Maximum levels of perfluoroalkyl substances in foods

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New PFAS maximum levels on certain fish, shellfish, meat, and animal products

Commission Regulation (EU) 2022/2388 of 7 December 2022 amending Regulation (EC) No 1881/2006 as regards maximum levels of perfluoroalkyl substances in certain foodstuffs

Update

The EU has introduced a new contaminant category, “perfluoroalkyl substances”, and has set maximum levels for eggs, fish, meat, crustaceans, bivalve molluscs, meat, and animal products.

Impacted products

Eggs, fish, meat, crustaceans, bivalve molluscs, meat and edible offal of bovine animals, pigs, poultry, sheep, and game animals

What is changing?

This legislation amends Regulation (EC) No. 1881/2006 on contaminants in foods (now replaced by Regulation (EU) 2023/915 – see Regulation on maximum levels for certain contaminants in food). It introduces perfluoroalkyl substances (PFAS) as a new category of contaminants. It sets maximum levels for PFAS in eggs, fish, crustaceans, bivalve molluscs, meat, and animal products (details in Table 1).

Why?

Limiting production and use of PFAS in food processing and packaging will help limit future dietary exposure.

EFSA has concluded that for parts of the European population, exposure to these substances exceeds the tolerable weekly intake (TWI). This is of concern because PFAS may have adverse effects on serum cholesterol, the liver and the immune system, and birth weight. EFSA considers the effects on the immune system to be the most critical. Maximum levels in food for the sum of perfluorooctane sulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorononanoic acid (PFNA), and perfluorohexane sulfonic acid (PFHxS) should therefore be set to ensure a high

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level of human health protection.

Timeline

The new PFAS maximum limits apply from 1 January 2023.

What are the major implications for exporting countries?

Bioaccumulation reflects long-term use of PFAS. Comprehensive overviews of historical and current production of PFOA, PFOS and compounds suggest that production volumes are decreasing in Western Europe, Japan and the USA, where their manufacture is becoming regulated (Wang et al. 2014). In contrast, volumes of PFAS and its production appear to be increasing in China, India, Poland and Russia (Wang et al. 2014). Third countries where manufacturing of these substances is absent or less concentrated are less likely to be directly concerned by this regulation.

Recommended Actions

Exporters of dairy and animal products, fish and seafood, meat, and livestock should review existing levels of PFAS in these products.

Where levels exceed the EU's limits, further initiatives must be undertaken to identify and reduce exposure.

For information on recommended methods of sampling and analysis of PFAS in foodstuffs, see EURL-POPs (2022).

Background

Perfluoroalkyl substances (PFAS) are used in numerous commercial and industrial applications. Together with their persistence in the environment, this has resulted in widespread contamination of food with these substances, mainly due to bioaccumulation in aquatic and terrestrial food chains. Diet is the major source of PFAS exposure, but the use of food contact materials containing PFAS, including non-stick coatings on cookware, is also likely to contribute to human exposure. Contamination from packaging and processing reflects the current production and use of PFAS.

EFSA (2020) evaluated the risk to human health related to the presence of PFAS in food. This followed the EFSA (2018) opinion on two PFAS: perfluorooctane sulfonic acid (PFOS) and

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perfluorooctanoic acid (PFOA), which derived separate tolerable weekly intakes (TWI) for these compounds based on effects observed in humans.

Resources

EFSA (2018) Risk to human health related to the presence of perfluorooctane sulfonic acid and perfluorooctanoic acid in food. EFSA Journal, 16(12): 5194.

EFSA (2020) Risk to human health related to the presence of perfluoroalkyl substances in food. EFSA Journal, 18(9): 6223.

EURL-POPs (2022) Guidance Document on Analytical Parameters for the Determination of Per- and Polyfluoroalkyl Substances (PFAS) in Food and Feed. European Union Reference Laboratory for halogenated POPs in Feed and Food.

Wang, Z., Cousins, I.T., Scheringer, M. et al. (2014) Global emission inventories for C14–C14 perfluoroalkyl carboxylic acid (PFCA) homologues from 1951 to 2030, Part I: production and emissions from quantifiable sources. Environment International, 70: 62–75.

Sources

Regulation (EU) 2022/2388 as regards maximum levels of perfluoroalkyl substances in certain foodstuffs

Regulation (EU) 2023/915 on maximum levels for certain contaminants in food

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Tables & Figures

Table 1
Maximum levels of perfluoroalkyl substances (PFAS)

Food category	Products	Maximum level (µg/kg wet weight)				
		PFOS	PFOA	PFNA	PFHxS	Max. sum[1]
Meat, edible offal	Bovine, pig, poultry meat	0.3	0.8	0.2	0.2	1.3
	Sheep meat	1.0	0.2	0.2	0.2	1.6
	Bovine, sheep, pig, poultry offal	6.0	0.7	0.4	0.5	8.0
	Game meat (except bear)	5.0	3.5	1.5	0.6	9.0
	Game offal (except bear)	50.0	25.0	45.0	3.0	50.0
Fishery products, bivalve molluscs	Muscle meat of Baltic herring, bonito, burbot, European sprat, flounder, grey mullet, horse mackerel, pike, plaice, sardine and pilchard, seabass, sea catfish, sea lamprey, tench, vendace, silverly lightfish, wild salmon and wild trout, wolf fish[2]	7.0	1.0	2.5	0.2	8.0
	Muscle meat of anchovy, barbel, bream, char, eel, pike-perch, perch, roach, smelt, whitefish (*Coregonus* species)[2]	35.0	8.0	8.0	1.5	45
	Muscle meat of other fish (and of above species if intended for infants and young children)	2.0	0.2	0.5	0.2	2.0
	Crustaceans[3] and bivalve molluscs[4]	3.0	0.7	1.0	1.5	5.0
Eggs		1.0	0.3	0.7	0.3	1.7

1 The sum of the individual levels may not exceed this number, which is the maximum allowable level of all PFAS combined. PFOS, perfluorooctane sulfonic acid; PFOA, perfluorooctanoic acid; PFNA, perfluorononanoic acid; PFHxS, perfluorohexane sulfonic acid.
2 If not intended for infants and young children.
3 Muscle meat from appendages and abdomen (cephalothorax excluded); in case of crabs and crab-like crustaceans, muscle meat from appendages only. For canned crustaceans, maximum level applies to whole content of can.
4 If *Pecten maximus*, adductor muscle and gonad only.

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Source: based on Annex to Regulation (EU) 2022/2388

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