# Discussion paper as regards maximum levels for MOAH in food

(this document is linked to SANTE PLAN 2023/2345).

## Commodities for which MLs should be established

It could be considered to establish MLs for the commodity groups, which are the main contributors to the exposure.

* + Main contributors to the exposure
    - Animal and vegetables fats and products based thereof
    - Tea and herbal infusions
    - Coffee and coffee based products
    - Sugar and confectionary
    - Food for infants and young children
    - Grains and grain based products
    - Legumes, nuts and oilseeds (vegetarians)
    - Cocoa and cocoa based products
  + Products, which can contain very high concentrations of MOAH
    - Food supplements
    - Spices and dried herbs
  + Commodities, which contribute to the exposure, but to a lesser extent (Table 15 of the EFSA opinion)
    - Composite dishes
    - Milk and dairy products
    - Processed fish products
    - Processed meat and offal products
  + Raw ingredients for the production of edible oils and fats: oilseeds and oil fruits
    - The EU FBO’s are experiencing difficulties to convince third country producers to apply mitigation measures and to deliver raw materials, which allow to produce edible oils and fats, which comply with the EU limits. Certain EU FBOs believe that MLs for oilseeds and oil fruits will be helpful to ensure the application of mitigation measures by third country FBO, as well as the delivery of raw materials, with concentrations of MOAH below the LOQ.

The statement of the SC PAFF of 21 April 2022 applied to all foods. MOAH is a processing contaminants that can occur in high concentrations in all foods. When setting only MLs for specific food categories, it will be more difficult to enforce high MOAH levels in the other food categories. It could also be considered to set MLs for all foods other than fresh or frozen fruits, vegetables, meat, offal, fish and seafood. This way only unprocessed products, in which hardly any MOAH is found, are exempted from the MLs. When following this approach, also food additives might need to be exempted, as the DG SANTE team on food additives is planning dedicated measures for MOAH in food additives.

## General approach for establishing MLs

It is proposed to establish the MLs at the same levels as the LOQ limits from the statement of the SC PAFF of 21 April 2022, with an exception for higher MLs for certain specific foods, in case it can be demonstrated that, by following good practices, concentrations of MOAH below the LOQ cannot be achieved.

### Vegetable and animal oils and fats

When looking at the cleaned EFSA data set from the EFSA 2023 opinion, it appears that the P90 for most oils and fats is below the limit LOQ of 2 mg/kg. From this it can be concluded that, when using good practices, an ML of 2.0 mg/kg is reasonably achievable. However for a few oils there are compliance issues with the limit of 2 mg/kg:

* **Olive pomace oil**. Because olives don’t contain MOAH and extra virgin and other olive oils can comply with the LOQ limit of 2 mg/kg, it is clear that the source of the MOAH in olive pomace oil should be identified in the production process, in order to allow the application of mitigation measures. As long as the FBOs don’t come up with clear information on the source of MOAH in olive pomace oils and on mitigation measures, it is not possible to establish an ML other than the LOQ in accordance with the ALARA principle, when using good practices. Therefore it is proposed to consult stakeholders on an ML of 2.0 mg/kg and let them explain which mitigation measures should be implemented to achieve the absence of quantifiable concentrations of MOAH in these oils.
* **Coconut oil**. The limited data available for coconuts, show no high MOAH concentrations, so also for coconuts it is up to FBOs to explain how the MOAH ends up in the coconut oil and to propose mitigation measures. Therefore it is proposed to consult stakeholders on an ML of 2.0 mg/kg.
* **Palm oil** the P90 of the data set of the opinion, as well as the P95 of the most recent data of confirms the achievability of an ML of 2.0 mg/kg.
* For **sesame oil** only limited data are available. According to the 2022-2023 data, an ML of 2.0 mg/kg should be achievable. If not, this should be indicated by FBOs and should be supported by data and information on the source of the MOAH. For sesame seeds only one sample is available, which doesn’t contain quantified concentrations of MOAH.
* For **walnut oil** only limited data are available. Some samples point to possible non-compliance issues with an ML of 2.0 mg/kg. However it is not clear whether this is a result of bad practices. Therefore it is proposed to consult stakeholders on an ML of 2.0 mg/kg.

For walnuts the P95(10) is 2.95 mg/kg

* **Butter**: In the cleaned EFSA data set the concentrations of MOAH in butter were below the LOQ. In the 2022-2023 non-cleaned data set suddenly the P95 is 8 mg/kg. The recent samples originate are all from one Member State. 3 on 51 samples show very high concentrations of MOAH (8, 10 and 14 mg/kg) and these samples drive the P95. However 47/51 of these samples comply with an ML of 2.0 mg/kg and the P90 of 2.3 mg/kg confirms the achievability of an ML of 2.0 mg/kg for butter. Therefore an ML of 2.0 mg/kg is proposed for butter.
* **Marine oils:** Comments were submitted as regards the analytical achievability of an ML of 2.0 mg/kg for marine oils due to interferences. The EURL-PC is looking into the matter.

### Coffee-cocoa drinks-tea-juices

For **cocoa powder and powdered cocoa beverage preparations** the data show that an ML at the LOQ should be achievable. Most samples show concentrations below the LOQ, however a few samples with high MOAH concentrations (up to 100 mg/kg) confirm the necessity of setting an ML for these products.

Limited data are available for **coffee**, however literature data show that coffee beans can get contaminated in the same way as cocoa beans. It is proposed to consult stakeholders as regards an ML at the LOQ.

For **tea and herbal infusions** most samples show concentrations below the LOQ. However some specific samples with high concentrations show that an ML for tea and herbal infusions would be appropriate. It is proposed to set the ML at the LOQ. In case of specific compliance issues for certain tea or herbal infusions species, stakeholders should comment and provide data.

### Composite products and seasonings

* This category contains mostly oil and cereal containing products (crisps, sauces, prepared dishes and snacks) dishes. 1 sample of crisps contains 2.5 mg/kg, 2 samples of stock cubes contain concentrations of 4.2 and 8.1 mg/kg and all other samples contain < 2 mg/kg of MOAH. This category would be covered to a large extent by an ML for products containing fats or cereals.

### Dietary foods-food imitates and food supplements

* In most samples of **dietary foods and meat and dairy imitates** the concentrations of MOAH are low or below the LOQ. However one sample of vegetarian sausages with a concentration of 6.4 mg/kg of MOAH, shows that MOAH contamination can also occur in this food category. Most products from the categories dietary foods and meat and dairy imitates would be covered by the ML for foods containing fats or cereals.
* High concentrations of MOAH are present in certain **food supplements** and seaweed based products, such as micro-algae. Therefore also for food supplements an ML at the LOQ is proposed.

### Eggs and egg products

* No quantified concentrations of MOAH are found in **fresh eggs**, so no ML is proposed for fresh eggs. **Egg products** would be covered by the MLs for products containing fat or cereals, in case they contain such ingredients.

### Fish and seafood

* **Fresh fish and other seafood**: no quantified concentrations of MOAH are found, so no ML is proposed for fresh fish and other seafood.
* **Processed fish and other seafood** (marinated, coated with bread crumbs, canned and smoked) contains in certain cases MOAH. This is mainly the case for canned fish and also for one sample of smoked fish. This could be due to the addition of oil during the canning process. An ML for processed fish products could be considered.

### Food for infants and young children

* The P95 of the occurrence data is for a 0.000 for liquid formulae and cereal based food for infants and young children. For baby food the P95 is 0.3 mg/kg and for dry formulae 1.0 mg/kg. This shows that the previous LOQ limits are achievable and can be officialised as MLs.

### Grains and grain based products

**Cereal grains**

The vast majority (80-85%) of the grains samples would comply with an ML of 0.5 mg/kg. However some rice samples with very high concentrations are reported: some with concentrations around 10 mg/kg and even one with a concentration of 118 mg/kg. The samples, which were taken after the statement of April 2022, all comply with the LOQ limit of 0.5 mg/kg. Therefore an ML of 0.5 mg/kg would be achievable and appropriate.

**Cereal flour**

The P85 of the occurrence data for cereal flour is below 0.5 mg/kg and all data collected after the statement are non-quantified samples. This shows that an ML of 0.50 mg/kg is achievable for cereal flours.

**Cereal based products**

In most samples of cereal based products no quantified concentrations of MOAH are present. 85% of the samples would comply with the LOQ limits from the statement. This shows that when using good practices, the concentrations of MOAH in bread, rusks, crackers, pasta, breakfast cereals and fine bakery wares can be kept below the LOQ. However some samples of breakfast cereals, fine bakery and pasta show high concentrations of MOAH. Several samples of fine bakery wares show concentrations above 100 mg/kg. This clearly proves the necessity of setting an ML for all cereal based and cereal containing products at the LOQ.

### Pulses, nuts and oilseeds

* For **pulses** the data show that compliance with an ML of 0.5 mg/kg is feasible. A limited number of samples with quantified concentrations for pulses and flour from pulses shows that an ML would be appropriate.
* For **oilseeds** limited data are available, which indicate that compliance with an ML of 2.0 mg/kg is achievable. Mitigation measures similar to those for cereals can be applied. Most samples show non-quantified concentrations of MOAH. However the few samples with quantified concentrations show that, when using bad practices, MOAH can contaminate oilseeds. Therefore an ML would be justified for this category. Certain FBOs requested the establishment of MLs for the raw oilseeds because third country producers are reluctant to apply mitigation measures and to deliver raw products, which allow to produce edible oils and fats, which contain no quantifiable concentrations of MOAH. An ML would be helpful as a strong limit value for MOAH for the import of raw materials for further processing by the EU oil producing sector.
* For **oil fruits** no EFSA data are available. Normally agricultural crops don’t contain quantifiable concentrations of MOAH. In the further supply chain mitigation measures similar to those cereals and oilseeds can be applied to avoid quantifiable concentrations of MOAH. Certain FBOs requested the establishment of MLs for certain oil fruits, such as coconuts for the same reasons as their request for oil fruits.
* For **tree nuts** most samples show non-quantified concentrations of MOAH. An ML of 1 or 2 mg/kg, depending the fat content, is achievable. Samples with concentration between 0.2 and 3 mg/kg show that MOAH can be present in tree nut, so an ML seems justified.

### Meat and meat products

* All samples of meat, offal and processed meat products show concentrations of MOAH below the LOQ. In principle MOAH can end up in meat products during processing or due to the addition of oil. Therefore it is in principle possible that MOAH contaminates meat. However according to the current data there seem to be no major issues for MOAH in meat or meat products. We should discuss whether you consider an ML for products based on or containing meat or offal of terrestrial animals is necessary.

### Milk and dairy products

* The concentrations of MOAH in milk and dairy products are low in general. MOAH has been quantified in a few samples of milk powder, cheese, ice cream and pudding in concentrations up to 2.6 mg/kg. These low occurrence data result in a quite low contribution of dairy products to the overall exposure. However the occurrence of MOAH in certain processed dairy products shows that MOAH contamination can occur in these products. We should discuss whether an ML for MOAH should be set in these products. If yes, it is clear that the LOQ limits from the statement are achievable.

### Sugar and confectionary

* In chocolate, chocolate based products, cocoa powder and confectionary not containing chocolate in most samples the concentrations are low or not quantified. However for each of these categories some samples with high to very high concentrations are recorded, which indicates structural contamination issues and the use of bad practices in certain processes. These samples lead to the EFSA conclusion that the category chocolate and confectionary is a relevant contributor to the exposure. Therefore MLs for this category are appropriate. According to the data MLs at the LOQ (1 or 2 mg/kg depending the fat content) should be feasible for cocoa beans, cocoa based products, cocoa containing products and for sugar containing products and confectionary.
* According to the limited data, an ML for sugar and honey doesn’t seem necessary at this stage.

### Vegetables and fruits

* Vegetables and fruits were not considered by EFSA to be relevant contributors to the exposure. The limited data for fresh fruits and vegetables don’t show quantified concentrations of MOAH. In certain processed fruit and vegetable products low concentrations of MOAH are found. It could be discussed whether a an ML would be needed for processed fruit and vegetable products.

### Spices and dried herbs

* Limited data are available for MOAH in **spices,** however certain samples of paprika powder and anise seeds show that also in this commodity group high concentrations of MOAH can be present. Therefore MLs at the LOQ could be useful to limit MOAH exposure from this group and to ensure the use of good practices for the production of these products.
* For **dried herbs** only one sample is available. However dried herbs can get contaminated during the drying process, transport and packaging, just as spices. Therefore it is proposed to also establish an ML for dried herbs. As in fresh herbs no quantifiable concentrations of MOAH are expected, MOAH concentrations below the LOQ are considered to be achievable. Therefore it is proposed to consult stakeholders on an ML at the LOQ.