# QUASIMEME

**Quality assurance of information for marine environmental monitoring**

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## Certificate of Analysis

**Biota**

**REFERENCE MATERIAL**

**Biota sample 381**

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# Certificate of Analysis Biota 381

## 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, the 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 8 results and a maximum relative uncertainty of 6.25%. Indicative Values are based on a maximum relative uncertainty of 35% and a minimum of 4 and maximum of 7 results, or a relative uncertainty greater than 6.25% when there are at least 8 results.

For each determinand the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median, MAD (Median of Absolute Deviation), the uncertainty of the mean (consensus or indicative) value and the relative uncertainty.

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 381 of Pike-perch from lake Markermeer, 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 |
|---|---|---|
| 2025.1 | BT1 | QTM148BT |
| 2025.1 | BT2 | QOR163BT |

# Consensus Values BT1

**Method: Metals - BT1**

| Element | Unit | Mean | Std.Dev. | CV % | N | Median | MAD | Uncertainty | Rel.Uncert. % |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | µg/kg | 155 | 21.0 | 13.6 | 25 | 154 | 12.5 | 5.25 | 3.39 |
| Copper | µg/kg | 361 | 35.3 | 9.8 | 22 | 365 | 22.8 | 9.41 | 2.60 |
| Cobalt | µg/kg | 3.89 | 0.597 | 15.4 | 11 | 3.82 | 0.246 | 0.225 | 5.79 |
| Iron | mg/kg | 3.63 | 0.610 | 16.8 | 15 | 3.70 | 0.409 | 0.197 | 5.43 |
| Selenium | µg/kg | 486 | 58.3 | 12.0 | 18 | 487 | 36.4 | 17.2 | 3.54 |
| Arsenic | mg/kg | 0.094 | 0.010 | 10.6 | 18 | 0.095 | 0.006 | 0.003 | 3.13 |
| Chromium | µg/kg | 51.6 | 10.2 | 19.8 | 19 | 52.1 | 7.87 | 2.93 | 5.68 |
| Zinc | mg/kg | 8.38 | 0.656 | 7.8 | 22 | 8.37 | 0.363 | 0.175 | 2.08 |

**Method: Weight - BT1**

| Element | Unit | Mean | Std.Dev. | CV % | N | Median | MAD | Uncertainty | Rel.Uncert. % |
|---|---|---|---|---|---|---|---|---|---|
| Dry-weight | % | 24.7 | 0.445 | 1.8 | 14 | 24.6 | 0.225 | 0.149 | 0.602 |

# Indicative Values BT1

**Method: Metals - BT1**

| Element | Unit | Mean | Std.Dev. | CV % | N | Median | MAD | Uncertainty | Rel.Uncert. % |
|---|---|---|---|---|---|---|---|---|---|
| Cadmium | µg/kg | 0.750 | 0.152 | 20.3 | 8 | 0.753 | 0.066 | 0.067 | 8.97 |
| Lead | µg/kg | 3.80 | 1.15 | 30.3 | 11 | 4.09 | 0.736 | 0.434 | 11.4 |
| Manganese | µg/kg | 323 | 141 | 43.4 | 17 | 320 | 63.0 | 42.6 | 13.2 |
| Nickel | µg/kg | 7.27 | 3.92 | 54.0 | 9 | 8.00 | 2.42 | 1.63 | 22.5 |
| Vanadium | µg/kg | 1.16 | 0.284 | 24.5 | 6 | 1.20 | 0.205 | 0.145 | 12.5 |
| Sodium | mg/kg | 577 | 32.2 | 5.6 | 6 | 585 | 25.0 | 16.4 | 2.85 |
| Magnesium | mg/kg | 274 | 32.5 | 11.9 | 7 | 280 | 20.0 | 15.4 | 5.62 |
| Phosphorus | mg/kg | 2289 | 174 | 7.6 | 4 | 2290 | 91.0 | 109 | 4.76 |
| Potassium | mg/kg | 3206 | 162 | 5.1 | 6 | 3230 | 90.5 | 82.7 | 2.58 |
| Calcium | mg/kg | 238 | 46.3 | 19.5 | 4 | 237 | 23.9 | 28.9 | 12.2 |
| Molybdene | µg/kg | 5.11 | 0.336 | 6.6 | 5 | 5.20 | 0.200 | 0.188 | 3.67 |
| Barium | µg/kg | 28.9 | 7.94 | 27.5 | 5 | 31.2 | 4.95 | 4.44 | 15.4 |

**Method: Lipids - BT1**

| Element | Unit | Mean | Std.Dev. | CV % | N | Median | MAD | Uncertainty | Rel.Uncert. % |
|---|---|---|---|---|---|---|---|---|---|
| Total-Lipid | % | 3.51 | 1.00 | 28.6 | 6 | 3.56 | 0.610 | 0.513 | 14.6 |

## Consensus Values BT2

**Method: Chlorinated organics - BT2**

| Element | Unit | Mean | Std.Dev. | CV % | N | Median | MAD | Uncertainty | Rel.Uncert. % |
|---|---|---|---|---|---|---|---|---|---|
| PCB101 | µg/kg | 3.65 | 0.565 | 15.5 | 12 | 3.73 | 0.450 | 0.204 | 5.58 |
| PCB118 | µg/kg | 2.42 | 0.371 | 15.3 | 11 | 2.31 | 0.270 | 0.140 | 5.78 |
| PCB153 | µg/kg | 9.26 | 1.17 | 12.6 | 12 | 9.02 | 0.665 | 0.422 | 4.56 |
| PCB138 | µg/kg | 5.51 | 0.587 | 10.7 | 12 | 5.54 | 0.290 | 0.212 | 3.85 |

# Indicative Values BT2

**Method: Chlorinated organics - BT2**

| Element | Unit | Mean | Std.Dev. | CV % | N | Median | MAD | Uncertainty | Rel.Uncert. % |
|---|---|---|---|---|---|---|---|---|---|
| Dieldrin | µg/kg | 0.337 | 0.135 | 40.1 | 4 | 0.322 | 0.062 | 0.084 | 25.0 |
| pp'-DDE | µg/kg | 2.61 | 0.418 | 16.0 | 10 | 2.70 | 0.285 | 0.165 | 6.32 |
| pp'-DDD | µg/kg | 0.887 | 0.241 | 27.2 | 9 | 0.937 | 0.173 | 0.100 | 11.3 |
| HCB | µg/kg | 0.281 | 0.076 | 27.0 | 7 | 0.289 | 0.051 | 0.036 | 12.7 |
| PCB28 | µg/kg | 0.386 | 0.117 | 30.2 | 10 | 0.419 | 0.087 | 0.046 | 11.9 |
| PCB52 | µg/kg | 1.21 | 0.210 | 17.4 | 11 | 1.20 | 0.110 | 0.079 | 6.55 |
| PCB105 | µg/kg | 0.441 | 0.017 | 4.0 | 6 | 0.443 | 0.008 | 0.009 | 2.02 |
| PCB156 | µg/kg | 0.322 | 0.138 | 43.0 | 7 | 0.320 | 0.080 | 0.065 | 20.3 |
| PCB180 | µg/kg | 2.82 | 0.561 | 19.9 | 12 | 2.81 | 0.265 | 0.202 | 7.18 |
| PCB31 | µg/kg | 0.210 | 0.056 | 26.4 | 6 | 0.210 | 0.032 | 0.028 | 13.5 |
| PCB187 | (µg/kg) | 2.12 | 0.375 | 17.7 | 6 | 2.04 | 0.280 | 0.191 | 9.02 |
| PCB170 | (µg/kg) | 1.05 | 0.307 | 29.3 | 6 | 1.06 | 0.116 | 0.157 | 15.0 |
| PCB128 | (µg/kg) | 0.716 | 0.199 | 27.8 | 4 | 0.735 | 0.093 | 0.124 | 17.4 |
| PCB110 | (µg/kg) | 2.15 | 0.544 | 25.2 | 5 | 2.07 | 0.310 | 0.304 | 14.1 |

**Method: Lipids - BT2**

| Element | Unit | Mean | Std.Dev. | CV % | N | Median | MAD | Uncertainty | Rel.Uncert. % |
|---|---|---|---|---|---|---|---|---|---|
| Total-Lipid | % | 3.33 | 0.265 | 8.0 | 5 | 3.34 | 0.150 | 0.148 | 4.44 |