Government Chemist Conference

SAFE FOOD FOR TOMORROW'S WORLD

23 – 24 June 2021

Full conference programme

@NML_ChemBioGC
#GCconf2021
www.gov.uk/governmentchemist

LGC

Safe
authentic
sustainable | food

Government Chemist Conference
SAFE FOOD FOR TOMORROW'S WORLD

23 June — Session 1: Perspectives from the UK's Official Control System

Session Chair: Paul Berryman
Chair, Government Chemist Programme Expert Group

Time (BST)	Title	Speaker
10:00	Welcome address	**Julian Braybrook, LGC** *Government Chemist*
10:15	Keynote speech	**Gideon Henderson, Defra** *Chief Scientific Adviser*
10:45	Overview of recent referee cases	**Paul Hancock, LGC** *Referee Analyst*
11:05	Opportunities and challenges facing the Public Analyst Service	**Jane White, Association of Public Analysts** *President*
11:30	Actions and impact of the Food Crime Unit	**Hayley Ward-Ivan, National Food Crime Unit** *Prevention Officer*
11:55	Chair's closing remarks	**Paul Berryman, Session Chair** *GCPEG*
12:00	***Lunch break***	
13:00	**Networking Event: Deep Dive - Defra**	

23 June — Session 2: Regulation for a global market

Session Chair: Declan Naughton, Kingston University

Time (BST)	Title	Speaker
14:00	Chair's introduction	**Declan Naughton, Kingston University** *Professor*
14:05	The role of data science to achieve the objectives of the FSA	**Julie Pierce, Food Standards Agency** *Director of Openness, Data and Digital*
14:25	Food Standards Scotland – Strategy and approach to science	**Geoff Ogle, Food Standards Scotland** *Chief Executive*
14:45	The NIST Food Quality Program: Measurements and standards to support the global food industry	**Katrice Lippa, NIST** *Group Leader*
15:05	Authentication analysis of tonic food products in Hong Kong	**Foo-Wing Lee, Government Chemist Hong Kong** *Assistant Government Chemist*
15:25	The importance of company culture in assuring food safety and integrity	**Fiona Humphries, BRCGS** *Ethical Trade & Responsible Sourcing*
15:45	Achieving business compliance in an international market	**Ingrid Fiordaliso Candalino, McCormick & Co Inc** *Director Global Laboratory Governance*
16:05	**Chair's final remarks**	

Government Chemist Conference
SAFE FOOD FOR TOMORROW'S WORLD

24 June — Session 3: Science for improved health outcomes

Session Chair: Helen Munday, Institute of Food Science And Technology

Time (BST)	Title	Speaker
10:00	Chair's introduction	**Helen Munday, IFST** *President*
10:05	The importance of standardization of biomarker measurements in nutrition	**Ian Young, Queen's University Belfast** *Clinical Professor*
10:30	Current perspectives in food toxicology	**Stella Cochrane, Unilever** *Science Leader, Allergy and Immunology*
10:55	Challenges in measuring clinical proteins and allergens	**Milena Quaglia, LGC** *Principal Scientist, Proteins*
11:20	CBD and controlled cannabinoids in consumer products	**Selvarani Elahi, LGC** *Deputy Government Chemist* **Christopher Hopley, LGC** *Principal Scientist, Organic Chemistry*
11:45	Microbiome for protected status	**Marc Kennedy, Fera** *Senior Risk Analyst*
12.10	Chair's final remarks	

24 June — Session 4: Novel solutions for food authenticity and sustainability

Session Chair: Simon Branch, Herbalife Nutrition, Senior Director

Time (BST)	Title	Speaker
13:30	Chair's introduction	**Simon Branch, Herbalife Nutrition** *Senior Director*
13:35	Nuclear and complementary field-deployable technologies to build food authenticity capability	**Simon Kelly, International Atomic Energy Agency** *Food Safety Specialist (Traceability)*
14:00	Effective solutions for GMO analysis	**Malcolm Burns, LGC** *Principal Scientist*
14:25	Desirability and plausibility of meat alternatives	**Barbara Van Mierlo, Wageningen University** *Associate Professor*
14:50	Science assurance in a sustainable food system	**Professor Robin May, FSA** *Chief Scientific Adviser*
15:15	Final remarks and questions	**Simon Branch, Herbalife Nutrition** *Senior Director*
15:30	Conference closing	**Julian Braybrook, LGC** *Government Chemist*

Day 1- Wednesday 23 June

Welcome and introduction

Dr Julian Braybrook, Government Chemist

Dr Julian Braybrook is Director of Measurement Science for the National Measurement Laboratory at LGC, and Government Chemist, where he is responsible for the science strategy and partnership development of the associated metrology and regulatory analysis programmes, in support of the UK National Measurement System.

Since joining LGC in 1988, Julian has carried out a variety of roles delivering and managing national and European analytical research innovation and exploitation and contract service solutions, for a variety of chemical and biotechnology applications and across both the public and private sectors. He holds several national, European and international positions informing standards generation and application, as well as government and commercial policy and practise.

Julian has a degree in Chemistry from the University of London and a PhD from the University of Cambridge for research into novel contrast agents for magnetic resonance spectroscopy and imaging. He has an honorary DSc from Kingston University London for his contributions to chemistry. He is a Chartered Chemist, Fellow of the Royal Society of Chemistry (CChem FRSC).

Contact

Julian.Braybrook@lgcgroup.com

Government.Chemist@lgcgroup.com

Session 1: Perspectives from the UK's Official Control System

Session Chair: Paul Berryman, Chair of Government Chemist Programme Expert Group

Paul is the Director of Berryman Food Science Ltd, which works closely with government and businesses, including the Department for International Trade (DIT), Innovate UK, FERA and SGS Ltd. He is a visiting Professor at the University of Reading. Paul has an extensive career spanning more than 30 years in which he has worked at senior level with most of the top 100 global food companies. An Expert Witness and former Public Analyst, he holds the MChemA, an MBA and a PhD in Science Strategy. He was also CEO and Research Director at Leatherhead Food Research Ltd.

Keynote speech

Gideon Henderson, Chief Scientific Adviser, DEFRA

Speaker biography

Gideon became Defra's Chief Scientific Adviser in October 2019 and is a Professor of Earth Sciences at the Department of Earth Sciences, University of Oxford. He is also a Senior Research Fellow at University College, Oxford and an Adjunct Associate Research Scientist at the Lamont Doherty Earth Observatory of Columbia University. In 2013, he was elected a Fellow of the Royal Society. His research uses geochemistry to understand surface earth processes, particularly those relating to climate, the ocean, and the carbon cycle.

Overview of recent referee cases

Paul Hancock, Referee Analyst, LGC

Abstract

Following an introduction into the referee process, a review of recent referee cases will be given. Whilst Covid has impacted on the level of sampling activities by enforcement bodies, leading to a reduction in the number of referee cases received, the technical complexity of the cases has increased. Cases received include, genetically modified rice from China, antibiotics in honey and labelling of a novel food / food supplement.

Speaker biography

Paul Hancock joined the Government Chemist programme in July 2020 as Head of the Office of the Government Chemist, Referee Analyst and Nominated Officer.

Paul has 24 years' experience of enforcement analytical chemistry, including 11 years' experience as a public and agriculture analyst and 8 years as head of an official control laboratory. Prior to this Paul worked in environmental analysis and coal utilisation research, and has recent experience of the animal feed industry.

His technical areas of expertise include high level interpretative skills in food safety and standards, general analytical chemistry and associated issues; working knowledge of ISO 17025 (UKAS) quality issues, ISO 9000 lead auditor qualified and he is a specialist in food law application (labelling, allergens, health claims, composition, additives, GMOs, contaminants, consumer complaints).

Paul has also served on the Association of Public Analysts' training committee for over 20 years, including as secretary and currently as APA Training Officer. He has also used his experience to successfully mentor a number of candidates through the MChemA examination process.

Contact

Head of the Office of the Government Chemist

LGC, Queens Road, Teddington, Middlesex

TW11 0LY, UK

paul.hancock@lgcgroup.com

Day 1 – Wednesday 23 June

Opportunities and challenges facing the Public Analyst Service

Jane White, President, Association of Public Analysts

Abstract

There is an ever changing landscape within the area of Food and Agriculture enforcement particularly just now. COVID and BREXIT have brought both opportunities and challenges for the Public Analyst laboratories. I would like to highlight some of these during my presentation and hopefully open give you a better insight into what we do.

Speaker biography

Jane studied Physical sciences at Robert Gordon University in Aberdeen. She then worked with a building consultancy within the area of contaminated land reclamation before joining Glasgow Scientific Services in 1992.

Jane obtained her MChemA in 2000 and went on to be appointed as Public Analyst to 16 Scottish Local Authorities. She is also part of a team that provides remote and on site scientific support to Scottish Fire and Rescue.

Contact

jane.white@glasgow.gov.uk

Actions and impact of the Food Crime Unit

Hayley Ward-Ivan, National Food Crime Unit

Abstract

The National Food Crime Unit (NFCU) is a dedicated law enforcement function of the Food Standards Agency (FSA). The unit provides leadership on food crime across England, Wales, and Northern Ireland. The NFCU was established in 2015 following a review of the 2013 horse meat incident. The NFCU is tasked with protecting consumers and the food industry from food crime within food supply chains.

The presentation will cover the NFCU's current priorities as outlined in the Control Strategy as well as the outputs that are available to the food industry with the aim of keeping them informed and build resilience to food crime. The presentation will also describe the impact of the unit in the fight against food crime.

Speaker biography

Hayley Ward-Ivan is a Prevention Officer within the Food Standards Agency's National Food Crime Unit (NFCU). She works on the National Food Crime Unit's Prevention team who aim to reduce the likelihood and impact of food crime. As a Prevention Officer her role involves working on tailored initiatives to both neutralising the motivations of suspected and potential offenders and reduce the vulnerability of victims of food crime. Her role involves working closely with food businesses of all sizes to raise awareness of their own vulnerabilities to food crime and what they can do to protect themselves.

Prior to joining the NFCU in 2019 Hayley spent over 10 years working in the food service sector in various management roles. She has also recently completed a degree in Environmental Health.

Contact

Hayley.ward-ivan@food.gov.uk

Day 1 Wednesday 23 June

Session 2: Regulation for a global market

Session Chair: Professor Declan Naughton, Kingston University

Following the award of a BSc in Chemistry at University College Dublin and a PhD in Trinity College Dublin, Declan joined the Inflammation Research Group at Barts and The London School of Medicine and Dentistry for 10 years.

Two years in Bath University followed by five years as a Senior Lecturer in Analytical Sciences in the University of Brighton, preceded his current appointment as Professor of Biomolecular Sciences in 2005. In addition, I was appointed as Associate Dean for Research and Enterprise for the Faculty of Science, Engineering and Computing in June 2016.

Defra Deep-dive workshop session: Consumer confidence in food integrity and authenticity beyond composition

The aim of this deep-dive session is to explore some of the emerging trends impacting on our food system and discuss what the integrity of the food supply looks like in a post pandemic/EU Exit world – from industry, consumer and enforcement perspectives.

Defra would like to invite participants to think about what the current and future technical challenges for food integrity and authenticity are likely to be beyond the usual compositional authenticity issues.

During the session the participants will have a deeper dive into:

- the impacts of climate change, achieving decarbonisation (net zero), sustainable agriculture production (including organic) on food integrity

- the current and future scientific challenges and potential solutions to ensure food authenticity including Food origin, Provenance and Protected Food names

Defra will use the outputs to help them identify future priorities for research and innovation to support consumer confidence in the food system.

The role of data science to achieve the objectives of the FSA

Julie Pierce, Food Standards Agency

Abstract

The world in which we operate has been becoming increasingly data rich, or data satiated. The FSA realised that this was an opportunity for a government regulator to exploit that data for the consumer. But also realised that it might have new responsibilities in the creation, management and exploitation of that data.

This talk will outline the journey we have been on. How we started, and how we progressively moved forward and where we are now at the more innovative edge of the envelope, certainly for a regulator. We will talk about the great things that can be done with data, but also understand the simple, basics that should not be forgotten. Then we will explore some of the new roles we think government needs to take on, for our domain of food safety and authenticity.

Speaker biography

Julie champions the use of modern digital approaches and technologies, within government but also across the food system. She is also responsible for Science and again is pushing for modern, data enabled approaches to our research, evidence gathering and insight generation.

Julie is a member of the FSA Executive, and is the Director with oversight responsibility for the FSA in Wales.

Previously Julie was the Chief Information Officer at Defra. She spent much of her earlier career in the private sector implementing technology enabled change programmes as a partner at PricewaterhouseCoopers in pharmaceuticals, financial services, defence as well as central government, both in the UK and mainland Europe.

Contact

Food Standards Agency

Clive House

70 Petty France

London SW1H 9EX

Food Standards Scotland – Strategy and approach to science

Geoff Ogle, Food Standards Scotland

Abstract

Food Standards Scotland (FSS) recently launched their second strategy “Safe, Healthy, Sustainable: Driving Scotland’s Food Future” for 2021 – 2026. The strategy sets out how as an independent public sector food body FSS will help protect the diverse interests of people in Scotland. The organisation plans to continue to take a robust evidence-based approach in our activities as the trusted and influential source on food information and advice. In his presentation Geoff will provide background to FSS, the context FSS works in and FSS’s approach to the use of science and evidence.

Speaker biography

Geoff was appointed the first Chief Executive of the new food body, Food Standards Scotland, which came into effect on 1 April 2015 . This followed his appointment as Acting Director for Food Standards Agency (FSA) in Scotland on 2nd June 2014 . Before doing so, Geoff was Portfolio Director responsible for improving FSA’s approach to programme management.

Geoff joined the FSA in December 2008 and worked in field operations until Jan 2013 responsible for all compliance and enforcement of all FSA approved premises. He moved from that role to become the senior investigating officer for the horsemeat incident. Geoff became the interim FSA Director for Wales from May 2013 until February 2014 where he gained valuable experience working in a Devolved Government setting. Geoff has also undertaken a strategic review of the FSA’s approach to SMEs and was lead reviewer for the focus on enforcement review of OFSTED Early Years Inspection.

Prior to the FSA, Geoff worked in Department of Work and Pensions for over 20 years, as Head of the International Pension Centre in charge of the largest of the centres with 2.2 million customers and a spend of over £2bn a year. While in DWP Geoff did a range of posts including operational delivery, policy development and programme management. He was also Private Secretary to the Child Support Agency Chief Executive Officer from 1997 to 2000.

Contact

[Personal Assistant] **Emma.scott@fss.scot**

The NIST Food Quality Program: Measurements and standards to support the global food industry

Dr Katrice Lippa, NIST

Abstract

Food safety and nutrition, product authenticity, and food defense all contribute to the complexity of 'food quality' requirements and associated measurement challenges that impact the global food industry. As part of the US Department of Commerce, NIST is a non-regulatory agency with a mission to help promote competitiveness and confidence in the US food industry (and other sectors) by advancing measurement science, standards and technology. The NIST Food Quality Program has provided extensive standards for the food industry in the form of matrix-based reference materials, measurement services support through quality assurance programs, and metrology-based support for global food manufacturers to meet US regulatory-based labelling requirements. Examples from NIST's current portfolio related to various contaminants in agricultural materials, polyfluoroalkyl substances (PFAS) in meat, cannabinoids in hemp products, and nutritional markers (e.g., vitamins, proximates) in infant formula will be described. Findings from a recent 2020 NIST workshop with >150 food industry stakeholders to assess the global needs for measurements and standards will be summarized (also published in a workshop report). Such standards and measurement solutions developed in collaboration with the food industry will help them make timely, well-informed, data-driven decisions to ensure production of high-quality and safe food for consumers and to prevent or curb food waste and associated economic losses.

Speaker biography

Dr Katrice Lippa obtained her Ph.D. in environmental chemistry from Johns Hopkins University in 2002, joined NIST as a research chemist following a National Research Council postdoctoral fellowship, and has led the Organic Chemical Metrology Group at NIST as a supervisory research chemist for the past 5 years. The group designs, produces and maintains an extensive portfolio of Standard Reference Materials and data products, primary standards, and Quality Assurance programs for organic species in clinical, nutritional assessment and metabolomics, food safety and nutrition, dietary supplement and natural products, chemical manufacturing, and forensics program areas.

The group also provides advice and measurement services to other government agencies, scientific organizations, and US industry and engages with international standards organizations and other National Metrology Institutes (NMIs) to establish comparability of measurement capabilities.

Contact

National Institute of Standards and Technology (NIST)

Chemical Sciences Division

Gaithersburg, MD 20899 USA

katrice.lippa@nist.gov

https://www.nist.gov/people/katrice-lippa

Authentication analysis of tonic food products in Hong Kong

Foo-Wing Lee, Government Chemist Hong Kong

Abstract

Consumption of tonic food for bolstering bodily health had been a long tradition among the Chinese. The popularity of Chinese tonic products in Hong Kong has drawn the attention of the general public to their authenticity and quality.

Owing to financial incentives, substitution or adulteration of the products are occasionally found in the local market. Not only the desirable efficacy of the products is influenced, but some may even cause harmful health effects. In Hong Kong, the Trade Descriptions Ordinance enacted in 1981 constituted an important legal basis in protecting consumers by prohibiting false label descriptions, misleading or incomplete information, and misstatements in respect of consumer goods provided in the course of trade.

The Government Laboratory has major scientific and statutory commitments as referee analyst under various ordinances and regulations. One of the major roles is to support the Custom & Excise Department in the enforcement of the Trade Descriptions Ordinance with regards to the analysis of consumer goods in relation to fitness with their trade classification. Laboratory testing is essential to provide scientific evidence on the authenticity of tonic products.

While the conventional authenticity checks on most of the Chinese tonic products are based on physical / sensory examination alone, mis-identification is sometimes inevitable due to the difficulty in exclusively distinguishing a genuine product from its substitutes or adulterants under various circumstances. The demand for a reliable traceability system applicable to tonic products has called for support from scientific research; and hence multi-analytical approach have emerged to tackle the problem. With the recent advancement in molecular technology, DNA-based analysis has been rapidly developed for authenticating the species origin of tonic products in market samples. Given the high biological variety and complexity of some tonic products, orthogonal testing schemes combining DNA and proteomic-based methods are adopted to match the increasingly sophisticated needs of authentication on complex products.

The experience in the authentication of some typical cases of fraudulent tonic products such as Cordyceps, dried crocodile meat and donkey-hide glue are described to exemplify the power of scientific contribution in the enforcement of the Trade Descriptions Ordinance in Hong Kong.

Speaker biography

Mr. Foo-wing LEE joined the Hong Kong Government Laboratory (GL) as a professional chemist in 1989, after his graduation as master of philosophy on biochemistry from the University of Hong Kong. He is currently the Chief Chemist of the Other Scientific Services Group of the Hong Kong Government Laboratory responsible for overseeing the service provision in specialized testing areas ranging from trade commodities, drugs, Chinese medicines, smoking products, radiochemistry, chemical safety to environmental chemistry.

He has participated in the activities of various international and regional bodies including Nucleic Acid Working Group of the Consultative Committee for Amount of Substance - Metrology in Chemistry, ISO/TC34: Food Products and ISO/TC276: Biotechnology, Tobacco Laboratory Network of the World Health Organization, Codex Committee for Contaminants in Foods, and Asia Pacific Legal Metrology Forum.

Contact

Mr Foo-wing LEE,
Government Laboratory
7/F Ho Man Tin Government Offices
88 Chung Hau Street
Hong Kong

The importance of company culture in assuring food safety and integrity

Fiona Humphries, BRCGS

Abstract

After introducing BRCGS and its portfolio of product safety and ethical trade standards, the presentation will focus on the definition of culture in organisations. It will consider how it impacts on the behaviour of staff with a specific focus on Schein's organisational culture model developed in the 1980s. It will consider key definitions like the Global Food Safety Initiative's, as well as the key influencers of culture such as leadership and the components of a strong food safety culture.

It will then propose how an organisation might get a better understanding of their unique culture and the types of resources available to support them, such as the BRCGS Food Safety Cultural Assessment module and how it works in practice. The presentation will end with a short conclusion that references Frank Yiannis's book "Food Safety Culture" and that a positive one means that an organisation has a shared mindset that is committed to preserving the integrity of food and keeping consumers safe.

Speaker biography

Fiona is a sustainability professional who has worked in both the private and public sectors for over 20 years, supporting businesses to change their cultural mindsets and deliver improved environmental and social responsibility performance.

She has worked for BRCGS for the last 3 years, developing and launching its new Ethical Trade & Responsible Sourcing standard for use by both specifiers and their suppliers to minimise their supply chain risks and ensure that workers' well-being, employment and human rights – particularly the most vulnerable – are protected and upheld in the workplace.

Contact

Fiona Humphries PIEMA
Ethical Trade & Responsible Sourcing
BRCGS
7 Harp Lane, London, EC3R 6DP

Achieving business compliance in an international market

Ingrid Fiordaliso Candalino, McCormick & Co Inc

Speaker biography

Ingrid Fiordaliso Candalino is Director Global Laboratory Governance for the Global Quality & Food Safety Center of Excellence at McCormick & Co. Inc. In this role, her key areas of focus include herb and spice supply chain integrity, analytical sciences, internal and external laboratory governance and external trade association and laboratory engagement.

Ms. Fiordaliso Candalino has worked in the herb and spice Industry for more than 18 years holding a number of technical roles including food safety, quality assurance, laboratory, supplier quality and regulatory responsibilities.

Ms. Fiordaliso Candalino joined McCormick in 2015 and was appointed to her current position of Director Global Laboratory Governance for the Global Quality & Food Safety Center of Excellence in 2018.

Prior to joining McCormick, Ms. Fiordaliso Candalino worked in a food laboratory and then as Quality and Supply Chain Director at Drogheria e Alimentari (IT).

Ms. Fiordaliso Candalino has a BSc degree in Chemistry, physical chemistry from the University of Florence (IT).

Day 2 Thursday 24 June

Session 3: Science for improved health outcomes

Session Chair: Helen Munday, President, IFST

Helen Munday is the President of the Institute of Food Science and Technology, Previously she held the role of Chief Scientific Officer at the Food and Drink Federation.

Helen has a wealth of experience of the food and drink sector. She started her career with Mars Petcare where she spent 20 years in various roles including nutrition research, product development and innovation processes. A significant period of time was spent overseas, gaining invaluable international experience. Helen served as Head of Research at the Mars Petcare Global Research Centre for over five years.

Helen has also held the position of Director of Scientific and Regulatory Affairs for Coca-Cola and worked as Lead Technologist in AgriFood at InnovateUK.

Helen is a Fellow of Institute of Food Science & Technology and a Registered Nutritionist. With her qualifications in Agricultural Science and Meat Science, together with her vast business experience, Helen has a broad and deep knowledge across the entire AgriFood chain. On a daily basis, Helen is working with stakeholders at the most senior levels in Government, regulatory agencies, academia and NGOs, to apply developments in the topics of food science and technology for the good of all.

The importance of standardization of biomarker measurements in nutrition

Professor Ian S. Young, The Centre for Public Health, Queen's University Belfast

Abstract

Measurement of biomarkers plays a critical role in assessment of nutritional intake and status. In particular, nutritional guidelines and recommendations are heavily dependent on studies which relate markers of nutrient intake or status to clinically relevant outcomes; frequently, the results of such studies are combined by meta-analysis or in systematic review in order to draw conclusions and inform guideline development.

In general, those conducting meta-analysis assume comparability of biomarker measurement across the range of studies which are being combined and show little awareness of the significant between-method and between-laboratory differences which may exist. In practice, such differences may be substantial and make meaningful combination of results from different studies of limited value. In the worst cases, inappropriate conclusions may be drawn.

In clinical practice where individual patient decisions are made based on biomarker measurement, significant between method differences will lead to variation in clinical outcomes which are dependent on the laboratory and measurement procedure used.

At present, full metrological traceability is available for only a small minority of nutritional biomarkers, and even where this is possible partial or inadequate implementation by manufacturers of commercial measurement systems is common. Development of reference measurement systems, including methods, materials and laboratories, remains a need in many areas. Regulators have an important role to play in terms of mandating traceability to commutable reference materials and ensuring that this is adequately maintained. Users should ensure that they employ standardized methods where these are available. External quality assurance (EQA) scheme providers should employ commutable samples in order to allow maintenance of standardization of commercial assays and laboratory performance to be monitored. In the case of clinical laboratories, information about EQA performance for all assays should be publicly available. Journals should require publications utilising nutritional biomarkers to include a core dataset in relation to the measurement procedures used and their performance, in order to allow more meaningful meta-analysis.

Speaker biography

Ian Young is Professor of Medicine at Queen's University Belfast, and Deputy Medical Director and Consultant Chemical Pathologist at Belfast Health and Social Care Trust. In addition, he is Chief Scientific Advisor to the Department of Health, Northern Ireland, and Director of Research for Health and Social Care. His main clinical and research interests are in nutrition and lipid metabolism, particularly in relation to cardiovascular disease prevention and management of patients with complex lipid disorders. He is author of over 400 published research papers. He is Past-President of the Association for Clinical Biochemistry and Laboratory Medicine, UK, and is currently Chair of the International Consortium for the Harmonization of Laboratory Test Results (ICHCLR) He is Chair of the UK Government's Scientific Advisory Committee on Nutrition SCAN), Associate Editor for the journal Clinical Chemistry, and a member of the editorial boards of a number of other international journals.

Contact

Prof. Ian S. Young

The Centre for Public Health

Queen's University Belfast

Current perspectives in food toxicology

Dr Stella Cochrane, Unilever

Abstract

Drawing on experience as a member of the UK Committee on Toxicity, and as Science Leader for Allergy and Immunology in Unilever's Safety and Environmental Assurance Centre, Stella will cover emerging areas of science, and challenges, in the field of food toxicology reflecting changes such as the increasing interest in vegan foods and improving sustainability in the supply chain, with a focus on measurement science.

Areas to be covered will include, exposure assessment, material characterisation, New Approach Methodologies (NAMs) and food allergy risk assessment and risk management.

Speaker biography

Dr Cochrane is a science leader, project leader and risk assessor with many years of experience gained working in academia and Unilever's Safety and Environmental Assurance Centre (SEAC).

Dr Cochrane has expertise in immunology with a focus on IgE-mediated allergy and provides scientific expertise and leadership, covering risk assessment and risk management of consumer products and ingredients including foods and novel food proteins.

Additionally, Dr Cochrane is Deputy Chair of the UK Food and Drink Federation Allergen Steering Group, the Co-Chair of the FoodDrinkEurope Allergens Group and a member of the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT).

Challenges in measuring clinical proteins and allergens

Dr Milena Quaglia, LGC

Abstract

Effective patient care, clinical research, and public health efforts require comparability of laboratory results independent of time, place, and measurement procedure. Comparability is achieved by establishing metrological traceability, which ensures that measurement procedures measure the same quantity and that the calibration of measurement procedures is traceable to a common reference system consisting of reference methods and materials. Whereas standardisation ensures traceability to the International System of Units (SI), harmonisation ensures traceability to a reference system agreed on by convention.

Here we provide an overview of the challenges faced by the metrological community in standardising and harmonising protein measurement results, developing commutable reference materials and reference measurement procedures. Those include the appropriate definition of the measurand, an overview of the current routes for ensuring traceability to the SI through quantification of the chemical composition of a protein, correlation with routine testing and gaps in metrological approaches. Examples will be provided where metrological traceability was achieved for clinical measurements and food allergens with an overview of the infrastructure currently available and future developments.

Speaker biography

Milena is an experienced protein mass spectrometrist and metrologist involved in a number of standardisation initiatives for protein measurements including the Joint Committee for Traceability in Laboratory Medicine, the Consultative Committee on the Quantity of Material (Bureau International des Poids et Mesures), the European Metrology Network on Traceability in Laboratory Medicine and the recent Joint Programme Network on Food Safety.

Milena completed her PhD in Analytical Chemistry in 2001 and after 4 years of postdoctoral experience in industry and research hospitals, she joined the organic mass spectrometry team at NML at LGC as a researcher. Since 2009 she has been leading protein metrology projects at NML on purity determination of proteins and peptides, standardisation of clinical biomarkers, food allergens and protein tertiary structural analysis measurements tailored to define operative frameworks for higher order structural analysis standardisation, serving the biopharmaceutical area and bridging gaps for standardisation of clinical measurements. Milena is coordinator and principal investigator on a number of European metrology programs on neurogenerative disease biomarkers and cardiac markers. Author of more than 40 peer review publications and two book chapters.

Contact

National Laboratories and Science

LGC

Queens Road

Teddington

Middlesex

TW11 0LY

UK

Milena.Quaglia@lgcgroup.com

CBD and controlled cannabinoids in consumer products

Selvarani Elahi MBE and Christopher Hopley, LGC

Abstract

Cannabidiol (CBD) is a non-psychoactive cannabinoid present in the cannabis plant (Cannabis sativa L) along with many other cannabinoids that may either exhibit psychoactive or non-psychoactive properties. CBD plant extract or plant isolates have gained salience as an ingredient in food supplements and in some cosmetic products, and there has been a proliferation of such products, available online and on the high street.

Government Chemist horizon scanning activities identified CBD in consumer products as a topic of interest for GC activities, and so in the 2020 – 2023 programme, an advisory project was scoped to assess the measurement issues related to CBD in foods and to develop GC capability to discharge the statutory function of Referee Analyst in case of submission of referee samples.

On 13 February 2020, the Food Standards Agency confirmed the novel food status of CBD containing foods setting a deadline of 31 March 2021 for businesses to submit CBD novel food authorisation applications to continue to sell existing products. Thus, it became evident that many government bodies had an interest in the development of a high accuracy method for CBD and controlled cannabinoids in consumer products. Through discussions with the Home Office, the Food Standards Agency, the Office of Product Safety and Standards in BEIS, Food Standards Scotland and the Defence Science & Technology Laboratory, it became apparent that a collaborative approach would provide value for money, avoid duplication and ensure fit for purpose methods were available by 31 March 2021 to enforce regulations and ultimately protect the consumer.

This talk will describe a range of activities that the Government Chemist has actively engaged in related to the determination of CBD and controlled cannabinoids in consumer products to support effective regulation. The presentation will focus on the outcome of a cross government funded international ring trial to determine the CBD and controlled cannabinoid content of commercially available consumer products.

The results of the ring trial have been provided to the Home Office Advisory Council on the Misuse of Drugs (ACMD) in response to their call for evidence and will assist in their assessment of UK capability to determine CBD and controlled cannabinoids in consumer products.

Speaker biography – Selvarani Elahi

Selvarani is the UK Deputy Government Chemist and Executive Director of the Food Authenticity Network at LGC. She has over 25 years' experience in the analysis of food and agriculture samples working across a variety of policy areas, with different stakeholder groups, to improve standards in measurement science.

Selvarani has been the Chair of the UK Department for Environment, Food and Rural Affairs (Defra) Authenticity Methods Working Group since 2013 and sits in a number of national and international commmittees.

Selvarani leads the Food Authenticity Network which is an open access website that gathers information on food authenticity testing, food fraud mitigation and food supply chain integrity helping to build more resilient food supply chains.

Selvarani a Chartered Chemist and a Fellow of the Royal Society of Chemistry, and a Fellow of the Institute of Food Science and Technology.

Selvarani serves on the Governance Board of the Safe to Trade Scheme which was launched in direct response to the Coronavirus (COVID-19) pandemic, to help businesses instil consumer and worker confidence that that they can reopen and trade safely.

In October 2020, Selvarani was awarded an MBE in the Queen's Birthday Honours List 2020 for services to food measurement services.

Speaker biography – Christopher Hopley

Christopher Hopley is the Principal Scientist in Mass Spectrometry at LGC's National Measurement Laboratory.

Chris has over 20 year's mass spectrometry research experience, with a particular focus on instrumental performance, for both qualitative and quantitative applications, mostly for small molecule applications.

He has published 27 papers and has around 300 citations. Chris works on both clinical and forensic applications of mass spectrometry, with a key focus on measurement traceable to the SI system of units to underpin the UK National Measurement Infrastructure.

Contact

National Laboratories and Science

LGC

Queens Road

Teddington

Middlesex

TW11 0LY

UK

Selvarani.Elahi@lgcgroup.com

Christopher.Hopley@lgcgroup.com

Microbiome for protected status

Dr Marc Kennedy, Fera

Abstract

The ability to verify provenance claims is of increasing importance due to consumer preference for foods of particular origin. High margins can be made by labelling products as being derived from a particular country or location, thus there is a need to protect the consumer from any potential mislabelled provenance claims. There is also a requirement to protect industry from imitation products that seek to undermine genuine origin and quality labelling claims. Methods that can verify the provenance of foods play a critical role in meeting these objectives.

Food carries its own microbial communities, shaped by origin and the method of production, which are a promising target for the development of methodology for provenance attribution. Across two projects (FA0141, FA0160, funded jointly by Defra and FSA) Next Generation Sequencing (NGS) Technology was used to attempt to identify microbial communities associated with two foodstuffs (Pacific Oysters and Stilton Cheese) from a variety of locations.

We sequenced part of the 16S gene to identify bacterial taxa (for oysters and cheese), and part of the Internal Transcribed Spacer (ITS1) region to identify fungal taxa (only for the cheese). The resulting datasets have a very high dimension, relative to the number of samples available.

Statistical models were used to extract features of the data linked to particular groups of samples, effectively reducing the high dimensional data to a more manageable level and allowing for more conventional statistical classification. Importantly, these methods offer a measure of uncertainty in the classification which can help to prevent misclassification in situations where the data are relatively weak.

The results demonstrate that markers of origin can be extracted from the microbiome of these foods. Cross-validation was used to test the accuracy of the classification. For oyster samples, around 35% could be assigned to specific sites and 50% to larger geographical regions. For cheese samples the accuracy was 70-90% accuracy depending on the type of classification required (e.g. individual producer, country, blue stilton vs. other blue cheese).

Assessing the seasonality of oyster samples, a high level of temporal variability was found, which may explain the lower accuracy. The methods may be more suited to identifying fermented foods. Further testing of the approach is recommended with larger samples, before developing more robust practical software tools for more routine use.

Speaker biography

Marc Kennedy has a PhD in statistics from the university of Nottingham. He has worked at Fera Science since 2006, following research positions at the University of Nottingham, University of Sheffield and US National Institute of Statistical Sciences. He has over 25 years' experience developing statistical methods and software that have been applied within fields of engineering, radiological safety, vegetation modelling, food safety and occupational health.

He has most recently worked on several EU projects including the Acropolis and Euromix projects for assessing aggregate and cumulative exposures to pesticides and other contaminants, and the Browse project to simulate bystander, resident, operator and worker exposures from crop spraying. He has served as an expert for EFSA and ILSI-Europe on modelling methodology and led exposure modelling projects funded by the UK Food Standards Agency and Chemicals Regulation Division of HSE.

Contact

Dr Marc Kennedy

Fera Science Limited, York Biotech Campus, Sand Hutton, York, YO41 1LZ, UK

Marc.Kennedy@fera.co.uk

Day 2 Thursday 24 June

Session 4: Novel solutions for food authenticity and sustainability

Session Chair: Simon Branch, Herbalife Nutrition

Simon joined RHM Technology as a Senior Analytical Chemist in 1990, where he progressed through a number of roles to become Head of Innovation and Improvement, before moving to the McCormick Corporation where he took responsibility for the Product and Process Development teams and subsequently to Goldenfry as Head of Innovation. Simon is currently the Director of Research, Development and Scientific Affairs at Herbalife.

During his career, Simon has sat on a number of committees including the Royal Society of Chemistry (RSC) LGC advisory committee and the RSC Science and Technology Board.

Nuclear and complementary field-deployable technologies to build food authenticity capability

Dr Simon Kelly, International Atomic Energy Agency

Abstract

Recurrent food authenticity and safety crises have the potential to endanger public health and provoke loss of public confidence. These crises may also result in substantial economic losses by authentic product manufacturers and cause reputational damage to entire economic sectors, leading to barriers to international trade. At the same time, national gate-keepers, both food control regulators and Customs authorities, may find themselves inadequately equipped with food adulteration screening technology to stand up to the challenge of uncovering food fraud.

This presentation will cover the applied and adaptive research activities coordinated by the Joint FAO/IAEA Centre's Food and Environmental Protection Laboratory, within the framework of international projects, to assist and support developing countries to gain access to appropriate analytical techniques and develop protocols to assess the authenticity, safety and quality of food.

Various foods have been studied including rice, vegetable oils, spices and fruit juice as exemplar commodities chosen by the Member States to establish methods and guidance for food adulteration testing. The aim of the Coordinated Research Projects (CRP) programme is to close the gap between capabilities confined to sophisticated research labs, and technologies that can be utilised by various control bodies in developing countries. Part of the opportunity to accomplish this goal stems from an on-going reduction in the cost of analytical equipment and an increase in its portability. Throughout the last decade the analytical instrument industry has delivered new families of handheld, portable and transportable tools. This presentation covers some of the applications developed within the framework of the CRPs, based on hand-held and some bench-top laboratory instruments that have become 'field' transportable including techniques such as gas chromatography - ion mobility spectrometry (GC-IMS).

There will also be examples of laboratory based testing, with nuclear techniques, that has been simplified and made more rapid to improve accessibility and facilitate wider use.

Speaker biography

Dr Simon Kelly is a Food Safety Specialist in the United Nations Joint FAO/IAEA Centre of Nuclear Techniques in Food and Agriculture, Vienna, Austria.

He has been actively involved in applied and adaptive research with stable isotope, elemental analyses and complementary techniques to determine the authenticity of foods with respect to the presence of adulterants, geographical and production origin for over 25 years. He previously participated in several major European food authenticity projects and currently coordinates several international projects to build food authenticity research and technical capacity in developing countries, with a strong emphasis on simplifying and improving accessibility to analytical methods.

He has previously held positions at the UK's Food and Environment Research Agency and the Institute of Food Research. Dr Kelly is a member of the UK's Department for the Environment, Food and Rural Affairs Food Authenticity Methodology Working Group. He gained his degree in Chemistry from Anglia Polytechnic in 1992 and completed his PhD in the School of Environmental Sciences at the University of East Anglia in 2002, where he holds an honorary lectureship. Dr Kelly is a Chartered Chemist and Fellow of the Royal Society of Chemistry.

Contact:

Dr Simon KELLY

Food and Environmental Protection Laboratory

Joint FAO/IAEA Centre of Nuclear Techniques in Food and Agriculture

Department of Nuclear Sciences and Applications

International Atomic Energy Agency

Vienna International Centre,

Wagramer Strasse 5, PO Box 100

1400 Vienna, Austria

Towards effective solutions for GMO analysis

Dr Malcolm Burns, LGC

Abstract

Since the approval of the first genetically modified plant for use in food and feed in the EU in the mid-1990s, genetically modified organisms (GMOs) have demanded a lot of attention and been in the spotlight for a number of stakeholder communities, inclusive of governments, regulators, agri-tech firms, scientists, retailers and consumers.

Towards the end of 2008, only a handful of GM crop plants were authorised for use in the EU, making it a relatively straightforward affair to detect and identify this limited number. Currently however, in 2021, regulators are expected to identify and quantify around 90 GM crop varieties, and screen for countless unauthorised lines as well. The situation is further compounded by hurdles presented from difficult food matrices, the advent of new GMOs, the need for reference materials, legislative rulings on such things as gene editing, and the challenges and opportunities that “Brexit” has presented.

This talk will describe a range of national and international activities that the Government Chemist programme has actively engaged in to help towards supporting effective GMO analyses. The presentation will illustrate solutions being used to combat the increasing complexity of GMO analysis, inclusive of efficient DNA extraction approaches, validation of reference materials, involvement in international expert working groups, provision of harmonised and published best measurement practice and technical guidance, evaluation of cutting-edge laboratory based analytical technologies, and adherence and incorporation into recognised quality management systems.

The presentation concludes that it is only through continued engagement and networking with relevant stakeholders (inclusive of UK government, official control laboratories, industry, producers, retailers, consumers, and national/international expert groups and regulatory bodies), further supported by the application of sound analytical measurement science, will we continue to develop and then maintain effective solutions for GMO analysis.

Speaker biography

Malcolm is the Principal Scientist and Special Adviser to the Government Chemist, based at LGC in Teddington (UK). Malcolm has over twenty years' post-doctoral experience as a molecular biologist and project manager, and is also the manager for the UK National Reference Laboratory for GMOs in Food and Feed.

Malcolm specialises in the use of molecular biology approaches for food authenticity testing and is an international expert on the identification and quantitation of genetically modified ingredients in food materials. He has extensive experience in developing and validating methods for DNA analysis both at national and international level. Malcolm leads a team of specialist food scientists at LGC and has published over 60 peer reviewed papers and EU guidance notes on food authenticity, GMO quantitation, method validation and estimation of measurement uncertainty.

Malcolm works as a consultant adviser for departments within the UK Government with respect to best practice measurement guidance on food analysis, and also on international projects aimed at standardising results in the bioanalytical community. Malcolm gives regular presentations at national and international level, and is a member of a number of international working groups and expert advisory committees related to metrology and food authenticity testing.

Contact:

Dr Malcolm Burns

Principal Scientist and Special Adviser to the Government Chemist

Molecular and Cell Biology

National Laboratories and Science

LGC, Queens Road, Teddington, Middlesex

TW11 0LY, UK

Malcolm.Burns@lgcgroup.com

Desirability and plausibility of meat alternatives

Dr Barbara Van Mierlo, Wageningen University

Abstract

Meat, an important source of protein and other nutrients in human diets, and an appreciated part of human diets, is one of the major drivers of global environmental change in terms of greenhouse gas emissions, land and water use, and issues related to animal welfare and human health. Novel alternatives, including novel meat proxies (cultured meat, plant-based meat alternatives), insects and novel protein sources (like algae) receive increasing attention. The socio-technological change pathways for their further development have not yet been compared in an integrative, interdisciplinary perspective.

I will present a sustainability transitions perspective on the challenges of moving beyond animal-based food systems. In this light, I will show the findings of a study to comparatively assess the nutritional implications, potential sustainability gains and required technological and social-institutional change of five meat alternatives.

High levels of transformation and processing limit the environmental sustainability gains of cultured meat, highly processed plant-based meat alternatives, algae- and insect-based food. At the same time, a high degree of societal coordination is needed to enable the potentially disruptive level of technological, organisational and institutional innovations needed to make these novel alternatives viable. Widespread expectations that solutions require break-through novelties or high-tech alternatives imply a neglect of existing and viable alternatives. Our integrative analysis suggests that the priority given to meat alternatives with limited sustainability potential does not just raise questions of technological optimisation of production systems, but also about the desirability of the current prominent search directions in the context of the so-called “protein transition” (Van Weele et al. 2019).

In the light of this conclusion, the presentation will end with a plea for more interdisciplinary collaboration among researchers and show what the role of social-scientists could be.

Reference: Van der Weele, C., Feindt, P., van der Goot, A. J., van Mierlo, B., & van Boekel, M. (2019). Meat alternatives: an integrative comparison. Trends in Food Science & Technology, 88, 505-512.

Speaker biography

Barbara van Mierlo is an associate professor, working as a sociologist at the Knowledge, Technology and Innovation Group of Wageningen University. She studies processes of transformative, systemic change towards sustainability and their intersection with everyday social practices. Being actively engaged in these processes, special interests include the significance and features of interactive learning and discursive strategies, the value of change-oriented evaluation, emergence of reflexivity, responsible innovation, and transdisciplinary collaboration.

She has developed the methodology of Reflexive Monitoring in Action (RMA), which has a wide international uptake in among others sustainable agriculture, natural resource management, renewable energy and health.

Contact:

Dr Barbara van Mierlo
barbara.vanmierlo@wur.nl

Science assurance in a sustainable food system

Professor Robin May, FSA

Abstract

The food system is evolving at a remarkable rate. For those of us lucky enough not to have to worry about starvation, meals are often a central focus of our social and cultural life but are also an important vehicle for ethical or moral concerns. Increasingly, many of us are ranging ever-wider in our choice of foods; perhaps to reduce concerns about food miles or animal welfare, or often simply to try something new and exotic. The food industry and the science that underpins it is responding rapidly to this changing marketplace, creating a galaxy of new foods and food supplements and the promise of a 21st century revolution in diets. Many of these are traditional foods presented in new ways – ground cricket flour or freeze-dried mealworms, for instance. But some are completely novel to the human diet – lab grown meat or highly-concentrated plant extracts.

The future of the planet depends on sustainable, ethical food production but it is critical that consumers can continue to have complete confidence that these novel foods are safe and what they say they are. To achieve that, we need to be developing the technology, data and quantitative methods that will underpin food standards over the coming decades. In this talk, I will discuss some of the future foods that might be hitting the market in the near, medium and long-term future, some of the concerns associated with them and what we as scientists, engineers and regulators can do to help support safe, innovative and sustainable foods for the 21st century.

Speaker biography

Professor Robin May, took up his role as the Chief Scientific Adviser (CSA) for the Food Standards Agency (FSA) in July 2020.

Professor May's early training was in Plant Sciences at the University of Oxford, followed by a PhD on mammalian cell biology at University College London and the University of Birmingham. After postdoctoral research on gene silencing at the Hubrecht Laboratory, The Netherlands, he returned to the UK in 2005 to establish a research program on human infectious diseases. He was Director of the Institute of Microbiology and Infection at the University of Birmingham from 2017-2020.

Professor May continues his work on Infectious Disease at the University of Birmingham. A Wolfson Royal Society Research Merit Fellow and Fellow of the American Academy of Microbiology, Professor May specialises in research into human infectious diseases, with a particular focus on how pathogens survive and replicate within host organisms.

As the FSA's Chief Scientific Adviser, Professor May will provide expert scientific advice to the UK government and plays a critical role in helping to understand how scientific developments will shape the work of the FSA, as well as the strategic implications of any possible changes.