QUASIMEME

Quality assurance of information for marine environmental monitoring

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Certificate of Analysis

Biota

REFERENCE MATERIAL

Biota sample 355

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis Biota 355

General Information

In this report an overview is given of analytical data for this sample collected in our proficiency testing program. The consensus values are calculated using a robust statistical model. With this NDA model mean and standard deviation are calculated using all reported data when at least 4 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

This report is divided into two sections: Consensus Values and Indicative Values. The division is made on the reliability of the data. Consensus Values are based on at least 10 results while the relative uncertainty is smaller than 6.25%. Indicative Values are based on a relative uncertainty of maximum 35% with at least 4 and less than 10 results or a relative uncertainty higher than 6.25%.

For each determinand the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median, MAD (Median of Absolute Deviation) and the uncertainty in the assigned value. The confidence limits (at 95 % probabilty) are calculated for these determinands.

The results of each determinand is expressed on a wet weight basis.

Sample information

QUASIMEME reference materials cover a range of natural Biota species from contaminated waters from the North Sea and/or Mediterranean. The supplied wet test materials are homogenised and sterilised by autoclaving.

This Biota sample 355 of Sprat (whole fish) from North Sea is prepared for the QUASIMEME proficiency programs. The results on which the values in this report are based were taken from the periods given in the following table.

Year.Round	Program	Sample Round Id
2023.2	BT1	QTM141BT
2021.2	BT2	QOR148BT
2019.2	BT1	QTM124BT
2018.1	BT1	QTM119BT
2017.2	BT2	QOR133BT

Consensus Values BT1

Method: Metals - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Mercury	µg/kg	20.6	2.85	13.9	83	20.6	1.40	0.39	19.9 - 21.2
Copper	µg/kg	858	120.8	14.1	74	858	71.7	17.6	830 - 886
Cadmium	µg/kg	17.5	2.44	13.9	63	17.2	1.56	0.38	16.9 - 18.1
Aluminium	mg/kg	2.27	0.543	24.0	25	2.25	0.293	0.136	2.04 - 2.49
Lead	µg/kg	22.6	6.47	28.6	52	23.4	4.07	1.12	20.8 - 24.4
Cobalt	µg/kg	13.1	1.75	13.4	33	13.0	0.99	0.38	12.5 - 13.7
Iron	mg/kg	17.9	2.41	13.5	52	18.2	1.60	0.42	17.2 - 18.6
Manganese	µg/kg	4578	532.1	11.6	49	4470	341.0	95.0	4426 - 4731
Selenium	µg/kg	511	64.1	12.5	50	502	36.5	11.3	493 - 530
Arsenic	mg/kg	2.18	0.188	8.7	71	2.16	0.121	0.028	2.13 - 2.22
Chromium	µg/kg	89.1	22.76	25.6	58	89.7	14.90	3.74	83.1 - 95.0
Zinc	mg/kg	20.1	1.95	9.7	74	20.2	1.18	0.28	19.7 - 20.6
Vanadium	µg/kg	14.0	2.93	20.9	23	13.6	1.99	0.76	12.8 - 15.3
Sodium	mg/kg	3462	236.9	6.8	15	3430	143.0	76.4	3332 - 3592
Magnesium	mg/kg	648	40.9	6.3	19	644	21.0	11.7	628 - 667
Potassium	mg/kg	3533	265.0	7.5	15	3504	166.0	85.5	3387 - 3679
Calcium	mg/kg	5268	592.0	11.2	15	5208	315.6	191.1	4942 - 5594
Molybdene	µg/kg	29.1	4.22	14.5	23	30.5	2.76	1.10	27.3 - 30.9
Uranium	µg/kg	5.63	0.520	9.2	20	5.61	0.355	0.145	5.38 - 5.87

Method: Weight - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Dry-weight	%	29.3	0.52	1.8	56	29.3	0.29	0.09	29.18 - 29.45

Method: Lipids - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Total-Lipid	%	9.09	0.756	8.3	11	9.08	0.420	0.285	8.59 - 9.59

Indicative Values BT1

Method: Metals - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Lithium	µg/kg	145	19.7	13.6	6	141	10.6	10.1	125 - 165
Nickel	µg/kg	28.7	17.81	62.1	50	30.0	9.42	3.15	23.6 - 33.7
Silver	µg/kg	1.83	0.615	33.6	13	1.92	0.400	0.213	1.46 - 2.20
Tin	µg/kg	25.4	11.25	44.2	20	25.9	5.51	3.15	20.2 - 30.7
Methyl. Mercury	µg/kg	19.1	2.10	11.0	6	19.3	0.86	1.07	17.0 - 21.2
Phosphorus	mg/kg	4727	874.0	18.5	11	4785	423.2	329.4	4150 - 5310
Sulfur	mg/kg	-	-	-	4	1937	88.8	-	- - -
Rubidium	µg/kg	649	24.1	3.7	6	650	13.3	12.3	625 - 673
Strontium	µg/kg	9444	1091.8	11.6	7	9561	440.4	515.8	8470 - 10420
Antimony	µg/kg	1.85	0.874	47.2	16	1.91	0.530	0.273	1.39 - 2.32
Cesium	µg/kg	-	-	-	4	14.5	0.1	-	- - -
Barium	µg/kg	71.6	19.36	27.0	15	71.7	16.05	6.25	61.0 - 82.3
Thallium	µg/kg	0.641	0.1969	30.7	9	0.691	0.1010	0.0820	0.493 - 0.790
Bismuth	µg/kg	-	-	-	4	0.754	0.3	-	- - -

Method: Weight - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Ash-Weight	%	-	-	-	5	3.20	0.2	-	- - -

Consensus Values BT2

Method: Chlorinated organics - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
pp'-DDE	µg/kg	2.63	0.433	16.5	35	2.65	0.194	0.092	2.48 - 2.78
pp'-DDD	µg/kg	0.986	0.2581	26.2	32	0.995	0.1315	0.0570	0.893 - 1.08
HCB	µg/kg	0.773	0.2049	26.5	32	0.774	0.1250	0.0453	0.699 - 0.847
PCB28	µg/kg	0.319	0.0725	22.8	33	0.330	0.0440	0.0158	0.293 - 0.344
PCB52	µg/kg	0.965	0.1608	16.7	37	0.980	0.0915	0.0330	0.911 - 1.02
PCB101	µg/kg	2.36	0.407	17.2	38	2.39	0.218	0.082	2.23 - 2.50
PCB105	µg/kg	0.397	0.0935	23.5	24	0.403	0.0605	0.0238	0.358 - 0.436
PCB118	µg/kg	1.63	0.314	19.3	37	1.64	0.209	0.065	1.52 - 1.73
PCB153	µg/kg	4.87	0.705	14.5	38	4.81	0.428	0.143	4.64 - 5.11
PCB180	µg/kg	0.619	0.1194	19.3	36	0.619	0.0645	0.0249	0.578 - 0.659
PCB31	µg/kg	0.238	0.0378	15.9	19	0.239	0.0240	0.0108	0.220 - 0.256
PCB138	µg/kg	2.88	0.459	15.9	30	2.91	0.262	0.105	2.71 - 3.05

Method: Lipids - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Total-Lipid	%	8.21	0.872	10.6	16	8.17	0.505	0.272	7.75 - 8.68
Extractable-Lipid	%	8.73	1.058	12.1	10	8.61	0.745	0.418	7.99 - 9.48

Indicative Values BT2

Method: Chlorinated organics - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Transnonachlor	µg/kg	0.126	0.0445	35.3	12	0.135	0.0295	0.0161	0.0982 - 0.154
Dieldrin	µg/kg	1.32	1.001	76.1	9	1.53	0.573	0.417	0.561 - 2.07
PCB138+PCB163	µg/kg	2.93	0.734	25.1	10	2.82	0.530	0.290	2.41 - 3.45
PCB156	µg/kg	0.147	0.0346	23.5	21	0.143	0.0230	0.0094	0.131 - 0.163
d-HCH	µg/kg	-	-	-	5	0.100	0.1	-	- - -
Heptachlor-epoxide (sum)	(µg/kg)	0.110	0.0279	25.3	6	0.121	0.0165	0.0142	0.0825 - 0.138