

FAQ Mineral Oil in various food products

How reliable are the laboratory results and how has foodwatch tested these products?

In order to ensure that product testing has the highest possible accuracy, repeatability and reliability, foodwatch has commissioned two laboratories to carry out the testing.

The analytical method chosen by foodwatch has been classified as the method of choice by the European Commission in its *"Guidance on sampling, analysis and data reporting for the monitoring of mineral oil hydrocarbons in food and food contact materials"* published in February 2019:

*"The combination of LC, which separates MOSH from MOAH, and GC-FID for quantification allows for an appropriate determination of the MOSH and MOAH content. In the GC-FID chromatograms of the MOSH and MOAH fractions, further fractions can be defined based on the retention time of the corresponding n-alkanes under the same chromatographic conditions. It has been decided in agreement with EFSA to collect data for mineral oils up to n-C50 atoms in their molecules in order to reflect the composition of some lubricant oil with heavier oil fractions."*¹

The products in which the MOAH mineral oil constituents, suspected of being carcinogenic, were found, have been tested independently by two different laboratories. For this purpose, these products were tested for so-called 'markers', i.e. reference substances from mineral oil sources, using special, technically complex detection methods.

According to good laboratory practice and analysis technology, a higher degree of assurance of the results can hardly be achieved.

¹ See chapter 4.3 on pages 11ff : <https://publications.europa.eu/en/publication-detail/-/publication/85bdda9a-3656-11e9-8d04-01aa75ed71a1/language-en> (last visit: 03.12.2021)

How dangerous are Mineral Oils in food?

Mineral oils are found in many areas of the human environment. They have already been found - including through tests commissioned by foodwatch - in numerous foods such as rice, pasta, chocolate and edible oils, but can also be found in packaging, children's toys, animal feed and cosmetics².

According to the European Food Safety Authority (EFSA) and the German Federal Institute for Risk Assessment (BfR), different groups of mineral oils - MOSH and MOAH - have different toxicological potential.³

Given the genotoxic and mutagenic nature demonstrated for certain MOAHs, the French Food Safety Authority (ANSES)⁴ believes that priority should be given to reducing the contamination of food by these compounds. ANSES recommends limiting consumer exposure to MOHs, and to MOAHs in particular, by acting initially on the main sources of mineral oils in paper and cardboard packaging. ANSES recommends the use of barriers to limit the migration of MOHs from packaging into foods.

The intake of **MOAH** should generally be avoided as "a possible carcinogenic potential [...] cannot be excluded"⁵. In addition, since no toxicological data are available for evaluation so far, no tolerable intake has been derived to date. A final risk assessment by the European Food Safety Authority (EFSA) is still pending.

MOSH can be easily absorbed by the body and accumulate in fatty tissue. In experiments with rats, these caused damage in certain organs. Depending on the number of carbon atoms (chain length) and toughness (viscosity), MOSH can be enriched in organs of the human body, some

² EFSA Panel on Contaminants in the Food Chain (CONTAM); Scientific Opinion on Mineral Oil Hydrocarbons in Food. EFSA Journal 2012;10(6):2704.

³ Bundesinstitut für Risikobewertung (BfR); Fragen und Antworten zu Mineralölbestandteilen in Lebensmitteln - Aktualisierte FAQ des BfR vom 12. Dezember 2017.

https://www.bfr.bund.de/de/fragen_und_antworten_zu_mineraloelbestandteilen_in_lebensmitteln-132213.html (last visit: 03.12.2021)

⁴ Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail (ANSES), see: <https://www.anses.fr/en/content/anses-issues-recommandations-reduce-foodstuff-contamination-mineral-oils> (last visit: 03.12.2021)

⁵ Bundesinstitut für Risikobewertung (BfR); Fragen und Antworten zu Mineralölbestandteilen in Lebensmitteln - Aktualisierte FAQ des BfR vom 12. Dezember 2017.

https://www.bfr.bund.de/de/fragen_und_antworten_zu_mineraloelbestandteilen_in_lebensmitteln-132213.html (last visit: 03.12.2021)

fractions are considered by EFSA to be of concern. However, only MOSH with a chain length greater than 16 carbon atoms (C16) are enriched in the body.⁶

In January 2017, the European Commission decided to monitor "mineral oil hydrocarbons in foodstuffs and materials and articles intended to come into contact with foodstuffs". The resulting data are still not available and are now expected for 2022. EFSA will make use of these for evaluation.⁷

In July 2019 a study by the Dutch National Institute for Public Health and the Environment (RIVM) was published which evaluates new toxicological data and links them to consumption data. The RIVM does not consider the dietary exposure of the Dutch population to MOSH to be a health concern. But the exposure to MOAH is seen problematic by the RIVM, because among them are substances with carcinogenic effects. However, not all mineral oils containing MOAH are considered to be carcinogenic. Therefore, a distinction must be made concerning the origins of MOAH. Those containing potentially carcinogenic MOAH compounds should be minimised, for example crude oils and heated oils.⁸

In June 2018, in Germany the "Consumer Protection Consortium of the Federal States (LAV)" and the German "Food Industry Association" ("Lebensmittelverband" formerly BLL) launched a joint project to derive so-called „Benchmark levels for mineral oil hydrocarbons (MOH) in foods."⁹

- Based on a comprehensive data collection, the first list of benchmark levels for three food categories was published in March 2019. This was updated twice (June 2020 and August 2021) and supplemented by other additional product categories.
- As of now (the values apply to eight product groups on the market and represent the state of good manufacturing and packaging practice. But "(d)ue to insufficient data"

⁶ EFSA Panel on Contaminants in the Food Chain (CONTAM); Scientific Opinion on Mineral Oil Hydrocarbons in Food. EFSA Journal 2012;10(6):2704.

⁷ COMMISSION RECOMMENDATION (EU) 2017/84 of 16 January 2017 on the monitoring of mineral oil hydrocarbons in food and in materials and articles intended to come into contact with food: <https://eur-lex.europa.eu/legal-content/ENG/TXT/PDF/?uri=CELEX:32017H0084&from=DA> (last visit: 03.12.2021)

⁸ D. Buijtenhuijs, B.M: van den Ven, National Institute for Public Health and the Environment; Mineral oils in food; a review of occurrence and sources; RIVM Letter report 2019-0048; DOI 10.21945/RIVM-2019-0048

⁹ Benchmark levels for mineral oil hydrocarbons (MOH) in food: Consumer Protection Consortium of the Federal States, (LAV); German Federation for Food Law and Food Science,(BLL) Date: August 2021, available in English at:

<https://www.lebensmittelverband.de/de/aktuell/20190502-veroeffentlichung-moh-orientierungswerte> (last visit 03.12.2021)

oils/fats obtained from tropical plants (e.g. coconut oil) have up to now not been included in that list.¹⁰

- **For MOAH, the analytically achievable limit of quantification (LOQmax) is applicable for each of the product categories listed there according to the JRC technical guidance.**
- **For MOAH, in Germany food control authorities and food industry have agreed that the analytically achievable limit of quantification (LOQmax according to the JRC technical guidance) is applicable for each of the eight product categories listed.**¹¹
- For MOSH there are differentiated benchmark levels which vary in a range from 4 mg/kg (for example for nuts, oilseeds, coconut, peanuts and dried fruit) up to 22 mg/kg (milk and milk products).¹²

How does the mineral oil get into food products?

There are sources of possible contamination in the entire production chain of food products, i.e. from the harvesting of the raw materials to the mechanical processing of the products in the manufacturing process and through to contamination from the packaging used, different and also multiple input sources are conceivable.

The use of various raw materials can also result in multiple inputs into the food product.

For example, the use of contaminated raw materials such as palm and coconut oils/fats can lead to inputs of mineral oil in the final product.

Which batches are affected?

See column "Batch number" in the tables of the Project report.

¹⁰ See FN 9, p. 4.

¹¹ See FN 9, p 4.

¹² See FN 9, p 4

What about the other batches?

For the majority of the products tested positively for MOAH (> 0.5 mg/kg), a second different batch was also tested. In most of the products of the second batch tested, the content of MOAH was confirmed. However, it also showed that in the products of Nutella (Germany), the first batch had a MOAH content of 2.3mg/kg and in the second batch no MOAH content could clearly be identified in the range of < 1.0 mg/kg. Similarly in Lindt Lindor Milch (Austria) one batch was contaminated with 3.3 mg/kg and another batch with 0.98 mg/kg.

foodwatch demands

foodwatch calls on all manufacturers / private brand retailers, to:

1. immediately initiate public product warnings in all Member States where their MOAH-contaminated products are sold and immediately withdraw the products from sale;
2. prevent any contamination with MOAH mineral oil components suspected of being carcinogenic as well as to publicly commit to selling only food products that do not contain detectable MOAH.

foodwatch calls on all relevant authorities at national and EU level, to:

1. clarify by law that the analytical detection of MOAH in accordance with the relevant JRC guideline will result in the product not being marketable in the sense of Article 14 of the General Food Law (178/2002).
2. establish immediately corresponding requirements for MOAH in the EU contaminants legislation for all food categories and not to allow any exceptions.
3. lay down immediately requirements for MOSH in the EU contaminants legislation for all food categories which, in accordance with the ALARA principle, only allow deviations from a regular maximum level of 2 mg MOSH / kg food if there is a scientifically justified need for this. The exceptions are to be defined as narrowly as possible with regard to both the food categories and the exception for exceeding 2 mg MOSH/kg food.

Are other food products free of contamination?

foodwatch cannot answer this question with certainty for all products on the market, because we only have laboratory data available for the products we have tested. However, our findings, indicate that mineral oil contamination is still an issue in certain food products.

Isn't mineral oil forbidden in food?

No, not yet.

The scientific discussion about the level of danger of certain mineral oil fractions has been going on intensively for several years. So far, however, there is not even a limit value for exposure to mineral oils.

Mineral oils are found in many areas of the human environment. They have already been found - including through tests commissioned by foodwatch - in numerous foods such as rice, pasta, chocolate and edible oils, but can also be found in packaging, children's toys, animal feed and cosmetics.

MOAH:

There is agreement that aromatic mineral oil compounds (so-called MOAH) can cause cancer if the molecules consist of more than two ring systems. Therefore, such MOAH are undesirable and should not be present in foodstuffs according to the competent authorities (EFSA, ANSES, BfR, RIVM). In France, given the genotoxic and mutagenic nature demonstrated for certain MOAHs, ANSES believes that priority should be given to reducing the contamination of food by these compounds.¹³

There is ongoing discussion as to whether there are toxicological differences between 1-to-2 ring systems and the more-than-3 ring systems of MOAH. However, there are no analytical methods from either the manufacturer or the scientific side that allow differentiation according to the ring systems in food. According to EFSA, in the absence of any additional information on the presence of 3-7 Polycyclic Aromatic Compounds (PAC), the detection of MOAH in food should be

¹³ <https://www.anses.fr/en/content/anses-issues-recommendations-reduce-foodstuff-contamination-mineral-oils> (last visit: 03.12.2021)

considered of potential concern for human health. In addition, due to the lack of a full toxicological characterisation of MOAH-containing substances, even if there was enough information to exclude the presence of 3-7 PAC in food, the characterisation of possible non-neoplastic hazards would not be feasible.¹⁴

Therefore, any detection of MOAH in food is currently questionable from foodwatch's point of view in terms of consumer health protection. The sale of such products is unacceptable.

For six years now, foodwatch has been calling on European legislators and national governments to legally set maximum levels for the detection of mineral oils in foodstuffs. For aromatic mineral oils suspected of causing cancer, we demand setting the maximum value as the slightest detection of MOAH. .

In other words:

Any trace of the existence of MOAH identified in food should mean that the product is not marketable and therefore must not be sold. It must be the responsibility of every manufacturer and retailer to ensure and to be able to prove at any time that there are NO carcinogenic MOAH detectable in the food products.

MOSH:

In the case of aliphatic mineral oils (MOSH), foodwatch demands - also in accordance with the scientific discussion - the setting of strict maximum values and continuous minimisation. The maximum value of 2 milligrams MOSH per kilogram of food should only be exceeded in precisely defined exceptional cases for certain food categories (e.g. vegetable oils and fats, dairy) with corresponding proof from the manufacturer.

The European Commission started an EU-wide monitoring programme in January 2017, but no results have been published on this programme to date. The aim is to generate a broad database in order to derive maximum values. The monitoring programme has been started late and, contrary to what the European Commission originally intended, has still not been completed by December 2021.

¹⁴ 11 APPROVED: 15 November 2019 doi:10.2903/sp.efsa.2019.EN-1741www.efsa.europa.eu/publicationsEFSA Supporting publication 2019:EN-1741 Rapid risk assessment on the possible risk for public health due to the contamination of infant formula and follow-on formula by mineral oil aromatic hydrocarbons(MOAH) European Food Safety Authority (EFSA), Davide Arcella, Katleen Baert, Marco Binaglia <https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/sp.efsa.2019.EN-1741> (last visit: 03.12.2021)

Has the problem been known for some time?

The problem of contamination of food with mineral oil components has been known for many years. Most recently, the focus was on analysing and preventing the migration of mineral oil components from recycled cardboard packaging into food. In addition, various ways of introducing mineral oils into the food chain during harvesting, raw material transport and production processes were investigated. In the case of vegetable foods, progress has been made in various areas. There is little or no data available on food of animal origin. This also applies to the replacement milks for babies examined by foodwatch in 2019.

Nevertheless, foodwatch assumes that the manufacturers are particularly aware of the problem of mineral oil contamination of their products.

In addition, foodwatch will continue to campaign for companies' commitment and a European Regulation that ensures that ALL food products have:

- **no detectable (carcinogenic) MOAH**
- **a maximum of 2mg/kg of MOSH** (with exceptions only if scientifically justified)

Several major retailers have already made such a commitment following the first test results published by foodwatch in 2015. However, we are still waiting for similar commitments from the rest of the retailers and the food companies such as Unilever or Lindt. Commitments on a voluntary basis are insufficient.

foodwatch urgently asks for legislation at the European level in order to protect all European consumers.

There is no reason to wait any longer. This is a matter of public health.