



QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis



Biota

REFERENCE MATERIAL

Biota sample 355



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 % probability) 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
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		
Arsenic	mg/kg	2.18	0.186	8.5	52	2.16	0.129	0.032	2.13	-	2.23
Cadmium	µg/kg	17.2	1.96	11.4	47	17.0	1.35	0.36	16.7	-	17.8
Calcium	mg/kg	5220	517	9.9	13	5130	357	179	4911	-	5530
Chromium	µg/kg	86.0	16.09	18.7	44	88.3	11.21	3.03	81.1	-	90.9
Cobalt	µg/kg	13.2	1.44	10.9	24	13.0	1.00	0.37	12.6	-	13.8
Copper	µg/kg	870	118.7	13.6	57	867	81.0	19.6	839	-	902
Iron	mg/kg	17.9	2.59	14.5	41	18.3	1.87	0.50	17.0	-	18.7
Lead	µg/kg	20.6	5.47	26.6	38	21.1	3.70	1.11	18.8	-	22.4
Magnesium	mg/kg	649	32.3	5.0	15	644	21.0	10.4	631	-	666
Manganese	µg/kg	4450	402	9.0	38	4400	281	82	4321	-	4586
Mercury	µg/kg	20.7	2.10	10.1	55	20.9	1.46	0.35	20.1	-	21.2
Molybdene	µg/kg	29.3	4.42	15.0	15	30.9	2.90	1.43	26.9	-	31.8
Potassium	mg/kg	3540	231	6.5	12	3520	150	83	3392	-	3682
Selenium	µg/kg	517	51.9	10.0	37	506	34.0	10.7	500	-	534
Sodium	mg/kg	3400	161	4.7	12	3360	110	58	3299	-	3502
Uranium	µg/kg	5.57	0.600	10.8	13	5.52	0.430	0.208	5.21	-	5.93
Zinc	mg/kg	19.9	1.68	8.4	57	19.9	1.15	0.28	19.4	-	20.3

Method: Weight - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Dry-weight	%	29.3	0.61	2.1	37	29.2	0.43	0.13	29.11	-	29.52



Indicative Values BT1

Method: Metals - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Aluminium	mg/kg	2.10	0.490	23.3	18	2.10	0.340	0.144	1.86	-	2.34
Antimony	µg/kg	1.69	0.924	54.6	12	1.75	0.639	0.333	1.11	-	2.27
Barium	µg/kg	56.4	26.16	46.4	9	54.0	17.65	10.90	36.7	-	76.1
Methyl. Mercury	µg/kg	18.2	3.30	18.1	4	19.2	2.30	2.06	13.7	-	22.8
Nickel	µg/kg	28.7	20.30	70.7	36	31.4	14.21	4.23	21.8	-	35.6
Phosphorus	mg/kg	4600	896	19.5	9	4710	589	373	3930	-	5280
Rubidium	µg/kg	641	27.1	4.2	5	646	17.0	15.1	610	-	672
Silver	µg/kg	1.86	0.558	30.1	11	1.92	0.400	0.210	1.49	-	2.23
Strontium	µg/kg	9380	986	10.5	6	9500	714	503	8400	-	10370
Sulfur	mg/kg	1960	74	3.8	4	1980	56	46	1852	-	2058
Thallium	µg/kg	0.632	0.2660	42.1	7	0.691	0.2020	0.1257	0.394	-	0.870
Tin	µg/kg	24.6	13.54	55.0	15	25.6	8.67	4.37	17.1	-	32.0
Titanium	µg/kg	185	30.3	16.4	5	194	21.6	16.9	150	-	219
Vanadium	µg/kg	14.2	3.08	21.6	18	14.3	2.25	0.91	12.7	-	15.8

Method: Lipids - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Total-Lipid	%	9.40	0.290	3.1	6	9.36	0.210	0.148	9.12	-	9.69



Consensus Values BT2

Method: Chlorinated organics - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
PCB28	µg/kg	0.320	0.0645	20.2	33	0.330	0.0440	0.0140	0.297	-	0.343
PCB31	µg/kg	0.237	0.0351	14.8	19	0.239	0.0240	0.0101	0.220	-	0.254
PCB52	µg/kg	0.966	0.1288	13.3	37	0.980	0.0915	0.0265	0.923	-	1.01
PCB101	µg/kg	2.35	0.311	13.2	38	2.39	0.218	0.063	2.25	-	2.45
PCB105	µg/kg	0.398	0.0853	21.4	24	0.403	0.0605	0.0218	0.362	-	0.434
PCB118	µg/kg	1.63	0.298	18.3	37	1.64	0.209	0.061	1.53	-	1.73
PCB138	µg/kg	2.89	0.377	13.1	30	2.91	0.262	0.086	2.75	-	3.03
PCB153	µg/kg	4.88	0.605	12.4	38	4.81	0.428	0.123	4.68	-	5.08
PCB156	µg/kg	0.147	0.0337	22.9	21	0.143	0.0230	0.0092	0.132	-	0.163
PCB180	µg/kg	0.614	0.0909	14.8	36	0.619	0.0645	0.0189	0.583	-	0.645
HCB	µg/kg	0.774	0.1853	23.9	32	0.774	0.1250	0.0409	0.707	-	0.841
pp'-DDD	µg/kg	0.973	0.1905	19.6	32	0.995	0.1315	0.0421	0.904	-	1.04
pp'-DDE	µg/kg	2.62	0.283	10.8	35	2.65	0.194	0.060	2.53	-	2.72

Method: Lipids - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Total-Lipid	%	8.22	0.757	9.2	16	8.17	0.505	0.237	7.82	-	8.62
Extractable-Lipid	%	8.74	1.053	12.1	10	8.61	0.745	0.416	7.99	-	9.48



Indicative Values BT2

Method: Chlorinated organics - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
PCB138+PCB163	µg/kg	2.92	0.745	25.5	10	2.82	0.530	0.294	2.40	-	3.45
Dieldrin	µg/kg	1.31	0.806	61.5	9	1.53	0.573	0.336	0.702	-	1.92
Transnonachlor	µg/kg	0.126	0.0408	32.4	12	0.135	0.0295	0.0147	0.100	-	0.152
Heptachlor-epoxide (sum)	(µg/kg)	0.111	0.0239	21.5	6	0.121	0.0165	0.0122	0.0875	-	0.135