DOI 10.17590/20231211-164022-0

German Federal Institute for Risk Assessment

Fish consumption during pregnancy and breastfeeding: Some fish species have high levels of methylmercury

BfR Opinion No. 047 / 2023 of 29 November 2023

Fish contains important nutrients, trace elements, and vitamins. The German Nutrition Society (DGE) therefore advises eating fish once or twice a week. However, the organic form of mercury (Hg), methylmercury (MeHg), can accumulate in fish via the marine food chain. Some species of fish, especially predatory fish, may therefore have elevated levels of MeHg. Unborn children and infants are particularly sensitive to the neurotoxic effects of MeHg. Special dietary recommendations therefore apply to pregnant and breastfeeding women. For example, the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) has published a consumer advice on fish species that pregnant and breastfeeding women should avoid because of high levels of methylmercury.

The German Federal Institute for Risk Assessment (BfR) has evaluated recent occurrence data of Hg in fish. Based on this, the level of MeHg intake was estimated for women of child-bearing age (15–49 years, assumed body weight 65 kg) who consume certain species of fish. The BfR determined the amount of intake over one to three fish portions of 150 g each and compared this to the *tolerable weekly intake* (TWI). The TWI specifies the quantity of a substance that can be consumed on a weekly basis over an entire lifetime without appreciable health risk.

The result shows that the choice of fish and seafood being consumed is decisive for the amount of Hg or MeHg intake. According to the current mean occurrence data, the TWI for MeHg is exceeded when consuming one or two portions of the fish species shark or swordfish. Exposure to mean levels via tuna consumption remains well below the TWI at the recommended two weekly portions but approaches it at three servings per week. In cases of high levels (95th percentile), the TWI is almost exhausted with one tuna portion per week. If fish species such as halibut and eel have high levels, the TWI for MeHg is also exceeded with one or two portions.

The current assessment by the BfR based on recently available data does not give any reason to change the BMUV consumer advice on fish consumption for pregnant and breastfeeding women. The BfR points out that when it comes to fish consumption, not only the level of contaminants but also the health benefits should be taken into account. These health benefits result, among other things, from the supply of vitamins, trace elements, and certain polyunsaturated fatty acids.

1 Subject of the assessment

The BfR has carried out an exposure assessment for the intake of Hg or MeHg via the consumption of different fish species based on current data. Occurrence data from the RASCS project (Risk Assessment Strategies for Contaminants in Seafood) served as a basis. As part of RASCS, the Federal Office of Consumer Protection and Food Safety (BVL) and the state monitoring offices requested data on Hg levels in fish and seafood from the years 2017–2020.

The new exposure assessment, which is based on current data, was used to check whether the consumer advice of the BMUV "During pregnancy and breastfeeding, consume fish species with comparatively low levels of mercury"[1] is still relevant.

2 Result

The hypothetical exposure assessment for women of child-bearing age (15–49 years, 65 kg) shows that the choice of fish and seafood being consumed is crucial for the amount of Hg or MeHg intake. Certain consumption patterns lead to the *tolerable weekly intake*, TWI) of 1.3 µg MeHg/kg body weight (BW) per week being exceeded. Thus, the exposure of women of child-bearing age through the consumption of shark (curled strips of smoked dogfish) as well as swordfish can exceed the TWI for MeHg according to the recommendations on fish consumption of the German Nutrition Society (DGE) (1–2 portions of 150 g fish weekly) and based on the current occurrence data (mean values).

Furthermore, the hypothetical exposure for women of child-bearing age exceeds the TWI at three times weekly consumption in case of mean levels (halibut) or at once weekly consumption in case of high levels (other cyprinids). In this scenario, high levels in unspecified fish, which have been grouped as "other fish", also lead to an exposure above the TWI if consumed once per week.

If other species are consumed, the TWI may be exceeded assuming repeated consumption of fish with high levels (tuna, eel, bream, chub, perch-like marine fish, and cod fish if consumed twice a week; redfish, perch-like freshwater fish, Alaska pollock/pollack, and wels catfish if consumed three times a week). From the point of view of the BfR, the exposure assessment for the intake of Hg or MeHg based on current data does not give reason to change the consumer advice of the BMUV on fish consumption for pregnant and breastfeeding women.

The BfR points out that when it comes to fish consumption, not only the level of contaminants but also the health benefits should be taken into account. These health benefits result, among other things, from the supply of vitamins, trace elements, and certain polyunsaturated fatty acids.

[1] https://www.bmuv.de/themen/gesundheit/lebensmittelsicherheit/verbrauchertipps#c15513

3 Rationale

3.1 Risk assessment

3.1.1 Hazard identification and characterisation

Mercury occurs as an environmental contaminant in fish and seafood mainly in the form of MeHg. In its opinion, the European Food Safety Authority (EFSA) identified unborn children as the most sensitive group to the developmental neurotoxic effects of MeHg. Because pregnant women may be among the group of high and frequent fish consumers, foetal exposure can occur at a critical stage of brain development (EFSA 2012).

The EFSA has derived a health-based guideline value for the long-term intake of MeHg of 1.3 µg/kg BW per week (TWI).

3.1.2 Exposure estimation and assessment

Methodology

The BfR has carried out a hypothetical exposure assessment for the intake of Hg or MeHg for women of child-bearing age. The basis for this was the BVL occurrence data, which were collected as part of the RASCS project as well as the occurrence data from the first German total-diet study “Meals for the Exposure Assessment and Analysis of Food” (BfR-MEAL Study).

This report uses the occurrence data on Hg in fish and seafood from the years 2017–2020; these were requested by the BVL and the state monitoring offices as part of the RASCS project. For the evaluation of the MeHg occurrence data, the suspect and follow-up samples were first excluded from this data set. The modified *lower bound* (mLB) approach and the *upper bound* (UB) approach were used to account for non-quantifiable and undetectable values. For the mLB, the values below the limit of detection (LOD) are set to 0 and those below the limit of quantification (LOQ) to the LOD. For the UB, all values below the LOD/LOQ are set to the respective LOD/LOQ. If at least 20 measurement results were available for a fish species, it was evaluated as a separate group. In the case of a lower number of measurement results, the assignment was made to the corresponding upper group.

Because no suitable consumption data for pregnant women are available for the individual fish species, the exposure assessment is based on the mean body weight of 65 kg for women of child-bearing age from 15 to 49 years (according to the National Nutrition Survey II; MRI 2008) and a hypothetical intake of Hg or MeHg through one to three portions (150 g each) of fish per week. This portion size has already been used and described in previous BfR opinions on contaminants in fish (e. g. No. 041/2006). According to the Federal Food Code (BLS, Version 3.02), a medium portion corresponds to 150 g of fish. This consumption quantity is also used by the German Nutrition Society (DGE) for its consumption recommendation of one to two portions of fish per week (DGE 2016). A consumption frequency of three times per week can thus be considered as a scenario for frequent consumers and results in higher intakes.

In summary, the hypothetical exposure to Hg from fish and seafood consumption is calculated based on the standard body weight for women of child-bearing age (65 kg), a portion size of 150 g, and a consumption frequency of 1–3 times per week at mean and high Hg levels *(upper bound*). About 80–100% of the total Hg in fish muscle is present as MeHg. The EFSA assumes in a conservative scenario that 100% of the Hg in fish is present as MeHg. For the risk characterisation, the calculated intake is compared with the TWI for MeHg of 1.3 µg/kg

BW (EFSA 2012).

Occurrence data

The data of the BVL and Federal States and on fish and seafood from the years 2017–2020 contain only levels of total Hg. After exclusion of the suspect and follow-up samples, 3,748 measured values were used for the evaluation (including results on 644 monitoring planned samples). The fish and seafood examined belong to 32 food groups.

As in an earlier exposure assessment of the BfR from 2019 for the review of the consumer advice for which Hg occurrence data from monitoring by the federal government and the Federal States from 1995–2017 were used, sharks and swordfish are the fish species with the highest levels of Hg (Table 1). For sharks, the mean (0.71 mg/kg) and high levels (1.71 mg/kg) of the current data are lower than those of the samples measured in 2006 (0.90 mg/kg (mean) and 2.12 mg/kg (95th percentile). In the BfR MEAL study, a mean Hg level of 0.52 mg/kg (0.58 mg/kg MeHg) was found for smoked dogfish (Sarvan et al. 2021). Swordfish also have slightly lower levels of 0.66 mg/kg (mean, 2017–2020) and 2.10 mg/kg (P95, 2017–2020) compared with the 2019 evaluations of 0.84 mg/kg (mean, 2006) and 2.20 mg/kg (P95, 2006). The next highest levels of Hg are found in halibut and tuna. The levels for halibut in the last BfR evaluation were lower with 0.08 mg/kg (Greenland halibut, mean, 1998) to 0.17 mg/kg (smoked halibut, mean, 2008)) than in the present evaluation (0.23 mg/kg (mean, 2017–2020). In the BfR MEAL study, mean Hg levels of 0.08–0.11 mg/kg (0.08–0.09 mg/kg MeHg) were found for halibut (Sarvan et al. 2021). For tuna, the levels in the current evaluation are lower than in the evaluation from 2019 with 0.17 mg/kg (mean, 2017–2020) and 0.55 mg/kg (P95, 2017–2020) compared with 0.29 mg/kg (mean, 2011) and 0.62 mg/kg (P95, 2011). In the BfR-MEAL study, the mean levels for Hg in the tuna pools (fillet, canned, oil-packed, smoked) ranged from 0.13 to 0.67 mg/kg (0.12–0.70 mg/kg MeHg) (Sarvan et al. 2021).

The lowest levels of Hg in fish are found in pangasius (0.005 mg/kg, mean, UB), rainbow trout , and trout (both 0.02 mg/kg, mean). Pangasius was also examined in the BfR MEAL study with an Hg content below the LOQ (<0.01 mg/kg MeHg). Mercury levels in the trout pools of the BfR-MEAL study from different regions (fresh and smoked) were 0.014–0.031 mg/kg (0.010–0.026 mg/kg MeHg) and thus comparable to the results presented in Table 1 (Sarvan et al. 2021).

Table 1: Mercury levels in fish and seafood in descending order of mean concentrations (BVL, 2017–2020)

Food group	N determinable (proportion)	n. q.	n. d.	Mercury in mg/kg			
				mLB		UB	
				Mean	P95	Mean	P95
Curled strips of smoked dogfish, shark	28 (100%)	0	0	0.707	1.707	0.707	1.707
Swordfish	46 (100%)	0	0	0.655	2.100	0.655	2.100
Halibut	131 (100%)	0	0	0.234	0.960	0.234	0.960
Tuna	397 (99%)	4	0	0.172	0.550	0.173	0.550
Eel	150 (99%)	1	0	0.170	0.370	0.170	0.370
other cyprinids	33 (100%)	0	0	0.157	0.777	0.157	0.777
Other fish	186 (81%)	35	8	0.145	0.740	0.156	0.740
Bream	78 (100%)	0	0	0.133	0.290	0.133	0.290
Chub	24 (100%)	0	0	0.126	0.329	0.126	0.329
Redfish (*Sebastes marinus*)	194 (100%)	0	0	0.105	0.206	0.105	0.206
Perch-like freshwater fish	73 (100%)	0	0	0.105	0.250	0.105	0.250
Perch-like marine fish	94 (100%)	0	0	0.099	0.381	0.099	0.381
Vendace (*Coregonus albula*), maraena whitefish (*Coregonus maraena*), whitefish (family Coregonidae)	91 (100%)	0	0	0.099	0.160	0.099	0.160
Codfish	34 (100%)	0	0	0.099	0.309	0.099	0.309
Alaskan Pollack/pollack	152 (99%)	2	0	0.072	0.214	0.074	0.214
Mackerel	99 (99%)	1	0	0.059	0.092	0.060	0.095
Atlantic cod (*Gadus morhua*)	102 (99%)	1	0	0.059	0.140	0.060	0.140
Plaice (*Pleuronectes platessa*)	64 (100%)	0	0	0.045	0.103	0.045	0.103
Sea mussels	109 (76%)	25	10	0.038	0.050	0.039	0.050
Herring fish	354 (96%)	13	2	0.036	0.072	0.038	0.076
Wels catfish	55 (77%)	16	0	0.036	0.240	0.037	0.240
Carp	60 (94%)	4	0	0.035	0.092	0.035	0.092
Salmon-like freshwater fish	101 (95%)	5	0	0.032	0.075	0.032	0.075
Other crustaceans/shellfish and molluscs	25 (54%)	12	9	0.029	0.050	0.038	0.160
Salmon-like marine fish	61 (95%)	3	0	0.029	0.067	0.032	0.130
Crustaceans	237 (78%)	62	5	0.026	0.088	0.027	0.088
Trout	92 (98%)	2	0	0.021	0.046	0.021	0.046
Rainbow trout	96 (92%)	8	0	0.020	0.045	0.021	0.045
Other mussels	49 (67%)	19	5	0.016	0.052	0.018	0.052
Squid	59 (57%)	44	0	0.014	0.042	0.017	0.042
Pangasius	49 (28%)	55	74	0.003	0.009	0.005	0.010

n. q.: non-quantifiable, n. d.: non-detectable

A review of the BVL monitoring reports of recent years (BVL 2016–2020) showed comparable mean levels to Table 1 for herring with 0.05 mg/kg (2017, n = 82), pangasius with 0.005 mg/kg (2017, n = 109), tuna with 0.20 mg/kg (2018, n = 111), and redfish with 0.10 mg/kg (2019, n =

102). For wels catfish, however, the mean levels are lower with 0.01 mg/kg (2020, n = 40). In the BVL evaluations, the values below the LOD and LOQ are included at half the respective limits. However, differences in the occurrence data may also be due to the different sample numbers.

The percentage of values below the LOD and LOQ is below 10% for most fish groups (Table 1). The exceptions include the group of other crustaceans/shellfish and molluscs with 46% non-quantifiable or non-detectable values. Here, it is also true that the LOD and LOQ are partly above the measured values and consequently lead to large differences between the mLB and UB values. Thus, the P95 in the UB of 0.160 mg/kg represents the value of the highest LOQ in this group. Although this is still below the maximum actual measured value of 0.87 mg/kg, it is considerably higher than the second highest actual measured value of 0.043 mg/kg.

<u>Exposure scenarios</u>

For the exposure estimation, the *upper bound* levels (mean and 95th percentile) of the BVL from 2017–2020 are used. The hypothetical exposures in different scenarios are presented below and calculated using an assumed portion size of 150 g for the consumption of fish with frequencies of 1–3 times a week. Since the focus of the BMUV consumer advice is on pregnant and breastfeeding women, the hypothetical intake is related to the mean body weight of 65 kg for women of child-bearing age (15–49 years) which is then compared to the health-based guidance value.

Table 2 shows the hypothetical exposure to Hg from fish and seafood consumption normalised to the standard body weight for women of child-bearing age. The EFSA assumes in a conservative scenario that 100% of the Hg in fish is present as MeHg. Thus, for the risk characterisation, the calculated intake is compared with the TWI for MeHg of 1.3 µg/kg BW (EFSA 2012).

The values with a grey background in Table 2 show more than a 100% exhaustion of the TWI through consumption of fish and seafood.

For women of child-bearing age, the consumption of shark or swordfish leads to exceedance of the TWI, when assuming a weekly portion of 150 g fish. These results are in line with the previous exposure assessment in 2019, which also showed an exceedance of the TWI for all exposure scenarios considered due to the consumption of shark or swordfish (1: medium levels x two servings per week; 2: high levels x two servings per week; 3: medium levels x 422 g fish per week; 4: high levels x 422 g fish per week).

The consumption of halibut can also lead to an exceedance of the TWI if it is consumed three times a week at mean Hg levels (Table 2). If high levels are considered, the TWI is exceeded with a single consumption of 150 g per week. This is also true for other cyprinids and other fish. Because of lower Hg levels, the consumption of carp *(Cyprinus carpio*) as such results in lower exhaustions of the TWI (6–19% at mean levels and 16–49% at high levels) compared to the group of other cyprinids. The results are similar to the BfR exposure assessment of 2019 in which a TWI exceedance was calculated for exposure Scenarios 2 and 4 for halibut consumption but not for any of the four exposure scenarios for carp consumption.

According to the data in Table 2, further exceedances of the TWI are shown exclusively at high Hg levels for tuna, eel, bream, chub, perch-like marine fish, and codfish, each consumed two or three times a week. For redfish, perch-like freshwater fish, Alaskan pollock/pollack and wels catfish, the TWI is exceeded when consumed three times per week and at high levels. Based on the monitoring data from 1995–2017, the BfR exposure assessment of 2019 also showed an exceedance of the TWI for tuna and escolar /snake mackerel at medium Hg levels for twice weekly consumption. For redfish, a TWI exceedance was calculated only for high Hg levels when consumed three times per week. For Alaskan pollock/pollack and catfish, no TWI exceedance was calculated.

Based on the current occurrence data from 2017 to 2020 (data query within the framework of the RASCS project), the lowest intake and thus exhaustions of the TWI result from the consumption of the fish species pangasius, rainbow trout, and trout as well as from the consumption of seafood such as squid, mussels, and crustaceans.

Table 2: Hypothetical intake of MeHg as total Hg and exhaustion of the TWI for MeHg (1.3 µg/kg BW) via the consumption of fish and seafood by women of child-bearing age (15–49 years) assuming a portion size of 150 g and a consumption frequency of 1–3 times per week at mean and high levels (upper bound)

	MeHg intake in µg/kg BW per week (mean level, 150 g portion, 65 kg BW)			TWI exhaustion (1.3 µg/kg BW) in %			MeHg intake in µg/kg BW per week (P95 level, 150 g portion, 65 kg BW)			TWI exhaustion (1.3 µg/kg BW) in %		
	1x	2x	3x	1x	2x	3x	1x	2x	3x	1x	2x	3x
Curled strips of smoked dogfish, shark	1.63	3.26	4.89	125	251	376	3.94	7.88	11.82	303	606	909
Swordfish	1.51	3.02	4.54	116	233	349	4.85	9.69	14.54	373	746	1118
Halibut	0.54	1.08	1.62	42	83	125	2.22	4.43	6.65	170	341	511
Tuna	0.40	0.80	1.20	31	61	92	1.27	2.54	3.81	98	195	293
Eel	0.39	0.78	1.18	30	60	90	0.85	1.71	2.56	66	131	197
Other cyprinids	0.36	0.72	1.08	28	56	83	1.79	3.59	5.38	138	276	414
Other fish	0.36	0.72	1.08	28	55	83	1.71	3.42	5.12	131	263	394
Bream	0.31	0.61	0.92	24	47	71	0.67	1.34	2.01	51	103	154
Chub	0.29	0.58	0.87	22	45	67	0.76	1.52	2.28	58	117	175
Redfish	0.24	0.48	0.73	19	37	56	0.48	0.95	1.43	37	73	110
Perch-like freshwater fish	0.24	0.48	0.72	19	37	56	0.58	1.15	1.73	44	89	133
Perch-like marine fish	0.23	0.46	0.69	18	35	53	0.88	1.76	2.63	68	135	203
Whitefish (family Coregonidae)	0.23	0.46	0.68	18	35	53	0.37	0.74	1.11	28	57	85
Codfish	0.23	0.46	0.69	18	35	53	0.71	1.43	2.14	55	110	165
Alaskan pollock/pollack	0.17	0.34	0.51	13	26	39	0.49	0.99	1.48	38	76	114
Mackerel	0.14	0.28	0.42	11	21	32	0.22	0.44	0.66	17	34	51
Atlantic cod	0.14	0.28	0.41	11	21	32	0.32	0.65	0.97	25	50	75
Plaice (*Pleuronectes platessa*)	0.10	0.21	0.31	8	16	24	0.24	0.48	0.71	18	37	55
Sea mussels	0.09	0.18	0.27	7	14	21	0.12	0.23	0.35	9	18	27
Herring fish	0.09	0.17	0.26	7	13	20	0.18	0.35	0.53	13	27	40
Wels catfish	0.09	0.17	0.26	7	13	20	0.55	1.11	1.66	43	85	128
Carp	0.08	0.16	0.24	6	12	19	0.21	0.42	0.64	16	33	49
Salmon-like freshwater fish	0.07	0.15	0.22	6	11	17	0.17	0.34	0.52	13	26	40
Other crustacean /shellfish and molluscs	0.09	0.17	0.26	7	13	20	0.37	0.74	1.11	28	57	85
Salmon-like marine fish	0.07	0.15	0.22	6	12	17	0.30	0.60	0.90	23	46	69
Crustaceans	0.06	0.13	0.19	5	10	14	0.20	0.40	0.61	16	31	47
Trout	0.05	0.10	0.14	4	7	11	0.11	0.21	0.32	8	16	24
Rainbow trout	0.05	0.10	0.15	4	8	11	0.10	0.21	0.31	8	16	24
Other mussels	0.04	0.08	0.13	3	6	10	0.12	0.24	0.36	9	18	28
Squid	0.04	0.08	0.12	3	6	9	0.10	0.19	0.29	7	15	22
Pangasius	0.01	0.02	0.04	1	2	3	0.02	0.05	0.07	2	4	5

Grey markings: Exhaustion of the TWI >100%

3.1.3 Discussion

In the present exposure assessments, numerous assumptions were made that either under- or overestimate the actual intake. Thus, the scenarios assume that only one type of fish or seafood (with mean or high levels) is consumed at a time. However, in reality, consumers are eating different species in which the levels vary. In addition, other foods besides fish may contribute to exposure to Hg. In term of the long-term intake estimates considered here, the scenarios with higher levels are only relevant if there is an increased probability of individuals consuming fish with high levels of Hg over a longer period of time.

In general, it should be noted that the occurrence data used come from various food monitoring programmes. Even though suspect and follow-up samples were excluded, a statement about the representativeness of the samples for the German market cannot be made. Similarly, the analytical limits for some fish species have a considerable influence on the contents in the *upper bound*.

Finally, a standard portion size of 150 g of fish or seafood was used, and assumptions were made about the frequency of consumption. This allowed consideration of the levels of Hg in different groups of fish and seafood. The actual consumption of individual fish and seafood may differ from the assumptions made here. This, in turn, may lead to an under- or overestimation of intake. In addition, a standard body weight of 65 kg was used for the evaluations. In the case of lower body weights, the exposure (i.e. the body weight-related intake) would increase accordingly; in the case of higher body weights, the exposure would be lower (all other assumptions being equal).

Further information on the BfR website on nutrition during pregnancy

Consumer tip for pregnant and breastfeeding women to restrict their consumption of tuna fish is still valid (BfR opinion no. 041/2008 dated 10 September 2008)
https://www.bfr.bund.de/cm/349/consumer_tip_for_pregnant_and_breastfeeding_women_to_restrict_their_consumption_of_tuna_fish_is_still_valid.pdf

Planning a pregnancy? – Don’t Forget Your Folic Acid!
https://www.bfr.bund.de/en/press_information/2022/02/planning_a_pregnancy____don_t_forget_your_folic_acid_-291829.html

“Meals for the Exposure Assessment and Analysis of Food” (BfR MEAL study)
https://www.bfr.bund.de/en/frequently_asked_questions_on_the_bfr_meal_study-199370.html

4 References

BVL, Bundesamt für Verbraucherschutz und Lebensmittelsicherheit (2016–2020): Berichte zur Lebensmittelsicherheit – Monitoring. Gemeinsamer Bericht des Bundes und der Länder. https://www.bvl.bund.de/DE/Arbeitsbereiche/01_Lebensmittel/01_Aufgaben/02_AmtlicheLeb ensmitteluebeerwachung/04_Monitoring/lm_monitoring_node.html

DGE, Deutschen Gesellschaft für Ernährung e.V. (2016): Regelmäßig Fisch auf den Tisch! Presseinformation: Presse, DGE aktuell, dated 2 August 2016. https://www.dge.de/presse/pm/regelmaessig-fisch-auf-den-tisch/

EFSA, Europäische Behörde für Lebensmittelsicherheit (2012): Scientific Opinion on the risk for public health related to the presence of mercury and methylmercury in food. EFSA Journal, 10(12), 1–241.

MRI, Max Rubner-Institut (2008): Nationale Verzehrsstudie II – Die bundesweite Befragung zur Ernährung von Jugendlichen und Erwachsenen. Ergebnisbericht, Teil 1 & Ergänzungs-band: Ausgewählte Ergebnisse nach Schichtindex. Retrieved from https://www.mri.bund.de/fileadmin/MRI/Institute/EV/NVS_II_Abschlussbe-richt_Teil_1_mit_Ergaenzungsbericht.pdf

Sarvan I., Kolbaum A.E., Pabel U., Buhrke T., Greiner M., Lindtner O. (2021): Exposure assessment of methylmercury in samples of the BfR MEAL Study. Food and Chemical Toxicology 149, 112005, https://doi.org/10.1016/j.fct.2021.112005.

About the BfR

The German Federal Institute for Risk Assessment (BfR) is a scientifically independent institution within the portfolio of the German Federal Ministry of Food and Agriculture (BMEL). The BfR advises the Federal Government and the German federal states ("Laender") on questions of food, chemicals, and product safety. The BfR conducts independent research on topics that are closely linked to its assessment tasks.

This text version is a translation of the original German text which is the only legally binding version.