QUASIMEME

Quality assurance of information for marine environmental monitoring

Certificate of Analysis

Biota

REFERENCE MATERIAL

Biota sample 354

WAGENINGEN UNIVERSITY & RESEARCH

Certificate of Analysis Biota 354

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 354 of Mix of Turbot and Brill liver 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
2021.1	BT1	QTM131BT
2019.2	BT2	QOR140BT
2018.2	BT2	QOR137BT
2017.2	BT9	QBC053BT
2017.2	BT10	QPF007BT

Consensus Values BT1

Method: Metals - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Arsenic	mg/kg	11.6	1.04	9.0	25	11.7	0.70	0.26	11.2 - 12.0
Cadmium	µg/kg	31.9	2.72	8.5	24	31.7	1.95	0.69	30.7 - 33.0
Chromium	µg/kg	151	25.4	16.8	20	153	17.7	7.1	139 - 163
Cobalt	µg/kg	90.5	4.25	4.7	11	89.3	2.60	1.60	87.7 - 93.4
Copper	µg/kg	3740	242	6.5	25	3720	159	60	3641 - 3840
Iron	mg/kg	64.2	4.32	6.7	15	64.3	3.10	1.39	61.9 - 66.6
Lead	µg/kg	61.6	8.38	13.6	22	63.8	5.83	2.23	57.9 - 65.3
Manganese	µg/kg	2540	181	7.1	16	2530	121	56	2446 - 2637
Mercury	µg/kg	139	17.0	12.3	29	140	11.7	4.0	132 - 145
Selenium	µg/kg	1880	205	10.9	19	1850	135	59	1779 - 1975
Silver	µg/kg	67.9	4.57	6.7	13	67.4	2.96	1.58	65.2 - 70.6
Zinc	mg/kg	24.7	2.38	9.6	23	24.8	1.70	0.62	23.7 - 25.7

Method: Weight - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Dry-weight	%	32.1	1.20	3.7	16	32.2	0.78	0.37	31.4 - 32.7

Indicative Values BT1

Method: Metals - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Aluminium	mg/kg	8.62	4.287	49.7	8	8.65	3.048	1.895	5.12 - 12.1
Calcium	mg/kg	1060	41	3.9	4	1040	30	26	999 - 1113
Magnesium	mg/kg	411	5.0	1.2	5	410	4.0	2.8	405 - 417
Molybdene	µg/kg	118	15.6	13.2	5	121	11.0	8.7	100 - 136
Nickel	µg/kg	49.0	13.30	27.1	18	50.5	9.63	3.92	42.4 - 55.6
Sodium	mg/kg	1740	67	3.8	4	1740	47	42	1649 - 1834
Tin	µg/kg	24.2	5.71	23.6	4	24.1	3.74	3.57	16.3 - 32.1
Vanadium	µg/kg	56.4	5.23	9.3	9	55.3	3.70	2.18	52.5 - 60.4

Method: Lipids - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Total-Lipid	%	11.7	0.70	6.0	7	11.5	0.50	0.33	11.0 - 12.3

Consensus Values BT2

Method: Chlorinated organics - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
PCB28	µg/kg	0.589	0.1289	21.9	31	0.600	0.0900	0.0289	0.542 - 0.636
PCB52	µg/kg	1.84	0.233	12.6	36	1.89	0.161	0.049	1.76 - 1.92
PCB101	µg/kg	6.99	0.799	11.4	39	7.12	0.564	0.160	6.74 - 7.25
PCB105	µg/kg	2.24	0.239	10.7	24	2.30	0.165	0.061	2.14 - 2.35
PCB118	µg/kg	8.84	1.030	11.6	38	8.93	0.686	0.209	8.50 - 9.18
PCB138	µg/kg	16.5	2.75	16.7	35	16.8	1.99	0.58	15.6 - 17.5
PCB153	µg/kg	28.5	2.60	9.1	39	28.7	1.70	0.52	27.7 - 29.4
PCB156	µg/kg	0.983	0.1192	12.1	24	0.995	0.0815	0.0304	0.933 - 1.03
PCB180	µg/kg	4.68	0.757	16.2	41	4.74	0.540	0.148	4.44 - 4.92
HCB	µg/kg	1.78	0.317	17.8	37	1.79	0.220	0.065	1.67 - 1.88
pp'-DDD	µg/kg	0.913	0.1874	20.5	29	0.930	0.1300	0.0435	0.842 - 0.984
pp'-DDE	µg/kg	15.3	1.84	12.0	35	15.5	1.31	0.39	14.7 - 16.0

Method: Lipids - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Total-Lipid	%	11.5	0.61	5.3	17	11.6	0.42	0.18	11.19 - 11.81
Extractable-Lipid	%	12.0	0.38	3.2	11	12.0	0.28	0.14	11.79 - 12.30

Indicative Values BT2

Method: Chlorinated organics - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
PCB31	µg/kg	0.353	0.1220	34.6	16	0.390	0.0820	0.0381	0.288 - 0.417
PCB138+PCB163	µg/kg	17.1	2.77	16.2	8	16.8	2.00	1.22	14.8 - 19.3
Dieldrin	µg/kg	1.10	0.497	45.0	8	1.30	0.293	0.219	0.698 - 1.51
Transnonachlor	µg/kg	0.0429	0.0278	64.8	9	0.0650	0.0250	0.0116	0.0220 - 0.0639
Heptachlor-epoxide (sum)	(µg/kg)	0.0296	0.0060	20.4	4	0.0320	0.0046	0.0038	0.0212 - 0.0380
cis-chlordane	(µg/kg)	0.127	0.0406	31.9	8	0.125	0.0284	0.0179	0.0941 - 0.160

Consensus Values BT9

Method: Brominated Flame Retardants - BT9

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
BDE47	µg/kg	2.38	0.303	12.7	14	2.41	0.224	0.101	2.21 - 2.56
BDE100	µg/kg	0.649	0.0912	14.1	14	0.637	0.0660	0.0305	0.596 - 0.701

Indicative Values BT9

Method: Brominated Flame Retardants - BT9

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
BDE28	µg/kg	0.0850	0.0152	17.9	12	0.0858	0.0105	0.0055	0.0754 - 0.0946
BDE66	µg/kg	0.0748	0.0232	31.1	6	0.0830	0.0170	0.0119	0.0516 - 0.0980
BDE99	µg/kg	0.127	0.0225	17.7	12	0.132	0.0165	0.0081	0.112 - 0.141
BDE153	µg/kg	0.0722	0.0205	28.4	11	0.0727	0.0128	0.0077	0.0586 - 0.0858
BDE154	µg/kg	0.321	0.0799	24.9	12	0.325	0.0550	0.0288	0.270 - 0.371

Indicative Values BT10

Method: Perfluorinated alkyl substances - BT10

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
n-PFOS	µg/kg	7.98	2.722	34.1	9	8.01	1.820	1.134	5.93 - 10.0
PFOSA	µg/kg	6.68	0.950	14.2	4	6.62	0.625	0.593	5.36 - 7.99