Potential future discussion items – horizon scanning

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Background

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1. The Committee Terms of Reference specify “To advise at the request of” (……government departments). Therefore, the work of the Committee is primarily reactive and the agendas are set by the Secretariat based upon the need for advice from Government Departments and Agencies particularly, but not exclusively, the Food Standards Agency (FSA) and the UK Health Security Agency (HSA).

2. The Code of Practice for Scientific Advisory Committees (Office of Science and Technology, December 2021), specifies that “committees should ensure that they have mechanisms in place that allow them to consider on a regular basis whether new issues in their particular areas of responsibility are likely to emerge for which scientific advice or research might be needed”.

3. Members have agreed that it would be useful to have an annual agenda item to discuss potential future topics. A list of upcoming topics is also displayed on the Committee's website: Forthcoming COT meetings | Committee on Toxicity.

4. As Members are aware, now that the UK has left the European Union the authorisation of regulated products that would have been done by EFSA is being done in the UK. Two Joint Expert Groups (JEGs) have been established to cover the authorisation of regulated products and these are overseen by the COT who will provide challenge, comment and assurance of their work. The FCMJEG covers food contact materials and AEJEG covers food additives, enzymes and other regulated products. An additional AEJEG working group is working solely on the reauthorisation of smoke flavourings.

5. Requests for COT advice are also being received from the Nutrition, Labelling Composition and Standards Group which is a risk management group for the 4 countries of the UK and covers legislative areas such as infant formula and follow on foods, food supplements, and nutrient sources where the policy lead is the responsibility if the Department of Health and Social Care in England, FSA Northern Ireland, the Scottish Government and the Welsh Assembly; topics previously raised by NLCS include green tea catechins, fortificants in bread and flour and folic acid hypersensitivity.

6. This has been reflected in the agendas of the Committee in the last few years. It is envisaged that the COT will continue to review Committee Advice Documents from AEJEG and FCMJEG. However, the Secretariat are not aware of any requests for advice from NLCS in the near future.

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Agenda items for 2026

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Ongoing items

7. There are a number of ongoing items, either on the current agenda or scheduled for further discussion at a future meeting:

- COT input into the Scientific Advisory Committee on Nutrition (SACN) review of the maternal diet. Topics are expected to include echinacea, tea, phytoestrogens, selenium and vitamin E.
- Biologically based food contact materials.
- Ashwagandha.
- Garcinia cambogia.
- COT Woking Group on PFAS.
- COT Working Group on Guidance.

Upcoming items

8. Upcoming items may include:

- Arsenic - review of the recent Health-Based Guidance Values from EFSA and JECFA with a view to establishing the most appropriate for risk assessment purposes.
- Dioxins - review of the final EFSA opinion when available.
- Acrylamide – An FSA call for data on acrylamide levels in foods has recently been completed. The Committee may be asked to consider the implications of UK exposures.
- Fluoride – review toxicity information with respect to fluoride in relation to neurotoxicity, effects on bone and effects on the thyroid, and to consider the potential risks in the context of UK exposure levels through dental products, drinking water, and other exposure sources.
- Nanoplastics- Currently there is no internationally agreed definition of a nanoplastic however some organisations have proposed certain criteria. Nanoplastics are usually defined as synthetic particles or heavily modified

natural particles with a high polymer content with a diameter from 1 nm to 100nm. The COT has reviewed the potential effects of microplastics by the oral and inhalation routes with statement being published in 2021 and 2024, respectively. Given the increase in the database, Members will wish to consider whether it would be appropriate to consider nanoparticles separately. The proposal is to review the recent data for the potential effects nanoplastics via the oral route.

Proposed Workshops

9. The two most recent COT workshops have been “Gut Reactions: Xenobiotics and the microbiome” and “Exploring Artificial Intelligence in Chemical Risk Assessment” which took place in October 2024 and 2025 respectively.

10. A possible topic for the 2026 workshop could be weight of evidence assessment, do Members have any suggestions?

COC and COM horizon scanning

11. Following discussions by COC on horizon scanning over the past few years, the Committee has agreed to hold a list of topics categorised by topics that will be progressed, topics on which a watching brief is being kept or which are not yet prioritised, and topics which have been raised but are not considered a priority or which are outside of COC’s remit. This table is provided in Annex A.

12. COM continues to monitor activities at OECD on the development of Detailed Review Papers (DRPs) as well as proposals for new Test Guidelines (TGs): papers on error corrected sequencing and recent advances in γH2AX biomarker-based genotoxicity assays will be considered in 2026.

13. In addition, the literature and specific meeting agendas are periodically scanned for any interesting advances in mutagenicity and genotoxicity methods for the detection of DNA damage or non-genotoxic mechanisms.

14. A more formal horizon scan strategy has not been developed/implemented by COM.

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Other Updates

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FSA-funded Computational Toxicology Fellowship and LIDo PhD student in AI

15. The FSA and COT have been reviewing New Approach Methodologies (NAMs) to scope the best scientific methodologies available to be used in risk assessment of chemicals in foods and the environment and understand how these can be incorporated in a regulatory context with validation approaches.

16. The FSA have recruited a computational toxicology fellow at the University of Birmingham and a PhD Student (London Interdisciplinary Doctoral Program-LIDo-TOX AI) at King's College London. The aims of the projects are to develop *in silico* tools (*i.e.* artificial intelligence machine learning) for toxicological prediction of chemicals through case studies and proof of concept studies. The fellow and student will also work alongside other government departments to understand how NAMs will improve indicative levels of safety in chemical risk assessment.

17. The programme of work in the fellowship consists of (i) scoping the FSA's problem space in chemical risk assessment and mapping this to our

computational NAMs solution space, thereby aiding the FSA to develop a strategy for the utilisation of NAMs; (ii) ensuring that the FSA is trained in the use of computational NAMs by delivering training courses, including an introduction to existing and emerging NAM technologies, and topics selected from the FSA's NAM strategy; (iii) developing and evaluating confidence in a new hazard assessment workflow that integrates in vitro omics toxicity data, benchmark dose modelling and PBPK modelling to serve as the basis for quantitative risk assessment for human health, i.e., towards generating human health-based safety thresholds for FSA and other regulators; and (iv) developing and delivering a second case study that fortifies the community-wide acceptance of 21st century methods in risk assessments, to accelerate the successful application of NAMs within the FSA.

18. The postdoctoral fellow continues to work on the internationally accepted case study (APCRA meeting, Ottawa, CA, 2024) Utilising in silico, in vitro and 'omics New Approach Methodologies (NAMs) for priority-setting and safety assessment of tropane alkaloids (TAs) as potential food contaminants.

19. This study aims to generate toxicity data for several more TAs, determine the most potent TA, and prioritize substances to inform UK monitoring decisions. A four-tiered approach was implemented to tackle these objectives. Tier 1 focuses on literature and databases searches, in silico target identification and potency prediction; tier 2 focuses on in vitro potency estimation; tier 3 focuses on multi-omics technologies applied to a subset of TAs to derive molecular PoDs; and tier 4 focuses on quantitative in vitro to in vivo extrapolation to derive health-based guidance values.

20. Preliminary results in Tier 1 revealed (a) neurotoxicity-related pathways such as neuroactive ligand-receptor interaction, signalling pathways (calcium, sphingolipid and cAMP), synapses (cholinergic, serotonergic, and dopaminergic), chemical carcino-genesis and pathways of neurodegeneration; (b) neurotoxicity-related MIEs such as muscarinic acetylcholine receptors (mAChRs) subtypes M1, M2, M3, M4, and M5; sodium-dependent transporters for dopamine, serotonin, and noradrenaline; sigma non-opioid intracellular receptor 1; and 5-hydroxytryptamine receptor 3A. Potential interactions between the TAs and all relevant targets were analysed using molecular docking.

21. Additionally, binary and regression QSAR models were generated and validated in compliance with OECD principles to predict the potency of each TA against all mAChRs subtypes, enabling ten TAs (atropine, 2-hydroxymethyl atropine, scopolamine, anisodine, aposcopolamine, convolvine, fillalbine, convolamine, noratropine, and O-acetylscopolamine) to be prioritized for

progression to tier 2.

22. Our recent work on tropane alkaloids (Silva et al., 2025) has been presented at QSAR Milan 2025 and was short-listed for the Alfonso Lostia Award on Food Safety research at EuroTox 2025.

23. The programme of work in the PhD up to the present is composed of 4 parts: (1) Development of QSAR models of mutagenicity, using feed-forward neural networks and an exploration of dimensionality reduction techniques, before moving on to Graph Convolutional Networks (GCNs) and mining of Structural Alerts (SAs), (2) Case study on BFRs, using Graph Attention Networks (GATs) to predict in-vivo doses and concentrations relevant to neurotoxicity, developmental toxicity and reproductive toxicity, via both graph-regression over molecular graphs and node-regression over knowledge graphs containing numerous molecules (Kalian et al., 2024); (3) Case study on SARMs, using transfer learning on GCNs to predict Drug-Induced Liver Injury (DILI), Drug-Induced Renal Injury (DIRI) and Drug-Induced Cardiotoxicity (DICT) (Kalian et al 2025); (4) Exploration of different GNN architectures – GCNs, GATs and Graph Isomorphism Networks (GINs), in order to characterise the most advantageous GNN architectures for navigating varying toxicological assay data environments. (Kalian et al 2025).

24. The PhD student presented this work at QSAR Milan 2025 and SOT 2025.

FSA Research Programme

25. The FSA research strategy has seen the consolidation of all research in the portfolio into a series of programmes by area of research interest.

26. Current projects in the Chemical, Radiological and Hypersensitivity Research Evidence Programme include:

- Determination of the bioavailability of hydrogen cyanide following consumption. This project aims to determine the bioavailability of hydrogen cyanide from a range of foods.
- Method development for PFAS in fruit and vegetables. The aim of this project is to develop analytical techniques to measure 30 pre-identified PFAS in a range of fruit and vegetable matrices.

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Balance of expertise on the Committee

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27. It has previously been agreed that the following types of specialist expertise are required by the Committee for some or all of its evaluations:

Analytical techniques

Bioinformatics

Biochemistry

Cell biology

Clinical practice

Dietary exposure assessment

Endocrinology

Environmental exposure assessment

Epidemiology

Human toxicology

Immunology

Mathematical Modelling

Mechanistic toxicology

Molecular biology

Neurotoxicology

Nutrition

Paediatrics

Pharmacokinetics

Pharmacology

Probabilistic modelling

Reproductive toxicology

Respiratory toxicology

Risk assessment

Statistical aspects of experimental design

Statistics

Systems biology

Toxicogenomics

Toxicological pathology

Xenobiotic metabolism

28. It would not be necessary to have an individual member for each listed expertise as some people would have a combination of the required skills. Additional key experts can also be invited to attend meetings for specific topics to supplement missing knowledge.

29. As Members are aware recruitment to the FSA Scientific Advisory Committees is now carried out annually by a central team, starting in the Autumn , while this process was paused for 2026, it is envisaged that recruitment for 2027 will start later in 2026. The balance of expertise set out below is used to guide the process.

30. Members are invited to comment on whether this list is still appropriate and if there are important gaps amongst the current membership or in light of possible future developments.

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Questions on which the views of the Committee are sought:

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31. Members are invited to comment on each of the above areas and also to consider the following questions:

i) Do Members have additional suggestions for future topics for:

- Specific issues to be included as routine agenda items.
- Focussed topics for one-day meetings or workshops.
- Generic issues requiring establishment of a Working Group.

ii) Do Members consider that consideration of nanoplastics would be worthwhile?

iii) Do Members have any proposals for research that FSA should fund in order to improve future COT risk assessments?

iii) Do Members have any comments on the balance of skills on the Committee?

iv) Members are reminded that they may draw particular issues to the attention of the Secretariat at any time.

Secretariat

January 2026

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