

Mineral oil hydrocarbons and food

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EU to set maximum levels on mineral oil aromatic hydrocarbons in food in 2024/2025

[Summary Report](#) of the Standing Committee on Plants, Animals, Food and Feed: Section *Novel Food and Toxicological Safety of the Food Chain*, 21 April 2022

Update

The European Commission intends to adopt maximum permitted levels of mineral oil aromatic hydrocarbons (MOAH) in food in the second half of 2024 or the first half of 2025. These maximum levels will be based on the limits of quantification (LOQ) set out in a [joint statement](#) in the Summary Report of 21 April 2022. That joint statement establishes a uniform approach by EU Member States when MOAH are found during official controls of food: “to withdraw and, if necessary, to recall products from the market” when LOQs are exceeded.

What is changing?

EU Member States have agreed that analytical LOQs will be the reference point used during enforcement of official food controls when deciding whether to withdraw or recall products from the market due to excessive levels of MOAH. This was agreed in June 2021 (specifically for formulae for infants and young children), and then in April 2022.

These LOQs are:

- 0.5 mg/kg for dry foods with a low fat/oil content ($\leq 4\%$ fat/oil)
- 1 mg/kg for foods with a higher fat/oil content ($> 4\%$ fat/oil, $\leq 50\%$ fat/oil)
- 2 mg/kg for fats/oils or foods with $> 50\%$ fat/oil.

In 2024, the EU will discuss the establishment of maximum levels (limits in law, rather than indicative levels for action). The starting point for these discussions will be the previously agreed LOQs. Maximum levels for contaminants will be set taking into account the maximum levels that can be met according to the best available practices. This is known as the “ALARA” (as low as reasonably achievable) principle.

Currently no EU limits are in place for mineral oil saturated hydrocarbons (MOSH). There will be no discussions on establishing maximum levels for MOSH in 2024.

Why?

In 2023 the European Food Safety Authority updated its risk assessment on mineral oil hydrocarbons in food ([EFSA 2023](#)). The regulatory focus is mainly on MOAH, which have potential genotoxic and carcinogenic activity.

There is also discussion about MOSH, which bioaccumulate in various organs. EFSA considers that, according to the present knowledge, the current exposure to MOSH does not raise concerns for human health. However, the consequences of long-term accumulation of MOSH have not yet been investigated and remain uncertain.

Timeline

Discussions on MOAH maximum levels will continue in 2024, and the European Commission aims to adopt levels in the second half of 2024 or the first half of 2025. Member States may continue to apply the LOQs in food safety controls.

What are the major implications for exporting countries?

There are numerous potential sources of MOAH, and testing for them is complex. Although controls for mineral oils are already in place in the EU, setting maximum levels is likely to mean buyers will request suppliers to demonstrate compliance with the new levels. In the short term, there may be significant work required in many value chains to identify sources of MOAH and strategies to prevent their presence. This in turn may require an increase in analytical capacity to test for MOAH.

Recommended Actions

Suppliers of food in all sectors should increase monitoring of MOAH to identify any presence of these substances in their products. When MOAH or MOSH are identified in food, suppliers should check all steps of the supply process, identify the sources of contamination, and develop measures to avoid further contamination of their production. Guidance is available on preventing the transfer of undesired MOAH into food ([FoodDrink Europe 2018](#)).

In many non-EU countries, the capacity for analysing MOAH may be limited. The European Commission's Joint Research Centre has published Guidance on sampling, analysis and data reporting for the monitoring of mineral oil hydrocarbons in food and food contact materials ([JRC 2023](#)).

Currently no EU limits are in place for MOSH in food. However, some Member States have established national benchmark levels, and food business operators are recommended to also monitor foods for MOSH and develop measures to prevent contamination.

Background

Mineral oil hydrocarbons

Mineral oil hydrocarbons fall into two main classes:

- mineral oil saturated hydrocarbons (MOSH)
- mineral oil aromatic hydrocarbons (MOAH).

Mineral oil hydrocarbons enter the food chain at various points: through environmental contamination during harvesting; through accidental contact with lubricants during processing; or as a result of migration from food contact materials. Recycled paperboard may contain residues of printing ink solvents that can easily migrate to food.

For more information see the European Commission webpage [Mineral Oil Hydrocarbons](#).

Analysis of MOAH

The analyses for MOAH in food are typically carried out by coupling liquid and gas chromatography with subsequent flame ionisation detection (LC-GC-FID). However, in cases where naturally occurring/ biogenic substances interfere with the analysis, a confirmatory analysis with two-dimensional gas chromatography (GCxGC) is needed to confirm the concentration of MOAH ([JRC 2023](#)).

Resources

EFSA (2023) [Update of the risk assessment of mineral oil hydrocarbons in food](#). EFSA Journal, 21(9): 1–143.

FoodDrink Europe (2018) [Toolbox on reducing the transfer of mineral oils into food](#).

JRC (2023) [Guidance on sampling, analysis and data reporting for the monitoring of mineral oil hydrocarbons in food and food contact materials](#). European Commission, Joint Research Centre.

Sources

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