Mineral oil hydrocarbons in food

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EU to set maximum levels for mineral oil aromatic hydrocarbons in food

Draft Commission Regulation amending Regulation (EU) 2023/915 as regards maximum levels of mineral oil aromatic hydrocarbons in food

Draft Annex [on maximum levels]

Draft Commission Recommendation on the monitoring of mineral oil hydrocarbons in food

Draft Commission Implementing Regulation amending Regulation (EC) No 333/2007 as regards the methods of sampling and analysis for the control of levels of mineral oil hydrocarbons in foodstuffs

Draft Annex [on sampling and analysis]

Update

The European Union (EU) intends to set maximum permitted limits (maximum levels) of mineral oil aromatic hydrocarbons (MOAH) in certain foods. For most foods, the new maximum levels apply from **1 January 2027**, but a later application date will apply for some foods.

The foods affected by the proposal are oilseeds, oil fruits, animal and vegetable fats and oils, tree nuts, pulses, cereal grains and products derived from cereals, milk, dairy products, cocoa beans and cocoa products, confectionary, spices, dried herbs, teas and herbal infusions, compound or processed foods containing these ingredients, foods for infants and young children, food supplements, and food additives.

From 2026 to 2029, the European Commission also recommends the monitoring of MOAH for certain other foods for which no maximum levels are set, and mineral oil saturated hydrocarbons (MOSH) for a wider range of foods. For these products, the Commission will recommend MOAH and MOSH “indicative levels”. If products are found to contain MOAH or MOSH that exceed indicative levels, they will not necessarily be excluded from the EU market (except where levels are very high), but it should lead to investigations by operators into the source of contamination.

The European Commission has updated its Frequently Asked Questions document on the proposed Regulation.

Impacted products

Oilseeds and oil fruits, animal and vegetable fats and oils, tree nuts, pulses, cereal grains (including rice), milk, dairy products, milk, dairy products, cocoa beans, cocoa products, spices, dried herbs, dry tea and herbal infusions (as instant products or used as an ingredient food), compound and processed foods containing these ingredients, food supplements, food additives, foods for infants and young children

What is changing?

Maximum levels

As mineral oil aromatic hydrocarbons (MOAH) are dangerous to humans, the EU is proposing to set maximum permitted levels of these substances in certain foods (see Table 1).

For processed/compound products for which no specific maximum level (ML) is set in Table 1, until **1 January 2030** the ML must be calculated, taking into account:

- changes in the MOAH concentration resulting from drying, diluting, or other processing
- the proportion of the ingredients in the product
- the limit of quantification (LOQ); the ML cannot be below the LOQ.

Further guidance on these calculations can be found in the FAQ document (European Commission 2026), pages 5–8 and Annex.

Commission recommendations for EU Member State monitoring

For certain foods, the European Commission also recommends EU Member States, in collaboration with food operators, to monitor:

- MOAH (in foods for which maximum levels have not been set)
- mineral oil saturated hydrocarbons (MOSH)

This monitoring aims to ensure that consumers are not being increasingly exposed to these substances.

For monitoring purposes, “indicative levels” will be set for MOAH (see Table 2) and MOSH (see Table 3).

If MOAH or MOSH in these foods exceed the recommended indicative levels, these products will not necessarily be excluded from the EU market, but the source of contamination should be investigated. When EU Member States, based on national risk assessment, consider that a particular product is not safe because levels of MOAH or MOSH are very high, that product will

not be permitted onto the market (General Food Law Regulation 178/2002 (Art. 14)).

Sampling and laboratory analysis

To ensure that controls of MOH by competent authorities are carried out consistently, the EU has developed detailed requirements for sampling methods and laboratory analyses (see Draft Annex on sampling and analysis).

Why?

In 2023, the European Food Safety Authority (EFSA) updated its risk assessment on MOH in food with regard to human health (EFSA 2023). Maximum levels are set for MOAH, which EFSA considered to have potential genotoxic and carcinogenic activity.

Mineral oil saturated hydrocarbons (MOSH) bioaccumulate in various organs. EFSA considers that, according to present knowledge, the current exposure to MOSH does not raise concerns for human health (EFSA 2023). However, the consequences of long-term accumulation of MOSH have not yet been investigated and remain uncertain. The EU will adopt recommendations on MOSH in parallel to the MOAH maximum levels.

Maximum levels for contaminants are set considering the maximum levels that can be met when using the best available practices. This is known as the “ALARA” (as low as reasonably achievable) principle. Maximum levels are generally set at the LOQ. However, for certain foods it has been demonstrated that, even if good practices are applied, a maximum level at the LOQ cannot be met. For these products, timetables have been set for lowering the maximum levels (see Table 1).

Timeline

The maximum levels for MOAH were approved on 13 May 2026 by EU Member States; formal adoption is targeted for October 2026.

The new maximum levels will apply from **1 January 2027**, except in the specific cases listed in Table 1 where a later application date applies.

What are the major implications for exporting countries?

The rules today

Currently there are no maximum levels for MOAH and MOSH under EU law. EU Member States apply a common approach to controlling food containing MOAH, which helps them to ensure that food is safe as required by the General Food Law Regulation 178/2002 (Art. 14). This approach is set out in a joint statement in the Summary Report of 21 April 2022: when MOAH are found during official controls of food, Member States should "withdraw and, if necessary, [...] recall products from the market" when the limit of quantification (LOQ) is exceeded.

These LOQs are:

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

While not set in EU law, this agreed approach helps EU Member States to ensure that food is safe, as required by the General Food Law Regulation 178/2002 (Art. 14).

Impacts of maximum limits on trading partners

The current agreed approach among EU Member States of removing foods "where necessary" has not always been applied consistently across the EU, creating ambiguity and uncertainty for food operators.

Maximum levels will provide greater clarity. For certain products, these levels are higher than the LOQs currently used for enforcement. Operators should expect a more consistent approach to enforcement by EU control bodies: foods exceeding MOAH maximum levels will not be permitted to enter the EU market. Operators should also anticipate that due to increased controls of MOAH by competent authorities, European buyers may require suppliers to provide evidence that foods exported to the EU comply with the new maximum levels.

Preparing for compliance with new maximum limits

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

Food suppliers in all sectors should increase monitoring of MOAH and MOSH 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 products. 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 Union Reference Laboratory for Processing Contaminants (EURL-PC) has compiled an indicative list of laboratories that are able to analyse food for content of total MOAH in accordance with the required LOQs. The list is available on request by sending an email to eurl-pc@food.dtu.dk with "GET MOAH LAB LIST" in the subject field.

The European Commission's Joint Research Centre (JRC) has published Guidance on sampling, analysis, and data reporting for monitoring MOH in food and food contact materials (Bratinova et al. 2023).

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 (MOH).

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 (Bratinova et al. 2023).

The European Commission has updated its FAQs on the draft regulatory measures on MOH in food (European Commission 2026).

Resources

Bratinova, S., Hoekstra, E. and Robouch, P. (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.

EFSA (2023) Update of the risk assessment of mineral oil hydrocarbons in food. EFSA Journal, 21(9): e08215.

European Commission (2022) Standing Committee on Plants, Animals, Food and Feed: Section Novel Food and Toxicological Safety of the Food Chain, 21 April 2022. Summary Report.

European Commission (2026) FAQ document on the regulatory measures on mineral oil hydrocarbons (MOHs) in food-Rev.3.

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

Sources

Draft Commission Regulation amending Regulation (EU) 2023/915 as regards maximum levels of mineral oil aromatic hydrocarbons in food [PLAN/2023/2345]

Draft Annex on maximum levels [PLAN/2023/2345]

Draft Commission Recommendation on the monitoring of mineral oil hydrocarbons in food [PLAN/2023/2727]

Draft Commission Implementing Regulation amending Regulation (EC) No 333/2007 as regards the methods of sampling and analysis for the control of levels of mineral oil hydrocarbons in foodstuffs [PLAN/2023/2726]

Draft Annex on sampling and analysis [PLAN/2023/2726]

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Table & Figures

Table 1
Proposed maximum levels for mineral oil aromatic hydrocarbons[1,2]

Product	Maximum levels (MLs) (mg/kg)	Notes
Oilseeds and oil fruits	2.0	
Animal and vegetable fats and oils	This category does not include essential oils, lampante and crude olive pomace oil	
Maize, rapeseed, sunflower, soyabean, linseed oils; dairy butter and fat	2.0	For products placed on the market for the final consumer or used an ingredient in food
	2.0 from 1 Jan 2030	Where these are sold for further refining and labelled as such
Groundnut, sesame, coconut, cereal germ oils	6.0 from 1 Jan 2027 4.0 from 1 Jan 2028 2.0 from 1 Jan 2030	For products placed on the market for the final consumer or used an ingredient in food
	2.0 from 1 Jan 2030	Where these are sold for further refining and labelled as such
Grape seed, cotton seed, blackcurrant seed, argan oils	10.0 from 1 Jan 2027 5.0 from 1 Jan 2028 2.0 from 1 Jan 2030	For products placed on the market for the final consumer or used an ingredient in food
	2.0 from 1 Jan 2030	Where these are sold for further refining and labelled as such
Olive pomace oil; refined olive pomace oil	10.0 from 1 Mar 2028 5.0 from 1 Mar 2029 2.0 from 1 Jan 2030	
Fish oils; oils from other marine organisms and algae	10.0 from 1 Jan 2027 5.0 from 1 Jan 2030	For products placed on the market for the final consumer or used an ingredient in food
	2.0 from 1 Jan 2030	Where these are sold for further refining and labelled as such
Other oils and fats	4.0 from 1 Mar 2027 2.0 from 1 Jan 2028	For products placed on the market for the final consumer or used an ingredient in food (includes cocoa butter)
	2.0 from 1 Jan 2030	Where these are sold for further refining and labelled as such
Products derived from maize, rapeseed, sunflower, soyabean, and linseed oils; and dairy butter and fat or “other oils and fats” containing >50% fat/oil content (and only containing these fats and oils)	2.0 from 1 Jan 2028	Products “derived from fats and oils” are defined as products containing >80% of fats and oils
Tree nuts	2.0	
Pulses	0.50	
Cereal grains	0.50	

Continued…

Table 1
Continued

Product		Maximum levels (MLs) (mg/kg)	Notes
Products (except oils, see MLs above) containing >80% cereals with fat/oil content:[3,4]			
<4%		0.50	
≥4% and ≤50%		1.0	
Milk		0.50	
Dairy products with fat/oil content:[3]			
<4%		0.50	
≥4% and ≤50%		1.0	
>50%		2.0	
Cocoa beans		2.0 from 1 Jan 2030	
Cocoa mass		2.0	
Cocoa powder and fat-reduced cocoa powder		1.0	
Spices, dried herbs, dry tea and dry herbal infusions that are used as an ingredient in food, dry instant tea, and dry instant herbal infusions		10.0 from 1 Jan 2027 5.0 from 1 Jan 2030	
Foods for infants and young children[5] with fat/oil content:[3]			
<4%		0.50	
≥4% and ≤50%		1.0	
>50%		2.0	
Food supplements		10.0 from 1 Jan 2027 5.0 from 1 Jan 2030	
Food additives		Where food additives are produced from oils or fats, the raw material must comply with the MLs for oils and fats "placed on the market to the final consumer or used as an ingredient in food". Other raw materials from which food additives are derived must comply with the MLs in this Regulation. The ML for the food additive can be calculated, taking into account a processing factor.[6]	
Processed and compound foods[7] containing ingredients for which there are MLs in this Regulation			
From 1 Jan 2027 to 31 Dec 2029		If no specific ML established, ML must be calculated in accordance with Regulation 2023/195, Art. 3 (see "What is changing")	
From 1 Jan 2030, where whole product has fat/oil content:[3]	<4%	0.50	For tea and herbal infusions, these MLs apply only to instant tea, instant herbal infusions, and tea and herbal infusions that are used as an ingredient in food
	≥4% and ≤50%	1.0	
	>50%	2.0	
Compound foods containing ≥15% spices, and/or dried herbs, and/or dry tea			
From 1 Jan 2030, where content of these ingredients is:	≥75%	5.0	
	≥50% and <75%	3.5	
	≥15% and <50%	2.0	

1. Mineral oil aromatic hydrocarbons (≥C10 to ≤C50).
2. To be added to Annex of Regulation 2023/915.
3. "Fat/oil content": declared fat/oil content or, if not present, content determined by the competent authority.
4. ML does not apply to cereals used for the production of beer or distillates, provided the remaining cereal residue is not placed on the market as food.
5. Includes infant formulas, follow-on formulas, young-child formulas, food for special medical purposes intended for infants and young children, baby food, processed cereal-based food for infants and young children, and drinks for infants and young children.
6. The processing factor reflects changes in concentration of mineral oil aromatic hydrocarbons (MOAH) resulting from drying, diluting, or other processing.
7. This does not include the categories foods for infants and young children, food supplements, or food additives.

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Source: Draft Annex [on maximum levels]

Table 2 Indicative maximum levels for mineral oil aromatic hydrocarbons[1]		
Products	Indicative levels (mg/kg)	Notes
Coffee beans, instant coffee (dried products), cereal grains used to produce beer or distillates	1.0	Residue from cereals in beer production must not be placed on the market as food for final consumers
Processed vegetables, processed fruits, processed meat and offal, processed fish and other seafood, processed eggs, animal- and vegetable-based fats and oils sold for further refining (and labelled as such)	2.0	
Tea and herbal infusions (dried product)	5.0	Not including instant tea/herbal infusions, or when used as an ingredient in food for which maximum levels are set
Essential oils	10	
1. Mineral oil aromatic hydrocarbons (MOAH) ≥C10 to ≤C50.		

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Source: Draft Commission Recommendation on the monitoring of mineral oil hydrocarbons in food

Table 3 Indicative maximum levels for mineral oil saturated hydrocarbons	
Product	Indicative levels (mg/kg)
Olive pomace oil, grapeseed oil, blackcurrant seed oil, cottonseed oil, cereal germ oil, safflower oil, essential oils, fish oils and oils from other marine organisms and algae, and products derived from these[1]	50
Linseed oil, maize oil, rapeseed oil, sunflower oil, soybean oil, cocoa butter, spices, dried herbs, tea (dried products), herbal infusions (dried products), food supplements, products derived from these[1]	15
Other animal and vegetable fats and oils, and products derived from these[1]	30
Cocoa beans, cocoa and chocolate products other than cocoa butter, confectionary other than cocoa and chocolate products, processed meat and offal, processed fish and other seafood and processed eggs	10
Oilseeds, oil fruits, tree nuts, pulses, cereal grains, cereal based foods[2], milk, dairy, coffee beans, eggs, dry infant and dry follow-on formulae, cereal based foods for infants and young children and baby food, processed vegetables, processed fruits	5.0
Liquid infant and follow-on formulae, drinks for infants and young children placed on the market and labelled as such	1.0
1. Products derived from fats and oils are defined as products containing more than 80% of fats and oils. 2. Products derived from cereals are defined as products containing more than 80% of cereal products, excluding cereal germ oils. AGRINFO www.agrinfo.eu	

Source: Draft Commission Recommendation on the monitoring of mineral oil hydrocarbons in food