Ongoing Work 2024

In this guide

This is a paper for discussion. This does not represent the views of the Committee and should not be cited.

Advice on the risk to human health from consumption of bivalve molluscs (shellfish) harvested from UK waters associated with marine biotoxins

1.79 The Food Standards Agency (FSA) is considering the current advice and monitoring programme for marine biotoxins and whether there is a need to update or change existing legislative standards. The main purpose of this work is to identify any emerging marine biotoxins in UK waters, including considerations on increasing occurrence with increasing temperatures due to climate change. The views of the COT were sought on whether any of these emerging marine biotoxins would pose a risk to human health.

1.80 In December 2023 a scoping paper was presented to the Committee on whether a number of emerging marine biotoxins would pose a risk to human health. Following the discussions, and to aid the Committee in ranking the risk of each emerging marine biotoxin, the Secretariat produced a discussion paper in July 2024 providing a table with the main toxicological information. In addition, a table of the main toxicological information of currently regulated marine biotoxins was included, for comparison.

1.81 Limited estimates of potential adult exposures to the unregulated marine biotoxins, based on the European Food Safety Authority's (EFSA) shellfish portion size of 400 g, and a fish portion size of 140 g, as suggested by the Ministry of Agriculture, Fisheries and Food portion size book and assuming a body weight of 78.6 kg were also provided. The aim of the estimated exposures was to help Members establish whether occurrence at the levels reported in the literature would be of potential risk. However, this was not a detailed exposure assessment, and consumption data was not based on UK consumers, and hence may have overestimated actual exposures in the UK. Going forward it may be more appropriate, if required, to use data from the National Diet and Nutrition Survey (NDNS) to enable a more accurate and refined exposure assessment, although data for consumption of shellfish from this survey may still be limited.

1.82 There was limited data available, in general, but also on the impact of biotoxins on other animals living in (e.g. fish and shellfish) or frequenting (e.g. wild birds) freshwater. However, it is generally assumed that animals would avoid areas of high blooms, if they can. There was also very limited data on the overlap between algal blooms and exposure to toxins, made more difficult with some algae species having benthic stages.

1.83 Data on adverse effects of marine biotoxins were commonly from animal studies, and not from human data. Nonetheless, specifically for cyclic imines (CIs) monitoring was undertaken in some countries even though no human intoxications had been reported. The route of administration in animal studies differed widely, adding to the uncertainty in the available data, but intraperitoneal injection appeared to increase toxicity in a number of studies compared to oral administration.

1.84 The COT considered it useful for the UK to have a more formal strategy for the reporting of potential marine biotoxin intoxications, however they acknowledged that this may prove difficult for some marine toxins as standard testing may not be available.

1.85 There would however be benefits from enhanced UK surveillance programmes and looking at monitoring programmes in other countries, specifically e.g. in Scotland and Northern Ireland, and whether they could be adapted for England or rolled out UK wide. The Committee acknowledged the potential cost of such monitoring programmes but noted that this was outside the Committee's remit and would sit with the FSA.

1.86 Given the potential impact of climate change on the presence of marine biotoxins in UK waters, it could also prove useful to feed into the climate change impact strategy when considering the effects/impact of global warming on the ecosystem.

1.87 The Committee agreed that there were significant data gaps, especially the occurrence data for the UK therefore making it difficult to conclude on potential risk based on the currently available information.

1.88 However, the COT considered risk ranking the emerging marine biotoxins based on a scoring system, adapting a system that had previously been applied to mycotoxins. This would consist of assigning a numerical score to each emerging toxin for the following categories: toxicity, occurrence in UK waters, human health impact, and monitoring and/or regulation. Toxins exhibiting severe health effects and demonstratable occurrence in UK waters would score high and therefore should be prioritised for monitoring in UK fish and shellfish.

1.89 The Committee have asked the Secretariat to produce a discussion paper providing a risk ranking for each toxin, considering the different weighting of factors that would influence the final score.

1.90 The full 2024 discussion paper can be found at: Advice on the risk to human health from consumption of bivalve molluscs (shellfish) harvested from UK waters associated with marine biotoxins | Committee on Toxicity.

1.91 A final discussion paper/statement is expected for 2025.

Deriving a health-based guidance value for antimony to support development of UK Drinking Water Standards

1.92 The UK Health Security Agency (UKHSA) advises the Drinking Water Inspectorate (DWI) on potential health risks from chemicals in drinking water.

Post EU exit, the DWI is reviewing the regulatory standards for some chemicals in drinking water, including antimony. UKHSA is seeking advice from the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT) with respect to an appropriate health-based guidance value (HBGV) for antimony.

1.93 In 2024, the COT considered an initial discussion paper on the study underpinning evaluations by the World Health Organization (WHO, 2003), the US Agency for Toxic Substances and Disease Registry (ATSDR, 2019) and Health Canada (Health Canada, 2024). The COT will consider further papers in 2025.

Citrinin in the maternal diet

1.94 The Scientific Advisory Committee on Nutrition (SACN) is reviewing the scientific evidence that bears on the Government's dietary recommendations for women of childbearing age. The SACN have requested that the Committee on Toxicity (COT) review the risks of toxicity from chemicals in the maternal diet, including citrinin.

1.95 Citrinin is a mycotoxin produced by several species of fungi of the genera *Aspergillus*, *Penicillium* and *Monascus* and is generally formed after harvest under storage conditions. It occurs mainly in grains but can also occur in other products of plant origin e.g. beans, fruits, fruit and vegetable juices, herbs and spices as well as in spoiled dairy products.

1.96 Citrinin is acutely nephrotoxic in mice and rats, rabbits, pigs and poultry, causing swelling and eventual necrosis of the kidneys. Citrinin also affects liver function but to a lesser extent. Both *in vitro* and *in vivo* studies have provided evidence for reproductive and developmental toxicity of citrinin.

1.97 The potential risk from citrinin in the maternal diet was discussed by the Committee in October 2024. It was concluded that citrinin would not have adverse effects on maternal health at likely levels of exposure. A statement on citrinin will be presented to the COT in 2025.

The potential risks from ergot alkaloids in the maternal diet

1.98 As part of the ongoing programme of work on the maternal diet (see above), the Committee were asked whether exposure to ergot alkaloids (EAs) would pose a risk to maternal health.

1.99 Ergot alkaloids (EA) are secondary metabolites produced by the fungi families *Clavicipitaceae* and *Trichocomaceae*, with Claviceps purpurea being the most widespread Claviceps species in Europe. Based on their occurrence and the available toxicological data the European Food Safety Authority (EFSA) considered six EAs in their risk assessment in 2005, namely: ergotamine, ergocornine, α-ergocryptine, ergosine, ergocristine (peptide ergot alkaloids) and ergometrine (a lysergic acid amide). EFSA further included both forms (-ine and inine) in their assessment, while the -inine forms are considered biologically inactive interconversion occurs under various conditions. Bromocriptine is a synthetic ergoline derivate and is used in the treatment of Parkinson's disease and pituitary tumours.

1.100 Due to their structural similarities to neurotransmitters, EAs have been suggested as agonists or antagonists of noradrenaline, dopamine and serotonin neurotransmitters (and have been reported to produce direct peripheral effects such as uterotonic action or vasoconstriction, indirect peripheral effects such as serotonin antagonism or adrenergic blockade, and central nervous system (CNS) effects such as induction of hypothermia and emesis.

1.101 In 2022 the Committee discussed the potential risk from EAs in the maternal diet and concluded that EAs would not have adverse effects on maternal health at the estimated levels of exposure in the UK.

1.102 A second draft statement was presented to the Committee in February 2024. Following the discussions, the Committee requested for additional paragraphs to be added regarding the effects of ergot alkaloids on the immune system and on the overall exposure.

1.103 The statement is expected to be published in 2025.

Ginger in the maternal diet

1.104 As part of the current programme of work on the maternal diet, the Committee considered the use of herbal dietary supplements during pregnancy. These were supplements that were not officially recommended by the relevant authorities, but which were promoted by anecdotal evidence and unofficial sources as having various purported benefits. Ginger was identified as one of the supplements that should be considered in more detail.

1.105 Ginger (*Zingiber officinale*) is a flowering tropical plant originating in Southeast Asia and grown in warm climates including China, India, Africa and the

Caribbean. The rhizome (underground stem) of the ginger plant is commonly used as a spice and flavouring in many countries around the world and is increasingly growing in popularity as a natural remedy due to its purported immune system-boosting properties and also for motion sickness and post-operative nausea and vomiting.

1.106 The COT have previously reviewed the potential effects of ginger and in particular, the use of ginger supplements during pregnancy and lactation, reviewing the available data on toxicity to the mother, effects on the development of the foetus or embryo, possible interactions with medicines and the possible influence on cyclooxygenase (COX) and prostaglandin activity.

1.107 The final statement on ginger in the maternal diet will be published in 2025.

Discussion paper on the effects of Calcidiol supplementation during pregnancy

1.108 As part of the current programme of work on the maternal diet, the Committee considered the exposure to excess calcidiol would pose a risk to maternal health, as part of this review. This follows the previous review of vitamin D published in 2023.

1.109 Calcidiol is a novel source of vitamin D3 which is formed via chemical synthesis from cholestatrienol. Calcidiol is also known as calcidiol monohydrate, 25- hydroxycholecalciferol monohydrate (25(OH)D3 monohydrate), calcifediol or 25- hydroxyvitamin D (25(OH)D), with the latter two being the forms used in supplementation. Calcidiol is a synthetic form of 25(OH)D, which is an inactive precursor to the biologically active form of vitamin D known as 1,25-dihydroxyvitamin D (1,25 (OH)2D).

1.110 In 2024 the ACNFP established a Tolerable Upper Level (TUL) of 40 µg/day for an application submitted for calcidiol monohydrate. A conversion factor of 2.5 was applied to the EFSA TUL of 100 µg/day for vitamin D to calculate the TUL for calcidiol. However, EFSA determined a safe level of intake of 10 µg/day for the same calcidiol monohydrate product; which may have reflected the request from the applicant.

1.111 Exposures to calcidiol from food sources did not exceed the ANCFP TUL of 40 µg/day or the EFSA safe level of intake of 10 µg/day. Combined exposures

from food and supplements showed intakes were below the ACNFP TUL but exceeded the EFSA safe level of intake up to 2.1-fold.

1.112 The COT were unable to conclude on an appropriate Health Based Guidance Value (HGBV) for risk characterisation and requested the paper return to the COT with more clarification on how EFSA derived a safe level of intake of 10 µg/day.

1.113 A final COT statement is due to be published in 2025.

Assessment of ocean bound plastic (OBP)

1.114 The Food Standards Agency (FSA) and Food Standards Scottland (FSS) are currently undertaking work on the potential use of plastic materials from the open environment in food packaging applications, specifically plastic materials intercepted before entering the marine environment.

1.115 Following the FSA and FSS call for evidence between March and October 2022 and the identification of additional suppliers of these materials between November 2022 and January 2024, the Food Contact Materials Joint Expert Group (FCMJEG) have assessed all information provided to the FSA and FSS up until January 2024.

1.116 The final assessment by the FCMJEG on environmental plastic and ocean bound plastic, and confidential supplementary material from the call for evidence was discussed by the COT and overall, the COT was content with the position statement of the FCMJEG. Publication is expected in early 2025.

Risk assessment of T2 and HT2 mycotoxins in food

1.117 The assessment of T-2 and HT-2 mycotoxins in food was initiated following a proposal by the European Commission in 2020 to establish maximum levels for these mycotoxins, which are lower than the indicative levels set under EU Recommendation 2013/165/EU. The FSA requested the COT evaluate the potential risks these toxins pose to UK consumers. This review aimed to support the FSA’s reassessment of mycotoxin limits and inform potential risk management strategies, particularly as T-2 and HT-2 are known to contaminate cereal grains and products, posing possible health risks through dietary exposure.

1.118 At the July 2024 committee meeting, the discussion centred on a scoping paper that presented an initial exposure assessment based on UK dietary habits and occurrence data from both industry submissions and national surveys. This assessment employed data spanning 2008 to 2023, reflecting the inherent variability in mycotoxin levels due to weather conditions and agricultural practices. However, most data represented unprocessed food commodities, adding uncertainty to the exposure estimates. For example, the lack of consideration of the effect of processing such as dehulling or scouring, would significantly reduce mycotoxin levels thus exposures are likely to be overestimated.

1.119 The approach also relied on consumption data from the National Diet and Nutrition Survey (NDNS), applying high-percentile consumption models across multiple food groups. This methodology assumes an unrealistically high exposure scenario, as it is improbable that a single individual would consistently consume foods at the 97.5th percentile across all categories. These factors, combined with variability in analytical methods over time, resulted in significant uncertainties in the risk assessment.

1.120 During the meeting, the Committee raised questions about the reliability of the data and analytical methods, highlighting the need for validation of industry-supplied occurrence data. The absence of robust data on processed food products and actual consumer consumption patterns further limited the assessment. More targeted surveys and studies, particularly focusing on processed foods, will be crucial for refining exposure estimates. The potential utility of biomonitoring data, such as urinary mycotoxin levels in specific populations, was also noted as a promising avenue for understanding actual exposures.

1.121The review considered health-based guidance values (HBGVs) established by EFSA and JECFA for both acute and chronic exposures. Preliminary findings indicated that while mean exposures were generally below the acute reference dose (ARfD), high-percentile chronic exposures exceeded the tolerable daily intake (TDI) in some population groups. However, these exceedances were uncertain due to the limitations of the exposure model. Consequently, the Committee concluded that it could not definitively characterise the health risks associated with these mycotoxins at this stage.

1.122 The Committee acknowledged the importance of addressing these uncertainties and refining the risk assessment process. Suggestions included improved occurrence data collection, accounting for processing factors, and trend analysis to better understand mycotoxin variability. A refined exposure

assessment and risk characterisation, incorporating these elements, is planned for presentation in 2025. This will enable more informed regulatory decisions and public health guidance concerning the safety of T-2 and HT-2 mycotoxins in the UK food supply.

Application to authorise iron enriched yeast as a permitted form of iron which can be voluntarily added to foods for specific groups, food supplements and general foods (Reserved)

1.123 Following a request from the DHSC under the Nutritional Labelling Standards and Composition Group (NLCS) framework, the COT reviewed an Application from Danstar Ferment AG a subsidiary company of Lallemand Inc. to include iron enriched yeast (Saccharomyces cerevisiae) as an optional permitted form of iron which can be added to fortify foods, food supplements and categories in scope of foods for specific groups (FSG) in Great Britain.

1.124 DHSC received a request from Lallemand Bio-Ingredients in November 2022 for iron enriched yeast to be voluntarily permitted as a source of iron in the following Great Britain legislations: Annex II of assimilated Regulation (EC) No 1925/2006, assimilated Regulation (EU) No 609/2013 and Schedule 1 & 2 of The Nutrition (Amendment etc.) (EU Exit) Regulations 2019.

1.125 This item was reserved as the application contains confidential information and is still under review by the COT.