



QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis



Biota

REFERENCE MATERIAL

Biota sample 371



Certificate of Analysis Biota 371

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 371 of Mussel tissue from Yerseke, the Netherlands 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
2022.2	BT1	QTM136BT
2022.1	BT2	QOR151BT
2022.1	BT4	QPH106BT
2022.1	BT8	QSP082BT



Consensus Values BT1

Method: Metals - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic	mg/kg	1.59	0.123	7.8	29	1.60	0.084	0.029	1.55	-	1.64
Cadmium	µg/kg	97.6	7.25	7.4	31	97.9	4.90	1.63	94.9	-	100.2
Chromium	µg/kg	194	16.6	8.5	25	193	11.7	4.1	187	-	201
Cobalt	µg/kg	146	10.9	7.4	14	148	7.5	3.6	140	-	152
Copper	µg/kg	1420	144	10.1	30	1430	106	33	1367	-	1474
Iron	mg/kg	42.0	2.28	5.4	17	42.1	1.65	0.69	40.8	-	43.1
Lead	µg/kg	116	9.2	7.9	26	117	6.3	2.2	112.0	-	119.4
Manganese	µg/kg	3930	210	5.3	19	3920	138	60	3827	-	4029
Mercury	µg/kg	13.1	1.84	14.1	31	13.3	1.31	0.41	12.4	-	13.8
Nickel	µg/kg	344	43.5	12.6	25	347	31.3	10.9	326	-	362
Selenium	µg/kg	561	53.8	9.6	17	547	37.9	16.3	533	-	588
Silver	µg/kg	7.92	1.138	14.4	10	7.64	0.771	0.450	7.12	-	8.72
Vanadium	µg/kg	183	19.1	10.4	11	182	14.1	7.2	171	-	196
Zinc	mg/kg	23.3	1.42	6.1	30	23.5	0.96	0.32	22.7	-	23.8

Method: Weight - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Dry-weight	%	21.8	0.35	1.6	23	21.8	0.25	0.09	21.67	-	21.97



Indicative Values BT1

Method: Metals - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Aluminium	mg/kg	20.0	4.11	20.6	14	20.6	2.83	1.37	17.6	-	22.3
Antimony	µg/kg	3.10	0.792	25.6	7	2.88	0.578	0.374	2.39	-	3.80
Barium	µg/kg	510	39.8	7.8	5	529	29.0	22.3	465	-	556
Calcium	mg/kg	411	14.8	3.6	4	413	9.5	9.3	391	-	432
Lithium	µg/kg	55.8	7.32	13.1	5	58.9	5.89	4.09	47.4	-	64.2
Magnesium	mg/kg	403	30.2	7.5	6	403	19.8	15.4	372	-	433
Molybdene	µg/kg	114	7.6	6.7	8	116	5.6	3.4	107	-	120
Phosphorus	mg/kg	2140	207	9.7	4	2210	153	129	1849	-	2424
Potassium	mg/kg	1570	46	2.9	4	1560	30	29	1503	-	1629
Sodium	mg/kg	4640	256	5.5	4	4660	161	160	4282	-	4992
Thallium	µg/kg	2.08	0.127	6.1	4	2.09	0.082	0.079	1.90	-	2.25
Tin	µg/kg	16.0	6.84	42.8	6	18.4	5.18	3.49	9.15	-	22.8
Uranium	µg/kg	24.4	1.98	8.1	7	24.9	1.30	0.94	22.7	-	26.2

Method: Lipids - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Total-Lipid	%	2.33	0.408	17.5	5	2.30	0.271	0.228	1.86	-	2.80



Consensus Values BT2

Method: Chlorinated organics - BT2

Element

PCB153

Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
µg/kg	1.47	0.116	7.9	12	1.49	0.081	0.042	1.40	-	1.54



Indicative Values BT2

Method: Chlorinated organics - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
PCB28	µg/kg	0.0677	0.0417	61.6	5	0.0669	0.0249	0.0233	0.0198	- 0.116
PCB31	µg/kg	0.0492	0.0072	14.6	4	0.0520	0.0055	0.0045	0.0393	- 0.0591
PCB52	µg/kg	0.106	0.0367	34.6	9	0.130	0.0200	0.0153	0.0783	- 0.134
PCB101	µg/kg	0.431	0.1101	25.6	8	0.451	0.0770	0.0486	0.341	- 0.520
PCB105	µg/kg	0.0582	0.0141	24.2	4	0.0633	0.0107	0.0088	0.0386	- 0.0778
PCB118	µg/kg	0.263	0.0773	29.4	10	0.273	0.0526	0.0306	0.208	- 0.317
PCB138	µg/kg	0.923	0.1834	19.9	11	0.970	0.1300	0.0691	0.801	- 1.04
PCB156	µg/kg	0.0427	0.0048	11.3	4	0.0428	0.0030	0.0030	0.0360	- 0.0494
PCB180	µg/kg	0.106	0.0611	57.5	9	0.137	0.0411	0.0255	0.0602	- 0.152
HCB	µg/kg	0.0660	0.0080	12.1	8	0.0693	0.0064	0.0035	0.0595	- 0.0725
Dieldrin	µg/kg	0.224	0.0800	35.7	5	0.230	0.0530	0.0447	0.132	- 0.316
pp'-DDE	µg/kg	0.387	0.0994	25.7	12	0.391	0.0665	0.0359	0.325	- 0.450

Method: Lipids - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
Total-Lipid	%	2.56	0.224	8.8	7	2.61	0.163	0.106	2.36	- 2.76



Consensus Values BT4

Method: Polycyclic aromatic hydrocarbons - BT4

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Benzo[a]anthracene	µg/kg	1.20	0.209	17.4	19	1.20	0.141	0.060	1.10	-	1.30
Benzo[g,h,i]perylene	µg/kg	0.847	0.1485	17.5	15	0.850	0.1000	0.0479	0.765	-	0.929
Chrysene	µg/kg	1.82	0.223	12.3	17	1.81	0.152	0.068	1.70	-	1.93
Fluoranthene	µg/kg	5.05	0.567	11.2	20	5.14	0.411	0.158	4.79	-	5.32
Phenanthrene	µg/kg	10.6	1.45	13.7	18	10.6	0.99	0.43	9.92	-	11.4
Pyrene	µg/kg	2.75	0.437	15.9	18	2.92	0.331	0.129	2.53	-	2.96



Indicative Values BT4

Method: Polycyclic aromatic hydrocarbons - BT4

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
Acenaphthene	µg/kg	0.280	0.1534	54.7	8	0.353	0.1174	0.0678	0.155	- 0.405
Acenaphthylene	µg/kg	0.205	0.0815	39.7	9	0.247	0.0524	0.0340	0.144	- 0.267
Anthracene	µg/kg	0.305	0.2278	74.8	14	0.366	0.1655	0.0761	0.174	- 0.435
Benzo[a]pyrene	µg/kg	0.406	0.0920	22.7	14	0.431	0.0646	0.0307	0.353	- 0.458
Benzo[b]fluoranthene	µg/kg	1.03	0.366	35.4	17	1.07	0.270	0.111	0.845	- 1.22
Benzo[e]pyrene	µg/kg	1.47	0.372	25.3	8	1.51	0.280	0.164	1.17	- 1.78
Benzo[k]fluoranthene	µg/kg	0.540	0.1704	31.6	14	0.557	0.1158	0.0569	0.442	- 0.637
Fluorene	µg/kg	1.26	0.446	35.4	12	1.35	0.305	0.161	0.981	- 1.54
Indeno[1,2,3-cd]pyrene	µg/kg	0.444	0.1143	25.7	13	0.487	0.0830	0.0396	0.376	- 0.512
Naphthalene	µg/kg	2.11	1.242	58.8	9	2.23	0.926	0.517	1.17	- 3.05

Method: Lipids - BT4

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
Total-Lipid	%	2.56	0.220	8.6	9	2.60	0.154	0.092	2.40	- 2.73



Indicative Values BT8

Method: Organometals - BT8

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Monobutyltin (MBT)	µg Sn/kg	0.503	0.1352	26.9	5	0.578	0.0740	0.0756	0.347	-	0.658
Dibutyltin (DBT)	µg Sn/kg	0.488	0.0783	16.0	7	0.492	0.0560	0.0370	0.418	-	0.558
Tributyltin (TBT)	µg Sn/kg	1.25	0.219	17.6	11	1.24	0.152	0.083	1.10	-	1.39