large lots, spices and food supplements, performance criteria for T-2, HT-2 toxin and citrinin and screening methods of analysis. OJ L 147, 17.5.2014, p. 29–43. ELI: <http://data.europa.eu/eli/reg/2014/519/oj>
- (21) Directive 2002/32/EC of the European Parliament and of the Council of 7 May 2002 on undesirable substances in animal feed. OJ L 140, 30.5.2002, p. 10–22. ELI: <http://data.europa.eu/eli/dir/2002/32/2013-12-27>.
- (22) Commission Regulation (EU) No 574/2011 of 16 June 2011 amending Annex I to Directive 2002/32/EC of the European Parliament and of the Council as regards maximum levels for nitrite, melamine, Ambrosia spp. and carry-over of certain coccidiostats and histomonostats and consolidating Annexes I and II thereto. OJ L 159, 17.6.2011, p. 7–24. ELI: <http://data.europa.eu/eli/reg/2011/574/oj>
- (23) Commission Recommendation of 17 August 2006 on the presence of deoxynivalenol, zearalenone, ochratoxin A, T-2 and HT-2 and fumonisins in products intended for animal feeding (2006/576/EC). OJ L 118M, 8.5.2007, p. 1111–1113. ELI: <http://data.europa.eu/eli/reco/2006/576/oj>
- (24) Commission Recommendation (EU) 2015/976 of 19 June 2015 on the monitoring of the presence of tropane alkaloids in food. ELI: <http://data.europa.eu/eli/reco/2015/976/oj>
- (25) Commission Recommendation (EU) 2016/2115 of 1 December 2016 on the monitoring of the presence of Δ^9 -tetrahydrocannabinol, its precursors and other cannabinoids in food. ELI: <http://data.europa.eu/eli/reco/2016/2115/oj>
- (26) Commission Regulation (EU) 2018/192 of 8 February 2018 amending Annex VII to Regulation (EC) 882/2004 the European Parliament and of the Council as regards the EU reference laboratories in the field of contaminants in feed and food. OJ L 36, 9.2.2018, p. 15–17. ELI: <http://data.europa.eu/eli/reg/2018/192/oj>
- (27) Commission Regulation (EU) 2015/1005 of 25 June 2015 amending Regulation (EC) No 1881/2006 as regards maximum levels of lead in certain foodstuffs. OJ L 161, 26.6.2015, p. 9–13. ELI: <http://data.europa.eu/eli/reg/2015/1005/oj>
- (28) Commission Regulation (EU) No 488/2014 of 12 May 2014 amending Regulation (EC) No 1881/2006 as regards maximum levels of cadmium in foodstuffs. OJ L 138, 13.5.2014, p. 75–79. ELI: <http://data.europa.eu/eli/reg/2014/488/oj>
- (29) Commission Regulation (EU) 2015/1006 of 25 June 2015 amending Regulation (EC) No 1881/2006 as regards maximum levels of inorganic arsenic in foodstuffs. OJ L 161, 26.6.2015, p. 14–16. ELI: <http://data.europa.eu/eli/reg/2015/1006/oj>

- (30) Commission Regulation (EU) No 1258/2011 of 2 December 2011 amending Regulation (EC) No 1881/2006 as regards maximum levels for nitrates in foodstuffs. OJ L 320, 3.12.2011, p. 15–17. ELI: <http://data.europa.eu/eli/reg/2011/1258/oj>
- (31) Commission Regulation (EU) No 594/2012 of 5 July 2012 amending Regulation (EC) 1881/2006 as regards the maximum levels of the contaminants ochratoxin A, non dioxin-like PCBs and melamine in foodstuffs. OJ L 176, 6.7.2012, p. 43–45. ELI: <http://data.europa.eu/eli/reg/2012/594/oj>
- (32) Commission Regulation (EC) No 333/2007 of 28 March 2007 laying down the methods of sampling and analysis for the official control of the levels of lead, cadmium, mercury, inorganic tin, 3-MCPD and benzo(a)pyrene in foodstuffs. OJ L 88, 29.3.2007, p. 29–38. ELI: <http://data.europa.eu/eli/reg/2007/333/oj>
- (33) Commission Regulation (EU) 2016/582 of 15 April 2016 amending Regulation (EC) No 333/2007 as regards the analysis of inorganic arsenic, lead and polycyclic aromatic hydrocarbons and certain performance criteria for analysis. OJ L 101, 16.4.2016, p. 3–6. ELI: <http://data.europa.eu/eli/reg/2016/582/oj>
- (34) Commission Regulation (EC) No 1882/2006 of 19 December 2006 laying down methods of sampling and analysis for the official control of the levels of nitrates in certain foodstuffs. OJ L 364, 20.12.2006, p. 25–31. ELI: <http://data.europa.eu/eli/reg/2006/1882/oj>
- (35) Commission Recommendation (EU) 2018/464 of 19 March 2018 on the monitoring of metals and iodine in seaweed, halophytes and products based on seaweed. ELI: <http://data.europa.eu/eli/reco/2018/464/oj>
- (36) UN Environment Programme, 2019. Stockholm Convention, www.pops.int, Stockholm Convention Annexes
<http://www.pops.int/TheConvention/ThePOPs/AllPOPs/tabid/2509/Default.aspx>
- (37) EFSA, 2015. Scientific Opinion on acrylamide in food. EFSA Panel on Contaminants in the Food Chain (CONTAM). The EFSA Journal 2015;13(6):4104. <http://www.efsa.europa.eu/en/efsajournal/pub/4104>
- (38) Commission Regulation (EU) 2017/2158 of 20 November 2017 establishing mitigation measures and benchmark levels for the reduction of the presence of acrylamide in food. OJ L 304, 21.11.2017, p. 24–44. ELI: <http://data.europa.eu/eli/reg/2017/2158/oj>
- (39) EFSA, 2017. Scientific Opinion Risks for public health related to the presence of furan and methylfurans in food. <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.3/j.efsa.2017.5005>
- (40) Commission Regulation (EU) 2018/290 of 26 February 2018 amending Regulation (EC) No 1881/2006 as regards maximum levels of glycidyl fatty acid esters in vegetable oils and fats, infant formula, follow-on formula and foods for special medical purposes intended for infants and young children. OJ L 55, 27.2.2018, p. 27–29. ELI: <http://data.europa.eu/eli/reg/2018/290/oj>

- (41) Regulation (EC) No 1935/2004 of the European Parliament and of the Council of 27 October 2004 on materials and articles intended to come into contact with food and repealing Directives 80/590/EEC and 89/109/EEC. <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32004R1935>

Appendix 2: EURLs

EURL Mycotoxins and Plant Toxins in Food and Feed

Wageningen Food Safety Research
Wageningen Campus,
Akkermaalsbos 2 (building 123),
6708 WB Wageningen

Tel.: +31(0)317 480 318

eurl.mycotoxins-planttoxins@wur.nl

<https://www.wur.nl/en/Research-Results/Research-Institutes/rikilt/Reference-laboratory/European-Union-Reference-Laboratory-1/EURL-mycotoxins-plant-toxins.htm>

Contact person: Monique de Nijs

EURL Metals and Nitrogenous Compounds

National Food Institute,
Technical University of Denmark
Kemitorvet
Bygning 202
DK-2800 Kgs Lyngby
Denmark

Tel.: +45 35 88 70 00

eurl-mn@food.dtu.dk

<http://www.eurl-mn.eu/>

Operating Manager: Jens Jørgen Sloth

EURL Halogenated Persistent Organic Pollutants (POPs) in Feed and Food

c/o State Institute for Chemical and Veterinary Analysis
(CVUA Freiburg)
Bissierstrasse 5
D-79114 Freiburg
Germany

Tel.: +49 761 8855 500

info@eurl-freiburg.eu

<http://www.crl-freiburg.eu/dioxin/index.html>

Director: Dr. Alexander Schaechtele

EURL Processing Contaminants

National Food Institute, Technical University of Denmark
Kemitorvet
Bygning 202
DK-2800 Kgs Lyngby
Denmark

Tel.: +45 35 88 70 00

EURL-PC@food.dtu.dk

<http://www.eurl-pc.eu/>

Senior adviser: Arvid Fromberg

EURL Food Contact Materials

European Commission
Directorate General Joint Research Centre
Directorate F - Health, Consumers and Reference Materials
Unit Food and Feed Compliance
EURL for Food Contact Materials
Via E. Fermi 2749 (TP 260)
I-21027 Ispra (VA)
Italy

Tel.: +39 0332 785319

JRC-EURL-FCM@ec.europa.eu

<https://ec.europa.eu/jrc/en/eurl/food-contact-materials>

Operating Manager: Eddo Hoekstra

Appendix 3: Fera NRLs

Area	Name and Contact Details
General enquiries and information	<p>Fera Science Ltd (Fera) National Agri-Food Innovation Campus, Sand Hutton, York, YO41 1LZ. nrl@fera.co.uk +44 (0)1904 462000 https://www.fera.co.uk/national-reference-laboratory</p> <p>Head of NRL Chemical Safety in Food and Feed Susan MacDonald susan.macdonald@fera.co.uk +44 (0)1904 462558</p>
NRL Mycotoxins and Plant Toxins in Feed and Food	<p>Susan MacDonald susan.macdonald@fera.co.uk +44 (0)1904 462558 https://www.fera.co.uk/about-us/national-reference-laboratory/mycotoxins</p>
NRL Heavy Metals and Nitrogenous Compounds in Feed and Food	<p>Mike Walls michael.walls@fera.co.uk +44 (0)1904 462150 https://www.fera.co.uk/about-us/national-reference-laboratory/heavy-metals</p>
NRL Halogenated POPs in Feed and Food	<p>Frankie Smith frankie.smith@fera.co.uk +44 (0)1904 462525 https://www.fera.co.uk/about-us/national-reference-laboratory/dioxins-pcbs</p>
NRL Processing Contaminants	<p>Sean Panton sean.panton@fera.co.uk +44 (0)1904 462098 https://www.fera.co.uk/about-us/national-reference-laboratory/pahs</p>
NRL Materials and Articles in Contact with Food	<p>Claire McKillen claire.mckillen@fera.co.uk +44 (0)1904 462609 https://www.fera.co.uk/about-us/national-reference-laboratory/food-contact</p>