



Directorate-General for Health & Food Safety

Review of MLs for PAHs in smoked fish and fishery products Outlook on future discussions on possible review of MLs

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Review of MLs for PAHs in smoked fish and fishery products

Maximum levels for PAH in smoked fish and fishery products –background

- MLs for PAH are for benzo(a)pyrene and the sum of PAH4: benzo(a)pyrene, benz(a)anthracene, benzo(b)fluoranthene and chrysene
- Current maximum levels for PAH were established in 2011, applicable since 1 September 2014
- Codex Code of Practice for the Reduction of Contamination of Food with Polycyclic Aromatic Hydrocarbons (PAH) from Smoking and Direct Drying Processes (CXC 68-2009)

Replacement of Reg. (EC) 1881/2006 → by Regulation (EU) 2023/915

- Regulation (EC) 1881/2006 has been already more than 45 times been amended
- [Commission Regulation \(EU\) 2023/915 of 25 April 2023 on maximum levels for certain contaminants in food and repealing Regulation \(EC\) No 1881/2006](#) includes all amendments
- Harmonised terminology
- Footnotes in most cases replaced by comments in an additional comment box (similar format as provided for in the Codex General Standard for Contaminants and Toxins in food and Feed CXS 193-1995)

Current MLs for PAHs

5.1.7	Smoked fishery products ⁽²⁾ except products listed in 5.1.8	2,0	12,0	<p>In case of fish, the maximum level applies to muscle meat of fish.</p> <p>Where fish are intended to be eaten whole, the maximum level applies to the whole fish.</p> <p>The maximum level for smoked crustaceans applies to muscle meat from appendages and abdomen, that means, that the cephalothorax of crustaceans is excluded. In case of smoked crabs and crab-like crustaceans (<i>Brachyura</i> and <i>Anomura</i>) it applies to muscle meat from appendages.</p>
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Current MLs for PAHs

5.1.8	<p>Smoked sprats and canned smoked sprats (<i>Sprattus sprattus</i>)</p> <p>Smoked Baltic herring ≤ 14 cm length and canned smoked Baltic herring ≤ 14 cm length (<i>Clupea harengus membras</i>)</p> <p>Katsuobushi (dried bonito, <i>Katsuwonus pelamis</i>)</p> <p>Bivalve molluscs ⁽²⁾ (fresh, chilled or frozen)</p>	5,0	30,0	<p>Where fish are intended to be eaten whole, the maximum level applies to the whole fish.</p> <p>For the canned products, the maximum level applies to the whole content of the can. As regards the maximum level for the whole composite product, Article 3(1), point (c) and Article 3(2) apply.</p>
5.1.9	Smoked bivalve molluscs ⁽²⁾	6,0	35,0	



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Review of the Maximum levels Number of samples for smoked products

	Data before 2024	Only 2024 data -BaP	Only 2024 data PAH4
5.1.7. Smoked fishery products except products listed in 5.1.8	5654	577	436
5.1.8. Smoked sprats and canned smoked sprats (<i>Sprattus sprattus</i>)	622	38	16
5.1.9. Smoked bivalve molluscs	48	0	0

Review of Maximum levels

Given that the maximum levels have been significantly lowered for smoked fishery products as from 1 September 2014, for the review of the maximum levels only data as from the sampling year 2015 were considered .

For smoked bivalve molluscs, given the limited number of occurrence data, all available occurrence data for the review of the maximum levels have been taken into account



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Review of Maximum levels

Number of samples

	Before 2015	From 2015 onwards	Only 2024 data BaP	Only 2024 data PAH4
5.1.7. Smoked fishery products except products listed in 5.1.8	2968	2686	577	436
5.1.8. Smoked sprats and canned smoked sprats (<i>Sprattus sprattus</i>)	215	407	38	16
5.1.9. Smoked bivalve molluscs	43	5	0	0

Review of Maximum levels

Number of samples considered

	# B(a)P	# PAH4
5.1.7. Smoked fishery products except products listed in 5.1.8	2649	2467
5.1.8. Smoked sprats and canned smoked sprats (<i>Sprattus sprattus</i>)	407	407
5.1.9. Smoked bivalve molluscs	46	37



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Review of Maximum levels Presence of B(a)P – levels in $\mu\text{g}/\text{kg}$ Samples 2015-2023

	# data	P50	P75	P85	P90	P95	Comments # data exceeding a certain level
5.1.7. Smoked fishery products except products listed in 5.1.8	2649	0.0	0.0	0.3	0.7	1.3	> 2.0 $\mu\text{g}/\text{kg}$: 71 data (2.7 %) > 1.5 $\mu\text{g}/\text{kg}$: 102 data (3.9 %) > 1.0 $\mu\text{g}/\text{kg}$: 169 data (6.4 %)
5.1.8. Smoked sprats and canned smoked sprats (<i>Sprattus sprattus</i>)	407	0.0	1.3	1.9	2.4	3.4	> 5.0 $\mu\text{g}/\text{kg}$: 6 data (1.5 %) > 4.0 $\mu\text{g}/\text{kg}$: 14 data (3.4 %) > 3.0 $\mu\text{g}/\text{kg}$: 27 data (6.6 %)
5.1.9. Smoked bivalve molluscs	46	0.4	0.8	1.7	1.9	3.4	> 5.0 $\mu\text{g}/\text{kg}$: 2 data (4.3 %) > 3.0 $\mu\text{g}/\text{kg}$: 3 data (6.5 %) > 2.0 $\mu\text{g}/\text{kg}$: 4 data (8.7 %)



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Review of Maximum levels Presence of B(a)P – levels in $\mu\text{g}/\text{kg}$ Samples reported in 2024 only

	# data	P50	P75	P85	P90	P95	Comments # data exceeding a certain level
5.1.7. Smoked fishery products except products listed in 5.1.8	577	0	0	0.1	0.3	0.9	> 2.0 $\mu\text{g}/\text{kg}$: 15 data (2.6 %) > 1.5 $\mu\text{g}/\text{kg}$: 23 data (4.0 %) > 1.0 $\mu\text{g}/\text{kg}$: 27 data (4.7 %)
5.1.8. Smoked sprats and canned smoked sprats (<i>Sprattus sprattus</i>)	38	0	0.3	0.6	0.8	1.1	> 5.0 $\mu\text{g}/\text{kg}$: 0 data > 4.0 $\mu\text{g}/\text{kg}$: 0 data > 3.0 $\mu\text{g}/\text{kg}$: 0 data
5.1.9. Smoked bivalve molluscs	0						



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Review of Maximum levels Presence of PAH4 – levels in $\mu\text{g}/\text{kg}$ Samples 2015-2023

	# data	P50	P75	P85	P90	P95	Comments # data exceeding a certain level
5.1.7. Smoked fishery products except products listed in 5.1.8	2467	0.0	1.1	2.9	4.3	8.8	> 12.0 $\mu\text{g}/\text{kg}$: 79 data (3.2 %) > 10.0 $\mu\text{g}/\text{kg}$: 103 data (4.2 %) > 9.0 $\mu\text{g}/\text{kg}$: 117 data (4.7 %) > 8.0 $\mu\text{g}/\text{kg}$: 142 data (5.8 %) > 7.0 $\mu\text{g}/\text{kg}$: 164 data (6.6 %) > 6.0 $\mu\text{g}/\text{kg}$: 182 data (7.4 %)
5.1.8. Smoked sprats and canned smoked sprats (<i>Sprattus sprattus</i>)	407	4.0	9.7	13.9	18.0	23.0	> 30.0 $\mu\text{g}/\text{kg}$: 10 data (2.5 %) > 25.0 $\mu\text{g}/\text{kg}$: 16 data (3.9 %) > 20.0 $\mu\text{g}/\text{kg}$: 21 data (5.2 %) > 18.0 $\mu\text{g}/\text{kg}$: 41 data (10.1 %)



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Review of Maximum levels

Presence of PAH4 – levels in $\mu\text{g}/\text{kg}$

Samples 2015-2023

	# data	P50	P75	P85	P90	P95	Comments # data exceeding a certain level
5.1.9. Smoked bivalve molluscs	37	4.1	11.3	25.7	33.9	60.3	> 35.0 $\mu\text{g}/\text{kg}$: 3 data (8.1 %) > 30.0 $\mu\text{g}/\text{kg}$: 5 data (13.5 %) > 25.0 $\mu\text{g}/\text{kg}$: 6 data (16.2%) > 20.0 $\mu\text{g}/\text{kg}$: 6 data (16.2 %) > 18.0 $\mu\text{g}/\text{kg}$: 6 data (16.2 %)



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Review of Maximum levels Presence of PAH4 – levels in $\mu\text{g}/\text{kg}$ samples reported in 2024 only

	# data	P50	P75	P85	P90	P95	Comments # data exceeding a certain level
5.1.7. Smoked fishery products except products listed in 5.1.8	434	0	0.6	1.6	2.5	5.2	> 12.0 $\mu\text{g}/\text{kg}$: 13 data (3.0 %) > 10.0 $\mu\text{g}/\text{kg}$: 16 data (3.7 %) > 9.0 $\mu\text{g}/\text{kg}$: 16 data (3.7 %) > 8.0 $\mu\text{g}/\text{kg}$: 17 data (3.9 %) > 7.0 $\mu\text{g}/\text{kg}$: 17 data (3.9 %) > 6.0 $\mu\text{g}/\text{kg}$: 18 data (4.1 %)
5.1.8. Smoked sprats and canned smoked sprats (<i>Sprattus sprattus</i>)	16	5.3	7.1	7.7	8.4	9.3	> 30.0 $\mu\text{g}/\text{kg}$: 0 data > 25.0 $\mu\text{g}/\text{kg}$: 0 data > 20.0 $\mu\text{g}/\text{kg}$: 0 data > 18.0 $\mu\text{g}/\text{kg}$: 0 data
5.1.9. Smoked bivalve molluscs	0						

Review of Maximum levels stakeholder consultation

- The derogations for the traditionally smoked fish and smoked fishery products provided for in Article 7 (4) of Regulation (EU) 2023/915 are proposed to be maintained.
- Taking into account the occurrence data since 2015, the following maximum levels are under discussion (in red changed maximum levels compared to the current applicable maximum levels). The entries and number of the entries refer to the entries of Annex I to Commission Regulation (EU) 2023/915.
- The maximum levels for smoked fish/fishery products do not only apply to smoked food but also to foods with smoke taste following the use of smoked ingredients, spices, etc ...



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Review of Maximum levels stakeholder consultation

	Current ML ($\mu\text{g}/\text{kg}$)		ML for discussion ($\mu\text{g}/\text{kg}$)	
	B(a)P	PAH4	B(a)P	PAH4
5.1.7. Smoked fishery products except products listed in 5.1.8	2.0	12.0	1.0	6.0
5.1.8. Smoked sprats and canned smoked sprats (<i>Sprattus sprattus</i>)	5.0	30.0	3.0	18.0
5.1.9. Smoked bivalve molluscs	6.0	35.0	3.0	18.0

Review of Maximum levels stakeholder consultation

- Comments received from
 - **CLITRAVI**
 - **COPA-COGECA**
 - **ESSA**
 - **FOODDRINKEUROPE**
 - **FRUCOM**
 - **FVE**
 - **Farmhouse and Artisan Cheese & Dairy producers
European Network**

Review of Maximum levels PAH next steps

- WG industrial and environmental contaminants on 18/02/2024
- Outcome
- Next steps



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Outlook on future discussions on possible review of MLs

Existing MLs for fish and fishery products

- For fish and fishery products: MLs for lead, cadmium, mercury, dioxins and PCBs, PFAS (PFOS, PFOA, PFHxS, PFNA, sum of the 4), PAH (benzo(a)pyrene, PAH4), 3-MCPD fatty acid esters, glycidyl fatty acid esters (for fish oil and other marine oils only), melamine
- For algae and seaweed: MLs for melamine, perchlorate, nickel
- Food supplements (with specific reference to seaweed) : cadmium, PAH (spirulina)
- Food supplements (general): lead, mercury

Nickel

- [Commission Recommendation \(EU\) 2024/907](#) of 22 March 2024 on the monitoring of nickel in food
 - It is recommended to monitor in 2025, 2026 and 2027 nickel in food:
 - Food supplements, chocolate, cocoa beans and chocolate spreads, nut spreads, cereal based products, ready to eat soups, coffee, tea, vegetables, seaweed, oilseeds and soy-based products, pulses, nuts, **fish and other seafood**
 - For seaweed, the species, including its Latin name, should be reported and whether the data concern fresh or dry seaweed.

Inorganic arsenic fish and fishery products

- Discussion on MLs for inorganic arsenic (sum of As(III) and As(V)) in fish and other seafood.
- Extensive presentation provided by Veerle Vanheusden 30/01/2025

MOH (MOSH and MOAH)

Regulatory measures under discussion

- No MLs for MOAH in fresh and frozen fish and seafood foreseen but ML under discussion for marine oil.
- Indicative level of MOAH in a recommendation for processed vegetables (including seaweed) and for processed fish and other seafood
- Indicative level for MOSH (trigger for investigation no safety level) : marine oils, processed seaweed and processed fish and other processed seafood.

Metals in algae and seaweed

- Given the change in dietary pattern (higher consumption of algae and seaweed in diet) presence of metals in algae and seaweed of increasing importance for exposure and human health.
- EFSA report on ["Dietary exposure to metals and iodine via consumption of seaweed and halophytes in the European population"](#) (published January 2023) -Occurrence data of contaminants in seaweed
- Discussion on maximum levels for inorganic arsenic, cadmium, lead, mercury and iodine in algae as currently MLs are established only for food supplements (consisting exclusively or mainly of seaweed or products derived from seaweed).

Dioxins and PCBs

Update on review TEFs – follow-up

- [WHO expert consultation on updating the 2005 toxic equivalency factors for dioxin like compounds, including some polychlorinated biphenyls](#) - 17 to 21 October 2022.
- **Publication of TEF values with scientific justification**
Available Online 14 November 2023
- <https://www.sciencedirect.com/journal/regulatory-toxicology-and-pharmacology/special-issue/1015NJNC6Q6>

Dioxins and PCBs

Update on review TEFs – follow-up

- Next steps – mandate to EFSA
 - Conversion of existing congener-specific occurrence data in the EFSA database into the new TEF values
 - Update occurrence data and human and animal exposure. (data from the last 10 years – sampling years 2014-2023)
 - main changes following the use of the 2022 WHO TEF values compared to the use of the 2005 WHO TEF values in occurrence and relative contribution of the dioxin-like PCBs to the total TEQ level for the different feed and food categories as well the main changes in contributors to the exposure of animals and humans. A detailed overview of the occurrence data of dioxins and dioxin-like PCBs in feed and food in toxic equivalent values (TEQ) on the basis of the new 2022 WHO TEF values with information on the main changes compared to the occurrence data based on the 2005 WHO TEF values should be available by 31/01/2025

Dioxins and PCBs

Update on review TEFs – follow-up

- Next steps:
 - Update of the risk characterisation part and other parts of the EFSA 2018 opinion (30/04/2026)
 - Comprehensive review of EU legislation/of EU MLs.

Chlorinated paraffins

- An approach for analysis of chlorinated paraffins in food and feed was agreed.
- The sum of polychlorinated alkanes (PCAs) C10-17 to be analysed as semi-quantitative screening against a threshold. If threshold is exceeded, more specific analysis is recommended.
- A monitoring recommendation will be prepared on this basis



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Brominated flame retardants (BFRs) Polybrominated diphenyl ethers (PBDEs)

PBDE's : EFSA opinion adopted November 2023,
published January 2024

The most important contributors to the chronic dietary Lower Bound exposure to PBDEs were meat and meat products and **fish and seafood**. Taking into account the uncertainties affecting the assessment, the Panel concluded that it is likely that current dietary exposure to PBDEs in the European population raises a health concern.

- Regulatory follow-up

Organic arsenic

Follow-up to [EFSA risk assessment on small organoarsenic species in food](#)

Monomethylarsonic acid V (MMA(V)) and dimethylarsinic acid V (DMA(V)) are the most abundant of these compounds in food. The highest concentrations are found in rice, algae and seafood.

Exposure to DMA raises a health risk, particularly for high consumers while exposure to MMA would not pose a risk

→ Regulatory follow-up



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Other future/upcoming issues in the field of contaminants

- Comprehensive risk benefit- assessment fish consumption (comprehensive: mercury, dioxins and PCBs, PFAS and PBDE)
- Micro-and nanoplastics
- MLs - PFAS (> 4, other foods)
- ...



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**Thank you
for your
attention !**