STAATSMINISTERIUM FÜR SOZIALES
UND GESELLSCHAFTLICHEN
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The German way of handling MOH contamination:

the work of the benchmark levels project group and the benchmark level concept

EU online forum on mineral oil hydrocarbons in food January 18th 2024

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Verbraucherschutzministerkonferenz

Statement of the 13th Conference of the Länder Ministers for Consumer Protection 2017

- *… to initiate and coordinate a national approach to minimize mineral oil contamination in food based on already existing data from industry and enforcement authorities and with consideration of future data resulting from the EU monitoring (following Recommendation 2017/84)*

Geman benchmark levels - how it started…

- formation of a project group comprising of relevant representatives of the food authorities of the federal states (Working group on foodstuffs and consumer goods, wine and cosmetics - ALB) of Germany and industry experts of the food federation Germany and associated federations
  - discussion on a harmonized benchmark level concept as part of the national minimizing strategy
  - following technical practicability and GMP
  - following ALARA principle (comparable to acrylamide)
  - first meeting January 16th 2018

Benchmark level concept (1)

- using actual MOH data based on agreed analytical methods (JRC technical reports)
- whole fraction MOSH (including MOSH analogues such as POSH, PAO or MORE) and MOAH C_{10} – C_{50}
- not driven by exposure / toxicity considerations, does not include legal or health assessment
- statistical assessment of different food categories after successful implementation of a reduction strategy

intention:

- ✓ to reduce the levels of MOH in market products (consumer food, no raw materials covered)
- ✓ to define good practice with regard to MOH
- ✓ to give a point of departure for ALARA

→ **first publication of benchmark levels for three food categories in April 2019**

Benchmark level concept (2)

- **definition:** “The levels provide **guidance on the content, regardless of source**, of mineral oil-like hydrocarbons (MOH as the sum of MOSH and MOSH analogues (such as POSH, PAO, MORE) and as MOAH) in foodstuffs of a specific group that can be **expected with high statistical probability as the result of a good technical manufacturing practice** at the various process stages and due to ubiquitous influences. If benchmark levels are exceeded, this may indicate possible sources of contamination along a supply chain, which may be avoidable by adopting good practice within the manufacturing and packaging process and shall also provide a reason to instigate research into the causes.”

- https://www.lebensmittelverband.de/en/news/20221012-update-of-the-recommended-benchmark-levels-for-moh - publication of the benchmark level concept

Overview of the MOH data set

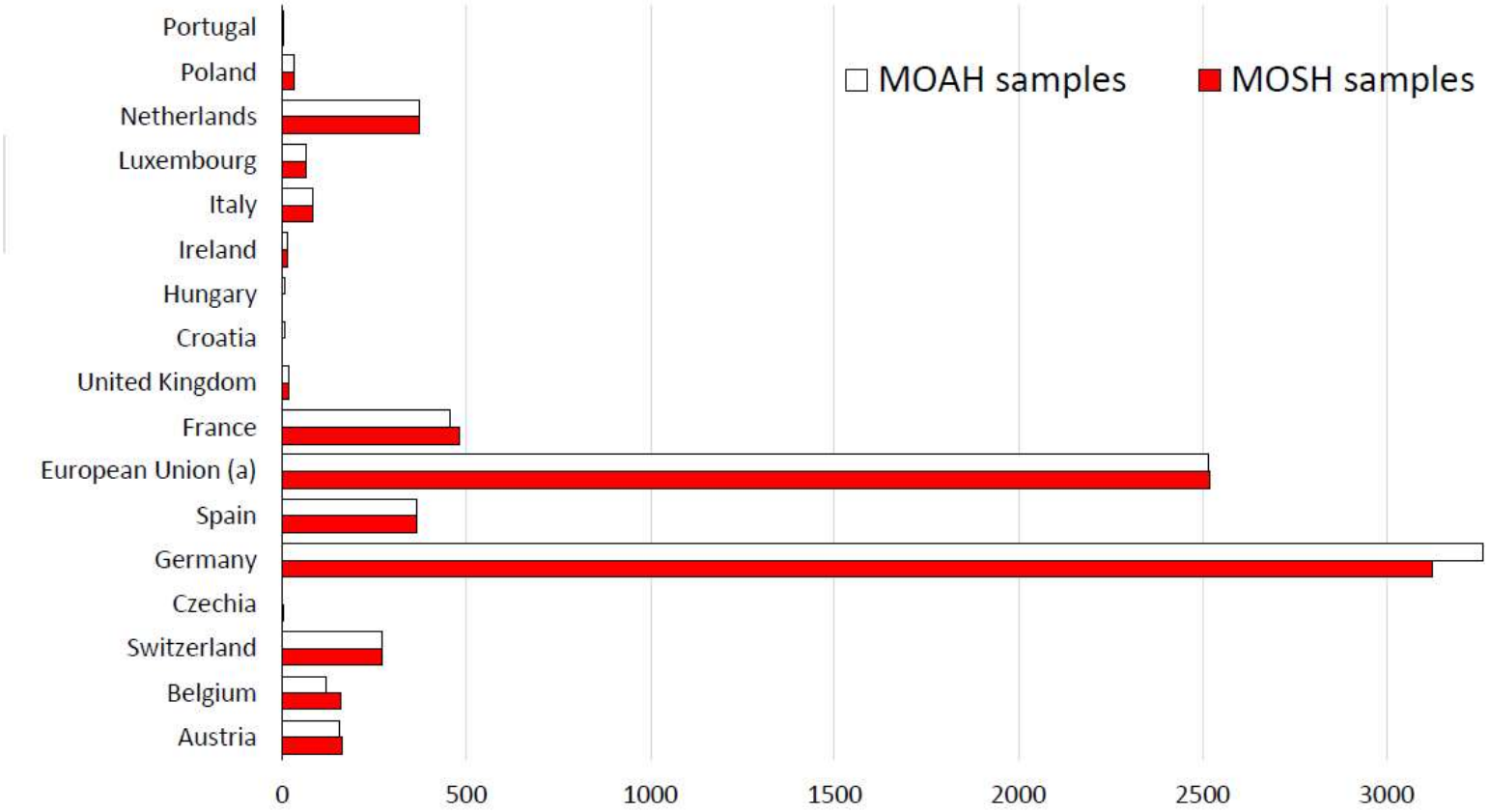
- as of December 28th 2023

total	16,083
number of food categories	9 with benchmark levels
number of samples with MOSH > LOQ	ca. 11,800
number of samples with MOAH > LOQ	ca. 2,700

continuous data collection for all food categories → allows for evaluation of further categories and reevaluation of established benchmark levels

EFSA – scientific opinion 2023

- 7,840 samples (only), mainly from Germany



(a) Samples reported by European food associations without specifying the sampling country.

LAV and Lebensmittelverband: Common MOH-Benchmark levels (UPDATE September 2022)

No.	Product group Food category (consumer products)[2]	MOSH and analogues [mg/kg] C_{10}-C_{50}	MOAH [mg/kg] C_{10}- C_{50}	Notes on the application Notes on the food groups covered/on products not covered and delimitations/on justifications or other special features (see footnotes, if applicable) **MOH orientation values are always to be applied in conjunction with the definition described.**
1	Vegetable oils and fats (such as rapeseed oil, sunflower oil, soya oil, linseed oil, olive oil and margarines) (excluding oils/fats of tropical plants)	13	n.q.[3]	not for use with oils/fats obtained from tropical plants (e.g. coconut oil)[5]
2	Bread and biscuits, fine pastries, cereal products and cereal-based products, cereals, rice, pasta	6	n.q.[4]	not to raw commodities or raw doughs
3	Confectionery (sugar confectionery except chewing gum), chocolate and cocoa-based confectionery	9	n.q.[4]	
4	Nuts, Shell fruits, oilseeds, coconut, peanuts and dried fruit, including mixtures thereof	4	n.q.[4]	
5a	Desserts (ready-to-eat) and ice cream (except category 5b)	4	n.q.[4]	
5b	Ice cream with fat-based coatings, glazes and couvertures (whether or not in pieces on / in ice cream, on / in wafers)	10	n.q.[4]	
6	Meat, meat preparations and meat products (including sausages)	9	n.q.[4]	not for firm raw sausages with cheese, with cheese or pepper coatings; not for meat preparations in oil-based marinades
7	Fish and fish products (including canned fish in aqueous infusion/own juice)	4	n.q.[4]	not for canned fish and fish products in oil or oil-based sauces and dips; not for crustaceans and molluscs and products thereof
8	Milk and milk products (such as cream, butter, yoghurt, cheese) including preparations thereof	22 mg/kg milk fat	n.q.[3/4]	assessment is made in all milk products and preparations in relation to the milk fat content[6]; not for mixed spreadable fat products
9a	Vegan and vegetarian savory spreads, toppings, cold cuts and similar products (meat, fish and sausage substitutes)	5	n.b.[3/4]	not for plant based alternatives for milk, cheese and dairy[5]
9b	Vegan and vegetarian pan products with leanings towards products of animal origin, such as ground meat and ground meat products, burger patties, breaded products	11	n.b.[3/4]	

Definition:

The levels provide guidance on the content, regardless of source, of mineral oil-like hydrocarbons (MOH as the sum of MOSH and MOSH analogues (such as POSH, PAO, MORE) and as MOAH) in foodstuffs of a specific group that can be expected with high statistical probability as the result of a good technical manufacturing practice at the various process stages and due to ubiquitous influences. If benchmark levels are exceeded, this may indicate possible sources of contamination along a supply chain, which may be avoidable by adopting good practice within the manufacturing and packaging process and may also provide a reason to instigate research into the causes.

n.q. - not quantifiable, i.e. contents < limit of quantification (here: LOQmax in mg/kg in accordance with the JRC Guidance on sampling, analysis and data reporting for monitoring of mineral oil hydrocarbons in food and food contact materials, Valid as of 2019)

Reduction of the contamination

exemplarily in the category meat and meat products

- industry successfully established minimizing strategies for MOH contamination (e.g. substitution of MO as oil for sausage casings)

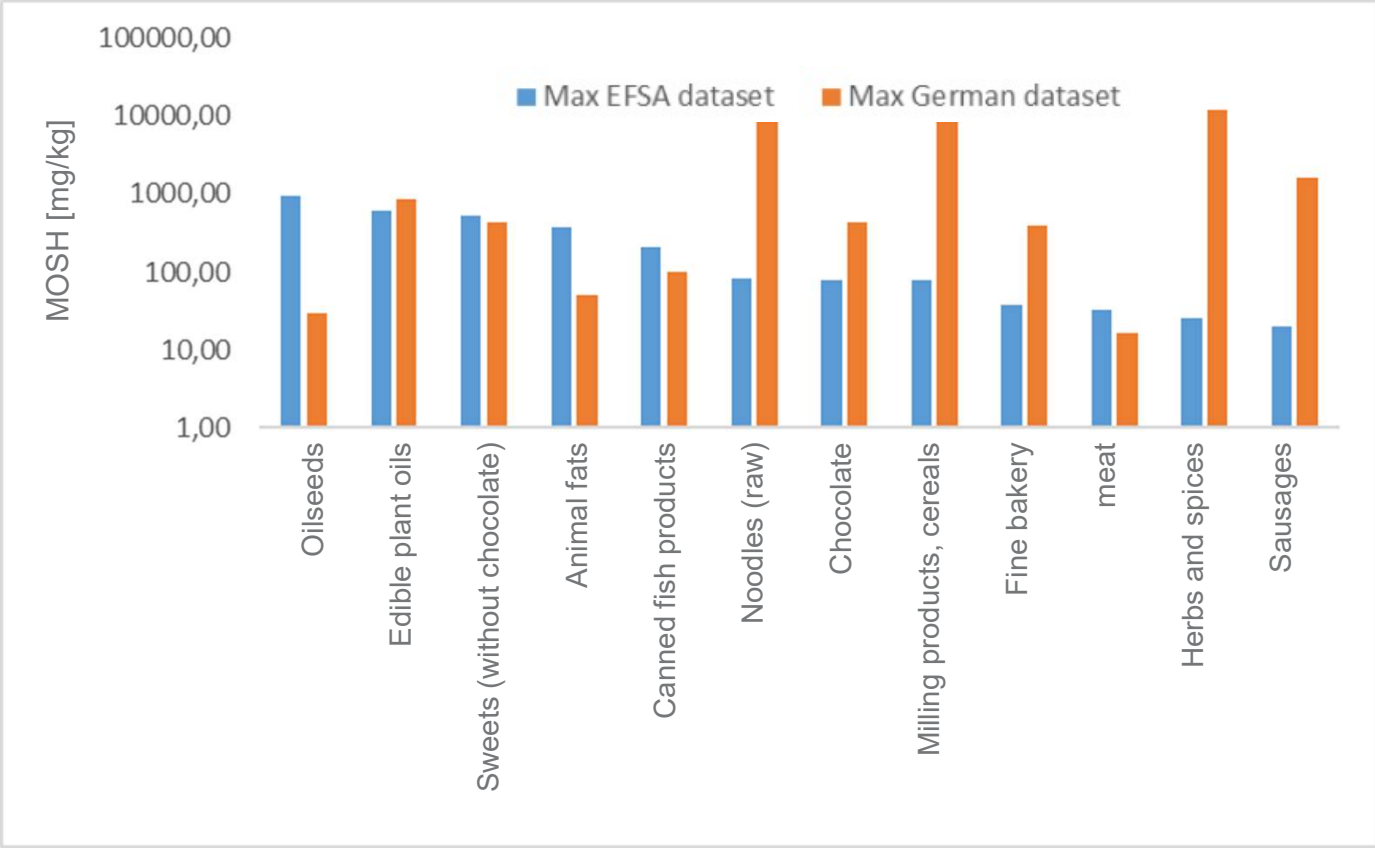
→ significant change in the data set visible

as of December 28th 2023

MOSH in mg/kg	total data set	before Jan. 2019	since Jan. 2019
number	779	360	419
minimum	0.0	0.0	0.0
maximum	1,918.0	1,918.0	1,585.6
median	0.5	0.0	0.7
75th percentile	3.4	4.0	3.2
90th percentile	11.1	29.7	8.2
95th percentile	39.5	201.9	13.0

→ calculation of the benchmark levels for meat and meat products was based on data since January 2019

Comparison of the maximum MOSH values with EFSA 2012 data



- very high values still occur in all categories
- this underlines the importance of the benchmark levels in order to identify and avoid high values
- max values in German data set also much higher compared to new EFSA data set (2023)

Highest MOSH content for selected food categories, sorted by EFSA 2012 values. The following EFSA categories are not subdivided in the German data set and therefore show the same values:

- "Milling products" und "Noodles (raw)"
- "Sweets" and "Chocolate"

discussion paper EU monitoring recommondation (1)

- In some aspects similiar to the benchmark levels approach
- What is the scientific basis for the proposed indicative levels for MOSH?

discussion paper EU monitoring recommondation (2)

- MOSH indicative levels: good accordance for some product categories

	Indicative level	Benchmark level
Vegetable oils and fats	15 mg/kg	13 mg/kg (not for use with oils/fats obtained from tropical plants)
chocolate and confectionary	10 mg/kg	9 mg/kg
processed meat	10 mg/kg	9 mg/kg
grains, grain containing products	5 mg/kg	6 mg/kg
tree nuts, pulses, oilseeds, products containing tree nuts, pulses and oilseeds	5 mg/kg	4 mg/kg
imitation meat	5 mg/kg	5 mg/kg

UPDATE Benchmark levels for mineral oil hydrocarbons (MOH) in foods (Consumer Protection Consortium of the Federal States - Working group on foodstuffs and consumer goods, wine and cosmetics and Food Federation Germany) Date: September 2022

discussion paper EU monitoring recommondation (3)

- Dismatch between indicative levels and benchmark levels for MOSH

	Indicative level	Benchmark level
processed fish	10 mg/kg	4 mg/kg
dairy, dairy containing products	5 mg/kg	22 mg/kg milk fat (in relation to the milk fat content)
composite products	5 mg/kg	10 mg/kg (Ice cream with fat-based coatings, glazes and couvertures)
imitation meat	5 mg/kg	11 mg/kg (Vegan and vegetarian pan products)

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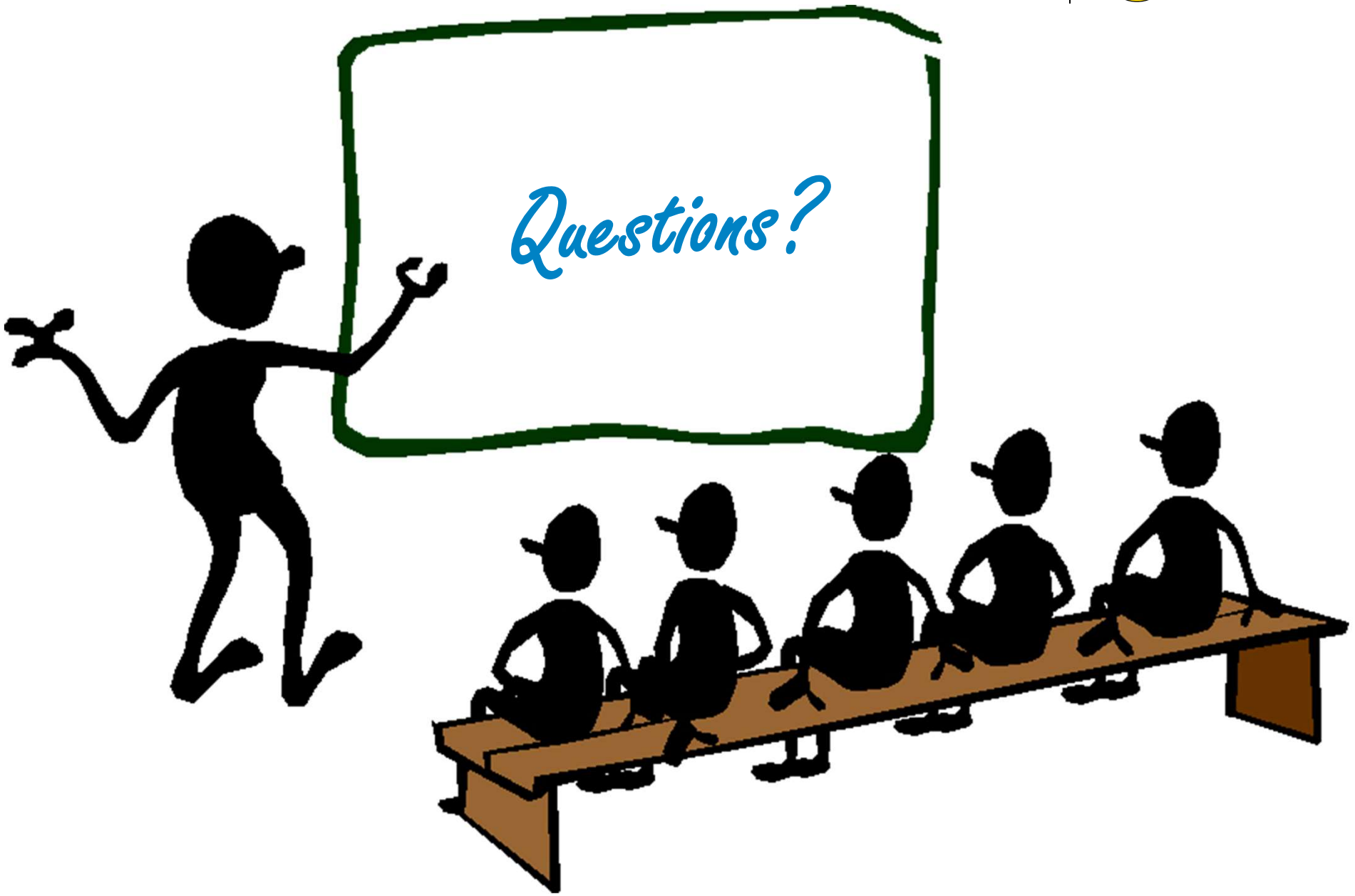
Summary – benchmark level concept

- promising, ongoing cooperation between German industry and food safety authorities
- statistical approach based on current data, after reduction strategies were introduced
- benchmark levels
  - reflect market situation and allow manufacturer to react adequately
  - give orientation for food safety authorities, consumers, retailer and NGOs
  - additional scientific use as they can give an overview on potential sources and make improvements visible and enable exposure assessments
  - help to reduce MOH contamination in food
  - → to keep away highly contaminated products from the market improves the situation for consumers in a significant way


Questions?