



# QUASIMEME

Quality assurance of information  
for marine environmental monitoring

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## Certificate of Analysis



Biota

REFERENCE MATERIAL

Biota sample 329

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## Certificate of Analysis Biota 329

### 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 329 of Turbot 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
2018.1	BT1	QTM118BT
2017.1	BT9	QBC050BT
2014.1	BT1	QTM101BT



## Consensus Values BT1

### Method: Metals - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic	mg/kg	9.03	0.536	5.9	53	9.00	0.370	0.092	8.88	-	9.18
Cadmium	µg/kg	26.6	2.48	9.3	56	26.7	1.69	0.41	25.9	-	27.3
Cobalt	µg/kg	115	7.4	6.5	21	113	5.0	2.0	111.3	-	118.1
Copper	µg/kg	2410	158	6.6	62	2410	110	25	2366	-	2446
Iron	mg/kg	66.1	5.11	7.7	30	67.5	3.84	1.17	64.2	-	68.0
Lead	µg/kg	16.3	5.11	31.4	40	17.0	3.65	1.01	14.6	-	17.9
Manganese	µg/kg	1170	88	7.5	30	1180	64	20	1136	-	1201
Mercury	µg/kg	76.0	6.30	8.3	61	75.9	4.30	1.01	74.4	-	77.7
Molybdene	µg/kg	121	9.3	7.7	14	121	6.5	3.1	116	-	126
Selenium	µg/kg	2460	222	9.0	36	2430	159	46	2388	-	2538
Silver	µg/kg	28.4	2.95	10.4	26	28.2	2.00	0.72	27.2	-	29.6
Tin	µg/kg	398	38.4	9.7	17	400	27.6	11.6	378	-	417
Vanadium	µg/kg	32.9	6.42	19.5	19	31.1	4.30	1.84	29.9	-	36.0
Zinc	mg/kg	18.9	1.47	7.8	59	18.9	1.07	0.24	18.47	-	19.24

### Method: Weight - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Dry-weight	%	40.8	0.51	1.2	37	40.9	0.34	0.10	40.68	-	41.01

### Method: Lipids - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Total-Lipid	%	20.4	0.96	4.7	11	20.0	0.70	0.36	19.7	-	21.0



## Indicative Values BT1

### Method: Metals - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Aluminium	mg/kg	4.48	2.212	49.3	11	4.72	1.608	0.834	3.02	-	5.95
Barium	µg/kg	34.8	17.35	49.9	8	34.7	12.70	7.67	20.6	-	48.9
Calcium	mg/kg	150	19.5	12.9	8	148	14.0	8.6	135	-	166
Chromium	µg/kg	101	35.8	35.4	49	105	24.5	6.4	90.8	-	111
Magnesium	mg/kg	190	11.5	6.1	9	189	8.0	4.8	182	-	199
Nickel	µg/kg	44.6	14.44	32.3	39	46.7	11.00	2.89	40.0	-	49.3
Phosphorus	mg/kg	2360	59	2.5	4	2340	45	37	2282	-	2445
Potassium	mg/kg	2890	183	6.3	7	2830	130	86	2729	-	3056
Rubidium	µg/kg	1000	30	3.0	4	1000	20	19	962	-	1045
Sodium	mg/kg	1240	71	5.7	8	1240	52	31	1187	-	1303
Strontium	µg/kg	985	159.8	16.2	6	1011	116.5	81.5	825	-	1144
Uranium	µg/kg	1.23	0.204	16.5	6	1.19	0.130	0.104	1.03	-	1.44



### Consensus Values BT9

Method: Brominated Flame Retardants - BT9

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
BDE28	µg/kg	0.198	0.0380	19.2	15	0.202	0.0270	0.0123	0.177	-	0.219
BDE47	µg/kg	7.32	0.725	9.9	18	7.32	0.501	0.214	6.96	-	7.68
BDE99	µg/kg	0.463	0.0686	14.8	16	0.474	0.0438	0.0214	0.426	-	0.499
BDE153	µg/kg	0.178	0.0280	15.7	16	0.184	0.0191	0.0088	0.163	-	0.193



### Indicative Values BT9

**Method: Brominated Flame Retardants - BT9**

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
BDE66	µg/kg	0.216	0.0674	31.2	8	0.223	0.0456	0.0298	0.161	-	0.271
BDE100	µg/kg	1.69	0.454	26.9	17	1.67	0.300	0.138	1.46	-	1.92
BDE154	µg/kg	0.612	0.1473	24.1	16	0.587	0.0897	0.0460	0.534	-	0.690