SUPPORTING INFORMATION

Changes in concentrations of perfluorinated compounds, polybrominated diphenyl ethers and polychlorinated biphenyls in Norwegian breast-milk during twelve months of lactation

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Analysis of breast-milk

Determination of PBDEs, HBCD, and PCBs

Chemicals

Up to 11 brominated flame retardants (BFRs) (BDE-28, 37, 47, 85, 99, 100, 153, 154, 183, 209, and sum HBCDs) and 18 PCBs (CB-101, 105, 114, 118, 123, 128, 138, 153, 156, 157, 167, 170, 180, 183, 187, 189, 194, and 209) were determined, and the standards (both native and labeled) were obtained from Wellington Laboratories (Guelph, Ontario, Canada), CIL (Andover, MA, USA) or AccuStandard (New Haven, CT, USA). All solvents used were of pesticide grade from sds (Peypin, France) and sulfuric acid, silica gel, and sodium sulfate were from Merck (Darmstadt, Germany).

Glassware

All glassware used in the analysis was washed in 2.5% RBS 25 foaming cleaner (Chemical Products, Brussels, Belgium) rinsed with distilled water, and subsequently heated at 450 °C for 4 h (volumetric equipment was not heated).

Analysis and quantification

The frozen breast-milk samples were thawed in a refrigerator (4 °C) and homogenized in a shake incubator at 37 °C before five grams was sampled and added internal standard solutions of PBDEs (0.1 ng BDE-18, 51, 103, 156, 181, and 1.0 ng ¹³C-labeled 209) and PCBs (1.0 ng ¹³C-labeled CB-101, 105, 114, 118, 123, 138, 153, 156, 157, 167, 170, 180, 189, 194, and 209). The samples were kept overnight in a refrigerator and extracted and cleaned up as described in details by Thomsen et al. (1). The lipid content was determined gravimetrically. The extracts were analyzed using a GC-MS system (6890/5973 from Agilent) equipped with an HP 7683 autosampler as described by Thomsen et al. (2). The HBCD isomers are not

separated by GC, thus the total amount of HBCDs was quantified using BDE-156 as internal standard. All samples from each participant were analyzed in one batch. The LOQ, which is based on the lowest level in the calibration curve, was 3 pg/g breast-milk (~0.1 ng/g lipids) for BDE-209, 0.3 pg/g breast-milk (~0.01 ng/g lipids) for the other PBDEs, 4.8 pg/g breast-milk (~0.2 ng/g lipids) for HBCD, and 0.6-3 pg/g breast-milk for the PCBs (~0.02 - 0.1 ng/g lipids). Eleven procedural blanks were included in the analysis series, and BDE-47, 99, and 209, and CB-101 were found in almost all. The measured concentrations in the breast-milk samples of these compounds were thus corrected by the corresponding blank level. The amounts of the other PCBs in the procedural blanks were negligible. Compounds below the LOQ or compounds not detected have been left out from the calculations.

References

- (1) Thomsen, C.; Stigum, H.; Frøshaug, M.; Broadwell, S. L.; Becher, G.; Eggesbø, M. Determinants of brominated flame retardants in breast-milk from a large scale Norwegian study. *Environ. Int.* **2010**, *36*, 68-74.
- (2) Thomsen, C.; Liane, V. H.; Becher, G. Automated solid-phase extraction for the determination of polybrominated diphenyl ethers and polychlorinated biphenyls in serum - application on archived Norwegian samples from 1977 to 2003. *J. Chromatogr. B* **2007**, *846*, 252-263.

Table S1. The median and concentration range of detected PBDEs, PCBs, and HBCDs in ng/g lipids and PFOA and PFOS in ng/mL in the breast milk samples.

	<i>n</i> ^a	Median	Min	Max
BDE-28	60	0.14	< LOQ	0.53
BDE-37	6	0.013	< LOQ	0.08
BDE-47	70	1.9	0.37	11
BDE-85	24	0.12	< LOQ	0.46
BDE-99	70	0.44	0.16	3.3
BDE-100	69	0.42	< LOQ	2.0
BDE-153	70	0.74	0.36	2.0
BDE-154	51	0.048	< LOQ	0.31
BDE-183	19	0.069	< LOQ	0.30
BDE-209	45	0.62	< LOQ	2.8
HBCD	32	0.27	< LOQ	3.0
CB-101	70	6.4	1.8	36
CB-105	70	1.8	0.89	3.2
CB-114	70	0.32	0.17	0.64
CB-118	70	9.3	4.0	15
CB-123	64	0.10	< LOQ	0.32
CB-128*	70	0.53	0.18	1.1
CB-138	70	16	8.0	30
CB-153	70	38	20	68
CB-156	70	3.2	1.5	5.9
CB-157	70	0.59	0.29	1.2
CB-167	70	0.90	0.38	1.4
CB-170	70	6.7	3.6	13
CB-180	70	17	8.5	32
CB-183	70	2.1	1.1	3.5
CB-187	70	5.2	2.6	11

CB-189	70	0.25	0.11	0.53
CB-194	70	1.2	0.55	2.4
CB-209*	70	0.10	0.059	2.4
PFOA	66	0.050	0.016	0.19
PFOS	68	0.11	0.028	0.36
Fat content (%)	70	2.83	0.61	7.7

^a*n* shows the number of samples in which the compound was detected.

*blank level ~20% of median.