



QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis



Biota

REFERENCE MATERIAL

Biota sample 372



Certificate of Analysis Biota 372

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 372 of Cod liver from Commercial market (origin: Iceland) 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	QTM137BT
2021.2	BT2	QOR149BT
2021.2	BT10	QPF025BT



Consensus Values BT1

Method: Metals - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic	mg/kg	4.69	0.402	8.6	18	4.71	0.272	0.118	4.50	-	4.89
Cadmium	µg/kg	505	27.6	5.5	19	506	17.9	7.9	492	-	518
Copper	µg/kg	4120	348	8.4	19	4150	236	100	3952	-	4285
Selenium	µg/kg	595	28.7	4.8	12	594	20.3	10.4	577	-	613
Zinc	mg/kg	12.3	0.91	7.4	18	12.3	0.61	0.27	11.9	-	12.8

Method: Weight - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Dry-weight	%	68.2	1.06	1.6	11	68.0	0.67	0.40	67.5	-	68.9



Indicative Values BT1

Method: Metals - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Chromium	µg/kg	22.2	12.11	54.7	11	25.0	8.83	4.56	14.1	-	30.2
Cobalt	µg/kg	7.72	0.524	6.8	8	7.87	0.363	0.231	7.30	-	8.15
Iron	mg/kg	8.47	0.943	11.1	9	8.77	0.610	0.393	7.75	-	9.18
Lead	µg/kg	3.72	1.389	37.3	12	4.07	1.050	0.501	2.85	-	4.59
Manganese	µg/kg	534	44.2	8.3	9	547	29.2	18.4	500	-	567
Mercury	µg/kg	20.9	5.71	27.4	19	21.0	4.00	1.64	18.1	-	23.6
Molybdene	µg/kg	63.3	7.20	11.4	7	66.0	5.57	3.40	56.9	-	69.8
Nickel	µg/kg	26.6	7.92	29.7	12	27.3	5.50	2.86	21.7	-	31.6
Silver	µg/kg	203	30.2	14.9	7	202	20.6	14.3	176	-	230
Vanadium	µg/kg	49.3	2.55	5.2	5	50.0	1.67	1.42	46.4	-	52.3

Method: Lipids - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Total-Lipid	%	61.9	5.26	8.5	5	60.5	3.73	2.94	55.9	-	68.0



Consensus Values BT2

Method: Chlorinated organics - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
PCB28	µg/kg	2.32	0.270	11.6	12	2.30	0.195	0.097	2.15	-	2.49
PCB52	µg/kg	7.53	1.260	16.7	12	7.23	0.847	0.455	6.74	-	8.32
PCB101	µg/kg	10.3	1.25	12.1	12	10.5	0.81	0.45	9.53	-	11.1
PCB118	µg/kg	12.6	1.11	8.7	12	12.8	0.81	0.40	12.0	-	13.3
PCB138	µg/kg	18.5	2.67	14.4	10	18.7	1.75	1.06	16.6	-	20.4
PCB153	µg/kg	25.6	3.09	12.1	12	25.7	2.19	1.12	23.7	-	27.6
PCB180	µg/kg	6.42	0.483	7.5	11	6.35	0.350	0.182	6.10	-	6.74
pp'-DDE	µg/kg	71.4	6.50	9.1	13	71.5	4.58	2.25	67.5	-	75.3



Indicative Values BT2

Method: Chlorinated organics - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
PCB31	µg/kg	0.911	0.2052	22.5	6	0.943	0.1405	0.1047	0.706	- 1.12
PCB105	µg/kg	3.67	0.355	9.7	7	3.70	0.248	0.167	3.35	- 3.98
PCB156	µg/kg	0.960	0.0739	7.7	6	0.971	0.0529	0.0377	0.887	- 1.03
a-HCH	µg/kg	0.662	0.1604	24.2	10	0.658	0.1095	0.0634	0.549	- 0.775
b-HCH	µg/kg	0.402	0.0423	10.5	8	0.403	0.0305	0.0187	0.367	- 0.436
g-HCH	µg/kg	0.0914	0.0445	48.7	5	0.1120	0.0360	0.0249	0.0402	- 0.143
HCB	µg/kg	25.7	6.54	25.4	12	27.0	4.75	2.36	21.6	- 29.8
Dieldrin	µg/kg	21.4	3.04	14.2	4	21.5	2.00	1.90	17.2	- 25.6
pp'-DDD	µg/kg	26.8	7.93	29.6	12	29.2	5.69	2.86	21.8	- 31.8
Transnonachlor	µg/kg	30.9	1.77	5.7	6	30.5	1.34	0.90	29.2	- 32.7
cis-chlordane	(µg/kg)	20.4	1.65	8.1	5	20.0	1.06	0.92	18.5	- 22.3
trans-chlordane	(µg/kg)	3.79	0.144	3.8	5	3.80	0.104	0.081	3.63	- 3.96
Oxychlordane	(µg/kg)	5.90	1.019	17.3	6	5.77	0.696	0.520	4.88	- 6.92

Method: Lipids - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
Total-Lipid	%	58.5	2.81	4.8	8	58.5	1.88	1.24	56.2	- 60.7
Extractable-Lipid	%	59.8	0.90	1.5	4	59.8	0.60	0.56	58.6	- 61.1



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	0.191	0.0149	7.8	4	0.196	0.0110	0.0093	0.170 - 0.211
total-PFOS	µg/kg	0.233	0.0534	23.0	6	0.231	0.0350	0.0273	0.179 - 0.286
PFDA	µg/kg	0.0829	0.0194	23.3	4	0.0770	0.0140	0.0121	0.0561 - 0.110
PFUnDA	µg/kg	0.317	0.1915	60.4	7	0.350	0.1260	0.0905	0.146 - 0.488
PFTTrDA	µg/kg	0.263	0.0739	28.2	6	0.291	0.0260	0.0377	0.189 - 0.336