



# Fera NRL Annual Report 2020 to 2021

Report to the Food Standards Agency



# 1. Annual Report

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## **Annual Report on Operation of National Reference Laboratories (Chemical Safety in Food and Feed)**

**Fera Science Ltd.**

**April 2020 – March 2021**

Title	National Reference Laboratory for Food Contaminants
Competent Authority	Food Standards Agency
FSA Project Officer	Misty Gilbert
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## 2. Fera Science Ltd. (Fera)

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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.

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## 4. Executive summary

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Fera Science Ltd (Fera) acts as National Reference Laboratory (NRL) under Regulation (EU) 2017/625<sup>(1)</sup> 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 1<sup>st</sup> April 2020 to 31<sup>st</sup> March 2021.

The NRLs provided impartial advice to the FSA, Official Laboratories (OLs) 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-MP newsletters were forwarded to the FSA. Updates were provided to the FSA on NRL activities on at least a monthly basis. The NRL provided an open website for OLs and a dedicated NRL email address that was regularly monitored. An up to date list of OLs and contact details was maintained. Where provided by the EURL, information from EURL Workshops and Core Working Groups, Task Forces and Ad Hoc committees was forwarded to the FSA.

NRL staff participated in a number of international scientific conferences as speakers and delegates, e.g. ILSI Europe, Packaging Materials Task Force Workshop, Waters Contaminants conference in September 2020, and the Future Cannabis Strategies Europe Conference in March 2021.

The UK left the EU on 31<sup>st</sup> January 2020. The UK and European Union (EU) negotiated arrangements that have allowed some limited participation in EURL PTs and participation in events later in the year. From March 2021 the NRLs will be able to fully participate with EURL activities as a third country.

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 participated in meetings, which were all held on-line due to COVID-19 restrictions. NRL-POPs was involved in an addendum to a Guidance document on Limits of Detection/Limits

of Quantification (LOD/LOQs). One publication in "Science of the Total Environment" was co-authored by the NRL-POPs and the other members of the EURL Working Group on Congener Patterns. 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 scope of which was extended to include metals as well as plastic food contact materials.

Advice and methodology were provided to OLs where requested.

During 2020-2021, the NRLs were involved in thirteen Proficiency Tests (PTs) run by the EURLs and other providers (not including Fapas® PTs). A PT to determine ergot sclerotia was conducted for the first time, Fera and three OLs had satisfactory performance. Most PT results were satisfactory, a very small number of individual results were not. In one case a problem was identified before the PT results were received and measures put in place to correct the issue. In all cases any issues were investigated in accordance with ISO17025 quality procedures and follow up action completed.

NRL Network Meetings were held on-line in June and October 2020. These were very effective for allowing FSA, Food Standards Scotland (FSS), NRL and OL network to communicate, all UK OLs were represented. Information on developments in sampling and testing was exchanged and information from the respective EURLs on methodology and PTs was disseminated to all UK OLs. Where applicable, OLs were invited to participate in EURL PTs.

NRL Annual Reports are published annually on the NRL website. The NRLs provided the FSA with monthly NRL Activity Logs which are a timely summary of ongoing activities. Fera NRLs uphold confidentiality with work for all customers. Communication of results or reports was with permission of the FSA. Records have been maintained and kept for the requisite period.

## 5. List of abbreviations

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AAS	- Atomic Absorption Spectroscopy
APA	- Association of Public Analysts
BfR	- Bundesinstitut für Risikobewertung (The German Federal Institute for Risk Assessment)
BFR(s)	- Brominated Flame Retardants
CA	- Competent Authority
CEN	- European Committee for Standardization
CP(s)	- Chlorinated paraffins
CWG	- Core Working Group
dSPE	- Dispersive solid phase extraction
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
EUWA	- European Union (Withdrawal) Act
FAAS	- Flame Atomic Absorption Spectroscopy
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
GFAAS	- Graphite Flame Atomic Absorption Spectroscopy

HBCDDs	- Hexabromocyclododecanes
HPLC F(L)D	- High Performance Liquid Chromatography Fluorescence Detection
HPLC-ICP-MS	- High Performance Liquid Chromatography Inductively Coupled Plasma Mass Spectrometry
HS GC-MS	- Headspace Gas Chromatography – Mass Spectrometry
IAC	- Immunoaffinity Columns
ICP-MS	- Inductively Coupled Plasma Mass Spectrometry
ILC	- Interlaboratory comparison exercise
LCCP	- long-chain chlorinated paraffins (C <sub>&gt;17</sub> )
LC-MS/MS	- Liquid Chromatography Tandem Mass Spectrometry
LOD	- Limit of Detection
LOQ	- Limit of Quantification
MANCP	- Multi Annual National Control Plan
MCCP	- Medium-chain chlorinated paraffins (C <sub>14–17</sub> )
MOAH	- Mineral oil aromatic hydrocarbons
MOSH	- Mineral oil saturated hydrocarbons
MVS	- Method validation study
NIPH	- Norwegian Institute for Public Health
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
OL	- Official Laboratory
OCR	- Retained Regulation (EU) 2017/625 <sup>(1)</sup>
PAHs	- Polycyclic Aromatic Hydrocarbons
PBDEs	- Polybrominated diphenyl ethers
PC	- Processing Contaminants
PCBs	- Polychlorinated biphenyls



PCDDs	- Polychlorinated dibenzo-p-dioxins
PCDFs	- Polychlorinated dibenzofurans
PCDD/Fs	- Polychlorinated dibenzo-p-dioxins/dibenzofurans
PCN	- Polychlorinated naphthalenes
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 <sub>10-13</sub> )
SI	- Statutory Instruments
SOPs	- Standard Operating Procedures
TC	- Technical Committee
WG	- Working Group

## 6. Introduction

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Retained Regulation (EU) 2017/625<sup>(1)</sup> 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<sup>(1)</sup> (OCR), repealed and replaces Regulation (EC) 882/2004<sup>(2)</sup> on official controls. 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. Requirements on sampling, analysis, tests and diagnosis, accreditation and obligations of official laboratories have been better specified compared to Regulation (EC) 882/2004<sup>(2)</sup>. The European Commission (EC) created a network of laboratories at EU and Member State levels. European Union Reference Laboratories (EURLs) are appointed by the Commission through Regulation (EU) No 2017/625<sup>(1)</sup>. EURLs provide scientific and technical assistance to the Commission, especially where Member States contest analytical results. 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) in Scotland.

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 Laboratories (OLs). In the UK CAs also appoint National Reference Laboratories (NRLs). The overall objective of the EURLs and NRLs is to improve the quality, accuracy and comparability of the results of OLs.

The UK left the EU on 31st January 2020. There was a transition period until 31st December 2020 while the UK and EU negotiated arrangements. The European Union (Withdrawal) Act 2018<sup>(3)</sup> (the 'EUWA') as amended converted directly applicable EU legislation as it stood at the end of the transition period into domestic law. It preserves legislation previously made in the UK to implement EU obligations. Some legislation has been amended by statutory instruments (SIs) made under EUWA to ensure the legislation continues to work at the end of transition. A full list of relevant EU Exit SIs is available on the FSA website<sup>(4)</sup>. This includes the England national enforcement corrections to ensure that the current England-only enforcement regulations continue to work with retained EU law. Wales and Scotland have produced their own national SIs to ensure that their national enforcement regulations continue to work properly with the retained EU law.

Due to the ongoing global coronavirus (COVID-19) pandemic there were national lockdowns in the UK in this reporting period. This meant some activities had to be postponed or moved

on-line. The NRLs have continued to deliver the service as far as possible under these circumstances.

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 1<sup>st</sup> April 2020 to 31<sup>st</sup> March 2021.

## 7. Role and scope of the NRL

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The basic duties of the National Reference Laboratories are based on Retained Regulation (EU) No 625/2017<sup>(1)</sup>, Article 101. The scope of services each NRL in its area of competence provide are outlined as follows:

- a) cooperate internationally (and where possible with the relevant EURL);
- b) collaborate with international laboratories (where possible with the relevant EURL) and participate in training courses and inter-laboratory comparative tests organised by these laboratories.
- c) coordinate the activities of official laboratories responsible for the analysis of samples (in accordance with Article 34 and 37 of Retained Regulation (EU) 2017/625 on official controls) to ensure the verification of compliance with feed and food law;
- d) where appropriate, organise inter-laboratory comparative tests between the official laboratories and ensure an appropriate follow-up of such comparative testing;
- e) ensure the dissemination of any information required by the competent authority;
- f) 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 of Retained Regulation (EU) 2017/625;
- g) where necessary, conduct training courses for the staff of official laboratories;
- h) upon request by the appropriate authority, actively assist in relevant emergency situations and in cases of non-compliance of consignments, by carrying out confirmatory analysis;
- i) be responsible for carrying out other specific duties as required by the competent authority, where appropriate and by prior agreement.

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 function 1 – Secretariat Services

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

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

A detailed workplan that included all planned PT participation (EURL and Fapas®), and dates for planned EURL training events, workshops and working groups was produced for all five Fera NRLs and sent to the FSA at the start of the reporting period.

#### 8.1.1. NRL Network Meeting

Two NRL Network Meetings were held on 29<sup>th</sup> June 2020 and 13<sup>th</sup> October 2020 online via Microsoft Teams to disseminate information from all five NRLs, the respective EURLs and the FSA and FSS. The meetings were attended by representatives of all Fera NRLs, all UK OLs, FSA Scientific Sampling and Laboratory Policy Team and Contaminants Policy Teams, and FSS.

A meeting note was produced after each meeting, and was sent to the FSA, FSS and all OLs along with copies of all the presentations given by the NRL staff.

#### 8.1.2. NRL-MP

- The EURL Work Programme was downloaded from the EURL area of the CIRCABC website and sent to the FSA.
- A representative for the NRL-MP attended and presented information at the NRL Network Meetings held on 29<sup>th</sup> June 2020 and 13<sup>th</sup> October 2020.
- The FSA also attended the NRL Network Meetings in June 2020 and October 2020 and gave a comprehensive overview of ongoing discussions on legislation for mycotoxins and updates on EU transition.
- Newsletters received from the EURL-MP were forwarded to the FSA.
- Presentations from the EURL Workshop were forwarded to the FSA.
- The final report of the EURL Workshop 2020 was sent to the FSA.
- Fera NRL-MP was involved in a Working group to help develop criteria for analysis of mycotoxins and plant toxins and to help draft the replacement for Regulation (EU) 401/2006. Copies of these documents were shared with the FSA throughout the process.

### 8.1.3. NRL-MN

- A representative for the NRL-MN attended and presented information at the NRL Network Meetings held on 29<sup>th</sup> June 2020 and 13<sup>th</sup> October 2020.
- The FSA also attended the NRL Network Meetings and gave an update on relevant EU discussions.
- Updated NRL-MN contact information was sent to the EURL-MN to ensure their records were up to date.
- A Newsletter was received on 30<sup>th</sup> March 2020 with revisions to the proposed dates for the forthcoming PT samples due to COVID-19. This was forwarded to the FSA.
- On the 28<sup>th</sup> and 29<sup>th</sup> October 2020, NRL-MN attended the EURL-MN Workshop hosted by the DTU in Copenhagen as an online event. The event was well organised, well presented and informative. Copies of the presentations were provided to the FSA.

### 8.1.4. NRL-POPs

- A representative for the NRL-POPs attended and presented information at the NRL Network Meetings held on 29<sup>th</sup> June 2020 and 13<sup>th</sup> October 2020.
- The FSA also attended the NRL Network Meetings and gave an update on relevant EU discussions.
- In April, the NRL-POPs received version 3.2 of a guidance document regarding LOD/LOQ for halogenated POPs from the EURL-POPs – feedback was requested. The NRL-POPs forwarded the document to the FSA, received feedback, and provided comments and suggestions for modifications to the EURL-POPs in May. The feedback was acknowledged and confirmed that the suggestions would be implemented in a later version of the document.
- The final version of the technical report from the EURL/NRL workshop held in Freiburg in November 2019 which was not attended by the UK-NRL due to the Brexit situation, was received belatedly in May 2020, and was forwarded to the FSA.
- In April, it was announced that the planned EURL/NRL workshop in May would be cancelled and a one day webinar held instead, with the intention that the 2<sup>nd</sup> workshop in November would be extended to two full days. As the global COVID situation did not improve sufficiently later in the year, the 2<sup>nd</sup> workshop was also converted to a webinar rather than a physical meeting. Following UK government/FSA guidelines, Fera NRL-POPs did not attend either of these meetings.
- In May, the EURL distributed a questionnaire on PFASs in food to get a better picture of regional occurrences across the network, which was completed by the UK-NRL in

June along with feedback on the guidance document on analytical recommendations for PFASs.

- The EURL/NRL-POPs network meeting/workshop was held in May. This meeting was held online. No delegates from the UK NRL-POPs attended as per UK FSA guidance, and as a result, no meeting notes were received. The announcement and programme schedule were sent to the FSA prior to the meeting.
- In June, CWG for PFAS was held online but in-line with UK government/FSA policy, NRL-POPs did not send representatives for these. Meeting notes were only received for some of these webinars, in which case they were forwarded to the FSA.
- In July, the NRL-POPs received notification from the EURL-POPs of the timings for meetings to be held in the latter half of the year. These were the planned online meeting in September for the CWG for PFAS, and physical meetings in Freiburg for the CWGs for CPs and PFAS scheduled for October. A training course on PBDEs and HBCDDs in Freiburg, the 2nd EURL/NRL workshop of 2020 in Berlin and a CWG for Brominated contaminants in Berlin were all planned for November. This information was forwarded to the FSA. The meetings were later all re-scheduled to be held online due to the ongoing COVID situation.
- In August, the NRL-POPs received news from the EURL that the publication on "Congener patterns of polychlorinated dibenzo-p-dioxins, dibenzofurans and biphenyls as a useful aid to source identification during a contamination incident in the food chain" was available, and it was forwarded to the FSA.
- In September, the NRL-POPs received a link to EFSA's scientific opinion on the risk to human health related to the presence of perfluoroalkyl substances in food. The FSA were notified of this publication.
- Core working group meetings for BFRs (November), CPs (October), PFAS (September and October) were held online but in-line with UK government/FSA policy, NRL-POPs did not send representatives for these. Meeting notes were only received for some of these webinars, in which case they were forwarded to the FSA.
- Three EURL questionnaires regarding the analysis of PFAS in food, PFAS in feed and PCNs in food and feed were completed in November/December.
- An email containing a joint statement on "sampling and measurement uncertainty (MU) of the four EURLs working in the field of contaminants in food and feed" was received from the EURL and passed to the FSA.
- In December, NRL-POPs forwarded the results and conclusions from discussions on LOQs, analytical criteria and methods from the Core Working Group for PFAS to the FSA.

#### 8.1.5. NRL-PC

- A representative for the NRL-PC attended and presented information at the NRL Network Meetings held on 29<sup>th</sup> June 2020 and 13<sup>th</sup> October 2020.
- Members of the FSA were also present and updated on European discussions on processing contaminants.

#### 8.1.6. NRL-FCM

- A representative for the NRL-FCM attended and presented information at the NRL Network Meetings held on 29<sup>th</sup> June 2020 and 13<sup>th</sup> October 2020.
- Members of the FSA were also present and updated on European discussions on food contact materials.
- The NRL-FCM attended the EURL-FCM plenary meeting held via Webex in October 2020. A report and all slides were sent to the FSA and a follow up meeting was held to discuss. The agenda included:
  - Overview of 2020 EURL activities
  - News from DG SANTE on food and FCM legislations
  - Overview of NRL activities (tour de table)
  - NRL project presentations
  - An overview of the ILC's carried out in the previous year
  - Planning network activities for 2021
  - Next plenary meeting and AOB
- Draft kitchenware guidelines were received from the EURL-FCM and forwarded to the OLs for comment. The inclusion of metal articles in the guidance was an extension to the scope of the previous published version which just covered plastic kitchenware. Comments were invited on the test conditions proposed. The NRL-FCM attended a meeting held via Webex in July 2020 to review the responses and the resulting revised 'Testing Conditions for Kitchenware Articles in Contact with Foodstuffs: Plastics and Metals' were received from the EURL-FCM and shared with OLs and the FSA at the October Network Meeting.

### **8.2. Core function 1(b) co-ordinating the activities of OLs 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 OLs and the NRLs and as a vehicle for feedback by OLs on NRL performance. This has proved to be a valuable platform for the exchange of information and includes the FSA and FSS as well as the OLs 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.

Due to the on-going COVID-19 pandemic physical meeting could not take place and these NRL Network Meetings were held on 29<sup>th</sup> June 2020 and 13<sup>th</sup> October 2020 via Microsoft Teams. Representatives from all five Fera NRLs, FSS and the FSA attended. A representative from all UK OLs was present for part or all of the meetings. Positive verbal feedback was received from the OLs about these meetings.

NRL Network Meeting Notes were prepared and circulated to all OLs, the FSA and FSS. The presentations given at the meetings by the five NRL areas were also distributed.

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. The feedback following these meetings was that the online format worked well and was convenient, allowing more OL participation. It was agreed that in future it may be preferred to hold 2 meetings per year, one in person and one on-line.

### **8.3. Core function 1(c) creating and maintaining an efficient two-way channel of communication with OLs 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, this 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 OLs 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 OLs and contact details was maintained.
- A dedicated NRL email address is regularly monitored: [nrl@fera.co.uk](mailto:nrl@fera.co.uk)
- The FSA, EURLs and OLs are able to individually email the named lead person for each NRL.
- The NRLs seek feedback on questions or issues from the OLs to raise with the EURL. Working relationships are well established with the EURLs so this ensures efficient communication.
- Fera NRL staff are Associate Members of the Association of Public Analysts (APA).

### 8.3.1. NRL Network Meetings

The NRL Network Meetings held on 29<sup>th</sup> June 2020 and 13<sup>th</sup> October 2020 were a very effective way for the FSA-FSS-NRL-OL network to communicate (see Section 8.1.1).

### 8.3.2. NRL-MP

- The NRL-MP attended and presented information at the NRL Network Meetings on 29<sup>th</sup> June 2020 and 13<sup>th</sup> October 2020.
- 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-OL network and wider. The NRL Network Meetings were chaired by the Head of the NRL-MP.
- There were many questions relating to Mycotoxins and Plant Toxins raised by the OLs at the Network meeting. Specifically, concerns were raised by the OLs about the costs of Home Office Licences to allow them to carry out some analyses covered by this function, e.g. ergot alkaloids or delta 9-THC. These points were followed up by the NRL-MP with the FSA after the Network meetings.
- A presentation on Ergot Alkaloids analysis was given at an on-line Contaminants conference sponsored by Waters, held in September 2020.
- A presentation on Contaminants 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 were being investigated but at 31 March 2021 no alternative has been agreed, a decision will be made later in the year.
- The lead for the NRL-MP is a member of CEN TC/275 WG5 and CEN TC/327 WG5, both of which met on-line in 2020-21.
- The lead for the NRL-MP is a member of the European Directorate for the Quality of Medicines Working Group on pyrrolizidine alkaloids in herbal substances. This group's work resulted in the publication of a new chapter in the European Pharmacopeia on Pyrrolizidine Alkaloids.
- Newsletters, presentations and meeting reports from the EURL-MP were shared.

### 8.3.3. NRL-MN

- The NRL-MN attended and presented information at the NRL Network Meeting on 29<sup>th</sup> June 2020 and 13<sup>th</sup> October 2020.
- The NRL-MN recruited three OLs to participate in a method trial for methyl mercury in fish.

#### 8.3.4. NRL-POPs

- A representative from NRL-POPs attended and presented at the NRL Network Meeting held 29<sup>th</sup> June 2020 and 13<sup>th</sup> October 2020.

#### 8.3.5. NRL-PC

- A representative for the NRL-PC attended and presented information at the NRL Network Meeting held on 29<sup>th</sup> June and 13<sup>th</sup> October 2020.
- None of the OLs are routinely analysing for PAHs and process contaminants, (except acrylamide and 3-MCPD) although there has been dialogue regarding the provision of training in these areas for one OL in the future.

#### 8.3.6. NRL-FCM

- A representative from NRL-FCM attended and presented at the NRL Network Meetings held 29<sup>th</sup> June 2020 and 13<sup>th</sup> October 2020.
- The NRL-FCM sought feedback from the EURL-FCM for the following questions / issues raised by the FSA / OLs:
  - How they organise and store samples received through the EFSA evaluation process, to inform the UK post EU exit plans.
  - Clarification on how to interpret the changes in the plastics legislation (Regulation 2020/1245<sup>(36)</sup> amending Regulation 10/2011<sup>(37)</sup>) applicable to repeat use articles and the impact they will have on testing.

Responses were fed back to the relevant OL.

- A presentation on food contact materials 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 were being investigated but at 31 March 2021 no alternative has been agreed, a decision will be made later this year.

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

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

**8.5. 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 OLs, 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. OL 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>

- All Fera Contaminants NRLs Annual reports from 2013 onwards are available in a designated area of the website:  
<https://www.fera.co.uk/about-us/national-reference-laboratory>

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

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### 9.1. Core function 2(a) providing impartial expert advice as requested to the FSA, OLs 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:

- One OL enquired in February 2021 about the NRL providing analytical support as they had encountered problems shipping samples to their laboratories in Europe. Information on costs was provided, in the event no samples were sent to the NRL, but samples were sent to other OLs for analysis.
- A document was received from Defra, entitled OCR Laboratory Guidance. The guidance was developed by Defra, Food Standards Agency and Food Standards Scotland and aimed to provide some clarification on those articles of the (OCR) that apply to official laboratories in order to facilitate compliance. This was forwarded to all OLs in the Contaminants network.

#### 9.1.1. NRL-MP

- The NRL lead for Mycotoxins and Plant Toxins gave a presentation on ergot alkaloid analysis at the Waters Contaminants conference in September 2020.
- The NRL lead for Mycotoxins and Plant Toxins gave a presentation on analysis of aflatoxins and ochratoxin A at the Future Cannabis Strategies Europe Conference in March 2021.
- NRL-MP was involved in the EURL-MP Working Group that drafted the document Guidance document on performance criteria.
- In February 2021 the EURL-MP sent two questionnaires. 1. About possible online training events, and 2. Methods and Controlled Drug Licences for opium alkaloids. The questionnaires were completed and returned to the EURL-MP, stating that as they had been sent to Fera we were sending a response, but as we are no longer

officially part of the EURL-NRL network we would wait to be advised if we were eligible to take part in any of the future training events.

- Newsletter received from the EURL-MP, containing information about workshop dates and planned training events were circulated to the CA and OLs.

#### 9.1.2. NRL-MN

- At the request of the FSA, Fera NRL-MN emailed the EURL-MN to make enquiries about a more substantial forward workplan for 2020/21, no further information was received.
- Fera registered in April 2020 to participate in the PT round EURL-MN PT-2020-02, cocoa powder. Fera registered for two further PT rounds in June of 2021, EURL-MN PT-2020-01, fresh fish, and EURL-MN PT-2020-03, molasses. Performance in all three rounds was satisfactory. Intermediate and final reports were submitted to the FSA as they were received. There was some confusion amongst some of the participants regarding the application of the dry matter correction for EURL-MN PT-2020-03, molasses. There were also problems with the correct reporting format for the nitrate and nitrite results. The EURL-MN extended an invitation for the participant laboratories to re-submit corrected results. Fera results had been entered correctly and were satisfactory.
- In July 2020 the possibility of a collaborative trial of the methyl mercury method, adapted by Fera, with the OL's was discussed with the Competent Authority. The OLs were emailed to ask if they would be interested in participating in a method validation study or interlaboratory comparison for methyl mercury in fish. They were asked some questions about their equipment availability, and if they would be willing to participate. These discussions culminated in a small collaborative trial of the method in March of 2021. Three OL laboratories participated.
- In September 2020 NRL-MN completed a short survey supplied with the recent received PT report requesting information on aluminium analysis. The EURL asked the NRL's to complete a brief survey on the methodology used in the analysis of aluminium in EURL-MN PT-2020-02 cocoa powder. Fera responded as requested.

#### 9.1.3. NRL-POPs

- The Irish NRL contacted Fera NRL-POPs in September 2020 regarding analysis of HBCDDs. Answers to the queries were provided by email on the same day with agreement to discuss further by telephone at a later date if required.
- In April, the NRL-POPs received version 3.2 of a guidance document regarding LOD/LOQ for halogenated POPs from the EURL-POPs – feedback was requested. The NRL-POPs forwarded the document to the FSA, received feedback, and provided comments and suggestions for modifications to the EURL-POPs in May.

The feedback was acknowledged and confirmed that the suggestions would be implemented in a later version of the document.

- In May, the EURL distributed a questionnaire on PFASs in food to get a better picture of regional occurrences across the network, which was completed by the UK-NRL in June along with feedback on the guidance document on analytical recommendations for PFASs.
- Three further EURL questionnaires regarding the analysis of PFASs in food, PFASs in feed and PCNs in food and feed were completed in November/December.

#### 9.1.4. NRL-PC

- A request for information and assistance for methods for determination of acrylamide in coffee and PAHs in smoked foods was received from an OL. The information requested was provided.
- Fera NRL-PC participated in an international (EU) ring trial for PAH analysis in food supplements. A method had been developed and was validated in a collaborative trial for determination of 15 PAHs in food supplements. The method performance characteristics were assessed in a collaborative trial with 12 participating laboratories on five food supplements (Cranberry capsules, Seed husks, Ginger tablets, Rose hip dried extract and dried spirulina extract). Based on the statistical evaluation the method failed for the compounds acenaphthene, acenaphthylene and pyrene for the five food supplements included and is therefore validated for 12 PAHs. Based on the statistical evaluation, the method succeeded for the regulated 4 PAHs Benzo[b]fluoranthene, benzo[a]pyrene, benzo[a]anthracene and chrysene for all food supplements, except for ginger (benzo[a]anthracene and chrysene). The method will be made available to OLs.

#### 9.1.5. NRL-FCM

- The NRL lead for NRL-FCM discussed biobased FCMs with a Public Policy student at Cambridge, who was completing a work placement at the FSA. The discussion was to support their research into the market and safety analysis associated with the rise in alternatives to plastic packaging for food items.
- The NRL-FCM provided advice to the FSA / OLs on the following:
  - Interpretation of OM results for silicone testing.
  - Interpretation and reporting of migration results for formaldehyde from melamine ware
  - The impact of Regulation 2020/1245 amending Regulation 10/2011 on repeat testing.
  - The viability of testing for active oxygen.

- Whether polylactic acid is considered a plastic under Regulation 10/2011.
- The NRL-FCM proposed establishing methodology in-house for styrene in foods, followed by roll out to the OLs to ensure capability to deliver against new restrictions for this monomer expected following an EFSA evaluation.
- An OL enquired about the NRL-FCM providing analytical testing on two FCMs.
- The NRL lead for NRL-FCM gave a 'Food for Thought' presentation on FCM for the FSA webinar series in February 2021.

**9.2. 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;**

Due to the on-going pandemic meetings took place on-line in 2020-2021. In some cases, due to the UK Exit from the EU the NRLs were not able to participate in all meetings. Where attendance was possible, 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.

**9.2.1. NRL-MP**

- The EURL-MP Workshop was held on 6<sup>th</sup> to 7<sup>th</sup> October 2020. The workshop was held on-line. There were presentations about a variety of topics including an update on EU legislation for mycotoxins and plant toxins, results of EURLPT-MP02 on pyrrolizidine alkaloids, results of EURLPT-MP03 on ergot alkaloids, results of an interlaboratory validation of a CEN multi-mycotoxin method, an update on CEN activities in food and feed, documents on performance criteria and LOQ for update of Regulation (EC) 401/2006, and analytical aspects for glycoalkaloids / quinolizidine alkaloids and opium alkaloids as they have been the subject of EFSA opinions. The work programme for 2021 (including PTs and training) was also presented.
- Copies of all presentations and the report of the meeting were sent to the FSA.
- The provisional dates for the next EURL-NRL workshop are 5<sup>th</sup> - 6<sup>th</sup> October 2021.

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

- Fera NRL-MP is a member of an EURL Working Group on criteria for methods of analysis for mycotoxins and plant toxins.



- The Working Group was asked to comment on draft documents prepared as a result of WG discussions. 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. These were discussed at the network meeting in October 2020 and some changes made. The final draft version of the report was sent to NRLs for review before it was submitted to the Commission. The final draft version of the text to replace Regulation (EC) 401/2006 was sent to the Commission in December 2020. This was forwarded to the FSA.

### 9.2.2. NRL-MN

- The 3<sup>rd</sup> annual EURL-MN Workshop was held on 28<sup>th</sup> to 29<sup>th</sup> October 2020. Fera NRL-MN received permission from the FSA to attend, but as UK specialists not as UK government representatives – Over the two days presentations included:-
  - Discussions on three PT materials tested by the NRL's.
  - Work in the EFSA Contaminant Panel
  - A summary of the Aluminium analysis questionnaire completed by the NRL's earlier in the year
  - A discussion on problems experienced with Nitrate/Nitrite analysis in the recent molasses PT material
  - An evaluation of the NRL's performance throughout the year.
  - Dates for the 2021 workshop are 9<sup>th</sup> – 10<sup>th</sup> November 2021. A location has yet to be announced.
- Copies of presentations were shared with the FSA.

### 9.2.3. NRL-POPs

- On 16<sup>th</sup> March 2020 – a message was received from the EURL-POPs announcing that it was unlikely that the next EURL/NRL Workshop (Freiburg, 19<sup>th</sup> to 20<sup>th</sup> 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. The meeting was replaced by an online webinar on the 19<sup>th</sup> May 2020, for which the draft programme was forwarded to the FSA.
- Likewise, the 2<sup>nd</sup> EURL/NRL-POPs workshop of the year in November was also rescheduled as an online webinar but could not be attended by Fera in the role of NRL.

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

- Core working group meetings for BFRs (November), CPs (October), PFAS (June, September and October) were held online but in-line with UK government/FSA policy, Fera did not send representatives for these. Meeting notes and programmes were only received for some of these webinars, in which case they were forwarded to the FSA.

#### 9.2.4. NRL-PC

- EURL-PC Virtual Workshop was held on 29<sup>th</sup> to 30<sup>th</sup> September 2020. Topics for discussion were: Results and discussion of PTs, Underperformance in PTs and Presentations from NRLs. No delegates from NRL-PC attended due to UK Brexit policy
- Dates for the 2021 EURL-PC Workshop are yet to be confirmed.

#### 9.2.5. NRL-FCM

- The NRL-FCM attended the EURL-FCM plenary meeting held via Webex in October 2020. A report and all slides were sent to the FSA and a follow up meeting was held to discuss. The agenda included: Overview of 2020 EURL activities; News from DG SANTE on food and FCM legislations; Overview of NRL activities (tour de table); NRL project presentations; An overview of the ILC's carried out in the previous year; Planning network activities for 2021; Next plenary meeting and AOB.
- A representative from the NRL-FCM participated in 'Printing Inks Working Group MCA-Peer Review 001 (Multianalyte methods for the determination of migrants from printing inks)' videoconferences in June and September 2020. The purpose of the meetings was to present, discuss and report the results of the study.
- The NRL lead for NRL-FCM attended the February COT meeting as an observer, as biobased packaging was on the agenda.
- The NRL lead for NRL-FCM attended the ILSI Europe, Packaging Materials Task Force Workshop - Best practices in identifying and quantifying unknown migrants from food contact materials in February 2021. This meeting provided ILSI with a review mechanism for a transcript that they have prepared on identifying and quantifying NIAS. Comments received during the discussion will be consolidated into the final version of the document prior to publication.
- The NRL lead for FCM attended a meeting of the test conditions task force held via Webex in July 2020. This meeting was held to review the responses received on the consultation on the draft 'Testing Conditions for Kitchenware Articles in Contact with Foodstuffs: Plastics and Metals' guidance prior to publication.

**9.3. 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. ILSI Europe, Packaging Materials Task Force Workshop, Waters Contaminants conference in September 2020, and the Future Cannabis Strategies Europe Conference in March 2021.

**9.4. Core function 2(d) advising the FSA, OLs 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 OLs, ensure that this task is met.

- Fera participated in a survey from the FSA to determine any impact that EU Exit would have on NRLs in the event that NRLs could no longer access or participate in network meetings, take part in proficiency tests or access reference materials.
- FSA requested ideas for possible methods that could be suitable for validation studies that would support official control activities. A list of suggested methods was provided.
- Fera NRLs participated in The Post Transition Period EU-GB Imports workshop that was held on 29<sup>th</sup> September 2020.
- Fera NRLs completed a request for information from FSA about Official Control sampling undertaken for Northern Ireland.
- Fera NRL leads participated in a semi-independent review of the NRLs conducted by FSA's Sampling, Strategy and Laboratory Policy (SSLP) Team. This involved participation in a telephone interview, the clarification / review of the transcript of the interview.

**9.4.1. NRL Network Meeting**

As mentioned in 8.1.1, two NRL Network Meetings were held on 29<sup>th</sup> June 2020 and 13<sup>th</sup> October 2020 online via Microsoft Teams to disseminate information from all five NRLs. The meetings were attended by representatives of all Fera NRLs, all UK OLs, the FSA Sampling, Strategy and Laboratory Policy Team, FSA Policy Teams and Food Standards Scotland.

Currently, no visits or face to face training can be undertaken due to COVID-19.

#### 9.4.2. APA annual conference

The APA annual conference was postponed due to COVID-19.

#### 9.4.3. 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 and were scheduled to present at the MChemA training course at Reading University in April 2020. This event was postponed due to the current COVID-19 pandemic. Alternative methods to deliver the training material, i.e. via the web-based applications, were being investigated by the Association of Public Analysts but no decision has been made at 31 March 2021.

#### 9.4.4. NRL-MP

- A request for training on ergot alkaloids from an OL was received and will be followed up.
- OLs were invited to participate in EURLPT-MP05 Determination of ergot sclerotia and three OLs registered to participate.
- Fera staff provided training on sampling and official controls to import inspection staff in Northern Ireland.

#### 9.4.5. NRL-FCM

- The NRL-FCM provided advice to the FSA / OLs on the following:
  - Interpretation of OM results for silicone testing.
  - Interpretation and reporting of migration results for formaldehyde from melamine ware
  - The impact of Regulation 2020/1245 amending Regulation 10/2011 on repeat testing.
  - The viability of testing for active oxygen.
  - Whether polylactic acid is considered a plastic under Regulation 10/2011.
- The NRL-FCM proposed establishing methodology in-house for styrene in foods, followed by roll out to the OLs to ensure capability to deliver against new restrictions for this monomer expected following an EFSA evaluation.
- Fera staff provided training on sampling and official controls to import inspection staff in Northern Ireland.

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

### 9.5.1. NRL Network Meeting

Developments in sampling and testing were discussed at the NRL Network Meetings on 29<sup>th</sup> June 2020 and 13<sup>th</sup> October 2020. Updates were presented by all NRLs, in particular recent information from the October 2020 EURL-NRL workshops was presented.

### 9.5.2. NRL-MP

- The EURL-MP sent an email with suggestions for future training options. These were:
  - Analytical Quality control
  - Method validation - general aspects
  - Method validation - plant toxins
  - Method validation - visual methods
  - Sampling and sample preparation.

NRLs were asked to rank the training offers and suggest personnel that may wish to participate. Fera completed the survey with the caveat that we may not be able to participate in the future. This training will be offered in May or June 2021.

- The EURL-MP informed NRLs that all places on the planned training course for EURLTR-MP05 (Analysis of deoxynivalenol and related conjugates; 12<sup>th</sup> and 13<sup>th</sup> May 2020) had been filled. Fera did not apply for this training as we have extensive experience in this analysis and had received 100% satisfactory performance in the recent PT. This training was rescheduled due to COVID-19.
- The EURL-MP informed NRLs that all places on the planned training EURLTR-MP06 (Method validation and quality control; 7<sup>th</sup> and 8<sup>th</sup> October 2020) had been filled. The NRL-MP had not applied for a place on this training as places were limited.

### 9.5.3. 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 NRL-MN did not apply as we already hold ISO17025 accreditation for the method. The training was planned for 17<sup>th</sup> to 18<sup>th</sup> June 2020 at DTU, Lyngby, Denmark. In March this was put on hold due to COVID-19. The EURL-MN has plans to hold training workshops in the autumn of 2021 for determination of nitrite and nitrate in feed and food by LC/IC-UV and determination of inorganic arsenic in feed and food by HPLC-ICPMS. More information will be made available in the spring.

#### 9.5.4. NRL-POPs

- The EURL-POPs held an online training course on PBDEs and HBCDDs in Freiburg on 3<sup>rd</sup> to 4<sup>th</sup> November 2020. Fera already had methods established for these analyses and so did not register to participate.

#### 9.5.5. NRL-PC

- The EURL-PC held an on-line Training Workshop for analysis of acrylamide on 28<sup>th</sup> September 2020. The NRL-PC did not attend the workshop as we had attended a previous session on this topic.
- NRL-PC received updated methods for analysis of furans, acrylamide, MPCD and glycidyl esters in food and sources of standards and reference materials for these analytes from EURL-PC.

#### 9.5.6. NRL-FCM

##### 9.5.6.1. 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 NRL-FCM participated in the task force set up to review these guidelines. The scope of the guidance has now been increased to include metals as well as plastics and the resulting guidelines are now available via the EURL website:

[https://ec.europa.eu/jrc/sites/jrcsh/files/jacobowska\\_jrc121622\\_jrc121622-kitchenware-conditions-2020-plasticmetals-protected.pdf](https://ec.europa.eu/jrc/sites/jrcsh/files/jacobowska_jrc121622_jrc121622-kitchenware-conditions-2020-plasticmetals-protected.pdf)

##### 9.5.6.2. Multi-analyte methods

- The NRL-FCM participated in the ‘Printing Inks Working Group MCA-Peer Review 001 (Multianalyte methods for the determination of migrants from printing inks)’. This resulted in the recommendation that a method be published for the following:
  - Determination of ten analytes in 95 % EtOH using GC-MS/MS or LC-MS/MS and
  - Determination of ten analytes in oat flakes by QuEChERS extraction followed by GC-MS/MS or LC-MS/MS

Copies of the Final Study Report and Draft Analytical Procedure were forwarded to the FSA in December 2020 but a Final Analytical Procedure has not yet been received.

- The activities of the EURL task force on the development of multi-analyte methods is ongoing. Following October 2020 publication of the assessment of styrene by EFSA

<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2020.6247><sup>(5)</sup> it was agreed that methodology for volatiles using headspace GC-MS should be considered and in doing so extend the scope of the methodology to other volatile migrants, i.e. take forward the multi-analyte headspace GC-MS method previously provided by the NRL-FCM.

## **9.6. Core function 2(f) identifying and informing the FSA, OLs 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 were communicated directly if relevant and a list of contacts for OLs 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 ergot alkaloids at a Contaminants in Food conference in September 2020.
- Emerging analytical issues and developments were discussed with the FSA and OLs at the NRL Network Meeting on 29<sup>th</sup> June and 13<sup>th</sup> October 2020.
- Four OLs registered to participate in EURLPT-MP05 SCL, methodology was provided to the OLs as part of this PT.
- A list of methods that would support official controls that could be considered for further inter-laboratory validation was shared with FSA, and a small study on methyl mercury in fish involving three OLs was instigated.
- Information from EURL Workshops and Working Groups was shared with FSA.
- The NRL-FCM proposed establishing methodology in-house for styrene in foods, followed by roll out to the OLs to ensure capability to deliver against new restrictions for this monomer expected following an EFSA evaluation.
- The NRL-FCM sent information to the FSA regarding the public consultation on 'EFSA Guidance on technical requirements for regulated food and feed product applications to establish the presence of small particles including nanoparticles'.

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

### **9.7.1. NRL-MP**

#### **9.7.1.1. CEN TC275 WG5 – Horizontal methods of analysis in food - Biotoxins**

The majority of the work of WG5 has been conducted by correspondence during the reporting period. One on-line meeting was held on 19<sup>th</sup> October 2020. The main agenda

item was to handle the comments from the CEN enquiry on the draft standard for *Alternaria* toxins. The document was amended and sent for formal vote.

NRL-MP is project leader for two 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. They were approved by voting and have been published as:

- BS EN 17425:2020 Foodstuffs - Determination of ergot alkaloids in cereals and cereal products by dSPE clean-up and HPLC-MS/MS
- BS EN 17424:2020 Foodstuffs - Determination of aflatoxins in spices other than paprika by IAC clean-up and HPLC-FLD with post-column derivatization.

Other methods from Mandate M520 were also sent for formal vote and were approved this year. These were:

- BS EN 17203:2020 Foodstuffs. Determination of citrinin in food by HPLC-MS/MS
- and
- BS EN 16923: Foodstuffs - Determination of T-2 toxin and HT-2 toxin in cereals and cereal products for infants and young children by SPE clean-up and HPLC-MS/MS.

The standard on T-2 toxin and HT-2 toxin had been published previously, but a revised version with additional clarification and instructions about the clean-up eluting procedure have been added. The final versions of these standards will be published in 2021, both are available as draft standards from BSI.

- FprEN 17521:2020 Foodstuffs — Determination of *Alternaria* toxins in tomato, wheat and sunflower seeds by SPE clean-up and HPLC-MS/MS.

This has been sent for formal vote, with a deadline of 30<sup>th</sup> April 2021. Fera NRL-MP lodged a vote in favour of this standard through the BSI.

The draft multi-mycotoxin method proposed by Nestle was adopted to the WG5 programme and circulated for comments as:

- BS EN 17641. Foodstuffs. Multimethod for the determination of aflatoxins, deoxynivalenol, fumonisins, ochratoxin A, T-2 toxin, HT-2 toxin and zearalenone by LC-MS/MS.

The deadline for comments was 15 March 2021. These will be compiled and dealt with at a future meeting of WG5.

Several other methods were also re-confirmed after systematic review. These were:

- BS EN 14132:2009, Foodstuffs - Determination of ochratoxin A in barley and roasted coffee - HPLC method with immunoaffinity column clean-up.



- BS EN 14133:2009, Foodstuffs - Determination of ochratoxin A in wine and beer - HPLC method with immunoaffinity column clean-up
- BS EN 14352:2004, Foodstuffs - Determination of fumonisin B1 and B2 in maize based foods - HPLC method with immunoaffinity column clean-up
- BS EN 15829:2010, Foodstuffs - Determination of ochratoxin A in currants, raisins, sultanas, mixed dried fruit and dried figs - HPLC method with immunoaffinity column clean-up and fluorescence Detection
- BS EN 15835:2009, Foodstuffs - Determination of ochratoxin A in cereal based foods for infants and young children - HPLC method with immunoaffinity column clean-up and fluorescence detection
- BS EN 15850:2010, Foodstuffs - Determination of zearalenone in maize based baby food, barley flour, maize flour, polenta, wheat flour and cereal based foods for infants and young children - HPLC method with immunoaffinity column clean-up and fluorescence detection
- BS EN 15851:2010, Foodstuffs - Determination of aflatoxin B1 in cereal based foods for infants and young children - HPLC method with immunoaffinity column clean-up and fluorescence detection
- BS EN 16187:2015, Foodstuffs - Determination of fumonisin B1 and fumonisin B2 in processed maize containing foods for infants and young children - HPLC method with immunoaffinity column clean-up and fluorescence detection after pre-column derivatisation

The following methods were subject to systematic review, with a deadline to vote of January 2021:

- BS EN 15891\_2010 Foodstuffs - Determination of deoxynivalenol in cereals, cereal products and cereal based foods for infants and young children - HPLC method with immunoaffinity column clean-up and UV detection
- BS EN 15890\_2010 Foodstuffs - Determination of patulin in fruit juice and fruit based puree for infants and young children - HPLC method with liquid/liquid partition clean-up and solid phase extraction

#### 9.7.1.2. CEN TC327 WG5 – Horizontal methods of analysis in feed – Natural toxins

A meeting was held on-line on 7<sup>th</sup> September 2020. The main topics covered were updates on progress of the following projects from Mandates M522 and M523:

prEN17504 –Animal feeding stuffs: Methods of sampling and analysis –Determination of gossypol in cotton seed and feeding stuff by LC-MS/MS

Comments received from the CEN enquiry were discussed. The project leader agreed to finalise the collated comments table and share with the WG5, the and the draft standard would be shared with the WG for a final commenting period before sending for Formal vote.

WI 00327113 -Methods of sampling and analysis -Determination of pyrrolizidine alkaloids in animal feeding stuff by LCMS/MS

The project leader had not received any comments. Some were received and discussed in the meeting and the text was amended. A timetable for progressing the standard was produced, and it was agreed the draft standard would be sent for Enquiry at the start of 2021.

WI 00327111 –Animal feeding stuffs: Methods of sampling and analysis -Determination of intact glucosinolates in rapeseed by LC-MS/MS

The project leader gave an update about the project. The invitation for collaborative trial participants was ready to be sent and would be shared across members of all WG under TC 327 and CEN TC/275 WG5.

The timetable for the project plan was shared, the target for completion of the collaborative study was March 2021 for participants reporting, with a date of May 2021 for data analysis and finalising the document by the end of 2021.

Fera NRL-MP has participated in all of the above method validation studies.

#### 9.7.2. NRL-MN

A meeting of CEN/TC 275/WG 10 took place on-line on 21<sup>st</sup> September 2020, Fera NRL-MN did not participate in the meeting. Several methods were subject to systematic review. The following were confirmed for another five years:

- EN 16801:2016 Foodstuffs - Determination of elements and their chemical species - Determination of methylmercury in foodstuffs of marine origin by isotope dilution GC-ICP-MS
- EN 16802:2016 Foodstuffs - Determination of elements and their chemical species - Determination of inorganic arsenic in foodstuffs of marine and plant origin by anion-exchange HPLC-ICP-MS
- EN 15763:2009 Foodstuffs - Determination of trace elements -Determination of arsenic, cadmium, mercury and lead in foodstuffs by inductively coupled plasma mass spectrometry (ICP-MS) after pressure digestion
- EN 15764:2009 Foodstuffs - Determination of trace elements -Determination of tin by flame and graphite furnace atomic absorption spectrometry (FAAS and GFAAS) after pressure digestion
- EN 15765:2009 Foodstuffs - Determination of trace elements -Determination of tin by inductively coupled plasma mass spectrometry (ICP-MS) after pressure digestion

- EN 13805:2014 Foodstuffs -Determination of trace elements -Pressure digestion

And

- CEN/TS 16731:2014 Foodstuffs - Determination of hydride-reactive arsenic compounds in rice by atomic absorption spectrometry (Hydride-AAS) following acid extraction for another three years.

There had been discussions between CEN TC/275 and CEN/TC 302 (dairy products) about areas of overlap in the work programmes, and it was recommended to establish a liaison between CEN/TC 275 and CEN/TC 302.

Several actions were proposed:

- Action 1/2020: Subject: New work item on the determination of methyl mercury by LC/ICP-MS. A presentation will be prepared for the next WG 10 meeting for discussion as potential new work item of WG 10.
- Action 2/2020: Subject: New work item on the determination of arseno betaine. the Belgian NRL would be asked if there is interest in launching a survey on the need of a European Standard or Technical Specification for the determination on arseno betaine. If so, the Belgian NRL will contact the EURL/MN to help start the survey.
- Action 3/2020: Subject: Potential new work items of the EURL. WG 10 will be informed at its next meeting of the outcome of the EURL and potential new work items.
- Action 4/2020: Subject: Proposal on proficiency tests on insects as novel food stuffs by the EURL/MN in 2021 or 2022. WG 10 will be informed of the potential outcome of the proposal, which still needs approval by the EC.

### 9.7.3. NRL-PC

CEN/TC275/WG 13 Process contaminants – there are no current activities of WG13 so no meetings were held this year. Several methods came under systematic review, NRL-PC voted to confirm them through the BSI portal.

- EN 16618\_2015 Food analysis - Determination of acrylamide in food by liquid chromatography tandem mass spectrometry (LC-ESI-MS/MS)
- EN 16619\_2015 Food analysis - Determination of benzo[a]pyrene, benz[a]anthracene, chrysene and benzo[b]fluoranthene in foodstuffs by gas chromatography mass spectrometry (GC-MS)
- EN 16620\_2015 Food analysis - Determination of furan in coffee and coffee products by headspace gas chromatography and mass spectrometry (HS GC-MS)

- CEN/TS 16621:2014, Food analysis - Determination of benzo[a]pyrene, benz[a]anthracene, chrysene and benzo[b]fluoranthene in foodstuffs by high performance liquid chromatography with fluorescence detection (HPLC-FD).
- EN 14573:2004, Foodstuffs - Determination of 3-monochloropropane-1,2-diol by GC/MS.
- CEN/TS 17083\_2017 Foodstuffs - Determination of acrylamide in food and coffee by gas chromatography-mass spectrometry (GC-MS)

The results of the systematic reviews of EN 14573:2004 and CEN/TS 16621:2014 have been made available and confirm these documents for another period.

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

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

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

In December 2020 a joint statement on sampling and Measurement Uncertainty was issued from EURL-MP, EURL-POPs, EURL-MN and EURL-PC. This was forwarded to the FSA.

#### 10.1.1. NRL-MP

##### 10.1.1.1. CEN TC275 WG5

NRL-MP attended one meeting of CENTC275 WG5 via telecon during the year. A full outline of CEN activities is given in Section 10.7.1.1.

As part of the EURLPT-MP05 ergot sclerotia in cereals an SOP was provided to the laboratories that registered.

##### 10.1.1.2. CEN TC327 WG5

NRL-MP attended one meeting of CENTC327 WG5 via telecon during the year. A full outline of CEN activities is given in Section 10.7.1.2.

#### 10.1.2. 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. 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 OLs via training and dissemination activities. The OLs were emailed to ask if they would be interested in participating in a method validation study or interlaboratory comparison for methyl mercury in fish. They were asked some questions about their equipment availability,

and if they would be willing to participate. These discussions culminated in a small collaborative trial of the method in March of 2021. Three OL laboratories participated.

### 10.1.3. NRL-POPs

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

Fera NRL-POPs has not participated in this working group this year. Notification was received that at its last meeting in February 2021 the CWG has agreed to expand its scope to also include polychlorinated naphthalenes and will now be known as Core Working Group (CWG): Brominated contaminants and PCNs.

#### 10.1.3.2. Core Working Group: PFAS

CWG PFAS held an on-line meeting on 17<sup>th</sup> June 2020. The Technical Report of this meeting was received from the EURL-POPs, despite the fact that Fera had not attended. This was forwarded to the FSA. The main topics discussed were the PT, the results of the analysis of the fish QC sample, definitions for LOQ and list of analytes of interest was agreed.

#### 10.1.3.3. Core Working Group: Chlorinated Paraffins (CPs)

"Guidance document on the Analysis of Chlorinated Paraffins" (V1.6) prepared by the core working group "Chlorinated paraffins" was distributed to the members of the CWG with a request for comments/feedback. This was forwarded to the FSA.

#### 10.1.3.4. Core Working Group: Congener Patterns

The EURL-POPs sent notification of a publication entitled "Congener patterns of polychlorinated dibenzo-p-dioxins, dibenzofurans and biphenyls as a useful aid to source identification during a contamination incident in the food chain"<sup>(6)</sup> which was a product of the Core Working Group on Congener Patterns (which has now completed its purpose and no longer meets).

10.1.3.5. EFSA published its scientific opinion on the risk to human health related to the presence of perfluoroalkyl substances in food in September 2020<sup>(7)</sup>.

#### 10.1.3.6. Guidance document on analytical parameters for the determination of PFASs

NRL-POPs sent comments and feedback on this document to the EURL-POPs.

#### 10.1.3.7. Update LOD/LOQ guidance document - suggested general approach

The EURLs working in the field of contaminants met to discuss the reconsideration and simplification of a joint guidance document on LOD/LOQ for measurements in the field of contaminants.

The four EURLs agreed to develop one joint guidance document and include one recommended and generally described approach: the lowest successfully validated level.

This approach was also already described in the addendum to the LOD/LOQ guidance document developed by the EURL/NRL network for halogenated POPs. The latest version of the addendum to the LOD/LOQ guide (V3.3) was sent as the basis for the discussion and conclusion of this proposal at the EURL/NRL POPs workshop in November.

#### 10.1.4. NRL-PC

See above re development of a general approach for LOD/LOQ being considered by all four contaminants EURLs.

#### 10.1.5. NRL-FCM

##### 10.1.5.1. Kitchenware Test Conditions Guidelines

The scope of the “Guidelines on Testing Conditions for Articles In Contact With Foodstuffs (With A Focus on Kitchenware)” has now been extended to include metals and the document “Testing conditions for kitchenware articles in contact with foodstuffs: Plastics and Metals” published on the EURL-FCM website:

[https://ec.europa.eu/jrc/sites/jrcsh/files/jacobowska\\_jrc121622\\_jrc121622-kitchenware-conditions-2020-plasticmetals-protected.pdf](https://ec.europa.eu/jrc/sites/jrcsh/files/jacobowska_jrc121622_jrc121622-kitchenware-conditions-2020-plasticmetals-protected.pdf)

##### 10.1.5.2. Multi-analyte methods

The NRL-FCM participated in the ‘Printing Inks Working Group MCA-Peer Review 001 (Multianalyte methods for the determination of migrants from printing inks)’. This resulted in the recommendation that a method be published for the following:

- Determination of ten analytes in 95% EtOH using GC-MS/MS or LC-MS/MS  
and
- Determination of ten analytes in oat flakes by QuEChERS extraction followed by GC-MS/MS or LC-MS/MS

Copies of the Final Study Report and Draft Analytical Procedure were forwarded to the FSA in December 2020 but a Final Analytical Procedure has not yet been received.

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

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

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

Performance of the OLs 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. There were no opportunities to undertake training in 2020-21 due to the ongoing pandemic, events were cancelled or postponed, e.g. the MChemA training course.

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

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

Fera NRLs have supported OL 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 OL participants to run a bespoke NRL run PT, OLs have been registered within a Fapas® PT round. By participating in PT rounds in this way the OLs 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 OL performance.

#### 11.2.1. NRL-MP

##### 11.2.1.1. EURLPT-MP05 SCL – Ergot sclerotia in cereals

The invitation to register for this PT was received in July 2020. It was circulated to OLs and three OLs registered to participate. Participating laboratories received an SOP for detection of ergot sclerotia with the test samples. The final report of the PT was received in April 2021, Fera NRL-MP and the three UK OLs all achieved satisfactory performance. Overall 48 laboratories participated in this PT, the first of its kind to be organised by the EURL. Forty



participants (85%) obtained satisfactory results for the contamination level, and forty three participants (91%) correctly indicated the decision on compliance after examination of two sub samples, the overall the general performance was good. The report was sent to the FSA.

#### 11.2.1.2. EURLPT-MP06 Tropane alkaloids in cereals

The invitation to register for this PT was received in July 2020. It was circulated to OLs, none registered to participate.

#### 11.2.2. NRL-MN

##### 11.2.2.1. EURL-MN PT-2020-01 As, Cd, Pb, Hg, inorganic As (optional) and MeHg (optional) in fresh frozen fish

The EURL-MN did not offer PT participation for OLs, so UK OLs were not invited to participate.

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

The EURL-MN did not offer PT participation for OLs, so UK OLs were not invited to participate.

##### 11.2.2.3. EURL-MN PT-2020-03 (feed): As, Cd, Pb, Hg, nitrite and nitrate (optional) in molasses

The EURL-MN did not offer PT participation for OLs, so UK OLs were not invited to participate.

#### 11.2.3. NRL-POPs

##### 11.2.3.1. EURL-ILS-CP\_1905-PO - EURL Interlaboratory Study on determination of CPs in pork sausage 2019

The final report of this study was received from the EURL-POPs and forwarded to the FSA in April 2020.

##### 11.2.3.2. EURLPT-POP-2001-FI PCDD/Fs, PCBs, BFRs, PFASs and CPs in Fish fillet 2020

In December 2019, an announcement and registration deadline were received.

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 OLs should 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. NRL-POPs registered, the invitation was sent to the OLs but none registered as they were not conducting the analysis.

#### 11.2.3.3. EURL-PT-DP-2002-MF - EURL Proficiency Test on the Determination of PCDD/Fs and DL-PCBs in milk fat by Bioanalytical Screening Methods 2020

An invitation to participate in this PT was received in June 2020.

This PT was open for NRLs for Halogenated POPs from EU member states, for OLs and other official laboratories and commercial laboratories using bioanalytical screening methods in order to check the comparability of results not only within the EURL/NRL/OFL network, but also with official and private laboratories performing official control or self-control of food business operators.

The invitation was circulated to OLs, none registered to participate.

#### 11.2.3.4. EURLPT-DPB-2003-FF - EURL Proficiency Test on the Determination of PCDD/Fs, PCBs and BFRs in Feed fat 2020

The invitation to register for this PT was received in July 2020. It was circulated to OLs, none registered to participate.

#### 11.2.3.5. EURL PT on PCDD/Fs, PCBS, PBDEs and HBCDDs in Baby food 2021

Fera was invited to participate in this PT in January 2021 and registered, the invitation was extended to UK OLs but none registered to participate.

### 11.2.4. NRL-PC

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

OLs were also invited to participate in this EURL-PC PT. No UK OLs accepted this invitation.

11.2.4.2. EURL-PC PT-2020-05 for furans and acrylamide in baby food.

Details were circulated to UK OLs, 2 of whom accepted the invitation to participate. The OLs submitted data for acrylamide only. The results for the OLs were satisfactory ( $|z\text{-score}| < 2$ ).

#### 11.2.5. NRL-FCM

Two Inter-Laboratory Comparison (ILC) exercises were scheduled by the EURL-FCM for completion in 2020. They were:

##### 11.2.5.1. EURL-FCM-20/01 Determination of MOSH / MOAH in paperboard and muesli

The invitation to participate was sent to the OLs, none registered to participate.

##### 11.2.5.2. EURL-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

This was postponed from April-June 2020 to November 2020-February 2021, due to COVID-19. The invitation to participate was sent to the OLs, none registered to participate.

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

#### 11.3.1. NRL-MP

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

### **11.4. 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.

#### 11.4.1. NRL-MP

##### 11.4.1.1. EURLPT 2019 MP01 Pyrrolizidine alkaloids in food and feed matrices

Fera NRL-MP participated in the EURL-MP PT for pyrrolizidine alkaloids in food and feed in 2019. The results of the study were presented at the EURL Workshop in October 2020, when the study was described as a research study and was no longer being evaluated as a PT. When the results were treated as a sum parameter, 19 out of 26 laboratories had satisfactory z-scores for both test materials. Individual results varied more widely. A full final report of the study has not been received to date.

#### 11.4.1.2. EURLPT-MP03 Ergot alkaloids in cereals

This PT took place in the previous reporting period, the report of the study was received in July 2020. Fera NRL-MP obtained 24/24 satisfactory z-scores for individual analytes and 2/2 satisfactory performance for total sum parameters. No OLs participated in the PT. The report of the study was sent to the FSA.

A follow up report for those labs that did not obtain satisfactory performance was completed in April 2021. In summary 42 NRLs were invited to participate in the PT, 28 returned results. Seven Member States were not represented by their NRL for food. Eight NRLs showed 100% satisfactory performance, the other 20 and those that did not participate were sent a follow up form by the EURL-MP. This follow up report summarises the responses.

Eleven of the fourteen that did not participate completed the follow up form, the most common reason for not participating was lack of equipment or skilled personnel. For the other 20 NRLs, 16 had all 12 ergot alkaloids in their scope, the other four had 11 or fewer. Most sub-optimal performance was due to un-satisfactory Z-scores, two NRLs reported false negative results. Most NRLs indicated they will improve or develop their method to include all ergot alkaloids.

#### 11.4.1.3. EURLPT-MP05 SCL – Ergot sclerotia in cereals

Fera NRL-MP and three OLs registered to participate, all achieved satisfactory performance (see 12.2.1.1).

#### 11.4.1.4. EURLPT-MP06 Tropane alkaloids in cereals

The final report of the PT was received in April 2021. Fera NRL-MP obtained 4/4 satisfactory z-scores for individual tropane alkaloids (atropine and scopolamine) and 2/2 satisfactory z-scores for the sum parameters. Thirty-eight laboratories participated, a lower number obtained satisfactory results for the low level sample (79 and 71%), at a level close to the EU maximum permitted level of 1 µg/kg for each alkaloid, compared to 90% satisfactory for the higher level sample. The report was sent to the FSA.

#### 11.4.1.5. MVS Determination of Alternaria toxins in tomato, wheat and sunflower seeds by SPE clean-up and HPLC-MS/MS

This method has recently undergone CEN enquiry, the deadline for voting closed on 30<sup>th</sup> April 2020.

#### 11.4.1.6. MVS (BfR) Pyrrolizidine alkaloids (PAs) in animal feed

The draft CEN standard for this method will be sent for Enquiry at the start of 2021.

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

NRL-MP participated in the MVS for multi-mycotoxins organised by Nestle in a previous reporting period. The method was submitted to CEN TC275 WG5 and was adopted as a work item so it can be developed as a CEN standard. The draft has been circulated for comments.

#### 11.4.1.8. MVS for glucosinolates in animal feed

Fera NRL-MP has participated in the pre-trial for this method validation study that is being co-ordinated by WFSR, The Netherlands, to develop a CEN standard through CEN TC327/WG5. No feedback had been received on the pre-trial results.

#### 11.4.1.9. MVS for quinolizidine alkaloids in lupin products

Fera NRL-MP registered to participate in this MVS, co-ordinated by BfR, Germany in December 2020. Pre-trial samples were received in March 2021 and the study is on-going.

### 11.4.2. NRL-MN

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

Fera NRL-MN registered to participate in this PT in June 2020 and received samples in August 2020. Preliminary and final reports were shared with the FSA. NRL-MN obtained 100% satisfactory z-scores and zeta-scores. NRL-MN was one of only seven laboratories that analysed the test material for methyl mercury, all obtained satisfactory results.

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

(\*denotes analyte is optional)

NRL-MN registered to participate in this PT in April 2020 and received samples in July 2020. Preliminary and final reports were shared with the FSA. Fera NRL-MN obtained 100% satisfactory z-scores and zeta-scores for all elements including the optional extra elements aluminium and copper.

#### 11.4.2.3. EURL-MN PT-2020-03, Fish meal feed for As, inorganic As, Cd, Pb, Hg, Methyl mercury\*, NO<sub>2</sub><sup>-</sup> and NO<sub>3</sub><sup>-\*</sup>

(\*denotes analyte is optional) Fera NRL-MN registered to participate in this PT in June 2020 and received samples in August 2020. Preliminary and final reports were shared with the FSA. NRL-MN obtained 100% satisfactory z-scores and zeta-scores for the metal elements. Seventeen laboratories analysed the test material for nitrite and nitrate (this was optional).

The EURL-MN concluded that the stability of nitrite could not be guaranteed in the matrix and this test was withdrawn from the PT. NRL-MN obtained satisfactory z-scores and zeta-scores for nitrate. Four of the seventeen laboratories obtained unsatisfactory results for nitrate analysis.

#### 11.4.3. NRL-POPs

##### 11.4.3.1. EURL PTs

###### 11.4.3.1.1. EURLPT-POP-2001-FI - PCDD/Fs, PCBs, BFRs, PFASs and CPs in Fish fillet 2020

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. 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.

The EURL-POPs sent revised deadlines for the PT, also stating that further extensions could be granted depending on the COVID-19 situation. NRL-POPs submitted results for the PCDD/Fs and PCBs, and PFASs in May on the agreed extended deadlines. A further extension was permitted for the PBDEs and HBCDDs until June. The NRL-POPs met the new deadlines for these analytes. Unfortunately, the NRL-POPs were unable to carry out the work for the non-compulsory CPs and other BFRs and apologies were sent to the EURL. The final reports for PCDD/Fs, PCBs, PBDEs and HBCDDs were received in September 2020 and UK-NRL-POPs' performance was generally good. The final report for the CPs and other BFRs was issued in November and forwarded to the FSA in December.

###### 11.4.3.1.2. EURL-PT-DP-2002-MF Bioanalytical Screening Methods 2020

NRLs were invited to take part by the EURL in June 2020. As UK NRL-POPs do not use bioanalytical screening methods for analysis of dioxin and dioxin-like compounds, registration was not initiated.

###### 11.4.3.1.3. EURLPT-DPB-2003-FF Dioxins, PCBS, PBDEs and HBCDDs in Feed fat 2020

Invitations were received in June to participate in a PT exercise in the latter half of the year. NRL-POPs registered to participate and invited UK OLs to participate also. All analyses were performed in September and October. and UK NRL-POPs performance was acceptable.

Preliminary and final reports for PCDD/Fs, PCBs, PBDEs and HBCDDs were received from the EURL and shared with the FSA.

NRL-POPs obtained all satisfactory scores for all compounds in both samples except for one questionable value for WHO-PCDD/F-TEQ in palm fatty acid distillate. The final report of this study was received in March 2021 and an investigation into this result is ongoing.

#### 11.4.3.1.4. EURL-POPs Interlaboratory Comparisons (ILC) - CPs in Solvent Standard Test Solution and Pork Sausage Meat

The final report for the study of chlorinated paraffins in a standard solution and the preliminary report for the analysis of chlorinated paraffins in pork sausage were received on 31<sup>st</sup> March 2020. The reports were forwarded to the FSA. The final report for the interlaboratory comparison exercise in pork sausage was finally received and forwarded to the FSA in September 2020.

#### 11.4.3.2. Other PTs

##### 11.4.3.2.1. 2020 NIPH Interlaboratory Comparison exercise for halogenated POPs (including PFAS)

This was the 21<sup>st</sup> 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 completed registration form was sent to the organisers in February 2020 and confirmation of registration was received. Samples were delayed in shipping, a request was made for an extension to the deadline 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 1<sup>st</sup> July 2020 (the original deadline had been 1<sup>st</sup> May 2020). A further extension was granted to all participants until 1<sup>st</sup> August.

The study included the determination of the 2,3,7,8-chlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs), as well as dioxin-like non-ortho and mono-ortho chlorinated biphenyls (PCBs) in three different food items. Laboratories could also determine the concentrations of six indicator PCBs, polybrominated diphenyl ethers (PBDEs) and hexabromocyclododecanes (HBCDs) in the same food samples.

For the second time a matrix, designated for the determination of the following poly- and perfluoroalkyl substances (PFASs): Perfluorooctanesulfonate (PFOS), perfluorohexanesulfonate (PFHxS), perfluorooctanoate (PFOA), perfluorononanoate (PFNA), perfluorodecanoate (PFDA) and perfluoroundecanoate (PFUnDA) was also included. Results for all analytes were submitted on the first of August. The draft report was received in November 2020. UK NRL-POPs performance was acceptable.

#### 11.4.4. NRL-PC

##### 11.4.4.1. EURL-PC PT-2020-04 3-MCPD, 2-MPCD and glycidyl esters in powder infant formula

This PT was announced in February 2020. Due to the COVID-19 crisis, the PT was delayed, the Final Report was issued at the end of October 2020.

NRL performance was satisfactory ( $|z\text{-score}| < 2$ ) for 3-MCPD esters and 2-MPCD esters. A questionable z-score was obtained for glycidyl esters, but the results for this analyte were issued as indicative as the test material did not pass the stability test during the period of study. It was noted that glycidyl esters did not meet the stability criteria at room temperature or  $-18^{\circ}\text{C}$ . The report of the PT was shared with the FSA.

##### 11.4.4.2. 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'.

NRL-PC submitted data for furans and acrylamide. For acrylamide, z score for NRL-PC was acceptable ( $|z\text{-score}| < 2$ ). NRL-PC performance for furans were unsatisfactory. Investigations found this was due to degradation of calibration standards. This issue had already been identified and procedures put in place to minimise and eliminate these effects prior to the PT report being received. Additional material was requested from the EURL to confirm the corrective action was effective, however there were no test samples available. Subsequent participation in a Fapas® round for furans gave 100% satisfactory performance for all analytes thus confirming the new procedure was effective.

#### 11.4.5. NRL-FCM

Two Inter-Laboratory Comparison (ILC) exercises were scheduled by the EURL-FCM for completion in 2020. They were:

- EURL-FCM-20/01 Determination of MOSH / MOAH in paperboard and muesli – the NRL-FCM did not register to participate in this as they do not have this capability.
- EURL-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 – this was postponed from April-June 2020 to November 2020-February 2021, due to COVID-19. Results were submitted on time but the final report has not yet been received.

No details have been received yet of the EURL-FCM 2021 ILCs

The NRL-FCM participated in the 'Printing Inks Working Group MCA-Peer Review 001 (Multianalyte methods for the determination of migrants from printing inks)'. This resulted in the recommendation that a method be published for the following:



- Determination of ten analytes in 95 % EtOH using GC-MS/MS or LC-MS/MS and
- Determination of ten analytes in oat flakes by QuEChERS extraction followed by GC-MS/MS or LC-MS/MS

Copies of the Final Study Report and Draft Analytical Procedure were forwarded to the FSA in December 2020, but a Final Analytical Procedure has not yet been received.

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

Under normal circumstances training is offered to be carried out on request, either at Fera or in the individual OL laboratories. Training at Fera allows many OLs to be trained at the same time giving economies of scale and the opportunity for interaction. This has not been possible in the last year due to COVID-19.

- Regional training for sampling officers, that was due to be held at an OL was postponed due to COVID-19.
- An open invitation for training and visits was re-iterated to the OLs at the NRL Network Meetings in June and October 2020.
- A training video demonstrating a method for methyl mercury was produced as part of an Ad Hoc project to support transfer of methods to OLs.

#### 11.5.1. 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 have contributed to the MChemA training course for over ten years 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 postponed due to the COVID-19 pandemic. The organiser wanted to use this as an opportunity to explore options to develop online or digital training materials for the course. There has been no further information or follow up about this, however Fera are committed to continue their participation in the event.

#### 11.5.2. APA annual conference

The conference did not take place in 2020 due to the COVID pandemic, Fera plan to participate in future conferences.

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

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### **12.1. 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 OLs and where appropriate other relevant laboratories. Any EURL recommendations have been fed back promptly to the FSA, OLs and other relevant laboratories and any specific issues would be disseminated by e-mail to the OL distribution list.

Fera is a member of four CEN Working groups, the activity on the groups has been on-line this year, some groups are currently not very active as their Mandates or work programmes have been completed. In many areas new standardisation requests are under discussion and it is anticipated activity will increase.

NRL staff are on the mailing list to receive updates from Defra about Codex activities, NRL leads keep abreast of development in their areas.

#### 12.1.1. NRL-MP

##### 12.1.1.1. CEN TC275 WG5 and CEN TC327 WG5

A full outline of CEN activities is given in Sections 10.7.1.1 and 10.7.1.2.

12.1.1.2. EURLPTs-MP03 Ergot alkaloids in cereals, MP05 SCL – Ergot sclerotia in cereals, and MP06 – Tropane alkaloids in cereals

Fera NRL-MP performed well for all analytes, details are in sections 12.4.1.1 to 12.4.1.3.

12.1.1.3. MVS for glucosinolates in animal feed and for quinolizidine alkaloids in lupin products

Fera NRL-MP is participating in these two international MVS, see sections 12.4.1.8 and 12.4.1.9.

##### 12.1.1.4. EDQM Working Group on pyrrolizidine alkaloids

Fera was a member of the working group that developed a monograph for the determination of pyrrolizidine alkaloids in herbal substances.

#### 12.1.1.5. AOAC's Cannabis Analytical Science Program (CASP)

Fera is registered as a member of the working groups for analytical methods and method criteria for mycotoxins and cannabinoids.

#### 12.1.2. NRL-MN

12.1.2.1. EURL-MN PT-2020-01 (food): As, Cd, Pb, Hg, iAs (optional) and MeHg (optional) in fresh frozen fish, EURL-MN PT-2020-02: Cd, Pb, Ni, Al (optional) and Cu (optional) in cocoa powder and EURL-MN PT-2020-03 (feed): As, Cd, Pb, Hg, nitrite and nitrate (optional) in molasses

Details are given in sections 12.4.2.1 to 12.4.2.3.

12.1.2.2. EURL-MN PT-2021-01: Baby food (rice-based) (food), As, Cd, Pb and inorganic As.

Planned for May 2021. Registration will open in April 2021.

12.1.2.3. EURL-MN PT-2021-02: Insect meal, (feed and food), As, Cd, Pb, Hg and Ni (optional).

Planned for May 2021. Registration will open in April 2021.

12.1.2.4. EURL-MN PT-2021-03: Vegetable-based animal feed (feed), Cd, Pb, Ni, Cu, Hg, As, iAs, NO<sub>2</sub><sup>-</sup>, NO<sub>3</sub><sup>-</sup>.

Planned for August 2021. Registration will open in June 2021.

#### 12.1.3. NRL-POPs

12.1.3.1. EURL PT - PCDD/Fs, PCBs, BFRs, PFASs and CPs in Fish fillet 2020, EURL PT Dioxins, PCBS, PBDEs and HBCDDs in Feed fat 2020.

See sections 12.4.3.1.1 and 12.4.3.1.2.

12.1.3.2. 2020 NIPH Interlaboratory Comparison exercise for halogenated POPs (including PFAS)

See section 12.4.3.2.1.

12.1.3.3. EURL PT on PCDD/Fs, PCBS, PBDEs and HBCDDs in Baby food 2021

Fera NRL-POPs has registered to participate in this PT.

#### 12.1.4. NRL-PC

12.1.4.1. EURL-PC PT-2020-04 3-MCPD, 2-MPCD and glycidyl esters in powder infant formula and EURL-PC PT-2020-05 Furans and acrylamide in baby food.

See sections 12.4.4.1 and 12.4.4.2.

#### 12.1.5. NRL-FCM

##### 12.1.5.1. : 2020 EURL-FCM ILCs

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

No results have been received to date for these, see sections 12.2.5.1 and 12.2.5.2.

12.1.5.2. 'Printing Inks Working Group MCA-Peer Review 001 (Multianalyte methods for the determination of migrants from printing inks)'.  
NRL-FCM participated in this, see section 11.1.5.2.

## 13. Core function 6 - Communication of results and data use

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In the reporting period:

13.1. 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)

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

Core function 6 (b)

13.3. No unusual occurrences were encountered.

Core function 6 (c)

13.4. No additional interim reports were requested.

Core function 6 (d)

13.5. 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)

13.6. 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)

## 14. Summary

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Under Retained Regulation (EU) 2017/625<sup>(1)</sup> 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 1<sup>st</sup> April 2020 to 31<sup>st</sup> March 2021 and demonstrates how the requirements of Retained Regulation (EU) No 625/2017<sup>(1)</sup> (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](mailto: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 OLs and other NRLs throughout the period. EURL information was disseminated to the FSA.

Joint NRL Network Meetings were held on 29<sup>th</sup> June 2020 and 13<sup>th</sup> October 2020 online, these were attended by all UK OLs, the FSA and FSS. Advice and methodology were provided to OLs where requested.

Where provided by the EURL, Work Programmes were forwarded to the FSA. The NRLs also planned Work Programmes and these were sent to the FSA. Fera NRLs were not able to participate in EURL training this year, however future participation in EURL activities has been agreed by the UK government and Fera has pre-registered for training in some areas.

For the EURL Workshops and Core Working Groups, Task Forces and Ad Hoc committees that the NRLs attended, NRL Meeting Notes, official reports and documents and where available, presentations were sent to the FSA. 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 thirteen Proficiency Tests (PTs); EURL PTs and PTs from other providers (this does not include Fapas® PT participation which Fera also takes part in) for a wide range of groups of contaminants. As well as the current year, three PTs carried over from the previous year and were finalised. A PT to determine ergot sclerotia was conducted

for the first time, Fera and three OLs had satisfactory performance. Most other PT results were satisfactory, a very small number of individual results were not. In one case a problem was identified before the PT results were received and measures put in place to correct the issue. In all cases any issues are investigated in accordance with ISO17025 quality procedures and follow up action completed.

## Annexes

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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

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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<sup>(8)</sup> provide for the enforcement of European Commission Regulation (EC) No 1881/2006<sup>(9)</sup>. There are similar domestic Regulations for Scotland, Wales and Northern Ireland. These are amended by Contaminants in Food (Amendment) (EU Exit) Regulations 2019<sup>(10)</sup> for application in the UK. Methods to be used for sampling and analysis for enforcement purposes are prescribed in Commission Regulation (EC) No 401/2006<sup>(11)</sup> and its subsequent amendments Commission Regulation (EU) No 178/2010<sup>(12)</sup> and Commission Regulation (EU) No 519/2014<sup>(13)</sup>. Directive 2002/32/EC<sup>(14)</sup> (amended<sup>(15)</sup>) establishes the maximum levels of contaminants, including aflatoxins, permitted in feed. Commission Recommendation 2006/576/EC<sup>(16)</sup> 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<sup>(9)</sup> (as amended) and Directive 2002/32/EC<sup>(14)</sup> on undesirable substances in animal feed (as amended<sup>(15)</sup>). 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<sup>(17)</sup>) and tetrahydrocannabinol (THC) and its precursors (Commission Recommendation (EU) 2016/2115<sup>(18)</sup>). 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 1<sup>st</sup> April 2017, the scope of the Mycotoxin NRL was expanded to also include plant toxins under Commission Regulation (EU) 2018/192<sup>(19)</sup>.

#### **EURL-MP**

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

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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<sup>(9)</sup> sets maximum levels for certain contaminants in foodstuffs. It is amended by Commission Regulations (EU) No 2015/1005<sup>(20)</sup> for Lead, (EU) No 488/2014<sup>(21)</sup> for Cadmium and (EU) No 2015/1006<sup>(22)</sup> for inorganic arsenic. Commission Regulation (EU) No 1258/2011<sup>(23)</sup> for nitrates in foodstuffs and Commission Regulation (EU) No 594/2012<sup>(24)</sup> adds maximum levels for melamine in foodstuffs. Undesirable substances in feed, including nitrite and melamine, are covered by Directive 2002/32/EC<sup>(19)</sup>, amended by Commission Regulation (EU) No 574/2011<sup>(20)</sup>. Sampling methods and the methods of analysis for the official control of the levels are given in Commission Regulation (EC) No 333/2007<sup>(25)</sup> and Commission Regulation (EU) 2016/582<sup>(26)</sup> for lead, cadmium, mercury, inorganic tin and inorganic arsenic and in Commission Regulation (EC) No 1882/2006<sup>(27)</sup> for nitrates.

In alignment with the EURL changes under Commission Regulation (EU) 2018/192<sup>(19)</sup>, the NRL scope was extended from 1<sup>st</sup> 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<sup>(28)</sup> 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 1<sup>st</sup> 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

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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](http://www.pops.int)

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, C<sub>10-13</sub>), medium-chain CPs (MCCPs, C<sub>14-17</sub>) and long-chain CPs (LCCPs, C<sub>>17</sub>). They have various uses such as temperature moderators for machining/drilling processes, flame retardants and plasticisers. SCCPs are listed in the Stockholm Convention 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

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

Since 1<sup>st</sup> 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 renamed as Processing Contaminants (EURL-PC) under Commission Regulation (EU) 2018/192<sup>(19)</sup>.

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<sup>(9)</sup>, 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<sup>(29)</sup>). Commission Regulation (EU) 2017/2158<sup>(30)</sup> 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<sup>(31)</sup>). 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<sup>(32)</sup>. 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.

#### **EURL-PC**

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

## Annex 5:

### NRL Materials and Articles in Contact with Food

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The term 'materials and articles in contact with food' describes anything that is intended to come into direct or indirect contact with food, including drinks and beverages. This includes packaging, containers, kitchenware, tableware, cutlery and processing equipment.

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').

The National regulations Materials and Articles in Contact with Food Regulations (England, Wales and Scotland Regulations<sup>(33,34,35)</sup>) retain the relevant EU regulations which include provisions for materials and articles expected to come into contact with foods or to transfer their constituents to food, for example, materials like printing inks and adhesive labels. These regulations include the requirement 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

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- (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) European Union (Withdrawal) Act 2018. UK Public General Acts. <https://www.legislation.gov.uk/ukpga/2018/16/contents/enacted>
- (4) Food Standards Agency, Statement about updating content produced before the end of the EU transition or while the UK was in the EU, 15 January 2021. <https://www.food.gov.uk/about-us/statement-about-updating-content-produced-before-the-end-of-the-eu-transition-or-while-the-uk-was-in-the-eu>
- (5) EFSA, 2020. Assessment of the impact of the IARC Monograph Vol. 121 on the safety of the substance styrene (FCM No 193) for its use in plastic food contact materials <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2020.6247>
- (6) Hoogenboom, R.L.A.P, Malisch, R., van Leeuwen, S.P.J., Vanderperren, H., Hove, H., Fernandes, A., Schachtele, A., and Rose, M. (2020). Congener patterns of polychlorinated dibenzo-p-dioxins, dibenzofurans and biphenyls as a useful aid to source identification during a contamination incident in the food chain. Science of The

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- (25) 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>
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- (27) 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>
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<http://data.europa.eu/eli/reg/2011/10/oj>

## Appendix 2: EURLs

### **EURL Mycotoxins and Plant Toxins in Food and Feed**

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<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**

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Operating Manager: Jens Jørgen Sloth

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

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

Director: Dr. Alexander Schaechtele

**EURL Processing Contaminants**

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Senior adviser: Arvid Fromberg

**EURL Food Contact Materials**

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Directorate F - Health, Consumers and Reference Materials  
Unit Food and Feed Compliance  
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## Appendix 3: Fera NRLs

Area	Name and Contact Details
General enquiries and information	<p>Fera Science Ltd (Fera) York Biotech Campus, Sand Hutton, York, YO41 1LZ.</p> <p><a href="mailto:nrl@fera.co.uk">nrl@fera.co.uk</a> +44 (0)1904 462000 <a href="https://www.fera.co.uk/national-reference-laboratory">https://www.fera.co.uk/national-reference-laboratory</a></p> <p>Head of NRL Chemical Safety in Food and Feed Susan MacDonald <a href="mailto:susan.macdonald@fera.co.uk">susan.macdonald@fera.co.uk</a> +44 (0)1904 462558</p>
NRL Mycotoxins and Plant Toxins in Feed and Food	<p>Susan MacDonald <a href="mailto:susan.macdonald@fera.co.uk">susan.macdonald@fera.co.uk</a> +44 (0)1904 462558 <a href="https://www.fera.co.uk/about-us/national-reference-laboratory/mycotoxins">https://www.fera.co.uk/about-us/national-reference-laboratory/mycotoxins</a></p>
NRL Heavy Metals and Nitrogenous Compounds in Feed and Food	<p>Mike Walls <a href="mailto:michael.walls@fera.co.uk">michael.walls@fera.co.uk</a> +44 (0)1904 462150 <a href="https://www.fera.co.uk/about-us/national-reference-laboratory/heavy-metals">https://www.fera.co.uk/about-us/national-reference-laboratory/heavy-metals</a></p>
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NRL Materials and Articles in Contact with Food	<p>Claire McKillen <a href="mailto:claire.mckillen@fera.co.uk">claire.mckillen@fera.co.uk</a> +44 (0)1904 462609 <a href="https://www.fera.co.uk/about-us/national-reference-laboratory/food-contact">https://www.fera.co.uk/about-us/national-reference-laboratory/food-contact</a></p>