



EURL Interlaboratory Study on the Determination of Brominated Contaminants, PCNs, CPs and PFAS in Powdered Infant Milk / Formula

2024

EURL-ILS-BCF_2403-PIM

FOOD

Final report

PFASs

(Report Version 1.0)

06 March 2026



**Funded by
the European Union**

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Summary

Test sample	<p>Sample A: Powdered Infant Milk [2403-PIM-A]</p> <p>Sample B: Powdered Infant Milk [2403-PIM-B] - Blank</p>
Analytes of interest	<p>Fluorinated</p> <p>PFAS (PFOS, PFOA, PFNA, PFHxS, Sum parameters) other PFAS (PFCAs, PFSA etc.)</p>
Methods	Any kind of method
Participants	NRLs, OFLs, other official laboratories, commercial laboratories performing the analysis of samples taken by food business operators, research institutes and universities
Statistical evaluation	ISO 13528:2022 [1], IUPAC Protocol [2]
Final Report	06 March 2026
Publication	EURL POPs reserves all rights to publish and present the anonymised results of the interlaboratory study in scientific journals and/or during conferences.



1. Structure of the ILS, test material and analytes

This interlaboratory study (ILS) on the determination of several **brominated contaminants (BCons)**, **polychlorinated naphthalenes (PCNs)**, **polychlorinated alkanes (PCAs** – main constituent of CPs) and **per- and polyfluorinated substances (PFAS)** in Powdered Infant Milk / Formula was organized by the EURL for halogenated POPs in Feed and Food to be performed between July and October 2024. The objective was to assess analytical performance of laboratories and interlaboratory comparability of results from analyses of **PBDEs, HBCDDs, TBBPA, eBFRs, PBDD/Fs, PXDD/Fs, PBB, PCNs, PCAs** and **PFAS** in a Powdered Infant Milk test material.

Official laboratories, research laboratories, Universities and commercial laboratories performing the analysis of samples taken by food business operators are invited to participate in this interlaboratory study.

1.1. Samples and coding

Test sample A was prepared from commercially available Powdered Infant Milk and fortified with analytes of interest. Test sample B was prepared from the same commercially available Powdered Infant Milk but not fortified with analytes of interest.

Powdered Infant Milk A	Sample no. 2403-PIM-A-xxx
Powdered Infant Milk B (Blank)	Sample no. 2403-PIM-B-xxx

Each participant received about **100 g** of each test sample in a HDPE bottle.



1.2. Analytes of interest

Participants were strongly encouraged to determine as many of the following analyte groups as possible, but at least one of the analyte groups (as many analytes as possible from each group):

Fluorinated Contaminants:

■ Main PFAS

- Total perfluorooctane sulfonic acid (total PFOS¹), perfluorooctanoic acid (PFOA), perfluorononanoic acid (PFNA), perfluorohexane sulfonic acid (PFHxS)
- Sum of total PFOS¹, PFOA, PFNA, PFHxS

■ Additional PFASs and PFCAs

- **Perfluoroalkylsulfonic acids (PFASs):** perfluorobutanesulfonic acid (PFBS), perfluoropentanesulfonic acid (PFPeS), perfluoroheptanesulfonic acid (PFHpS), linear perfluorooctanesulfonic acid (L-PFOS), branched perfluorooctanesulfonic acids (br-PFOS), perfluorononanesulfonic acid (PFNS), perfluorodecanesulfonic acid (PFDS), perfluoroundecane sulfonic acid (PFUnDS), perfluorododecane sulfonic acid (PFDoDS), perfluorotridecane sulfonic acid (PFTrDS)
- **Perfluoroalkylcarboxylic acids (PFCAs):** perfluorobutanoic acid (PFBA), perfluoropentanoic acid (PFPeA), perfluoroheptanoic acid (PFHpA), perfluorodecanoic acid (PFDA), perfluoroundecanoic acid (PFUnDA), perfluorododecanoic acid (PFDoDA), perfluorotridecanoic acid (PFTrDA), perfluorotetradecanoic acid (PFTeDA)

■ Other PFAS

- Perfluorooctane sulphonamide (**FOSA**)
- 2,2,3-Trifluoro-3-[1,1,2,2,3,3-hexafluor-3-(trifluoromethoxy)propoxy]-propionic acid (**DONA**)
- 2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)-propanoic acid (**GenX**)
- Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate (major component of **F-53B**)
Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate (minor component of **F-53B**)
- 1-Propanaminium, N,N-dimethyl-N-oxide-3-[[3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, hydroxide (**Capstone A**)
- 1-Propanaminium, N-(carboxymethyl)-N,N-dimethyl-3-[[3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, hydroxide (**Capstone B**)

1.3. Methods

All kinds of detection and quantification methods may be applied.

¹ sum of linear and branched stereoisomers, whether they are chromatographically separated or not
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1.4. Coding of laboratories and confidentiality

The identity of participating laboratories will be kept confidential.

For NRLs of EU member states, the suggested “protocol for management of underperformance in comparative testing or lack of collaboration of National Reference Laboratories (NRLs)” will be followed. The confidentiality of NRLs will be kept according to this protocol.

For OFLs of EU member states cooperating with NRL, the respective NRLs will inform the EURL for halogenated POPs about the participating OFLs and will receive the respective laboratory codes, invoices for participation fee and certificates of participation of the OFLs

1.5. Results of PFAS

Laboratories should:

- use their own reference standards for identification and quantification,
- report results for each analyte,
- report upper and lower bound results for sum parameters,
- report the limit of quantification (LOQ), at least for each non-quantified analyte,
- give method information and
- give information about the accreditation of the laboratory according to ISO/IEC 17025 (*for metrological traceability of consensus values of participants used as assigned values*).

Results had to be reported in **µg/kg product** for **PFAS**. Product meaning dry powder as received (not reconstituted).

2. Participating laboratories

This proficiency test was open for participation of:

- National Reference Laboratories (NRLs) of EU member states
- National Reference Laboratories of other European countries
- Official laboratories
- Commercial laboratories

61 laboratories registered for this proficiency test. For PFAS 53 sets of results were reported.



3. Test for sufficient homogeneity

The test for sufficient homogeneity was performed according to ISO 13528:2022 [1] and the International Harmonized Protocol for the Proficiency Testing of Analytical Chemistry Laboratories [2]. Therefore, 10 portions of the test samples 2403-PIM-A were analysed in duplicate for PFAS. The test for sufficient homogeneity was performed for the individual substances. The test materials showed sufficient homogeneity for PFAS in this proficiency test.

4. Determination of the assigned value

Statistical evaluation of the PT results was performed by the EURL for halogenated POPs in feed and food according to ISO 13528:2022 [1] and the International Harmonized Protocol for the Proficiency Testing of Analytical Chemistry Laboratories [2].

The determination of the assigned value was performed according [1] by estimating of the assigned value as the consensus of participants' results (using only results of physico-chemical methods). The Huber robust mean was taken as assigned value after excluding extreme outliers (outside the range of $\pm 50\%$ of the median of all reported results) and examination of the distribution of the remaining results using histogram and Kernel density estimation, if necessary.

Assigned values were calculated for individual PFAS compounds, and sum parameters (including limits of quantification (LOQs)), if possible. Additionally, the median of all values was calculated.

For individual substances (including LOQs) assigned values were only calculated according to the above mentioned procedure, if more than 2/3 of all results are above the LOQ and less than 1/3 of all results (including LOQs) are outside the range of $\pm 50\%$ of the median of all reported results. Levels for individual congeners are only taken for evaluation and calculation if these levels are equal to or above the LOQ; otherwise the LOQ will be taken instead.

Due to high variation of participants' results, no assigned values could be calculated for:

- PFBA, PFHxA, PFHpA, PFUnDA, PFDODA
- PFBS, PFPeS, PFHpS, PFNS, PFDS, PFUnDS, PFDODS, PFTTrDS
- FOS, GenX, major component of F-53B, minor component of F-53B, Capstone A, Capstone B



4.1 Assigned values of individual substances and sum parameters

The assigned values for the test sample 2403-PIM-A were calculated as consensus of participants' results for individual PFAS, taking into account the calculation criteria described above (Table 1; tabular summary see annex 1).

Table 1: Assigned values for Perfluoroalkylcarboxylic acids for 2403-PIM-A (rounded to three significant figures)

Powdered Infant Milk A (2403-PIM-A)	Assigned value PFCAs µg/kg product
PFPeA	0.380
PFOA	0.258
PFNA	0.116
PFDA	0.203
PFTrDA	0.267
PFTeDA	0.183

Table 2: Assigned values for Perfluoroalkylsulfonic acids for 2403-PIM-A (rounded to three significant figures)

Powdered Infant Milk A (2403-PIM-A)	Assigned value PFSAs µg/kg product
PFHxS	0.0422
L-PFOS	0.0856
br-PFOS	0.0765
total PFOS	0.164

Table 3: Assigned values for other PFAS for 2403-PIM-A (rounded to three significant figures)

Powdered Infant Milk A (2403-PIM-A)	Assigned value other PFAS µg/kg product
DONA	0.205

Table 4: Assigned values for sum parameters for 2403-PIM-A (rounded to three significant figures)

Powdered Infant Milk A (2403-PIM-A)	Assigned value µg/kg product
Sum of Total PFOS, PFOA, PFNA, PFHxS (ub)	0.593
Sum of Total PFOS, PFOA, PFNA, PFHxS (lb)	0.569

5. Scoring of results – Z-scores

For evaluation of results, the z-scores were calculated according to the following formula:

$$z = \frac{(x - x_a)}{\sigma_{p_{rel}} * x_a}$$

x : participant's result

x_a : assigned value

$\sigma_{p_{rel}}$: relative fitness-for-purpose-based "standard deviation for proficiency assessment"

For individual substances and sum parameters, the standard deviation for proficiency assessment $\sigma_{p_{rel}}$ is defined as 20 %.

Z-scores for individual substances and sum parameters were only calculated and reported if levels for these congeners are equal to or above the LOQ. Otherwise, no z-scores will be given.

Interpretation of z-scores:

$ z\text{-score} \leq 2$	<i>satisfactory performance</i>
$2 < z\text{-score} < 3$	<i>questionable performance (warning signal)</i>
$ z\text{-score} \geq 3$	<i>unsatisfactory performance (action signal)</i>

5.1 Participants' z-scores of individual substances and sum parameters

Z-scores for individual substances were calculated (Tables 5 to 8; tabular summary see annex 3).

Table 5: Distribution of participants' z-scores for PFCAs for Powdered Infant Milk A (2403-PIM-A)

Percentage of participants' results PFCAs	$ z\text{-score} \leq 2$	$2 < z\text{-score} < 3$	$ z\text{-score} \geq 3$
PFPeA	95%	-	5%
PFOA	98%	2%	-
PFNA	96%	4%	-
PFDA	100%	-	-
PFTrDA	91%	3%	6%
PFTeDA	97%	-	3%

Table 6: Distribution of participants' z-scores for PFSA for Powdered Infant Milk A (2403-PIM-A)

Percentage of participants' results PFSA	$ z\text{-score} \leq 2$	$2 < z\text{-score} < 3$	$ z\text{-score} \geq 3$
PFHxS	95%	5%	-
L-PFOS	95%	-	5%
br-PFOS	88%	12%	-
total PFOS	98%	2%	-

Table 7: Distribution of participants' z-scores for other PFAS for Powdered Infant Milk A (2403-PIM-A)

Percentage of participants' results Other PFAS	$ z\text{-score} \leq 2$	$2 < z\text{-score} < 3$	$ z\text{-score} \geq 3$
DONA	97%	-	3%



Table 8: Distribution of participants' z-scores for sum parameters for Powdered Infant Milk A (2403-PIM-A)

Percentage of participants' results Sum parameters	$ z\text{-score} \leq 2$	$2 < z\text{-score} < 3$	$ z\text{-score} \geq 3$
Sum of Total PFOS, PFOA, PFNA, PFHxS (ub)	98%	-	2%
Sum of Total PFOS, PFOA, PFNA, PFHxS (lb)	98%	-	2%

6. Quality control

The Deutsche Akkreditierungsstelle GmbH attests that the provider of proficiency testing Chemisches und Veterinäruntersuchungsamt Freiburg, EU Reference Laboratory (EURL) for halogenated persistent organic pollutants (POPs) in feed and food is competent under the terms of DIN EN ISO/IEC 17043:2010 to carry out proficiency testing in the testing field of determination of halogenated persistent organic pollutants (POPs) in food and feed (Accreditation number: D-EP-18625-01-00).

7. Results of participants

An overview of the PFAS results for the PT test samples Powdered Infant Milk A and B (2403-PIM-A and 2403-PIM-B) is given in the following annexes. Laboratories are coded according to the laboratory codes sent after registration.

8. References

- [1] ISO 13528:2022, Statistical methods for use in proficiency testing by interlaboratory comparisons, International Organization for Standardization
- [2] M. Thompson, S.L.R. Ellison, R. Wood: The International Harmonized Protocol For The Proficiency Testing Of Analytical Chemistry Laboratories, Pure Appl. Chem., Vol. 78, No. 1, pp. 145-196, 2006.

9. Annex

Powdered Infant Milk – 2403-PIM	
1	2403-PIM-A - Assigned values – PFCAs, PFASs, sum parameters and DONA
2	2403-PIM-A - Participants' results – Tables – PFCAs, PFASs, sum parameters, other PFAS
3	2403-PIM-A - Participants' z-scores – Tables – PFCAs, PFASs, sum parameters, DONA
4	2403-PIM-A - Participants' z-scores – Charts – PFCAs, PFASs, sum parameters, DONA
5	2403-PIM-A - Test for homogeneity for PFAS
6	2403-PIM-B - Participants' results – Tables – PFCAs, PFASs, sum parameters, other PFAS
7	Overview of participants' methods

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Annex 1: Assigned values of PFCAs, PFSAs, sum of PFOS, PFOA, PFNA, PFHxS and DONA

Test sample - Powdered Infant Milk A (2403-PIM-A)

Assigned values of individual substances and sum parameters

Estimation of the assigned value as the consensus of participants' results

Assigned value = Huber robust mean after exclusion of extreme outliers



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Perfluoroalkylcarboxylic acids (PFCAs) - Assigned values

Analyte	Result µg/kg product	Assigned value [outliers removed]	Robust standard deviation [outliers removed]	Standard uncertainty [outliers removed]	No. of results contributing to assigned value	Median [all values]
Perfluorobutanoic acid (PFBA)						0.200
Perfluoropentanoic acid (PFPeA)		0.380	0.043	0.009	36	0.377
Perfluorohexanoic acid (PFHxA)						0.0400
Perfluoroheptanoic acid (PFHpA)						0.0200
Perfluorooctanoic acid (PFOA)		0.258	0.038	0.0067	51	0.257
Perfluorononanoic acid (PFNA)		0.116	0.016	0.0029	49	0.119
Perfluorodecanoic acid (PFDA)		0.203	0.032	0.0061	44	0.200
Perfluoroundecanoic acid (PFUnDA)						0.0200
Perfluorododecanoic acid (PFDoDA)						0.0200
Perfluorotridecanoic acid (PFTrDA)		0.267	0.064	0.014	34	0.270
Perfluorotetradecanoic acid (PFTeDA)		0.183	0.026	0.0057	32	0.180



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Perfluoroalkylsulfonic acids (PFASs) - Assigned values

Analyte	Result µg/kg product	Assigned value [outliers removed]	Robust standard deviation [outliers removed]	Standard uncertainty [outliers removed]	No. of results contributing to assigned value	Median [all values]
Perfluorobutanesulfonic acid (PFBS)						0.0190
Perfluoropentanesulfonic acid (PFPeS)						0.0175
Perfluorohexanesulfonic acid (PFHxS)		0.0422	0.0094	0.0017	49	0.0430
Perfluoroheptanesulfonic acid (PFHpS)						0.0200
Linear Perfluorooctanesulfonic acid (L-PFOS)		0.0856	0.012	0.0024	40	0.088
Sum of branched Perfluorooctanesulfonic acids (br-PFOS)		0.0765	0.015	0.0030	38	0.078
Sum of branched and linear perfluorooctanesulfonic acids (total PFOS)		0.164	0.028	0.0050	50	0.166
Perfluorononanesulfonic acid (PFNS)						0.0300
Perfluorodecanesulfonic acid (PFDS)						0.0250
Perfluoroundecane sulfonic acid (PFUnDS)						0.0500
Perfluorododecane sulfonic acid (PFDoDS)						0.0500
Perfluorotridecane sulfonic acid (PFTrDS)						0.0500



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Sum of PFOS, PFOA, PFNA, PFHxS - Assigned values

Analyte	Result µg/kg product	Assigned value [outliers removed]	Robust standard deviation [outliers removed]	Standard uncertainty [outliers removed]	No. of results contributing to assigned value	Median [all values]
Sum of total PFOS, PFOA, PFNA, PFHxS (ub)		0.593	0.085	0.015	48	0.590
Sum of total PFOS, PFOA, PFNA, PFHxS (lb)		0.569	0.083	0.015	49	0.572



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Other PFAS - Assigned values

Analyte	Result µg/kg product	Assigned value [outliers removed]	Robust standard deviation [outliers removed]	Standard uncertainty [outliers removed]	No. of results contributing to assigned value	Median [all values]
Perfluorooctane sulphonamide (FOSA)						0.0500
2,2,3-Trifluoro-3-[1,1,2,2,3,3-hexafluor-3-(trifluoromethoxy)propoxy]-propionic acid (DONA)		0.205	0.026	0.006	30	0.2010
2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)-propanoic acid (GenX)						0.0500
Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate (major component of F-53B)						0.0210
Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate (minor component of F-53B)						0.0500
1-Propanaminium, N,N-dimethyl-N-oxide-3-[[[(3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, hydroxide (Capstone A)						0.0250
1-Propanaminium, N-(carboxymethyl)-N,N-dimethyl-3-[[[(3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, hydroxide (Capstone B)						0.0500



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Annex 2: Participants' results of PFCAs, PFSAs, sum of PFOS, PFOA, PFNA, PFHxS and other PFASs

Test sample - Powdered Infant Milk A (2403-PIM-A)

* Modified/additional results reported after distribution of preliminary results to all participating laboratories

Powdered Infant Milk A (2403-PIM-A)
 Perfluoroalkylcarboxylic acids (PFCA) - Results

LC	Sample	Result µg/kg product	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
1	2403-PIM-A		< 0.1	0.4	< 0.01	< 0.01	0.32	0.17	0.25	< 0.1	< 0.05	0.27	0.18
2	2403-PIM-A		< 0.235	0.391			0.289	< 0.25	0.251			0.321	
4	2403-PIM-A		< 0.3	0.359	< 0.02	< 0.02	0.239	0.129	0.187	< 0.02	< 0.02	0.26	0.162
5	2403-PIM-A						0.246	0.126					
7	2403-PIM-A		< 1.26	0.39	< 0.12	< 0.07	0.26	0.11	0.21	< 0.04	< 0.05	0.21	0.22
10	2403-PIM-A		0.767	0.431	0.525	0.826	0.356	0.154	0.238	0.031	0.043	0.352	
11	2403-PIM-A						0.23	0.09					
12	2403-PIM-A			0.324	< 0.04	< 0.04	0.216	0.103	0.159	< 0.04	< 0.04		< 0.04
14	2403-PIM-A		< 0.1	0.357	< 0.1	< 0.1	0.236	0.103	0.192	< 0.1	< 0.1	< 0.3	< 0.3
15	2403-PIM-A		< 0.1	0.34	< 0.03	< 0.03	0.21	0.098	0.18	< 0.05	< 0.05	0.24	0.15
16	2403-PIM-A		0.0797	0.357	< 0.05	< 0.005	0.246	0.112	0.191	< 0.005	< 0.02	0.21	0.169
17	2403-PIM-A		< 0.5	0.435	< 0.015	< 0.015	0.285	0.137	0.241	< 0.015	< 0.015	0.348	0.176
18	2403-PIM-A		< 0.5	0.349	< 0.099	< 0.099	0.242	0.105	0.199	< 0.099	< 0.099	0.276	0.165
19	2403-PIM-A		< 0.2	0.412	< 0.05	< 0.015	0.264	0.117	0.207	< 0.015	< 0.05	0.276	0.192
20	2403-PIM-A						0.264	0.122	0.224				0.251
21	2403-PIM-A		< 0.1	0.378	< 0.02	< 0.02	0.268	0.108	0.195	< 0.02	< 0.02	0.31	0.183
22	2403-PIM-A		< 0.5	0.391	< 0.01	< 0.01	0.273	0.108	0.196	< 0.01	< 0.01	0.276	0.196
24	2403-PIM-A		< 0.04	< 0.04	< 0.04	< 0.04	0.273	0.128	0.198	< 0.04		0.274	0.189
25	2403-PIM-A			0.354			0.212	0.098	0.154			0.36	0.153
26	2403-PIM-A		< 0.546	0.39	< 0.009	0.009	0.285	0.171	0.276	< 0.017		< 0.01	< 0.01
27	2403-PIM-A						0.25	0.12					
28	2403-PIM-A				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
29	2403-PIM-A		< 0.5	0.343	< 0.05	< 0.05	0.24	0.104	0.238	< 0.05	< 0.05	0.236	0.232
30	2403-PIM-A		0.0553	0.405	< 0.01	< 0.01	0.261	0.111	0.213	< 0.01	< 0.01	0.563	0.187
31	2403-PIM-A		0.517	0.024	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.012	< 0.01	< 0.01
32	2403-PIM-A		< 0.4	0.37	< 0.2	< 0.05	0.24	0.19	0.24	< 0.05	< 0.05	0.21	0.2
33	2403-PIM-A		< 0.602	0.532	< 0.065	< 0.033	0.284	0.13	0.225	< 0.011	< 0.021	0.32	0.201
34	2403-PIM-A		< 0.5	0.52	< 0.05	< 0.05	0.38	0.12	0.23	< 0.05	< 0.05	0.37	0.31
35	2403-PIM-A		< 0.3	0.35	< 0.1	< 0.01	0.25	0.12	0.2	< 0.01	< 0.01	0.29	0.18
37	2403-PIM-A				< 0.025	< 0.01	0.313	0.133	0.26	< 0.013	< 0.011		
39	2403-PIM-A		< 0.1	0.378	< 0.01	< 0.01	0.26	0.119	0.212	< 0.01	< 0.01	0.309	0.209
40	2403-PIM-A				< 0.01	< 0.01	0.17	0.075	0.14	< 0.01	< 0.01	0.2	0.14
41	2403-PIM-A				< 0.05	< 0.1	0.212	0.097	0.165	< 0.005	< 0.005	0.194	0.137
43	2403-PIM-A				< 0.0025	0.00464	0.274	0.121	0.212	< 0.0025	< 0.0025	0.18	0.189
44	2403-PIM-A						0.336	0.144					
45	2403-PIM-A		0.09	0.37	< 0.05	< 0.05	0.26	0.13	0.22	< 0.05	< 0.05		
46	2403-PIM-A		< 0.2	0.432	< 0.01	< 0.01	0.275	0.123	0.201	< 0.01	< 0.01	0.179	0.169
47	2403-PIM-A		0.318	0.325	< 0.2	< 0.2	0.228	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
48	2403-PIM-A		0.097	0.386	< 0.05	< 0.01	0.273	0.13	0.214	< 0.05	< 0.05	0.253	0.193
49	2403-PIM-A		< 0.2	0.418	< 0.01	< 0.01	0.313	0.124	0.238	< 0.01	< 0.01	0.201	0.223
50	2403-PIM-A		< 0.5	0.322	< 0.02	< 0.01	0.209	0.098	0.17	< 0.01	< 0.01	0.313	0.157
51	2403-PIM-A				< 0.02	< 0.02	0.257	0.112	0.18	< 0.02	< 0.02		
52	2403-PIM-A						0.206	0.0939					
53	2403-PIM-A						0.29	0.12					
54	2403-PIM-A		< 2	0.32	< 0.05	< 0.05	0.22	0.1	0.18	< 0.05	< 0.05	0.29	0.18
55	2403-PIM-A		< 0.5	< 0.5	< 0.1	< 0.05	0.23	0.1	0.18	< 0.05	< 0.1	< 0.5	< 0.5
56	2403-PIM-A		< 0.05	0.351	< 0.05	< 0.05	0.248	0.128	0.17	< 0.05	< 0.05	0.088	
57	2403-PIM-A		< 0.01	0.426	< 0.01	< 0.01	0.303	0.126	0.245	< 0.01	< 0.01	< 0.01	< 0.01
58	2403-PIM-A		< 0.1	0.115	< 0.01	< 0.01	0.224	0.102	0.175	< 0.01	< 0.01	0.302	0.174
60	2403-PIM-A		0.0753	0.382	< 0.05	< 0.05	0.244	0.111	0.195	< 0.05	< 0.05	0.154	0.173
61	2403-PIM-A		0.051	0.325	< 0.01	< 0.01	0.203	0.102	0.154	< 0.01	< 0.01	0.247	0.155
93	2403-PIM-A						0.311	0.138					
49A	2403-PIM-A		< 0.2	0.377	< 0.01	< 0.01	0.265	0.11	0.212	< 0.01	< 0.01	0.33	0.208
57*	2403-PIM-A		< 0.01	0.426	< 0.01	< 0.01	0.303	0.126	0.245	< 0.01	< 0.01		

Powdered Infant Milk A (2403-PIM-A)
 Perfluoroalkylsulfonic acids (PFASs) - Results

LC	Sample	Result µg/kg product	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentanesulfon ic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptanesulfonic acid (PFHpS)	Linear Perfluorooctanesulfonic acid (L-PFOS)	Sum of branched Perfluorooctanesulfonic acid (br-PFOS)	Sum of branched and linear Perfluorooctanesulfonic acid (total PFOS)	Perfluorononane- sulfonic acid (PFNS)	Perfluorodecane- sulfonic acid (PFDS)	Perfluoroundecane- sulfonic acid (PFUnDS)	Perfluorododecane- sulfonic acid (PFDoDS)	Perfluorotridecane- sulfonic acid (PFTrDS)
1	2403-PIM-A		< 0.05	< 0.05	0.059	< 0.05	0.092	0.075	0.17	< 0.03	< 0.03		< 0.05	
2	2403-PIM-A				0.036	< 0.025	0.093	0.068	0.161					
4	2403-PIM-A		< 0.02	< 0.02	0.0422	< 0.02	0.104	0.0829	0.187	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
5	2403-PIM-A				0.0299		0.0734	0.119	0.192					
7	2403-PIM-A		< 0.04	< 0.03	0.039	< 0.03	0.089	0.098	0.187	< 0.04	< 0.06	< 0.07	< 0.08	< 0.1
10	2403-PIM-A		< 0.01	< 0.01	0.047	0.034	0.094	0.076	0.17	< 0.025	< 0.05	< 0.05	< 0.05	< 0.1
11	2403-PIM-A				< 0.06				0.13					
12	2403-PIM-A		< 0.04		< 0.04		0.075	0.083	0.158					
14	2403-PIM-A		< 0.1	< 0.1	< 0.1	< 0.1			0.138	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
15	2403-PIM-A		< 0.05	< 0.05	0.066	< 0.05	0.14	< 0.05	0.14	< 0.05	< 0.1	< 0.1	< 0.1	< 0.1
16	2403-PIM-A		< 0.02	< 0.005	0.032	< 0.005	0.0803	0.0684	0.149	< 0.005	< 0.02	< 0.02	< 0.005	< 0.01
17	2403-PIM-A		< 0.015	< 0.015	0.042	< 0.015	0.098	0.079	0.177	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
18	2403-PIM-A		< 0.089	< 0.094	< 0.037	< 0.047	0.076	0.059	0.135	< 0.097	< 0.097			
19	2403-PIM-A		< 0.015	< 0.015	0.052	< 0.015	0.089	0.067	0.156	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
20	2403-PIM-A				0.0385		0.0722	0.0765	0.149					
21	2403-PIM-A		< 0.02	< 0.02	0.042	< 0.02	0.091	0.072	0.163	< 0.02	< 0.02			
22	2403-PIM-A		< 0.01	< 0.01	0.058	< 0.01	0.083	0.082	0.165	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
24	2403-PIM-A		< 0.04		0.047				0.107					
25	2403-PIM-A				< 0.05		0.154	0.065	0.219					
26	2403-PIM-A		0.015	< 0.01	0.043	< 0.01	0.107	0.114	0.221	< 0.01	< 0.016			
27	2403-PIM-A				0.037				0.18					
28	2403-PIM-A			< 0.05	< 0.05	< 0.05	< 0.03	< 0.03		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
29	2403-PIM-A		< 0.05	< 0.05	< 0.05	< 0.05	0.097	0.07	0.167	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
30	2403-PIM-A		< 0.01	< 0.02	0.036	< 0.02	0.0835	0.102	0.185	< 0.01	< 0.02			
31	2403-PIM-A		< 0.01		< 0.01	< 0.01	< 0.01							
32	2403-PIM-A		< 0.05	< 0.05	0.03	< 0.05	0.1		0.15	< 0.2	< 0.2			
33	2403-PIM-A		< 0.018	< 0.014	0.047	< 0.018	0.088	0.078	0.166	< 0.038	< 0.017	< 0.077	< 0.024	< 0.007
34	2403-PIM-A		< 0.05	< 0.05	0.056	< 0.05			0.22	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
35	2403-PIM-A		< 0.01	< 0.01	0.046	< 0.01	0.066	0.06	0.13	< 0.1	< 0.1	< 0.1	< 0.1	< 0.01
37	2403-PIM-A		0.003	< 0.005	0.04	< 0.003	0.096	0.118	0.214					
39	2403-PIM-A		< 0.01	< 0.01	0.044	0.058	0.084	0.091	0.175	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
40	2403-PIM-A		< 0.01	< 0.01	0.022	< 0.01	0.057	0.036	0.093	< 0.01	< 0.01			
41	2403-PIM-A		< 0.00443	< 0.00484	0.031	< 0.095	0.064	0.06	0.124	< 0.00484	< 0.1			
43	2403-PIM-A		0.012		0.0329	< 0.0025			0.155		< 0.01			
44	2403-PIM-A				0.05				0.201					
45	2403-PIM-A				< 0.05		0.1	0.08	0.18					
46	2403-PIM-A		< 0.2	< 0.2	0.041	< 0.01	0.079	0.094	0.173	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
47	2403-PIM-A		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
48	2403-PIM-A		< 0.01	< 0.01	0.039	< 0.01	0.092	0.075	0.167	< 0.05	< 0.01	< 0.05	< 0.05	< 0.5
49	2403-PIM-A		< 0.01	< 0.01	0.044	< 0.01	0.098	0.108	0.206	< 0.01	< 0.01		< 0.01	
50	2403-PIM-A		< 0.02	< 0.05	0.029	< 0.01	0.075	0.052	0.127	< 0.01	< 0.01	< 0.02	< 0.05	< 0.05
51	2403-PIM-A				0.03		0.07	0.09	0.16					
52	2403-PIM-A				0.0488				0.141					
53	2403-PIM-A				< 0.03		0.09	0.09						
54	2403-PIM-A		< 0.05		< 0.05		0.08	0.08	0.16		< 0.05			
55	2403-PIM-A		< 0.05	< 0.1	< 0.05	< 0.1	0.085	0.082	0.167	< 0.1	< 0.1			
56	2403-PIM-A		< 0.05	< 0.05	< 0.05	< 0.05	0.09	0.078	0.168	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
57	2403-PIM-A		< 0.01	< 0.01	0.048	< 0.01	0.097	0.084	0.181	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
58	2403-PIM-A		< 0.01	< 0.01	0.0353	< 0.01	0.0739	0.0637	0.138	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
60	2403-PIM-A		< 0.05	< 0.05	0.0384	< 0.05	0.0806	0.0794	0.16	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
61	2403-PIM-A		< 0.01	< 0.01	0.0278	< 0.01	0.0677	0.0572	0.125	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
93	2403-PIM-A				0.046		0.087	0.048	0.135					
49A	2403-PIM-A		< 0.01	< 0.01	0.047	< 0.01	0.093	0.083	0.176	< 0.01	< 0.01		< 0.01	
57*	2403-PIM-A		< 0.01	< 0.01	0.048	< 0.01	0.097	0.084	0.181	< 0.01	< 0.01		< 0.01	

Powdered Infant Milk A (2403-PIM-A)
 Sum of PFOS, PFOA, PFNA, PFHxS - Results

LC	Sample	Result µg/kg product	Sum of total-PFOS, PFOA, PFNA, PFHxS	Sum of total-PFOS, PFOA, PFNA, PFHxS
			(lb)	(lb)
1	2403-PIM-A		0.719	0.719
2	2403-PIM-A		0.736	0.486
4	2403-PIM-A			0.597
5	2403-PIM-A		0.595	0.595
7	2403-PIM-A		0.602	0.602
10	2403-PIM-A		0.725	0.725
11	2403-PIM-A		0.48	
12	2403-PIM-A		0.517	0.477
14	2403-PIM-A		0.577	0.477
15	2403-PIM-A		0.62	0.52
16	2403-PIM-A		0.539	0.539
17	2403-PIM-A		0.641	0.641
18	2403-PIM-A		0.518	0.481
19	2403-PIM-A		0.59	0.59
20	2403-PIM-A		0.573	0.573
21	2403-PIM-A		0.581	0.581
22	2403-PIM-A		0.604	0.604
24	2403-PIM-A		0.554	0.554
25	2403-PIM-A		0.579	0.529
26	2403-PIM-A		0.72	0.72
27	2403-PIM-A			0.58
28	2403-PIM-A		0.2	
29	2403-PIM-A		0.561	0.511
30	2403-PIM-A		0.593	0.593
31	2403-PIM-A			
32	2403-PIM-A		0.53	0.53
33	2403-PIM-A		0.627	0.627
34	2403-PIM-A		0.77	0.77
35	2403-PIM-A		0.55	0.55
37	2403-PIM-A		0.7	0.7
39	2403-PIM-A		0.598	0.598
40	2403-PIM-A		0.36	0.36
41	2403-PIM-A		0.464	0.464
43	2403-PIM-A		0.583	0.583
44	2403-PIM-A		0.732	0.732
45	2403-PIM-A		0.62	0.57
46	2403-PIM-A		0.613	0.613
47	2403-PIM-A		0.828	0.228
48	2403-PIM-A		0.609	0.609
49	2403-PIM-A		0.689	0.689
50	2403-PIM-A		0.463	0.463
51	2403-PIM-A		0.56	0.56
52	2403-PIM-A			0.49
53	2403-PIM-A		0.53	0.5
54	2403-PIM-A		0.54	0.48
55	2403-PIM-A		0.55	0.5
56	2403-PIM-A		0.594	0.544
57	2403-PIM-A		0.658	0.658
58	2403-PIM-A		0.499	0.499
60	2403-PIM-A		0.554	0.554
61	2403-PIM-A		0.457	0.457
93	2403-PIM-A		0.63	0.63
49A	2403-PIM-A		0.598	0.598
57*	2403-PIM-A		0.658	0.658

Powdered Infant Milk A (2403-PIM-A)
 Other PFAS - Results

LC	Sample	Result µg/kg product	Perfluorooctane sulphonamide	2,2,3-Trifluoro-3-[1,1,2,2,3,3-hexafluoro-3-(trifluoromethoxy)propoxy]-propionic acid	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)-propanoic acid	Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	1-Propanaminium, N,N-dimethyl-N-oxide-3-[[[(3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, hydroxide	1-Propanaminium, N-(carboxymethyl)-N,N-dimethyl-3-[[[(3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, hydroxide
			FOSA	DONA	GenX	(major component of F-53B)	(minor component of F-53B)	Capstone A	Capstone B
1	2403-PIM-A		< 0.01	0.25	< 0.05	< 0.05	< 0.05		
2	2403-PIM-A								
4	2403-PIM-A		< 0.02	0.206	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
5	2403-PIM-A								
7	2403-PIM-A			0.221					
10	2403-PIM-A		0.054	< 0.01	< 0.01	< 0.01	< 0.01	< 0.025	< 0.025
11	2403-PIM-A		< 0.3	0.18	< 0.5	< 0.1	< 0.1		
12	2403-PIM-A								
14	2403-PIM-A								
15	2403-PIM-A		< 0.1	0.16	< 0.1	< 0.05			
16	2403-PIM-A		< 0.05	0.222					
17	2403-PIM-A			0.2	< 0.015	< 0.015	< 0.015		
18	2403-PIM-A			0.181		< 0.092	< 0.094		
19	2403-PIM-A			0.211	< 0.05	< 0.015	< 0.05		
20	2403-PIM-A			0.2					
21	2403-PIM-A		< 0.02	0.224	< 0.25	< 0.02	< 0.02		
22	2403-PIM-A			0.501	< 0.01	< 0.01	< 0.01		
24	2403-PIM-A								
25	2403-PIM-A								
26	2403-PIM-A		< 0.01	0.246	< 0.05	< 0.005	< 0.005		
27	2403-PIM-A			0.207	< 0.05	< 0.05	< 0.05		
28	2403-PIM-A								
29	2403-PIM-A								
30	2403-PIM-A			0.207	< 0.02				
31	2403-PIM-A		< 0.01						
32	2403-PIM-A			0.19	< 0.05	< 0.05	< 0.05		
33	2403-PIM-A		< 0.188	< 0.018	< 0.012	< 0.021	< 0.022		
34	2403-PIM-A		< 0.05	0.27	< 0.05	< 0.05	< 0.05	< 0.1	< 0.3
35	2403-PIM-A		< 0.01	0.17	< 0.1	< 0.01	< 0.01		
37	2403-PIM-A								
39	2403-PIM-A			0.251	< 0.01	< 0.01	< 0.01		
40	2403-PIM-A				< 0.05				
41	2403-PIM-A			0.148					
43	2403-PIM-A			0.201	< 0.0025				
44	2403-PIM-A								
45	2403-PIM-A				< 0.1				
46	2403-PIM-A		< 0.01	< 0.2	< 0.01	< 0.01	< 0.2	< 0.2	< 0.2
47	2403-PIM-A		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2		
48	2403-PIM-A			0.192	< 0.05	< 0.05	< 0.05		
49	2403-PIM-A		< 0.2	0.153	< 0.5	< 0.1	< 0.1		
50	2403-PIM-A			0.201	< 0.1	< 0.01	< 0.01	< 0.01	< 0.2
51	2403-PIM-A								
52	2403-PIM-A								
53	2403-PIM-A								
54	2403-PIM-A		< 0.05						
55	2403-PIM-A								
56	2403-PIM-A				< 0.05	< 0.05	< 0.05		
57	2403-PIM-A		< 0.01	0.221	< 0.01				
58	2403-PIM-A		< 0.01	0.215	< 0.01	< 0.005	< 0.005	< 0.01	< 0.01
60	2403-PIM-A		< 0.05	0.222	< 0.05	< 0.05	< 0.25		
61	2403-PIM-A		< 0.01	0.188	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05
93	2403-PIM-A								
49A	2403-PIM-A		< 0.2	0.22	< 0.5	< 0.1	< 0.1		
57*	2403-PIM-A		< 0.01	0.221	< 0.01				



**EURL Interlaboratory Study on the Determination of Brominated Contaminants, PCNs, CPs and PFAS in Powdered Infant Milk / Formula 2024
[EURL-ILS-BCF_2403-PIM]**

EURL for Halogenated Persistent Organic Pollutants (POPs) in Feed and Food

06 March 2026

Annex 3: Participants' z-scores of PFCAs, PFSA's and sum of PFOS, PFOA, PFNA, PFHxS

Test sample - Powdered Infant Milk A (2403-PIM-A)

Z-scores of individual substances and sum parameters

Calculation of z-score on basis of assigned value

$$z = (x - x_a) / \sigma_{\text{prel}} * x_a$$

x_a : assigned value

x : participant's result

σ_{prel} : relative fitness-for-purpose-based standard deviation for proficiency assessment

20%: Evaluated individual substances and sum parameters

* Modified/additional results reported after distribution of preliminary results to all participating laboratories

Powdered Infant Milk A (2403-PIM-A)
Perfluoroalkylcarboxylic acids (PFCAs) - Z-scores

LC	Sample	Z-score [σ _p = 20 %]	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
1	2403-PIM-A			0.3			1.2	2.3	1.2			0.1	-0.1
2	2403-PIM-A			0.1			0.6		1.2			1.0	
4	2403-PIM-A			-0.3			-0.4	0.6	-0.4			-0.1	-0.6
5	2403-PIM-A						-0.2	0.4					
7	2403-PIM-A			0.1			0.0	-0.3	0.2			-1.1	1.0
10	2403-PIM-A			0.7			1.9	1.6	0.9			1.6	
11	2403-PIM-A						-0.5	-1.1					
12	2403-PIM-A			-0.7			-0.8	-0.6	-1.1				
14	2403-PIM-A			-0.3			-0.4	-0.6	-0.3				
15	2403-PIM-A			-0.5			-0.9	-0.8	-0.6			-0.5	-0.9
16	2403-PIM-A			-0.3			-0.2	-0.2	-0.3			-1.1	-0.4
17	2403-PIM-A			0.7			0.5	0.9	0.9			1.5	-0.2
18	2403-PIM-A			-0.4			-0.3	-0.5	-0.1			0.2	-0.5
19	2403-PIM-A			0.4			0.1	0.0	0.1			0.2	0.2
20	2403-PIM-A						0.1	0.3	0.5				1.9
21	2403-PIM-A			0.0			0.2	-0.3	-0.2			0.8	0.0
22	2403-PIM-A			0.1			0.3	-0.3	-0.2			0.2	0.4
24	2403-PIM-A						0.3	0.5	-0.1			0.1	0.2
25	2403-PIM-A			-0.3			-0.9	-0.8	-1.2			1.7	-0.8
26	2403-PIM-A			0.1			0.5	2.4	1.8				
27	2403-PIM-A						-0.2	0.2					
28	2403-PIM-A												
29	2403-PIM-A			-0.5			-0.3	-0.5	0.9			-0.6	1.3
30	2403-PIM-A			0.3			0.1	-0.2	0.2			5.5	0.1
31	2403-PIM-A			-4.7									
32	2403-PIM-A			-0.1			-0.3	0.2	-0.3			-1.1	0.5
33	2403-PIM-A			2.0			0.5	0.6	0.5			1.0	0.5
34	2403-PIM-A			1.8			2.4	0.2	0.7			1.9	3.5
35	2403-PIM-A			-0.4			-0.2	0.2	-0.1			0.4	-0.1
37	2403-PIM-A						1.1	0.7	1.4				
39	2403-PIM-A			0.0			0.0	0.1	0.2			0.8	0.7
40	2403-PIM-A						-1.7	-1.8	-1.6			-1.3	-1.2
41	2403-PIM-A						-0.9	-0.8	-0.9			-1.4	-1.3
43	2403-PIM-A						0.3	0.2	0.2			-1.6	0.2
44	2403-PIM-A						1.5	1.2					
45	2403-PIM-A			-0.1			0.0	0.6	0.4				
46	2403-PIM-A			0.7			0.3	0.3	0.0			-1.6	-0.4
47	2403-PIM-A			-0.7			-0.6						
48	2403-PIM-A			0.1			0.3	0.6	0.3			-0.3	0.3
49	2403-PIM-A			0.5			1.1	0.3	0.9			-1.2	1.1
50	2403-PIM-A			-0.8			-0.9	-0.8	-0.8			0.9	-0.7
51	2403-PIM-A						0.0	-0.2	-0.6				
52	2403-PIM-A						-1.0	-1.0					
53	2403-PIM-A						0.6	0.2					
54	2403-PIM-A			-0.8			-0.7	-0.7	-0.6			0.4	-0.1
55	2403-PIM-A						-0.5	-0.7	-0.6				
56	2403-PIM-A			-0.4			-0.2	0.5	-0.8			-3.4	
57	2403-PIM-A			0.6			0.9	0.4	1.0				
58	2403-PIM-A			-3.5			-0.7	-0.6	-0.7			0.7	-0.2
60	2403-PIM-A			0.0			-0.3	-0.2	-0.2			-2.1	-0.3
61	2403-PIM-A			-0.7			-1.1	-0.6	-1.2			-0.4	-0.8
93	2403-PIM-A						1.0	0.9					
49A	2403-PIM-A			0.0			0.1	-0.3	0.2			1.2	0.7
57*	2403-PIM-A			0.6			0.9	0.4	1.0				

Powdered Infant Milk A (2403-PIM-A)
 Perfluoroalkylsulfonic acids (PFASs) - Z-scores

LC	Sample	Z-score [σ _p = 20 %]	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentanesulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptanesulfonic acid (PFHpS)	Linear Perfluorooctanesulfonic acid (L-PFOS)	Sum of branched Perfluorooctanesulfonic acid (br-PFOS)	Sum of branched and linear Perfluorooctanesulfonic acid (total PFOS)	Perfluorononane- sulfonic acid (PFNS)	Perfluorodecane- sulfonic acid (PFDS)	Perfluoroundecane- sulfonic acid (PFUnDS)	Perfluorododecane- sulfonic acid (PFDoDS)	Perfluorotridecane- sulfonic acid (PFTrDS)
1	2403-PIM-A				2.0		0.4	-0.1	0.2					
2	2403-PIM-A				-0.7		0.4	-0.6	-0.1					
4	2403-PIM-A				0.0		1.1	0.4	0.7					
5	2403-PIM-A				-1.5		-0.7	2.8	0.9					
7	2403-PIM-A				-0.4		0.2	1.4	0.7					
10	2403-PIM-A				0.6		0.5	0.0	0.2					
11	2403-PIM-A								-1.0					
12	2403-PIM-A						-0.6	0.4	-0.2					
14	2403-PIM-A								-0.8					
15	2403-PIM-A				2.8		3.2							
16	2403-PIM-A				-1.2		-0.3	-0.5	-0.5					
17	2403-PIM-A				0.0		0.7	0.2	0.4					
18	2403-PIM-A						-0.6	-1.1	-0.9					
19	2403-PIM-A				1.2		0.2	-0.6	-0.2					
20	2403-PIM-A				-0.4		-0.8	0.0	-0.5					
21	2403-PIM-A				0.0		0.3	-0.3	0.0					
22	2403-PIM-A				1.9		-0.2	0.4	0.0					
24	2403-PIM-A				0.6				-1.7					
25	2403-PIM-A						4.0	-0.8	1.7					
26	2403-PIM-A				0.1		1.3	2.5	1.7					
27	2403-PIM-A				-0.6				0.5					
28	2403-PIM-A													
29	2403-PIM-A						0.7	-0.4	0.1					
30	2403-PIM-A				-0.7		-0.1	1.7	0.6					
31	2403-PIM-A													
32	2403-PIM-A				-1.4		0.8		-0.4					
33	2403-PIM-A				0.6		0.1	0.1	0.1					
34	2403-PIM-A				1.6				1.7					
35	2403-PIM-A				0.5		-1.1	-1.1	-1.0					
37	2403-PIM-A				-0.3		0.6	2.7	1.5					
39	2403-PIM-A				0.2		-0.1	0.9	0.3					
40	2403-PIM-A				-2.4		-1.7	-2.6	-2.2					
41	2403-PIM-A				-1.3		-1.3	-1.1	-1.2					
43	2403-PIM-A				-1.1				-0.3					
44	2403-PIM-A				0.9				1.1					
45	2403-PIM-A						0.8	0.2	0.5					
46	2403-PIM-A				-0.1		-0.4	1.1	0.3					
47	2403-PIM-A													
48	2403-PIM-A				-0.4		0.4	-0.1	0.1					
49	2403-PIM-A				0.2		0.7	2.1	1.3					
50	2403-PIM-A				-1.6		-0.6	-1.6	-1.1					
51	2403-PIM-A				-1.4		-0.9	0.9	-0.1					
52	2403-PIM-A				0.8				-0.7					
53	2403-PIM-A						0.3	0.9						
54	2403-PIM-A						-0.3	0.2	-0.1					
55	2403-PIM-A						0.0	0.4	0.1					
56	2403-PIM-A						0.3	0.1	0.1					
57	2403-PIM-A				0.7		0.7	0.5	0.5					
58	2403-PIM-A				-0.8		-0.7	-0.8	-0.8					
60	2403-PIM-A				-0.5		-0.3	0.2	-0.1					
61	2403-PIM-A				-1.7		-1.0	-1.3	-1.2					
93	2403-PIM-A				0.5		0.1	-1.9	-0.9					
49A	2403-PIM-A				0.6		0.4	0.4	0.4					
57*	2403-PIM-A				0.7		0.7	0.5	0.5					

Powdered Infant Milk A (2403-PIM-A)

Sum of Total PFOS, PFOA, PFNA, PFHxS - Z-scores

LC	Sample	Z-score [$\sigma_p = 20\%$]	Sum of Total PFOS, PFOA, PFNA, PFHxS (ub)	Sum of Total PFOS, PFOA, PFNA, PFHxS (lb)
1	2403-PIM-A		1.1	1.3
2	2403-PIM-A		1.2	-0.7
4	2403-PIM-A			0.2
5	2403-PIM-A		0.0	0.2
7	2403-PIM-A		0.1	0.3
10	2403-PIM-A		1.1	1.4
11	2403-PIM-A		-1.0	
12	2403-PIM-A		-0.6	-0.8
14	2403-PIM-A		-0.1	-0.8
15	2403-PIM-A		0.2	-0.4
16	2403-PIM-A		-0.5	-0.3
17	2403-PIM-A		0.4	0.6
18	2403-PIM-A		-0.6	-0.8
19	2403-PIM-A		0.0	0.2
20	2403-PIM-A		-0.2	0.0
21	2403-PIM-A		-0.1	0.1
22	2403-PIM-A		0.1	0.3
24	2403-PIM-A		-0.3	-0.1
25	2403-PIM-A		-0.1	-0.4
26	2403-PIM-A		1.1	1.3
27	2403-PIM-A			0.1
28	2403-PIM-A		-3.3	
29	2403-PIM-A		-0.3	-0.5
30	2403-PIM-A		0.0	0.2
31	2403-PIM-A			
32	2403-PIM-A		-0.5	-0.3
33	2403-PIM-A		0.3	0.5
34	2403-PIM-A		1.5	1.8
35	2403-PIM-A		-0.4	-0.2
37	2403-PIM-A		0.9	1.2
39	2403-PIM-A		0.0	0.3
40	2403-PIM-A		-2.0	-1.8
41	2403-PIM-A		-1.1	-0.9
43	2403-PIM-A		-0.1	0.1
44	2403-PIM-A		1.2	1.4
45	2403-PIM-A		0.2	0.0
46	2403-PIM-A		0.2	0.4
47	2403-PIM-A		2.0	-3.0
48	2403-PIM-A		0.1	0.4
49	2403-PIM-A		0.8	1.1
50	2403-PIM-A		-1.1	-0.9
51	2403-PIM-A		-0.3	-0.1
52	2403-PIM-A			-0.7
53	2403-PIM-A		-0.5	-0.6
54	2403-PIM-A		-0.4	-0.8
55	2403-PIM-A		-0.4	-0.6
56	2403-PIM-A		0.0	-0.2
57	2403-PIM-A		0.5	0.8
58	2403-PIM-A		-0.8	-0.6
60	2403-PIM-A		-0.3	-0.1
61	2403-PIM-A		-1.1	-1.0
93	2403-PIM-A		0.3	0.5
49A	2403-PIM-A		0.0	0.3
57*	2403-PIM-A		0.5	0.8

Powdered Infant Milk A (2403-PIM-A)
 Other PFAS - Z-scores

LC	Sample	Z-score [σ _p = 20 %]	Perfluorooctane sulphonamide FOSA	2,2,3-Trifluoro-3-[1,1,2,2,3,3-hexafluor-3-(trifluoromethoxy)propoxy]-propionic acid DONA	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)-propanoic acid GenX	Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate (major component of F-53B)	Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate (minor component of F-53B)	1-Propanaminium, N,N-dimethyl-N-oxide-3-[[[3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-hydroxide Capstone A	1-Propanaminium, N-(carboxymethyl)-N,N-dimethyl-3-[[[3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-hydroxide Capstone B
1	2403-PIM-A			1.1					
2	2403-PIM-A								
4	2403-PIM-A			0.0					
5	2403-PIM-A								
7	2403-PIM-A			0.4					
10	2403-PIM-A								
11	2403-PIM-A			-0.6					
12	2403-PIM-A								
14	2403-PIM-A								
15	2403-PIM-A			-1.1					
16	2403-PIM-A			0.4					
17	2403-PIM-A			-0.1					
18	2403-PIM-A			-0.6					
19	2403-PIM-A			0.1					
20	2403-PIM-A			-0.1					
21	2403-PIM-A			0.5					
22	2403-PIM-A			7.2					
24	2403-PIM-A								
25	2403-PIM-A								
26	2403-PIM-A			1.0					
27	2403-PIM-A			0.0					
28	2403-PIM-A								
29	2403-PIM-A								
30	2403-PIM-A			0.0					
31	2403-PIM-A								
32	2403-PIM-A			-0.4					
33	2403-PIM-A								
34	2403-PIM-A			1.6					
35	2403-PIM-A			-0.9					
37	2403-PIM-A								
39	2403-PIM-A			1.1					
40	2403-PIM-A								
41	2403-PIM-A			-1.4					
43	2403-PIM-A			-0.1					
44	2403-PIM-A								
45	2403-PIM-A								
46	2403-PIM-A								
47	2403-PIM-A								
48	2403-PIM-A			-0.3					
49	2403-PIM-A			-1.3					
50	2403-PIM-A			-0.1					
51	2403-PIM-A								
52	2403-PIM-A								
53	2403-PIM-A								
54	2403-PIM-A								
55	2403-PIM-A								
56	2403-PIM-A								
57	2403-PIM-A			0.4					
58	2403-PIM-A			0.2					
60	2403-PIM-A			0.4					
61	2403-PIM-A			-0.4					
93	2403-PIM-A								
49A	2403-PIM-A			0.4					
57*	2403-PIM-A			0.4					



**EURL Interlaboratory Study on the Determination of Brominated Contaminants, PCNs, CPs and PFAS in Powdered Infant Milk / Formula 2024
[EURL-ILS-BCF_2403-PIM]**

EURL for Halogenated Persistent Organic Pollutants (POPs) in Feed and Food

06 March 2026

Annex 4: Participants' z-scores of PFCAs, PFSA, and sum of PFOS, PFOA, PFNA, PFHxS - charts

Test sample - Powdered Infant Milk A (2403-PIM-A)

Z-scores of individual substances and sum parameters

Calculation of z-score on basis of assigned value

$$z = (x - x_a) / \sigma_{\text{prel}} * x_a$$

x_a : assigned value

x : participant's result

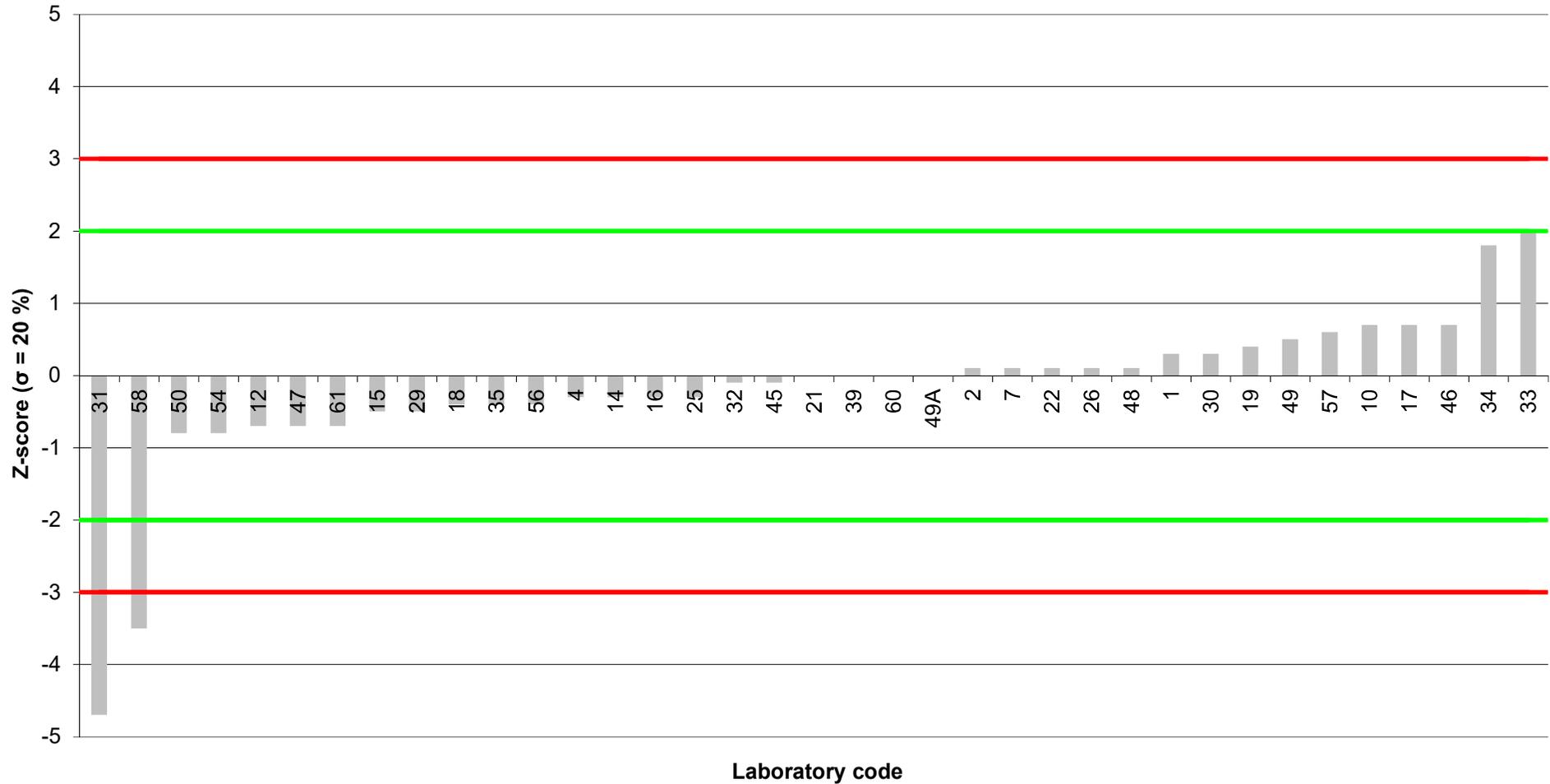
σ_{prel} : relative fitness-for-purpose-based standard deviation for proficiency assessment

20%: Evaluated individual substances and sum parameters

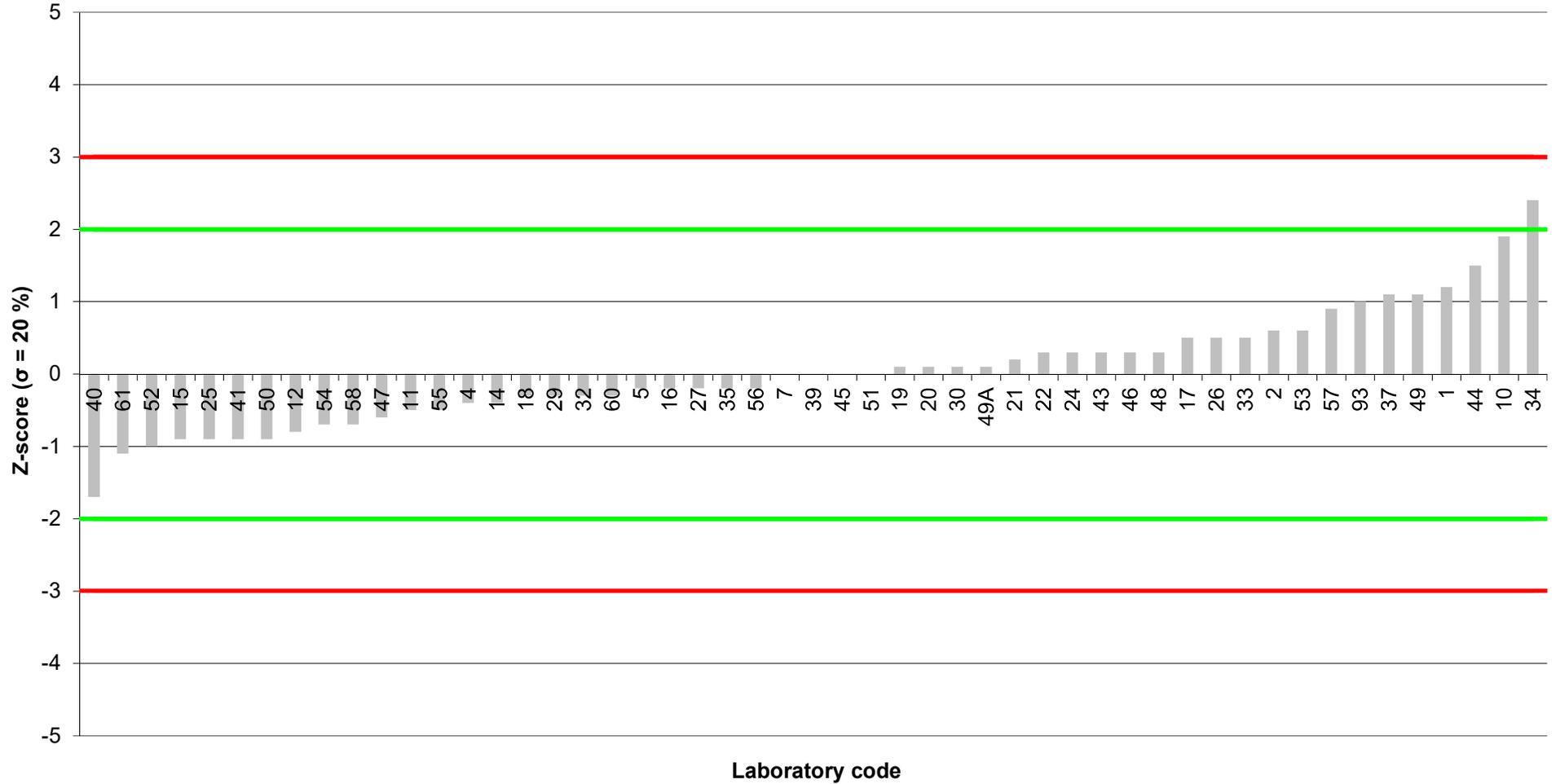
± 2 z-scores: 

± 3 z-scores: 

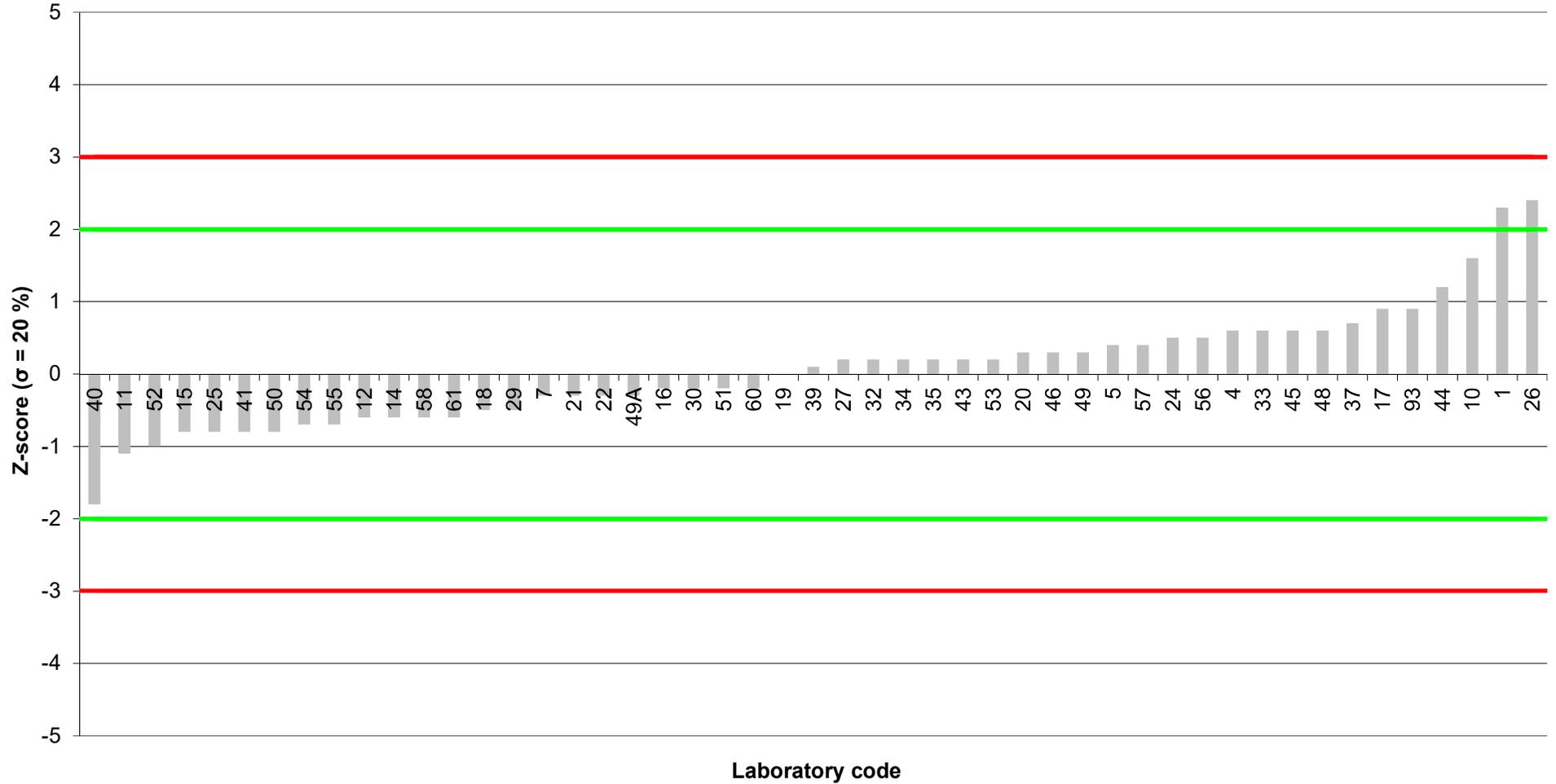
EURL-ILS-BCF_2403-PIM - A
Perfluoropentanoic acid
Assigned value: 0.38 µg/kg product



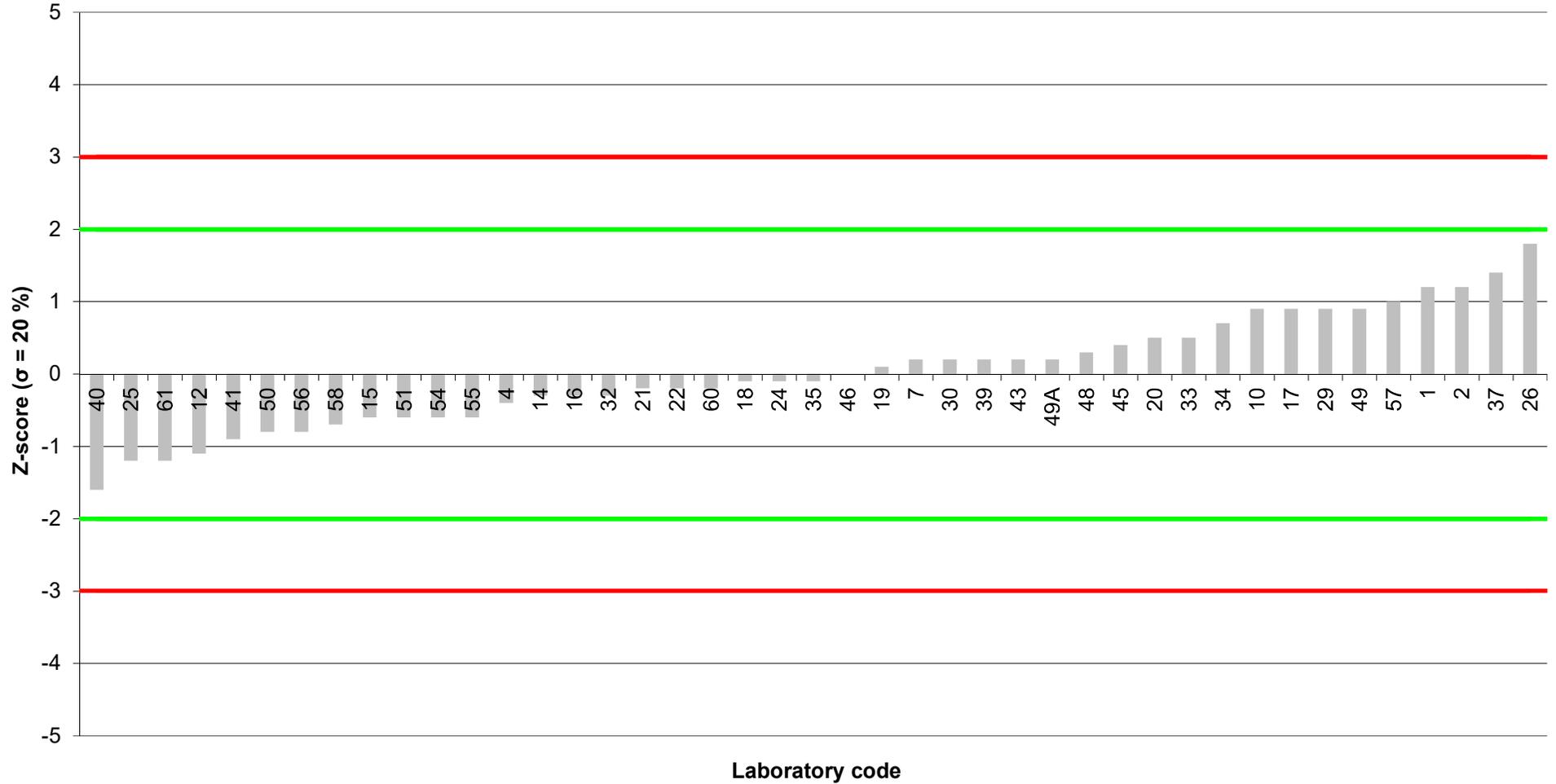
EURL-ILS-BCF_2403-PIM - A
Perfluorooctanoic acid
Assigned value: 0.258 µg/kg product



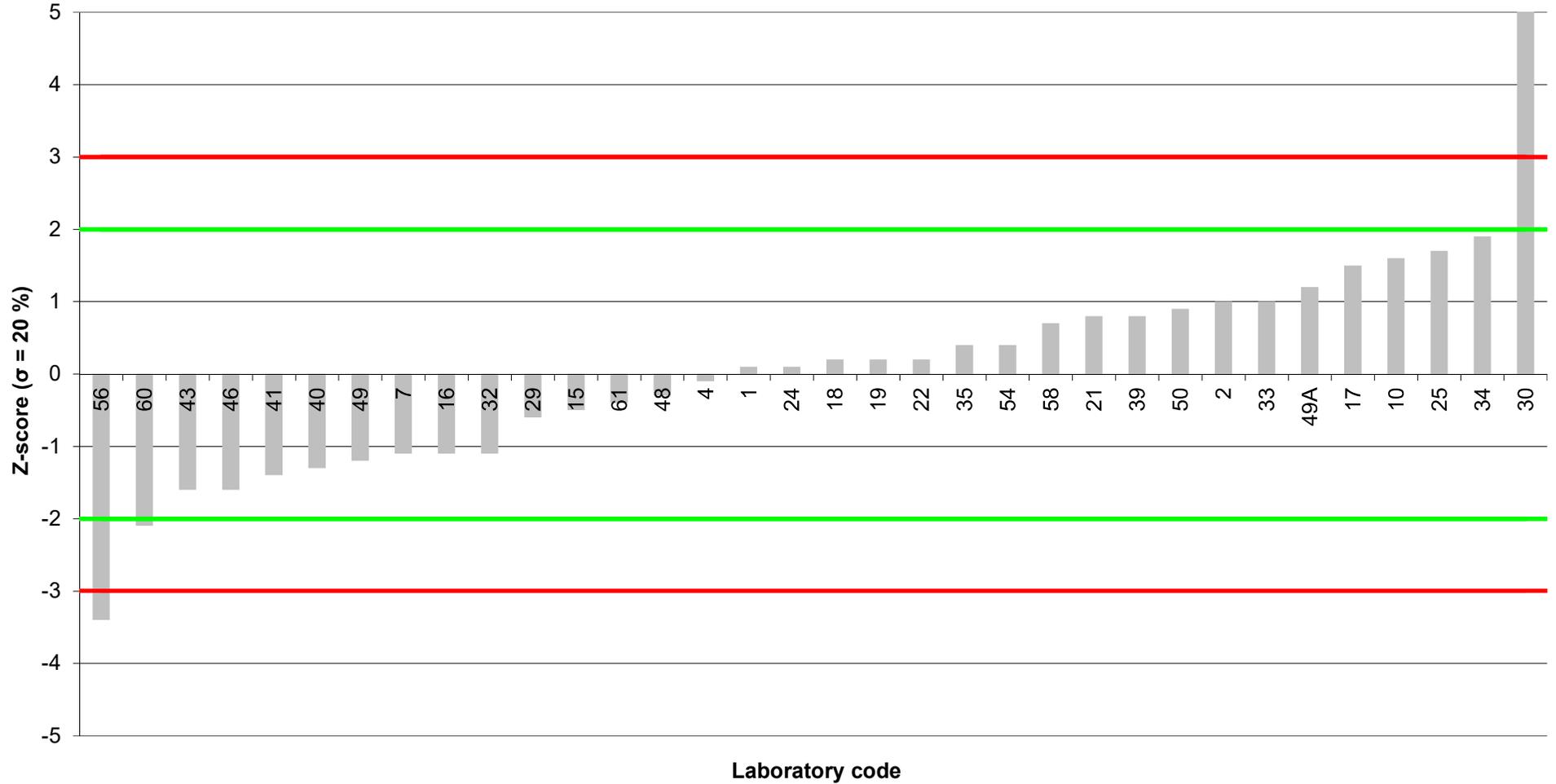
EURL-ILS-BCF_2403-PIM - A
Perfluorononanoic acid
Assigned value: 0.116 µg/kg product



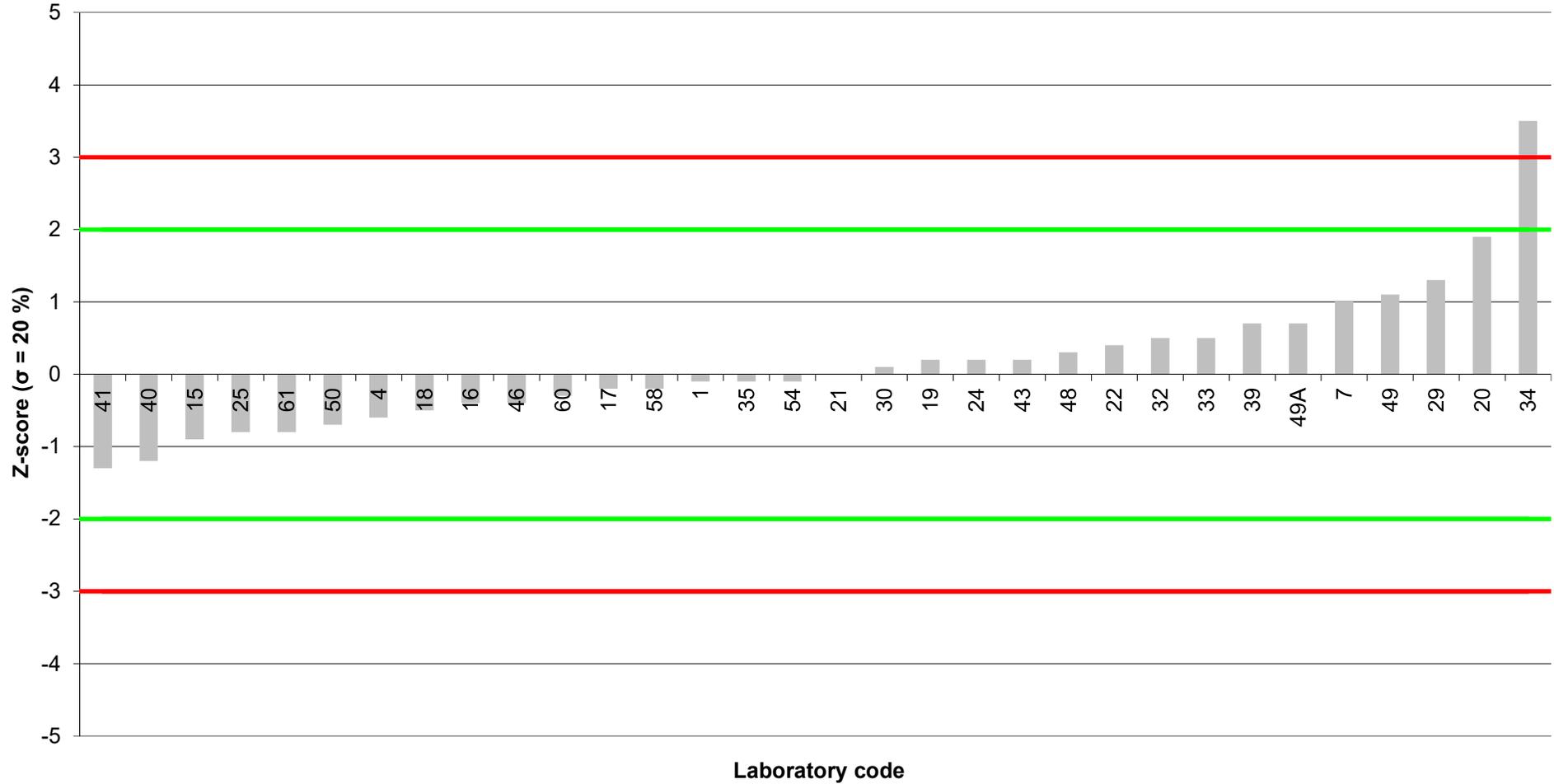
EURL-ILS-BCF_2403-PIM - A
Perfluorodecanoic acid
Assigned value: 0.203 µg/kg product



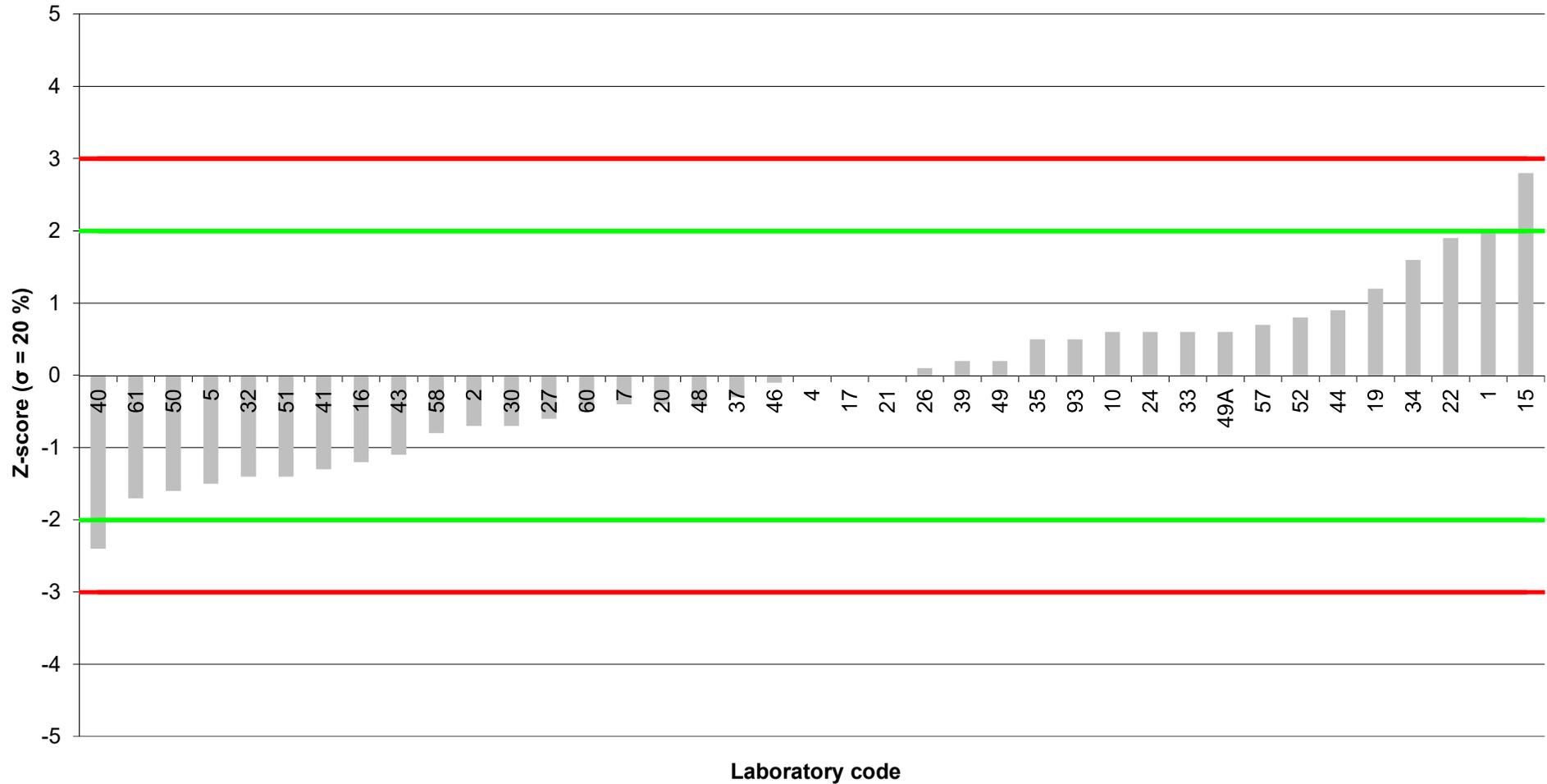
EURL-ILS-BCF_2403-PIM - A
Perfluorotridecanoic acid
Assigned value: 0.267 µg/kg product



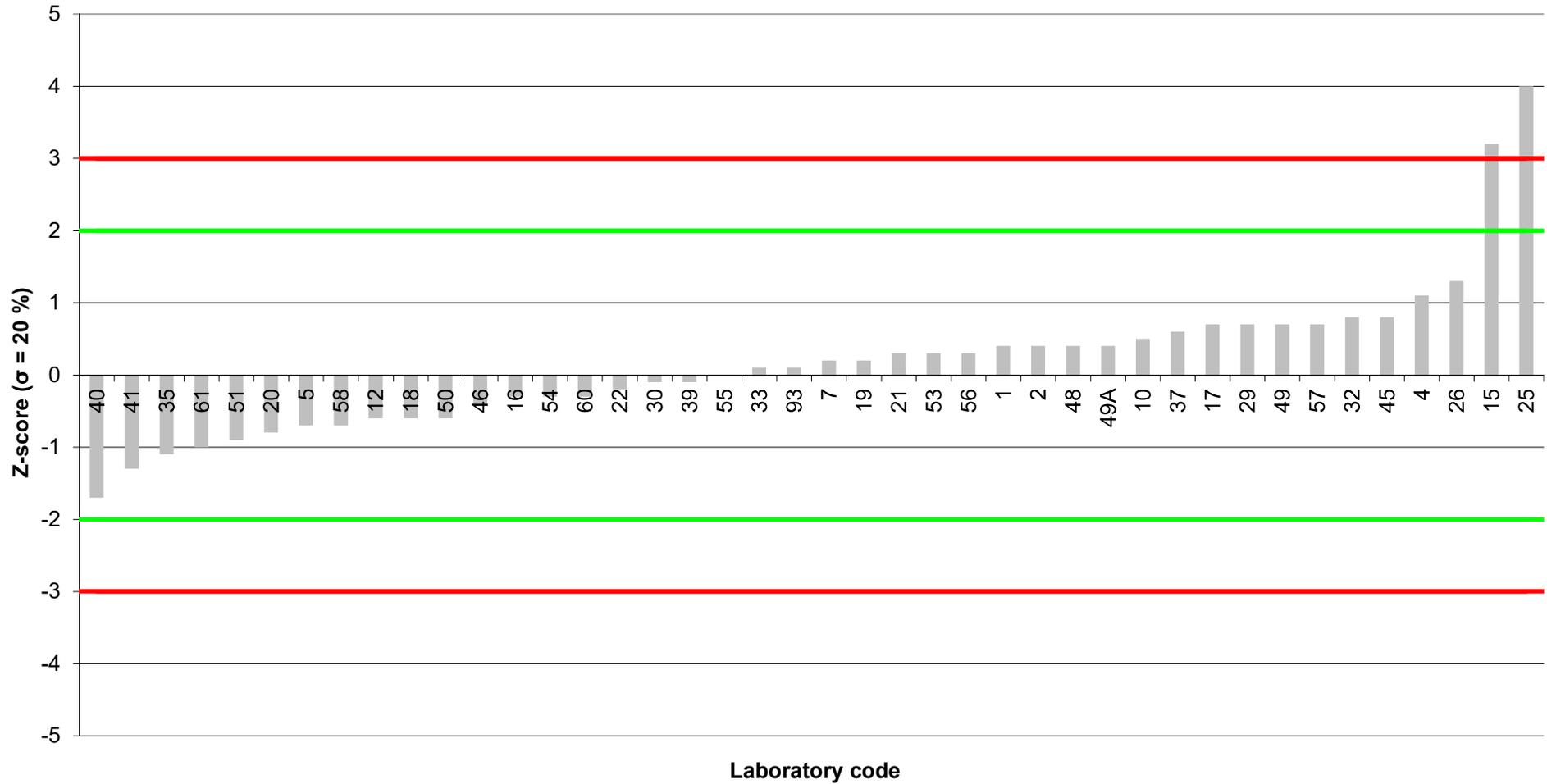
EURL-ILS-BCF_2403-PIM - A
Perfluorotetradecanoic acid
Assigned value: 0.183 µg/kg product



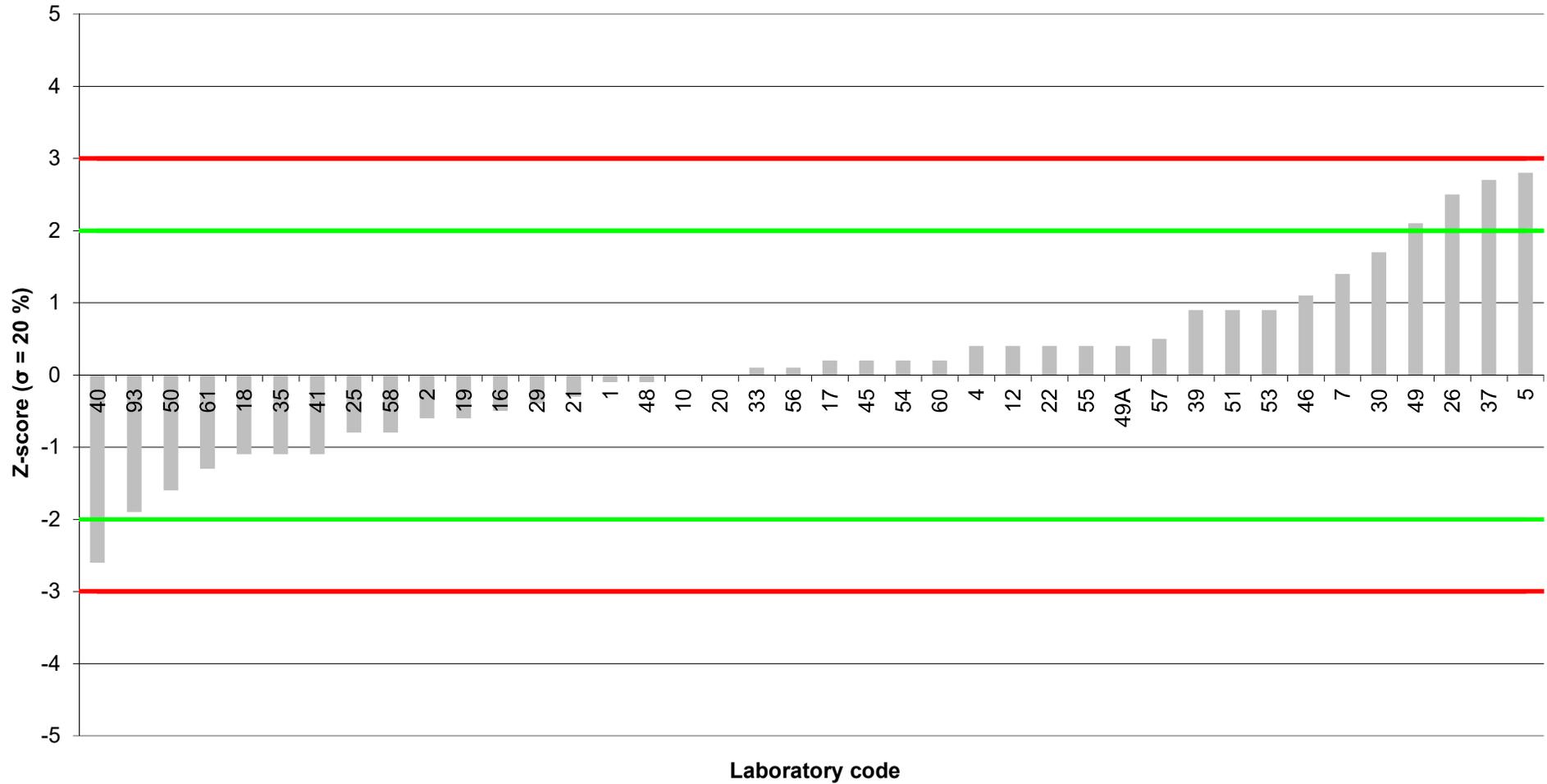
EURL-ILS-BCF_2403-PIM - A
Perfluorohexanesulfonic acid
Assigned value: 0.0422 µg/kg product



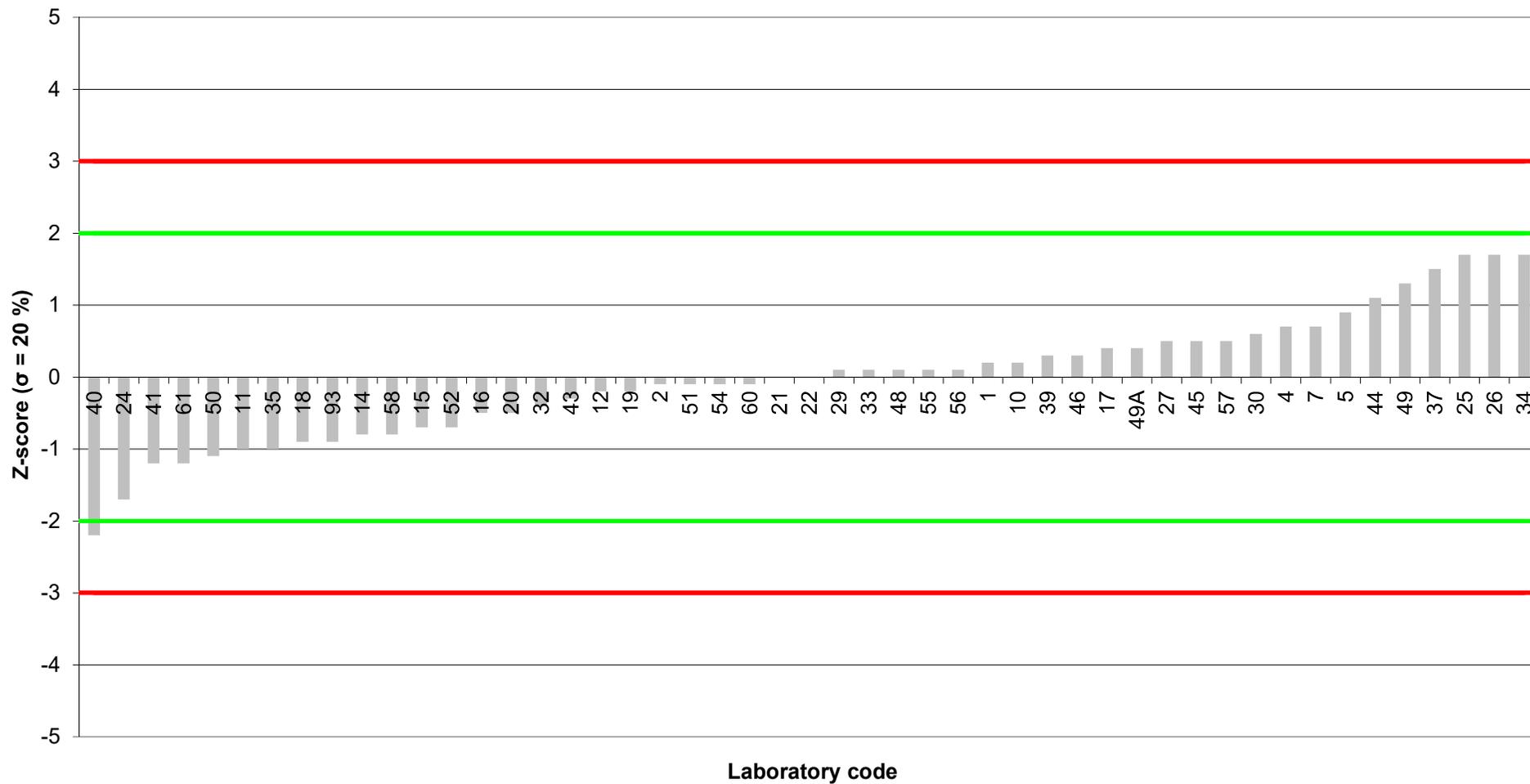
EURL-ILS-BCF_2403-PIM - A
Linear Perfluorooctanesulfonic acid
Assigned value: 0.0856 µg/kg product



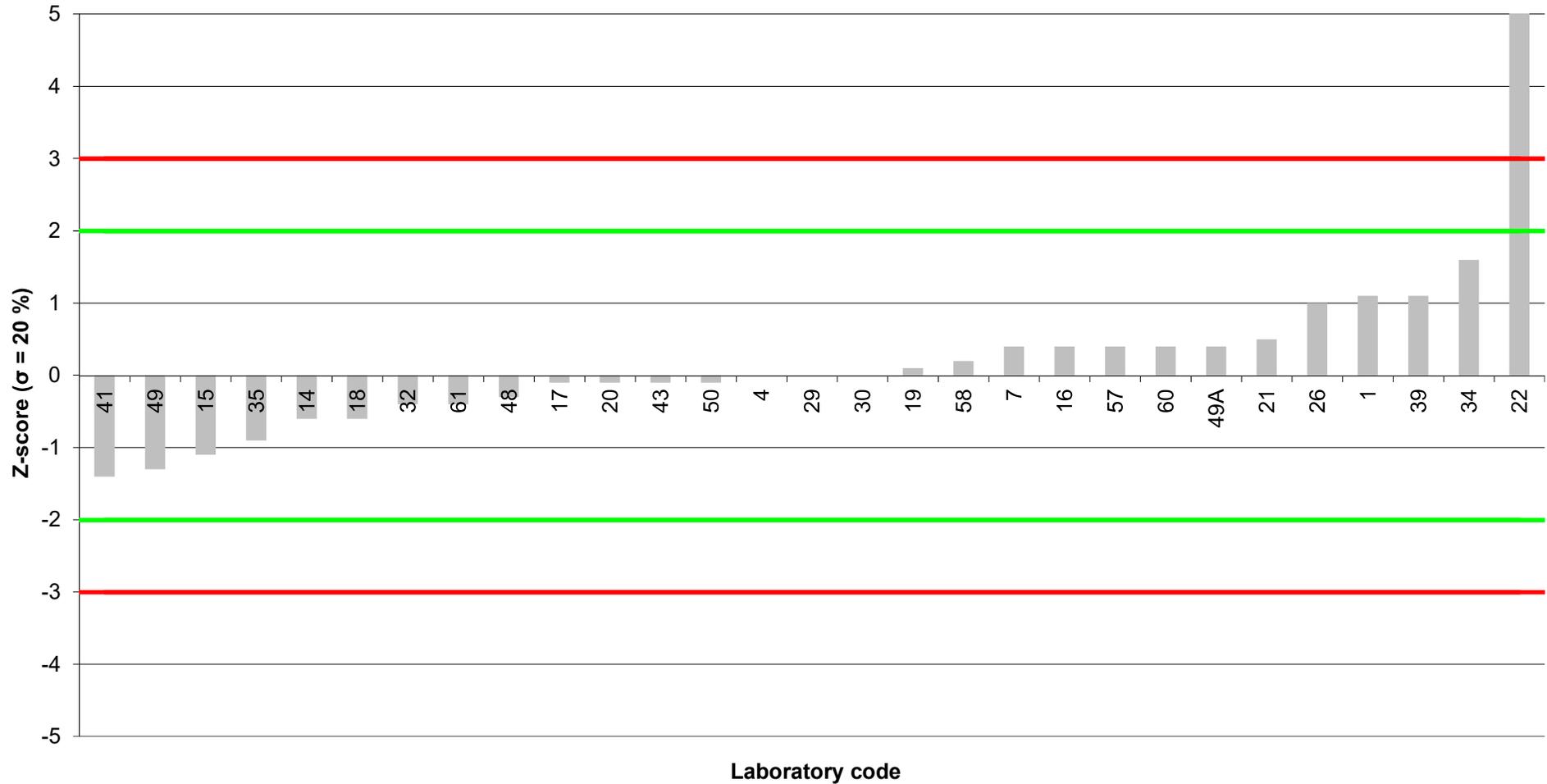
EURL-ILS-BCF_2403-PIM - A
Sum of branched Perfluorooctanesulfonic acid
Assigned value: 0.0765 µg/kg product



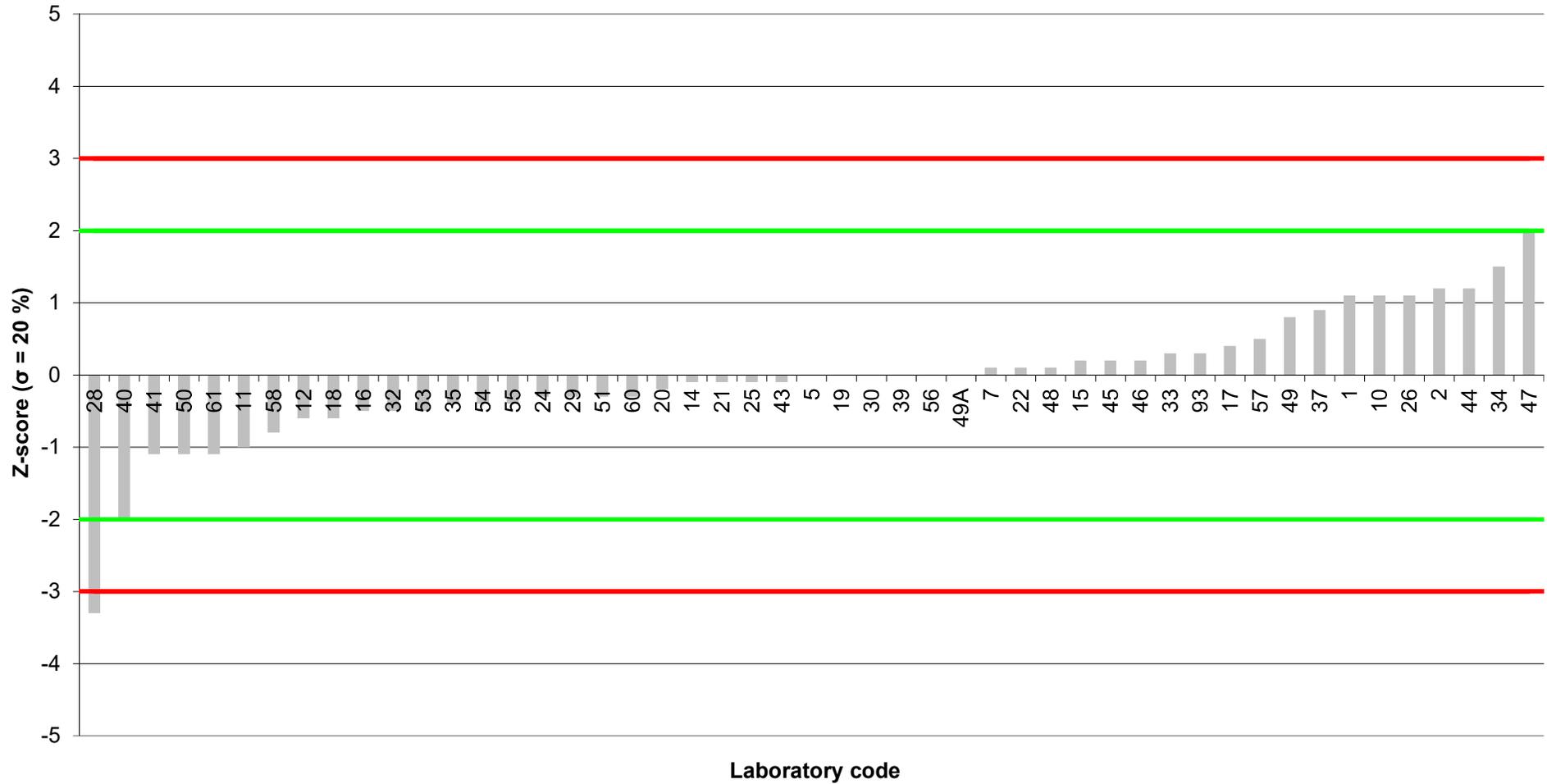
EURL-ILS-BCF_2403-PIM - A
Sum of branched and linear Perfluorooctanesulfonic acid
Assigned value: 0.164 µg/kg product



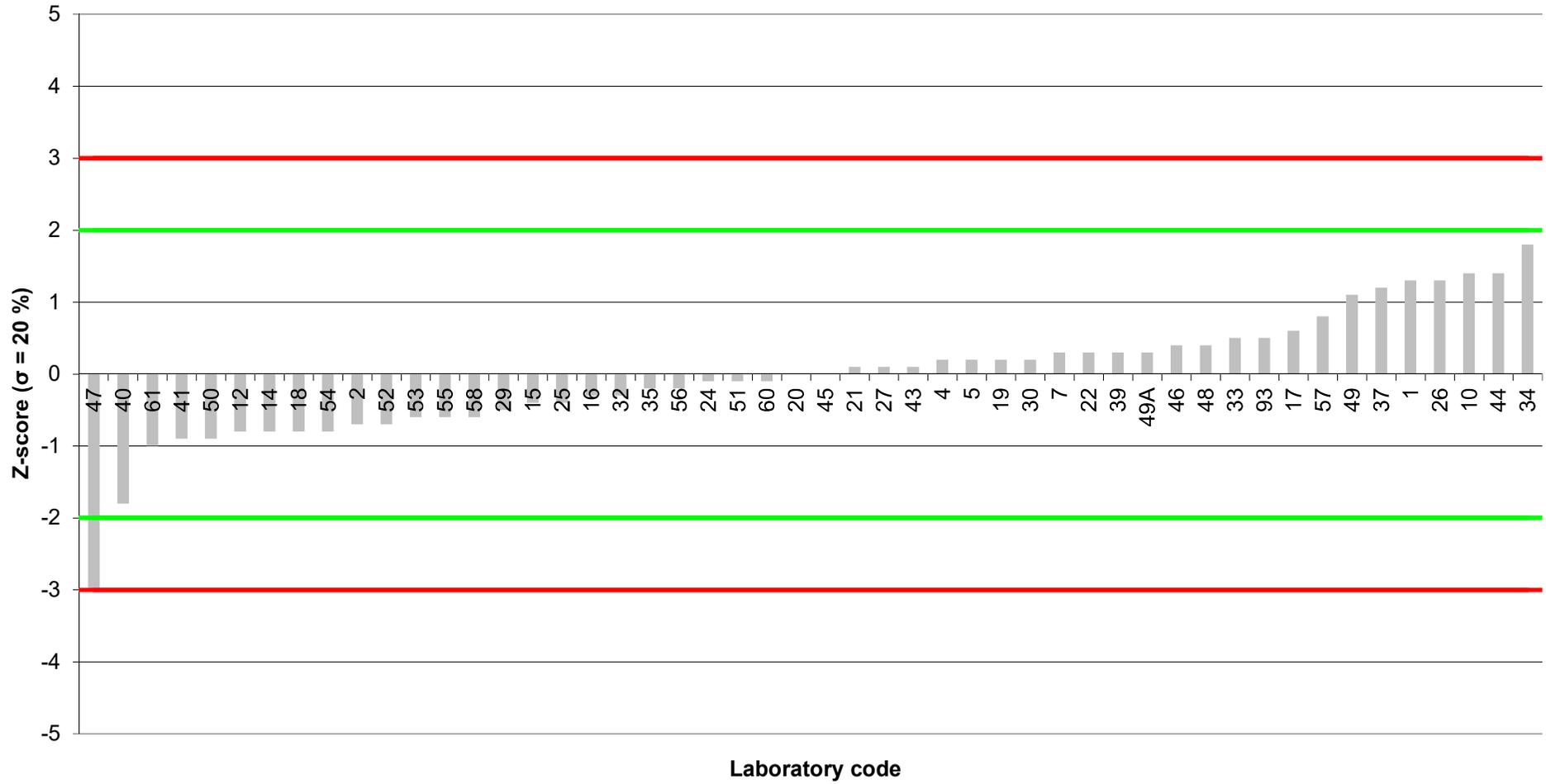
EURL-ILS-BCF_2403-PIM - A
DONA
Assigned value: 0.205 µg/kg product



EURL-ILS-BCF_2403-PIM - A
Sum of total PFOS, PFOA, PFNA, PFHxS (ub)
Assigned value: 0.593 µg/kg product



EURL-ILS-BCF_2403-PIM - A
Sum of total PFOS, PFOA, PFNA, PFHxS (lb)
Assigned value: 0.569 µg/kg product





**EURL Interlaboratory Study on the Determination of Brominated Contaminants, PCNs, CPs and PFAS in Powdered Infant Milk / Formula 2024
[EURL-ILS-BCF_2403-PIM]**

EURL for Halogenated Persistent Organic Pollutants (POPs) in Feed and Food

06 March 2026

Annex 5: Test for sufficient homogeneity for PFCAs, PFSA

Test sample - Powdered Infant Milk A (2403-PIM-A)

EURL Interlaboratory Study on the Determination of Brominated Contaminants, PCNs, CPs and PFAS in Powdered Infant Milk / Formula 2024 [EURL-ILS-BCF_2403-PIM]

EURL for Halogenated Persistent Organic Pollutants (POPs) in Feed and Food

Powdered infant milk A (2403-PIM-A)

PFCAs, PFSA's - Homogeneity test - Data

Analyte	Result µg/kg product	Mean (n = 10, duplicate analysis)	Median (n = 10, duplicate analysis)	Relative standard deviation [%]
PFBA		0.103	0.102	11%
PFPeA		0.370	0.372	4%
PFOA		0.295	0.294	4%
PFDA		0.221	0.220	4%
PFNA		0.125	0.125	11%
PFTrDA		0.266	0.264	4%
PFTeDA		0.200	0.201	3%
PFHxS		0.0390	0.0395	9%
n-PFOS		0.0880	0.0863	8%
Br-PFOS		0.0840	0.0826	9%
Total PFOS		0.172	0.172	4%
NaDONA		0.193	0.194	4%

EURL Interlaboratory Study on the Determination of Brominated Contaminants, PCNs, CPs and PFAS in Powdered Infant Milk / Formula 2024 [EURL-ILS-BCF_2403-PIM]
 EURL for Halogenated Persistent Organic Pollutants (POPs) in Feed and Food

Powdered infant milk A (2403-PIM-A)
 Selected compounds - Homogeneity test - Data

Sample	Replicate	Result µg/kg product	PFOA	PFHxS	DONA
13	1		0.319	0.044	0.195
	2		0.293	0.038	0.202
27	1		0.294	0.033	0.184
	2		0.301	0.043	0.194
37	1		0.295	0.036	0.199
	2		0.291	0.042	0.181
39	1		0.285	0.036	0.206
	2		0.301	0.039	0.193
47	1		0.316	0.046	0.193
	2		0.295	0.040	0.185
49	1		0.292	0.041	0.184
	2		0.308	0.041	0.192
58	1		0.296	0.039	0.204
	2		0.279	0.033	0.200
77	1		0.289	0.041	0.194
	2		0.297	0.040	0.184
78	1		0.279	0.038	0.194
	2		0.295	0.033	0.193
128	1		0.285	0.041	0.188
	2		0.281	0.037	0.201
Cochran's C-test					
C			0.274	0.354	0.314
C _{critical} (α = 0.05, m = 2, n = 10)			0.602	0.602	0.602
C _{critical} (α = 0.01, m = 2, n = 10)			0.718	0.718	0.718
C < C _{critical}			yes	yes	yes
Outliers			no evidence for analytical outliers	no evidence for analytical outliers	no evidence for analytical outliers
Homogeneity test					
General average \bar{x}			0.295	0.0390	0.193
Standard deviation of sample averages s_x			0.008	0.002	0.0051
Within-sample standard deviation s_w			0.011	0.004	0.0071
Between-sample standard deviation s^s			0.000	0.000	0.001
Standard deviation for proficiency assessment σ^{PT}			0.059	0.0078	0.039
s^s / σ^{PT}			0.000	0.000	0.033
Test for homogeneity ($s_s \leq 0.3 \sigma_{PT}$)			passed	passed	passed



**EURL Interlaboratory Study on the Determination of Brominated Contaminants, PCNs, CPs and PFAS in Powdered Infant Milk / Formula 2024
[EURL-ILS-BCF_2403-PIM]**

EURL for Halogenated Persistent Organic Pollutants (POPs) in Feed and Food

06 March 2026

Annex 6: Participants' results of PFCAs, PFSAs, sum of PFOS, PFOA, PFNA, PFHxS and other PFASs

Test sample - Powdered Infant Milk B (2403-PIM-B)

Powdered Infant Milk B (2403-PIM-B)
 Perfluoroalkylcarboxylic acids (PFCA) - Results

LC	Sample	Result µg/kg product	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
1	2403-PIM-B		< 0.1	< 0.05	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05
2	2403-PIM-B							< 0.15					
4	2403-PIM-B		< 0.3	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
5	2403-PIM-B												
7	2403-PIM-B		< 1.26	< 0.1	< 0.12	< 0.07	< 0.07	< 0.04	< 0.04	< 0.04	< 0.05	< 0.1	< 0.05
10	2403-PIM-B		0.128	0.133	0.49	0.658	0.083	0.063	0.042	0.044	0.04	0.06	
11	2403-PIM-B						< 0.025	< 0.05					
12	2403-PIM-B			< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
14	2403-PIM-B		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.3	< 0.3
15	2403-PIM-B		< 0.1	< 0.05	< 0.03	< 0.03	< 0.03	< 0.04	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05
16	2403-PIM-B												
17	2403-PIM-B												
18	2403-PIM-B		< 0.5	< 0.1	< 0.1	< 0.1	< 0.05	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.05
19	2403-PIM-B												
20	2403-PIM-B							0.005					
21	2403-PIM-B		< 0.1	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
22	2403-PIM-B												
24	2403-PIM-B		< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
25	2403-PIM-B			< 0.1			< 0.05	< 0.05	< 0.1			< 0.1	< 0.1
26	2403-PIM-B												
27	2403-PIM-B						< 0.01	< 0.01					
28	2403-PIM-B				< 0.05	< 0.05	0.27	0.096	0.19	< 0.05	< 0.05	0.093	0.11
29	2403-PIM-B												
30	2403-PIM-B		< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
31	2403-PIM-B		0.522	0.415	< 0.01	< 0.01	0.22	0.094	0.191	< 0.01	0.015	0.526	0.522
32	2403-PIM-B												
33	2403-PIM-B		< 0.602	< 0.066	< 0.065	< 0.033	< 0.027	< 0.01	< 0.034	< 0.011	< 0.021	< 0.018	< 0.021
34	2403-PIM-B		< 0.5	< 0.1	< 0.05	< 0.05	< 0.01	< 0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
35	2403-PIM-B		< 0.3	< 0.1	< 0.1	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
37	2403-PIM-B				< 0.025	< 0.01	< 0.007	< 0.005	< 0.014	< 0.013	< 0.011	< 0.01	< 0.01
39	2403-PIM-B		< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
40	2403-PIM-B				< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
41	2403-PIM-B				< 0.05	< 0.1	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.1	< 0.05
43	2403-PIM-B				0.0027	0.00294	0.0269	0.0039	0.00635	< 0.0025	< 0.0025	< 0.005	< 0.01
44	2403-PIM-B						< 0.05	< 0.05					
45	2403-PIM-B		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
46	2403-PIM-B		< 0.2	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
47	2403-PIM-B		0.256	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
48	2403-PIM-B												
49	2403-PIM-B		< 0.2	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
50	2403-PIM-B		< 0.5	< 0.02	< 1	< 0.01	< 0.01	< 0.02	< 0.02	< 0.01	< 0.01	< 0.02	< 0.02
51	2403-PIM-B				< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
52	2403-PIM-B						< 0.003	< 0.003					
53	2403-PIM-B						0.27	0.12					
54	2403-PIM-B		< 2	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05
55	2403-PIM-B		< 0.5	< 0.5	< 0.1	< 0.05	< 0.05	< 0.1	< 0.1	< 0.05	< 0.1	< 0.5	< 0.5
56	2403-PIM-B		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
57	2403-PIM-B		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
58	2403-PIM-B		< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
60	2403-PIM-B		< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
61	2403-PIM-B		< 0.01	< 0.01	< 0.01	< 0.01	< 0.001	0.0017	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
93	2403-PIM-B						< 0.03	< 0.03					
49A	2403-PIM-B		< 0.2	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Powdered Infant Milk B (2403-PIM-B)
 Perfluoroalkylsulfonic acids (PFASs) - Results

LC	Sample	Result µg/kg product	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentanesulfon ic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptanesulfonic acid (PFHpS)	Linear Perfluorooctanesulfonic acid (L-PFOS)	Sum of branched Perfluorooctanesulfonic acid (br-PFOS)	Sum of branched and linear Perfluorooctanesulfonic acid (total PFOS)	Perfluorononane- sulfonic acid (PFNS)	Perfluorodecane- sulfonic acid (PFDS)	Perfluoroundecane- sulfonic acid (PFUnDS)	Perfluorododecane- sulfonic acid (PFDoDS)	Perfluorotridecane- sulfonic acid (PFTrDS)
1	2403-PIM-B		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.03	< 0.03		< 0.05	
2	2403-PIM-B						0.011	0.005	0.016					
4	2403-PIM-B		< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
5	2403-PIM-B													
7	2403-PIM-B		< 0.04	< 0.03	< 0.03	< 0.03	< 0.04	< 0.04	< 0.04	< 0.04	< 0.06	< 0.07	< 0.08	< 0.1
10	2403-PIM-B		< 0.01	< 0.01	< 0.01	< 0.025	0.017	0.011	0.028	< 0.025	< 0.05	< 0.05	< 0.05	< 0.1
11	2403-PIM-B				< 0.06				< 0.05					
12	2403-PIM-B		< 0.04		< 0.04		< 0.04	< 0.04	< 0.04					
14	2403-PIM-B		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
15	2403-PIM-B		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.1
16	2403-PIM-B													
17	2403-PIM-B													
18	2403-PIM-B		< 0.09	< 0.095	< 0.037	< 0.047	< 0.037	< 0.045		< 0.097	< 0.097			
19	2403-PIM-B													
20	2403-PIM-B				0.011			0.015	0.015					
21	2403-PIM-B		< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02			
22	2403-PIM-B													
24	2403-PIM-B		< 0.04		< 0.04				< 0.04					
25	2403-PIM-B				< 0.05		< 0.05	< 0.05	< 0.05					
26	2403-PIM-B													
27	2403-PIM-B				< 0.01				0.014					
28	2403-PIM-B			< 0.05	< 0.05	< 0.05	0.063	0.057	0.12	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
29	2403-PIM-B													
30	2403-PIM-B		< 0.01	< 0.02	< 0.01	< 0.02	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02			
31	2403-PIM-B		< 0.01		0.0338	< 0.01	0.107				< 0.01			
32	2403-PIM-B													
33	2403-PIM-B		< 0.018	< 0.014	< 0.023	< 0.018	< 0.022	< 0.022	< 0.022	< 0.038	< 0.017	< 0.077	< 0.024	< 0.007
34	2403-PIM-B		< 0.05	< 0.05	< 0.04	< 0.05			0.015	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
35	2403-PIM-B		< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	0.014	< 0.1	< 0.1	< 0.1	< 0.1	< 0.01
37	2403-PIM-B		< 0.002	< 0.005	< 0.001	< 0.003	0.02	< 0.002						
39	2403-PIM-B		< 0.01	< 0.01	< 0.01	< 0.01	0.04	0.012	0.052	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
40	2403-PIM-B		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01			
41	2403-PIM-B		< 0.00443	< 0.00484	< 0.00473	< 0.095	0.007	0.003	0.01	< 0.00484	< 0.1			
43	2403-PIM-B		0.0142		< 0.0025	< 0.0025			0.0115		< 0.01			
44	2403-PIM-B				< 0.05				< 0.05					
45	2403-PIM-B				< 0.05		< 0.05	< 0.05	< 0.05					
46	2403-PIM-B		< 0.2	< 0.2	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
47	2403-PIM-B		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
48	2403-PIM-B													
49	2403-PIM-B		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01	
50	2403-PIM-B		< 0.02	< 0.05		< 0.01	< 0.01	< 0.01	< 0.02	< 0.01	< 0.01	< 0.02	< 0.05	< 0.05
51	2403-PIM-B				< 0.02		< 0.02	< 0.02	< 0.02					
52	2403-PIM-B				< 0.003				0.0122					
53	2403-PIM-B				< 0.03		0.09	0.09						
54	2403-PIM-B		< 0.05		< 0.05		< 0.05	< 0.05	< 0.05		< 0.05			
55	2403-PIM-B		< 0.05	< 0.1	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1			
56	2403-PIM-B		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
57	2403-PIM-B		< 0.01	< 0.01	< 0.01	< 0.01	0.025	< 0.01	0.025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
58	2403-PIM-B		< 0.01	< 0.01	< 0.01	< 0.01	0.0122	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
60	2403-PIM-B		< 0.05	< 0.05	< 0.01	< 0.05	0.0109	< 0.01	0.0169	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01
61	2403-PIM-B		< 0.01	< 0.01	< 0.004	< 0.01	0.0068	0.0026	0.0094	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
93	2403-PIM-B				< 0.03		< 0.03	< 0.03	< 0.03					
49A	2403-PIM-B		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01	

Powdered Infant Milk B (2403-PIM-B)
 Sum of PFOS, PFOA, PFNA, PFHxS - Results

LC	Sample	Result µg/kg product	Sum of total-PFOS, PFOA, PFNA, PFHxS (µb)	Sum of total-PFOS, PFOA, PFNA, PFHxS (lb)
1	2403-PIM-B		0.2	0
2	2403-PIM-B			0.016
4	2403-PIM-B			
5	2403-PIM-B			
7	2403-PIM-B		0.155	0
10	2403-PIM-B		0.184	0.174
11	2403-PIM-B			
12	2403-PIM-B		0.016	0
14	2403-PIM-B		0.4	
15	2403-PIM-B			
16	2403-PIM-B			
17	2403-PIM-B			
18	2403-PIM-B		0.269	0
19	2403-PIM-B			
20	2403-PIM-B		0.0404	0.0404
21	2403-PIM-B			
22	2403-PIM-B			
24	2403-PIM-B		0.016	0
25	2403-PIM-B		0.2	00.014
26	2403-PIM-B			
27	2403-PIM-B			
28	2403-PIM-B		0.55	0.5
29	2403-PIM-B			
30	2403-PIM-B		0.06	
31	2403-PIM-B		0.454	0.454
32	2403-PIM-B			
33	2403-PIM-B		0.082	0
34	2403-PIM-B		0.085	0.015
35	2403-PIM-B		0.039	0.014
37	2403-PIM-B		0.037	0.02
39	2403-PIM-B		0.082	0.052
40	2403-PIM-B		0.04	0
41	2403-PIM-B		0.025	0.01
43	2403-PIM-B		0.0423	0.0423
44	2403-PIM-B		0.2	0
45	2403-PIM-B		0.2	
46	2403-PIM-B		0.04	0.01
47	2403-PIM-B		0.8	0
48	2403-PIM-B			
49	2403-PIM-B		0.04	0
50	2403-PIM-B			
51	2403-PIM-B			0
52	2403-PIM-B		0.131	0.122
53	2403-PIM-B		0.51	0.48
54	2403-PIM-B		0.2	0
55	2403-PIM-B		0.3	
56	2403-PIM-B		0.25	0
57	2403-PIM-B		0.055	0.025
58	2403-PIM-B		0.0422	0.0122
60	2403-PIM-B		0.0469	0.0169
61	2403-PIM-B		0.0161	0.0111
93	2403-PIM-B		0.12	0.03
49A	2403-PIM-B		0.04	

Powdered Infant Milk B (2403-PIM-B)
 Other PFAS - Results

LC	Sample	Result µg/kg product	Perfluorooctane sulphonamide	2,2,3-Trifluoro-3-[1,1,2,2,3,3-hexafluoro-3-(trifluoromethoxy)propoxy]-propionic acid	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)-propanoic acid	Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	1-Propanaminium, N,N-dimethyl-N-oxide-3-[[[(3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, hydroxide	1-Propanaminium, N-(carboxymethyl)-N,N-dimethyl-3-[[[(3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, hydroxide
			FOSA	DONA	GenX	(major component of F-53B)	(minor component of F-53B)	Capstone A	Capstone B
1	2403-PIM-B		< 0.01	< 0.05	< 0.05	< 0.05	< 0.05		
2	2403-PIM-B								
4	2403-PIM-B		< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
5	2403-PIM-B								
7	2403-PIM-B		< 0.065	< 0.01	< 0.025	< 0.03	< 0.05		< 0.8
10	2403-PIM-B		< 0.025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.025	< 0.025
11	2403-PIM-B								
12	2403-PIM-B								
14	2403-PIM-B		< 0.3	< 0.1	< 0.5	< 0.1	< 0.1		
15	2403-PIM-B		< 0.1	< 0.05	< 0.1	< 0.05			
16	2403-PIM-B								
17	2403-PIM-B								
18	2403-PIM-B			< 0.047		< 0.092	< 0.095		
19	2403-PIM-B								
20	2403-PIM-B			0.001					
21	2403-PIM-B		< 0.02	< 0.02	< 0.25	< 0.02	< 0.02		
22	2403-PIM-B								
24	2403-PIM-B								
25	2403-PIM-B								
26	2403-PIM-B								
27	2403-PIM-B								
28	2403-PIM-B								
29	2403-PIM-B								
30	2403-PIM-B			< 0.02	< 0.02				
31	2403-PIM-B		< 0.01						
32	2403-PIM-B								
33	2403-PIM-B		< 0.188	< 0.018	< 0.012	< 0.021	< 0.022		
34	2403-PIM-B		< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.1	< 0.3
35	2403-PIM-B		< 0.01	< 0.1	< 0.1	< 0.01	< 0.01		
37	2403-PIM-B								
39	2403-PIM-B			< 0.01	< 0.01	< 0.01	< 0.01		
40	2403-PIM-B				< 0.05				
41	2403-PIM-B			< 0.05					
43	2403-PIM-B			< 0.0025	< 0.0025				
44	2403-PIM-B								
45	2403-PIM-B				< 0.1				
46	2403-PIM-B		< 0.01	< 0.2	< 0.2	< 0.01	< 0.2	< 0.2	< 0.2
47	2403-PIM-B		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2		
48	2403-PIM-B								
49	2403-PIM-B		< 0.2	< 0.1	< 0.5	< 0.1	< 0.1		
50	2403-PIM-B			< 0.01	< 0.1	< 0.01	< 0.01	< 0.01	< 0.2
51	2403-PIM-B								
52	2403-PIM-B								
53	2403-PIM-B								
54	2403-PIM-B		< 0.05						
55	2403-PIM-B								
56	2403-PIM-B				< 0.05	< 0.05	< 0.05		
57	2403-PIM-B		< 0.01	< 0.01	< 0.01				
58	2403-PIM-B		< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.01	< 0.01
60	2403-PIM-B		< 0.05	< 0.05	< 0.05	< 0.05	< 0.25		
61	2403-PIM-B		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05
93	2403-PIM-B								
49A	2403-PIM-B		< 0.2	< 0.1	< 0.5	< 0.1	< 0.1		



**EURL Interlaboratory Study on the Determination of Brominated Contaminants, PCNs, CPs and PFAS in Powdered Infant Milk / Formula 2024
[EURL-ILS-BCF_2403-PIM]**

EURL for Halogenated Persistent Organic Pollutants (POPs) in Feed and Food

06 March 2026

Annex 7: Participants' methods for PFAS

Test sample - Powdered Infant Milk (2403-PIM)

Powdered Infant Milk (2403-PIM)
 Methods PFAS - General and internal standards

LC	Sample	Accreditation according to ISO/IEC 17025	Weighed sample [g]	Subtraction of procedural blank	Use of isotope-labelled internal standards for ...			Other internal standards	Use of recovery / injection standard(s) (yes/no)	Matrix calibration (yes/no)
					PFCAs (yes/no)	PFSAs (yes/no)	Other PFAS(yes/no)			
1	2403-PIM	No	10	No	Yes	Yes	Yes		Yes	No
2	2403-PIM	Yes	10 g	No	Yes	Yes	Yes		No	No
4	2403-PIM	yes	1g	no	yes	yes (except PFD0DS)	yes (except Capstone A)		no	no (except PFD0DS and Capstone A)
5	2403-PIM	no	10	yes	yes	yes			yes	yes
7	2403-PIM	yes	1	no	yes	yes	yea and no		no	no
10	2403-PIM	no	1	yes	yes	yes		M8FOSA	no	yes
11	2403-PIM									
12	2403-PIM	yes	2	yes	yes	yes			yes	no
14	2403-PIM	yes	2.5		yes	yes			yes	yes
15	2403-PIM	yes	1	yes	yes	yes	yes		yes/no	no
16	2403-PIM	yes	1,5 - 3.0	yes	yes	yes			yes	no
17	2403-PIM	no	1		yes	yes	yes		yes	no
18	2403-PIM	no	0.4	yes	yes	yes	yes		no	yes
19	2403-PIM	no	5	yes	yes : MPFAC-24ES from Well. Labs.	yes : MPFAC-24ES from Well. Labs.	M3HFPO-DA from Well. Labs.		yes : MPFAC-C-IS from Well. Labs.	no
20	2403-PIM	no	2	yes	yes	yes	yes	N-EtFOSAA, N-MeFOSAA (MPFAC-24ES from wellington labs)	yes	no
21	2403-PIM	yes	2	no	yes	yes	yes		yes	no
22	2403-PIM	no	1	no	yes	yes	yes		yes	no
24	2403-PIM	NO	5	NO	Yes	Yes			No	No
25	2403-PIM	no	2	no	yes	yes			yes	no
26	2403-PIM	yes	2	no	yes	yes	yes	M2-6FTS, M2-6FTS, M2-8FTS, d3-N-MeFOSAA, d5-N-EtFOSAA, M8FOSA	yes	yes
27	2403-PIM	yes	10	no	yes	yes	no	no	no	no
28	2403-PIM	no	0.5	yes	yes	yes	no		no	no
29	2403-PIM	no	1	no	yes	yes	yes		yes	no
30	2403-PIM	no	0.25	yes	yes	yes	yes		no	no
31	2403-PIM	yes	5g	no	yes	yes	yes	M5PFHxA (Perfluoro-n-(1,2,3,4,6-13C5) Hexanoic acid), M3PFHxS (Sodium perfluor-1-(1,2,3-13C3)Hexane sulfonate), M8PFOA (perfluoro-n-(13C8) octanoic acid), M8PFOS (Sodium perfluoro-1-(1,2,3,4-13C4) octanesulfonate), MPFDoDA (Perfluoro-n-(1,2-13C2) dodecanoic acid)	no	no
32	2403-PIM	yes	1	yes	yes	yes	yes		yes	no
33	2403-PIM	Y	1.11	N	y	y	y	HFPO-DA	y	n
34	2403-PIM	yes	5	no	no	no	no		yes	yes
35	2403-PIM	Yes	2	Yes	Yes	Yes	Yes		No	No
37	2403-PIM	yes	2	no	yes	yes			yes	no
39	2403-PIM	No	1	Yes	yes	yes	yes		no	yes
40	2403-PIM	no	2	no	yes	yes	yes		no	yes
41	2403-PIM	yes	2		yes	yes	yes		no	no
43	2403-PIM	yes	1.35	no	yes	yes	yes	DONA -> 13C- PFHpA	yes	yes
44	2403-PIM	yes	1	yes	yes	yes			yes	no
45	2403-PIM	yes	5	no	yes	yes	yes		no	no
46	2403-PIM	yes	1.5	no	yes	yes	yes	no	no	no
47	2403-PIM	yes	5	no	yes	yes	yes		no	no
48	2403-PIM	no	1	yes (only for PFBA)	yes	yes	yes	GenX13C3, PFUnDA13C2	no	no
49	2403-PIM	yes	2	yes	YES	YES	YES		YES	NO
50	2403-PIM	yes	1	yes	yes	yes	yes		yes	no
51	2403-PIM	yes	1	No	yes	yes			yes	no
52	2403-PIM	yes	1g	yes	yes	yes			no	no
53	2403-PIM		2.95	no	Yes	Yes			No	No
54	2403-PIM	Yes	1.0	Yes	Yes	Yes	Yes		No	No
55	2403-PIM	yes	1.00		yes	yes	no		no	no
56	2403-PIM	no	2.0	no	yes	yes	yes		yes	no
57	2403-PIM	No	5	Yes	Yes	Yes	Yes		Yes	No
58	2403-PIM	no	5	yes	yes	yes	yes		no	no
60	2403-PIM	yes	2	no	yes	yes	yes	13C8-FOSAA, d3-N-MeFOSAA, d5-N-EtFOSAA, 13C2-4,4-ETS, 13C2-6,2-ETS, 13C2-8,2-ETS, 13C2-HEPO-DA	no	no
61	2403-PIM	Yes	5	yes	yes	yes	yes		no	no
93	2403-PIM	yes	5	yes	yes		no analysis of further PFAS		no	no

Powdered Infant Milk (2403-PIM)
 Methods Perfluoroalkylcarboxylic acids (PFCAs) - Internal Standards

LC	Sample	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
1	2403-PIM	13C4 PFBA	13C5 PFPeA	13C5 PFHxA	13C4 PFHpA	13C8 PFOA	13C9 PFNA	13C6 PFDA	13C7 PFUnDA	13C2 PFDoDA	13C2 PFTrDA	13C2 PFTeDA
2	2403-PIM	MPFBA (PFBA-13C4)	M5PFPeA (PFPeA-13C5)			M8PFOA (PFOA-13C8)	M9PFNA (PFNA-13C9)	M6PFDA			M2PFTrDA	
4	2403-PIM	MPFBA	MPFPeA	MPFHxA	MPFOS			MPFDA	MPFUnDA	MPFDoDA	MPFDoDA	MPFTrDA
5	2403-PIM											
7	2403-PIM	Perfluoro-n-(1,2,3,4-13C4)butansäure (MPFBA)	Perfluoro-n-(13C5)pentansäure (M5PFPeA)	Perfluoro-n-(1,2,3,4,6-13C5)hexansäure (M5PFHxA)	Perfluoro-n-[1,2,3,4-13C4]heptansäure (M4PFHpA)	Perfluoro-n-(13C8)octansäure (M8PFOA)	Perfluoro-n-(13C9)nonansäure (M9PFNA)	Perfluoro-n-(1,2,3,4,5,6-13C6)decansäure (M6PFDA)	Perfluoro-n-(1,2,3,4,5,6,7-13C7)undecansäure (M7PFUnDA)	Perfluoro-n-(1,2-13C2)dodecansäure (MPFDoDA)	Perfluoro-n-(1,2-13C2)dodecansäure (MPFDoDA)	Perfluoro-n-(1,2-13C2)dodecansäure (MPFDoDA)
10	2403-PIM	M2PFOA	M2PFOA	M2PFOA	M2PFOA	M2PFOA	M2PFOA	M2PFOA	M2PFOA	M2PFOA	M2PFOA	M2PFOA
11	2403-PIM											
12	2403-PIM		M5PFPeA	M5PFHxA	M4PFHpA	M8PFOA	M9PFNA	M6PFDA	M7PFUnDA	MPFDoA		M2PFTrDA
14	2403-PIM	13C4-PFBA	13C5-PFPeA	13C5-PFHxA	13C4-PFHpA	13C8-PFOA	13C5-PFNA	13C2-PFDA	13C2-PFUnA	13C2-PFDoA	13C2-PFTrDA	13C2-PFTeDA
15	2403-PIM	PFBA-13C2	PFPeA-13C5	PFHxA-13C3	PFHpA-13C4	PFOA-13C8	PFNA-13C9	PFDA-13C6	PFUnDA-13C6	PFDoDA-13C2		PFTeDA-13C2
16	2403-PIM	13C-PFBA	13C-PFPeA	13C-PFHxA	13C-PFHpA	13C-PFOA	13C-PFNA	13C-PFDA			13C-PFUnDA	13C-PFTeDA
17	2403-PIM	PFBA13C4	PFPeA13C3	PFHxA13C2	PFHpA13C4	PFOA13C4	PFNA13C5	PFDA13C2	PFUnDA13C2	PFDoDA13C2	PFTeDA13C2	PFTeDA13C2
18	2403-PIM	PFBA-13C4	PFPeA-13C5	PFHxA-13C5	PFHpA-13C2	PFOA-13C8	PFNA-13C9	PFDA-13C6	PFUnA-13C7	PFDoA-13C2	PFTeDA-13C2+PFDoA-13C2	PFTeDA-13C2
19	2403-PIM	MPFBA	MPFPeA	MPFHxA	MPFHpA	MPFOA	MPFNA	MPFDA	MPFUnDA	MPFDoDA	MPFDoDA/MPFTrDA	MPFTrDA
20	2403-PIM					M8PFOA	M9PFNA	M6PFDA				M2PFTrDA
21	2403-PIM	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFDoDA	PFTeDA
22	2403-PIM	13C3-PFBA	13C5-PFPeA	13C6-PFHxA	13C7-PFHpA	13C8-PFOA	13C9-PFNA	13C9-PFDA	13C9-PFUnDA	13C12-PFDoDA	13C12-PFDoDA	13C2-PFTeDA
24	2403-PIM					MPFOA	MPFNA	MPFDA				
25	2403-PIM		13C5-PFPeA			13C8-PFOA	13C9-PFNA	13C6-PFDA			13C2-PFTeDA	13C2-PFTeDA
26	2403-PIM	MPFBA.IS	M5PFPeA.IS	M5PFHxA.IS	M4PFHpA.IS	M8PFOA.IS	M9PFNA.IS	M6PFDA.IS	M7PFUnDA.IS	MPFDoA .IS	M8PFOS.IS	M2PFTrDA.IS
27	2403-PIM					13C4-PFOA	13C5-PFNA					
28	2403-PIM			13C-PFHxA	13C-PFHpA	13C-PFOA	13C-PFNA	13C-PFDA	13C-PFUnDA	13C-PFDoDA	13C-PFTrDA	13C-PFTeDA
29	2403-PIM	PFBA-13C4	PFPeA-13C3	PFHxA-13C2	PFHpA-13C7	PFOA-13C4	PFNA-13C5	PFDA-13C2	PFUnA-13C2	PFDoDA-13C2	GenX-13C3	PFTeDA-13C2
30	2403-PIM	PFBA 13C4	PFPeA 13C5	PFHxA 13C5	PFHpA 13C4	PFOA 13C8	PFNA 13C9	PFDA 13C6	PFUnDA 13C7	PFDoDA 13C2	PFTeDA 13C2	PFTeDA 13C2
31	2403-PIM	M5PFHxA (Perfluoro-n-(1,2,3,4,6-13C5) Hexanoic acid)	M8PFOA (perfluoro-n-(13C8) octanoic acid)	M8PFOA (perfluoro-n-(13C8) octanoic acid)	M8PFOA (perfluoro-n-(13C8) octanoic acid)	M8PFOA (perfluoro-n-(13C8) octanoic acid)	MPFDoDA (Perfluoro-n-(1,2-13C2) dodecanoic acid)	MPFDoDA (Perfluoro-n-(1,2-13C2) dodecanoic acid)	MPFDoDA (Perfluoro-n-(1,2-13C2) dodecanoic acid)			
32	2403-PIM	13C4-PFBA	13C5-PFPeA	13C5-PFHxA	13C4-PFHpA	13C8-PFOA	13C9-PFNA	13C6-PFDA	13C7-PFUnDA	13C2-PFDoDA	13C2-PFDoDA	13C2-PFTeDA
33	2403-PIM	13C3PFBA	13C3PFPeA	13C5PFHxA	13C8PFOA	13C8PFOA	13C8PFOA	M2PFUnA	M2PFUnA	M2PFDoA	M2PFTrDA	M2PFTrDA
34	2403-PIM											
35	2403-PIM	13C4-PFBA	13C5-PFPeA	13C5-PFHxA	13C4-PFHpA	13C4-PFOA	13C5-PFNA	13C6-PFDA	13C7-PFUnDA	13C2-PFDoA	13C2-PFDoA	13C2-PFTeDA
37	2403-PIM			Perfluoro-n-[1,2,3,4,6-13C12] hexanoic acid	Perfluoro-n-[1,2,3,4-13C12] heptanoic acid	Perfluoro-n-[1,2,3,4-13C12] octanoic acid	Perfluoro-n-[1,2,3,4,5-13C12] nonanoic acid	Perfluoro-n-[1,2-13C12] decanoic acid	Perfluoro-n-[1,2,3,4,5,6,7-113C12]undecanoic acid	Perfluoro-n-[1,2-13C12] dodecanoic acid		
39	2403-PIM	13C4-PFBA	13C5-PFPeA	13C5-PFHxA	13C4-PFHpA	13C8-PFOA	13C9-PFNA	13C6-PFDA	13C7-PFUnDA	13C2-PFDoA	13C2-PFDoA	13C2-PFTeDA
40	2403-PIM			13C5_PFHxA	13C4_PFHpA	13C8_PFOA	13C9-PFNA	13C2_PFDA	13C7_PFUnA	13C2_PFDoA	13C2_PFDoA	13C2_PFTeDA
41	2403-PIM			13C5-PFHxA	13C4-PFHpA	13C8-PFOA	13C9-PFNA	13C6-PFDA	13C7-PFUnDA	13C2-PFDoDA	13C2-PFDoDA	13C2-PFTeDA
43	2403-PIM	13C-PFBA	13C-PFPeA	13C-PFHxA	13C-PFHpA	13C-PFOA	13C-PFNA	13C-PFDA	13C-PFUnDA	13C-PFDoDA	13C-PFDoDA	13C-PFTeDA
44	2403-PIM					13C4 - PFOA	13C9 - PFNA					
45	2403-PIM	perfluoro-n[13C4] butanoic acid	perfluoro-n[13C5] pentanoic acid	perfluoro-n-[1,2,3,4,6-13C5] hexanoic acid	perfluoro-n-[1,2,3,4, -13C4] heptanoic acid	perfluoro-n[13C8] octanoic acid	perfluoro-n[13C9] nonanoic acid	perfluoro-n-[1,2,3,4,5,6-13C6] decanoic acid	perfluoro-n-[1,2,3,4,5,6,7-13C7] undecanoic acid	perfluoro-n-[1,2-13C2] dodecanoic acid		
46	2403-PIM	13C-PFBA	13C-PFPeA	13C-PFHxA	13C-PFHpA	13C-PFOA	13C-PFNA	13C-PFDA	13C-PFUnDA	13C-PFDoDA	13C-PFDoDA	1C-PFTeDA
47	2403-PIM	MPFBA	M5PFPeA	13C2-PFHA	M4PFHpA	13C4-PFOA	13C-PFNA	13C2-PFDA	13C2-PFUnDA	13C2-PFDoA	13C2-PFDoA	M2PFTrDA
48	2403-PIM	PFBA 13C4	PFPeA 13C3	PFHxA 13C2	PFHpA 13C4	PFOA 13C4	PFNA 13C5	PFDA 13C2	PFUnDA 13C2	PFDoDA 13C2	PFTeDA 13C2	PFTeDA 13C2
49	2403-PIM	13C4-PFBA	13C5-PFPeA	13C5-PFHxA	13C4-PFHpA	13C8-PFOA	13C9-PFNA	13C6-PFDA	13C7-PFUnDA	13C2-PFDoDA	13C2-PFDoDA	13C2-PFTeDA
50	2403-PIM	M13C4 PFBA	M13C3 PFPeA	M13C2 PFHxA	M13C4 PFHpA	M13C4 PFOA	M13C5 PFNA	M13C2 PFDA	M13C2 PFUnDA	M13C2 PFDoDA	M13C2 PFDoDA et M13C2 PFTeDA	M13C2 PFTeDA
51	2403-PIM			M5PFHxA	M4PFHpA	M8PFOA	M9PFNA	M6PFDA	M7PFUnDA	MPFDoA		
52	2403-PIM					Perfluoro-n-[1,2,3,4-13C4]octanoic acid	Perfluoro-n-[1,2,3,4,5-13C5]nonanoic acid					
53	2403-PIM					13C8-PFOA	13C9-PFNA					
54	2403-PIM	MPFBA	M5PFPeA	M5PFHxA	M4PFHpA	M8PFOA	M9PFNA	M6PFDA	M7PFUnDA	MPFDoA	MPFDoA	M2PFTrDA
55	2403-PIM	M4PFBA	M5PFPeA	M2PFHxA	M4PFHpA	M4PFOA	M5PFNA	M6PFDA	M7PFUnDA	M2PFDoDA	M2PFDoDA	M2PFTrDA
56	2403-PIM											
57	2403-PIM	PFBA-13C3	PFPeA-13C5	PFHxA-13C5	PFHpA--13C4	PFOA-13C8	PFNA-13C9	PFDA-13C6	PFUnDA-13C7	PFDoDA-13C2	PFTeDA-13C2	PFTeDA-13C2
58	2403-PIM	13C_PFBA	13C_PFDoA	13C_PFHxA	13C_PFHpA	13C_PFOA	13C_PFNA	13C_PFDA	13C_PFUnDA	13C_PFDoDA	13C_PFDoDA	13C_PFTeDA
60	2403-PIM	13C4-PFBA	13C5-PFPeA	13C5-PFHxA	13C4-PFHpA	13C8-PFOA	13C9-PFNA	13C6-PFDA	13C7-PFUnDA	13C2-PFDoDA	13C2-PFDoDA	13C2-PFTeDA
61	2403-PIM	13C-PFBA	13C-PFPeA	13C-PFHxA	13C-PFHpA	13C-PFOA	13C-PFNA	13C-PFDA	13C-PFUnDA	13C-PFDoDA	13C-PFTrDA	13C-PFTeDA
93	2403-PIM					M8PFOA	M9PFNA					

Powdered Infant Milk (2403-PIM)
 Methods Perfluoroalkylcarboxylic acids (PFCAs) - Recovery Standards

LC	Sample	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTeDA)	Perfluorotetradecanoic acid (PFTeDA)
1	2403-PIM	13C3 PFBA	13C3 PFBA	13C2 PFHxA	13C2 PFHxA	13C4 PFOA	13C5 PFNA	13C2 PFDA				
2	2403-PIM											
4	2403-PIM											
5	2403-PIM											
7	2403-PIM											
10	2403-PIM											
11	2403-PIM											
12	2403-PIM											
14	2403-PIM	13C4-PFOA	13C4-PFOA	13C4-PFOA	13C4-PFOA	M2PFOA 13C4-PFOA	13C4-PFOA	MPFDA 13C4-PFOA	13C4-PFOA	13C4-PFOA	13C4-PFOA	13C4-PFOA
15	2403-PIM											
16	2403-PIM	R-PFBA	R-PFOS	R-PFOA	R-PFOA	R-PFOA	R-PFDA	R-PFDA	R-PFDA	R-PFOA		R-PFOS
17	2403-PIM	PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8
18	2403-PIM											
19	2403-PIM	M3PFBA-inj	M3PFBA-inj	M3PFBA-inj	M3PFBA-inj	M2PFOA-inj	M2PFOA-inj	MPFDA-inj	MPFDA-inj	MPFDA-inj	MPFDA-inj	MPFDA-inj
20	2403-PIM					MPFHxS	MPFDA	MPFDA	MPFDA	MPFDA	MPFDA	MPFDA
21	2403-PIM	PFBA	PFBA	PFOA	PFOA	PFOA	PFOA	PFDA	PFDA	PFDA	PFDA	PFDA
22	2403-PIM	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS
24	2403-PIM											
25	2403-PIM		13C2-PFHxA			13C4-PFOA	13C5-PFNA	13C2-PFDA			13C2-PFDA	13C2-PFDA
26	2403-PIM											
27	2403-PIM											
28	2403-PIM											
29	2403-PIM	PFOS-13C8	PFOS-13C8	PFOS-13C8	PFOS-13C8	PFOS-13C8	PFOS-13C8	PFOS-13C8	PFOS-13C8	PFOS-13C8	PFOS-13C8	PFOS-13C8
30	2403-PIM	-	-	-	-	-	-	-	-	-	-	-
31	2403-PIM											
32	2403-PIM	13C3-PFBA		13C2-PFHxA		13C4-PFOA	13C5-PFNA	13C2-PFDA				
33	2403-PIM	13C4PFOA	13C4PFOA	13C4PFOA	13C4PFOA	13C4PFOA	13C4PFOA	M7PFUnA	M7PFUnA	M7PFUnA	M7PFUnA	M7PFUnA
34	2403-PIM											
35	2403-PIM											
37	2403-PIM			Sodium perfluoro- [13C8]octanesulfonate								
39	2403-PIM	No	No	No	No	No	No	No	No	No	No	No
40	2403-PIM											
41	2403-PIM											
43	2403-PIM	PFOA - M8	PFOA - M8	PFOA - M8	PFOA - M8	PFOA - M8	PFOA - M8	PFOA - M8	PFOA - M8	PFOA - M8	PFOA - M8	PFOA - M8
44	2403-PIM											
45	2403-PIM	89.70	108.20	106.00	95	107.90	112.00	102.30	110.00	103.00		
46	2403-PIM											
47	2403-PIM											
48	2403-PIM	PFOS 13C8	PFOS 13C8	PFOS 13C8	PFOS 13C8	PFOS 13C8	PFOS 13C8	PFOS 13C8	PFOS 13C8	PFOS 13C8	PFOS 13C8	PFOS 13C8
49	2403-PIM	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS
50	2403-PIM	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS
51	2403-PIM			M2PFHxA	M4PFOA	M4PFOA	M5PFNA	M2PFDA	M2PFDA	M2PFDA	M2PFDA	M2PFDA
52	2403-PIM											
53	2403-PIM											
54	2403-PIM											
55	2403-PIM											
56	2403-PIM											
57	2403-PIM	PFOA-13C2	PFOA-13C2	PFOA-13C2	PFOA-13C2	PFOA-13C2	PFOA-13C2	PFDA-13C2	PFDA-13C2	PFDA-13C2	PFDA-13C2	PFDA-13C2
58	2403-PIM											
60	2403-PIM											
61	2403-PIM	none	none	none	none	none	none	none	none	none	none	none
93	2403-PIM					no	no					

Powdered Infant Milk (2403-PIM)
 Methods Perfluoroalkylcarboxylic acids (PFCAs) - Comments

LC	Sample	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
1	2403-PIM	Single Mass Transition used	Single Mass Transition used									
2	2403-PIM	2 MS/MS transitions	2 MS/MS transitions									
4	2403-PIM	A second chromatographic separation was used for identification.	A second chromatographic separation was used for identification.									
5	2403-PIM											
7	2403-PIM											
10	2403-PIM	One MRM transition										
11	2403-PIM											
12	2403-PIM		not validated, 263 -> 219							not validated		not validated
14	2403-PIM											
15	2403-PIM											
16	2403-PIM											
17	2403-PIM	only one MS/MS	only one MS/MS									
18	2403-PIM	not confirmed	not confirmed									
19	2403-PIM		Confirmation qualitative by HRMS									
20	2403-PIM					This is a non accredited matrix therefor no LOQ or MU	This is a non accredited matrix therefor no LOQ or MU	This is a non accredited matrix therefor no LOQ or MU				This is a non accredited matrix therefor no LOQ or MU
21	2403-PIM	Identification and quantification were performed by HRMS	Identification and quantification were performed by HRMS									
22	2403-PIM											
24	2403-PIM											
25	2403-PIM		1 transition used.									
26	2403-PIM		confirmation with second chromatographic run							not part of used Standardmix		
27	2403-PIM											
28	2403-PIM			both <LOQ	both <LOQ	PIM-A <LOQ	PIM-A <LOQ	PIM-A <LOQ	both <LOQ	both <LOQ	PIM-A <LOQ	PIM-A <LOQ
29	2403-PIM	only one MS/MS transition	only one MS/MS transition									
30	2403-PIM	only ms/ms	only ms/ms									
31	2403-PIM			Below our LOQ	Below our LOQ				Below our LOQ			
32	2403-PIM		263>219, LC-MS/MS, not confirmed									
33	2403-PIM	1 transition; results not confirmed	1 transition; results not confirmed									
34	2403-PIM	Validation not finished	Validation not finished; 2 MRM accessible at this concentration	Validation not finished	Validation not finished			Validation not finished				
35	2403-PIM											
37	2403-PIM											
39	2403-PIM	HRMS	HRMS									
40	2403-PIM											
41	2403-PIM											
43	2403-PIM											
44	2403-PIM											
45	2403-PIM											
46	2403-PIM											
47	2403-PIM	One MS/MS transition was used for identification; MU: not determined	One MS/MS transition was used for identification; MU: not determined	MU: not determined	MU: not determined			MU: not determined				
48	2403-PIM	Only one MS/MS transition	Only one MS/MS transition									
49	2403-PIM	Confirmed by a second chromatographic separation	Confirmed by a second chromatographic separation									
50	2403-PIM	216,9 > 171,9 , not confirmed by HRMS	265,9 > 221,9 , not confirmed by HRMS									
51	2403-PIM			Method validation underway. LOQ calculated back from indicative LOQ for reconstituted Inf. Form. MU approx 35% - not confirmed.	Method validation underway. LOQ calculated back from indicative LOQ for reconstituted Inf. Form. MU approx 35% - not confirmed.	Method validation underway. LOQ calculated back from indicative LOQ for reconstituted Inf. Form. MU approx 35% - not confirmed.	Method validation underway. LOQ calculated back from indicative LOQ for reconstituted Inf. Form. MU approx 35% - not confirmed.	Method validation underway. LOQ calculated back from indicative LOQ for reconstituted Inf. Form. MU approx 35% - not confirmed.	Method validation underway. LOQ calculated back from indicative LOQ for reconstituted Inf. Form. MU approx 35% - not confirmed.	Method validation underway. LOQ calculated back from indicative LOQ for reconstituted Inf. Form. MU approx 35% - not confirmed.	Method validation underway. LOQ calculated back from indicative LOQ for reconstituted Inf. Form. MU approx 35% - not confirmed.	Method validation underway. LOQ calculated back from indicative LOQ for reconstituted Inf. Form. MU approx 35% - not confirmed.
52	2403-PIM											
53	2403-PIM											
54	2403-PIM											
55	2403-PIM	only one MS/MS transition and no additional confirmation	only one MS/MS transition and no additional confirmation									
56	2403-PIM											
57	2403-PIM		only one MS/MS transition			Sum of Linear and Branched Isomeres						
58	2403-PIM		Only MS/MS									
60	2403-PIM	no confirmation	no confirmation									
61	2403-PIM											
93	2403-PIM											

Powdered Infant Milk (2403-PIM)
 Methods Perfluoroalkylsulfonic acids (PFASs) - Internal Standards

LC	Sample	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentanesulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptanesulfonic acid (PFHpS)	Linear Perfluorooctanesulfonic acid (L-PFOS)	Sum of branched PFOS acids (br-PFOS)	Total-Perfluorooctanesulfonic acids (total PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecanesulfonic acid (PFDS)	Perfluoroundecane- sulfonic acid (PFUnDS)	Perfluorododecane- sulfonic acid (PFDoDS)	Perfluorotridecane- sulfonic acid (PFTrDS)
1	2403-PIM	13C3 PFBS	13C3 PFBS	13C3 PFHxS	13C3 PFHxS	13C8 PFOS	13C8 PFOS	13C8 PFOS	13C8 PFOS	13C8 PFOS		13C8 PFOS	
2	2403-PIM			M3PFHxS	M9PFNA	M8PFOS	M8PFOS	M8PFOS					
4	2403-PIM	MPFHxS	MPFOS	MPFHxS	MPFHxS	MPFOS	MPFOS	MPFOS	MPFHxS	MPFHxS	MPFHxS		MPFTEDA
5	2403-PIM												
7	2403-PIM	Perfluoro-1-(2,3,4-13C3)butansulfonsäure (Na.salz) (M3PFBS)		Perfluoro-1-(2,3,4-13C3)hexansulfonsäure (Na.salz) (M3PFHxS)		Perfluoro-n-(13C8)octansulfonsäure (Natriumsalz) (M8PFOS)	Perfluoro-n-(13C8)octansulfonsäure (Natriumsalz) (M8PFOS)	Perfluoro-n-(13C8)octansulfonsäure (Natriumsalz) (M8PFOS)					
10	2403-PIM	M8PFOS	M8PFOS	M8PFOS	M8PFOS	M8PFOS	M8PFOS	M8PFOS	M8PFOS	M8PFOS	M8PFOS	M8PFOS	M8PFOS
11	2403-PIM												
12	2403-PIM	M3PFBS		M3PFHxS		M8PFOS	M8PFOS	M8PFOS					
14	2403-PIM	13C3-PFBS	13C3-PFBS	18O2-PFHxS	18O2-PFHxS			13C4-PFOS	13C8-PFOA	13C2-PFUnA	13C2-PFDoA	13C2-PFDoA	13C2-PFTEDA
15	2403-PIM	PFBS-13C3		PFHxS-13C3		PFOS-13C8	PFOS-13C8						
16	2403-PIM			13C-PFHxS		13C-PFOS m/z 80	13C-PFOS m/z 80, 13C-PFOS m/z 99						
17	2403-PIM	PFBS13C3	PFBS13C3	PFHxS18O2	PFHxS18O2	PFOS13C4	PFOS13C4	PFOS13C4	PFDA13C2	PFDA13C2	PFUnDA13C2	PFTeDA13C2	PFTeDA13C2
18	2403-PIM	PFBS-13C3	PFHxS-13C3	PFHxS-13C3	lin-PFOS-13C8	lin-PFOS-13C8	lin-PFOS-13C8		lin-PFOS-13C8	lin-PFOS-13C8			
19	2403-PIM	MPFBS	MPFHxS	MPFHxS	MPFHxS	MPFOS	MPFOS	MPFOS	MPFHxS	MPFUnDA	MPFUnDA	MPFDoDA/MPFTEDA	MPFTEDA
20	2403-PIM			M3PFHxS		M8PFOS	M8PFOS	M8PFOS					
21	2403-PIM	PFBS	PFBS	PFHxS	PFHxS	PFOS	PFOS	PFOS	PFOS	PFOS			
22	2403-PIM	13C4-PFBS	13C4-PFBS	13C6-PFHxS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS
24	2403-PIM			MPFHxS									
25	2403-PIM			13C3-PFHxS		13C8-PFOS	13C8-PFOS	13C8-PFOS					
26	2403-PIM	M3PFBS.IS	M4PFHpA.IS	M3PFHxS.IS	M8PFOA.IS	M8PFOS.IS	M8PFOS.IS	M8PFOS.IS	M9PFNA	M8PFOS.IS	Analyte not tested	Analyte not tested	Analyte not tested
27	2403-PIM			18O2-PFHxS				13C4-PFOS					
28	2403-PIM		13C-PFPeS	13C-PFHxS	13C-PFHxS	13C-PFOS	13C-PFOS	13C-PFOS	13C-PFOS	13C-PFOS	13C-PFUnDA	13C-PFDoDA	13C-PFTEDA
29	2403-PIM	PFBS-13C4	PFHxS-18O2	PFHxS-18O2	PFOS-13C4	PFOS-13C4	PFOS-13C4	PFOS-13C4	PFHxS-18O2	PFHxS-18O2	PFHxS-18O2	PFHxS-18O2	PFTeDA-13C2
30	2403-PIM	PFBS 13C3	PFBS 13C3	PFHxS 13C3	PFHxS 13C3	PFOS 13C8	PFOS 13C8	PFOS 13C8	PFOS 13C8	PFOS 13C8			
31	2403-PIM	M3PFHxS (Sodium perfluoro-1-(1,2,3-13C3)Hexane sulfonate)		M3PFHxS (Sodium perfluoro-1-(1,2,3-13C3)Hexane sulfonate)	M3PFHxS (Sodium perfluoro-1-(1,2,3-13C3)Hexane sulfonate)	M8PFOS (Sodium perfluoro-1-(1,2,3,4-13C4) octanesulfonate)	M8PFOS (Sodium perfluoro-1-(1,2,3,4-13C4) octanesulfonate)	M8PFOS (Sodium perfluoro-1-(1,2,3,4-13C4) octanesulfonate)		M8PFOA (perfluoro-n-(13C8) octanoic acid)			
32	2403-PIM	13C3-PFBS	13C3-PFHxS	13C3-PFHxS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS			
33	2403-PIM	C3PFBS	C3PFBS	C3PFHxS	C3PFHxS	C8PFOS	C8PFOS	C8PFOS	C8PFOS	C8PFOS	C8PFOS	C8PFOS	C8PFOS
34	2403-PIM												
35	2403-PIM	13C3-PFBS	13C3-PFBS	18O2-PFHxS	18O2-PFHxS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C2-PFDoA
37	2403-PIM	sodium perfluoro-1-[2,3,4-13C12] butanesulfonate	sodium perfluoro-1-hexane[18O2]sulfonate	sodium perfluoro-1-hexane[18O2]sulfonate	sodium perfluoro-1-hexane[18O2]sulfonate	Sodium perfluoro-1-[1,2,3,4-13C12] octanesulfonate.	Sodium perfluoro-1-[1,2,3,4-13C12] octanesulfonate.	Sodium perfluoro-1-[1,2,3,4-13C12] octanesulfonate.					
39	2403-PIM	13C3-L-PFBS	13C3-L-PFHxS	13C3-L-PFHxS	13C3-L-PFHxS	13C8-L-PFOS	13C8-L-PFOS	13C8-L-PFOS	13C6-PFDA	13C7-PFUDA	13C2-PFTEDA	13C7-PFUDA	13C2-PFTEDA
40	2403-PIM	13C3_PFBS	13C3_PFBS	13C3_PFHxS	13C3_PFHxS	13C8_PFOA	13C8_PFOA	13C8_PFOA	13C8_PFOA	13C8_PFOA	13C8_PFOA	13C8_PFOA	13C8_PFOA
41	2403-PIM	13C3-PFBS	13C3-PFHxS	13C3-PFHxS	13C3-PFHxS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS
43	2403-PIM	13C-PFBS		18O-PFHxS	18O-PFHxS	13C-PFOS 80	13C-PFOS 80	13C-PFOS 80	13C-PFOS 80	13C-PFOS 80			
44	2403-PIM			13C3 - PFHxS				13C4 - PFOS					
45	2403-PIM			sodium perfluoro-1-[2,3,4-13C3] butansulfonate		sodium perfluoro-1-[13C8] octansulfonate	sodium perfluoro-1-[13C8] octansulfonate						
46	2403-PIM	18O-PFHxS	18O-PFHxS	18O-PFHxS	18O-PFHxS	13C-PFOS	13C-PFOS	13C-PFOS	13C-PFOS	13C-PFOS	13C-PFOS	13C-PFOS	13C-PFOS
47	2403-PIM	M3PFBS	18O-PFHS	18O-PFHS	18O-PFHS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS
48	2403-PIM	PFBS 13C3	PFHxS 18O2	PFHxS 18O2	PFHxS 18O2	PFOS 13C4	PFOS 13C4	PFOS 13C4	PFUnDA 13C2	PFUnDA 13C2	PFUnDA 13C2	PFUnDA 13C2	PFTeDA 13C2
49	2403-PIM	13C3-PFBS	13C3-PFHxS	13C3-PFHxS	13C3-PFHxS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C6-PFDA	13C2-PFUnDA	13C2-PFDoDA	13C2-PFUnDA
50	2403-PIM	M13C3 PFBS	M13C3 PFBS	M18O2 PFHxS	M18O2 PFHxS	M13C4 PFOS	M13C4 PFOS	M13C4 PFOS	M13C2 PFUnDA	M13C2 PFUnDA	M13C2 PFUnDA	M13C2 PFUnDA	M13C2 PFUnDA
51	2403-PIM			M3PFHxS		M8PFOS	M8PFOS	M8PFOS					
52	2403-PIM			Sodium perfluoro-1-hexane[18O2]sulfonate				Sodium perfluoro-1-[1,2,3,4-13C4]octanesulfonate					
53	2403-PIM			13C3-PFHxS		13C8-PFOS	13C8-PFOS						
54	2403-PIM												
55	2403-PIM	M3PFBS	M3PFBS	M3PFHxS	M4PFOS	M4PFOS	M4PFOS	M4PFOS	M4PFOS	M4PFOS	M4PFOS	M4PFOS	M4PFOS
56	2403-PIM												
57	2403-PIM	PFBS-13C3	PHHxS-13C3	PFHxS-13C3	PFOS-13C8	PFOS-13C8	PFOS-13C8	PFOS-13C8	PFOS-13C8	PFOS-13C8		PFOS-13C8	
58	2403-PIM	13C_PFHxS	13C_PFHxS	13C_PFHxS	13C_PFHxS	13C_PFOA	13C_PFOA	13C_PFOA	13C_PFOA	13C_PFOA	13C_PFOA	13C_PFOA	13C_PFOA
60	2403-PIM	13C3-PFBS	13C3-PFHxS	13C3-PFHxS	13C3-PFHxS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C8-PFOS	13C3-PFHxS	13C8-PFOS	13C8-PFOS
61	2403-PIM	13C-PFHxS	13C-PFHxS	13C-PFHxS	13C-PFOA	13C-PFOA	13C-PFOA	13C-PFOA	13C-PFOA	13C-PFOA	13C-PFOA	13C-PFOA	13C-PFOA
93	2403-PIM			M3PFHxS		M8PFOS	M8PFOS	M8PFOS					

Powdered Infant Milk (2403-PIM)
 Methods Perfluoroalkylsulfonic acids (PFASs) - Recovery Standards

LC	Sample	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentanesulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptanesulfonic acid (PFHpS)	Linear Perfluorooctanesulfonic acid (L-PFOS)	Sum of branched PFOS acids (br-PFOS)	Total-Perfluorooctanesulfonic acids (total PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecanesulfonic acid (PFDS)	Perfluoroundecane- sulfonic acid (PFUnDS)	Perfluorododecane- sulfonic acid (PFDoDS)	Perfluorotridecane- sulfonic acid (PFTrDS)
1	2403-PIM	18O2 PFHxS	18O2 PFHxS	18O2 PFHxS	18O2 PFHxS	13C4 PFOS	13C4 PFOS		13C4 PFOS	13C4 PFOS		13C4 PFOS	
2	2403-PIM												
4	2403-PIM												
5	2403-PIM												
7	2403-PIM												
10	2403-PIM												
11	2403-PIM												
12	2403-PIM					MPFOS	MPFOS	MPFOS					
14	2403-PIM	13C4-PFOA	13C4-PFOA	13C4-PFOA	13C4-PFOA			13C4-PFOA	13C4-PFOA	13C4-PFOA	13C4-PFOA	13C4-PFOA	13C4-PFOA
15	2403-PIM												
16	2403-PIM	R-PFOS		R-PFOA		R-PFOS							
17	2403-PIM	PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8
18	2403-PIM												
19	2403-PIM	M3PFBA-inj	M3PFBA-inj	M3PFBA-inj	M3PFBA-inj	MPFOS-inj	MPFOS-inj	MPFOS-inj	M3PFBA-inj	MPFDA-inj	MPFDA-inj	MPFDA-inj	MPFDA-inj
20	2403-PIM					MPFDA	MPFDA	MPFDA					
21	2403-PIM	PFOS	PFOS	PFOS	PFOS	PFOS	PFOS	PFOS	PFOS	PFOS	PFOS	PFOS	PFOS
22	2403-PIM	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS
24	2403-PIM												
25	2403-PIM			18O2-PFHxS		13C4-PFOS	13C4-PFOS	13C4-PFOS					
26	2403-PIM												
27	2403-PIM												
28	2403-PIM												
29	2403-PIM	PFOS-13C8	PFOS-13C8	PFOS-13C8	PFOS-13C8	PFOS-13C8	PFOS-13C8		PFOS-13C8	PFOS-13C8	PFOS-13C8	PFOS-13C8	PFOS-13C8
30	2403-PIM	-	-	-	-	-	-	-	-	-	-	-	-
31	2403-PIM												
32	2403-PIM			13O2-PFHxS		13C4-PFOS		13C4-PFOS					
33	2403-PIM	C4 PFOS	C4 PFOS	C4 PFOS	C4 PFOS	C4 PFOS	C4 PFOS	C4 PFOS	C4 PFOS				
34	2403-PIM												
35	2403-PIM												
37	2403-PIM	Sodium perfluoro- [13C8]octanesulfonate	Sodium perfluoro- [13C8]octanesulfonate	Sodium perfluoro- [13C8]octanesulfonate									
39	2403-PIM	No	No	No	No	No	No	No	No	No	No	No	No
40	2403-PIM												
41	2403-PIM												
43	2403-PIM	PFOA - M8		PFOA - M8	PFOA - M8	PFOS - M8	PFOS - M8	PFOS - M8		PFOA - M8			
44	2403-PIM												
45	2403-PIM			105.90		111.80							
46	2403-PIM												
47	2403-PIM												
48	2403-PIM	PFOS 13C8	PFOS 13C8	PFOS 13C8	PFOS 13C8	PFOS 13C8	PFOS 13C8	PFOS 13C8	PFOS 13C8				
49	2403-PIM	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS
50	2403-PIM	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS				
51	2403-PIM												
52	2403-PIM												
53	2403-PIM												
54	2403-PIM												
55	2403-PIM												
56	2403-PIM												
57	2403-PIM	PFOS-13C3	PFOS-13C3	PFOS-13C3	PFOS-13C3	PFOS-13C3	PFOS-13C3	PFOS-13C3	PFOS-13C3	PFOS-13C3		PFOS-13C3	
58	2403-PIM												
60	2403-PIM												
61	2403-PIM	none	none	none	none	none	none	none	none	none	none	none	none
93	2403-PIM			no		no	no	no	no	no	no	no	no

Powdered Infant Milk (2403-PIM)
 Methods Perfluoroalkylsulfonic acids (PFASs) - Comments

LC	Sample	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentanesulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptanesulfonic acid (PFHpS)	Linear Perfluorooctanesulfonic acid (L-PFOS)	Sum of branched PFOS acids (br-PFOS)	Total-Perfluorooctanesulfonic acids (total PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecane-sulfonic acid (PFDS)	Perfluoroundecane-sulfonic acid (PFUnDS)	Perfluorododecane-sulfonic acid (PFDoDS)	Perfluorotridecane-sulfonic acid (PFTrDS)	
1	2403-PIM													
2	2403-PIM					L-PFOS used to quantify	br-PFOS used to quantify Reference standard: L-PFOS; mass transitions: m/z 499 > 80	Sum calculated from br-PFOS and L-PFOS Reference standard: L-PFOS; mass transitions: m/z 499 > 80						
4	2403-PIM													
5	2403-PIM													
7	2403-PIM			PFHxS Sum 0,050		Transition 499/80	Difference of Total PFOS and L-PFOS, L-PFOS was used to quantify br-PFOS	Transition 499/80, L-PFOS was used to quantify br-PFOS						
10	2403-PIM													
11	2403-PIM													
12	2403-PIM						L-PFOS, 499 -> 80	L-PFOS, 499 -> 80						
14	2403-PIM													
15	2403-PIM													
16	2403-PIM						average m/z 80 and m/z 99; L-PFOS	m/z 80 L-PFOS + average m/z 80 and m/z 99 br-PFOS						
17	2403-PIM					499>80.0	mean 499>80.0 & 499>99.1	br-pfos, 499>80						
18	2403-PIM						br-pfos, 499>80	br-pfos, 499>80						
19	2403-PIM			br-PFHxS included			br-PFOSK, average of trans 79,95 & 89,95	br-PFOSK, average of trans 79,95 & 89,95						
20	2403-PIM			This is a non accredited matrix therefor no LOQ or MU		This is a non accredited matrix therefor no LOQ or MU	This is a non accredited matrix therefor no LOQ or MU	This is a non accredited matrix therefor no LOQ or MU						
21	2403-PIM					L-PFOS was quantified using a calibration curve with L-PFOS and mass-labelled PFOS.	br-PFOS was calculated as difference between Total PFOS and L-PFOS	A 3-point calibration curve was built-up using a mixture of linear and branched PFOS (br-PFOSK - Wellington laboratories) and mass-labelled PFOS was used as IS. The calculated RF was applied to quantify Total PFOS in the sample.						
22	2403-PIM													
24	2403-PIM													
25	2403-PIM					Quant: L-PFOS 499->80 m/z	Quant: br-PFOS 499->99 m/z							
26	2403-PIM											not part of used Standardmix	not part of used Standardmix	not part of used Standardmix
27	2403-PIM							Reference standard: L-PFOS; MS/MS transitions: m/z 499>80 L-PFOS						
28	2403-PIM		both <LOQ	both <LOQ	both <LOQ	both <LOQ	L-PFOS	and average of the 2 MS/MS transitions 499>80 and 499>99	both <LOQ	both <LOQ	both <LOQ	both <LOQ	both <LOQ	both <LOQ
29	2403-PIM						quantification against L-PFOS							
30	2403-PIM						L-PFOS, 499 ->80							
31	2403-PIM		not part of our scope				not part of our scope	not part of our scope	not part of our scope			not part of our scope	not part of our scope	not part of our scope
32	2403-PIM							L-PFOS, 499>80						
33	2403-PIM													
34	2403-PIM	Validation not finished	Validation not finished		Validation not finished			technical grade; 499.0 / 79.9	Validation not finished	Validation not finished	Validation not finished	Validation not finished	Validation not finished	Validation not finished
35	2403-PIM													
37	2403-PIM													
39	2403-PIM			Sum of linear and branched			L-PFOS	L-PFOS						
40	2403-PIM						br-PFOSK; 499.0-99.0							
41	2403-PIM					L-PFOS, SUM of both mass transitions	substraction total PFOS - L-PFOS	L-PFOS, SUM of both mass transitions				Only qualitativ	Only qualitativ	Only qualitativ
43	2403-PIM													
44	2403-PIM													
45	2403-PIM													
46	2403-PIM													
47	2403-PIM	MU: not determined	MU: not determined			MU: not determined	Branched PFOS is determined by subtracting linear PFOS from total PFOS. Transition 499 > 99 used for quantification 499 > 80 was used for Qualification. cf comments - Method PFAS		MU: not determined	MU: not determined	MU: not determined	MU: not determined	MU: not determined	MU: not determined
48	2403-PIM													
49	2403-PIM							L-PFOS; transition: 499>80						
50	2403-PIM						Average of Quantifier (498,9 > 80) and Qualifier (498,9 > 99) values, determined with L-PFOS calibration ("Av L" approach from the Comparative Study on the Determination of linear, branched, and total PFOS) in Pork Liver 2023 linear, branched, and total PFOS							
51	2403-PIM			Method validation underway. LOQ calculated back from indicative LOQ for reconstituted Inf. Form. MU approx 35% - not confirmed. L PFHxS = 0.032, L- + Br- = 0.036		Method validation underway. LOQ calculated back from indicative LOQ for reconstituted Inf. Form. MU approx 35% - not confirmed.	Method validation underway. LOQ calculated back from indicative LOQ for reconstituted Inf. Form. MU approx 35% - not confirmed.	Method validation underway. LOQ calculated back from indicative LOQ for reconstituted Inf. Form. MU approx 35% - not confirmed.						
52	2403-PIM							quantify by L-PFOS						
53	2403-PIM													
54	2403-PIM		Not analyzed	Detected below LOQ, estimated conc. 0,034 µg/kg	Not analyzed				Not analyzed		Not analyzed	Not analyzed	Not analyzed	Not analyzed

Powdered Infant Milk (2403-PIM)
 Methods Perfluoroalkylsulfonic acids (PFASs) - Comments

LC	Sample	Perfluorobutanesulfonic acid (PFBS)	Perfluoropentanesulfonic acid (PFPeS)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptanesulfonic acid (PFHpS)	Linear Perfluorooctanesulfonic acid (L-PFOS)	Sum of branched PFOS acids (br-PFOS)	Total-Perfluorooctanesulfonic acids (total PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecanesulfonic acid (PFDS)	Perfluoroundecanesulfonic acid (PFUnDS)	Perfluorododecanesulfonic acid (PFDoDS)	Perfluorotridecane-sulfonic acid (PFTrDS)
55	2403-PIM						reference Standard: L-PFOS; mass transition: 499 > 80	reference Standard: L-PFOS; mass transition: 499 > 80			we do not measure this compound	we do not measure this compound	we do not measure this compound
56	2403-PIM												
57	2403-PIM						same MS transition of linear PFOS only the linear (L-PFOS)	498,9>80,1 498,9>99,1 only the linear (L-PFOS)			not analyzed		not analyzed
58	2403-PIM						L-PFOS standard; 499->80	L-PFOS standard; 499->80					
60	2403-PIM						L-PFOS; 499>80	L-PFOS; 499>80					
61	2403-PIM						499,0 ->98,8, in Routine nur Angabe PFOS-gesamt	499,0 ->98,8, in Routine nur Angabe PFOS-gesamt					
93	2403-PIM			399,0 -> 80,0		499,0 ->98,8, in Routine nur Angabe PFOS-gesamt	499,0 ->98,8, in Routine nur Angabe PFOS-gesamt	499,0 ->98,8					

Powdered Infant Milk (2403-PIM)
 Methods Sum of PFOS, PFOA, PFNA, PFHxS - Comments

LC	Sample	Sum of total-PFOS, PFOA, PFNA, PFHxS (ub)	Sum of total-PFOS, PFOA, PFNA, PFHxS (lb)
1	2403-PIM		
2	2403-PIM		
4	2403-PIM		
5	2403-PIM		
7	2403-PIM	only L-PFHxS content was used	only L-PFHxS content was used
10	2403-PIM		
11	2403-PIM		
12	2403-PIM		
14	2403-PIM		
15	2403-PIM		
16	2403-PIM		
17	2403-PIM		
18	2403-PIM	PIM-A 19%, PIM-B 21%	
19	2403-PIM		
20	2403-PIM	This is a non accredited matrix therefor no LOQ or MU	This is a non accredited matrix therefor no LOQ or MU
21	2403-PIM		
22	2403-PIM		
24	2403-PIM		
25	2403-PIM		
26	2403-PIM		
27	2403-PIM		MU% calculated from absolute MU (0,1 µg/kg for A) (MU% for B is 29% based on absolute MU of 0,004 µg/kg)
28	2403-PIM		
29	2403-PIM		
30	2403-PIM		
31	2403-PIM		
32	2403-PIM		
33	2403-PIM		
34	2403-PIM		
35	2403-PIM		
37	2403-PIM		
39	2403-PIM		
40	2403-PIM		
41	2403-PIM		
43	2403-PIM		
44	2403-PIM		
45	2403-PIM		
46	2403-PIM		
47	2403-PIM		
48	2403-PIM		
49	2403-PIM		
50	2403-PIM		
51	2403-PIM		% MU can't be used - absolute MU -0.11 for PIM-A
52	2403-PIM		
53	2403-PIM		
54	2403-PIM		
55	2403-PIM		
56	2403-PIM		
57	2403-PIM		
58	2403-PIM		
60	2403-PIM		
61	2403-PIM		
93	2403-PIM		

Powdered Infant Milk (2403-PIM)
 Methods Other PFAS - Internal Standards

LC	Sample	Perfluorooctane sulphonamide	2,2,3-Trifluoro-3-[1,1,2,2,3,3-hexafluor-3-(trifluoromethoxy)propoxy]-propionic acid	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)-propionic acid	Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	1-Propanaminium, N,N-dimethyl-N-oxide-3-[[[3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, hydroxide	1-Propanaminium, N-(carboxymethyl)-N,N-dimethyl-3-[[[3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, hydroxide
		FOSA	DONA	GenX	(major component of F-53B)	(minor component of F-53B)	Capstone A	Capstone B
1	2403-PIM	13C8 PFOSA	13C3 HFPO-DA	13C3 HFPO-DA	13C8 PFOS	13C8 PFOS		
2	2403-PIM							
4	2403-PIM	MFOSA	MPFHxS	MGENX	MPFHxS	MPFHxS		MPFHxS
5	2403-PIM							
7	2403-PIM	Perfluoro-n-(13C8)octansulfonamid (M8FOSA)	Perfluoro-4,8-dioxa-3H-nonansäure-13C2-Carboxyl Ammoniumsalz	2,3,3,3-Tetrafluoro-2(1,1,2,2,3,3,3-heptafluoropropoxy)-13C3-prpanoic acid (M3HFPO- DA)				
10	2403-PIM	M8FOSA	M2PFOA	M2PFOA	M8PFOS	M8PFOS	M8PFOS	M8PFOS
11	2403-PIM							
12	2403-PIM							
14	2403-PIM	13C8-PFOSA	13C4-PFHpA	13C3-HFPO-DA	13C4-PFOS	13C2-PFDoA		
15	2403-PIM			GenX-13C3				
16	2403-PIM		13C-PFHpA					
17	2403-PIM		GenX13C3	GenX13C3	PFNA13C5	PFDA13C2		
18	2403-PIM		PFHpA-13C2		lin-PFOS-13C8	lin-PFOS-13C8		
19	2403-PIM		MPFOA	MHFPO-DA	MPFOS	MPFOS		
20	2403-PIM							
21	2403-PIM	FOSA	PFOA	GENX	PFOS	PFOS		
22	2403-PIM		13C3-GenX	13C3-GenX	13C3-GenX	13C3-GenX		
24	2403-PIM							
25	2403-PIM							
26	2403-PIM	M8FOSA	M4PFHpA	M5PFHxA	M9PFNA	M7PFUdA	Analyte not tested	Analyte not tested
27	2403-PIM							
28	2403-PIM							
29	2403-PIM		GenX-13C3	GenX-13C3	PFHxS-18O2	PFHxS-18O2		
30	2403-PIM		PFHpA 13C4	HFPO-DA 13C3				
31	2403-PIM	M8PFOA (perfluoro-n-(13C8) octanoic acid)						
32	2403-PIM		13C4-PFHpA					
33	2403-PIM	C8FOSA	C3HFPO-DA	C3HFPO-DA	C8PFOS	C8PFOS		
34	2403-PIM							
35	2403-PIM	13C8-FOSA	13C4-PFHpA	13C3-HFPO-DA	13C8-PFOS	13C8-PFOS		
37	2403-PIM							
39	2403-PIM		13C5-PFHxS	13C3-M3HFPO-DA	13C7-PFUdA	13C7-PFUdA		
40	2403-PIM			13C5_PFHxA				
41	2403-PIM		13C3-HFPO-DA	13C3-HFPO-DA				
43	2403-PIM		13C-PFHpA	13C-GenX				
44	2403-PIM							
45	2403-PIM			perfluoro-n- [1,2,3,4,6-13C5] hexanoic acid				
46	2403-PIM	13C-PFOSA	13C-GenX	13C-GenX	13C-PFOS	13C-PFOS	13C-PFOS	13C-PFOS
47	2403-PIM	13C8-FOSA	13C-GENX	13C-GENX	13C4-PFOS	13C4-PFOS		
48	2403-PIM		GenX 13C3	GenX 13C3	PFUnDA 13C2	PFUnDA 13C2		
49	2403-PIM	PFOSA-13C8	13C5-PFHxA	HFPO-DA-13C3				
50	2403-PIM		M13C3 GenX	M13C3 GenX	M13C2 PFUnDA	M13C2 PFUnDA	M13C5 PFNA	M13C5 PFNA
51	2403-PIM							
52	2403-PIM							
53	2403-PIM							
54	2403-PIM	MPFOSA						
55	2403-PIM							
56	2403-PIM							
57	2403-PIM	13C8-FOSA	13C3-GenX	13C3-GenX				
58	2403-PIM	13C_FOSA	13C_GenX	13C_GenX	13C_PFOS	13C_PFOS	d-N-MeFOSA	13C_FOSA
60	2403-PIM	13C8-FOSA	13C4-PFHpA	13C3-HFPO-DA	13C8-PFOS	13C8-PFOS		
61	2403-PIM	13C-FOSA	13C-PFOA	13C-PFHpA	13C-PFOS	13C-PFOS	13C-PFNA	13C-PFNA
93	2403-PIM							

Powdered Infant Milk (2403-PIM)
 Methods Other PFAS - Recovery Standards

LC	Sample	Perfluorooctane sulphonamide	2,2,3-Trifluoro-3-[1,1,2,2,3,3-hexafluor-3-(trifluoromethoxy)propoxy]-propionic acid	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)-propanoic acid	Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	Potassium 11-chloroheicosafuoro-3-oxaundecane-1-sulfonate	1-Propanaminium, N,N-dimethyl-N-oxide-3-[[[3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, hydroxide	1-Propanaminium, N-(carboxymethyl)-N,N-dimethyl-3-[[[3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, hydroxide
		FOSA	DONA	GenX	(major component of F-53B)	(minor component of F-53B)	Capstone A	Capstone B
1	2403-PIM	13C4 PFOS	13C4 PFOS	13C4 PFOS	13C4 PFOS	13C4 PFOS		
2	2403-PIM							
4	2403-PIM							
5	2403-PIM							
7	2403-PIM							
10	2403-PIM							
11	2403-PIM							
12	2403-PIM							
14	2403-PIM	13C4-PFOA	13C4-PFOA	13C4-PFOA	13C4-PFOA	13C4-PFOA		
15	2403-PIM							
16	2403-PIM	R-PFDA		R-PFOA				
17	2403-PIM		PFOS13C8	PFOS13C8	PFOS13C8	PFOS13C8		
18	2403-PIM							
19	2403-PIM		M2PFOA-inj	M3PFBA-inj	MPFOS-inj	MPFOS-inj		
20	2403-PIM							
21	2403-PIM	PFOS	PFOA	PFOA	PFOS	PFOS		
22	2403-PIM		13C4-PFOS	13C4-PFOS	13C4-PFOS	13C4-PFOS		
24	2403-PIM							
25	2403-PIM							
26	2403-PIM							
27	2403-PIM							
28	2403-PIM							
29	2403-PIM		PFOS-13C8	PFOS-13C8	PFOS-13C8	PFOS-13C8		
30	2403-PIM							
31	2403-PIM							
32	2403-PIM							
33	2403-PIM	d5-NEtFOSAA	C4PFOA	C4PFOA	C4PFOS	C4PFOS		
34	2403-PIM							
35	2403-PIM							
37	2403-PIM							
39	2403-PIM		No	No	No	No		
40	2403-PIM							
41	2403-PIM							
43	2403-PIM		PFOA - M8	PFOA - M8				
44	2403-PIM							
45	2403-PIM			90.00				
46	2403-PIM							
47	2403-PIM							
48	2403-PIM		PFOS 13C8	PFOS 13C8	PFOS 13C8	PFOS 13C8		
49	2403-PIM	PFOS-13C4	PFOS-13C4	PFOS-13C4	PFOS-13C4	PFOS-13C4		
50	2403-PIM		M13C8 PFOS	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS	M13C8 PFOS
51	2403-PIM							
52	2403-PIM							
53	2403-PIM							
54	2403-PIM							
55	2403-PIM							
56	2403-PIM							
57	2403-PIM	13C4-PFOS	13C4-PFOS	13C4-PFOS				
58	2403-PIM							
60	2403-PIM							
61	2403-PIM	none	none	none	none	none	none	none
93	2403-PIM							

Powdered Infant Milk (2403-PIM)

Methods Perfluoroalkylcarboxylic acids (PFCAs), Perfluoroalkylsulfonic acids (PFASs) and Other PFAS - Pre-treatment and extraction

LC	Sample	Pre-treatment and extraction					
1	2403-PIM	Sample spiked with internal standards	Added Methanol with Potassium Hydroxide	Tumbled 8 hours	Centrifuged @ 3000 rpm		
2	2403-PIM	Reconstitution of 10 g powder in 40 g water.	Sample weight of reconstituted milk: 10 g	Defatting of sample with 20 mL hexane.	Extraction with 5 mL acetonitrile + 150 uL acetic acid. Extraction time: 5 min.		
4	2403-PIM	No pre-treatments.	Addition of internal standards.	Extraction: shaking with water/acetonitrile at room temperature.			
5	2403-PIM						
7	2403-PIM	Pre-treatment: -		Extraction method: extraction according to a modified version of the QuEChERS method:	1g sample, addition of 10 ml water and 10 ml ACN , ultrasonic extraction, and shaking after addition of Citrat-Extraction-Tube (CET) for QuEChERS, centrifugation, clean up of the supernatant		
10	2403-PIM	1 g sample	20 mL Acetonitrile	300 uL formic acid	shaker 30 min	ultrasonic 1 h	1 hour at freezer
11	2403-PIM						centrifuge 8000 rpm, temperature 4 oC, 10 min
12	2403-PIM	adding of 10 mL water to 2 g weighed sample, mixing with vortex, adding of internal standards,	extraction with 2x 5 mL acetonitrile, 20 sec Vortex, 15 min ultrasonic bath (40 °C), centrifugation and combine the extracts				
14	2403-PIM	Quechers-Extraction					
15	2403-PIM	ultrasonic extraction using acetonitrile					
16	2403-PIM	# addition of 10 mL dest. water to 1,5 / 3 g	# extraction with 10 mL ACN and 60 µL HCl (6 MOL), shaking (20 min) and ultrasonication (20 min)	# addition of 4 g MgSO4 and 1 g NaCl	# 15 min centrifugation, transfer of organic layer to 15 mL tube	# evaporation to 1 mL using nitrogen (50 °C), add 1 mL ACN	# addition of 8 mL 25mM NH4Ac buffer (pH = 6)
17	2403-PIM	lyophilisation de l'échantillon	extraction solide/liquide avec methanol hydroxide de potassium				
18	2403-PIM	PFAS were extracted with acetonitrile					
19	2403-PIM	Quechers extraction using Water, Acetonitrile, NaCl and MgSO4 salts.	After centrifugation, organic phase is taken for clean-up steps.				
20	2403-PIM	no pre-treatment	2g sample, 5 ml acetonitril, vigorously shaking 5 min, ultra sonic bath 15 min, centrifugation.	Repeat with 5ml additional acetonitrile.			
21	2403-PIM	Addition of 10 mL water and 10 mL acetonitrile. Sample was shaken for 15 min.	QuEChERS extraction packet was added to the extract and shaken again.				
22	2403-PIM						
24	2403-PIM	Reconstitution in water, extraction with CH3CN					
25	2403-PIM	Pretreatment: Sample container was shaken before taking aliquots. Sample was not reconstituted in water.		Extraction method: 2 g of sample was weighed out in triplicate	50 uL of internal standard added to sample (10 ng/mL, MPFAC-24ES)	Sample extracted with 5 mL of methanol and sonicated for 15 mins, process repeated.	Supernatants combined in 15 mL tube.
26	2403-PIM	weigh 2 g of sample (milkpowder), add 5 mL water, vortex					
27	2403-PIM	Sample spiked with internal standards	Extraction: shaking with water/acetonitrile/formic acid	Add QuEChERS salts (4g MgSO4 + 1g NaCl)	Shake at room temperature	Centrifuge 10 minutes at 3500 rpm	
28	2403-PIM	Samples are weighted into a pp tube and extracted with methanol.	ISTD is added.				
29	2403-PIM	Pre-treatment and extraction following French NRL method (LABERCA/PFAS-tma.1.03) :	drying sample (if not dry)	extraction with methanoloic solution of potassium hydroxyde			
30	2403-PIM	no pre-treatment	extraction mixture of acetonitrile and methanol (1/1) with 0.1 % NH4OH	evaporated till dryness and reconstituted in water - methanol			
31	2403-PIM	Weigh 5 ± 0.01 grams of the sample into a 50 ml centrifuge tube, add 100 µl of Internal Standard.	Add 10 ml Acetonitrile with 5% Formic acid, Add 15 ml HPLC-Water for dry samples, Shake the collomix for 2 minutes.	Add 6.5 grams of QuEChERS salt, Shake in the collomix for 4 minutes.Centrifuge at 10000 rpm for 4 minutes			
32	2403-PIM	Sample + 10 mL H2O + 10 mL ACN	60 min ultrasonic extraction (shaking by hand every 15 min)	Cooling down to room temp	Addition of 4 g MgSO4, 1 g NaCl, 250 mg carbon	Shaking by hand rapidly	Centrifugation
33	2403-PIM	Dried powder was hydrated with 15 mL of water and put through a QuEChERS extraction using	NaCl, MgSO4, formic acid, and acetonitrile.				
34	2403-PIM	to 5g of sample 5ml water was added	ILIS, 10ml ACN was added and shaken	salt mix 1 (4g MgSO4, 1g NaCl, 0.5g Na2H citrate, 1g Na3 citrate) was added	shaken, centrifugated		
35	2403-PIM	Modified QuEChERS. The sample is extracted two times with acetonitrile, MgSO4 and NaCl is added.					
37	2403-PIM	Extraction using 10 ml of methanol/potassium hydroxide for 17 hours.					
39	2403-PIM	Reconstitution in water and double extractions with acetonitrile					
40	2403-PIM	QuEChERS NaCl:MgSO4 (1:4), acetonitrile and water					
41	2403-PIM	solid liquid extraction with 20 mL 0.1 % NH3 in acetonitrile					
43	2403-PIM	Reconstitution in 9 mL MQ	Centrifuge, afterwards remove fat layer by using a spoon to skim off the fat	Extraction with 10 mL MeOH	Addition of formic acid	Vortex, head-over-head, centrifugation	Dilution with MQ
44	2403-PIM	1 g of sample	addition of internal standards + standard addition	extraction with water : acetonitrile 1:1 (10 + 10 ml)	vortex, shaking, vortex, shaking head over head		
45	2403-PIM	5 grams reconstituted with 10 ml of water	extraction with 10 ml of Acetonitrile	salting out with Quechers Extraction EN method			
46	2403-PIM	extraction with 1%NF3 in ACN					
47	2403-PIM	homogenized sample is weighed and spiked with internal standard. Left alone for 15 minutes	Solvents and quecher salt is added.				
48	2403-PIM	Pre-treatment includes a grinding, freeze-drying and supplementation step.	Extraction involves the use of a methanol solution containing potassium hydroxide.				
49	2403-PIM	EXTRACTION WITH ACETONITRILE					
50	2403-PIM	Sample is dry	1g of dry sample is extracted with 15 ml MeOH/KOH 0,01M during 16 hours	Evaporate 5ml of supernatant until 1ml, dilute with 4ml of water			
51	2403-PIM	Addition of internal std	Alkaline digestion, NaOH - neutralise with HCl.	Extraction in Acetonitrile - shake and sonicate x 2			
52	2403-PIM	Extraction with ACN/Water -> shaking -> freeze für 2h -> centrifugate					
53	2403-PIM	Sample was extracted with acetonitrile in an ultrasonic bath					
54	2403-PIM	Addition of 3 mL water. Extraction with ACN.					

Powdered Infant Milk (2403-PIM)

Methods Perfluoroalkylcarboxylic acids (PFCAs), Perfluoroalkylsulfonic acids (PFASs) and Other PFAS - Pre-treatment and extraction

LC	Sample	Pre-treatment and extraction					
55	2403-PIM	homogenization	addition of 10 mL water, 10 mL acetonitrile and internal standard	agitate intensively	60 min ultrasonic bath (agitate all 15 min)	addition of buffering salts for phase-separation	centrifugation (4000 U/min, T<12°C), 5 mL aliquot, Add 5 mL water + mix, Use 80% (8 mL) for SPE
56	2403-PIM	extraction with water/methanol.	elution with PFAS-wax column			agitate intensively	
57	2403-PIM	extraction with NaOH 0,05M in methanol					
58	2403-PIM	Extraction with acidified Water / Acetonitrile					
60	2403-PIM	2 g sample + 2 ml water were mixed with ISTD and extracted twice with 5 mL acetonitrile					
61	2403-PIM	Quechers-Extraktion using 10mL H2O + 10 mL ACN + 150 µL Formic Acid	shaking 15 min				
93	2403-PIM	only mix the sample before extraction		5 g (sample) + 10 mL 0,1% NH3 in acetonitrile -> shake for two hours (Vibrations-Mixgerät; z. B. Phoenix Instrument RS-VF10)			

Powdered Infant Milk (2403-PIM)

Methods Perfluoroalkylcarboxylic acids (PFACs), Perfluoroalkylsulfonic acids (PFASs) and Other PFAS - Clean-up

LC	Sample	Clean-up						
1	2403-PIM	Eluant passed through activated carbon cartridge (ENVI-CARB 1000 mg), eluted with Methanol.	Evaporated under nitrogen, passed through 0.2 µm filter.	Transferred to polypropylene LC vial, recovery standard added.				
2	2403-PIM	Addition of 4000 mg MgSO4 and 1000 mg NaCl. Vortexing for 5 min., centrifugation for 10 min.	Addition 900 mg MgSO4, 300 mg PSA, 150 mg graphitized carbon black to of organic supernatant.	Vortexing for 5 min, followed by centrifugation for 10 min.	Dilution of organic phase with water (1:1).	Injection of 200 µL and analysis by LC-MSMS		
4	2403-PIM	Clean up with quechers salts and degreasing by freezing.						
5	2403-PIM							
7	2403-PIM	purification of the extracts using a mixed-mode weak anion-exchange sorbent combined with GCB SPE- tube (Strata PFAS (WAX/GCB); 200 mg / 50 mg in a 6 mL Tube)	SPE: condition: 4 ml 0,3% NH4OH/MeOH, 6 ml water	load: sample (8ml extract diluted with about 22 ml water (30 ml final volume))	wash: 2x 4 ml water	elute: 8 ml 0,3% NH4OH/MeOH	solvent evaporation to 100 µl water	addition of 100 µl ACN/MeOH-mix (10/90), sample measured in ACN-MeOH-H2O mix
10	2403-PIM	18 mL supernatant	150 mg PSA	50 mg Graphitize Carbon Black	shaker 30 min	overnight at freezer	centrifuge 8000 rpm, temperature 4 oC, 10 min	15 mL supernant, dryness under nitrogen, reconstitution 500 µL MeOH:water 0.1% Formic Acid (75:25, v/v)
11	2403-PIM							
12	2403-PIM	adding of dSPE-Salt (2 g MgSO4, 0,5 g NaCl, 0,1 g C18, 0,1 g GCB)	shaking and centrifugation (10 min, 3500 rpm)	supernatant was transferred into 15 mL centrifuge test tube	evaporation to dryness in N2-Stream (40 °C)	addition of recovery standard (50 µL) and MeOH (200 µL) and 250 µL mobile Phase A (H2O, 2 mmol ammoniumacetate, 0,1 % acetic acid), then vortex and transfer into vial		
14	2403-PIM	SPE Cleanup						
15	2403-PIM	degreasing using n-hexane	dispersive SPE using activated carbon					
16	2403-PIM	# SPE (Strata X-AW, 200 mg)	# GCB 250 mg	# elution using 3 x 3 mL 1% ammonia in methanol	# evaporation to dryness under nitrogen stream (50 °C)	# addition of recovery standard and MeOH/ 1% formic acid; final volume of 500 µL	# freeze over night and syringe filtration (PES 0,2 µm)	
17	2403-PIM	purification sur SPE Chromabond PFAS	purification sur SPE ENVI carb					
18	2403-PIM	Hexane wash and SPE						
19	2403-PIM	Purification on SPE Envicarb	Evaporation to 10 ml	Mix with water and pH adapted to 3	Purification on SPE Agilent polymeric weak anion exchange 500mg	Evaporation to 0,1 ml, recovery standards added and MeOH/H2O added for total volume of 0,5ml	Injection in Polypropylene vial	
20	2403-PIM	dSPE (0,1 g C18, 0,1 g GCB, 2 g MgSO4, 0,5 g NaCl)						
21	2403-PIM	6 mL of the supernatant was treated with dSPE sorbent phase in a 15 mL tube.	The sorbent mixture consisted of 900 mg of magnesium sulphate, 150 mg of PSA, and 150 mg of C18-EC.	The mixture was manually shaken for 1 min and centrifuged for 5 min.	4 mL of the purified extract was evaporated to dryness under a nitrogen stream and dissolved in 100 µL of the recovery solution.			
22	2403-PIM							
24	2403-PIM	DSPE (PSA, MgSO4)						
25	2403-PIM	dSPE clean up with 0.1 g C18, 0.1 ENVI-CARB, 2 g MgSO4 and 0.5 NaCl.	Shaken for 1 min and centrifuged at 4000 rpm.	Supernatant transferred to 15 mL tube and dried under nitrogen at 50°C.	Dried extract redissolved in 450 µL mobile phases (1:1 v/v).	50 µL of recovery standard added (10 ng/mL, MPFAC-HIF-IS).	Filtered using microcentrifuge tube and cellulose acetate filter, centrifuged at 15000 rpm for 5 min.	
26	2403-PIM	add IS mix, wait 10 min, add 0,5 g NaCl + DSPE-Kit (600 mg PSA, 300 mg C18 und 900 mg MgSO4) and 10 mL acetonitrile	shaking 15 min, centrifuge 10 min (14000 rpm)	GCB column	evaporate upper ACN phase by nitrogenstream at 60°C to <0,5 mL	reconstitution of sample with 3 mL 2,5% acetic acid	SPE with Strata W-AX 100 mg/3 mL, elution 2 times with 1% NH3 / MeOH	evaporate MeOH eluate by nitrogenstream at 60°C, reconstitution of sample with 0,5 mL 0,05%FA in Water/Methanol 1:1, (all in plastic tubes)
27	2403-PIM	Add QuEChERS salts (4g MgSO4 + 1g NaCl)	Shake at room temprature	Centrifuge 10 minutes at 3500 rpm	Evaporate to dryness under nitrogen stream (50 °C)	Reconstitution of sample with 0,5 mL 0,5% FA in water/methanol 1:1		
28	2403-PIM	Solid Phase extraction using HR-XAW and CarbonA, purchased from Macherey&Naqel. Clean-up following French NRL method (LABERCA/PFAS-tma.1.03) :	The Method is a modification of the DIN 38407-42					
29	2403-PIM	loaded on SPE - WAX cartridge	First clean-up SPE Chromabond PFAS	Second clean-up SPE ENVI Carb				
30	2403-PIM	washed with diluted acetic acid and a mixture of tetrahydrofuran and methanol	washed with diluted acetic acid and a mixture of tetrahydrofuran and methanol	eluted with methanol + 0.1% NH4OH				
31	2403-PIM	Add 7 ml of the extract to the dSPE tube (GCB, PSA, magnesiumsulfaat)	Shake in the Collomix for 2 minutes. Centrifuge at 4500 rpm for 6 minutes.	Evaporate 3 ml of the extract to 0.3 ml at 55 degrees Celsius.	Shake the extract in the vortex for 2 minutes, Transfer the sample to the vial.			
32	2403-PIM	SPE using Oasis WAX 6 cc, 150 mg Sorbent, 30 µm particle size	Conditioning with 4 mL 0.1% NH3 in MeOH, 4 mL MeOH, 4 mL 25 mM CH3COONH4 in H2O (pH 4 using acetic acid)	6 mL extract + 4 mL H2O	Washing with 4 mL H2O, 4 mL Acetone/ACN (50/50), 4 mL MeOH	Elution with 2x 1.5 mL 0.1% NH3 in MeOH	Keeper (ethylene glycole, 50 µL) was used during evaporation	Reconstitution with MeOH/H2O (50/50)
33	2403-PIM	QuEChERS supernatant was first cleaned up with GCB and dried with MgSO4. 1 mL of supernatant was then	cleaned with weak anion exchange solid phase extraction (WAX SPE).				WAX SPE cartridge was conditioned with 0.3% (w/v) ammonium hydroxide in methanol and water	Sample was washed with water and 0.05 M formic acid in 50/50 water/methanol and then eluted with 0.3% (w/v) ammonium hydroxide in methanol. Sample was concentrated to 1 mL.
34	2403-PIM	frozen out with liquid N2, centrifugated	6ml of ACN phase was added to salt mix III (0.9g MgSO4, 0.15g d-SPE)	shaken and centrifugated	4ml extract was evaporated to complete dryness	resolved in 0.4ml MeOH	filled in ALS-Vials for chromatography	
35	2403-PIM	After MgSO4 and NaCl is added, clean-up by using fluorisil and ENVI-carb, centrifugated,	supernatant transfered, evaporated and reconstituted in methanol before injection on the ENVI Carb Solid Phase (500 mg, 6 mL) (Supelco, USA) were used.	instrument.				
37	2403-PIM	Solid phase extractions (SPE) cartridge Oasis WAX (150 mg, 6 ml) (Waters Corp., USA) and Weak anionic exchange (WAX) SPE plus graphitized carbon black (Envicarb)						
39	2403-PIM	DSPE (C18+ graphitised carbon)						
40	2403-PIM	automated solid-phase extraction with a SPE with a combination	of Strata-GCB (250 mg Bottom) and Strata-X-AW (100 mg Bottom)					
41	2403-PIM	SPE (Strata-X-AW, 200mg/6ml, 33µm, Phenomenex)	Condition with MeOH and 0.04M HCl in MQ	Washing with 25mM sodium acetate buffer and 0.04M HCl in MeOH	Elution with 2% NH4OH in ACN			
43	2403-PIM	addition of 4 g MgSO4 + 1 g NaCl - quick shaking + then head over head shaking for 5 mins	Centrifugation (4000 rpm, 10 min)	5 ml of acetonitrile layer transferred to new 15 ml centrifuge test-tube	addition of 150 mg MgSO4 + 50 mg PSA - shaking, vortex	Centrifugation (4000 rpm, 10 min), 2.5 ml of supernatant transferred to the new 15 ml centrifuge test-tube, addition of 12 ml water	vakuum SPE - Strata X-AW 200 mg 33 µm Polymeric Weak Anion	4 ml placed to nitrogen concentrator (60°C, ca 2-3h) till one drop remain, dissolved in 500 ul of MeOH - vortex - centrifugation - transfer to vials
45	2403-PIM	dSPE (150mg PSA - 900mg MgSO4 - 150mg C18 EC)						
46	2403-PIM	SPE clean up (oasis wax + envicarb)						
47	2403-PIM	sample is shaken and centrifuged. Than brought onto a dSPE tube	sample is shaken and centrifuged again and put into an autosampler vial that is vortexed again then measured.					
48	2403-PIM	Clean-up on 2 SPE cartridges: CHROMABOND PFAS and ENVI-Carb	CHROMABOND :	- Column Conditioning: Prepare column with methanol/NH4OH, methanol, and water.	- Sample Application: Apply sample onto cartridge and pass through column.	- Column Washing: Rinse column with ammonium acetate and methanol.	ENVI-Carb : - Column Conditioning: Prepare column with methanol.	- Sample Application: Apply Sample onto cartridge and pass through column. - Column Washing: Rinse column with glacial acetic acid and methanol.
49	2403-PIM	SPE CLEAN-UP WITH STRATA X-AW 200 mg - dSPE-Envicarb 80mg						

Powdered Infant Milk (2403-PIM)
 Methods Perfluoroalkylcarboxylic acids (PFCAs), Perfluoroalkylsulfonic acids (PFASs) and Other PFAS - Clean-up

LC	Sample	Clean-up					
50	2403-PIM	first purification on cartridge SPE Chromabond PFAS	second purification on cartridge SPE Envi carb 500mg				
51	2403-PIM	2D SPE - OASIS WAX + STRATA GCB	Evaporation and reconstitution	Addition of recovery std			
52	2403-PIM	QuEChERS					
53	2403-PIM	dSPE with C18 and envicarb					
54	2403-PIM	Dispersiv SPE, addition of MgSO4, NaCl, C18 dSPE and ENVI-carb dSPE.	Evaporation and dissolution in 75% Methanol.				
55	2403-PIM	SPE (Strata X-AW, 200 mg, 3 mL)		Wash: 2 mL 0,1% formic acid; 2 mL methanol	Elute: 4 mL methanol (w=0,1% ammonia)	Dry	Dilute in 250 µL mixture of 0,1% formic acid : methanol, ratio 1 : 2
56	2403-PIM	elution with PFAS-wax column					Ready for LC-QQQ
57	2403-PIM	SPE Oasis-WAX 200mg	sample in water pH<6	washing with water, methanol	elution with methanol 5% ammonia	evaporated on water bath at 50°C with nitrogen	
58	2403-PIM	Quechers I+ Spe Captiva (Agilent)					
60	2403-PIM	Add dSPE mixture (2.0 g MgSO4, 0.5 g NaCl, 0.01 g C18, 0.10 g ENVI-Carb) to the combined extract	and shake vigorously.	Centrifuge, transfer supernatant into a new tube and evaporate to dryness under N2 at 40°C.	Dissolve the residue in 500 µL eluent (add 300 µL methanol and mix, then add 200 µL milliQ water and mix).	Centrifuge using Spin-X.	
61	2403-PIM	phase separation (MgSO4+NaCl)	Clean up using Agilent EMR PFAS II	concentration using N2			
93	2403-PIM		SPE (LCTech (Freestyle) according toGuidance Document PFAS, Annex Version 1.1 (Draft) 6.4.3.1				

Powdered Infant Milk (2403-PIM)

Methods Perfluoroalkylcarboxylic acids (PFCA), Perfluoroalkylsulfonic acids (PFSA) and Other PFAS - Chromatographic separation and detection

LC Sample	Chromatographic separation and detection						
1 2403-PIM	2 µL of extract injected onto UPLC system, Waters Acquity BEH C18 2.1 x 50mm 1.7 µm.	Gradient (A) De-ionised water + ammonium acetate, B) Methanol + ammonium acetate.	Detection by MSMS, Sciex 6500+ in Electron Spray negative mode, unit resolution	7 point calibration curve and internal standards used for quantitation	PFHxS and PFOS both used a combination of branched and linear certified calibration standards		
2 2403-PIM	Analytical column: Phenomenex Luna Omega PS C18, 3 µm, 100 x 3 mm	Delay column: Phenomenex Gemini C18, 5 µm, 50 x 3 mm	Mobile phase A: 5 mM Ammoniumformate in water	Mobile phase B: 5 mM Ammoniumformate in methanol	Flow rate: 0.6 mL/min	LC-MSMS System: Sciex 6500+, ESI negative mode	
4 2403-PIM	Column C18 UPLC, 100 x 2.1 mm 1.6 µm (Waters)	Mobile phase: methanol / ammonium acetate	Injection volume: 5 µL	Flow rate 0.25 mL/min	Mass detector: triple quadrupole (SCIEX QTrap 7500)		
5 2403-PIM							
7 2403-PIM	LC-MS/MS, reversed phase, column: Gemini 3µ C18 110Å, 100 x 2.0 . MRM measurement.	mobile phase 1: 95 % water + 5% ACN + 5mM ammonium acetate	mobile phase 2: 40 % MeOH + 60 % ACN + 5mM ammonium acetate				
10 2403-PIM	Delay column: Xbridge BEH C18 2.5 µm, 3x75 mm	Column: Xterra C18 3.5 µm, 100x2.1 mm	LC-MS/MS: AB Sciex Qtrap 6500+	mobile phase A: MeOH	mobile phase B: buffer 5 mM Ammonium Acetate, 5 mM 1 Methyl Piperidine	gradient Program	
11 2403-PIM							
12 2403-PIM	Agilent 6495 LC/TQ, 1290 Infinity	MRM-Mode	ESI-	Injection volume 10 µl	separation column: Poroshell 120, C18, 2,7µm, 2,1x150mm; delay column: Poroshell 120 C18, 2,1µm. 3.0x50mm	mobile phase A (H2O, 2 mmol ammoniumacetate, 0,1 % acetic acid), mobile phase B (40 % acetonitrile in methanol)	Scan mode: MRM
14 2403-PIM	Measurement: HPLC	Injection method: standard	Injection volume (µl): 5	Stationary phase: C18-Phase	Detection: MS/MS		
15 2403-PIM	seperation on reversed phase C18	detection in multiple reaction monitoring mode (ESI neg)					
16 2403-PIM	Agilent InfinityLab Poroshell 120 2.7 µm column, EC-C18, 2,1 x 150 mm	Delay column: Agilent InfinityLab Poroshell 120 EC-C18, 3,0 x 50 mm, 2,7 µm LC-Säule	mobile phase A: 2 mmol/L ammonium acetate + 0,1 % acetic acid	mobile phase B: methanol/acetonitrile 60:40 v %	Flow: 0,25 mL/min	0-0,5 min: 20% B; 0,5-2 min to 55% B, 2-10 min to 80% B, 10-13 min to 98% B hold until 17,5 min, 17,5-18.5 min to 20% B	Injection volume: 10 µL, MS/MS: 6495 B; resolution: unit to unit
17 2403-PIM	LC-MS/MS xevo TQXS waters unispray négatif	colonne de piegeage isolator	colonne HSST3 2.1*100mm	10 µl injectés	run 16 min		
18 2403-PIM	LC-MS/MS separation using C18 column and triple-quadrupole as an MS detector						
19 2403-PIM	Injection on Xevo TQ Absolute 2, ESI-	Mobile phase A : Water - acetate ammonium 20 mM/Methanol 96/4 v/v	Mobile phase B : Methanol/ Water - acetate ammonium 20 mM 96/4 v/v	Run time : 13 minutes	Column : Acquity UPLC BEH C18 1,7 µm		
20 2403-PIM	Separation on a BEH shield RP18 column.	Buffer A: 100% MilliQ, Buffer B: 70% methanol, 30% Acetonitrile.	20 minute gradient. Gradient start 60/40 A/B to 0/100 A/B over 17 min.				
21 2403-PIM	Chromatographic column: Luna Omega PS C18 (1,6 µm 2,1x 100 mm)	Mobile phase: (A) Water 10 mM of ammonium acetate (B) Methanol:Acetonitrile (1:1)	LC-HRMS (ESI-)				
22 2403-PIM							
24 2403-PIM	UPLC-HRMS						
25 2403-PIM	Chromatography: Thermo Vanquish LC	Analytical column: Raptor C18 150 x 3 mm, 2,7 µm, Flow rate: 0.3 mL/min	Gradient elution: 2 mM ammonium acetate in water and 2 mM ammonium acetate in methanol	Delay column: Thermo Hypersil Gold 50 x 4.6 mm, 1.9 µm delay column	Detection: Thermo TSQ Altis qqq MS	Negative ionisation mode 2500 V, H-ESI ion source	
26 2403-PIM	Luna Omega 3µ PS 150x2.1mm 00F-4756	Agilent_PFAS_Delay_Phase	Pump A: 0.05g NH4AC+AcOH 5%MeOH / Pump C: ACN / Pump D: MeoH	Gradient	Detection : Sciex Qtrap 6500+ MRM neg		
27 2403-PIM	LC-MS/MS	Analytical column: Kinetex C18 2,1 mm x 100 mm x 1,7 µm	Isolator column: Waters isolator kolom C18 2,1 mm x 50 mm x 3,5 µm	Gradient elution: mobile phase (A) 2mM ammonium acetate in water/methanol 98:2; (B) Acetonitrile	Injection 10 µL		
28 2403-PIM	Separation is performed on an Agilent 1290 Infinity II System, equipped with a	ZORBAX Eclipse Plus C18 2.1 x 5 1.8 MICRON. Injection volume is 100 µL. Mobile Phases are Water (A)	and Methanol (B), both contain 2mM Ammoniumacetate.				
29 2403-PIM	System : UHPLC/MS/MS	Analytical column : C18 reversed-phase	Mobile phase : 2 mM ammonium acetate in water / acetonitrile in elution gradient mode	MS type : triple quadrupole	Ionization Mode : ESI negative		
30 2403-PIM	eluens 5 mM NH4HCOO and methanol	column Xbridge BEH C18 100*2.1*2.5	delay column	LC-MS/MS negative ionisation			
31 2403-PIM	Determination for PFAS in Milk by means of the Liquid Chromatography Mas Spectrometry (LC-MSMS).	Analytical Column: ZORBAX Eclipse Plus C18 RRHD (50mm 2.1mm 1.8µm)	Agilent UPLC 1290 infinity II, Agilent MS 6470 Triple Quad				
32 2403-PIM	HPLC-MS/MS (Dynamic MRM, ESI- with an Agilent 6470 mass spec)	Waters xBridge BEH C18 2.5 µm 2.1 x 150 mm using an Agilent UHPLC	Channel A: 100 % Water with 2 mM CH3COONH4	Channel B: 40 % ACN/60 % MeOH	2 min 90 % Channel A, 9 min 15 % Channel A	12 min 2 % Channel A, 15 min 2 % Channel A	15.1 min 90 % Channel A, 20 min 90 % Channel A
33 2403-PIM	Reverse Phase HPLC-MSMS using C-18 LC column (3µm, 150mm x 2mm)	Mobile phase A: 5 mM ammonium acetate (aq)	Mobile Phase B: 5 mM ammonium acetate in 50/50 (v/v) methanol / acetonitrile				
34 2403-PIM	LC: Agilent Technologies 1290 Infinity	MS: Sciex QTRAP 6500+	MRM-Mode	chromatographic column: Atlantis Premier BEH C18 AX 2.1 x 100 mm, 1.7 µm	delay column: Atlantis Premier BEH C18 AX 2.1 x 50 mm, 5 µm	solvent A: 5mM NH4OAc in H2O solvent B: 5mM NH4OAc in MeOH gradient: 60:40 (v:v, A:B) to 5:95 (v:v, A:B) in 4 minutes	4µl injection volume, 7.5 min total run, 50°C column temperature
35 2403-PIM	Gradient with MS/MS detection	Ammoniumacetate as buffer, methanol as the organic mobile phase.	8 min separation on column going from 100% MilliQ to 95 % methanol and back.				
37 2403-PIM	Mobile phases:20 mM ammonium acetate aqueous solution and methanol	Flow rate was 0.6 mL/min, and the injection volume of 10 µL.	Gemini C18 chromatographic column (3 µm, 50 x 2,0 mm).	Detection:LC-MS/MS using a Sciex 7500 system operated in the negative electrospray ionization			
39 2403-PIM	Reverse phase separation using XB column (100 x 3 mm, 2.6 µm - Phenomenex)	Mobile phases: water and methanol both containing 5 mM ammonium acetate	Acquisition: LC-Q-Orbitrap system using Full/SIM				
40 2403-PIM	Delay column: COLUMN C 18 (2,1 x 50 mm)	UHPLC column: Phenomenex Luna Omega PS C18 100 A° (100 x 2,1 mm - 1,6 µm)	Mobile Phases: ammonium acetate 2mM and acetonitrile				
41 2403-PIM	LC-MS/MS	Analytical column: Acquity UPLC BEH C18, 150 x 3.0 mm, 2.7 µm	Trap column: InfinityLab PFC Delay Column 4.6 x 30 mm	HPLC gradient (Mobile phase A 2 mM ammonium acetate in water, 5 % acetonitrile.	mobile phase B: acetonitrile/ methanol 60/40 v/v)		Detection Triple quadrupole (ESI negative), dvnamic multiple reaction monitoring
43 2403-PIM	LC-MS/MS	Column: Luna Omega 1.6µ PS C18 100 A (100 x 21 mm)	Isolator column: Gemini 3µm C18 110A (50 x 3 mm)	Mobile phase A: 20 mM ammonium acetate in MQ	Mobile phase B: ACN		
44 2403-PIM	delay column: HALO PFAS Delay (50 x 3.0 mm, 2.7 µm, 160 A)	analytical column: Atlantis T3 (30 x 2.1 mm, 3 µm)	MP: A - 2 mM Ammonium Acetate in MeOH	MP: B - 2 mM Ammonium Acetate in water	injection of 10 ul, temperature of column: 30 °C	gradient elution	LC-MS/MS detection (MRM) - 2 transitions, ESI negative
45 2403-PIM	mobile phase A: water 10mM Ammonium Acetate	mobile phase B: Methanol/ Acetonitrile (80/20)	Column: LC Acquity BEH Shield RP18 1,7µm				
46 2403-PIM	LCMSMS analysis		column :acquity premier BEH shield RP18 1.7µm	LCMSMS : XEVO TQ-XS Waters			
47 2403-PIM	samples are measured on an Waters XEVO TQ Absolute with unispray	using an Acquity UPLC C18 2.1 x 100 mm; 1.7 µm column	MRM/US negative				
48 2403-PIM	UPLC ACQUITY PREMIER chromatographic system (Waters)	Column: Acquity Premier HSST3 1.8µm VanGuard FIT 2.1x100 mm	Trap column: Atlantis Premier BEH C18 AX 5 µm 2.1x100 mm	Tandem Mass Spectrometry on Xevo TQ Absolute in negative electrospray ionization mode (source Unispray)	Water and methanol mobile phases buffered with 2mM ammonium acetate		
49 2403-PIM	CHROMATOGRAPHIC COLUMN: Phenomenex luna omega PS, C18,1.6 µm (100 x 2.1 mm)	INJECTION MODE: PARTIAL LOOP	INJECTION VOLUME: 20 microL	MOBILE PHASE: A) ACN; B) AMMONIUM ACETATE 2mM in H2O	FLOW: gradient from 0.1- 0.20 mL/min	DETECTION: LC-MS/MS	SOURCE: ESI
50 2403-PIM	Hypersil Gold (100 x 2,1 mm) 1,9 µm	LC-(ESI-)-MS/MS - Agilent 6495C					
51 2403-PIM	The detection/confirmation is done by LCMSMS in MRM detection mode	The concentration of each analyte is calculated using the isotope dilution technique	The percent recoveries of the isotope dilution analogues are calculated using the integrated peak areas of the recovery standards	Quantitation is performed using a solvent curve & a stored calibration may be used	LC - ACQUITY UPLC I-Class with PFC kit Column - ACQUITY CSH Phenyl hexyl 1.7µm, 2.1 x 100 mm Injection vol 30 µL	MPA - 95:5 Water: methanol + 2mM ammonium acetate, MPB - Methanol + 2 mM ammonium acetate	MS - Xevo TQ-XS, ESI -
52 2403-PIM	HPLC-MSMS (positive Mode)						

Powdered Infant Milk (2403-PIM)

Methods Perfluoroalkylcarboxylic acids (PFCAs), Perfluoroalkylsulfonic acids (PFASs) and Other PFAS - Chromatographic separation and detection

LC	Sample	Chromatographic separation and detection						
53	2403-PIM	Sample extracts were analyzed by LC-MS/MS with ESI operating in negative mode. HPLC equipped with a C18 column was coupled to triple quadrupole.						
54	2403-PIM	Detection LC-MS/MS, neg. Mode, MRM.	Waters Acquity UPLC BEH C18	Second chromatography system: Waters Acquity UPLC HSS T3				
55	2403-PIM	LCQQQ (Agilent Technologies 1290 Infinity, Agilent Technologies 6495C)	Pre-Column: Agilent InfinityLab PFC Delay Column, 4.6 x 30 mm	Column: Agilent Zorbax Eclipse XDB-C18, 1.8-Micron, 600Bar, 4,6 x 100mm	Flow rate: 0,3 mL/min, Column Temp: 40 °C, injection volume: 1 µL	Eluent A: 5 mmol NH4FA in H2O	Eluent B: 5 mmol NH4FA in MeOH	ESI, negative mode, capillary voltage:3000 V, nebulizer pressure: 20 psi, Sheath-Gas: T = 250 °C, flow rate: 11L/min, Gas flow rate: 14 L/min
56	2403-PIM	LC-MS/MS						
57	2403-PIM	HPLC-MS/MS, column BEH C18 100x2,1mm*1,7µm,	mobile phase water/methanol with ammonium acetate					
58	2403-PIM	UHPLC - LCMSMS						
60	2403-PIM	Agilent INFINITY II HPLC-System	Delay-Column ZORBAX Eclipse Plus C18, 4.6 x 30 mm, 3.5 µm	Column ACQUITY Premier BEH C18, 2.1 x 100 mm, 1,7 µm	Eluent A: 10 mM Ammoniumacetate / Acetonitrile (90:10, v/v); Eluent B: Methanol / Acetonitrile (60:40, v/v)	Gradient: 0 (90:10) -> 0.01 (60:40) -> 10 (25:75) -> 15 (5:95) -> 16 (5:95) -> 16.1 (90:10) -> 20 (90:10)	Column temperature: 40 °C , flow rate: 0.3 mL/min, injection volume: 10 µL, sampler temperature: 10 °C	Triple Quad 6495C with Agilent Jet Stream Source dMRM-Method, Total MRMs = 92; Min/Max Dwell = 27.76 ms/398.00 ms
61	2403-PIM	Mobile phase A: 5 mMol NH4Ac in H2O	Mobile phase B: ACN/MeOH 1/1	Column: C18 100 x 3 mm; 2.7 µm Coreshell	Detection ESI(-): Agilent 1290/6495	Injection Volume 5µL		
93	2403-PIM		LC-MS/MS-System Agilent 6470, Trennsäule InfinityLab Poroshell 120 EC-C18 (3,0 x 150 mm, Teilchengröße 2,7 µm), zzgl. Vorsäule Poroshell 120 EC-C18 (2,1 x 5mm; 2,7µm,) und Delay Column, Poroshell 120 EC-C18 (3,0 x 50 mm; 2,7 µm)		Eluent: 2 mmol/L Ammoniumacetat (Gradient, wässrig nach methanolisch)			

Powdered Infant Milk (2403-PIM)

Methods Perfluoroalkylcarboxylic acids (PFCAs), Perfluoroalkylsulfonic acids (PFASs) and Other PFAS - LOQ determination, measurement uncertainty calculation and additional information

LC	Sample	Limit of quantification (LOQ) approach	Measurement Uncertainty (MU) approach	Additional Information
1	2403-PIM	Performance of calibration standards, Batch blank level	Top down estimation from reproducibility of spiked samples	
2	2403-PIM	LOQ = reporting limit (= lowest standard of calibration curve).	Calculated by spiking 16 milk samples with PFAS analytes.	
4	2403-PIM	By spiking samples at LOQ concentration level.	By combining the contributions from: the precision of the method, the systematic effects on mass and volume measurements, the recovery factor of each compound compared with the recovery of the respective internal reference material, the chromatographic response factor and the concentration of reference materials,	
5	2403-PIM			Person in charge of the method absent, will send you info later.
7	2403-PIM	estimation of LOD and LOQ based on the analysis of spiked blank samples: Wenzl, T., Haedrich, J., Schaechtele, A., Robouch, P., Stroka, J., Guidance Document on the Estimation of LOD and LOQ for Measurements in the Field of Contaminants in Feed and Food; EUR 28099, Publications Office of the European Union, Luxembourg, 2016, ISBN 978-92-79-61768-3; doi:10.2787/8931		
10	2403-PIM			
11	2403-PIM			
12	2403-PIM	lowest validated level approach. Established by spiking samples and taking as the LOQ the lowest value which satisfied the validation criteria	MU were estimated based on precision and trueness from fortification experiments including in validation process	
14	2403-PIM			
15	2403-PIM			
16	2403-PIM	lowest fortification level meeting the criteria according to the Guidance Document on Analytical Parameters for the Determination of Per- and Polyfluoroalkyl Substances (PFAS) in Food and Feed	top-down approach as described in the "Guidance document on measurement uncertainty for laboratories performing PCDD/F and PCB analysis", Sum parameter: $U = \text{square root of sum of squares of MU of individual PFAS}$	
17	2403-PIM			
18	2403-PIM	For the LOQ determination, the lowest validated level approach was used	The expanded measurement uncertainty U was calculated using a coverage factor of 2 ($U=2u$). The calculation of the combined standard measurement uncertainty 'u' (as an absolute value) of the sum parameter is calculated as the square root of the sum of squares of the individual (abs. values of) combined uncertainties. Relative U for sum parameter was calculated $U(\text{rel}) = U(\text{abs})/\text{Content}$.	
19	2403-PIM	Lowest validated level of a similar procedure using Quecher extraction.	$U = k \cdot u = \text{square root} [(CV_{rw2}) + (\text{bias})^2]$	
20	2403-PIM			
21	2403-PIM	The LOQ was estimated as the lowest concentration of the sample fortified with acceptable precision and trueness, by applying the complete analytical method and identification criteria	The expanded measurement uncertainties were obtained using a top-down approach as reported in the "Guidance document on measurement uncertainty for laboratories performing PCDD/F and PCB analysis using isotope dilution mass spectrometry – 2017". For the MU of the sum of four PFASs the RSS approach was used.	
22	2403-PIM			
24	2403-PIM	Signal to noise ratio of 10:1		
25	2403-PIM			
26	2403-PIM			
27	2403-PIM			
28	2403-PIM			
29	2403-PIM			
30	2403-PIM	sample material spiked on LO level analyzed in eightfold, standard deviation times 10	bias of spiked material + two times reproducibility	
31	2403-PIM	LOQ was determined according to NEN 7777:2011 & SANTE/11312/2021, by measuring 10 duplicates of blank material spiked at the LOD (limit of detection)	Measurement uncertainty was determined according to NEN 7777:2011 & SANTE/11312/2021, by measuring 10 duplicates of blank material spiked at 0.1 ug/kg and then calculated using the reproducibility, repeatability and the bias.	
32	2403-PIM	According to Guidance Document	Es gelten die extrapolierten Analysenspielräume des VDLUFA	
33	2403-PIM			
34	2403-PIM	lowest validated concentration	square root of square sum of average of bias, standard deviation of bias and relative standard deviation of recovery	The 4 PFAS (PFOA, PFNA, PFHxS, PFOS) are already fully validated und accredited, Other PFAS are currently in validation process, thus LOQ was estimated and no MU was determined yet
35	2403-PIM			
37	2403-PIM	LOD and LOQ were estimated based on analysis of 10 blank spiked samples	MU were estimated based on precision and trueness from fortification experiment	
39	2403-PIM	According to EURL "Guidance Document on Analytical Parameters for the Determination of Per- and Polyfluoroalkyl Substances (PFAS) in Food and Feed" v.1.2. 11 May 2022	According to Horwitz-Thompson equation	
40	2403-PIM			
41	2403-PIM	Spiking Experiments according to the Guidance Document	According to the Guidance Document	
43	2403-PIM	lowest validated level method according to guidelines	validation - calculation based on accuracy, reproducibility	
44	2403-PIM			
45	2403-PIM	lowest validation level	Horwitz -Thompson	sample was concentrated 5 fold before analysis and reconstituted with mobile phase.
46	2403-PIM			
47	2403-PIM			
48	2403-PIM	LOQ was determined on spiked samples of milk powder	uncertainty from Reference Laboratory validation	Quantification of Branched PFOS : e.g L-PFOS used to quantify, using the average of quantification with 498.9 > 80.2 and quantification with 498.9 > 99.1
49	2403-PIM	Spiked samples at the LOQ	From validation data including reproducibility and trueness contributions	
50	2403-PIM	blank value *3 or S/n=10		
51	2403-PIM	Inf. Form. Validation underway. LOQ has been calculated according to LVL for reconstituted infant formula. Proposed LOQ for wet weight infant formula = 0.002 ug/kg, Validation report in preparation		If any additional details are required on method please contact hannah.smith@statelab.ie
52	2403-PIM	Stock blank material	Validation by Stocking blank Material	
53	2403-PIM			
54	2403-PIM	Lowest validated level where criteria for identification, trueness and precision are met.		
55	2403-PIM	Measurement of different spiked samples, LOQ is the value were the following criteria are fulfilled: Recovery: 70-120%; RSD <=20%, Peak identification criteria fulfilled	Analysis of the QM-samples over 1-2 years, According to SANTE/11312/2021V2: Appendix C, Approach 1 (Estimating MU based on intra-laboratory validation/QC data.)	
56	2403-PIM	based on different matrices with addition of standard.	based on different matrices with addition of standard.	
57	2403-PIM			
58	2403-PIM			
60	2403-PIM			
61	2403-PIM			
93	2403-PIM	lowest validated level according guidance document PFAS V 2.0 No. 2.2	estimation based on the results of control standards (spiked) -> consideration of accuracy and precision	

Powdered Infant Milk (2403-PIM)
 Methods Perfluoroalkylcarboxylic acids (PFCAs) - Measurement Uncertainty [%]

LC	Sample	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTeDA)	Perfluorotetradecanoic acid (PFTeDA)
1	2403-PIM	30	30	30	30	30	30	30	30	30	30	30
2	2403-PIM	33	17	37	20	22	28	21	22	42	40	
4	2403-PIM	45	45	45	45	45	45	45	45	45	45	45
5	2403-PIM											
7	2403-PIM											
10	2403-PIM	19	8.2	11	6.3	5	8.7	5	27.3	18.8	16.2	
11	2403-PIM											
12	2403-PIM		30	30	30	30	30	30	30	30		30
14	2403-PIM	30	30	30	30	30	30	30	30	30	30	30
15	2403-PIM		45			25	20	25			45	45
16	2403-PIM	44.6	20.9			22.9	15.1	19.2	17.8	21.8	52.9	24.4
17	2403-PIM	40	40	40	40	40	40	40	40	40	40	40
18	2403-PIM	30	30	40	40	30	40	30	30	30	40	40
19	2403-PIM	30	30	30	30	30	30	30	30	30	30	30
20	2403-PIM											
21	2403-PIM	40	13	21	20	16	18	18	23	34	47	23
22	2403-PIM	30	25	25	25	25	25	25	25	25	25	25
24	2403-PIM											
25	2403-PIM		19			20	11	9			33	21
26	2403-PIM											
27	2403-PIM					30	29					
28	2403-PIM					16	7.7	4.9			9.7	4.9
29	2403-PIM	40	40	40	40	40	40	40	40	40	40	40
30	2403-PIM	39	20	16	13	19	17	18	22	20	43	39
31	2403-PIM	34.7	47.3	31.2	32.1	21.6	37.1	40.2	33.8	32.8	26.6	37.6
32	2403-PIM	88	88	88	88	88	88	88	88	88	88	88
33	2403-PIM	0.156	0.474	0.272	0.16	0.112	0.104	0.101	0.109	0.129	0.327	0.181
34	2403-PIM					48	46					
35	2403-PIM	37	37	37	37	37	37	37	37	37	37	37
37	2403-PIM			31	22	20	27	24	21	32		
39	2403-PIM	44	44	44	44	44	44	44	44	44	44	44
40	2403-PIM			50	50	50	50	50	50	50	50	50
41	2403-PIM			30	30	25	25	30	30	30	30	30
43	2403-PIM		19	20	18	42	33	12	15	24	24	39
44	2403-PIM					18	25					
45	2403-PIM	44	44	44	44	44	44	44	44	44		
46	2403-PIM	21	21	20	13	18	22	23	25	27	21	23
47	2403-PIM					50	50					
48	2403-PIM					40	40					
49	2403-PIM	42	32	42	42	32	32	32	42	42	32	32
50	2403-PIM					18	12					
51	2403-PIM			35	35	35	35	35	35	35		
52	2403-PIM					30	30					
53	2403-PIM					10	10					
54	2403-PIM		18			14	15	14			48	15
55	2403-PIM	25	24	18	14	13	17	19	15	21	50	25
56	2403-PIM	37	21	18	19	21	23	28	29	17	116	
57	2403-PIM											
58	2403-PIM	50	50	50	50	50	50	50	50	50	50	50
60	2403-PIM	35	35			35	35	35			50	35
61	2403-PIM	30	30	30	30	30	30	30	30	30	30	30
93	2403-PIM					40	40					

Powdered Infant Milk (2403-PIM)
 Methods Perfluoroalkylcarboxylic acids (PFCAs) - Limit of detection (LOQ) in µg/kg product

LC	Sample	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
1	2403-PIM	0.1	0.05	0.01	0.01	0.05	0.05	0.05	0.1	0.05	0.05	0.05
2	2403-PIM	0.235	0.25			0.25	0.25	0.25			0.25	
4	2403-PIM	0.3	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
5	2403-PIM											
7	2403-PIM	1.26	0.1	0.12	0.07	0.07	0.04	0.04	0.04	0.05	0.1	0.05
10	2403-PIM	0.05	0.01	0.025	0.01	0.01	0.05	0.01	0.01	0.01	0.01	
11	2403-PIM											
12	2403-PIM		0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04		0.04
14	2403-PIM	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3
15	2403-PIM	0.1	0.05	0.03	0.03	0.03	0.04	0.02	0.05	0.05	0.05	0.05
16	2403-PIM		0.02	0.05	0.005	0.005	0.005	0.005	0.005	0.02	0.005	0.005
17	2403-PIM	0.5	0.015	0.015	0.015	0.01	0.005	0.015	0.015	0.015	0.015	0.015
18	2403-PIM	0.5	0.099	0.099	0.099	0.05	0.099	0.099	0.099	0.099	0.099	0.05
19	2403-PIM	0.2	0.05	0.05	0.015	0.015	0.015	0.05	0.015	0.05	0.05	0.05
20	2403-PIM											
21	2403-PIM	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
22	2403-PIM	0.5	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
24	2403-PIM	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04		0.04	0.04
25	2403-PIM		0.1			0.05	0.05	0.1			0.1	0.1
26	2403-PIM	0.546	0.016	0.009	0.004	0.016	0.024	0.009	0.017		0.01	0.01
27	2403-PIM					0.01	0.01					
28	2403-PIM			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
29	2403-PIM	0.5		0.05	0.05				0.05	0.05		
30	2403-PIM	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
31	2403-PIM	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
32	2403-PIM	0.4	0.05	0.2	0.05	0.2	0.05	0.05	0.05	0.05	0.05	0.05
33	2403-PIM	0.602	0.066	0.065	0.033	0.027	0.01	0.034	0.011	0.021	0.018	0.021
34	2403-PIM	0.5	0.1	0.05	0.05	0.01	0.02	0.05	0.05	0.05	0.05	0.05
35	2403-PIM	0.3	0.1	0.1	0.01	0.01	0.005	0.01	0.01	0.01	0.01	0.01
37	2403-PIM			0.025	0.01	0.007	0.005	0.014	0.013	0.011		
39	2403-PIM	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
40	2403-PIM			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
41	2403-PIM			0.05	0.1	0.005	0.005	0.005	0.005	0.005	0.1	0.05
43	2403-PIM			0.0025	0.0025	0.01	0.0025	0.0025	0.0025	0.0025	0.0025	0.01
44	2403-PIM					0.1	0.1					
45	2403-PIM	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05		
46	2403-PIM	0.2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
47	2403-PIM	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
48	2403-PIM			0.05	0.01				0.05	0.05		
49	2403-PIM	0.2		0.01	0.01				0.01	0.01		
50	2403-PIM	0.5		0.02	0.01				0.01	0.01		
51	2403-PIM			0.02	0.02	0.257	0.02	0.02	0.02	0.02		
52	2403-PIM					0.003	0.003					
53	2403-PIM					0.03	0.03					
54	2403-PIM	2	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.05
55	2403-PIM	0.5	0.5	0.1	0.05	0.05	0.1	0.1	0.05	0.1	0.5	0.5
56	2403-PIM	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
57	2403-PIM	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
58	2403-PIM	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
60	2403-PIM	0.05	0.05	0.05	0.05	0.01	0.01	0.05	0.05	0.05	0.05	0.05
61	2403-PIM	0.01	0.01	0.01	0.01	0.001	0.001	0.01	0.01	0.01	0.01	0.01
93	2403-PIM					0.03	0.03					

Powdered Infant Milk (2403-PIM)
 Methods Perfluoroalkylsulfonic acids (PFASs) - Measurement Uncertainty [%]

LC	Sample	Perfluorobutane- sulfonic acid (PFBS)	Perfluoropentane- sulfonic acid (PFPeS)	Perfluorohexane- sulfonic acid (PFHxS)	Perfluoroheptane- sulfonic acid (PFHpS)	Linear Perfluorooctane- sulfonic acid (L-PFOS)	Sum of branched Perfluorooctane- sulfonic acids (br-PFOS)	Total-Perfluorooctane- sulfonic acids (total PFOS)	Perfluorononane- sulfonic acid (PFNS)	Perfluorodecane- sulfonic acid (PFDS)	Perfluoroundecane- sulfonic acid (PFUnDS)	Perfluorododecane- sulfonic acid (PFDoDS)	Perfluorotridecane- sulfonic acid (PFTrDS)
1	2403-PIM	30	30	30	40	30	30	30	40	40		40	
2	2403-PIM	11	13	17	12	18	18	18	15	43			
4	2403-PIM	45	45	45	45	45	45	45	45	45	45	45	45
5	2403-PIM												
7	2403-PIM												
10	2403-PIM	12.5	15.7	9.2	17.1	7.2	7.2	7.2	18.2	15	17.2	17.5	18.1
11	2403-PIM												
12	2403-PIM	30		30		30	30	30					
14	2403-PIM	30	30	30	30			30	30	30	30	30	30
15	2403-PIM			30		40							
16	2403-PIM			25.4		20.1	27.1	17					
17	2403-PIM	40	40	40	40	40	40	40	40	40	40	40	40
18	2403-PIM	30	50	50	50	40	60	35	40	40			
19	2403-PIM	30	30	30	30			30	30	45	45	60	60
20	2403-PIM												
21	2403-PIM	12	18	20	18	21		21	14	16			
22	2403-PIM	25	25	25	25	25	25	25	25	25	25	25	25
24	2403-PIM												
25	2403-PIM			20		19	13	22					
26	2403-PIM												
27	2403-PIM			25				31					
28	2403-PIM					10.5	10.5	10.5					
29	2403-PIM	40	40	40	40	40	40	40	40	40	40	40	40
30	2403-PIM	16	38	23	45	14				43.6			
31	2403-PIM	33.4		32	29.3								
32	2403-PIM	88	88	88	88	88		88	88	88			
33	2403-PIM	0.22	0.158	0.167	0.141	0.172	0.172	0.172	0.215	0.308	0.471	0.43	0.318
34	2403-PIM			42				44					
35	2403-PIM	37	37	37	37	37	37	37	37	37	37	37	37
37	2403-PIM	23	25	24	20	27		39					
39	2403-PIM	44	44	44	44	44	44	44	44	44	44	44	44
40	2403-PIM	50	50	50	50	50	50	50	50	50			
41	2403-PIM	30	30	25	30								
43	2403-PIM	16		21	37	31	31	31		12			
44	2403-PIM			15				16					
45	2403-PIM			44		44	44	44					
46	2403-PIM	17	15	26	35	22	22	22	14	17	30	24	30
47	2403-PIM			50		50	50	50					
48	2403-PIM			40		40		40					
49	2403-PIM	42	42	32	42	32	32	32	42	42		42	
50	2403-PIM			18				19					
51	2403-PIM			35		35	35	35					
52	2403-PIM			30				30					
53	2403-PIM			10		10	10						
54	2403-PIM			29				23					
55	2403-PIM	15	27	19	25	15	15	15	21	44			
56	2403-PIM	13	24	14	22	24			38	40	80	39	35
57	2403-PIM												
58	2403-PIM	50	50	50	50	50	50	50	50	50	50	50	50
60	2403-PIM			35		35	35	35					
61	2403-PIM	30	30	30	30	30	30	30	30	40	40	40	40
93	2403-PIM			40				40					

Powdered Infant Milk (2403-PIM)
 Methods Perfluoroalkylsulfonic acids (PFASs) - Limit of detection (LOQ) in µg/kg product

LC	Sample	Perfluorobutane- sulfonic acid (PFBS)	Perfluoropentane- sulfonic acid (PFPeS)	Perfluorohexane- sulfonic acid (PFHxS)	Perfluoroheptane- sulfonic acid (PFHpS)	Linear Perfluorooctane- sulfonic acid (L-PFOS)	Sum of branched Perfluorooctane- sulfonic acids (br-PFOS)	Total-Perfluorooctane- sulfonic acids (total PFOS)	Perfluorononane- sulfonic acid (PFNS)	Perfluorodecane- sulfonic acid (PFDS)	Perfluoroundecane- sulfonic acid (PFUnDS)	Perfluorododecane- sulfonic acid (PFDoDS)	Perfluorotridecane- sulfonic acid (PFTrDS)
1	2403-PIM	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.03	0.03		0.05	
2	2403-PIM			0.025	0.025	0.025	0.025	0.025					
4	2403-PIM	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
5	2403-PIM												
7	2403-PIM	0.04	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.06	0.07	0.08	0.1
10	2403-PIM	0.01	0.01	0.01	0.025	0.01	0.01	0.01	0.025	0.05	0.05	0.05	0.1
11	2403-PIM			0.06									
12	2403-PIM	0.04		0.04		0.04	0.04	0.04					
14	2403-PIM	0.1	0.1	0.1	0.1			0.1	0.1	0.1	0.1	0.1	0.1
15	2403-PIM	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.1
16	2403-PIM	0.02	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.02	0.005	0.01
17	2403-PIM	0.015	0.015	0.015	0.015	0.01	0.01	0.01	0.015	0.015	0.015	0.015	0.015
18	2403-PIM	0.089	0.094	0.037	0.047	0.037	0.045		0.097	0.097			
19	2403-PIM	0.015	0.015	0.015	0.015	0.015		0.015	0.05	0.05	0.05	0.05	0.05
20	2403-PIM												
21	2403-PIM	0.02	0.02	0.02	0.02	0.02		0.02	0.02	0.02			
22	2403-PIM	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
24	2403-PIM	0.04		0.04				0.04					
25	2403-PIM			0.05		0.05	0.05	0.05					
26	2403-PIM	0.012	0.01	0.011	0.01	0.01	0.01	0.01	0.01	0.016			
27	2403-PIM			0.01				0.01					
28	2403-PIM		0.05	0.05	0.05	0.03	0.03		0.05	0.05	0.05	0.05	0.05
29	2403-PIM	0.05	0.05	0.05	0.05				0.05	0.05	0.05	0.05	0.05
30	2403-PIM	0.01	0.02	0.01	0.02	0.02	0.02	0.02	0.01	0.02			
31	2403-PIM	0.01		0.01	0.01	0.01				0.01			
32	2403-PIM	0.05	0.05		0.05	0.05		0.05	0.2	0.2			
33	2403-PIM	0.018	0.014	0.023	0.018	0.022	0.022	0.022	0.038	0.017	0.077	0.024	0.007
34	2403-PIM	0.05	0.05	0.04	0.05			0.01	0.05	0.05	0.05	0.05	0.05
35	2403-PIM	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.1	0.1	0.1	0.1	0.01
37	2403-PIM	0.002	0.005	0.001	0.003	0.002	0.002	0.002					
39	2403-PIM	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
40	2403-PIM	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
41	2403-PIM	0.00443	0.00484	0.00473	0.095	0.00478		0.00478	0.00484	0.1			
43	2403-PIM	0.0025		0.0025	0.0025			0.0025		0.01			
44	2403-PIM			0.05				0.1					
45	2403-PIM			0.05		0.05	0.05	0.05					
46	2403-PIM	0.2	0.2	0.01	0.01	0.01	0.01	0.01	0.2	0.2	0.2	0.2	0.2
47	2403-PIM	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
48	2403-PIM	0.01	0.01		0.01				0.05	0.01	0.05	0.05	0.5
49	2403-PIM	0.01	0.01		0.01				0.01	0.01		0.01	
50	2403-PIM	0.02	0.05		0.01				0.01	0.01	0.02	0.05	0.05
51	2403-PIM			0.02		0.02	0.02	0.02					
52	2403-PIM			0.003				0.003					
53	2403-PIM			0.03		0.03	0.03						
54	2403-PIM	0.05		0.05		0.05	0.05	0.05		0.05			
55	2403-PIM	0.05	0.1	0.05	0.1	0.05	0.05	0.05	0.1	0.1			
56	2403-PIM	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05
57	2403-PIM	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		0.01	
58	2403-PIM	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
60	2403-PIM	0.05	0.05	0.01	0.05	0.01	0.01	0.01	0.05	0.05	0.05	0.05	
61	2403-PIM	0.01	0.01	0.004	0.01	0.002	0.002	0.002	0.01	0.01	0.01	0.01	0.01
93	2403-PIM			0.03		0.03	0.03	0.03					

Powdered Infant Milk (2403-PIM)
 Methods Sum of PFOS, PFOA, PFNA, PFHxS - Measurement Uncertainty [%]

LC	Sample	Sum of total-PFOS, PFOA, PFNA, PFHxS	Sum of total-PFOS, PFOA, PFNA, PFHxS
		(ub)	(lb)
1	2403-PIM	30	30
2	2403-PIM	23	19
4	2403-PIM		0.25
5	2403-PIM	20	20
7	2403-PIM		
10	2403-PIM	15.4	15.4
11	2403-PIM		
12	2403-PIM	30	30
14	2403-PIM	30	30
15	2403-PIM		
16	2403-PIM	12	12
17	2403-PIM	40	40
18	2403-PIM	19	20
19	2403-PIM	17	17
20	2403-PIM		
21	2403-PIM	10	10
22	2403-PIM	25	25
24	2403-PIM		
25	2403-PIM	38	38
26	2403-PIM		
27	2403-PIM		17
28	2403-PIM		
29	2403-PIM	40	40
30	2403-PIM		
31	2403-PIM		
32	2403-PIM	88	88
33	2403-PIM	0.284	0.284
34	2403-PIM	27	27
35	2403-PIM	37	37
37	2403-PIM	57	57
39	2403-PIM	24.9	24.9
40	2403-PIM	50	50
41	2403-PIM	25	25
43	2403-PIM		
44	2403-PIM	38	38
45	2403-PIM	44	44
46	2403-PIM	26	26
47	2403-PIM	50	50
48	2403-PIM	40	40
49	2403-PIM	18	18
50	2403-PIM	19	19
51	2403-PIM		
52	2403-PIM		
53	2403-PIM	10	10
54	2403-PIM	8.9	9.7
55	2403-PIM	19	19
56	2403-PIM	40	40
57	2403-PIM		
58	2403-PIM	50	50
60	2403-PIM	35	35
61	2403-PIM	30	30
93	2403-PIM	40	40

Powdered Infant Milk (2403-PIM)
 Methods Other PFAS - Measurement Uncertainty MU [%]

LC	Sample	Perfluorooctane sulphonamide	2,2,3-Trifluoro-3-[1,1,2,2,3,3-hexafluor-3-(trifluoromethoxy)propoxy]-propionic acid	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)-propanoic acid	Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	1-Propanaminium, N,N-dimethyl-N-oxide-3-[[[(3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, hydroxide	1-Propanaminium, N-(carboxymethyl)-N,N-dimethyl-3-[[[(3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, hydroxide
		FOSA	DONA	GenX	(major component of F-53B)	(minor component of F-53B)	Capstone A	Capstone B
1	2403-PIM	30	30	30	30	30		
2	2403-PIM							
4	2403-PIM	45	45	45	45	45	45	45
5	2403-PIM							
7	2403-PIM							
10	2403-PIM	25	20	21	19	19	22	22
11	2403-PIM							
12	2403-PIM							
14	2403-PIM	30	30	30	30	30		
15	2403-PIM		45					
16	2403-PIM		43.4					
17	2403-PIM		40	40	40	40		
18	2403-PIM		30		40	40		
19	2403-PIM		30	30	30	50		
20	2403-PIM							
21	2403-PIM	12	40	28	17	29		
22	2403-PIM		30	30	30	30		
24	2403-PIM							
25	2403-PIM							
26	2403-PIM							
27	2403-PIM							
28	2403-PIM							
29	2403-PIM		40	40	40	40		
30	2403-PIM		21	20				
31	2403-PIM	42.4						
32	2403-PIM		88	88	88	88		
33	2403-PIM	0.194	0.155	0.162	0.192	0.438		
34	2403-PIM							
35	2403-PIM	37	37	37	37	37		
37	2403-PIM							
39	2403-PIM		44	44	44	44		
40	2403-PIM			50				
41	2403-PIM		30	30				
43	2403-PIM		35					
44	2403-PIM							
45	2403-PIM			44				
46	2403-PIM	29	50	42	42	50	50	50
47	2403-PIM							
48	2403-PIM		40	40	40	40		
49	2403-PIM	44	44	44	44	44		
50	2403-PIM							
51	2403-PIM							
52	2403-PIM							
53	2403-PIM							
54	2403-PIM							
55	2403-PIM							
56	2403-PIM			337	43	45		
57	2403-PIM							
58	2403-PIM	50	50	50	50	50	50	50
60	2403-PIM		40					
61	2403-PIM	30	30	30	30	30	40	40
93	2403-PIM							

Powdered Infant Milk (2403-PIM)
 Methods Other PFAS - Limit of detection (LOQ) in µg/kg product

LC	Sample	Perfluorooctane sulphonamide	2,2,3-Trifluoro-3-[1,1,2,2,3,3-hexafluor-3-(trifluoromethoxy)propoxy]-propionic acid	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)-propanoic acid	Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	1-Propanaminium, N,N-dimethyl-N-oxide-3-[[[3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, hydroxide	1-Propanaminium, N-(carboxymethyl)-N,N-dimethyl-3-[[[3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl)sulfonyl]amino]-, hydroxide
		FOSA	DONA	GenX	(major component of F-53B)	(minor component of F-53B)	Capstone A	Capstone B
1	2403-PIM	0.01	0.05	0.05	0.05	0.05		
2	2403-PIM							
4	2403-PIM	0.02	0.02	0.02	0.02	0.02	0.02	0.02
5	2403-PIM							
7	2403-PIM		0.01					
10	2403-PIM	0.03	0.01	0.01	0.01	0.01	0.03	0.03
11	2403-PIM							
12	2403-PIM							
14	2403-PIM	0.30	0.10	0.50	0.10	0.10		
15	2403-PIM	0.10	0.05	0.10	0.05			
16	2403-PIM	0.05	0.01					
17	2403-PIM		0.02	0.02	0.02	0.02		
18	2403-PIM		0.05	0.09	0.09	0.09		
19	2403-PIM		0.02	0.05	0.02	0.05		
20	2403-PIM							
21	2403-PIM	0.02	0.02	0.25	0.02	0.02		
22	2403-PIM		0.01	0.01	0.01	0.01		
24	2403-PIM							
25	2403-PIM							
26	2403-PIM	0.01	0.01	0.05	0.01	0.01		
27	2403-PIM							
28	2403-PIM							
29	2403-PIM			0.05	0.05	0.05		
30	2403-PIM		0.02	0.02				
31	2403-PIM	0.01						
32	2403-PIM		0.05	0.05	0.05	0.05		
33	2403-PIM	0.19	0.02	0.01	0.02	0.02		
34	2403-PIM	0.05	0.05	0.05	0.05		0.10	0.30
35	2403-PIM	0.01	0.10	0.10	0.01	0.01		
37	2403-PIM							
39	2403-PIM		0.01	0.01	0.01	0.01		
40	2403-PIM			0.05				
41	2403-PIM		0.05					
43	2403-PIM		0.00	0.00				
44	2403-PIM							
45	2403-PIM			0.10				
46	2403-PIM	0.01	0.20	0.01	0.01	0.20	0.20	0.20
47	2403-PIM	0.20	0.20	0.20	0.20	0.20		
48	2403-PIM			0.05	0.05	0.05		
49	2403-PIM	0.20		0.50	0.10	0.10		
50	2403-PIM			0.10	0.01	0.01	0.01	0.20
51	2403-PIM							
52	2403-PIM							
53	2403-PIM							
54	2403-PIM	0.05						
55	2403-PIM							
56	2403-PIM			0.05	0.05	0.05		
57	2403-PIM	0.01	0.01	0.01	0.01	0.01		
58	2403-PIM	0.01	0.01	0.01	0.01	0.01	0.01	0.01
60	2403-PIM	0.05	0.05	0.05	0.05	0.25		
61	2403-PIM	0.01	0.01	0.01	0.01	0.01	0.05	0.05
93	2403-PIM							