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Worldwide Interlaboratory Comparison on the Determination of Organochlorine Compounds, Polybrominated Diphenyl Ethers and Polycyclic Aromatic Hydrocarbons in a Fish Sample

ILC-IAEA-MESL-2019-01-OC

IAEA
International Atomic Energy Agency

WORLDWIDE INTERLABORATORY COMPARISON ON THE DETERMINATION OF ORGANOCHLORINE COMPOUNDS, POLYBROMINATED DIPHENYL ETHERS AND POLYCYCLIC AROMATIC HYDROCARBONS IN A FISH SAMPLE

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ILC-IAEA-MESL-2019-01-OC

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FOREWORD

The marine environment, as a global sink of persistent chemical mixtures, needs to be regularly monitored to assess the status of pollution and its impact on different marine compartments. Policy makers need access to reliable, accurate and comparable analytical data to enable sound management of the marine environment.

Among the goals of the IAEA Marine Environmental Laboratories is to assist Member States in understanding, monitoring and protecting the marine environment. In this scope, the Marine Environmental Studies Laboratory (MESL) in Monaco acts as an analytical support centre for the analysis of organic contaminants and trace elements in the marine environment. This is achieved by organizing worldwide laboratory performance studies, also known as interlaboratory comparisons (ILCs), by producing certified reference materials and by conducting training courses on the analysis of contaminants in marine samples.

This publication summarizes the results of the ILC-IAEA-MESL-2019-01-OC Fish Sample ILC on the determination of organic contaminants listed as persistent organic pollutants (POPs) in the Stockholm Convention as well as other POPs listed as priority substances, such as polycyclic aromatic hydrocarbons included in many environmental monitoring programmes. The goal of the ILCs is to demonstrate the measurement capabilities of the laboratories participating in the ILC exercises. The results, used to evaluate laboratory performance with respect to a wide range of pollutants, contribute to the reliability and comparability of worldwide analytical data. The ILC was coordinated by the IAEA through the Marine Environmental Studies Laboratory.

The IAEA is grateful to the Government of Monaco for the support provided to its Marine Environmental Laboratories and to all laboratories participating in this ILC exercise. The IAEA officers responsible for this publication were R. Cassi, D. Huertas and I. Tolosa of the Division of IAEA Marine Environmental Laboratories.

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CONTENTS

1. INTRODUCTION

One of the major programs of the International Atomic Energy Agency's Environment Laboratories (IAEA-NAEL) is to assist Member States in the use of nuclear and non-nuclear analytical techniques to understand, monitor and protect the environment. The Marine Environmental Studies Laboratory (MESL) of the IAEA-EL has conducted worldwide interlaboratory comparisons (ILCs) on trace organic contaminants for over forty years as part of its programmatic program to assist Member States in maintaining and improving the reliability of their analytical measurements in marine pollution.

The results from previous ILCs on persistent organic contaminants (POPs) [1, 2] have revealed some serious difficulties for many laboratories to obtain comparable data, in particular in difficult matrixes, such as biota samples. The accurate and precise determination of halogenated compounds and polycyclic aromatic hydrocarbons in marine samples is essential for assessing the pollution in coastal and ocean environments. To help improve the quality of analytical data, MESL has organized a new worldwide ILC in a marine fish to follow the progress of the performance of the participant laboratories in the analysis of persistent organic contaminants in seafood samples.

This report describes and evaluates results from the IAEA-MESL-2019-01-OC Interlaboratory comparison study, for the chemical analysis of organochlorine compounds (PCBs and organochlorine pesticides), polybrominated diphenyl ethers (PBDEs) and polycyclic aromatic hydrocarbons (PAHs) in tuna fish sample (IAEA-435).

2. SCOPE OF THE INTERLABORATORY COMPARISON

The scope of this worldwide ILC is to provide a valuable way for analyst participants to anonymously allow them to check the accuracy of their results and identify any analytical gap or problem that might require improvement or corrective action. Furthermore, it can be an opportunity to compare the data reported with their associated analytical procedures.

The target compounds of this ILC includes organic contaminants listed as Persistent Organic Pollutants (POPs) in the Stockholm Convention, as well as other POPs registered as priority substances (PSs), such as polycyclic aromatic hydrocarbons (PAHs) included in many environmental monitoring programmes.

Invitation letters for the present ILC were sent to 326 laboratories from 86 Member States, previously participated or expressed interest in participating in the IAEA ILCs. Positive responses were received from 79 laboratories from 43 Member States.

3. DESCRIPTION OF THE MATERIAL

A sample of 150 kg of Tuna (*Thunus thynnus*) was collected from the Mediterranean Sea in 2004. This sample was freeze-dried, ground, and sieved at 250 μm using a stainless-steel sieve. This powder was homogenized by mixing it in a stainless-steel rotating drum for two weeks. Then, aliquots of about 30 g were packed into glass bottles with aluminum screw caps, labeled IAEA-435 and sealed with Teflon tape. This material was previously used for a world-wide ILC in 2004-2005 and reported values were used for producing the IAEA 435 reference material which provides information values for petroleum hydrocarbons, PCBs and organochlorine pesticides [2].

Before dispatching the ILC samples to participating laboratories, the original labels were removed and replaced by labels reporting only the name of the exercise: (IAEA-MESL-2019-01-OC).

4. MOISTURE CONTENT

The moisture content of the lyophilized material, determined by drying an aliquot to a constant mass at 105 °C, was found to be 5.0 ± 0.7% at the time of the preparation of this sample in 2004 [2] and 7.0 ± 0.1% at the time of dispatching the bottles kept at 20 ^{0}C. As the moisture content may change with the ambient humidity and temperature, it was recommended that participants determine the water content of the ILC sample from a separate sub-sample (not the one taken for analysis of contaminants), by drying to a constant weight for at least 8 hours at 105 °C at the time of analysis in the laboratory.

5. HOMOGENEITY TEST

The homogeneity (between and within bottles) of the material was assessed for organochlorine compounds and polybrominated diphenyl ethers by determining the concentration of these compounds in 10 bottles randomly selected from the bottling of the bulk dry powder. Each bottle unit was extracted and analyzed in duplicate, resulting in 2 independent data values by bottle unit. A one-way variance analysis of the results indicated that the material can be

considered homogeneous. All measurements were performed in MESL, IAEA Organic Chemistry Laboratory using previously validated methods. For organochlorine and PBDEs compounds, subsamples of 3 g were extracted with a microwave oven, purified with sulphuric acid, fractionated by Florisil SPE column, and determined by GC-ECD in dual column and GC-MS/MS for confirmation.

Grubbs-tests at 95% and 99% confidence levels were performed to identify potentially outlying individual results as well as outlying bottle means. Few unit means were detected as outliers at 95% confidence levels for PCB 170, PCB 201, BDE154 and BDE153, but they were retained as they followed a normal distribution.

Quantification of between-unit homogeneity was estimated according to ISO Guide 35 [3] by analysis of variance (ANOVA) which can separate the between-unit variation (s_{bb}) from the within-unit variation (s_{wb}). The latter is equivalent to the method repeatability if the individual aliquots are representative for the whole unit. ANOVA allows the calculation of within-unit standard deviation s_{wb} and also between-units standard deviation s_{bb}:

$$s_{wb} = u_{wb} = \sqrt{MS_{wb}} \quad (1)$$

$$s_{bb} = u_{bb} = \sqrt{\frac{MS_{bb} - MS_{wb}}{n}} \quad (2)$$

s_{bb} and s_{wb} are estimates of the true standard deviations and are therefore subject to random fluctuations. In some cases, the mean square between groups (MS_{bb}) can be smaller than the mean squares within groups (MS_{wb}), resulting in negative arguments under the square root used for the estimation of the between-unit variation. In this case, u^*_{bb}, the maximum between-unit variability that could be masked by method repeatability, was calculated as described by Linsinger et al. [4]:

$$u^*_{bb} = \frac{s_{wb}}{\sqrt{n}} \sqrt[4]{\frac{2}{\nu_{MSwb}}} \quad (3)$$

Where: n is the number of replicate sub-samples per bottle; and ν_{MSwb} is the degrees of freedom of MS_{wb}.

As presented in Table 1, the between-unit variations (s_{bb} and u_{bb}*) for most of the selected compounds were between 1.2 and 4.1%, small enough to ensure the homogeneity of the material at 3 g sample size. The within-unit variation (s_{wb}) derived from the ANOVA calculation range between and 3.3 and 8.7%, which was similar to the typical method

repeatability (s_{meas}: 3.9-8.9%) derived from relative standard deviation of six replicates from the same bottle in the same batch.

The uncertainty u_{hom} associated with inhomogeneity of the material was estimated according to the ISO Guide 35 [3] by Eq. 4:

$$u_{hom} = \sqrt{u_{wb}^2 + u_{bb}^2} \quad (4)$$

where the u_{wb} was derived from ANOVA and the u_{bb} was taken as the maximum values of the between-unit variations (s_{bb} and u_{bb}*). As it is presented in Table 1, the uncertainty contribution related to inhomogeneity was estimated to range from 3.9 to 9.0 %, and, thus, we set the uncertainty associated with inhomogeneity at 8 % for all analytes.

TABLE THE ESTIMATE OF INHOMOGENEITY CONTRIBUTIONS TO THE TOTAL UNCERTAINTY FOR THE SELECTED PCBs, ORGANOCHLORINE PESTICIDES AND PBDEs COMPOUNDS AND REPEATABILITY OF THE METHOD

Compound	s_{wb}	s_{bb}	u_{bb}^{*}	**Repeatability**	u_{hom}
	%	**%**	**%**	**%**	**%**
PCB 28	4.7	[1)]	2.3	4.7	5.3
PCB 31	6.1	[1)]	3.0	5.7	6.8
PCB 52	3.3	2.1	1.6	3.9	3.9
PCB 99	4.9	2.5	2.4	5.4	5.5
PCB 101	4.0	1.2	1.9	4.1	4.2
PCB 118	5.9	4.3	2.9	7.2	7.3
PCB 126	4.9	1.3	2.4	4.9	5.1
PCB 138	6.9	[1)]	3.4	6.6	7.7
PCB 149	5.0	[1)]	2.4	4.8	5.5
PCB 151	6.9	[1)]	3.4	6.5	7.7
PCB 153	6.6	[1)]	3.2	6.3	7.3
PCB 169	5.7	3.1	2.8	6.3	6.5
PCB 170	5.0	3.7	2.4	6.0	6.2
PCB 174	3.8	1.7	1.9	4.1	4.2
PCB 180	5.0	2.8	2.4	5.5	5.7
PCB 183	4.6	[1)]	2.3	4.4	5.2
PCB 187	4.5	[1)]	2.2	4.1	5.0
PCB 194	5.7	1.9	2.8	6.2	6.0
PCB 195	6.9	[1)]	3.3	6.9	7.6
PCB 201	5.3	3.8	2.6	6.3	6.5
PCB 206	4.2	2.0	2.0	6.4	4.6
PCB 209	6.1	[1)]	3.0	5.3	6.8
pp'DDT	6.6	5.5	3.2	6.0	8.6
BDE 154	7.8	3.2	3.7	8.4	8.4
BDE 153	8.7	2.2	4.1	8.9	9.0

[1)] Not defined due to negative argument under the square root

6. SAMPLE DISPATCH AND DATA RETURN

The ILC sample labelled “ILC-IAEA-MESL-2019-01-OC, Organic Contaminants in Fish Sample’ was distributed to 79 laboratories worldwide between November and December 2019.

Due to the unfortunate pandemic situation, only a total of 51 laboratories from 28 countries reported results.

Each participating laboratory received one bottle of the test sample, accompanied by one information sheet and instruction for the use of the IAEA-NAEL on-line results reporting system. Participants were requested to determine PCBs, organochlorine pesticides, PBDEs and PAHs as many compounds as possible from the list reported in Annex, using the analytical procedures established in their laboratories.

Participants were requested to make at least three independent determinations and to report the results together with a short description of the method used. Participants were also required to provide proof of traceability of obtained results to the International System of Units (SI), via standard calibration solutions and CRM applied, as a part of their analytical procedures.

It was also requested that concentrations must be calculated on a dry mass basis and given as ng g^{-1}, leaving as many significant figures as justified by the precision of the method used.

Participants were advised that if a compound was not detected by the method used, the corresponding limit of detection should have been given rather than the statement "not detected".

For each class of compounds, participants were required also to report information about:

- Water content (in %);
- Total lipids (mg/g);
- Extractable lipids (mg/g);
- Extraction technique;
- Quantity extracted;
- Solvent used;
- Samples clean up;
- Sample fractionation;
- Detection method;
- Injector;
- GC or HPLC column;
- Results quantification;
- Statement on traceability of the obtained measurement results (standards and reference materials used);
- QA/QC;
- Surrogates spiked before extraction;

- Internal standards spiked before injection;
- Use of CRMs;
- Use of validated method;
- Accreditation.

Participants were requested to report their data and information using an on-line reporting. The initial deadline for reporting data was set on the 3rd of March 2020. However, due to the pandemic spread of Covid-19 disease and subsequent multiple lockdowns, it was agreed with participants to postpone the deadline to the 15th of December 2020.

7. RESULTS EVALUATION

Results reported by participants are presented in Appendix I (Tables 19 to 107).

For the purpose of this report, each laboratory is represented by a code number which remains unchanged throughout the data tables. The numbers do not correspond to the sequence of laboratories in the list of participants given at the end of the report, so that the anonymity of each laboratory is preserved.

Along with the computed arithmetic mean of the replicate determinations reported by participants, Tables 19 to 107 report also fundamental analytical and quality parameters like the instrument type, the use of surrogates, internal standards and Reference Materials and the existence of a quality assurance/quality control system in the laboratory.

7.1 MOISTURE AND LIPIDS CONTENT

Water content (in %) as well as Extractable lipids (mg/g) and/or Total lipids (mg/g) were parameters that participants had to report for each group of analytes. Unfortunately, many participants provided these type of information only partially. Moreover, some participants misinterpreted the indications about reporting units and some of the data provided were incoherent. As an indication of water content and extractable lipids it was decided to use data issued from the analysis performed in MESL, IAEA Organic Chemistry Laboratory. Water content was found to be equal to 7.0 ± 0.1% while extractable lipids were found to be equal to 136 ± 10 mg/g.

7.2 ANALYTICAL METHODS

Figure 1 shows a graphic representation of the techniques used by participants to extract the test sample for each group of compounds: Organochlorine Compounds, PBDEs and PAHs. Among the different techniques Soxhlet, Accelerated Solvent Extraction (ASE) and Microwave assisted extraction (MW) are by far the most used in every group of compounds.

Figure 2 exhibits a graphic representation of the type of instrument used by participants to analyze the test sample for each group of compounds: Organochlorine Compounds, PBDEs and PAHs. As expected, a clear predominance of gas chromatographic-mass spectrometry techniques were used for all different groups of compounds.

Table 2 reports abbreviations used in Figure 1 and 2 and along this report.

TABLE 2. ABBREVIATIONS OF TECHNIQUES AND INSTRUMENTS USED BY PARTICIPANTS FOR THE EXTRACTION AND ANALYSIS OF THE TEST SAMPLE

Abbreviation	
ASE	Accelerated Solvent Extraction
QUECHERS	Quick, Easy, Cheap, Effective, Rugged and Safe Solid Phase Extraction
MW	Microwave Assisted Extraction
Shaking (s/l)	Mechanical Shaking Solid/Liquid Extraction
GC/ECD	Gas Chromatography – Electron Capture Detector
GC/ECD & GC/MS	Gas Chromatography – ECD and peak confirmation with GC/MS
GC/ECD - Dual	Gas Chromatography – ECD with dual columns confirmation
GC/MS	Gas chromatography–mass spectrometry
GC/MS EI	Gas chromatography–mass spectrometry, Electron Ionization
GC/MS NCI	Gas chromatography–mass spectrometry, Negative Chemical Ionization
GC/MSMS	Gas Chromatography - Tandem Mass Spectrometry
GC/HRMS	Gas Chromatography - High Resolution Mass Spectrometry
HPLC-Fluo	High Performance Liquid Chromatography - Fluorescence Detector
HPLC-UV	High Performance Liquid Chromatography – Ultraviolet Detector

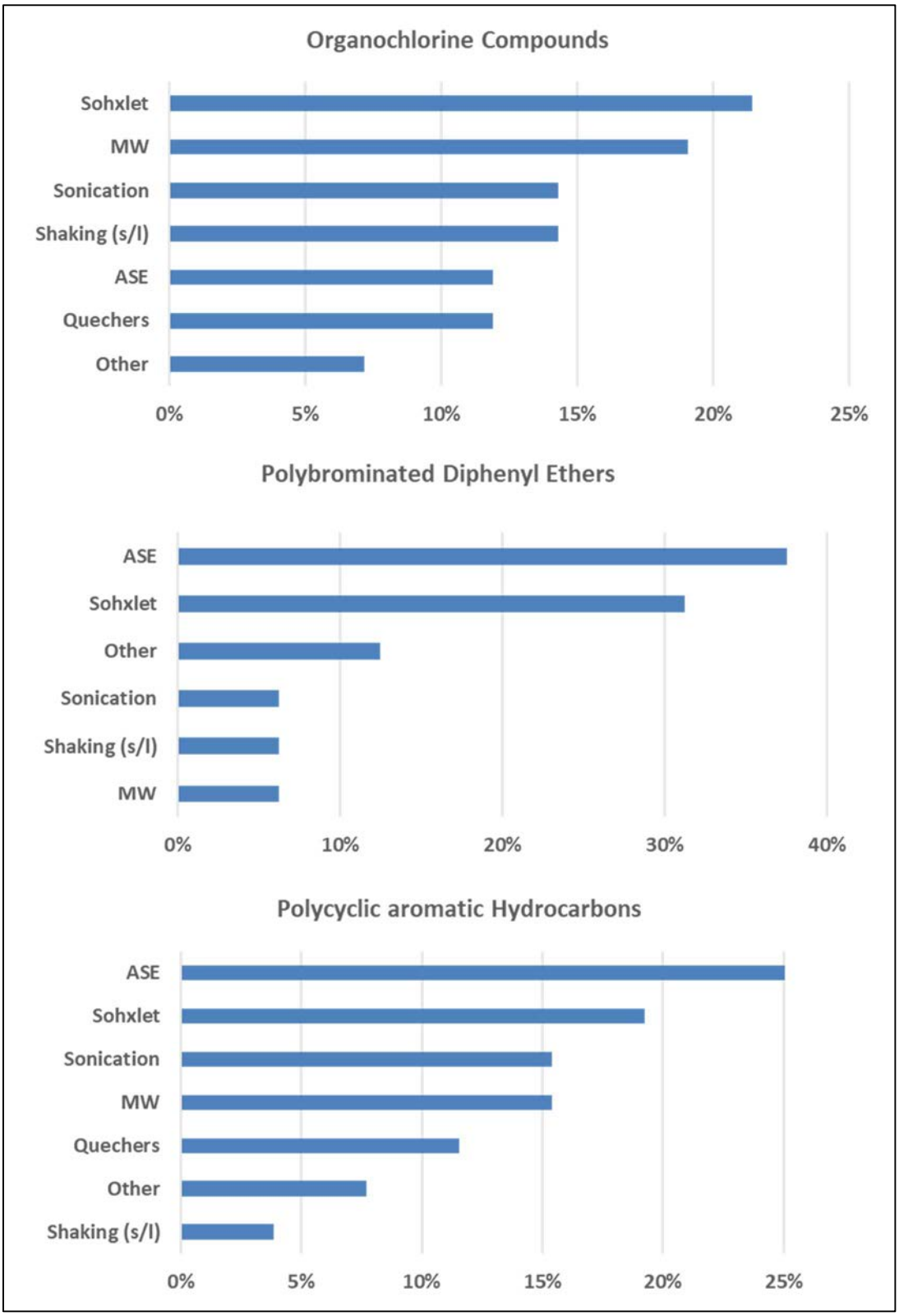

FIG. 1. Graphic representation of the techniques used by participants to extract the test sample

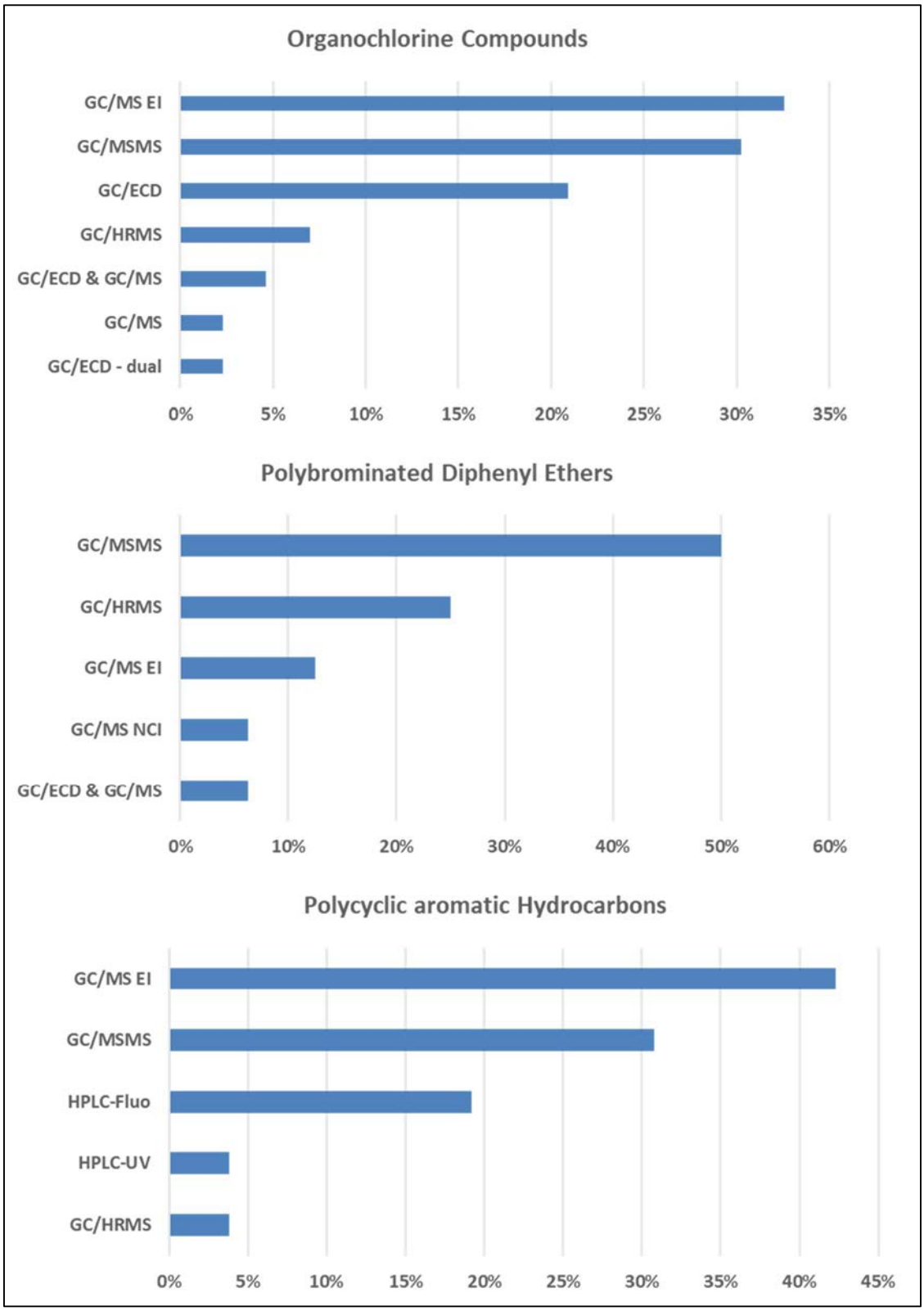

FIG. 2. Graphic representation of the type of instrument used by participants to analyze the test sample

7.3 ASSIGNED VALUES AND ASSOCIATED UNCERTAINTIES

The assigned values for organic contaminants in the ILC-IAEA-MESL-2019-01-OC sample were established according to the requirements of the ISO 17043 standard [5] using the statistical robust methods described in ISO 13528 [6] for use in proficiency testing by interlaboratory comparisons. Kernel density plot was also used as an appropriate tool to visualize and identify modes in the distribution of the results [7].

The first estimation of the robust average values was performed considering all reported values. Then, reported results that diverged more than ± 50% from the robust average were considered outliers and discarded, and new robust average was calculated with the remaining results for getting the final assigned values and associated uncertainties. No assigned values were calculated for compounds where most participating laboratories using mass spectrometry provided values lower than their detection limit.

The uncertainties associated with the new assigned values of the ILC-IAEA-MESL-2019-01-OC sample were conducted according to ISO Guide 35 [3], combining the standard uncertainties associated with the characterization (u_{char}), homogeneity (u_{hom}) and long-term stability (u_{stab}). Because the uncertainty component derived from the long-term stability was insignificant and assumed to be zero, the final expanded uncertainty was a combination of the other two contributions using the law of propagation of uncertainty as shown:

$$U_a = k \times \sqrt{u_{char}^2 + u_{ho}^2} \quad (5)$$

where k is the coverage factor of 2, representing a confidence level of 95%

μ_{hom} was set at 8%

μ_{char} was calculated as described in ISO 13528 [6] using:

$$u_{char} = 1.25 \times \frac{s^*}{\sqrt{p}} \quad (6)$$

where: s* is the robust standard deviation and p is the number of participating laboratories.

The new assigned values and their associated uncertainties for the target PCBs, organochlorinated pesticides, PBDE congeners and PAHs are shown in Tables 3, 4, 5 and 6 respectively. For data with number of numerical observations ≤ 3, the robust mean is given as an indicative value and no evaluation was performed. For compounds where most participating laboratories using mass spectrometry provided values lower than their detection limit, an indicative value as "<" than the assigned value derived from reference laboratories was attributed.

TABLE 3. ASSIGNED VALUES AND ASSOCIATED UNCERTAINTIES FOR PCBs IN THE ILC-IAEA-MESL-2019-01-OC

Compound	No. Participants	No. Results accepted	Robust mean x* µg kg^{-1}	u_{char} (k=1) (%)	U_a total (k=2) (%)
PCB 8	4	3	<0.30*		
PCB 18	9	5	0.71	17.5	39
PCB 28	33	17	1.31	11.6	28
PCB 31	14	10	0.62	11.2	27
PCB 44	9	8	1.75	12.8	30
PCB 49	4	4	2.15	19.4	42
PCB 52	34	24	3.90	7.7	22
PCB 66	4	3	7.12	26.5	55
PCB 70	3	2	5.12	16.0	36
PCB 74	3	3	3.61	18.4	40
PCB 87	4	4	6.54	9.1	24
PCB 95	10	5	5.23	9.4	25
PCB 97	2	2	5.34	10.3	26
PCB 99	11	8	17.4	17.5	38
PCB 101	38	28	23.3	6.9	21
PCB 105	16	13	8.00	6.4	21
PCB 110	11	9	12.4	13.7	32
PCB 118	29	20	28.4	5.4	19
PCB 128	10	5	8.43	8.0	23
PCB 138	36	24	68.1	5.4	19
PCB 146	7	4	18.2	3.7	18
PCB 149	18	11	27.3	8.1	23
PCB 151	10	6	9.29	11.1	27
PCB 153	35	24	90.0	5.4	19
PCB 156	15	13	3.85	4.4	18
PCB 170	14	9	11.9	6.7	21
PCB 174	2	2	7.67	5.6	20
PCB 177	10	7	8.16	12.1	29
PCB 180	36	24	34.8	5.6	20
PCB 183	11	7	9.51	16.3	36
PCB 187	12	6	29.5	10.9	27
PCB 194	12	10	4.30	10.5	26
PCB 195	4	4	1.62	17.8	39
PCB 201	3	2	3.58	17.5	38
PCB 206	5	3	3.31	4.4	18
PCB 209	9	5	1.94	5.1	19

*For compounds "< ", no assigned value was calculated as most participating laboratories using mass spectrometry provided values lower than their detection limit.

TABLE 4. ASSIGNED VALUES AND ASSOCIATED UNCERTAINTIES FOR THE ORGANOCHLORINE PESTICIDE COMPOUNDS IN THE ILC-IAEA-MESL-2019-01-OC

Compound	**No. Participants**	**No. Results accepted**	**Robust mean x* µg kg^{-1}**	**u_{char} (k=1) (%)**	**U_a total (k=2) (%)**
HCB	27	17	2.89	7.1	21
α-HCH	22	9	<0.15*		
β-HCH	22	8	<0.25*		
γ-HCH- Lindane	27	11	<0.15*		
δ-HCH	16	6	<0.15*		
pp'-DDD	29	14	13.1	5.2	19
pp'-DDE	34	25	121	7.0	21
pp'-DDT	29	20	18.2	7.0	21
op'-DDE	17	12	2.23	6.0	20
op'-DDD	16	11	2.95	9.2	24
op'-DDT	18	14	7.48	7.7	22
Heptachlor	24	12	<0.16*		
Aldrin	24	10	<0.10*		
Dieldrin	24	11	5.28	13.0	31
Endrin	19	7	<0.15*		
cis-Chlordane	15	9	6.53	11.7	28
trans-Chlordane	16	4	0.38	6.8	21
cis-Nonachlor	4	4	11.3	0.5	16
trans-Nonachlor	5	5	20.5	9.0	24
α-Endosulfan	20	6	<0.30*		
β-Endosulfan	16	4	<0.10*		
Endosulfan sulfate	10	4	<0.30*		
Heptachlor epoxide	22	7	0.81	13.4	31

*For compounds "< ", no assigned value was calculated as most participating laboratories using mass spectrometry provided values lower than their detection limit.

TABLE 5. ASSIGNED VALUES AND ASSOCIATED UNCERTAINTIES FOR PBDEs IN THE ILC-IAEA-MESL-2019-01-OC

Compound	No. Participants	No. Results accepted	Robust mean x* µg kg^{-1}	u_{char} (k=1) (%)	U_a total (k=2) (%)
BDE 17	4	4	<0.10		
BDE 28	18	14	1.21	8.3	23
BDE 47	18	16	22.4	4.6	18
BDE 49	5	4	2.07	7.9	22
BDE 66	7	7	2.55	11.3	28
BDE 85	6	6	<0.10*		
BDE 99	18	12	1.40	6.4	21
BDE 100	18	14	7.30	9.0	24
BDE 153	17	12	0.61	7.8	22
BDE 154	18	9	4.68	8.8	24
BDE 183	8	6	<0.10*		
BDE 209	6	4	<1.00*		

*For compounds "< ", no assigned value was calculated as most participating laboratories using mass spectrometry provided values lower than their detection limit.

TABLE 6. ASSIGNED VALUES AND ASSOCIATED UNCERTAINTIES FOR PAHs IN THE ILC-IAEA-MESL-2019-01-OC

Compound	No. Participants	No. Results accepted	Robust mean x* µg kg^{-1}	u_{char} (k=1) (%)	U_a total (k=2) (%)
Naphthalene	20	8	18.6	13.5	31
1-Methylnaphthalene	7	7	14.5	9.6	25
2-Methylnaphthalene	8	6	18.4	15.5	35
Acenaphthylene	18	5	0.94	7.5	22
Acenaphthene	21	7	1.62	17.6	39
Fluorene	22	9	4.04	10.9	27
Phenanthrene	23	12	11.8	11.7	28
Anthracene	21	9	<0.7*		
1-Methylphenanthrene	3	2	2.73	22.1	47
2-Methylphenanthrene	2	2	4.97	26.5	55
Benz[*a*]anthracene	23	12	<0.7*		
Chrysene (+Triphenylene)	22	10	<0.6*		
Fluoranthene	22	10	<2*		
Pyrene	21	9	<2*		
Benzo[*a*]pyrene	23	12	<0.6*		
Benzo[*e*]pyrene	9	6	<0.6*		
Benzo[*b+j*]fluoranthene	22	11	<0.7*		
Benzo[*g,h,i*]perylene	22	11	<0.6*		

*For compounds "< ", no assigned value was calculated as most participating laboratories using mass spectrometry provided values lower than their detection limit.

7.3.1 Evaluation criteria

The performance of each participant was evaluated with the *z*-score which expresses the difference between the mean of the laboratory and the assigned value in the same unit. The *z*-score represents a simple method of giving each participant a normalized performance score for the measurement bias of the respective measurement result. The standard deviation for the proficiency assessment (also called target standard deviation), σ_p, was set to be fit for purpose, according to the Harmonized Protocol [8] and was fixed to 12.5 % of the assigned values. The determination of the target standard deviation was done on the basis of the outcome of previous ILCs organized by MESL, for the same group of laboratories. Considering that the uncertainty (μ_a, k=1) in the assigned value x_a is not negligible ($\mu_a \geq 0.3\ \sigma_p$) [6], we combined the target standard deviation for proficiency assessment (σ_p), usually set at 12.5% with the target uncertainty of the assigned value (μ_a) for the calculation of the "Total error" according to the following formula:

$$Total\ error_a = \sqrt{u_a^2 + \sigma_p^2} \quad (7)$$

For the assessment of the laboratory performances based on ISO/IEC 17043:2010 [5] and ISO 13528 [6]:

a modified z_i-score is calculated taking in account the total error:

$$z_i = \frac{x_i - x*}{total\ error_a} \quad (8)$$

A Zeta-score, taking in account the measurement uncertainties reported by the respective participant are calculated following the Eq. (9),

$$\text{Zeta} = \frac{x_i - x*}{\sqrt{u_a^2 + u_{x_{lab}}^2}} \quad (9)$$

where:

z_i is the *z*-score of laboratory *i* for the respective analyte.

x_i is the reported result of laboratory *i* for that analyte, expressed as the mean of multiple determinations.

x* is the assigned value for the respective analyte.

total error is the target standard deviation for proficiency assessment (σ_p) combined with the uncertainty of the assigned value (μ_a).

u_{lab} is the standard uncertainty (k=1) reported by participant

The acceptability of a laboratory's performance was evaluated according to the following internationally accepted limits [8]:

$$|z \text{ or Zeta}| \leq 2.0 \text{ satisfactory}$$
$$2.0 < |z \text{ or Zeta}| < 3.0 \text{ questionable}$$
$$|z \text{ or Zeta}| \geq 3.0 \text{ unsatisfactory}$$

For data with the number of numerical observations ≤ 3, the robust mean was given as an indicative value and no evaluation was performed. Reported values as "<LD" from participants were evaluated as "Consistent (C)" or "Inconsistent (I)" to provide some extra information about their LD and their application to the exercise:

For those compounds with an assigned value, if a laboratory reported a "<LD" result, it has been evaluated by calculating a range based on the following criteria: Assigned Value – 2 x Total Error and Assigned Value + 6 x Total Error. If the absolute value of their result was inside this range, it has been evaluated as "Consistent (C)", if not then as "Inconsistent (I)".

When the assigned value is "<LD", the reported data of the laboratory was assigned "Consistent (C)" if the reported value was ≤ 6 x LD. Otherwise it was considered "Inconsistent (I)".

8. LABORATORIES PERFORMANCES

In total, 51 laboratories provided results for the analysis of at least one group of compounds by the final deadline. Among the data sets, 39 were submitted for PCBs, 37 for organochlorine pesticides, 18 for PBDEs and 27 for PAHs. The *z*-scores were calculated for 30 PCB congeners, 13 organochlorine pesticides, 8 PBDEs and 7 PAH compounds.

All reported data are compiled in Appendix I. For editorial purposes some results have been rounded to appropriate number of significant figures.

Graphical presentations of results obtained by participating laboratories; z scores and summary of the statistical evaluation as well as Kernel density plot [7] (when more than 8 results) are presented in Appendix II.

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8.1 OVERVIEW OF THE PCB RESULTS

In total, 39 datasets were submitted for PCB congeners with number of analytes reported by participants ranging from 1 to 36. Not surprisingly the seven most abundant PCB congeners (PCB 28, 52, 101, 118, 153, 138, and 180) were the most reported.

Assigned values were calculated for 30 out of the 36 PCB congeners that participants could report. For PCBs 70, 74, 97, 174 and 201, only indicative values were provided as the number of reported values were ≤3. For PCB 8 congener no assigned value was calculated since most participants reported values "<" than their detection limits.

Figures 3 illustrates the overall performances of the laboratories, as a z-scores, for each individual PCB congener. Among the 453 *z*-scores calculated for PCB congeners, 59% were found to be acceptable, 13% questionable and 28% were unsatisfactory.

Most participants reported uncertainties along with their measurements of the test sample and as shown in Figure 4, the corresponding Zeta-scores distribution followed closely the one for *z*-scores. Among the 318 Zeta-scores calculated for PCB congeners, 61% were found to be acceptable, 12% questionable and 27% were unsatisfactory.

Figures 5 and 6 shows the laboratories performances (*z*- and Zeta- scores, respectively) for the analyses of PCB congeners by laboratory code. Tables 7 and 8 report the overall calculated *z*-scores for PCB congeners. Tables 9 and 10 reports the overall calculated Zeta-scores for PCB congeners.

A large majority of participants extracted the test sample using either Soxhlet or Microwave Assisted Extraction while the most employed instrumental techniques were GC/MS EI and GC/MSMS.

The majority of participants used Certified Reference Materials, spiked surrogates before extraction and internal standards before injection of the test sample. Although most participants used validated methods, only a minority were accredited for the analysis of PCB congeners.

Overall, the comparability between the participating laboratories was relatively satisfactory for the major PCB congeners, whereas higher variability was observed for minor PCB congeners that may co-elute with other isomers on the commonly 5% phenyl-substituted methyl polysiloxane GC stationary phase used by the participants. In this aspect, the use of GC columns with minimum length of 50 m or at least two columns with stationary phases of different polarity is recommended.

8.2 OVERVIEW OF THE ORGANOCHLORINE PESTICIDES RESULTS

In total, 37 datasets were submitted for organochlorine pesticides with number of analytes reported by participants ranging from 2 to 23.

Assigned values were calculated for 13 out of the 23 organochlorine pesticides that participants could report. For ten analytes, no assigned values were calculated since most participants reported values "<" than their detection limits.

Figures 7 and 8 represent a graphical representation of laboratories performances (*z*- and Zeta-scores, respectively) by compound for organochlorine pesticides. Among the 219 *z*-scores calculated for organochlorine pesticides, 59% were found to be acceptable, 13% questionable and 28% were unsatisfactory. The Zeta-scores distribution for the participants that reported uncertainties along with their measurements of the test sample followed closely the one for *z*-scores. Among the 145 Zeta-scores calculated for organochlorine pesticides, 63% were found to be acceptable, 11% questionable and 26% were unsatisfactory.

Figures 9 and 10 represent a graphical representation of laboratories performances (*z*- and Zeta-scores, respectively) for the analyses of organochlorine pesticides by laboratory.

Since most of the time the analysis of PCB congeners and organochlorine pesticides are carried out simultaneously, similarly to what observed for PCBs, a large majority of participants extracted the test sample using either Soxhlet or Microwave Assisted Extraction while the most employed instrumental techniques were GC/MS EI and GC/MSMS.

The majority of participants used Certified Reference Materials, surrogate standards before extracting the sample and internal standards before the instrumental analysis. Although most participants used validated methods, only a minority were accredited for the analysis of organochlorine pesticides.

Tables 11 and 12 report the overall calculated *z*-scores for organochlorine pesticides. Table 13 reports the overall calculated Zeta-scores for organochlorine pesticides.

8.3 OVERVIEW OF THE PBDE RESULTS

In total, 18 datasets were submitted for PBDEs with number of analytes reported by participants ranging from 6 to 12. Assigned values were calculated for 8 out of the 12 BDEs that participants could report. For 4 BDE analytes no assigned values were calculated since most participants reported values "<" than their detection limits.

Figures 11 and 12 show the overall laboratory performances (*z*- and Zeta- scores, respectively) for each individual BDE congener. Among the 117 *z*-scores calculated for PBDEs, 62% were found to be acceptable, 15% questionable and 22% were unsatisfactory. Most of the participants reported uncertainties along with their measurements of the test sample and the corresponding Zeta-scores distribution followed closely the one for *z*-scores. Among the 86 Zeta-scores calculated for PBDEs, 64% were found to be acceptable, 10% questionable and 26% were unsatisfactory.

Figures 13 and 14 illustrates the laboratory performances (*z*- and Zeta- scores, respectively) for the analyses of PBDEs by laboratory code. Table 14 reports the overall calculated *z*-scores for PBDEs. Table 15 reports the overall calculated Zeta-scores for PBDEs

A large majority of participants extracted the test sample using either accelerated solvent extraction or Soxhlet while the most employed instrumental techniques were GC/MSMS and GC/HRMS. Also many of the participants used Certified Reference Materials, surrogates before the extraction of the sample, and internal standards before the instrumental analysis. Although most participants used validated methods, only one third were accredited for the analysis of PBDEs.

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8.4 OVERVIEW OF PAH RESULTS

For PAHs, 27 datasets covering between 1 and 19 analytes were submitted by the participants. Assigned values were calculated for 7 out of the 25 PAH analytes than participants could report. Indicative values were provided for 1-methylphenantrene and 2-methylphenantrene as the number of reported values were ≤3. For 16 PAH analytes, no assigned values were calculated since most participants reported values "<" than their detection limits.

Figures 15 and 16 shows the laboratory performances (z- and Zeta- scores, respectively) for each individual PAH compound. Among the 101 *z*-scores calculated for PAHs, 42% were found to be acceptable, 16% questionable and 43% were unsatisfactory. Most participants reported uncertainties along with their measurements of the test sample and the corresponding Zeta-scores distribution followed closely the one for *z*-scores. Among the 64 Zeta-scores calculated for PAHs, 55% were found to be acceptable, 11% questionable and 34% unsatisfactory.

Figures 17 and 18 represent a graphical representation of laboratories performances (z- and Zeta- scores, respectively) for the analyses of PAHs by laboratory. Table 16 and 17 reports the

overall calculated z-scores for PAHs. Table 18 reports the overall calculated Zeta-scores for PAHs. The values reported for each individual PAH compound were very variable, expected due to the relatively low concentrations of these chemicals in the whole tissue and the high lipid content of the fish material.

Most of the participants extracted the test sample using either Accelerated Solvent Extraction or Soxhlet while the most employed instrumental techniques were GC/MS EI and GC/MSMS. Less than half of participants used Certified Reference Materials, surrogate standards before extracting the sample and internal standards before the instrumental analysis. Similarly, less than half of the participants used validated methods, and only one third were accredited for the analysis of PAHs. Overall, the comparability between the participating laboratories was poor, probably due to the combination of high lipid content, low analyte concentrations and the variations in the analytical procedures used by the participants.

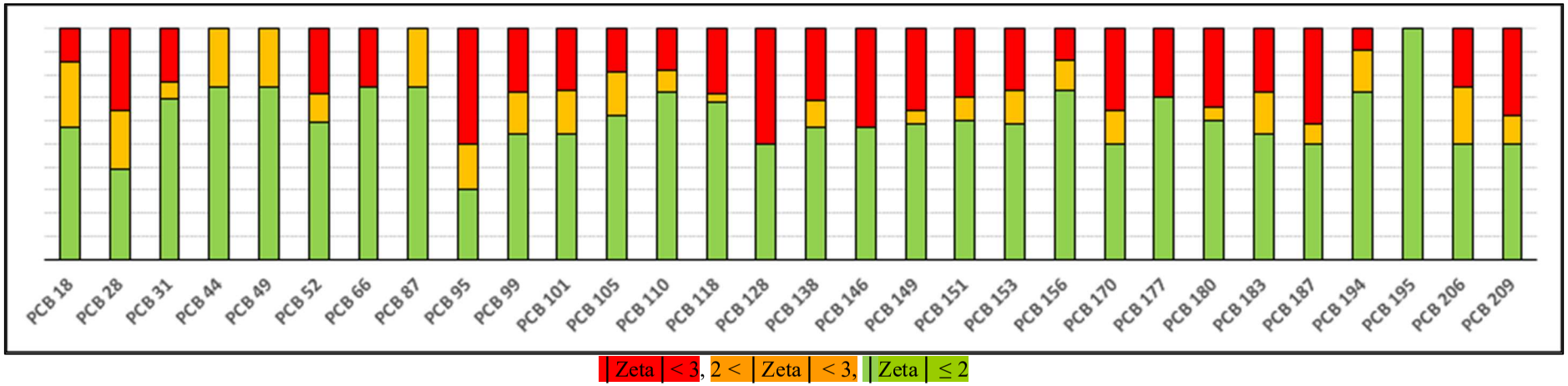


FIG. 3. Percentage distribution of the z-scores of results reported by the participants per PCB congener.

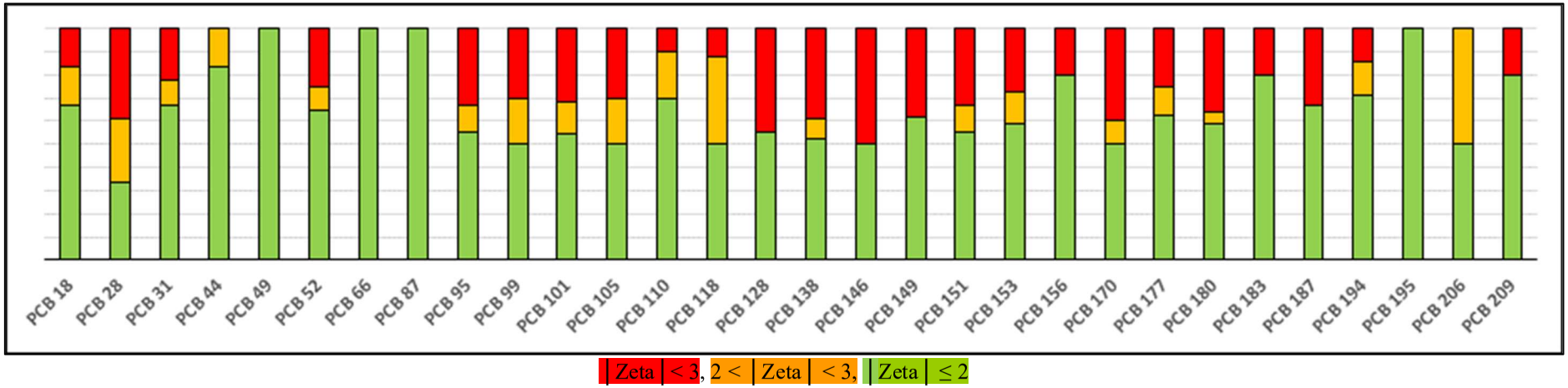


FIG. 4. Percentage distribution of the Zeta-scores of results reported by participants per PCB congener

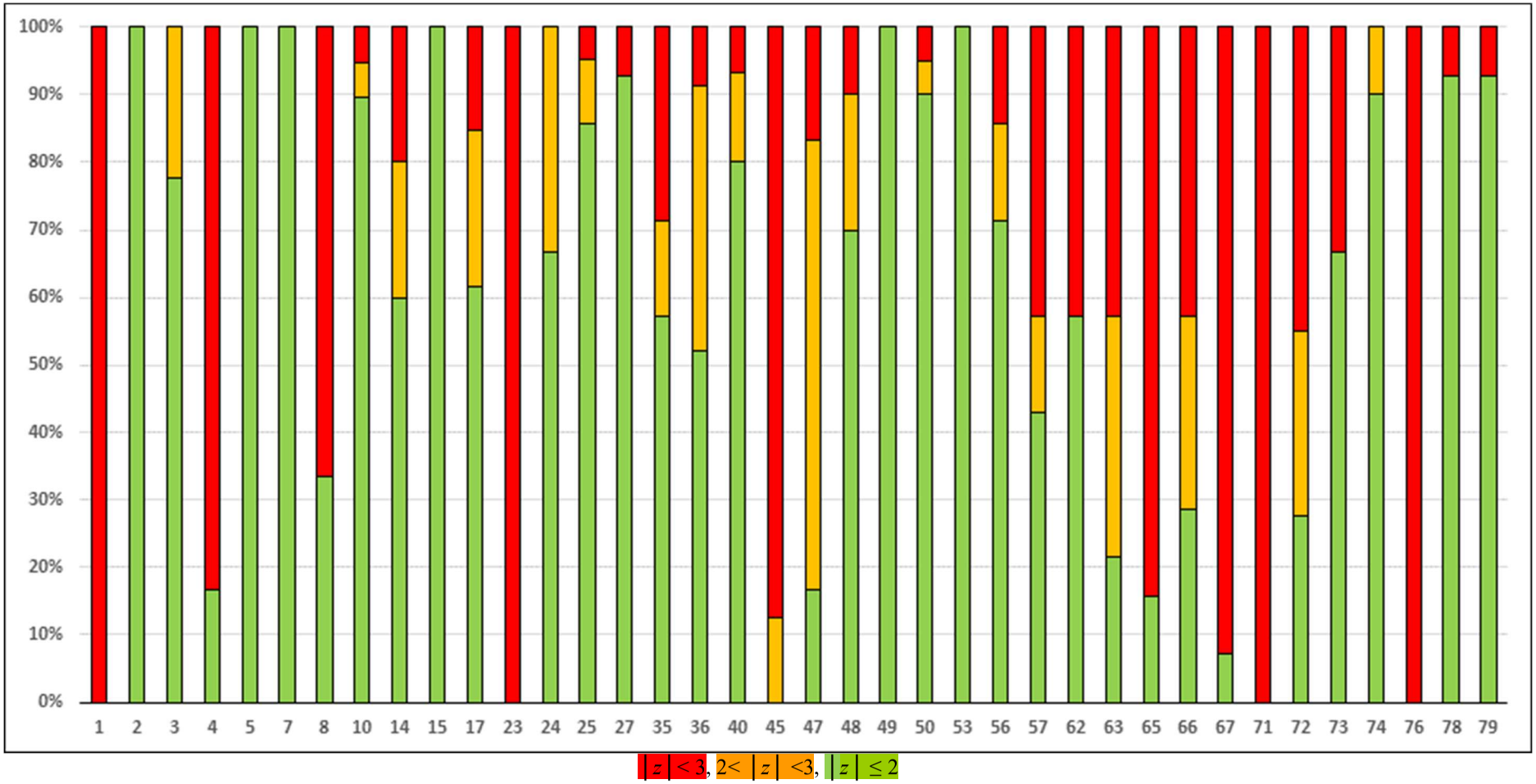


FIG. 5. Percentage distribution of the z-scores of PCBs results reported by participants per laboratory.

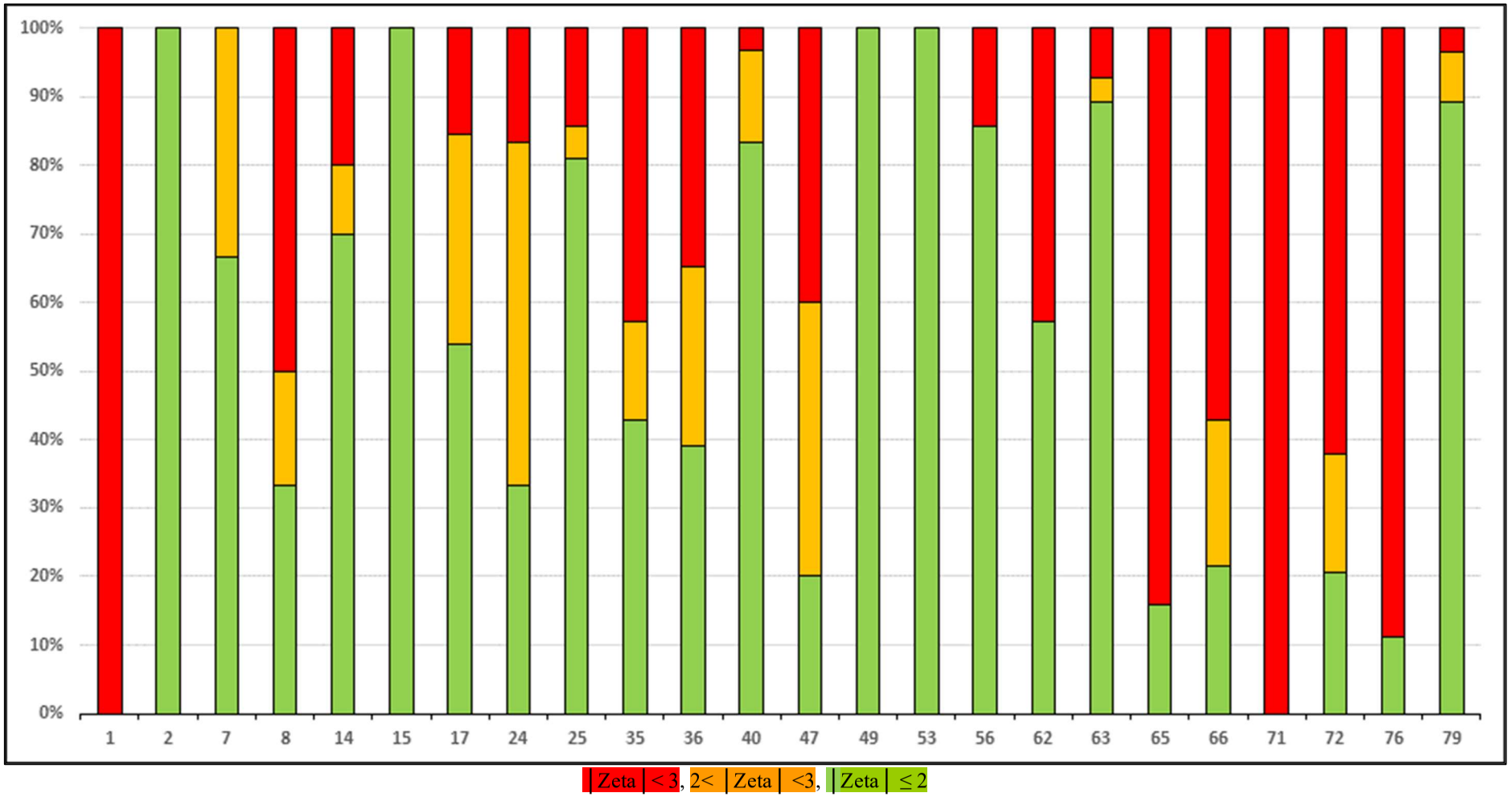


FIG. 6. Percentage distribution of the Zeta-scores of PCBs results reported by participants per laboratory.

TABLE 7. OVERALL ASSESSMENT OF LABORATORIES PERFORMANCES (*z*-SCORE) FOR PCBs (8 to 118).

Lab Code	PCB 8	PCB 18	PCB 28	PCB 31	PCB 44	PCB 49	PCB 52	PCB 66	PCB 87	PCB 95	PCB 99	PCB 101	PCB 105	PCB 110	PCB 118
1							-4.21								
2			C				I					1.33			-0.21
3			-1.19				-1.45					-0.85	-2.71		-0.77
4			-1.64									-5.64			-6.10
5			-1.52				0.46					0.13			-0.43
7			1.90				0.80					0.47			-1.73
8			16.5				97.7					6.48			
10			1.81				0.28			4.08	0.79	2.09	0.70	1.18	1.31
14							-1.96			-2.01	-2.10	-3.05		-1.21	
15			-0.42				1.13					1.51	-0.95		-0.44
17		0.80	-3.40	-1.94	-0.58		0.85					2.15			
23	I		51.4				104					4.14			29.2
24			-2.18				-0.97					-0.12			
25			-2.55	-1.12			-1.29			-0.60	-1.67	-2.23	-0.27	-1.20	-1.33
26			I				I					I			I
27			4.35	-1.35			-1.38					-1.13	0.14		0.32
35			2.28				0.70					1.44			3.20
36		-0.08	0.40	2.51	-2.35		-2.72			-0.82	-2.03	-2.29	-2.46	-1.78	-5.05
40	C	-2.14	-1.25	0.58	-1.05	0.08	0.08	-0.20	0.16	2.38	0.53	1.51	1.76	3.17	1.77
45			-2.97				19.1					-5.96			-4.42
47			15.7									-2.34			-2.30
48		1.32	-2.68	-0.41	-0.50		2.63					-0.18			1.24
49							0.15					-1.32			-0.46
50			-2.59				-1.61			9.07	0.50	-0.87	0.24	0.89	0.29
53												-1.43			
56			1.72				-1.61					0.23			3.18

Consistent (C) or Inconsistent (I) value after the assessment of <LD reported data.

TABLE 7. OVERALL ASSESSMENT OF LABORATORIES PERFORMANCES (*z*-SCORE) FOR PCBs (8 to 118) (Cont.)

Lab Code	PCB 8	PCB 18	PCB 28	PCB 31	PCB 44	PCB 49	PCB 52	PCB 66	PCB 87	PCB 95	PCB 99	PCB 101	PCB 105	PCB 110	PCB 118
57			0.05				-0.70					2.06			1.62
62			-3.96	-0.35			-1.80					1.69			
63		-2.56	-2.35	1.64	2.09	-2.01	-3.51		-2.52	-0.27	-3.97	-4.00	-5.66	-0.57	-4.16
65			-3.82				-4.89			-4.02	-3.52	-4.66	0.42	-3.84	0.36
66			13.3	32.2			2.63					-1.30	-2.19	-0.47	-1.74
67	C	I	17.5	59.8	I		17.5	23.4				12.9	49.0		30.5
71												-3.33			
72		4.23	1.11	8.09	1.72	1.36	2.33	-0.93	0.87	6.28	1.31	2.58	4.65	2.21	1.55
73			9.84				6.56					-1.79			
74			-2.33	-0.11			-0.63					0.40	0.01		0.17
76										17.5	14.1	9.24			
78		C	3.08	C	0.14		1.13					0.52	0.83		0.66
79	C	-0.21	-1.81	1.28	0.70	-0.07	3.13	1.54	-0.11		1.79	0.46	1.26	0.95	-0.60

Consistent (C) or Inconsistent (I) value after the assessment of <LD reported data.

TABLE 8. OVERALL ASSESSMENT OF LABORATORIES PERFORMANCES (*z*-SCORE) FOR PCBs (128 to 209)

Lab Code	PCB 128	PCB 138	PCB 146	PCB 149	PCB 151	PCB 153	PCB 156	PCB 170	PCB 177	PCB 180	PCB 183	PCB 187	PCB 194	PCB 195	PCB 206	PCB 209
2		0.67				0.01				-0.47			C			
3		-0.29				-0.34	-2.04			-2.00						
4		-5.83				-5.74				-5.12						
5		1.65				0.04				0.31						
7						-0.54				-0.81						
8		6.21				0.83				1.53						
10		-0.36	0.29	-0.08	0.28	1.17	0.22	0.36	1.62	1.13	0.09	0.28				
14	-1.20	-1.02		-3.60		-1.02					-1.12					
15		1.42				1.52	0.75			0.39						
17		0.42		1.54		2.14		2.98		3.03			0.64			0.20
23		3.55				8.39				3.95						353
24		-1.57				-2.55				-1.46						
25	0.29	-0.86	24.6	-0.85	-1.01	-0.23	0.09	-0.06	-1.05	0.30	-1.31	-0.99				
26		I				I				I						
27		-0.37		-0.27		-0.27	-0.52	-0.72		-1.39		-0.15	-0.86			
35		-0.14				0.28				3.03						
36	-4.57	-1.53	-0.34	-2.08	-1.73	-1.55	-0.68	-2.09	-1.81	-2.29	-1.39	-1.19				
40	0.32	3.56	0.29	1.66	0.77	1.31	0.71	-1.04	1.12	0.64	2.17	2.98	-1.20	-1.30	-0.06	0.55
45		-5.96				-5.72				-6.22						-6.24
47		-2.91				-2.58				-0.81						
48				-3.65						1.93			1.41			
49		-0.32		-0.99						-0.64			-1.04			
50	0.80	-0.79	-0.24	0.60	1.22	0.98	0.21	0.31	-0.16	1.23	1.32	1.59				
53		1.32				-0.40				-0.69						
56		2.03				-0.31				1.20						

Consistent (C) or Inconsistent (I) value after the assessment of <LD reported data

TABLE 8. OVERALL ASSESSMENT OF LABORATORIES PERFORMANCES (*z*-SCORE) FOR PCBs (128 to 209) (Cont)

Lab Code	PCB 128	PCB 138	PCB 146	PCB 149	PCB 151	PCB 153	PCB 156	PCB 170	PCB 177	PCB 180	PCB 183	PCB 187	PCB 194	PCB 195	PCB 206	PCB 209
57		-4.40				-4.56				-4.73						
62		1.41				-4.61				-6.10						
63	-0.67	-4.00		-3.49	-2.71	-4.05	-2.19	-3.36	-0.03	-3.04	-2.57	-3.35	-2.51	0.28	-4.81	-2.04
65	-4.09	-5.20	-5.08	-4.46	-4.25	-4.78	0.06	-4.85	-3.74		-3.41	-3.93				
66		-2.56		-0.89		-2.80	-6.13	-3.71		-3.64			-3.61			
67	-3.83	16.2		I		18.0		9.61		9.99		-3.84	0.96		I	I
71		-3.99				-4.50				-3.78						
72	4.35	2.75		3.40	3.31	2.81	4.08	3.33	3.86	2.06	3.00	4.22	2.02	1.30	2.35	3.68
73		0.52				0.97				0.13						
74		-0.48				1.05	0.04			0.22						
76		8.87	13.6	13.1	13.0				5.44	19.2	10.89	17.0				
78		0.54		1.15		0.89	0.65	0.13		0.96			0.09			-0.89
79	3.79	0.66		-0.07	0.13	-0.09	0.92	0.76	0.30	0.03	0.23	0.48	0.04	-0.28	-0.30	0.22

Consistent (C) or Inconsistent (I) value after the assessment of <LD reported data

TABLE 9. OVERALL ASSESSMENT OF LABORATORIES PERFORMANCES (ZETA-SCORE) FOR PCBs (18 to 118)

Lab Code	PCB 18	PCB 28	PCB 31	PCB 44	PCB 49	PCB 52	PCB 66	PCB 87	PCB 95	PCB 99	PCB 101	PCB 105	PCB 110	PCB 118
1						-5.98								
2											1.36			-0.25
7		2.18				0.99					0.58			-2.57
8		2.31				5.03					3.95			
14						-1.78			-1.88	-2.15	-3.25		-1.05	
15		-0.30				0.60					0.75	-0.65		-0.28
17	0.92	-4.52	-2.67	-0.57		0.79					2.77			
24		-2.71				-1.44					-0.18			
25		-3.38	-1.47			-1.90			-0.84	-1.99	-3.39	-0.31	-1.52	-2.04
35		3.01				1.04					2.21			4.90
36	-0.06	0.20	1.97	-1.87		-3.78			-0.89	-2.41	-3.53	-3.34	-2.14	-8.26
40	-2.34	-1.63	0.45	-1.01	0.07	0.12	-0.19	0.13	1.50	0.44	2.19	2.60	1.94	2.69
47		3.69												-2.27
49						0.02					-0.89			-0.33
50		-2.34				-1.09			2.02	0.29	-0.52	0.12	0.47	0.14
53											-1.07			
56		0.13				-0.09					0.17			1.70
62		-5.01	-0.22			-1.18					1.14			
63	-1.30	-0.77	0.23	0.29	-0.88	-1.37		-0.76	-0.05	-4.29	-1.81	-6.87	-0.13	-1.84
65		-4.68				-6.90			-5.06	-4.10	-6.47	0.27	-4.66	0.22
66		7.12	8.32			2.65					-1.86	-2.84	-0.53	-2.62
71											-4.37			
72	4.88	1.44	9.20	2.20	1.58	3.44	-1.01	1.21	8.63	1.54	3.93	7.14	2.78	2.49
76									7.66	7.26				
79	-0.23	-2.17	1.27	0.73	-0.08	2.79	1.50	-0.12		1.67	0.50	1.29	0.97	-0.72

TABLE 10. OVERALL ASSESSMENT OF LABORATORIES PERFORMANCE (ZETA-SCORE) FOR PCBs (128 to 209)

Lab Code	PCB 128	PCB 138	PCB 146	PCB 149	PCB 151	PCB 153	PCB 156	PCB 170	PCB 177	PCB 180	PCB 183	PCB 187	PCB 194	PCB 195	PCB 206	PCB 209
2		0.72				0.01				-0.55						
7						-0.73				-1.10						
8		3.37				0.72				1.50						
14	-0.96	-0.77		-4.30		-0.77					-0.99					
15		0.70				0.74	0.40			0.22						
17		0.45		1.74		2.37		2.76		3.01			0.57			0.18
24		-2.57				-4.18				-2.37						
25	0.42	-1.13	12.8	-1.24	-1.26	-0.33	0.09	-0.06	-1.30	0.41	-1.58	-1.32				
35		-0.23				0.46				4.71						
36	-6.34	-2.35	-0.59	-3.07	-2.28	-2.48	-0.79	-3.13	-2.37	-3.09	-1.54	-1.53				
40	0.24	4.98	0.45	1.12	0.58	1.99	1.15	-0.96	0.85	0.98	1.49	1.83	-1.13	-1.30	-0.05	0.84
47		-3.17				-2.66				-0.64						
49		-0.40		-0.72						-0.57			-0.15			
50	0.38	-0.44	-0.12	0.29	0.58	0.43	0.10	0.15	-0.09	0.52	0.68	0.71				
53		0.65				-0.25				-0.45						
56		3.14				-0.50				1.51						
62		1.68				-7.35				-9.88						
63	-0.13	-1.66		-1.39	-0.97	-1.71	-0.51	-1.18	-0.01	-0.92	-1.21	-1.51	-0.81	0.06	-2.74	-0.47
65	-5.21	-7.87	-7.71	-5.98	-5.44	-6.82	0.04	-6.93	-4.53		-3.96	-4.89				
66		-4.07		-1.22		-4.48	-10.4	-5.27		-5.57			-4.79			
71		-5.65				-6.72				-5.23						
72	5.61	4.38		4.92	4.41	4.48	6.37	4.75	4.76	3.18	3.53	5.55	2.65	1.50	2.48	5.23
76		5.83	7.19	7.07	6.87					7.88	1.51	7.88				
79	3.21	0.71		-0.08	0.14	-0.10	0.98	0.80	0.32	0.04	0.24	0.51	0.05	-0.30	-0.35	0.25

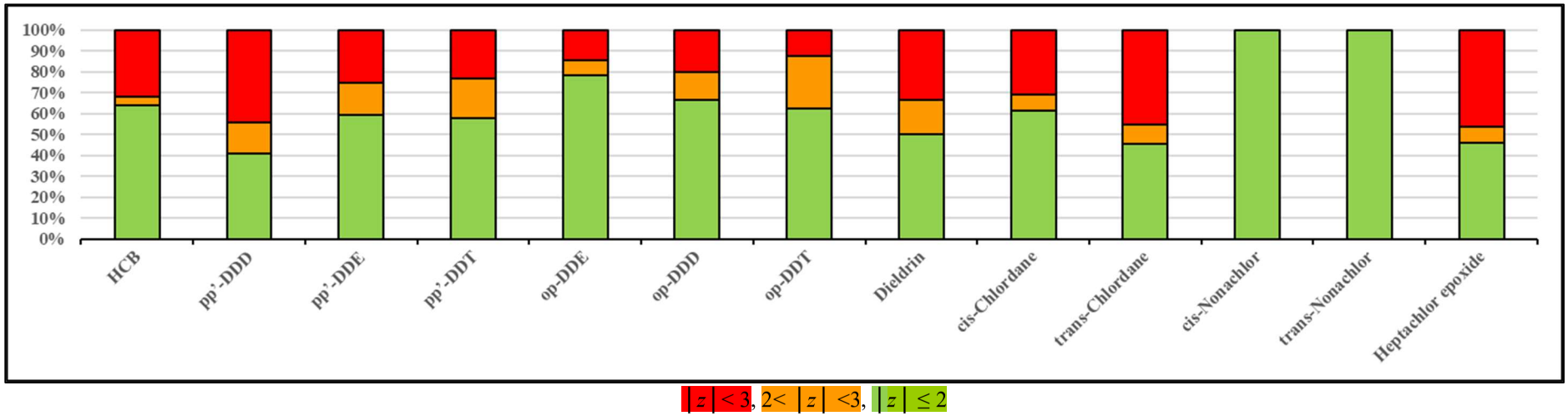


FIG. 7. Percentage distribution of the z-scores of results reported by participants per organochlorine pesticides compound.

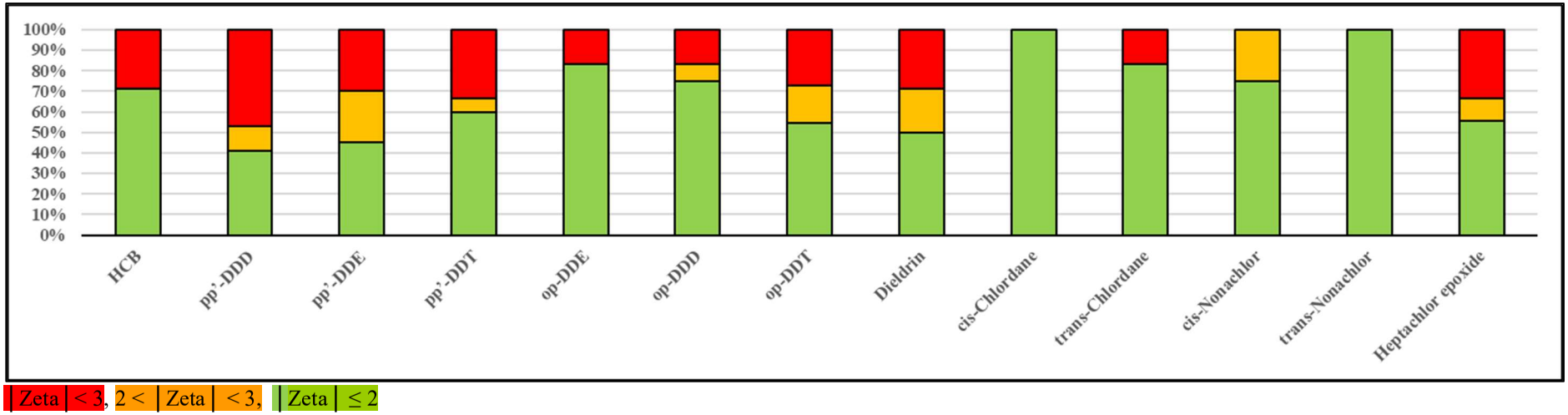


FIG. 8. Percentage distribution of the Zeta-scores of results reported by participants per organochlorine pesticides compound.

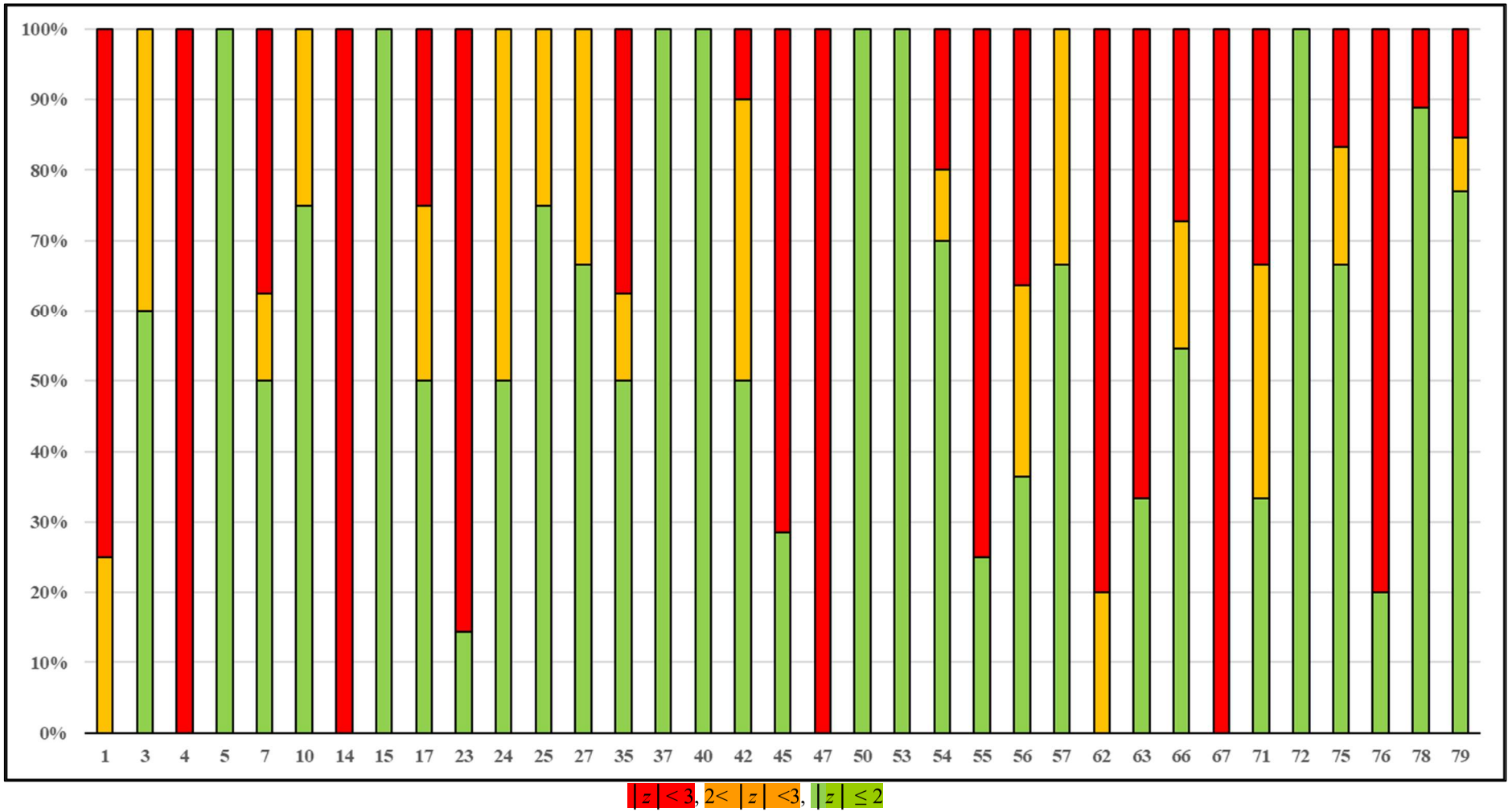


FIG. 9. Percentage distribution of the z-scores of results reported for organochlorine pesticides by participants per laboratory.

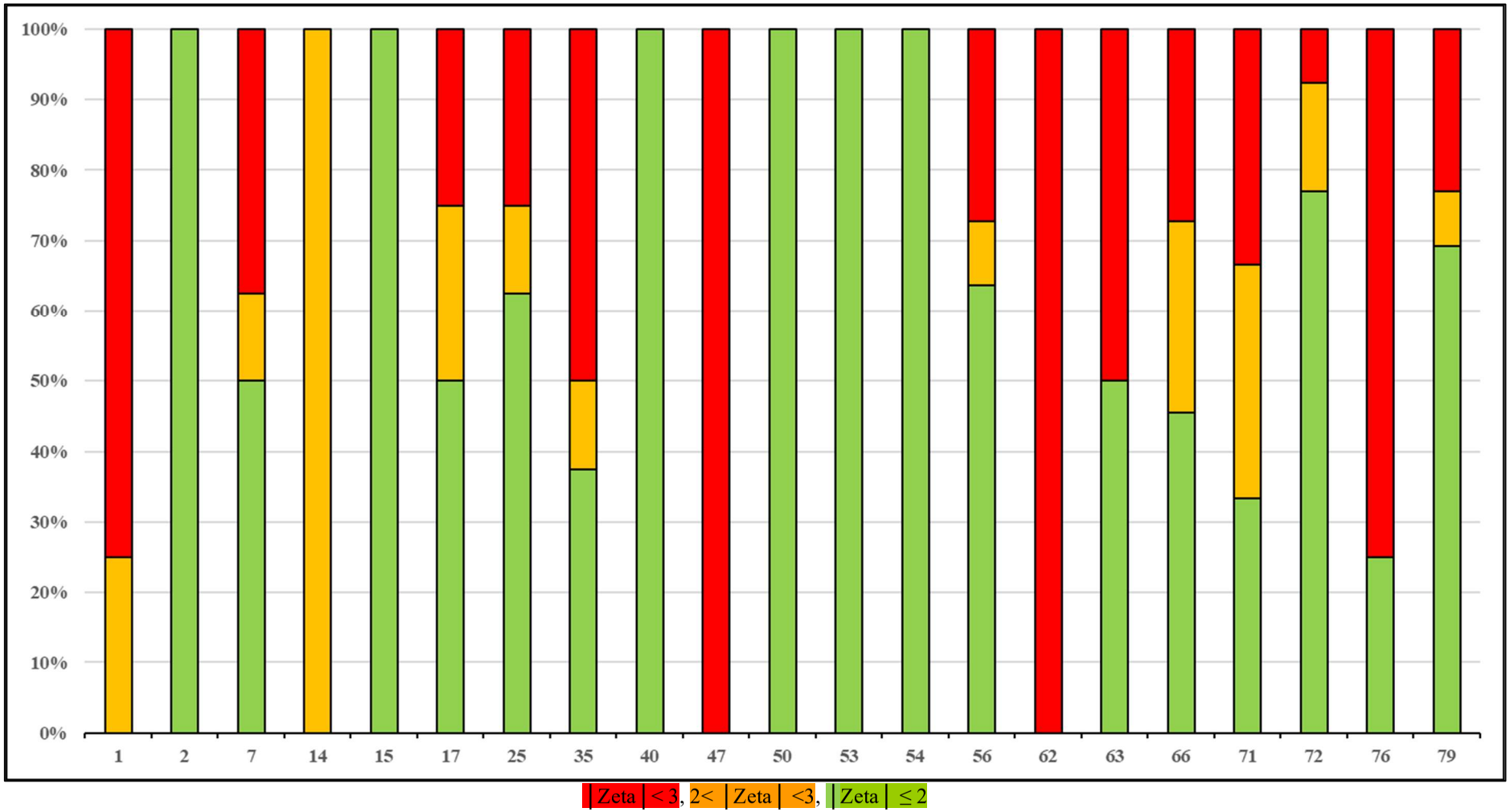


FIG. 10. Percentage distribution of the Zeta-scores of results reported for organochlorine pesticides by participants per laboratory.

Table 11. OVERALL ASSESSMENT OF LABORATORIES PERFORMANCE (*z*-SCORE) FOR ORGANOCHLORINE PESTICIDES

Lab Code	HCB	α-HCH	β-HCH	γ-HCH (Lindane)	*pp'*-DDD	*pp'*-DDE	*pp'*-DDT	δ-HCH	*op*-DDE	*op*-DDD	*op*-DDT	Heptachlor
1					-5.92	-5.92	-5.28					
2	C	I	I	I	I	-0.68	I	I	C	C	I	I
3	-1.91		C	C	-2.96	-0.08	-2.04					
4	-5.26			C				C				C
5		C	C	C	0.11	-1.09	0.39					
7	-0.25	I	C	C	-2.56	-0.43			0.82	16.7	10.3	I
10	1.74						-0.02				-0.41	C
14	I	I	I	I	12.4	5.39		I	I			I
15	0.97	I	I	I		1.80		I	-0.61	-0.76		I
17	-5.30	C	C	C	0.25	2.42	0.52	C	0.22	2.67	0.04	
23		I	I	I	14.4	-5.83	7.53	C				I
24	-2.10					-1.98						
25	-0.63	C	C	C	2.21	2.06	1.87	C	-0.12	0.74	-0.34	C
26		C	C	C	I	I	I					C
27	-1.61	C		C	-0.73	-1.01	-2.43				-2.77	
35	10.2	C	C	I	5.90	-0.75	2.17	C	1.04	0.93	1.81	C
37						-1.14	0.70					
40	0.22	C	C	C	-0.48	1.17	-0.24	C	-0.76	-1.59	-0.74	C
42	-1.70	C	C	C	-0.80	0.84	2.04		-2.60	-2.75	0.66	C
45		C	C	C	-4.95	-5.85	-5.63	C				I
50	0.22				0.01	0.80	-0.43		-0.37	-1.97	-0.93	
53	0.60					-0.53						
54	1.25	I	I	I	4.20	1.91	1.16	I	0.25	1.35	2.19	I
55	48.6	I	I	I		-1.48	I	I	I		C	I
56	1.97	C	C	C	5.67	2.41	7.33	C	-5.97	0.70	7.03	C

Consistent (C) or Inconsistent (I) value after the assessment of <LD reported data.

Table 11. OVERALL ASSESSMENT OF LABORATORIES PERFORMANCE (*z*-SCORE) FOR ORGANOCHLORINE PESTICIDES (Cont.)

Lab Code	HCB	α-HCH	β-HCH	γ-HCH (Lindane)	*pp'*-DDD	*pp'*-DDE	*pp'*-DDT	δ-HCH	*op'*-DDE	*op'*-DDD	*op'*-DDT	Heptachlor
57				C	-0.12	-2.17						C
62	-5.68			C	-3.81	-5.51	-2.92					C
63				I	-5.36	-5.33	-5.15					I
66	-1.54	C	C	I	0.54	-1.88	0.60	C	0.53	4.71	2.45	C
67	214	I	I	I	147	157	141					I
71					-3.13	-2.02	-1.50					
72	0.86	C	C	C	-0.56	1.83	-0.28		1.99	0.09	1.24	C
75	0.57				2.92	-0.89	0.32			6.57	-0.91	
76	9.34				16.9	18.5	-1.08					
78	0.51	I	I	I	1.86	1.08	1.15	I	-1.11	-0.36	0.45	I
79	-3.70	C	C	C	-0.74	-0.23	-1.27	C	9.89	-1.29	-2.60	C

Consistent (C) or Inconsistent (I) value after the assessment of <LD reported data.

TABLE 12 OVERALL ASSESSMENT OF LABORATORIES PERFORMANCE (*z*-SCORE) FOR ORGANOCHLORINE PESTICIDES

Lab Code	Aldrin	Dieldrin	Endrin	*cis*-Chlordane	*trans*-Chlordane	*cis*-Nonachlor	*trans*-Nonachlor	α-Endosulfan	β-Endosulfan	Endosulfan sulfate	Heptachlor epoxide
1		2.88									
2	I	I	I	I	I			I	I		I
3	C	-0.48	C								
4			C								
7	I	-1.31	I					I			3.94
10											-2.01
14	I			C	I						
15	I	C	I	-0.15	I			I	I	I	I
17											-4.13
23	I	0.50	I	-3.01	71.3			I	I	I	47.9
25	C	1.59	C					C	C		I
26	C	I	C					C	C	C	I
27	C			-1.04	I						
35	C	-4.89						C	C		I
37								I			
40	C	1.58	C	0.75	-0.86	0.01	0.45	C	I		0.20
42				-2.12	81.8		-1.67				
45	I	-0.72	I	-4.75	-0.27			I	I	I	22.1
47		42.3	I								282
50		0.01									
53											I
54	I	C	I	3.27	I	-0.05	-0.10	I	I	I	I
55	I	C	I	39.3	269			I	I	I	I
56	C	-2.96	I	1.26	-2.40			C	I		-0.55

Consistent (C) or Inconsistent (I) value after the assessment of <LD reported data

Table 12. OVERALL ASSESSMENT OF LABORATORIES PERFORMANCE (*z*-SCORE) FOR ORGANOCHLORINE PESTICIDES (Cont)

Lab Code	Aldrin	Dieldrin	Endrin	*cis*-Chlordane	*trans*-Chlordane	*cis*-Nonachlor	*trans*-Nonachlor	α-Endosulfan	β-Endosulfan	Endosulfan sulfate	Heptachlor epoxide
57	I							I	I	C	-0.15
62	I	5.79	I					C			
63	I	-3.04	I		-0.65			C	I		-1.37
66	C	-2.15	C	-0.89	18.3			C	I	C	4.89
67	I	141									
72	C	0.10		1.50	0.22	1.50	1.03	C			1.00
76	I	187									
78	I	I	I	1.51	117			I	I	I	I
79	C	-1.92	C	-0.90	0.70	-0.02	-0.15	C	C	C	-1.24

Consistent (C) or Inconsistent (I) value after the assessment of <LD reported data

TABLE 13. OVERALL ASSESSMENT OF LABORATORIES PERFORMANCE (ZETA-SCORE) FOR ORGANOCHLORINE PESTICIDES

Lab Code	HCB	*pp'*-DDD	*pp'*-DDE	*pp'*-DDT	*op'*-DDE	*op'*-DDD	*op'*-DDT	Dieldrin	*cis*-Chlordane	*trans*-Chlordane	*cis*-Nonachlor	*trans*-Nonachlor	Heptachlor epoxide
1		-9.73	-9.13	-8.04				2.31					
2			-0.78										
7	-0.28	-3.19	-0.47		1.00	4.38	7.48	-1.31					2.35
14		2.97	2.25										
15	0.51		0.87		-0.40	-0.53			-0.07				
17	-7.97	0.23	2.28	0.63	0.31	2.66	0.05						-4.86
25	-0.71	3.06	3.04	2.30	-0.14	0.79	-0.45	1.44					
35	9.28	8.82	-1.13	3.10	1.50	1.28	2.56	-6.29					
40	0.33	-0.76	1.71	-0.36	-1.17	-1.52	-1.09	1.98	0.98	-1.30	0.03	0.62	0.25
47								5.23					5.78
50	0.11	0.01	0.37	-0.24	-0.20	-1.48	-0.56	0.01					
53	0.33		-0.34										
54	0.62	1.54	0.91	0.61	0.14	0.72	1.00		1.41		-0.03	-0.06	
56	0.07	2.69	3.12	6.03	-0.15	0.09	5.85	-0.35	0.10	-0.01			-0.01
62	-8.71	-5.77	-8.50	-4.08				4.75					
63		-4.56	-5.30	-4.43				-1.40		-0.12			-0.37
66	-1.82	0.59	-2.64	0.71	0.61	4.71	2.14	-2.72	-1.14	6.14			4.04
71		-4.04	-2.27	-1.59									
72	1.29	-0.90	2.67	-0.41	3.10	0.13	1.84	0.12	1.95	0.33	2.48	1.46	1.26
76		6.76	14.01	-1.16				9.76					
79	-5.37	-0.75	-0.27	-1.58	5.68	-1.56	-3.50	-2.29	-1.03	0.77	-0.03	-0.17	-1.44

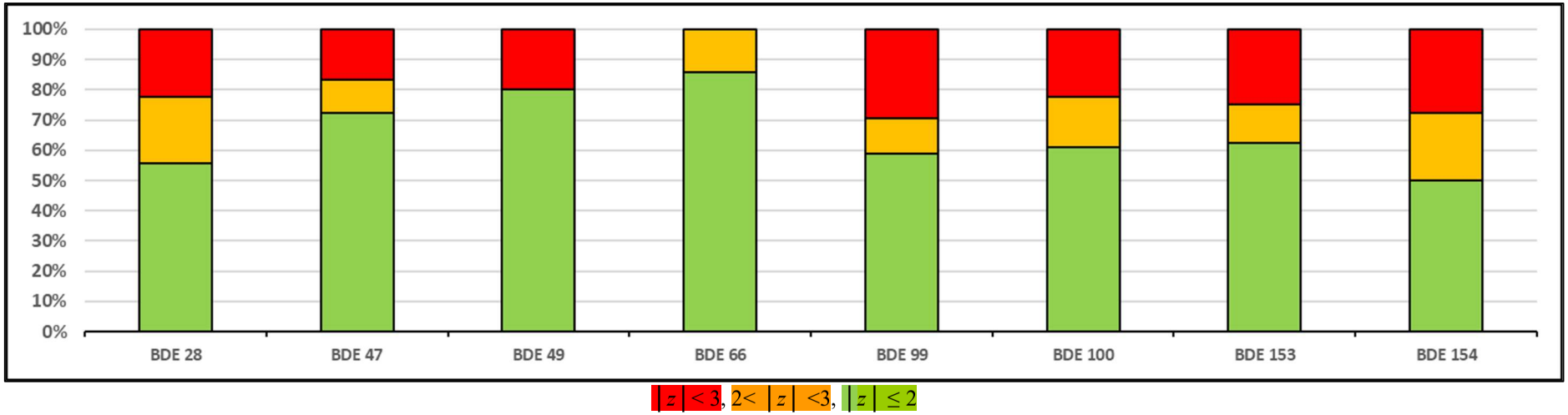


FIG. 11. The z-scores of results reported by participants per PBDEs compound.

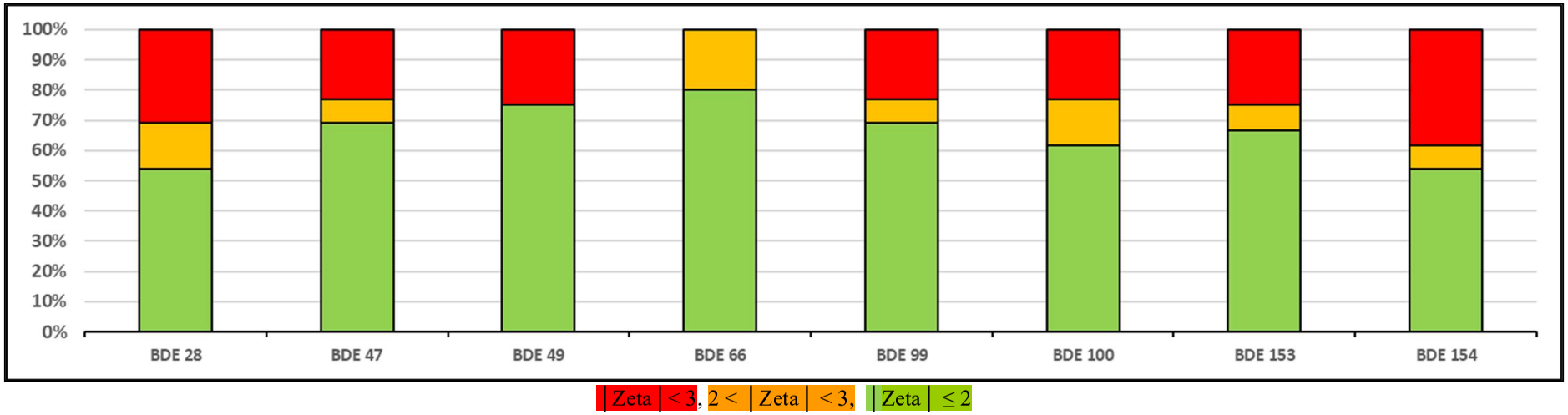


FIG. 12. Percentage distribution of the Zeta-scores of results reported by participants per PBDEs compound.

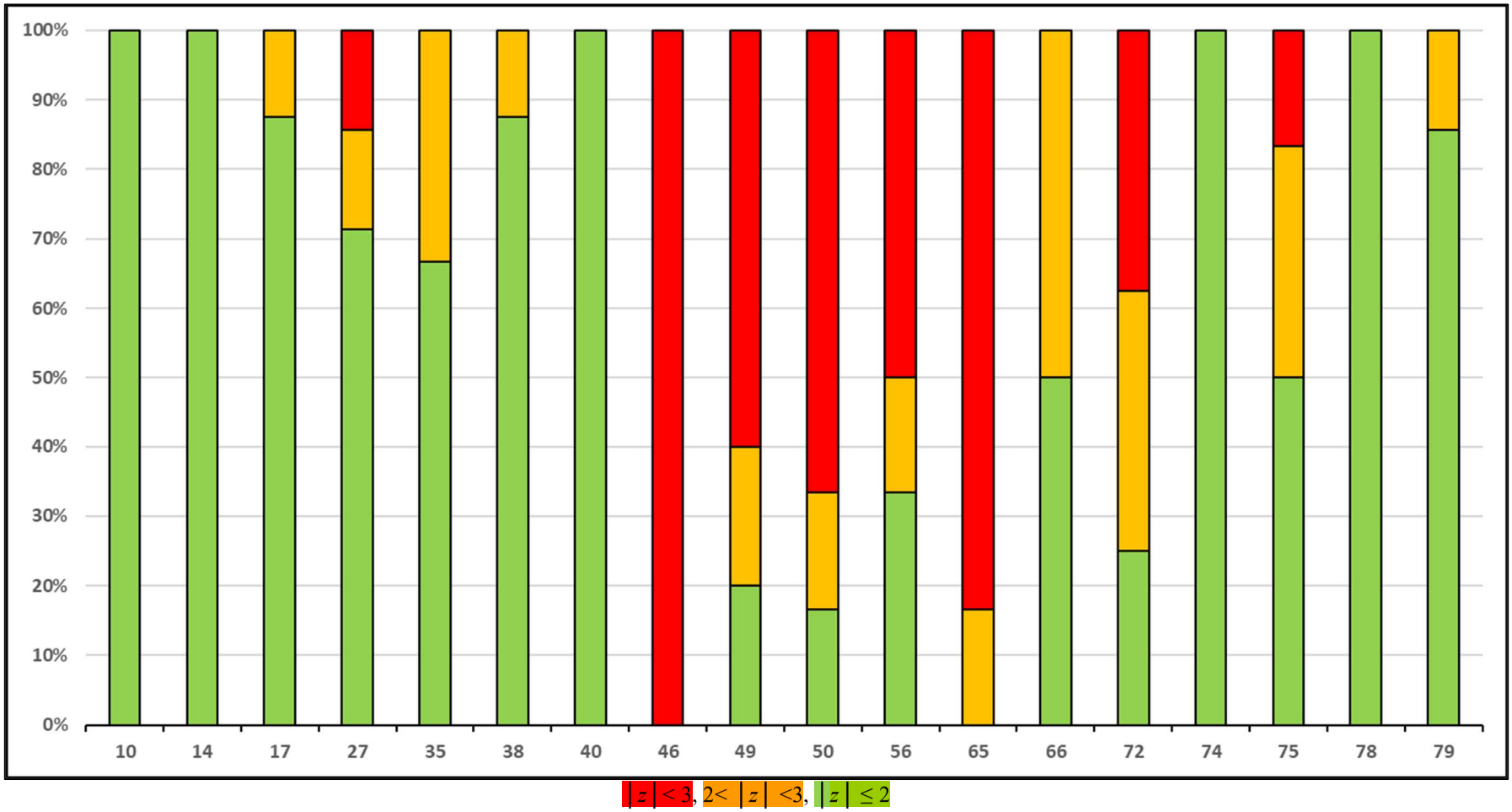


FIG. 13. Percentage distribution of the z-scores of PBDEs results reported by participants per laboratory.

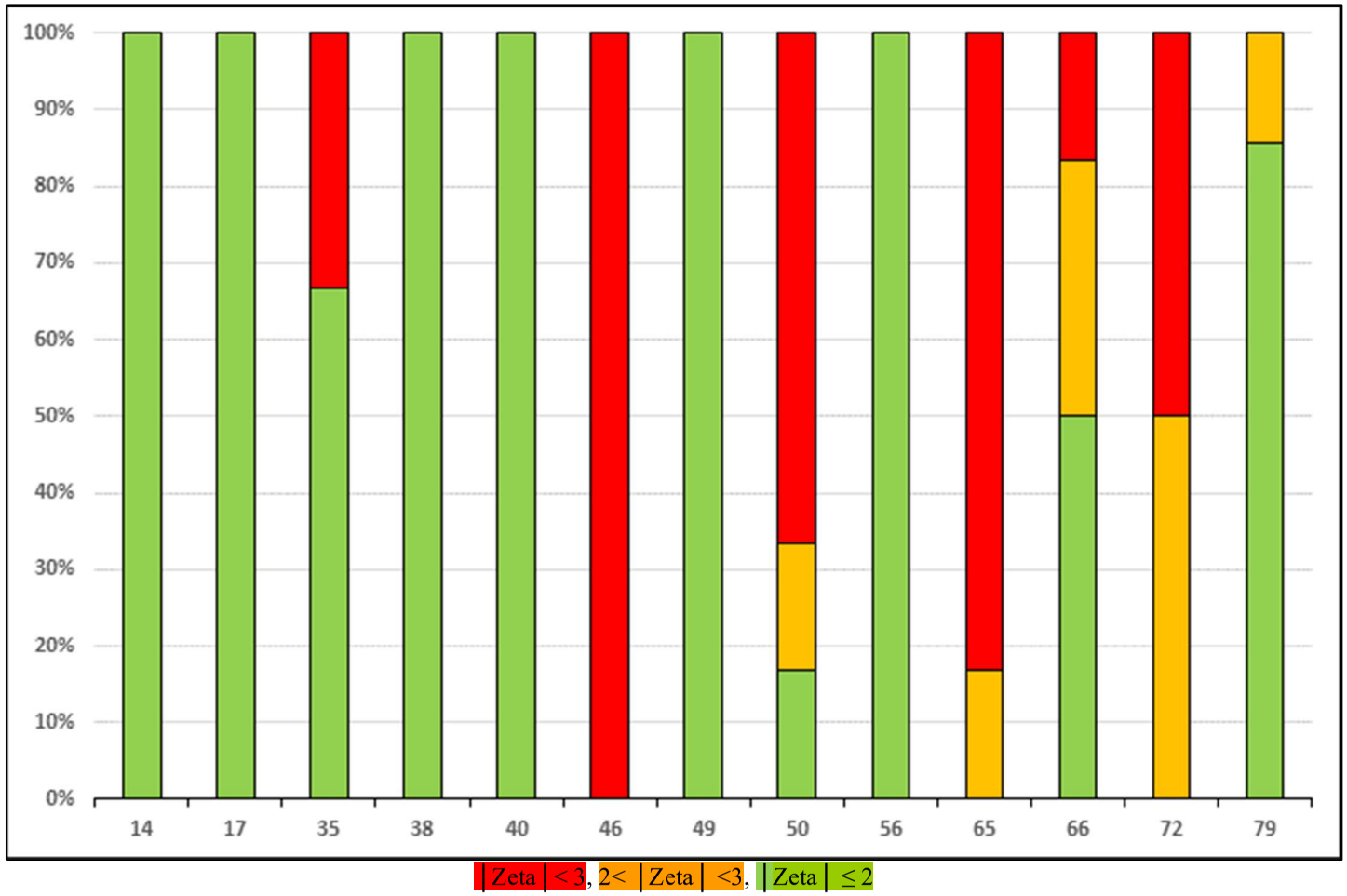


FIG. 14. Percentage distribution of the Zeta-scores of PBDEs results reported by participants per laboratory.

TABLE 14. OVERALL ASSESSMENT OF LABORATORIES PERFORMANCE (*z*-SCORE) FOR PBDEs

Lab Code	BDE 17	BDE 28	BDE 47	BDE 49	BDE 66	BDE 85	BDE 99	BDE 100	BDE 153	BDE 154	BDE 183	BDE 209
10		1.37	0.88				-0.54	0.78	0.78	0.69		
14		1.19	0.29				-0.13	0.33	1.51	1.43	C	
17	C	2.15	0.11	-0.76	-1.22	C	0.15	1.60	0.36	0.99	C	C
27		0.37	0.15		0.38		0.30	0.45	3.48	2.88		
35		0.74	0.48				0.73	2.16	1.39	2.82		
38	C	0.76	0.71	1.13	0.55	C	2.18	0.15	0.14	0.71	C	C
40	C	0.61	-0.31	-0.21	-0.70	C	-0.92	-0.12	0.49	-0.63	C	C
46		-5.86	-6.41				-6.16	-5.74	-5.92	-5.76		
49		-0.62	-2.47				14.1	-4.54		-4.33		
50		-5.87	-1.15				-6.17	-2.93	-5.95	-3.29		
56		-2.87	1.27				-3.67	-5.30	0.19	-5.14	C	I
65		-4.04	-4.32				-4.31	7946	-2.45	-3.66		
66		-2.39	-2.24				-1.70	-1.36	-1.91	2.41	C	
72		5.41	1.61	4.28	2.12	C	2.11	1.88	3.63	2.67	C	
74		0.25	-0.26	0.14	-1.12	C	-0.28	0.01	0.64	0.24	C	C
75		-1.41	-3.10				-1.95	-2.96	-2.25	-1.78		
78		-0.53	-0.43				C	-1.26	I	-1.18		
79	C	-2.06	0.16		0.17	C	0.64	-0.41	-1.19	-0.67		C

Consistent (C) or Inconsistent (I) value after the assessment of <LD reported data.

TABLE 15. OVERALL ASSESSMENT OF LABORATORIES PERFORMANCE (ZETA-SCORE) FOR PBDEs

Lab Code	BDE 28	BDE 47	BDE 49	BDE 66	BDE 99	BDE 100	BDE 153	BDE 154
14	0.70	0.18			-0.09	0.22	0.85	0.83
17	1.80	0.07	-0.77	-1.01	0.12	0.68	0.26	0.60
35	1.08	0.80			1.12	3.05	1.80	3.87
38	0.77	0.91	1.15	0.49	0.20	0.19	0.03	0.90
40	0.83	-0.48	-0.18	-0.63	-1.40	-0.17	0.70	-0.89
46	-5.68	-10.8			-5.96	-8.17	-3.89	-8.05
49	-0.01	-0.57			0.21	-0.38		-0.23
50	-8.67	-0.67			-9.73	-2.60	-8.92	-3.15
56	-0.18	0.67			-0.33	-1.33	0.00	-0.90
65	-5.12	-5.73			-5.69	9138	-2.40	-4.38
66	-2.76	-3.39			-1.99	-1.74	-2.00	2.70
72	7.59	2.56	5.97	2.77	2.87	2.57	5.16	3.58
79	-2.80	0.19		0.18	0.69	-0.47	-1.44	-0.78

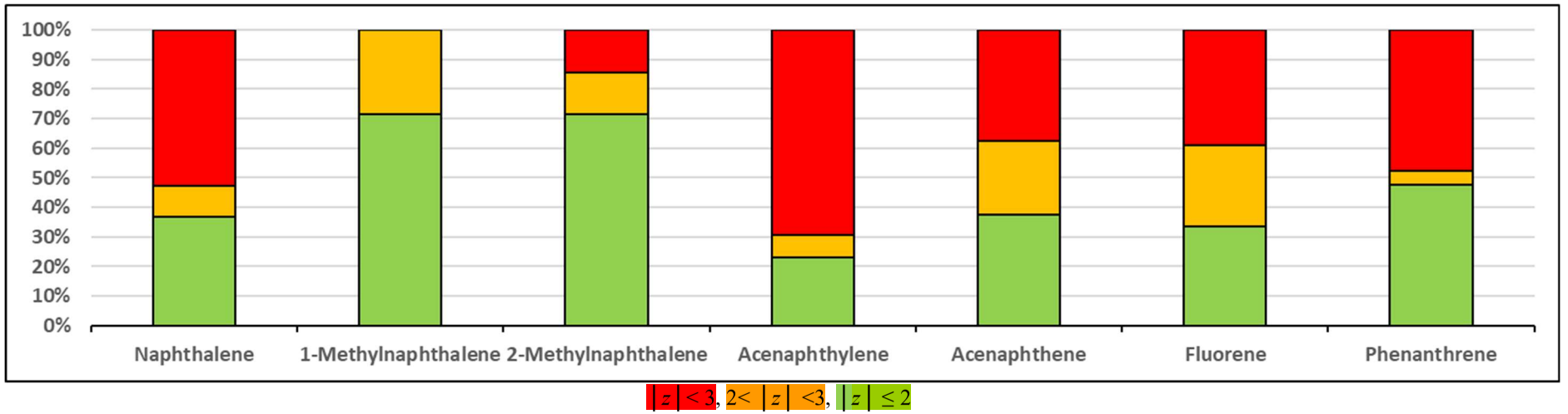


FIG. 15. Percentage distribution of the z-scores of PAH results reported by participants per compound.

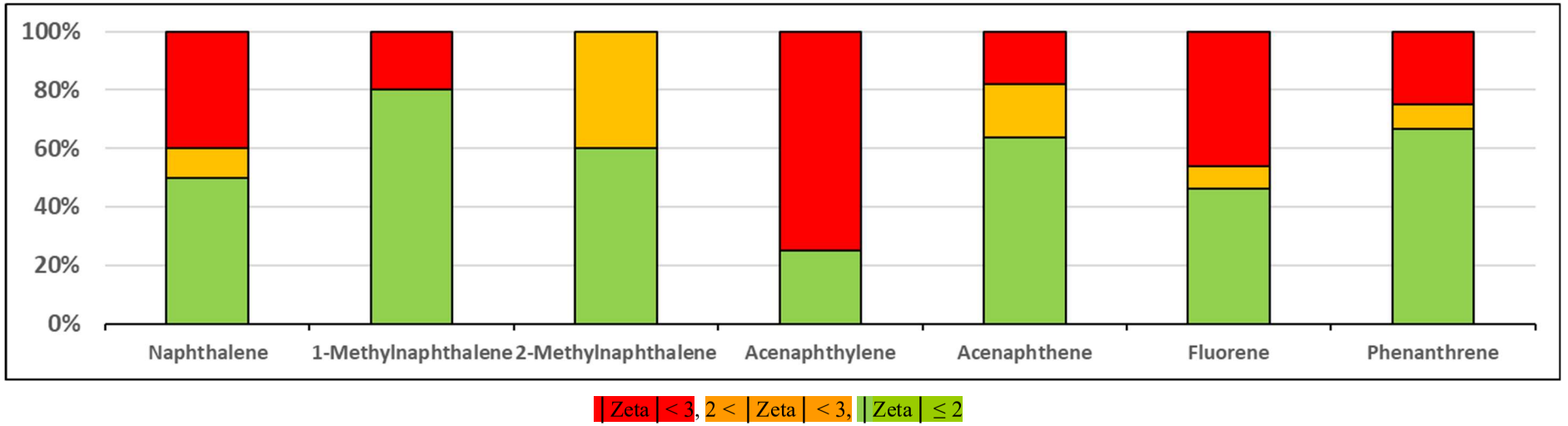


FIG. 16. Percentage distribution of the Zeta-scores of PAH results reported by participants per compound.

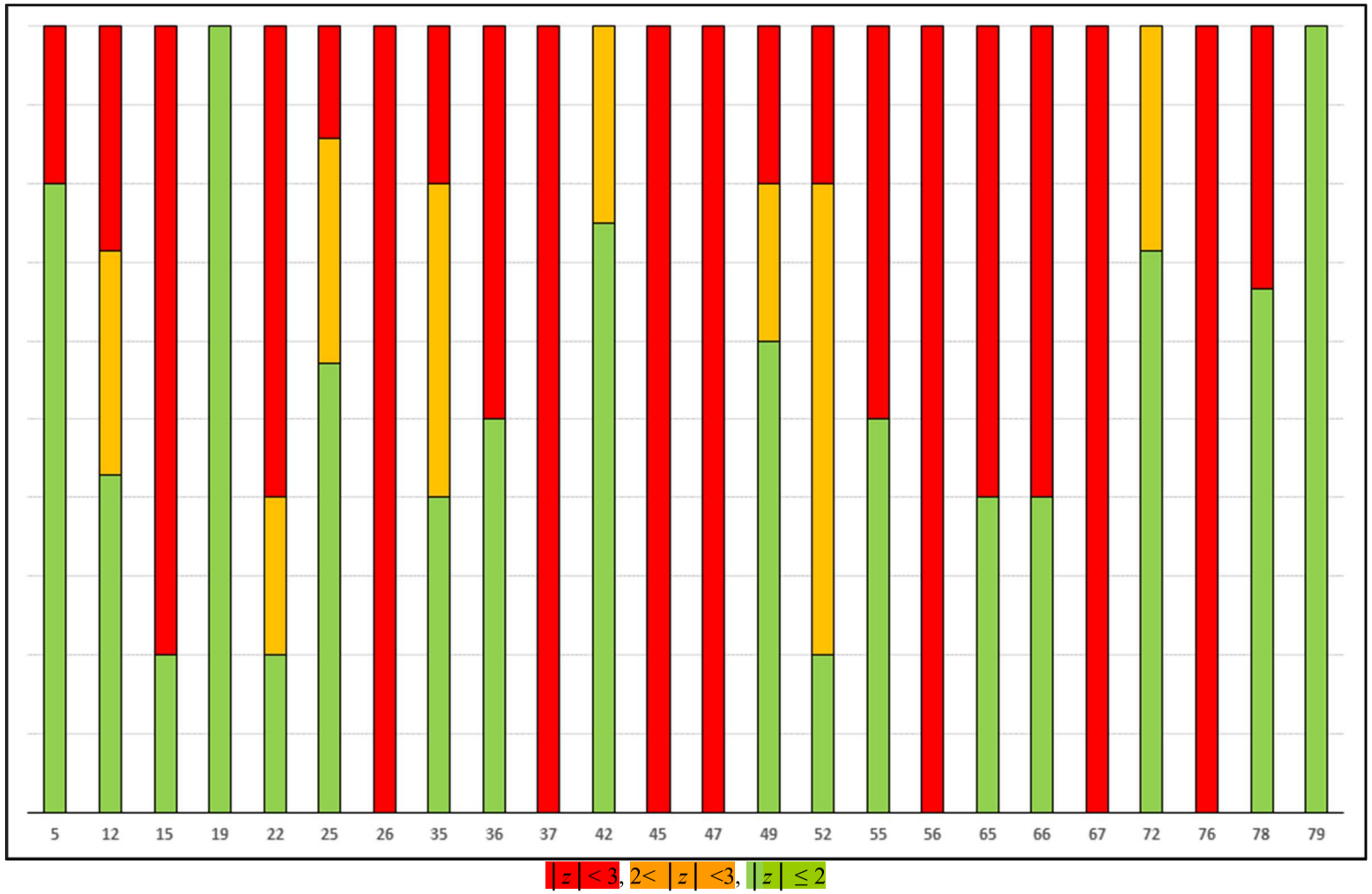


FIG. 17. Percentage distribution of the z-scores of PAH results reported by participants per laboratory.

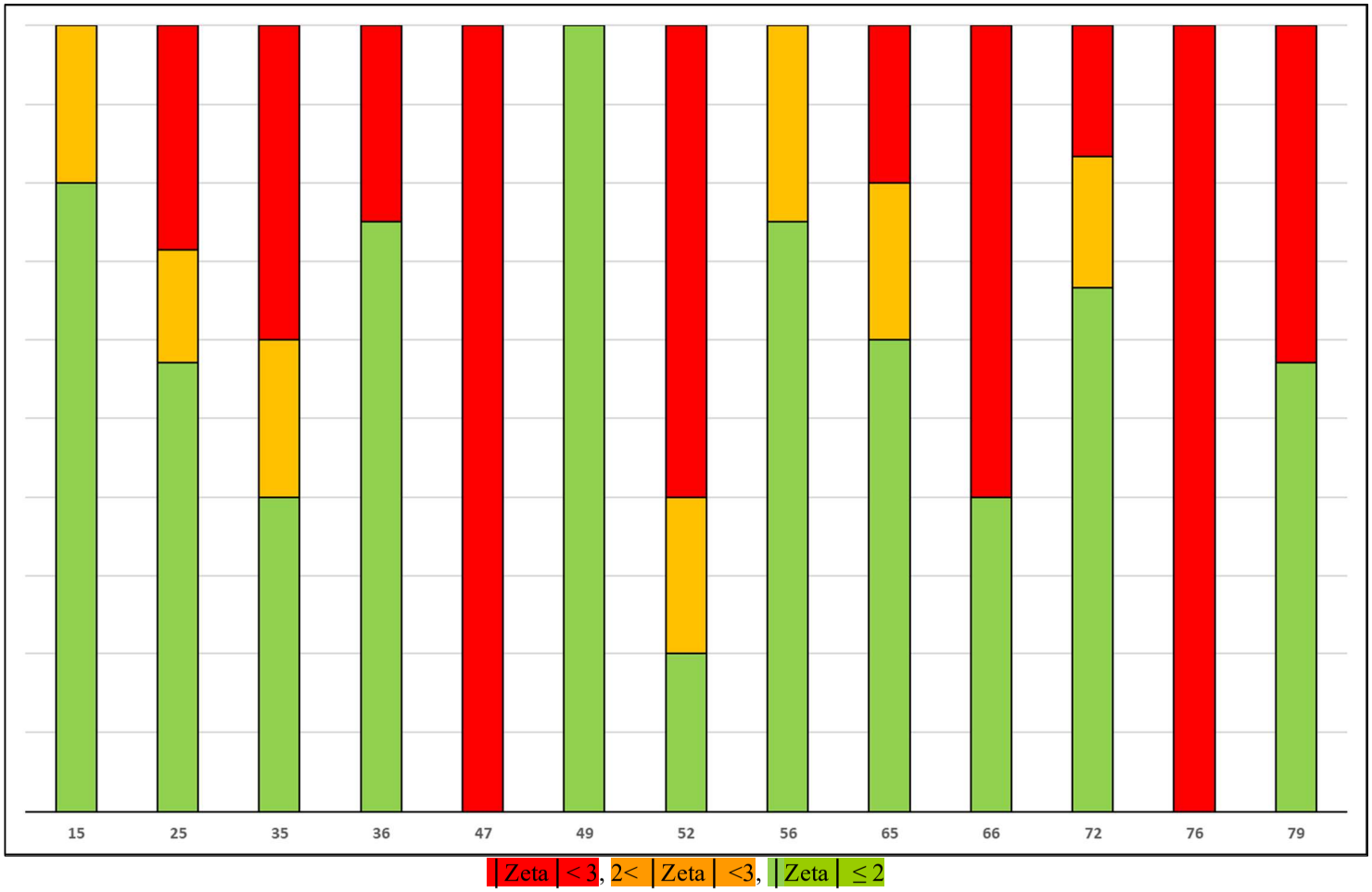


FIG. 18. Percentage distribution of the Zeta-scores of PAH results reported by participants per laboratory.

TABLE 16. OVERALL ASSESSMENT OF LABORATORIES PERFORMANCE (*z*-SCORE) FOR PAHs

Lab Code	Naphthalene	1-Methylnaphthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene
4								I
5	1.27			6.68	0.47	0.44	1.58	C
12	-2.60	-2.13	-1.35	9.64	10.7	-0.90	-1.46	C
14					I			
15	4.09	1.73	5.73	I	I	5.50	3.10	I
19							-1.09	C
22	-4.96			-0.70	-2.17	-5.25	-5.05	
25	12.9	2.82	-2.09	-0.47	-1.48	0.72	-0.55	C
26	-4.85			I	I	I	I	C
35	-0.64			-4.39	-2.16	-2.78	-0.17	C
36	-4.36				-1.04	-0.82	4.24	
37	29.2							
42	-1.32				-2.46	-0.72	1.91	C
45	-4.98			-5.99			-5.29	C
47						40.1	305	I
49		-0.31	1.01		5.23	-2.96	-1.44	
52	1.32			8.07	2.39	2.50	2.87	C
55	86.2	0.47	1.24	I	I	17.4	C	I
56				-5.11	-4.02	-5.19	-5.26	C
65	-0.71			28	0.84	3.72	5.30	C
66	0.78			90.7	4.85	1.75	12.9	C
67	837			C	C	I	174	C
72	-2.03	-0.81	-0.31	-0.23	0.22	-2.25	0.19	C
76	10.4			1668	711	15.2	-3.04	I
78	1.33		C	I	84.5	I	-1.21	C
79	-2.66	-0.17	0.87	-2.80	-1.39	-2.87	-1.65	C

Consistent (C) or Inconsistent (I) value after the assessment of <LD reported data.

TABLE 17. OVERALL ASSESSMENT OF LABORATORIES PERFORMANCE (*z*-SCORE) FOR PAHs

Lab Code	Benz[*a*]anthracene	Chrysene	Fluoranthene	Pyrene	Benzo[*a*]pyrene	Benzo[*e*]pyrene	Benzo[*b+j*]fluoranthene	Benzo[*g,h,i*]perylene
4	I		I		I		I	I
5	C	C	C	C	C		C	C
12	C	C	C	I	C		C	C
14					I			
15	I	I	I	C	I		I	I
19	C	C	C	C	C	C	C	C
22	C	I	C	C	C		C	
25	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C
35	C	C	C	C	C	C	C	C
36	I	I	I	C				
42	C	C	C	C	C			C
45	C	C	C	C	C	C	C	C
47	I	I			I		I	I
52			C	C				I
55	I	I	C	C	I		I	I
56	C	C	C	C	C		C	C
65	C	C	C	C	C		C	C
66	C	C	C	C	C		C	C
67	I	C	I	I	I	I	C	C
72	C	C	C	C	C	C	C	C
74	C	C			C		C	C
76	I	C	C	I	I		I	I
78	C	C	C	C	C	C	C	C
79	C	C	C	C	C	C	C	C

Consistent (C) or Inconsistent (I) value after the assessment of <LD reported data.

TABLE 18. OVERALL ASSESSMENT OF LABORATORIES PERFORMANCE (ZETA-SCORE) FOR PAHs

Lab Code	Naphthalene	1-Methylnaphthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene
15	1.70	0.87	2.10			1.95	1.39
25	14.4	3.27	-2.54	-0.44	-1.71	0.81	-0.63
35	-0.82			-6.62	-2.57	-3.74	-0.23
36	-5.58				-0.66	-0.94	0.94
47						8.70	9.83
49		-0.13	0.58		0.33	-0.36	-0.51
52	1.69			6.61	2.54	3.26	3.80
56				-0.18	-0.12	-2.85	-0.71
65	-0.58			3.62	0.62	1.73	2.16
66	0.88			15.6	3.68	1.79	11
72	-2.59	-1.10	-0.38		0.25	-3.05	0.24
76	6.65			10.4	13.3	5.45	
79	-3.11	-0.15	0.75	-3.35	-1.48	-3.46	-1.78

9. RECOMMENDATIONS AND CONCLUSIONS

Participants are recommended to review their individual data with their corresponding z-scores and Zeta-scores. The performance values of *z*-scores and Zeta-scores should assist participant laboratories to identify any systematic error in their measurement results and then apply the consequent corrective actions to improve the data quality. Although in general more than half of the calculated *z*-scores for each group of analytes were satisfactory, the *z*-scores distribution of some of the laboratories showed an inconsistent pattern. In some cases, for the same group of compounds, excellent *z*-scores values were reported for some compounds while for others, *z*-scores were completely outlying. Such *z*-scores variation suggests the existence of possible underlying issues linked to both sample preparation and instrumental analysis. In this context, clean-up and fractionation are key sample pre-treatment steps that need to be developed, optimized and monitored especially in the analysis of complex biological matrices such as fish tissue. Systematic and random errors may also be due to contamination issues. Solvents and reagents used for sample preparation and analysis should be of the highest available purity and checked on regular bases. Special care should also be taken during the evaporation procedure of the solvent extracts to avoid dryness and losses of the more volatile contaminants. In this aspect, the use of internal standards/surrogates with physico-chemical properties similar to the target analytes, such as deuterated and ^{13}C labeled compounds for GC-MS, is fully recommended to compensate for these losses. Furthermore, to overcome the common problems of co-elution and interferences in chromatographic analyses, a multi-column technique for complete separation of all isomers of PCBs, PBDEs and PAHs, as well as multiple detection strategies is recommended.

Some laboratories reported results which differed by one order of magnitude from the assigned value. This may be due to a “reporting” mistake (for example: wrong unit conversion or wrong dataset reported) or due to more severe analytical issues which would require immediate root cause analysis and consequent corrective actions. These laboratories should verify their analytical procedures and their data reporting units.

According to the results provided, many of the participating laboratories, including some accredited according to the ISO/IEC 17025, need to improve their QA/QC procedures by using certified reference materials and replicate samples to produce accurate results. Reference materials must match the test sample matrix and must undergo the same exact procedure of the test sample to be as effective as possible to avoid inaccuracy and precision issues. It is also recommended that participants provide their data along with their estimates of uncertainty in accordance to the approach set in the basic Guide to the expression of uncertainty in measurement (GUM). Unfortunately, many laboratories did not report their uncertainties and some of the uncertainties reported by participants were not realistic. The knowledge on basic

principles of method validation, traceability and uncertainty of measurement results, are still limited and laboratories that lack proficiency in this area should take action.

Overall, the results indicate the need to improve the routine monitoring capabilities of persistent organic contaminants and for that interlaboratory comparisons for trace level of organic compounds in complex matrices is a valuable approach for monitoring the quality assurance of the data.

APPENDIX I: RESULTS REPORTED BY PARTICIPANTS

I.1. RESULTS REPORTED FOR PCB CONGENERS

TABLE 19. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 8

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
23	GC/ECD	108.28						Yes[3]	Yes
40[1]	GC/HRMS	<0.3				Yes	No	Yes	Yes
67[1]	GC/ECD	<0.15							
79	GC/ECD[2]	<0.33				Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 20. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 18

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
17	GC/MSMS	0.84	0.08	0.80	0.92	Yes	Yes	Yes	No
36	GC/MS EI	0.7	0.3	-0.08	-0.06	No	No	Yes	No
40[1]	GC/HRMS	0.36	0.13	-2.14	-2.34	Yes	No	Yes	Yes
48	GC/ECD	0.93		1.32		Yes		Yes	Yes
63	GC/MS EI	0.29	0.07	-2.56	-1.30	No	No	Yes[3]	No
67[1]	GC/ECD	<0.15							
72[1]	GC/MS EI	1.4	0.07	4.23	4.88	Yes	Yes	Yes	Yes
78[1]	GC/MSMS	<1				Yes	Yes	No	Yes
79	GC/ECD[2]	0.68	0.14	-0.21	-0.23	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 21. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 28

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<1.0				No	Yes	No	Yes
3	GC/MSMS	1.01		-1.19		No	Yes	Yes	Yes
4[1]	GC/MS EI	0.9		-1.64		Yes	No	No	Yes
5	GC/MSMS	0.93		-1.52			Yes	Yes	Yes
7	GC/ECD	1.78	0.22	1.90	2.18	No	No	Yes	Yes
8	GC/ECD	5.38	3.5	16.5	2.31	No			
10	GC/MSMS	1.75		1.81		Yes	Yes	No	
15[1]	GC/MSMS	1.20	0.6	-0.42	-0.30	Yes	Yes	Yes	Yes
17	GC/MSMS	0.47	0.04	-3.40	-4.52	Yes	Yes	Yes	No
23	GC/ECD	14		51.4				Yes[4]	Yes
24	GC/MS EI	0.77	0.06	-2.18	-2.71	No	Yes	Yes	Yes
25	GC/MSMS	0.68	0.04	-2.55	-3.38	Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
27	GC/ECD	2.38		4.35		Yes	Yes	No	Yes
35	GC/MS EI	1.87	0.07	2.28	3.01	Yes	No	No	Yes
36	GC/MS EI	1.41	0.91	0.40	0.20	No	No	Yes	No
40[1]	GC/HRMS	1	0.07	-1.25	-1.63	Yes	No	Yes	Yes
45[1]	GC/ECD	0.57		-2.97		No	No	No	No
47[1]	GC/ECD	5.17	2.06	15.7	3.69	No	No	No	Yes
48	GC/ECD	0.65		-2.68		Yes		Yes	Yes
50	GC/MSMS	0.67	0.4	-2.59	-2.34	Yes	Yes	No	
56	GC/HRMS	1.73	6.73	1.72	0.13	Yes	No	Yes	Yes
57	GC/MSMS	1.32		0.05		Yes	Yes	No	Yes
62	GC/MS EI	0.33	0.15	-3.96	-5.01	Yes	No	Yes	No
63	GC/MS EI	0.73	0.06	-2.35	-0.77	No	No	Yes[4]	No
65	GC/HRMS	0.37	0.16	-3.82	-4.68	Yes	Yes	Yes[4]	Yes
66	GC/MSMS	4.57	0.83	13.3	7.12	No	No	No	Yes
67[1]	GC/ECD	5.61		17.5					
72[1]	GC/MS EI	1.58	0.09	1.11	1.44	Yes	Yes	Yes	Yes
73	GC/ECD	3.73		9.84		No	No	No	Yes
74[1]	GC/MSMS	0.73		-2.33		Yes	Yes	Yes	Yes
78[1]	GC/MSMS	2.07		3.08		Yes	Yes	No	Yes
79	GC/ECD[3]	0.86	0.17	-1.81	-2.17	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with dual column
[3]GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 22. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 31

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
17	GC/MSMS	0.39	0.04	-1.94	-2.67	Yes	Yes	Yes	No
25	GC/MSMS	0.49	0.03	-1.12	-1.47	Yes			Yes
27	GC/ECD	0.47		-1.35		Yes	Yes	No	Yes
36	GC/MS EI	0.91	0.23	2.51	1.97	No	No	Yes	No
40[1]	GC/HRMS	0.69	0.24	0.58	0.45	Yes	No	Yes	Yes
48	GC/ECD	0.58		-0.4		Yes		Yes	Yes
62	GC/MS EI	0.58	0.41	-0.35	-0.22	Yes	No	Yes	No
63	GC/MS EI	0.81	0.08	1.64	0.23	No	No	Yes[3]	No
66	GC/MSMS	4.35	0.87	32.2	8.32	No	No	No	Yes
67[1]	GC/ECD	7.55		59.8					
72[1]	GC/MS EI	1.56	0.11	8.09	9.20	Yes	Yes	Yes	Yes
74[1]	GC/MSMS	0.61		-0.11		Yes	Yes	Yes	Yes
78[1]	GC/MSMS	<1				Yes	Yes	No	Yes
79	GC/ECD[2]	0.77	0.15	1.28	1.27	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 23. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 44

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
17	GC/MSMS	1.55	0.45	-0.58	-0.57	Yes	Yes	Yes	No
36	GC/MS EI	0.95	0.69	-2.35	-1.87	No	No	Yes	No
40[1]	GC/HRMS	1.39	0.48	-1.05	-1.01	Yes	No	Yes	Yes
48	GC/ECD	1.58		-0.50		Yes		Yes	Yes
63	GC/MS EI	2.47	0.32	2.09	0.29	No	No	Yes[3]	No
67[1]	GC/ECD	<0.15							
72[1]	GC/MS EI	2.34	0.09	1.72	2.20	Yes	Yes	Yes	Yes
78[1]	GC/MSMS	1.80		0.14		Yes	Yes	No	Yes
79	GC/ECD[2]	1.99	0.40	0.70	0.73	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 24. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 49

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
40[1]	GC/HRMS	2.19	0.78	0.08	0.07	Yes	No	Yes	Yes
63	GC/MS EI	1.11	0.16	-2.01	-0.88	No	No	Yes[3]	No
72[1]	GC/MS EI	2.86	0.11	1.36	1.58	Yes	Yes	Yes	Yes
79	GC/ECD[2]	2.11	0.42	-0.07	-0.08	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 25. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 52

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
1	GC/MS EI	1.15	0.30	-4.21	-5.98	Yes	No	No	Yes
2[1]	GC/ECD[2]	<1.0				No	Yes	No	Yes
3	GC/MSMS	2.95		-1.45		No	Yes	Yes	Yes
5	GC/MSMS	4.20		0.46			Yes	Yes	Yes
7	GC/ECD	4.42	0.57	0.80	0.99	No	No	Yes	Yes
8	GC/ECD	67.6	25.3	97.7	5.03	No			
10	GC/MSMS	4.08		0.28		Yes	Yes	No	
14	GC/MS EI	2.62	1.14	-1.96	-1.78	No	No	No	Yes
15[1]	GC/MSMS	4.64	2.32	1.13	0.60	Yes	Yes	Yes	Yes
17	GC/MSMS	4.45	1.10	0.8	0.79	Yes	Yes	Yes	No
23	GC/ECD	71.5		104				Yes[4]	Yes
24	GC/MS EI	3.27	0.06	-0.97	-1.44	No	Yes	Yes	Yes
25	GC/MSMS	3.06	0.17	-1.29	-1.90	Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
27	GC/ECD	3.00		-1.38		Yes	Yes	No	Yes
35	GC/MS EI	4.36	0.12	0.70	1.04	Yes	No	No	Yes
36	GC/MS EI	2.12	0.36	-2.72	-3.78	No	No	Yes	No
40[1]	GC/HRMS	3.95	0.25	0.08	0.12	Yes	No	Yes	Yes
45[1]	GC/ECD	16.3		19.1		No	No	No	No
48	GC/ECD	5.62		2.63		Yes		Yes	Yes
49[1]	GC/MS EI	3.99	10.2	0.15	0.02		No	Yes	Yes
50	GC/MSMS	2.85	1.71	-1.61	-1.09	Yes	Yes	No	
56	GC/HRMS	2.85	24.1	-1.61	-0.09	Yes	No	Yes	Yes
57	GC/MSMS	3.44		-0.70		Yes	Yes	No	Yes
62	GC/MS EI	2.72	2.24	-1.80	-1.18	Yes	No	Yes	No
63	GC/MS EI	1.61	0.23	-3.51	-1.37	No	No	Yes[4]	No
65	GC/HRMS	0.71	0.31	-4.9	-6.90	Yes	Yes	Yes[4]	Yes
66	GC/MSMS	5.62	0.95	2.6	2.65	No	No	No	Yes
67[1]	GC/ECD	15.3		17.5					
72[1]	GC/MS EI	5.42	0.17	2.33	3.44	Yes	Yes	Yes	Yes
73	GC/ECD	8.18		6.56		No	No	No	Yes
74[1]	GC/MSMS	3.49		-0.63		Yes	Yes	Yes	Yes
78[1]	GC/MSMS	4.63		1.13		Yes	Yes	No	Yes
79	GC/ECD[3]	5.94	1.19	3.13	2.79	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2]GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 26. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 66

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
40[1]	GC/HRMS	6.70	2.30	-0.20	-0.19	Yes	No	Yes	Yes
67[1]	GC/ECD	57.7		23.4					
72[1]	GC/MS EI	5.12	0.17	-0.93	-1.01	Yes	Yes	Yes	Yes
79	GC/ECD[2]	10.5	2.09	1.54	1.50	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS

TABLE 27. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 70

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
40[1]	GC/HRMS	5.70	2			Yes	No	Yes	Yes
63	GC/MS EI	1.75	0.17			No	No	Yes[2]	No
72[1]	GC/MS EI	4.54	0.11			Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 28. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 74

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
40[1]	GC/HRMS	4.35	1.53			Yes	No	Yes	Yes
63	GC/MS EI	2.76	0.35			No	No	Yes[2]	No
72[1]	GC/MS EI	3.72	0.09			Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 29. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 87

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
40[1]	GC/HRMS	6.72	2.40	0.16	0.13	Yes	No	Yes	Yes
63	GC/MS EI	3.67	0.53	-2.52	-0.76	No	No	Yes[3]	No
72[1]	GC/MS EI	7.52	0.36	0.87	1.21	Yes	Yes	Yes	Yes
79	GC/ECD[2]	6.41	1.28	-0.11	-0.12	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 30. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 95

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
10	GC/MSMS	8.98		4.08		Yes	Yes	No	
14	GC/MS EI	3.38	1.48	-2.01	-1.88	No	No	No	Yes
25	GC/MSMS	4.68	0.21	-0.60	-0.84	Yes			Yes
36	GC/MS EI	4.47	1.10	-0.82	-0.89	No	No	Yes	No
40[1]	GC/HRMS	7.41	2.60	2.38	1.50	Yes	No	Yes	Yes
50	GC/MSMS	13.6	8.14	9.1	2.02	Yes	Yes	No	
63	GC/MS EI	4.99	0.43	-0.27	-0.05	No	No	Yes[2]	No
65	GC/HRMS	1.53	0.67	-4.02	-5.06	Yes	Yes	Yes[2]	Yes
72[1]	GC/MS EI	11	0.34	6.28	8.63	Yes	Yes	Yes	Yes
76	GC/MS EI	21.33	4.00	17.5	7.66	No	Yes		Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 31. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 97

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
40[1]	GC/HRMS	5.73	2.00			Yes	No	Yes	Yes
79	GC/ECD[2]	4.95	0.99			Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS

TABLE 32. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 99

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
10	GC/MSMS	20.5		0.79		Yes	Yes	No	
14	GC/MS EI	9.03	4.00	-2.10	-2.15	No	No	No	Yes
25	GC/MSMS	10.7	0.31	-1.67	-1.99	Yes			Yes
36	GC/MS EI	9.32	0.47	-2.03	-2.41	No	No	Yes	No
40[1]	GC/HRMS	19.5	6.90	0.53	0.44	Yes	No	Yes	Yes
50	GC/MSMS	19.4	11.6	0.5	0.29	Yes	Yes	No	
63	GC/MS EI	1.57	0.10	-3.97	-4.29	No	No	Yes[3]	No
65	GC/HRMS	3.38	1.49	-3.52	-4.10	Yes	Yes	Yes[3]	Yes
72[1]	GC/MS EI	22.6	1.10	1.31	1.54	Yes	Yes	Yes	Yes
76	GC/MS EI	73.7	14	14.1	7.26	No	Yes		Yes
79	GC/ECD[2]	24.5	5.32	1.79	1.67	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 33. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 101

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	28.4	5.70	1.33	1.36	No	Yes	No	Yes
3	GC/MSMS	20.1		-0.85		No	Yes	Yes	Yes
4[1]	GC/MS EI	1.78		-5.64		Yes	No	No	Yes
5	GC/MSMS	23.8		0.13			Yes	Yes	Yes
7	GC/ECD	25.1	3.67	0.47	0.58	No	No	Yes	Yes
8	GC/ECD	48.1	11.5	6.5	3.95	No			
10	GC/MSMS	31.3		2.09		Yes	Yes	No	
14	GC/MS EI	11.7	5.20	-3.05	-3.25	No	No	No	Yes
15[1]	GC/MSMS	29.1	14.6	1.51	0.75	Yes	Yes	Yes	Yes
17	GC/MSMS	31.6	3.32	2.2	2.77	Yes	Yes	Yes	No
23	GC/ECD	39.1		4.14				Yes[4]	Yes
24	GC/MS EI	22.9	1.42	-0.12	-0.18	No	Yes	Yes	Yes
25	GC/MSMS	14.8	0.89	-2.23	-3.39	Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
27	GC/ECD	19		-1.13		Yes	Yes	No	Yes
35	GC/MS EI	28.8	0.51	1.44	2.21	Yes	No	No	Yes
36	GC/MS EI	14.6	0.41	-2.29	-3.53	No	No	Yes	No
40[1]	GC/HRMS	29.1	1.80	1.51	2.19	Yes	No	Yes	Yes
45[1]	GC/ECD	0.54		-6.0		No	No	No	No
47[1]	GC/ECD	14.4		-2.34		No	No	No	Yes
48	GC/ECD	22.6		-0.18		Yes		Yes	Yes
49[1]	GC/MS EI	18.3	10.2	-1.32	-0.89		No	Yes	Yes
50	GC/MSMS	20.0	12.0	-0.87	-0.52	Yes	Yes	No	
53	GC/MSMS	17.9	8.90	-1.43	-1.07		Yes	Yes	Yes
56	GC/HRMS	24.2	9.05	0.23	0.17	Yes	No	Yes	Yes
57	GC/MSMS	31.2		2.06		Yes	Yes	No	Yes
62	GC/MS EI	29.8	12.7	1.7	1.14	Yes	No	Yes	No
63	GC/MS EI	8.06	1.24	-4.0	-1.81	No	No	Yes[4]	No
65	GC/HRMS	5.52	2.43	-4.66	-6.47	Yes	Yes	Yes[4]	Yes
66	GC/MSMS	18.4	2	-1.30	-1.86	No	No	No	Yes
67[1]	GC/ECD	72.8		12.93					
71	GC/ECD[3]	10.6	2.88	-3.33	-4.37	Yes		No	Yes
72[1]	GC/MS EI	33.2	0.89	2.58	3.93	Yes	Yes	Yes	Yes
73	GC/ECD	16.5		-1.79		No	No	No	Yes
74[1]	GC/MSMS	24.9		0.40		Yes	Yes	Yes	Yes
76	GC/MS EI	58.7	5	9.24		No	Yes		Yes
78[1]	GC/MSMS	25.3		0.52		Yes	Yes	No	Yes
79	GC/ECD[3]	25.1	5.02	0.46	0.50	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2]GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 34. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 105

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
3	GC/MSMS	4.50		-2.71		No	Yes	Yes	Yes
10	GC/MSMS	8.90		0.70		Yes	Yes	No	
15[1]	GC/MSMS	6.77	3.38	-0.95	-0.65	Yes	Yes	Yes	Yes
25	GC/MSMS	7.65	1.51	-0.27	-0.31	Yes			Yes
27	GC/ECD	8.18		0.14		Yes	Yes	No	Yes
36	GC/MS EI	4.82	0.96	-2.5	-3.34	No	No	Yes	No
40[1]	GC/HRMS	10.3	0.60	1.76	2.60	Yes	No	Yes	Yes
50	GC/MSMS	8.30	4.98	0.24	0.12	Yes	Yes	No	
63	GC/MS EI	0.68	0.15	-5.66	-6.87	No	No	Yes[3]	No
65	GC/HRMS	8.54	3.76	0.4	0.27	Yes	Yes	Yes[3]	Yes
66	GC/MSMS	5.16	1.14	-2.19	-2.84	No	No	No	Yes
67[1]	GC/ECD	71.3		48.96					
72[1]	GC/MS EI	14	0.39	4.65	7.14	Yes	Yes	Yes	Yes
74[1]	GC/MSMS	8.01		0.01		Yes	Yes	Yes	Yes
78[1]	GC/MSMS	9.07		0.83		Yes	Yes	No	Yes
79	GC/ECD[2]	9.63	1.93	1.26	1.29	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 35. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 110

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
10	GC/MSMS	15.4		1.18		Yes	Yes	No	
14	GC/MS EI	9.40	4.20	-1.21	-1.05	No	No	No	Yes
25	GC/MSMS	9.41	0.55	-1.20	-1.52	Yes			Yes
36	GC/MS EI	7.95	1.37	-1.78	-2.14	No	No	Yes	No
40[1]	GC/HRMS	20.4	7.10	3.17	1.94	Yes	No	Yes	Yes
50	GC/MSMS	14.7	8.82	0.9	0.47	Yes	Yes	No	
63	GC/MS EI	11.0	2.96	-0.57	-0.13	No	No	Yes[3]	No
65	GC/HRMS	2.79	1.23	-3.84	-4.66	Yes	Yes	Yes[3]	Yes
66	GC/MSMS	11.3	2.00	-0.47	-0.53	No	No	No	Yes
72[1]	GC/MS EI	18	0.57	2.2	2.78	Yes	Yes	Yes	Yes
79	GC/ECD[2]	14.8	2.97	0.95	0.97	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 36. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 118

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	27.5	5.50	-0.21	-0.25	No	Yes	No	Yes
3	GC/MSMS	25.0		-0.77		No	Yes	Yes	Yes
4[1]	GC/MS EI	1.07		-6.10		Yes	No	No	Yes
5	GC/MSMS	26.5		-0.43			Yes	Yes	Yes
7	GC/ECD	20.7	2.59	-1.73	-2.57	No	No	Yes	Yes
10	GC/MSMS	34.3		1.3		Yes	Yes	No	
15[1]	GC/MSMS	26.5	12.2	-0.44	-0.28	Yes	Yes	Yes	Yes
23	GC/ECD	160		29.21				Yes[4]	Yes
25	GC/MSMS	22.5	2.03	-1.33	-2.04	Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
27	GC/ECD	29.9		0.32		Yes	Yes	No	Yes
35	GC/MS EI	42.8	2.07	3.20	4.90	Yes	No	No	Yes
36	GC/MS EI	5.77	0.31	-5.05	-8.26	No	No	Yes	No
40[1]	GC/HRMS	36.4	2.20	1.77	2.69	Yes	No	Yes	Yes
45[1]	GC/ECD	8.62		-4.42		No	No	No	No
47[1]	GC/ECD	18.1	7.24	-2.30	-2.27	No	No	No	Yes
48	GC/ECD	34.0		1.24		Yes		Yes	Yes
49[1]	GC/MS EI	26.4	11	-0.46	-0.33		No	Yes	Yes
50	GC/MSMS	29.8	17.9	0.3	0.14	Yes	Yes	No	
56	GC/HRMS	42.7	15.9	3.18	1.70	Yes	No	Yes	Yes
57	GC/MSMS	35.7		1.62		Yes	Yes	No	Yes
63	GC/MS EI	9.78	0.72	-4.16	-1.84	No	No	Yes[4]	No
65	GC/HRMS	30.1	13.2	0.36	0.22	Yes	Yes	Yes[4]	Yes
66	GC/MSMS	20.6	2.50	-1.74	-2.62	No	No	No	Yes
67[1]	GC/ECD	165		30.47					
72[1]	GC/MS EI	35.4	1.10	1.55	2.49	Yes	Yes	Yes	Yes
74[1]	GC/MSMS	29.2		0.2		Yes	Yes	Yes	Yes
78[1]	GC/MSMS	31.4		0.7		Yes	Yes	No	Yes
79	GC/ECD[3]	25.7	5.15	-0.60	-0.72	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2]GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 37. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 128

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
14	GC/MS EI	6.73	3.00	-1.20	-0.96	No	No	No	Yes
25	GC/MSMS	8.84	0.29	0.29	0.42	Yes			Yes
36	GC/MS EI	1.94	0.76	-4.57	-6.34	No	No	Yes	No
40[1]	GC/HRMS	8.88	3.10	0.32	0.24	Yes	No	Yes	Yes
50	GC/MSMS	9.57	5.74	0.80	0.38	Yes	Yes	No	
63	GC/MS EI	7.48	1.09	-0.7	-0.13	No	No	Yes[3]	No
65	GC/HRMS	2.63	1.16	-4.09	-5.21	Yes	Yes	Yes[3]	Yes
67[1]	GC/ECD	2.99		-3.83					
72[1]	GC/MS EI	14.6	1.10	4.35	5.61	Yes	Yes	Yes	Yes
79	GC/ECD[2]	13.8	2.76	3.8	3.21	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 38. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 138

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	75.4	15.1	0.67	0.72	No	Yes	No	Yes
3	GC/MSMS	65.1		-0.29		No	Yes	Yes	Yes
4[1]	GC/MS EI	5.33		-5.83		Yes	No	No	Yes
5	GC/MSMS	85.9		1.65			Yes	Yes	Yes
8	GC/ECD	135	37.4	6.21	3.37	No			
10	GC/MSMS	64.2		-0.4		Yes	Yes	No	
14	GC/MS EI	57.2	25.2	-1.02	-0.77	No	No	No	Yes
15[1]	GC/MSMS	83.4	41.7	1.42	0.70	Yes	Yes	Yes	Yes
17	GC/MSMS	72.7	15.3	0.42	0.45	Yes	Yes	Yes	No
23	GC/ECD	106		3.5				Yes[4]	Yes
24	GC/MS EI	51.2	3.58	-1.57	-2.57	No	Yes	Yes	Yes
25	GC/MSMS	58.8	9.9	-0.86	-1.13	Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
27	GC/ECD	64.2		-0.37		Yes	Yes	No	Yes
35	GC/MS EI	66.6	1.39	-0.14	-0.23	Yes	No	No	Yes
36	GC/MS EI	51.7	4.65	-1.53	-2.35	No	No	Yes	No
40[1]	GC/HRMS	107	8	3.56	4.98	Yes	No	Yes	Yes
45[1]	GC/ECD	3.96		-5.96		No	No	No	No
47[1]	GC/ECD	36.8	14.7	-2.9	-3.17	No	No	No	Yes
49[1]	GC/MS EI	64.7	11.2	-0.32	-0.40		No	Yes	Yes
50	GC/MSMS	59.7	35.8	-0.79	-0.44	Yes	Yes	No	
53	GC/MSMS	82.3	41.2	1.32	0.65		Yes	Yes	Yes
56	GC/HRMS	90	4.56	2.03	3.14	Yes	No	Yes	Yes
57	GC/MSMS	20.8		-4.40		Yes	Yes	No	Yes
62	GC/MS EI	83.3	15.4	1.41	1.68	Yes	No	Yes	No
63	GC/MS EI	25.0	2.92	-4.00	-1.66	No	No	Yes[4]	No
65	GC/HRMS	12.2	5.37	-5.2	-7.87	Yes	Yes	Yes[4]	Yes
66	GC/MSMS	40.6	3.3	-2.6	-4.07	No	No	No	Yes
67[1]	GC/ECD	243		16.19					
71	GC/ECD[3]	25.2	7.07	-3.99	-5.65	Yes		No	Yes
72[1]	GC/MS EI	97.8	3.20	2.75	4.38	Yes	Yes	Yes	Yes
73	GC/ECD	73.8		0.52		No	No	No	Yes
74[1]	GC/MSMS	63		-0.48		Yes	Yes	Yes	Yes
76	GC/MS EI	164	30	8.87	5.83	No	Yes		Yes
78[1]	GC/MSMS	74		0.54		Yes	Yes	No	Yes
79	GC/ECD[3]	75.2	15	0.66	0.71	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2]GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 39. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 146

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
10	GC/MSMS	19		0.29		Yes	Yes	No	
25	GC/MSMS	86.7	10.25	24.58	12.77	Yes			Yes
36	GC/MS EI	17.3	0.48	-0.34	-0.59	No	No	Yes	No
40[1]	GC/HRMS	19.0	3.3	0.29	0.45	Yes	No	Yes	Yes
50	GC/MSMS	17.6	10.53	-0.24	-0.12	Yes	Yes	No	
65	GC/HRMS	4.07	1.79	-5.1	-7.71	Yes	Yes	Yes[2]	Yes
76	GC/MS EI	56	10.00	13.56	7.19	No	Yes		Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 40. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 149

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
10	GC/MSMS	26.9		-0.08		Yes	Yes	No	
14	GC/MS EI	10.7	4.6	-3.60	-4.30	No	No	No	Yes
17	GC/MSMS	34.4	5.3	1.54	1.74	Yes	Yes	Yes	No
25	GC/MSMS	23.4	0.92	-0.85	-1.24	Yes			Yes
27	GC/ECD	26.1		-0.27		Yes	Yes	No	Yes
36	GC/MS EI	17.7	0.56	-2.1	-3.07	No	No	Yes	No
40[1]	GC/HRMS	35.0	12.2	1.66	1.12	Yes	No	Yes	Yes
48	GC/ECD	10.4		-3.65		Yes		Yes	Yes
49[1]	GC/MS EI	22.7	11	-0.99	-0.72		No	Yes	Yes
50	GC/MSMS	30.1	18	0.6	0.29	Yes	Yes	No	
63	GC/MS EI	11.2	1.01	-3.49	-1.39	No	No	Yes[3]	No
65	GC/HRMS	6.71	2.95	-4.46	-5.98	Yes	Yes	Yes[3]	Yes
66	GC/MSMS	23.2	2.6	-0.89	-1.22	No	No	No	Yes
67[1]	GC/ECD	<0.15							
72[1]	GC/MS EI	43	1.4	3.40	4.92	Yes	Yes	Yes	Yes
76	GC/MS EI	88.0	16.0	13.14	7.07	No	Yes		Yes
78[1]	GC/MSMS	32.6		1.15		Yes	Yes	No	Yes
79	GC/ECD[2]	27	5.4	-0.07	-0.08	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 41. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 151

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
10	GC/MSMS	9.78		0.28		Yes	Yes	No	
25	GC/MSMS	7.54	1.07	-1.01	-1.26	Yes			Yes
36	GC/MS EI	6.31	0.57	-1.73	-2.28	No	No	Yes	No
40[1]	GC/HRMS	10.6	3.80	0.77	0.58	Yes	No	Yes	Yes
50	GC/MSMS	11.4	6.83	1.22	0.58	Yes	Yes	No	
63	GC/MS EI	4.62	0.73	-2.7	-0.97	No	No	Yes[3]	No
65	GC/HRMS	1.97	0.87	-4.25	-5.44	Yes	Yes	Yes[3]	Yes
72[1]	GC/MS EI	15	0.49	3.31	4.41	Yes	Yes	Yes	Yes
76	GC/MS EI	31.7	6	12.98	6.87	No	Yes		Yes
79	GC/ECD[2]	9.52	1.90	0.1	0.14	Yes	Yes	Yes	Yes

[1]Laboratory accredited
[2]GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 42. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 153

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	90.1	18	0.01	0.01	No	Yes	No	Yes
3	GC/MSMS	85.1		-0.34		No	Yes	Yes	Yes
4[1]	GC/MS EI	8.5		-5.74		Yes	No	No	Yes
5	GC/MSMS	90.5		0.04			Yes	Yes	Yes
7	GC/ECD	82.4	12	-0.54	-0.73	No	No	Yes	Yes
8	GC/ECD	102	27.8	0.8	0.72	No			
10	GC/MSMS	107		1.17		Yes	Yes	No	
14	GC/MS EI	75.6	33.2	-1.02	-0.77	No	No	No	Yes
15[1]	GC/MSMS	112	55.8	1.52	0.74	Yes	Yes	Yes	Yes
17	GC/MSMS	120	18.9	2.1	2.37	Yes	Yes	Yes	No
23	GC/ECD	209		8.39				Yes[4]	Yes
24	GC/MS EI	53.7	2.90	-2.55	-4.18	No	Yes	Yes	Yes
25	GC/MSMS	86.7	10.3	-0.23	-0.33	Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
27	GC/ECD	86.2		-0.27		Yes	Yes	No	Yes
35	GC/MS EI	94.0	2.10	0.28	0.46	Yes	No	No	Yes
36	GC/MS EI	68.0	3.89	-1.55	-2.48	No	No	Yes	No
40[1]	GC/HRMS	109	7.00	1.31	1.99	Yes	No	Yes	Yes
45[1]	GC/ECD	8.7		-5.7		No	No	No	No
47[1]	GC/ECD	53.4	21.4	-2.58	-2.66	No	No	No	Yes
50	GC/MSMS	104	62.4	0.98	0.43	Yes	Yes	No	
53	GC/MSMS	84.3	42.2	-0.40	-0.25		Yes	Yes	Yes
56	GC/HRMS	85.6	2.83	-0.31	-0.50	Yes	No	Yes	Yes
57	GC/MSMS	25.2		-4.56		Yes	Yes	No	Yes
62	GC/MS EI	24.6	5.01	-4.61	-7.35	Yes	No	Yes	No
63	GC/MS EI	32.5	3.74	-4.05	-1.71	No	No	Yes[4]	No
65	GC/HRMS	22.2	9.75	-4.8	-6.82	Yes	Yes	Yes[4]	Yes
66	GC/MSMS	50.3	3.80	-2.8	-4.48	No	No	No	Yes
67[1]	GC/ECD	346		18.04					
71	GC/ECD[3]	26.1	7.30	-4.50	-6.72	Yes		No	Yes
72[1]	GC/MS EI	130	4.20	2.81	4.48	Yes	Yes	Yes	Yes
73	GC/ECD	104		0.97		No	No	No	Yes
74[1]	GC/MSMS	105		1.05		Yes	Yes	Yes	Yes
78[1]	GC/MSMS	103		0.89		Yes	Yes	No	Yes
79	GC/ECD[3]	88.8	17.8	-0.09	-0.10	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 43. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 156

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
3	GC/MSMS	2.63		-2.04		No	Yes	Yes	Yes
10	GC/MSMS	3.98		0.22		Yes	Yes	No	
15[1]	GC/MSMS	4.29	2.15	0.75	0.40	Yes	Yes	Yes	Yes
25	GC/MSMS	3.90	1.02	0.09	0.09	Yes			Yes
27	GC/ECD	3.54		-0.52		Yes	Yes	No	Yes
36	GC/MS EI	3.44	0.74	-0.7	-0.79	No	No	Yes	No
40[1]	GC/HRMS	4.27	0.30	0.71	1.15	Yes	No	Yes	Yes
50	GC/MSMS	3.97	2.38	0.21	0.10	Yes	Yes	No	
63	GC/MS EI	2.54	0.41	-2.19	-0.51	No	No	Yes[3]	No
65	GC/HRMS	3.89	1.71	0.1	0.04	Yes	Yes	Yes[3]	Yes
66	GC/MSMS	0.20	0.07	-6.13	-10.36	No	No	No	Yes
72[1]	GC/MS EI	6.28	0.30	4.08	6.37	Yes	Yes	Yes	Yes
74[1]	GC/MSMS	3.87		0.04		Yes	Yes	Yes	Yes
78[1]	GC/MSMS	4.23		0.65		Yes	Yes	No	Yes
79	GC/ECD[2]	4.40	0.88	0.92	0.98	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 44. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 170

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
10	GC/MSMS	12.6		0.36		Yes	Yes	No	
17	GC/MSMS	17.7	3.38	2.98	2.76	Yes	Yes	Yes	No
25	GC/MSMS	11.8	2.93	-0.06	-0.06	Yes			Yes
27	GC/ECD	10.5		-0.72		Yes	Yes	No	Yes
36	GC/MS EI	7.88	0.74	-2.09	-3.13	No	No	Yes	No
40[1]	GC/HRMS	9.92	3.50	-1.0	-0.96	Yes	No	Yes	Yes
50	GC/MSMS	12.5	7.53	0.31	0.15	Yes	Yes	No	
63	GC/MS EI	5.41	0.80	-3.36	-1.18	No	No	Yes[3]	No
65	GC/HRMS	2.51	1.11	-4.85	-6.93	Yes	Yes	Yes[3]	Yes
66	GC/MSMS	4.73	1.14	-3.7	-5.27	No	No	No	Yes
67[1]	GC/ECD	30.6		9.61					
72[1]	GC/MS EI	18.4	1.10	3.33	4.75	Yes	Yes	Yes	Yes
78[1]	GC/MSMS	12.2		0.13		Yes	Yes	No	Yes
79	GC/ECD[2]	13.4	2.68	0.76	0.80	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 45. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 174

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
40[1]	GC/HRMS	7.97	2.80			Yes	No	Yes	Yes
79	GC/ECD[2]	7.36	1.47			Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS

TABLE 46. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 177

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
10	GC/MSMS	10.7		1.62		Yes	Yes	No	
25	GC/MSMS	6.52	0.86	-1.05	-1.30	Yes			Yes
36	GC/MS EI	5.34	0.21	-1.81	-2.37	No	No	Yes	No
40[1]	GC/HRMS	9.92	3.50	1.12	0.85	Yes	No	Yes	Yes
50	GC/MSMS	7.92	4.75	-0.16	-0.09	Yes	Yes	No	
63	GC/MS EI	8.11	0.83	0.0	-0.01	No	No	Yes[3]	No
65	GC/HRMS	2.31	1.02	-3.74	-4.53	Yes	Yes	Yes[3]	Yes
72[1]	GC/MS EI	14.2	0.89	3.86	4.76	Yes	Yes	Yes	Yes
76	GC/MS EI	16.7	3	5.44		No	Yes		Yes
79	GC/ECD[2]	8.63	1.73	0.3	0.32	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 47. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 180

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	32.2	6.40	-0.47	-0.55	No	Yes	No	Yes
3	GC/MSMS	23.8		-2.00		No	Yes	Yes	Yes
4[1]	GC/MS EI	6.54		-5.12		Yes	No	No	Yes
5	GC/MSMS	36.5		0.31			Yes	Yes	Yes
7	GC/ECD	30.4	4.43	-0.81	-1.10	No	No	Yes	Yes
8	GC/ECD	43.3	9.06	1.5	1.50	No			
10	GC/MSMS	41.0		1.13		Yes	Yes	No	
15[1]	GC/MSMS	37.0	18.5	0.39	0.22	Yes	Yes	Yes	Yes
17	GC/MSMS	51.5	8.76	3.03	3.01	Yes	Yes	Yes	No
23	GC/ECD	56.7		4.0				Yes[4]	Yes
24	GC/MS EI	26.8	2.27	-1.46	-2.37	No	Yes	Yes	Yes
25	GC/MSMS	36.5	4.61	0.30	0.41	Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
27	GC/ECD	27.1		-1.39		Yes	Yes	No	Yes
35	GC/MS EI	51.6	2.04	3.03	4.71	Yes	No	No	Yes
36	GC/MS EI	22.2	4.49	-2.29	-3.09	No	No	Yes	No
40[1]	GC/HRMS	38.3	2.40	0.64	0.98	Yes	No	Yes	Yes
45[1]	GC/ECD	0.45		-6.22		No	No	No	No
47[1]	GC/ECD	30.3	12.1	-0.8	-0.64	No	No	No	Yes
48	GC/ECD	45.5		1.93		Yes		Yes	Yes
49[1]	GC/MS EI	31.3	10.3	-0.64	-0.57		No	Yes	Yes
50	GC/MSMS	41.6	25.0	1.23	0.52	Yes	Yes	No	
53	GC/MSMS	31.0	15.5	-0.69	-0.45		Yes	Yes	Yes
56	GC/HRMS	41.5	5.60	1.20	1.51	Yes	No	Yes	Yes
57	GC/MSMS	8.70		-4.73		Yes	Yes	No	Yes
62	GC/MS EI	1.11	0.42	-6.10	-9.88	Yes	No	Yes	No
63	GC/MS EI	18.0	1.39	-3.0	-0.92	No	No	Yes[4]	No
66	GC/MSMS	14.7	2.40	-3.6	-5.57	No	No	No	Yes
67[1]	GC/ECD	90		9.99					
71	GC/ECD[3]	13.9	3.90	-3.78	-5.23	Yes		No	Yes
72[1]	GC/MS EI	46.2	2.20	2.06	3.18	Yes	Yes	Yes	Yes
73	GC/ECD	35.5		0.13		No	No	No	Yes
74[1]	GC/MSMS	36.0		0.22		Yes	Yes	Yes	Yes
76	GC/MS EI	140.7	26.0	19.16	7.88	No	Yes		Yes
78[1]	GC/MSMS	40.1		0.96		Yes	Yes	No	Yes
79	GC/ECD[3]	35.0	7	0.03	0.04	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2]GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 48. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 183

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
10	GC/MSMS	9.70		0.09		Yes	Yes	No	
14	GC/MS EI	7.17	3.20	-1.12	-0.99	No	No	No	Yes
25	GC/MSMS	6.77	0.27	-1.31	-1.58	Yes			Yes
36	GC/MS EI	6.60	1.55	-1.39	-1.54	No	No	Yes	No
40[1]	GC/HRMS	14.1	4.90	2.17	1.49	Yes	No	Yes	Yes
50	GC/MSMS	12.3	7.37	1.3	0.68	Yes	Yes	No	
63	GC/MS EI	4.11	0.59	-2.57	-1.21	No	No	Yes[3]	No
65	GC/HRMS	2.37	1.04	-3.41	-3.96	Yes	Yes	Yes[3]	Yes
72[1]	GC/MS EI	15.8	0.89	3.00	3.53	Yes	Yes	Yes	Yes
76	GC/MS EI	32.3	30	10.9	1.51	No	Yes		Yes
79	GC/ECD[2]	9.99	2	0.23	0.24	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 49. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 187

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
10	GC/MSMS	31.0		0.28		Yes	Yes	No	
25	GC/MSMS	24.1	1.67	-0.99	-1.32	Yes			Yes
27	GC/ECD	28.7		-0.15		Yes	Yes	No	Yes
36	GC/MS EI	23.0	2.90	-1.19	-1.53	No	No	Yes	No
40[1]	GC/HRMS	45.7	16	2.98	1.83	Yes	No	Yes	Yes
50	GC/MSMS	38.1	22.9	1.6	0.71	Yes	Yes	No	
63	GC/MS EI	11.3	0.49	-3.35	-1.51	No	No	Yes[3]	No
65	GC/HRMS	8.16	3.59	-3.93	-4.89	Yes	Yes	Yes[3]	Yes
67[1]	GC/ECD	8.64		-3.84					
72[1]	GC/MS EI	52.4	2.30	4.2	5.55	Yes	Yes	Yes	Yes
76	GC/MS EI	122	22	16.99	7.88	No	Yes		Yes
79	GC/ECD[2]	32.1	6.42	0.48	0.51	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 50. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 194

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
17	GC/MSMS	4.80	1.36	0.64	0.57	Yes	Yes	Yes	No
27	GC/ECD	3.63		-0.86		Yes	Yes	No	Yes
40[1]	GC/HRMS	3.36	1.20	-1.20	-1.13	Yes	No	Yes	Yes
48	GC/ECD	5.41		1.41		Yes		Yes	Yes
49[1]	GC/MS EI	3.49	10.8	-1.0	-0.15		No	Yes	Yes
63	GC/MS EI	2.34	0.24	-2.51	-0.81	No	No	Yes[4]	No
66	GC/MSMS	1.47	0.32	-3.61	-4.79	No	No	No	Yes
67[1]	GC/ECD	5.05		0.96					
72[1]	GC/MS EI	5.88	0.36	2.0	2.65	Yes	Yes	Yes	Yes
78[1]	GC/MSMS	4.37		0.09		Yes	Yes	No	Yes
79	GC/ECD[3]	4.33	0.87	0.04	0.05	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 51. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 195

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
40[1]	GC/HRMS	1.13	0.40	-1.30	-1.30	Yes	No	Yes	Yes
63	GC/MS EI	1.72	0.07	0.28	0.06	No	No	Yes[3]	No
72[1]	GC/MS EI	2.10	0.14	1.30	1.50	Yes	Yes	Yes	Yes
79	GC/ECD[2]	1.51	0.30	-0.28	-0.30	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 52. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 201

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
40[1]	GC/HRMS	4.03	1.40			Yes	No	Yes	Yes
63	GC/MS EI	0.95	0.15			No	No	Yes[3]	No
79	GC/ECD[2]	3.14	0.63			Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 53. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 206

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
40[1]	GC/HRMS	3.28	1.10	-0.06	-0.05	Yes	No	Yes	Yes
63	GC/MS EI	0.85	0.15	-4.81	-2.74	No	No	Yes[3]	No
67[1]	GC/ECD	<0.15							
72[1]	GC/MS EI	4.52	0.75	2.35	2.48	Yes	Yes	Yes	Yes
79	GC/ECD[2]	3.16	0.63	-0.30	-0.35	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 54. DATA REPORTED AND PERFORMANCE EVALUATION FOR PCB 209

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
17	GC/MSMS	2	0.58	0.20	0.18	Yes	Yes	Yes	No
23	GC/ECD	110		353.36				Yes[4]	Yes
40[1]	GC/HRMS	2.11	0.13	0.55	0.84	Yes	No	Yes	Yes
45[1]	GC/ECD	0.04		-6.24		No	No	No	No
63	GC/MS EI	1.32	0.22	-2.04	-0.47	No	No	Yes[3]	No
67[1]	GC/ECD	<0.15							
72[1]	GC/MS EI	3.06	0.23	3.68	5.23	Yes	Yes	Yes	Yes
78[1]	GC/MSMS	1.67		-0.89		Yes	Yes	No	Yes
79	GC/ECD[2]	2.01	0.40	0.22	0.25	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

I.2. RESULTS REPORTED FOR ORGANOCHLORINE PESTICIDES

TABLE 55. DATA REPORTED AND PERFORMANCE EVALUATION FOR HCB

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
3	GC/MSMS	1.98		-1.91		No	Yes	Yes	Yes
4[1]	GC/MS EI	0.39		-5.26		Yes	No	No	Yes
7	GC/ECD	2.77	0.58	-0.25	-0.28	No	No	Yes	Yes
10	GC/MSMS	3.72		1.74		Yes	Yes	No	
14	GC/MS EI	<10				No	No	No	Yes
15[1]	GC/MSMS	3.35	1.68	0.97	0.51	Yes	Yes	Yes	Yes
17	GC/MSMS	0.37	0.13	-5.30	-7.97	Yes	Yes	Yes	No
24	GC/MS EI	1.89		-2.10		No	Yes	Yes	Yes
25	GC/MSMS	2.59	0.57	-0.6	-0.71	Yes			Yes
27	GC/ECD	2.13		-1.61		Yes	Yes	No	Yes
35	GC/MS EI	7.73	0.83	10.2	9.28	Yes	No	No	Yes
40[1]	GC/HRMS	3	0.19	0.22	0.33	Yes	No	Yes	Yes
42	GC/MSMS	2.08		-1.70		Yes	Yes	Yes[4]	Yes
50	GC/MSMS	2.99	1.80	0.22	0.11	Yes	Yes	No	
53	GC/MSMS	3.18	1.60	0.60	0.33		Yes	Yes	Yes
54	GC/MSMS	3.48	1.80	1.25	0.62	Yes	Yes	No	Yes
55	GC/MS EI	26		48.6		No	No	No	No
56	GC/HRMS	3.83	28	2.0	0.07	Yes	No	Yes	Yes
62	GC/MS EI	0.19	0.06	-5.68	-8.71	Yes	No	Yes	No
66	GC/MSMS	2.16	0.53	-1.54	-1.82	No	No	No	Yes
67[1]	GC/ECD	105		214					
72[1]	GC/MS EI	3.30	0.14	0.86	1.29	Yes	Yes	Yes	Yes
75	GC/MS EI	3.16		0.57					
76	GC/MS EI	7.33		9.34		No	Yes		Yes
78[1]	GC/MSMS	3.13		0.51		Yes	Yes	No	Yes
79	GC/ECD[3]	1.13	0.23	-3.7	-5.37	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4] Yes of a different matrix of the test sample

TABLE 56. DATA REPORTED FOR α-HCH

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
5	GC/MSMS	0.02					Yes	Yes	Yes
7	GC/ECD	1.58	0.39			No	No	Yes	Yes
14	GC/MS EI	<10				No	No	No	Yes
15[1]	GC/MSMS	<5.0				Yes	Yes	Yes	Yes
17	GC/MSMS	<0.01				Yes	Yes	Yes	No
23	GC/ECD	7.28						Yes[4]	Yes
25	GC/MSMS	<0.10				Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
27	GC/ECD	0.19				Yes	Yes	No	Yes
35	GC/MS EI	0.20	0.02			Yes	No	No	Yes
40[1]	GC/HRMS	<0.15				Yes	No	Yes	Yes
42	GC/MSMS	<0.08				Yes	Yes	Yes[4]	Yes
45[1]	GC/ECD	0.32				No	No	No	No
54	GC/MSMS	<1.7				Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No	No	No
56	GC/HRMS	0.23	29.1			Yes	No	Yes	Yes
66	GC/MSMS	0.18	0.05			No	No	No	Yes
67[1]	GC/ECD	41.1							
72[1]	GC/MS EI	0.42	0.08			Yes	Yes	Yes	Yes
78[1]	GC/MSMS	<2				Yes	Yes	No	Yes
79	GC/ECD[3]	<0.01				Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 57. DATA REPORTED FOR β-HCH

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
3	GC/MSMS	0.05				No	Yes	Yes	Yes
5	GC/MSMS	0.17					Yes	Yes	Yes
7	GC/ECD	1.07	0.25			No	No	Yes	Yes
14	GC/MS EI	<10				No	No	No	Yes
15[1]	GC/MSMS	<5.0				Yes	Yes	Yes	Yes
17	GC/MSMS	0.04	0.02			Yes	Yes	Yes	No
23	GC/ECD	28.3						Yes[4]	Yes
25	GC/MSMS	<0.10				Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
35	GC/MS EI	0.43	0.06			Yes	No	No	Yes
40[1]	GC/HRMS	0.24	0.02			Yes	No	Yes	Yes
42	GC/MSMS	0.13				Yes	Yes	Yes[4]	Yes
45[1]	GC/ECD	0.56				No	No	No	No
54	GC/MSMS	<1.7				Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No	No	No
56	GC/HRMS	0.28	16.1			Yes	No	Yes	Yes
66	GC/MSMS	1.19	0.40			No	No	No	Yes
67[1]	GC/ECD	5.92							
72[1]	GC/MS EI	<0.30				Yes	Yes	Yes	Yes
78[1]	GC/MSMS	<2				Yes	Yes	No	Yes
79	GC/ECD[3]	0.64	0.13			Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 58. DATA REPORTED FOR γ-HCH (LINDANE)

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
3	GC/MSMS	0.18				No	Yes	Yes	Yes
4[1]	GC/MS EI	0.10				Yes	No	No	Yes
5	GC/MSMS	0.09					Yes	Yes	Yes
7	GC/ECD	0.69	0.29			No	No	Yes	Yes
14	GC/MS EI	<10				No	No	No	Yes
15[1]	GC/MSMS	<5.0				Yes	Yes	Yes	Yes
17	GC/MSMS	0.06	0.06			Yes	Yes	Yes	No
23	GC/ECD	4.78						Yes[4]	Yes
25	GC/MSMS	<0.10				Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
27	GC/ECD	0.30				Yes	Yes	No	Yes
35	GC/MS EI	1.17	0.17			Yes	No	No	Yes
40[1]	GC/HRMS	0.12	0.01			Yes	No	Yes	Yes
42	GC/MSMS	0.12				Yes	Yes	Yes[4]	Yes
45[1]	GC/ECD	0.79				No	No	No	No
54	GC/MSMS	<1.7				Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No	No	No
56	GC/HRMS	0.63	13.1			Yes	No	Yes	Yes
57	GC/MSMS	0.54				Yes	Yes	No	Yes
62	GC/MS EI	0.71	0.18			Yes	No	Yes	No
63	GC/MS EI	2.53	0.22			No	No	Yes[4]	No
66	GC/MSMS	2.26	0.63			No	No	No	Yes
67[1]	GC/ECD	44.8							
72[1]	GC/MS EI	<0.30				Yes	Yes	Yes	Yes
78[1]	GC/MSMS	<2				Yes	Yes	No	Yes
79	GC/ECD[3]	0.10	0.02			Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 59. DATA REPORTED FOR δ-HCH

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
4[1]	GC/MS EI	0.10				Yes	No	No	Yes
14	GC/MS EI	<10				No	No	No	Yes
15[1]	GC/MSMS	<5.0				Yes	Yes	Yes	Yes
17	GC/MSMS	<0.01				Yes	Yes	Yes	No
23	GC/ECD	0.88						Yes[4]	Yes
25	GC/MSMS	<0.10				Yes			Yes
35	GC/MS EI	0.28				Yes	No	No	Yes
40[1]	GC/HRMS	<0.15				Yes	No	Yes	Yes
45[1]	GC/ECD	0.84				No	No	No	No
54	GC/MSMS	<1.7				Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No	No	No
56	GC/HRMS	0.52				Yes	No	Yes	Yes
66	GC/MSMS	0.19				No	No	No	Yes
78[1]	GC/MSMS	<2				Yes	Yes	No	Yes
79	GC/ECD[3]	0.10	0.02			Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2]GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 60. DATA REPORTED AND PERFORMANCE EVALUATION FOR *pp'*-DDD

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	*z*-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
1	GC/MS EI	0.91	0.21	-5.92	-9.73	Yes	No	No	Yes
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
3	GC/MSMS	7.03		-2.96		No	Yes	Yes	Yes
5	GC/MSMS	13.4		0.11			Yes	Yes	Yes
7	GC/ECD	7.85	2.17	-2.56	-3.19	No	No	Yes	Yes
14	GC/MS EI	38.7	17	12.4	2.97	No	No	No	Yes
17	GC/MSMS	13.7	3.60	0.25	0.23	Yes	Yes	Yes	No
23	GC/ECD	42.8		14.35				Yes[4]	Yes
25	GC/MSMS	17.7	1.63	2.21	3.06	Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
27	GC/ECD	11.6		-0.73		Yes	Yes	No	Yes
35	GC/MS EI	25.3	1.16	5.90	8.82	Yes	No	No	Yes
40[1]	GC/HRMS	12.2	0.80	-0.48	-0.76	Yes	No	Yes	Yes
42	GC/MSMS	11.5		-0.80		Yes	Yes	Yes[4]	Yes
45[1]	GC/ECD	2.92		-4.95		No	No	No	No
50	GC/MSMS	13.2	7.9	0.01	0.01	Yes	Yes	No	
54	GC/MSMS	21.8	10.9	4.20	1.54	Yes	Yes	No	Yes
56	GC/HRMS	24.9	8.33	5.67	2.69	Yes	No	Yes	Yes
57	GC/MSMS	12.9		-0.1		Yes	Yes	No	Yes
62	GC/MS EI	5.26	1.36	-3.81	-5.77	Yes	No	Yes	No
63	GC/MS EI	2.08	0.42	-5.36	-4.56	No	No	Yes[4]	No
66	GC/MSMS	14.3	2.80	0.54	0.59	No	No	No	Yes
67[1]	GC/ECD	318		147					
71	GC/ECD[3]	6.68	1.87	-3.13	-4.04	Yes		No	Yes
72[1]	GC/MS EI	12	0.49	-0.56	-0.90	Yes	Yes	Yes	Yes
75	GC/MS EI	19.2		2.92					
76	GC/MS EI	48	10	16.9	6.76	No	Yes		Yes
78[1]	GC/MSMS	17		1.9		Yes	Yes	No	Yes
79	GC/ECD[3]	11.6	3.21	-0.74	-0.75	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 61 DATA REPORTED AND PERFORMANCE EVALUATION FOR *pp'*-DDE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	*z*-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
1	GC/MS EI	3.58	0.60	-5.92	-9.13	Yes	No	No	Yes
2[1]	GC/ECD[2]	108	21.6	-0.68	-0.78	No	Yes	No	Yes
3	GC/MSMS	120		-0.08		No	Yes	Yes	Yes
5	GC/MSMS	99.8		-1.09			Yes	Yes	Yes
7	GC/ECD	113	25.9	-0.43	-0.47	No	No	Yes	Yes
14	GC/MS EI	229	91.8	5.4	2.25	No	No	No	Yes
15[1]	GC/MSMS	157	78.7	1.80	0.87	Yes	Yes	Yes	Yes
17	GC/MSMS	170	33.5	2.42	2.28	Yes	Yes	Yes	No
23	GC/ECD	5.2		-5.83				Yes[4]	Yes
24	GC/MS EI	82		-2.0		No	Yes	Yes	Yes
25	GC/MSMS	163	7.97	2.06	3.04	Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
27	GC/ECD	101		-1.01		Yes	Yes	No	Yes
35	GC/MS EI	107	5.5	-0.75	-1.13	Yes	No	No	Yes
37[1]	GC/MS EI	98.7		-1.14					
40[1]	GC/HRMS	145	8.9	1.17	1.71	Yes	No	Yes	Yes
42	GC/MSMS	138		0.84		Yes	Yes	Yes[4]	Yes
45[1]	GC/ECD	4.9		-5.85		No	No	No	No
50	GC/MSMS	137	82.5	0.8	0.37	Yes	Yes	No	
53	GC/MSMS	111	56	-0.53	-0.34		Yes	Yes	Yes
54	GC/MSMS	160	79.8	1.91	0.91	Yes	Yes	No	Yes
55	GC/MS EI	92		-1.48		No	No	No	No
56	GC/HRMS	170	16.9	2.41	3.12	Yes	No	Yes	Yes
57	GC/MSMS	78.3		-2.17		Yes	Yes	No	Yes
62	GC/MS EI	11.6	1.97	-5.51	-8.50	Yes	No	Yes	No
63	GC/MS EI	15.3	2.72	-5.33	-5.30	No	No	Yes[4]	No
66	GC/MSMS	84.1	11.8	-1.9	-2.64	No	No	No	Yes
67[1]	GC/ECD	3251		157.1					
71	GC/ECD[3]	81.3	22.6	-2.02	-2.27	Yes		No	Yes
72[1]	GC/MS EI	158	8.9	1.83	2.67	Yes	Yes	Yes	Yes
75	GC/MS EI	104		-0.89					
76	GC/MS EI	491	46	18.54	14.01	No	Yes		Yes
78[1]	GC/MSMS	143		1.08		Yes	Yes	No	Yes
79	GC/ECD[3]	117	23.4	-0.23	-0.27	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 62. DATA REPORTED AND PERFORMANCE EVALUATION FOR *pp'*-DDT

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	*z*-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
1	GC/MS EI	2.44	0.50	-5.28	-8.04	Yes	No	No	Yes
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
3	GC/MSMS	12.1		-2.04		No	Yes	Yes	Yes
5	GC/MSMS	19.4		0.39			Yes	Yes	Yes
10	GC/MSMS	18.2		-0.02		Yes	Yes	No	
17	GC/MSMS	19.8	2.98	0.5	0.63	Yes	Yes	Yes	No
23	GC/ECD	40.8		7.53				Yes[4]	Yes
25	GC/MSMS	23.8	2.94	1.87	2.30	Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
27	GC/ECD	11.0		-2.4		Yes	Yes	No	Yes
35	GC/MS EI	24.7	1.62	2.17	3.10	Yes	No	No	Yes
37[1]	GC/MS EI	20.3		0.70					
40[1]	GC/HRMS	17.5	0.12	-0.24	-0.36	Yes	No	Yes	Yes
42	GC/MSMS	24.3		2.04		Yes	Yes	Yes[4]	Yes
45[1]	GC/ECD	1.38		-5.63		No	No	No	No
50	GC/MSMS	16.9	10.2	-0.43	-0.24	Yes	Yes	No	
54	GC/MSMS	21.7	10.9	1.16	0.61	Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No	No	No
56	GC/HRMS	40.2	6.16	7.3	6.03	Yes	No	Yes	Yes
62	GC/MS EI	9.48	2.26	-2.92	-4.08	Yes	No	Yes	No
63	GC/MS EI	2.81	0.54	-5.15	-4.43	No	No	Yes[4]	No
66	GC/MSMS	20	3.20	0.60	0.71	No	No	No	Yes
67[1]	GC/ECD	441		141.21					
71	GC/ECD[3]	13.7	3.85	-1.50	-1.59	Yes		No	Yes
72[1]	GC/MS EI	17.4	1.10	-0.28	-0.41	Yes	Yes	Yes	Yes
75	GC/MS EI	19.2		0.32					
76	GC/MS EI	15.0	4	-1.1	-1.16	No	Yes		Yes
78[1]	GC/MSMS	21.7		1.1		Yes	Yes	No	Yes
79	GC/ECD[3]	14.4	2.88	-1.27	-1.58	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2]GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 63. DATA REPORTED AND PERFORMANCE EVALUATION FOR *op'* -DDE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	*z*-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
7	GC/ECD	2.52	0.37	0.82	1.00	No	No	Yes	Yes
14	GC/MS EI	<10				No	No	No	Yes
15[1]	GC/MSMS	2.01	1.01	-0.61	-0.40	Yes	Yes	Yes	Yes
17	GC/MSMS	2.31	0.26	0.22	0.31	Yes	Yes	Yes	No
25	GC/MSMS	2.19	0.37	-0.1	-0.14	Yes			Yes
35	GC/MS EI	2.60	0.22	1.04	1.50	Yes	No	No	Yes
40[1]	GC/HRMS	1.96	0.12	-0.76	-1.17	Yes	No	Yes	Yes
42	GC/MSMS	1.30		-2.60		Yes	Yes	Yes[4]	Yes
50	GC/MSMS	2.10	1.26	-0.4	-0.20	Yes	Yes	No	
54	GC/MSMS	2.32	1.20	0.25	0.14	Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No	No	No
56	GC/HRMS	0.10	28.5	-5.97	-0.15	Yes	No	Yes	Yes
66	GC/MSMS	2.42	0.44	0.53	0.61	No	No	No	Yes
72[1]	GC/MS EI	2.94	0.11	1.99	3.10	Yes	Yes	Yes	Yes
78[1]	GC/MSMS	1.83		-1.11		Yes	Yes	No	Yes
79	GC/ECD[3]	5.76	1.15	9.89	5.68	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 64. DATA REPORTED AND PERFORMANCE EVALUATION FOR *op'*-DDD

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	*z*-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
7	GC/ECD	11.6	3.86	16.7	4.38	No	No	Yes	Yes
15[1]	GC/MSMS	2.56	1.28	-0.76	-0.53	Yes	Yes	Yes	Yes
17	GC/MSMS	4.33	0.75	2.67	2.66	Yes	Yes	Yes	No
25	GC/MSMS	3.34	0.67	0.74	0.79	Yes			Yes
35	GC/MS EI	3.43	0.22	0.9	1.28	Yes	No	No	Yes
40[1]	GC/HRMS	2.14	0.80	-1.59	-1.52	Yes	No	Yes	Yes
42	GC/MSMS	1.53		-2.75		Yes	Yes	Yes[4]	Yes
50	GC/MSMS	1.94	1.16	-1.97	-1.48	Yes	Yes	No	
54	GC/MSMS	3.65	1.90	1.4	0.72	Yes	Yes	No	Yes
56	GC/HRMS	3.32	7.85	0.70	0.09	Yes	No	Yes	Yes
66	GC/MSMS	5.38	0.74	4.71	4.71	No	No	No	Yes
72[1]	GC/MS EI	3	0.14	0.09	0.13	Yes	Yes	Yes	Yes
75	GC/MS EI	6.34		6.57					
78[1]	GC/MSMS	2.77		-0.36		Yes	Yes	No	Yes
79	GC/ECD[3]	2.29	0.46	-1.29	-1.56	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2]GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 65. DATA REPORTED AND PERFORMANCE EVALUATION FOR *op*'-DDT

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	*z*-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
7	GC/ECD	20.4	3.03	10.32	7.48	No	No	Yes	Yes
10	GC/MSMS	6.97		-0.41		Yes	Yes	No	
17	GC/MSMS	7.53	0.83	0.04	0.05	Yes	Yes	Yes	No
25	GC/MSMS	7.05	0.91	-0.34	-0.45	Yes			Yes
27	GC/ECD	4.02		-2.8		Yes	Yes	No	Yes
35	GC/MS EI	9.73	0.60	1.81	2.56	Yes	No	No	Yes
40[1]	GC/HRMS	6.55	0.40	-0.74	-1.09	Yes	No	Yes	Yes
42	GC/MSMS	8.30		0.66		Yes	Yes	Yes[4]	Yes
50	GC/MSMS	6.32	3.79	-0.9	-0.56	Yes	Yes	No	
54	GC/MSMS	10.2	5.10	2.19	1.00	Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No	No	No
56	GC/HRMS	16.3	2.49	7.03	5.85	Yes	No	Yes	Yes
66	GC/MSMS	10.5	2.32	2.45	2.14	No	No	No	Yes
72[1]	GC/MS EI	9.02	0.24	1.24	1.84	Yes	Yes	Yes	Yes
75	GC/MS EI	6.34		-0.91					
78[1]	GC/MSMS	8.03		0.45		Yes	Yes	No	Yes
79	GC/ECD[3]	4.23	0.85	-2.60	-3.50	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2]GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 66. DATA REPORTED AND PERFORMANCE EVALUATION FOR HEPTACHLOR

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
4[1]	GC/MS EI	0.15				Yes	No	No	Yes
7	GC/ECD	0.97	0.37			No	No	Yes	Yes
10	GC/MSMS	0.06				Yes	Yes	No	
14	GC/MS EI	<10				No	No	No	Yes
15[1]	GC/MSMS	<5.0				Yes	Yes	Yes	Yes
23	GC/ECD	9.73						Yes[4]	Yes
25	GC/MSMS	<0.10				Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
35	GC/MS EI	0.11	0.02			Yes	No	No	Yes
40[1]	GC/HRMS	<0.16				Yes	No	Yes	Yes
42	GC/MSMS	<0.08				Yes	Yes	Yes[4]	Yes
45[1]	GC/ECD	2.16				No	No	No	No
54	GC/MSMS	<1.7				Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No	No	No
56	GC/HRMS	0.49	4.00			Yes	No	Yes	Yes
57	GC/MSMS	0.23				Yes	Yes	No	Yes
62	GC/MS EI	0.20	0.07			Yes	No	Yes	No
63	GC/MS EI	1.62	0.27			No	No	Yes[4]	No
66	GC/MSMS	0.40	0.13			No	No	No	Yes
67[1]	GC/ECD	93.03							
72[1]	GC/MS EI	<0.30				Yes	Yes	Yes	Yes
78[1]	GC/MSMS	<1				Yes	Yes	No	Yes
79	GC/ECD[3]	<0.01				Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 67. DATA REPORTED FOR ALDRIN

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
3	GC/MSMS	0.08				No	Yes	Yes	Yes
7	GC/ECD	0.73	0.18			No	No	Yes	Yes
14	GC/MS EI	<10				No	No	No	Yes
15[1]	GC/MSMS	<5.0				Yes	Yes	Yes	Yes
23	GC/ECD	3.97						Yes[4]	Yes
25	GC/MSMS	<0.10				Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
27	GC/ECD	0.28				Yes	Yes	No	Yes
35	GC/MS EI	<0.05				Yes	No	No	Yes
40[1]	GC/HRMS	<0.06				Yes	No	Yes	Yes
45[1]	GC/ECD	2.16				No	No	No	No
54	GC/MSMS	<1.7				Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No	No	No
56	GC/HRMS	0.33	29.9			Yes	No	Yes	Yes
57	GC/MSMS	0.87				Yes	Yes	No	Yes
62	GC/MS EI	0.61	0.11			Yes	No	Yes	No
63	GC/MS EI	1.25	0.38			No	No	Yes[4]	No
66	GC/MSMS	0.18	0.06			No	No	No	Yes
67[1]	GC/ECD	198							
72[1]	GC/MS EI	<0.30				Yes	Yes	Yes	Yes
76	GC/MS EI	487	96			No	Yes		Yes
78[1]	GC/MSMS	<12.5				Yes	Yes	No	Yes
79	GC/ECD[3]	<0.09				Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2]GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 68. DATA REPORTED AND PERFORMANCE EVALUATION FOR DIELDRIN

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
1	GC/MS EI	8.28	1.50	2.88	2.31	Yes	No	No	Yes
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
3	GC/MSMS	4.78		-0.48		No	Yes	Yes	Yes
7	GC/ECD	3.91	1.32	-1.31	-1.31	No	No	Yes	Yes
15[1]	GC/MSMS	<5.0				Yes	Yes	Yes	Yes
23	GC/ECD	5.80		0.5				Yes[4]	Yes
25	GC/MSMS	6.93	1.65	1.59	1.44	Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
35	GC/MS EI	0.18	0.12	-4.89	-6.29	Yes	No	No	Yes
40[1]	GC/HRMS	6.92	0.50	1.6	1.98	Yes	No	Yes	Yes
45[1]	GC/ECD	4.52		-0.72		No	No	No	No
47[1]	GC/ECD	49.3	16.8	42.25	5.23	No	No	No	Yes
50	GC/MSMS	5.29	3.17	0.01	0.01	Yes	Yes	No	
54	GC/MSMS	<3.3				Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No	No	No
56	GC/HRMS	2.19	17.50	-2.96	-0.35	Yes	No	Yes	Yes
62	GC/MS EI	11.3	2.44	5.79	4.75	Yes	No	Yes	No
63	GC/MS EI	2.11	0.89	-3.04	-1.40	No	No	Yes[4]	No
66	GC/MSMS	3.03	0.34	-2.2	-2.72	No	No	No	Yes
67[1]	GC/ECD	153		141					
72[1]	GC/MS EI	5.38	0.40	0.10	0.12	Yes	Yes	Yes	Yes
76	GC/MS EI	201	40	187	9.76	No	Yes		Yes
78[1]	GC/MSMS	<12.5				Yes	Yes	No	Yes
79	GC/ECD[3]	3.28	0.66	-1.92	-2.29	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 69. DATA REPORTED FOR ENDRIN

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
3	GC/MSMS	0.05				No	Yes	Yes	Yes
4[1]	GC/MS EI	0.58				Yes	No	No	Yes
7	GC/ECD	2.92	1.27			No	No	Yes	Yes
15[1]	GC/MSMS	<5.0				Yes	Yes	Yes	Yes
23	GC/ECD	5.42						Yes[4]	Yes
25	GC/MSMS	<0.10				Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
40[1]	GC/HRMS	<0.15				Yes	No	Yes	Yes
45[1]	GC/ECD	3.67				No	No	No	No
47[1]	GC/ECD	7.88	2.68			No	No	No	Yes
54	GC/MSMS	<3.3				Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No	No	No
56	GC/HRMS	1.31	30.7			Yes	No	Yes	Yes
62	GC/MS EI	2.26	0.89			Yes	No	Yes	No
63	GC/MS EI	3.86	0.39			No	No	Yes[4]	No
66	GC/MSMS	0.86	0.26			No	No	No	Yes
78[1]	GC/MSMS	<12.5				Yes	Yes	No	Yes
79	GC/ECD[3]	<0.50				Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 70. DATA REPORTED AND PERFORMANCE EVALUATION FOR *cis*-CHLORDANE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
14	GC/MS EI	<10				No	No	No	Yes
15[1]	GC/MSMS	6.35	3.17	-0.15	-0.07	Yes	Yes	Yes	Yes
23	GC/ECD	2.83		-3.01				Yes[4]	Yes
27	GC/ECD	5.24		-1.04		Yes	Yes	No	Yes
40[1]	GC/HRMS	7.46	0.50	0.8	0.98	Yes	No	Yes	Yes
42	GC/MSMS	3.92		-2.12		Yes	Yes	Yes[4]	Yes
45[1]	GC/ECD	0.67		-4.75		No	No	No	No
54	GC/MSMS	10.6	5.30	3.27	1.41	Yes	Yes	No	Yes
55	GC/MS EI	55		39.3		No	No	No	No
56	GC/HRMS	8.08	30.7	1.26	0.10	Yes	No	Yes	Yes
66	GC/MSMS	5.43	0.58	-0.89	-1.14	No	No	No	Yes
72[1]	GC/MS EI	8.38	0.42	1.50	1.95	Yes	Yes	Yes	Yes
78[1]	GC/MSMS	8.40		1.51		Yes	Yes	No	Yes
79	GC/ECD[3]	5.42	1.08	-0.90	-1.03	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 71. DATA REPORTED AND PERFORMANCE EVALUATION FOR *trans*-CHLORDANE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	*z*-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
14	GC/MS EI	<10				No	No	No	Yes
15[1]	GC/MSMS	<5.0				Yes	Yes	Yes	Yes
23	GC/ECD	4.78		71.3				Yes[4]	Yes
27	GC/ECD	<0.05				Yes	Yes	No	Yes
40[1]	GC/HRMS	0.33	0.03	-0.9	-1.30	Yes	No	Yes	Yes
42	GC/MSMS	5.43		81.8		Yes	Yes	Yes[4]	Yes
45[1]	GC/ECD	0.36		-0.27		No	No	No	No
54	GC/MSMS	<3.3				Yes	Yes	No	Yes
55	GC/MS EI	17		269		No	No	No	No
56	GC/HRMS	0.23	31.6	-2.40	-0.01	Yes	No	Yes	Yes
63	GC/MS EI	0.34	0.06	-0.65	-0.12	No	No	Yes[4]	No
66	GC/MSMS	1.51	0.36	18.3	6.14	No	No	No	Yes
72[1]	GC/MS EI	0.39	0.02	0.22	0.33	Yes	Yes	Yes	Yes
78[1]	GC/MSMS	7.60		117		Yes	Yes	No	Yes
79	GC/ECD[3]	0.42	0.08	0.70	0.77	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2]GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 72. DATA REPORTED AND PERFORMANCE EVALUATION FOR *cis*-NONACHLOR

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	*z*-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
40[1]	GC/HRMS	11.3	0.7	0.01	0.03	Yes	No	Yes	Yes
54	GC/MSMS	11.2	5.60	-0.05	-0.03	Yes	Yes	No	Yes
72[1]	GC/MS EI	13.8	0.9	1.50	2.48	Yes	Yes	Yes	Yes
79	GC/ECD[2]	11.3	2.25	-0.02	-0.03	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS

TABLE 73. DATA REPORTED AND PERFORMANCE EVALUATION FOR *trans*-NONACHLOR

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	*z*-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
40[1]	GC/HRMS	22.1	1.40	0.45	0.62	Yes	No	Yes	Yes
42	GC/MSMS	14.6		-1.67		Yes	Yes	Yes[3]	Yes
54	GC/MSMS	20.2	10.1	-0.10	-0.06	Yes	Yes	No	Yes
72[1]	GC/MS EI	24.2	0.89	1.03	1.46	Yes	Yes	Yes	Yes
79	GC/ECD[2]	20	4	-0.15	-0.17	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 74. DATA REPORTED FOR α-ENDOSULFAN

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
7	GC/ECD	2.19	0.50			No	No	Yes	Yes
15[1]	GC/MSMS	<5.0				Yes	Yes	Yes	Yes
23	GC/ECD	7.2						Yes[4]	Yes
25	GC/MSMS	<0.10				Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
35	GC/MS EI	0.09	0.02			Yes	No	No	Yes
37[1]	GC/MS EI	109							
40[1]	GC/HRMS	<0.5				Yes	No	Yes	Yes
45[1]	GC/ECD	6.75				No	No	No	No
54	GC/MSMS	<3.3				Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No	No	No
56	GC/HRMS	1.61	29.3			Yes	No	Yes	Yes
57	GC/MSMS	2.3				Yes	Yes	No	Yes
62	GC/MS EI	1.23	0.47			Yes	No	Yes	No
63	GC/MS EI	1.12	0.33			No	No	Yes[4]	No
66	GC/MSMS	1.17	0.22			No	No	No	Yes
72[1]	GC/MS EI	<0.30				Yes	Yes	Yes	Yes
78[1]	GC/MSMS	<12.5				Yes	Yes	No	Yes
79	GC/ECD[3]	<0.52				Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 75. DATA REPORTED FOR β-ENDOSULFAN

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
15[1]	GC/MSMS	<5.0				Yes	Yes	Yes	Yes
23	GC/ECD	6.23						Yes[4]	Yes
25	GC/MSMS	<0.10				Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
35	GC/MS EI	<0.06				Yes	No	No	Yes
40[1]	GC/HRMS	<1				Yes	No	Yes	Yes
45[1]	GC/ECD	6.26				No	No	No	No
54	GC/MSMS	<3.3				Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No	No	No
56	GC/HRMS	1.67	28			Yes	No	Yes	Yes
57	GC/MSMS	1.41				Yes	Yes	No	Yes
63	GC/MS EI	1.49	0.21			No	No	Yes[4]	No
66	GC/MSMS	36.2	5.51			No	No	No	Yes
78[1]	GC/MSMS	<12.5				Yes	Yes	No	Yes
79	GC/ECD[3]	<0.09				Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

TABLE 76. DATA REPORTED FOR ENDOSULFAN SULFATE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
15[1]	GC/MSMS	<5.0				Yes	Yes	Yes	Yes
23	GC/ECD	8.6						Yes[3]	Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
45[1]	GC/ECD	2.28				No	No	No	No
54	GC/MSMS	<3.3				Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No	No	No
57	GC/MSMS	0.11				Yes	Yes	No	Yes
66	GC/MSMS	0.74	0.21			No	No	No	Yes
78[1]	GC/MSMS	<12.5				Yes	Yes	No	Yes
79	GC/ECD[2]	<0.18				Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 77. DATA REPORTED AND PERFORMANCE EVALUATION FOR HEPTACHLOR EPOXIDE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
2[1]	GC/ECD[2]	<3.0				No	Yes	No	Yes
7	GC/ECD	1.45	0.49	3.94	2.35	No	No	Yes	Yes
10	GC/MSMS	0.48		-2.01		Yes	Yes	No	
15[1]	GC/MSMS	<5.0				Yes	Yes	Yes	Yes
17	GC/MSMS	0.14	0.11	-4.13	-4.86	Yes	Yes	Yes	No
23	GC/ECD	8.58		47.9				Yes[4]	Yes
25	GC/MSMS	<0.10				Yes			Yes
26	GC/MS EI	<0.0010				Yes	No	No	Yes
35	GC/MS EI	<0.05				Yes	No	No	Yes
40[1]	GC/HRMS	0.84	0.05	0.2	0.25	Yes	No	Yes	Yes
45[1]	GC/ECD	4.40		22.13		No	No	No	No
47[1]	GC/ECD	46.5	15.8	282	5.78	No	No	No	Yes
53	GC/MSMS	<3					Yes	Yes	Yes
54	GC/MSMS	<3.3				Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No	No	No
56	GC/HRMS	0.72	22.4	-0.55	-0.01	Yes	No	Yes	Yes
57	GC/MSMS	0.79		-0.15		Yes	Yes	No	Yes
63	GC/MS EI	0.59	0.15	-1.37	-0.37	No	No	Yes[4]	No
66	GC/MSMS	1.60	0.29	4.9	4.04	No	No	No	Yes
72[1]	GC/MS EI	0.97	0.05	1	1.26	Yes	Yes	Yes	Yes
78[1]	GC/MSMS	<12.5				Yes	Yes	No	Yes
79	GC/ECD[3]	0.61	0.12	-1.24	-1.44	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2]GC/ECD and peak confirmation with dual column
[3] GC/ECD and peak confirmation with GC/MS
[4]Yes of a different matrix of the test sample

I.3. RESULTS REPORTED FOR PBDES

TABLE 78. DATA REPORTED FOR BDE 17

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
17	GC/MSMS	<0.10				Yes	Yes	Yes	No
38[1]	GC/HRMS	0.04	0.27			Yes	Yes	Yes	Yes
40[1]	GC/HRMS	0.03	0.01			Yes	Yes	Yes	Yes
79	GC/ECD[2]	<0.06				Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS

TABLE 79. DATA REPORTED AND PERFORMANCE EVALUATION FOR BDE 28

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
10	GC/MS EI	1		1.37		Yes	Yes	No	Yes
14	GC/MSMS	1.45	0.64	1.19	0.70	Yes	Yes	Yes	Yes
17	GC/HRMS	1.65	0.40	2.15	1.80	Yes	Yes	Yes	No
27	GC/MSMS	1.28		0.37		Yes	Yes		Yes
35	GC/MSMS	1.36	0.02	0.74	1.08	Yes	No	No	Yes
38[1]	GC/MS NCI	1.37	0.29	0.8	0.77	Yes	Yes	Yes	Yes
40[1]	GC/HRMS	1.34	0.12	0.61	0.83	Yes	Yes	Yes	Yes
46[1]	GC/HRMS	0.004	0.32	-5.86	-5.68		Yes	Yes[2]	Yes
49	GC/MSMS	1.08	30	-0.62	-0.01	No	No	Yes	Yes
50	GC/MS EI	0.002	0.001	-5.9	-8.67				
56	GC/HRMS	0.62	6.52	-2.87	-0.18	Yes	No	Yes	Yes
65	GC/HRMS	0.38	0.17	-4.04	-5.12	Yes	No	No	Yes
66	GC/MSMS	0.72	0.22	-2.39	-2.76	No	No	No	Yes
72[1]	GC/MSMS	2.32	0.09	5.41	7.59	Yes	Yes	Yes	Yes
74[1]	GC/MS EI	1.26		0.25		No	Yes		Yes
75	GC/MS EI	0.92		-1.41					
78[1]	GC/MSMS	1.10		-0.53		Yes	Yes	No	Yes
79	GC/MSMS	0.79	0.12	-2.06	-2.80	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 80. DATA REPORTED AND PERFORMANCE EVALUATION FOR BDE 47

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
10	GC/MSMS	25.5		0.88		Yes	Yes	No	Yes
14	GC/HRMS	23.4	10.3	0.29	0.18	Yes	Yes	Yes	Yes
17	GC/MSMS	22.8	10.6	0.11	0.07	Yes	Yes	Yes	No
27	GC/MSMS	22.9		0.15		Yes	Yes		Yes
35	GC/MS NCI	24.1	0.45	0.48	0.80	Yes	No	No	Yes
38[1]	GC/HRMS	24.9	3.58	0.7	0.91	Yes	Yes	Yes	Yes
40[1]	GC/HRMS	21.3	1.60	-0.31	-0.48	Yes	Yes	Yes	Yes
46[1]	GC/MSMS	0.08	0.30	-6.41	-10.76		Yes	Yes[3]	Yes
49	GC/MS EI	13.8	30	-2.47	-0.57	No	No	Yes	Yes
50	GC/MSMS	18.4	11.2	-1.2	-0.67				
56	GC/HRMS	26.8	12.4	1.27	0.67	Yes	No	Yes	Yes
65	GC/MSMS	7.35	3.23	-4.32	-5.73	Yes	No	No	Yes
66	GC/MSMS	14.6	2	-2.24	-3.39	No	No	No	Yes
72[1]	GC/MS EI	28.0	1.40	1.61	2.56	Yes	Yes	Yes	Yes
74[1]	GC/MSMS	21.5		-0.26		No	Yes		Yes
75	GC/MS EI	11.6		-3.10					
78[1]	GC/MSMS	20.9		-0.43		Yes	Yes	No	Yes
79	GC/ECD[2]	23.0	4.60	0.16	0.19	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 81. DATA REPORTED AND PERFORMANCE EVALUATION FOR BDE 49

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
17	GC/MSMS	1.81	0.50	-0.76	-0.77	Yes	Yes	Yes	No
38[1]	GC/HRMS	2.46	0.50	1.13	1.15	Yes	Yes	Yes	Yes
40[1]	GC/HRMS	2	0.70	-0.21	-0.18	Yes	Yes	Yes	Yes
72[1]	GC/MS EI	3.56	0.18	4.28	5.97	Yes	Yes	Yes	Yes
74[1]	GC/MSMS	2.12		0.14		No	Yes		Yes

[1] Laboratory accredited

TABLE 82. DATA REPORTED AND PERFORMANCE EVALUATION FOR BDE 66

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
17	GC/MSMS	1.97	0.90	-1.22	-1.01	Yes	Yes	Yes	No
27	GC/MSMS	2.73		0.38		Yes	Yes		Yes
38[1]	GC/HRMS	2.81	0.82	0.55	0.49	Yes	Yes	Yes	Yes
40[1]	GC/HRMS	2.22	0.77	-0.70	-0.63	Yes	Yes	Yes	Yes
72[1]	GC/MS EI	3.56	0.18	2.12	2.77	Yes	Yes	Yes	Yes
74[1]	GC/MSMS	2.02		-1.1		No	Yes		Yes
79	GC/ECD[2]	2.63	0.52	0.17	0.18	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS

TABLE 83. DATA REPORTED FOR BDE 85

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
17	GC/MSMS	<0.10				Yes	Yes	Yes	No
38[1]	GC/HRMS	0.02	1.01			Yes	Yes	Yes	Yes
40[1]	GC/HRMS	<0.028				Yes	Yes	Yes	Yes
72[1]	GC/MS EI	<0.30				Yes	Yes	Yes	Yes
74[1]	GC/MSMS	0.02				No	Yes		Yes
79	GC/ECD[2]	0.10	0.03			Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS

TABLE 84. DATA REPORTED AND PERFORMANCE EVALUATION FOR BDE 99

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
10	GC/MSMS	1.28		-0.54		Yes	Yes	No	Yes
14	GC/HRMS	1.37	0.60	-0.13	-0.09	Yes	Yes	Yes	Yes
17	GC/MSMS	1.44	0.50	0.15	0.12	Yes	Yes	Yes	No
27	GC/MSMS	1.47		0.30		Yes	Yes		Yes
35	GC/MS NCI	1.57	0.06	0.73	1.12	Yes	No	No	Yes
38[1]	GC/HRMS	1.90	4.82	2.2	0.20	Yes	Yes	Yes	Yes
40[1]	GC/HRMS	1.19	0.08	-0.92	-1.40	Yes	Yes	Yes	Yes
46[1]	GC/MSMS	0.01	0.37	-6.16	-5.96		Yes	Yes[3]	Yes
49	GC/MS EI	4.60	30.00	14.11	0.21	No	No	Yes	Yes
50	GC/MSMS	0.002	0.001	-6.2	-9.73				
56	GC/HRMS	0.57	5.03	-3.67	-0.33	Yes	No	Yes	Yes
65	GC/MSMS	0.43	0.19	-4.31	-5.69	Yes	No	No	Yes
66	GC/MSMS	1.02	0.26	-1.70	-1.99	No	No	No	Yes
72[1]	GC/MS EI	1.88	0.17	2.11	2.87	Yes	Yes	Yes	Yes
74[1]	GC/MSMS	1.34		-0.28		No	Yes		Yes
75	GC/MS EI	0.96		-1.95					
78[1]	GC/MSMS	<2.5				Yes	Yes	No	Yes
79	GC/ECD[2]	1.55	0.31	0.64	0.69	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 85. DATA REPORTED AND PERFORMANCE EVALUATION FOR BDE 100

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
10	GC/MSMS	8.29		0.78		Yes	Yes	No	Yes
14	GC/HRMS	7.72	3.40	0.33	0.22	Yes	Yes	Yes	Yes
17	GC/MSMS	9.33	5.97	1.60	0.68	Yes	Yes	Yes	No
27	GC/MSMS	7.87		0.45		Yes	Yes		Yes
35	GC/MS NCI	10.03	0.35	2.16	3.05	Yes	No	No	Yes
38[1]	GC/HRMS	7.49	1.18	0.2	0.19	Yes	Yes	Yes	Yes
40[1]	GC/HRMS	7.14	0.46	-0.12	-0.17	Yes	Yes	Yes	Yes
46[1]	GC/MSMS	0.03	0.29	-5.74	-8.17		Yes	Yes[3]	Yes
49	GC/MS EI	1.55	30	-4.54	-0.38	No	No	Yes	Yes
50	GC/MSMS	3.59	2.24	-2.9	-2.60				
56	GC/HRMS	0.59	9.91	-5.30	-1.33	Yes	No	Yes	Yes
65	GC/MSMS	10065	1.33	7945.84	9137.85	Yes	No	No	Yes
66	GC/MSMS	5.58	0.90	-1.36	-1.74	No	No	No	Yes
72[1]	GC/MS EI	9.68	0.60	1.88	2.57	Yes	Yes	Yes	Yes
74[1]	GC/MSMS	7.31		0.01		No	Yes		Yes
75	GC/MS EI	3.55		-2.96					
78[1]	GC/MSMS	5.70		-1.26		Yes	Yes	No	Yes
79	GC/ECD[2]	6.78	1.36	-0.41	-0.47	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 86. DATA REPORTED AND PERFORMANCE EVALUATION FOR BDE 153

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
10	GC/MSMS	0.69		0.78		Yes	Yes	No	Yes
14	GC/HRMS	0.77	0.34	1.51	0.85	Yes	Yes	Yes	Yes
17	GC/MSMS	0.65	0.25	0.36	0.26	Yes	Yes	Yes	No
27	GC/MSMS	0.97		3.48		Yes	Yes		Yes
35	GC/MS NCI	0.75	0.08	1.39	1.80	Yes	No	No	Yes
38[1]	GC/HRMS	0.63	0.83	0.1	0.03	Yes	Yes	Yes	Yes
40[1]	GC/HRMS	0.66	0.05	0.49	0.70	Yes	Yes	Yes	Yes
46[1]	GC/MSMS	0.004	0.28	-5.92	-3.89		Yes	Yes[3]	Yes
50	GC/MSMS	0.002	0.001	-5.95	-8.92				
56	GC/HRMS	0.63	9.20	0.2	0.00	Yes	No	Yes	Yes
65	GC/MSMS	0.36	0.16	-2.45	-2.40	Yes	No	No	Yes
66	GC/MSMS	0.42	0.14	-1.91	-2.00	No	No	No	Yes
72[1]	GC/MS EI	0.98	0.05	3.63	5.16	Yes	Yes	Yes	Yes
74[1]	GC/MSMS	0.68		0.64		No	Yes		Yes
75	GC/MS EI	0.38		-2.25					
78[1]	GC/MSMS	<5				Yes	Yes	No	Yes
79	GC/ECD[2]	0.49	0.10	-1.19	-1.44	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 87. DATA REPORTED AND PERFORMANCE EVALUATION FOR BDE 154

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
10	GC/MSMS	5.24		0.69		Yes	Yes	No	Yes
14	GC/HRMS	5.84	2.56	1.43	0.83	Yes	Yes	Yes	Yes
17	GC/MSMS	5.49	2.41	0.99	0.60	Yes	Yes	Yes	No
27	GC/MSMS	7.01		2.88		Yes	Yes		Yes
35	GC/MS NCI	6.96	0.37	2.82	3.87	Yes	No	No	Yes
38[1]	GC/HRMS	5.26	0.63	0.7	0.90	Yes	Yes	Yes	Yes
40[1]	GC/HRMS	4.18	0.27	-0.63	-0.89	Yes	Yes	Yes	Yes
46[1]	GC/MSMS	0.03	0.31	-5.76	-8.05		Yes	Yes[3]	Yes
49	GC/MS EI	1.18	30	-4.33	-0.23	No	No	Yes	Yes
50	GC/MSMS	2.03	1.27	-3.3	-3.15				
56	GC/HRMS	0.53	9.17	-5.14	-0.90	Yes	No	Yes	Yes
65	GC/MSMS	1.73	0.76	-3.66	-4.38	Yes	No	No	Yes
66	GC/MSMS	6.64	0.93	2.41	2.70	No	No	No	Yes
72[1]	GC/MS EI	6.84	0.46	2.67	3.58	Yes	Yes	Yes	Yes
74[1]	GC/MSMS	4.88		0.24		No	Yes		Yes
75	GC/MS EI	3.24		-1.78					
78[1]	GC/MSMS	3.73		-1.18		Yes	Yes	No	Yes
79	GC/ECD[2]	4.14	0.83	-0.67	-0.78	Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS
[3]Yes of a different matrix of the test sample

TABLE 88. DATA REPORTED FOR BDE 183

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
14	GC/HRMS	<0.008				Yes	Yes	Yes	Yes
17	GC/MSMS	<0.20				Yes	Yes	Yes	No
38[1]	GC/HRMS	<0.01	1.52			Yes	Yes	Yes	Yes
40[1]	GC/HRMS	0.02	0.002			Yes	Yes	Yes	Yes
56	GC/HRMS	0.29	8.25			Yes	No	Yes	Yes
66	GC/MSMS	0.42	0.15			No	No	No	Yes
72[1]	GC/MS EI	<0.30				Yes	Yes	Yes	Yes
74[1]	GC/MSMS	0.002				No	Yes		Yes

[1] Laboratory accredited

TABLE 89. DATA REPORTED FOR BDE 209

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
17	GC/MSMS	2.80	1.17			Yes	Yes	Yes	No
38[1]	GC/HRMS	<2	12.33			Yes	Yes	Yes	Yes
40[1]	GC/HRMS	0.05	0.01			Yes	Yes	Yes	Yes
56	GC/HRMS	80	378			Yes	No	Yes	Yes
74[1]	GC/MSMS	0.10				No	Yes		Yes
79	GC/ECD[2]	<2.05				Yes	Yes	Yes	Yes

[1] Laboratory accredited
[2] GC/ECD and peak confirmation with GC/MS

I.4. RESULTS REPORTED FOR PAHS

TABLE 90. DATA REPORTED AND PERFORMANCE EVALUATION FOR NAPHTHALENE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
5	GC/MSMS	23.3		1.27			Yes	Yes	Yes
12	GC/MS EI	8.91		-2.60		Yes	No	Yes	
15[1]	GC/MSMS	33.7	16.7	4.09	1.70	Yes	Yes	Yes	Yes
22		0.14		-4.96				Yes	
25	GC/MSMS	66.4	3.22	12.88	14.42	Yes			
26	GC/MS EI	0.53		-4.8		No	Yes		Yes
35	GC/MS EI	16.2	0.55	-0.64	-0.82	Yes	No	No	Yes
36	HPLC-Fluo	2.34	0.19	-4.36	-5.58	No	No	Yes	No
37	GC/MS EI	127		29.18		No	No		No
42	HPLC-Fluo	13.7		-1.3		Yes	No	Yes	Yes
45	GC/MS	0.03		-4.98		No	No	No	No
52	GC/MSMS	23.5	0.58	1.32	1.69	Yes	Yes	No	Yes
55	GC/MS EI	339		86.23		No	No		
65	GC/MS EI	15.9	7	-0.71	-0.58	Yes	Yes	Yes[2]	Yes
66	HPLC-Fluo	21.5	3.20	0.78	0.88	No		No	Yes
67[1]	GC/MS EI	3131		837.42		No	No	Yes	No
72[1]	GC/MS EI	11.0	0.51	-2.03	-2.59	Yes	Yes	Yes[2]	Yes
76	HPLC-UV	57.0	10	10.35	6.65	No	No	Yes[2]	Yes
78[1]	GC/MSMS	23.5		1.3		Yes	Yes	No	Yes
79	GC/MSMS	8.67	2.61	-2.66	-3.11	Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 91. DATA REPORTED AND PERFORMANCE EVALUATION FOR 1-METHYLNAPHTHALENE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
12	GC/MS EI	9.04		-2.13		Yes	No	Yes	
15[1]	GC/MSMS	18.9	9.45	1.73	0.87	Yes	Yes	Yes	Yes
25	GC/MSMS	21.7	2.53	2.82	3.27	Yes			
49[1]	GC/MS EI	13.7	12.2	-0.31	-0.13	No	No	Yes	Yes
55	GC/MS EI	15.7		0.47		No	No		
72[1]	GC/MS EI	12.4	1.10	-0.8	-1.10	Yes	Yes	Yes[2]	Yes
79	GC/MSMS	14.1	4.22	-0.17	-0.15	Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 92. DATA REPORTED AND PERFORMANCE EVALUATION FOR 2-METHYLNAPHTHALENE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
12	GC/MS EI	13.1		-1.35		Yes	No	Yes	
15[1]	GC/MSMS	41.1	20.6	5.73	2.10	Yes	Yes	Yes	Yes
25	GC/MSMS	10.2	1.12	-2.09	-2.54	Yes			
49[1]	GC/MS EI	22.5	12.2	1.01	0.58	No	No	Yes	Yes
55	GC/MS EI	23.3		1.24		No	No		
72[1]	GC/MS EI	17.2	0.89	-0.3	-0.38	Yes	Yes	Yes[2]	Yes
78[1]	GC/MSMS	<20				Yes	Yes	No	Yes
79	GC/MSMS	21.9	6.56	0.87	0.75	Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 93. DATA REPORTED AND PERFORMANCE EVALUATION FOR ACENAPHTHYLENE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
5	GC/MSMS	1.98		6.68			Yes	Yes	Yes
12	GC/MS EI	2.44		9.64		Yes	No	Yes	
15[1]	GC/MSMS	<5				Yes	Yes	Yes	Yes
22		0.83		-0.70				Yes	
25	GC/MSMS	0.86	0.26	-0.47	-0.44	Yes			
26	GC/MS EI	<0.0010				No	Yes		Yes
35	GC/MS EI	0.25	0.02	-4.39	-6.62	Yes	No	No	Yes
45	GC/MS	0.003		-5.99		No	No	No	No
52	GC/MSMS	2.19	0.32	8.07	6.61	Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No		
56	GC/HRMS	0.14	8.93	-5.11	-0.18	Yes	No	Yes	Yes
65	GC/MS EI	5.30	2.30	28.0	3.62	Yes	Yes	Yes[2]	Yes
66	HPLC-Fluo	15.1	1.81	90.7	15.6	No		No	Yes
67[1]	GC/MS EI	<1.75				No	No	Yes	No
72[1]	GC/MS EI	0.90		-0.23		Yes	Yes	Yes[2]	Yes
76	HPLC-UV	261	50	1668	10.4	No	No	Yes[2]	Yes
78[1]	GC/MSMS	<2.5				Yes	Yes	No	Yes
79	GC/MSMS	0.50	0.16	-2.80	-3.35	Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 94. DATA REPORTED AND PERFORMANCE EVALUATION FOR ACENAPHTHENE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
5	GC/MSMS	1.8		0.47			Yes	Yes	Yes
12	GC/MS EI	5.61		10.7		Yes	No	Yes	
14	HPLC-Fluo	<5				No	No	No	
15[1]	GC/MSMS	<5				Yes	Yes	Yes	Yes
22		0.81		-2.17				Yes	
25	GC/MSMS	1.07	0.16	-1.5	-1.71	Yes			
26	GC/MS EI	<0.0010				No	Yes		Yes
35	GC/MS EI	0.81	0.04	-2.16	-2.57	Yes	No	No	Yes
36	HPLC-Fluo	1.23	1.00	-1.04	-0.66	No	No	Yes	No
42	HPLC-Fluo	0.70		-2.5		Yes	No	Yes	Yes
49[1]	GC/MS EI	3.57	11.8	5.23	0.33	No	No	Yes	Yes
52	GC/MSMS	2.51	0.32	2.39	2.54	Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No		
56	GC/HRMS	0.12	25	-4.02	-0.12	Yes	No	Yes	Yes
65	GC/MS EI	1.93	0.90	0.84	0.62	Yes	Yes	Yes[2]	Yes
66	HPLC-Fluo	3.43	0.75	4.85	3.68	No		No	Yes
67[1]	GC/MS EI	<1.75				No	No	Yes	No
72[1]	GC/MS EI	1.70	0.14	0.22	0.25	Yes	Yes	Yes[2]	Yes
76	HPLC-UV	267	40	711	13.3	No	No	Yes[2]	Yes
78[1]	GC/MSMS	33.2		85		Yes	Yes	No	Yes
79	GC/MSMS	1.10	0.33	-1.39	-1.48	Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 95. DATA REPORTED AND PERFORMANCE EVALUATION FOR FLUORENE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
5	GC/MSMS	4.37		0.44			Yes	Yes	Yes
12	GC/MS EI	3.37		-0.90		Yes	No	Yes	
15[1]	GC/MSMS	8.13	4.06	5.50	1.95	Yes	Yes	Yes	Yes
22		0.13		-5.25				Yes	
25	GC/MSMS	4.57	0.74	0.72	0.81	Yes			
26	GC/MS EI	<0.0010				No	Yes		Yes
35	GC/MS EI	1.97	0.17	-2.78	-3.74	Yes	No	No	Yes
36	HPLC-Fluo	3.43	0.70	-0.82	-0.94	No	No	Yes	No
42	HPLC-Fluo	3.50		-0.72		Yes	No	Yes	Yes
45	GC/MS	0.0				No	No	No	No
47[1]	HPLC-Fluo	33.8		40.1	8.70	No	No	No	Yes
49[1]	GC/MS EI	1.84	12.2	-2.96	-0.36	No	No	Yes	Yes
52	GC/MSMS	5.89	0.32	2.50	3.26	Yes	Yes	No	Yes
55	GC/MS EI	17		17.4		No	No		
56	GC/HRMS	0.18	2.47	-5.19	-2.85	Yes	No	Yes	Yes
65	GC/MS EI	6.80	3	3.72	1.73	Yes	Yes	Yes[2]	Yes
66	HPLC-Fluo	5.34	0.96	1.75	1.79	No		No	Yes
67[1]	GC/MS EI	<1.75				No	No	Yes	No
72[1]	GC/MS EI	2.36	0.11	-2.25	-3.05	Yes	Yes	Yes[2]	Yes
76	HPLC-UV	15.3	4	15.2	5.45	No	No	Yes[2]	Yes
78[1]	GC/MSMS	<2.5				Yes	Yes	No	Yes
79	GC/MSMS	1.90	0.58	-2.87	-3.46	Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 96. DATA REPORTED AND PERFORMANCE EVALUATION FOR PHENANTHRENE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
5	GC/MSMS	15.3		1.58			Yes	Yes	Yes
12	GC/MS EI	8.54		-1.46		Yes	No	Yes	
15[1]	GC/MSMS	18.7	9.35	3.10	1.39	Yes	Yes	Yes	Yes
19[1]	GC/MSMS	9.36		-1.09			Yes		Yes
22		0.53		-5.05				Yes	
25	GC/MSMS	10.6	2.05	-0.6	-0.63	Yes			
26	GC/MS EI	<0.0010				No	Yes		Yes
35	GC/MS EI	11.4	0.46	-0.17	-0.23	Yes	No	No	Yes
36	HPLC-Fluo	21.2	19.7	4.24	0.94	No	No	Yes	No
42	HPLC-Fluo	16.1		1.9		Yes	No	Yes	Yes
45	GC/MS	0.003		-5.29		No	No	No	No
47[1]	HPLC-Fluo	691		305	9.83	No	No	No	Yes
49[1]	GC/MS EI	8.57	12.2	-1.44	-0.51	No	No	Yes	Yes
52	GC/MSMS	18.2	0.32	2.87	3.80	Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No		
56	GC/HRMS	0.06	32.9	-5.26	-0.71	Yes	No	Yes	Yes
65	GC/MS EI	23.6	10.4	5.30	2.16	Yes	Yes	Yes[2]	Yes
66	HPLC-Fluo	40.5	4	12.9	11	No		No	Yes
67[1]	GC/MS EI	401		174		No	No	Yes	No
72[1]	GC/MS EI	12.2	0.90	0.19	0.24	Yes	Yes	Yes[2]	Yes
76	HPLC-UV	5		-3.04		No	No	Yes[2]	Yes
78[1]	GC/MSMS	9.10		-1.21		Yes	Yes	No	Yes
79	GC/MSMS	8.10	2.43	-1.65	-1.78	Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 97. DATA REPORTED FOR ANTHRACENE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
4[1]	GC/MS EI	5.45				Yes	No	No	
5	GC/MSMS	2.12					Yes	Yes	Yes
12	GC/MS EI	2.36				Yes	No	Yes	
15[1]	GC/MSMS	<10				Yes	Yes	Yes	Yes
19[1]	GC/MSMS	<0.5					Yes		Yes
25	GC/MSMS	1.85	0.35			Yes			
26	GC/MS EI	<0.0010				No	Yes		Yes
35	GC/MS EI	0.31	0.03			Yes	No	No	Yes
42	HPLC-Fluo	0.63				Yes	No	Yes	Yes
45	GC/MS	0.0				No	No	No	No
47[1]	HPLC-Fluo	126				No	No	No	Yes
52	GC/MSMS	1.74	0.32			Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No		
56	GC/HRMS	0.14	5.76			Yes	No	Yes	Yes
65	GC/MS EI	<0.1				Yes	Yes	Yes[2]	Yes
66	HPLC-Fluo	0.28	0.10			No		No	Yes
67[1]	GC/MS EI	<1.75				No	No	Yes	No
72[1]	GC/MS EI	<0.67				Yes	Yes	Yes[2]	Yes
76	HPLC-UV	7.50				No	No	Yes[2]	Yes
78[1]	GC/MSMS	1				Yes	Yes	No	Yes
79	GC/MSMS	<0.3				Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 98. DATA REPORTED AND PERFORMANCE EVALUATION FOR 1-METHYLPHENANTHRENE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
25	GC/MSMS	14.3	73			Yes			
72[1]	GC/MS EI	2.30	0.14			Yes	Yes	Yes[2]	Yes
79	GC/MSMS	3.15	0.95			Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 99. DATA REPORTED AND PERFORMANCE EVALUATION FOR 2-METHYLPHENANTHRENE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
72[1]	GC/MS EI	4.04	0.22			Yes	Yes	Yes[2]	Yes
79	GC/MSMS	5.90	1.77			Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 100. DATA REPORTED FOR BENZ[*a*]ANTHRACENE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
4[1]	GC/MS EI	19				Yes	No	No	
5	GC/MSMS	0.49					Yes	Yes	Yes
12	GC/MS EI	2.63				Yes	No	Yes	
15[1]	GC/MSMS	16.4	8.20			Yes	Yes	Yes	Yes
19[1]	GC/MSMS	<0.1					Yes		Yes
22		1.83						Yes	
25	GC/MSMS	3.47	2.67			Yes			
26	GC/MS EI	<0.0010				No	Yes		Yes
35	GC/MS EI	<0.2				Yes	No	No	Yes
36	HPLC-Fluo	15.2	3.79			No	No	Yes	No
42	HPLC-Fluo	0.60				Yes	No	Yes	Yes
45	GC/MS	0.61				No	No	No	No
47[1]	HPLC-Fluo	145				No	No	No	Yes
55	GC/MS EI	<10				No	No		
56	GC/HRMS	0.06	21.3			Yes	No	Yes	Yes
65	GC/MS EI	<0.1				Yes	Yes	Yes[2]	Yes
66	HPLC-Fluo	0.63	0.19			No		No	Yes
67[1]	GC/MS EI	287				No	No	Yes	No
72[1]	GC/MS EI	<0.53				Yes	Yes	Yes[2]	Yes
74[1]	GC/MSMS	<0.3				No	Yes	No	Yes
76	HPLC-UV	40	8			No	No	Yes[2]	Yes
78[1]	GC/MSMS	<2.5				Yes	Yes	No	Yes
79	GC/MSMS	<0.7				Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 101. DATA REPORTED FOR CHRYSENE (+ TRYPHENYLENE)

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
5	GC/MSMS	1.45					Yes	Yes	Yes
12	GC/MS EI	1.05				Yes	No	Yes	
15[1]	GC/MSMS	<10				Yes	Yes	Yes	Yes
19[1]	GC/MSMS	<0.1					Yes		Yes
22		16.2						Yes	
25	GC/MSMS	2.31	0.47			Yes			
26	GC/MS EI	<0.0010				No	Yes		Yes
35	GC/MS EI	<0.2				Yes	No	No	Yes
36	HPLC-Fluo	10.8	2.34			No	No	Yes	No
42	HPLC-Fluo	0.63				Yes	No	Yes	Yes
45	GC/MS	0.03				No	No	No	No
47[1]	HPLC-Fluo	103				No	No	No	Yes
55	GC/MS EI	<10				No	No		
56	GC/HRMS	0.05	29.6			Yes	No	Yes	Yes
65	GC/MS EI	0.83	0.40			Yes	Yes	Yes[2]	Yes
66	HPLC-Fluo	1.42	0.28			No		No	Yes
67[1]	GC/MS EI	<1.75				No	No	Yes	No
72[1]	GC/MS EI	<0.53				Yes	Yes	Yes[2]	Yes
74[1]	GC/MSMS	<0.3				No	Yes	No	Yes
76	HPLC-UV	2.33				No	No	Yes[2]	Yes
78[1]	GC/MSMS	<2.5				Yes	Yes	No	Yes
79	GC/MSMS	<0.4				Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 102. DATA REPORTED FOR FLUORANTHENE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
4[1]	GC/MS EI	14.9				Yes	No	No	
5	GC/MSMS	4.34					Yes	Yes	Yes
12	GC/MS EI	3.49				Yes	No	Yes	
15[1]	GC/MSMS	24.4	12.2			Yes	Yes	Yes	Yes
19[1]	GC/MSMS	<0.5					Yes		Yes
22		0.74						Yes	
25	GC/MSMS	4.51	4.92			Yes			
26	GC/MS EI	<0.0010				No	Yes		Yes
35	GC/MS EI	0.42	0.17			Yes	No	No	Yes
36	HPLC-Fluo	28.48	5.43			No	No	Yes	No
42	HPLC-Fluo	1.63				Yes	No	Yes	Yes
45	GC/MS	0.002				No	No	No	No
52	GC/MSMS	3.58	0.32			Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No		
56	GC/HRMS	0.06	21.6			Yes	No	Yes	Yes
65	GC/MS EI	8.07	3.60			Yes	Yes	Yes[2]	Yes
66	HPLC-Fluo	5.96	1.20			No		No	Yes
67[1]	GC/MS EI	222				No	No	Yes	No
72[1]	GC/MS EI	1.02	0.10			Yes	Yes	Yes[2]	Yes
76	HPLC-UV	4				No	No	Yes[2]	Yes
78[1]	GC/MSMS	<2.5				Yes	Yes	No	Yes
79	GC/MSMS	<0.25				Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 103. DATA REPORTED FOR PYRENE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
5	GC/MSMS	3.82					Yes	Yes	Yes
12	GC/MS EI	0.0				Yes	No	Yes	
15[1]	GC/MSMS	<10				Yes	Yes	Yes	Yes
19[1]	GC/MSMS	<0.5					Yes		Yes
22		0.76						Yes	
25	GC/MSMS	4.01	3.17			Yes			
26	GC/MS EI	<0.0010				No	Yes		Yes
35	GC/MS EI	0.44	0.12			Yes	No	No	Yes
36	HPLC-Fluo	11.1	8.61			No	No	Yes	No
42	HPLC-Fluo	1.78				Yes	No	Yes	Yes
45	GC/MS	0.08				No	No	No	No
52	GC/MSMS	7.17	0.28			Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No		
56	GC/HRMS	0.04	26.80			Yes	No	Yes	Yes
65	GC/MS EI	4.47	2			Yes	Yes	Yes[2]	Yes
66	HPLC-Fluo	3.39	0.82			No		No	Yes
67[1]	GC/MS EI	144				No	No	Yes	No
72[1]	GC/MS EI	0.84				Yes	Yes	Yes[2]	Yes
76	HPLC-UV	37.7	8			No	No	Yes[2]	Yes
78[1]	GC/MSMS	<2.5				Yes	Yes	No	Yes
79	GC/MSMS	<0.24				Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 104. DATA REPORTED FOR BENZO[a]PYRENE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
4[1]	GC/MS EI	18.1				Yes	No	No	
12	GC/MS EI	0.0				Yes	No	Yes	
5	GC/MSMS	0.13					Yes	Yes	Yes
14	HPLC-Fluo	<5				No	No	No	
15[1]	GC/MSMS	<10				Yes	Yes	Yes	Yes
19[1]	GC/MSMS	<0.1					Yes		Yes
22		<0.3						Yes	
25	GC/MSMS	2.88	1.33			Yes			
26	GC/MS EI	0.58				No	Yes		Yes
35	GC/MS EI	<0.2				Yes	No	No	Yes
42	HPLC-Fluo	<0.5				Yes	No	Yes	Yes
45	GC/MS	0.12				No	No	No	No
47[1]	HPLC-Fluo	14.2				No	No	No	Yes
55	GC/MS EI	<10				No	No		
56	GC/HRMS	0.09	13			Yes	No	Yes	Yes
65	GC/MS EI	<0.1				Yes	Yes	Yes[2]	Yes
66	HPLC-Fluo	2.53	0.51			No		No	Yes
67[1]	GC/MS EI	237				No	No	Yes	No
72[1]	GC/MS EI	<0.54				Yes	Yes	Yes[2]	Yes
74[1]	GC/MSMS	<0.3				No	Yes	No	Yes
76	HPLC-UV	6.67				No	No	Yes[2]	Yes
78[1]	GC/MSMS	<2.5				Yes	Yes	No	Yes
79	GC/MSMS	<0.17				Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 105. DATA REPORTED FOR BENZO[e]PYRENE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	z-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
19[1]	GC/MSMS	<0.5					Yes		Yes
25	GC/MSMS	2.61	1.65			Yes			
26	GC/MS EI	<0.0010				No	Yes		Yes
35	GC/MS EI	<0.2				Yes	No	No	Yes
45	GC/MS	0.38				No	No	No	No
67[1]	GC/MS EI	152				No	No	Yes	No
72[1]	GC/MS EI	<0.53				Yes	Yes	Yes[2]	Yes
78[1]	GC/MSMS	<2.5				Yes	Yes	No	Yes
79	GC/MSMS	<0.14				Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 106. DATA REPORTED FOR BENZO[*b*+*j*]FLUORANTHENE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	*z*-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
4[1]	GC/MS EI	36				Yes	No	No	
5	GC/MSMS	0.35					Yes	Yes	Yes
12	GC/MS EI	0.0				Yes	No	Yes	
15[1]	GC/MSMS	<10				Yes	Yes	Yes	Yes
19[1]	GC/MSMS	<0.1					Yes		Yes
22		3.11							
25	GC/MSMS	2.62	0.53			Yes			
26	GC/MS EI	0.52				No	Yes		Yes
35	GC/MS EI	<0.2				Yes	No	No	Yes
42	HPLC-Fluo	0.67				Yes	No	Yes	Yes
45	GC/MS	0.23				No	No	No	No
47[1]	HPLC-Fluo	29.4				No	No	No	Yes
55	GC/MS EI	<10				No	No		
56	GC/HRMS	0.05	27.8			Yes	No	Yes	Yes
65	GC/MS EI	0.83	0.40			Yes	Yes	Yes[2]	Yes
66	HPLC-Fluo	3.69	0.63			No		No	Yes
67[1]	GC/MS EI	<1.75				No	No	Yes	No
72[1]	GC/MS EI	<0.53				Yes	Yes	Yes[2]	Yes
74[1]	GC/MSMS	<0.3				No	Yes	No	Yes
76	HPLC-UV	26.7	4			No	No	Yes[2]	Yes
78[1]	GC/MSMS	<2.5				Yes	Yes	No	Yes
79	GC/MSMS	<0.20				Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

TABLE 107. DATA REPORTED FOR BENZO[*g,h,i*]PERYLENE

Lab code	Instrument Type	X_{lab} µg kg^{-1} dw	U_{lab} (k=2) µg kg^{-1} dw	*z*-score	Zeta-score	Surrogate	Internal Standard	Reference Material	QA/QC
4[1]	GC/MS EI	19				Yes	No	No	
5	GC/MSMS	0.12					Yes	Yes	Yes
12	GC/MS EI	0.0				Yes	No	Yes	
15[1]	GC/MSMS	<10				Yes	Yes	Yes	Yes
19[1]	GC/MSMS	<0.5					Yes		Yes
25	GC/MSMS	2.74	1.26			Yes			
26	GC/MS EI	<0.0010				No	Yes		Yes
35	GC/MS EI	<0.2				Yes	No	No	Yes
42	HPLC-Fluo	<0.5				Yes	No	Yes	Yes
45	GC/MS	0.99				No	No	No	No
47[1]	HPLC-Fluo	7.12				No	No	No	Yes
52	GC/MSMS	10.8	1.76			Yes	Yes	No	Yes
55	GC/MS EI	<10				No	No		
56	GC/HRMS	0.11	6.84			Yes	No	Yes	Yes
65	GC/MS EI	0.93	0.40			Yes	Yes	Yes[2]	Yes
66	HPLC-Fluo	2.15	0.52			No		No	Yes
67[1]	GC/MS EI	<1.75				No	No	Yes	No
72[1]	GC/MS EI	<0.53				Yes	Yes	Yes[2]	Yes
74[1]	GC/MSMS	<0.3				No	Yes	No	Yes
76	HPLC-UV	69.7	12			No	No	Yes[2]	Yes
78[1]	GC/MSMS	<2.5				Yes	Yes	No	Yes
79	GC/MSMS	<0.6				Yes	Yes	Yes[2]	Yes

[1] Laboratory accredited
[2]Yes of a different matrix of the test sample

APPENDIX II: REPRESENTATION OF LABORATORY PERFORMANCES

II.1. LABORATORIES PERFORMANCES FOR PCB CONGENERS

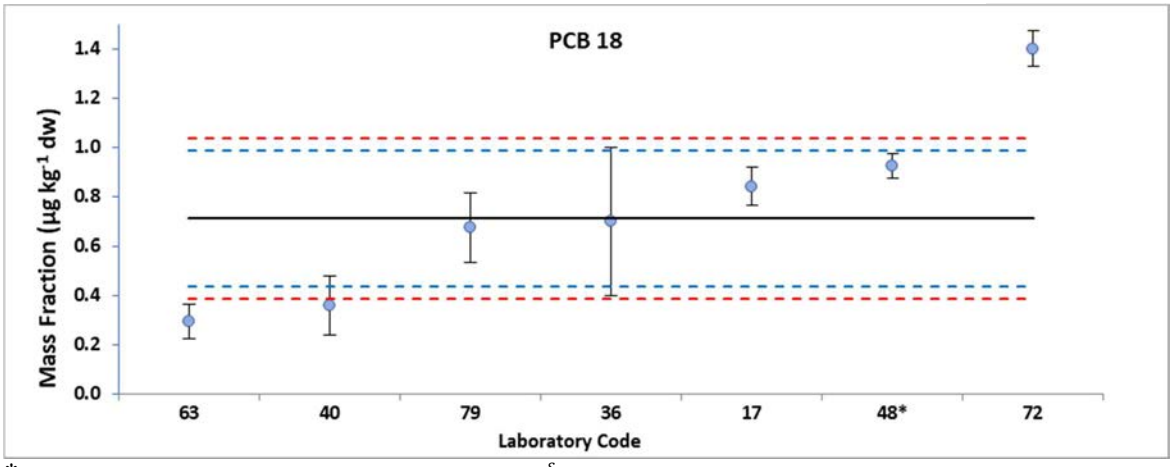
Evaluation of Reported data for PCB 18

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	57%	29%	14%
Zeta-score	67%	17%	17%

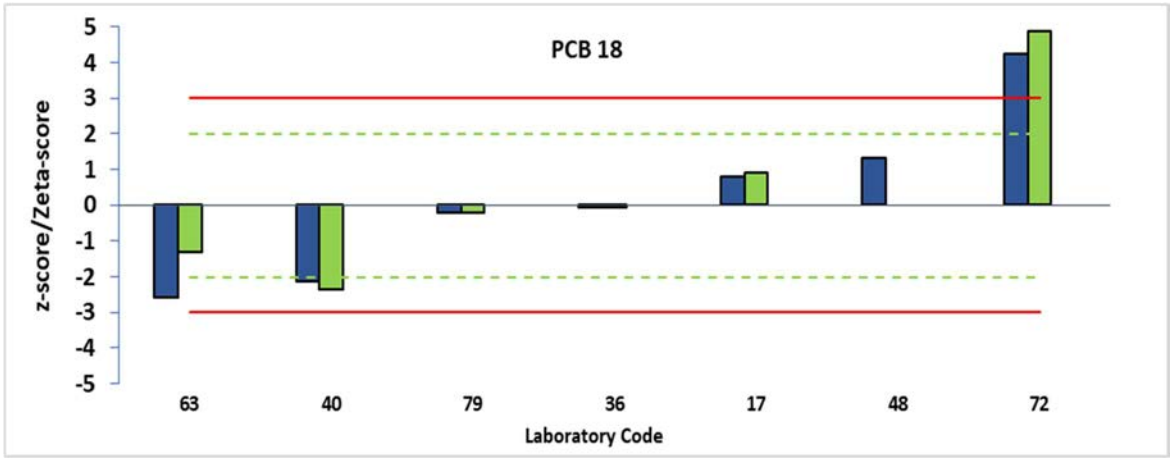
Assigned value (X_a)	0.71 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.27 µg kg^{-1}
2 Total error	0.33 µg kg^{-1}
Number of results reported	9
Number of results accepted	5

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - -$X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



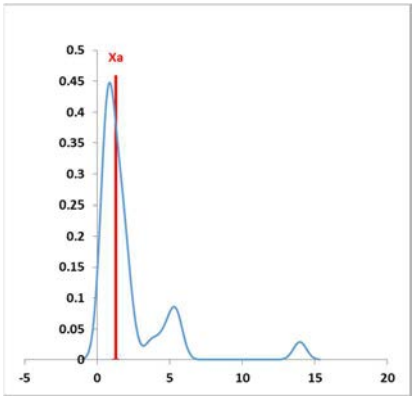
Evaluation of Reported data for PCB 28

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	39%	26%	35%
Zeta-score	33%	28%	39%

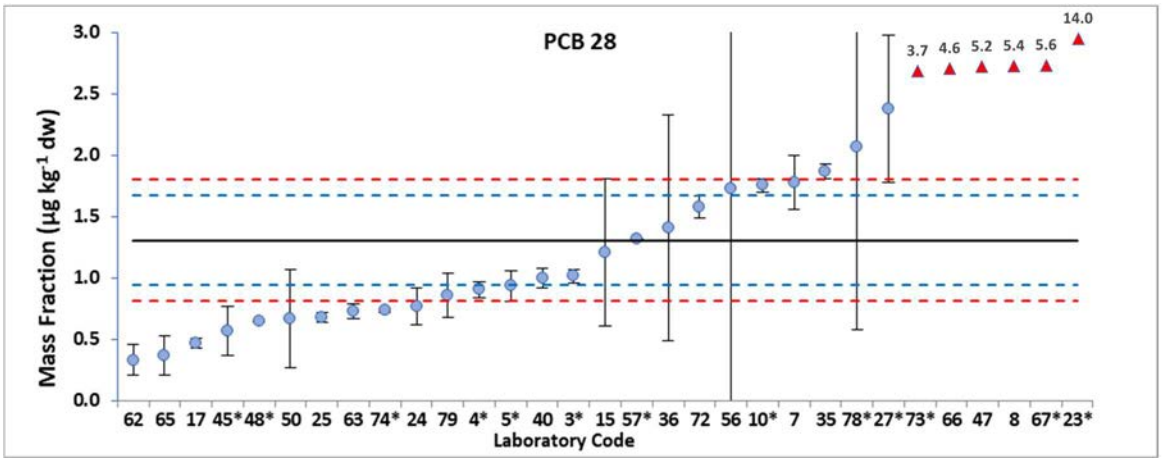
Assigned value (X_a)	1.31 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.37 µg kg^{-1}
2 Total error	0.49 µg kg^{-1}
Number of results reported	33
Number of results accepted	17

Kernel density plot:



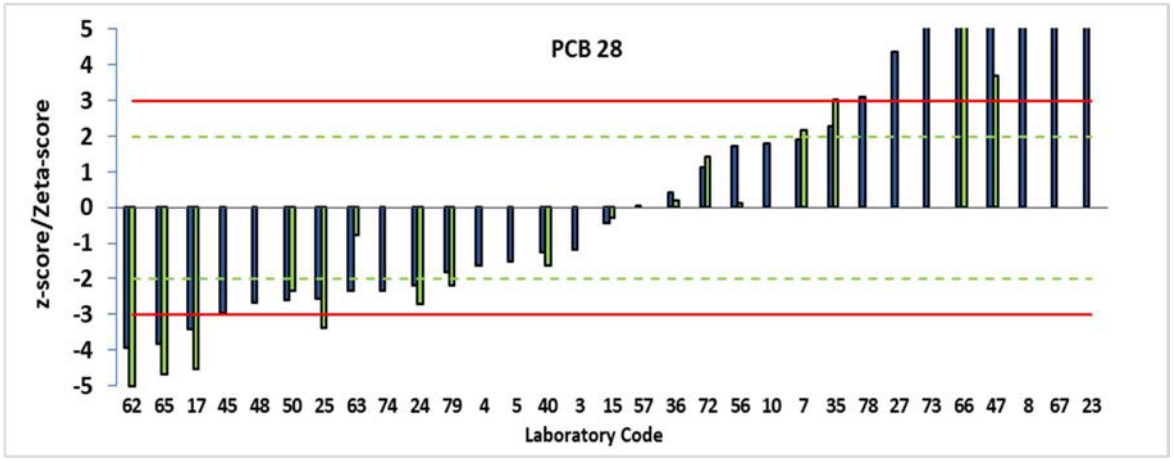
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



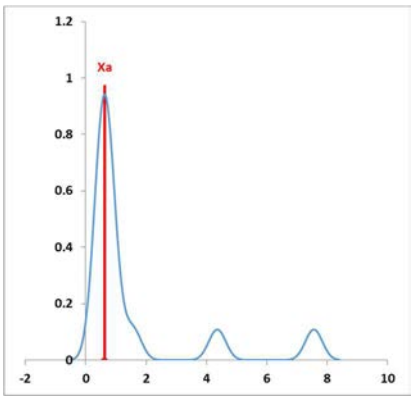
Evaluation of Reported data for PCB 31

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	69%	8%	23%
Zeta-score	67%	11%	22%

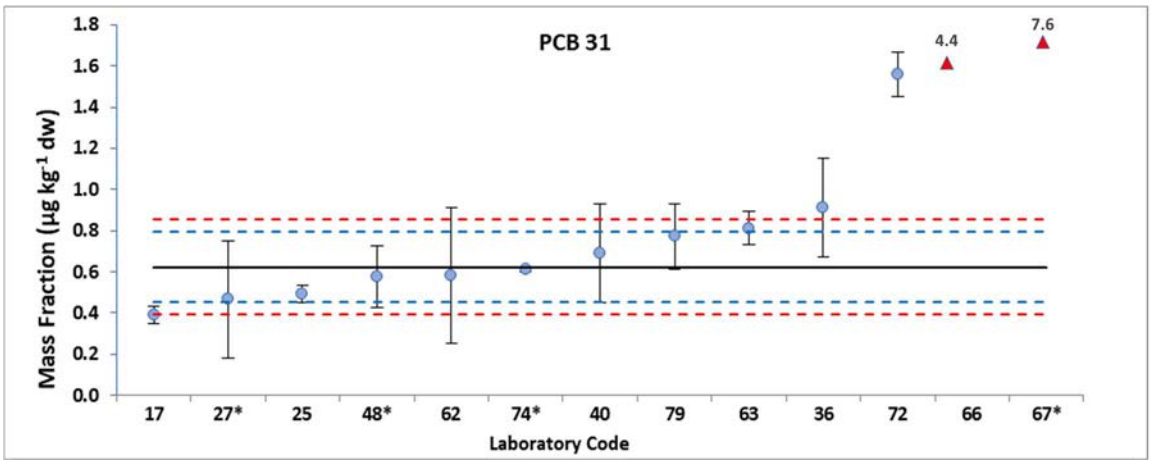
Assigned value (X_a)	0.62 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.17 µg kg^{-1}
2 Total error	0.23 µg kg^{-1}
Number of results reported	14
Number of results accepted	10

Kernel density plot:



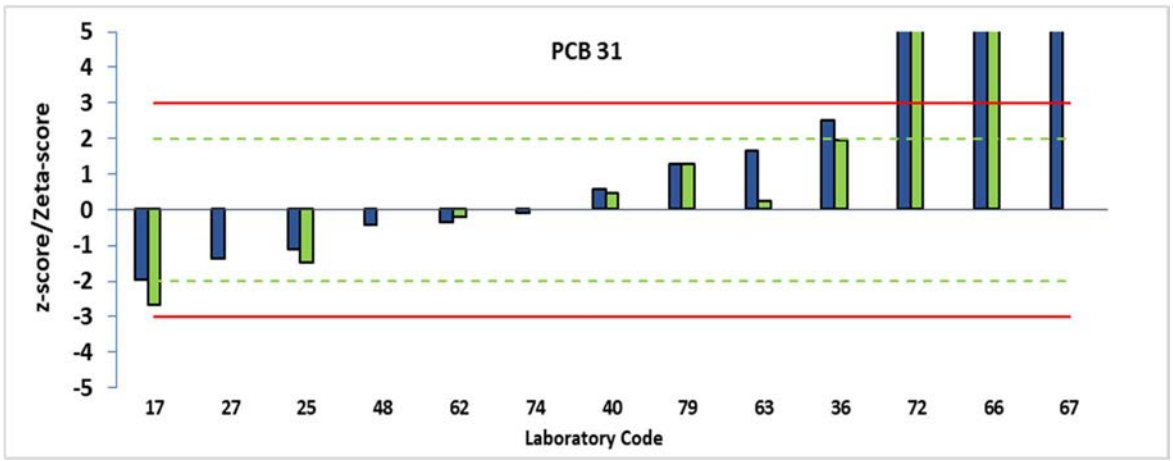
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



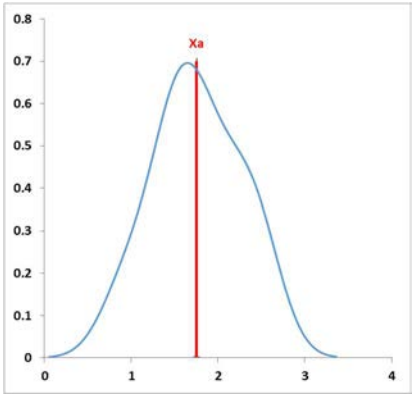
Evaluation of Reported data for PCB 44

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	75%	25%	0%
Zeta-score	83%	17%	0%

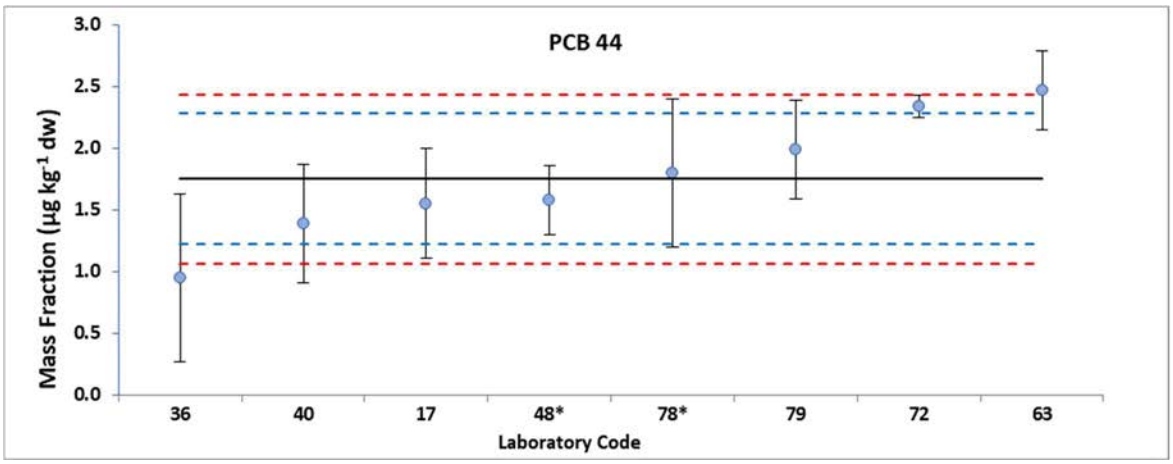
Assigned value (X_a)	1.75 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.53 µg kg^{-1}
2 Total error	0.69 µg kg^{-1}
Number of results reported	9
Number of results accepted	8

Kernel density plot:



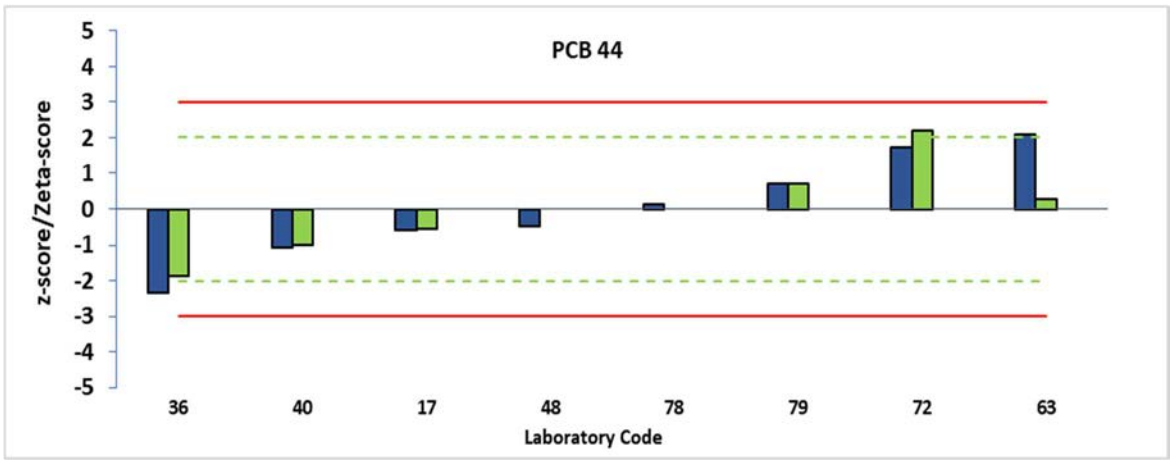
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



Evaluation of Reported data for PCB 49

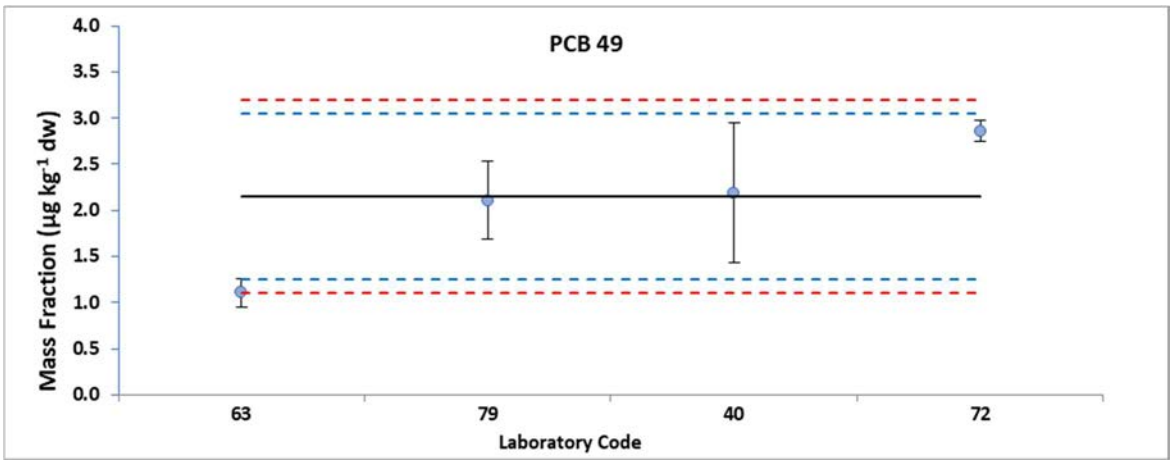
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	75%	25%	0%
Zeta-score	100%	0%	0%

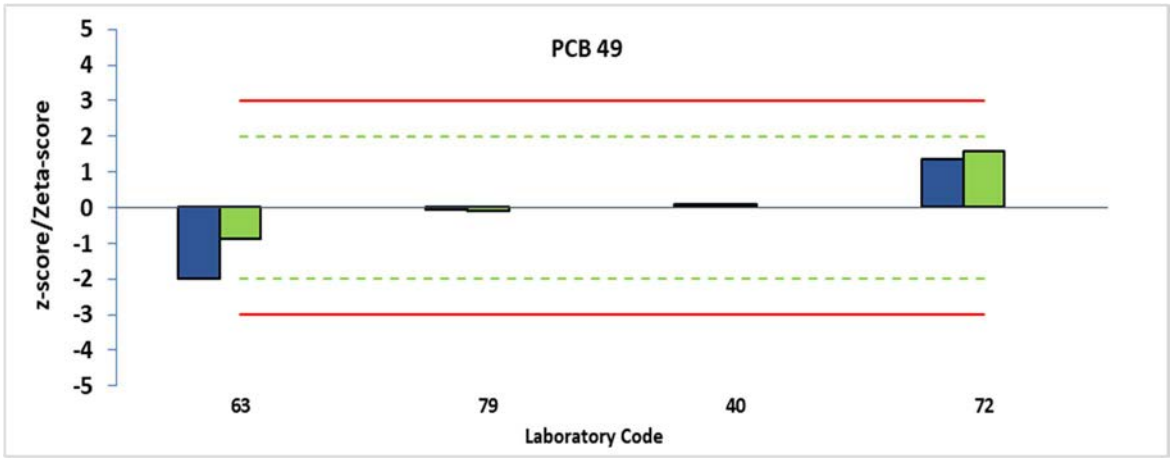
Assigned value (X_a)	2.15 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.90 µg kg^{-1}
2 Total error	1.05 µg kg^{-1}
Number of results reported	4
Number of results accepted	4

Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



Performance evaluation: *z*-score Zeta-score



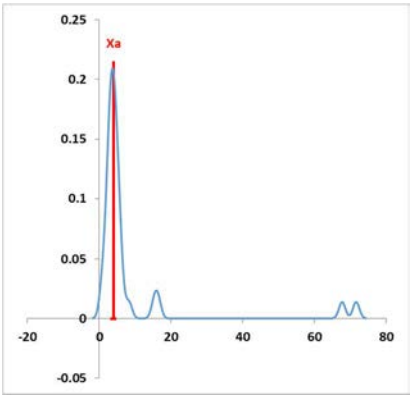
Evaluation of Reported data for PCB 52

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	59%	13%	28%
Zeta-score	65%	10%	25%

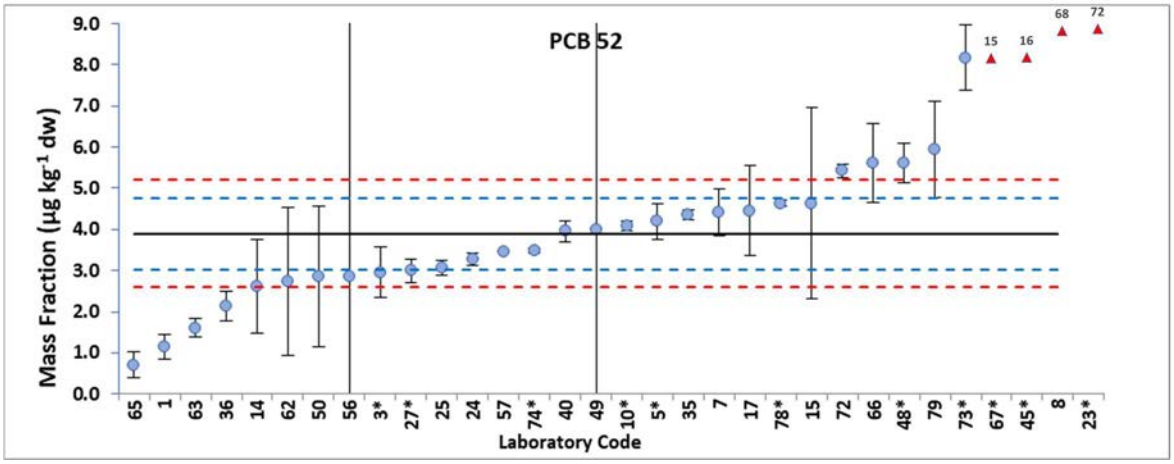
Assigned value (X_a)	3.90 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.87 µg kg^{-1}
2 Total error	1.30 µg kg^{-1}
Number of results reported	34
Number of results accepted	24

Kernel density plot:



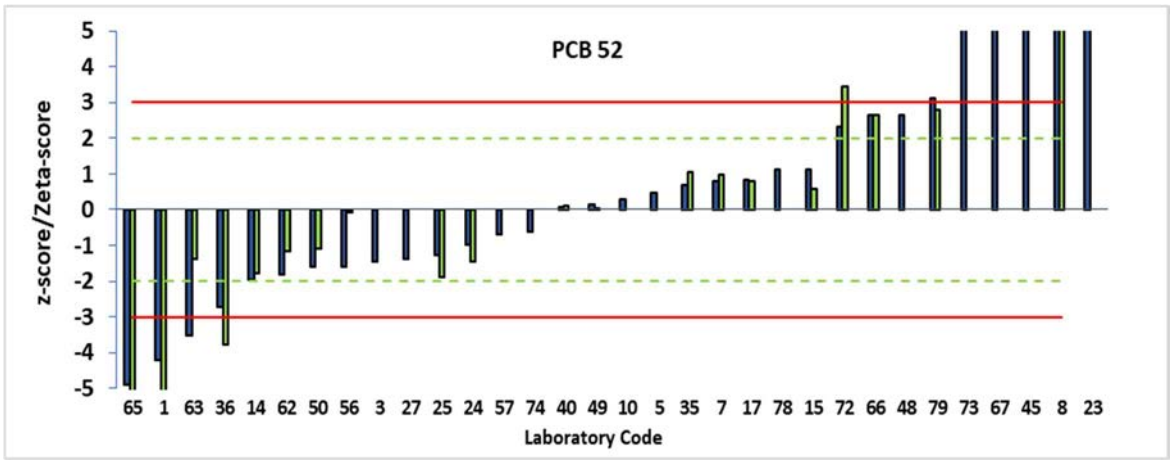
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



Evaluation of Reported data for PCB 66

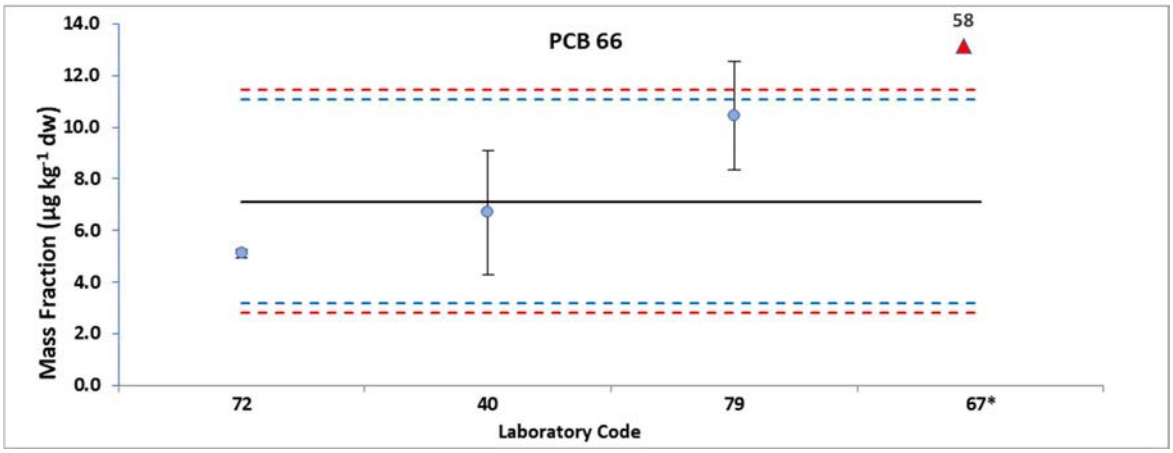
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	75%	0%	25%
Zeta-score	100%	0%	0%

Assigned value (X_a)	7.12 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	3.94 µg kg^{-1}
2 Total error	4.33 µg kg^{-1}
Number of results reported	4
Number of results accepted	3

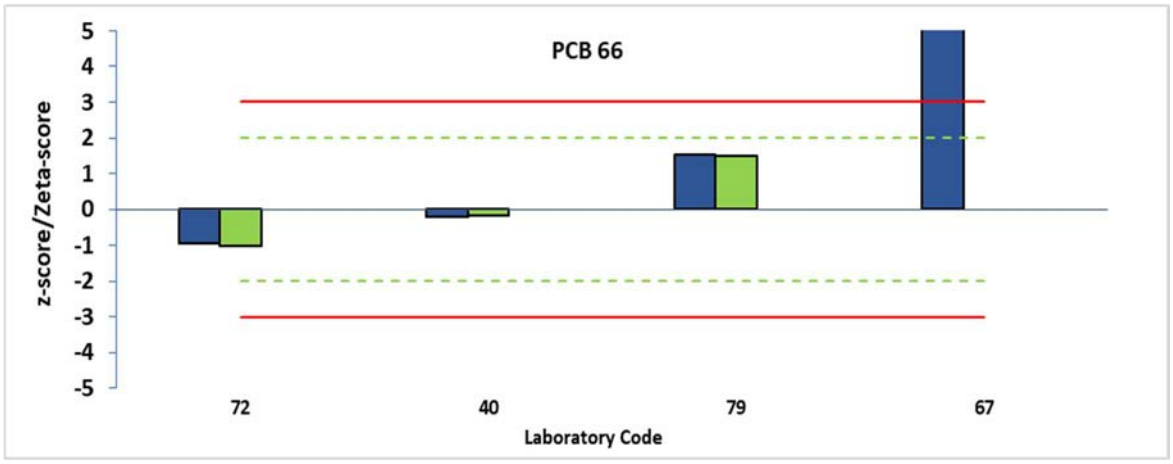
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



Evaluation of Reported data for PCB 70

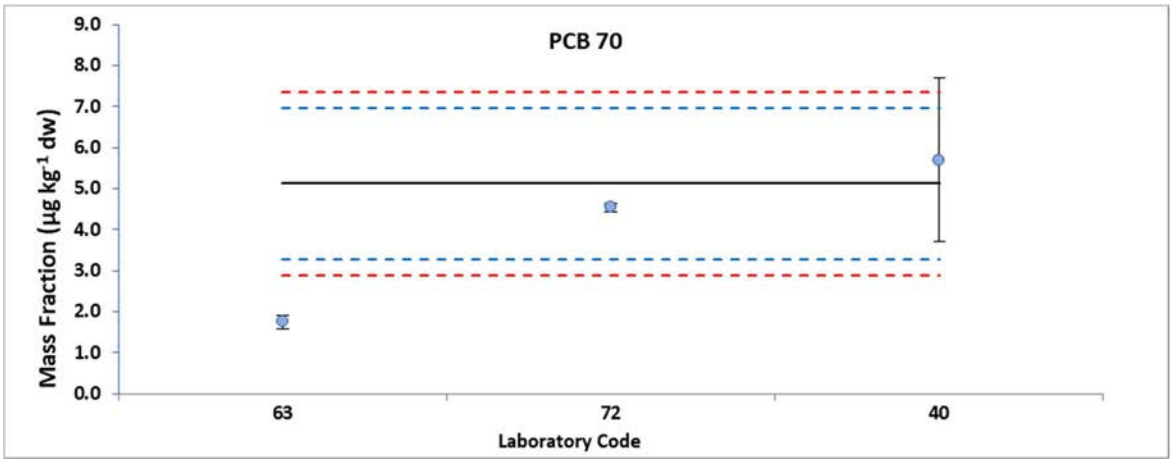
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score			
Zeta-score			

Assigned value (X_a)	5.12 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.83 µg kg^{-1}
2 Total error	2.23 µg kg^{-1}
Number of results reported	3
Number of results accepted	2

Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



Evaluation of Reported data for PCB 74

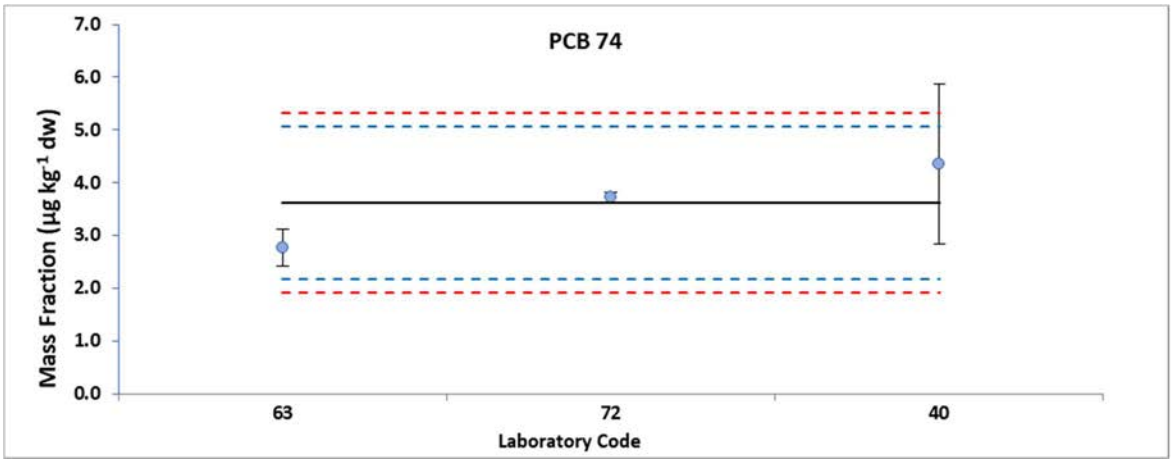
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score			
Zeta-score			

Assigned value (X_a)	3.61 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.45 µg kg^{-1}
2 Total error	1.71 µg kg^{-1}
Number of results reported	3
Number of results accepted	3

Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



Evaluation of Reported data for PCB 87

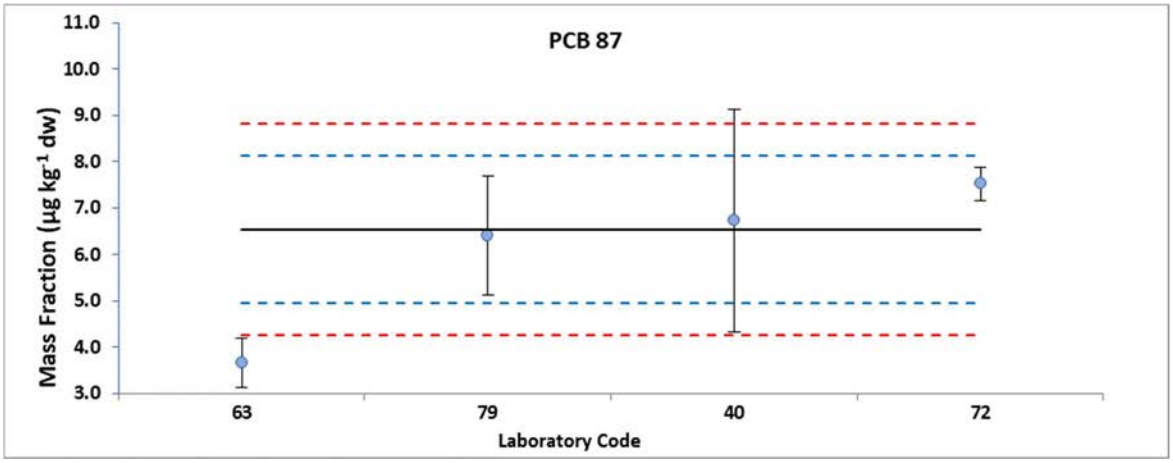
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	75%	25%	0%
Zeta-score	100%	0%	0%

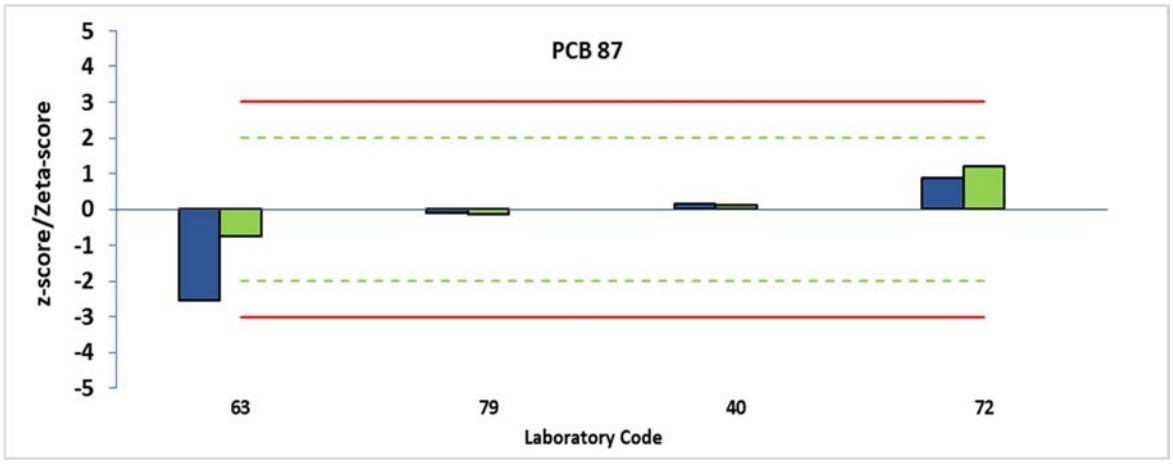
Assigned value (X_a)	6.54 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.58 µg kg^{-1}
2 Total error	2.27 µg kg^{-1}
Number of results reported	4
Number of results accepted	4

Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



Performance evaluation: *z*-score Zeta-score



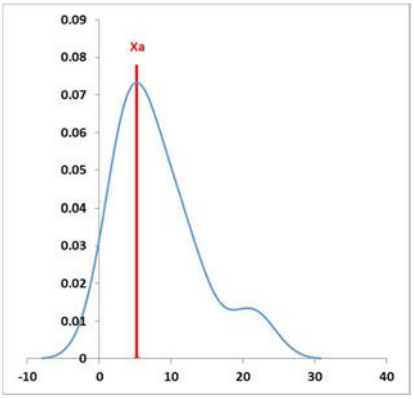
Evaluation of Reported data for PCB 95

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	30%	20%	50%
Zeta-score	56%	11%	33%

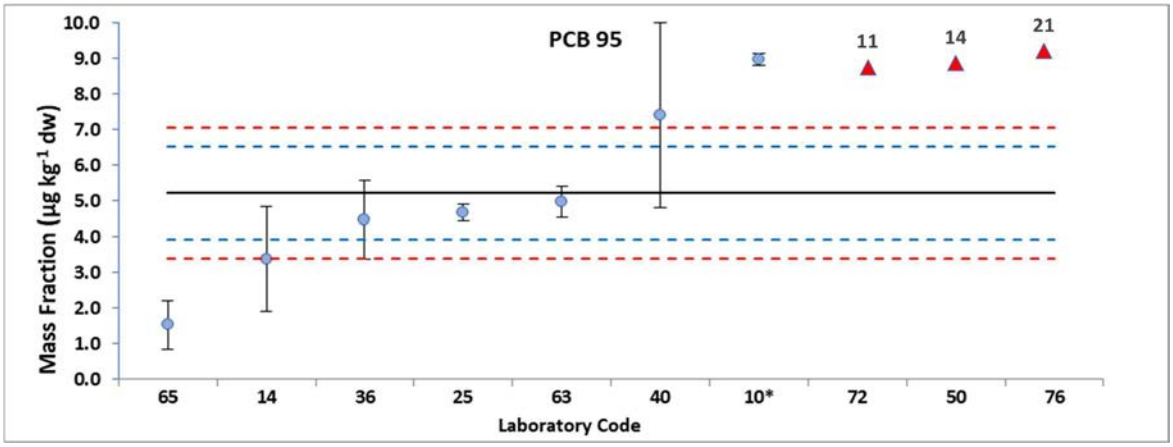
Assigned value (X_a)	5.23 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.29 µg kg^{-1}
2 Total error	1.84 µg kg^{-1}
Number of results reported	10
Number of results accepted	5

Kernel density plot:



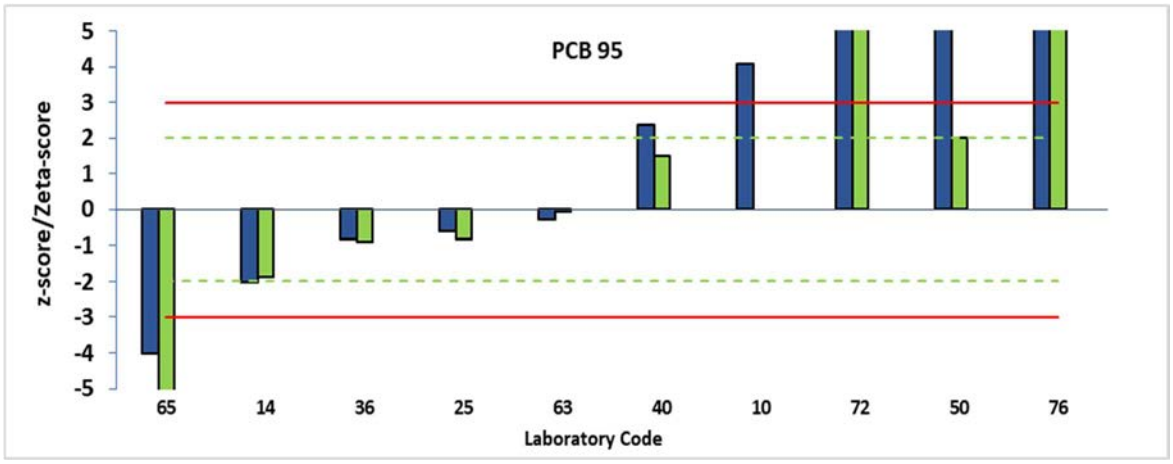
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



Evaluation of Reported data for PCB 97

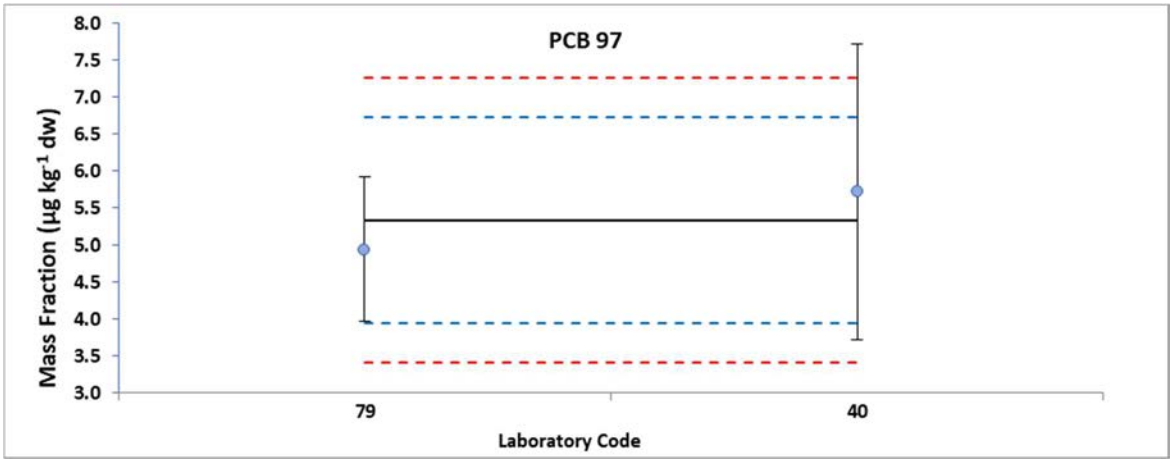
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score			
Zeta-score			

Assigned value (X_a)	5.34 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.39 µg kg^{-1}
2 Total error	1.93 µg kg^{-1}
Number of results reported	2
Number of results accepted	2

Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



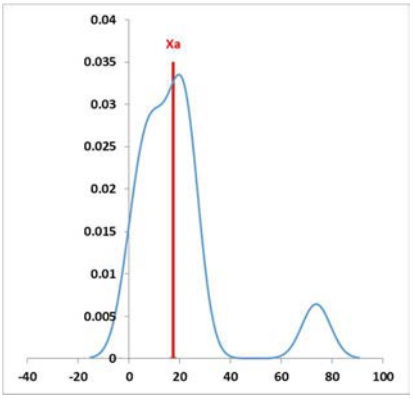
Evaluation of Reported data for PCB 99

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	55%	18%	27%
Zeta-score	50%	20%	30%

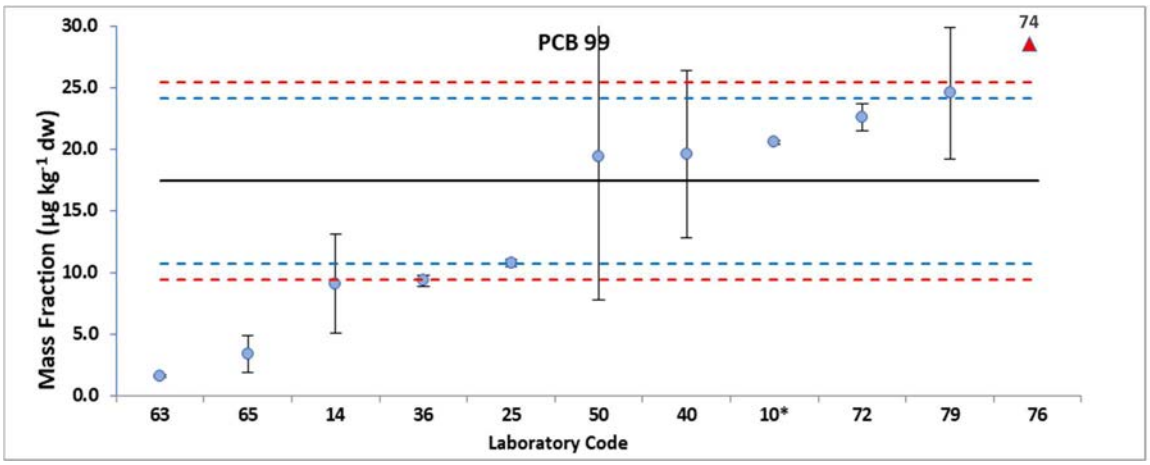
Assigned value (X_a)	17.40 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	6.68 µg kg^{-1}
2 Total error	7.97 µg kg^{-1}
Number of results reported	11
Number of results accepted	8

Kernel density plot:



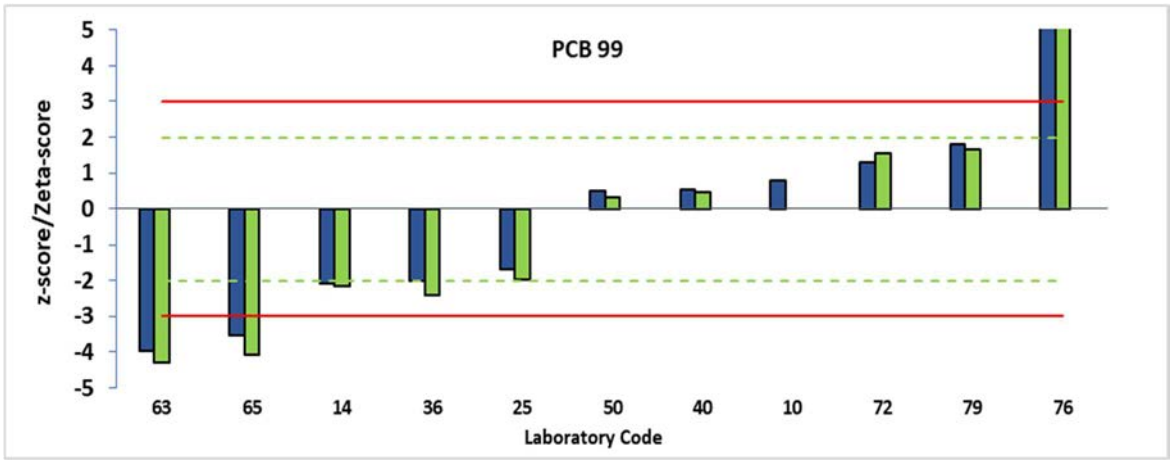
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



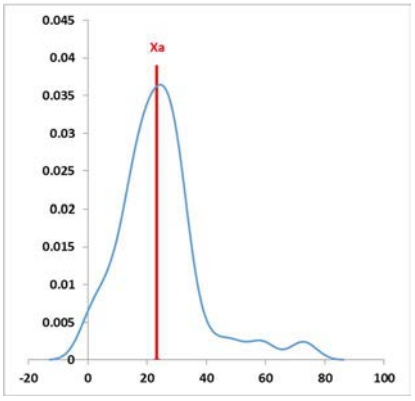
Evaluation of Reported data for PCB 101

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	39%	26%	35%
Zeta-score	33%	28%	39%

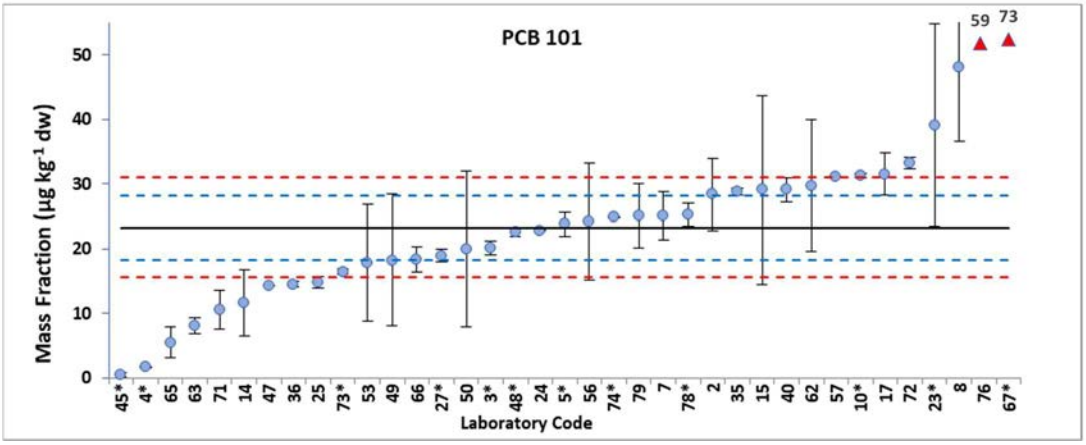
Assigned value (X_a)	1.31 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.37 µg kg^{-1}
2 Total error	0.49 µg kg^{-1}
Number of results reported	33
Number of results accepted	17

Kernel density plot:



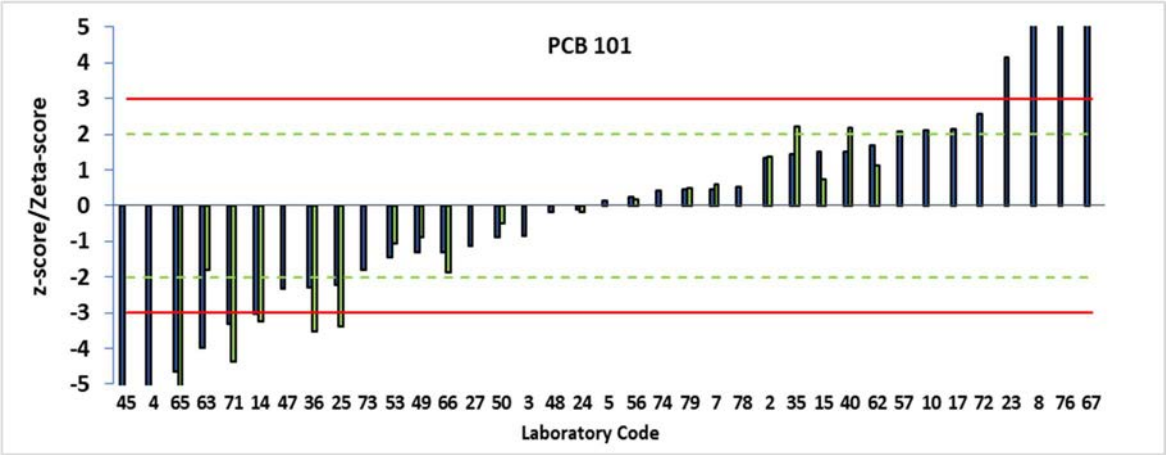
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



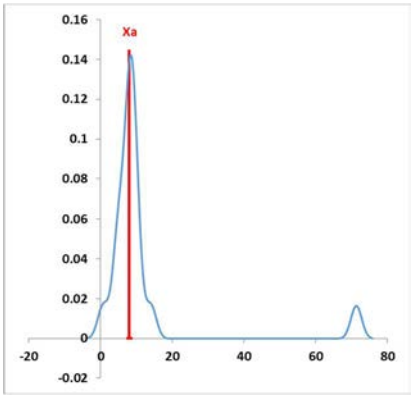
Evaluation of Reported data for PCB 105

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	63%	19%	19%
Zeta-score	50%	20%	30%

Assigned value (X_a)	8 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.64 µg kg^{-1}
2 Total error	2.58 µg kg^{-1}
Number of results reported	16
Number of results accepted	13

Kernel density plot:



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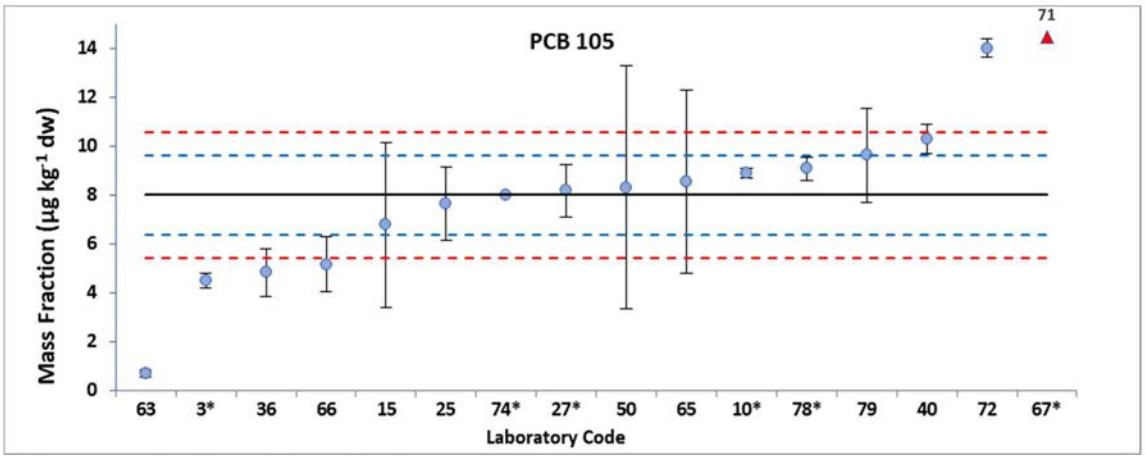
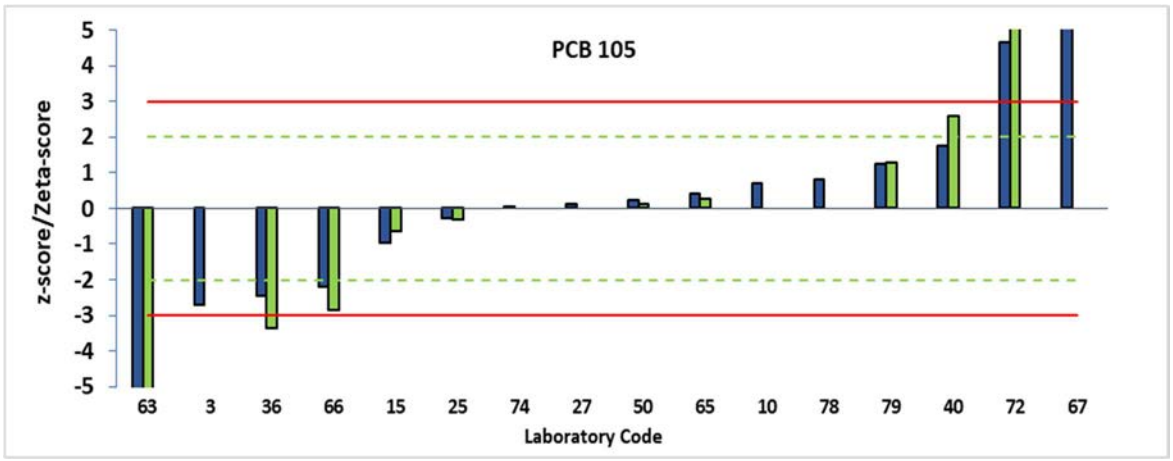
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



*Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



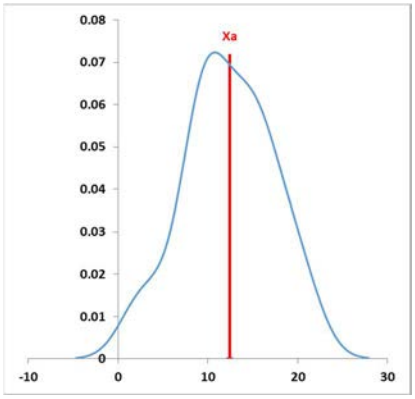
Evaluation of Reported data for PCB 110

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	73%	9%	18%
Zeta-score	70%	20%	10%

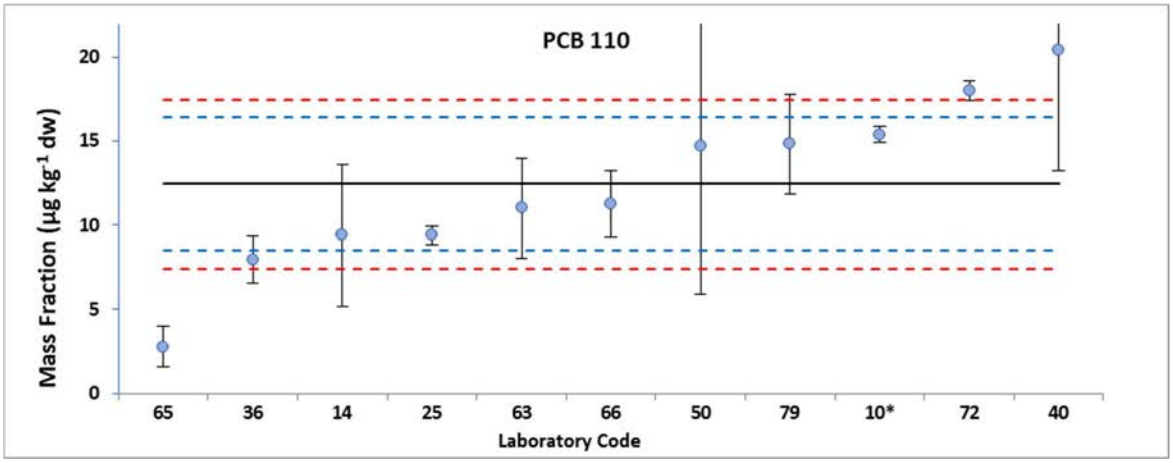
Assigned value (X_a)	12.4 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	3.96 µg kg^{-1}
2 Total error	5.03 µg kg^{-1}
Number of results reported	11
Number of results accepted	9

Kernel density plot:



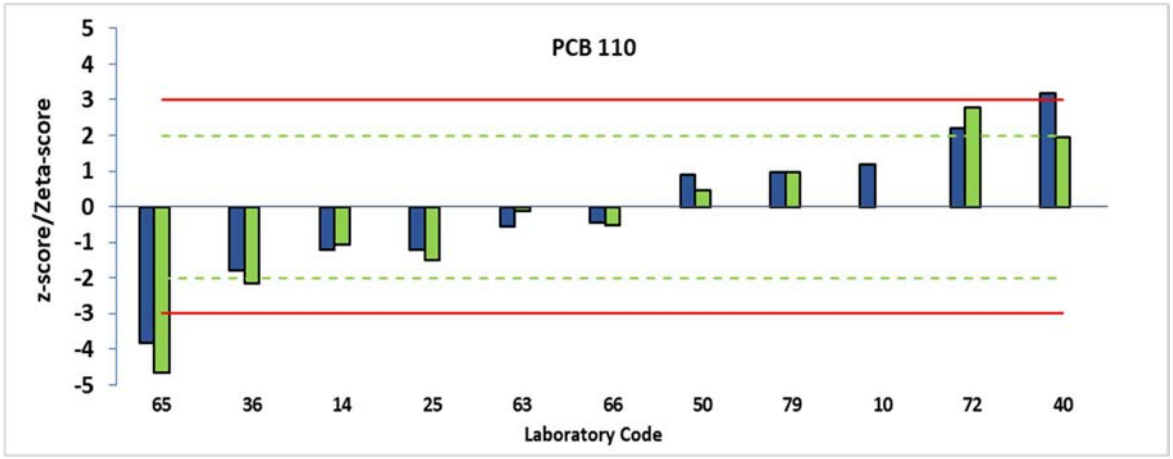
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



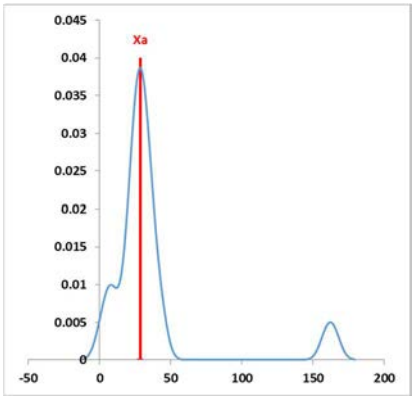
Evaluation of Reported data for PCB 118

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	68%	4%	29%
Zeta-score	50%	38%	13%

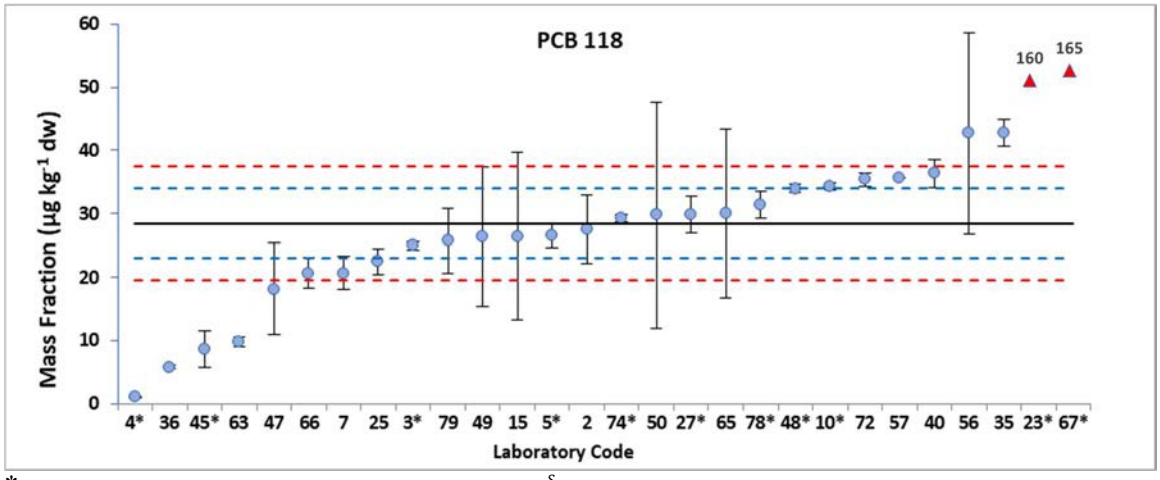
Assigned value (X_a)	28.4 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	5.48 µg kg^{-1}
2 Total error	8.98 µg kg^{-1}
Number of results reported	29
Number of results accepted	20

Kernel density plot:

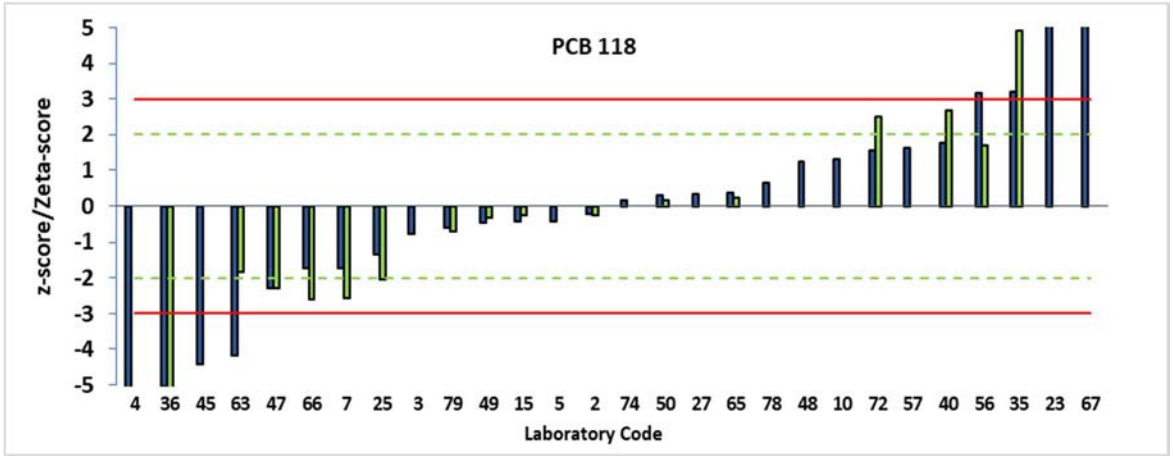


Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*



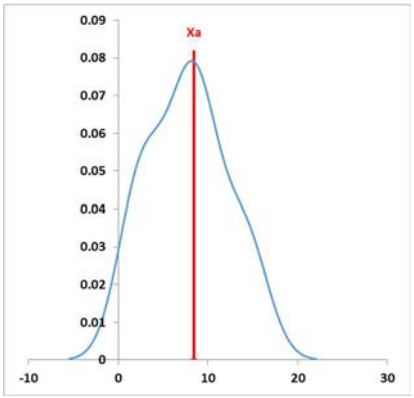
Evaluation of Reported data for PCB 128

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	50%	0%	50%
Zeta-score	56%	0%	44%

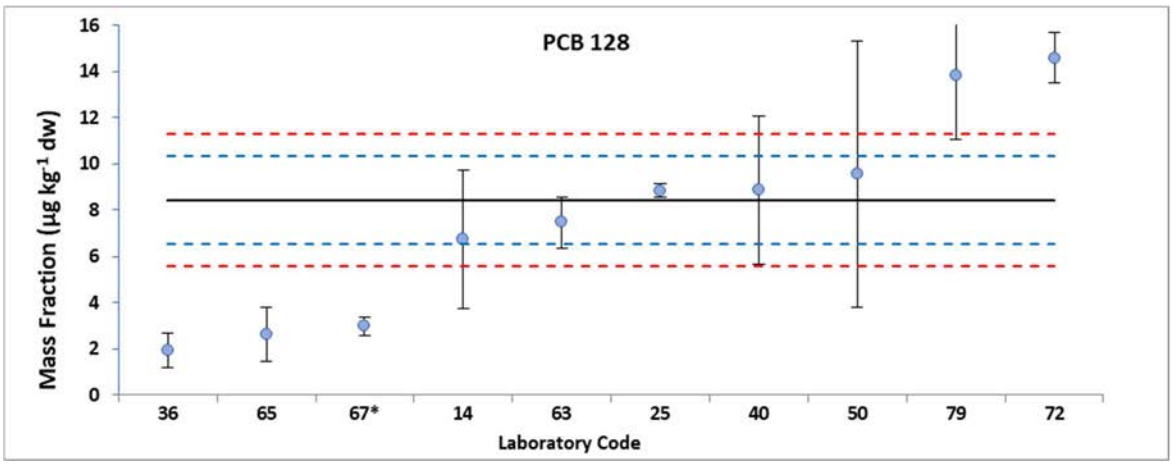
Assigned value (X_a)	8.43 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.90 µg kg^{-1}
2 Total error	2.84 µg kg^{-1}
Number of results reported	10
Number of results accepted	5

Kernel density plot:



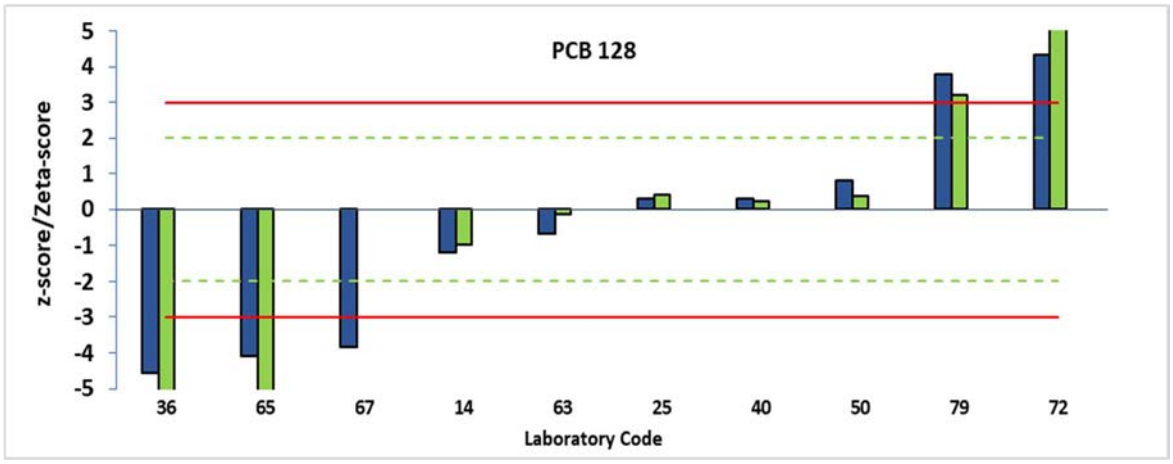
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



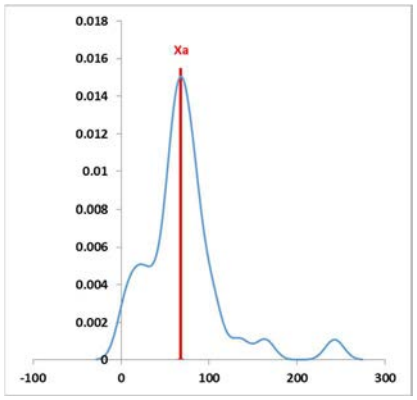
Evaluation of Reported data for PCB 138

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	57%	11%	31%
Zeta-score	52%	9%	39%

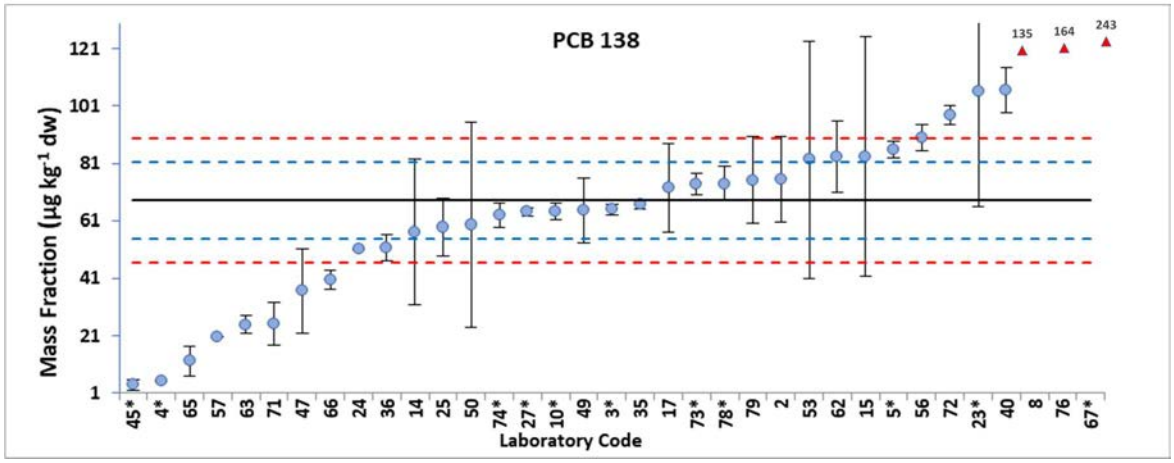
Assigned value (X_a)	68.1 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	13.2 µg kg^{-1}
2 Total error	21.5 µg kg^{-1}
Number of results reported	36
Number of results accepted	24

Kernel density plot:



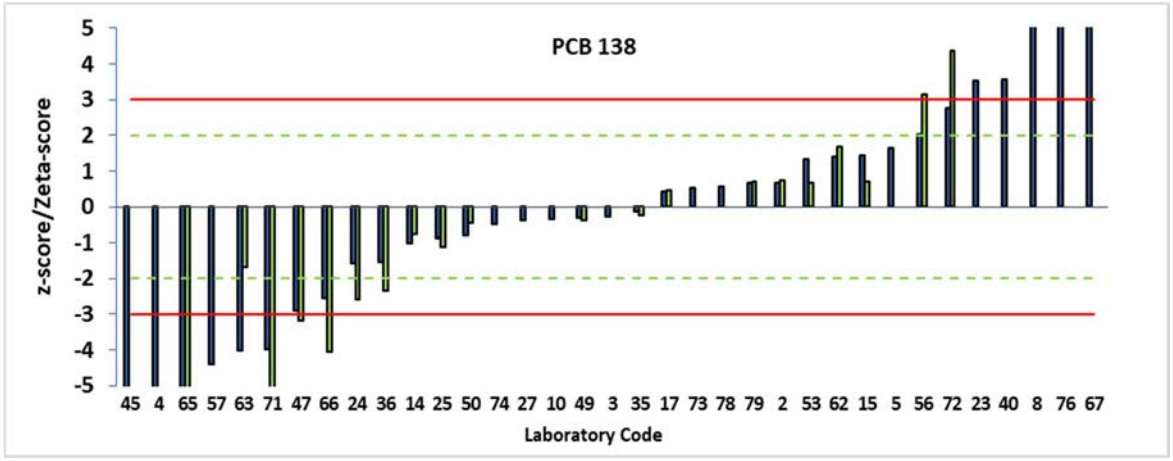
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



Evaluation of Reported data for PCB 146

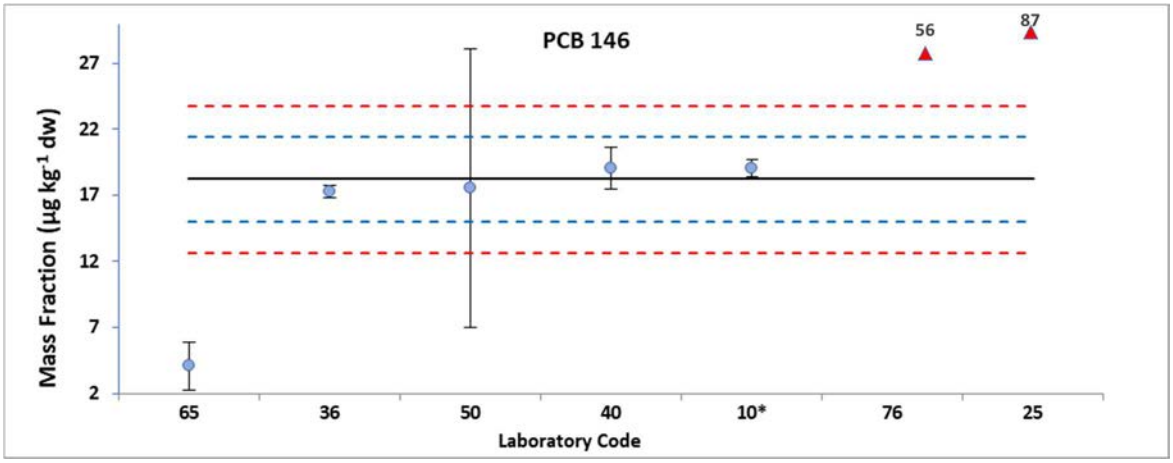
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	57%	0%	43%
Zeta-score	50%	0%	50%

Assigned value (X_a)	18.2 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	3.21 µg kg^{-1}
2 Total error	5.57 µg kg^{-1}
Number of results reported	7
Number of results accepted	4

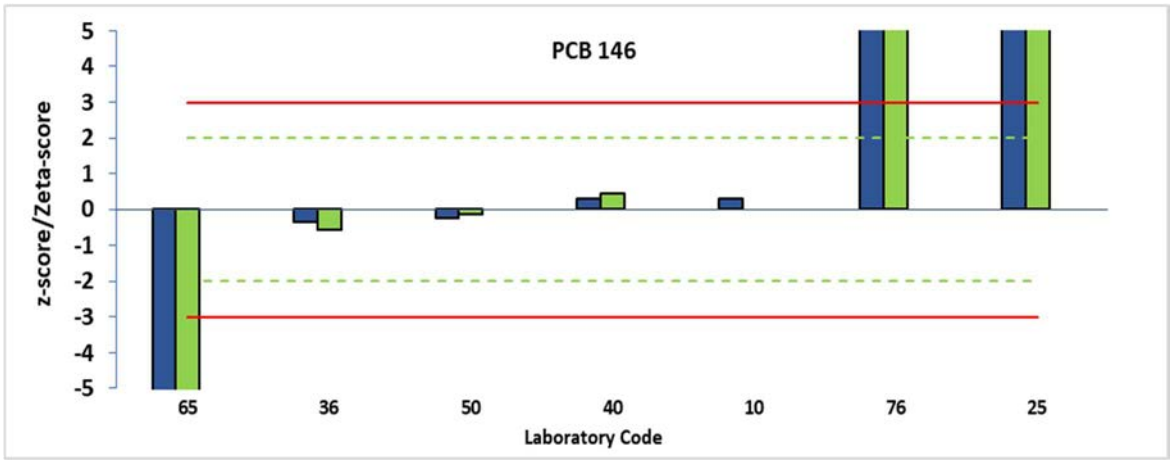
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



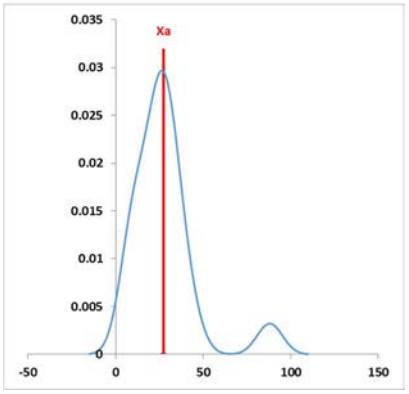
Evaluation of Reported data for PCB 149

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	59%	6%	35%
Zeta-score	62%	0%	38%

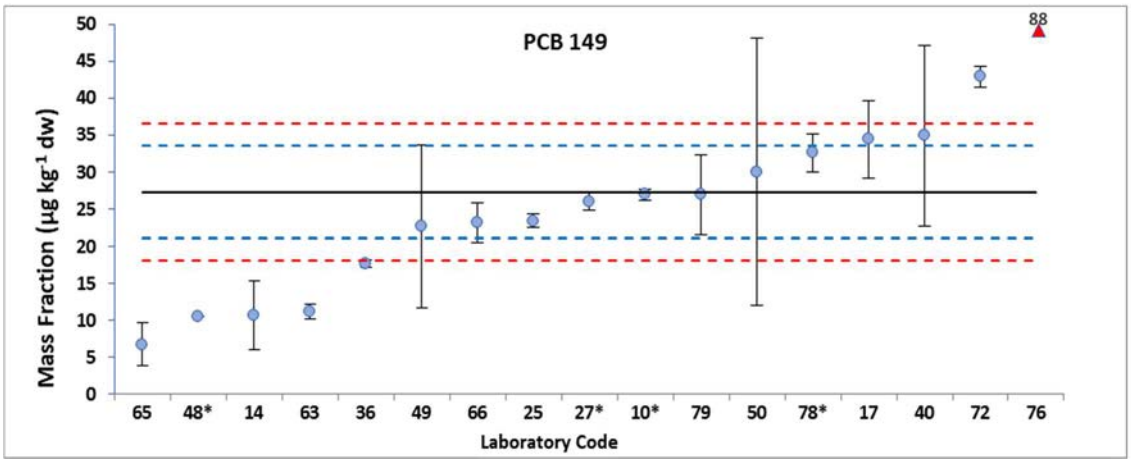
Assigned value (X_a)	27.3 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	6.23 µg kg^{-1}
2 Total error	9.24 µg kg^{-1}
Number of results reported	18
Number of results accepted	11

Kernel density plot:



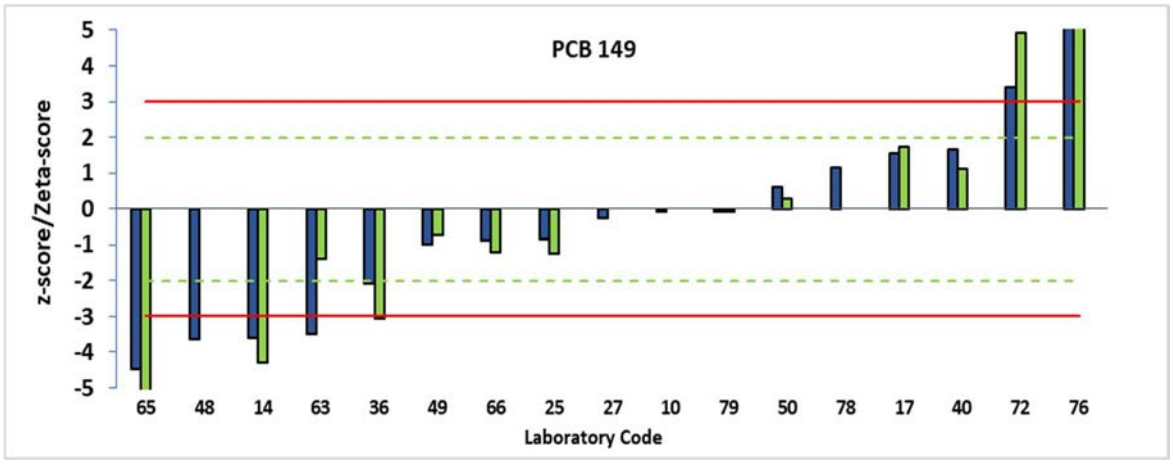
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



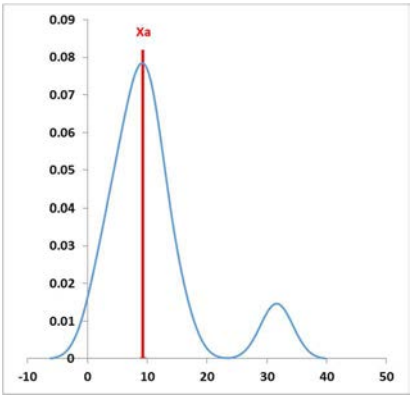
Evaluation of Reported data for PCB 151

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	60%	10%	30%
Zeta-score	56%	11%	33%

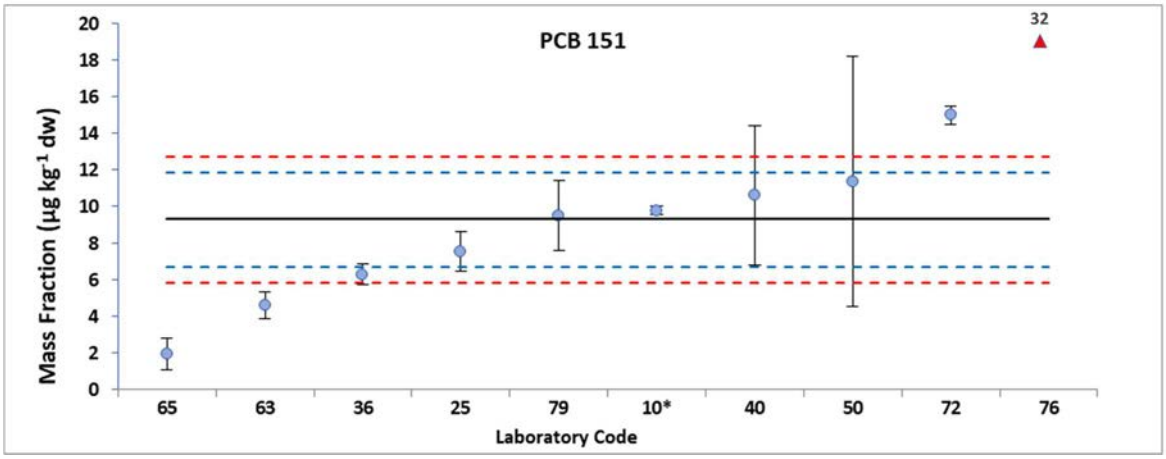
Assigned value (X_a)	9.29 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	2.55 µg kg^{-1}
2 Total error	3.45 µg kg^{-1}
Number of results reported	10
Number of results accepted	6

Kernel density plot:



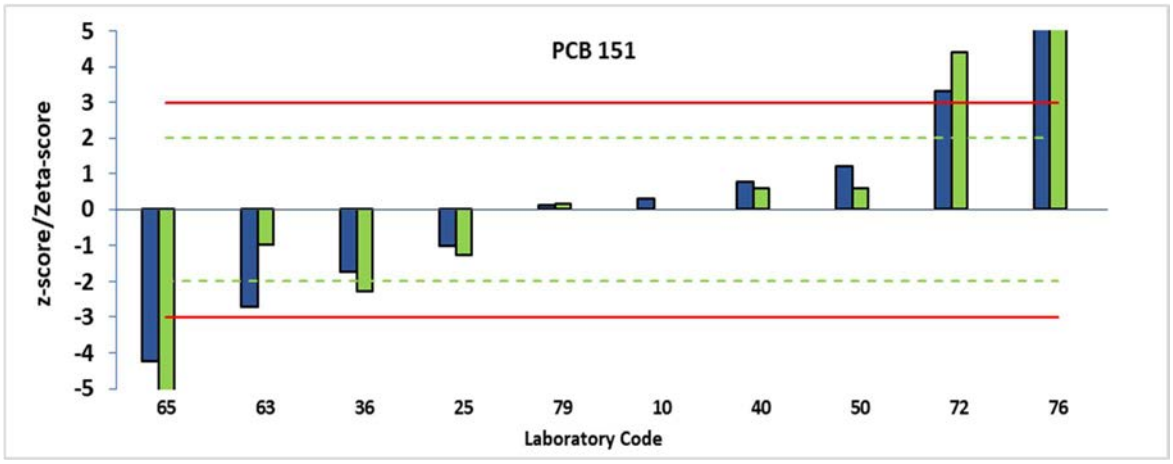
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



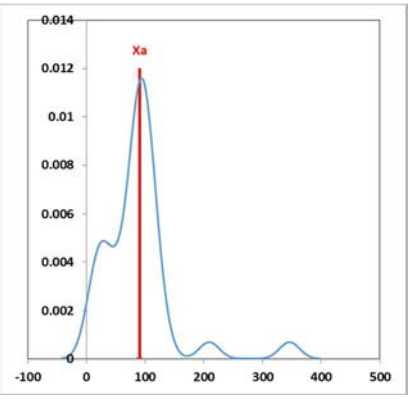
Evaluation of Reported data for PCB 153

\Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	59%	15%	26%
Zeta-score	59%	14%	27%

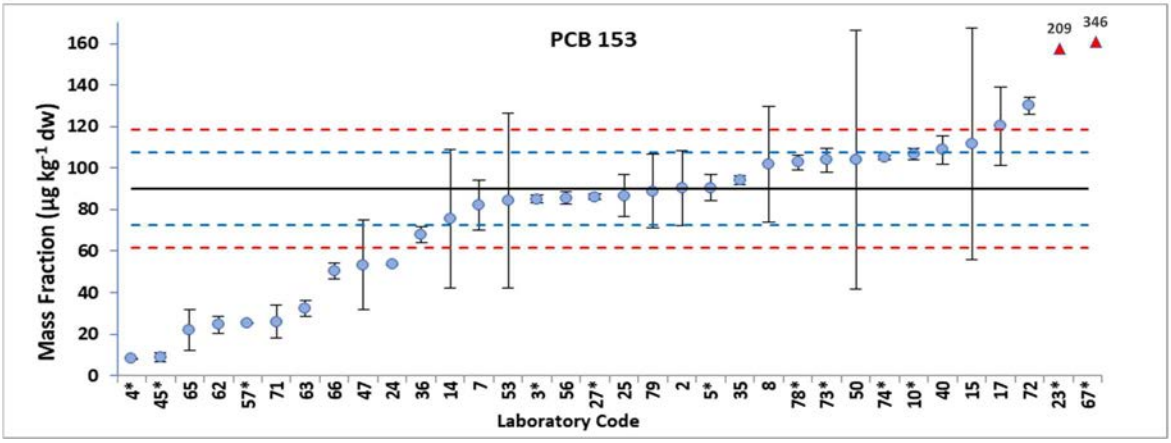
Assigned value (X_a)	90 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	17.3 µg kg^{-1}
2 Total error	28.4 µg kg^{-1}
Number of results reported	35
Number of results accepted	24

Kernel density plot:



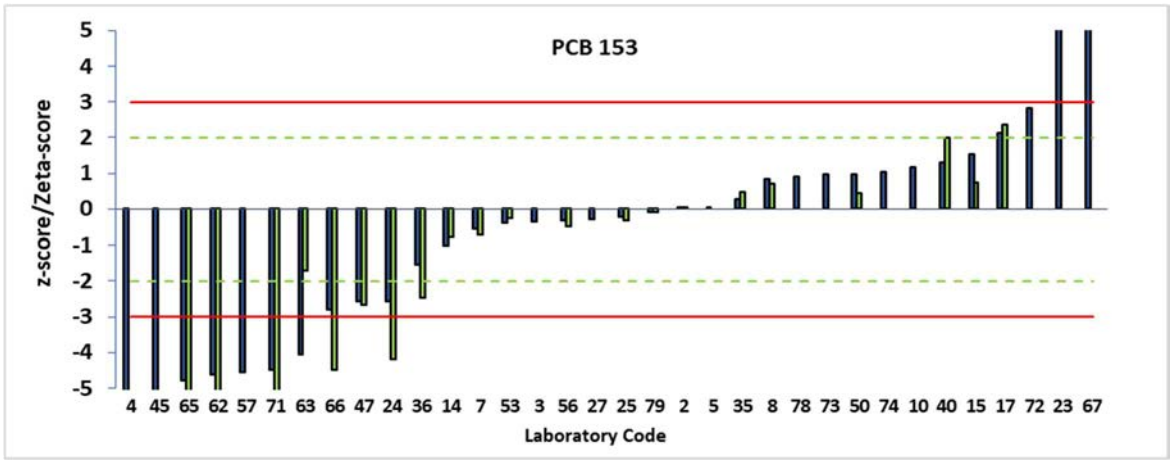
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



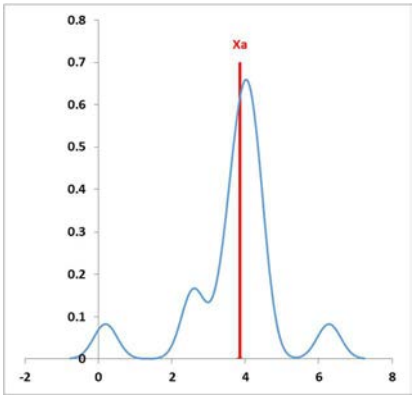
Evaluation of Reported data for PCB 156

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	73%	13%	13%
Zeta-score	80%	0%	20%

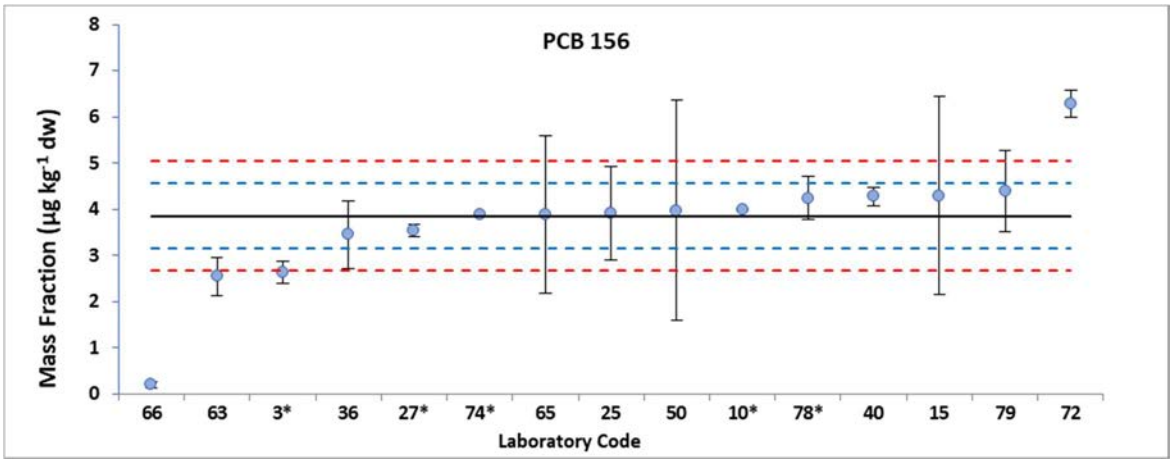
Assigned value (X_a)	3.85 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.70 µg kg^{-1}
2 Total error	1.19 µg kg^{-1}
Number of results reported	15
Number of results accepted	13

Kernel density plot:



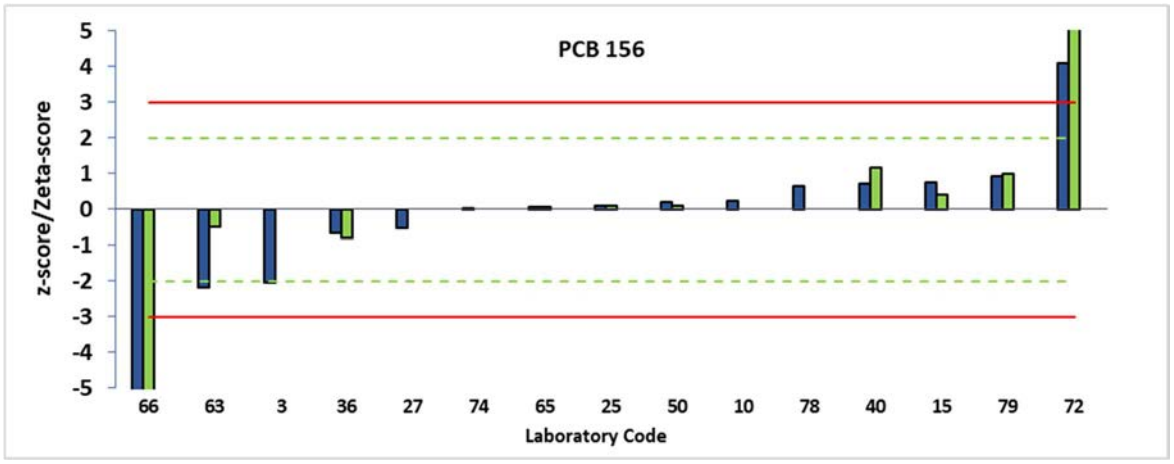
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



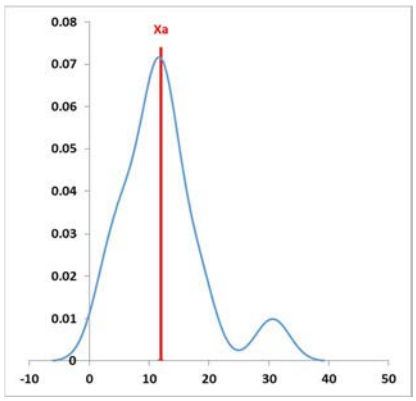
Evaluation of Reported data for PCB 170

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	50%	14%	36%
Zeta-score	50%	10%	40%

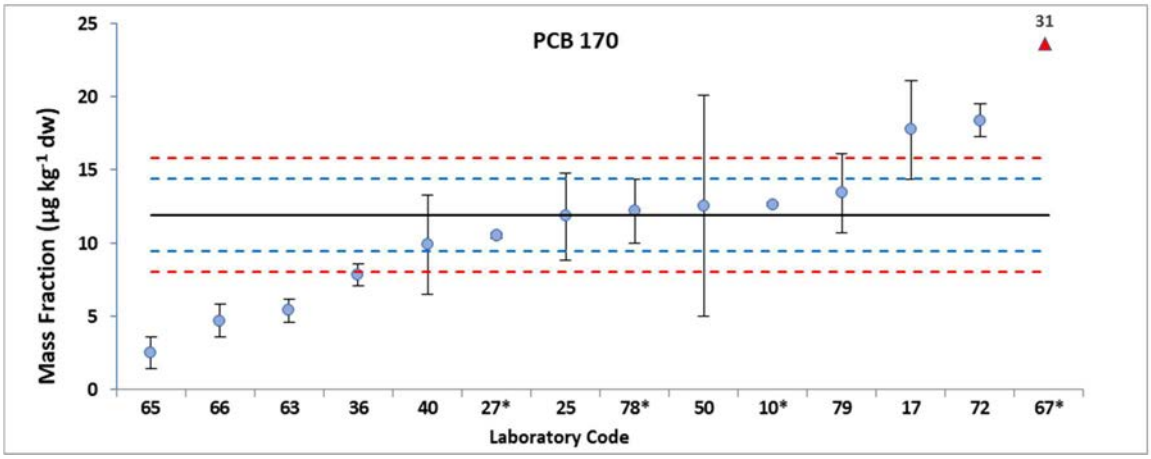
Assigned value (X_a)	11.9 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	2.49 µg kg^{-1}
2 Total error	3.88 µg kg^{-1}
Number of results reported	14
Number of results accepted	9

Kernel density plot:



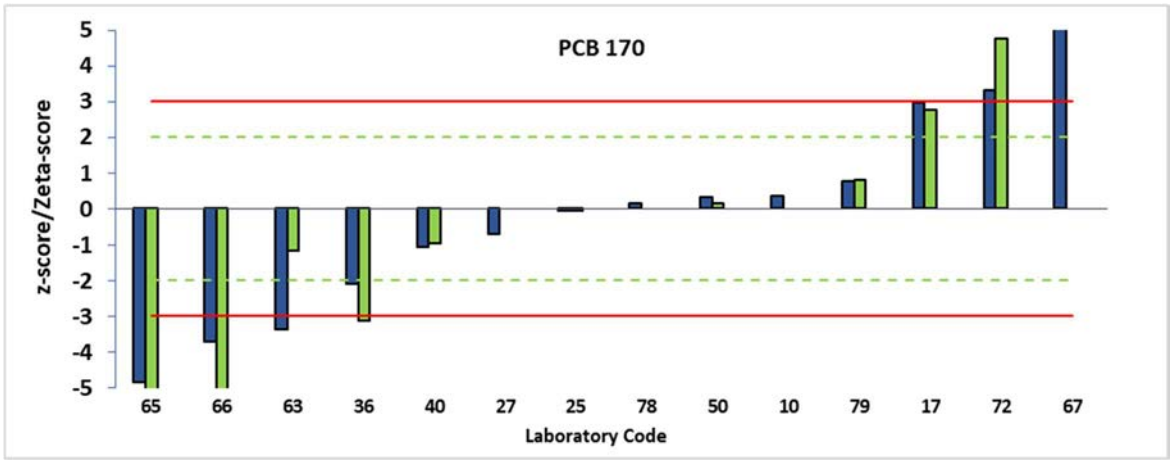
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



Evaluation of Reported data for PCB 174

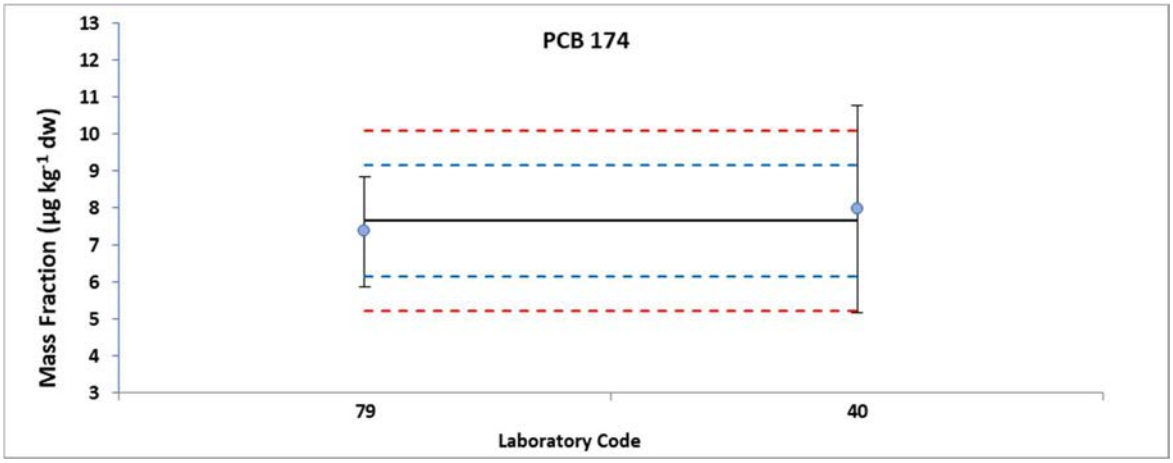
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score			
Zeta-score			

Assigned value (X_a)	7.67 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.50 µg kg^{-1}
2 Total error	2.43 µg kg^{-1}
Number of results reported	2
Number of results accepted	2

Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

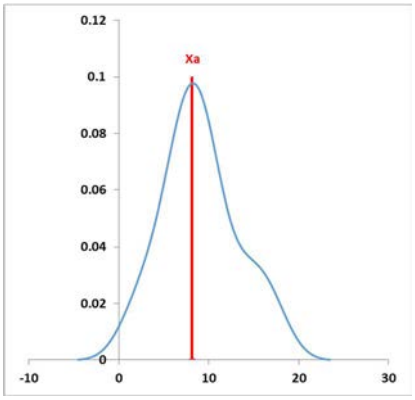
Evaluation of Reported data for PCB 177

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	70%	0%	30%
Zeta-score	63%	13%	25%

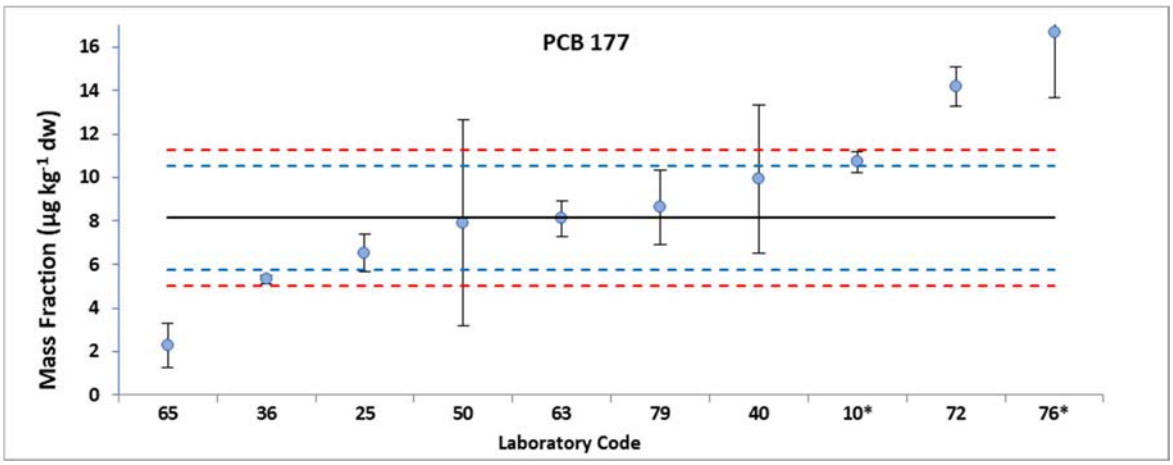
Assigned value (X_a)	8.16 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	2.37 µg kg^{-1}
2 Total error	3.13 µg kg^{-1}
Number of results reported	10
Number of results accepted	7

Kernel density plot:



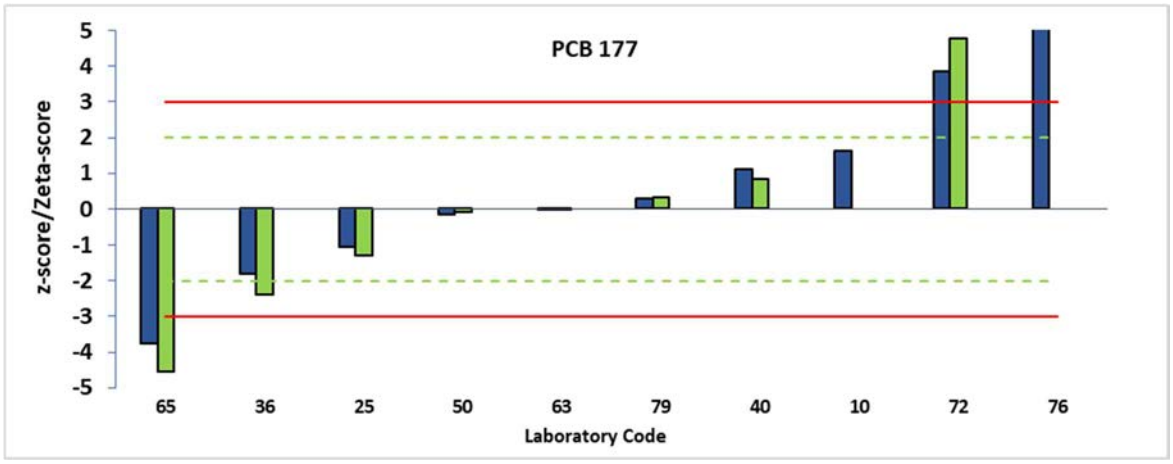
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



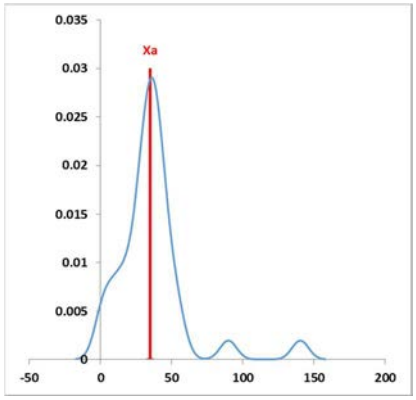
Evaluation of Reported data for PCB 180

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	60%	6%	34%
Zeta-score	59%	5%	36%

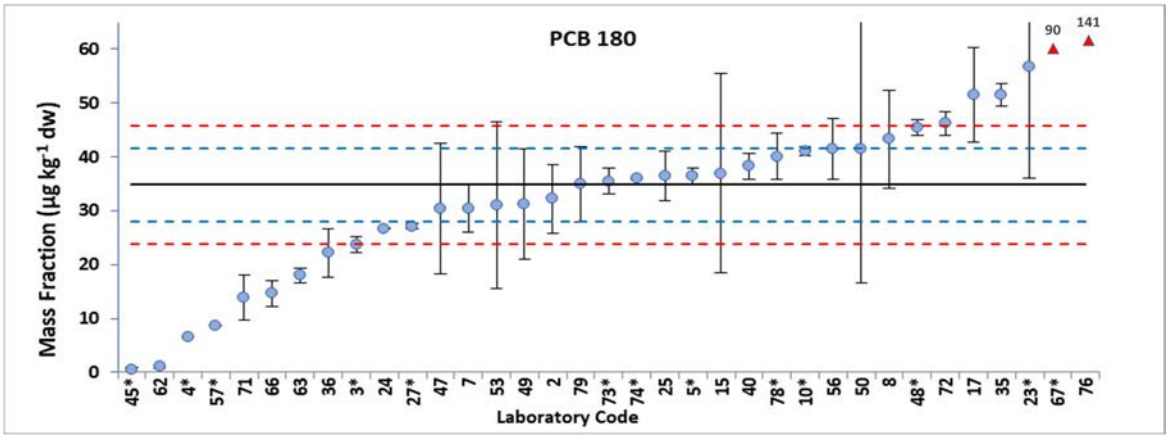
Assigned value (X_a)	34.8 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	6.81 µg kg^{-1}
2 Total error	11.1 µg kg^{-1}
Number of results reported	36
Number of results accepted	24

Kernel density plot:



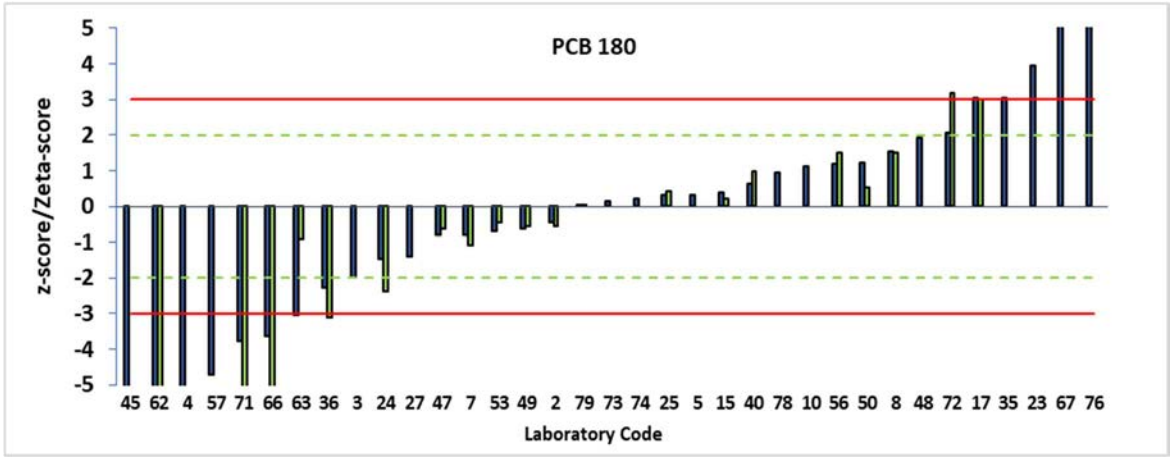
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



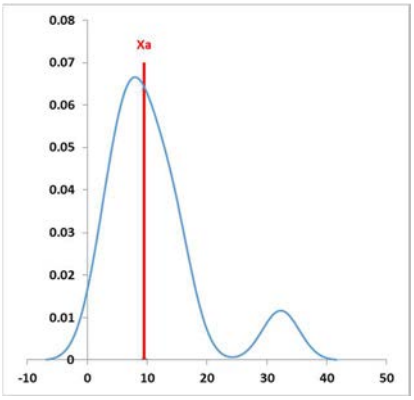
Evaluation of Reported data for PCB 183

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	55%	18%	27%
Zeta-score	80%	0%	20%

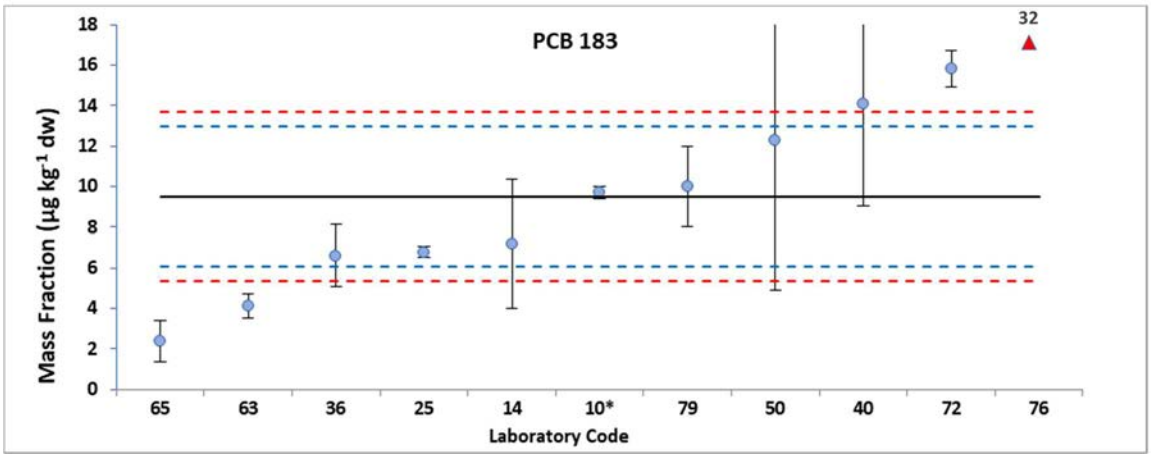
Assigned value (X_a)	9.51 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	3.45 µg kg^{-1}
2 Total error	4.19 µg kg^{-1}
Number of results reported	11
Number of results accepted	7

Kernel density plot:



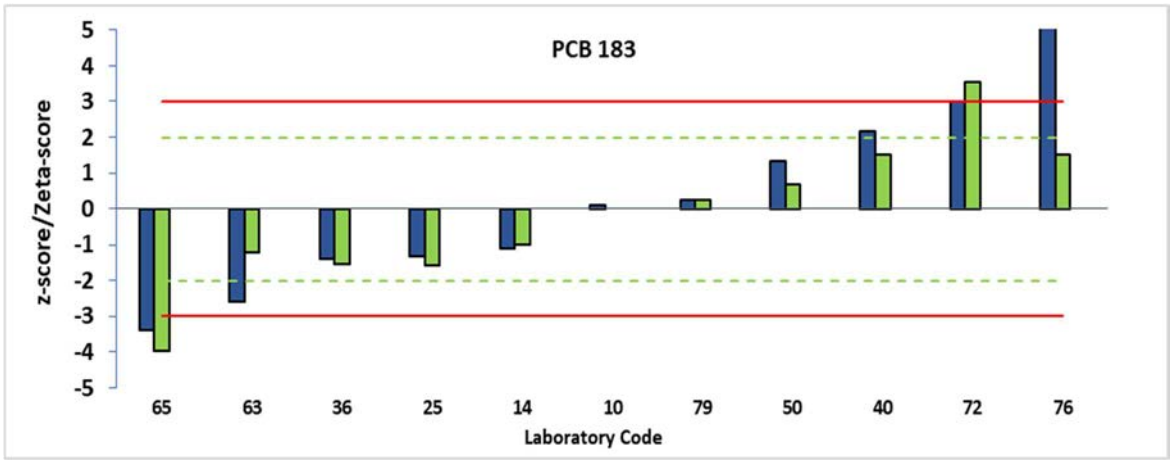
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



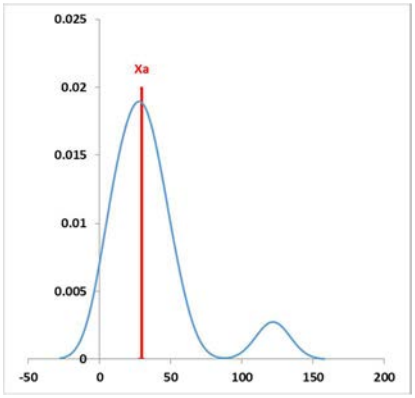
Evaluation of Reported data for PCB 187

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	50%	8%	42%
Zeta-score	67%	0%	33%

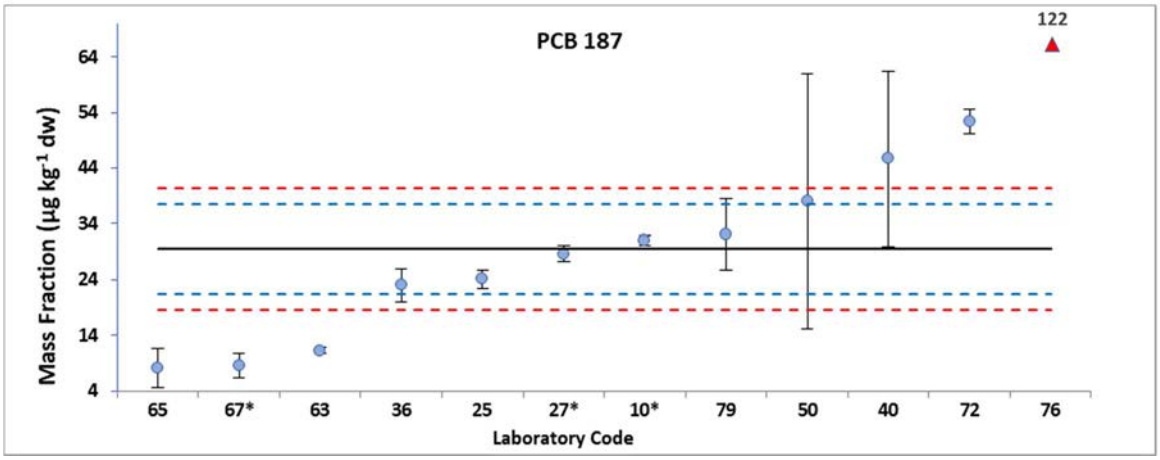
Assigned value (X_a)	29.5 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	7.96 µg kg^{-1}
2 Total error	10.9 µg kg^{-1}
Number of results reported	12
Number of results accepted	6

Kernel density plot:



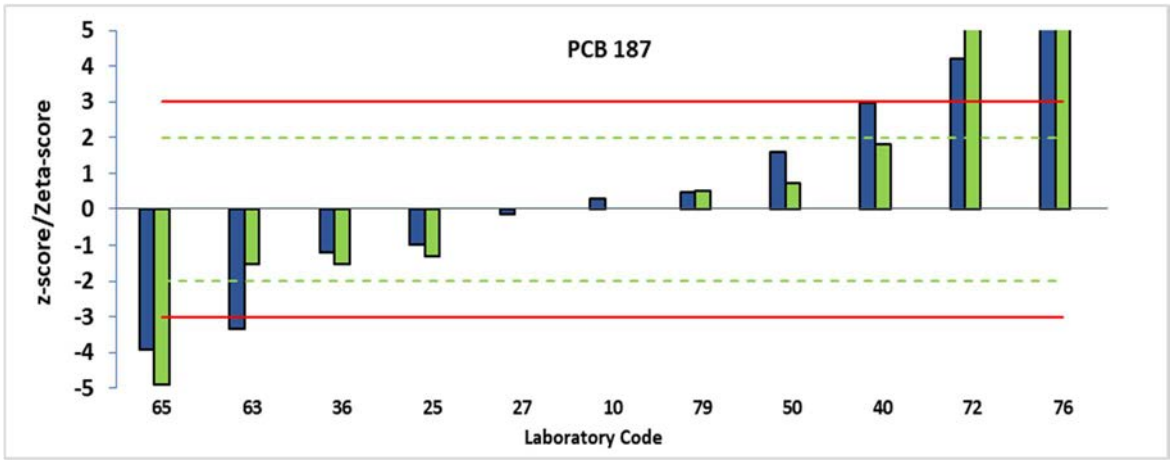
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



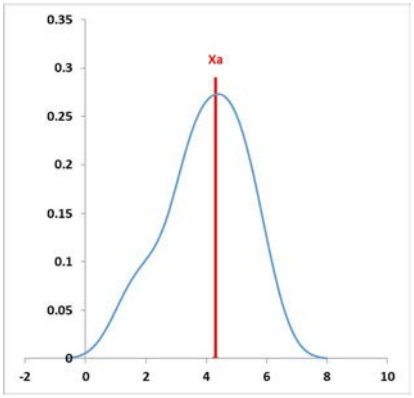
Evaluation of Reported data for PCB 194

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	73%	18%	9%
Zeta-score	71%	14%	14%

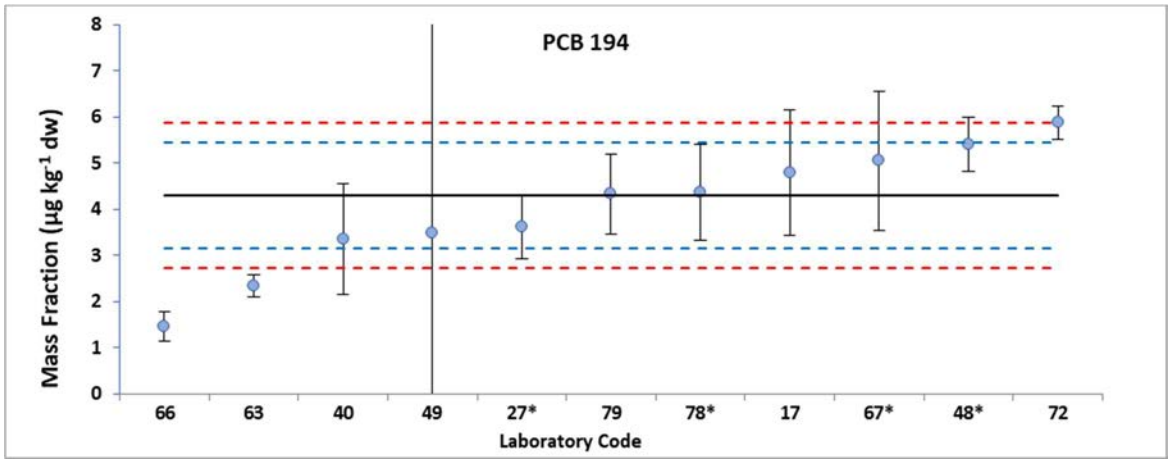
Assigned value (X_a)	4.30 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.14 µg kg^{-1}
2 Total error	1.56 µg kg^{-1}
Number of results reported	12
Number of results accepted	10

Kernel density plot:



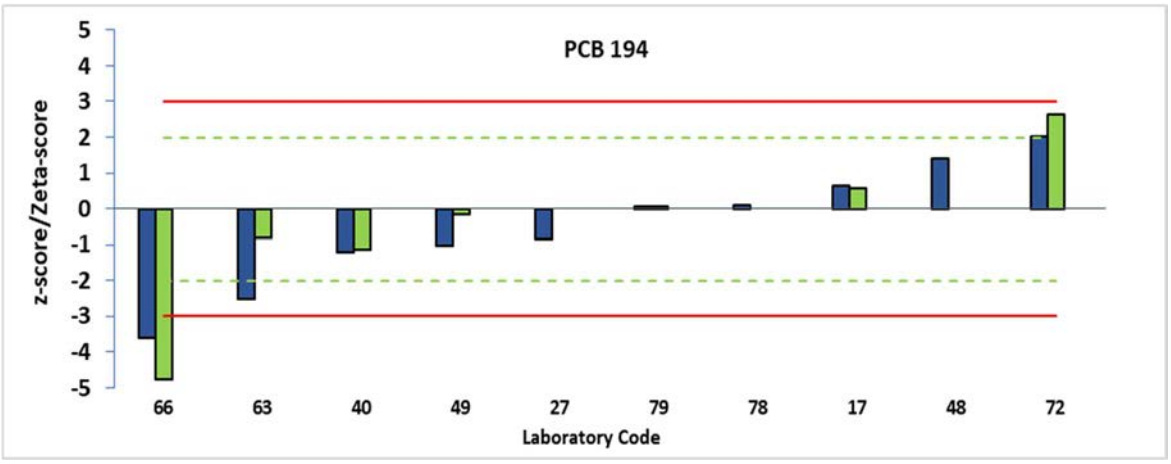
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



Evaluation of Reported data for PCB 195

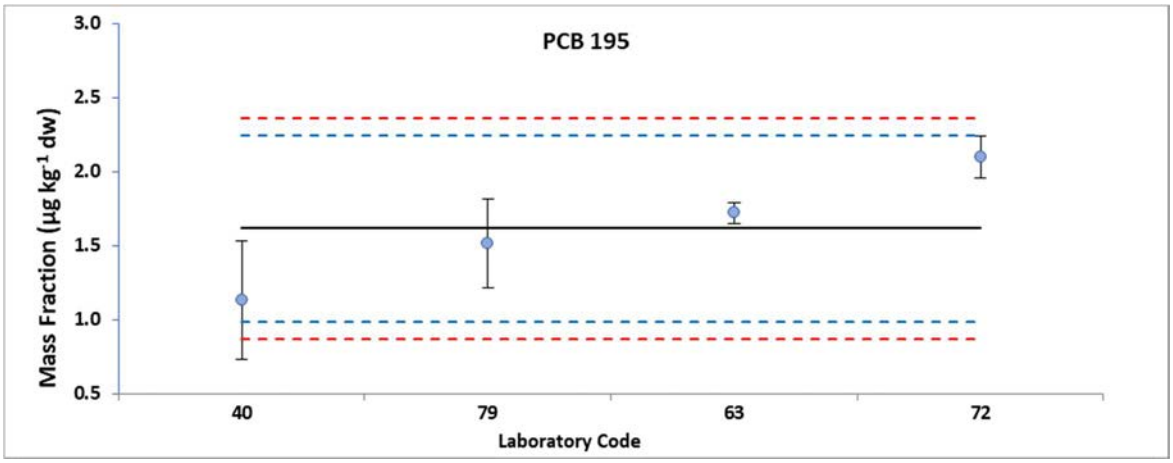
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	100%	0%	0%
Zeta-score	100%	0%	0%

Assigned value (X_a)	1.62 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.63 µg kg^{-1}
2 Total error	0.75 µg kg^{-1}
Number of results reported	4
Number of results accepted	4

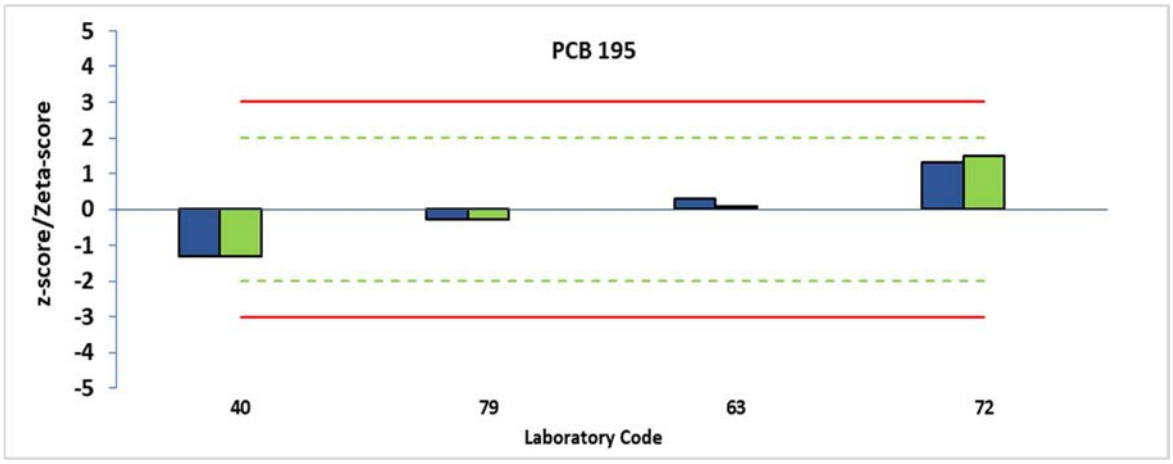
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



*Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



Evaluation of Reported data for PCB 201

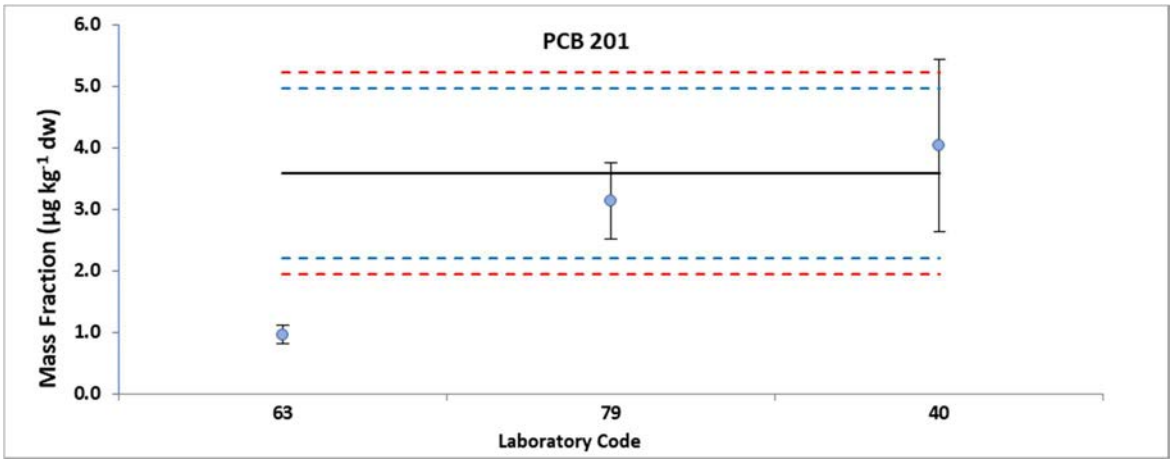
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score			
Zeta-score			

Assigned value (X_a)	3.58 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.38 µg kg^{-1}
2 Total error	1.65 µg kg^{-1}
Number of results reported	3
Number of results accepted	2

Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Evaluation of Reported data for PCB 206

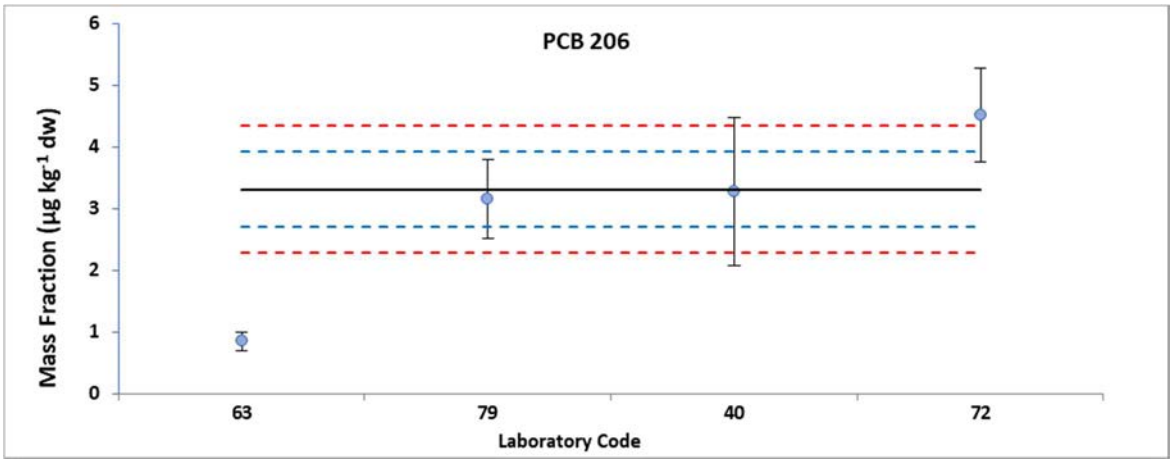
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	50%	25%	25%
Zeta-score	50%	50%	0%

Assigned value (X_a)	3.31 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.61 µg kg^{-1}
2 Total error	1.03 µg kg^{-1}
Number of results reported	5
Number of results accepted	3

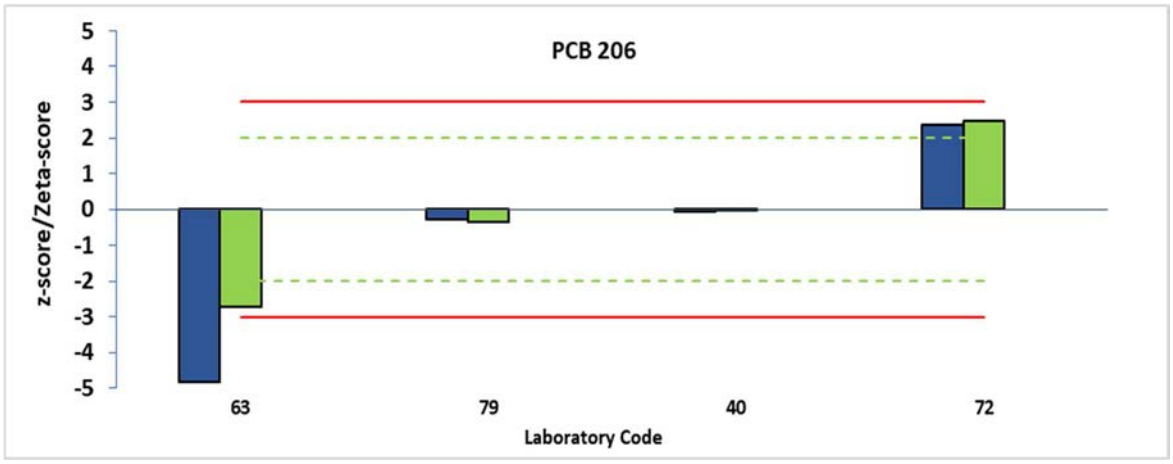
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



*Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



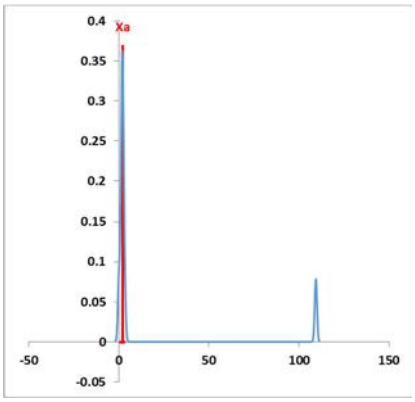
Evaluation of Reported data for PCB 209

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	50%	13%	38%
Zeta-score	80%	0%	20%

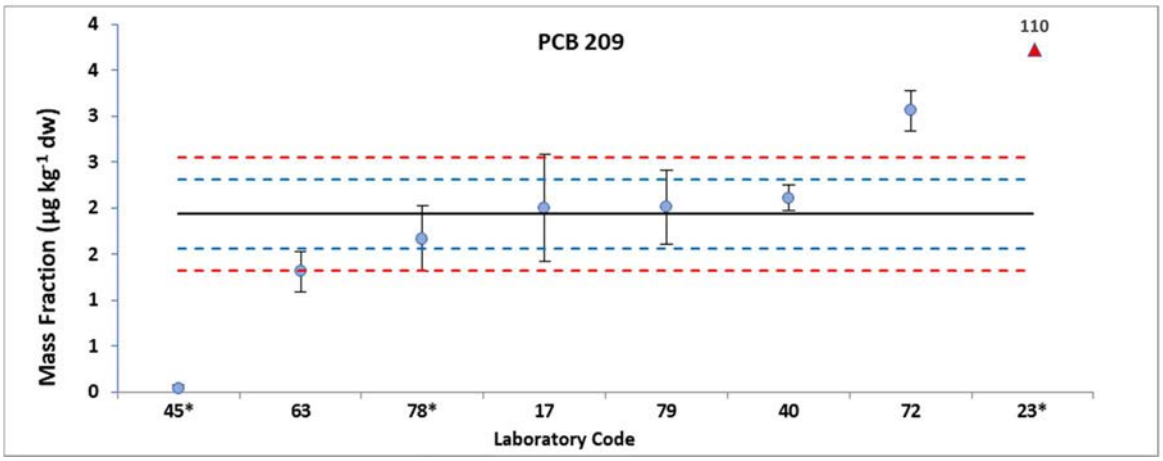
Assigned value (X_a)	1.94 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.37 µg kg^{-1}
2 Total error	0.61 µg kg^{-1}
Number of results reported	9
Number of results accepted	5

Kernel density plot:



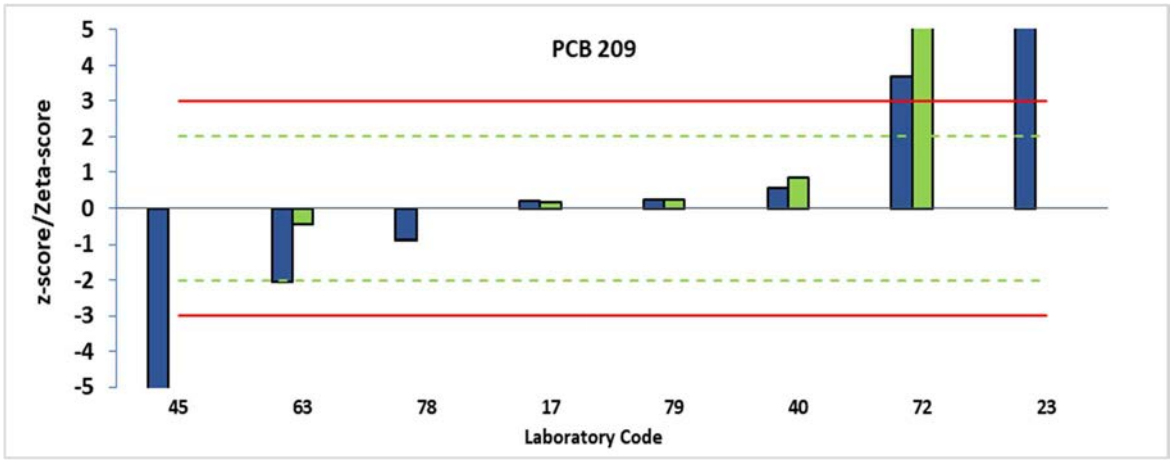
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



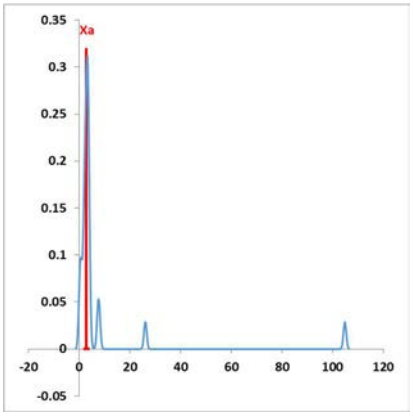
Evaluation of Reported data for HCB

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	64%	4%	32%
Zeta-score	71%	0%	29%

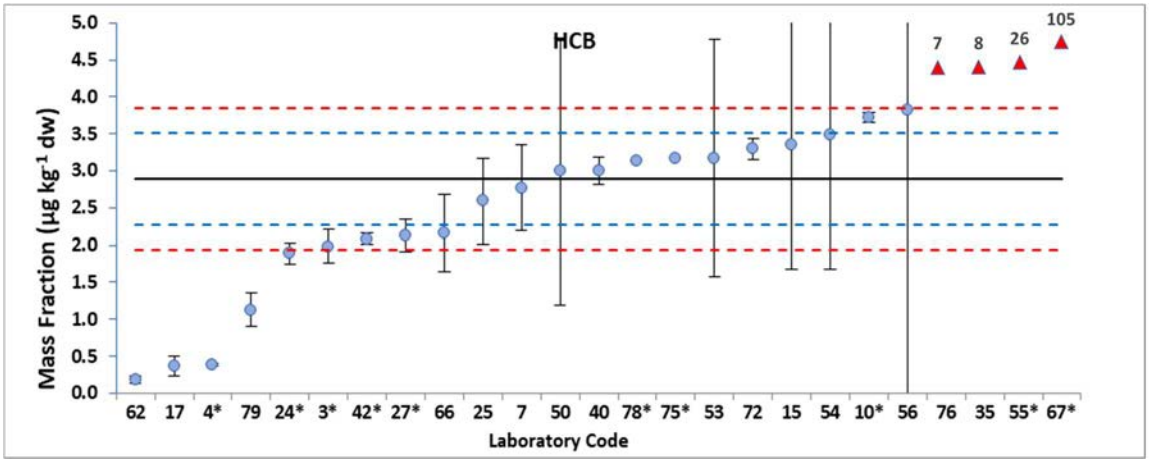
Assigned value (X_a)	2.89 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.62 µg kg^{-1}
2 Total error	0.95 µg kg^{-1}
Number of results reported	27
Number of results accepted	17

Kernel density plot:



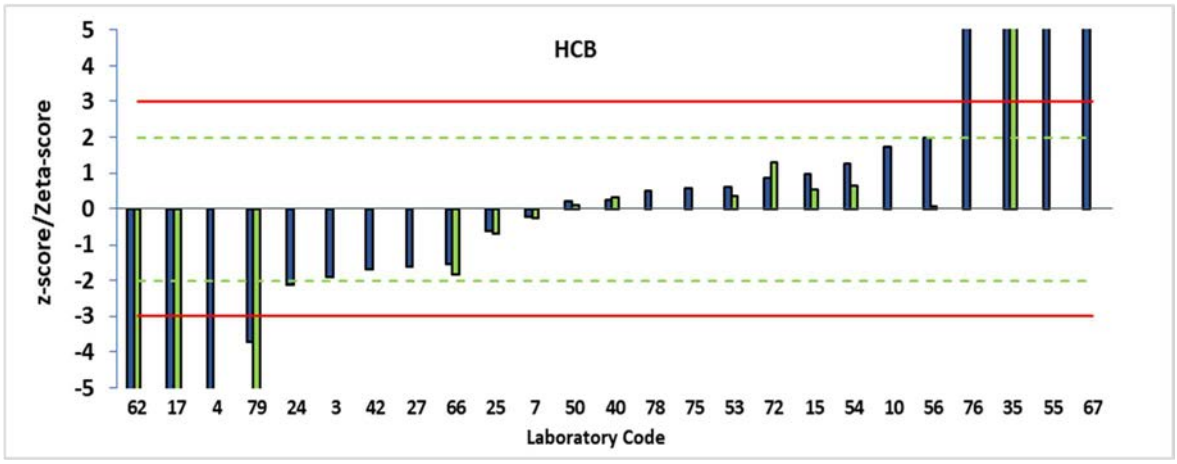
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



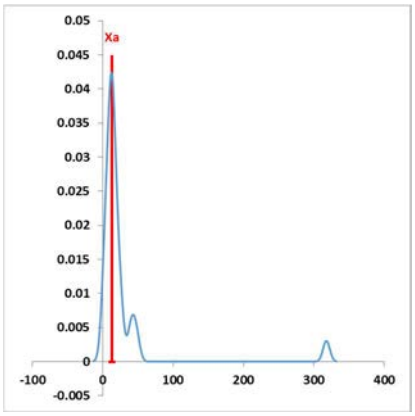
Evaluation of Reported data for *pp'*-DDD

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	41%	15%	44%
Zeta-score	41%	12%	47%

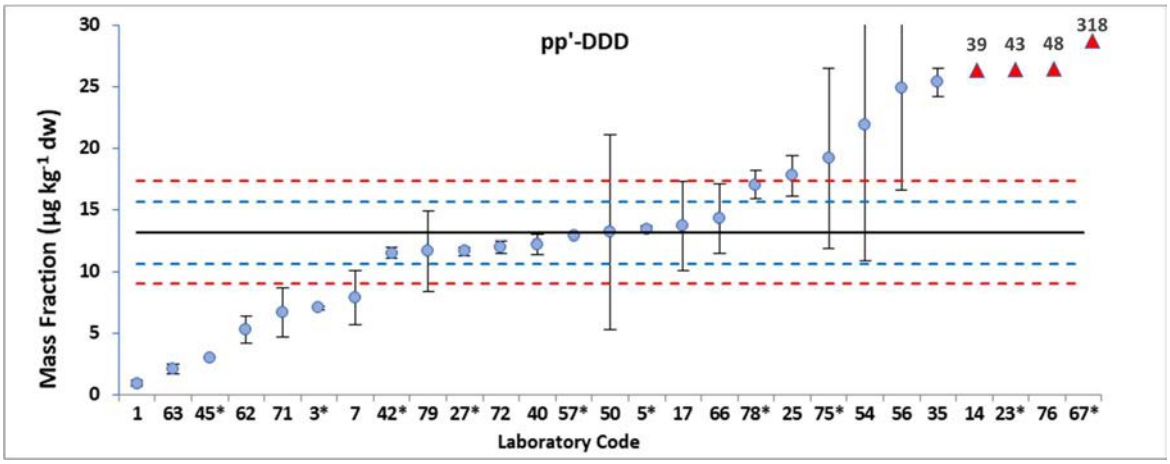
Assigned value (X_a)	13.1 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	2.51 µg kg^{-1}
2 Total error	4.13 µg kg^{-1}
Number of results reported	29
Number of results accepted	14

Kernel density plot:



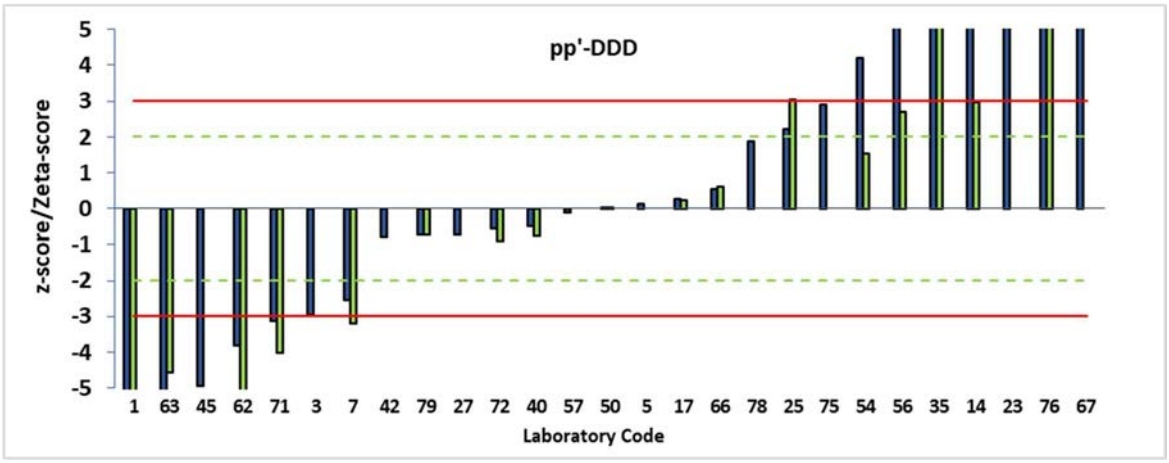
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



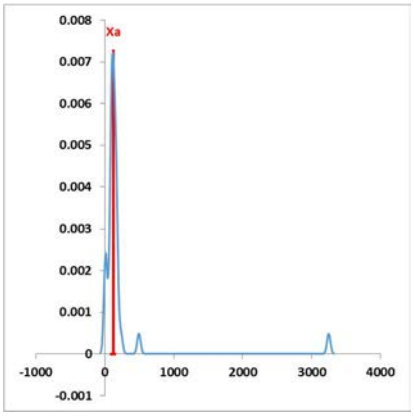
Evaluation of Reported data for *pp*'-DDE

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	59%	16%	25%
Zeta-score	45%	25%	30%

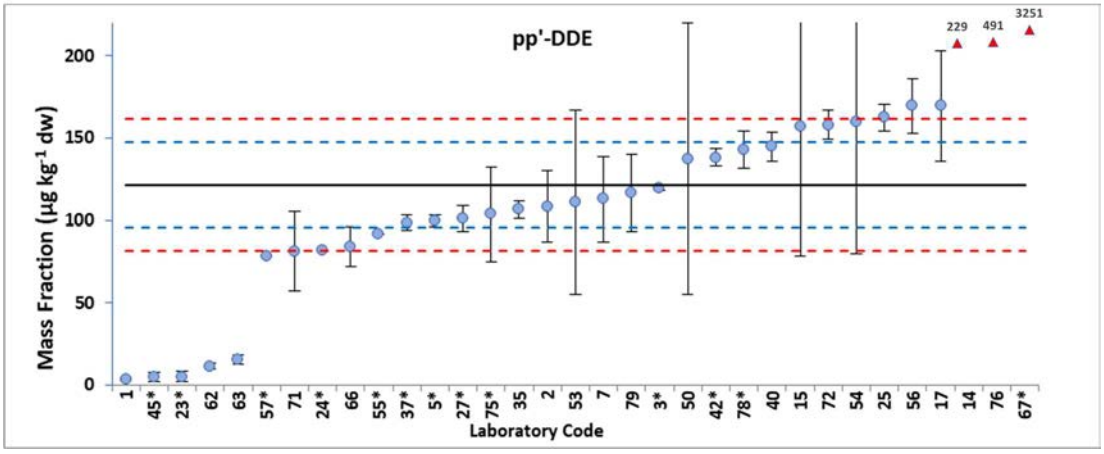
Assigned value (X_a)	121 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	25.8 µg kg^{-1}
2 Total error	39.9 µg kg^{-1}
Number of results reported	34
Number of results accepted	25

Kernel density plot:



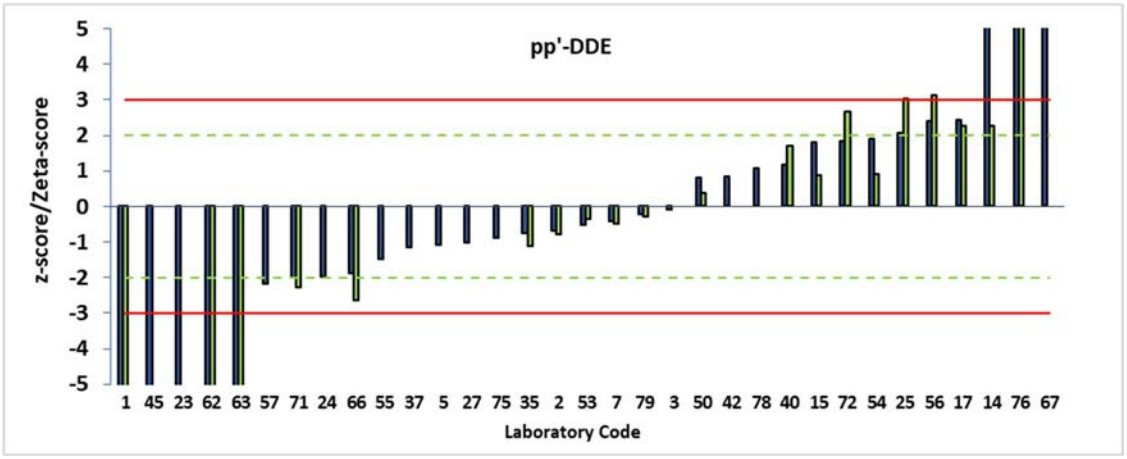
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



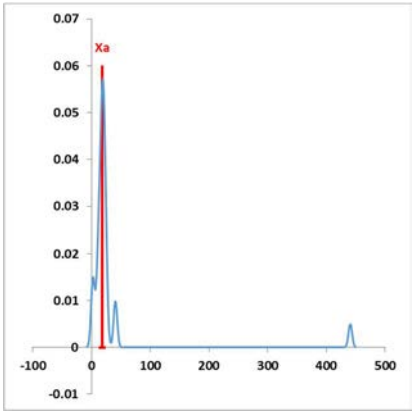
Evaluation of Reported data for *pp'*-DDT

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	58%	19%	23%
Zeta-score	60%	7%	33%

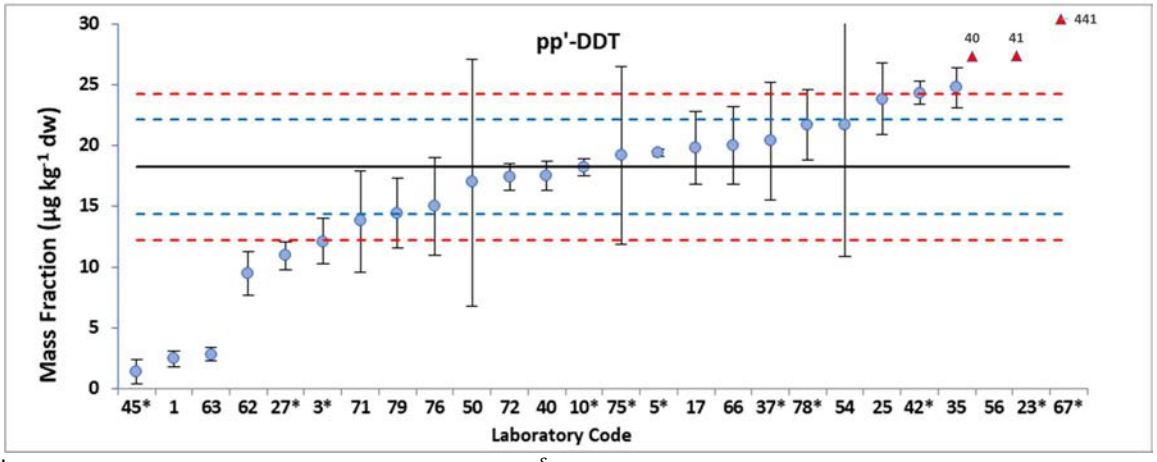
Assigned value (X_a)	18.2 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	3.88 µg kg^{-1}
2 Total error	5.98 µg kg^{-1}
Number of results reported	29
Number of results accepted	20

Kernel density plot:



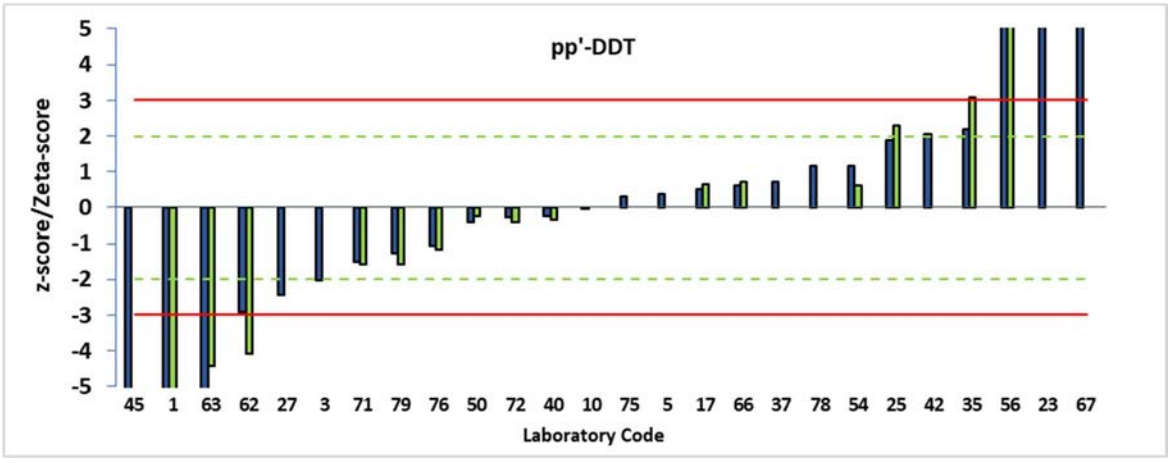
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



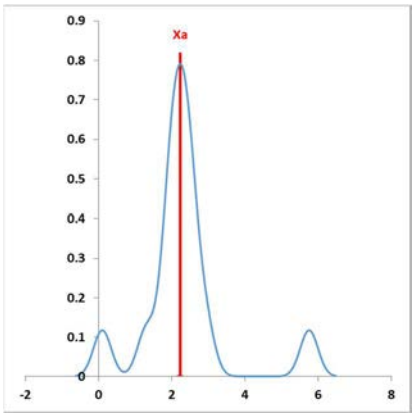
Evaluation of Reported data for *op*'-DDE

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	79%	7%	14%
Zeta-score	83%	0%	17%

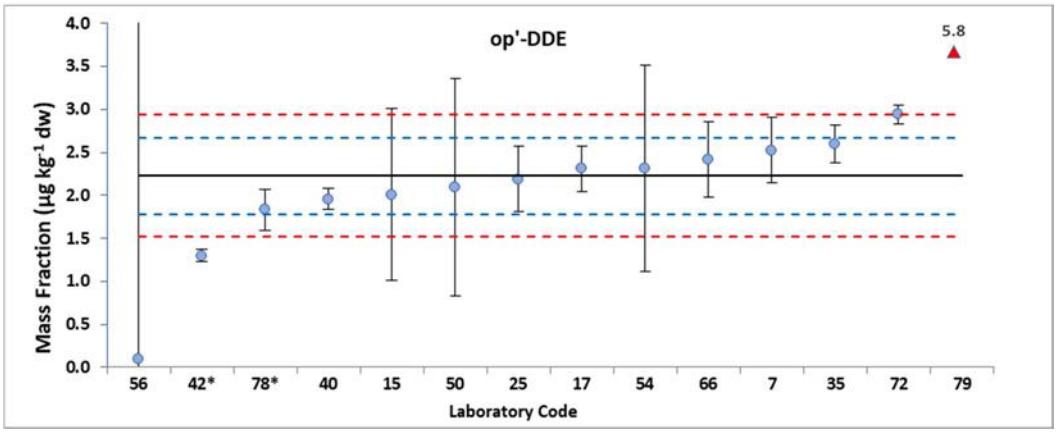
Assigned value (X_a)	2.23 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.45 µg kg^{-1}
2 Total error	0.71 µg kg^{-1}
Number of results reported	17
Number of results accepted	12

Kernel density plot:



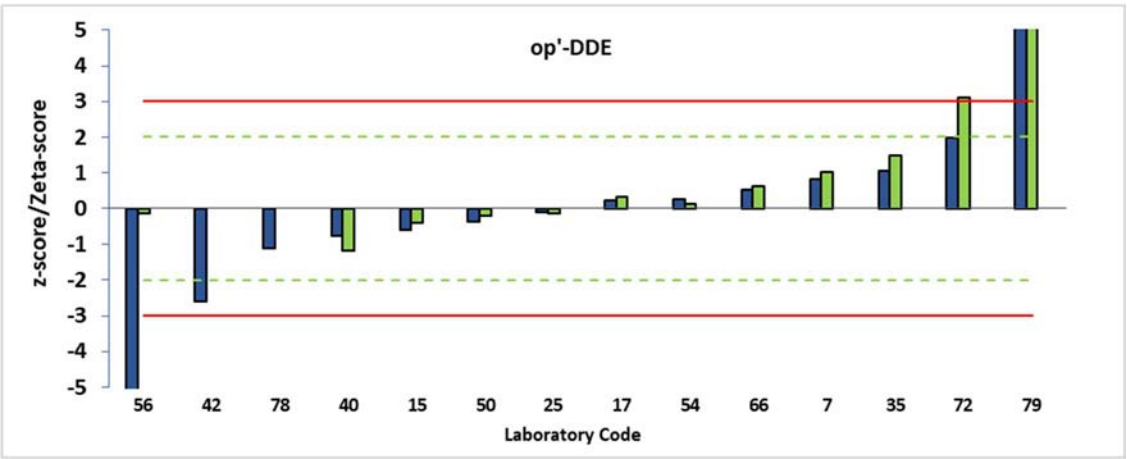
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



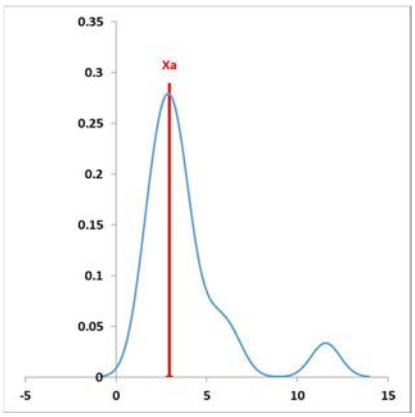
Evaluation of Reported data for *op*'-DDD

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	67%	13%	20%
Zeta-score	75%	8%	17%

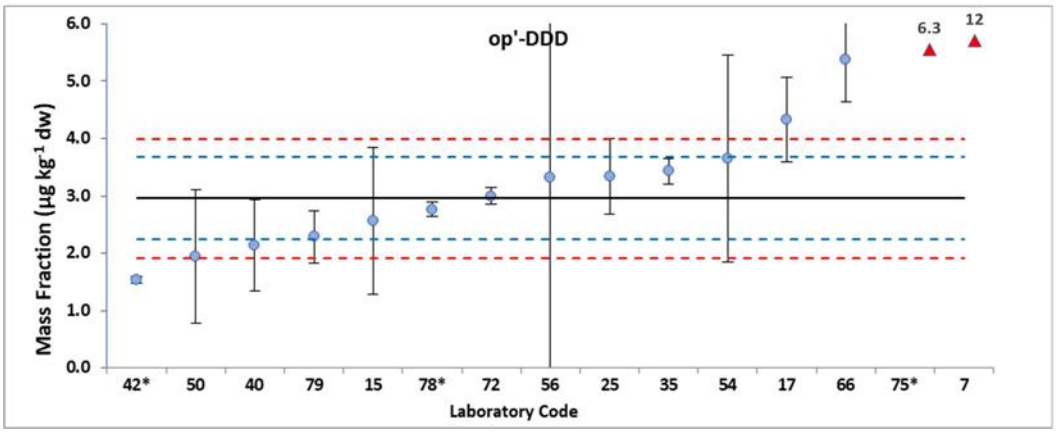
Assigned value (X_a)	2.95 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.72 µg kg^{-1}
2 Total error	1.03 µg kg^{-1}
Number of results reported	16
Number of results accepted	11

Kernel density plot:



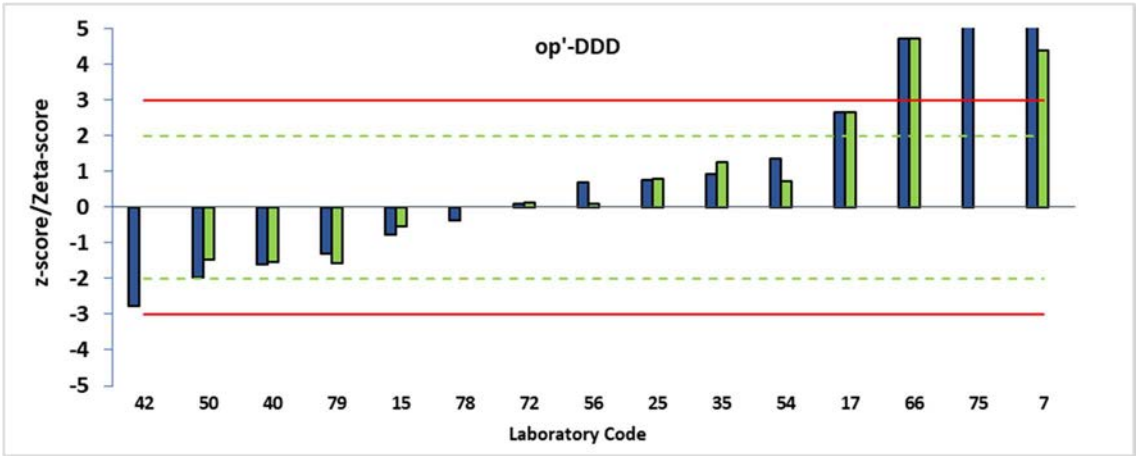
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



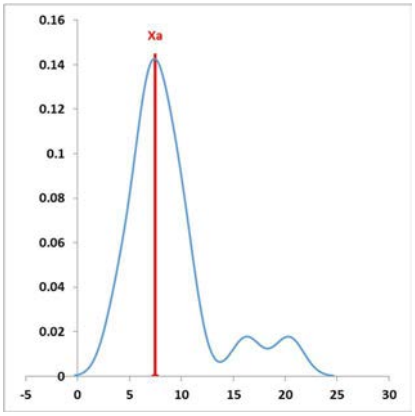
Evaluation of Reported data for *op*'-DDT

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	63%	25%	13%
Zeta-score	55%	18%	27%

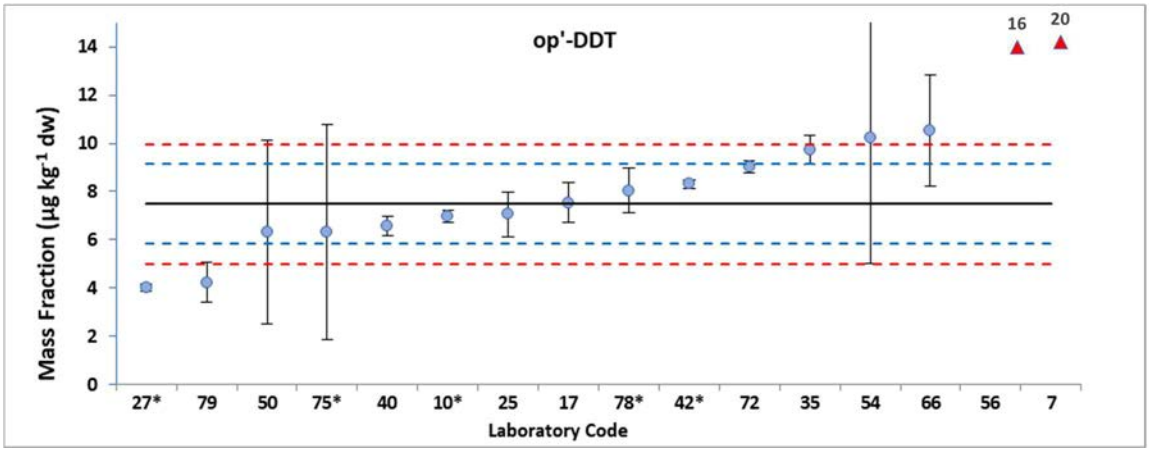
Assigned value (X_a)	7.48 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.66 µg kg^{-1}
2 Total error	2.50 µg kg^{-1}
Number of results reported	18
Number of results accepted	14

Kernel density plot:



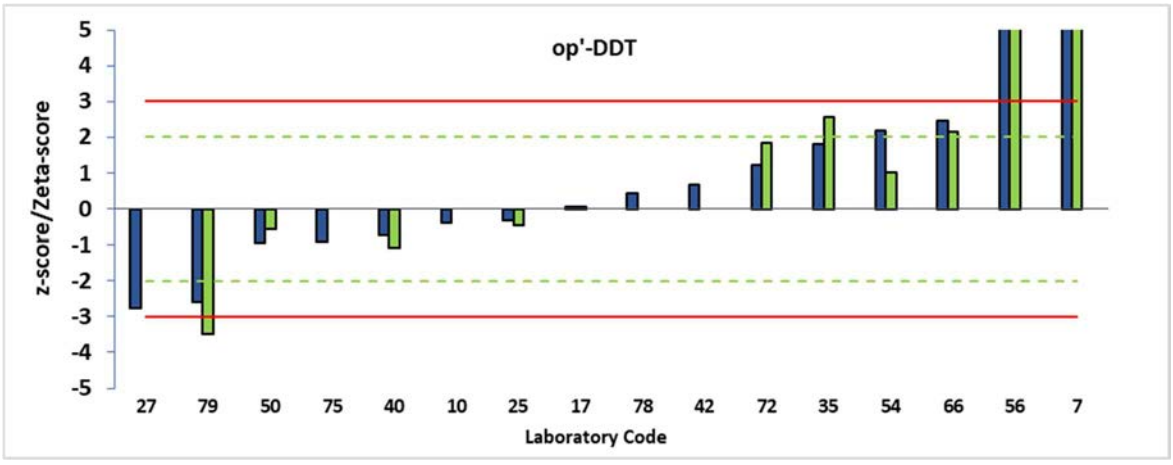
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



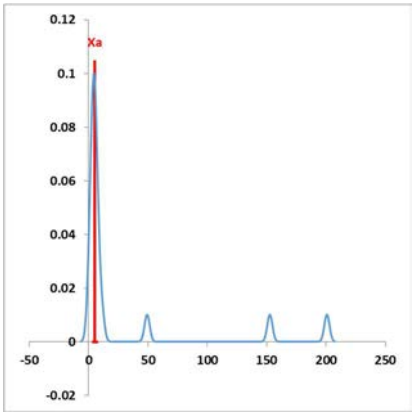
Evaluation of Reported data for Dieldrin

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	50%	17%	33%
Zeta-score	50%	21%	29%

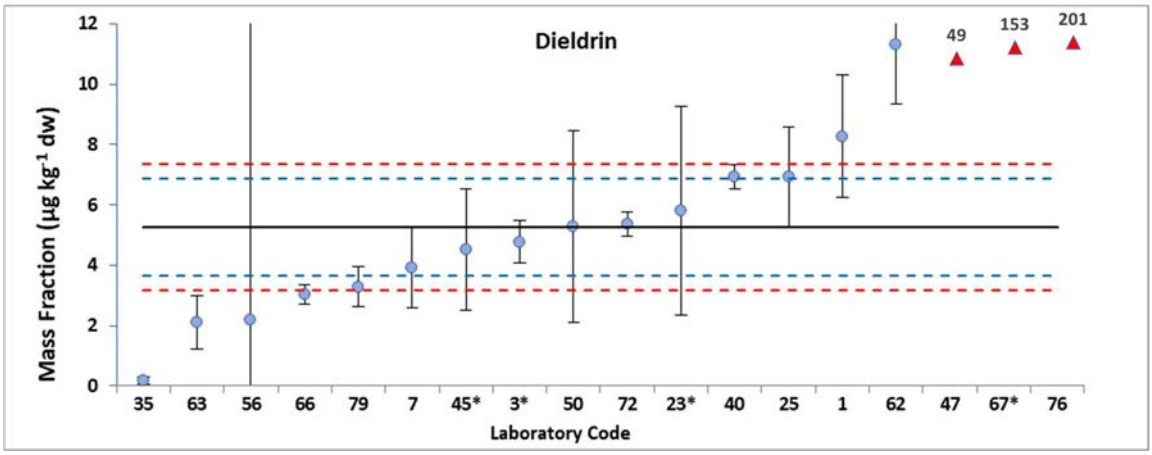
Assigned value (X_a)	5.28 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.62 µg kg^{-1}
2 Total error	2.09 µg kg^{-1}
Number of results reported	24
Number of results accepted	11

Kernel density plot:



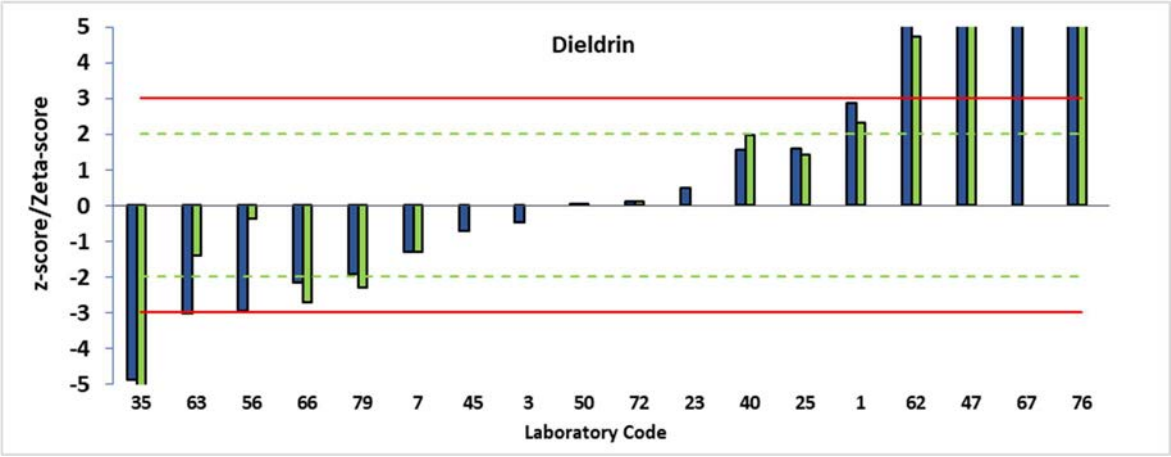
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



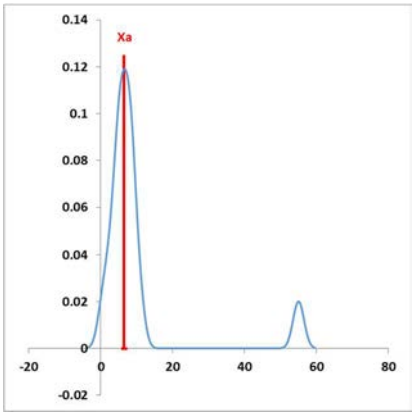
Evaluation of Reported data for cis-Chlordane

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	62%	8%	31%
Zeta-score	100%	0%	0%

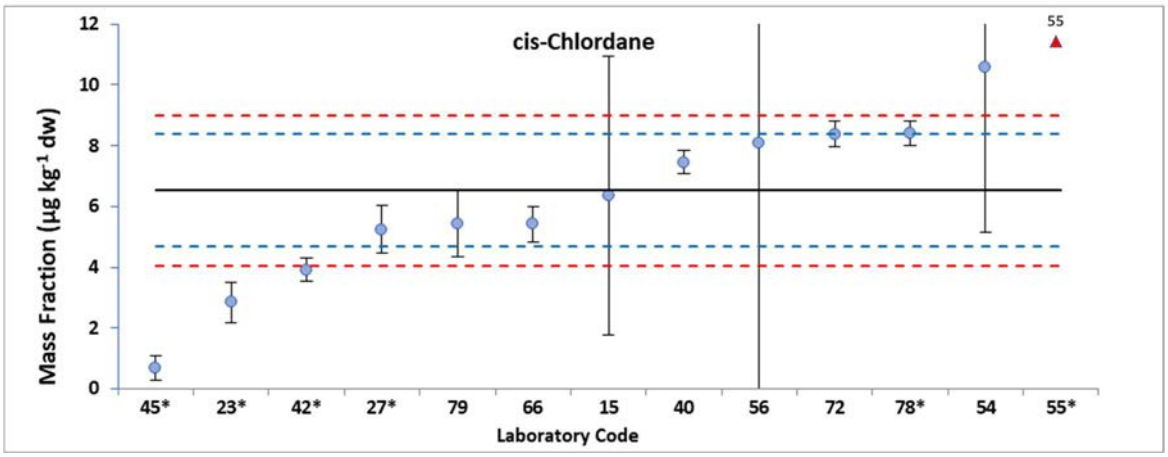
Assigned value (X_a)	6.53 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.85 µg kg^{-1}
2 Total error	2.47 µg kg^{-1}
Number of results reported	15
Number of results accepted	9

Kernel density plot:



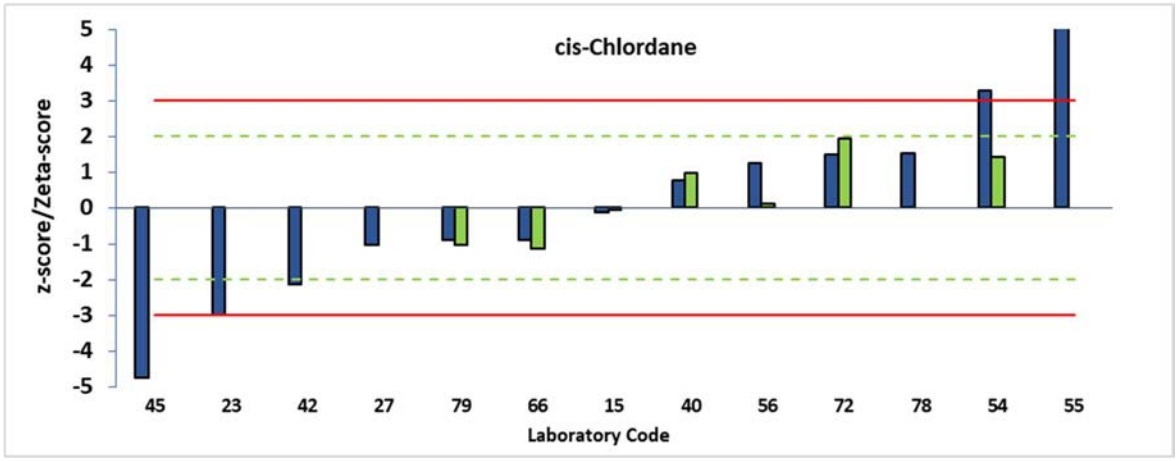
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



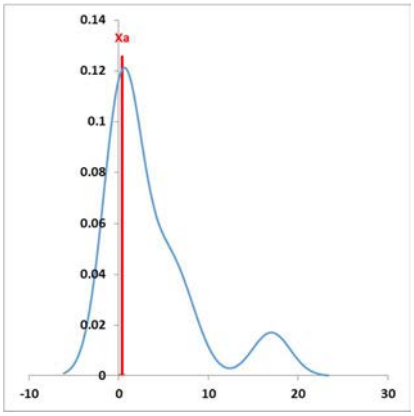
Evaluation of Reported data for trans-Chlordane

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	45%	9%	45%
Zeta-score	83%	0%	17%

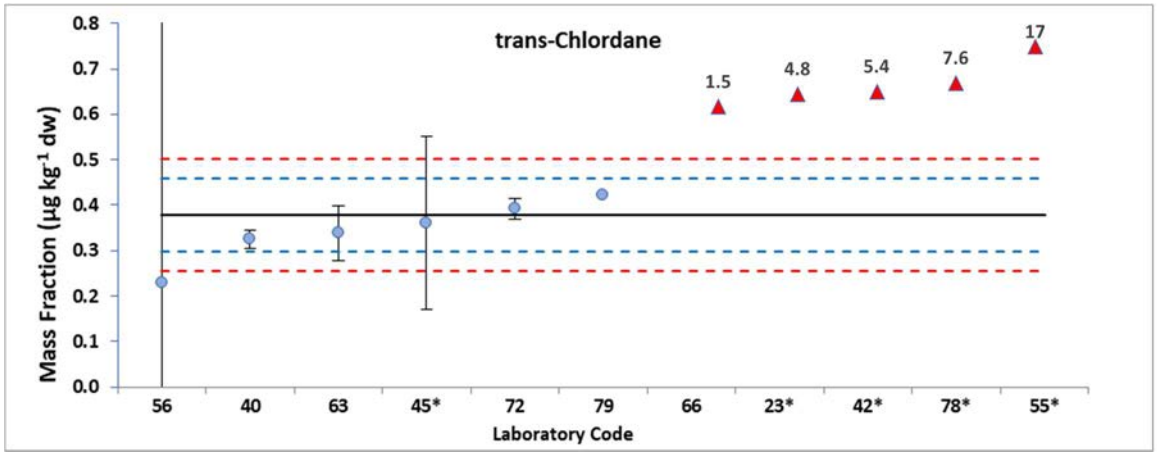
Assigned value (X_a)	0.38 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.08 µg kg^{-1}
2 Total error	0.12 µg kg^{-1}
Number of results reported	16
Number of results accepted	4

Kernel density plot:



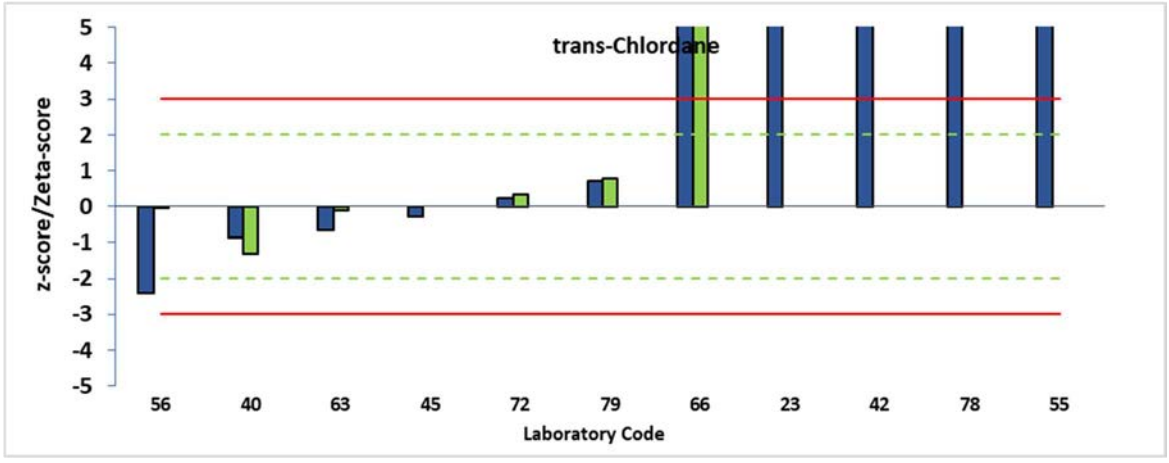
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



Evaluation of Reported data for cis-Nonachlor

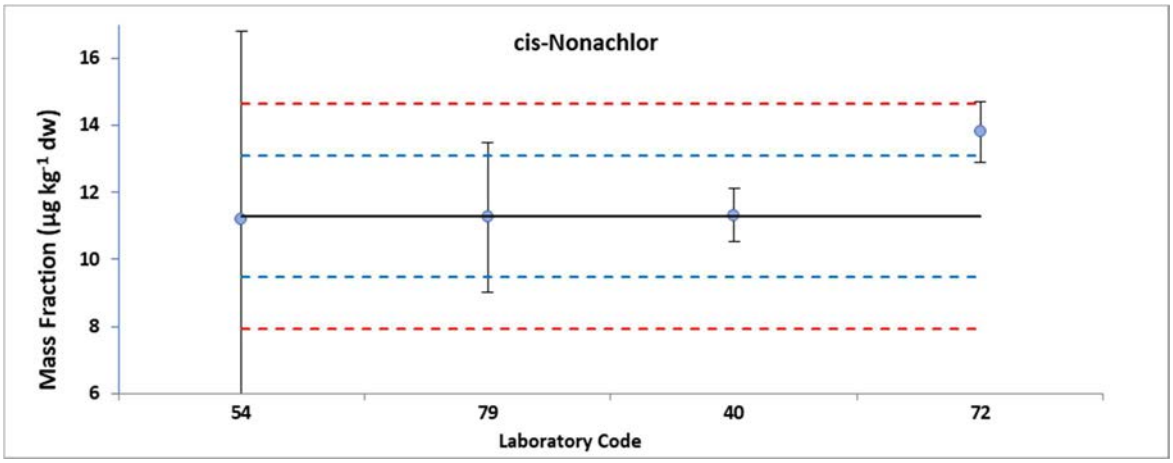
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	100%	0%	0%
Zeta-score	75%	25%	0%

Assigned value (X_a)	11.3 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.81 µg kg^{-1}
2 Total error	3.35 µg kg^{-1}
Number of results reported	4
Number of results accepted	4

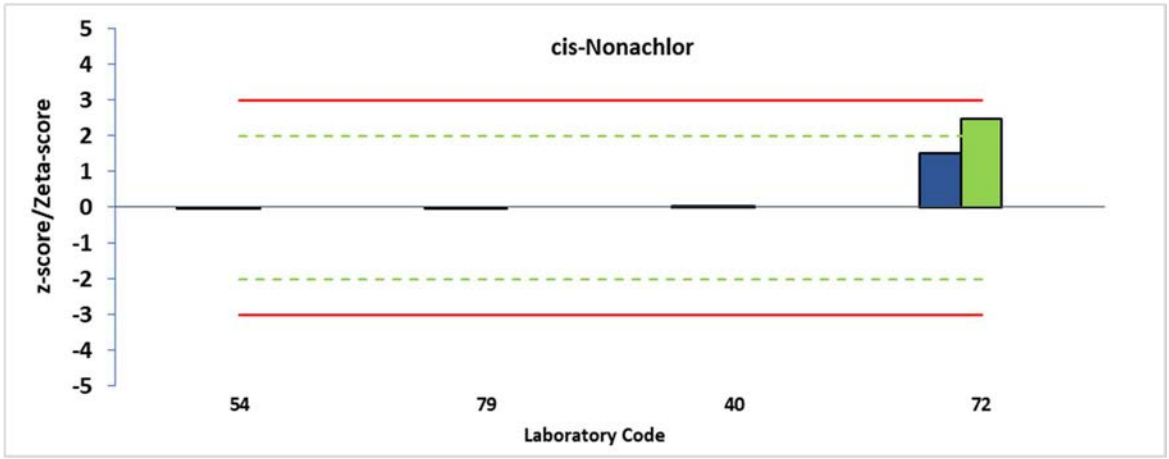
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm$ 2 Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



Evaluation of Reported data for trans-Nonachlor

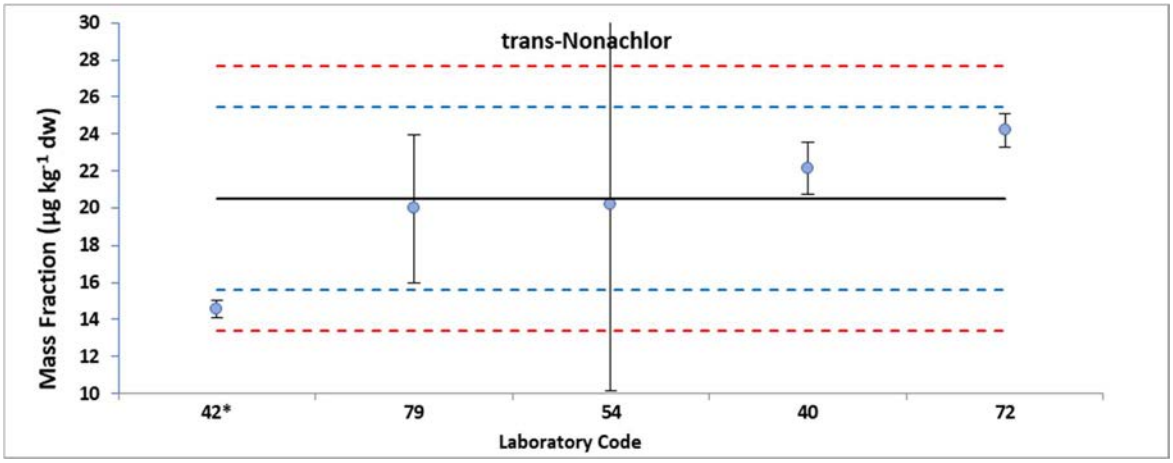
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	100%	0%	0%
Zeta-score	100%	0%	0%

Assigned value (X_a)	20.5 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	4.95 µg kg^{-1}
2 Total error	7.13 µg kg^{-1}
Number of results reported	5
Number of results accepted	5

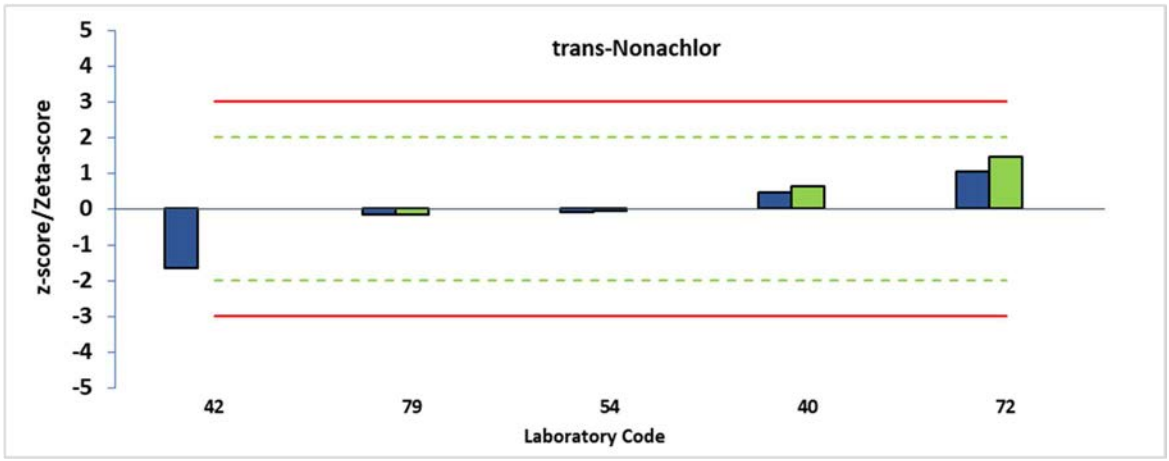
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



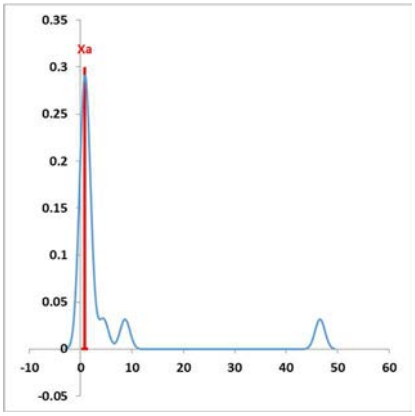
Evaluation of Reported data for Heptachlor epoxide

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	46%	8%	46%
Zeta-score	56%	11%	33%

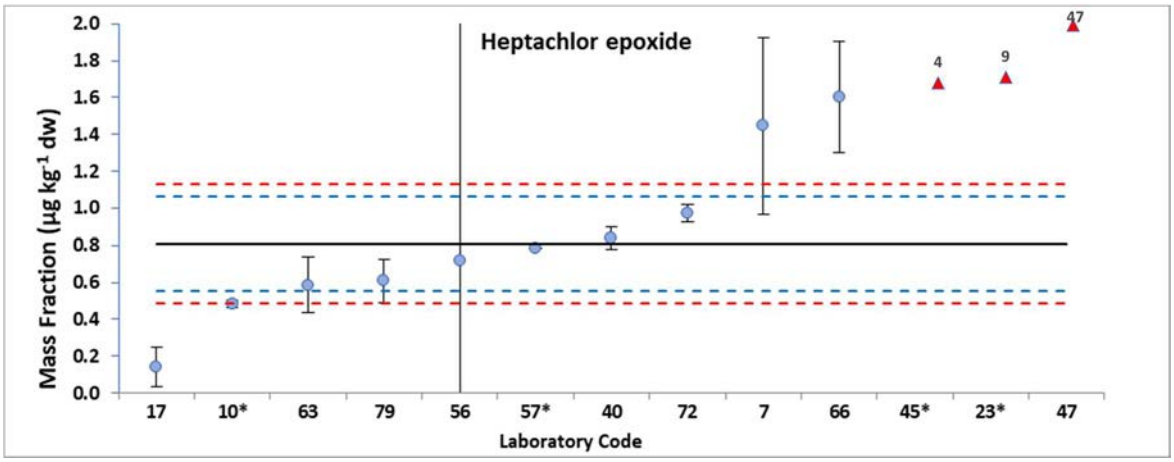
Assigned value (X_a)	0.81 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.25 µg kg^{-1}
2 Total error	0.32 µg kg^{-1}
Number of results reported	22
Number of results accepted	7

Kernel density plot:



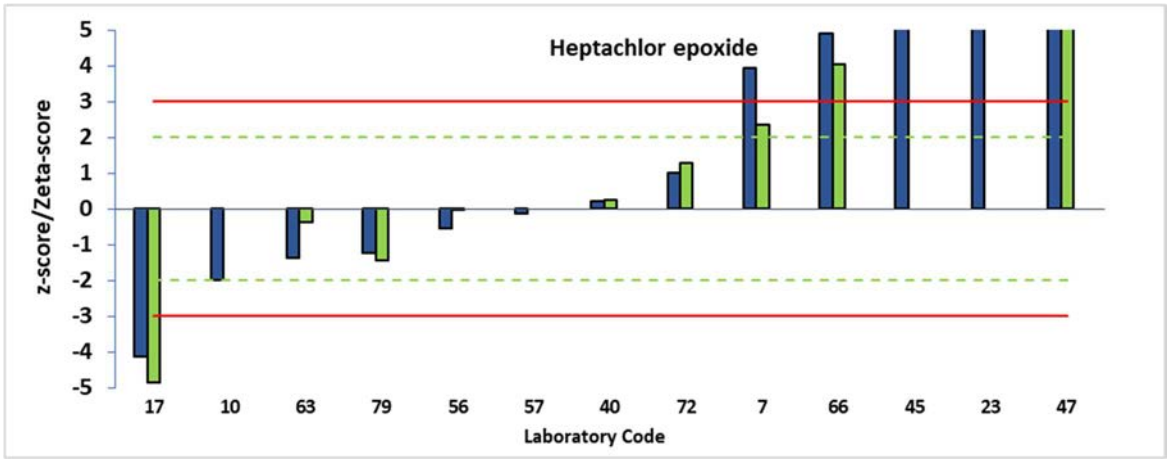
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



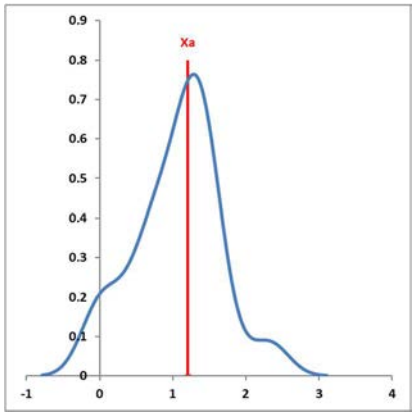
Evaluation of Reported data for BDE 28

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	56%	22%	22%
Zeta-score	54%	15%	31%

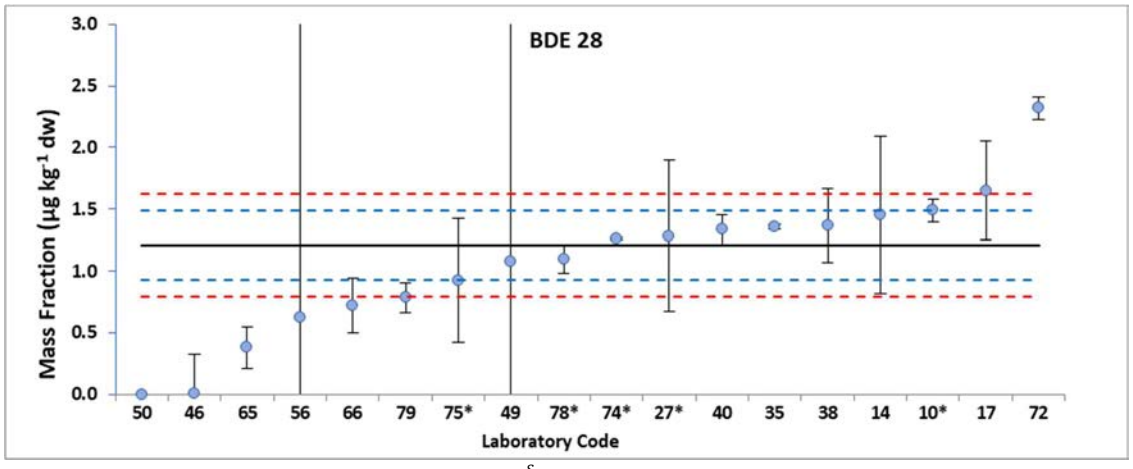
Assigned value (X_a)	1.21 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.28 µg kg^{-1}
2 Total error	0.41 µg kg^{-1}
Number of results reported	18
Number of results accepted	14

Kernel density plot:



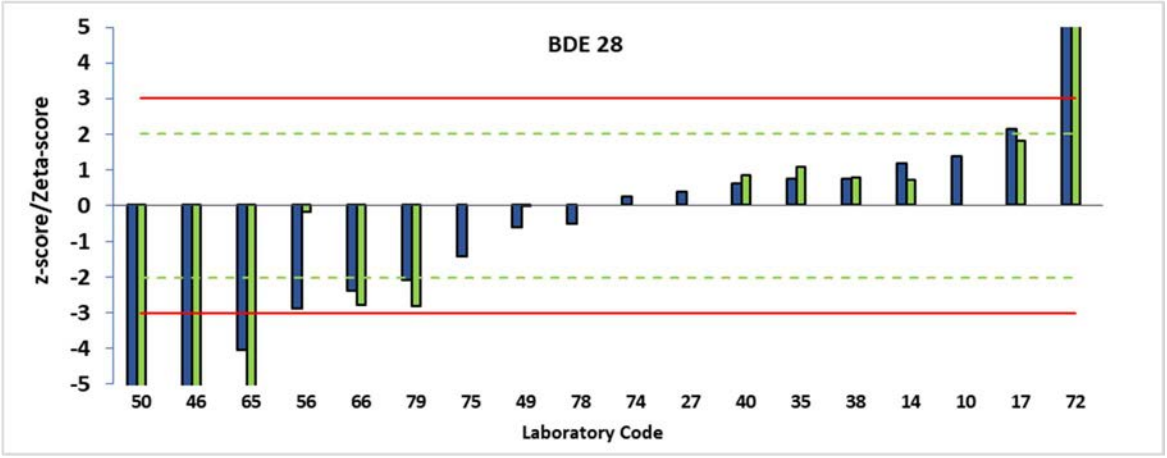
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) - - $X_a \pm$ 2 Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



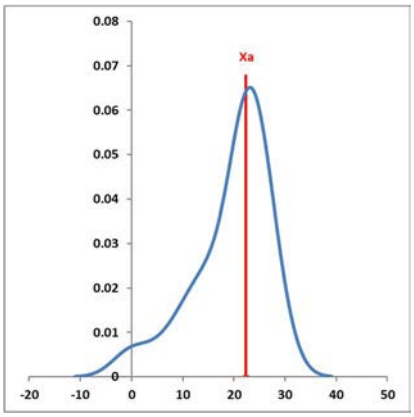
Evaluation of Reported data for BDE 47

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	72%	11%	17%
Zeta-score	69%	8%	23%

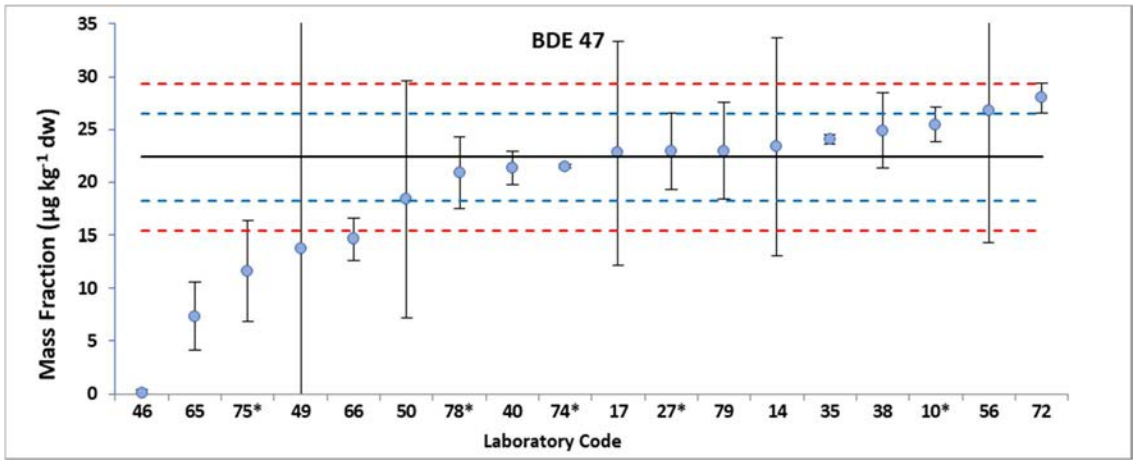
Assigned value (X_a)	22.4 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	4.14 µg kg^{-1}
2 Total error	6.97 µg kg^{-1}
Number of results reported	18
Number of results accepted	16

Kernel density plot:



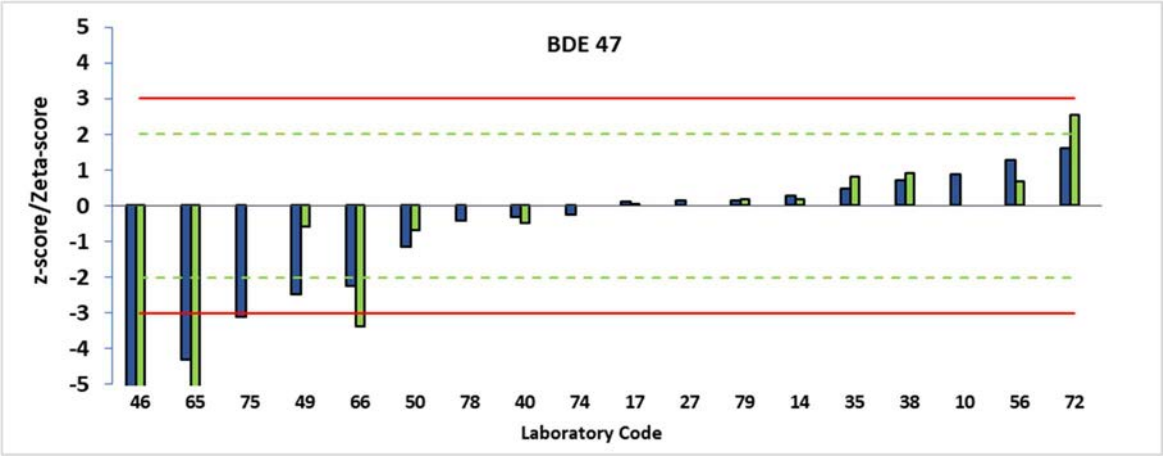
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



Evaluation of Reported data for BDE 49

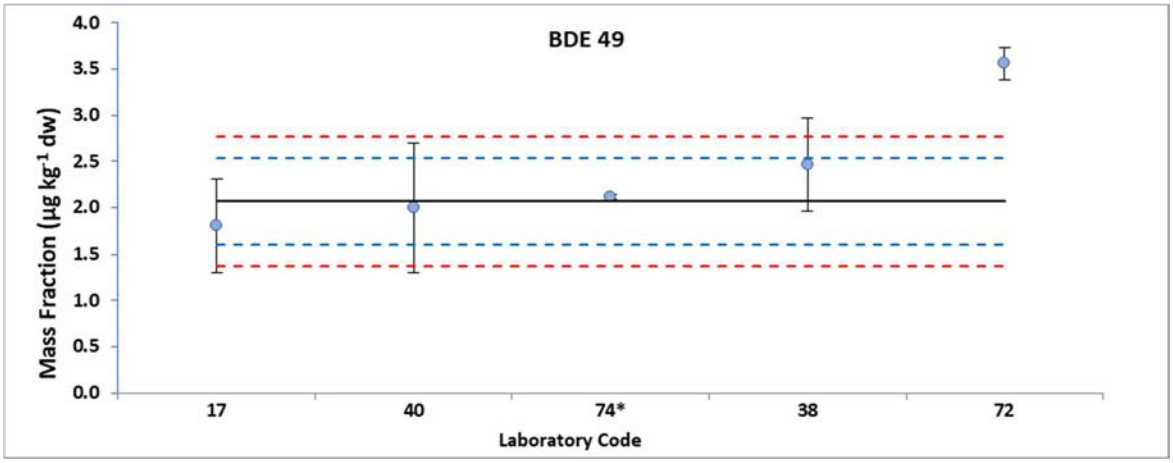
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	80%	0%	20%
Zeta-score	75%	0%	25%

Assigned value (X_a)	2.07 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.47 µg kg^{-1}
2 Total error	0.70 µg kg^{-1}
Number of results reported	5
Number of results accepted	4

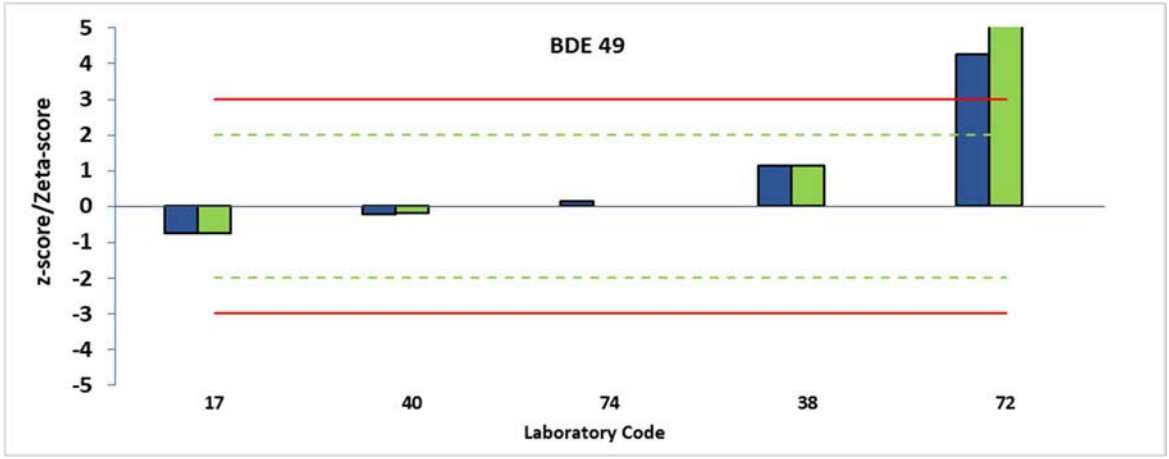
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



Evaluation of Reported data for BDE 66

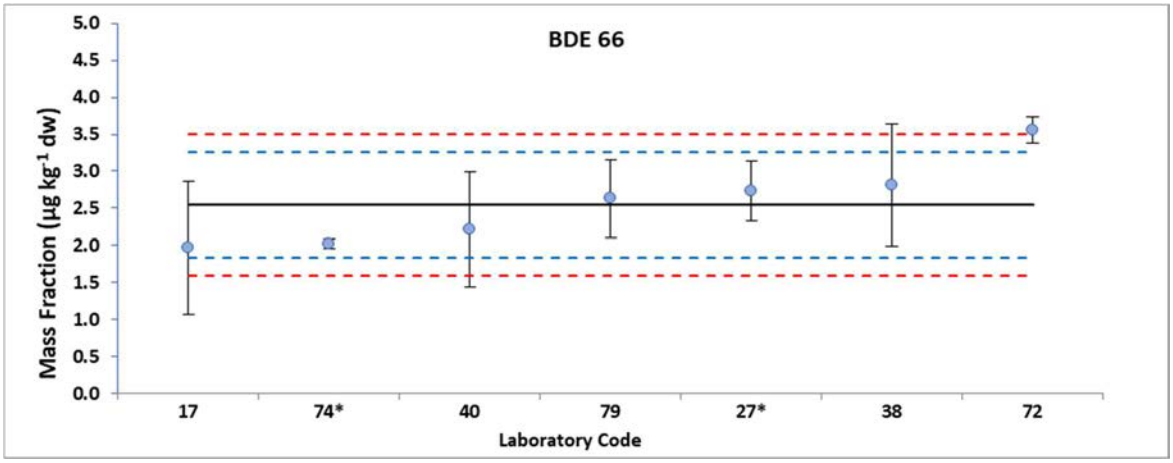
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	86%	14%	0%
Zeta-score	80%	20%	0%

Assigned value (X_a)	2.55 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.71 µg kg^{-1}
2 Total error	0.95 µg kg^{-1}
Number of results reported	7
Number of results accepted	7

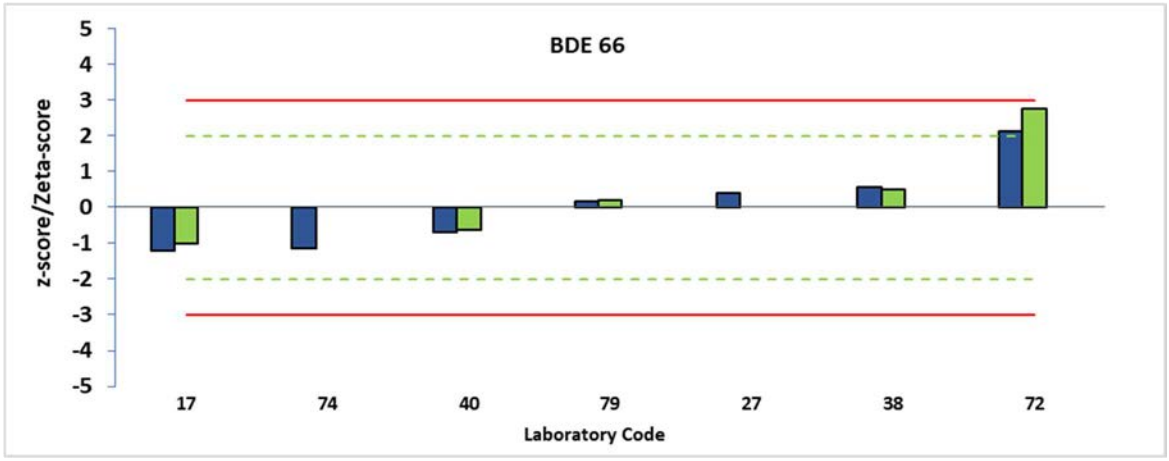
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm$ 2 Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



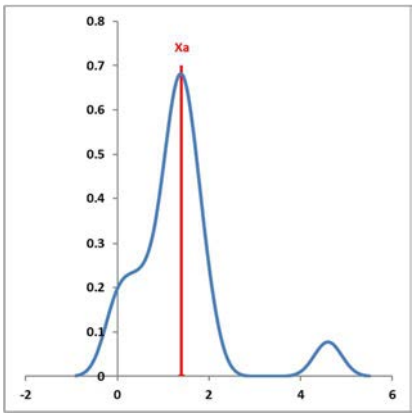
Evaluation of Reported data for BDE 99

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	59%	12%	29%
Zeta-score	69%	8%	23%

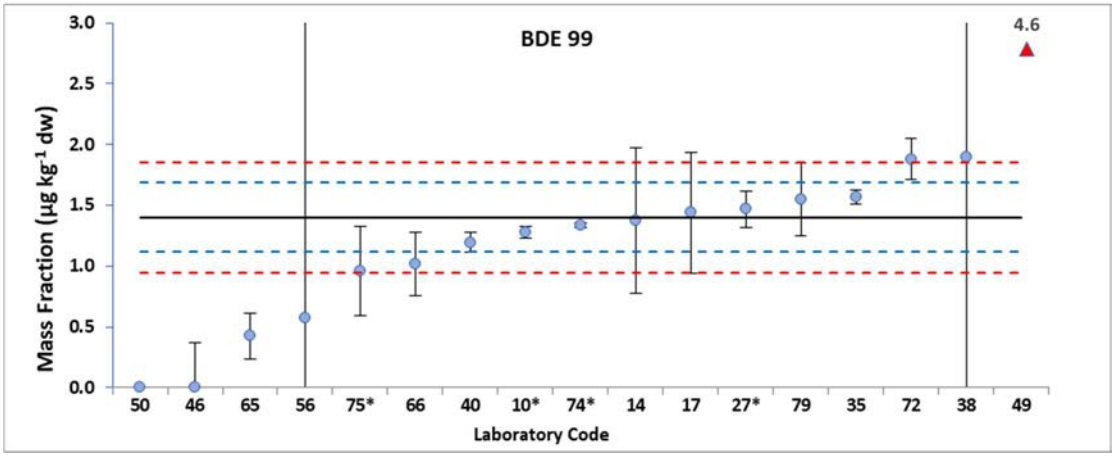
Assigned value (X_a)	1.40 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.29 µg kg^{-1}
2 Total error	0.45 µg kg^{-1}
Number of results reported	18
Number of results accepted	12

Kernel density plot:



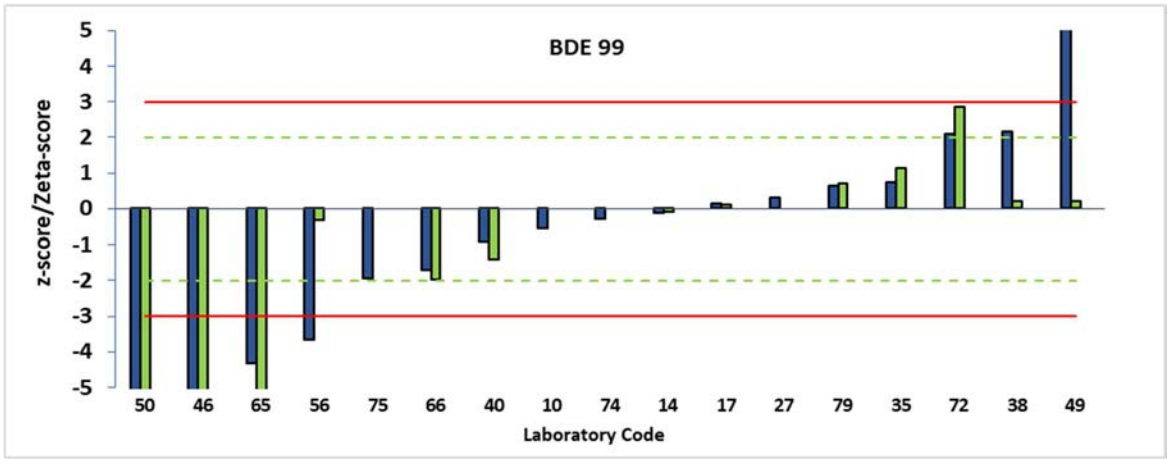
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm$ 2 Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



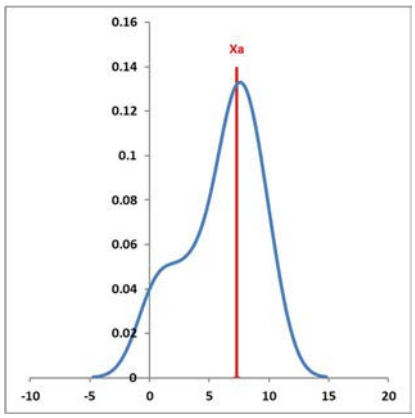
Evaluation of Reported data for BDE 100

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	61%	17%	22%
Zeta-score	62%	15%	23%

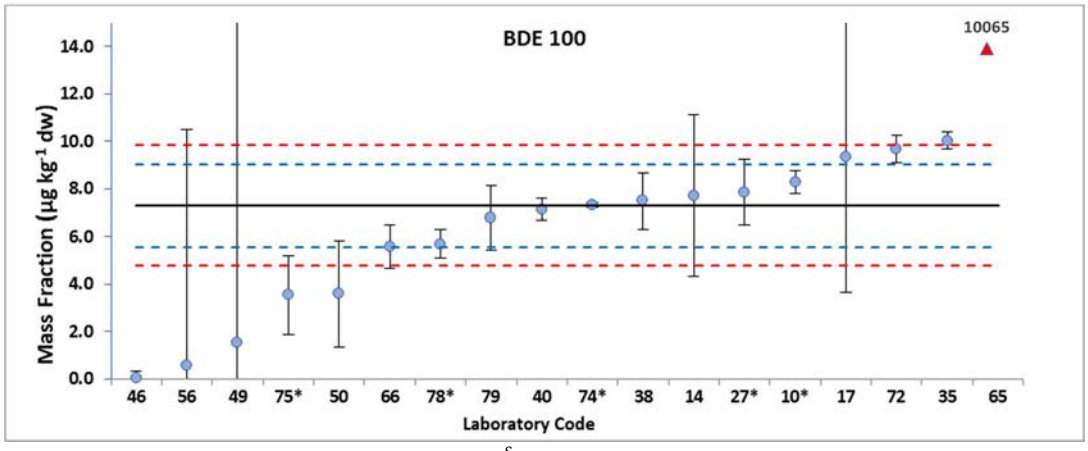
Assigned value (X_a)	7.30 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.76 µg kg^{-1}
2 Total error	2.53 µg kg^{-1}
Number of results reported	18
Number of results accepted	14

Kernel density plot:



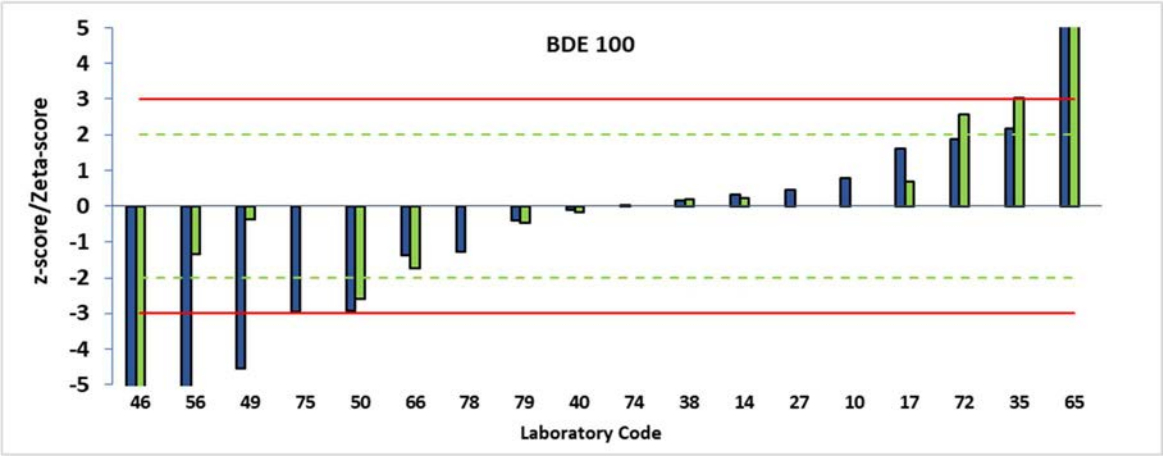
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where s is the standard deviation and n is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



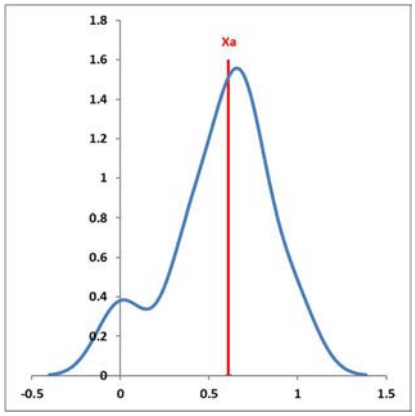
Evaluation of Reported data for BDE 153

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	63%	13%	25%
Zeta-score	67%	8%	25%

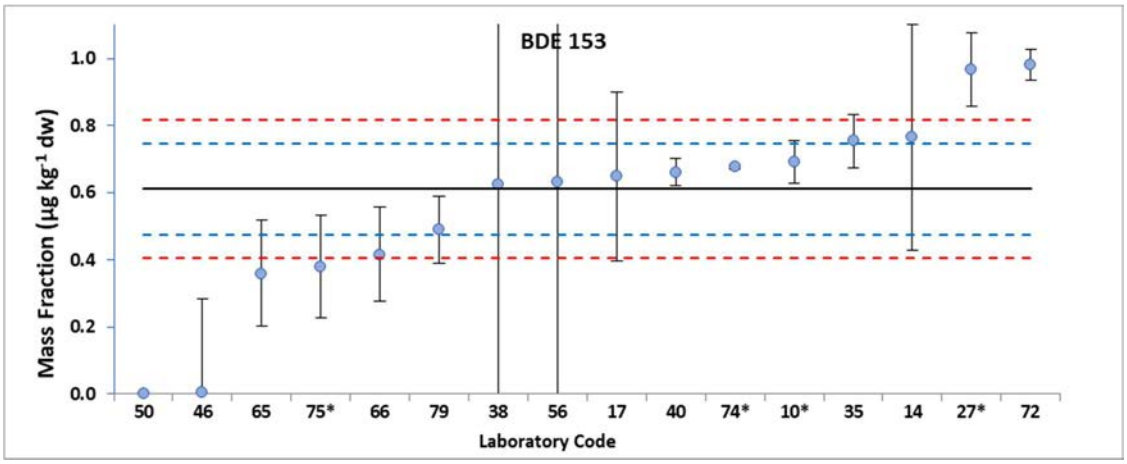
Assigned value (X_a)	0.61 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.14 µg kg^{-1}
2 Total error	0.20 µg kg^{-1}
Number of results reported	17
Number of results accepted	12

Kernel density plot:



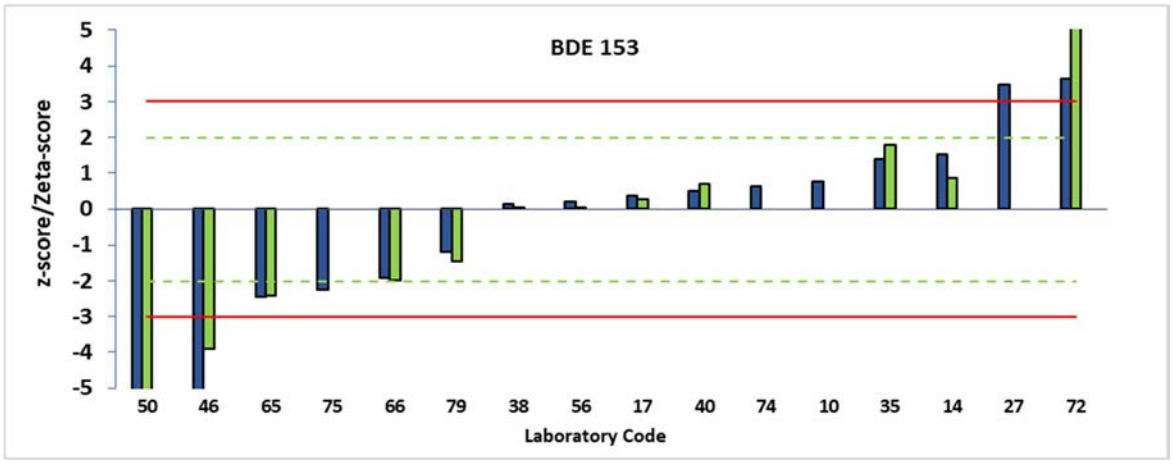
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



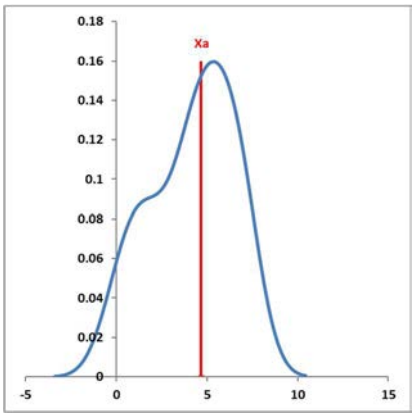
Evaluation of Reported data for BDE 154

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	50%	22%	28%
Zeta-score	54%	8%	38%

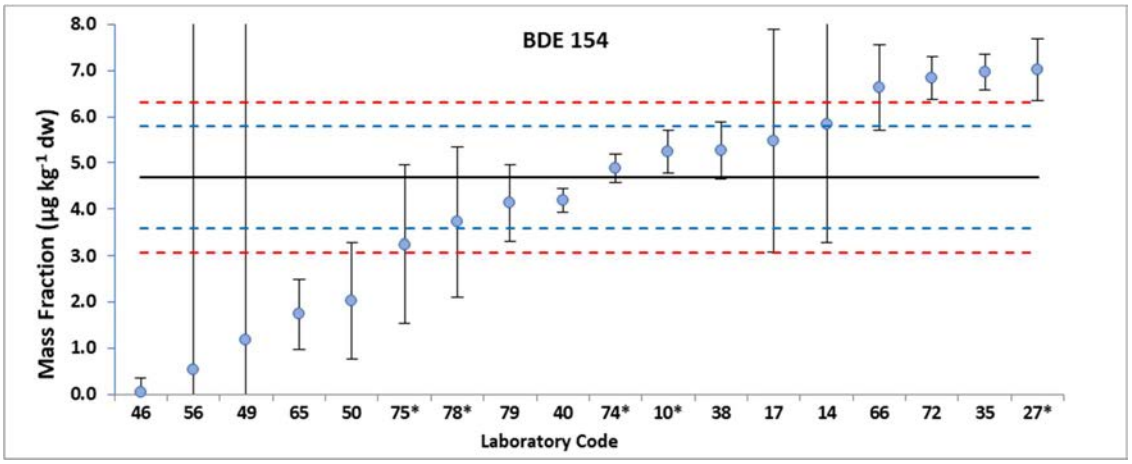
Assigned value (X_a)	4.68 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.11 µg kg^{-1}
2 Total error	1.62 µg kg^{-1}
Number of results reported	18
Number of results accepted	9

Kernel density plot:



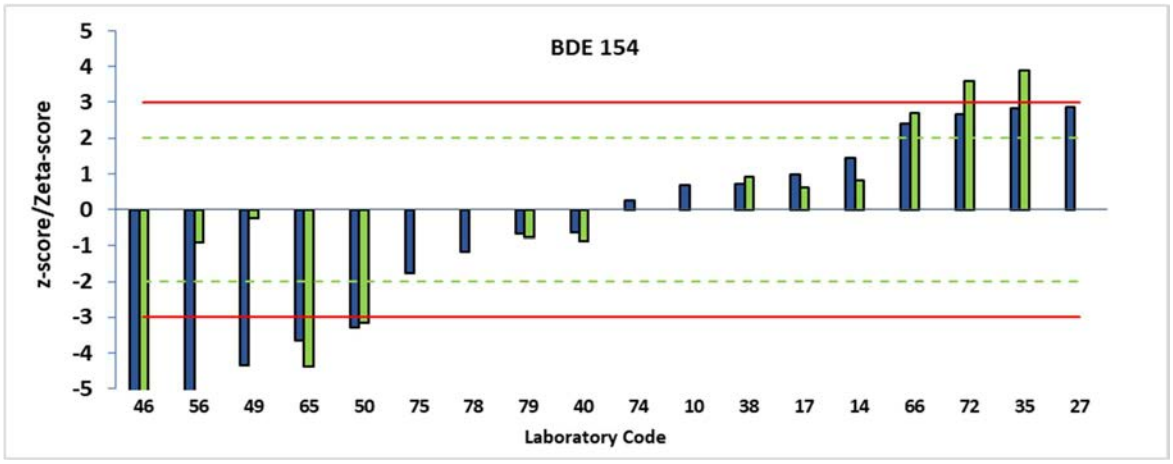
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



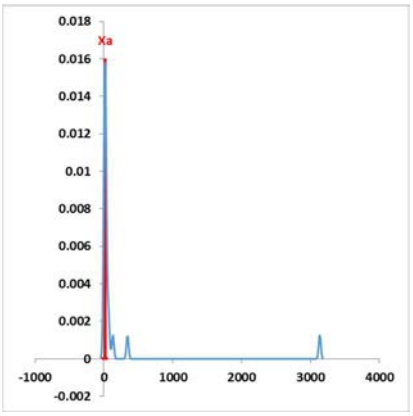
Evaluation of Reported data for Naphthalene

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	37%	11%	53%
Zeta-score	50%	10%	40%

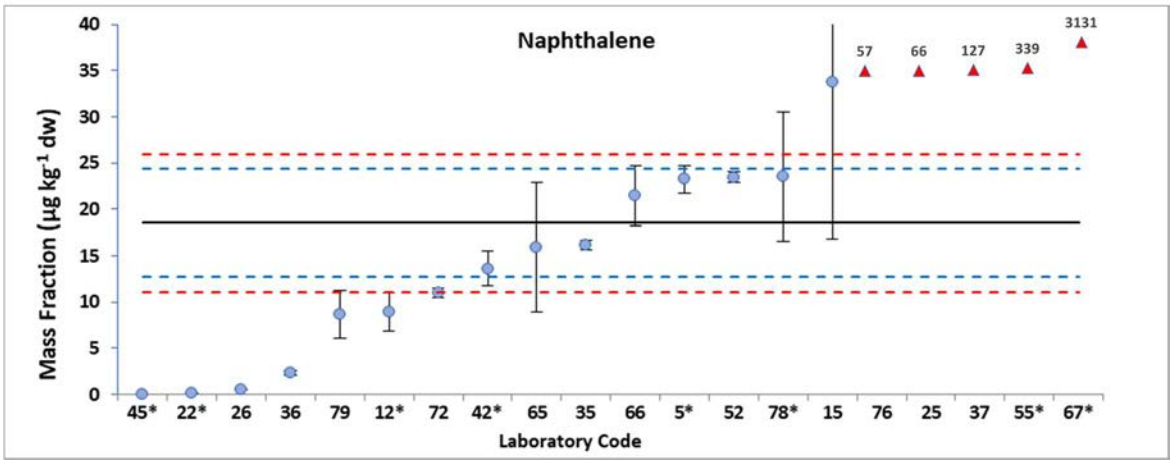
Assigned value (X_a)	18.6 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	5.81 µg kg^{-1}
2 Total error	7.43 µg kg^{-1}
Number of results reported	20
Number of results accepted	8

Kernel density plot:



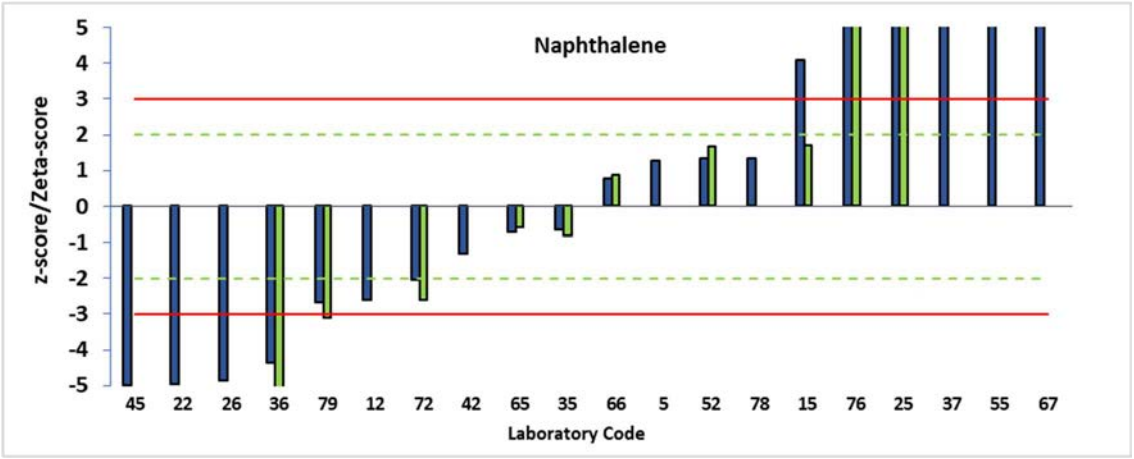
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm$ 2 Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



Evaluation of Reported data for 1-Methylnaphthalene

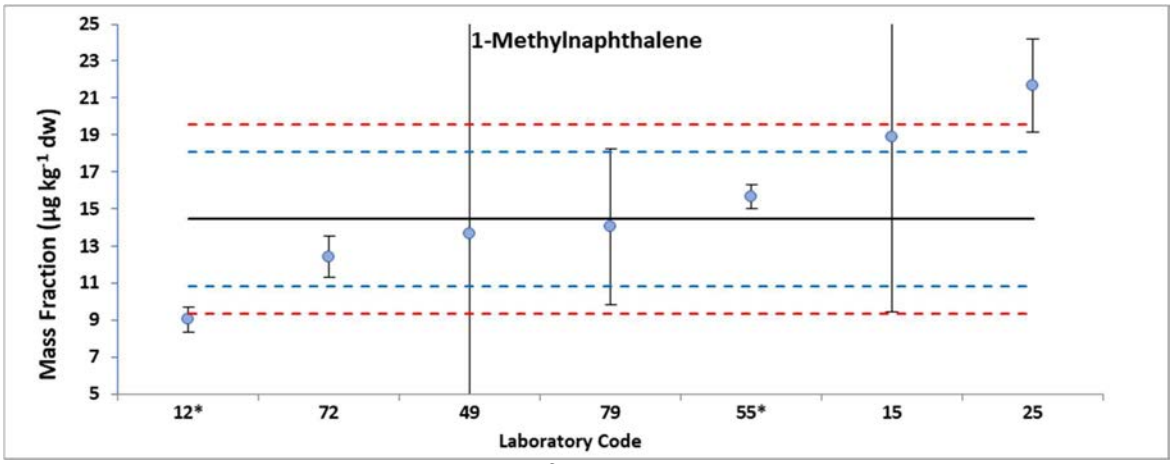
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	71%	29%	0%
Zeta-score	80%	0%	20%

Assigned value (X_a)	14.5 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	3.61 µg kg^{-1}
2 Total error	5.11 µg kg^{-1}
Number of results reported	7
Number of results accepted	7

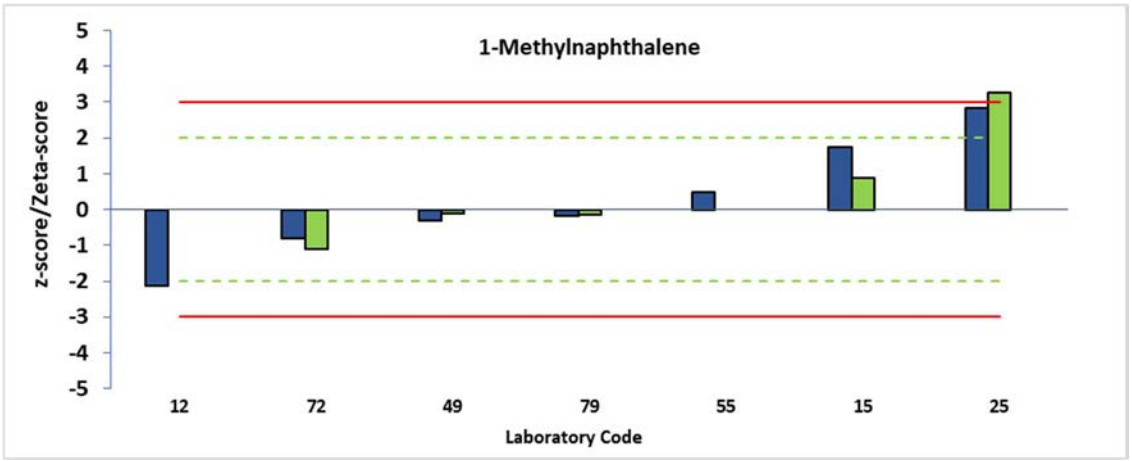
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm$ 2 Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



Evaluation of Reported data for 2-Methylnaphthalene

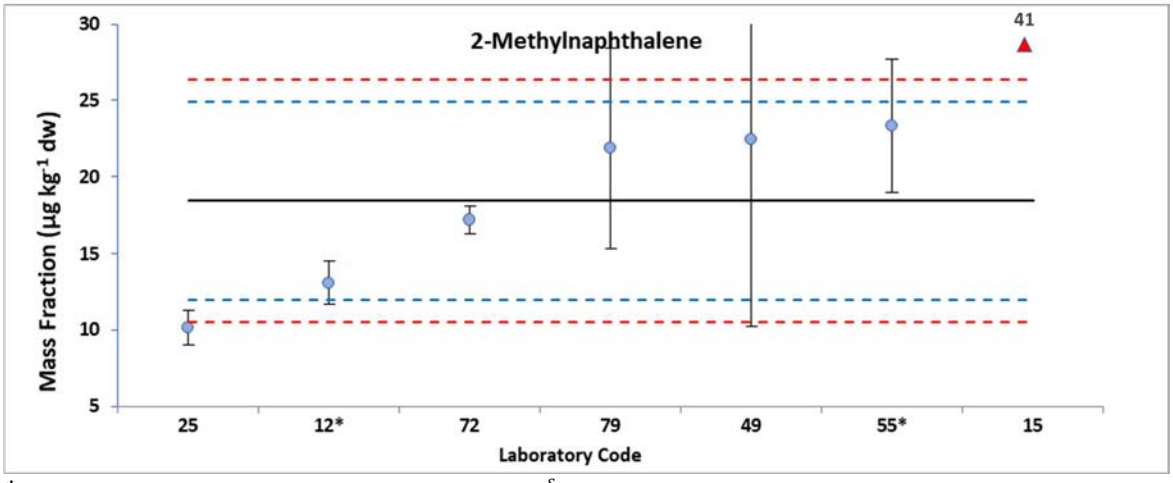
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	71%	14%	14%
Zeta-score	60%	40%	0%

Assigned value (X_a)	18.4 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	6.43 µg kg^{-1}
2 Total error	7.91 µg kg^{-1}
Number of results reported	8
Number of results accepted	6

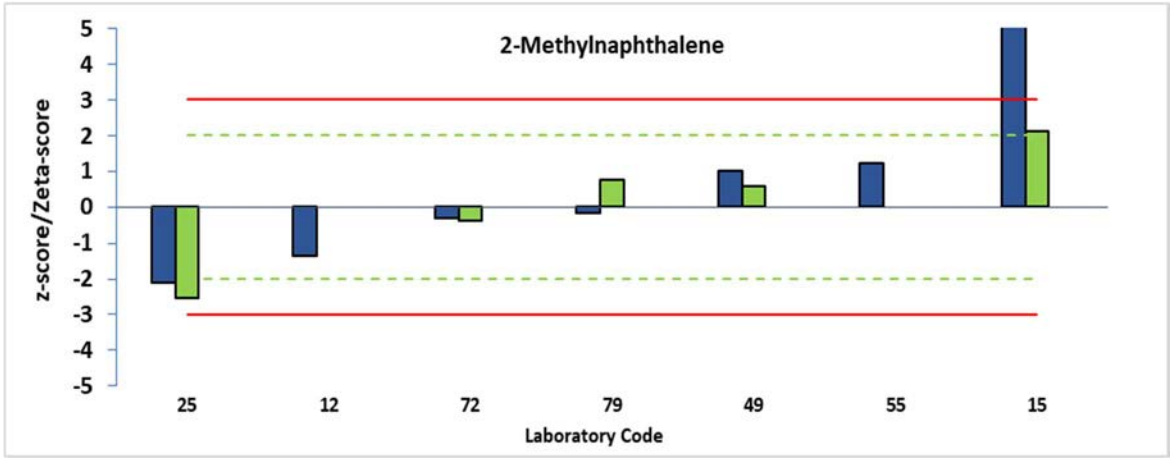
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



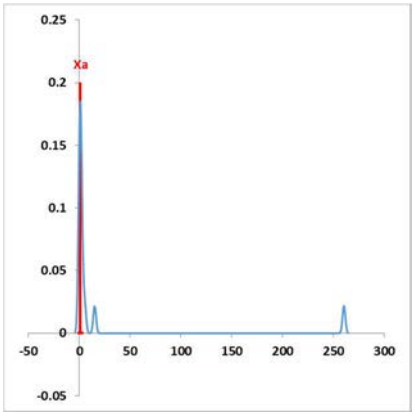
Evaluation of Reported data for Acenaphthylene

Summary of results:

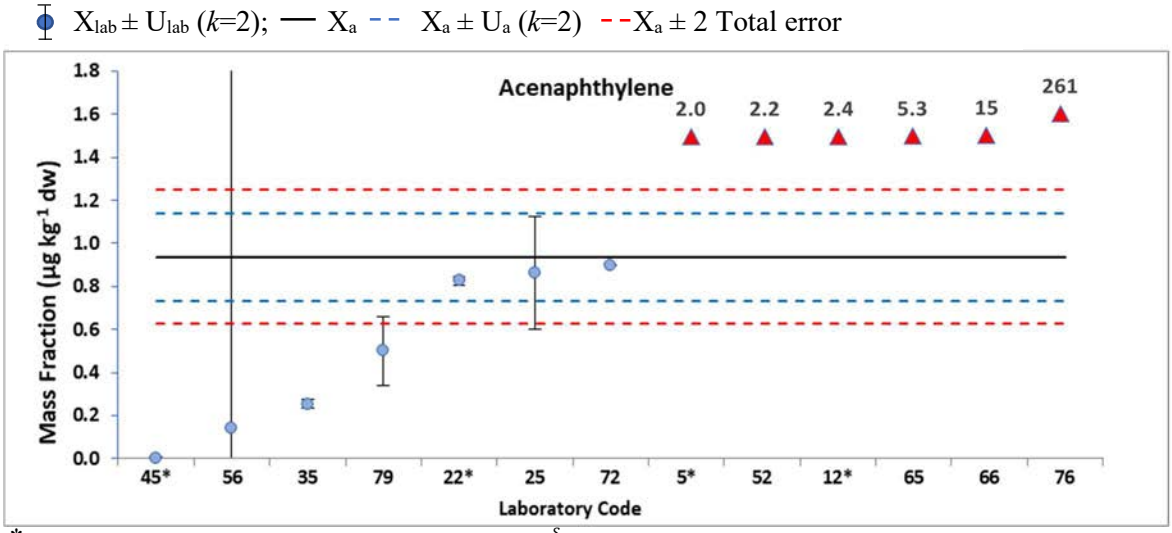
	Satisfactory	Questionable	Unsatisfactory
z-score	23%	8%	69%
Zeta-score	25%	0%	75%

Assigned value (X_a)	0.94 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.21 µg kg^{-1}
2 Total error	0.31 µg kg^{-1}
Number of results reported	18
Number of results accepted	5

Kernel density plot:

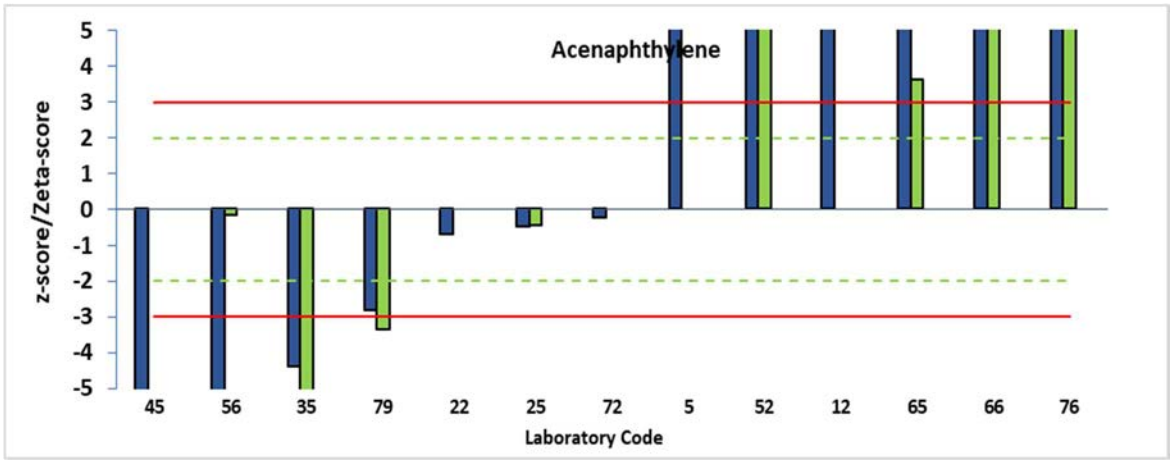


Reported results and expanded uncertainties:



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where s is the standard deviation and n is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



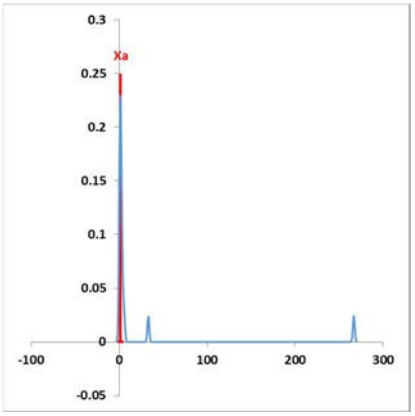
Evaluation of Reported data for Acenaphthene

Summary of results:

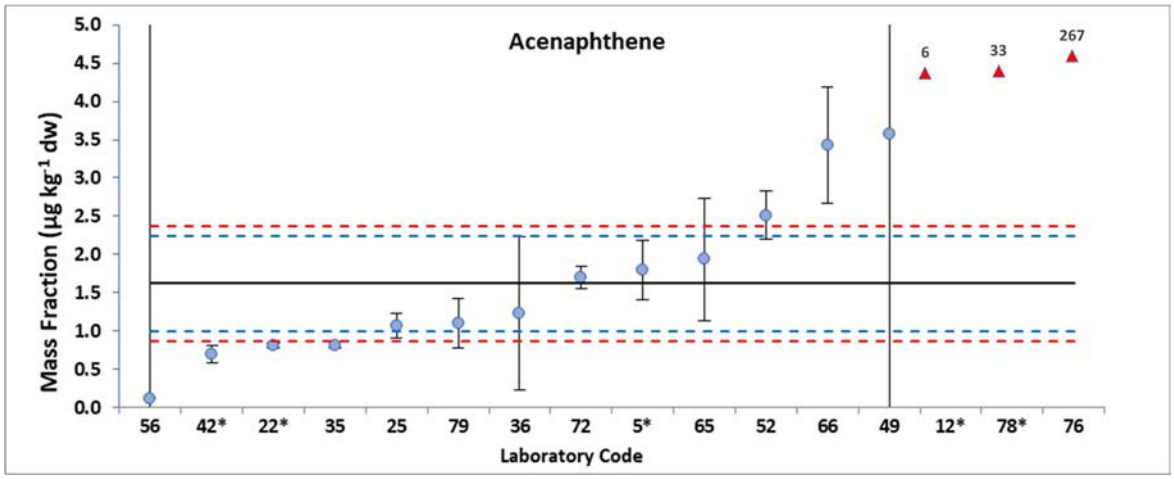
	Satisfactory	Questionable	Unsatisfactory
z-score	38%	25%	38%
Zeta-score	64%	18%	18%

Assigned value (X_a)	1.62 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	0.63 µg kg^{-1}
2 Total error	0.75 µg kg^{-1}
Number of results reported	21
Number of results accepted	7

Kernel density plot:

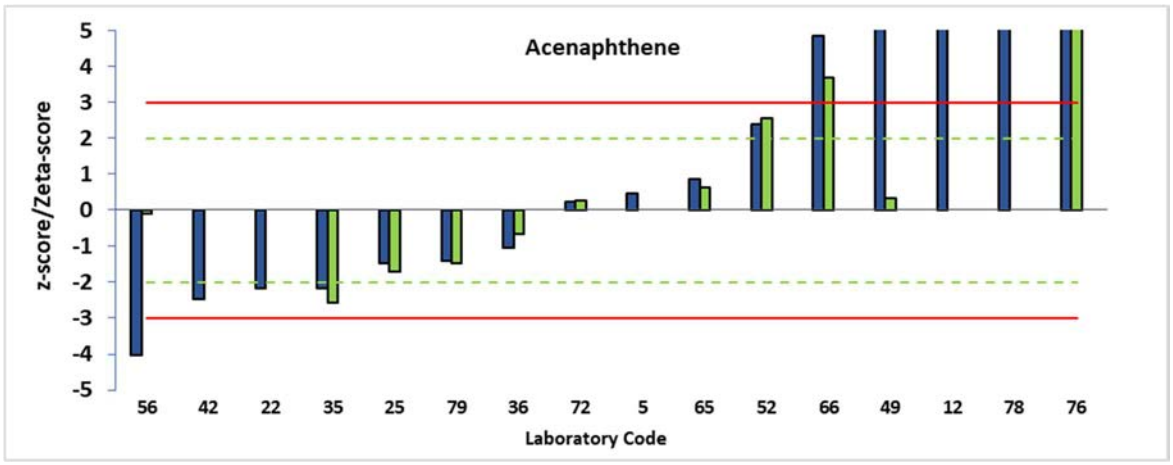


Reported results and expanded uncertainties:



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



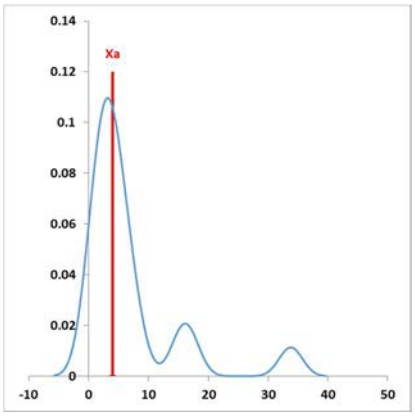
Evaluation of Reported data for Fluorene

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	33%	28%	39%
Zeta-score	46%	8%	46%

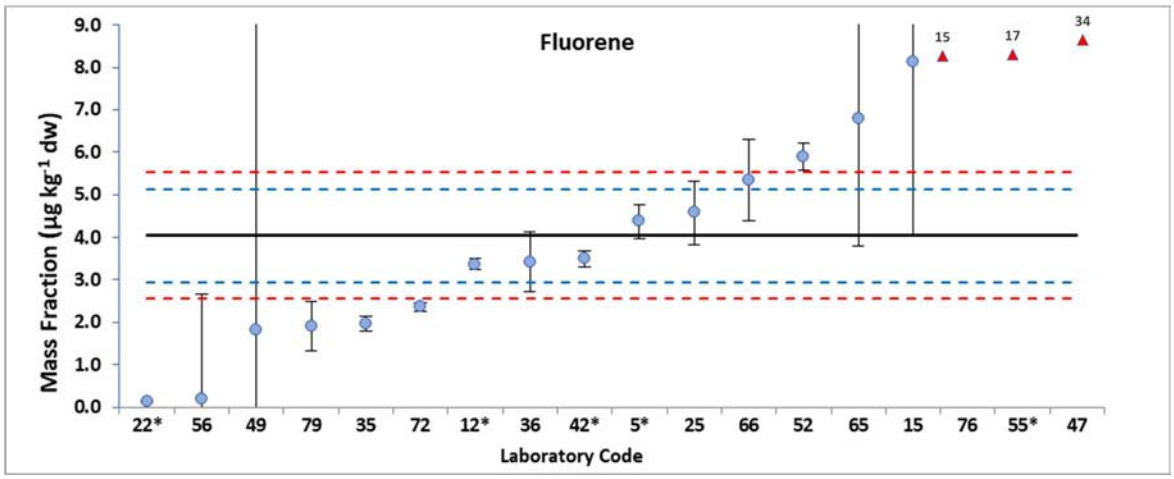
Assigned value (X_a)	4.04 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.09 µg kg^{-1}
2 Total error	1.49 µg kg^{-1}
Number of results reported	22
Number of results accepted	9

Kernel density plot:



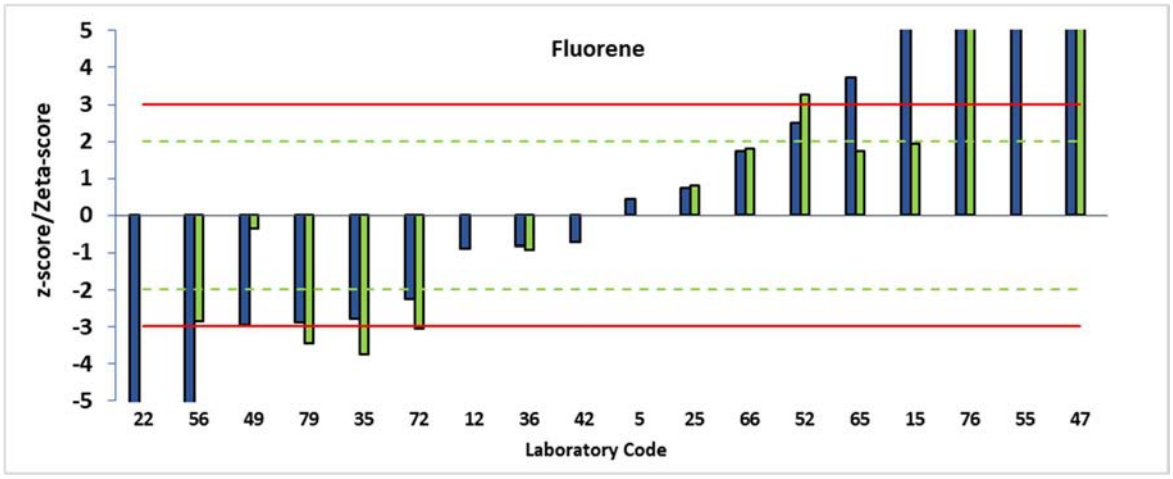
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

Performance evaluation: *z*-score Zeta-score



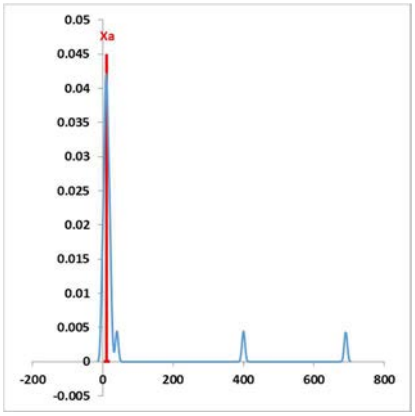
Evaluation of Reported data for Phenanthrene

Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score	48%	5%	48%
Zeta-score	67%	8%	25%

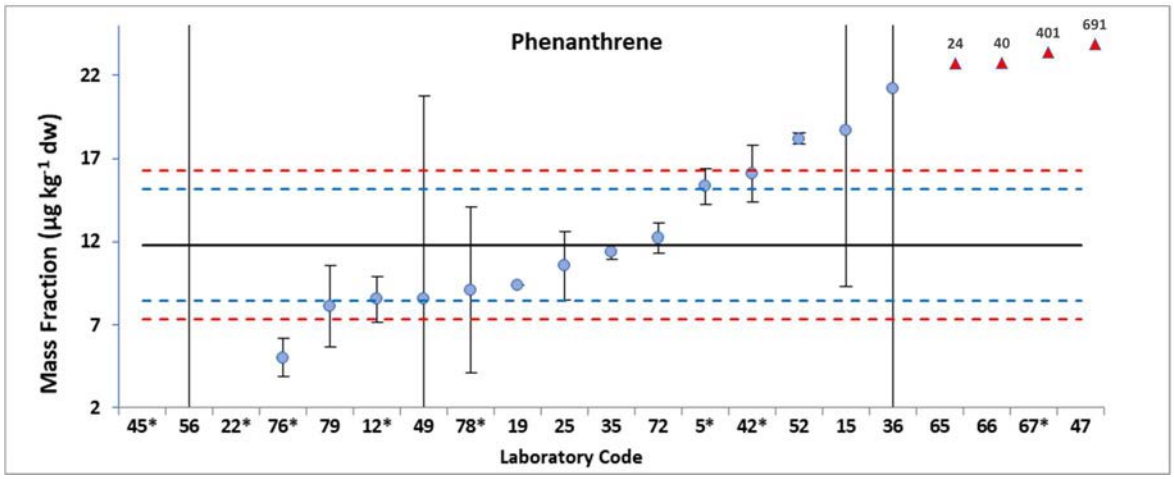
Assigned value (X_a)	11.8 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	3.35 µg kg^{-1}
2 Total error	4.46 µg kg^{-1}
Number of results reported	23
Number of results accepted	12

Kernel density plot:



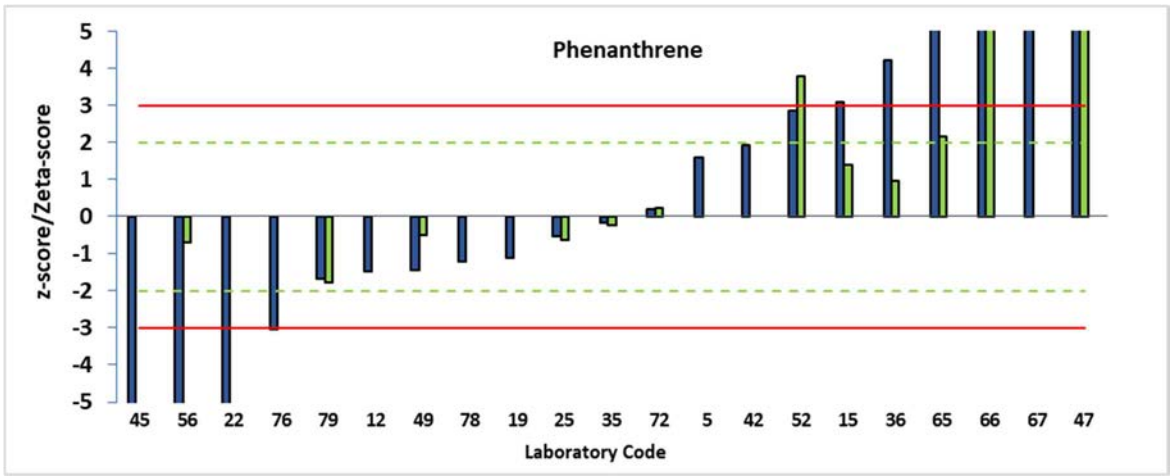
Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a -- $X_a \pm U_a$ (k=2) --$X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where s is the standard deviation and n is the number of measurements reported.*

Performance evaluation: *z*-score Zeta-score



Evaluation of Reported data for 1-Methylphenanthrene

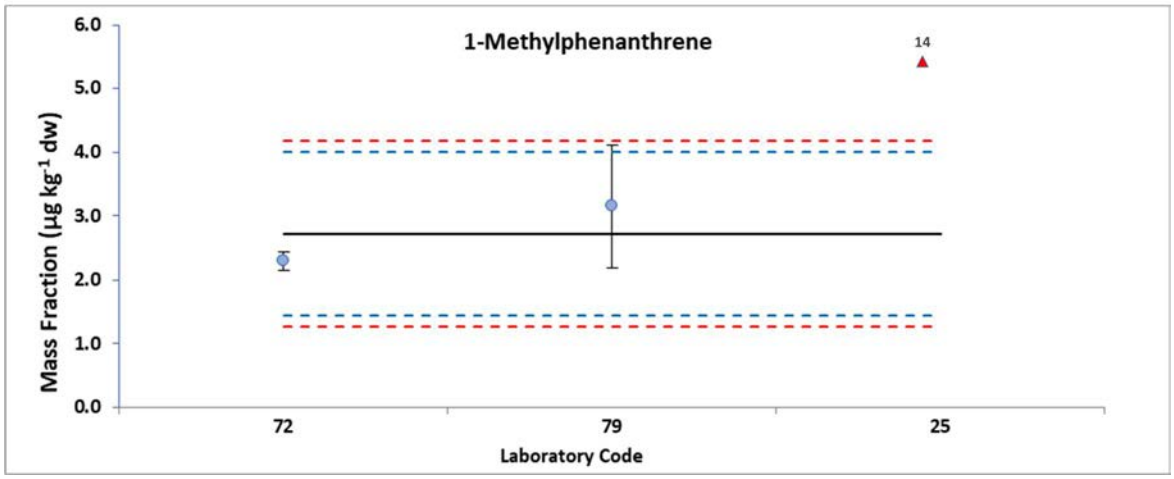
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score			
Zeta-score			

Assigned value (X_a)	2.73 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	1.28 µg kg^{-1}
2 Total error	1.45 µg kg^{-1}
Number of results reported	3
Number of results accepted	2

Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



**Uncertainty not reported by participant and calculated as:* $2\frac{s}{\sqrt{n}}$ *where* s *is the standard deviation and* n *is the number of measurements reported.*

Evaluation of Reported data for 2-Methylphenanthrene

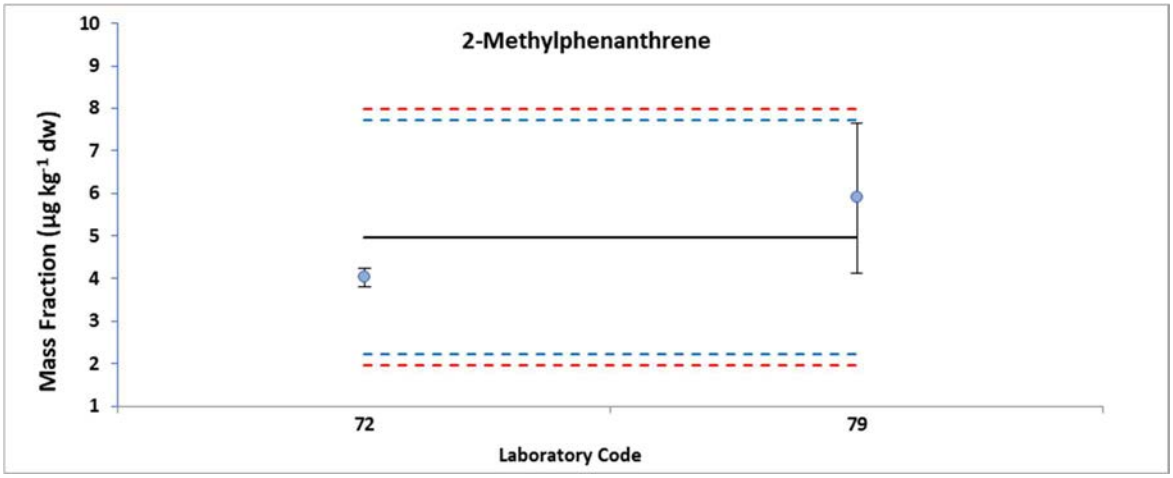
Summary of results:

	Satisfactory	Questionable	Unsatisfactory
z-score			
Zeta-score			

Assigned value (X_a)	4.97 µg kg^{-1}
Assigned uncertainty (U_a, k=2)	2.75 µg kg^{-1}
2 Total error	3.02 µg kg^{-1}
Number of results reported	2
Number of results accepted	2

Reported results and expanded uncertainties:

$X_{lab} \pm U_{lab}$ (k=2); — X_a - - $X_a \pm U_a$ (k=2) - - $X_a \pm 2$ Total error



*Uncertainty not reported by participant and calculated as: $2\frac{s}{\sqrt{n}}$ where s is the standard deviation and n is the number of measurements reported.

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In reply please refer to: Proficiency Test ILC-IAEA-MESL-2019-01-OC

INFORMATION SHEET: ILC-IAEA-MESL-2019-01-OC
PCBs, organochlorine pesticides, PBDEs and PAHs in a fish sample.

PLEASE READ THIS INFORMATION CAREFULLY BEFORE STARTING THE ANALYSES AND FILLING IN THE ONLINE DATA REPORTING FORM!

The present exercise is specifically organized for the determination of **PCBs, organochlorine pesticides, PBDEs and PAHs in a fish sample: ILC-IAEA-MESL-2019-01-OC.**

Description of the material:

A marine fish sample was collected for interlaboratory comparison purpose. This sample was deep-frozen, freeze-dried, ground and sieved through a 250 µm stainless steel sieve.

This powder, with a particle size of less than 250 µm was homogenized by mixing in a stainless-steel rotating drum for two weeks. Then aliquots of about 30 grams were packaged into glass bottles with aluminium screw caps and sealed with Teflon tape.

Homogeneity test:

The homogeneity of the material for PCBs, organochlorine pesticides, PBDEs and PAHs was checked by determining the concentration of these compounds in several samples taken randomly in the bulk of the powder. A one-way variance analysis indicated that the material can be considered as homogenous.

Moisture content:

Since the moisture content may change with the ambient humidity and temperature, it is recommended that the water content of this material always be determined in a separate sub-sample (not taken for analysis) by drying to **constant weight at 105 °C for 8 hrs**.
All results are to be reported on a dry mass basis using the unit specified on the reporting form.

Compounds to be determined:

The participants are requested to determine as many compounds as possible from the attached list using their established analytical methods.

Analytical quality control:

Procedures of quality control and laboratory quality assurance are recommended to be applied. The results of the analyses of the quality control (QC) sample should be reported together with the results from PT sample on the same reporting forms.

Reporting of results:

1. The participants are requested to make at least **three independent determinations** and to report the results together with a short **description of the method used**. Participants are also required to provide **proof of traceability** of obtained results to the International System of Units (SI), via standard calibration solutions and CRM applied, as a part of their analytical procedures.

2. The concentrations reported must be calculated on a dry mass basis and given as ng g^{-1}, leaving as many significant figures as justified by the precision of the method used.

3. If a compound is not detected by the method used, the corresponding limit of detection should be given rather than the statement "not detected".

4. For each class of compounds, the participants **MUST** report information about:

- Water content (in %);
- % Lipid;
- Extraction technique;
- Quantity extracted;
- Solvent used;
- Samples clean up;
- Samples fractionation;
- Detection method;
- Injector;
- GC or HPLC column;
- Results quantification;
- Statement on traceability of the obtained measurement results (standards and reference materials used);
- QA/QC;
- Surrogates spiked before extraction;
- Internal standards spiked before injection;
- Use of CRMs;
- Use of validated method;
- Accreditation;

5. For each compound the participants **MUST** report:

- Detection limit;
- Quantification limit;
- At least three determinations;
- Combined uncertainty;
- Expanded uncertainty;
- Coverage factor;
- Surrogate used;
- Result of CRM used for QC;
- CRM value (on certificate);

OTHER NOTES

1. About two weeks before the deadline, the organizers of the Proficiency Test will send to all participating laboratories deadline reminder and further instructions for the on-line submission of results by Email.

   The deadline for returning the results is **3 March 2020**.

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List of Chlorinated pesticides and PCBs compounds to be measured:

HCB
α HCH
β HCH
γ HCH- Lindane
pp' DDE
pp' DDD
pp' DDT
δ HCH
op' DDE
op' DDD
op' DDT
Heptachlor
Aldrin
Dieldrin
Endrin
cis-Chlordane
trans-Chlordane
cis-Nonachlor
trans-Nonachlor
α Endosulfan
β Endosulfan
Endosulfan sulfate
Heptachlor epoxide
PCB 8
PCB 18
PCB 28
PCB 31
PCB 44
PCB 49
PCB 52
PCB 66
PCB 70
PCB 74
PCB 95
PCB 87
PCB 97
PCB 99
PCB 101
PCB 105
PCB 110
PCB 118
PCB 128
PCB 138
PCB 138 (+169)
PCB 149
PCB 146
PCB 151
PCB 153
PCB 156
PCB 170
PCB 174
PCB 177
PCB 180
PCB 180 (+193)
PCB 183
PCB 187
PCB 194
PCB 195
PCB 201
PCB 206
PCB 209

List of Polybrominated Diphenylethers (PBDEs) to be measured:

BDE 17

BDE 28

BDE 28 + 33

BDE 47

BDE 49

BDE 66

BDE 85

BDE 99

BDE 100

BDE 153

BDE 154

BDE 183

BDE 209

List of Polycyclic Aromatic Hydrocarbons (PAHs) and aliphatic hydrocarbons to be measured:

Naphthalene

2-Methylnaphthalene

1-Methylnaphthalene

1,6-Dimethylnaphthalene + 2,7 -Dimethylnaphthalene

Biphenyl

Acenaphthene

Acenaphthylene

Fluorene

Phenanthrene

Anthracene

1-Methylphenanthrene

2-Methylphenanthrene

3,6-Dimethylphenanthrene

Fluoranthene

Pyrene

Benz(a)anthracene

Chrysene

Benzo(b)fluoranthene

Benzo(e)pyrene

Benzo(a)pyrene

Benzo(g,h,i)perylene

List of aliphatic hydrocarbons to be measured:

n-C17

Pristane

n-C18

Phytane

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