Interlaboratory Comparison on POPs in Food 2021

The twenty-second round of an international study

Interlaboratory Comparison on POPs in Food 2021

The twenty-second round of an international study

Nanna Bruun Bremnes, Line Småstuen Haug and Cathrine Thomsen

NIPH

Norwegian Institute of Public Health

Title:
Interlaboratory Study on POPs in Food
The twenty-second round of an international study

Authors:
Nanna Bruun Bremnes
Line Småstuen Haug
Cathrine Thomsen

Contents

4

Summary

The 22nd round of the Interlaboratory Comparison on POPs in Food was conducted in 2021 by the Norwegian Institute of Public Health (NIPH). The study included the determination of the 2,3,7,8-chlorinated dibenzo-*p*-dioxins (PCDDs) and dibenzofurans (PCDFs), as well as dioxin-like non-ortho and mono-ortho chlorinated biphenyls (PCBs) in three different food items. Additionally, the participating laboratories could determine the concentrations of six indicator PCBs, polybrominated diphenyl ethers (PBDEs) and hexabromocyclododecanes (HBCDs) in the same food samples.

A fourth matrix was also accessible to the participants, designated for the determination of the following poly- and perfluoroalkyl substances (PFASs): Perfluorooctanesulfonate (PFOS), perfluorohexanesulfonate (PFHxS), perfluorooctanoate (PFOA), perfluorononanoate (PFNA), perfluorodecanoate (PFDA) and perfluoroundecanoate (PFUnDA).

The objectives of this interlaboratory comparison study were

　　A.　To offer a tool for quality assurance to the participating laboratories
　　B.　To assess the between laboratory reproducibility
　　C.　To assess the readiness of expert laboratories worldwide to determine levels of chlorinated and brominated persistent organic pollutants, as well as for PFASs, in regular foodstuffs.

With respect to PCDDs/PCDFs, non-ortho PCBs, mono-ortho PCBs, indicator PCBs, PBDEs and α-HBCD, the 2021-round of the study was performed on unfortified homogenates of Sheep meat, Herring and Fish oil. An unfortified homogenate of perch was offered for the determination of PFASs.

If desired, the laboratories could also determine the concentrations of PCDDs/PCDFs, non-ortho PCBs, mono-ortho PCBs, indicator PCBs, PBDEs and α-HBCD in standard solutions from Cambridge Isotope Laboratories, provided by NIPH.

The test materials were sent to 62 laboratories worldwide in January and February, and results were returned from 60 of these.

Due to the ongoing corona-pandemic there has been some delays this year. A draft report would normally have been published in July, but due to the extended deadline for submitting results it was not made available on our webpage www.fhi.no/ILC until early October 2021, and the deadline for commenting on the published results was set to November 15th, 2021.

This report presents the reported results for all seventeen 2,3,7,8-substituted PCDDs/PCDFs, the four non-ortho substituted PCBs #77, 81, 126 and 169 and the eight

mono-ortho substituted PCBs #105, 114, 118, 123, 156, 157, 167, 189 in the three food items on a fresh weight and lipid weight basis.

The results of eight PBDEs #28, 47, 99, 100, 153, 154, 183 and 209, six indicator PCBs #28, 52, 101, 138, 153 and 180, and total HBCDs as well as the α-, β- and γ-isomers are also presented.

The results of PFOS, PFHxS, PFOA, PFNA, PFDA and PFUnDA in a sample of Perch are also included.

The consensus concentration (assigned value) for each analyte in the four food samples was determined as follows: For the seventeen 2,3,7,8-substituted PCDDs/PCDFs, the four non-ortho substituted PCBs and the eight mono-ortho substituted PCBs non-detected congeners were assigned a concentration corresponding to the reported detection limits. The median of all reported concentrations for each analyte was then calculated. All values above twice the median was removed from the calculation. The consensus median and consensus mean as well as standard deviation (SD) were calculated from the remaining data, and this second median was called consensus value.

For the PBDEs, the indicator PCBs and HBCDs the non-detects were removed from the data set. The median of all reported concentrations for each analyte was then calculated. All values above twice the median were removed from the calculation. The consensus median (consensus value) and consensus mean as well as standard deviation (SD) were calculated from the remaining data.

When calculating the results for PFASs in the sample of Perch, we adopted the same approach as we used for the indicator PCBs and PBDEs.

Toxic equivalents (TEQs) were calculated from the consensus medians of individual congeners using the toxic equivalency factors derived by WHO 2006 (from 2012: $WHO_{2006}TEQs$ as opposed to $WHO_{1998}TEQs$ as in the reports published before 2012).

Z-scores for the PCDD/PCDF TEQs were calculated for each laboratory using ±20 % of the consensus TEQs as a value for target standard deviation ($\sigma=0.2$), on both fresh weight and lipid weight basis. Further, Z-scores were calculated for the non-ortho PCB TEQ, the mono-ortho PCB TEQs, the total TEQ, the sum of six indicator PCBs, the sum of eight PBDEs, total HBCD, and the three isomers of HBCD and for each single congener in all three matrices of Sheep meat, Herring and Fish oil ($\sigma=0.2$) (both on a fresh weight and a lipid weight basis). The z-scores for PFASs were calculated in the same way, but on fresh weight basis only.

The consensus values of the standard solutions were calculated as mentioned above with the exception of the removal of all values exceeding ±50 % of the median prior to the final calculation of the consensus median and mean.

The consensus values for the lipid contents were calculated by first excluding results deviating more than two SD from the mean of all values, and then re-calculating the median, mean and SD.

The sample of Fish oil was the sample in this study with the highest total TEQ (8.2 pg TE/g fw, $WHO_{2006}TEFs$). For this sample, Z-scores within ±1 were obtained by 85 % of the participating laboratories, and Z-scores within ±2 were achieved by 89 % of the participants (Z scores within ±1 and ±2, corresponds to a trueness of ±20 % and ±40 %, respectively). The Fish oil -sample was followed by the sample of Herring, with a consensus total TEQ of 0.68 pg TE/g fw ($WHO_{2006}TEFs$). For this sample 89 % of the participants achieved Z-scores within ±1, and 91 % achieved Z-scores within ±2.

For the sample of Sheep meat, which on beforehand was assumed to be the sample with lowest level of contamination (total TEQ=0.0.020 pg TE/g, WHO_{2006}TEFs, fresh weight), Z-scores within ±1 were obtained by 42 % of the reporting participants on fresh weight basis, and Z-scores within ±2 was achieved by 60 % of the participants. This clearly mirrors the high number of non-detects reported for the PCDD/PCDFs, and the variation in the reported limits of detection reported by the participants.

The relative standard deviation (RSD) calculated for the total TEQ after removal of outliers was 8.2 and 6.7 % for the two samples that had the highest levels of contamination (Fish oil and Herring, respectively). For the lower contaminated Sheep meat-sample, the corresponding RSD was 16 %. Considering the levels of contamination in the three food samples in this study, it may be concluded that the abilities and performance of laboratories worldwide in determining dioxin-like compounds is generally good.

For the food samples, 39-48 laboratories reported results for the six indicator PCBs. The total consensus concentrations on fresh weight basis for six indicator PCBs were 121 pg/g (12 %) in Sheep meat, 4144 pg/g (8.2 %) in Herring and 50614 pg/g (11 %) in Fish oil, with total RSDs given in parentheses.

12-20 laboratories reported concentrations for all seven of the tetra- to hepta-PBDEs and 8-13 laboratories reported concentrations for PBDE-209. The consensus concentrations of the sum of the PBDEs with PBDE-209 excluded, were on fresh weight basis 3.5 (28 %), 430 (12 %) and 3966 (7.3 %) pg/g in Sheep meat, Herring and Fish oil, respectively, with total RSDs given in parentheses. The consensus concentrations for PBDE-209 were 9.7 (n=8, RSD=31 %), 27 (n=13, RSD=63 %) and 68 (n=9, not possible to calculate RSD due to many NDs) pg/g fresh weight in Sheep meat, Herring and Fish oil, respectively.

The consensus concentrations calculated for HBCDs are indicative, as only a few laboratories reported results (n=3-6).

15-16 laboratories reported results for the different PFASs in the sample of Perch. The sample was known to be contaminated with PFOS (consensus concentration 15100 pg/g fw). Eighty-eight percent of the participants obtained a Z-score ±2 for PFOS, and 69 % obtained Z-scores ≤1. For PFDA (consensus concentration 637 pg/g fw), 80 % of the participants obtained z-scores ≤1, and for PFUnDA (consensus concentration was 354 pg/g fw) 60 % obtained z-scores ≤1.

The consensus values for PFHxS, PFOA and PFNA are indicative due to few reported results (many NDs).

Introduction

Maximum residue limits and official food control systems are established in many countries for the monitoring of the levels of dioxins and dioxin-like PCBs in food and feed, both to map and to reduce human and animal exposure to these highly toxic pollutants. For the same reasons, the European Union introduced levels of legislation in 2014 for the indicator PCBs as well. New tolerable intakes for dioxins were introduced by EFSA in 2018 and for PFASs, tolerable weekly intakes for PFASs (more specifically; PFOS, PFOA, PFHx and PFNA) were established in 2020. To meet these requirements, there is a large demand for chemical analytical laboratories with the skills and abilities to determine these contaminants at very low concentrations and in complex matrixes.

Additionally, it is usually required by the authorities that laboratories performing such measurements are accredited according to ISO standards and prove their competence by successful participation in interlaboratory studies.

This is the 22nd round of the world-wide interlaboratory comparison study on dioxin-like compounds, eight PBDEs, six indicator PCBs and HBCD in food, organized by the Section for Food Safety (former "the Section of Environmental Exposure and Epidemiology") at the Norwegian Institute of Public Health (NIPH), Oslo, Norway. From 2019 a food sample designated for the determination of six selected PFASs was also added.

The main objective of this exercise is to assess the between laboratory reproducibility of dioxin-like compounds analyses in foods, and to provide a QA/QC instrument for each participating laboratory to contribute to its proficiency.

The exercise took place from February 2021, when the samples were shipped to the laboratories for analysis, until the reporting deadline in August 2021, when the last reports with results were received. A draft report was made available to the participants on our webpage (http://www.fhi.no/ILC) in October 2021.

All participants from previous rounds in this series of "Interlaboratory Comparisons on POPs in Food" were invited to participate. In addition, several other laboratories announced their interest and were invited to participate. There was no limit to the total number of participating laboratories. The 60 laboratories that submitted results, and thereby contributed to the study results, are presented in Table 1.

Table 1. Participants that reported results in the 22nd round of the Interlaboratory Comparison on POP's in Food 2021.

ALS Czech Republic Pardubice, Czech Republic	**ALS Environmental - Burlington** Burlington, Ontario, Canada
Analytical Biochemistry Research Centre (ABrC) Bayan Lepas, Malaysia	**Arkansas Laboratory (ARKL)** **Office of Regulatory Affairs** Jefferson, Arkansas, United States of America
AsureQuality Ltd – Wellington Lower Hutt, New Zealand	**Australian Ultra Trace Laboratory** **National Measurement Institute - North Ryde** Sydney, Australia
BUREAU VERITAS CANADA (2019) INC. (1) Mississauga, Ontario, Canada	**BUREAU VERITAS CANADA (2019) INC. (2)** Mississauga, Ontario, Canada

Canadian Food Inspection Agency (CFIA) Calgary, Alberta, Canada	**CARSO-LSEHL** Vénissieux, France
Chemisches und Veterinäruntersuchungsamt (CVUA) Freiburg Freiburg, Germany	**China National Center for Food Safety Risk Assessment** Beijing, China
Chinese Academy of Sciences Research Center for Eco-Environmental Sciences Beijing, China	**CVUA-MEL** Münster, Germany
Danish Veterinary and Food Administration Ringsted, Denmark	**Dioxin laboratory of Comprehensive test center of Chinese Academy of Inspection and Quarantine** Hangzhou, Beijing, China
Environmental Laboratory – IQS Barcelona, Spain	**Eurofins BioPharma Product Testing Hamburg GmbH** Hamburg, Germany
Eurofins Lab Zeeuws Vlaanderen (CNL027) TC Graauw, The Netherlands	**Eurofins GfA Lab Service GmbH** Hamburg, Germany
Eurofins Special Tests São Paulo, Brasil	**Eurofins Sun Dream Environmental Technology Corporation, Food Hygiene Laboratory (1)** Taichung City, Taiwan, R.O.C.
Eurofins Sun Dream Environmental Technology Corporation, Food Hygiene Laboratory (2) Taichung City, Taiwan, R.O.C.	**Finnish Institute for Health and Welfare Environmental Health Unit/Chemical Risks team** Kuopio, Finland
Food Research Division, Health Products and Food Branch, Health Canada Ottawa, Ontario, Canada	**Government Laboratory Additives, Contaminants and Composition Section** Hong Kong, China
Havforskningsinstituttet Bergen, Norway	**Hubei Provincial Centre for Disease Control and Prevention** Institute of Health Inspection and Testing Wuhan, Hubei Province, China
Istituto Zooprofilattico Sperimentale Lombardia Emilia Romagna-Bologna Chemical Department Bologna Bologna, Italy	**J&A Testing Center** Hangzhou, CHINA
Japan Food Research Laboratories Nagayama Tama-city, Tokyo, Japan	**La Drôme Laboratoire** Valence, France
Laboratoire de l'Environnement et de l'Alimentation de la Vendée La Roche Sur Yon, France	**Laboratory of SGS Bulgaria Ltd** Varna, Bulgaria
Landesamt für Umweltschutz Sachsen-Anhalt Halle/Saale, Germany	**Landesuntersuchungsamt Institut für Lebensmittelchemie** Speyer, Germany
Marchwood Scientific Services Southampton, United Kingdom	**mas | münster analytical solutions gmbh** Münster, Germany, Germany
Mass Spectrometry and Dioxin Analysis Laboratory NSCR "Demokritos" Athens, Greece	**MICROPOLLUANTS TECHNOLOGIE SA** Saint Julien-Les-Metz, France
National Cheng Kung University Research Center for Environmental Trace Toxic Substances Tainan, China	**Niedersächsisches Landesamt für Verbraucherschutz und Lebensmittelsicherheit Lebensmittel-und Veterinärinstitut Oldenburg** Oldenburg, Germany

NILU (Norwegian Institute for Air Research) Kjeller, Norway	**NofaLab B.V.** Schiedam, The Netherlands
Pacific Rim Laboratories Inc. Surrey BC, Canada	**SGS Analytics Germany GmbH** **(Synlab Analytics & Services Germany GmbH)** Jena, Germany
SGS AXYS Analytical services Ltd Sidney, British Colombia, Canada	**SGS Institut Fresenius GmbH** Bayreuth, Germany
SGS Taiwan Ltd. New Taipei City, Taiwan (R.O.C.)	**Shanghai Academy of Agricultural Sciences** Shanghai, China
Shanghai Municipal Center for Disease Control and Prevention Shanghai, China	**Sintef Industri** Avd. for Bioteknologi og Nanomedisin Trondheim, Norway
Super Micro Mass Research & Technology Center Cheng Shiu University Niaosong District, Kaohsiung City, Taiwan	**T.L.R. Technisch Laboratorium Rotterdam B.V.** Rotterdaam, The Netherlands
Taiwan Agricultural Chemicals and Toxic Substances Research Institute, Council of Agriculture Executive Yuan Taichung, Taiwan (R.O.C.)	**The State Laboratory - Ireland** Celbridge, Kildare, Ireland
Umeå University **Department of Chemistry** **Trace Analysis Platform** Umeå, Sweden	**Worthies Engineering Consultants Corp.** **Environmental & Ultra Trace Testing Lab** Taichung, Taiwan
Zhejiang Ecological and Environmental Monitoring Center **Zhejiang Key Laboratory of Ecological and Environmental Monitoring, Forewarning and Quality** Hangzhou, China	**Ökometric** Bayreuth, Germany

Design and practical implementation

Study design and reporting of results: PCDDs/PCDFs, non-ortho substituted PCBs, mono-ortho substituted PCBs, indicator PCBs, PBDEs and HBCDs

As in the previous rounds of this interlaboratory comparison study, the test material chosen represented naturally contaminated food items. The analytes to be determined were all seventeen 2,3,7,8-substituted PCDDs/PCDFs, the four non-ortho substituted PCBs #77, 81, 126 and 169 and the eight mono-ortho substituted PCBs #105, 114, 118, 123, 156, 157, 167 and 189. If desired, the laboratories could also determine eight PBDEs #28, 47, 99, 100, 153, 154, 183 and 209, six indicator PCBs #28, 52, 101, 138, 153 and 180, total HBCD and its three isomers (α-, β-, γ-HBCD). The six PCB congeners belong together with the mono-ortho PCB #118 to the selection of PCBs commonly referred to as ICES-7 (ICES-7: Report of the ICES Advisory Committee, 2010; Book 7).

The analysis should be performed using the laboratories' own methods for sample preparation and instrumental analysis, their own quantification standards and quantification procedures, and their own method for lipid determination.

It was recommended that laboratories determined as many as possible of the 2,3,7,8-substituted PCDDs/ PCDFs, dioxin-like PCBs, PBDEs, indicator PCBs and HBCD in the samples of Sheep meat, Herring and Fish oil.

The laboratories were to report the concentration of each detected congener (e.g. S/N ≥3) in the food items on fresh weight basis, as well as the limit of detection (LOD, e.g. S/N =3). Non-detected congeners (e.g., S/N <3) were to be marked "ND" in the comments-column of the Report forms. As the report was to include the determination of lipid percent in the food samples, the laboratories should also include the determined lipid percentage of the samples as well as sample amount used for the analysis.

In addition to the food samples, six standard solutions containing known concentrations of the analytes could be analyzed, using the laboratories' own quantification standards and methods. The provided standard solutions consisted of the following components:

1) Seventeen 2,3,7,8-substituted PCDDs/PCDFs (2:5:10 pg/μl for tetra:penta-hexa-hepta:octa chlorinated dibenzo-p-dioxins/-dibenzo furans respectively)

2) Four non-ortho PCBs (10 pg/μl)

3) Eight mono-ortho PCBs (100 pg/μl)

4) Eight PBDEs (100 pg/μl)

5) Six indicator PCBs (100 pg/μl)

6) α-HBCD (500 pg/μl)

The test materials consisted of homogenates of Sheep meat, Herring and Fish oil. The laboratories could choose to analyze one, two or all three food samples.

Study design and reporting of results: PFASs

For the 22nd round of the Norwegian POPs in Food-study, we also offered a food sample for the determination of the following PFASs: PFOS, PFHxS, PFOA, PFNA, PFDA and PFUnDA. The sample material consisted of Perch caught in an area well known to be contaminated by PFOS. As for the other matrices, the Perch sample was not fortified.

The laboratories' own methods for sample preparation and instrumental analysis, as well as their own quantification standards should be used for the analysis of the sample.

The laboratories were to report the concentration of each detected congener (e.g. S/N ≥3) in the Perch on fresh weight basis as well as the limit of detection (LOD, e.g., S/N =3). Non-detected congeners (e.g. S/N <3) were to be marked "ND" in the comment's column of the Report forms.

Confidentiality

Each participating laboratory was given an exclusive laboratory code by the coordinators. In the present report, the participants are presented in the tables and figures by their unique codes. The participants have access to their own code only, and laboratory codes were not revealed to any third parties.

When received by the coordinators, the raw data from the laboratories were entered into a database. A draft report was generated and made available to all participants on the web page www.fhi.no/ilc in October 2021.

Collection, preparation, and distribution of samples

Samples shipped to the participants consisted of one to three of the following:

- Sheep meat (~100 g)
- Herring (~80 g)
- Fish oil (~50 g)
- Perch (~25 g)

The test materials were produced from natural products and were not fortified with standards.

The Sheep meat was from Norwegian free-grazing sheeps. The Herring-sample was made from Herring fished in the Kategatt sea-area, and the Fish oil was was a kind gift from Vedde AS, a Norwegian producer of fish oil. The Perch was from a lake in Sweden called Fysingen and given to us by the Department of Enviromental Research and Monitoring at the Swedish Museum of Natural History.

The Sheep meat arrived as many packets of minced meat. They were pooled and mixed and homogenized before distribution into sub-samples.

The Herring originated from the Kategatt sea-area, and arrived as whole fish. The fish were fileted, then pooled and grinded, and finally homogenized thoroughly.

The Fish oil arrived as one big frozen sample from the same production batch. At arrival to the Norwegian Institute of Public Health the oil was defrosted and homogenized by continious stirring while it was heated gently.

The Perch arrived as whole, frozen fishes. The fishes were filleted before they were pooled and homogenized.

Sub-samples of at least 100 g of Sheep meat (Sheep meat-2021), 80 g of Herring (Herring-2021), 50 g of Fish oil (Fish oil-2021) and 25 g of Perch (Perch-2021) were placed into screw-cap polystyrene bottles. The bottles were all carefully washed, rinsed with methanol and dried before use. All samples were stored at –20 °C until shipment to the participating laboratories.

Statistical analysis

As for previous rounds, this is the approach for the calculation of the consensus concentrations (assigned value) for each of the congeners included in the study:

For PCDDs/PCDFs and dioxin-like PCBs: Congener-by-congener medians were calculated from the food sample data of all reporting laboratories. The detection limits were used as concentration for non-detected congeners (upper bound concentration).

For PBDEs, indicator PCBs and HBCD: Non-detected congeners in the food samples were removed from the data set prior to consensus calculation. The same approach was used for the calculation of the PFASs.

Outliers for all congeners were defined as those values exceeding twice the median of all values and thus removed from the data set.

The consensus values were defined as the median of the remaining data for each congener. The consensus mean and SD were calculated from this data set for each congener. The congener data that were removed prior to consensus calculation are marked accordingly in the tables presenting the individual results.

For the standard solutions, outliers were defined as those values outside ±50 % of the median of all reported values and were removed from the data set before the calculation of the median, mean and SD were calculated from the remaining data. The consensus of the lipid content was calculated as the mean after removal of values outside ±2*SD.

TEQs were calculated from the consensus medians for PCDDs/PCDFs, non-ortho PCBs, and mono-ortho PCBs, using the toxic equivalency factors derived by WHO in 1998 and 2006. As the detection limit was used for the concentration of non-detects, these TEQs represent upper bound concentrations.

Z-scores on both fresh weight and lipid weight basis for PCDD/PCDF TEQ as well as for the non-ortho PCB TEQ, the mono-ortho PCB TEQ, the total TEQ (WHO$_{2006}$TEFs), the sum of six indicator PCBs, the sum of eight PBDEs, total HBCD and for each congener were calculated for each laboratory according to the following equation:

$$Z = (x – X)/\sigma$$

Where x = reported value; X = consensus value (assigned value); σ = target value for standard deviation. A σ of 0.2 multiplied by the consensus value was used, i.e. Z-scores between +1 and -1 reflect a deviation of ±20 % from the consensus value.

The final report and certificate

The draft of the final report was prepared by the coordinators and published electronically in October 2021.

The final report will be made available to the participants in pdf format at www.fhi.no/ILC.

A certificate of participation, stating the participant's laboratory code, will be sent to each participating laboratory who has contributed to the results by the end of January 2022.

Coordination

The study was initiated and carried out by the Section for Food Safety (former "Section of Environmental Exposure and Epidemiology"), Norwegian Institute of Public Health, Oslo, Norway. Members of the coordination committee were:

Nanna Bruun Bremnes, Senior Engineer
nanna.margrethe.bruun.bremnes@fhi.no

Cathrine Thomsen, Head of Section
cathrine.thomsen@fhi.no

Results

Presentation in the report

Sixty laboratories worldwide submitted their results within the deadline and the results are presented in the following chapters. All participating laboratories will be able to compare their own performance, congener by congener, with the other laboratories. Since variations in performances are based on several factors, it is recommended that each laboratory carefully evaluate the factors that, favorably or unfavorably, may have contributed to its performance.

Readers of the report can without being participants in the study or without access to laboratory codes, get a general overview of the analytical performance of laboratories worldwide on the determination on dioxins, dioxin-like PCBs, indicator PCBs, PBDEs and HBCD in regular foodstuffs.

In Appendix E the consensus statistics are given on fresh and lipid weight basis for concentrations of individual congeners and TEQ values, a summary of TEQ values for each food item, and the Z-score plots on both fresh and lipid weight basis, based on a target deviation of ±20 % from the consensus TEQ_{2006}-values.

Individual results reported by the laboratories for each congener are given for Sheep meat, Herring and Fish oil in Appendix 2, 3 and 4. The results for PFAS in the sample of Perch are presented in Appendix 5, and results of the lipid determinations are presented in Appendix 6.

Summarizing comments on results

PCDDs/PCDFs

Analyte solution-2021
Concentrations of PCDDs/PCDFs were reported by 48 laboratories. The average RSD for the 17 congeners was 6.1 % ranging from 4.8 % for 1,2,3,6,7,8-HxCDF to 7.7 % for 1,2,3,4,6,7,8,9-OCDF. The calculation of Z-scores for the TEQs (target 12.5 pg TEQ/µL based on TEF_{2006}-values) of the PCDD/PCDF standard solution showed that 98 % of the laboratories were within the range of ±20 % of the consensus value. This clearly demonstrates that the calibration solutions used by the laboratories generally are of high quality.

Sheep meat-2021
For the sample of Sheep meat, PCDD/PCDF results from 43 laboratories were received. From these results, the calculated consensus TEQ (PCDD/PCDF TEQ based on WHO_{2006}-TEFs) was 0.011 pg TE/g fresh weight and 0.22 pg TE/g lipid weight.

The average RSD was 55 %, ranging from 40-69 % for 2,3,4,7,8-PeCDF and 1,2,3,4,6,7,8,9-OCDF respectively. Z-scores for the TEQs within ±1 were obtained by 14 % of the laboratories and 42 % of the laboratories had Z-scores within ±2 (fresh weight basis).

Herring-2021

PCDD/PCDF concentrations in the Herring sample were reported by 56 laboratories. The consensus TEQ was 0.36 pg TEQ/g fresh weight, and 6.0 pg TEQ/g lipid weight (PCDD/PCDF TEQ based on $WHO_{2006}TEFs$). The average RSD was 32 % ranging from 13-63 % (2,3,4,7,8-PeCDF and 1,2,3,7,8,9-HxCDF respectively). Z-scores were within ±1 for 79 % of the laboratories and within ±2 for 91 % of the laboratories (fresh weight basis).

Fish oil-2021

PCDD/PCDF concentrations in the sample of Fish oil were determined by 47 laboratories. The consensus TEQ for PCDD/PCDF based on $WHO_{2006}TEFs$ was 3.4 pg TEQ/g both on fresh weight and lipid weight basis (PCDD/PCDF TEQ based on $WHO_{2006}TEFs$). The average RSD was 32 % ranging from 16-62 % (1,2,3,7,8-PeCDF and 1,2,3,4,6,7,8,9-OCDF respectively). Z-scores for PCDD/PCDF TEQ within ±1 were obtained by 91 % of the laboratories and 94 % had Z-scores within ±2 (fresh weight basis).

Dioxin-like PCBs

Analyte solution-2021

The 12 dioxin-like PCBs in the analyte solution were analyzed and reported by 46-47 laboratories. The RSDs for the different congeners were ranging from 5.5 % for PCB-156 to 8.1 % for PCB-118, with an average of 7.1 %.

Sheep meat-2021

Dioxin-like PCB concentrations in the sample of Sheep meat were reported from 43 laboratories. The concentrations of the 12 congeners varied between 0.017 pg/g fresh weight (PCB-81) and 11 pg/g fresh weight (PCB-118). The average RSD for concentrations of individual dioxin-like PCB congeners was 30 % ranging from 18 % for PCB-156 to 50 % for PCB-123.

The dioxin-like PCBs contribute 48 % to the total TEQ (WHO TEF_{2006}) in the sample with PCB-126 as the main contributor (39 %).

Herring-2021

Of the participating laboratories, 56 measured and reported dioxin-like PCB concentrations in the Salmon sample. The concentrations ranged from 0.21 pg/g fresh weight for PCB-81 to 533 pg/g fresh weight for PCB-118. The average RSD for concentrations of individual dioxin-like PCB congeners on fresh weight basis was 17 % ranging from 9.8 % for PCB-156 to 40 % for PCB-123.

The dioxin-like PCBs contribute to about 47 % of the total TEQ in the sample with PCB-126 as the main contributor (37 %).

Fish oil-2021

Dioxin-like PCBs in Fish oil were reported by 47 laboratories. Levels were ranging from 2.8 pg/g fresh weigh for PCB-81 to 8570 pg/g fresh weight for PCB-118. The average RSD for concentrations of individual dioxin-like PCB congeners on fresh weight basis was 16 % ranging from 8.3 % for PCB-167 to 32 % for PCB-81.

The contribution of the dioxin-like PCBs to the total TEQ was about 59 % with PCB-126 as the main contributor (47 % of total TEQ).

Total TEQ

The total TEQ for the sample of Sheep meat was 0.020 pg TEQ/g fresh weight and 0.42 pg TEQ/g lipid weight (WHO TEF$_{2006}$). The total TEQ of the Herring-sample was 0.68 pg TEQ/g fresh weight and 11 pg TEQ/g lipid weight, and the Fish oil contained 8.2 pg TEQ/g both on fresh weight basis and lipid weight basis.

The RSDs for total TEQs on fresh weight basis calculated from the RSD of individual congeners were 16 % for the sample of Sheep meat, 6.7 % for Herring and 8.2 % for Fish oil.

In Figure 1 the percentage contribution to the TEQ-values for the three groups of compounds is depicted based on WHO TEF$_{2006}$ and WHO TEF$_{1998}$, respectively. For the selection of food-items included in this study the dioxin-like PCBs contributed from 42 % to 66 % to the total TEQ (using WHO TEF$_{2006}$), demonstrating the variation in contribution, and the importance of the PCBs for the determination of the total TEQs related to the toxic potency of food samples.

Figure 1. The percentage contribution of PCDDs/PCDFs, non-ortho PCBs and mono-ortho PCBs to the total TEQ calculated using both the WHO$_{2006}$ TEFs and WHO$_{1998}$ TEFs, in the three food samples.
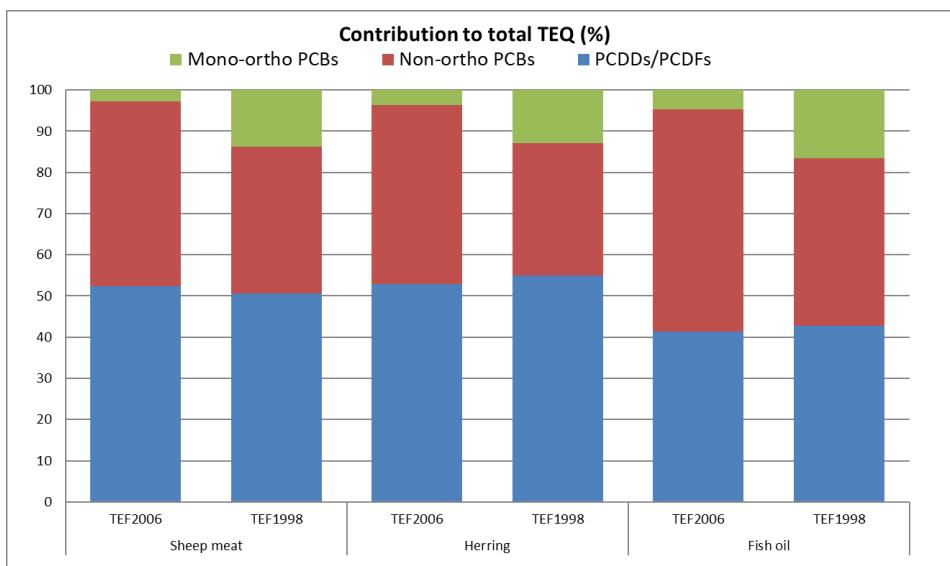
Indicator PCBs

Analyte solution-2021

40 laboratories reported indicator PCBs in the analyte solution. The average RSD was 8.1 % ranging from 5.8 to 12 % (outliers removed).

Sheep meat-2021

For the sample of Sheep meat, results for indicator PCBs were received from 39 laboratories. The consensus concentrations varied between 13 pg/g fresh weight (PCB-180) and 38 pg/g fresh weight (PCB-153). The RSDs were ranging from 22 to 31 % for PCB-180 and PCB-28 respectively, with an average of 26 % for all indicator PCBs. The consensus median for the sum of indicator PCBs was 121 pg/g fresh weight.

Herring-2021

Within the deadline, 48 laboratories reported results for indicator PCBs in the Herring sample. The consensus concentrations ranged from 173 pg/g fresh weight (PCB-28) to 1496 pg/g fresh weight (PCB-153) with a consensus median for the sum of indicator PCBs of 4144 pg/g fresh weight. The average RSD was 18 %, ranging from 14 to 25 % for PCB-180 and PCB-28 respectively.

Fish oil-2021

Results were obtained from 42 laboratories. The concentrations of indicator PCBs in Fish oil ranged from 2123 pg/g fresh weight (PCB-28) to 16552 pg/g (PCB-153) and the consensus median for the sum was 50614 pg/g fresh weight. The average RSD was 24 %, ranging from 19 to 29 % for PCB-52 and PCB-28 respectively.

PBDEs

Analyte solution-2021

The tri- to hepta-PBDE standard solution was analyzed by 19-20 laboratories and 14 laboratories reported values for PBDE-209. The RSDs were between 6.5-13 % for all congeners.

Sheep meat-2021

The PBDE concentrations in Sheep meat were reported by 12-13 laboratories, except for PBDE-209 for which 8 results were received. The consensus concentrations were in the range of 0.17 pg/g fresh weight for PBDE-154 to 1.1 pg/g fresh weight for PBDE-47. The consensus concentration for PBDE-209 was 9.7 pg/g fresh weight. The sum of tri- to hepta-PBDEs was 3.5 pg/g fresh weight. The range of RSDs on fresh weight basis was 23-62 %, with an average of 37 % including PBDE-209.

Herring-2021

Within the deadline, 18-20 laboratories had reported results for tri- to hepta-PBDEs in Herring and 13 laboratories had reported results for PBDE-209. The consensus concentrations varied between 1.8 pg/g fresh weight (PBDE-183) and 248 pg/g fresh weight (PBDE-47). The concentration for PBDE-209 was 27 pg/g fresh weight. The sum of tri- to hepta-PBDEs was 430 pg/g fresh weight. The RSD calculated from the concentrations on fresh weight ranged from 17-63 %, with an average of 29 % for PBDEs including PBDE-209.

Fish oil-2021

16-17 laboratories reported results for tri- to hepta-PBDEs in Fish oil, and 9 reported results for PBDE-209. The concentrations varied between 7.2 pg/g fresh weight (PBDE-183) and 2540 pg/g (PBDE-47). The concentration for PBDE-209 was 68 pg/g. The sum of tri- to hepta-PBDEs was 3966 pg/g fresh weight. The RSDs for the individual congeners were ranging from 9.6 to 31 % with an average of 19 % *not* including PBDE-209. (RSD for PBDE-209 could not be calculated due to too many outliers and non-detects.)

HBCD

Also, in this round of the study, total HBCD and the isomers α-, β- and γ-HBCD could be determined and reported. A total of 5 laboratories reported α-HBCD in the standard solution and 3-6 laboratories reported one or more of the three isomers in the food samples. The consensus concentrations for the sum of individual HBCD isomers were 1.3 pg/g fresh weight for the sample of Sheep meat, 125 pg/g for the Herring and 2193 pg/g fresh weight for the Fish oil sample. Since only a few laboratories reported HBCD, these results must be regarded as indicative values.

PFASs

A sample of Perch known to be contaminated with PFOS, was offered to the participants for the determination of PFASs. The participating laboratories were asked to report their results for as many as possible of the following PFASs: PFOS, PFHxS, PFOA, PFNA, PFDA and PFUnDA. Sixteen laboratories reported their results by the deadline, but not all participants reported results for all PFASs. The consensus concentration of the sum of individual PFASs was 16268 pg/g fresh weight, with PFOS as the main contributor (15100 pg/g fw, n=16). The concentration of PFUnDA in the sample was 354 pg/g fw, while the concentration of PFDA was 637 pg/g fw. The consensus values for PFHxS, PFOA and PFNA are only indicative due to many reported non-detects (38 pg/g fw, 35 pg/g fw and 104 pg/g fw respectively).

Lipid content

The mean and RSDs (in parentheses) for the lipid contents of the food samples were calculated to be 4.8 % (RSD=31 %) for the sample of Sheep meat, 6.1 % (RSD=31 %) for the Herring sample and 100 % (0.86 %) for the sample of Fish oil.

Acknowledgements

Appendix A:

Participant´s affiliations
and addresses

ALS Czech Republic, s.r.o. Miloslav Sebránek Pardubice, CZ-530 02 Czech Republic miloslav.sebranek@alsglobal.com	**ALS Environmental - Burlington** Cameron McIntosh Burlington, Ontario L7L 0E6 Canada quality.burlington@alsglobal.com
Analytical Biochemistry Research Centre (ABrC) Nor Farhana Binti Mohd Fazil 11900 Bayan Lepas Malaysia farhana_fazil@usm.my	**Arkansas Laboratory (ARKL)** J. Marc Gentry Jefferson, AR 72079 USA james.gentry@fda.hhs.gov
AsureQuality Limited - Wellington Laboratory Ushma Dahya Lower Hutt 5010 New Zealand wgtn-quality@asurequality.com	**Australian Ultra Trace Laboratory** **National Measurement Institute - North Ryde** Dr Alan Yates Sydney, NSW 2113 Australia dioxins@measurement.gov.au
BC Food Laboratory **Regulatory Operations and Enforcement Branch** **Health Canada** Arman Alimkulov and Daniel Sit Burnaby, British Columbia, V5G 4P2 Canada arman.alimkulov@canada.ca/daniel.sit@canada.ca	**BUREAU VERITAS CANADA (2019) INC. (1)** Salima Haniff Mississauga, Ontario L5N 2L8 Canada salima.haniff@bureauveritas.com
BUREAU VERITAS CANADA (2019) INC. (2) Salima Haniff Mississauga, Ontario L5N 2L8 Canada salima.haniff@bureauveritas.com	**Canadian Food Inspection Agency** Nishma Karim Calgary, Alberta, T2L 2L1 Canada nishma.karim@inspection.gc.ca
CARSO-LSEHL Stephanie Defour 69200 Vénissieux France sdefour@groupecarso.com	**Chemisches und Veterinäruntersuchungsamt** **(CVUA) Freiburg** Dr. Marco Müller D-79114 Freiburg Germany marco.mueller@cvuafr.bwl.de

China National Center for Food Safety Risk Assessment (CFSA) Dr. Lei Zhang Beijing, 100021 P. R. China zhanglei1@cfsa.net.cn	**CVUA-MEL** Dr. Thorsten Bernsmann 48147 Münster Germany thorsten.bernsmann@cvua-mel.de
Danish Veterinary and Food Administration Søren Sørensen 4100 Ringsted Denmark ssn@fvst.dk	**Dioxin laboratory of Comprehensive test center of Chinese Academy of Inspection and Quarantine** Yizhi Sun Beijing, 100123 P. R. China sunyizhi@caiqtest.com
Environmental Laboratory - IQS Eng. Ramon Martí 08017 Barcelona Spain ramon.marti@iqs.edu	**Eurofins | Laboratorium Zeeuws Vlaanderen** Saskia van Goethem and Dr. G.J.M. de Clercq 4569 TC Graauw The Netherlands saskiavangoethem@eurofins.com guidodeclercq@eurofins.com
Eurofins BioPharma Product Testing Hamburg GmbH Peter Ebsen 21079 Hamburg Germany peterebsen@eurofins.de	**Eurofins GfA Lab Service GmbH** Heike Henjes 21079 Hamburg Germany heikehenjes@eurofins.de
Eurofins Special Tests Maria Souza Mascarini and Carolina Nunes São Paulo / SP - CEP 04126-060 Brasil mariasouza@eurofins.com carolinanunes@eurofins.com	**Eurofins Sun Dream Environmental Technology Corporation (1)** Tzu Jia Chang(Dora Chang) Taichung City, 40768 Taiwan, R.O.C. tzujia@sundream.com.tw
Eurofins Sun Dream Environmental Technology Corporation (2) Tzu Jia Chang(Dora Chang) Taichung City, 40768 Taiwan, R.O.C. tzujia@sundream.com.tw	**Finnish Institute for Health and Welfare** Päivi Ruokojärvi Kuopio, FI-70210 Finland paivi.ruokojarvi@thl.fi

Food Research Division **Health Canada** Thea Rawn Ottawa, Ontario, K1A 0K9 CANADA thea.rawn@canada.ca	**Government Laboratory** **Hong Kong SAR Government** **Additives, Contaminants and Composition Section** Dr. P.W. KONG P.R. China Hong Kong pwkong@govtlab.gov.hk
Guangzhou Taiketianqing **Testing Technology Co. Ltd** Hong Zhang Macau, 999078 China dinggangdou@163.com	**Havforskningsinstituttet** **(Institute of Marine Research)** Bergitte Reiersen and Dagmar Nordgård 5005 Bergen Norway bre@hi.no dno@hi.no
Hubei Dioxin Lab, Hubei Provincial Centre for **Disease Control and Prevention** Xiaofang Liu Beijing 100044 P.R. China wenshenggy@aliyun.com	**Istituto Zooprofilattico Sperimentale** **Lombardia Emilia Romagna** Simonetta Menotta 40127 Bologna Italy simonetta.menotta@izsler.it
J&A Testing Center Cheng Mingsheng and Xie Wei Hangzhou, 310053 CHINA dioxin@jatests.com xiewei@jatests.com	**Japan Food Research Laboratories** Toshihiko Yanagi and Masaki Kosugi 6-21-6 Nagayama Tama-city Tokyo Japan yanagitos@jfrl.or.jp kosugim@jfrl.or.jp
La Drôme Laboratoire Benoît Planel/Anne-Gaëlle Valad 26000 Valence France agvalade@ladrome.fr bplanel@ladrome.fr	**Laboratoire de l'Environnement et de** **l'Alimentation de la Vendée** Alexia Pajot and Emmanuelle Quetier 85 000 La Roche Sur Yon France alexia.pajot@vendee.fr emmanuelle.quetier@vendee.fr
Laboratory of SGS Bulgaria Ltd. Veselka Pashova Varna 9003 Bulgaria veselka.pashova@sgs.com	**Landesamt für Umweltschutz Sachsen-Anhalt** Dr. Uwe Rauhut 06114 Halle/Saale Germany rauhut@lau.mlu.sachsen-anhalt.de

Landesuntersuchungsamt
Institut für Lebensmittelchemie Speyer
Stefanie Schmitt and Hildegard Gerstner
67346 Speyer
Germany
poststelle.ilcsp@lua.rlp.de

Marchwood Scientific Services
Karolina Pettit
Southampton
United Kingdom
karolina.pettit@marchwood-scientific.co.uk

mas | münster analytical solutions gmbh
Dr. Evridiki Plake and Dr. Stephan Hamm
D 48149 Münster, Germany
Germany
e.plake@mas-tp.com

Mass Spectrometry and Dioxin Analysis Lab.
NSCR DEMOKRITOS
Dr. Leondios Leondiadis
Athens 15310
GREECE
leondi@rrp.demokritos.gr

Micropolluants Technologie SA
Lolita Le Gal
57 070 - Saint Julien-Les-Metz
France
llegal@mp-tech.net
vfaivre@mp-tech.net

National Cheng Kung University
Ching-Chang Lee, Wei-Hsiang Chang, I-ChiaChen
Tainan,704
Taiwan, R.O.C
cclee@ncku.edu.tw
whchang@mail.ncku.edu.tw
illus7991@gmail.com

Niedersächsisches Landesamt für
Verbraucherschutz und Lebensmittelsicherheit
Dr. Elke Bruns-Weller, Dr. Annette Knoll,
Dr. Claudia Wenzel
D-26133 Oldenburg, Germany
elke.bruns-weller@laves.niedersachsen.de
annette.knoll@laves.niedersachsen.de
claudia.wenzel@laves.niedersachsen.de

NILU (Norwegian Institute for Air Research)
Stine Marie Bjørneby
2007 Kjeller
Norway
smb@nilu.no

NofaLab B.V.
Gijs Mulder
Schiedam, 3115JG
The Netherlands
qesh@nofagroup.nl

Pacific Rim Laboratories Inc.
Dave Hope
Surrey, BC V3S 8P8
Canada
dave@pacificrimlabs.com

Research Center for Eco-Environmental Sciences
Chinese Academy of Sciences
Yingming Li
Beijing 100085
CHINA
ymli@rcees.ac.cn

SGS Analytics Germany
(SYNLAB Analytics & Services Germany GmbH)
Dr. Uwe Dornberger
D-07743 Jena
Germany
uwe.dornberger@synlab.com

SGS AXYS Analytical services Ltd Rhonda Stoddard Sidney BC, V8L 5X2 Canada rhonda.stoddard@sgs.com	**SGS Institut Fresenius GmbH** Dr. Michael Gunzelmann 95448 Bayreuth Germany michael.gunzelmann@sgs.com
SGS Taiwan Hunting Chen New Taipei City 24803 Taiwan (R.O.C.) hunting.chen@sgs.com	**Shanghai Academy of Agricultural Sciences** **(Shanghai Co-Elite Agro-food Testing Technical Service Co., Ltd.)** Qinxiongrao Rao Shanghai 201403 China Qinxiongrao@163.com
Shanghai Municipal Center for Disease Control and Prevention Yuanjie Lin Shanghai 200336 P.R. China linyuanjie@scdc.sh.cn	**SINTEF Materialer og Kjemi** **Avd. for Bioteknologi og Nanomedisin** **Forskningsgruppe for Massespektrometri** Trude Sophie Guldberg 7034, Trondheim Norway Trude.guldberg@sintef.no
Super Micro Mass Research & Technology Center **Cheng Shiu University** Huang Ming Feng Niaosong District, Kaohsiung City, 833 Taiwan (ROC) k6208@gcloud.csu.edu.tw	**TLR International Laboratories** G. Clavan Rotterdam 3077 MB The Netherlands qc@tlr.nl
Taiwan Agricultural Chemicals and Toxic Substances Research Institute **Council of Agriculture, Executive Yuan** Tsen Chao-Ming Taichung 41358 Taiwan (R.O.C.) cmtsen@tactri.gov.tw	**The State Laboratory - Ireland** Myra Keogh and Niamh O'Shea Celbridge, Co. Kildare, W23 VW2C Ireland myra.keogh@statelab.ie niamh.oshea@statelab.ie
Umeå University **Department of Chemistry** **Trace Analysis Platform** Peter Haglund Umeå S-901 87 Sweden peter.haglund@umu.se	**Worthies Engineering Consultants Corp.** **Environmental & Ultra Trace Testing Lab** David Fang Taichung 40850 Taiwan David603@gmail.com moonscat99@gmail.com

Zhejiang Ecological and Environmental Monitoring Center Guohua Zhu Hangzhou, 310012 China 409459693@qq.com	**Ökometric** Horst Rottler 95448 Bayreuth Germany rottler@oekometric.de

Appendix B:

Study announcement and
instructions for participants

Announcement for
Interlaboratory Comparison on POPs in Food 2021

Introduction

We hereby announce the 22nd round of the Interlaboratory Comparison on the Determination of POPs in Food ("The Norwegian POPs in Food-study"). The study is open for academic, regulatory as well as commercial laboratories world-wide. The organizer of this study is Section of Environmental Exposure and Epidemiology at the Norwegian Institute of Public Health, Oslo, Norway. The study is scheduled to take place from April to July 2021.
A draft report will be available by September 2021, and the final report will be available to the participants by January 2022. All participants who have contributed to the results will receive a certificate of participation in the study.

Objectives

One of the main objectives of this exercise is to assess the interlaboratory consistency in results from analyses of dioxins, PCBs, PBDEs, HBCDs and PFAS in regular food items known to contribute to the intake in the general population. Further, the world-wide readiness and capacity in analysing halogenated persistent organic pollutants in food will be demonstrated. The study also serves as a tool of quality assurance for the participating laboratories.

Participants

We encourage all laboratories working in this field to participate and assess their analytical performance. To do this, participants are requested to completely fill out the Registration Form and mark the desired sample types and what analyte solutions they intend to determine.

Analytical requirements

In this interlaboratory comparison, all the seventeen 2, 3, 7, 8-substituted PCDDs and PCDFs, the four non-ortho PCBs, CB-77, 81, 126 and 169 as well as the eight mono-ortho PCBs, CB-105, 114, 118, 123, 156, 157, 167, and 189 will be assessed.
In addition, the participants are invited to determine six marker PCBs, eight PBDEs and HBCDs. The concentration of the following congeners can be reported: CB-28, 52, 101, 138, 153 and 180 and BDE-28, 47, 99, 100, 153, 154, 183 and 209.
The concentration of α-HBCD, β-HBCD and γ-HBCD as well as the total of these isomers will also be assessed.

For the matrix intended for the determination of PFASs, the participants are asked to report one or more of the following components: Perfluorooctanesulfonate (PFOS), perfluorohexanesulfonate (PFHxS), perfluorooctanoate (PFOA), perfluorononanoate (PFNA), perfluorodecanoate (PFDA) and perfluoroundecanoate (PFUnDA).

The test materials for the lipophilic POPs consist of three fresh food homogenates. You can choose to analyse one, two or all three of the food items. We encourage you to determine as many analytes as possible. You are further requested to determine and report the lipid content of the foods, except for the sample for PFAS.

In addition, one sample Perch for the analysis of selected PFASs will be available.

We also include standard solutions of all analytes, except PFAS, that should be analysed as solutions of known concentration, which may be used to check your own calibration solutions.

Test material
The test materials consist of three unfortified natural food product homogenates:

- Sheep meat (labelled "Sheep-2021") ~100 g
- Herring (labelled "Herring-2021") ~80 g
- Fish oil (labelled "Fish oil-2021") ~50 g

- Perch (PFASs only) (labelled Perch-2021)

The samples will be distributed by an international courier service to the participating laboratories.

Please note:
In order to avoid delay or retention of the samples at customs, please inform us if there are import restrictions in your country for any of the samples.

Instructions for analysis and reporting

In short, the participating laboratories should:
- use their own standard operation procedures for extraction, clean-up and instrumental determination
- use their own reference standards for identification and quantification
- report one single concentration for each analyte in each food matrix determined on fresh weight basis
- report limits of detection for all measured analytes in each food item
- report the lipid content

Further detailed instructions and reporting forms will be sent by e-mail simultaneously with the dispatch of the samples in April.

Time schedule

Announcement	**March 2021**
Return of registration form	**April 15th, 2021**
Shipment of test material	**From April 15th, 2021**
Confirmation of receipt of test material by participant	**Within 7 days after receevement**
Reporting of test results	**July 01st, 2021**
Publication of draft report on web-site	**September 2021**

Participation fee

All laboratories that have received the test materials will receive a corresponding invoice in Norwegian kroner (NOK). The participation fee for any combination of the analytes in one food item is 9 500 NOK, in two food items 11 700 NOK, 13 900 NOK for three food items and for the complete set of all four food items 14 900 NOK.

As the inclusion of the PFASs-matrix still is new, all the receivers of this invitation are encouraged to spread the words to possibly interested laboratories!

Co-ordinating group

Nanna Bruun Bremnes
nanna.margrethe.bruun.bremnes@fhi.no
Phone: +47 21 07 66 80

Cathrine Thomsen
cathrine.thomsen@fhi.no
Phone: +47 21 07 65 46

E-mail Address
For all enquiries by e-mail, please use dioxin@fhi.no.

Postal Address:
Norwegian Institute of Public Health
P.O. Box 222 Skøyen
N-0213 Oslo, Norway

Interlaboratory Comparison on Dioxins in Food 2021

Instructions for participants

April 2021

1. Introduction

This is the 22nd Round of the Interlaboratory Comparison Study on the Determination of POPs in Food organised by the Section of Environmental Exposure and Epidemiology, Norwegian Institute of Public Health, Oslo, Norway.

The objective of this exercise is to assess the interlaboratory comparability of the results from analyses of all dioxins and dioxin-like PCBs included in the WHO-TEF schemes in regular foods. Participants may also determine and report concentrations of six marker PCBs, eight polybrominated diphenylethers (PBDEs) and hexabromocyclododecane (HBCD). The exercise serves as a quality assurance instrument for the participating laboratories. A further purpose is to assess the world-wide readiness and capacity for the determination of dioxin-like compounds, marker PCBs, PBDEs and HBCD in food. Instructions for the analysis and submission of results are given below.

Additionally, we also offer a sample of perch for the determination of PFAS.

Please read these instructions carefully before starting the experimental work.

The participating laboratories will contribute to the interlaboratory comparability in the analytical performance for determination of
- dioxins and furans: all seventeen 2,3,7,8-substituted PCDDs and PCDFs
- non-ortho PCBs: CB-77, 81, 126 and 169
- mono-ortho PCBs: CB-105, 114, 118, 123, 156, 157, 167 and 189
- indicator PCBs: CB-28, 52, 101, 138, 153 and 180
- PBDEs: BDE-28, 47, 99, 100, 153, 154, 183 and 209
- HBCD   α-HBCD, β-HBCD, γ-HBCD and total HBCD

in the following samples:
- Sheep meat (Sheep meat-2021)
- Herring (Herring-2021)
- Fish oil (Fish oil-2021)

The mentioned analytes can also be determined in the respective six standard solutions. For HBCD, concentrations of α-HBCD, β-HBCD and γ-HBCD as well as the total of these isomers will be assessed.

The participants also are given the opportunity to determine

- perfluorooctanesulfonate (PFOS)
- perfluorohexanesulfonate (PFHxS)
- perfluorooctanoate (PFOA)
- perfluorononanoate (PFNA)
- perfluorodecanoate (PFDA)
- perfluoroundecanoate (PFUnDA).

in the following sample:
- Perch (Perch-2021)

2. Participants

A list of participants is attached. 61 laboratories have so far announced their participation in the study.

3. Design of the study

3.1 Test materials

Samples
One standard solution of each:
- EDF-5008-50 with PCDDs/PCDFs at concentrations 2:5:10 pg/µl for tetra:penta-hexa-hepta:octa chlorinated dibenzo-p-dioxins/-dibenzo furans respectively
- EC-4986/1000 with non-ortho PCBs at concentration 10 pg/µl
- EC-4987/100 with mono-ortho PCBs at concentration 100 pg/µl
- EC-5179/50 with marker PCBs at concentration 100 pg/µl
- EO-5103/100 with PBDEs at concentration 25 pg/µl, except BDE-209 at 100 pg/µl
- ULM-4834-S/100 with α-HBCD at a concentration 500 pg/µl

One sample of each
- approx. 100 g sheep meat
- approx. 80 g herring
- approx. 50 g fish oil
- approx. 30 g perch (PFAS only)

We do not provide any standard solution for the determination of PFAS.

Fortification
The samples are prepared from regular market foods. There is no fortification or spiking of the target analytes in the food samples.

Shipment
The samples are fresh frozen food homogenates. They are distributed by international courier and should reach the receiving laboratory in good condition within a few days.

3.2 Coding

Coding of laboratories
Upon arrival of the samples in the participant's laboratory, the Microsoft excel file named "Participant confirmation", shall be filled in and returned to the coordinators by e-mail. The code of the laboratory will then be given by the co-ordinators. The laboratory codes will not be revealed to the other participants or to any third parties.

Coding of samples
Sheep meat	Sheep meat-2021
Herring	Herring-2021
Fish oil	Fish oil-2021
Perch	Perch-2021

The above sample coding is marked on the sample bottles.

3.3 Analytical procedure

Storage of the samples
The samples are fresh, frozen homogenates of natural food items. They are shipped frozen and should be stored frozen until they are analysed.

Methods to be used
Laboratories shall use
- their own methods for sample preparation and instrumental analysis
- their own internal- and quantification standards
- their own lipid determination procedure

Standard solutions
The standard solutions should be analysed using the laboratory's own quantification standards and methods and the results shall be reported.

General
Beware of the high risk of background contamination and positive blank values when analysing food samples with levels of dioxins, PCBs, PBDEs and HBCD in the low ppt range.

Use sample size according to expected levels of dioxins for the determinations in order to achieve a detection level that leaves as few as possible analytes as non-detected. The sample amount dispatched is not meant for replicate analyses.

The samples might become inhomogeneous during freezing and transport. Re-homogenise all received material of each food item before any portion is taken out for analysis.

An estimate of the lipid content in the samples follows below:
- Sheep meat: 15-20 %
- Herring: 10-15 %
- Fish oil: 95-98 %

4. Reporting

4.1 Results to be reported

Laboratories are recommended to report as many as possible of the congeners mentioned in chapter 1.

The reports **should** include the determined lipid percent for the samples, with the exception of the perch-sample.

The analytical report must include concentrations for all the congeners in all the samples on fresh weight basis, see Report forms B, C, D for PCDD/PCDF and dioxin-like PCBs and Report form 2, 3, 4 for marker PCBs, PBDEs and HBCD, and the reportform "PFAS-2021" for PFASs.

Laboratories must report one concentration on fresh weight basis for each congener which is detected (S/N ≥3), **as well as** the limit of determination (LOD, S/N =3) for each sample. Non-detected congeners (S/N <3) must be marked ND in the Comments column of the Report form. **Please note that the LOD will be used as concentration of non-detected congeners.**

For the reporting of PFAS: The results should be reported as the anion, not the salt!

4.2 Checklist

Please use the attached checklist before returning the Report forms with your results.

4.3 Submitting results

Four Microsoft Excel files are provided to each participant comprising:

Participants confirmation
- Confirmation of receiving test materials

Report form dioxins and dioxinlike PCBs
- analytical data, Report forms A, B, C and D

Report form marker PCBs, PBDEs and HBCD
- analytical data, Report forms 1, 2, 3 and 4

Report form for PFASs

Participants are requested to submit their reports electronically to avoid possible transcription errors.

Please, do not alter rows or columns in the original Report forms!

The electronic report shall be sent to dioxin@fhi.no within the deadline.

Deadline

The reports must be in our hands no later than July 01th, 2121 to enable us to prepare the draft report to be published by the end of September 2021. There will normally be no extension of this deadline. A confirmation for the receipt of your results will be sent to you by e-mail within a week.

5. Statistical evaluations

Prior to the final report, a draft version will be prepared based on the data reported by July 01th. The co-ordinators will calculate mean, median and between-laboratory standard deviations for each congener. Outliers will be removed, and consensus values will be calculated. In case of extreme deviation from normal distribution, appropriate procedures will be used to get the best estimate of the true value as possible. For the dioxin-like compounds, TEQ values will be calculated for each laboratory and a consensus TEQ value based on the consensus of the congeners. Z-scores will be calculated for laboratories' results for all congeners, and for PCDD/PCDF TEQs and PCB TEQs as well.

6. Final report

The final report will be prepared by the co-ordinators and published in January 2022 and will then be made available for all interested parties in an electronic version on http://www.fhi.no. All participants will be presented by their laboratory code. Prior to this, a draft will be published on the Internet by the end of June.
Certificates of participation in the study will be given to all laboratories submitting results.

7. Fee

To all laboratories that have received the materials, an invoice will be sent. The participation fee for any combination of the 29 dioxin-like congeners, six marker PCBs, 8 PBDEs, HBCD and PFAS is

- NOK 9500 for one food item
- NOK 11700 for two food items
- NOK 13900 for three food items.
- NOK 14900 for four food items

Up to six standard solutions will be distributed free of charge to all participants, dependent on which analytes the participating laboratories intend to determine.

Invoices will be sent out after we have received the Participant confirmation from the participants.

8. Time schedule

Announcement	**March 2021**
Return of registration form	**April 15th, 2021**
Shipment of test material	**From April 15th, 2021**
Confirmation of receipt of test material by participant	**Within 7 days after receivement**
Reporting of test results	**July 01st, 2021**
Publication of draft report on web-site	**September 2021**
Final report available to all participants	**January 2022**

Please be sure that your results are reported in time as there normally will be

no extension of the deadline.

9. Co-ordinators of the study

Nanna Bruun Bremnes
nanna.margrethe.bruun.bremnes@fhi.no
phone: +47-21 07 66 80

Cathrine Thomsen
Cathrine.Thomsen@fhi.no
phone: +47-21 07 65 46

Postal Address:
Norwegian Institute of Public Health
att. Nanna Bruun Bremnes
P.O. Box 4403 Nydalen
N-0403 Oslo, Norway

Checklist

In order to avoid possible misunderstandings and errors when reporting your results, we here give a list of possible pitfalls. Please, check this list and your Report forms before reporting your results.

☐　　Are the results for each congener filled out in the correct order? Be especially aware of 2,3,4,6,7,8- and 1,2,3,7,8,9-HxCDF, and PCB 81.

☐　　Are all congener results reported in pg/µl for standards and pg/g for samples?

☐　　Did you remember to report the lipid percent of the samples?

☐　　Are the results of the samples reported on a *fresh weight basis*?

☐　　Are both concentration and LOD reported for each congener?

☐　　Are sample amount and measured lipid content filled in?

☐　　Are not detected congeners marked with ND in the Comments column?

Appendix C:

WHO TEFs for human risk assessment

WHO TEFs for human risk assessment based on the conclusions of the World Health Organisation Meeting in Stockholm, Sweden, 15-18 June 1997 and International Programme on Chemical Safety expert meeting in Geneva, June 2005 *(M. van den Berg et al., Environ Health Perspect 1998;106:775-792; M. van den Berg et al., Toxicological sciences 93(2), 223-241 (2006))*

Congener	WHO 1998 TEF	WHO 2005 TEF
chlorinated dibenzo-p-dioxiner		
2,3,7,8-TCDD	1	1
1,2,3,7,8-PeCDD	1	1
1,2,3,4,7,8-HxCDD	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01
OCDD	0.0001	0.0003
Chlorinated dibenzofuraner		
2,3,7,8-TCDF	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03
2,3,4,7,8-PeCDF	0.5	0.3
1,2,3,4,7,8-HxCDF	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01
1,2,3,4,7,8,9-HpCDF	0.01	0.01
OCDF	0.0001	0.0003
non-orhto substituted PCBs		
PCB 77	0.0001	0.0001
PCB 81	0.0001	0.0003
PCB 126	0.1	0.1
PCB 169	0.01	0.03
mono-ortho substituted PCBs		
PCB 105	0.0001	0.00003
PCB 114	0.0005	0.00003
PCB 118	0.0001	0.00003
PCB 123	0.0001	0.00003
PCB 156	0.0005	0.00003
PCB 157	0.0005	0.00003
PCB 167	0.00001	0.00003
PCB 189	0.0001	0.00003

Abbreviations used:

T = tetra; Pe = penta; Hx = hexa; Hp = hepta; O = octa;

CDD = chlorodibenzo-p-dioxin; CDF= chlorodibenzofuran; CB= chlorobiphenyl.

Appendix D:

Homogeneity testing

Homogeneity testing of test materials for "Interlaboratory Comparison on Dioxins in Food" organised by the Norwegian Institute of Public Health

Introduction

The International Harmonized Protocol for the Proficiency Testing of Analytical Chemistry Laboratories (Pure Appl Chem 2006;78:145-96) states that "The bulk material prepared for the proficiency test must be sufficient homogeneous and stable, in respect of each analyte, to ensure that all laboratories receive distribution units that do not differ to any consequential degree in mean analyte concentration. The scheme provider must clearly state the procedure used to establish the homogeneity of the test material".

The protocol requires that the variation in composition among the distributed units is negligible in relation to variation introduced by the measurements conducted by the participants of the proficiency test (PT). The estimated variation between the samples (s_{sam}) should be less than 30 % of the target standard deviation (σ_p), i.e., $s_{sam} < 0.3\ \sigma_p$.

Further the protocol states that homogeneity testing is required to reassure the participants in proficiency testing schemes that the distributed units of the test material are sufficiently similar. The test specified calls for the selection of ten or more units at random after the putative homogenized material has been split and packaged into discrete samples for distribution. The material from each sample is then analyzed in duplicate, under randomized repeatability conditions (that is, all in one run) using a method with sufficient analytical precision. The value of σ_{sam} is then estimated from the mean squares after one-way analysis of variance (ANOVA).

The quality of the analytical method used for homogenity testing has a large impact on the results. If the analytical precision (σ_{an}) of the homogeneity test is not small, important sampling variation may be obscured by analytical variation. We may get a non-significant result when testing for heterogeneity, not because it is not present, but the test has no power to detect it. It is recommended that the analytical (repeatability) precision of the method used in the
homogeneity test should satisfy $\sigma_{an} < 0.5\ \sigma_p$

Consequences for the Interlaboratory Comparison on Dioxins in Food

Below follows the consequences for the Interlaboratory Comparison on Dioxin in Food;

1.

The protocol recommends duplicate analysis of at least 10 distribution units. Due to limited amount of test material in each distribution unit and the requirement for sufficiently low analytical standard deviation, the test analysis has to be restricted to PCB, e.g., 6 indicator PCB or CB-153. It is, however, questionable whether analysis of indicator PCB also reflects the distribution of dioxins and other contaminants in the sample, as the test material is often prepared by mixing specifically contaminated material with background contaminated material in order to achieve a sufficient contamination level. Therefore, the distribution of PCBs in the sample might not be relevant for the distribution of dioxins in the sample. The analytical precision of the method used in the homogeneity test should be less than half of the target standard deviation, i.e., $\sigma_{an} < 0.5\ \sigma_p$. For determination of dioxins, the target standard deviation may be approximated by the requirement for trueness (Commission Regulation (EC) No 1883/2006) of ± 20 % for total TEQ, i.e., the analytical precision should be less than 10 %. This is unrealistic to achieve for the determination of dioxins.

2.

The homogeneity testing using, e.g., the determination of indicator PCBs, requires the analysis of at least 60 samples prior to shipment of the distribution units to the participants. This causes problems for the time schedule of the sample preparation and involves high costs.

3.

The laboratory conducting the homogeneity test on PT analytes would have access to the test material and knowledge of contamination levels prior to the start of the PT and would therefore not be qualified for participation in the PT.

Conclusion

A valid testing of homogeneity of the test materials of the Interlaboratory Comparison (ILC) on Dioxins in Food with respect to the distribution of dioxins and dioxin-like PCBs is not guaranteed using indicator PCBs. It is doubtful that the analytical precision is small enough to detect a lack in sufficient homogeneity. Given the need for annually testing three different matrices for homogeneity, alternative, rapid and low cost homogeneity tests using surrogate should be applied.

Present approach for homogeneity testing for the ILC on Dioxins in Food

The Harmonized Protocol states under Chapter Testing for sufficient homogeneity: "Tests for sufficient homogeneity are in practice never wholly satisfactory… However, given that sufficient homogeneity is a reasonable prior assumption (because proficiency testing scheme providers do their best to ensure it), and that the cost [and time-consumption] of testing for it is often high, it is sensible to make the main emphasis the avoidance of "Type 1 errors" (that is, false rejection of a satisfactory material).

Having this in mind and the facts that it is impossible to determine all analytes for homogeneity testing of food test material and that a single indicator analyte not necessarily reflects the distribution of the other analytes, we have developed an approach that ensures that the test material is thoroughly blended and evenly distributed among the individual test bottles. The homogeneity testing of solid samples is based on the principle of measuring electrolytic conductivity after addition of sodium chloride to a small portion of the coarsely blended test material. A demonstration of homogeneous distribution of the added salt in the sub samples would indicate our ability to evenly blend the food matrix, i.e., with this approach we ensure the efficiency of our blending procedure. This is especially of importance when blending highly contaminated food matrices with background contaminated food matrices.

When testing homogeneity of the food samples, sodium chloride was added to about 10% of the test material in such an amount that the conductivity was about doubled compared to the natural conductivity. This sub-sample was added to the total sample. For example, to 1 kg of homogenised chicken meat, 150 g NaCl were added resulting in an addition of 1 % NaCl to the final test material of 15 kg. Conductivity measurements are performed as follows: boiling water is added to 10.0 g of the test material, and the resulting dispersion is ultrasonicated. After centrifugation, the extract is filtered through folded paper filters and allowed to cool to room temperature. The electrolytic conductivity of the water extract is measured using a conductivity meter.

Homogeneity of the test material was demonstrated by comparing the conductivity in water extracts of 10 samples from the same bottle (variation within bottles), and in extracts from 10 different bottles (variation between bottles).

Example

As an example, the relative standard deviation (RSD) of 10 conductivity measurements within a sample bottle containing chicken meat homogenate was 2 %. The RSD for the measurement of samples from 10 different, randomly selected bottles was 3 %. The contribution of the inhomogeneity to the total variation, calculated from $RSD^2_{inhomogeneity} = RSD^2_{between} - RSD^2_{within}$[1] was 2.2 % and hence small and acceptable. The total uncertainty for the determination of PCDD/Fs is usually considerably larger, so the measured contribution of inhomogeneity to the total uncertainty can be neglected

[1] G. Becher, L.S. Haug, C. Thomsen, World-wide comparison on the quality of analytical determinations of PCDDs/PCDFs and dioxin-like PCBs in food, Talanta 63 (2004) 1115-1122.

Appendix E:

Summary results

Consensus of congener concentrations

	Sheep meat		Herring		Fish oil	
	pg/g fw.	pg/g lw.	pg/g fw.	pg/g lw.	pg/g fw.	pg/g lw.
2,3,7,8-TCDD	0,0020	0,042	0,020	0,34	0,22	0,22
1,2,3,7,8-PeCDD	0,0034	0,071	0,10	1,8	0,68	0,68
1,2,3,4,7,8-HxCDD	0,0037	0,078	0,022	0,36	0,11	0,11
1,2,3,6,7,8-HxCDD	0,0044	0,092	0,079	1,3	0,59	0,59
1,2,3,7,8,9-HxCDD	0,0030	0,063	0,018	0,30	0,15	0,15
1,2,3,4,6,7,8-HpCDD	0,0099	0,21	0,042	0,71	0,28	0,28
1,2,3,4,6,7,8,9-OCDD	0,030	0,62	0,052	0,87	0,25	0,25
2,3,7,8-TCDF	0,0050	0,10	0,58	9,8	9,3	9,3
1,2,3,7,8-PeCDF	0,0042	0,088	0,12	2,0	1,3	1,3
2,3,4,7,8-PeCDF	0,0060	0,13	0,48	8,0	4,2	4,2
1,2,3,4,7,8-HxCDF	0,0045	0,094	0,041	0,69	0,36	0,36
1,2,3,6,7,8-HxCDF	0,0038	0,080	0,041	0,69	0,49	0,49
2,3,4,6,7,8-HxCDF	0,0034	0,071	0,066	1,1	0,54	0,54
1,2,3,7,8,9-HxCDF	0,0025	0,052	0,0050	0,084	0,039	0,039
1,2,3,4,6,7,8-HpCDF	0,0050	0,10	0,027	0,45	0,20	0,20
1,2,3,4,7,8,9-HpCDF	0,0042	0,088	0,0060	0,10	0,035	0,035
1,2,3,4,6,7,8,9-OCDF	0,0093	0,20	0,014	0,23	0,067	0,067
PCB-77	0,38	8,0	8,2	139	78	78
PCB-126	0,079	1,6	2,5	42	39	39
PCB-169	0,036	0,76	1,5	25	18	18
PCB-81	0,017	0,36	0,21	3,5	2,8	2,8
PCB-105	3,3	68	166	2794	2713	2713
PCB-114	0,38	7,9	8,6	144	169	169
PCB-118	11	224	533	8958	8570	8570
PCB-123	0,15	3,2	4,9	83	100	100
PCB-156	2,7	56	46	778	640	640
PCB-157	0,50	10	16	265	205	205
PCB-167	0,62	13	25	422	366	366
PCB-189	0,28	6,0	5,3	89	56	56

fw. - fresh weight

lw. - lipid weight

Consensus of congener concentrations

	Sheep meat		Herring		Fish oil	
	pg/g fw.	pg/g lw.	pg/g fw.	pg/g lw.	pg/g fw.	pg/g lw.
PCB- 28	14	291	173	2885	2123	2123
PCB- 52	21	432	450	7525	6779	6779
PCB- 101	22	456	803	13432	10161	10161
PCB- 138	14	287	954	15949	11388	11388
PCB- 153	38	794	1496	25017	16552	16552
PCB- 180	13	282	268	4489	3611	3611
PBDE- 28	0,25	5,2	13	223	159	159
PBDE- 47	1,1	22	248	4147	2540	2540
PBDE- 99	0,89	19	26	430	160	160
PBDE- 100	0,45	9,4	101	1688	599	599
PBDE- 153	0,54	11	7,3	122	49	49
PBDE- 154	0,17	3,6	33	550	452	452
PBDE- 183	0,18	3,9	1,8	30	7,2	7,2
PBDE- 209	9,7	203	27	457	68	68
α-HBCD**	1,2	25	115	1926	2113	2113
β-HBCD**	*	*	1,3	22	6,4	6,4
γ-HBCD**	0,098	2,1	4,8	81	36	36
Tot HBCD**	1,2	26	125	2097	2193	2193
Sum PCB	121	2541	4144	69297	50614	50614
Sum BDE without 209	3,5	74	430	7190	3966	3966
Sum BDE	13	277	457	7647	4034	4034

fw. - fresh weight

lw. - lipid weight

*unable to calculate consensus value due to few submitted results

**Indiciative value only due to few reported results

Perch-2021: PFAS, consensus values

	Perch pg/g fw.
PFOS	15100
PFHxS*	38
PFOA*	35
PFNA*	104
PFDA	637
PFUnDA	354
Sum PFAS	16268

fw. - fresh weight

Indicative value due to few reported results

Consensus of TEQs

TEF$_{2006}$

	Sheep meat		Herring		Fish oil	
	pg TE/g fw.	pg TE/g lw.	pg TE/g fw.	pg TE/g lw.	pg TE/g fw.	pg TE/g lw.
2,3,7,8-TCDD	0,0020	0,042	0,020	0,33	0,22	0,22
1,2,3,7,8-PeCDD	0,0034	0,071	0,10	1,7	0,68	0,68
1,2,3,4,7,8-HxCDD	0,00037	0,0078	0,0022	0,036	0,011	0,011
1,2,3,6,7,8-HxCDD	0,00044	0,0092	0,0079	0,13	0,059	0,059
1,2,3,7,8,9-HxCDD	0,00030	0,0063	0,0018	0,029	0,015	0,015
1,2,3,4,6,7,8-HpCDD	0,000099	0,0021	0,00042	0,0071	0,0028	0,0028
1,2,3,4,6,7,8,9-OCDD	0,0000089	0,00019	0,000015	0,00026	0,000076	0,000076
2,3,7,8-TCDF	0,00050	0,010	0,058	0,97	0,93	0,93
1,2,3,7,8-PeCDF	0,00013	0,0026	0,0036	0,061	0,040	0,040
2,3,4,7,8-PeCDF	0,0018	0,038	0,14	2,4	1,3	1,3
1,2,3,4,7,8-HxCDF	0,00045	0,0094	0,0041	0,069	0,036	0,036
1,2,3,6,7,8-HxCDF	0,00038	0,0080	0,0041	0,068	0,049	0,049
2,3,4,6,7,8-HxCDF	0,00034	0,0071	0,0066	0,11	0,054	0,054
1,2,3,7,8,9-HxCDF	0,00025	0,0052	0,00050	0,0084	0,0039	0,0039
1,2,3,4,6,7,8-HpCDF	0,000050	0,0010	0,00027	0,0045	0,0020	0,0020
1,2,3,4,7,8,9-HpCDF	0,000042	0,00088	0,000060	0,0010	0,00035	0,00035
1,2,3,4,6,7,8,9-OCDF	0,0000028	0,000059	0,0000041	0,000068	0,000020	0,000020
PCB-77	0,000038	0,00080	0,00082	0,014	0,0078	0,0078
PCB-126	0,0079	0,16	0,25	4,2	3,9	3,9
PCB-169	0,0011	0,023	0,044	0,74	0,55	0,55
PCB-81	0,0000051	0,00011	0,000062	0,0010	0,00085	0,00085
PCB-105	0,000098	0,0020	0,0050	0,083	0,081	0,081
PCB-114	0,000011	0,00024	0,00026	0,0043	0,0051	0,0051
PCB-118	0,00032	0,0067	0,016	0,27	0,26	0,26
PCB-123	0,0000046	0,000097	0,00015	0,0025	0,0030	0,0030
PCB-156	0,000081	0,0017	0,0014	0,023	0,019	0,019
PCB-157	0,000015	0,00031	0,00047	0,0079	0,0061	0,0061
PCB-167	0,000019	0,00039	0,00075	0,013	0,011	0,011
PCB-189	0,0000085	0,00018	0,00016	0,0027	0,0017	0,0017
PCDDs/PCDFs	0,011	0,22	0,36	6,0	3,4	3,4
Non-ortho PCBs	0,0090	0,19	0,30	4,9	4,4	4,4
Mono-ortho PCBs	0,00056	0,012	0,024	0,40	0,38	0,38
Total TEQ	0,020	0,42	0,68	11	8,2	8,2

fw. - fresh weight

lw. - lipid weight

Consensus of TEQs

TEF$_{1998}$

	Sheep meat		Herring		Fish oil	
	pg TE/g fw.	pg TE/g lw.	pg TE/g fw.	pg TE/g lw.	pg TE/g fw.	pg TE/g lw.
2,3,7,8-TCDD	0,0020	0,042	0,020	0,33	0,22	0,22
1,2,3,7,8-PeCDD	0,0034	0,071	0,10	1,7	0,68	0,68
1,2,3,4,7,8-HxCDD	0,00037	0,0078	0,0022	0,036	0,011	0,011
1,2,3,6,7,8-HxCDD	0,00044	0,0092	0,0079	0,13	0,059	0,059
1,2,3,7,8,9-HxCDD	0,00030	0,0063	0,0018	0,029	0,015	0,015
1,2,3,4,6,7,8-HpCDD	0,000099	0,0021	0,00042	0,0071	0,0028	0,0028
1,2,3,4,6,7,8,9-OCDD	0,0000030	0,000062	0,0000052	0,000086	0,000025	0,000025
2,3,7,8-TCDF	0,00050	0,010	0,058	0,97	0,93	0,93
1,2,3,7,8-PeCDF	0,00021	0,0044	0,0061	0,10	0,066	0,066
2,3,4,7,8-PeCDF	0,0030	0,063	0,24	4,0	2,1	2,1
1,2,3,4,7,8-HxCDF	0,00045	0,0094	0,0041	0,069	0,036	0,036
1,2,3,6,7,8-HxCDF	0,00038	0,0080	0,0041	0,068	0,049	0,049
2,3,4,6,7,8-HxCDF	0,00034	0,0071	0,0066	0,11	0,054	0,054
1,2,3,7,8,9-HxCDF	0,00025	0,0052	0,00050	0,0084	0,0039	0,0039
1,2,3,4,6,7,8-HpCDF	0,000050	0,0010	0,00027	0,0045	0,0020	0,0020
1,2,3,4,7,8,9-HpCDF	0,000042	0,00088	0,000060	0,0010	0,00035	0,00035
1,2,3,4,6,7,8,9-OCDF	0,00000093	0,000020	0,0000014	0,000023	0,0000067	0,0000067
PCB-77	0,000038	0,00080	0,00082	0,014	0,0078	0,0078
PCB-126	0,0079	0,16	0,25	4,2	3,9	3,9
PCB-169	0,00036	0,0076	0,015	0,25	0,18	0,18
PCB-81	0,0000017	0,000036	0,000021	0,00035	0,00028	0,00028
PCB-105	0,00033	0,0068	0,017	0,28	0,27	0,27
PCB-114	0,00019	0,0040	0,0043	0,072	0,084	0,084
PCB-118	0,0011	0,022	0,053	0,89	0,86	0,86
PCB-123	0,000015	0,00032	0,00049	0,0082	0,010	0,010
PCB-156	0,0013	0,028	0,023	0,39	0,32	0,32
PCB-157	0,00025	0,0052	0,0079	0,13	0,10	0,10
PCB-167	0,0000062	0,00013	0,00025	0,0042	0,0037	0,0037
PCB-189	0,000028	0,00060	0,00053	0,0089	0,0056	0,0056
PCDDs/PCDFs	0,012	0,25	0,46	7,6	4,2	4,2
Non-ortho PCBs	0,0083	0,17	0,27	4,4	4,0	4,0
Mono-ortho PCBs	0,0032	0,068	0,11	1,8	1,7	1,7
Total TEQ	0,023	0,49	0,83	14	9,9	9,9

fw. - fresh weight

lw. - lipid weight

Consensus statistics

2021

Analyte solution

	Target value pg/μl	Consensus median, pg/μl	Median all values pg/μl	Consensus mean, pg/μl	Standard deviation, pg/μl	Relative standard deviation, %	No. of values reported	No. of values removed
2,3,7,8-TCDD	2,0	1,9	1,9	2,0	0,13	6,8	48	1
1,2,3,7,8-PeCDD	5,0	5,0	5,0	5,1	0,25	4,9	48	1
1,2,3,4,7,8-HxCDD	5,0	4,9	4,9	4,9	0,35	7,2	48	1
1,2,3,6,7,8-HxCDD	5,0	4,9	4,9	4,9	0,28	5,8	48	1
1,2,3,7,8,9-HxCDD	5,0	4,9	5,0	4,9	0,26	5,2	48	1
1,2,3,4,6,7,8-HpCDD	5,0	5,0	5,0	5,0	0,29	5,9	48	1
1,2,3,4,6,7,8,9-OCDD	10	9,9	9,9	9,8	0,61	6,2	48	2
2,3,7,8-TCDF	2,0	2,0	2,0	2,0	0,13	6,6	48	2
1,2,3,7,8-PeCDF	5,0	5,0	5,0	5,0	0,25	5,1	48	2
2,3,4,7,8-PeCDF	5,0	4,9	4,9	4,8	0,30	6,1	48	2
1,2,3,4,7,8-HxCDF	5,0	4,9	4,9	4,9	0,26	5,2	48	1
1,2,3,6,7,8-HxCDF	5,0	5,0	5,0	5,0	0,24	4,8	48	1
2,3,4,6,7,8-HxCDF	5,0	5,0	5,0	4,9	0,27	5,4	48	1
1,2,3,7,8,9-HxCDF	5,0	5,0	5,0	5,0	0,34	6,7	48	1
1,2,3,4,6,7,8-HpCDF	5,0	4,9	4,9	4,9	0,36	7,3	48	1
1,2,3,4,7,8,9-HpCDF	5,0	4,9	4,9	4,9	0,30	6,1	48	1
1,2,3,4,6,7,8,9-OCDF	10	10	10	9,8	0,75	7,7	48	1
PCB-77	10	9,9	9,9	9,9	0,76	7,7	46	0
PCB-126	10	10	10	9,8	0,79	8,1	46	0
PCB-169	10	9,9	9,9	9,9	0,66	6,7	46	0
PCB-81	10	10	10	9,9	0,69	6,9	46	0
PCB-105	100	102	102	101	7,7	7,7	47	0
PCB-114	100	100	100	99	7,8	7,8	47	0
PCB-118	100	103	103	101	8,2	8,1	47	0
PCB-123	100	102	102	101	8,0	7,9	47	0
PCB-156	100	100	100	100	5,5	5,5	47	1
PCB-157	100	100	100	99	6,1	6,1	47	1
PCB-167	100	100	100	100	6,5	6,5	47	0
PCB-189	100	101	101	100	5,7	5,7	47	0

Consensus statistics

Analyte solution

	Target value pg/µl	Median, pg/µl all values	Median, pg/µl outliers removed	Mean, pg/µl all values	Mean, pg/µl outliers removed
PCB-28	100	98	98	94	97
PCB-52	100	99	99	96	99
PCB-101	100	99	99	95	98
PCB-138	100	99	99	97	99
PCB-153	100	99	99	96	98
PCB-180	100	100	100	97	99
PBDE-28	25	25	25	25	25
PBDE-47	25	24	24	24	24
PBDE-99	25	24	24	25	25
PBDE-100	25	25	25	25	25
PBDE-153	25	25	25	24	24
PBDE-154	25	24	24	24	24
PBDE-183	25	25	25	25	25
PBDE-209	100	92	92	94	94
α-HBCD *	500	497	497	535	535

	Relative standard deviation, % all values	Relative standard deviation, % outliers removed	No. of values reported values	No. of reported outliers
PCB-28	20	12	40	1
PCB-52	17	5,8	40	1
PCB-101	18	9,0	40	1
PCB-138	17	6,0	40	1
PCB-153	18	7,8	40	1
PCB-180	18	8,2	40	1
PBDE-28	13	13	20	0
PBDE-47	9,3	9,3	20	0
PBDE-99	7,4	7,4	20	0
PBDE-100	7,9	7,9	20	0
PBDE-153	6,6	6,6	20	0
PBDE-154	6,5	6,5	20	0
PBDE-183	8,9	8,9	19	0
PBDE-209	8,7	8,7	14	0
α-HBCD *	18	18	5,0	0

NDs: Non-detects

* : Indicative value due to few reported values

Consensus statistics

2021

Sheep meat, fresh weight

	Consensus median, pg/g	Median all values pg/g	Consensus mean, pg/g	Standard deviation, pg/g	Relative standard deviation, %	No. of values reported	No. of values removed	No. of reported non-detects
2,3,7,8-TCDD	0,0020	0,0027	0,0022	0,0015	67	43	14	26
1,2,3,7,8-PeCDD	0,0034	0,0046	0,0038	0,0018	47	43	13	25
1,2,3,4,7,8-HxCDD	0,0037	0,0050	0,0041	0,0022	55	43	11	21
1,2,3,6,7,8-HxCDD	0,0044	0,0051	0,0046	0,0021	46	43	12	19
1,2,3,7,8,9-HxCDD	0,0030	0,0043	0,0032	0,0020	61	43	12	27
1,2,3,4,6,7,8-HpCDD	0,0099	0,015	0,011	0,0051	44	43	14	13
1,2,3,4,6,7,8,9-OCDD	0,030	0,040	0,032	0,020	62	43	11	12
2,3,7,8-TCDF	0,0050	0,0064	0,0054	0,0028	52	43	11	19
1,2,3,7,8-PeCDF	0,0042	0,0050	0,0043	0,0027	63	43	9	23
2,3,4,7,8-PeCDF	0,0060	0,0065	0,0059	0,0023	40	43	11	11
1,2,3,4,7,8-HxCDF	0,0045	0,0051	0,0045	0,0022	49	43	12	20
1,2,3,6,7,8-HxCDF	0,0038	0,0050	0,0044	0,0025	57	43	11	23
2,3,4,6,7,8-HxCDF	0,0034	0,0046	0,0039	0,0020	52	43	10	20
1,2,3,7,8,9-HxCDF	0,0025	0,0042	0,0029	0,0018	63	43	14	30
1,2,3,4,6,7,8-HpCDF	0,0050	0,0066	0,0057	0,0029	52	43	12	16
1,2,3,4,7,8,9-HpCDF	0,0042	0,0050	0,0039	0,0024	62	43	12	24
1,2,3,4,6,7,8,9-OCDF	0,0093	0,018	0,012	0,0084	69	43	13	19
PCB-77	0,38	0,41	0,39	0,11	28	43	7	5
PCB-126	0,079	0,080	0,085	0,024	29	43	6	8
PCB-169	0,036	0,039	0,039	0,012	31	43	9	12
PCB-81	0,017	0,022	0,018	0,0076	42	43	15	13
PCB-105	3,3	3,3	3,4	0,84	25	43	2	5
PCB-114	0,38	0,40	0,38	0,093	24	43	9	10
PCB-118	11	11	11	3,0	27	43	1	3
PCB-123	0,15	0,20	0,17	0,085	50	43	11	12
PCB-156	2,7	2,7	2,7	0,60	22	43	1	5
PCB-157	0,50	0,51	0,49	0,089	18	43	8	10
PCB-167	0,62	0,63	0,65	0,21	32	43	7	10
PCB-189	0,28	0,31	0,29	0,083	28	43	10	11

Consensus statistics

Sheep meat, fresh weight

	Median, pg/g all values	Median, pg/g outliers removed	Median, pg/g outliers and NDs removed	Mean, pg/g all values	Mean, pg/g outliers removed	Mean, pg/g outliers and NDs removed
PCB-28	15	14	14	31	15	15
PCB-52	21	21	21	37	21	21
PCB-101	22	22	22	37	23	23
PCB-138	14	14	14	28	14	14
PCB-153	40	38	38	51	38	38
PCB-180	14	13	13	27	14	13
PBDE-28	0,25	0,24	0,25	0,25	0,20	0,20
PBDE-47	1,9	1,1	1,1	2,6	1,5	1,5
PBDE-99	0,91	0,89	0,89	1,9	0,90	0,90
PBDE-100	0,48	0,45	0,45	0,71	0,51	0,43
PBDE-153	0,56	0,56	0,54	0,57	0,57	0,53
PBDE-154	0,19	0,17	0,17	0,32	0,20	0,20
PBDE-183	0,27	0,21	0,18	0,50	0,25	0,19
PBDE-209	16	7,6	9,7	22	8,9	9,7
α-HBCD *	3,5	2,0	1,2	27	2,5	1,2
β-HBCD *	3,3	1,5	**	27	2,2	**
γ-HBCD *	3,3	1,5	0,098	27	2,2	0,098
Tot HBCD *	3,5	2,0	1,2	27	2,5	1,2

	Relative standard deviation, % all values	Relative standard deviation, % outliers removed	Relative standard deviation, % outliers and NDs removed	No. of values reported	No. of reported outliers	No. of reported NDs
PCB-28	253	32	31	39	5	3
PCB-52	211	24	24	39	3	2
PCB-101	209	28	28	39	3	2
PCB-138	277	27	25	39	3	3
PCB-153	146	25	25	39	2	2
PCB-180	289	25	22	39	2	3
PBDE-28	81	64	54	12	1	4
PBDE-47	93	62	62	13	3	1
PBDE-99	135	22	23	13	3	2
PBDE-100	74	38	26	13	2	3
PBDE-153	33	33	26	13	0	1
PBDE-154	82	37	37	13	3	3
PBDE-183	110	53	36	12	3	3
PBDE-209	89	85	31	8	3	4
α-HBCD *	182	96	100	4	1	2
β-HBCD *	184	114	**	4	1	4
γ-HBCD *	184	115	**	4	1	3
Tot HBCD *	182	93	91	4	1	2

NDs: Non-detects

* : Indicative value due to few reported values

** : Not possible to calculate results due to few reported results

Consensus statistics

2021

Herring, fresh weight

	Consensus median, pg/g	Median all values pg/g	Consensus mean, pg/g	Standard deviation, pg/g	Relative standard deviation, %	No. of values reported	No. of values removed	No. of reported non-detects
2,3,7,8-TCDD	0,020	0,020	0,021	0,0065	32	56	6	11
1,2,3,7,8-PeCDD	0,10	0,10	0,10	0,025	24	56	4	5
1,2,3,4,7,8-HxCDD	0,022	0,022	0,021	0,0058	27	56	13	12
1,2,3,6,7,8-HxCDD	0,079	0,080	0,077	0,021	27	56	3	8
1,2,3,7,8,9-HxCDD	0,018	0,019	0,018	0,0060	34	56	11	13
1,2,3,4,6,7,8-HpCDD	0,042	0,045	0,044	0,011	26	56	10	11
1,2,3,4,6,7,8,9-OCDD	0,052	0,066	0,060	0,029	48	56	12	14
2,3,7,8-TCDF	0,58	0,58	0,59	0,089	15	56	1	0
1,2,3,7,8-PeCDF	0,12	0,12	0,12	0,025	20	56	5	4
2,3,4,7,8-PeCDF	0,48	0,48	0,48	0,064	13	56	0	2
1,2,3,4,7,8-HxCDF	0,041	0,042	0,042	0,013	30	56	6	9
1,2,3,6,7,8-HxCDF	0,041	0,042	0,042	0,010	24	56	5	10
2,3,4,6,7,8-HxCDF	0,066	0,066	0,067	0,017	26	56	3	8
1,2,3,7,8,9-HxCDF	0,0050	0,0099	0,0067	0,0043	63	56	15	33
1,2,3,4,6,7,8-HpCDF	0,027	0,028	0,029	0,0096	34	56	9	10
1,2,3,4,7,8,9-HpCDF	0,0060	0,0095	0,0078	0,0047	60	56	14	36
1,2,3,4,6,7,8,9-OCDF	0,014	0,021	0,015	0,0074	49	56	20	25
PCB-77	8,2	8,2	8,4	1,2	15	56	0	0
PCB-126	2,5	2,5	2,5	0,36	14	56	2	2
PCB-169	1,5	1,5	1,5	0,22	15	56	0	4
PCB-81	0,21	0,22	0,20	0,055	27	56	13	8
PCB-105	166	166	162	17	11	56	0	0
PCB-114	8,6	8,6	8,8	1,8	20	56	3	3
PCB-118	533	533	518	59	11	56	0	0
PCB-123	4,9	5,7	5,3	2,1	40	56	13	9
PCB-156	46	46	46	4,5	9,8	56	0	0
PCB-157	16	16	15	1,8	11	56	2	0
PCB-167	25	25	25	3,3	13	56	2	0
PCB-189	5,3	5,3	5,6	1,2	22	56	1	4

Consensus statistics

Herring, fresh weight

	Median, pg/g all values	Median, pg/g outliers removed	Median, pg/g outliers and NDs removed	Mean, pg/g all values	Mean, pg/g outliers removed	Mean, pg/g outliers and NDs removed
PCB-28	175	174	173	187	176	175
PCB-52	451	451	450	446	446	445
PCB-101	803	803	803	800	800	800
PCB-138	954	954	954	977	977	977
PCB-153	1496	1496	1496	1500	1500	1500
PCB-180	270	270	268	266	266	261
PBDE-28	13	13	13	13	13	13
PBDE-47	248	248	248	254	254	254
PBDE-99	25	25	26	25	25	26
PBDE-100	101	101	101	105	105	105
PBDE-153	7,4	7,3	7,3	7,9	7,4	7,3
PBDE-154	34	33	33	38	33	33
PBDE-183	1,8	1,8	1,8	1,9	1,9	2,0
PBDE-209	34	20	27	59	22	26
α-HBCD *	115	115	115	108	108	108
β-HBCD *	5,0	3,1	1,3	23	4,3	1,3
γ-HBCD *	7,3	2,3	4,8	29	3,5	4,8
Tot HBCD *	125	125	125	116	116	116

	Relative standard deviation, % all values	Relative standard deviation, % outliers removed	Relative standard deviation, % outliers and NDs removed	No. of values reported	No. of reported outliers	No. of reported NDs
PCB-28	37	25	25	48	2	2
PCB-52	17	17	17	48	0	1
PCB-101	15	15	15	48	0	0
PCB-138	18	18	18	48	0	0
PCB-153	16	16	16	48	0	0
PCB-180	19	19	14	48	0	1
PBDE-28	24	24	24	19	0	0
PBDE-47	17	17	17	20	0	0
PBDE-99	33	33	25	20	0	1
PBDE-100	21	21	21	20	0	0
PBDE-153	35	23	24	20	1	1
PBDE-154	41	25	25	20	2	0
PBDE-183	35	35	38	18	0	4
PBDE-209	123	81	63	13	4	5
α-HBCD *	20	20	20	6	0	0
β-HBCD *	183	97	**	5	1	4
γ-HBCD *	144	94	74	5	2	2
Tot HBCD *	15	15	15	5	0	0

NDs: Non-detects

* : Indicative value due to few reported values

** : Not possible to calculate results due to few reported results

Consensus statistics

2021

Fish oil, fresh weight

	Consensus median, pg/g	Median all values pg/g	Consensus mean, pg/g	Standard deviation, pg/g	Relative standard deviation, %	No. of values reported	No. of values removed	No. of reported non-detects
2,3,7,8-TCDD	0,22	0,22	0,20	0,059	29	47	1	2
1,2,3,7,8-PeCDD	0,68	0,69	0,67	0,17	26	47	1	0
1,2,3,4,7,8-HxCDD	0,11	0,12	0,12	0,038	31	47	3	4
1,2,3,6,7,8-HxCDD	0,59	0,59	0,58	0,11	19	47	0	0
1,2,3,7,8,9-HxCDD	0,15	0,15	0,15	0,046	31	47	1	6
1,2,3,4,6,7,8-HpCDD	0,28	0,29	0,26	0,084	33	47	2	4
1,2,3,4,6,7,8,9-OCDD	0,25	0,29	0,27	0,12	42	47	5	9
2,3,7,8-TCDF	9,3	9,3	9,2	1,7	19	47	1	0
1,2,3,7,8-PeCDF	1,3	1,3	1,3	0,21	16	47	1	0
2,3,4,7,8-PeCDF	4,2	4,3	4,2	0,74	17	47	1	0
1,2,3,4,7,8-HxCDF	0,36	0,36	0,35	0,071	21	47	3	0
1,2,3,6,7,8-HxCDF	0,49	0,49	0,48	0,11	23	47	0	0
2,3,4,6,7,8-HxCDF	0,54	0,54	0,53	0,13	25	47	0	0
1,2,3,7,8,9-HxCDF	0,039	0,054	0,045	0,026	59	47	10	26
1,2,3,4,6,7,8-HpCDF	0,20	0,21	0,20	0,064	32	47	3	1
1,2,3,4,7,8,9-HpCDF	0,035	0,044	0,039	0,024	61	47	13	24
1,2,3,4,6,7,8,9-OCDF	0,067	0,10	0,080	0,050	62	47	11	20
PCB-77	78	78	78	14	18	47	0	0
PCB-126	39	39	38	6,8	18	47	2	0
PCB-169	18	18	18	3,7	21	47	0	0
PCB-81	2,8	3,0	2,7	0,87	32	47	8	3
PCB-105	2713	2713	2689	258	9,6	47	0	0
PCB-114	169	169	171	31	18	47	0	0
PCB-118	8570	8570	8472	867	10	47	0	0
PCB-123	100	105	103	28	27	47	8	1
PCB-156	640	640	626	57	9,1	47	0	0
PCB-157	205	205	203	19	9,6	47	0	0
PCB-167	366	366	369	31	8,3	47	1	0
PCB-189	56	56	56	5,2	9,4	47	0	0

Consensus statistics

Fish oil, fresh weight

	Median, pg/g all values	Median, pg/g outliers removed	Median, pg/g outliers and NDs removed	Mean, pg/g all values	Mean, pg/g outliers removed	Mean, pg/g outliers and NDs removed
PCB-28	2160	2123	2123	2427	2194	2194
PCB-52	6779	6779	6779	6792	6792	6792
PCB-101	10161	10161	10161	9873	9873	9873
PCB-138	11388	11388	11388	11746	11746	11746
PCB-153	16552	16552	16552	16026	16026	16026
PCB-180	3611	3611	3611	3477	3477	3477
PBDE-28	159	159	159	161	161	161
PBDE-47	2540	2540	2540	2636	2636	2636
PBDE-99	160	160	160	164	164	164
PBDE-100	599	599	599	597	597	597
PBDE-153	49	49	49	52	52	52
PBDE-154	452	452	452	436	436	436
PBDE-183	7,8	7,1	7,2	16	6,8	7,2
PBDE-209	68	25	68	236	32	68
α-HBCD *	2113	2113	2113	2237	2237	2237
β-HBCD *	5,0	5,0	6,4	4,1	4,1	6,4
γ-HBCD *	36	36	36	46	46	46
Tot HBCD *	2193	2193	2193	2319	2319	2319

	Relative standard deviation, % all values	Relative standard deviation, % outliers removed	Relative standard deviation, % outliers and NDs removed	No. of values reported	No. of reported outliers	No. of reported NDs
PCB-28	44	29	29	42	3	0
PCB-52	19	19	19	42	0	0
PCB-101	23	23	23	42	0	0
PCB-138	23	23	23	42	0	0
PCB-153	26	26	26	42	0	0
PCB-180	23	23	23	42	0	0
PBDE-28	23	23	23	16	0	0
PBDE-47	10	9,6	9,6	17	0	0
PBDE-99	20	20	20	17	0	0
PBDE-100	16	16	16	17	0	0
PBDE-153	31	31	31	17	0	0
PBDE-154	20	20	20	17	0	0
PBDE-183	131	30	16	16	4	5
PBDE-209	122	81	**	9	4	6
α-HBCD *	21	21	21	4	0	0
β-HBCD *	71	71	**	3	0	2
γ-HBCD *	46	46	46	3	0	0
Tot HBCD *	26	26	26	3	0	0

NDs: Non-detects

* : Indicative value due to few reported values

** : Not possible to calculate results due to few reported results

Consensus statistics

Perch, fresh weight

	Median, pg/g all values	Median, pg/g outliers removed	Median, pg/g outliers and NDs removed	Mean, pg/g all values	Mean, pg/g outliers removed	Mean, pg/g outliers and NDs removed
PFOS	15115	15100	15100	16398	15440	15440
PFHxS *	78	43	38	103	63	63
PFOA *	51	41	35	94	33	33
PFNA *	106	104	104	137	104	104
PFDA	637	637	637	632	632	632
PFUnDA	358	358	354	355	344	344

	Relative standard deviation, % all values	Relative standard deviation, % outliers removed	Relative standard deviation, % outliers and NDs removed	No. of reported values	No. of outliers	No. of reported NDs
PFOS	30	21	21	16	1	0
PFHxS *	117	59	59	15	0	6
PFOA *	128	34	34	16	1	11
PFNA *	76	20	20	15	0	5
PFDA	19	19	19	15	0	0
PFUnDA	32	32	32	15	0	1

NDs: Non-detects

* : Indicative value due to few reported values

Laboratories' reported TEQs, sum indicator PCB and sum PBDE without PBDE 209

TEF$_{2006}$	Median pg/g	Mean pg/g	Standard deviation, pg/g	Relative standard deviation, %	Min pg/g	Max pg/g	Reporting laboratories
Sheep meat, fresh weight							
PCDD/PCDF TEQ	0,015	0,080	0,14	171	0,0042	0,47	43
Non-ortho PCB TEQ	0,0091	0,050	0,12	239	0,0061	0,48	43
Mono-ortho PCB TEQ	0,00057	0,00070	0,00037	53	0,00036	0,0024	43
Total TEQ	0,026	0,13	0,24	189	0,015	0,95	43
Sum indicator PCB	127	211	461	219	66	3000	39
Sum PBDE without PBDE-209	4,3	6,8	5,9	86	2,5	22	13
Herring, fresh weight							
PCDD/PCDF TEQ	0,37	0,50	0,14	28	0,19	1,1	56
Non-ortho PCB TEQ	0,30	0,35	0,33	94	0,21	2,5	56
Mono-ortho PCB TEQ	0,024	0,024	0,0023	9,8	0,018	0,029	56
Total TEQ	0,68	0,78	0,35	45	0,52	2,8	56
Sum indicator PCB	4162	4175	547	13	2285	5351	48
Sum PBDE without PBDE-209	441	444	66	15	336	583	20
Fish oil, fresh weight							
PCDD/PCDF TEQ	3,4	18	90	512	0,34	622	47
Non-ortho PCB TEQ	4,4	4,7	2,2	47	0,37	16	47
Mono-ortho PCB TEQ	0,39	0,38	0,033	8,5	0,30	0,47	47
Total TEQ	8,3	22	90	413	1,1	626	47
Sum indicator PCB	51308	50341	9131	18	54	63195	42
Sum PBDE without PBDE-209	3927	4051	371	9,2	3484	4893	17

Laboratories' reported TEQs, sum indicator PCB and sum PBDE without PBDE 209

TEF$_{1998}$	Median pg/g	Mean pg/g	Standard deviation, pg/g	Relative standard deviation, %	Min pg/g	Max pg/g	Reporting laboratories
Sheep meat, fresh weight							
PCDD/PCDF TEQ	0,017	0,080	0,14	180	0,0055	0,49	43
Non-ortho PCB TEQ	0,0084	0,043	0,10	235	0,0055	0,40	43
Mono-ortho PCB TEQ	0,0034	0,0043	0,0030	70	0,0020	0,019	43
Total TEQ	0,030	0,13	0,23	180	0,018	0,90	43
Sum indicator PCB	127	211	461	219	66	3000	39
Sum PBDE without PBDE-209	4,3	6,8	5,9	86	2,5	22	13
Herring, fresh weight							
PCDD/PCDF TEQ	0,47	0,50	0,15	30	0,26	1,2	56
Non-ortho PCB TEQ	0,27	0,32	0,33	103	0,19	2,5	56
Mono-ortho PCB TEQ	0,11	0,11	0,0094	8,9	0,079	0,13	56
Total TEQ	0,84	0,93	0,35	38	0,63	2,9	56
Sum indicator PCB	4162	4175	547	13	2285	5351	48
Sum PBDE without PBDE-209	441	444	66	15	336	583	20
Fish oil, fresh weight							
PCDD/PCDF TEQ	4,3	18	90	512	0,39	622	47
Non-ortho PCB TEQ	4,1	4,4	2,2	51	0,34	15	47
Mono-ortho PCB TEQ	1,7	1,6	0,13	7,7	1,4	2,0	47
Total TEQ	10	24	90	381	2,4	627	47
Sum indicator PCB	51308	50341	9131	18	54	63195	42
Sum PBDE without PBDE-209	3927	4051	371	9,2	3484	4893	17

Laboratories' Z-scores: Analyte solution

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-orto PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
1	-0,23	-0,22	-0,31	-0,23		0,12	0,10
2	30	33	-0,77	0,0056	-0,30	0,38	0,84
3							
4							
5	0,079	0,095	-0,082	0,38	0,45	-0,056	-0,063
6	-0,13	-0,081	-0,56	-0,61		-0,058	-0,17
7							
8							
9							
10							
11							
12	0,32	0,27	0,77	0,030	0,13		
13	0,49	0,69	-1,4	-1,1			
14							
15							
16	-0,11	-0,11	-0,13	-0,12	0,61		
17							
18							
19	-0,22	-0,20	-0,36	0,35	0,25	-1,5	0,43
20							
21							
22							
23	-0,15	-0,20	0,28	-0,027	-0,0052	0,61	0,27
24							
25							
26	-0,040	-0,049	0,047	0,13	-0,15		
27							
28							
29	-0,26	-0,29	0,064	0,29	0,36		
30							
31							
32	0,14	0,082	0,72	0,13	-0,48		
33							
34	-0,12	-0,049	-0,77	0,22	-0,81		
35	-0,072	-0,075	-0,046	-0,13	-0,055		
36	-0,093	-0,10	0,016	0,077	0,19		-0,77
37							
38	-0,36	-0,37	-0,27	0,43	0,50		
39							
40	0,016	0,024	-0,054	0,049	0,14		0,014
41							
42	-0,11	-0,15	0,23	0,60	0,038		
43	0,15	0,16	0,036	0,031		0,27	0,15
44	-0,0037	0,030	-0,33	0,096	-0,51	-0,0044	-0,019
45	0,23	0,25	0,12	0,0089	-0,26		-0,26
46	0,056	0,063	-0,016	0,22	-0,073		
47	-0,33	0,15		-0,32			
48	-0,25	-0,27	-0,069	0,26	0,18		
49							
50	-0,020	-0,023	0,0074	0,058	0,038		
51							
52							
53	0,034	0,056	-0,17	-0,19	0,0041	0,15	-0,025
54	0,00078	-0,00049	0,013	0,0033	0,021		
55	-0,089	-0,076	-0,21	0,077			
56							
57							
58							
59							
60							
61							
62							
63							
64							
65	-0,25	-0,27	-0,061	1,9	-0,081		
66							
67							
68	0,14	0,11	0,49	0,30	-0,0035	-0,058	0,15
69							
70	0,055	0,038	0,22	0,041	-4,9		

Laboratories' Z-scores: Analyte solution (continued)

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-orto PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
71	-0,81	-0,36					
72	-0,024	-0,028	0,0093	0,030	-0,32		
73							
74	0,054	0,061	-0,011	0,20	-0,11		
75							
76							
77							
78							
79	-0,072	-0,075	-0,046	-0,13	-0,055		
80							
81	-0,0011	0,0073	-0,080	-0,052			
82							
83							
84							
85							
86							
87	-0,12	-0,14	0,12	-0,13	-0,057		
88	-0,26	-0,25	-0,30	0,058	-0,17		
89	-0,088	-0,11	0,087	-0,035	-0,39	-0,59	-0,75
90	0,36	0,39	0,11	-0,19	-0,0052	-0,25	-0,32
91							
92							
93	0,13	0,14	0,065	-0,55	-0,80		
94							
95							
96							
97	0,17	0,18	0,084	0,044	0,32	0,13	0,21
98	-0,12	-0,090	-0,39	-0,12	-0,037		-0,12
99							
100	-0,068	-0,030	-0,43	-0,36	0,094		
101							
102							
103	-0,023	-0,017	-0,084	-0,0042	0,082		
104							
105							
106							
107							
108							
109	0,15	0,15	0,062	0,32	0,34		0,35
110	-0,25	-0,27	-0,0013	0,095	0,059	0,057	-0,030
111							
112							
113							
114							
115							
116							
117							
118							
119	-0,41	-0,41	-0,42	-0,18	-0,89	-0,46	-0,68
120							

Laboratories' Z-scores: Sheep meat-2021, fresh weight

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-orto PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
1							
2	166	136	211	1,7	0,97	11	26
3							
4							
5	-0,83	-1,0	-0,71	0,33	1,8		
6							
7							
8							
9							
10							
11							
12	3,2	5,0	1,2	0,16	0,34		
13							
14							
15	13	27	-1,6	-1,8			
16							
17							
18							
19							
20							
21							
22							
23	1,4	3,2	-0,78	3,0	2,9	-0,28	6,0
24							
25							
26							
27							
28							
29	3,7	3,3	4,4	-1,7	-2,3		
30							
31							
32	100	190	1,8	-0,12	0,26		
33	122	113	140	3,1	2,6		
34	-0,55	-0,23	-0,97	0,42	-0,21		
35	0,59	1,2	-0,071	0,044	0,11		
36	0,44	-0,13	1,1	0,47	0,58		17
37							
38	0,64	1,9	-0,84	0,64	-0,22		
39							
40	-1,2	-1,7	-0,54	-0,19	-0,36		-0,31
41							
42	1,8	3,6	-0,26	1,0	0,86		
43	113	216	0,017	-0,35		0,41	-1,5
44							
45							
46	2,0	2,7	1,1	0,84	0,68		
47							
48	-0,000038	0,48	-0,65	1,4	0,57		
49							
50	6,7	9,9	3,3	2,7	8,1		
51							
52							
53	-0,90	-1,3	-0,45	0,057	0,25	17	2,2
54	0,68	2,1	-0,82	-1,7	-1,1		
55	1,4	-1,1	4,4	0,099	0,14	-3,3	1,1
56							
57	17	29	2,3	4,9	1,9		
58	3,5	7,2	-0,54	-0,59	-0,022		
59						-0,097	
60							
61							
62							
63							
64							
65	231	218	260	4,0	-0,73		
66							
67							
68	0,42	1,1	-0,39	-0,13	-0,016		-1,3
69							
70	62	60	67	11	119		

Laboratories' Z-scores: Sheep meat-2021, fresh weight (continued)

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-orto PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
71	231	218	260	4,0			
72							
73							
74	1,8	2,7	0,87	0,88	0,64		
75							
76							
77							
78							
79	1,0	2,0	-0,071	0,044	0,11		
80							
81	4,4	7,8	0,66	0,038			
82							
83							
84							
85							
86							
87	-0,44	-2,1	1,5	-0,13	0,041		
88	-0,26	-0,26	-0,28	-0,12	-1,5		
89	-0,72	-3,0	1,9	-0,83	-0,66	12	-0,78
90	-0,69	-1,5	0,25	-0,038	0,39	-0,52	1,1
91							
92							
93	1,0	1,8	0,078	0,045	-1,1		
94							
95	7,4	2,2	14	1,8			
96							
97							
98	4,1	3,9	4,5	-0,20	-1,8		-1,4
99							
100	0,039	0,27	-0,21	-0,31	0,0015		
101							
102							
103	0,13	-1,3	1,8	0,40	1,0		
104							
105							
106							
107							
108							
109	1,2	2,9	-0,64	-0,62	0,53		8,2
110	-0,79	-1,7	-0,080	4,6	4,1	11	4,1
111							
112							
113	37	70	-1,4	17	7,4		
114							
115							
116	0,41	1,4	-0,69	-1,2	-1,1		
117							
118							
119							
120							

Laboratories' Z-scores: Sheep meat-2021, lipid weight

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-orto PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
1							
2	173	142	220	2,0	1,2	12	28
3							
4							
5	-0,034	-0,23	0,12	1,3	3,1		
6							
7							
8							
9							
10							
11							
12	2,3	4,0	0,56	-0,37	-0,21		
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23	1,2	2,9	-0,90	2,8	1,9	-0,42	5,7
24							
25							
26							
27							
28							
29	13	12	15	1,8	0,70		
30							
31							
32	106	201	2,1	0,15	0,56		
33	113	105	130	2,5	2,1		
34	-2,2	-2,0	-2,4	-1,5	-1,9		
35	-0,072	0,45	-0,65	-0,55	-0,49		
36	0,23	-0,32	0,87	0,25	0,36		16
37							
38	-3,5	-3,1	-3,9	-3,5	-3,7		
39							
40	-1,6	-2,1	-1,1	-0,76	-0,91		-0,87
41							
42	1,8	3,6	-0,26	1,0	0,86		
43	29	58	-3,6	-3,7		-3,5	-4,0
44							
45							
46	2,5	3,3	1,6	1,3	1,1		
47							
48	0,20	0,70	-0,48	1,7	0,80		
49							
50	5,3	8,1	2,3	1,8	6,6		
51							
52							
53	-0,49	-0,97	0,015	0,57	0,78	19	2,9
54	-0,16	1,0	-1,4	-2,2	-1,7		
55	0,68	-1,6	3,4	-0,47	-0,43	-3,5	0,44
56							
57	14	26	1,5	3,8	1,1		
58	3,9	7,7	-0,36	-0,41	0,18		
59						-0,041	
60							
61							
62							
63							
64							
65	228	215	257	3,9	-0,77		
66							
67							
68	0,60	1,3	-0,24	0,037	0,15		-1,2
69							
70	49	47	53	8,0	95		

Laboratories' Z-scores: Sheep meat-2021, lipid weight (continued)

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-orto PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
71	228	215	257	3,9			
72							
73							
74	2,4	3,3	1,3	1,4	1,1		
75							
76							
77							
78							
79	0,21	1,1	-0,72	-0,62	-0,56		
80							
81	1045	1427	627	557			
82							
83							
84							
85							
86							
87	-1,5	-2,7	0,045	-1,2	-1,1		
88	-0,096	-0,092	-0,11	0,054	-1,4		
89	-0,37	-2,8	2,5	-0,49	-0,31	13	-0,45
90	-0,85	-1,7	0,054	-0,23	0,19	-0,69	0,84
91							
92							
93	3,9	5,1	2,5	2,5	0,83		
94							
95	7,6	2,2	14	1,8			
96							
97							
98	-0,71	-0,78	-0,50	-2,7	-3,5		-3,3
99							
100	-0,21	0,011	-0,45	-0,55	-0,25		
101							
102							
103	0,70	-0,92	2,6	1,0	1,7		
104							
105							
106							
107							
108							
109	0,78	2,4	-0,95	-0,93	0,14		7,3
110	-0,59	-1,5	0,15	5,1	4,5	12	4,5
111							
112							
113	102	189	4,4	51	27		
114							
115							
116	2,1	3,5	0,69	-0,0068	0,096		
117							
118							
119							
120							

Laboratories' Z-scores: Herring-2021, fresh weight

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-orto PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
1							
2	9,9	3,6	18	0,62	1,3	0,82	0,96
3							
4							
5	-0,41	-0,076	-0,84	-0,063	0,15		0,31
6	-0,027	0,39	-0,51	-0,34		1,1	0,43
7							
8							
9							
10							
11							
12	0,59	0,47	0,78	0,095	0,017		
13	-0,78	-1,1	-0,46	-0,086			
14							
15	0,36	1,5	-0,97	0,24			
16	0,0046	-0,017	0,014	0,21	0,65		
17							
18							
19							
20							
21							
22							
23	-0,13	-0,12	-0,16	0,017	0,34	0,61	0,57
24							
25							
26	-0,0015	0,21	-0,26	-0,029	0,024		
27							
28							
29	0,90	0,58	1,3	0,48	0,75		
30							
31							
32	0,42	1,5	-0,86	-0,45	-0,44		
33	0,78	1,7	-0,23	0,11	0,62		
34	0,20	1,4	-1,2	0,44	-0,30		
35	0,13	0,20	0,070	-0,0097	-0,12		
36	0,15	-0,19	0,60	-0,28	-0,27		-0,29
37							
38	-0,35	-0,69	0,010	0,26	0,090		
39							
40	0,37	0,21	0,59	0,11	-0,11		-0,22
41							
42	0,38	0,50	0,20	0,67	1,1		
43	5,0	9,8	-0,31	-0,29		-0,20	-0,033
44	-0,069	-0,072	-0,075	0,059	-0,19	0,75	0,19
45	0,47	0,48	0,48	0,42	1,1		1,8
46	0,53	0,72	0,32	0,073	-0,21		
47	-0,0053	0,51	-0,72	1,1	0,71		
48	-0,41	-0,72	-0,092	0,34	0,013		
49							
50	-0,075	-0,73	0,72	-0,17	0,44		
51							
52							
53	0,33	0,10	0,60	0,19	0,014	0,58	-0,60
54	-0,11	-0,19	0,029	-0,77	-0,55		
55	0,96	0,29	1,8	0,21	0,19	-0,096	0,21
56							
57	-0,97	-0,64	-1,3	-1,3	-2,2		
58	-0,095	-0,20	0,021	0,091	0,29		
59	0,036	-0,27	0,38	0,41	-0,30		
60							
61							
62							
63							
64	-0,059	-0,24	0,13	0,24			
65	4,0	7,0	0,75	-0,25	-0,54		
66							
67							
68	0,81	0,72	0,93	0,66	0,11		0,74
69							
70	-0,24	0,11	-0,62	-0,64	0,50		

Laboratories' Z-scores: Herring-2021, fresh weight (continued)

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-orto PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
71	4,0	7,0	0,75	-0,25			
72	0,90	1,5	0,18	1,1	0,61		
73							
74	0,61	0,91	0,28	0,051	-0,22		
75							
76							
77							
78							
79	0,43	0,75	0,070	-0,0097	-0,12		
80							
81	-0,013	0,20	-0,28	0,093			
82							
83							
84							
85							
86							
87							
88	-0,050	-0,17	0,069	0,20	-1,1		
89	-0,20	-0,19	-0,19	-0,47	-0,69	-0,41	-0,66
90	-0,24	-0,071	-0,43	-0,44	0,0025	-0,24	-0,027
91							
92	-0,53	-1,0	0,063	-0,22	0,031	-0,19	0,074
93	0,20	0,52	-0,13	-0,65	-0,77		
94							
95	0,19	-0,15	0,64	-0,28			
96							
97	0,68	0,96	0,50	-1,3	-0,44	1,6	-1,1
98	0,56	0,10	1,2	-0,20	0,71		1,7
99							
100	0,048	0,14	-0,022	-0,50	0,019		
101							
102							
103	0,018	0,12	-0,10	-0,0013	0,31		
104							
105							
106							
107							
108							
109	-0,79	-0,75	-0,89	-0,19	1,5		0,39
110	-0,27	-0,30	-0,27	0,35	0,14	-0,019	-0,27
111							
112							
113	-0,076	0,41	-0,68	0,093	0,10		
114							
115							
116	-1,1	-0,87	-1,5	-1,2	-1,3		
117							
118							
119	15	-2,3	38	-0,22	-0,35	-0,94	-1,0
120	-0,16	0,0037	-0,34	-0,43	0,36		

Laboratories' Z-scores: Herring-2021, lipid weight

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-orto PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
1							
2	9,4	3,4	17	0,46	1,1	0,65	0,78
3							
4							
5	6,2	7,0	5,1	7,0	7,5		7,9
6	-0,46	-0,076	-0,90	-0,74		0,56	-0,039
7							
8							
9							
10							
11							
12	0,59	0,47	0,78	0,095	0,017		
13	-2,3	-2,5	-2,1	-1,9			
14							
15							
16	0,047	0,025	0,056	0,25	0,69		
17							
18							
19							
20							
21							
22							
23	-0,68	-0,67	-0,70	-0,54	-0,26	-0,018	-0,053
24							
25							
26	-2,9	-2,8	-3,0	-2,9	-2,9		
27							
28							
29	0,52	0,21	0,91	0,12	0,37		
30							
31							
32	0,56	1,7	-0,76	-0,33	-0,32		
33	0,47	1,3	-0,49	-0,17	0,32		
34	-1,5	-0,69	-2,5	-1,3	-1,8		
35	-0,048	0,013	-0,11	-0,19	-0,30		
36	0,19	-0,15	0,65	-0,24	-0,23		-0,25
37							
38	-3,9	-4,0	-3,8	-3,7	-3,8		
39							
40	-0,89	-1,0	-0,72	-1,1	-1,3		-1,3
41							
42	0,51	0,64	0,34	0,82	1,2		
43	-2,6	-1,4	-3,9	-3,9		-3,8	-3,8
44	-0,55	-0,56	-0,56	-0,44	-0,66	0,18	-0,32
45	1,5	1,5	1,5	1,4	2,2		3,1
46	0,87	1,1	0,65	0,39	0,091		
47	0,097	0,63	-0,63	1,2	0,83		
48	-0,58	-0,87	-0,27	0,14	-0,17		
49							
50	-0,53	-1,1	0,19	-0,61	-0,069		
51							
52							
53	0,95	0,71	1,3	0,81	0,61	1,2	-0,077
54	-0,60	-0,67	-0,47	-1,2	-0,99		
55	0,25	-0,34	1,0	-0,42	-0,43	-0,68	-0,41
56							
57	-1,1	-0,76	-1,4	-1,4	-2,3		
58	-0,60	-0,69	-0,49	-0,43	-0,25		
59	0,26	-0,063	0,61	0,65	-0,098		
60							
61							
62							
63							
64							
65	4,1	7,1	0,80	-0,21	-0,51		
66							
67							
68	0,23	0,15	0,34	0,11	-0,40		0,17
69							
70	-0,22	0,13	-0,61	-0,63	0,52		

Laboratories' Z-scores: Herring-2021, lipid weight (continued)

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-orto PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
71	4,1	7,2	0,86	-0,16			
72							
73							
74	0,96	1,3	0,68	0,43	0,079		
75							
76							
77							
78							
79	-0,17	0,18	-0,43	-0,51	-0,65		
80							
81	560	591	536	579			
82							
83							
84							
85							
86							
87							
88	-0,13	-0,19	0,040	0,17	-1,2		
89	0,19	0,26	0,26	-0,051	-0,33	-0,034	-0,31
90	-0,26	-0,042	-0,40	-0,41	-0,023	-0,26	-0,052
91							
92							
93	0,35	0,75	0,071	-0,47	-0,65		
94							
95	0,32	0,026	0,85	-0,11			
96							
97	1,9	2,3	1,7	-0,45	0,51	2,9	-0,28
98							
99							
100	-0,23	-0,090	-0,25	-0,71	-0,26		
101							
102							
103	0,26	0,42	0,19	0,29	0,56		
104							
105							
106							
107							
108							
109	-1,2	-1,2	-1,3	-0,66	0,77		-0,19
110	-0,093	-0,077	-0,047	0,61	0,33	0,16	-0,10
111							
112							
113	0,18	0,75	-0,40	0,41	0,37		
114							
115							
116	-0,35	0,034	-0,70	-0,36	-0,59		
117							
118							
119	60	3,7	134	10	9,8	7,9	7,7
120	-1,7	-1,5	-1,7	-1,8	-1,3		

Laboratories' Z-scores: Fish oil-2021, fresh weight

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-orto PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
1	-1,0	-1,0	-1,0	-0,70			-0,12
2	5,7	0,026	10	1,2	0,86	1,1	1,2
3							
4							
5	0,33	0,46	0,20	0,68	0,87		0,43
6	-0,34	-0,12	-0,49	-0,55		0,54	-0,12
7							
8							
9	0,44	0,51	0,37	0,50	1,2		
10							
11							
12	1,0	0,80	1,3	0,15	0,28		
13	-0,56	-0,17	-0,91	-0,12			
14							
15	5,5	13	-0,070	-0,71			
16							
17							
18							
19	0,12	0,28	0,018	-0,053	-0,019		0,29
20							
21							
22							
23							
24							
25							
26							
27							
28							
29	0,19	0,078	0,28	0,12	0,64		
30							
31							
32	-0,074	0,16	-0,23	-0,41	-0,59		
33	-0,47	-0,30	-0,64	-0,071	0,65		
34	-0,34	0,86	-1,3	0,096	-0,097		
35	0,45	0,92	0,12	0,13	0,46		
36							
37							
38	0,015	-0,74	0,56	0,36	0,17		
39							
40	-0,37	-0,35	-0,40	-0,12	-0,20		-0,50
41							
42	0,48	0,80	0,24	0,51	0,74		
43							
44							
45							
46	0,14	0,47	-0,077	-0,31	-0,60		
47							
48	-0,16	-0,39	-0,0036	0,14	-0,47		
49							
50	0,22	-0,29	0,59	0,43	0,64		
51							
52							
53	0,24	0,0035	0,42	0,15	-0,066	0,064	-0,10
54	-0,00053	-0,076	0,097	-0,46	0,093		
55	0,65	-0,20	1,3	0,23	0,22	0,020	0,10
56							
57	-0,089	-0,18	-0,016	-0,16	-0,24		
58	0,24	0,47	0,043	0,38	0,18		
59	-0,094	-0,69	0,32	0,38	-0,19		
60							
61							
62							
63							
64							
65							
66							
67							
68	-0,13	0,15	-0,34	-0,27	-0,41		-0,095
69							
70	-0,070	0,32	-0,34	-0,45	0,032		

Laboratories' Z-scores: Fish oil-2021, fresh weight (continued)

| LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-orto PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
71							
72	-0,12	-0,10	-0,19	0,47	0,043		
73							
74	0,23	0,43	0,11	-0,26	-0,54		
75							
76							
77							
78							
79	0,41	0,82	0,12	0,13	0,46		
80							
81	-0,15	0,15	-0,41	0,14			
82							
83							
84							
85							
86							
87							
88	-0,047	-0,34	0,14	0,40	0,34		
89	0,12	0,24	0,057	-0,17	-0,14		-0,19
90	378	916	-0,49	-0,61	-0,085	-0,048	-0,049
91							
92	-4,3	-4,5	-4,6	0,11	0,078	0,92	0,96
93	-0,21	0,21	-0,46	-1,0	-0,93		
94							
95	0,085	-0,16	0,26	0,24	-5,0		
96							
97	0,38	0,45	0,43	-0,84	-0,092	0,14	-0,25
98	0,36	-0,50	1,0	0,063	0,31		0,40
99							
100	0,11	0,38	-0,043	-0,46	0,071		
101							
102							
103	0,097	0,75	-0,39	-0,071	0,11		
104							
105							
106							
107							
108							
109	-0,42	-0,041	-0,73	-0,22	0,066		0,45
110	-0,35	-0,63	-0,16	-0,070	0,033	0,96	0,064
111							
112							
113	-0,17	-0,029	-0,29	-0,14	0,25		
114							
115							
116	-0,37	-0,64	-0,23	0,28	0,15		
117							
118							
119	6,5	-0,74	13	0,18	-0,45	-0,66	-0,61
120							

Laboratories' Z-scores: Fish oil-2021, lipid weight

| LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-orto PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
1	-1,0	-1,0	-1,0	-0,70			-0,12
2	5,8	0,067	11	1,2	0,91	1,1	1,2
3							
4							
5	0,33	0,46	0,20	0,68	0,87		0,43
6	-0,34	-0,12	-0,49	-0,55		0,54	-0,12
7							
8							
9	0,45	0,52	0,39	0,51	1,3		
10							
11							
12	1,0	0,80	1,3	0,15	0,28		
13	-0,56	-0,17	-0,91	-0,12			
14							
15							
16							
17							
18							
19	0,12	0,28	0,018	-0,053	-0,019		0,29
20							
21							
22							
23							
24							
25							
26							
27							
28							
29	0,41	0,29	0,50	0,33	0,88		
30							
31							
32	-0,064	0,17	-0,22	-0,40	-0,58		
33							
34	-0,34	0,86	-1,3	0,096	-0,097		
35	0,45	0,92	0,12	0,13	0,46		
36							
37							
38	0,015	-0,74	0,56	0,36	0,17		
39							
40	-0,37	-0,35	-0,40	-0,12	-0,20		-0,50
41							
42	0,52	0,84	0,28	0,55	0,78		
43							
44							
45							
46	0,14	0,47	-0,077	-0,31	-0,60		
47							
48	-0,16	-0,39	-0,0036	0,14	-0,47		
49							
50	0,22	-0,29	0,59	0,43	0,64		
51							
52							
53	0,24	0,0035	0,42	0,15	-0,066	0,064	-0,10
54	-0,00053	-0,076	0,097	-0,46	0,093		
55	0,65	-0,20	1,3	0,23	0,22	0,020	0,10
56							
57	0,10	0,013	0,18	0,035	-0,057		
58	0,24	0,47	0,043	0,38	0,18		
59	-0,094	-0,69	0,32	0,38	-0,19		
60							
61							
62							
63							
64							
65							
66							
67							
68	-0,13	0,15	-0,34	-0,27	-0,41		-0,095
69							
70	-0,062	0,33	-0,33	-0,44	0,040		

Laboratories' Z-scores: Fish oil-2021, lipid weight (continued)

| LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-orto PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
71							
72							
73							
74	0,23	0,43	0,11	-0,26	-0,54		
75							
76							
77							
78							
79	0,41	0,82	0,12	0,13	0,46		
80							
81	484	515	458	514			
82							
83							
84							
85							
86							
87							
88	-0,047	-0,34	0,14	0,40	0,34		
89	0,12	0,24	0,057	-0,17	-0,14		-0,19
90	378	916	-0,49	-0,61	-0,085	-0,048	-0,049
91							
92							
93	-0,21	0,21	-0,46	-1,0	-0,93		
94							
95	0,085	-0,16	0,26	0,24	-5,0		
96							
97	0,38	0,45	0,43	-0,84	-0,092	0,14	-0,25
98							
99							
100	0,13	0,40	-0,028	-0,45	0,087		
101							
102							
103	0,097	0,75	-0,39	-0,071	0,11		
104							
105							
106							
107							
108							
109	-0,42	-0,041	-0,73	-0,22	0,066		0,45
110	-0,33	-0,62	-0,14	-0,050	0,053	0,98	0,085
111							
112							
113	-0,17	-0,024	-0,28	-0,14	0,26		
114							
115							
116	-0,33	-0,60	-0,19	0,32	0,19		
117							
118							
119	6,5	-0,74	13	0,18	-0,45	-0,66	-0,61
120							

Z-score analyte solution; total TEQ
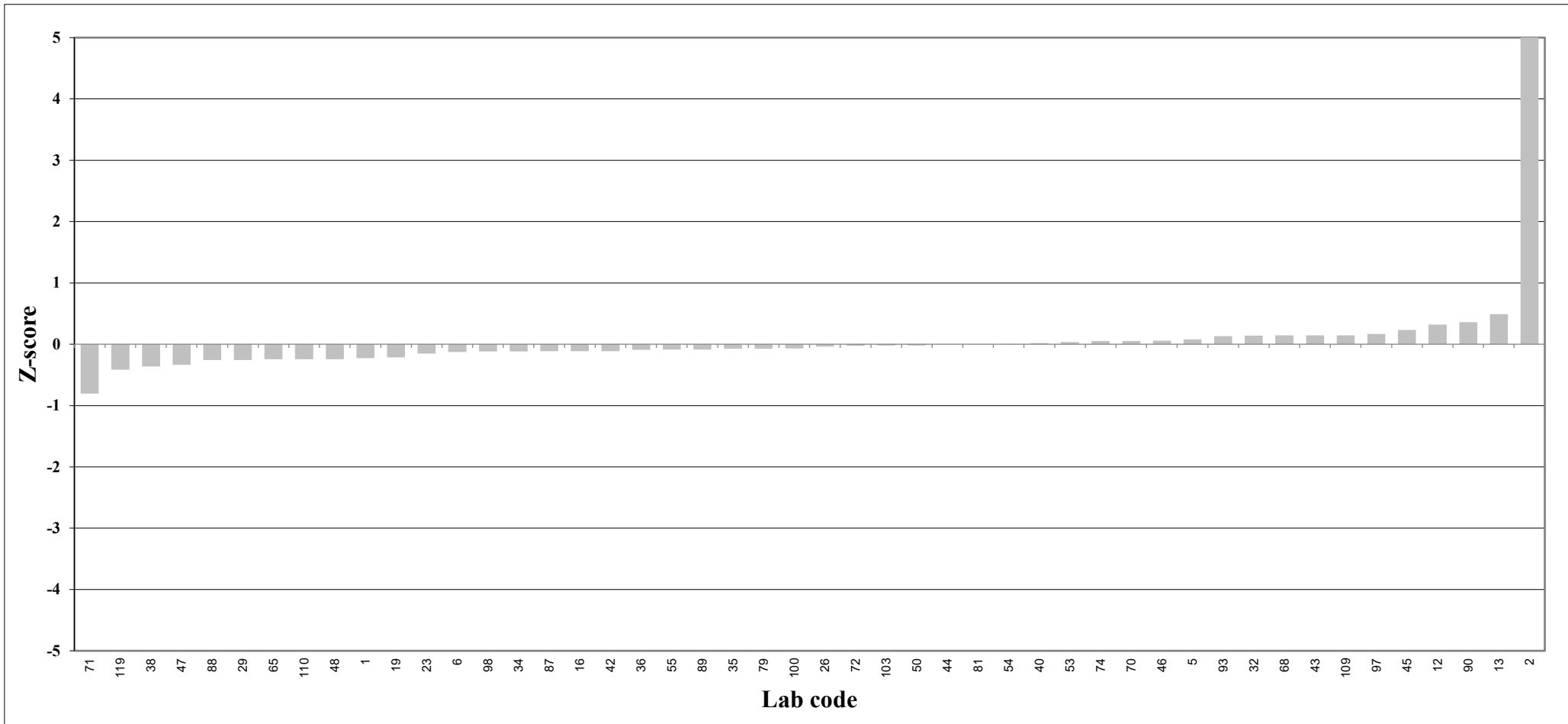
Z-score analyte solution; PCDD/PCDF TEQ
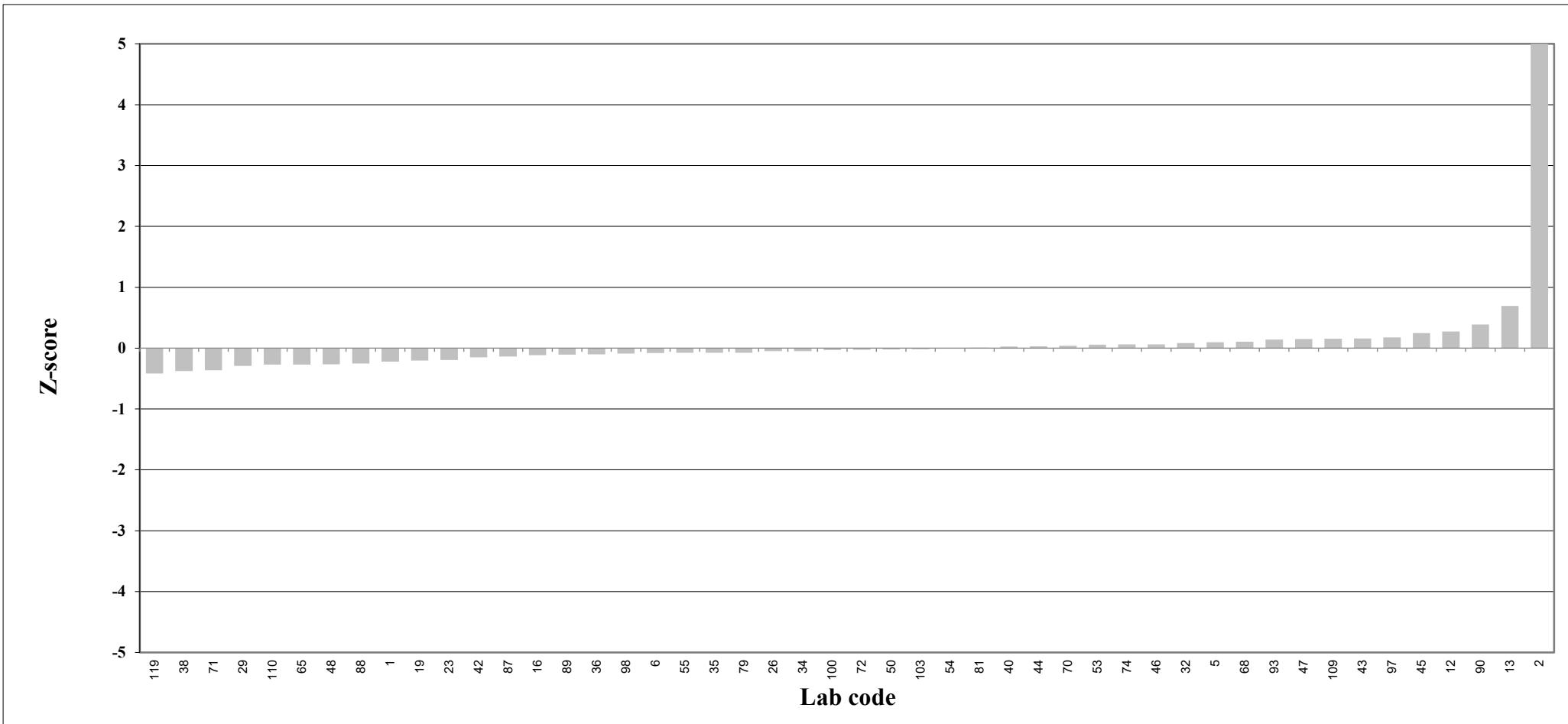
Z-score analyte solution; non-ortho PCB TEQ
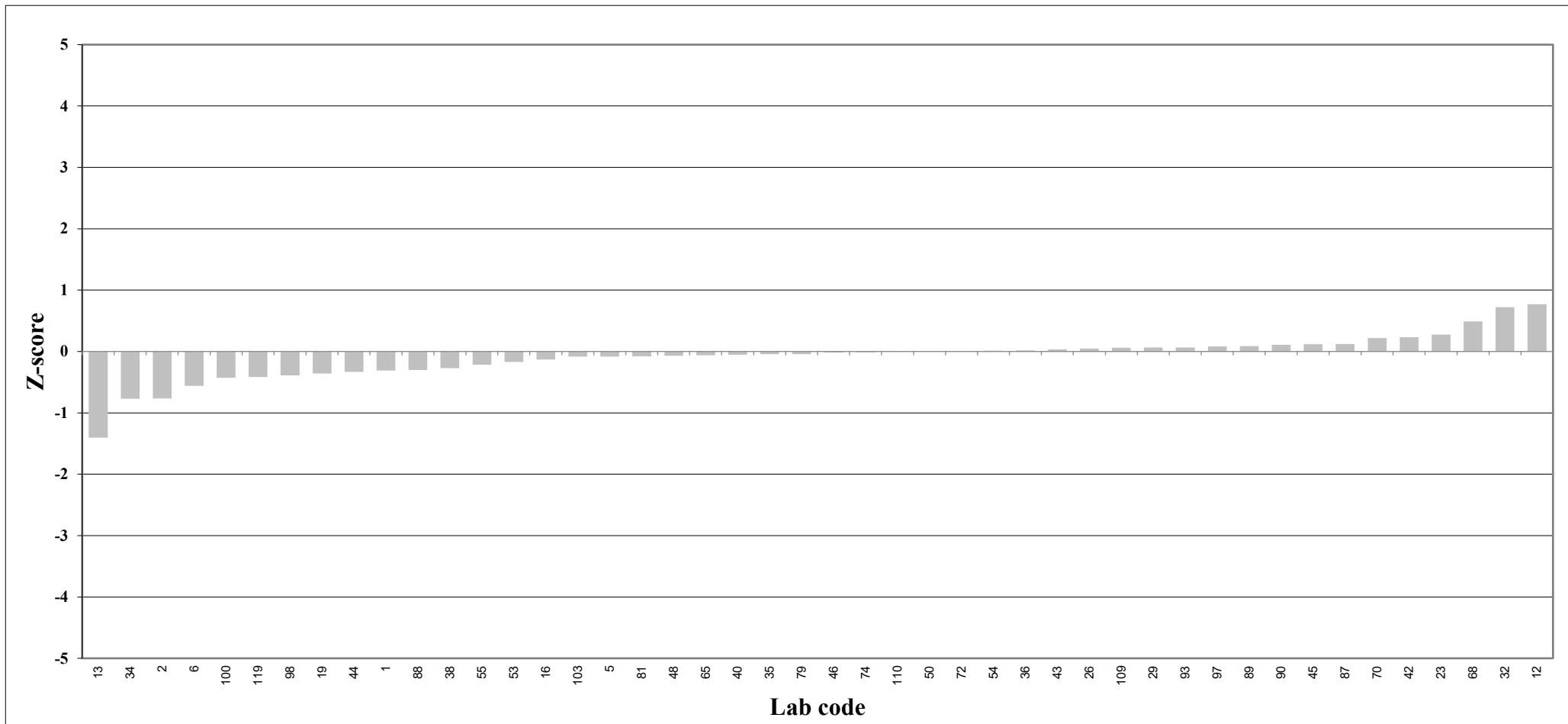
Z-score analyte solution; mono-ortho PCB TEQ
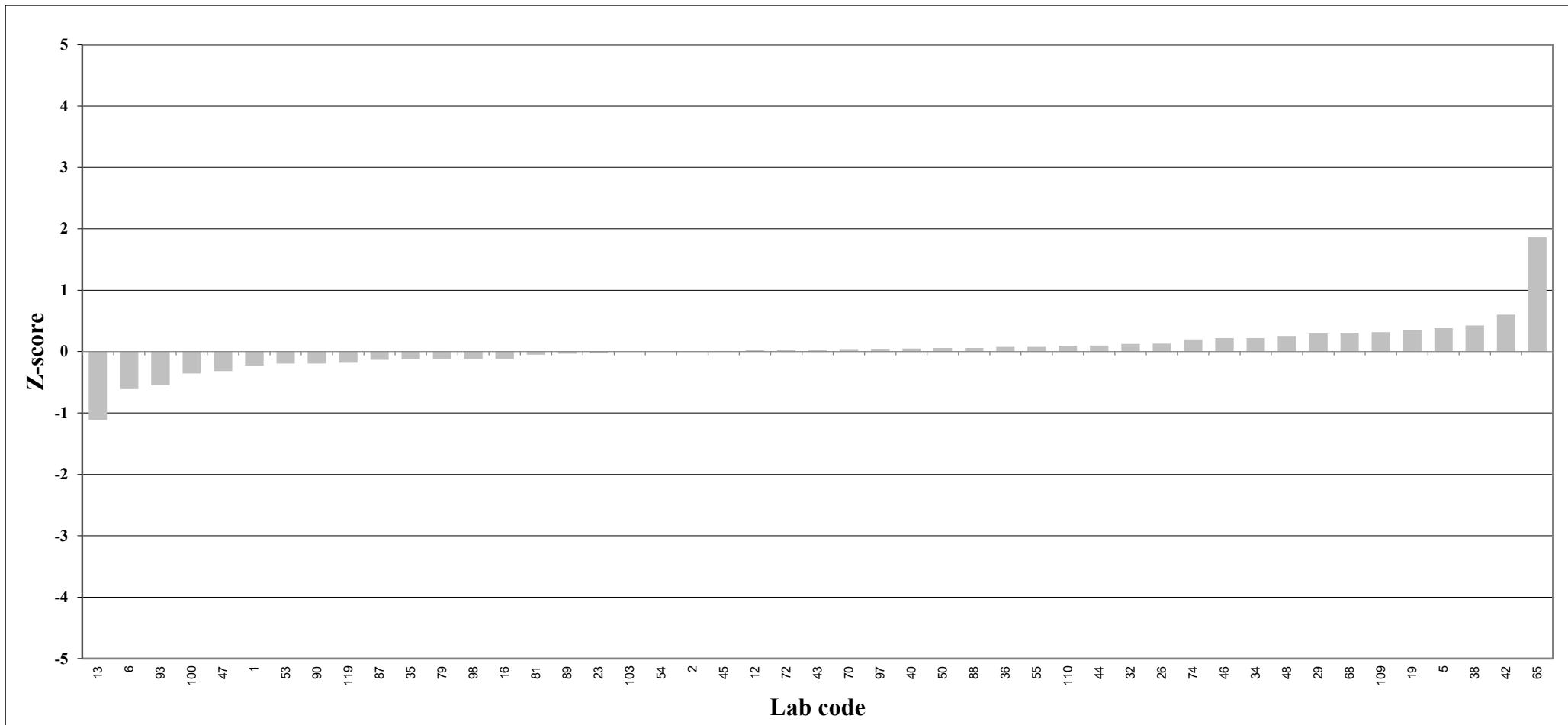
Z-score analyte solution; sum indicator PCB
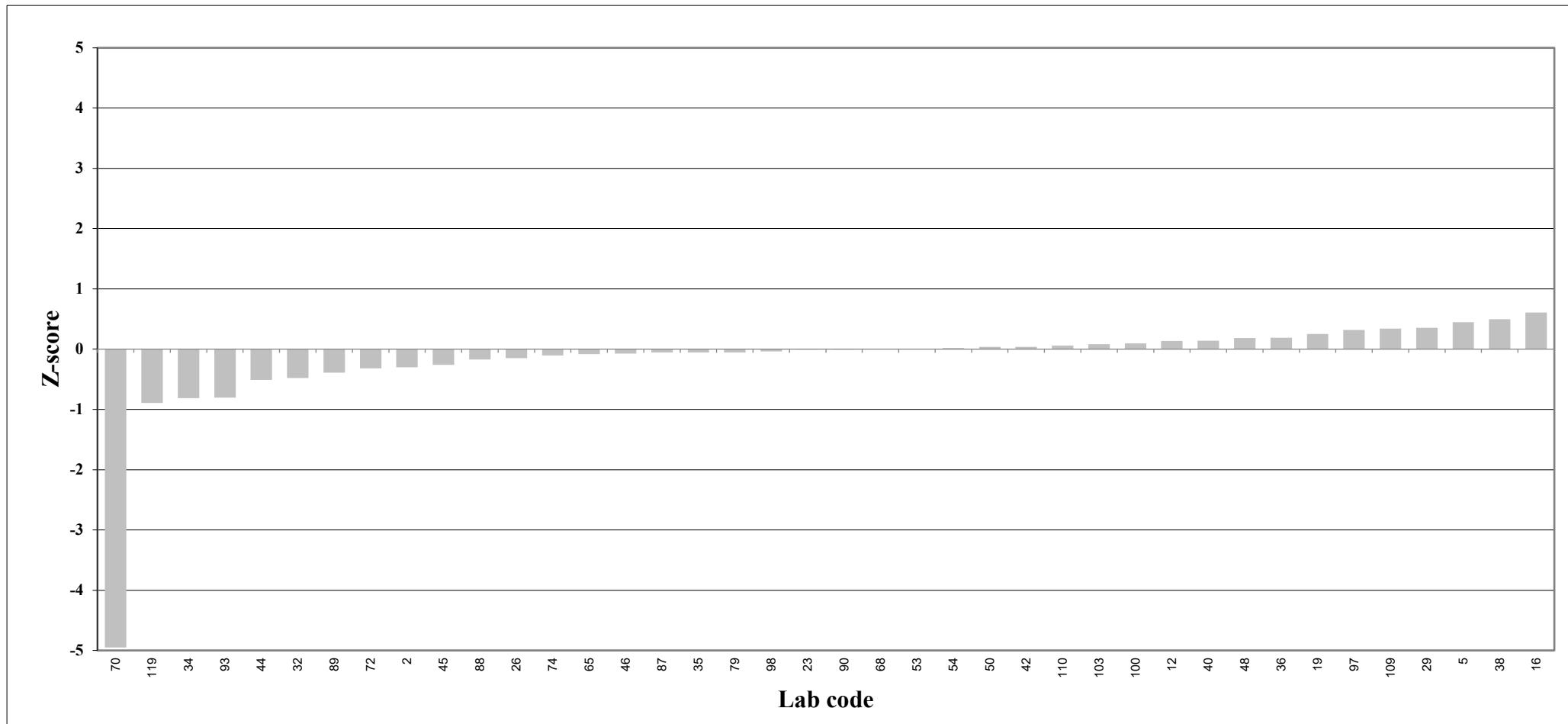
Z-score analyte solution; sum PBDE without PBDE-209
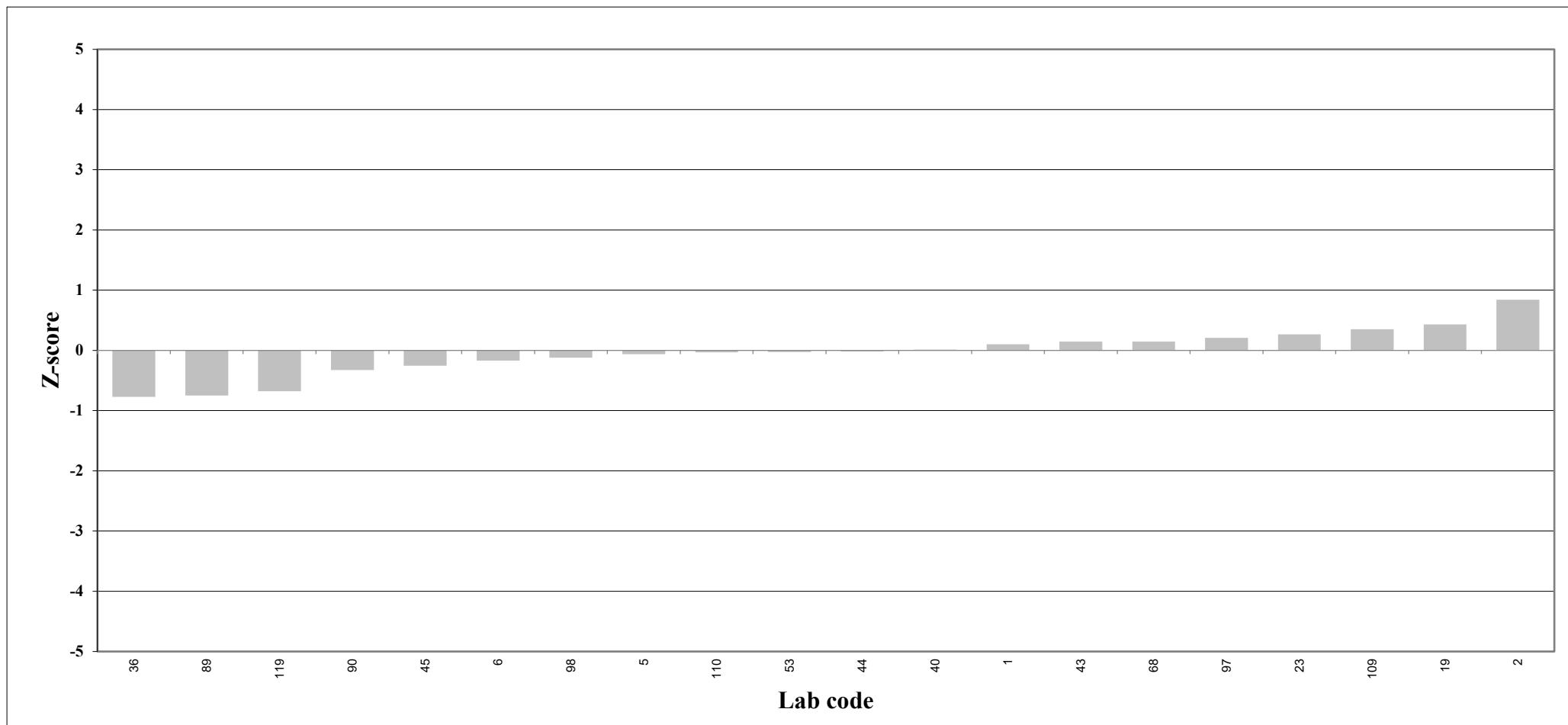
Z-score Sheep meat, fresh weight; total TEQ
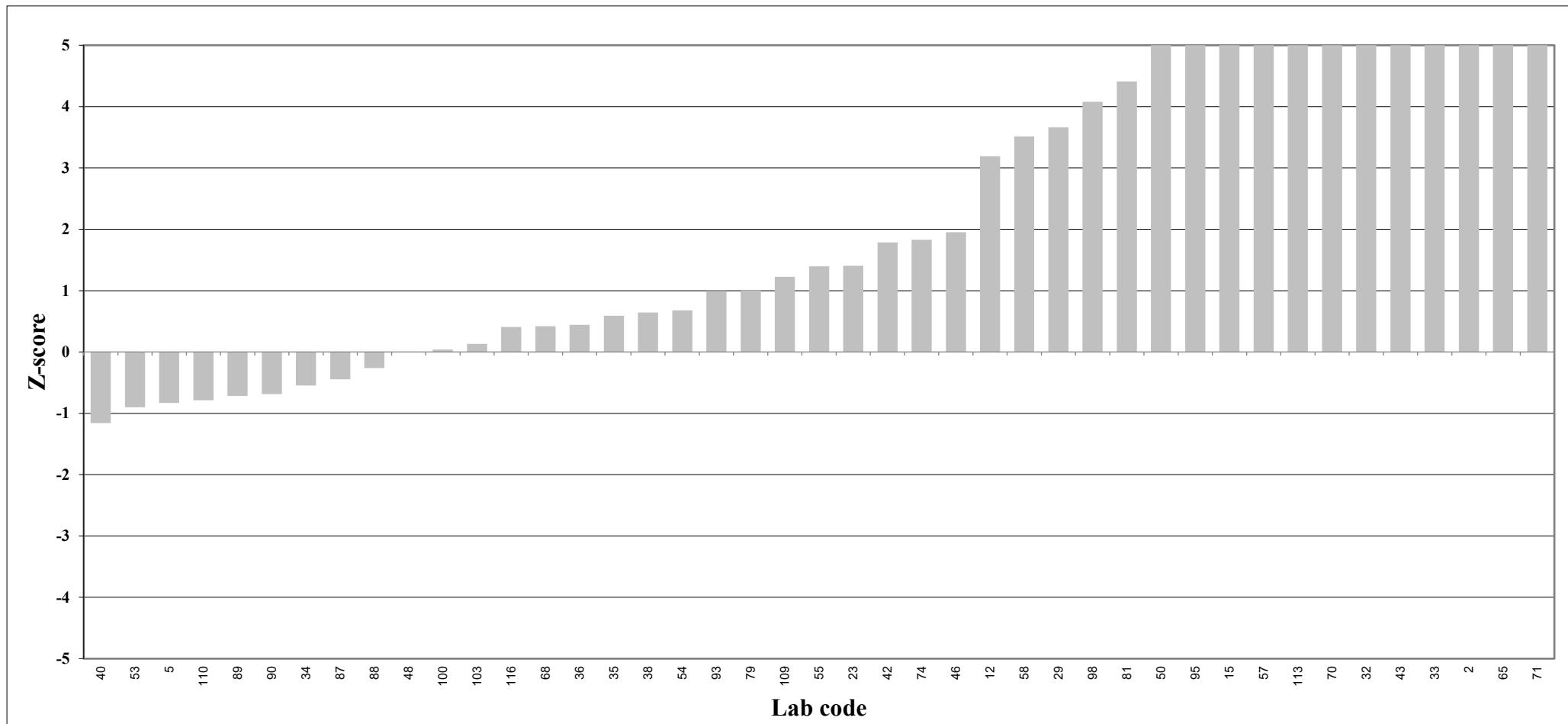
Z-score Sheep meat, fresh weight; PCDD/PCDF TEQ
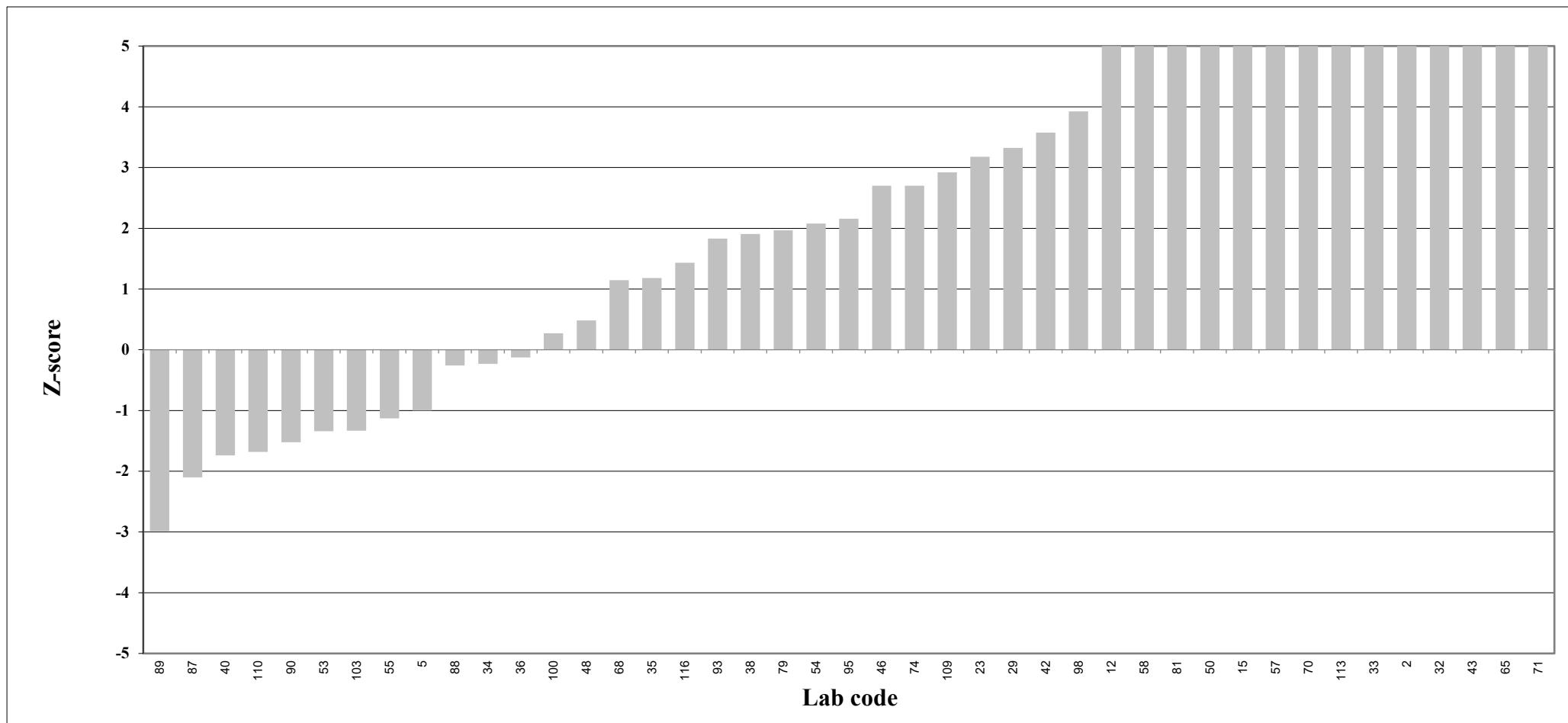
Z-score Sheep meat, fresh weight; non-ortho PCB TEQ
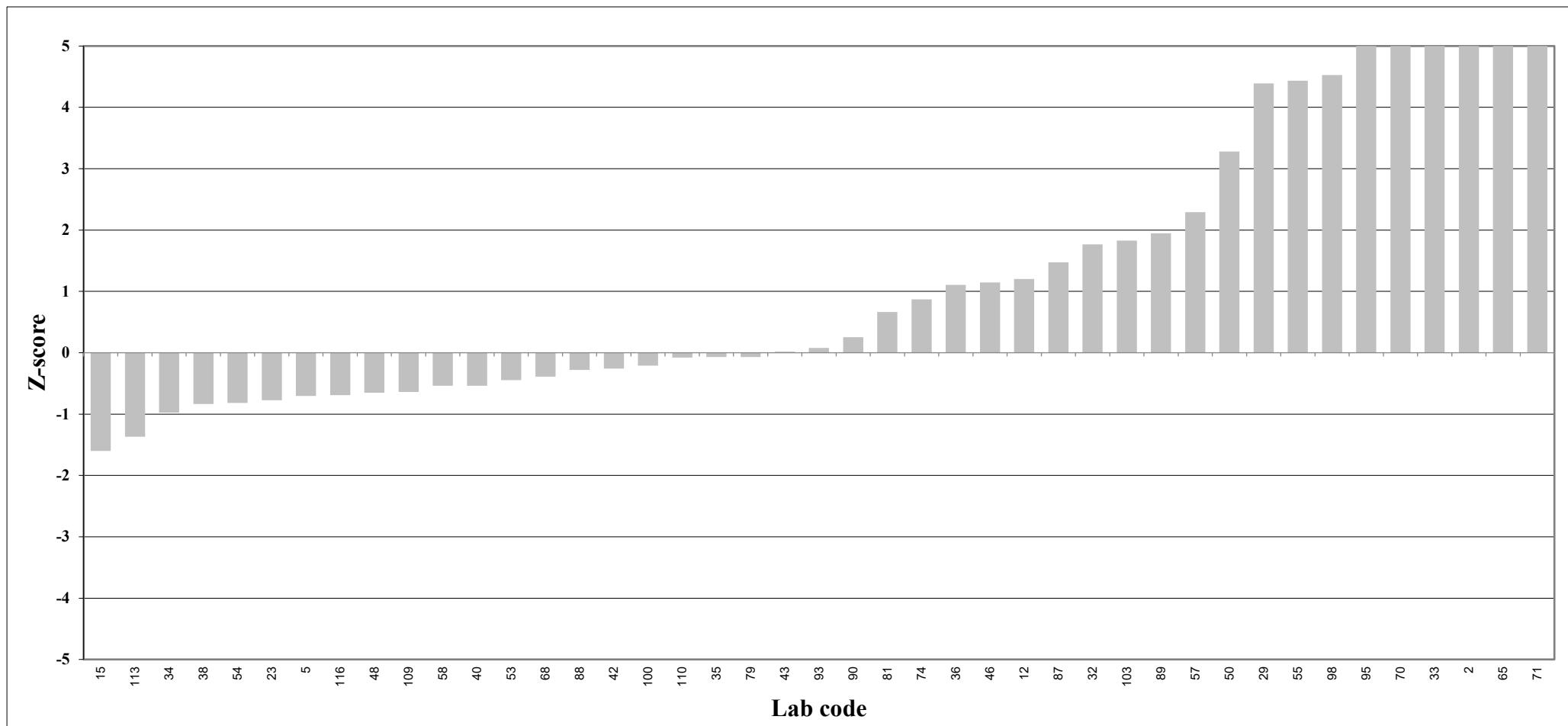
Z-score Sheep meat, fresh weight; mono-ortho PCB TEQ
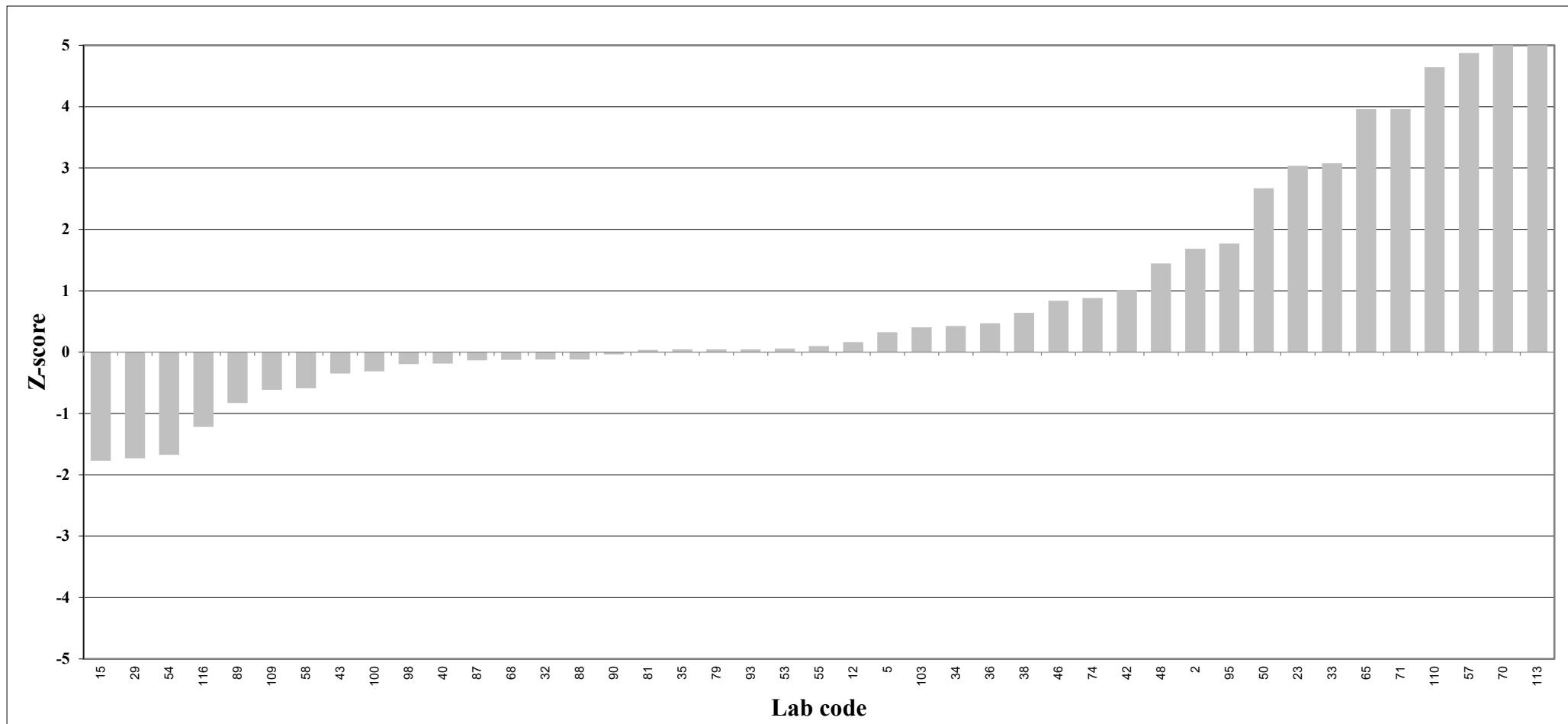
Z-score Sheep meat, fresh weight; sum indicator PCB

Z-score Sheep meat, fresh weight; sum PBDE without PBDE-209

Z-score Sheep meat, lipid weight; total TEQ

Z-score (y-axis)

Lab code (x-axis): 38, 34, 40, 87, 90, 98, 110, 53, 89, 100, 54, 88, 35, 5, 48, 79, 36, 68, 55, 103, 109, 23, 42, 116, 12, 74, 46, 58, 93, 50, 95, 29, 57, 43, 70, 113, 32, 33, 2, 65, 71, 81
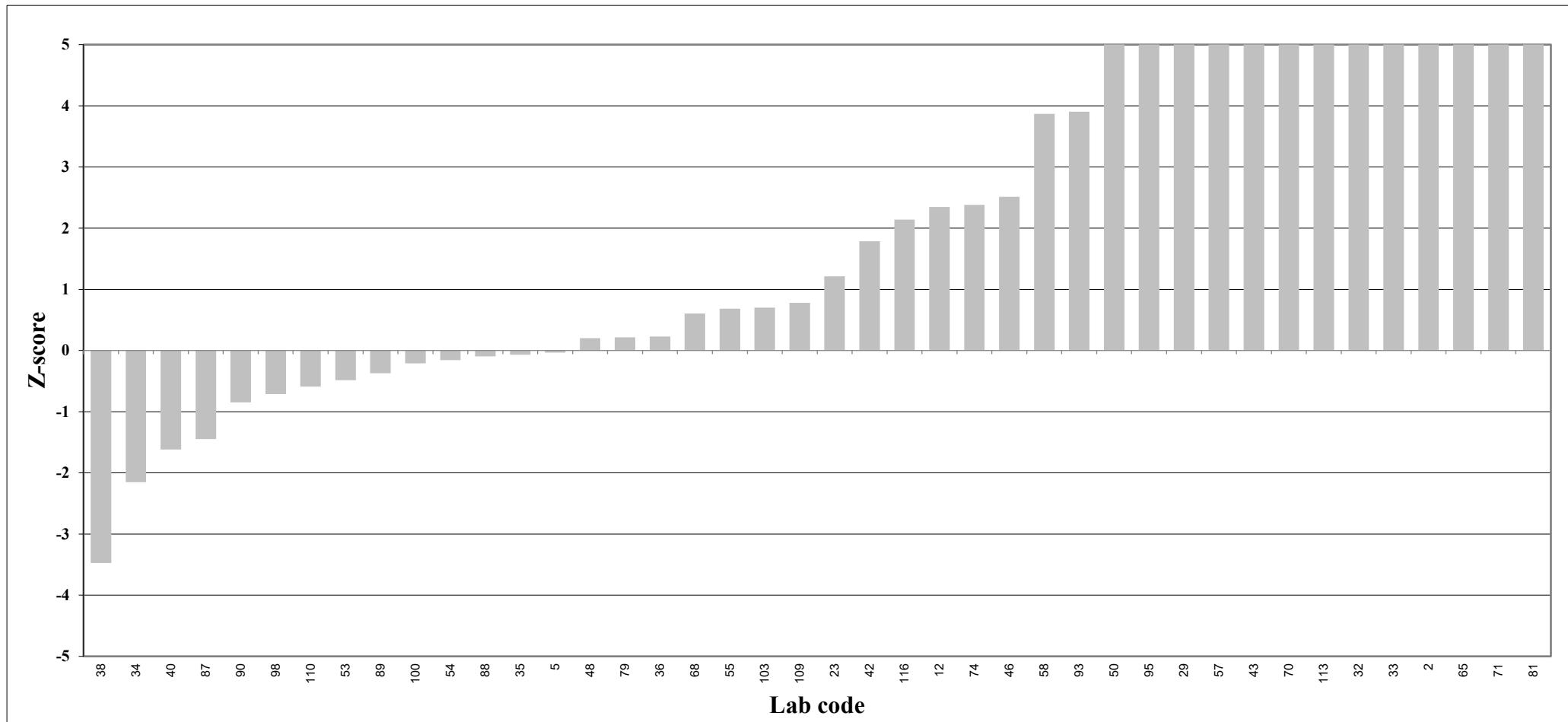
Z-score Sheep meat, lipid weight; PCDD/PCDF TEQ

Z-score Sheep meat, lipid weight; non-ortho PCB TEQ
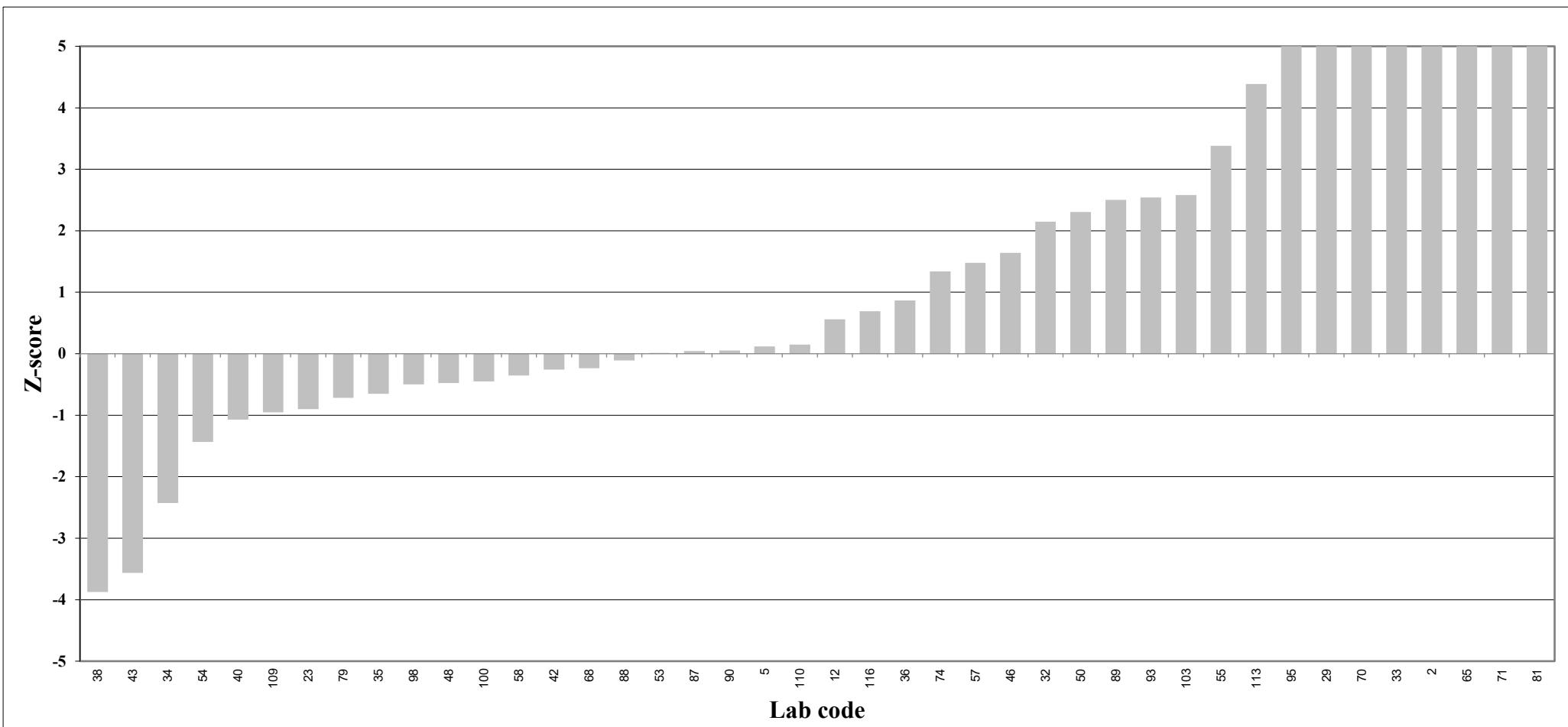
Z-score Sheep meat, lipid weight; mono-ortho PCB TEQ
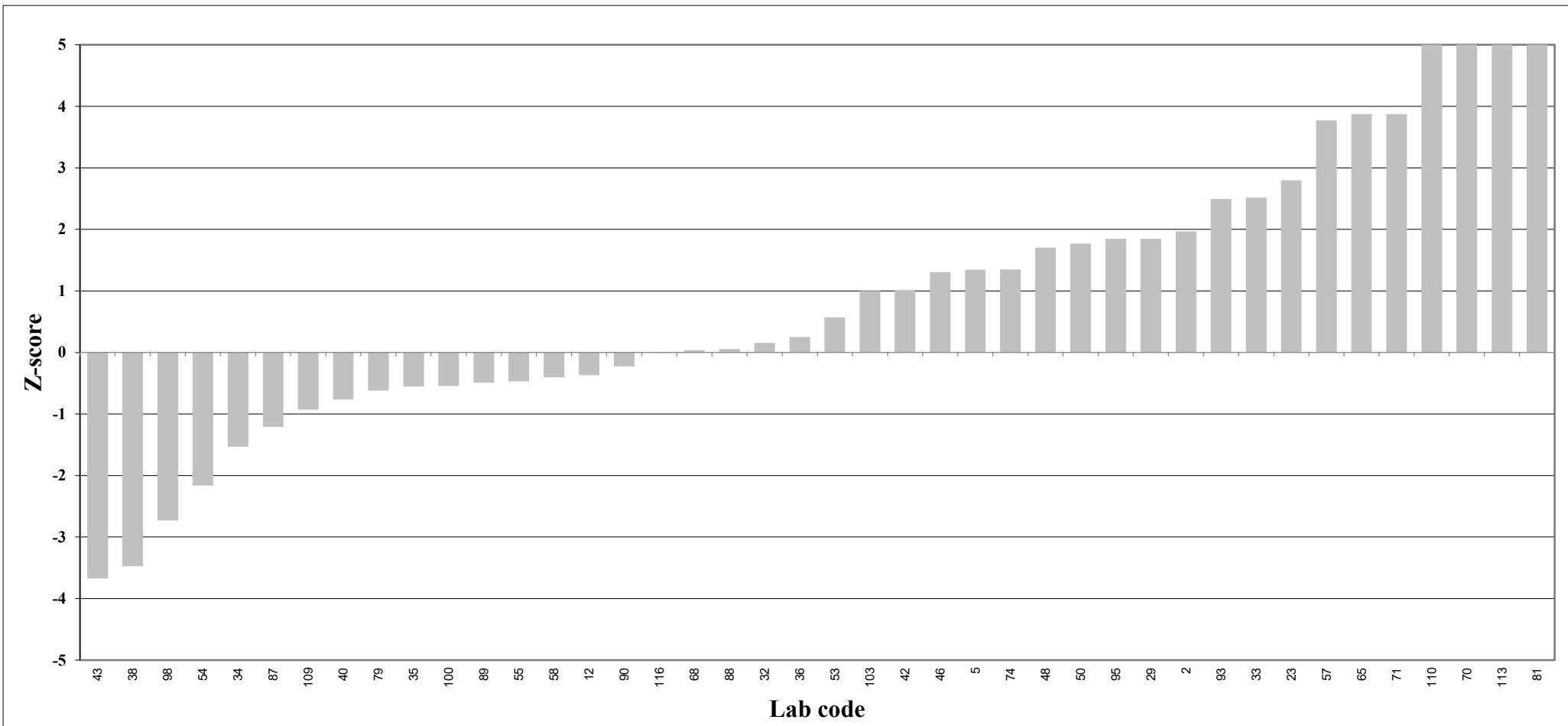
Z-score Sheep meat, lipid weight; sum indicator PCB
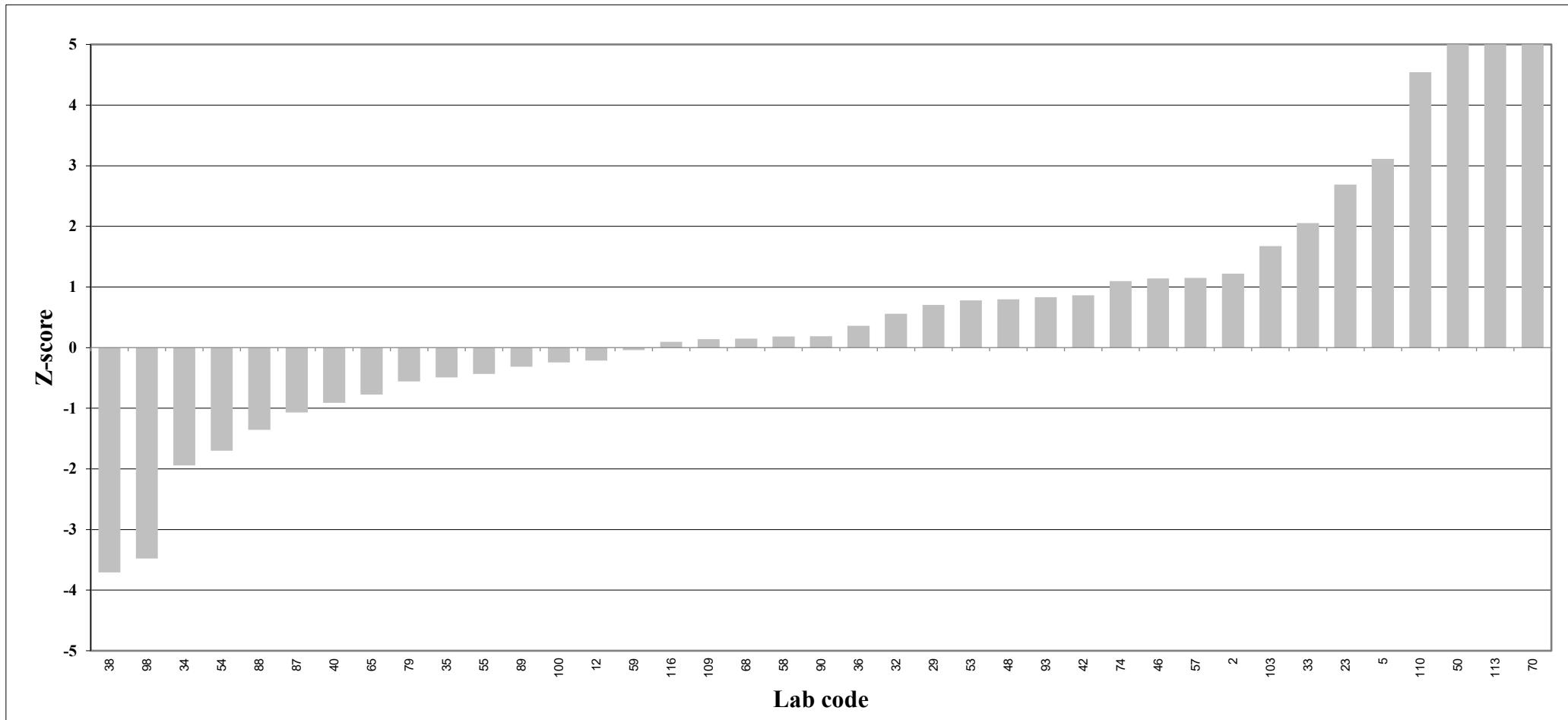
Z-score Sheep meat, lipid weight; sum PBDE without PBDE-209
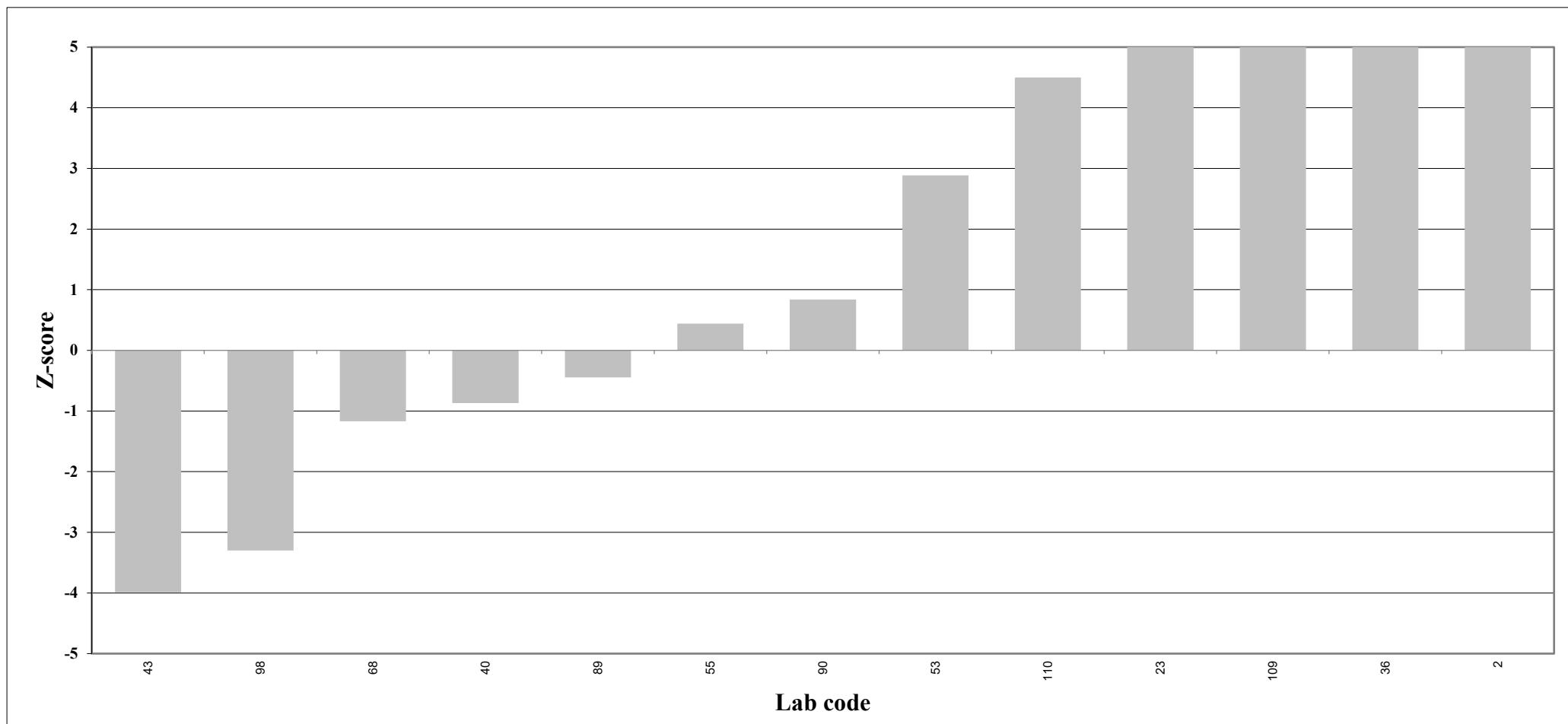
Z-score Herring, fresh weight; total TEQ
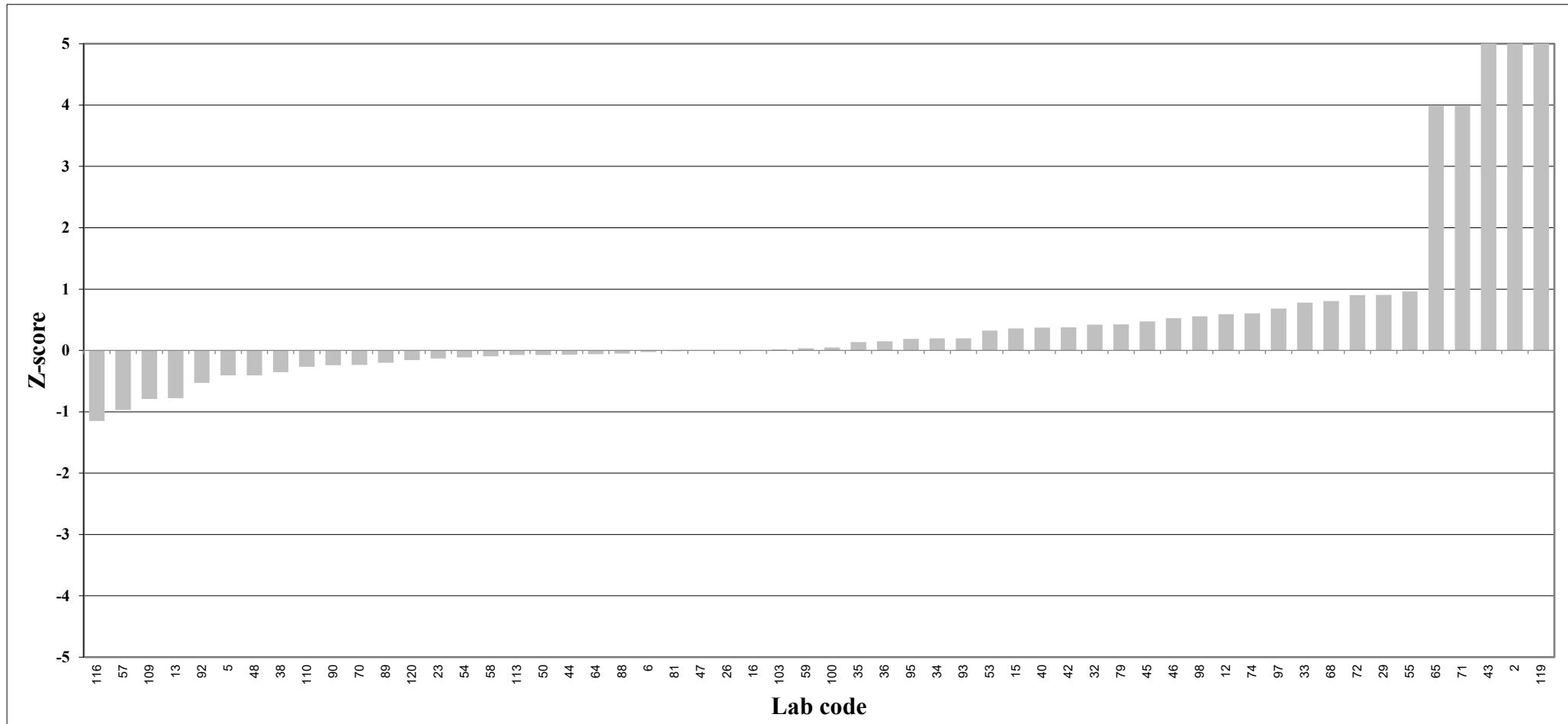
Z-score Herring, fresh weight; PCDD/PCDF TEQ
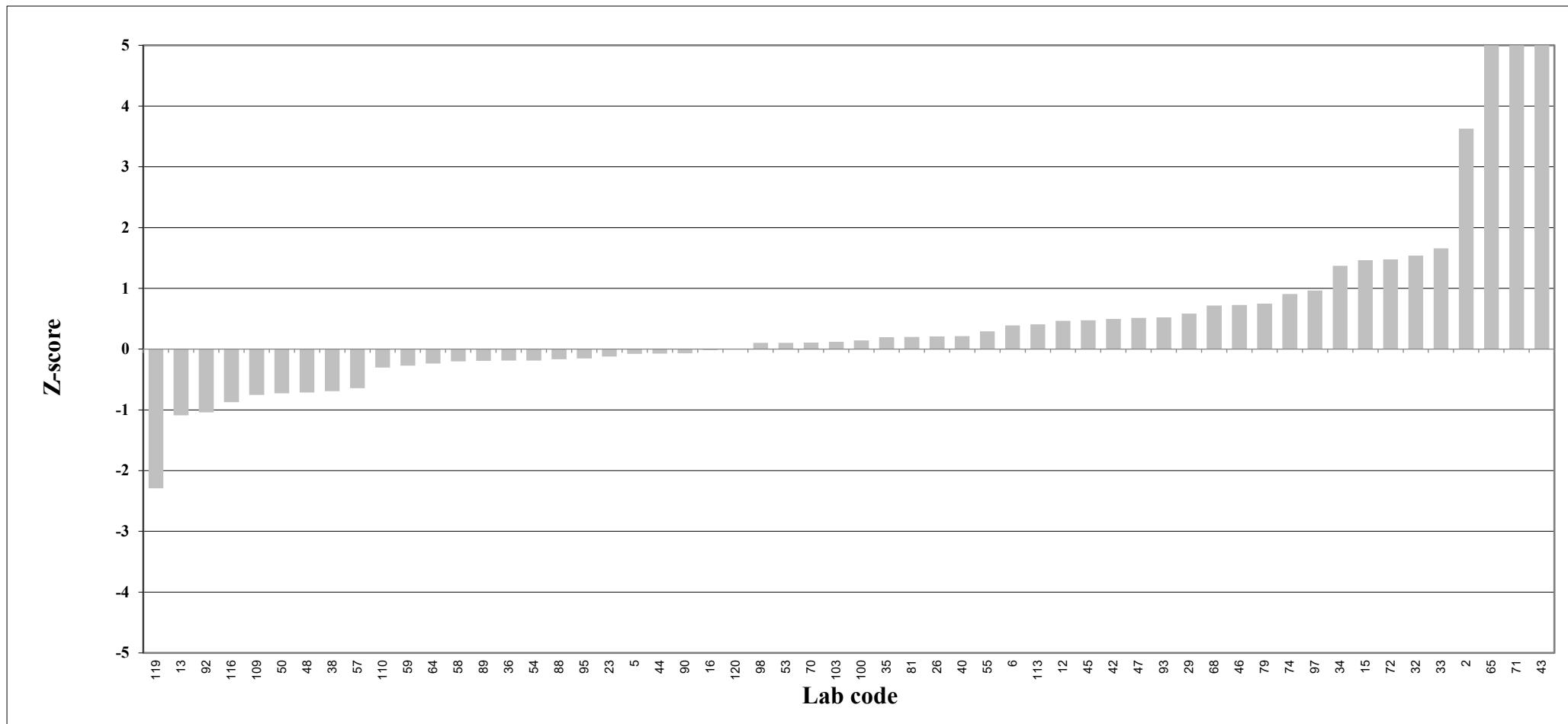
Z-score Herring, fresh weight; non-ortho PCB TEQ
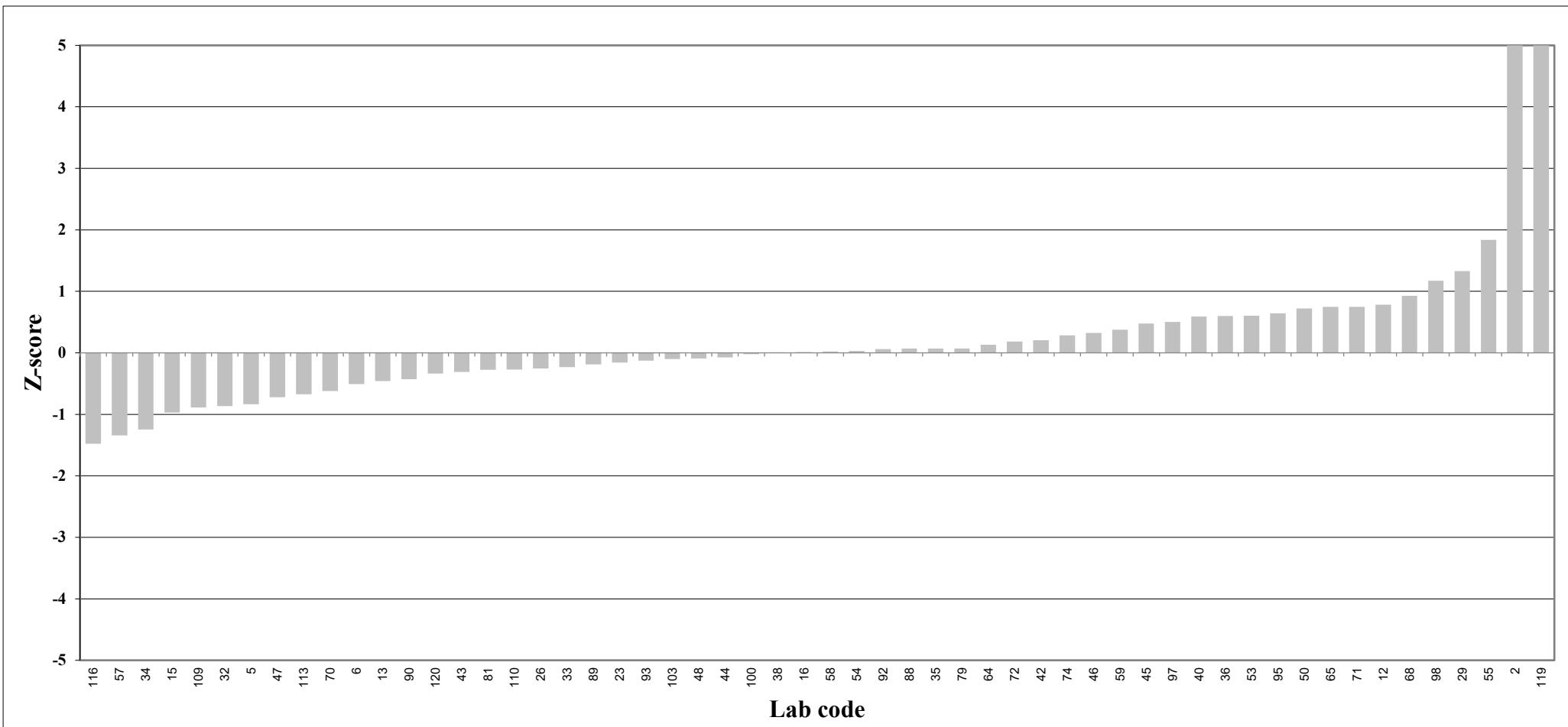
Z-score Herring, fresh weight; mono-ortho PCB TEQ

Z-score Herring, fresh weight; sum indicator PCB

Y-axis: **Z-score**

X-axis: **Lab code**

Lab codes (left to right): 57, 116, 88, 93, 89, 54, 65, 32, 97, 119, 59, 34, 36, 74, 46, 44, 35, 79, 40, 90, 48, 53, 12, 100, 26, 92, 38, 113, 68, 110, 5, 55, 58, 103, 23, 120, 50, 70, 72, 33, 16, 47, 98, 29, 42, 45, 2, 109
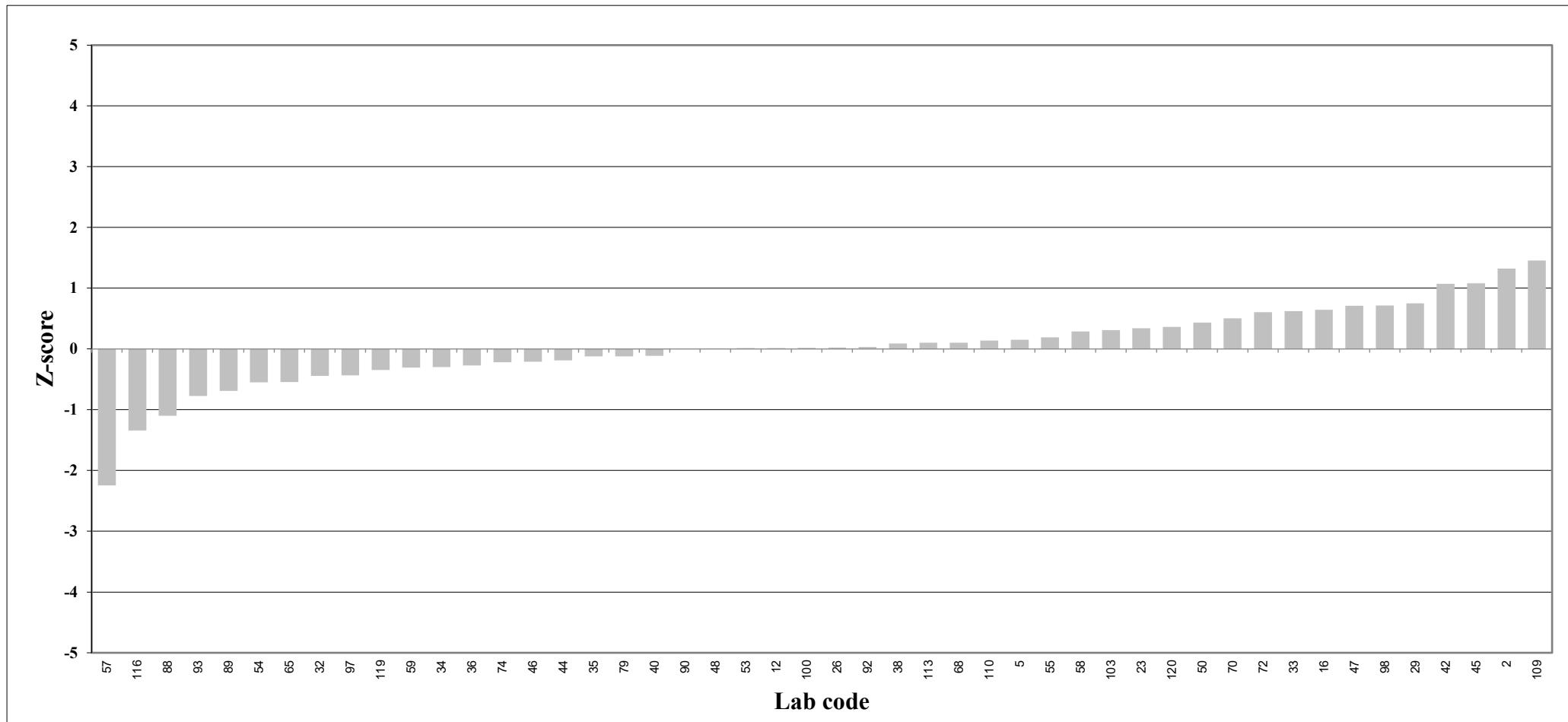
Z-score Herring, fresh weight; sum PBDE without PBDE-209

Z-score Herring, lipid weight; total TEQ
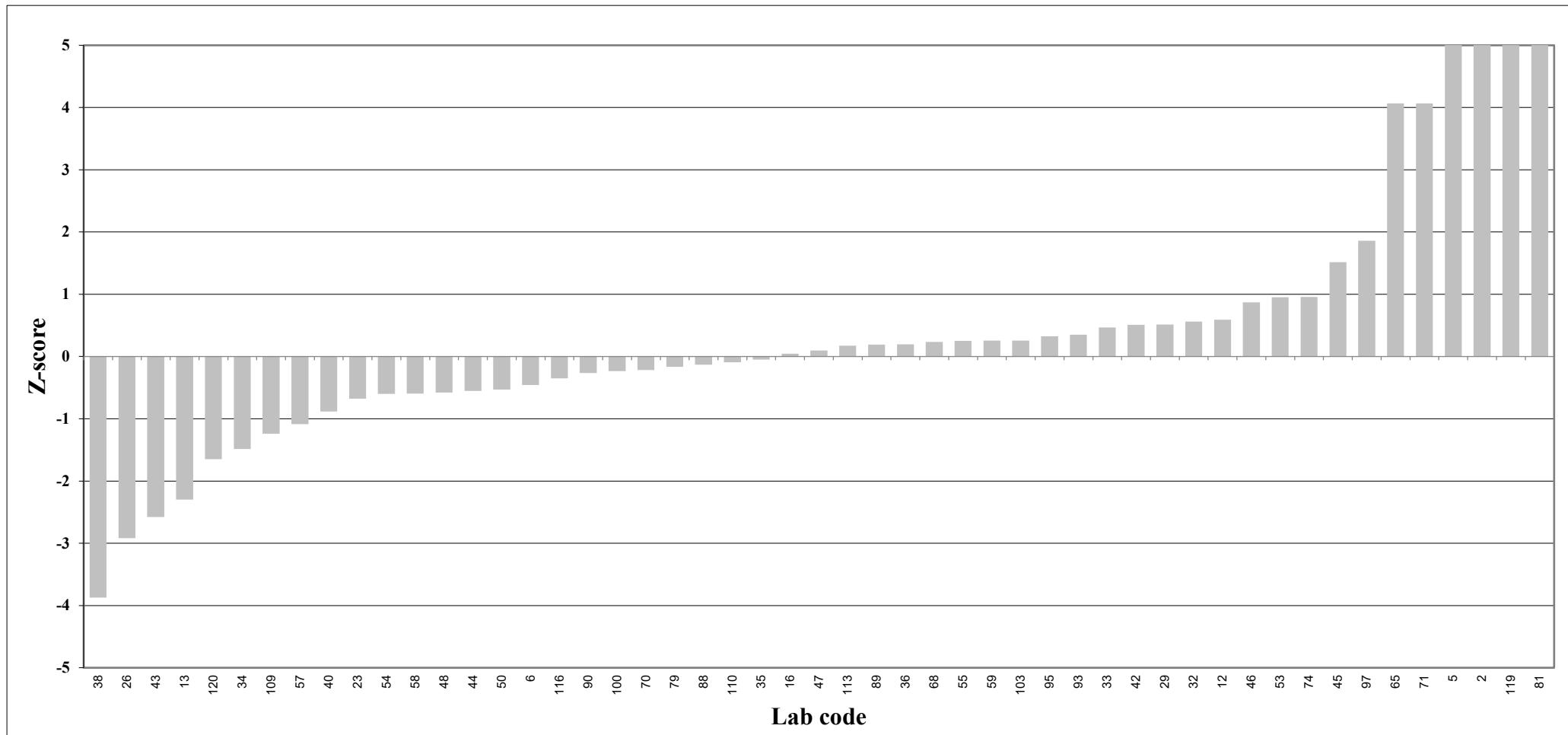
Z-score Herring, lipid weight; PCDD/PCDF TEQ
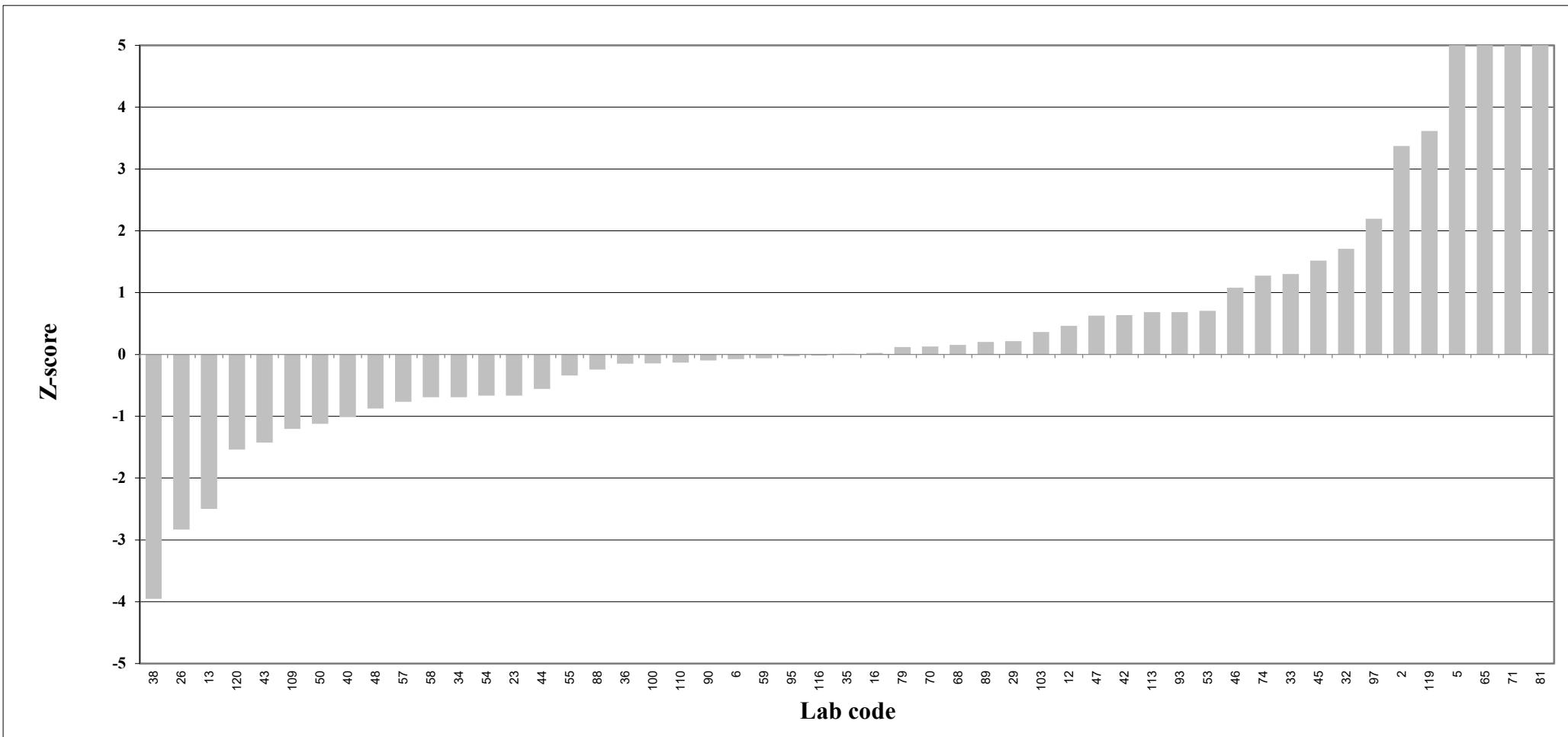
Z-score Herring, lipid weight; non-ortho PCB TEQ
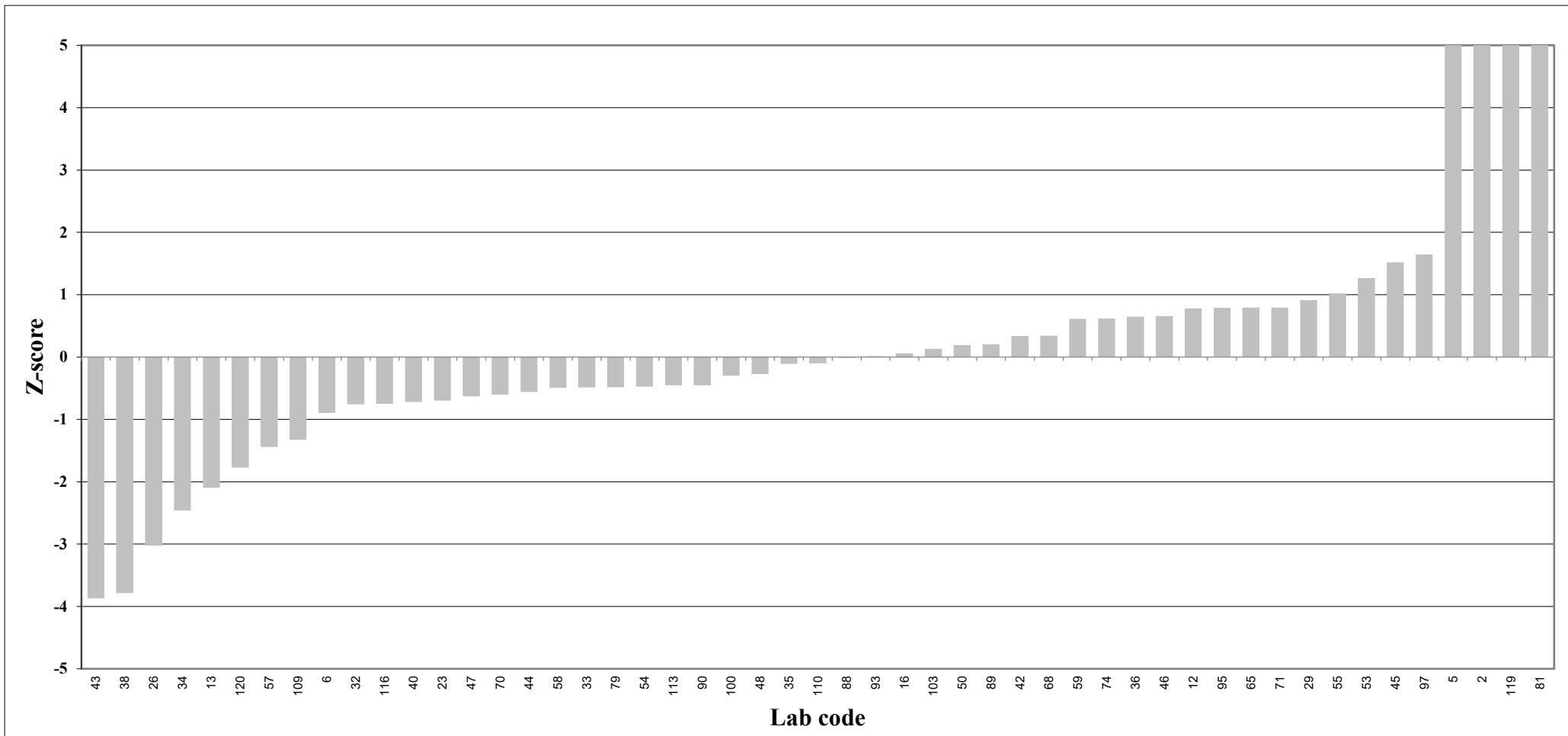
Z-score Herring, lipid weight; mono-ortho PCB TEQ
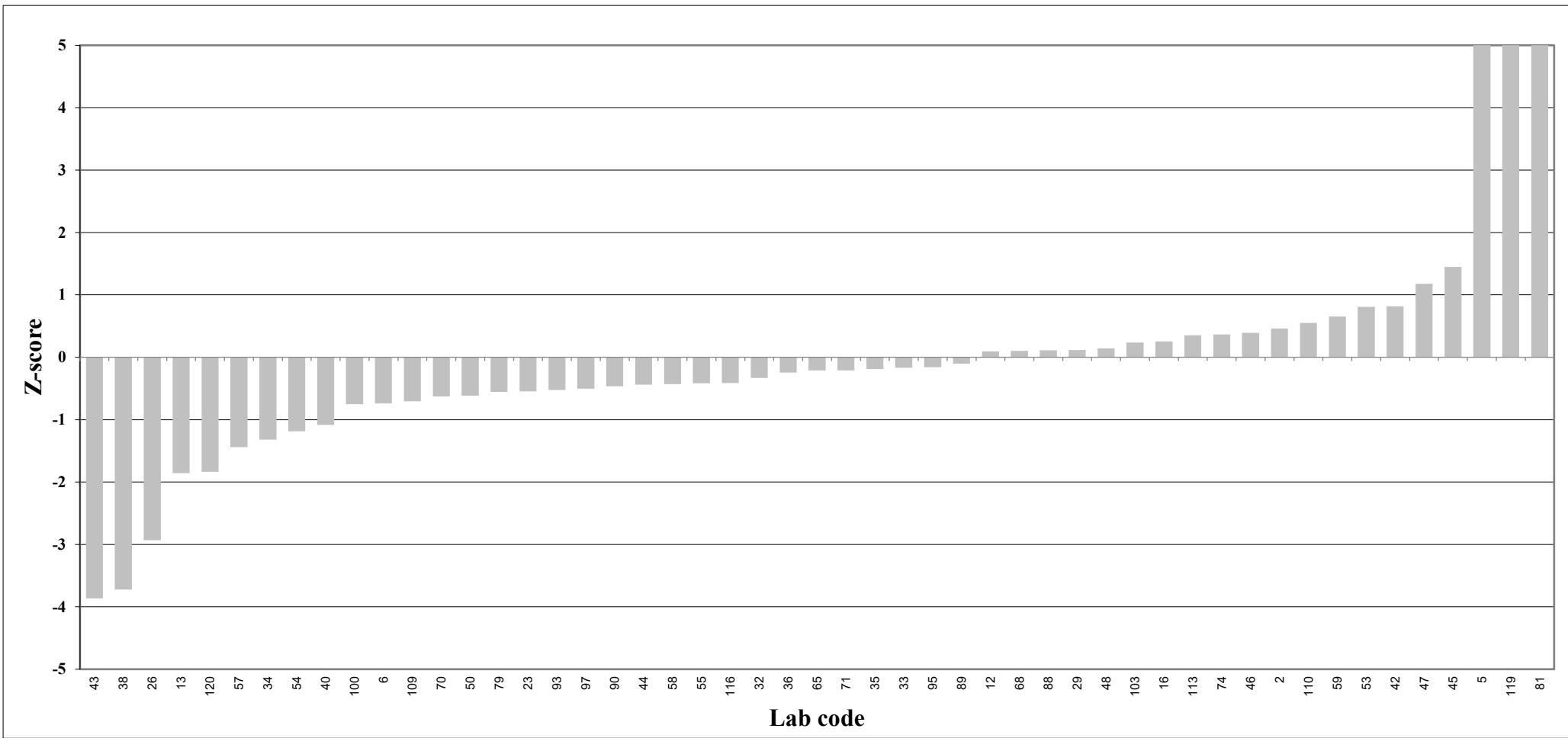
Z-score Herring, lipid weight; sum indicator PCB
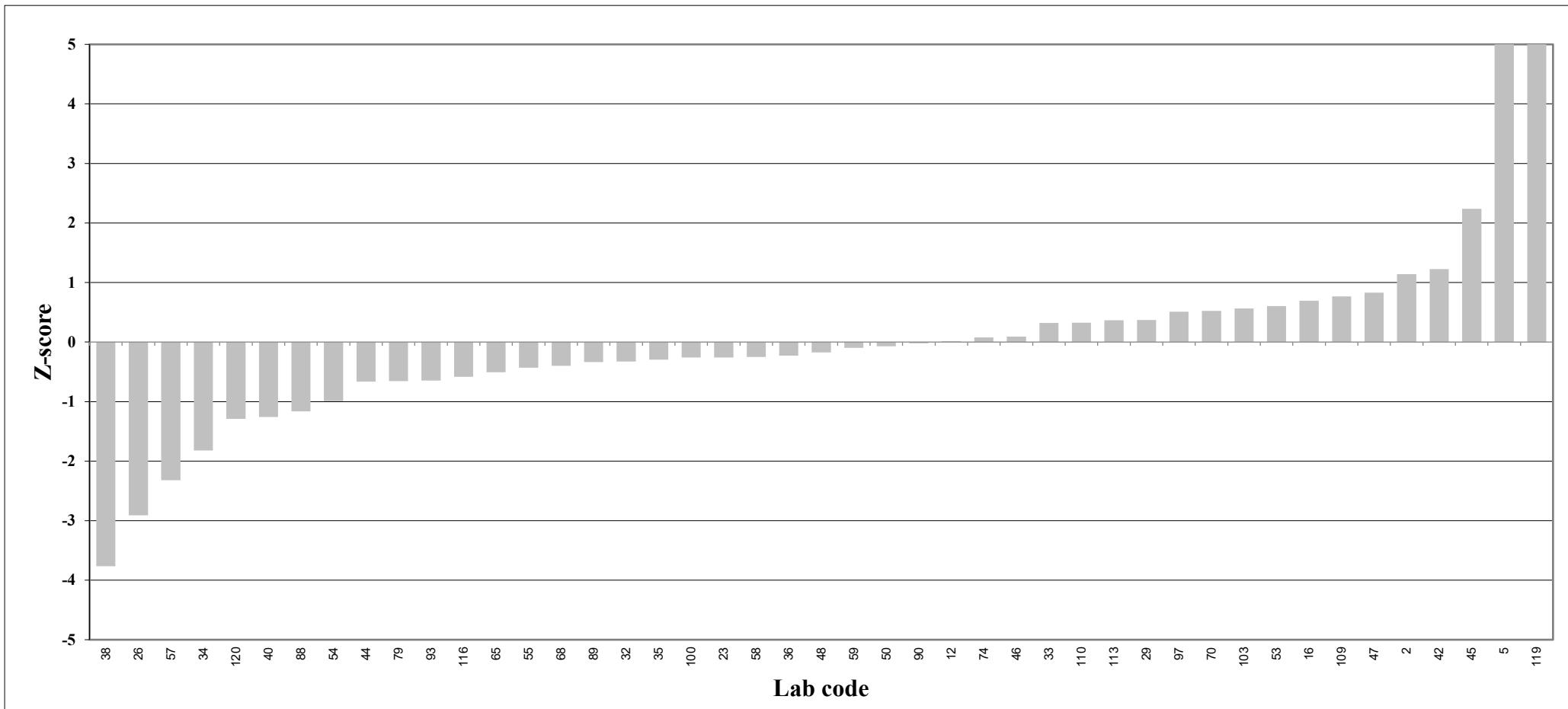
**Z-score Herring, lipid weight; sum PBDE without PBDE-209**
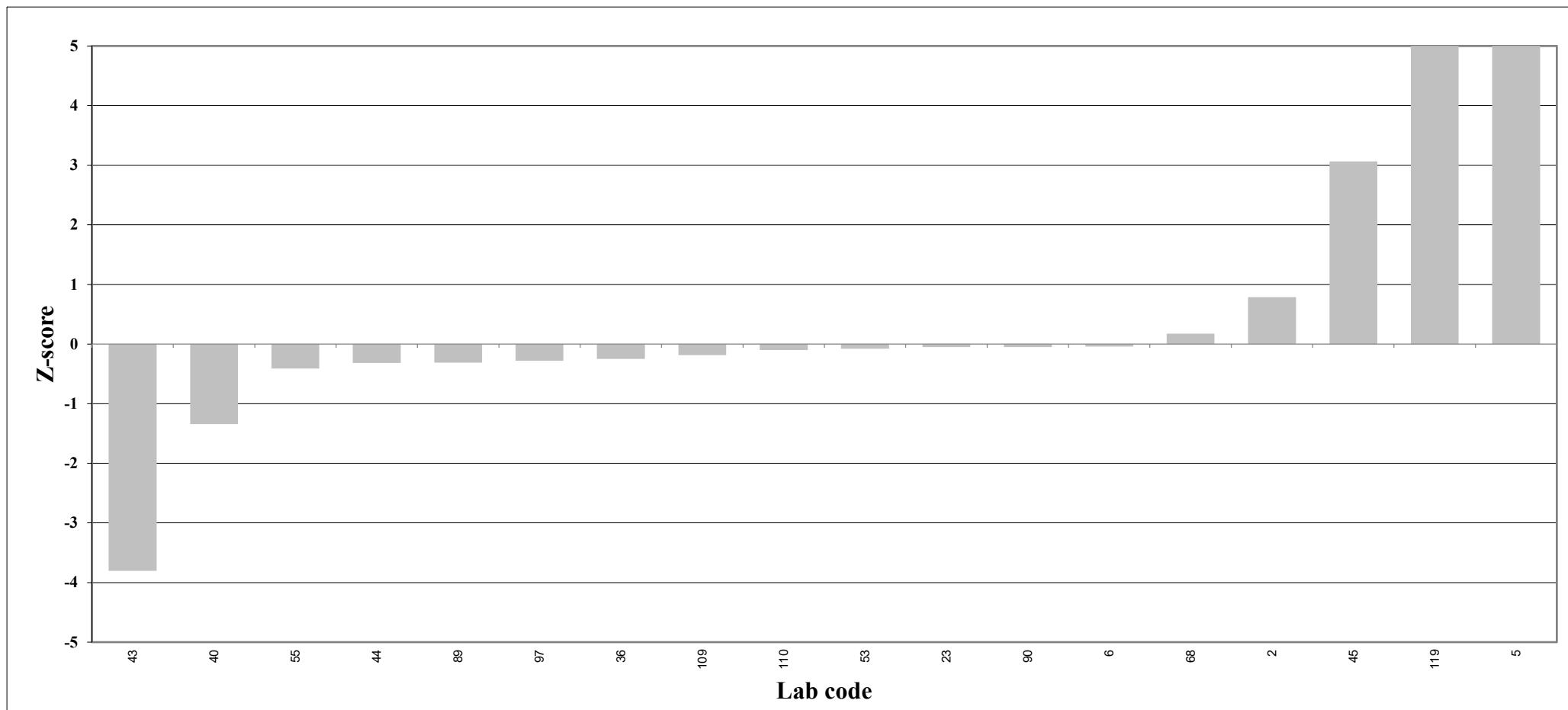
Z-score Fish oil, fresh weight; total TEQ
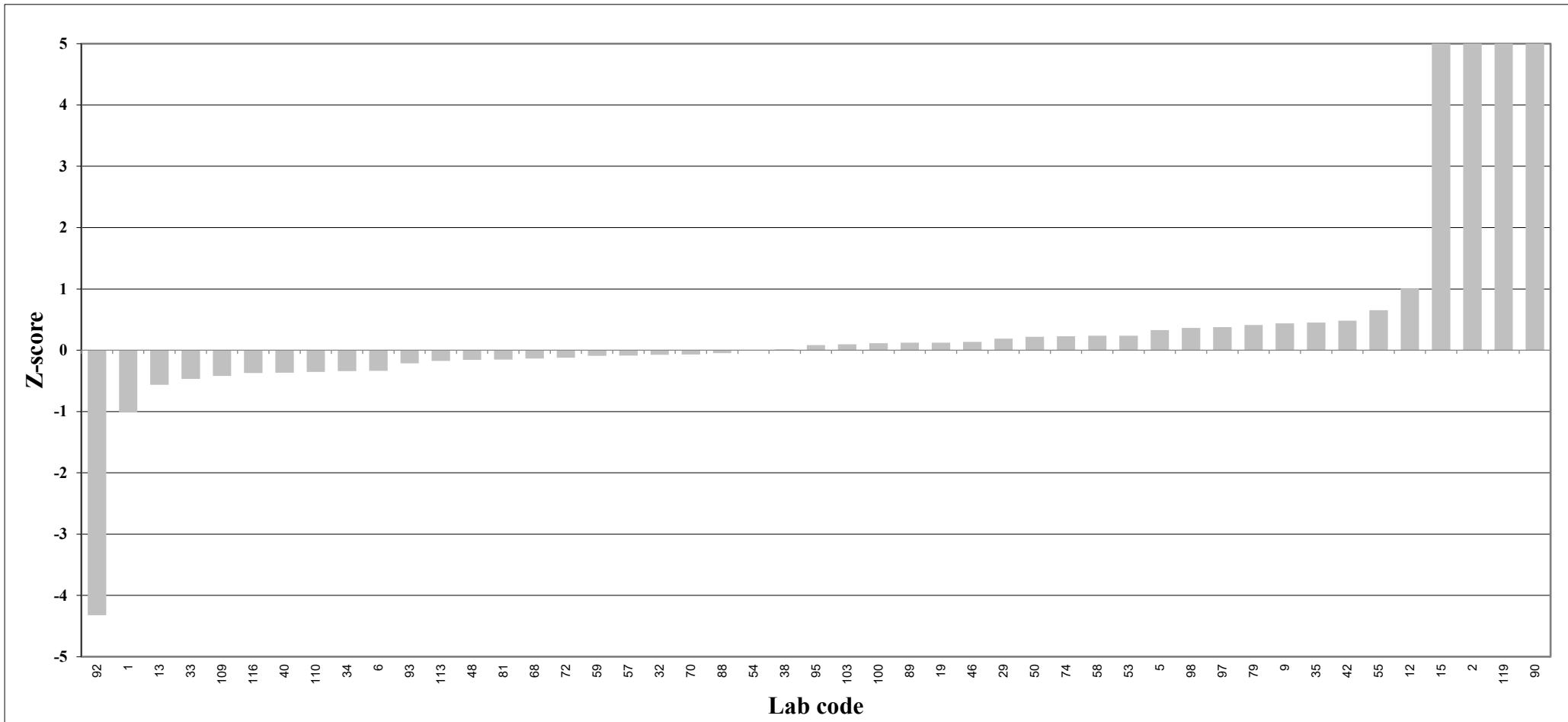
Z-score Fish oil, fresh weight; PCDD/PCDF TEQ
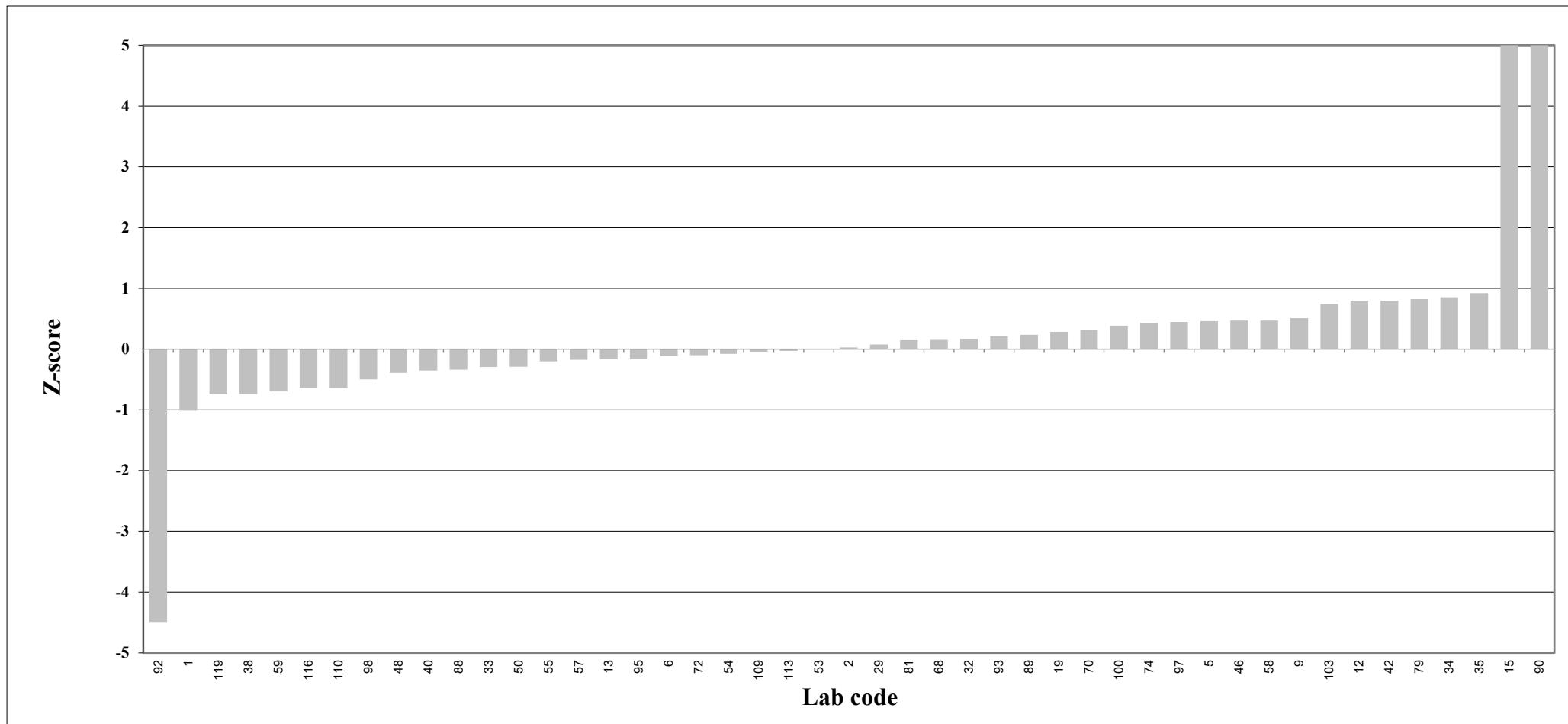
Z-score Fish oil, fresh weight; non-ortho PCB TEQ
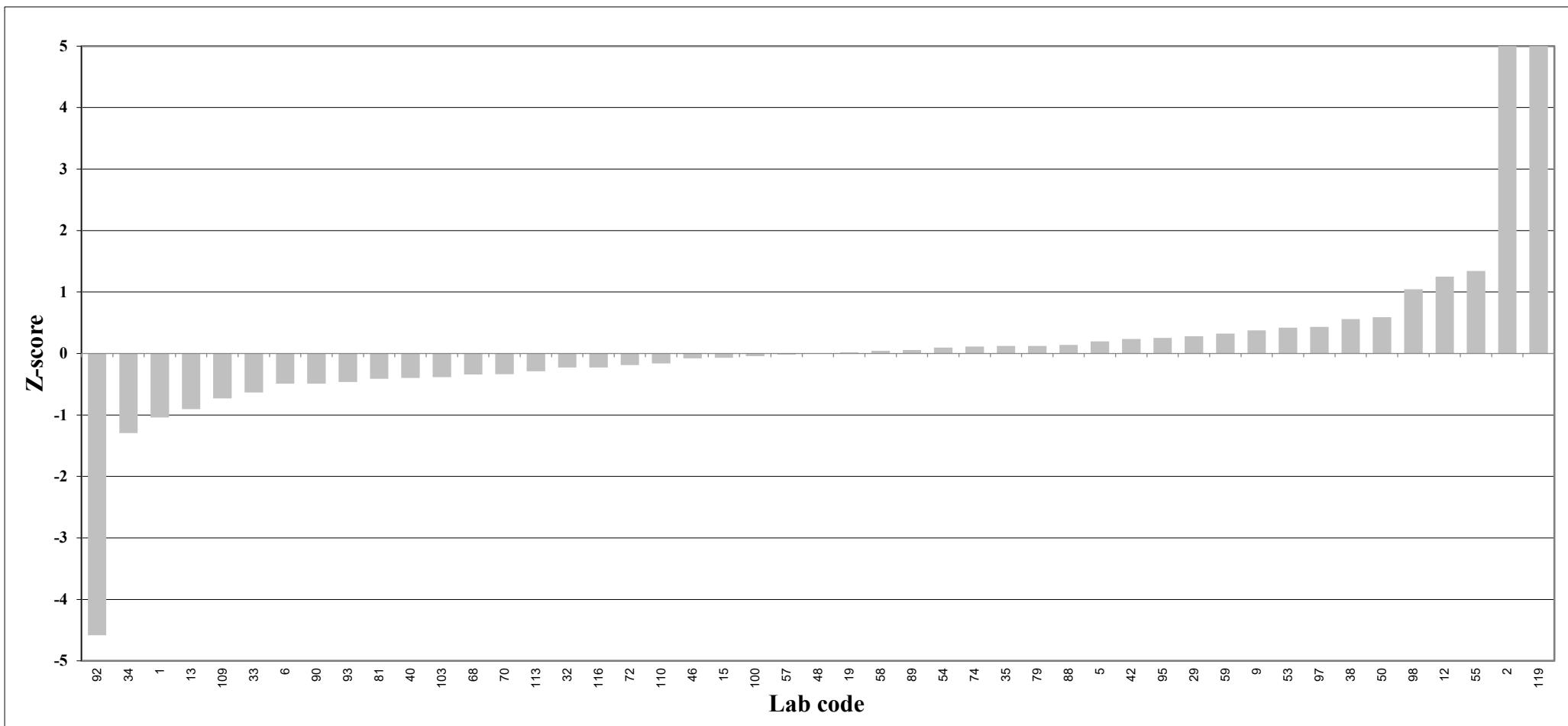
Z-score Fish oil; mono-ortho PCB TEQ
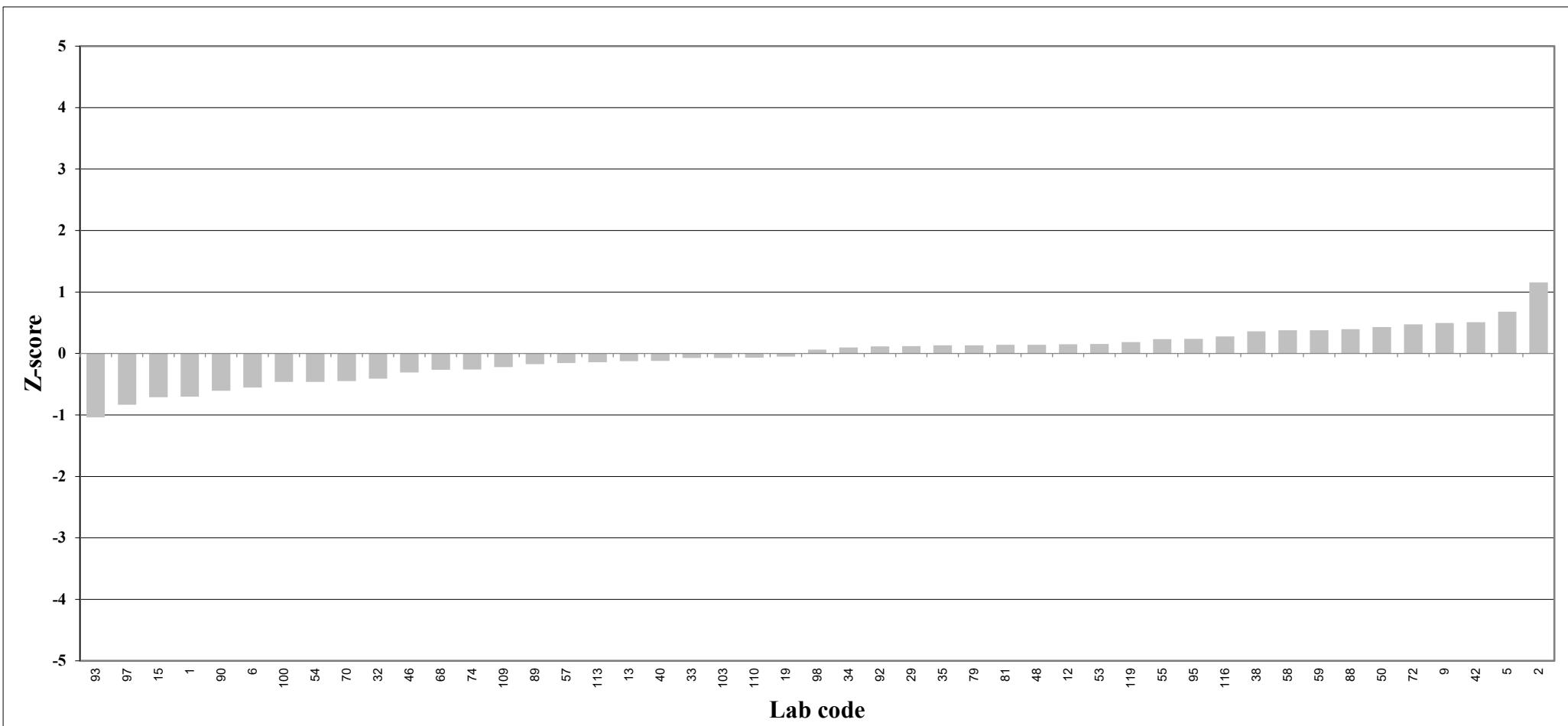
Z-score Fish oil, fresh weight; sum indicator PCB
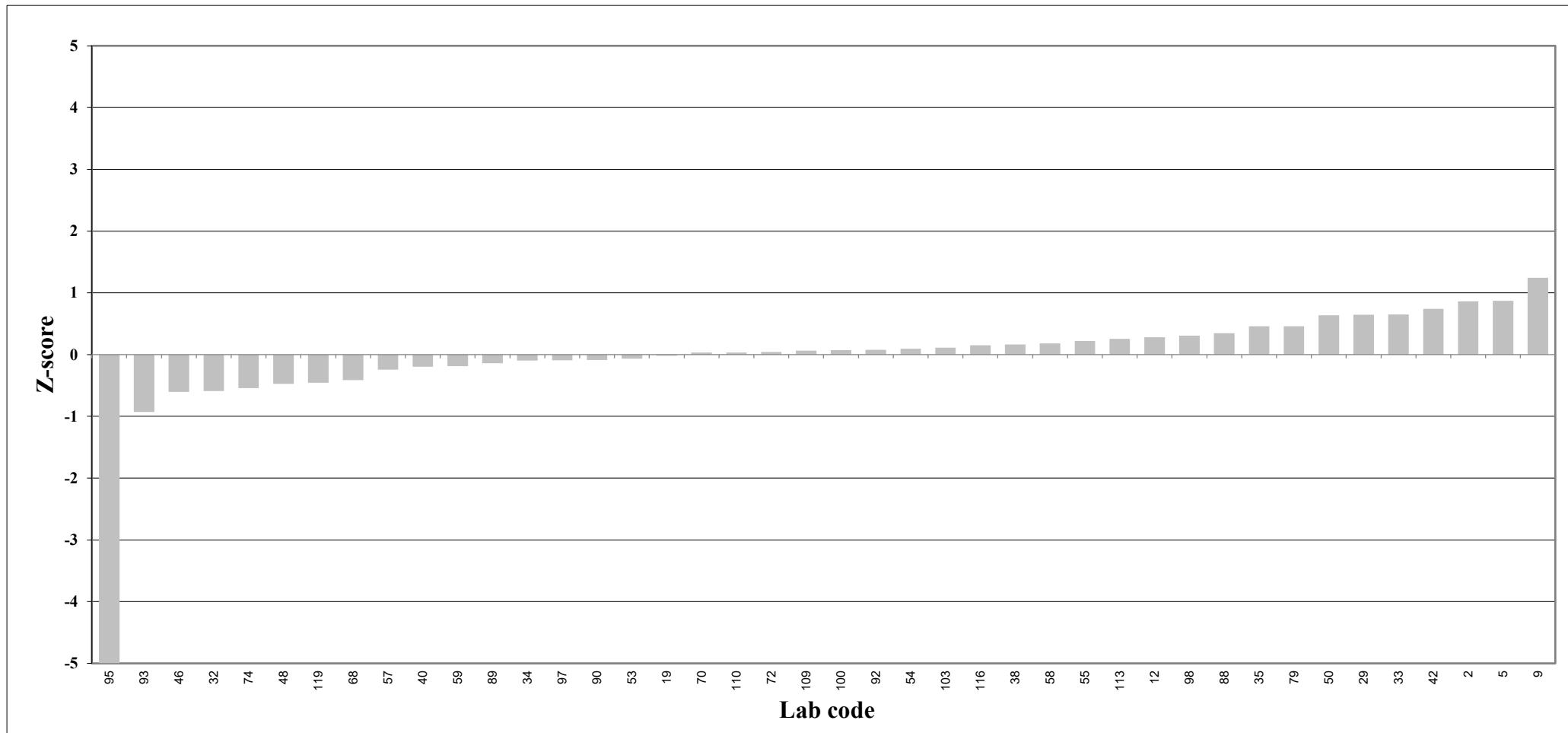
Z-score Fish oil, fresh weight; sum PBDE without PBDE-209
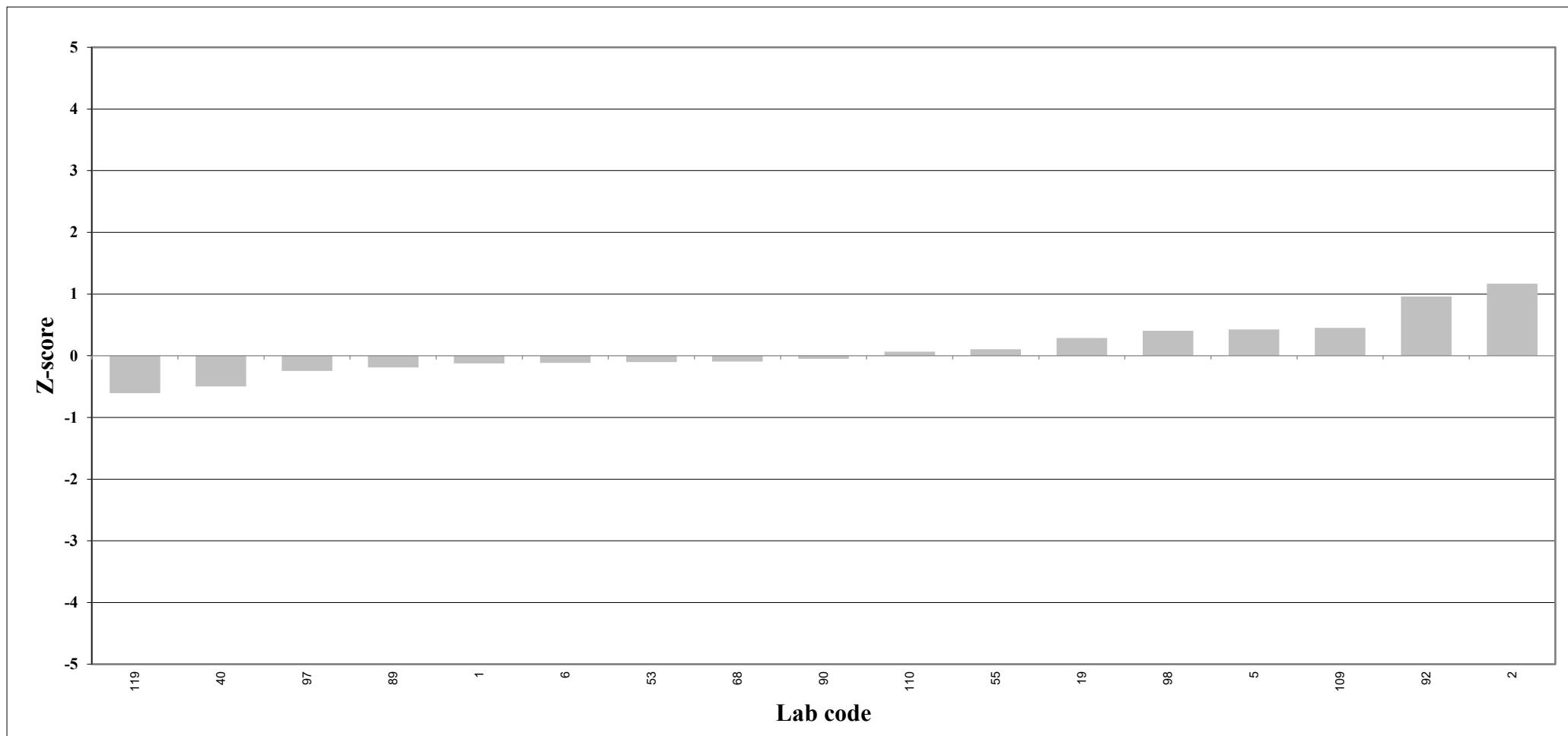
Z-score Fish oil, lipid weight; total TEQ
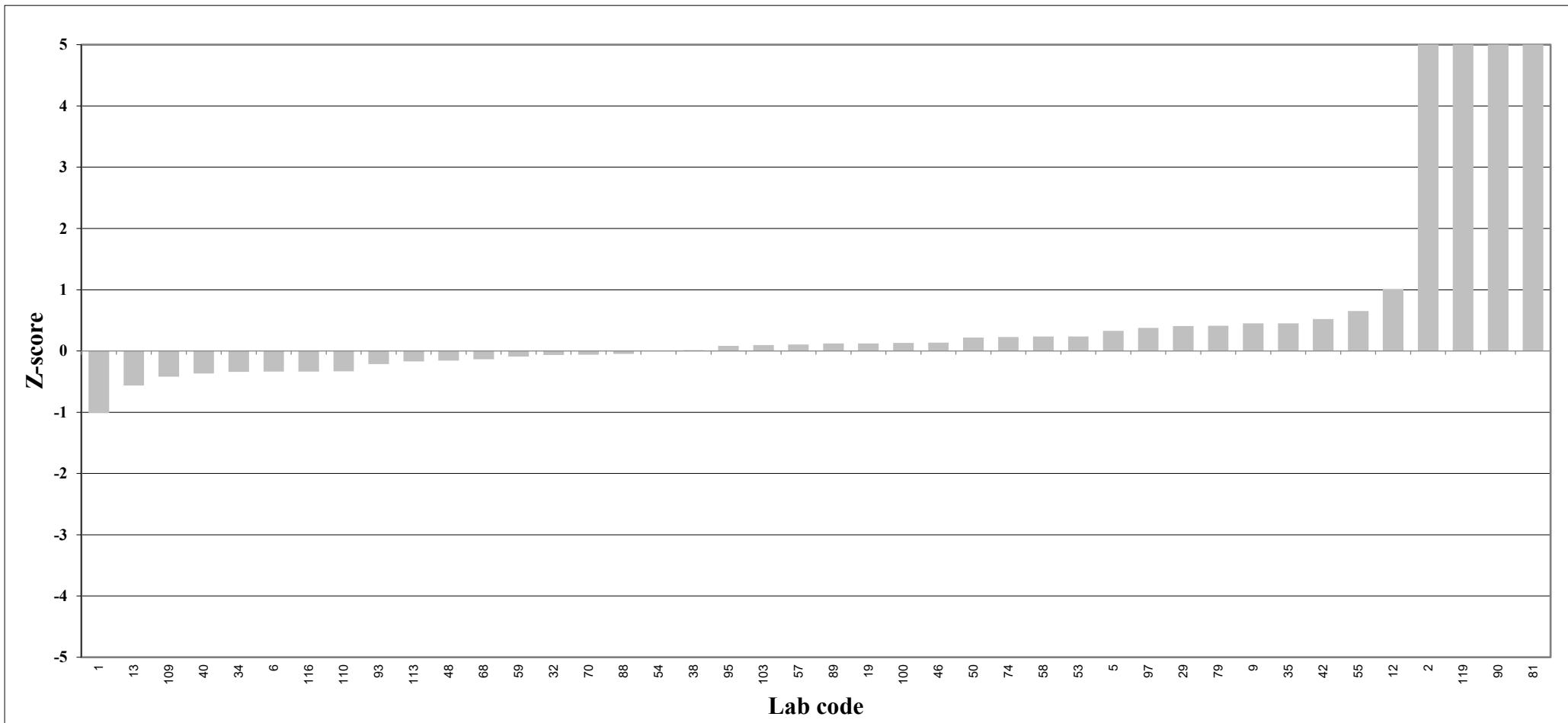
Z-score Fish oil, lipid weight; PCDD/PCDF TEQ
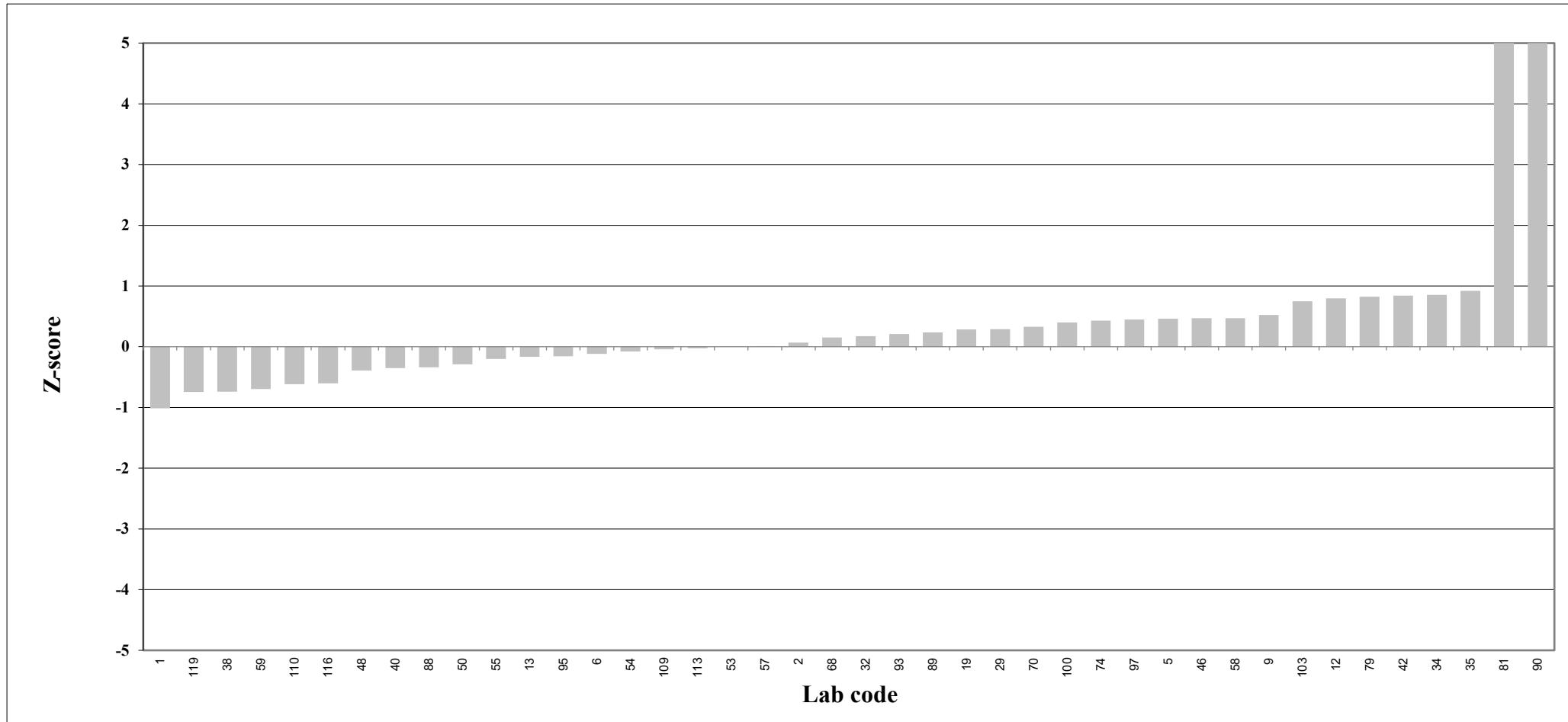
Z-score Fish oil, lipid weight; non-ortho PCB TEQ
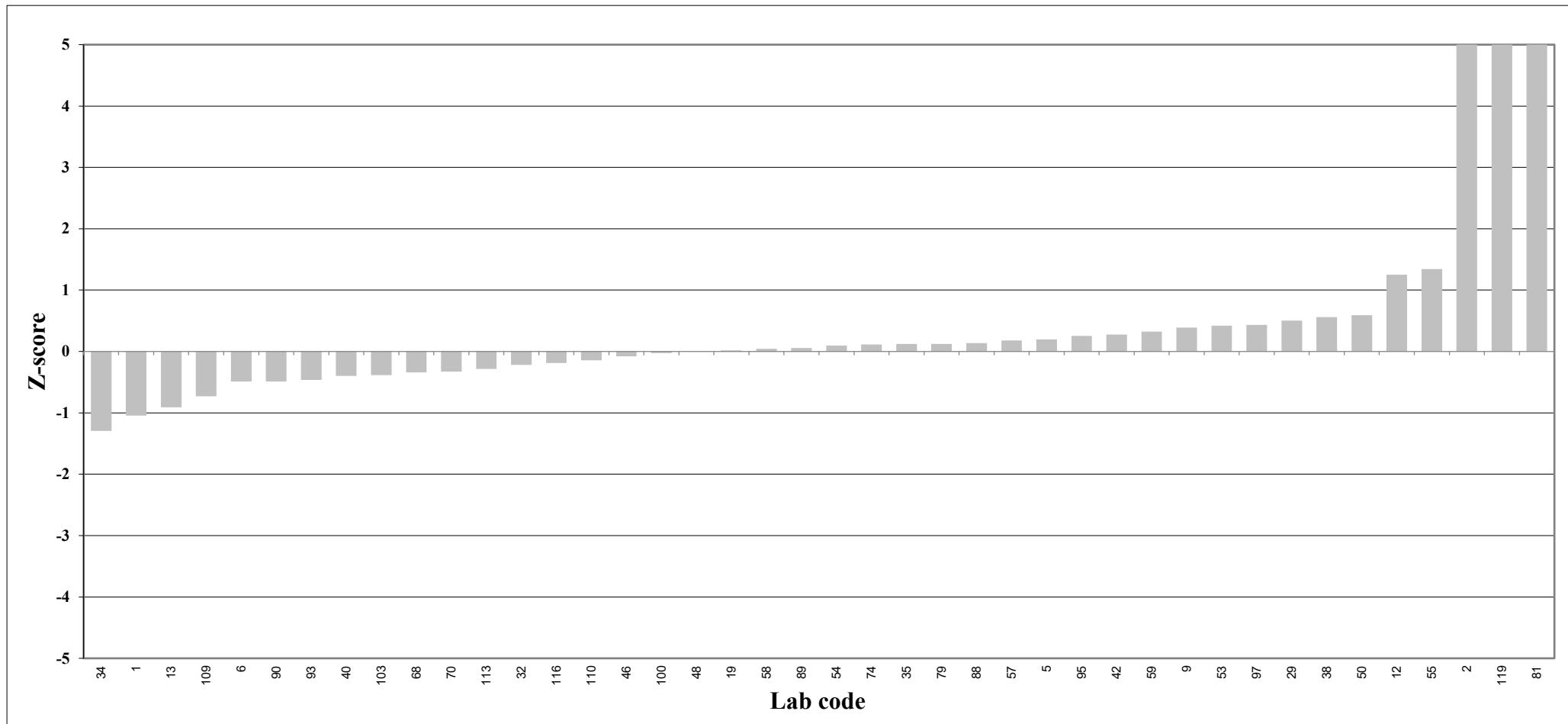
Z-score Fish oil, lipid weight; mono-ortho PCB TEQ
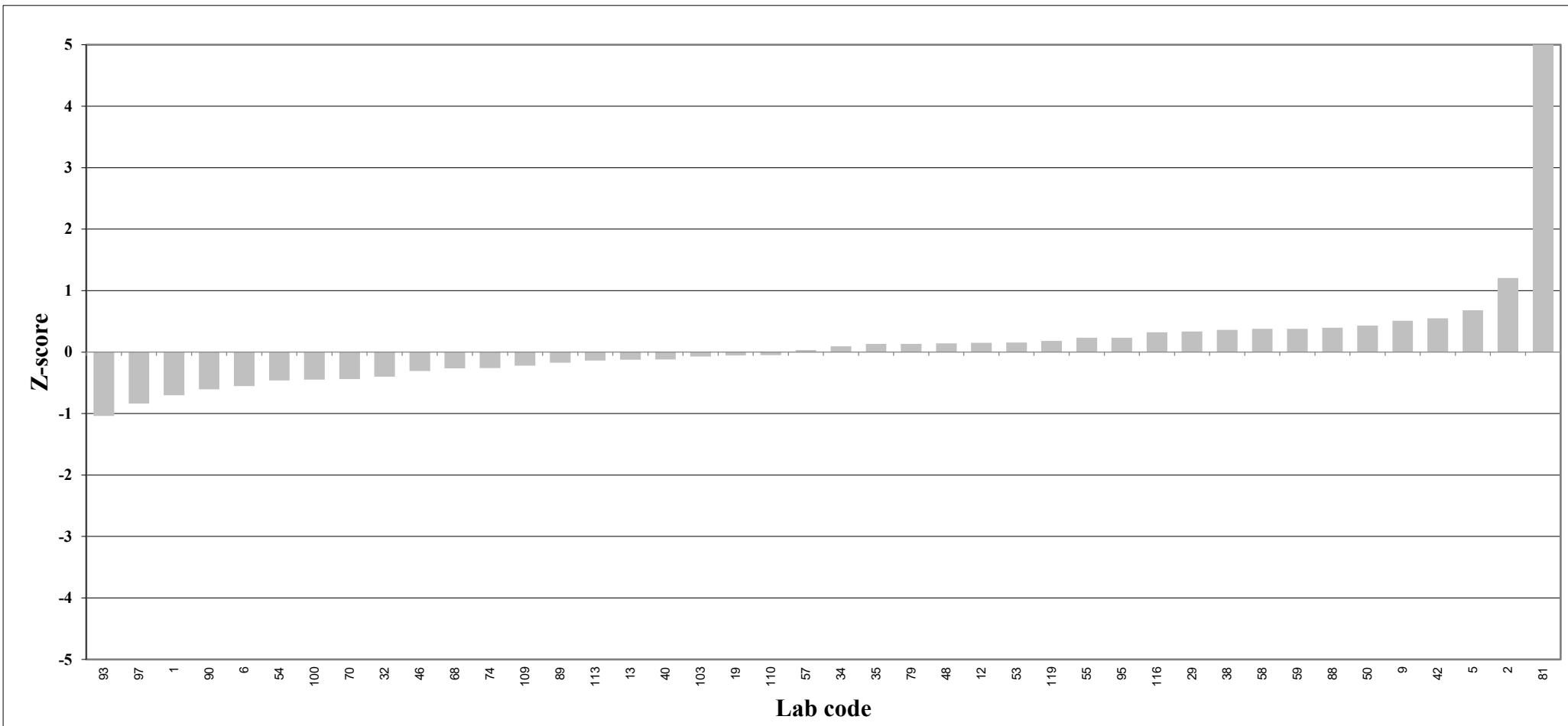
Z-score Fish oil, lipid weight; sum indicator PCB
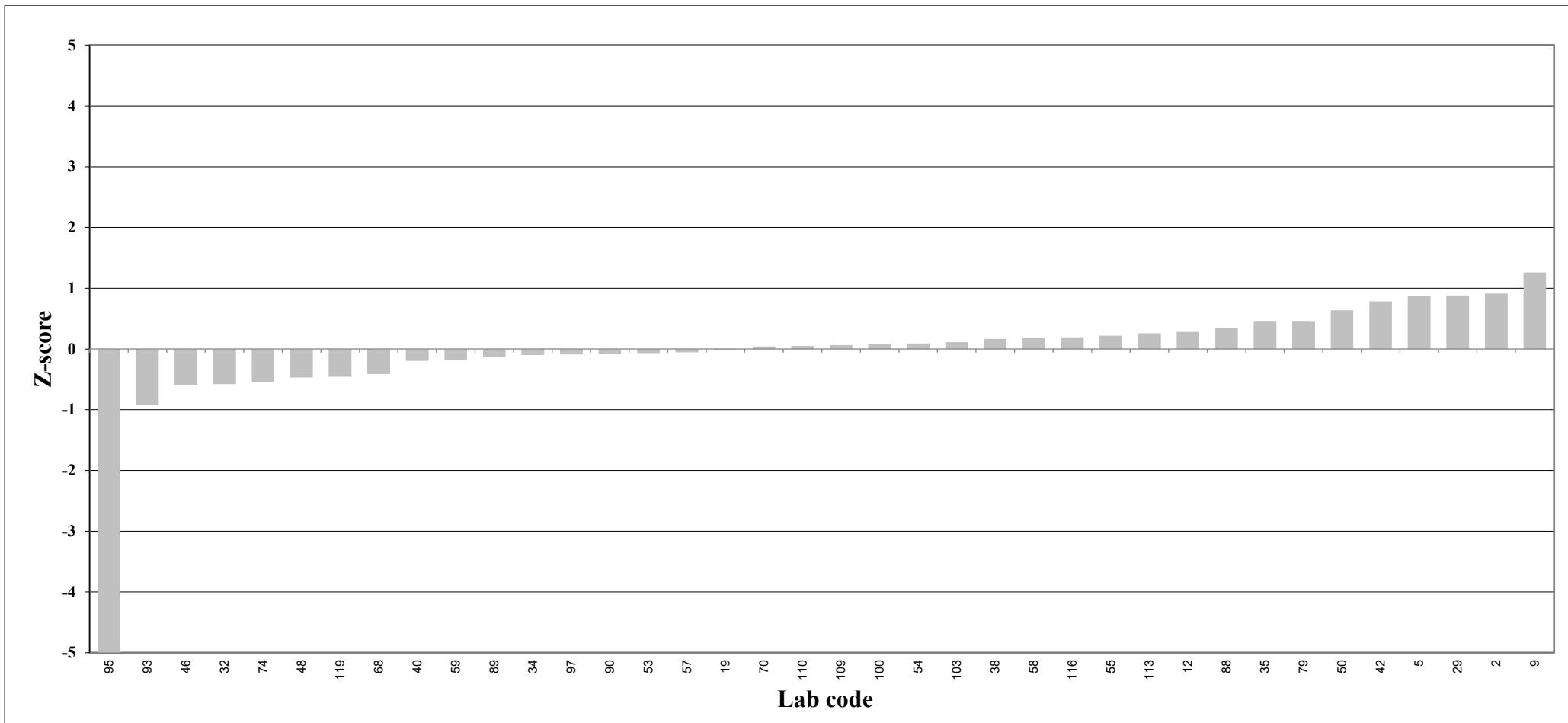
Z-score Fish oil, lipid weight; sum PBDE without PBDE-209
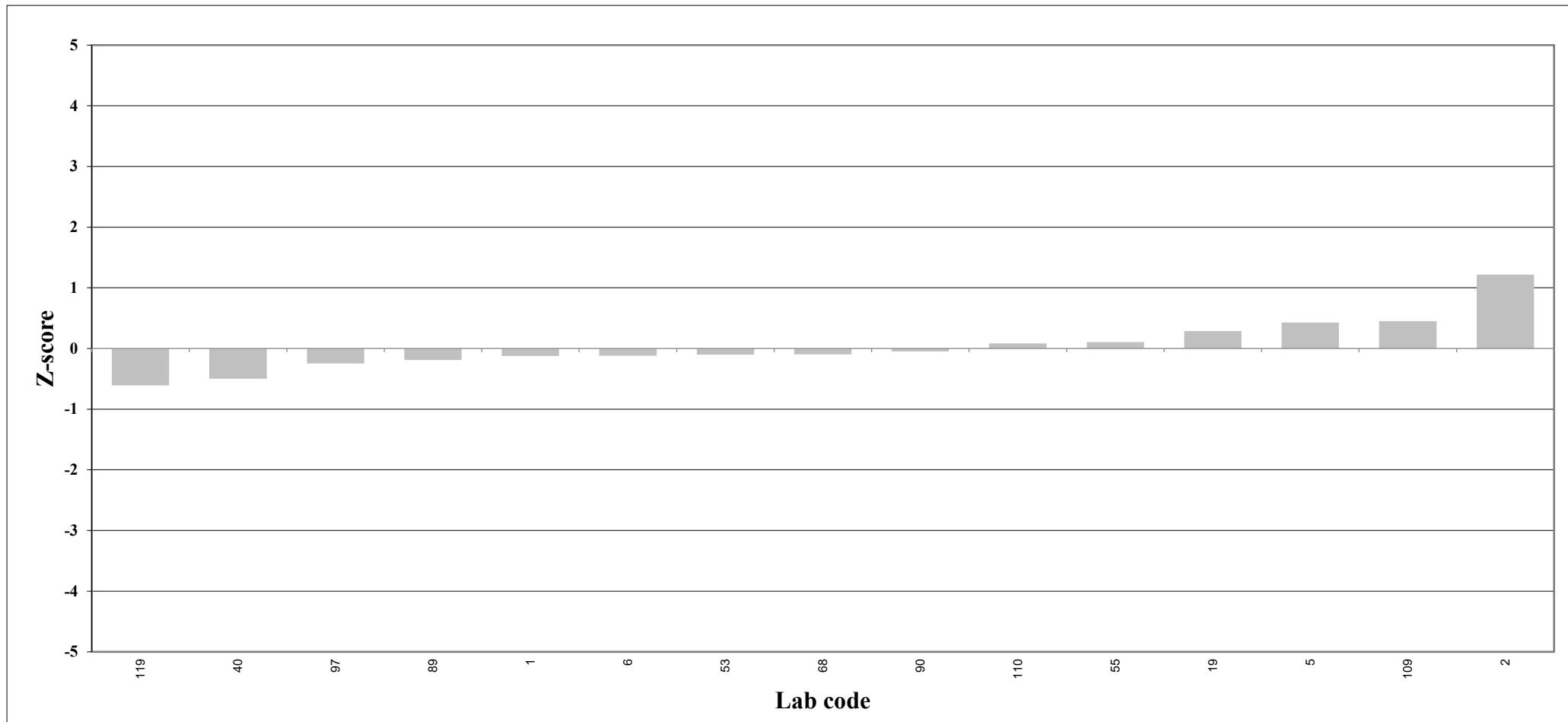
Appendix 1:

Presentation of results
for analyte solution

Appendix 1: Presentation of results: Analyte solution

Statistic calculations for PCDDs, PCDFs, dioxin-like PCBs, indicator PCBs, PBDEs and α-HBCD

The analyte solution contained
- PCDDs/PCDFs at concentrations of 2:5:10 pg/µl for tetra:penta-hexa-hepta:octa chlorinated dibenzodioxins/furans respectively.
- Non-ortho PCBs at concentration of 10 pg/µl.
- Mono-ortho PCBs and indicator PCBs at concentration of 100 pg/µl.
- PBDE at a concentration of 25 pg/µl, except BDE-209 at 100 pg/µl.
- α-HBCD at a concentration of 500 pg/µl.

These concentrations are called the congeners' target value.

For each congener, the outliers were removed and the consensus calculated according to the following procedure:

1. The median was calculated from all the reported data.
2. Values outside a range of 50 % to 150 % of this median, were defined as outliers and removed from the data set.
3. Median, mean and standard deviation were re-calculated from the remaining data. This median and mean were called consensus median and mean.

The diagram shows the target value and the reported data. Values outside a range of 50 % to 150 % of "median of all values", were defined as outliers and are not shown in the plot.
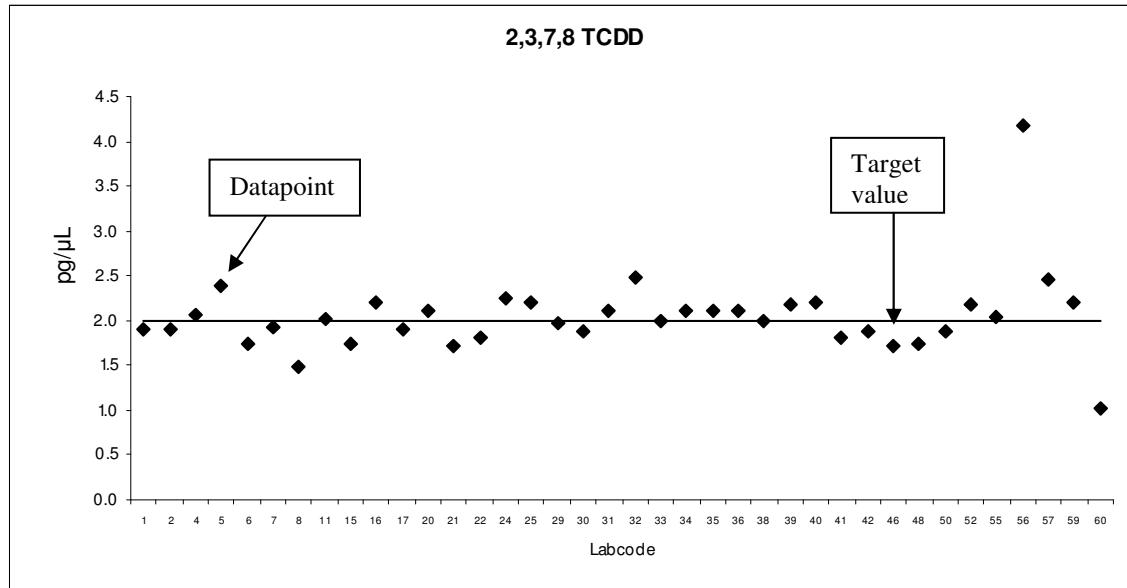
Z-Scores of individual congeners

Z-scores of each congener were calculated for each laboratory according to the following equation:

$$z = (x - X)/\sigma$$

Where x = reported value; X = assigned value (consensus); σ = target value for standard deviation. A σ of 20% of the consensus was used, i.e. z-scores between +1 and -1 reflect a deviation of ± 20% from the consensus value.

Analyte solution
Congener: 2,3,7,8 TCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	1,7	-0,51		109	2,0	0,20	
2	13	29	Outlier	110	1,8	-0,45	
5	1,8	-0,34		119	1,7	-0,65	
6	1,9	-0,24					
12	2,1	0,50					
13	2,2	0,56					
16	2,0	0,17					
19	1,9	-0,087					
23	1,9	-0,24					
26	2,0	0,15					
29	2,0	0,034					
32	2,0	0,13					
34	1,9	-0,018					
35	1,9	0,00					
36	1,9	-0,087					
38	1,7	-0,54					
40	1,9	-0,0018					
42	1,9	-0,13					
43	2,1	0,45					
44	2,1	0,40					
45	2,2	0,54					
46	2,1	0,38					
47	1,9	-0,010					
48	1,9	-0,077					
50	2,0	0,14					
53	2,2	0,65					
54	2,0	0,14					
55	1,9	-0,19					
65	1,8	-0,32					
68	2,2	0,58					
70	2,2	0,57					
71	1,7	-0,75					
72	1,9	-0,063					
74	1,9	-0,062					
79	1,9	0,00					
81	2,0	0,26					
87	1,9	-0,087					
88	1,8	-0,39					
89	2,0	0,22					
90	2,1	0,40					
93	2,2	0,56					
97	2,0	0,24					
98	2,0	0,14					
100	1,9	0,00					
103	2,0	0,027					

Consenus statistics

Consensus median, pg/g	1,9
Median all values pg/g	1,9
Consensus mean, pg/g	2,0
Standard deviation, pg/g	0,13
Relative standard deviation, %	6,8
No. of values reported	48
No. of values removed	1
No. of reported non-detects	0
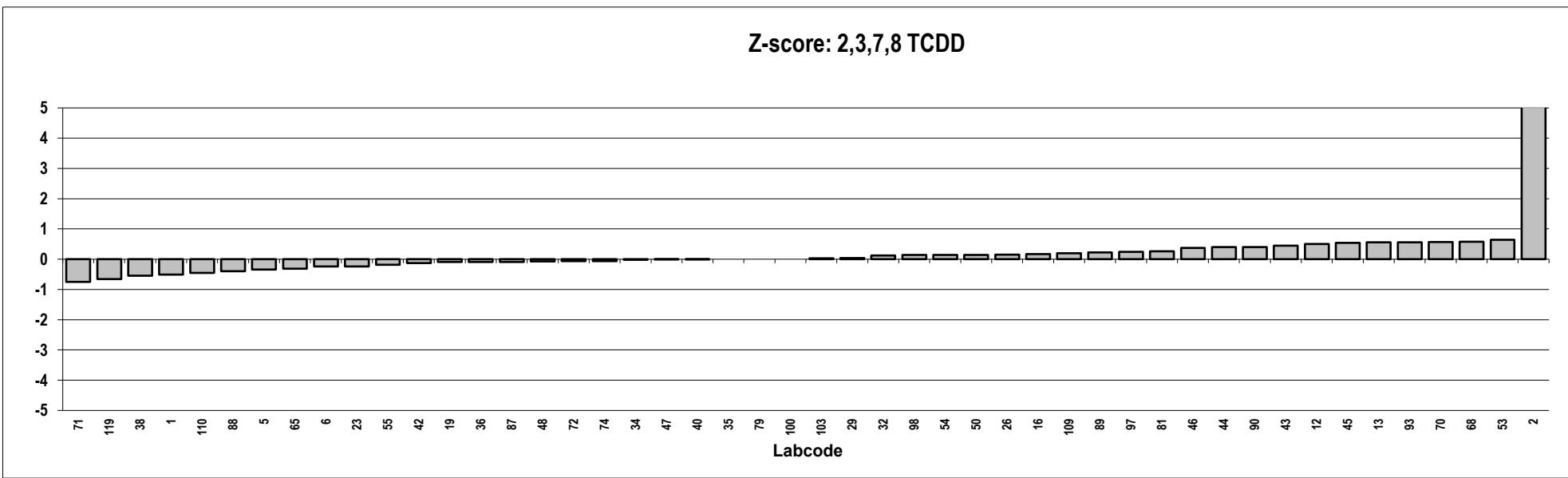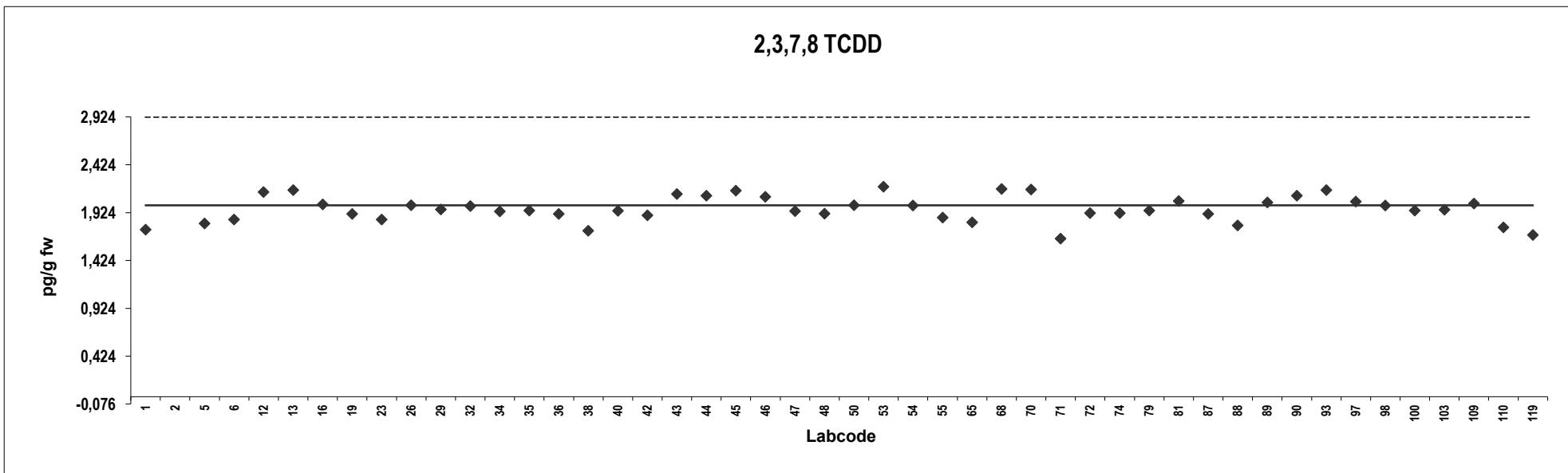
2,3,7,8 TCDD

pg/g fw — Labcode

Z-score: 2,3,7,8 TCDD

Labcode

Analyte solution
Congener: 1,2,3,7,8 PeCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	5,2	0,19		109	5,3	0,27	
2	40	35	Outlier	110	4,9	-0,092	
5	5,2	0,23		119	4,8	-0,19	
6	5,0	-0,0089					
12	5,4	0,36					
13	5,9	0,88					
16	4,9	-0,079					
19	4,8	-0,16					
23	5,0	0,0011					
26	4,9	-0,075					
29	4,6	-0,42					
32	5,3	0,27					
34	5,0	-0,041					
35	4,9	-0,056					
36	4,8	-0,18					
38	4,8	-0,20					
40	5,1	0,077					
42	5,0	-0,048					
43	5,1	0,093					
44	5,2	0,18					
45	5,2	0,22					
46	5,1	0,13					
47	5,3	0,30					
48	4,8	-0,16					
50	5,0	-0,0089					
53	4,9	-0,070					
54	5,0	0,00					
55	5,4	0,40					
65	5,0	-0,038					
68	5,1	0,081					
70	4,9	-0,073					
71	5,0	-0,046					
72	5,1	0,11					
74	5,3	0,30					
79	4,9	-0,056					
81	5,0	0,0031					
87	4,9	-0,059					
88	4,9	-0,090					
89	4,6	-0,36					
90	5,8	0,78					
93	5,1	0,071					
97	5,5	0,49					
98	4,9	-0,14					
100	5,1	0,059					
103	5,1	0,052					

Consensus statistics

Consensus median, pg/g	5,0
Median all values pg/g	5,0
Consensus mean, pg/g	5,1
Standard deviation, pg/g	0,25
Relative standard deviation, %	4,9
No. of values reported	48
No. of values removed	1
No. of reported non-detects	0

1,2,3,7,8 PeCDD

pg/g fw

Labcode

Z-score: 1,2,3,7,8 PeCDD
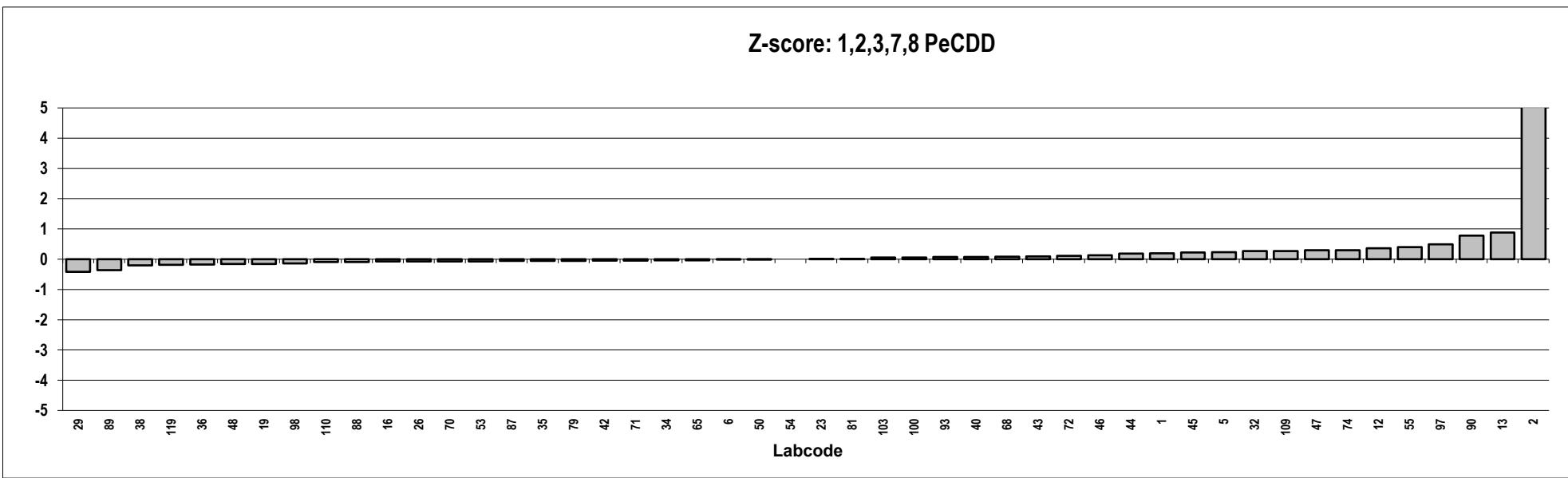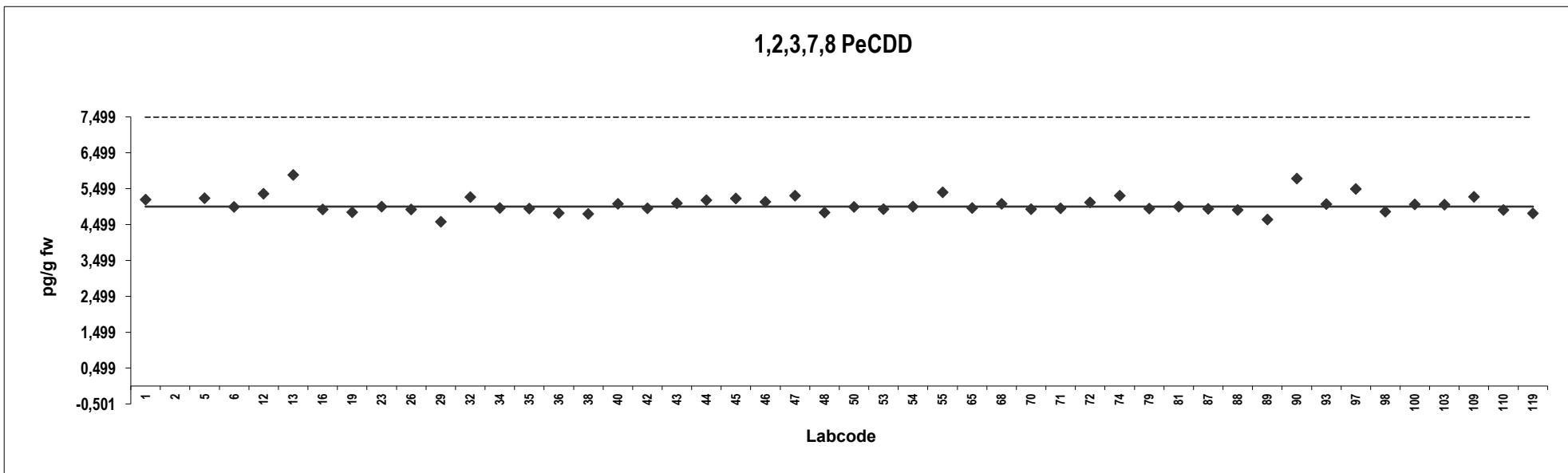
Labcode

Analyte solution
Congener: 1,2,3,4,7,8 HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	4,6	-0,33		109	5,2	0,22	
2	38	33	Outlier	110	4,7	-0,25	
5	4,8	-0,17		119	4,3	-0,65	
6	4,6	-0,36					
12	5,5	0,59					
13	5,8	0,90					
16	4,7	-0,20					
19	4,9	-0,080					
23	5,0	0,072					
26	5,0	0,070					
29	4,8	-0,13					
32	4,8	-0,17					
34	4,9	0,00					
35	5,0	0,032					
36	4,6	-0,29					
38	4,4	-0,52					
40	5,0	0,066					
42	4,7	-0,19					
43	5,2	0,23					
44	4,7	-0,19					
45	5,3	0,39					
46	5,0	0,051					
47	4,7	-0,26					
48	4,3	-0,63					
50	4,9	-0,0094					
53	4,7	-0,26					
54	5,0	0,087					
55	5,1	0,17					
65	4,6	-0,35					
68	5,2	0,27					
70	4,7	-0,23					
71	3,9	-1,1					
72	4,9	0,019					
74	5,1	0,12					
79	5,0	0,032					
81	5,2	0,24					
87	4,9	-0,060					
88	4,5	-0,42					
89	5,6	0,72					
90	5,2	0,24					
93	5,0	0,051					
97	5,5	0,54					
98	4,6	-0,36					
100	4,9	0,0017					
103	5,0	0,095					

Consenus statistics

Consensus median, pg/g	4,9
Median all values pg/g	4,9
Consensus mean, pg/g	4,9
Standard deviation, pg/g	0,35
Relative standard deviation, %	7,2
No. of values reported	48
No. of values removed	1
No. of reported non-detects	0
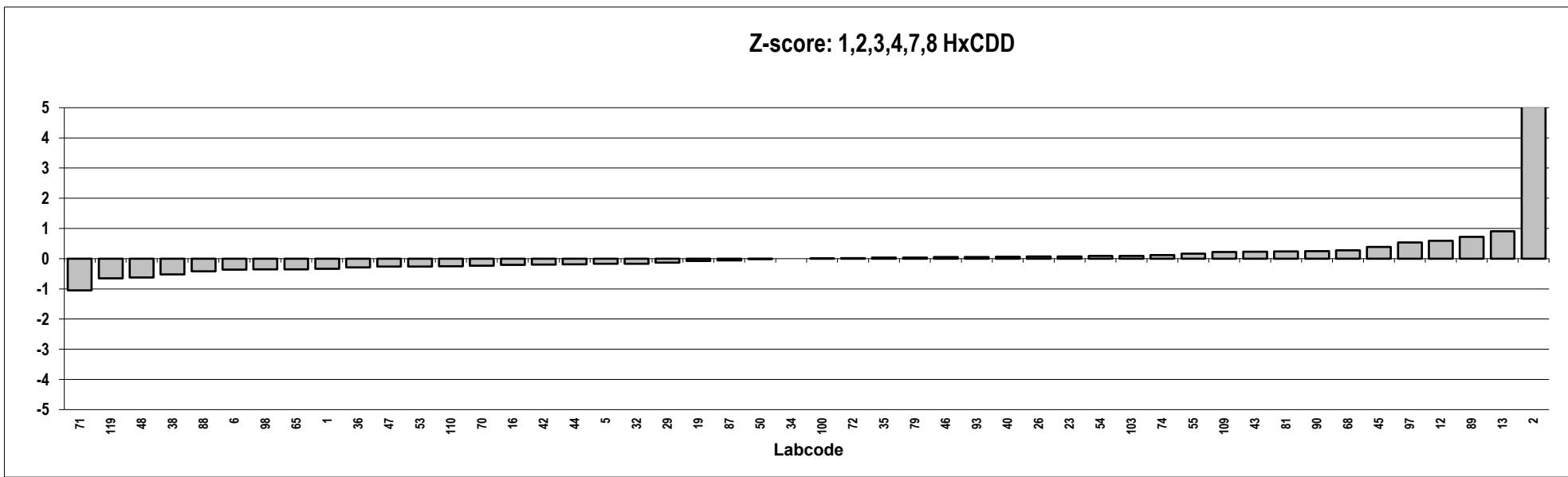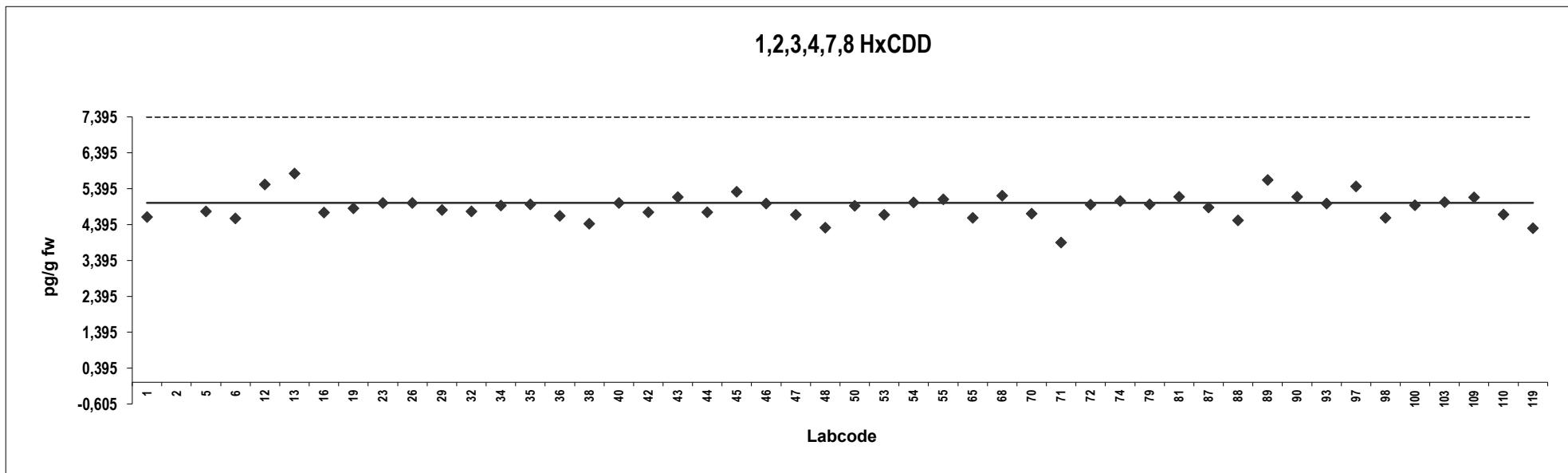
1,2,3,4,7,8 HxCDD

Z-score: 1,2,3,4,7,8 HxCDD

Analyte solution
Congener: 1,2,3,6,7,8 HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	4,9	-0,010		109	5,2	0,37	
2	32	28	Outlier	110	4,5	-0,41	
5	5,3	0,47		119	4,8	-0,042	
6	4,7	-0,14					
12	5,0	0,13					
13	5,0	0,13					
16	4,7	-0,20					
19	4,8	-0,093					
23	5,0	0,13					
26	5,0	0,15					
29	4,6	-0,30					
32	4,8	-0,036					
34	5,1	0,18					
35	4,8	-0,062					
36	5,2	0,33					
38	4,4	-0,46					
40	5,0	0,12					
42	5,0	0,10					
43	5,1	0,25					
44	4,9	-0,011					
45	5,1	0,27					
46	4,8	-0,032					
47	4,5	-0,37					
48	4,9	0,035					
50	5,0	0,091					
53	5,2	0,36					
54	5,0	0,13					
55	4,9	0,00					
65	4,1	-0,77					
68	5,3	0,41					
70	5,0	0,12					
71	4,0	-0,88					
72	4,8	-0,025					
74	4,9	-0,022					
79	4,8	-0,062					
81	4,8	-0,047					
87	4,6	-0,31					
88	4,6	-0,23					
89	5,4	0,54					
90	5,0	0,10					
93	5,1	0,20					
97	5,2	0,36					
98	4,5	-0,38					
100	4,8	-0,039					
103	4,9	0,037					

Consensus statistics

Consensus median, pg/g	4,9
Median all values pg/g	4,9
Consensus mean, pg/g	4,9
Standard deviation, pg/g	0,28
Relative standard deviation, %	5,8
No. of values reported	48
No. of values removed	1
No. of reported non-detects	0

1,2,3,6,7,8 HxCDD

Z-score: 1,2,3,6,7,8 HxCDD
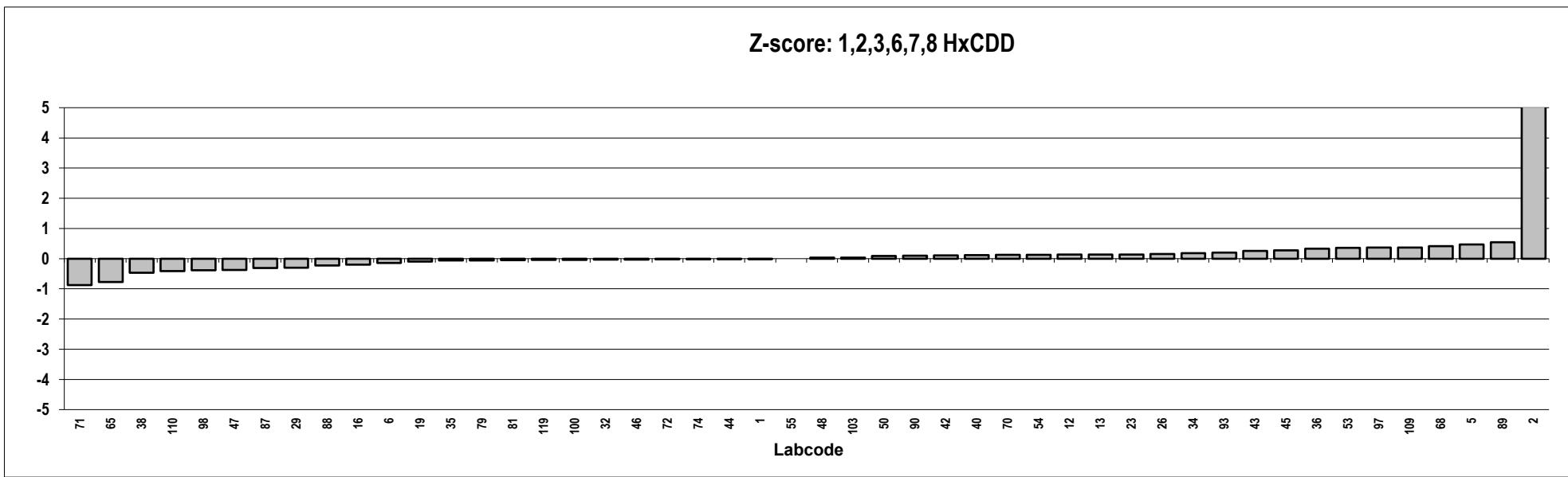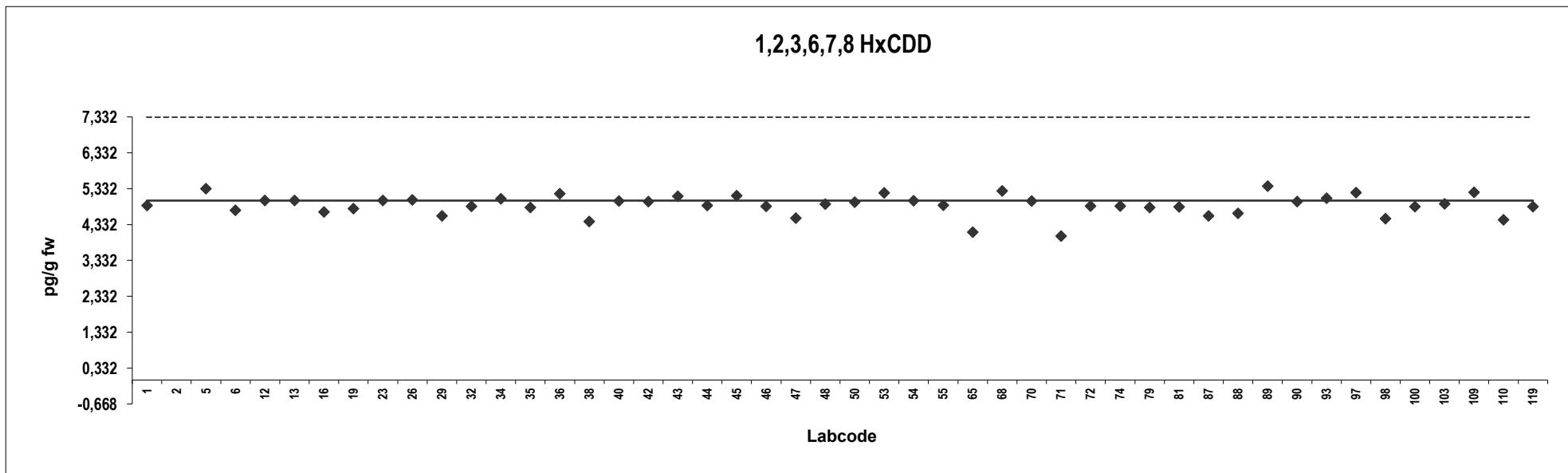
Analyte solution
Congener: 1,2,3,7,8,9 HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	4,8	-0,12		109	5,1	0,14	
2	38	34	Outlier	110	4,9	-0,074	
5	5,2	0,21		119	4,4	-0,52	
6	5,2	0,28					
12	5,4	0,42					
13	5,2	0,30					
16	5,2	0,21					
19	4,9	-0,079					
23	4,6	-0,35					
26	5,0	0,063					
29	4,6	-0,34					
32	4,9	0,00					
34	5,0	0,013					
35	4,9	-0,027					
36	4,8	-0,13					
38	4,8	-0,12					
40	5,1	0,13					
42	4,9	-0,044					
43	5,4	0,41					
44	5,3	0,39					
45	5,1	0,12					
46	5,0	0,053					
47	4,6	-0,32					
48	4,4	-0,52					
50	5,0	0,093					
53	5,1	0,13					
54	5,0	0,053					
55	4,9	-0,037					
65	4,5	-0,44					
68	5,1	0,10					
70	5,2	0,23					
71	4,2	-0,74					
72	5,1	0,17					
74	4,9	-0,059					
79	4,9	-0,027					
81	5,2	0,24					
87	4,8	-0,20					
88	4,7	-0,27					
89	4,9	-0,028					
90	5,2	0,30					
93	5,3	0,36					
97	4,9	-0,078					
98	5,1	0,15					
100	4,7	-0,28					
103	4,9	-0,052					

Consensus statistics

Consensus median, pg/g	4,9
Median all values pg/g	5,0
Consensus mean, pg/g	4,9
Standard deviation, pg/g	0,26
Relative standard deviation, %	5,2
No. of values reported	48
No. of values removed	1
No. of reported non-detects	0

1,2,3,7,8,9 HxCDD

Z-score: 1,2,3,7,8,9 HxCDD
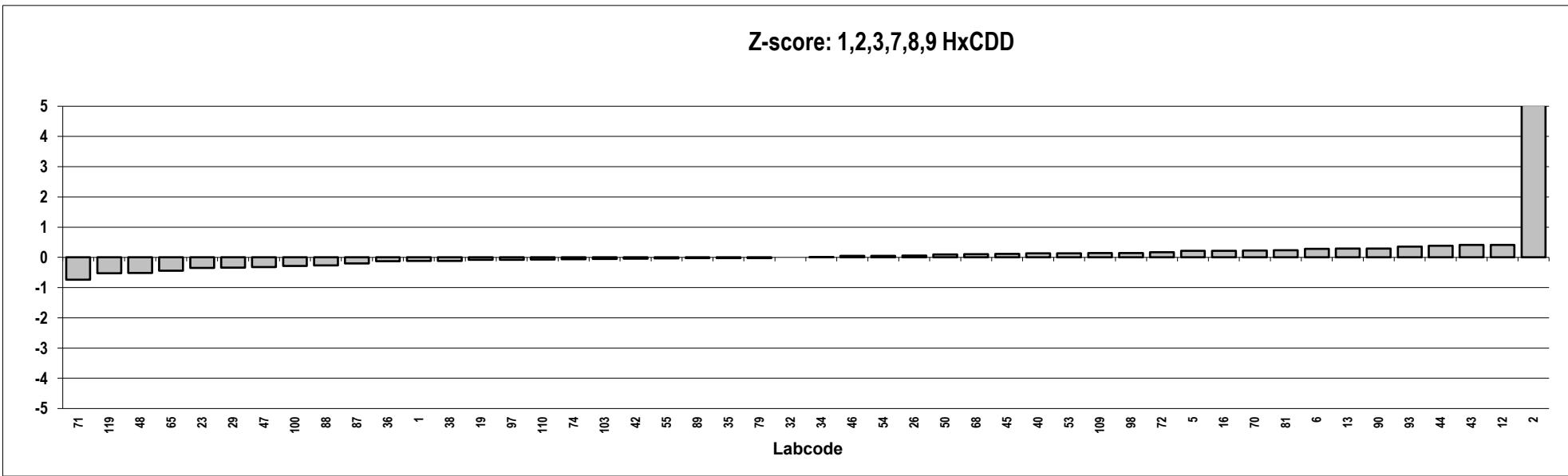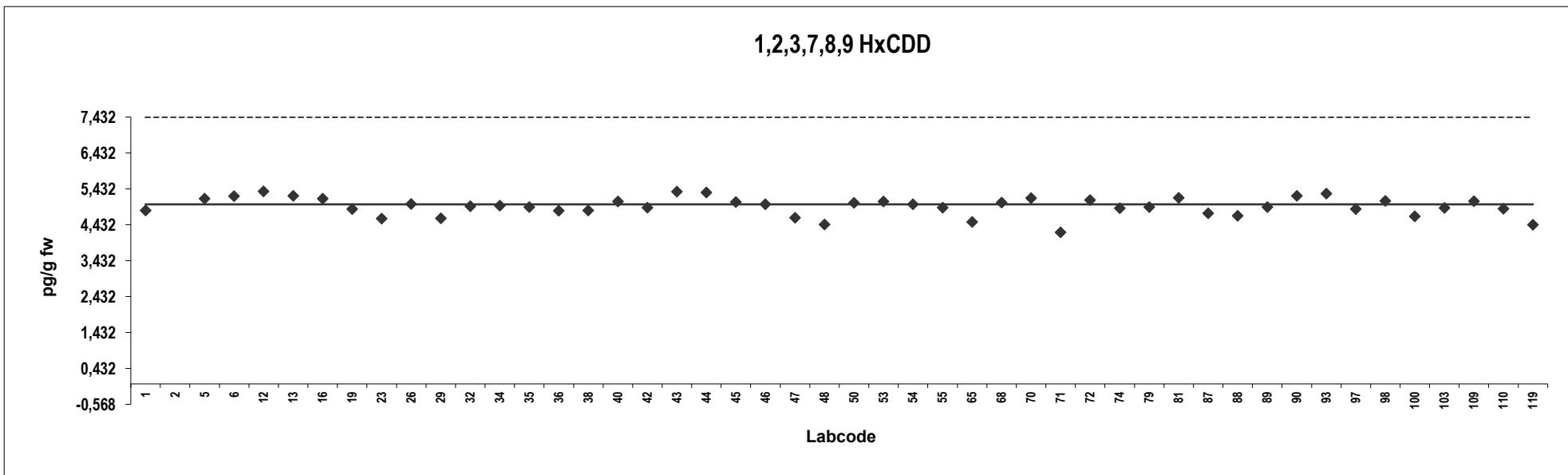
Analyte solution
Congener: 1,2,3,4,6,7,8 HpCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	4,6	-0,41		109	5,4	0,38	
2	38	33	Outlier	110	4,9	-0,12	
5	5,2	0,24		119	4,3	-0,66	
6	4,6	-0,40					
12	5,2	0,18					
13	6,1	1,2					
16	4,7	-0,26					
19	4,8	-0,15					
23	5,0	0,029					
26	5,0	0,014					
29	4,7	-0,23					
32	4,6	-0,37					
34	5,0	0,020					
35	4,9	-0,084					
36	5,2	0,20					
38	4,6	-0,40					
40	5,0	0,026					
42	4,8	-0,21					
43	5,1	0,084					
44	5,0	-0,011					
45	5,2	0,23					
46	5,2	0,18					
47	4,9	-0,081					
48	4,8	-0,18					
50	4,9	-0,041					
53	5,0	0,043					
54	5,0	0,021					
55	4,7	-0,22					
65	5,0	-0,021					
68	5,1	0,13					
70	5,5	0,49					
71	4,6	-0,34					
72	5,0	0,052					
74	5,3	0,34					
79	4,9	-0,084					
81	4,9	-0,081					
87	4,9	-0,11					
88	4,6	-0,36					
89	5,1	0,16					
90	5,1	0,16					
93	5,2	0,19					
97	5,1	0,12					
98	4,6	-0,33					
100	5,0	0,00					
103	5,1	0,11					

Consenus statistics

Consensus median, pg/g	5,0
Median all values pg/g	5,0
Consensus mean, pg/g	5,0
Standard deviation, pg/g	0,29
Relative standard deviation, %	5,9
No. of values reported	48
No. of values removed	1
No. of reported non-detects	0

1,2,3,4,6,7,8 HpCDD

Z-score: 1,2,3,4,6,7,8 HpCDD
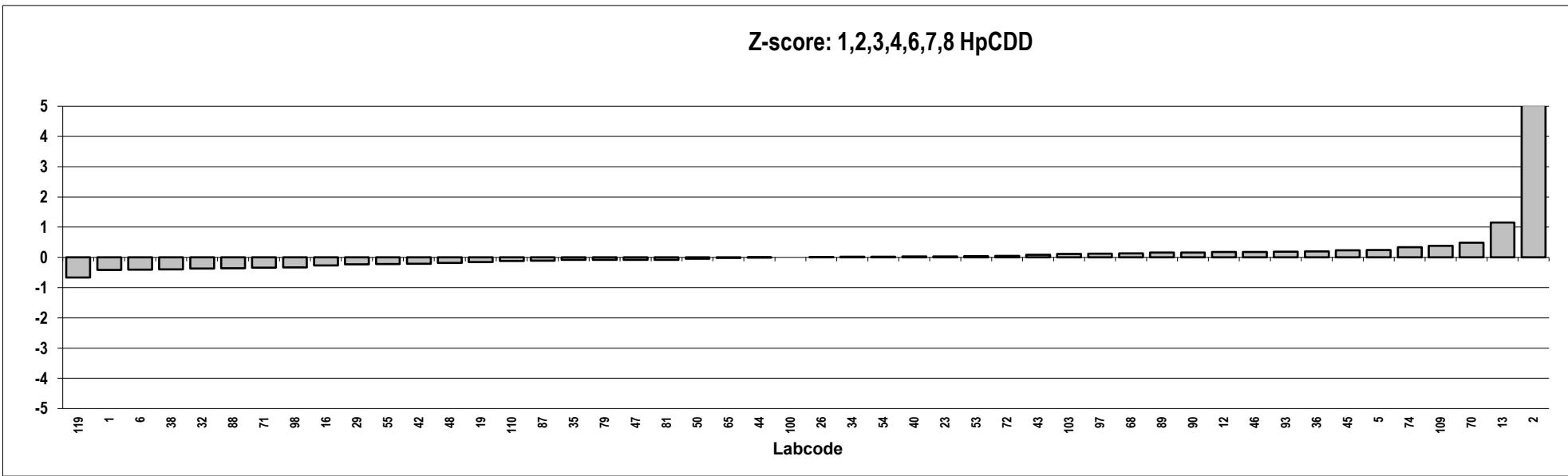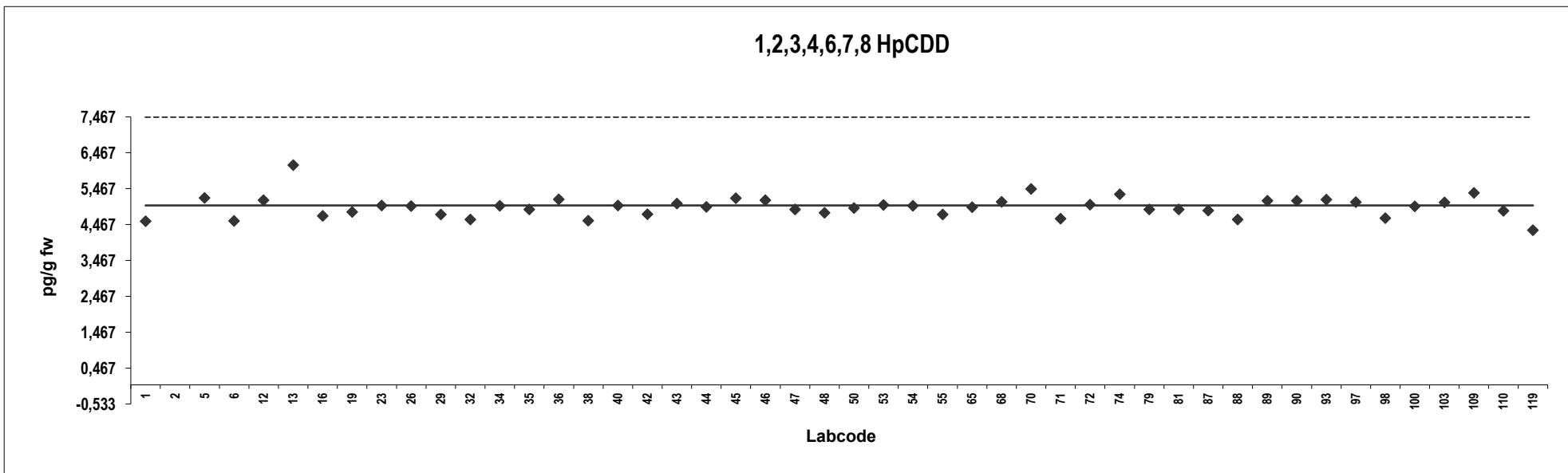
Analyte solution
Congener: OCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	11	0,35		109	10	0,27	
2	68	29	Outlier	110	9,7	-0,14	
5	10	0,19		119	8,1	-0,92	
6	8	-0,74					
12	10	0,14					
13	11	0,44					
16	9,5	-0,20					
19	9,5	-0,20					
23	11	0,29					
26	10	0,079					
29	9,6	-0,14					
32	9,6	-0,17					
34	10	0,28					
35	9,9	0,00					
36	11	0,34					
38	9,9	-0,0074					
40	9,6	-0,18					
42	9,0	-0,49					
43	10	0,11					
44	9,7	-0,10					
45	10	0,15					
46	10	0,037					
47	9,2	-0,37					
48	11	0,32					
50	9,9	-0,0086					
53	9,5	-0,23					
54	10	0,035					
55	4,7	-2,6	Outlier				
65	9,0	-0,45					
68	10	0,19					
70	10	0,099					
71	8,3	-0,83					
72	9,9	-0,022					
74	10	0,14					
79	9,9	0,00					
81	9,9	-0,0081					
87	9,4	-0,28					
88	8,8	-0,58					
89	9,7	-0,10					
90	10	0,087					
93	10	0,092					
97	10	0,11					
98	9,5	-0,21					
100	10	0,068					
103	10	0,038					

Consenus statistics

Consensus median, pg/g	9,9
Median all values pg/g	9,9
Consensus mean, pg/g	9,8
Standard deviation, pg/g	0,61
Relative standard deviation, %	6,2
No. of values reported	48
No. of values removed	2
No. of reported non-detects	0

OCDD

Z-score: OCDD
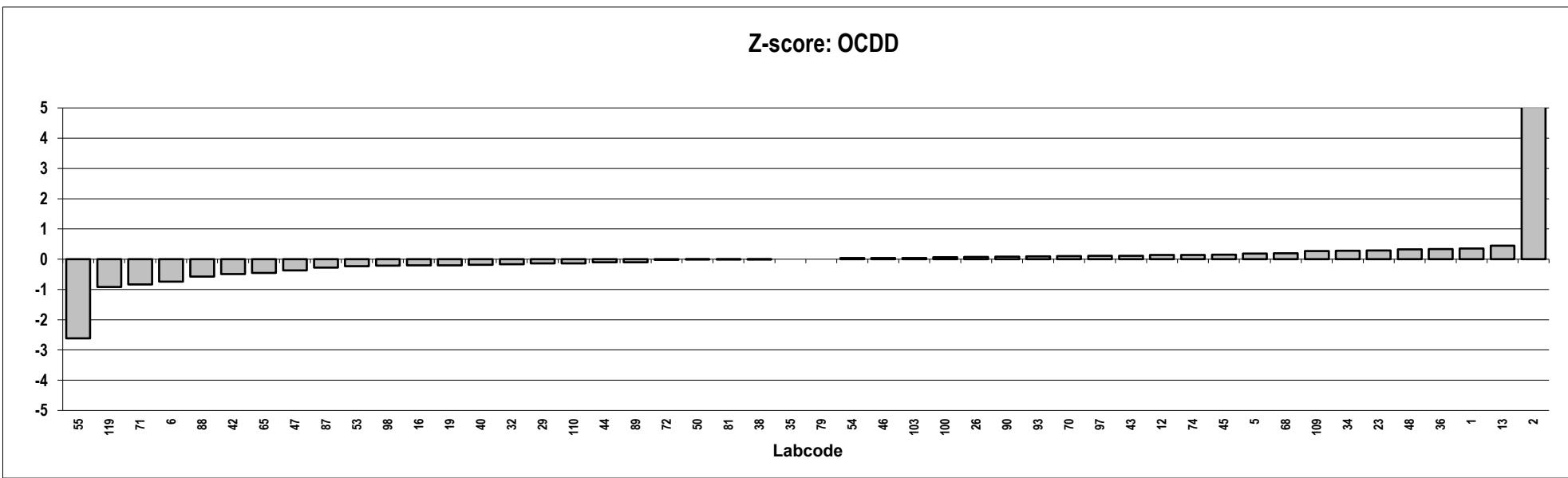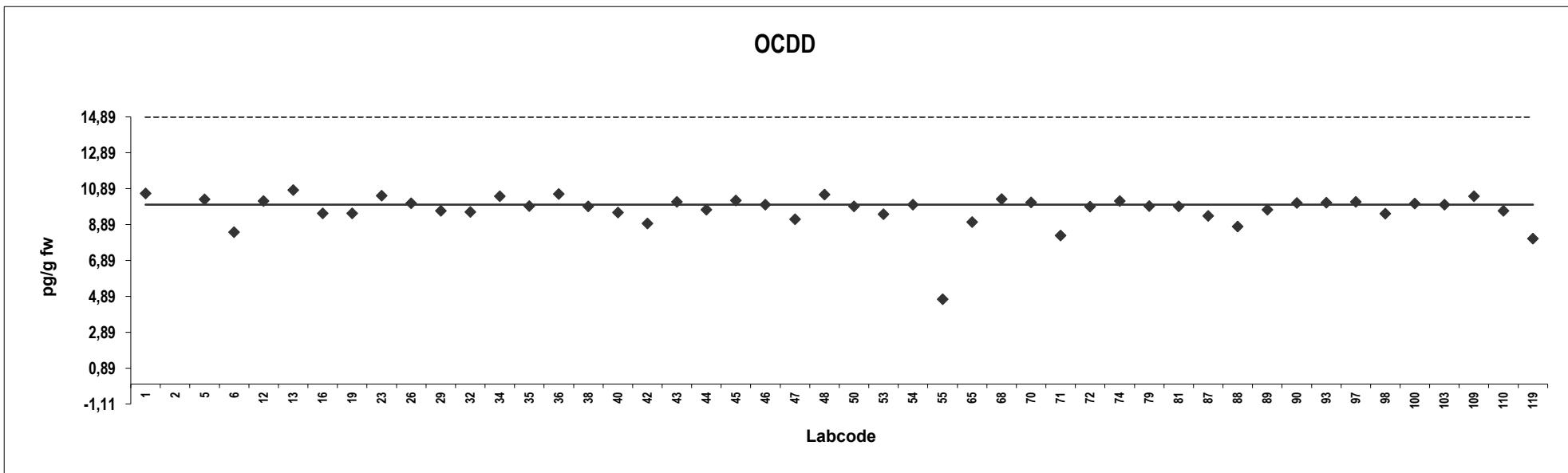
Analyte solution
Congener: 2,3,7,8 TCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	1,7	-0,81		109	2,1	0,24	
2	15	31	Outlier	110	1,8	-0,50	
5	1,9	-0,14		119	1,8	-0,47	
6	2,1	0,21					
12	2,1	0,19					
13	2,5	1,2					
16	2,0	0,0098					
19	2,0	-0,12					
23	1,9	-0,34					
26	2,0	-0,021					
29	1,9	-0,21					
32	1,9	-0,30					
34	2,2	0,45					
35	1,9	-0,21					
36	2,1	0,31					
38	1,8	-0,43					
40	2,1	0,17					
42	1,9	-0,31					
43	2,2	0,47					
44	2,0	0,0098					
45	2,1	0,36					
46	2,1	0,21					
47	2,2	0,51					
48	2,0	0,020					
50	2,0	-0,015					
53	1,9	-0,31					
54	2,0	0,031					
55	4,8	7,0	Outlier				
65	1,9	-0,25					
68	2,1	0,16					
70	2,1	0,30					
71	1,9	-0,16					
72	2,0	-0,062					
74	1,9	-0,22					
79	1,9	-0,21					
81	2,0	0,050					
87	2,1	0,14					
88	2,0	-0,071					
89	2,0	-0,015					
90	2,1	0,26					
93	2,1	0,21					
97	2,0	0,0078					
98	1,9	-0,24					
100	2,0	-0,0078					
103	2,0	0,10					

Consensus statistics

Consensus median, pg/g	2,0
Median all values pg/g	2,0
Consensus mean, pg/g	2,0
Standard deviation, pg/g	0,13
Relative standard deviation, %	6,6
No. of values reported	48
No. of values removed	2
No. of reported non-detects	0

2,3,7,8 TCDF

Z-score: 2,3,7,8 TCDF
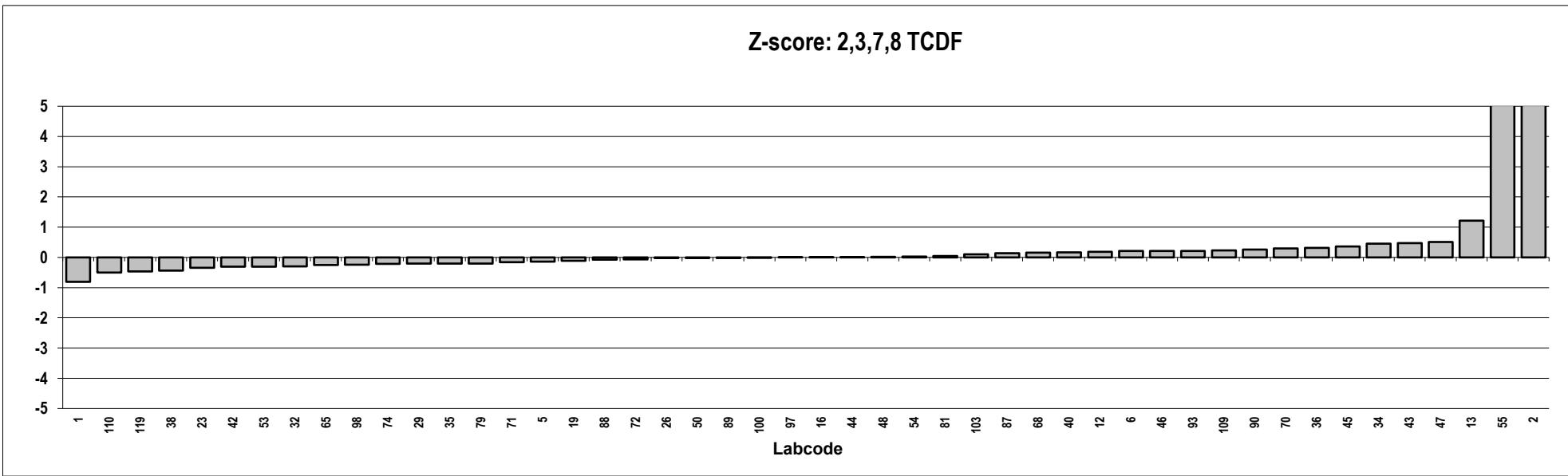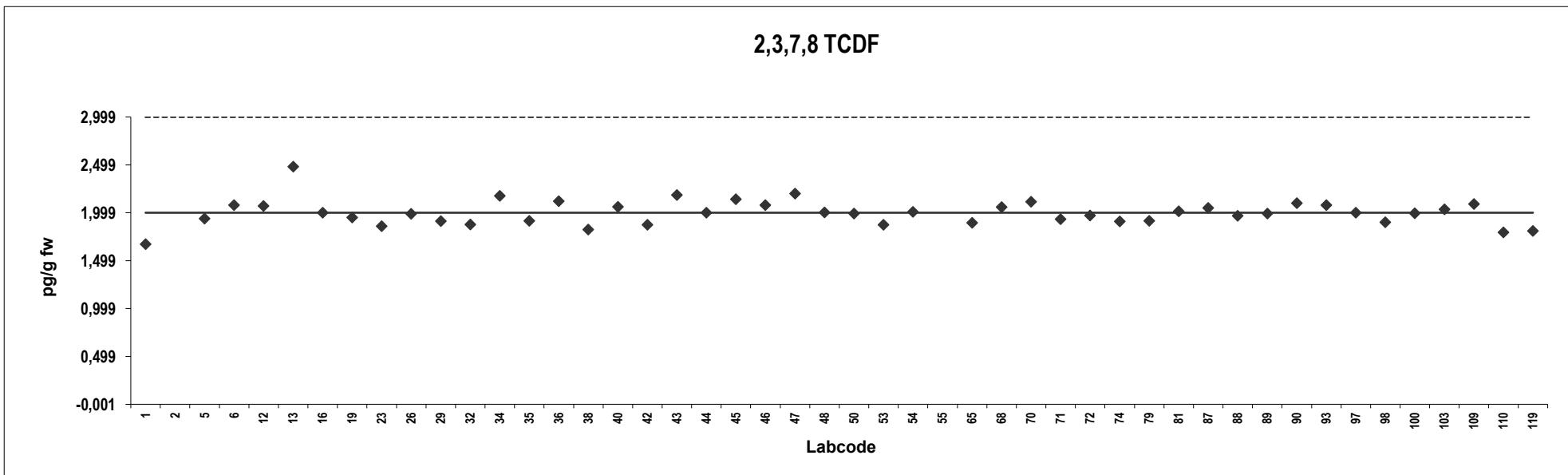
Analyte solution
Congener: 1,2,3,7,8 PeCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	4,9	-0,042		109	5,1	0,19	
2	41	36	Outlier	110	4,7	-0,22	
5	5,3	0,39		119	5,1	0,095	
6	5,4	0,44					
12	5,1	0,13					
13	5,9	0,91					
16	4,8	-0,21					
19	4,5	-0,42					
23	5,5	0,55					
26	5,0	0,0092					
29	4,6	-0,36					
32	5,1	0,19					
34	4,6	-0,37					
35	4,8	-0,14					
36	5,1	0,11					
38	4,9	-0,073					
40	5,0	0,0018					
42	4,8	-0,11					
43	5,0	0,080					
44	4,8	-0,13					
45	5,3	0,38					
46	5,0	0,085					
47	5,2	0,26					
48	4,9	-0,081					
50	4,9	-0,036					
53	5,0	0,045					
54	5,0	0,042					
55	9,9	5,0	Outlier				
65	4,8	-0,15					
68	5,1	0,11					
70	4,9	-0,089					
71	4,9	-0,084					
72	4,9	-0,019					
74	5,0	0,015					
79	4,8	-0,14					
81	4,8	-0,13					
87	4,9	-0,036					
88	4,8	-0,19					
89	4,6	-0,41					
90	5,4	0,45					
93	5,1	0,16					
97	4,8	-0,21					
98	5,0	0,033					
100	5,0	0,051					
103	5,0	-0,0018					

Consensus statistics

Consensus median, pg/g	5,0
Median all values pg/g	5,0
Consensus mean, pg/g	5,0
Standard deviation, pg/g	0,25
Relative standard deviation, %	5,1
No. of values reported	48
No. of values removed	2
No. of reported non-detects	0

1,2,3,7,8 PeCDF
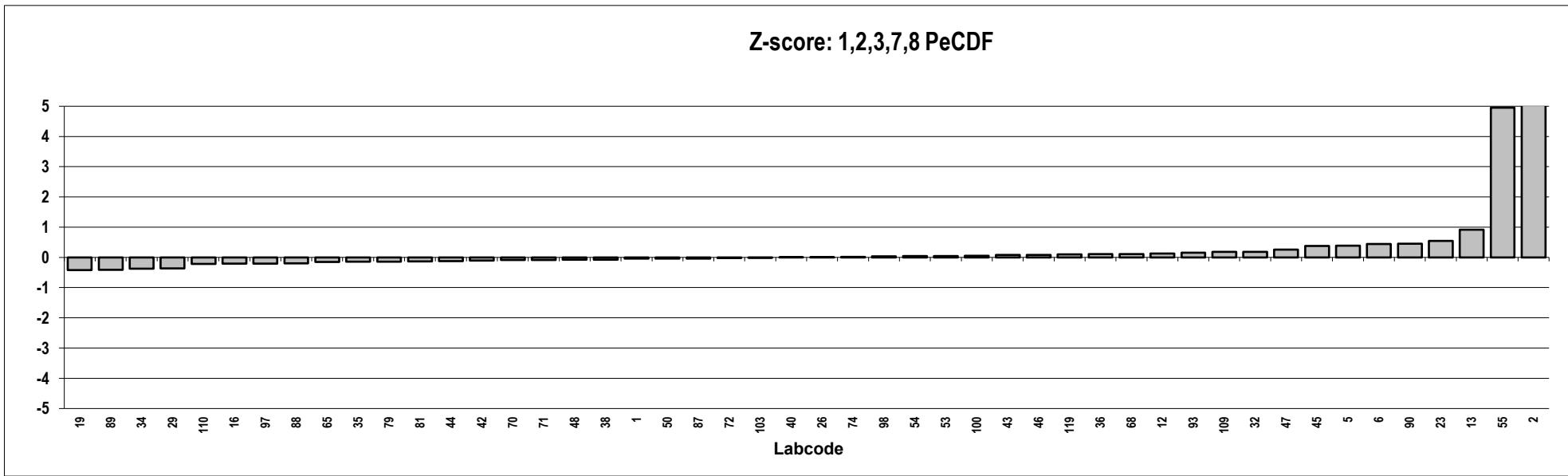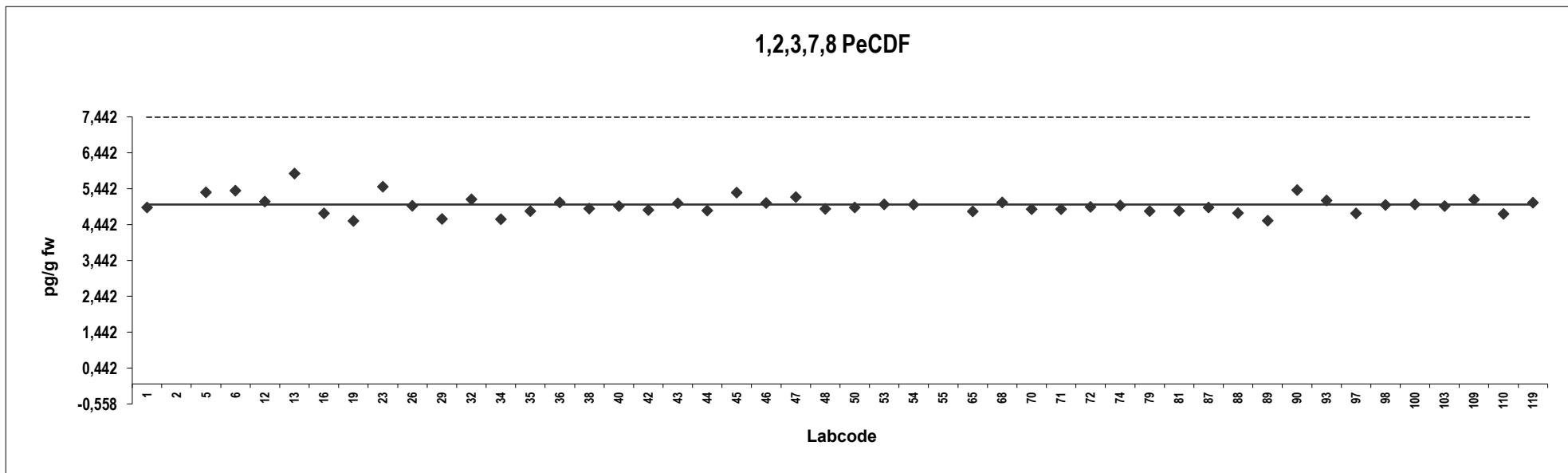
Analyte solution

Congener: 2,3,4,7,8 PeCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	4,6	-0,28		109	4,9	0,034	
2	39	35	Outlier	110	4,5	-0,40	
5	5,3	0,45		119	4,6	-0,32	
6	5,0	0,075					
12	5,3	0,38					
13	5,8	0,93					
16	4,6	-0,25					
19	4,8	-0,058					
23	4,6	-0,28					
26	4,9	0,042					
29	4,7	-0,23					
32	4,6	-0,25					
34	5,0	0,088					
35	4,9	0,071					
36	4,8	-0,068					
38	4,2	-0,70					
40	5,1	0,20					
42	4,5	-0,36					
43	5,2	0,31					
44	4,4	-0,50					
45	5,2	0,30					
46	4,9	-0,0067					
47	5,5	0,64					
48	4,4	-0,46					
50	4,9	0,034					
53	4,8	-0,11					
54	5,0	0,12					
55	2,0	-3,0	Outlier				
65	4,3	-0,63					
68	4,9	0,014					
70	4,8	-0,11					
71	4,7	-0,19					
72	4,8	-0,060					
74	4,9	0,0035					
79	4,9	0,071					
81	4,9	0,054					
87	4,9	0,055					
88	4,7	-0,22					
89	5,0	0,086					
90	4,8	-0,037					
93	5,0	0,13					
97	4,7	-0,20					
98	4,9	-0,0035					
100	5,0	0,15					
103	5,0	0,093					

Consensus statistics	
Consensus median, pg/g	4,9
Median all values pg/g	4,9
Consensus mean, pg/g	4,8
Standard deviation, pg/g	0,30
Relative standard deviation, %	6,1
No. of values reported	48
No. of values removed	2
No. of reported non-detects	0

2,3,4,7,8 PeCDF

Z-score: 2,3,4,7,8 PeCDF
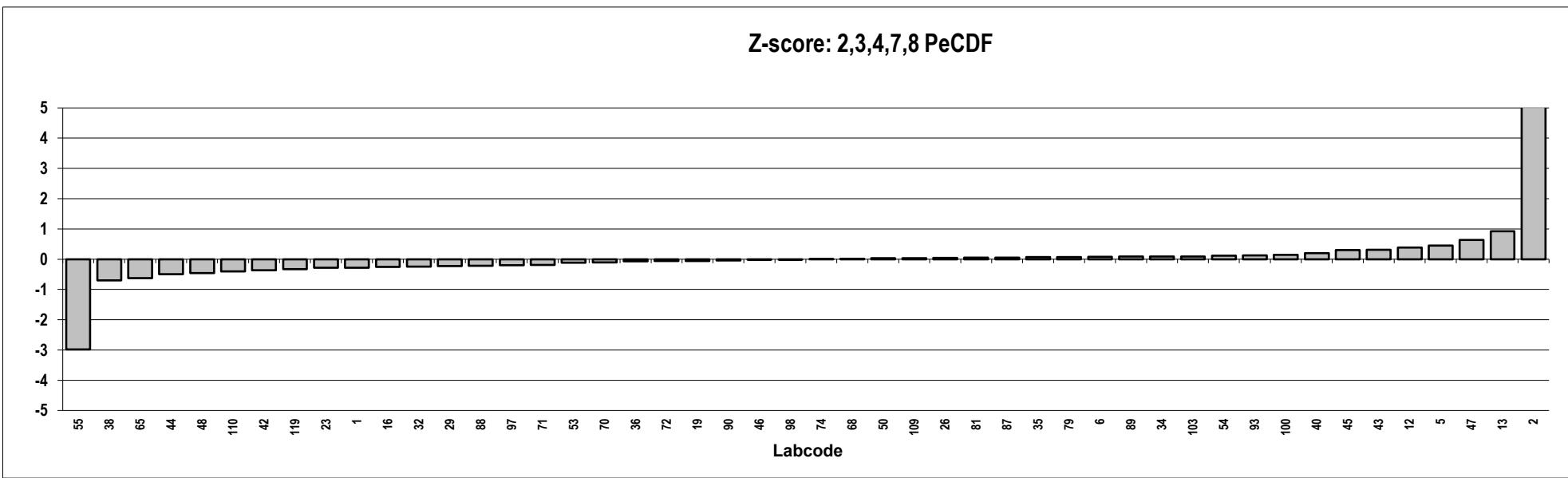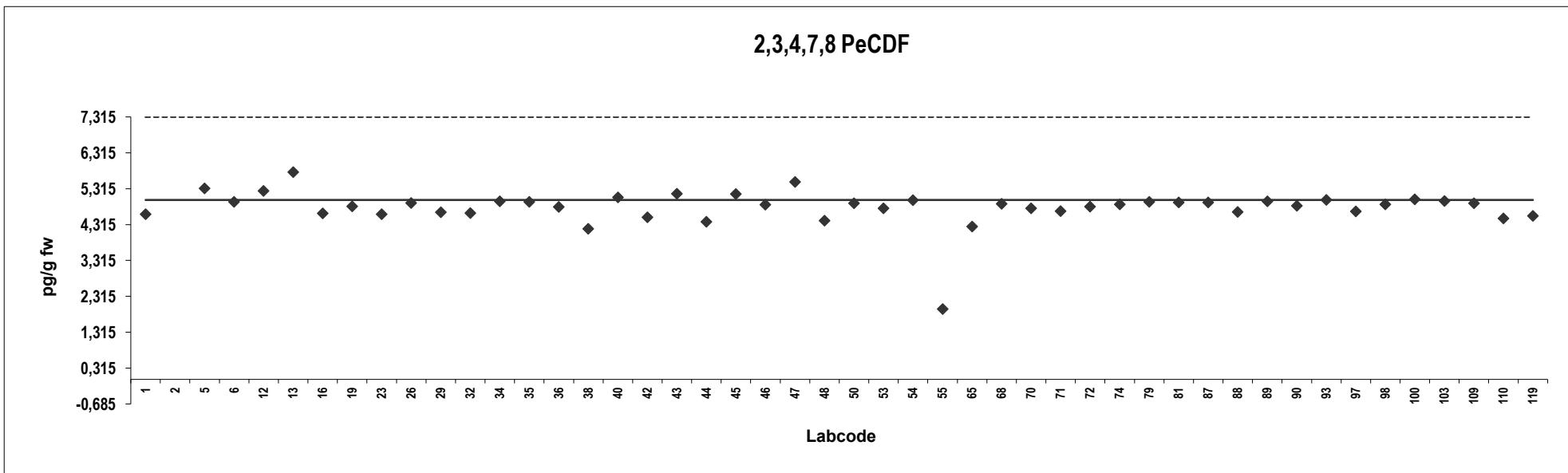
Analyte solution
Congener: 1,2,3,4,7,8 HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	4,5	-0,40		109	4,8	-0,10	
2	39	34	Outlier	110	4,7	-0,21	
5	4,8	-0,094		119	4,3	-0,61	
6	5,0	0,078					
12	5,2	0,22					
13	5,7	0,82					
16	4,9	-0,0030					
19	4,7	-0,29					
23	4,9	-0,033					
26	4,9	-0,051					
29	4,9	-0,055					
32	5,1	0,12					
34	4,8	-0,15					
35	4,9	0,0010					
36	5,5	0,54					
38	4,6	-0,33					
40	5,0	0,089					
42	4,6	-0,33					
43	5,3	0,32					
44	5,0	0,11					
45	5,3	0,38					
46	5,0	0,048					
47	4,8	-0,10					
48	4,9	-0,051					
50	4,9	-0,013					
53	5,1	0,12					
54	5,0	0,073					
55	5,5	0,57					
65	4,8	-0,15					
68	4,9	-0,084					
70	5,3	0,33					
71	4,7	-0,21					
72	4,8	-0,15					
74	5,0	0,027					
79	4,9	0,0010					
81	5,1	0,20					
87	4,6	-0,32					
88	4,6	-0,30					
89	5,0	0,078					
90	5,2	0,27					
93	5,1	0,19					
97	5,1	0,15					
98	5,1	0,13					
100	4,9	0,00					
103	4,9	-0,031					

Consenus statistics

Consensus median, pg/g	4,9
Median all values pg/g	4,9
Consensus mean, pg/g	4,9
Standard deviation, pg/g	0,26
Relative standard deviation, %	5,2
No. of values reported	48
No. of values removed	1
No. of reported non-detects	0

1,2,3,4,7,8 HxCDF

Z-score: 1,2,3,4,7,8 HxCDF
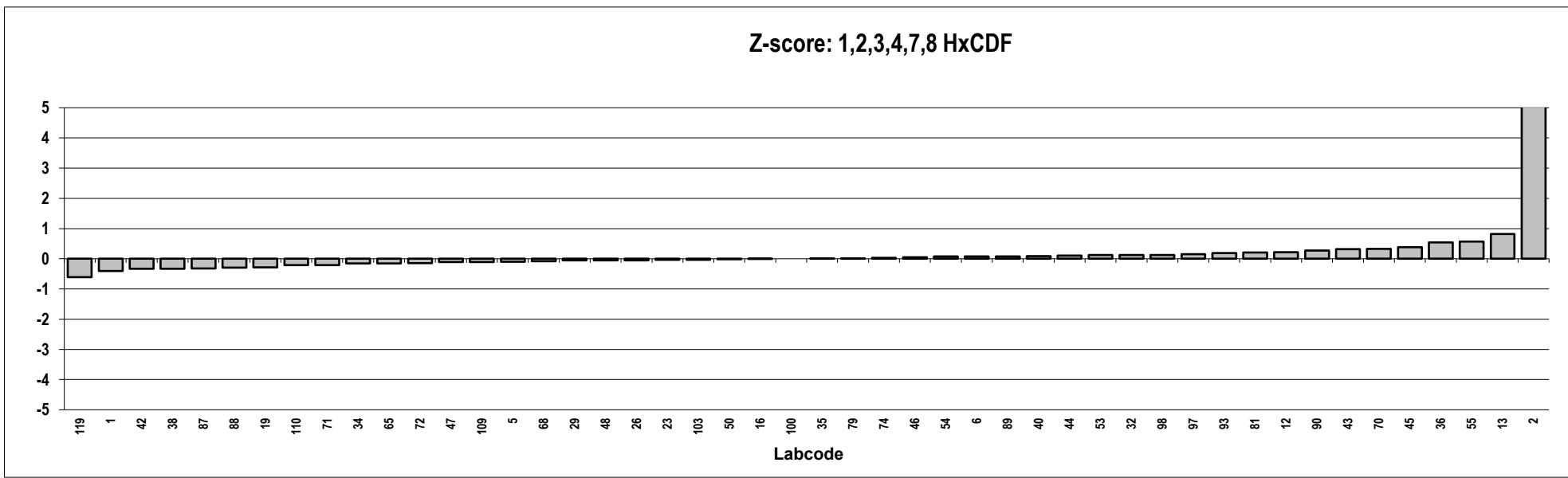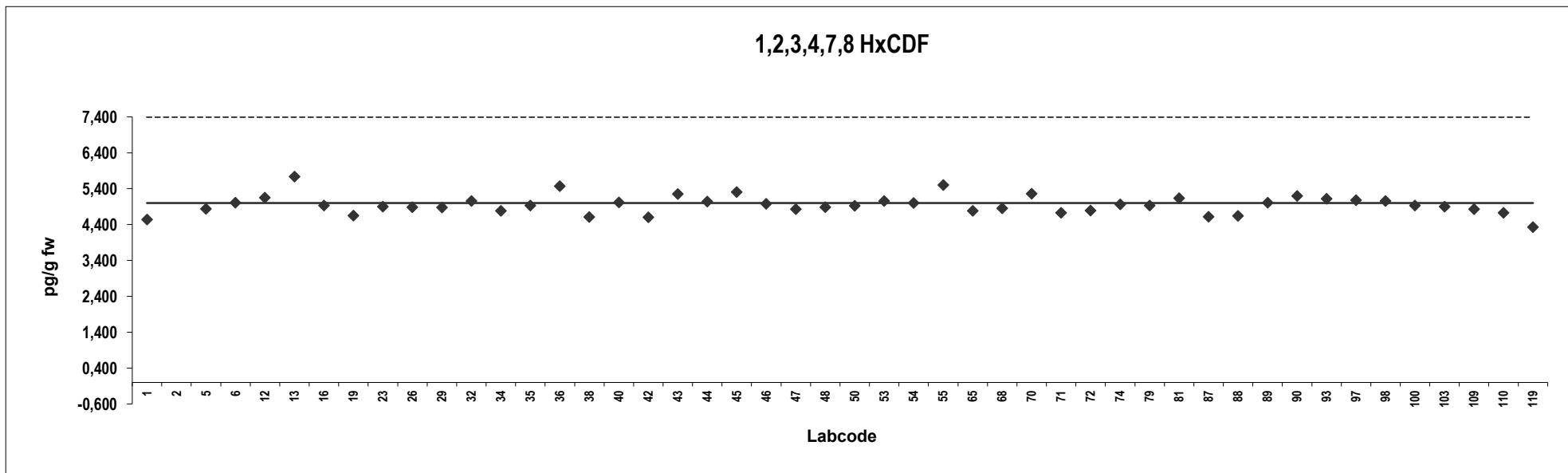
Analyte solution

Congener: 1,2,3,6,7,8 HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	4,4	-0,62		109	5,5	0,49	
2	38	33	Outlier	110	4,8	-0,19	
5	5,3	0,26		119	4,5	-0,54	
6	5,0	0,010					
12	5,0	0,020					
13	5,5	0,47					
16	4,8	-0,18					
19	4,7	-0,29					
23	5,0	0,00					
26	5,0	-0,037					
29	5,2	0,17					
32	5,2	0,19					
34	5,1	0,085					
35	5,0	-0,014					
36	5,2	0,20					
38	4,9	-0,11					
40	5,0	0,032					
42	5,0	0,014					
43	5,1	0,15					
44	5,0	0,020					
45	5,2	0,22					
46	4,9	-0,10					
47	5,4	0,42					
48	4,6	-0,35					
50	5,0	-0,050					
53	5,5	0,48					
54	5,0	-0,0038					
55	5,3	0,26					
65	4,9	-0,061					
68	4,9	-0,10					
70	5,3	0,33					
71	5,2	0,18					
72	5,0	-0,012					
74	5,2	0,15					
79	5,0	-0,014					
81	4,8	-0,20					
87	4,8	-0,22					
88	4,9	-0,13					
89	4,6	-0,37					
90	5,2	0,20					
93	5,3	0,27					
97	5,0	-0,029					
98	5,2	0,17					
100	5,0	-0,050					
103	4,9	-0,072					

Consensus statistics

Consensus median, pg/g	5,0
Median all values pg/g	5,0
Consensus mean, pg/g	5,0
Standard deviation, pg/g	0,24
Relative standard deviation, %	4,8
No. of values reported	48
No. of values removed	1
No. of reported non-detects	0

1,2,3,6,7,8 HxCDF

Z-score: 1,2,3,6,7,8 HxCDF
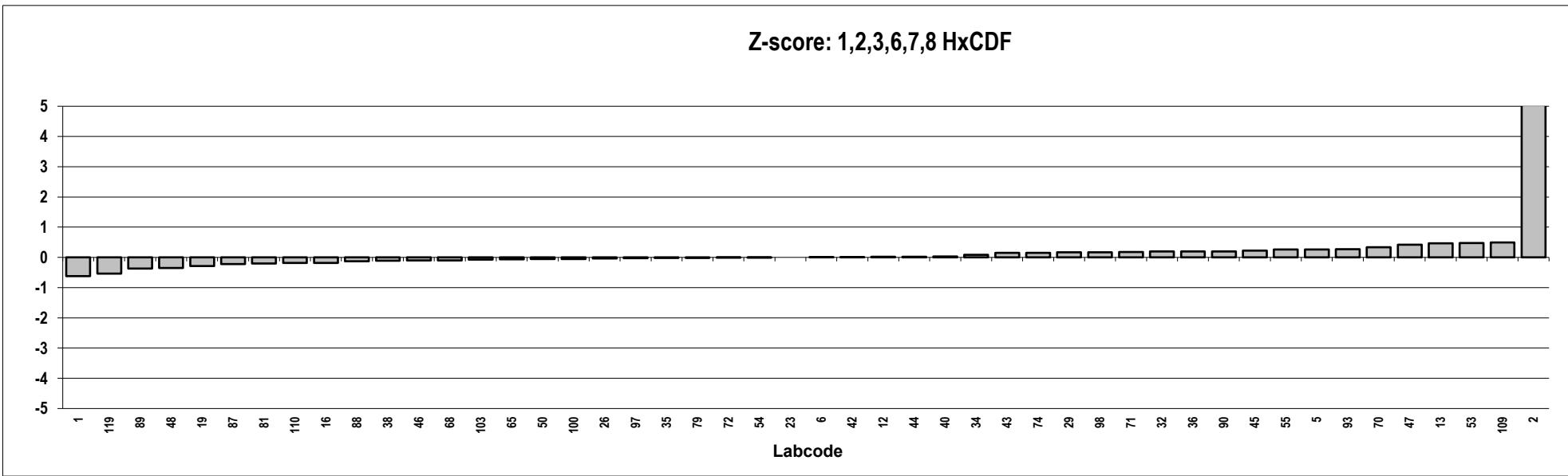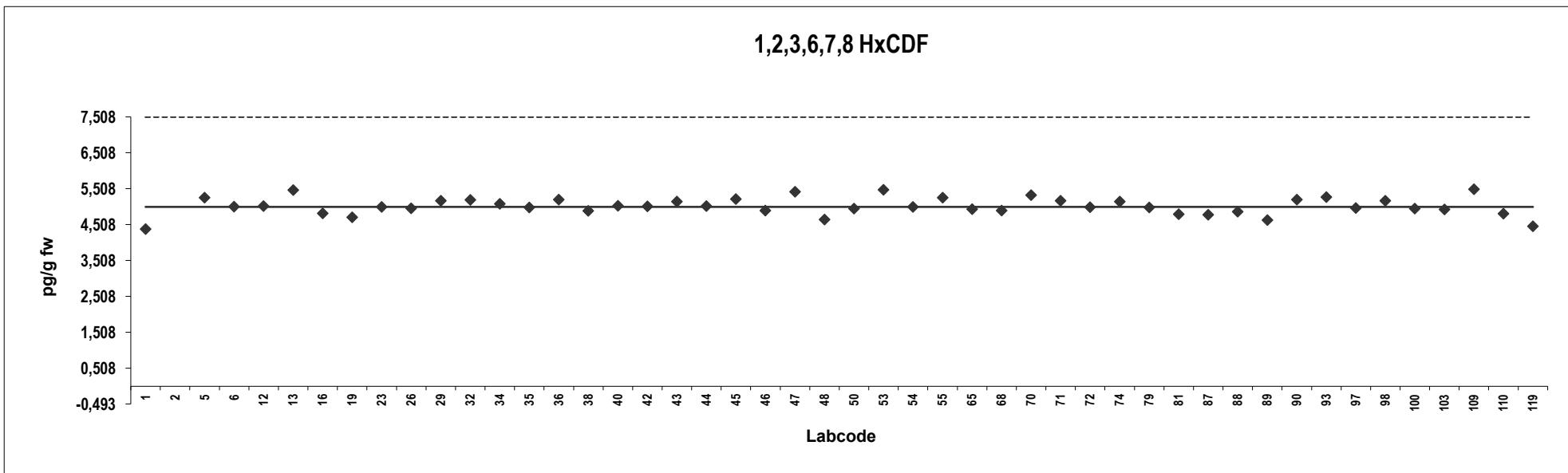
Analyte solution
Congener: 2,3,4,6,7,8 HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	4,2	-0,79		109	5,1	0,17	
2	35	30	Outlier	110	4,6	-0,36	
5	5,3	0,35		119	4,4	-0,55	
6	4,7	-0,21					
12	5,0	0,00					
13	5,9	0,93					
16	4,8	-0,19					
19	4,8	-0,16					
23	4,7	-0,25					
26	5,0	0,023					
29	5,0	0,033					
32	5,1	0,17					
34	5,1	0,19					
35	5,0	0,058					
36	5,2	0,22					
38	4,8	-0,16					
40	5,1	0,13					
42	4,9	-0,043					
43	5,1	0,17					
44	4,8	-0,19					
45	5,4	0,41					
46	4,9	-0,030					
47	5,3	0,34					
48	4,9	-0,024					
50	5,0	0,040					
53	5,1	0,19					
54	5,0	0,049					
55	4,7	-0,21					
65	5,1	0,11					
68	5,1	0,11					
70	5,1	0,10					
71	4,5	-0,49					
72	4,9	-0,046					
74	4,9	-0,081					
79	5,0	0,058					
81	4,8	-0,13					
87	4,8	-0,16					
88	4,8	-0,18					
89	4,7	-0,21					
90	5,0	0,051					
93	5,2	0,21					
97	4,9	-0,015					
98	5,1	0,20					
100	4,9	-0,028					
103	4,9	-0,039					

Consensus statistics	
Consensus median, pg/g	5,0
Median all values pg/g	5,0
Consensus mean, pg/g	4,9
Standard deviation, pg/g	0,27
Relative standard deviation, %	5,4
No. of values reported	48
No. of values removed	1
No. of reported non-detects	0
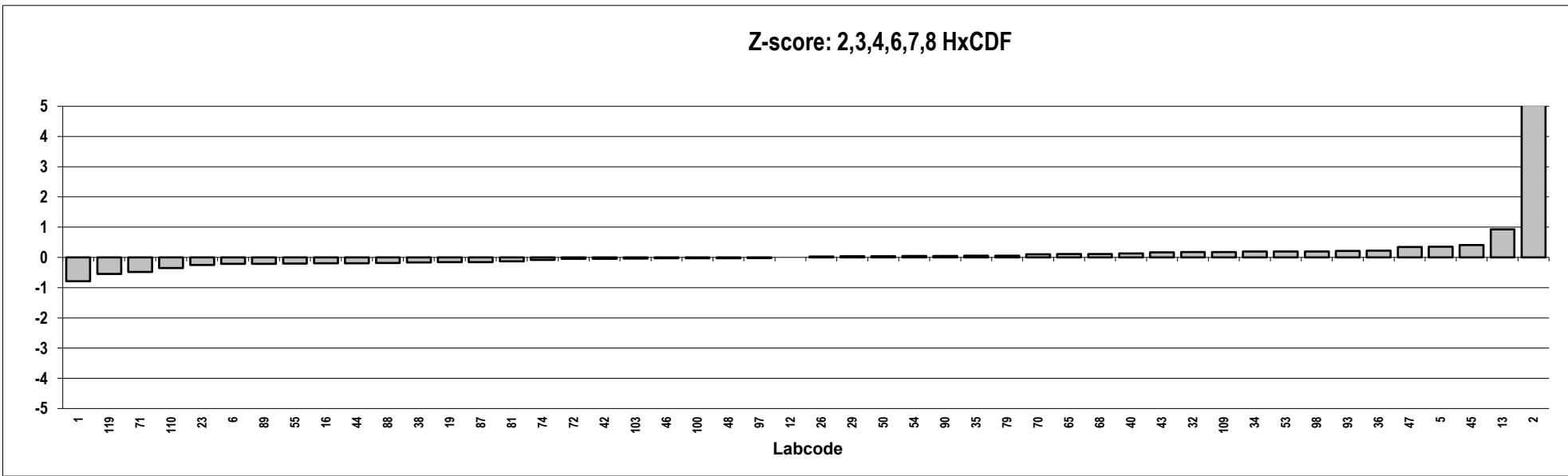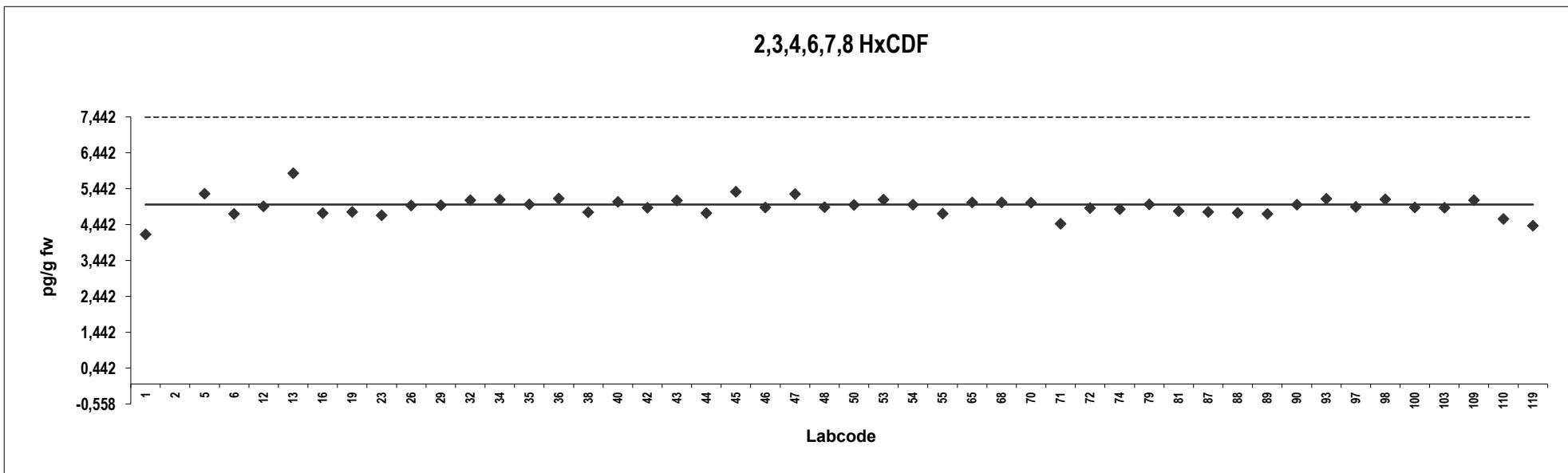
2,3,4,6,7,8 HxCDF

pg/g fw

Labcode

Z-score: 2,3,4,6,7,8 HxCDF

Labcode

Analyte solution

Congener: 1,2,3,7,8,9 HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	4,4	-0,59		109	5,1	0,10	
2	38	33	Outlier	110	5,1	0,13	
5	5,3	0,28		119	4,5	-0,48	
6	5,3	0,27					
12	5,0	-0,010					
13	5,4	0,40					
16	5,1	0,070					
19	4,6	-0,38					
23	3,6	-1,4					
26	5,0	-0,039					
29	4,7	-0,33					
32	5,9	0,85					
34	5,0	-0,032					
35	5,0	-0,054					
36	5,0	0,00					
38	5,2	0,16					
40	5,0	-0,057					
42	5,3	0,26					
43	4,9	-0,096					
44	5,1	0,090					
45	5,1	0,12					
46	5,0	0,020					
47	5,4	0,34					
48	4,6	-0,43					
50	5,1	0,050					
53	5,3	0,25					
54	5,0	-0,00025					
55	5,0	-0,057					
65	4,9	-0,13					
68	5,0	0,020					
70	5,1	0,085					
71	4,7	-0,35					
72	5,0	-0,014					
74	5,0	-0,020					
79	5,0	-0,054					
81	5,0	0,037					
87	4,9	-0,15					
88	4,8	-0,24					
89	5,6	0,59					
90	5,3	0,29					
93	5,1	0,13					
97	4,7	-0,34					
98	5,2	0,22					
100	4,9	-0,066					
103	5,0	0,025					

Consensus statistics

Consensus median, pg/g	5,0
Median all values pg/g	5,0
Consensus mean, pg/g	5,0
Standard deviation, pg/g	0,34
Relative standard deviation, %	6,7
No. of values reported	48
No. of values removed	1
No. of reported non-detects	0

1,2,3,7,8,9 HxCDF

Z-score: 1,2,3,7,8,9 HxCDF
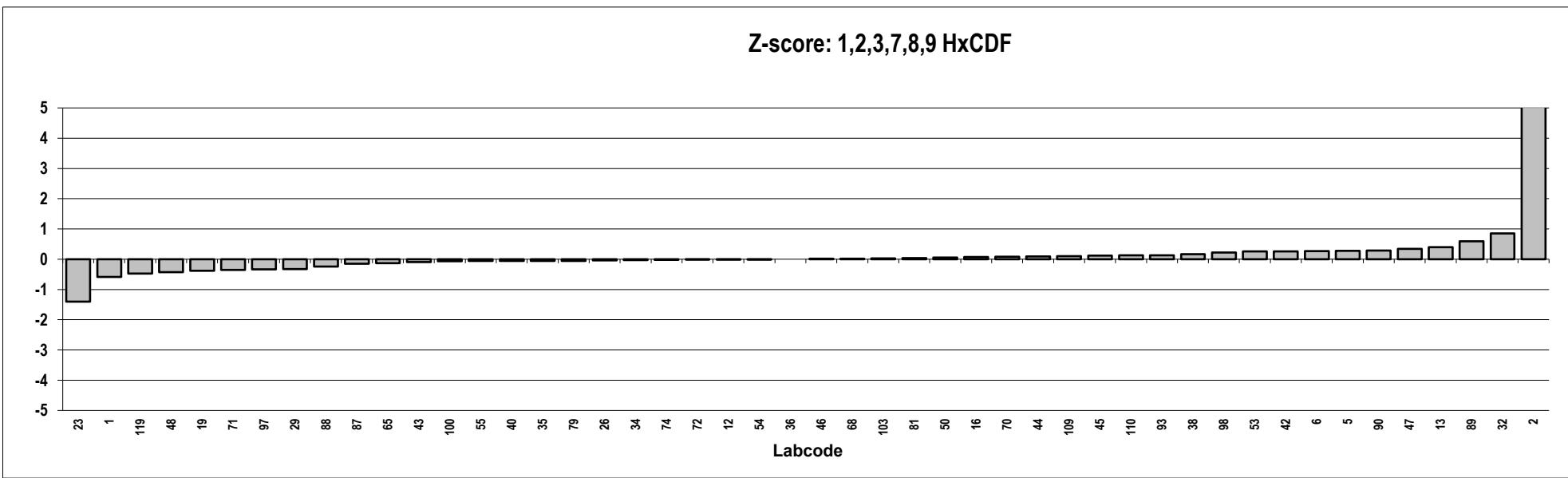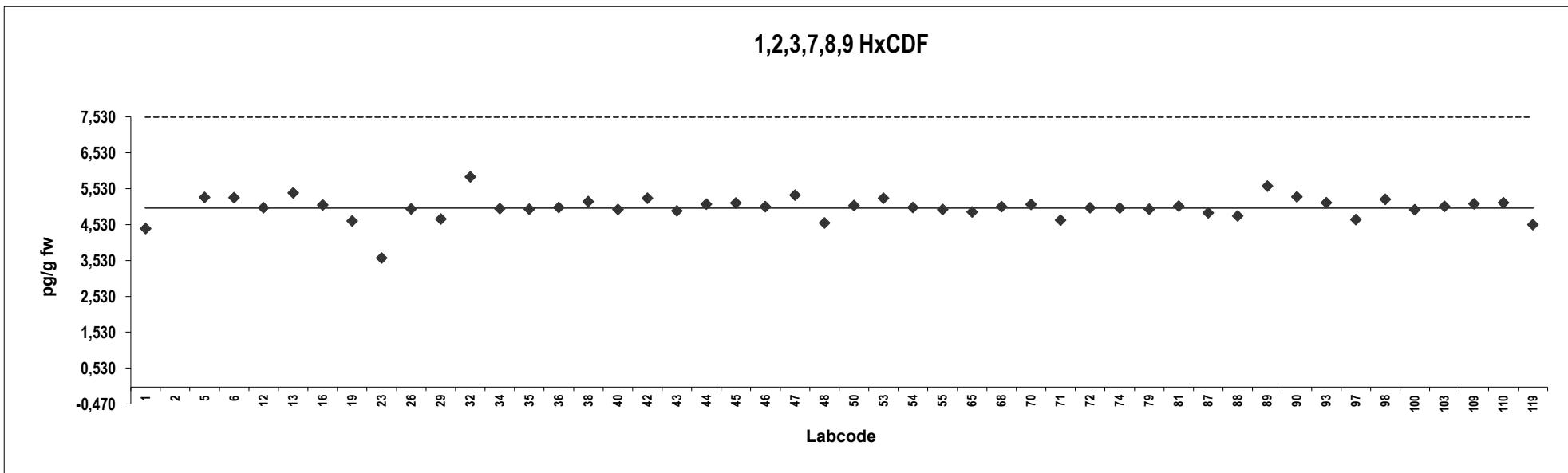
Analyte solution
Congener: 1,2,3,4,6,7,8 HpCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	4,2	-0,69		109	5,4	0,51	
2	36	32	Outlier	110	4,9	0,00	
5	5,3	0,36		119	4,6	-0,32	
6	5,2	0,26					
12	5,0	0,11					
13	6,0	1,1					
16	4,7	-0,22					
19	4,6	-0,35					
23	5,8	0,89					
26	4,9	-0,025					
29	4,7	-0,22					
32	4,7	-0,27					
34	4,7	-0,28					
35	4,9	-0,041					
36	5,1	0,18					
38	4,5	-0,42					
40	4,9	-0,0091					
42	4,8	-0,13					
43	5,2	0,23					
44	5,1	0,12					
45	5,4	0,48					
46	5,1	0,19					
47	4,7	-0,23					
48	4,8	-0,15					
50	5,0	0,034					
53	5,0	0,073					
54	5,0	0,079					
55	4,7	-0,21					
65	4,5	-0,48					
68	5,4	0,45					
70	4,9	0,014					
71	4,3	-0,59					
72	5,0	0,076					
74	5,1	0,17					
79	4,9	-0,041					
81	5,0	0,058					
87	5,0	0,064					
88	4,7	-0,23					
89	4,1	-0,80					
90	5,4	0,48					
93	5,3	0,42					
97	4,8	-0,098					
98	4,7	-0,23					
100	5,0	0,058					
103	4,9	-0,0083					

Consenus statistics	
Consensus median, pg/g	4,9
Median all values pg/g	4,9
Consensus mean, pg/g	4,9
Standard deviation, pg/g	0,36
Relative standard deviation, %	7,3
No. of values reported	48
No. of values removed	1
No. of reported non-detects	0

1,2,3,4,6,7,8 HpCDF

Z-score: 1,2,3,4,6,7,8 HpCDF
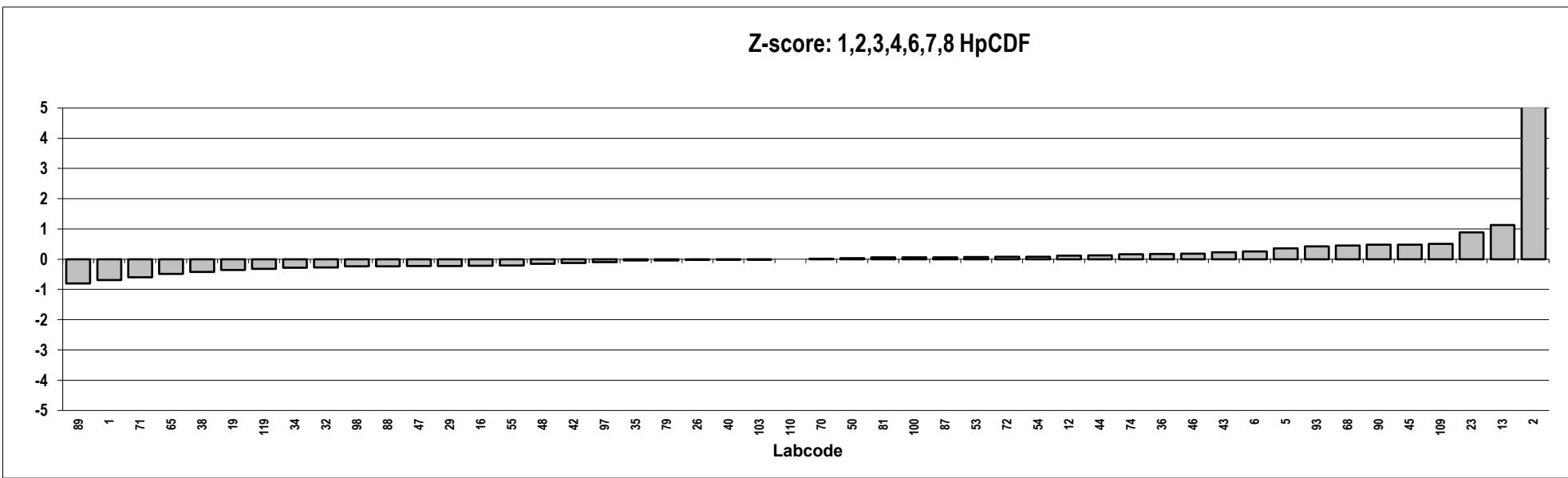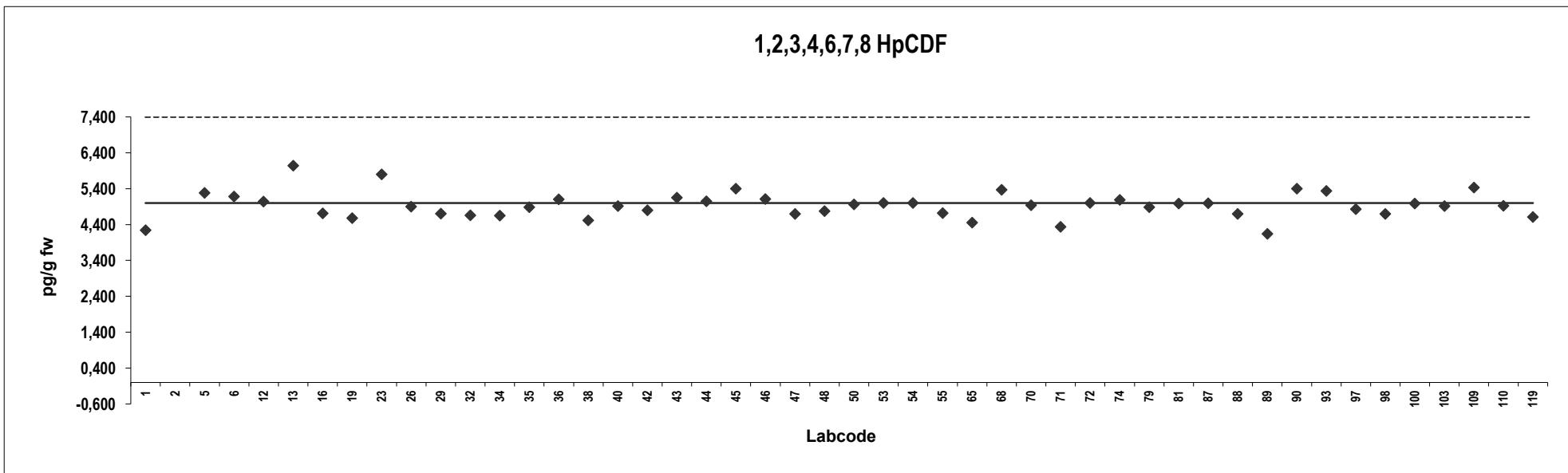
Analyte solution
Congener: 1,2,3,4,7,8,9 HpCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	4,8	-0,11		109	5,0	0,061	
2	35	30	Outlier	110	4,8	-0,098	
5	4,9	0,00		119	4,6	-0,34	
6	4,9	-0,041					
12	4,8	-0,11					
13	5,5	0,58					
16	4,5	-0,39					
19	4,6	-0,37					
23	4,2	-0,72					
26	4,9	0,013					
29	4,7	-0,17					
32	4,5	-0,43					
34	5,0	0,12					
35	5,1	0,15					
36	5,0	0,071					
38	4,5	-0,38					
40	5,1	0,17					
42	4,9	0,017					
43	5,0	0,13					
44	4,9	-0,041					
45	5,2	0,30					
46	5,0	0,13					
47	4,8	-0,14					
48	4,7	-0,22					
50	5,0	0,081					
53	5,7	0,85					
54	5,0	0,11					
55	4,9	-0,010					
65	4,9	-0,0078					
68	5,0	0,13					
70	5,1	0,15					
71	4,0	-0,88					
72	4,8	-0,12					
74	4,8	-0,10					
79	5,1	0,15					
81	5,0	0,042					
87	4,7	-0,23					
88	4,5	-0,40					
89	5,2	0,31					
90	5,1	0,19					
93	5,1	0,16					
97	4,3	-0,62					
98	4,7	-0,23					
100	5,0	0,12					
103	5,0	0,046					

Consensus statistics

Consensus median, pg/g	4,9
Median all values pg/g	4,9
Consensus mean, pg/g	4,9
Standard deviation, pg/g	0,30
Relative standard deviation, %	6,1
No. of values reported	48
No. of values removed	1
No. of reported non-detects	0

1,2,3,4,7,8,9 HpCDF

pg/g fw

Labcode

Z-score: 1,2,3,4,7,8,9 HpCDF
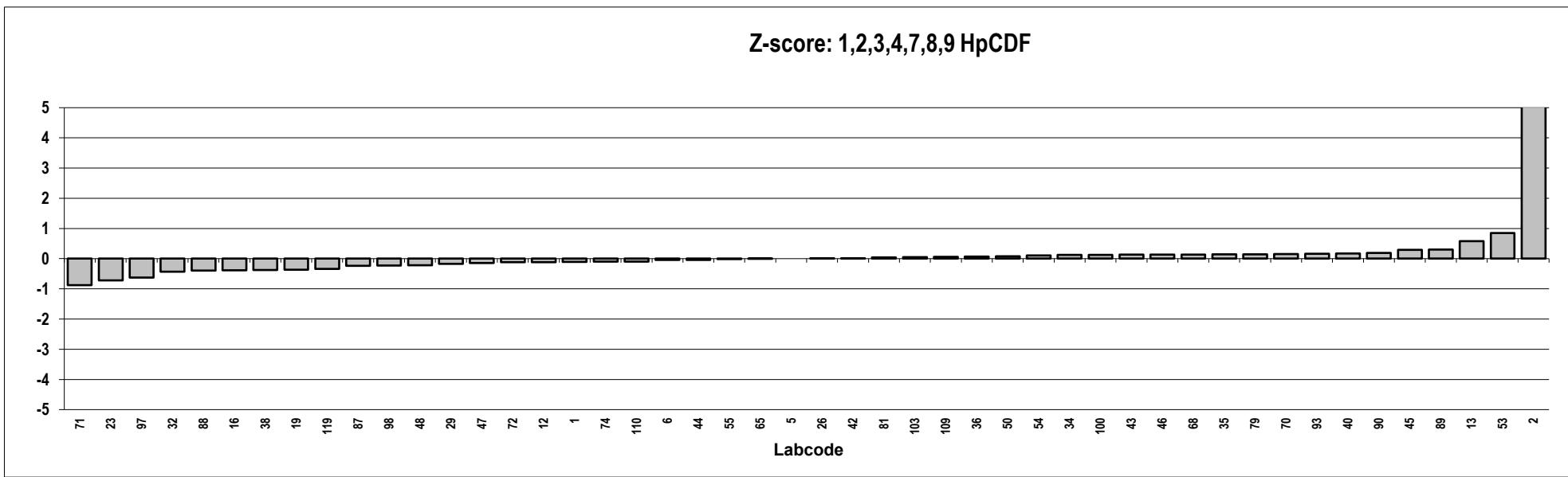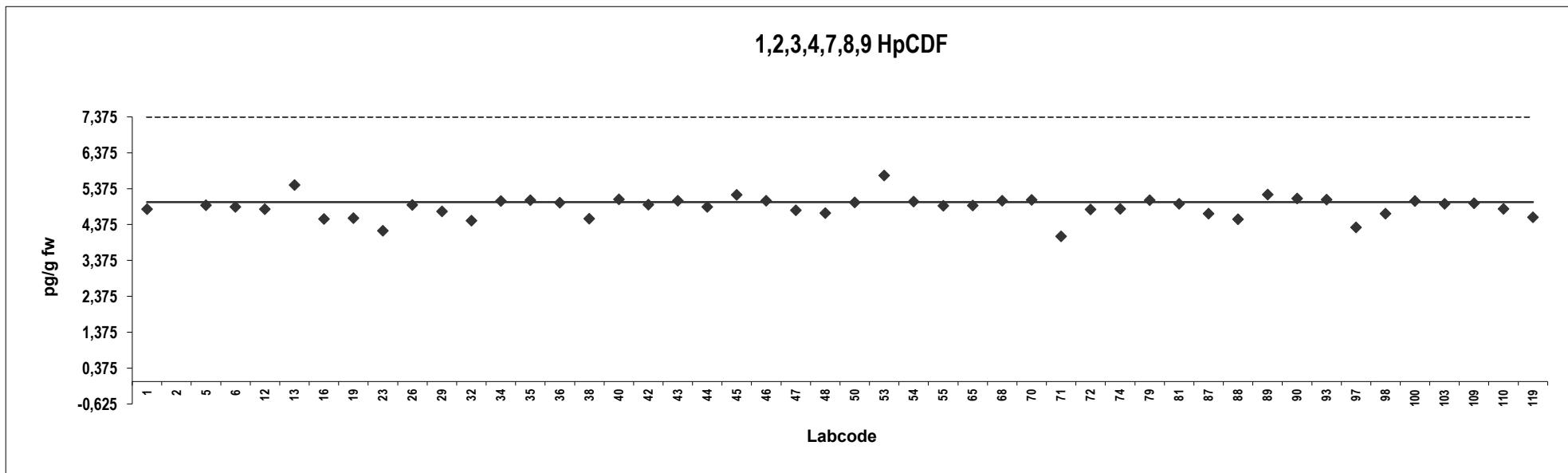
Labcode

Analyte solution

Congener: OCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	9,5	-0,21		109	9,4	-0,29	
2	76	33	Outlier	110	10	0,036	
5	11	0,27		119	8,3	-0,83	
6	8,1	-0,93					
12	10	0,12					
13	11	0,42					
16	8,8	-0,60					
19	9,6	-0,17					
23	8,4	-0,78					
26	10	0,00					
29	9,6	-0,20					
32	9,0	-0,46					
34	8,5	-0,75					
35	10	0,033					
36	10	0,022					
38	9,9	-0,025					
40	10	0,18					
42	9,9	-0,0072					
43	11	0,29					
44	10	0,022					
45	9,7	-0,14					
46	9,8	-0,083					
47	9,6	-0,19					
48	10	0,12					
50	10	0,012					
53	10	0,23					
54	10	0,035					
55	8,2	-0,87					
65	9,3	-0,31					
68	11	0,68					
70	10	0,10					
71	8,6	-0,70					
72	10	0,044					
74	9,8	-0,083					
79	10	0,033					
81	9,8	-0,09					
87	9,4	-0,27					
88	8,9	-0,55					
89	12	0,82					
90	11	0,32					
93	10	0,062					
97	10	0,045					
98	10	0,060					
100	9,5	-0,23					
103	10	0,070					

Consensus statistics

Consensus median, pg/g	10
Median all values pg/g	10
Consensus mean, pg/g	9,8
Standard deviation, pg/g	0,75
Relative standard deviation, %	7,7
No. of values reported	48
No. of values removed	1
No. of reported non-detects	0

OCDF

Z-score: OCDF
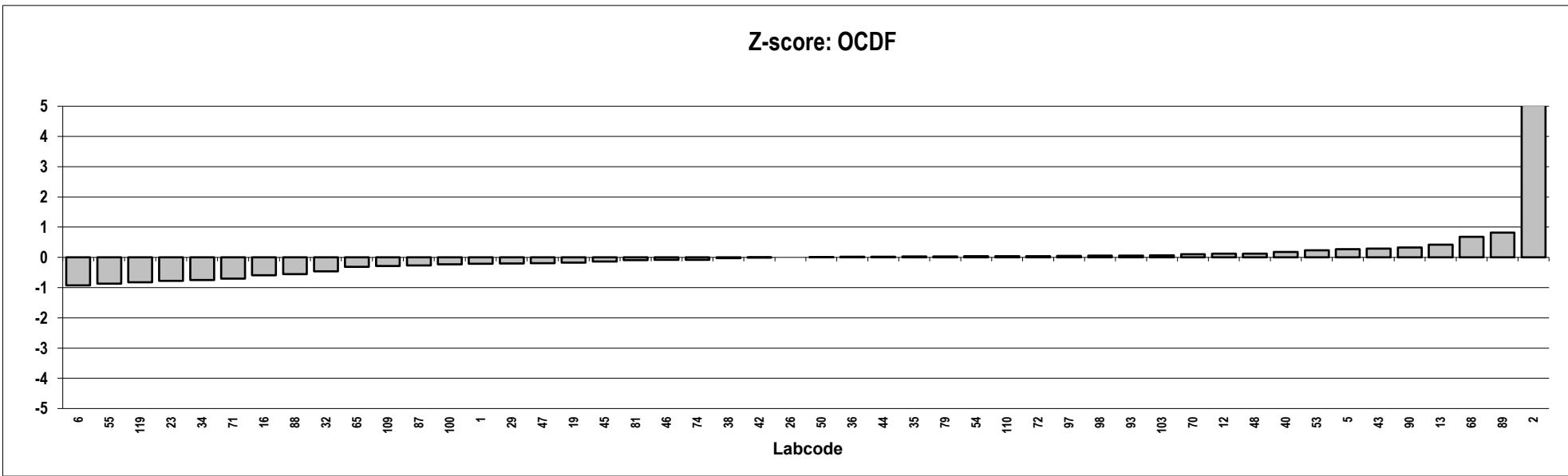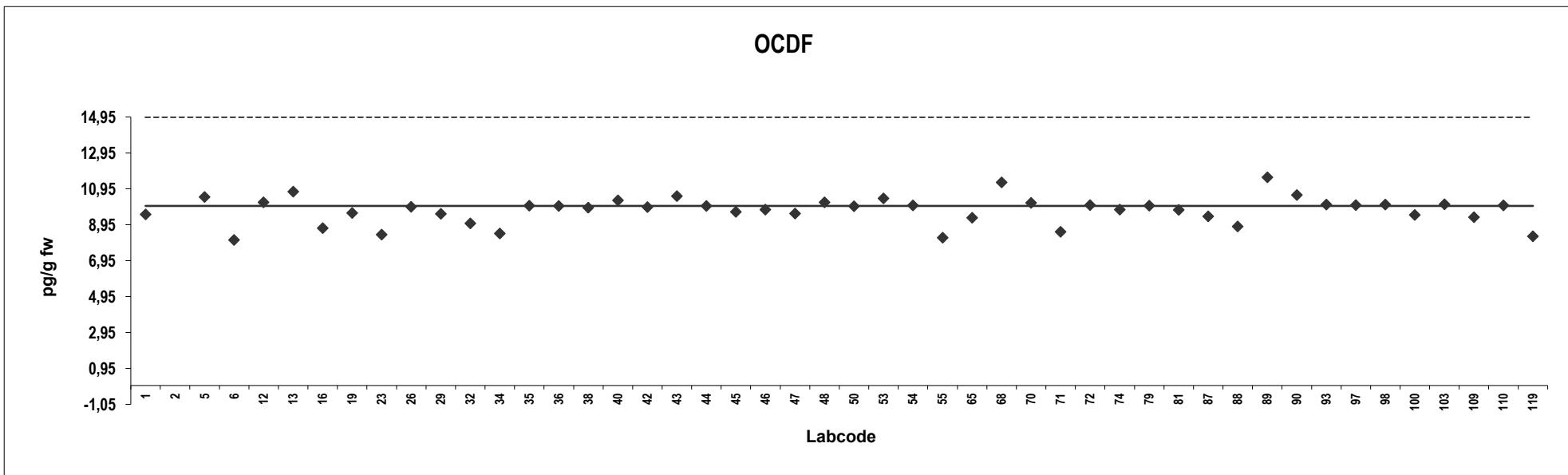
Analyte solution
Congener: PCB 77

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	9,7	-0,12		119	8,3	-0,81	
2	9,3	-0,35					
5	10	0,021					
6	8,7	-0,64					
12	10	0,082					
13	7,1	-1,4					
16	9,6	-0,15					
19	9,7	-0,12					
23	10	0,18					
26	10	0,14					
29	9,2	-0,35					
32	12	0,95					
34	9,1	-0,44					
35	9,9	-0,021					
36	10	0,18					
38	9,6	-0,16					
40	10	0,043					
42	11	0,43					
43	10	0,052					
44	9,1	-0,40					
45	11	0,45					
46	9,9	-0,024					
48	8,9	-0,53					
50	10	0,17					
53	10	0,23					
54	10	0,053					
55	9,5	-0,21					
65	9,4	-0,29					
68	10	0,14					
70	11	0,44					
72	10	0,040					
74	10	0,18					
79	9,9	-0,021					
81	9,6	-0,15					
87	9,6	-0,19					
88	9,5	-0,20					
89	9,8	-0,079					
90	11	0,33					
93	10	0,21					
97	10	0,18					
98	11	0,51					
100	9,5	-0,24					
103	10	0,22					
109	10	0,046					
110	9,7	-0,12					

Consensus statistics	
Consensus median, pg/g	9,9
Median all values pg/g	9,9
Consensus mean, pg/g	9,9
Standard deviation, pg/g	0,76
Relative standard deviation, %	7,7
No. of values reported	46
No. of values removed	0
No. of reported non-detects	0

PCB 77

Z-score: PCB 77
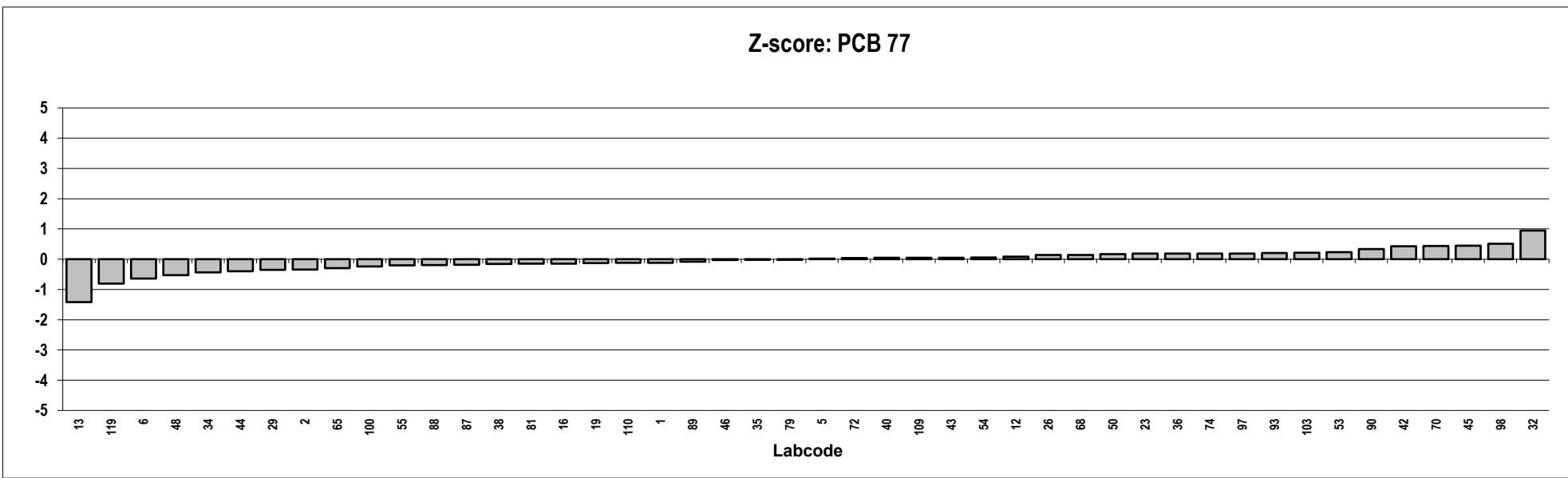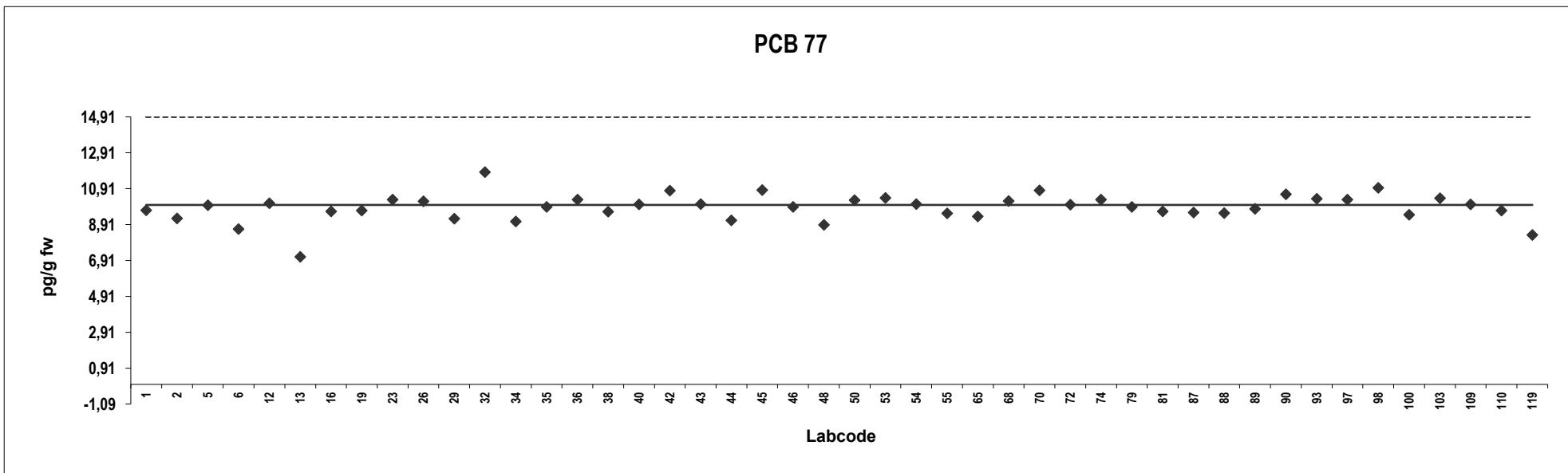
Analyte solution
Congener: PCB 126

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	9,4	-0,26		119	8,8	-0,57	
2	8,5	-0,71					
5	9,8	-0,074					
6	8,7	-0,64					
12	12	0,93					
13	7,0	-1,5					
16	9,6	-0,18					
19	9,2	-0,40					
23	11	0,32					
26	10	0,032					
29	10	0,22					
32	11	0,72					
34	8,0	-0,98					
35	10	-0,0027					
36	10	0,072					
38	9,6	-0,17					
40	9,9	-0,030					
42	11	0,29					
43	10	0,0027					
44	9,5	-0,25					
45	10	0,16					
46	9,9	-0,013					
48	10	0,087					
50	10	0,027					
53	9,8	-0,095					
54	10	0,031					
55	9,6	-0,18					
65	9,9	-0,037					
68	11	0,50					
70	10	0,24					
72	10	0,024					
74	10	0,022					
79	10	-0,0027					
81	9,8	-0,054					
87	10	0,12					
88	9,4	-0,26					
89	10	0,14					
90	10	0,072					
93	10	0,062					
97	10	0,12					
98	9,1	-0,42					
100	9,1	-0,41					
103	9,9	-0,047					
109	10	0,097					
110	10	0,025					

Consenus statistics

Consensus median, pg/g	10
Median all values pg/g	10
Consensus mean, pg/g	9,8
Standard deviation, pg/g	0,79
Relative standard deviation, %	8,1
No. of values reported	46
No. of values removed	0
No. of reported non-detects	0

PCB 126

Z-score: PCB 126
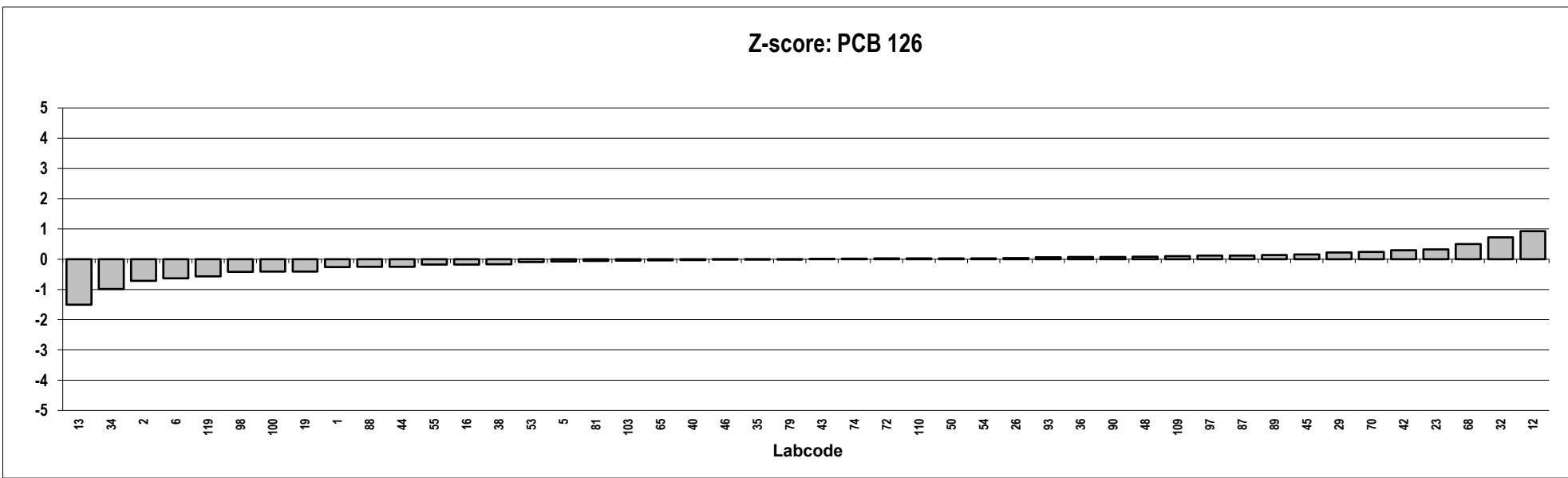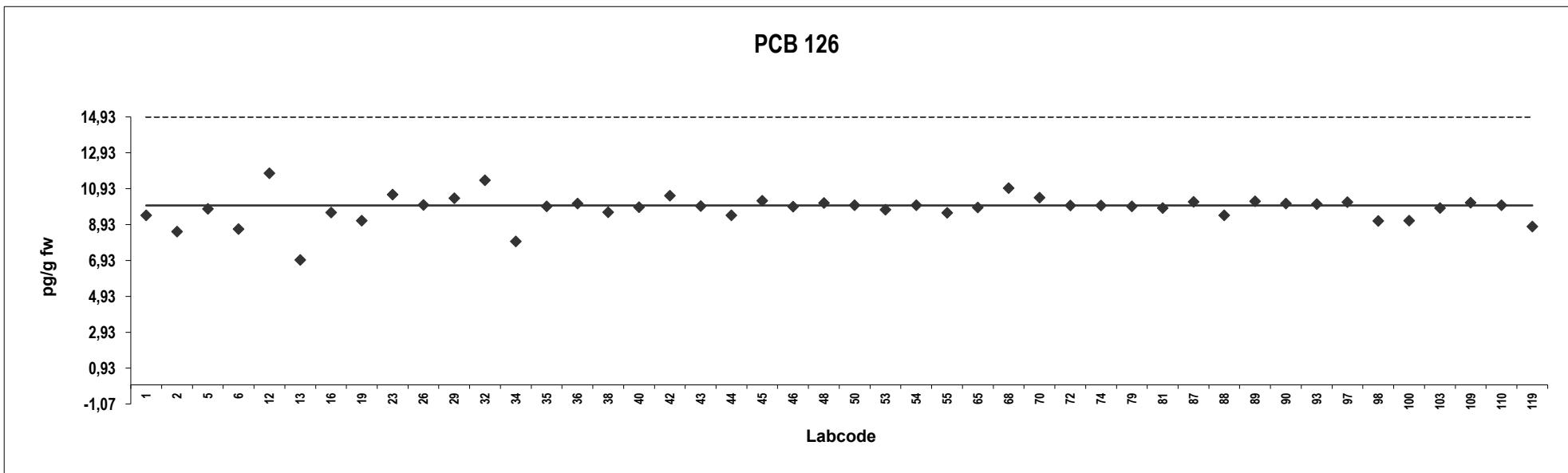
Analyte solution
Congener: PCB 169

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	9,2	-0,39		119	10	0,17	
2	8,2	-0,87					
5	9,9	-0,012					
6	9,5	-0,21					
12	11	0,38					
13	8,0	-1,0					
16	10	0,13					
19	9,7	-0,11					
23	10	0,23					
26	10	0,20					
29	9,2	-0,35					
32	12	0,82					
34	10	0,029					
35	9,8	-0,088					
36	9,8	-0,072					
38	8,9	-0,53					
40	9,9	-0,035					
42	10	0,13					
43	10	0,25					
44	9,0	-0,49					
45	10	0,088					
46	10	0,079					
48	9,0	-0,48					
50	10	0,044					
53	9,3	-0,33					
54	10	0,053					
55	9,5	-0,22					
65	9,9	-0,038					
68	11	0,56					
70	10	0,25					
72	10	0,064					
74	9,9	-0,022					
79	9,8	-0,088					
81	9,8	-0,068					
87	10	0,23					
88	9,2	-0,37					
89	10	0,023					
90	11	0,33					
93	10	0,17					
97	10	0,078					
98	9,5	-0,22					
100	9,1	-0,40					
103	9,7	-0,11					
109	10	0,049					
110	10	0,012					

Consensus statistics

Consensus median, pg/g	9,9
Median all values pg/g	9,9
Consensus mean, pg/g	9,9
Standard deviation, pg/g	0,66
Relative standard deviation, %	6,7
No. of values reported	46
No. of values removed	0
No. of reported non-detects	0

PCB 169

Z-score: PCB 169
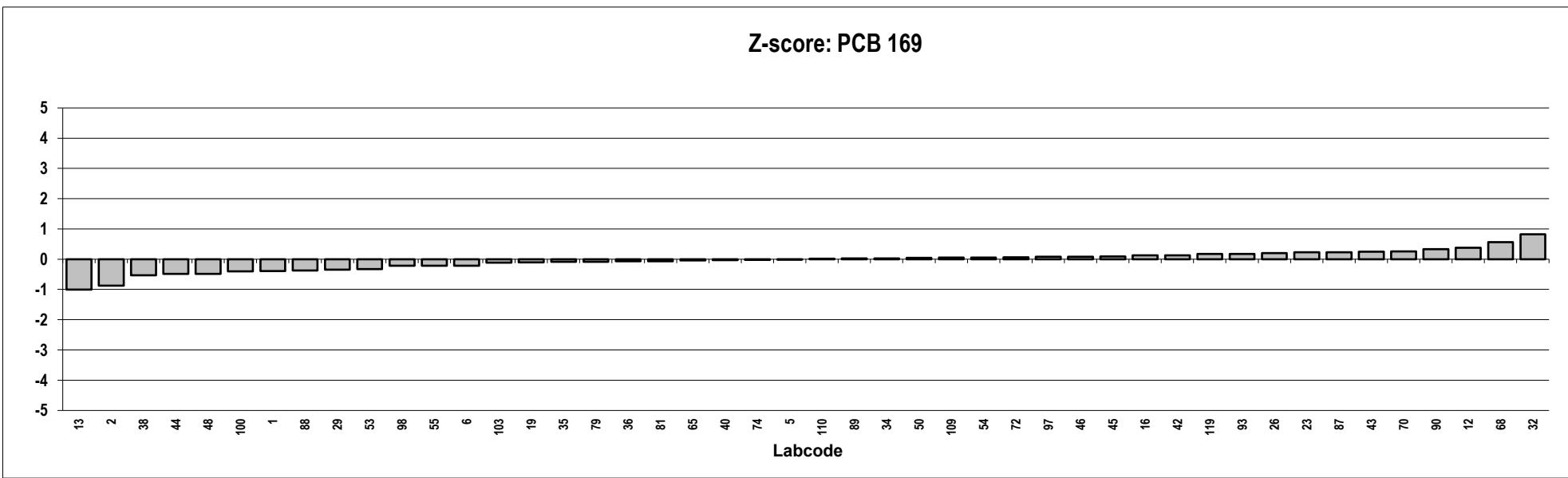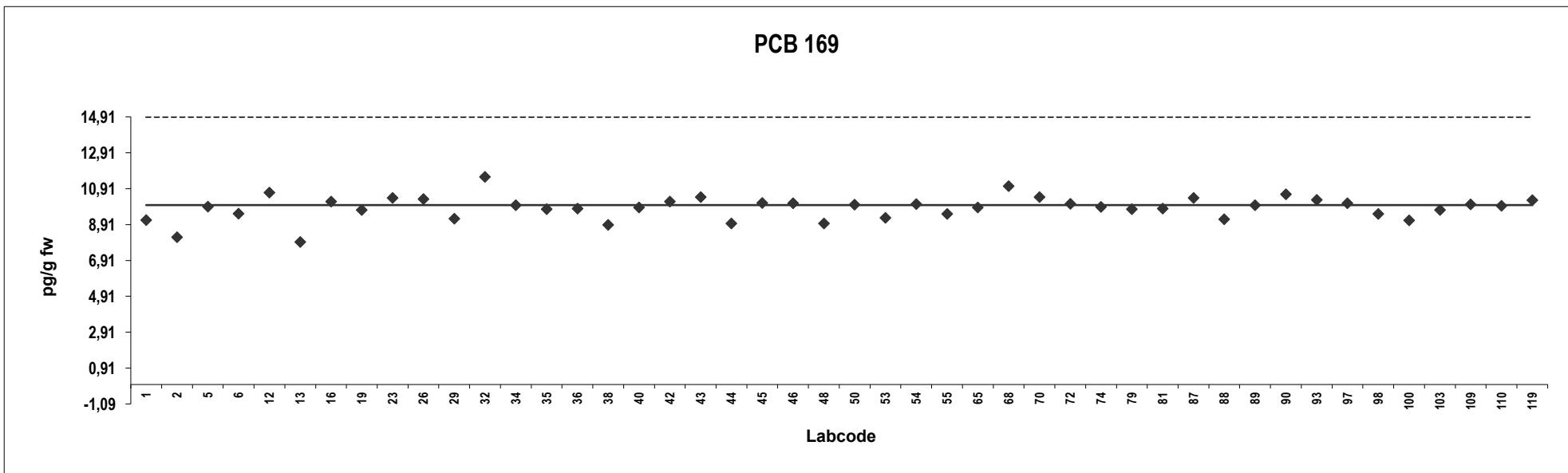
Analyte solution
Congener: PCB 81

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	9,1	-0,44		119	11	0,26	
2	9,5	-0,26					
5	10	0,20					
6	8,7	-0,67					
12	11	0,25					
13	7,7	-1,1					
16	10	-0,013					
19	9,8	-0,088					
23	10	0,10					
26	10	0,24					
29	9,0	-0,48					
32	11	0,64					
34	9,0	-0,51					
35	9,5	-0,23					
36	11	0,30					
38	10	0,039					
40	10	0,058					
42	11	0,37					
43	10	0,20					
44	9,1	-0,43					
45	11	0,32					
46	9,9	-0,058					
48	9,7	-0,16					
50	10	0,0072					
53	9,2	-0,42					
54	10	-0,0028					
55	8,8	-0,58					
65	9,1	-0,43					
68	11	0,42					
70	11	0,46					
72	9,9	-0,025					
74	10	0,10					
79	9,5	-0,23					
81	9,9	-0,066					
87	9,8	-0,093					
88	9,6	-0,20					
89	10	0,022					
90	11	0,40					
93	11	0,28					
97	10	0,24					
98	10	0,11					
100	9,4	-0,32					
103	9,8	-0,12					
109	10	0,037					
110	10	0,0028					

Consenus statistics

Consensus median, pg/g	10
Median all values pg/g	10
Consensus mean, pg/g	9,9
Standard deviation, pg/g	0,69
Relative standard deviation, %	6,9
No. of values reported	46
No. of values removed	0
No. of reported non-detects	0

PCB 81

Z-score: PCB 81
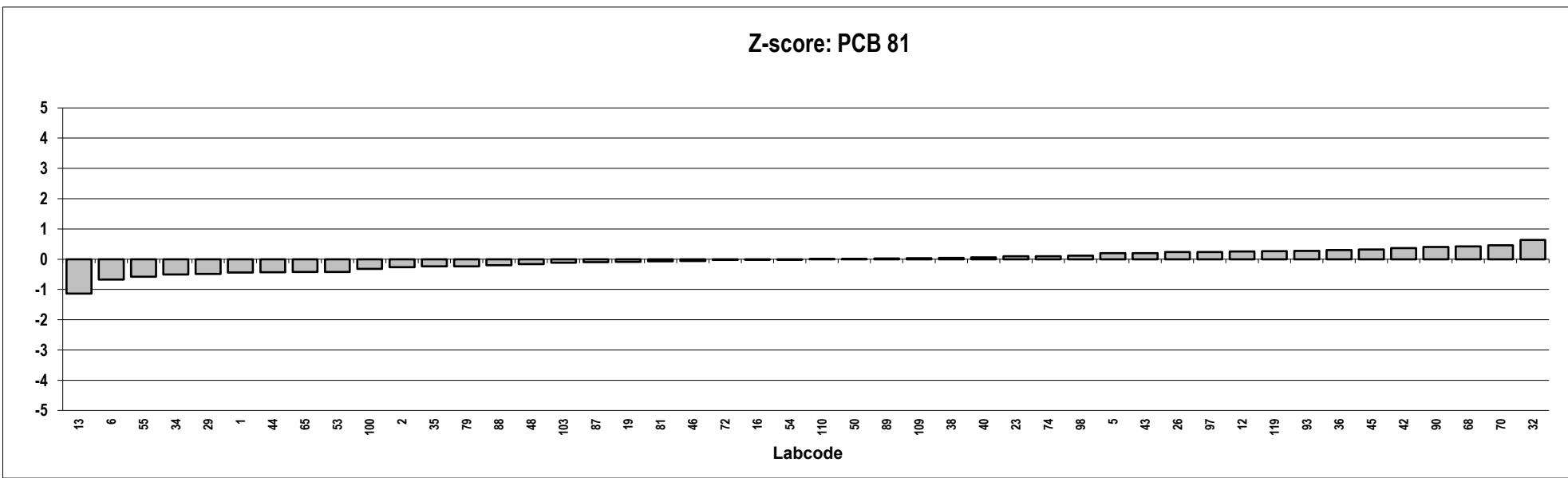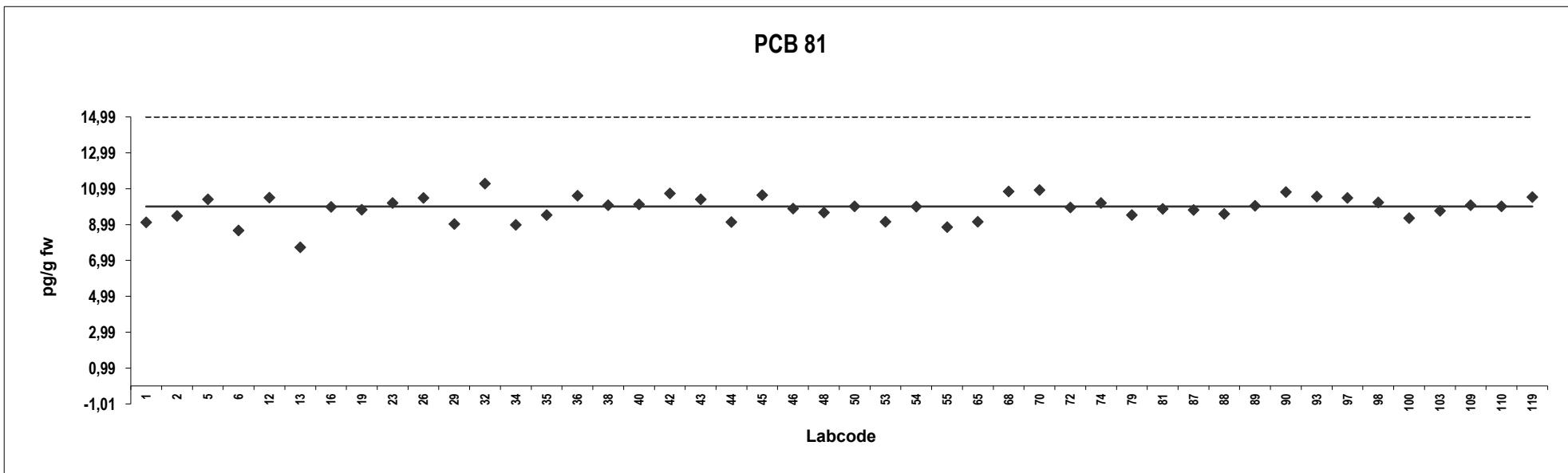
Analyte solution
Congener: PCB 105

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	103	0,043		110	103	0,042	
2	98	-0,18		119	114	0,59	
5	110	0,41					
6	91	-0,55					
12	99	-0,12					
13	70	-1,6					
16	102	0,0094					
19	104	0,11					
23	99	-0,14					
26	101	-0,021					
29	109	0,35					
32	103	0,078					
34	107	0,24					
35	97	-0,22					
36	100	-0,11					
38	109	0,35					
40	100	-0,083					
42	111	0,46					
43	100	-0,071					
44	103	0,058					
45	98	-0,20					
46	108	0,30					
47	91	-0,54					
48	107	0,27					
50	101	-0,057					
53	101	-0,061					
54	101	-0,063					
55	103	0,061					
65	109	0,33					
68	109	0,37					
70	102	0,00					
72	103	0,051					
74	105	0,16					
79	97	-0,22					
81	98	-0,18					
87	94	-0,39					
88	103	0,073					
89	98	-0,20					
90	94	-0,38					
93	83	-0,93					
97	102	0,0020					
98	104	0,095					
100	92	-0,49					
103	100	-0,082					
109	115	0,66					

Consenus statistics

Consensus median, pg/g	102
Median all values pg/g	102
Consensus mean, pg/g	101
Standard deviation, pg/g	7,7
Relative standard deviation, %	7,7
No. of values reported	47
No. of values removed	0
No. of reported non-detects	0

PCB 105

Z-score: PCB 105
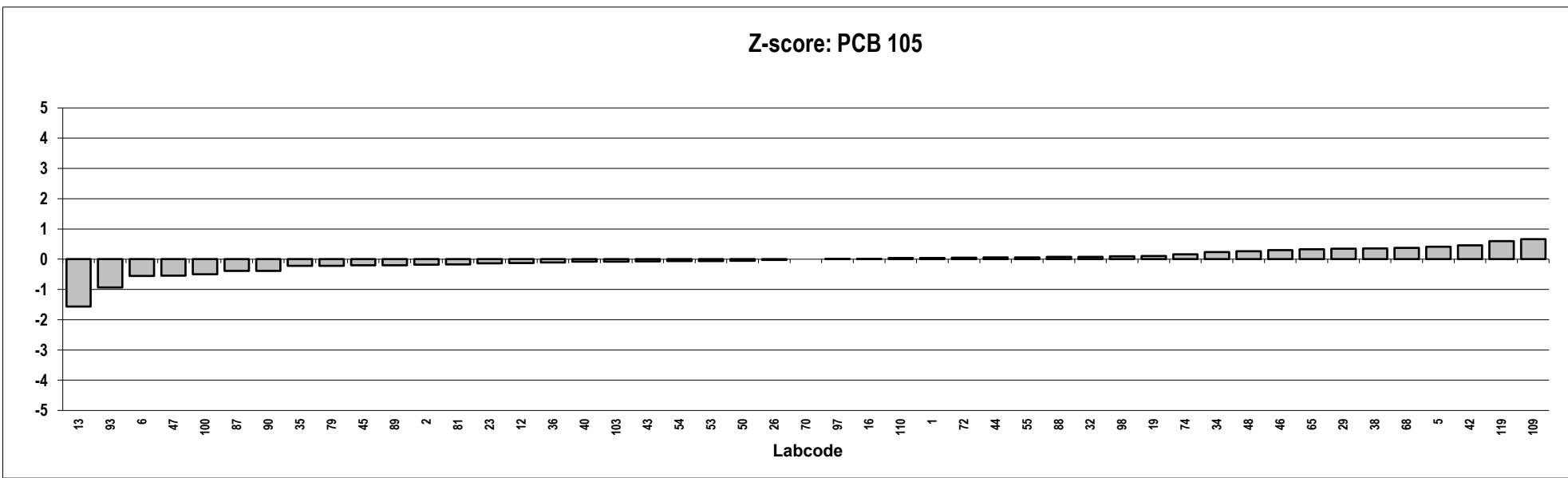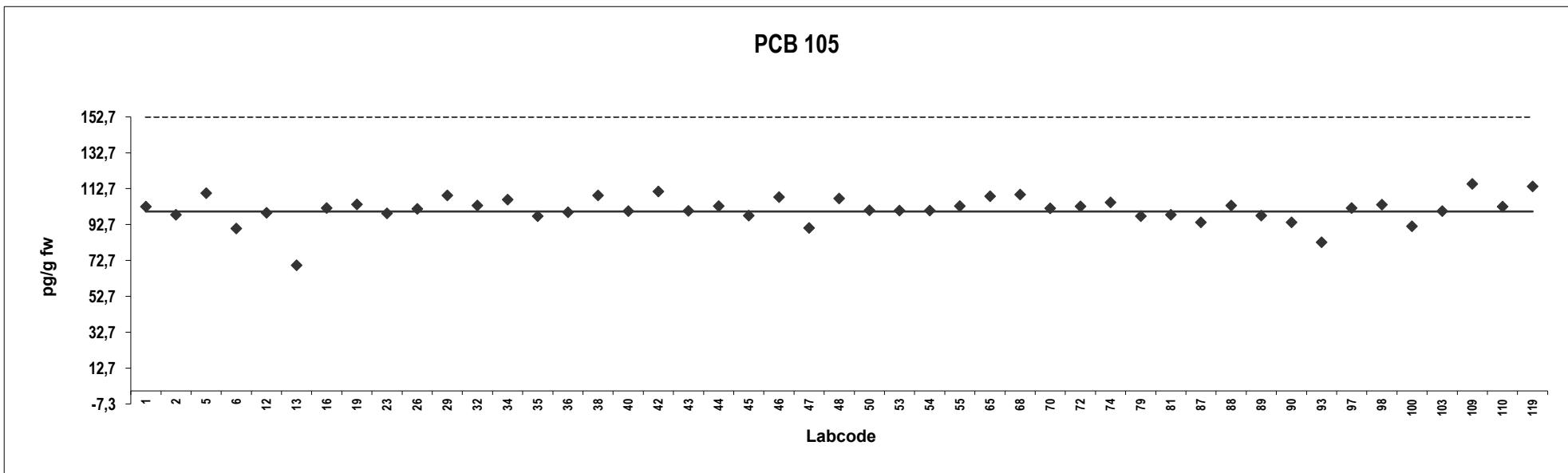
Analyte solution
Congener: PCB 114

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	95	-0,23		110	104	0,20	
2	103	0,14		119	104	0,19	
5	110	0,49					
6	84	-0,82					
12	101	0,049					
13	74	-1,3					
16	91	-0,48					
19	108	0,39					
23	90	-0,51					
26	104	0,19					
29	111	0,56					
32	102	0,11					
34	94	-0,29					
35	95	-0,25					
36	100	-0,0060					
38	110	0,50					
40	99	-0,055					
42	110	0,50					
43	103	0,16					
44	103	0,14					
45	99	-0,036					
46	104	0,19					
47	91	-0,47					
48	104	0,19					
50	101	0,050					
53	94	-0,31					
54	100	0,00					
55	94	-0,33					
65	107	0,32					
68	108	0,40					
70	101	0,023					
72	98	-0,099					
74	104	0,19					
79	95	-0,25					
81	97	-0,13					
87	99	-0,041					
88	102	0,099					
89	97	-0,16					
90	91	-0,46					
93	80	-1,0					
97	103	0,14					
98	100	-0,020					
100	90	-0,50					
103	99	-0,044					
109	107	0,35					

Consenus statistics

Consensus median, pg/g	100
Median all values pg/g	100
Consensus mean, pg/g	99
Standard deviation, pg/g	7,8
Relative standard deviation, %	7,8
No. of values reported	47
No. of values removed	0
No. of reported non-detects	0

PCB 114

Z-score: PCB 114
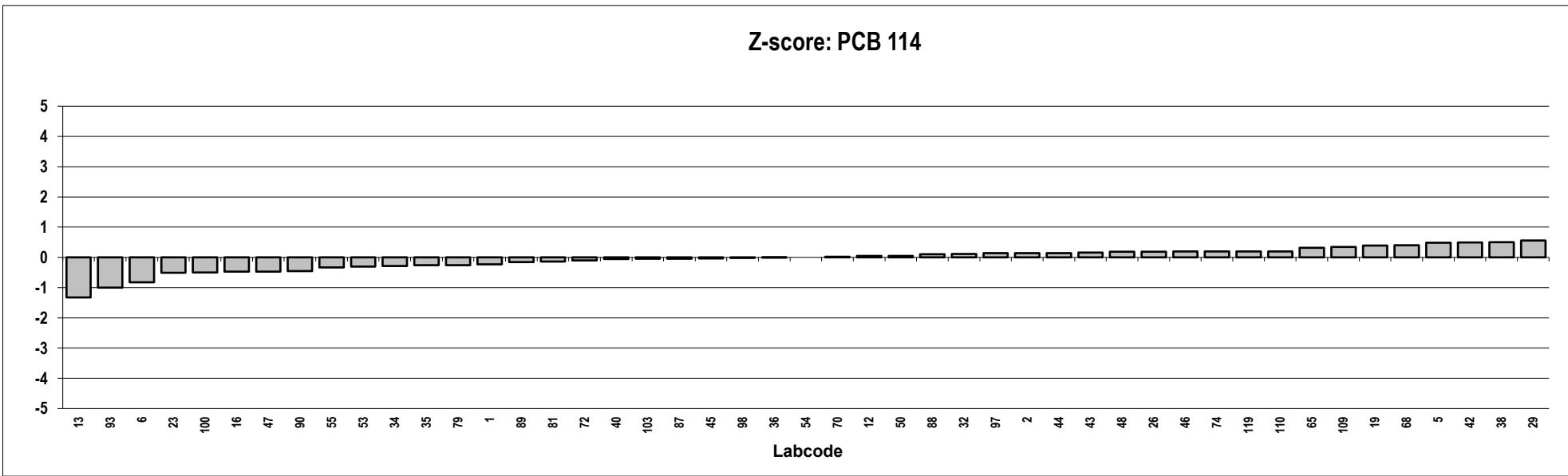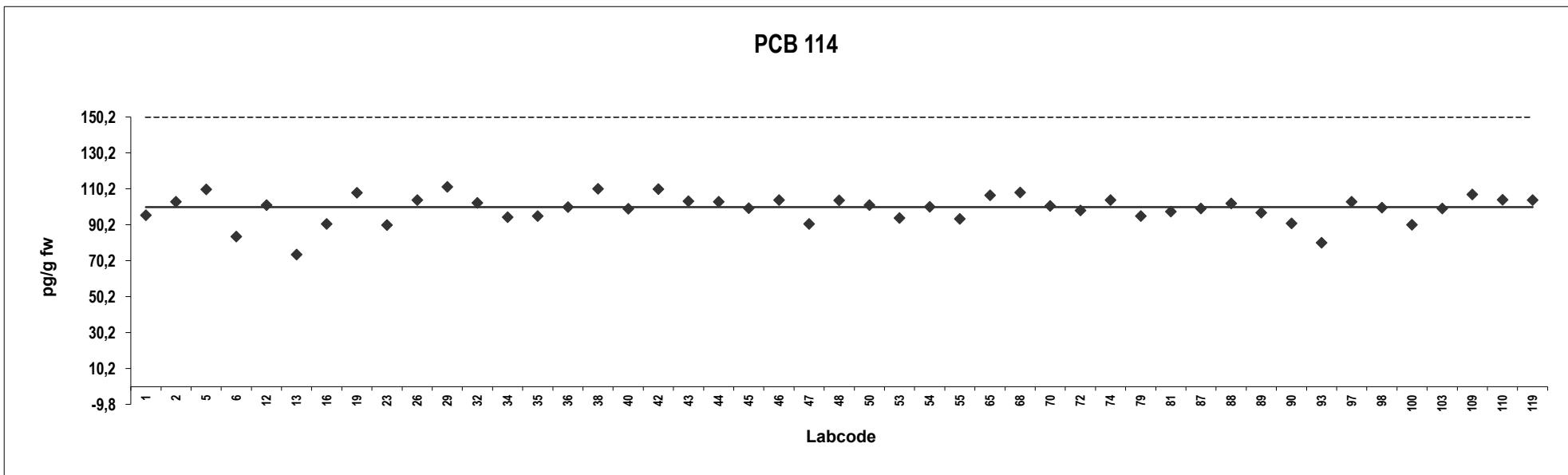
Analyte solution
Congener: PCB 118

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	91	-0,58		110	104	0,052	
2	104	0,060		119	109	0,32	
5	112	0,46					
6	83	-0,94					
12	100	-0,14					
13	72	-1,5					
16	104	0,060					
19	109	0,30					
23	101	-0,086					
26	108	0,25					
29	109	0,30					
32	103	0,0096					
34	101	-0,067					
35	99	-0,19					
36	103	0,011					
38	104	0,074					
40	103	0,00					
42	116	0,63					
43	99	-0,17					
44	104	0,060					
45	96	-0,33					
46	106	0,16					
47	90	-0,65					
48	110	0,37					
50	102	-0,023					
53	97	-0,28					
54	100	-0,14					
55	104	0,050					
65	106	0,14					
68	109	0,32					
70	98	-0,23					
72	107	0,23					
74	107	0,21					
79	99	-0,19					
81	102	-0,055					
87	97	-0,27					
88	106	0,15					
89	102	-0,035					
90	92	-0,52					
93	82	-1,0					
97	101	-0,075					
98	114	0,54					
100	96	-0,33					
103	100	-0,15					
109	107	0,21					

Consensus statistics

Consensus median, pg/g	103
Median all values pg/g	103
Consensus mean, pg/g	101
Standard deviation, pg/g	8,2
Relative standard deviation, %	8,1
No. of values reported	47
No. of values removed	0
No. of reported non-detects	0

PCB 118

Z-score: PCB 118
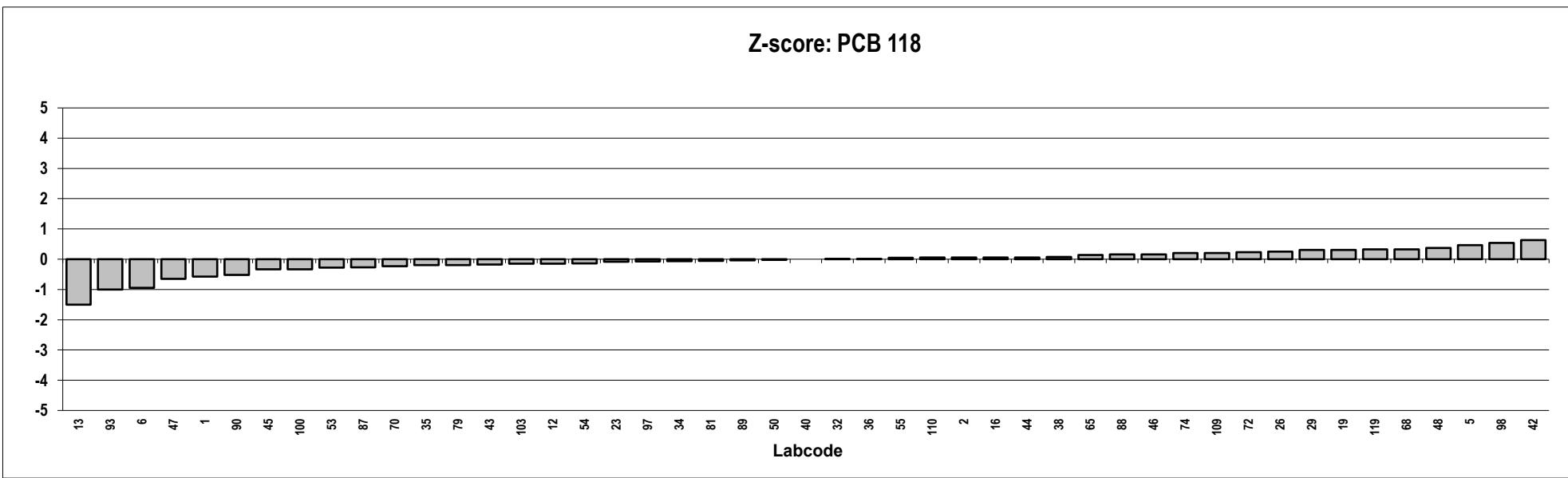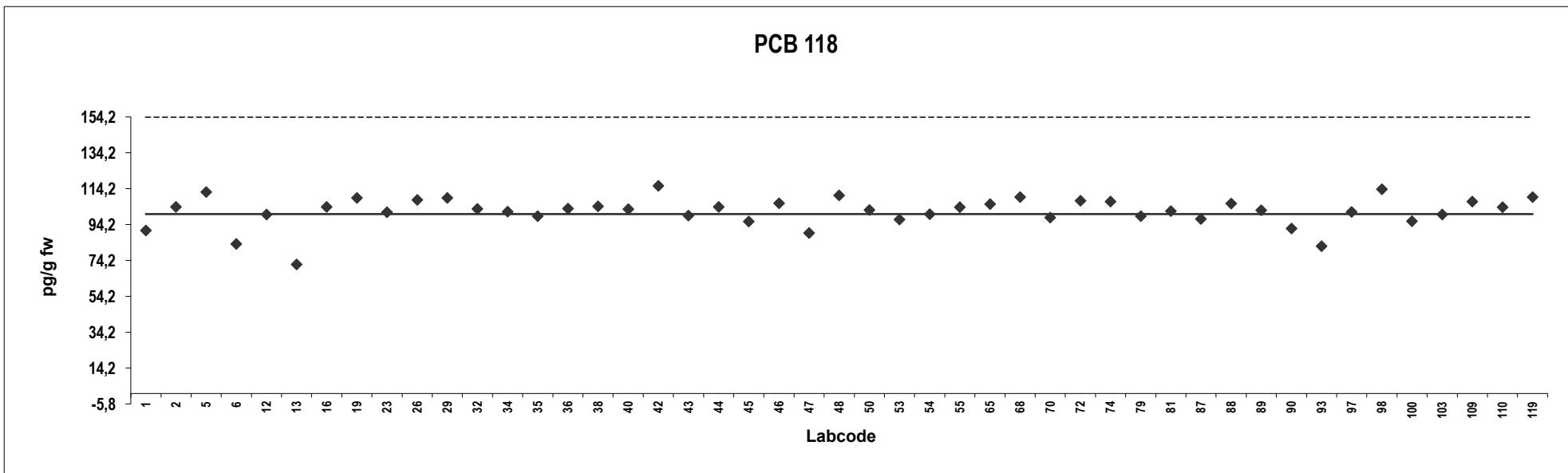
Analyte solution
Congener: PCB 123

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	93	-0,42		110	103	0,035	
2	109	0,34		119	90	-0,59	
5	110	0,38					
6	85	-0,86					
12	103	0,025					
13	72	-1,5					
16	107	0,25					
19	108	0,29					
23	102	-0,015					
26	106	0,21					
29	105	0,14					
32	105	0,14					
34	109	0,36					
35	98	-0,18					
36	102	0,00					
38	111	0,46					
40	101	-0,030					
42	117	0,73					
43	100	-0,11					
44	107	0,25					
45	101	-0,067					
46	104	0,098					
47	96	-0,31					
48	109	0,35					
50	102	-0,014					
53	97	-0,25					
54	100	-0,098					
55	100	-0,12					
65	111	0,46					
68	109	0,32					
70	102	0,021					
72	106	0,18					
74	105	0,15					
79	98	-0,18					
81	97	-0,23					
87	92	-0,50					
88	104	0,099					
89	96	-0,31					
90	99	-0,15					
93	88	-0,68					
97	107	0,24					
98	96	-0,27					
100	90	-0,58					
103	100	-0,11					
109	108	0,30					

Consensus statistics

Consensus median, pg/g	102
Median all values pg/g	102
Consensus mean, pg/g	101
Standard deviation, pg/g	8,0
Relative standard deviation, %	7,9
No. of values reported	47
No. of values removed	0
No. of reported non-detects	0

PCB 123

Z-score: PCB 123
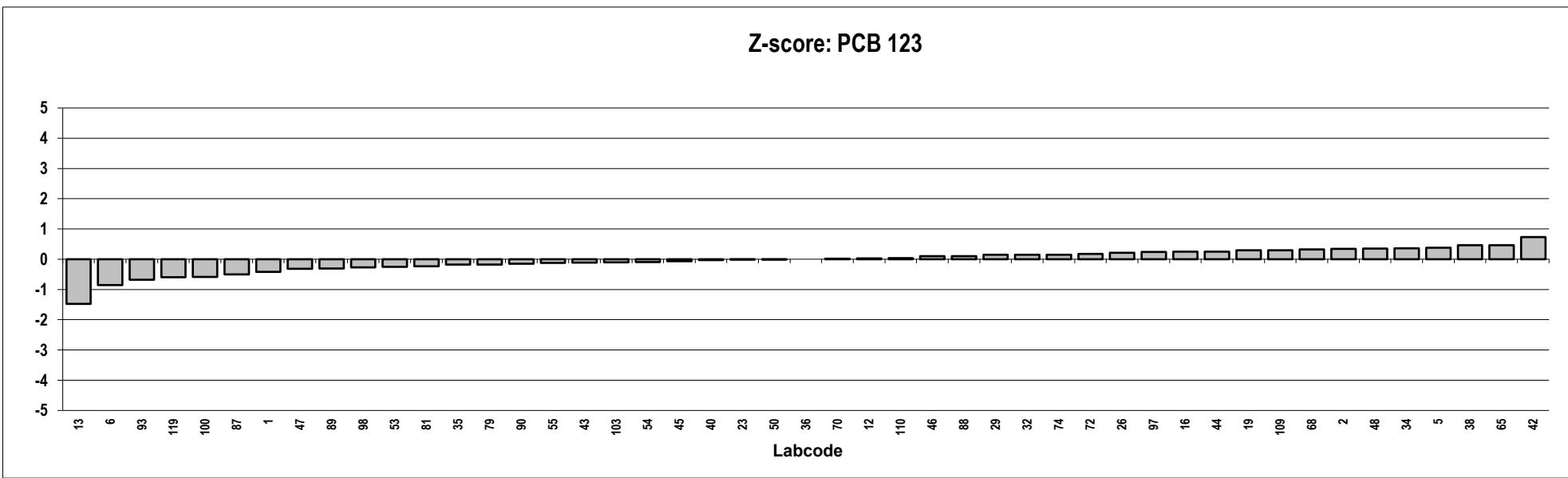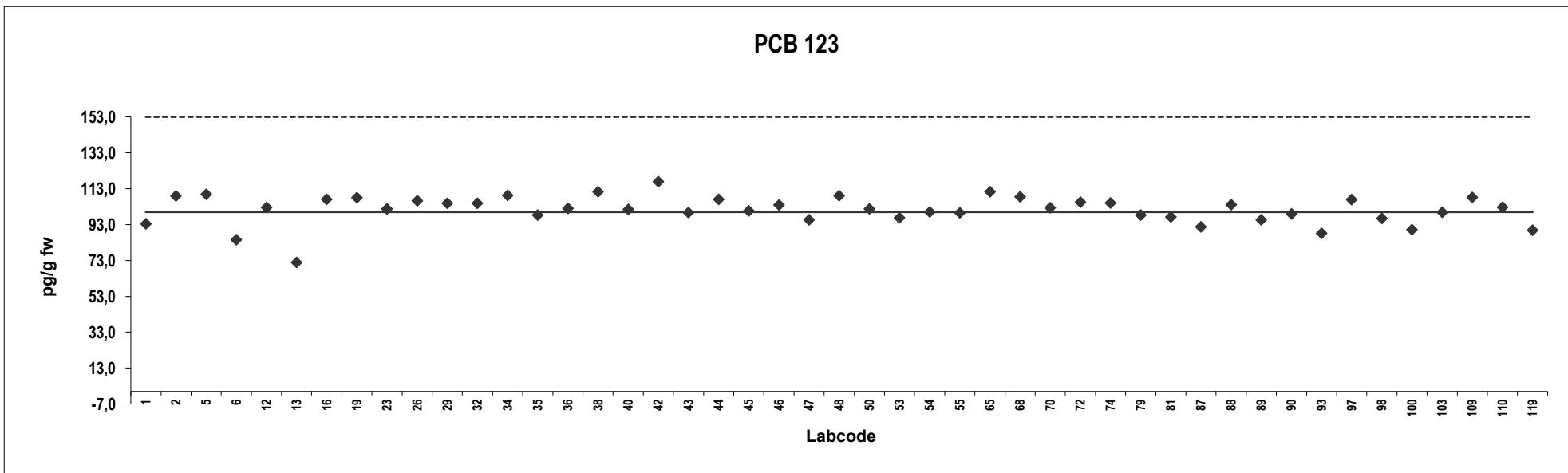
Analyte solution
Congener: PCB 156

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	93	-0,33		110	101	0,061	
2	90	-0,51		119	93	-0,37	
5	105	0,26					
6	93	-0,36					
12	100	-0,026					
13	90	-0,52					
16	95	-0,24					
19	109	0,45					
23	100	-0,00095					
26	100	0,00095					
29	106	0,30					
32	102	0,12					
34	99	-0,071					
35	97	-0,15					
36	105	0,25					
38	107	0,33					
40	102	0,085					
42	114	0,69					
43	100	-0,0050					
44	94	-0,32					
45	100	0,017					
46	103	0,15					
47	95	-0,28					
48	104	0,19					
50	102	0,11					
53	95	-0,26					
54	100	-0,0035					
55	104	0,18					
65	218	5,9	Outlier				
68	109	0,44					
70	103	0,16					
72	101	0,066					
74	104	0,20					
79	97	-0,15					
81	100	0,0025					
87	99	-0,066					
88	98	-0,085					
89	103	0,13					
90	91	-0,45					
93	91	-0,44					
97	104	0,21					
98	92	-0,39					
100	94	-0,28					
103	99	-0,059					
109	102	0,080					

Consenus statistics

Consensus median, pg/g	100
Median all values pg/g	100
Consensus mean, pg/g	100
Standard deviation, pg/g	5,5
Relative standard deviation, %	5,5
No. of values reported	47
No. of values removed	1
No. of reported non-detects	0

PCB 156

Z-score: PCB 156
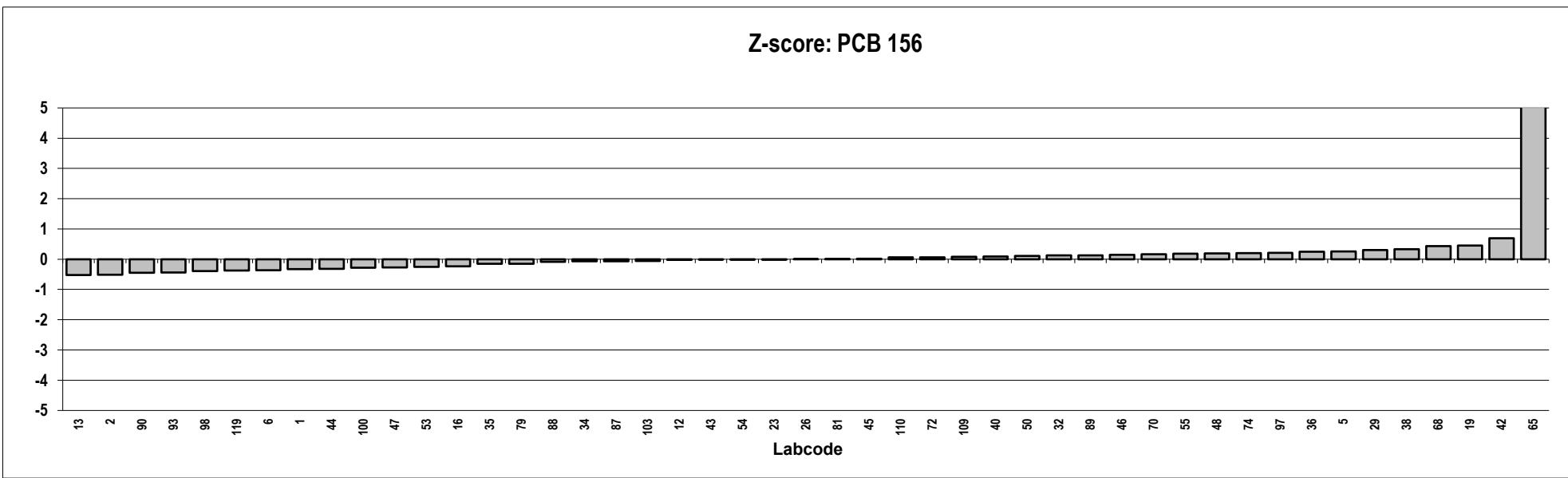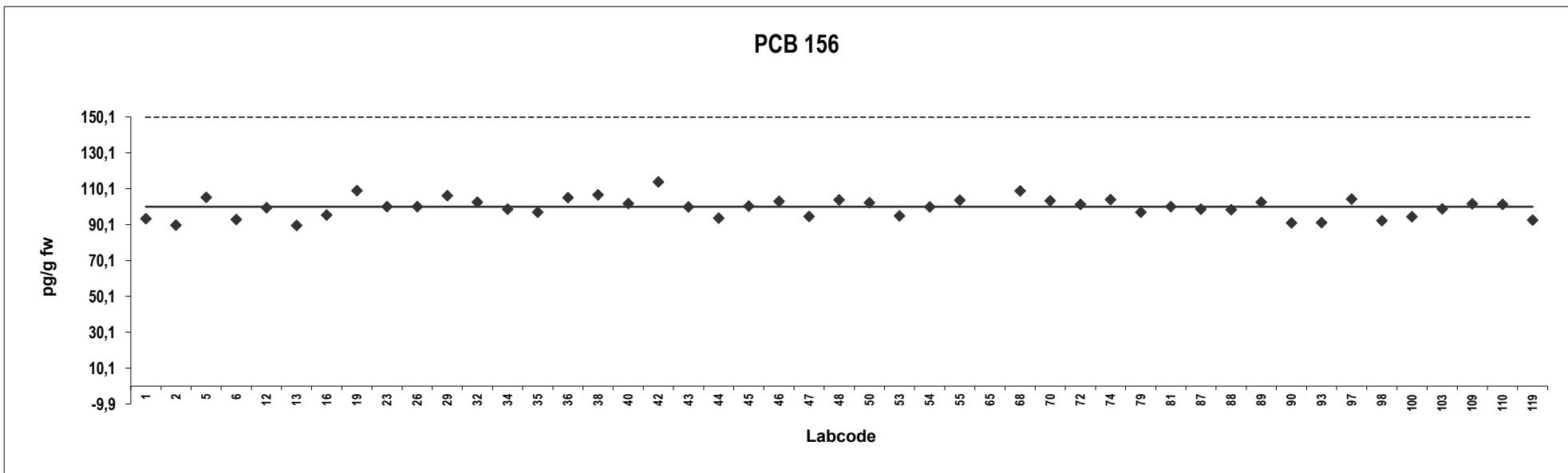
Analyte solution
Congener: PCB 157

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	91	-0,45		110	99	-0,032	
2	94	-0,30		119	84	-0,80	
5	106	0,28					
6	94	-0,28					
12	98	-0,097					
13	84	-0,78					
16	96	-0,18					
19	105	0,25					
23	105	0,25					
26	98	-0,12					
29	103	0,16					
32	99	-0,033					
34	111	0,56					
35	98	-0,11					
36	105	0,25					
38	108	0,39					
40	101	0,073					
42	111	0,55					
43	102	0,090					
44	101	0,053					
45	101	0,064					
46	102	0,10					
47	95	-0,24					
48	102	0,10					
50	102	0,080					
53	94	-0,28					
54	100	0,0052					
55	107	0,36					
65	218	5,9	Outlier				
68	98	-0,11					
70	103	0,15					
72	100	0,010					
74	100	0,0033					
79	98	-0,11					
81	97	-0,17					
87	101	0,053					
88	97	-0,14					
89	97	-0,13					
90	107	0,35					
93	90	-0,52					
97	92	-0,42					
98	91	-0,44					
100	93	-0,36					
103	100	-0,0033					
109	108	0,41					

Consensus statistics

Consensus median, pg/g	100
Median all values pg/g	100
Consensus mean, pg/g	99
Standard deviation, pg/g	6,1
Relative standard deviation, %	6,1
No. of values reported	47
No. of values removed	1
No. of reported non-detects	0

PCB 157

Z-score: PCB 157
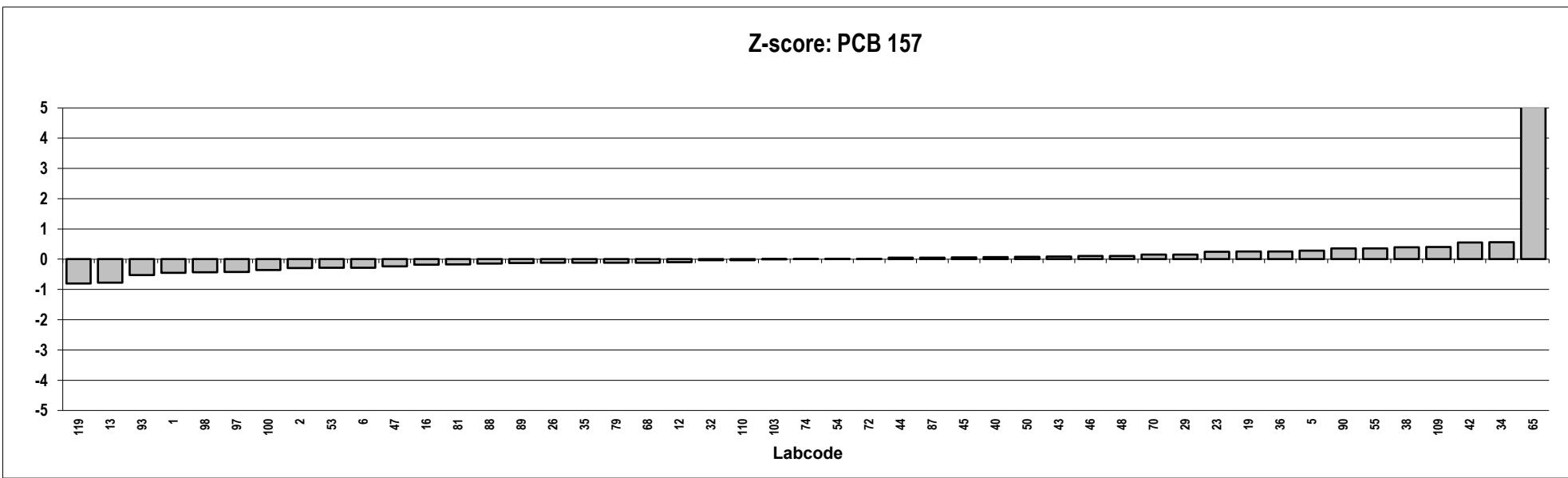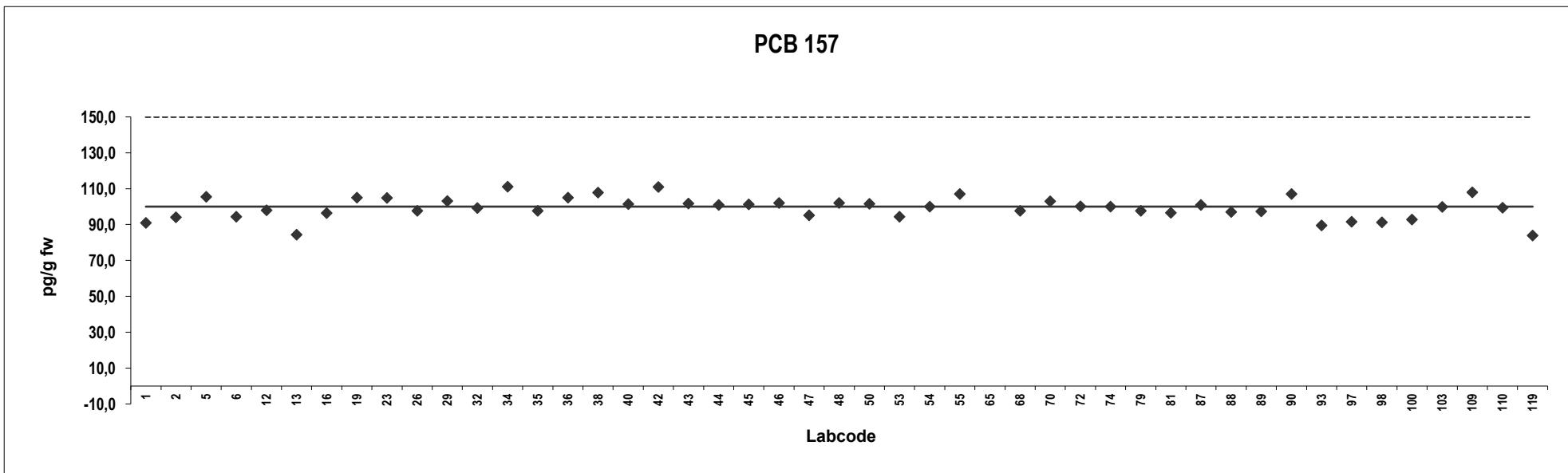
Analyte solution
Congener: PCB 167

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	102	0,099		110	100	-0,015	
2	102	0,095		119	89	-0,56	
5	105	0,26					
6	83	-0,87					
12	103	0,15					
13	84	-0,83					
16	91	-0,47					
19	104	0,19					
23	100	-0,020					
26	99	-0,040					
29	100	-0,025					
32	102	0,11					
34	109	0,42					
35	98	-0,11					
36	102	0,095					
38	111	0,53					
40	100	0,020					
42	112	0,60					
43	101	0,042					
44	100	-0,015					
45	103	0,12					
46	103	0,14					
47	102	0,10					
48	104	0,20					
50	99	-0,079					
53	95	-0,26					
54	100	-0,0047					
55	102	0,089					
65	120	0,99					
68	104	0,20					
70	98	-0,11					
72	93	-0,35					
74	104	0,19					
79	98	-0,11					
81	99	-0,075					
87	102	0,095					
88	101	0,027					
89	100	-0,0020					
90	94	-0,30					
93	100	0,00					
97	102	0,11					
98	90	-0,49					
100	92	-0,39					
103	99	-0,065					
109	100	-0,030					

Consensus statistics

Consensus median, pg/g	100
Median all values pg/g	100
Consensus mean, pg/g	100
Standard deviation, pg/g	6,5
Relative standard deviation, %	6,5
No. of values reported	47
No. of values removed	0
No. of reported non-detects	0

PCB 167
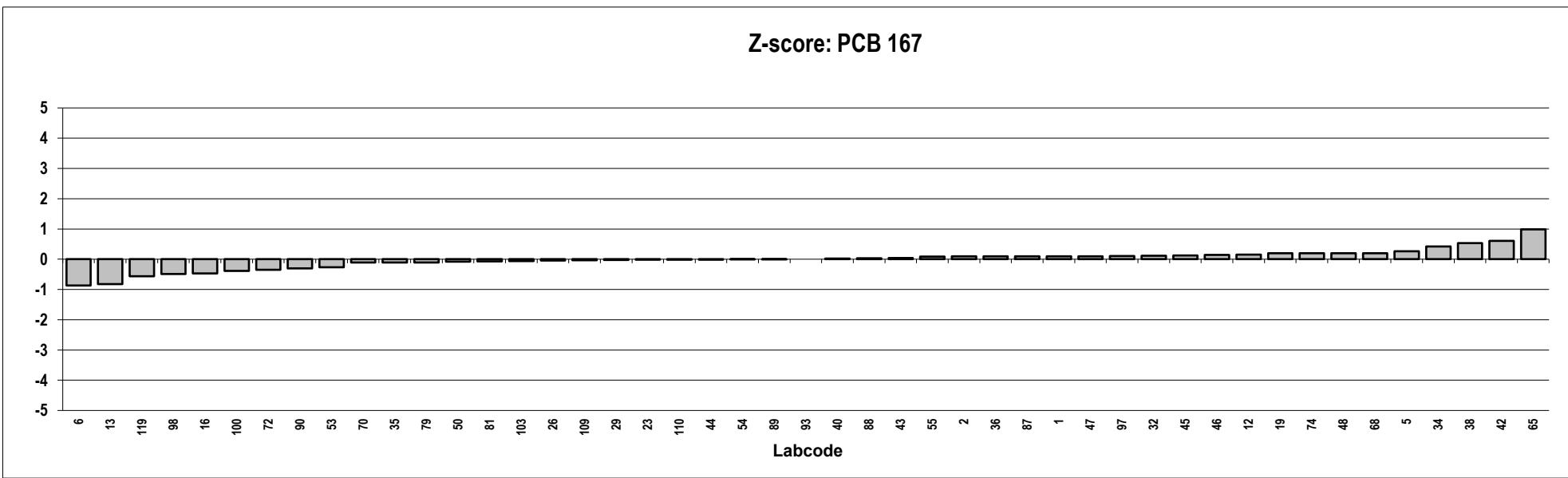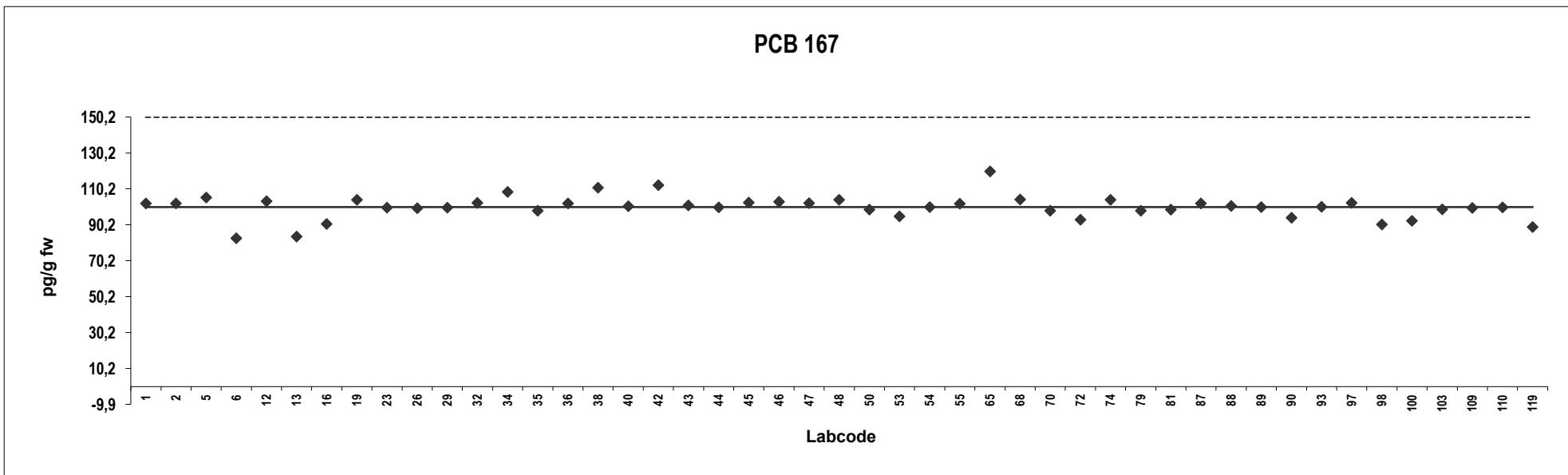
Analyte solution
Congener: PCB 189

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	94	-0,33		110	102	0,036	
2	101	0,0057		119	89	-0,61	
5	103	0,10					
6	91	-0,51					
12	101	0,026					
13	77	-1,2					
16	95	-0,29					
19	109	0,40					
23	99	-0,074					
26	104	0,15					
29	104	0,15					
32	102	0,078					
34	106	0,23					
35	97	-0,17					
36	96	-0,26					
38	108	0,36					
40	101	0,00					
42	105	0,21					
43	100	-0,051					
44	104	0,15					
45	104	0,14					
46	105	0,20					
47	91	-0,49					
48	101	-0,017					
50	101	0,016					
53	97	-0,21					
54	100	-0,046					
55	100	-0,054					
65	109	0,41					
68	102	0,071					
70	100	-0,067					
72	96	-0,22					
74	103	0,10					
79	97	-0,17					
81	102	0,048					
87	95	-0,32					
88	98	-0,15					
89	102	0,062					
90	101	0,0057					
93	98	-0,13					
97	96	-0,24					
98	93	-0,38					
100	95	-0,28					
103	103	0,099					
109	104	0,15					

Consensus statistics

Consensus median, pg/g	101
Median all values pg/g	101
Consensus mean, pg/g	100
Standard deviation, pg/g	5,7
Relative standard deviation, %	5,7
No. of values reported	47
No. of values removed	0
No. of reported non-detects	0

PCB 189

Z-score: PCB 189
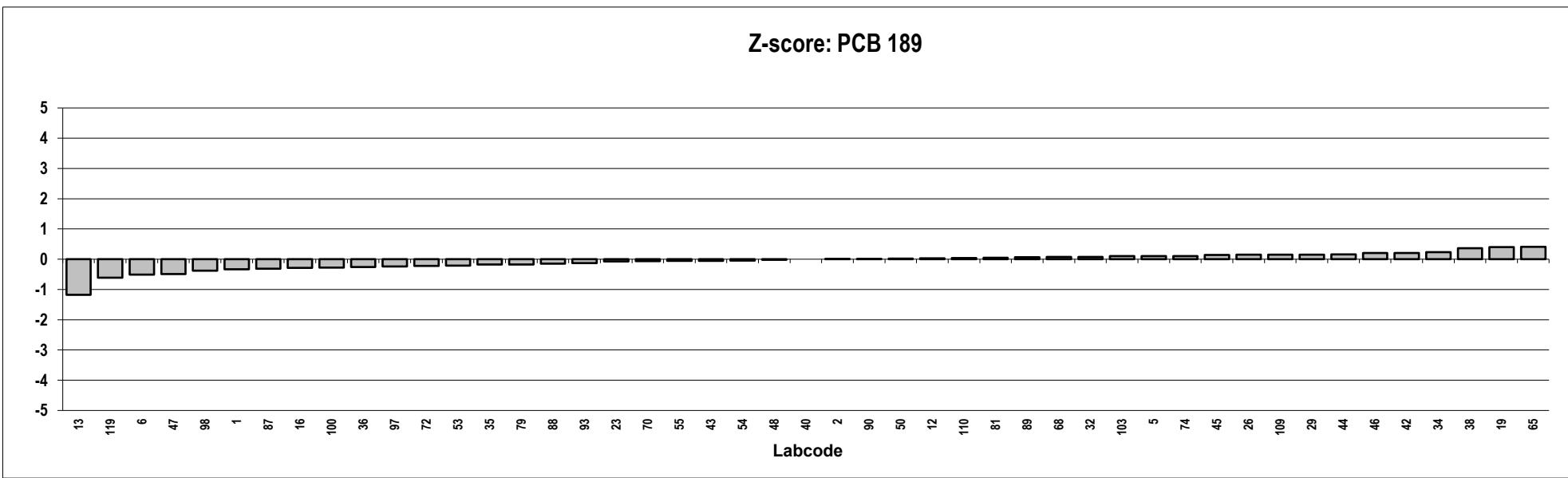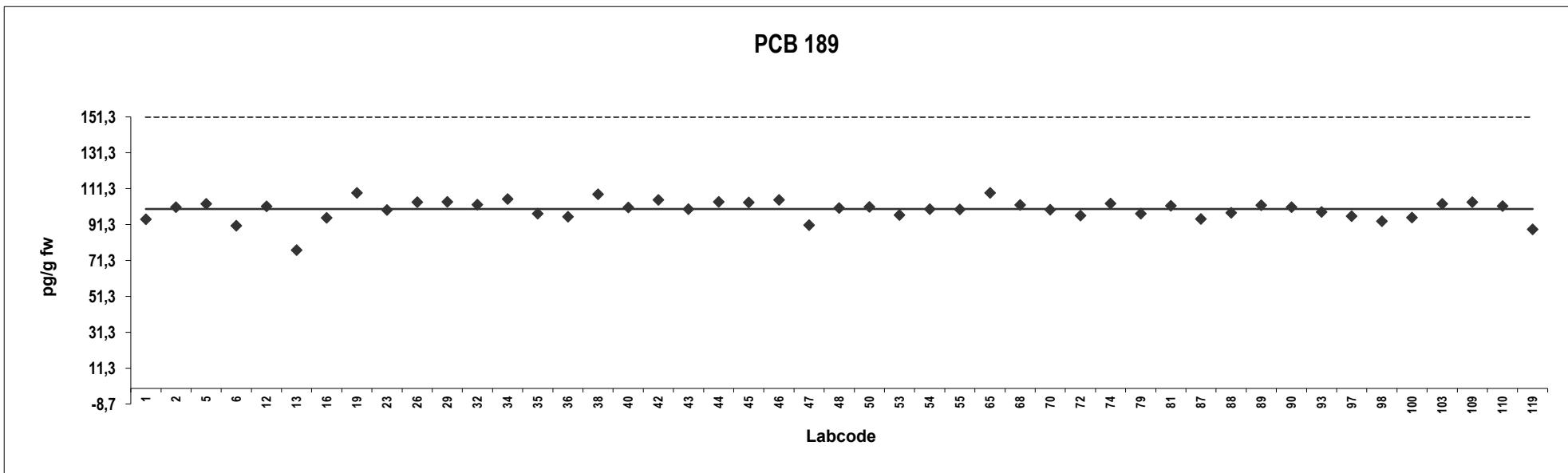
Analyte solution
Congener: PCB 28

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	86	-0,63					
5	106	0,41					
12	101	0,16					
16	110	0,61					
19	116	0,92					
23	103	0,26					
26	97	-0,030					
29	111	0,64					
32	50	-2,4					
34	75	-1,2					
35	98	-0,015					
36	100	0,10					
38	108	0,52					
40	103	0,25					
42	104	0,33					
44	91	-0,35					
45	92	-0,30					
46	100	0,092					
48	93	-0,25					
50	99	0,062					
53	95	-0,16					
54	99	0,076					
65	90	-0,40					
68	88	-0,53					
70	1,0	-4,9	Outlier				
72	96	-0,10					
74	98	-0,0051					
79	98	-0,015					
87	98	0,00					
88	92	-0,33					
89	95	-0,16					
90	101	0,16					
93	81	-0,87					
97	100	0,10					
98	104	0,29					
100	100	0,087					
103	99	0,048					
109	118	1,0					
110	98	-0,0064					
119	82	-0,80					

Consensus statistics

Consensus median, pg/g	98
Median all values pg/g	98
Consensus mean, pg/g	97
Standard deviation, pg/g	12
Relative standard deviation, %	12
No. of values reported	40
No. of values removed	1
No. of reported non-detects	0

PCB 28

pg/g fw

Labcode

Z-score: PCB 28
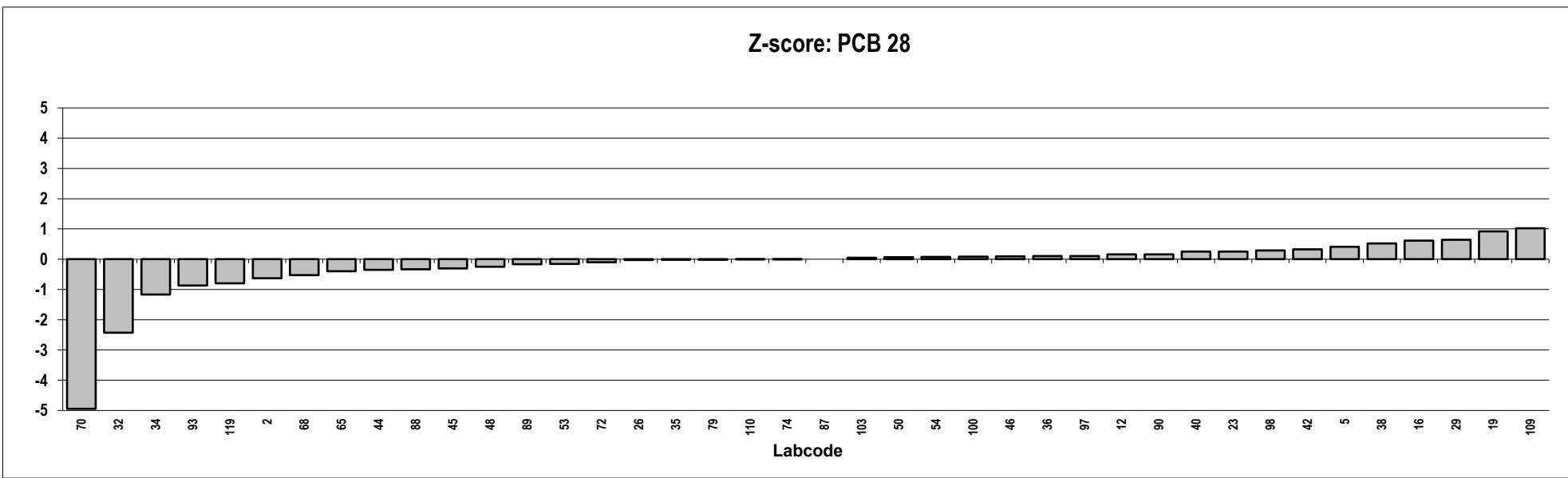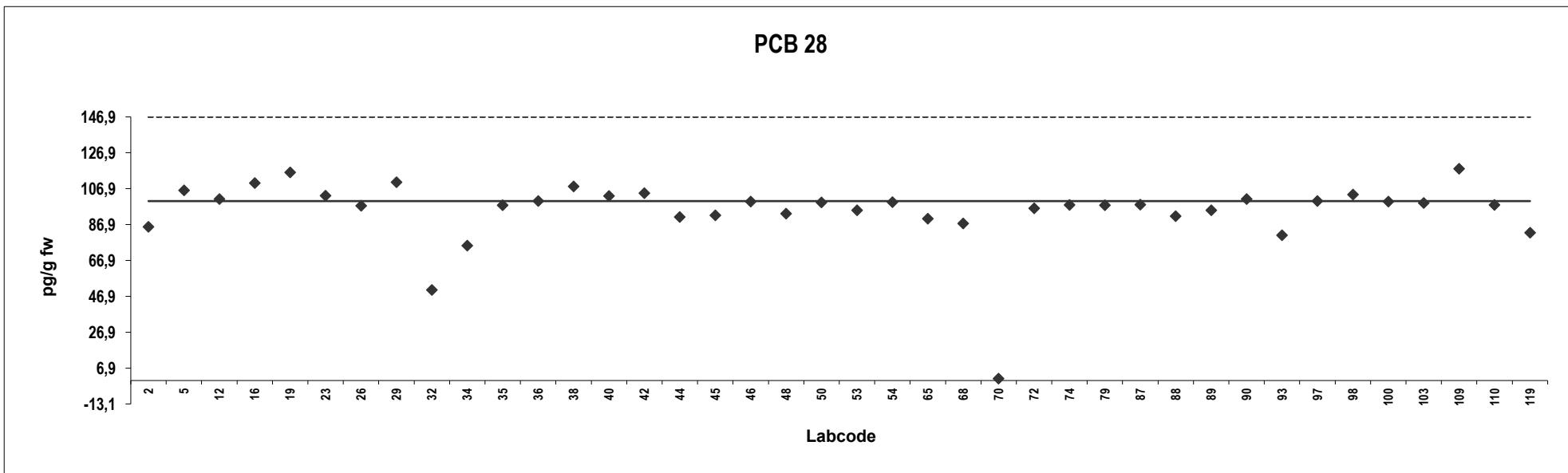
Labcode

Analyte solution
Congener: PCB 52

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	93	-0,30					
5	110	0,55					
12	99	0,0071					
16	112	0,65					
19	96	-0,16					
23	98	-0,038					
26	99	0,017					
29	102	0,12					
32	97	-0,12					
34	86	-0,69					
35	100	0,042					
36	106	0,34					
38	110	0,56					
40	103	0,18					
42	101	0,10					
44	88	-0,56					
45	90	-0,45					
46	97	-0,10					
48	97	-0,093					
50	102	0,13					
53	100	0,050					
54	99	0,00					
65	97	-0,13					
68	100	0,047					
70	1,0	-4,9	Outlier				
72	93	-0,29					
74	98	-0,084					
79	100	0,042					
87	97	-0,13					
88	97	-0,10					
89	95	-0,22					
90	100	0,037					
93	89	-0,54					
97	104	0,24					
98	95	-0,19					
100	100	0,052					
103	103	0,18					
109	102	0,14					
110	98	-0,056					
119	91	-0,42					

Consenus statistics	
Consensus median, pg/g	99
Median all values pg/g	99
Consensus mean, pg/g	99
Standard deviation, pg/g	5,7
Relative standard deviation, %	5,8
No. of values reported	40
No. of values removed	1
No. of reported non-detects	0

PCB 52

Z-score: PCB 52
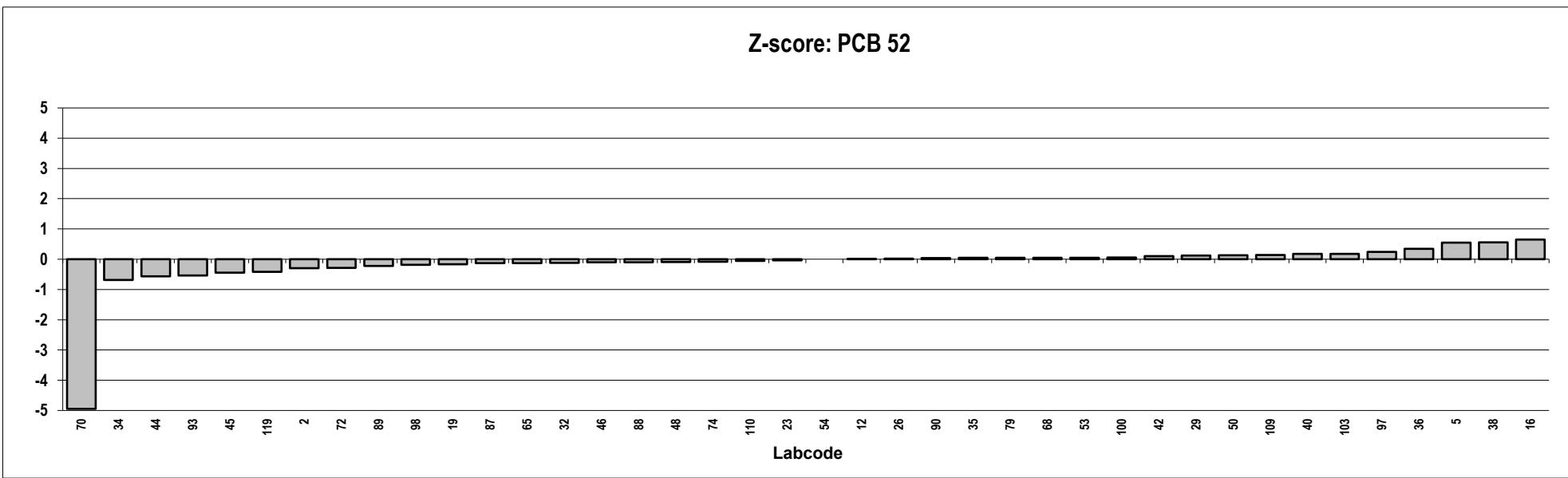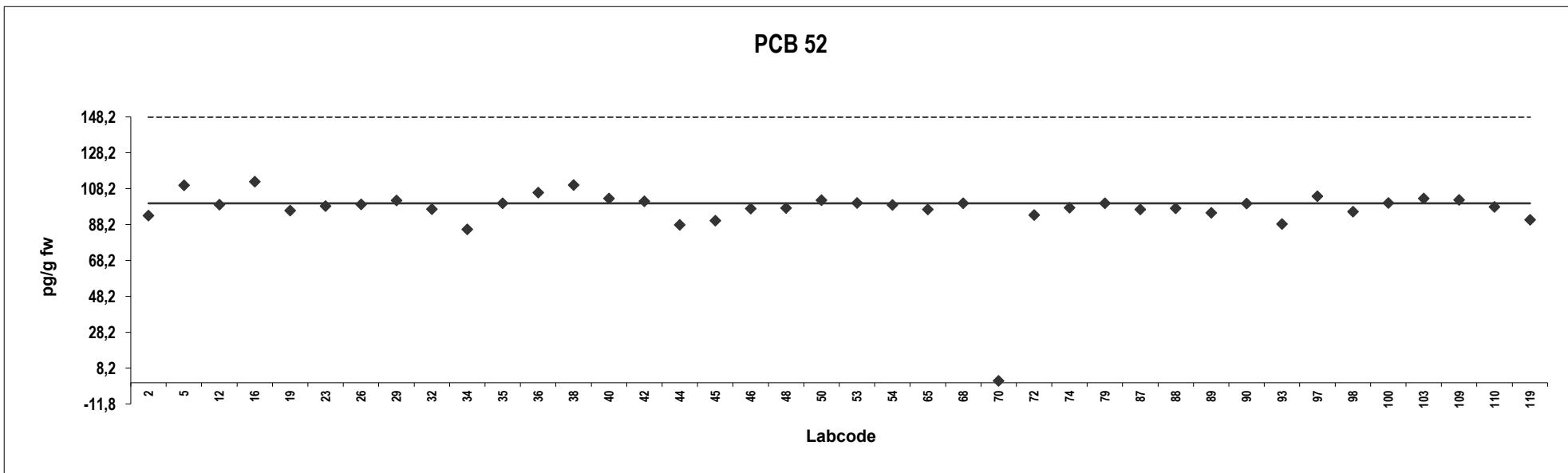
Analyte solution
Congener: PCB 101

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	85	-0,73					
5	110	0,55					
12	105	0,29					
16	112	0,65					
19	101	0,096					
23	101	0,096					
26	97	-0,087					
29	119	1,0					
32	98	-0,037					
34	79	-1,0					
35	95	-0,18					
36	99	0,00					
38	100	0,043					
40	102	0,15					
42	103	0,22					
44	86	-0,66					
45	97	-0,096					
46	99	0,00					
48	102	0,15					
50	100	0,032					
53	99	-0,017					
54	100	0,023					
65	100	0,037					
68	103	0,18					
70	1,0	-4,9	Outlier				
72	93	-0,32					
74	96	-0,16					
79	95	-0,18					
87	99	0,010					
88	97	-0,10					
89	89	-0,49					
90	98	-0,035					
93	79	-1,0					
97	110	0,56					
98	96	-0,15					
100	98	-0,054					
103	102	0,17					
109	92	-0,34					
110	101	0,080					
119	74	-1,3					

Consensus statistics

Consensus median, pg/g	99
Median all values pg/g	99
Consensus mean, pg/g	98
Standard deviation, pg/g	8,8
Relative standard deviation, %	9,0
No. of values reported	40
No. of values removed	1
No. of reported non-detects	0

PCB 101

Z-score: PCB 101
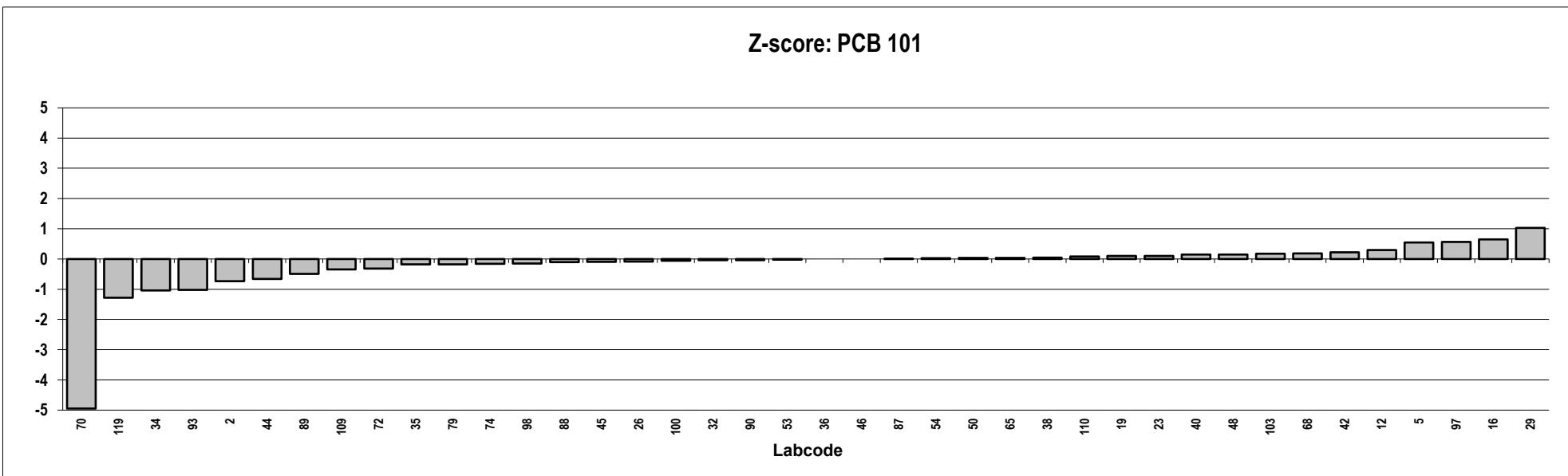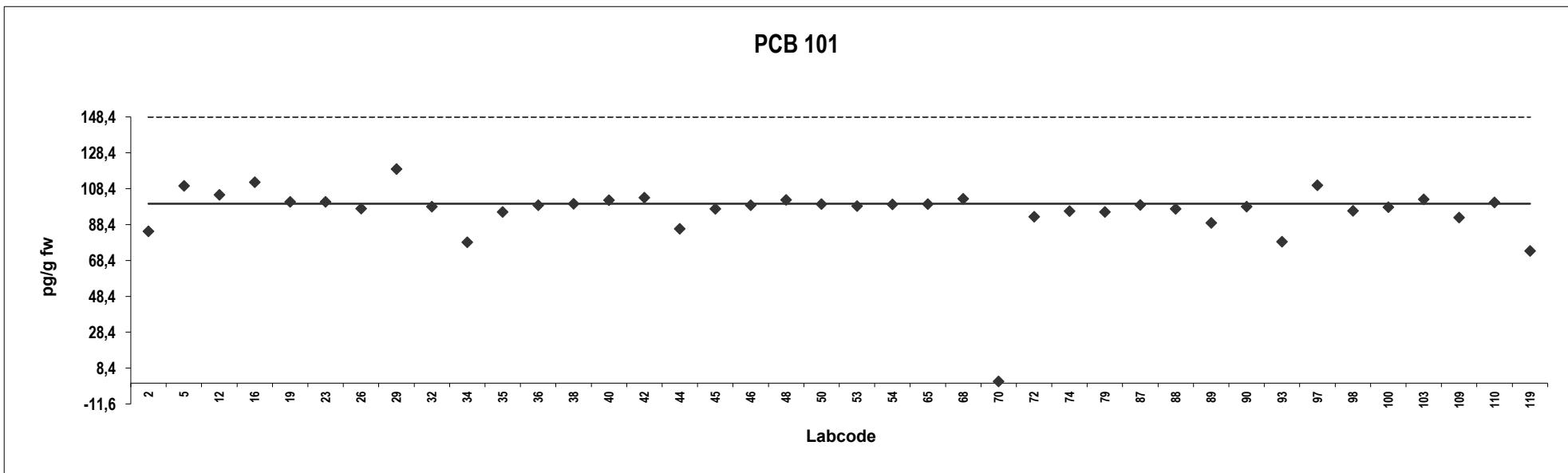
Analyte solution
Congener: PCB 138

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	97	-0,11					
5	108	0,44					
12	103	0,17					
16	111	0,59					
19	100	0,033					
23	103	0,18					
26	92	-0,35					
29	102	0,12					
32	97	-0,11					
34	90	-0,50					
35	98	-0,060					
36	105	0,28					
38	107	0,40					
40	102	0,12					
42	95	-0,20					
44	87	-0,62					
45	92	-0,35					
46	97	-0,13					
48	98	-0,089					
50	99	0,00					
53	102	0,13					
54	100	0,021					
65	103	0,18					
68	99	0,0027					
70	0,98	-5,0	Outlier				
72	93	-0,33					
74	97	-0,11					
79	98	-0,060					
87	98	-0,073					
88	95	-0,20					
89	91	-0,44					
90	98	-0,048					
93	88	-0,58					
97	108	0,45					
98	103	0,20					
100	104	0,24					
103	101	0,061					
109	107	0,41					
110	102	0,11					
119	89	-0,54					

Consenus statistics

Consensus median, pg/g	99
Median all values pg/g	99
Consensus mean, pg/g	99
Standard deviation, pg/g	5,9
Relative standard deviation, %	6,0
No. of values reported	40
No. of values removed	1
No. of reported non-detects	0

PCB 138

Z-score: PCB 138
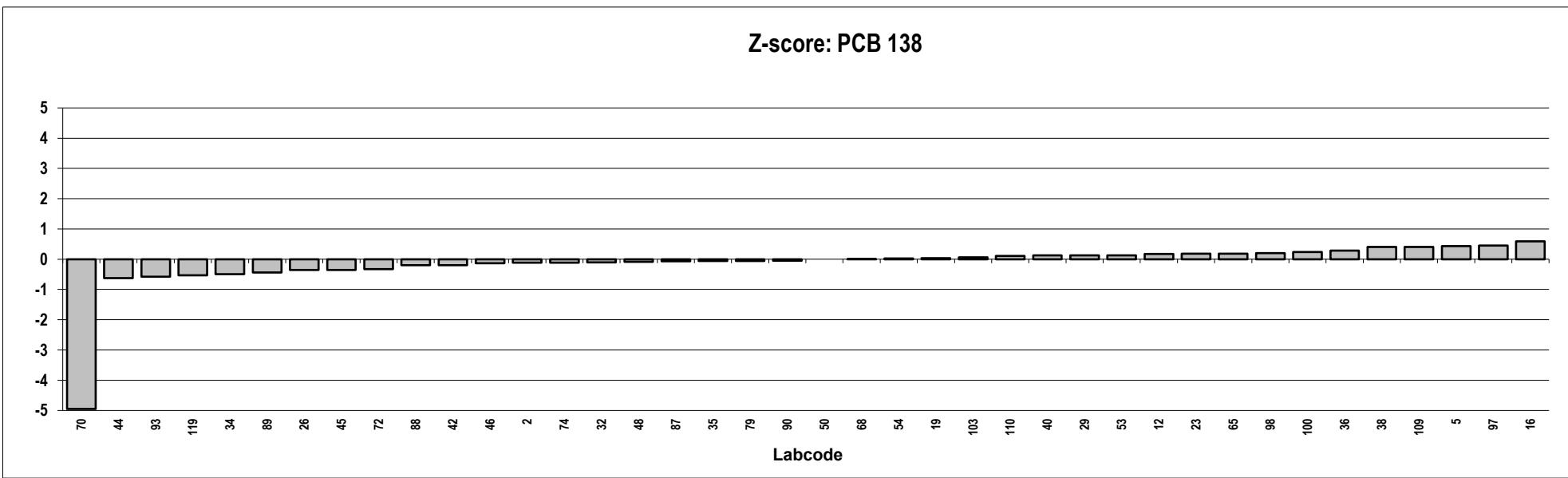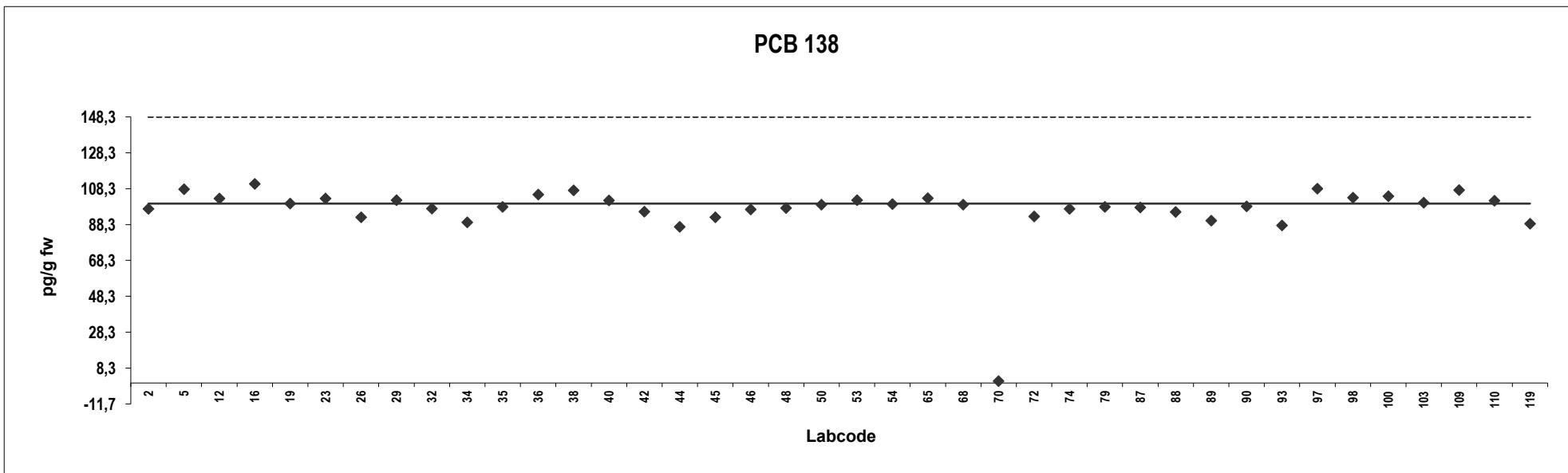
Analyte solution
Congener: PCB 153

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	107	0,38					
5	108	0,43					
12	102	0,15					
16	112	0,64					
19	103	0,18					
23	92	-0,38					
26	94	-0,28					
29	102	0,14					
32	98	-0,083					
34	85	-0,71					
35	97	-0,13					
36	99	0,0018					
38	109	0,48					
40	101	0,058					
42	99	0,00					
44	85	-0,70					
45	98	-0,071					
46	97	-0,11					
48	109	0,49					
50	100	0,027					
53	98	-0,058					
54	100	0,034					
65	95	-0,23					
68	101	0,10					
70	1,0	-4,9	Outlier				
72	89	-0,52					
74	98	-0,084					
79	97	-0,13					
87	100	0,017					
88	93	-0,30					
89	89	-0,54					
90	98	-0,048					
93	83	-0,84					
97	103	0,20					
98	94	-0,26					
100	104	0,21					
103	100	0,025					
109	108	0,42					
110	101	0,11					
119	75	-1,2					

Consenus statistics

Consensus median, pg/g	99
Median all values pg/g	99
Consensus mean, pg/g	98
Standard deviation, pg/g	7,7
Relative standard deviation, %	7,8
No. of values reported	40
No. of values removed	1
No. of reported non-detects	0

PCB 153

Z-score: PCB 153

Analyte solution
Congener: PCB 180

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	92	-0,42					
5	106	0,30					
12	100	0,022					
16	110	0,50					
19	109	0,45					
23	97	-0,14					
26	97	-0,16					
29	102	0,089					
32	97	-0,13					
34	84	-0,78					
35	100	0,010					
36	108	0,40					
38	119	0,97					
40	102	0,082					
42	96	-0,21					
44	97	-0,16					
45	94	-0,28					
46	96	-0,18					
48	118	0,88					
50	100	-0,020					
53	101	0,077					
54	99	-0,025					
65	101	0,044					
68	103	0,17					
70	0,99	-5,0	Outlier				
72	93	-0,36					
74	96	-0,19					
79	100	0,010					
87	97	-0,17					
88	100	0,00					
89	90	-0,47					
90	98	-0,098					
93	81	-0,97					
97	107	0,34					
98	98	-0,11					
100	101	0,031					
103	100	0,013					
109	108	0,40					
110	102	0,12					
119	78	-1,1					

Consensus statistics	
Consensus median, pg/g	100
Median all values pg/g	100
Consensus mean, pg/g	99
Standard deviation, pg/g	8,2
Relative standard deviation, %	8,2
No. of values reported	40
No. of values removed	1
No. of reported non-detects	0

PCB 180

Z-score: PCB 180
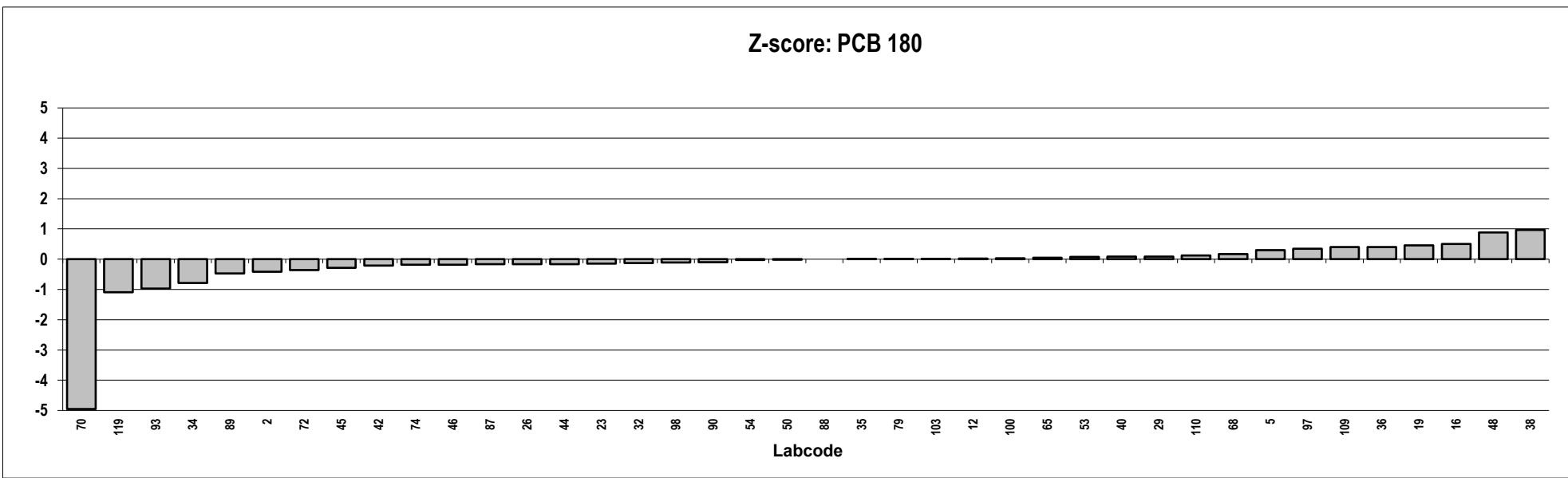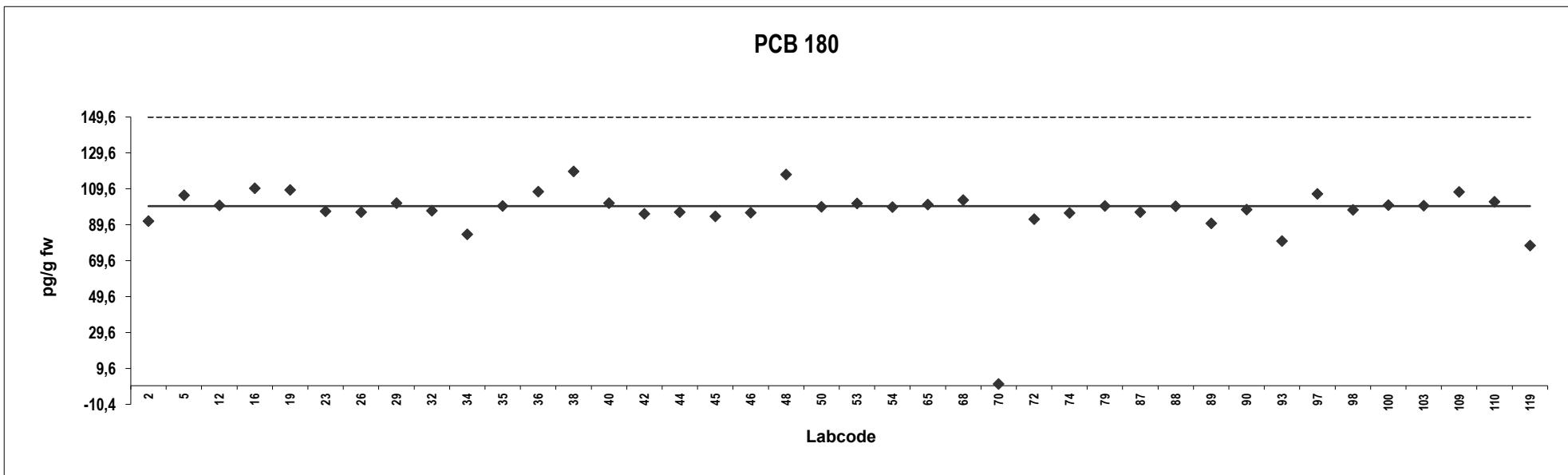
Analyte solution
Congener: PBDE 28

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	24	-0,22					
2	34	1,9					
5	25	0,10					
6	22	-0,55					
19	26	0,24					
23	25	0,10					
36	25	-0,040					
40	24	-0,12					
43	25	0,098					
44	28	0,75					
45	24	-0,18					
53	25	0,073					
68	25	0,040					
89	20	-0,95					
90	22	-0,51					
97	26	0,24					
98	23	-0,27					
109	27	0,47					
110	24	-0,059					
119	17	-1,5					

Consensus statistics

Consensus median, pg/g	25
Median all values pg/g	25
Consensus mean, pg/g	25
Standard deviation, pg/g	3,3
Relative standard deviation, %	13
No. of values reported	20
No. of values removed	0
No. of reported non-detects	0

PBDE 28

Z-score: PBDE 28
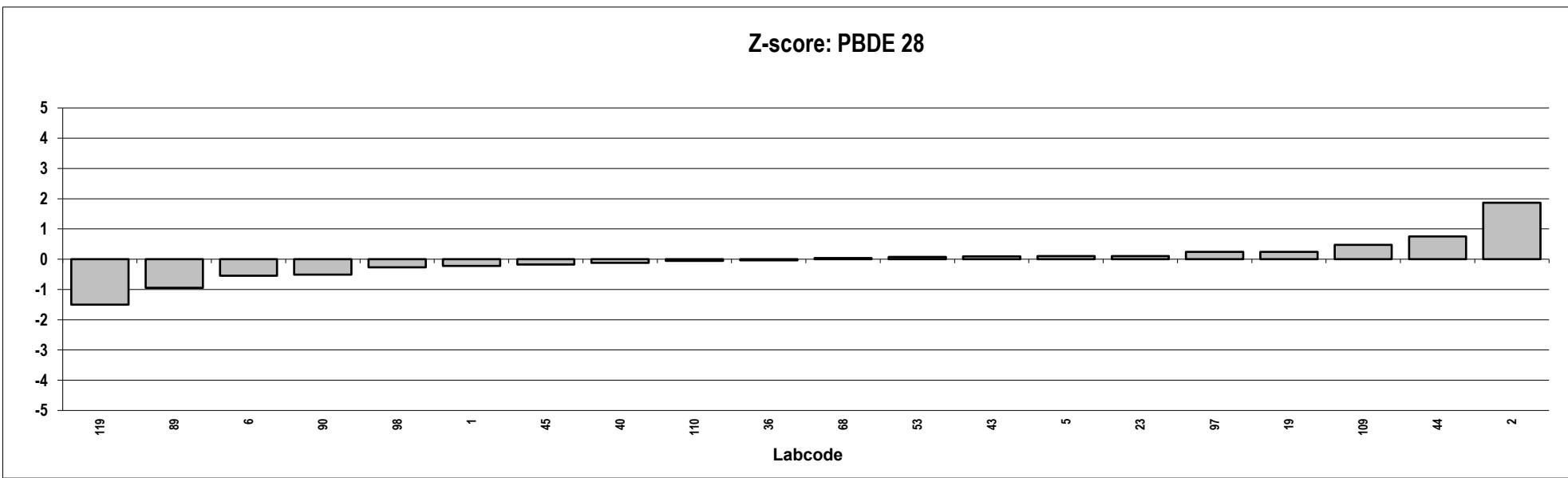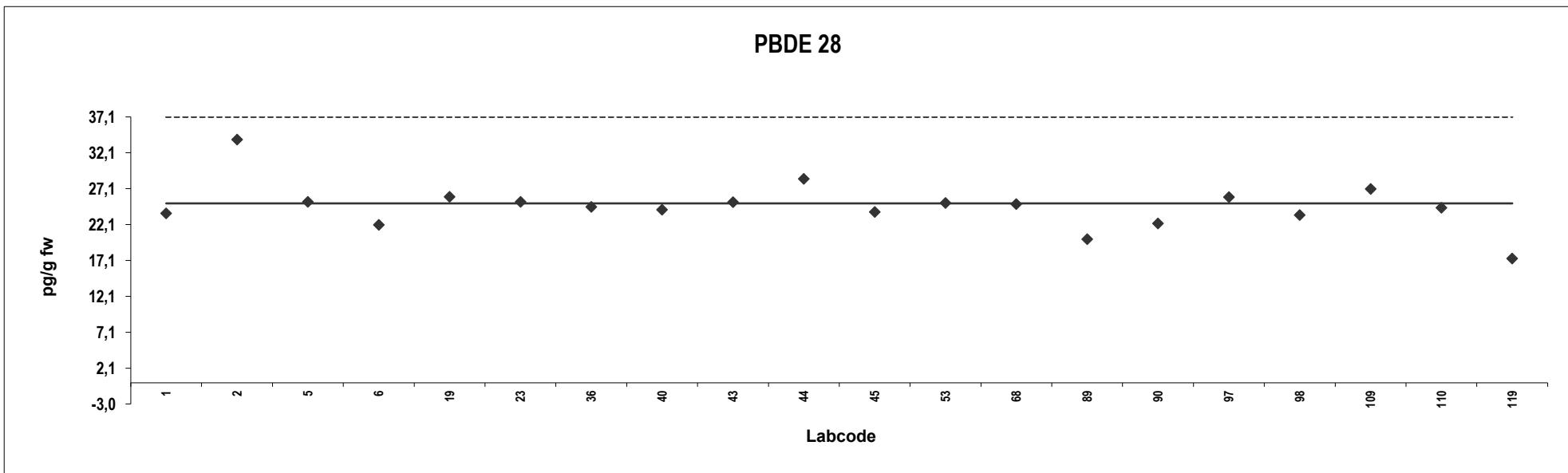
Analyte solution

Congener: PBDE 47

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	26	0,36					
2	29	0,89					
5	24	-0,13					
6	23	-0,40					
19	26	0,28					
23	26	0,40					
36	25	0,011					
40	24	-0,065					
43	26	0,24					
44	24	-0,11					
45	22	-0,40					
53	24	-0,011					
68	25	0,073					
89	22	-0,55					
90	23	-0,34					
97	26	0,27					
98	24	-0,16					
109	25	0,21					
110	25	0,11					
119	18	-1,4					

Consenus statistics

Consensus median, pg/g	24
Median all values pg/g	24
Consensus mean, pg/g	24
Standard deviation, pg/g	2,3
Relative standard deviation, %	9,3
No. of values reported	20
No. of values removed	0
No. of reported non-detects	0

PBDE 47

Z-score: PBDE 47
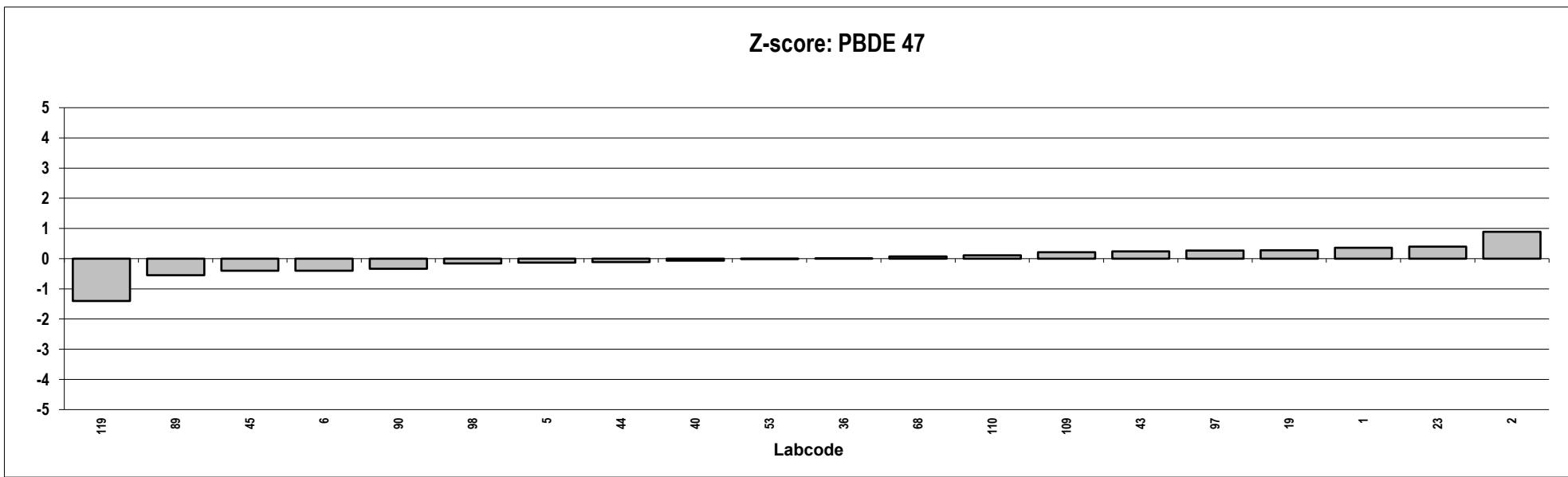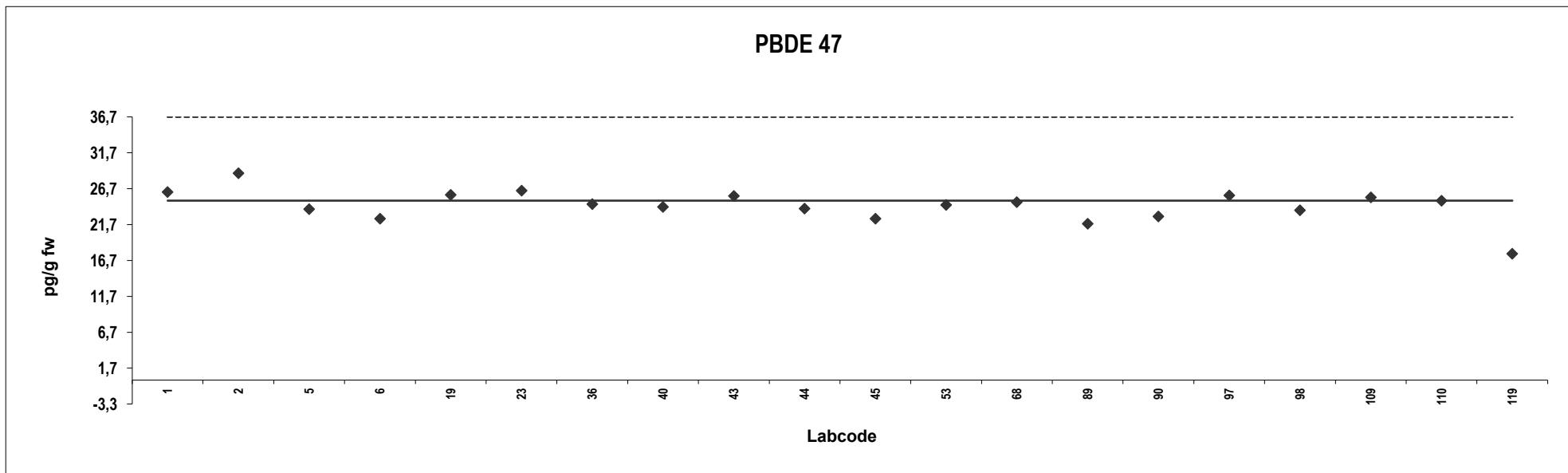
Analyte solution
Congener: PBDE 99

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	24	-0,010					
2	30	1,1					
5	24	-0,031					
6	26	0,21					
19	28	0,69					
23	26	0,32					
36	23	-0,34					
40	25	0,043					
43	25	0,037					
44	25	0,010					
45	23	-0,22					
53	23	-0,25					
68	25	0,092					
89	22	-0,49					
90	24	-0,17					
97	26	0,25					
98	24	-0,028					
109	24	-0,077					
110	25	0,11					
119	22	-0,50					

Consenus statistics

Consensus median, pg/g	24
Median all values pg/g	24
Consensus mean, pg/g	25
Standard deviation, pg/g	1,8
Relative standard deviation, %	7,4
No. of values reported	20
No. of values removed	0
No. of reported non-detects	0

PBDE 99

Z-score: PBDE 99
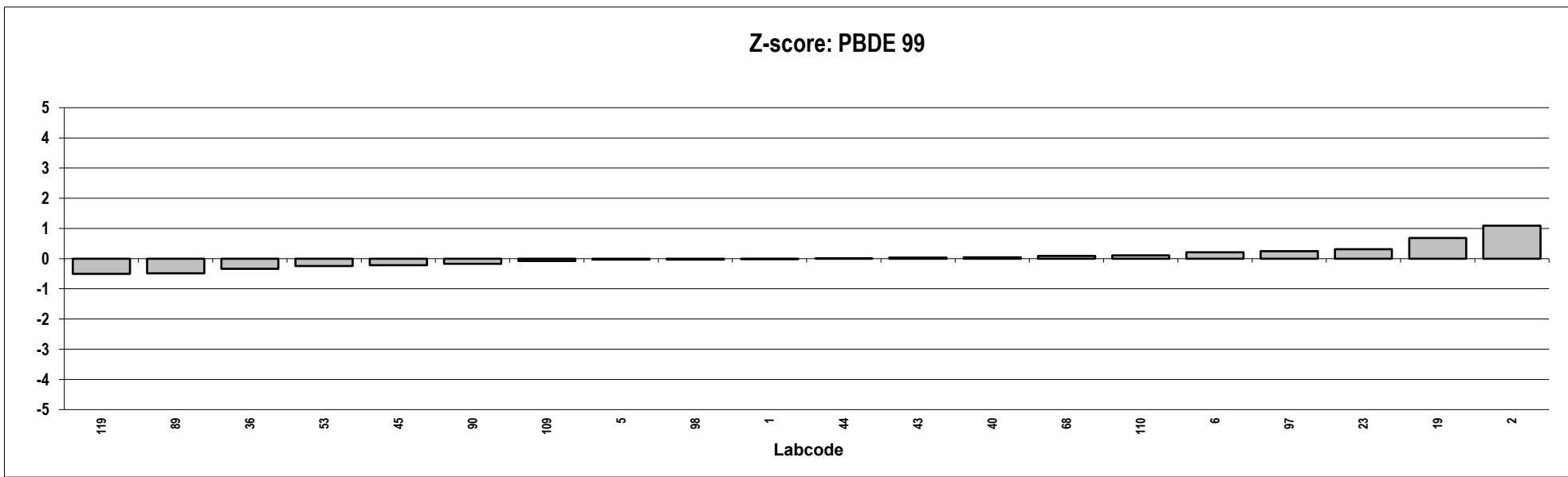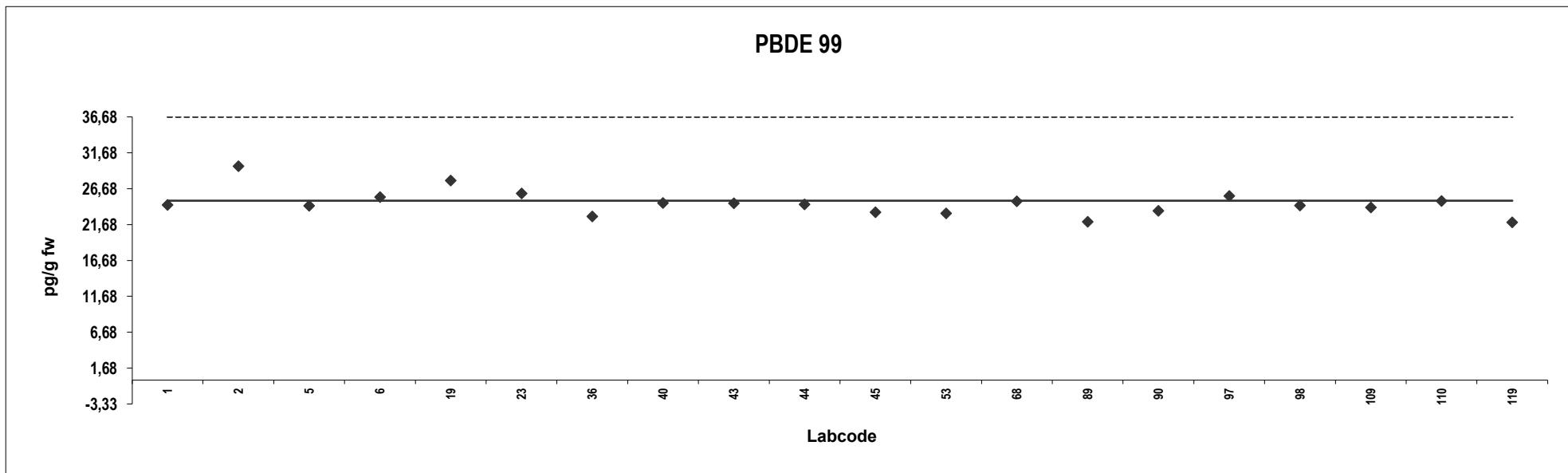
Analyte solution
Congener: PBDE 100

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	29	0,89					
2	27	0,58					
5	24	-0,13					
6	24	-0,21					
19	28	0,64					
23	26	0,38					
36	25	-0,0087					
40	25	0,14					
43	25	0,0087					
44	24	-0,13					
45	22	-0,47					
53	26	0,27					
68	26	0,34					
89	22	-0,51					
90	24	-0,17					
97	26	0,27					
98	24	-0,053					
109	27	0,47					
110	24	-0,057					
119	21	-0,64					

Consenus statistics

Consensus median, pg/g	25
Median all values pg/g	25
Consensus mean, pg/g	25
Standard deviation, pg/g	2,0
Relative standard deviation, %	7,9
No. of values reported	20
No. of values removed	0
No. of reported non-detects	0

PBDE 100

Z-score: PBDE 100
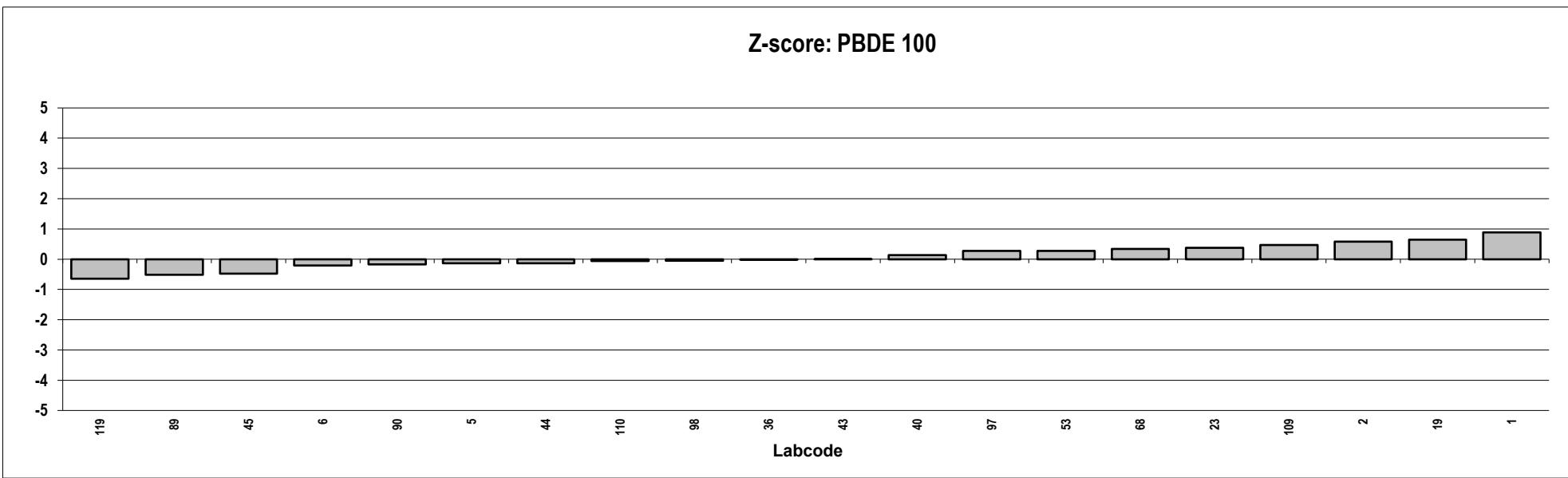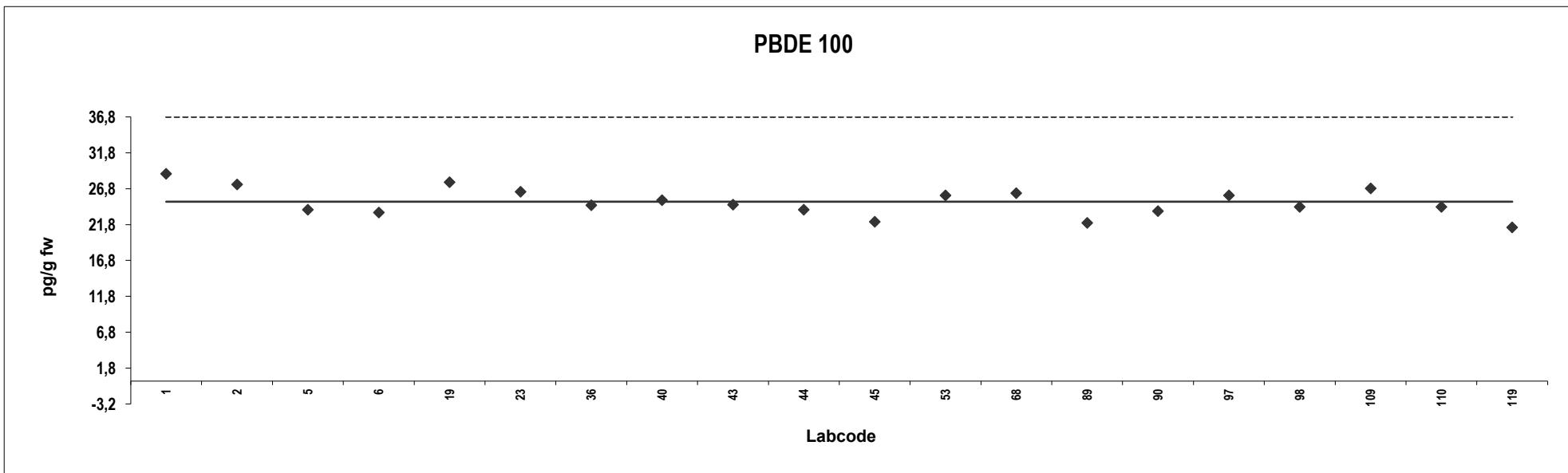
Analyte solution
Congener: PBDE 153

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	25	0,013					
2	25	0,074					
5	25	-0,0072					
6	22	-0,48					
19	25	0,013					
23	26	0,30					
36	25	-0,0072					
40	25	0,0072					
43	26	0,26					
44	24	-0,048					
45	24	-0,18					
53	25	0,037					
68	26	0,34					
89	20	-0,94					
90	22	-0,54					
97	25	0,18					
98	24	-0,17					
109	27	0,49					
110	24	-0,14					
119	23	-0,29					

Consensus statistics

Consensus median, pg/g	25
Median all values pg/g	25
Consensus mean, pg/g	24
Standard deviation, pg/g	1,6
Relative standard deviation, %	6,6
No. of values reported	20
No. of values removed	0
No. of reported non-detects	0

PBDE 153
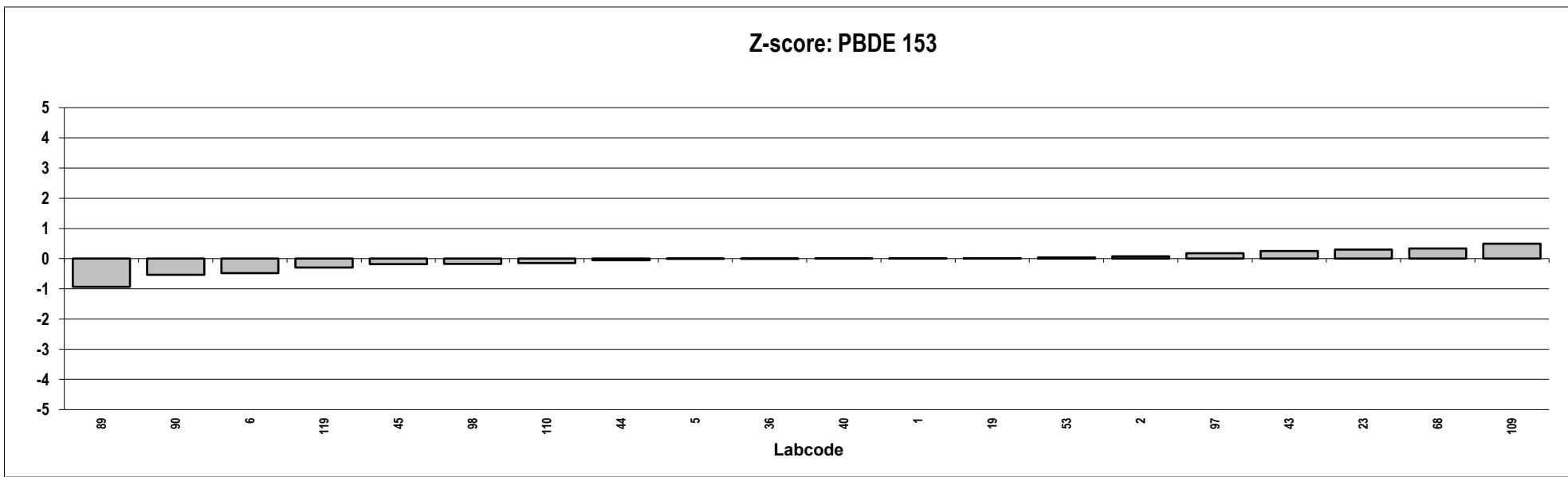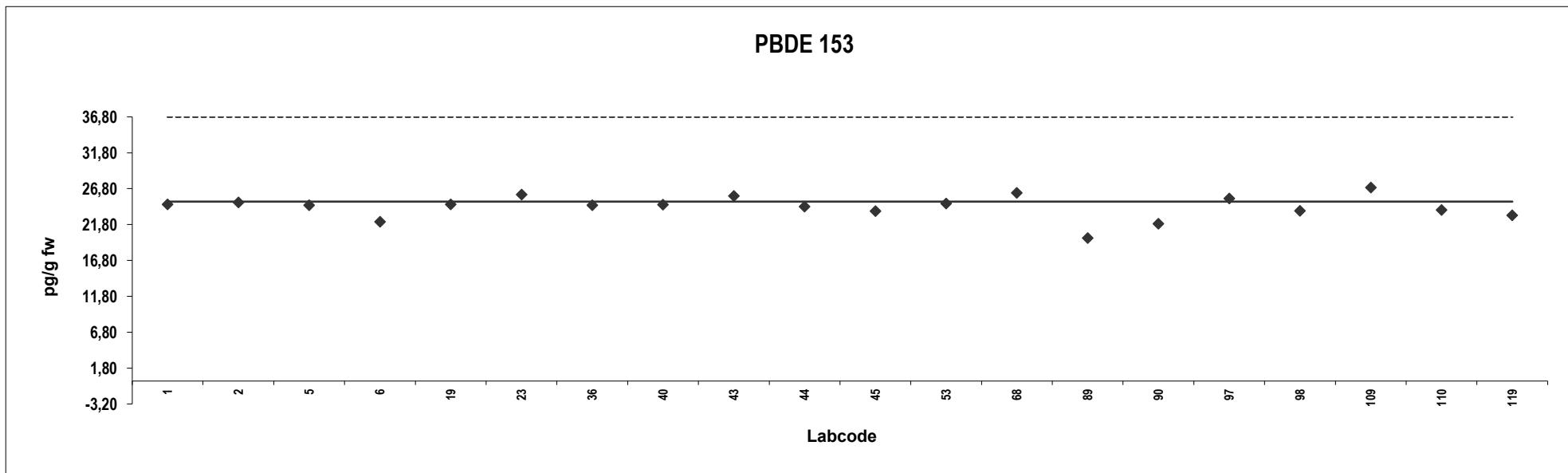
Z-score: PBDE 153

Analyte solution
Congener: PBDE 154

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	23	-0,35					
2	27	0,56					
5	22	-0,49					
6	26	0,29					
19	26	0,34					
23	25	0,13					
36	24	0,046					
40	24	-0,026					
43	25	0,26					
44	23	-0,31					
45	23	-0,27					
53	24	-0,11					
68	25	0,15					
89	22	-0,53					
90	22	-0,41					
97	25	0,18					
98	24	-0,078					
109	27	0,58					
110	24	-0,091					
119	24	0,026					

Consenus statistics

Consensus median, pg/g	24
Median all values pg/g	24
Consensus mean, pg/g	24
Standard deviation, pg/g	1,6
Relative standard deviation, %	6,5
No. of values reported	20
No. of values removed	0
No. of reported non-detects	0

PBDE 154

Z-score: PBDE 154
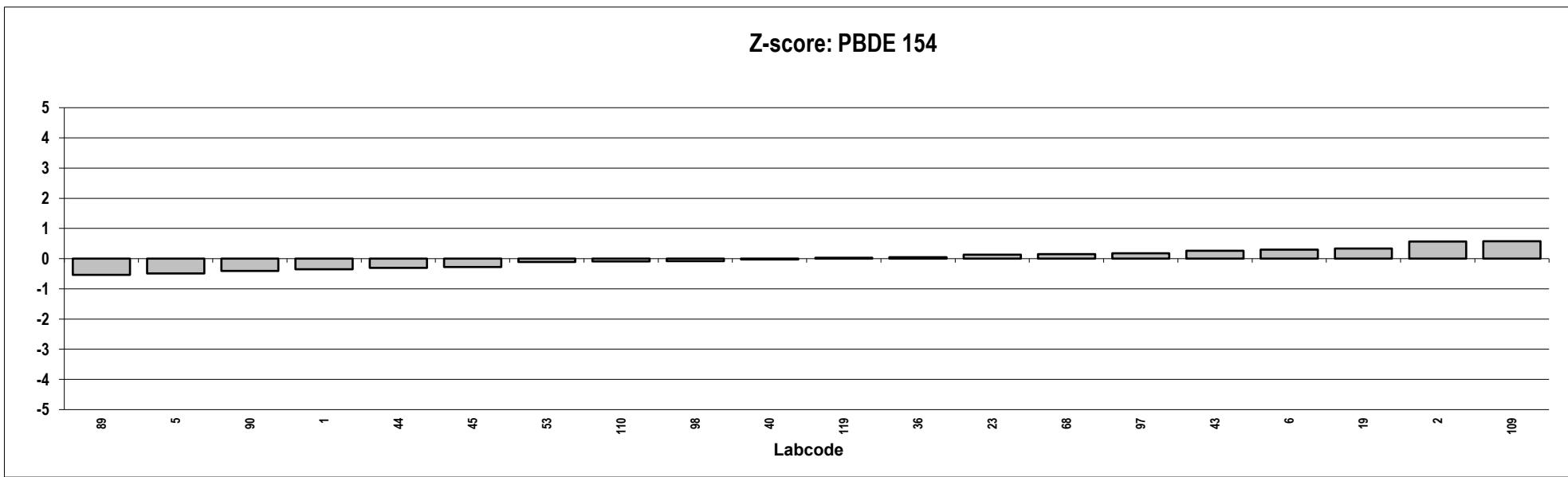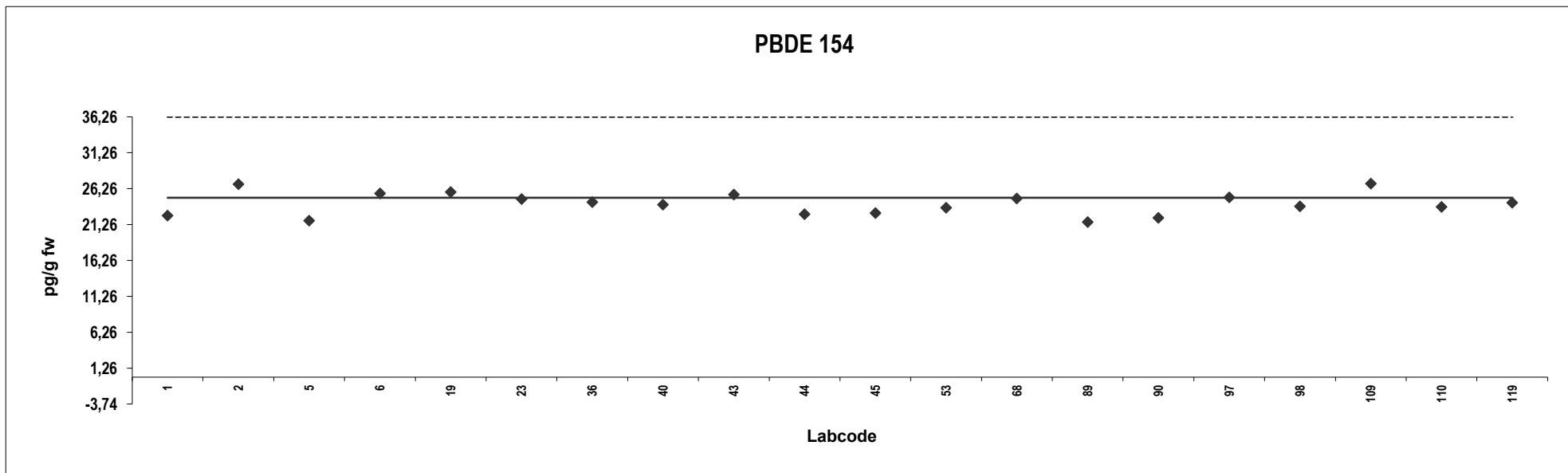
Analyte solution
Congener: PBDE 183

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	25	0,020					
2	29	0,83					
5	26	0,24					
6	25	-0,060					
19	29	0,81					
23	26	0,24					
40	25	0,12					
43	25	0,12					
44	23	-0,30					
45	24	-0,068					
53	24	-0,19					
68	25	0,00					
89	19	-1,3					
90	24	-0,14					
97	25	0,065					
98	24	-0,095					
109	26	0,31					
110	24	-0,079					
119	23	-0,42					

Consenus statistics

Consensus median, pg/g	25
Median all values pg/g	25
Consensus mean, pg/g	25
Standard deviation, pg/g	2,2
Relative standard deviation, %	8,9
No. of values reported	19
No. of values removed	0
No. of reported non-detects	0

PBDE 183
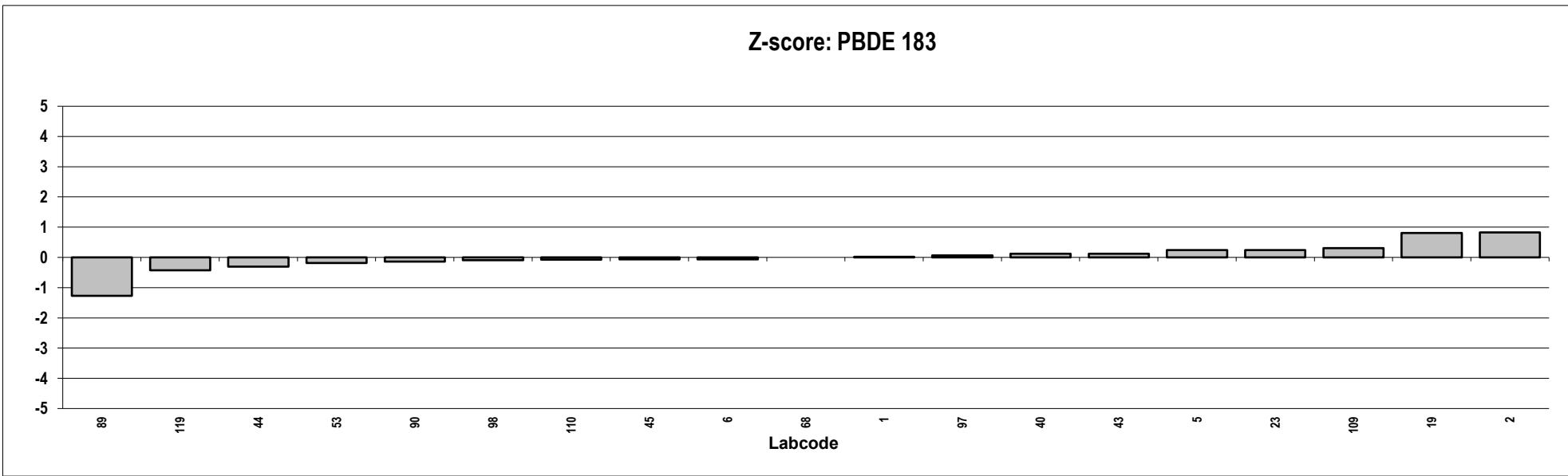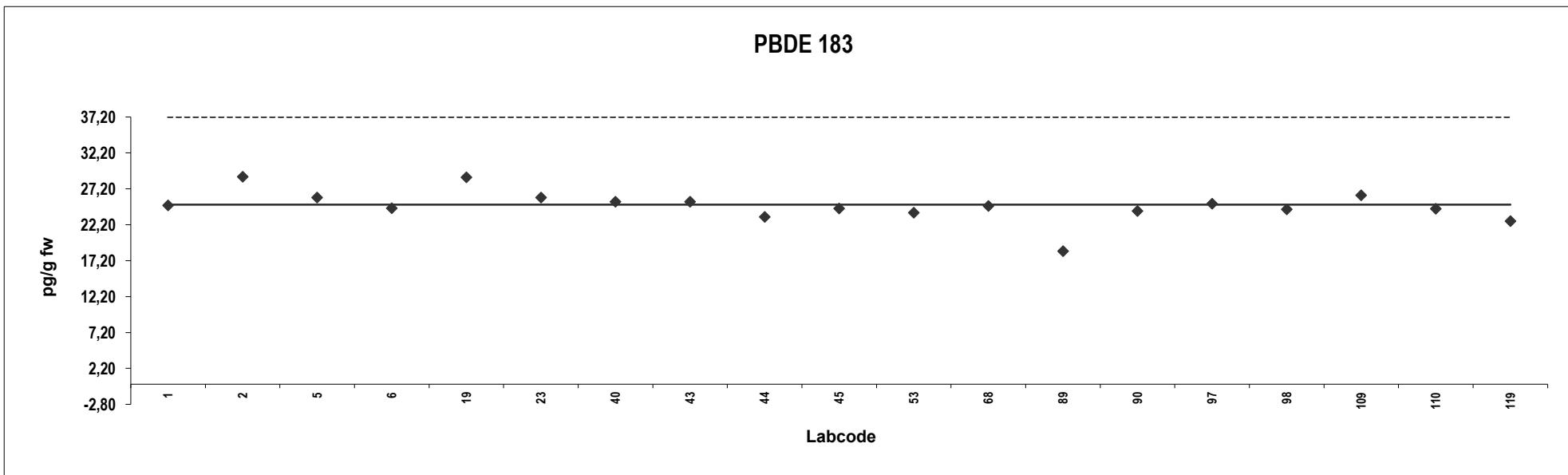
Analyte solution

Congener: PBDE 209

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	94	0,14					
2	83	-0,49					
5	91	-0,043					
6	95	0,15					
23	115	1,3					
43	101	0,50					
44	92	0,023					
53	101	0,48					
68	84	-0,44					
89	86	-0,29					
90	90	-0,097					
97	91	-0,023					
110	96	0,22					
119	91	-0,064					

Consenus statistics

Consensus median, pg/g	92
Median all values pg/g	92
Consensus mean, pg/g	94
Standard deviation, pg/g	8,2
Relative standard deviation, %	8,7
No. of values reported	14
No. of values removed	0
No. of reported non-detects	0
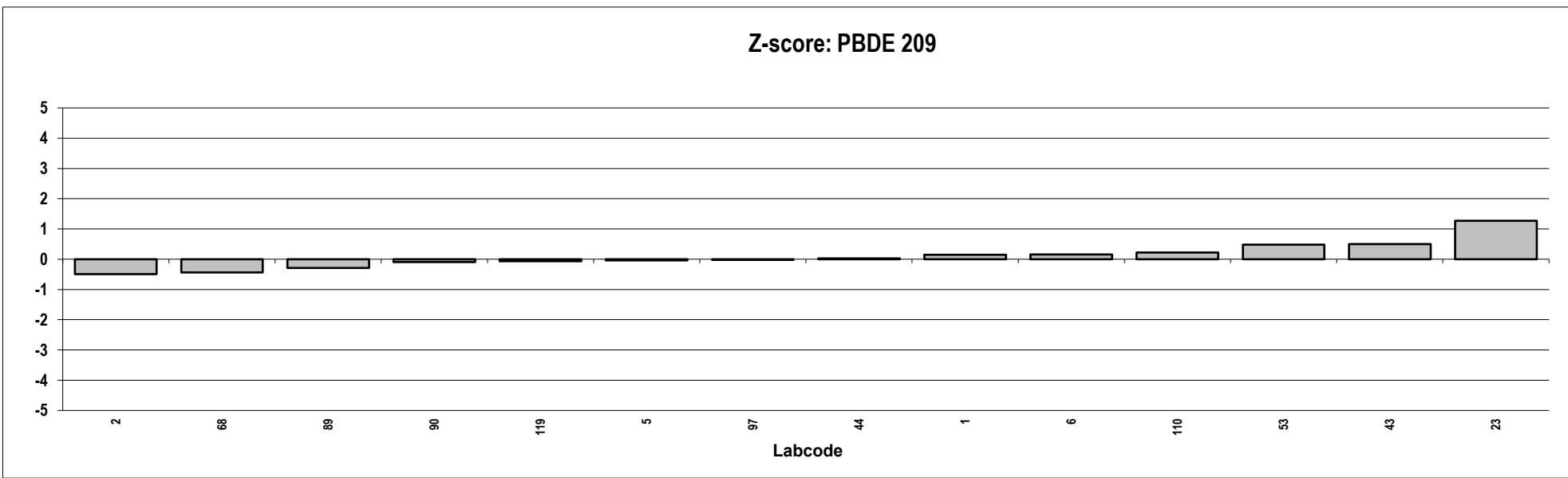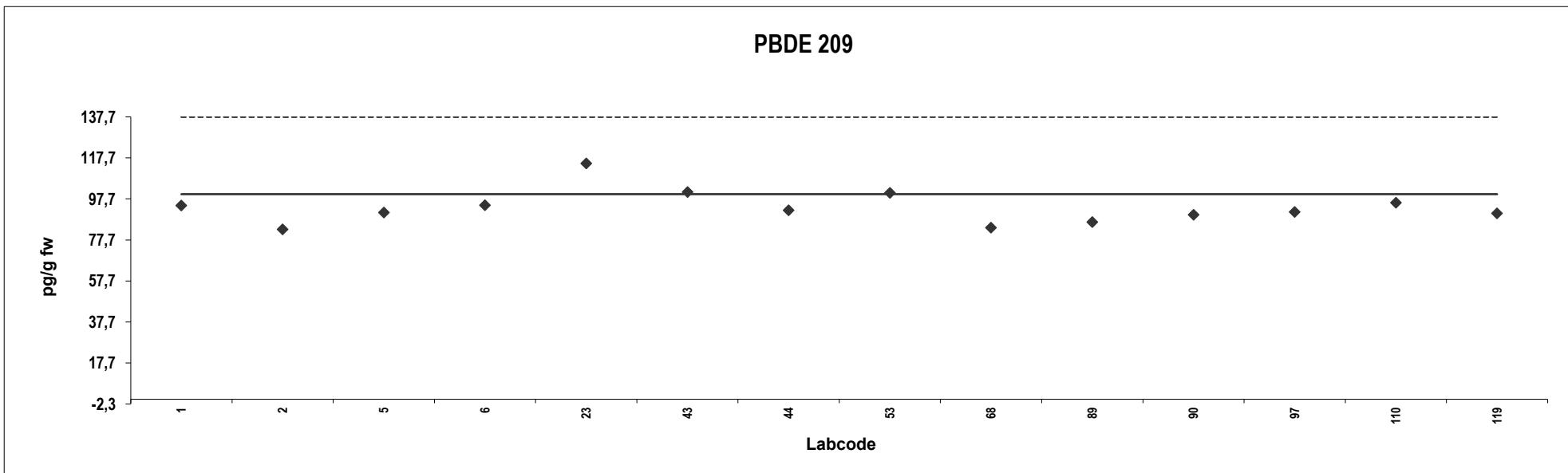
PBDE 209

Z-score: PBDE 209

Analyte solution

Congener: α-HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
5	466	-0,31					
23	521	0,24					
42	493	-0,040					
55	497	0,00					
89	700	2,0					

Consenus statistics

Consensus median, pg/g	497
Median all values pg/g	497
Consensus mean, pg/g	535
Standard deviation, pg/g	94
Relative standard deviation, %	18
No. of values reported	5
No. of values removed	0
No. of reported non-detects	0

α-HBCD

Labcode

Y-axis: pg/g fw

Z-score: α-HBCD

Labcode
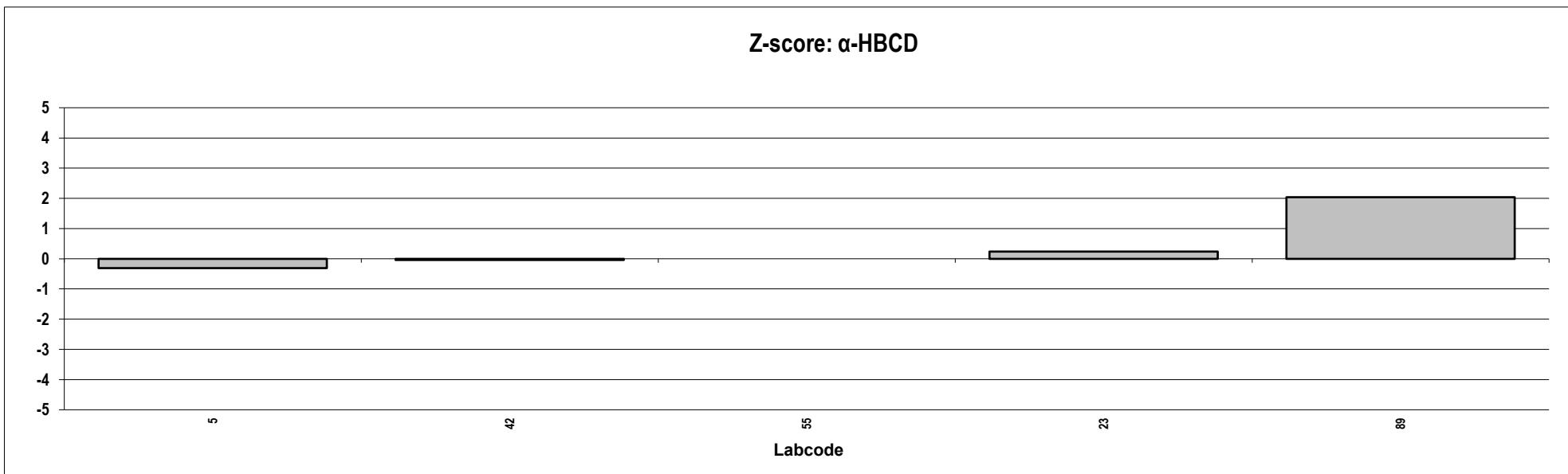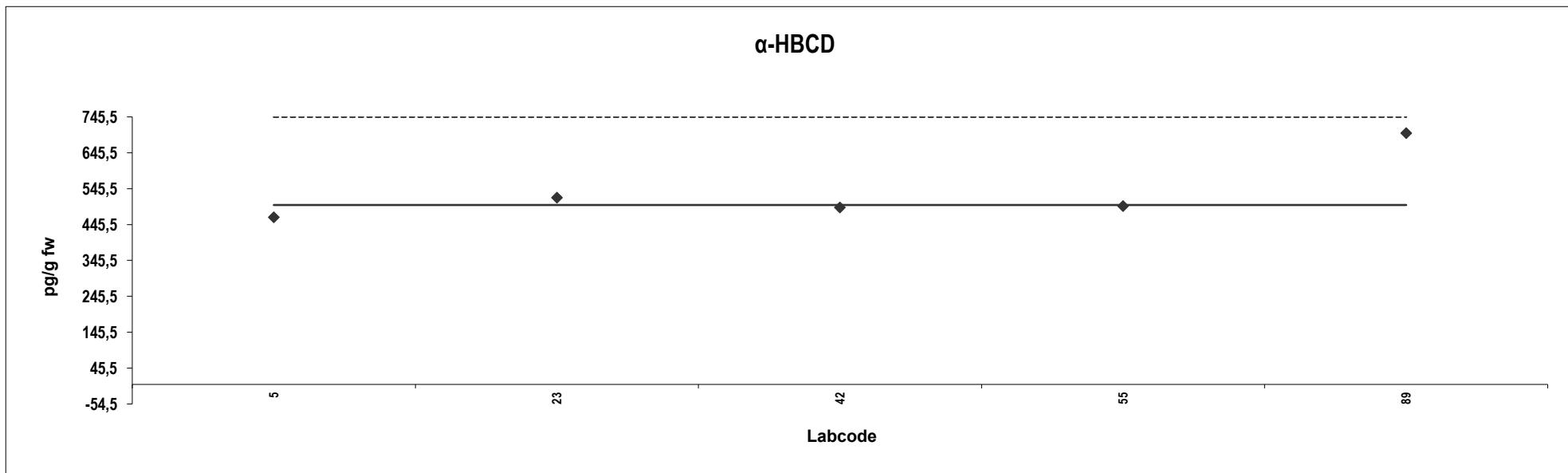
Appendix 2:

Presentation of results for
Sheep meat-2021

Appendix 2: Presentation of results: Sheep meat-2021

Statistic calculations for PCDDs, PCDFs and dioxin-like PCBs

For each congener, the outliers were removed and the consensus calculated according to the following procedure:
1. The median was calculated from all the reported data, using the detection limit as concentration for non-detected congeners.
2. Values exceeding 2 × this median were defined as outliers and removed from the data set.
3. Median, mean and standard deviation were re-calculated from the remaining data. This second median was called consensus.

Statistic calculations for indicator PCBs, PBDEs and HBCD

For each congener, the outliers were removed and the consensus calculated according to the following procedure:
1. The median was calculated from all the reported data, using the detection limit as concentration for non-detected congeners (NDs).
2. Values exceeding 2 × this median were defined as outliers and removed from the data set. The NDs were also removed.
3. Median, mean and standard deviation were re-calculated from the remaining data. This second median was called consensus.
4. For comparison, median, mean and standard deviation were also calculated without removing NDs.

The diagram shows the reported data up to approximately the limit for outliers (2 × the first median).

Z-Scores of individual congeners

Z-scores of each congener were calculated for each laboratory according to the following equation:

$$z = (x - X)/\sigma$$

where x = reported value; X = assigned value (consensus); σ = target value for standard deviation. A σ of 20% of the consensus was used, i.e. z-scores between +1 and -1 reflect a deviation of ± 20% from the consensus value.

Sheep meat
Congener: 2,3,7,8 TCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,098	240	Outlier,ND				
5	0,0011	-2,3					
12	0,0039	4,7					
15	0,015	33	Outlier				
23	0,0061	10	Outlier,ND				
29	0,0023	0,73	ND				
32	0,013	28	Outlier				
33	0,063	153	Outlier,ND				
34	0,0013	-1,7	ND				
35	0,0024	1,0					
36	0,0011	-2,2					
38	0,0046	6,5	ND				
40	0,00080	-3,0	ND				
42	0,00093	-2,7					
43	0,078	191	Outlier				
46	0,0050	7,5	ND				
48	0,0022	0,60					
50	0,0099	20	Outlier,ND				
53	0,0011	-2,4					
54	0,0035	3,8	ND				
55	0,00036	-4,1	ND				
57	0,020	45	Outlier,ND				
58	0,0080	15	Outlier				
65	0,16	390	Outlier,ND				
68	0,0013	-1,7					
70	0,040	95	Outlier,ND				
71	0,16	390	Outlier,ND				
74	0,0050	7,5	ND				
79	0,0025	1,3					
81	0,0097	19	Outlier				
87	0,0010	-2,5	ND				
88	0,0020	0,00					
89	0,00030	-4,2	ND				
90	0,0010	-2,5	ND				
93	0,0027	1,8	ND				
95	0,0026	1,5					
98	0,0026	1,5					
100	0,0030	2,5	ND				
103	0,00070	-3,2	ND				
109	0,0051	7,8	ND				
110	0,00091	-2,7	ND				
113	0,050	120	Outlier,ND				
116	0,0014	-1,5	ND				

Consensus statistics	
Consensus median, pg/g	0,0020
Median all values pg/g	0,0027
Consensus mean, pg/g	0,0022
Standard deviation, pg/g	0,0015
Relative standard deviation, %	67
No. of values reported	43
No. of values removed	14
No. of reported non-detects	26

2,3,7,8 TCDD

Z-score: 2,3,7,8 TCDD
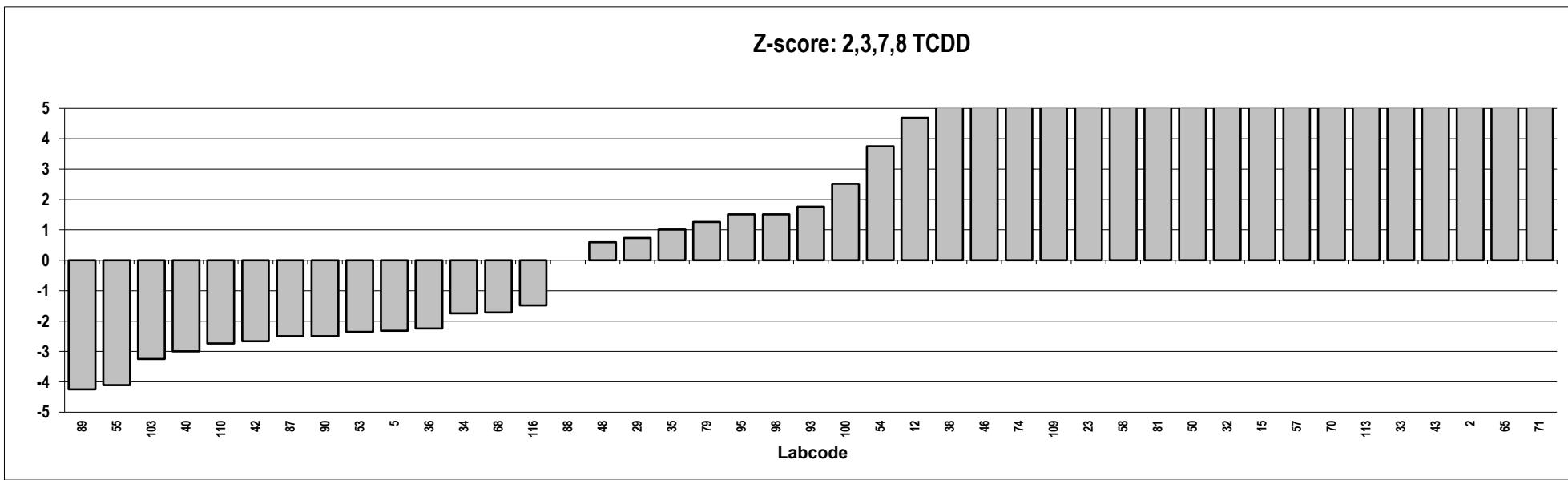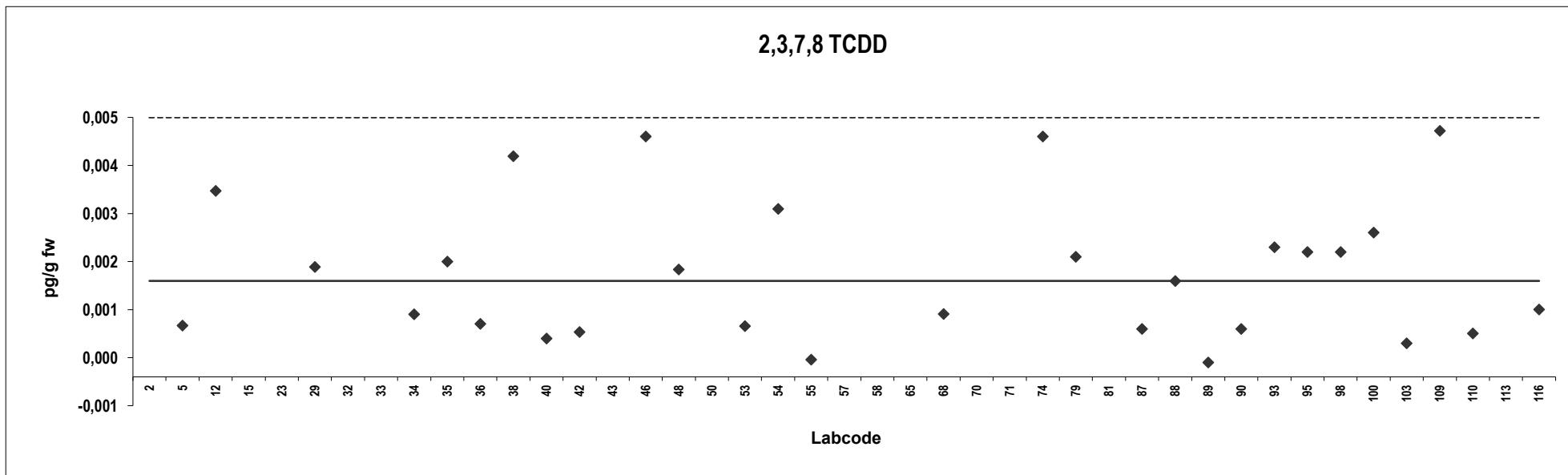
Sheep meat
Congener: 1,2,3,7,8 PeCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,099	142	Outlier,ND				
5	0,0027	-0,95					
12	0,0078	6,6					
15	0,032	42	Outlier				
23	0,0050	2,4	ND				
29	0,0065	4,7	ND				
32	0,085	121	Outlier				
33	0,063	88	Outlier,ND				
34	0,0028	-0,85	ND				
35	0,0031	-0,40					
36	0,0038	0,64					
38	0,0046	1,8	ND				
40	0,0028	-0,84					
42	0,0020	-2,1					
43	0,25	362	Outlier				
46	0,0050	2,4	ND				
48	0,0030	-0,50					
50	0,0099	9,7	Outlier,ND				
53	0,0032	-0,29					
54	0,0036	0,29	ND				
55	0,0011	-3,4	ND				
57	0,020	25	Outlier,ND				
58	0,0095	9,1	Outlier				
65	0,17	252	Outlier,ND				
68	0,0085	7,6					
70	0,040	54	Outlier,ND				
71	0,17	252	Outlier,ND				
74	0,0050	2,4	ND				
79	0,0041	1,1					
81	0,0052	2,7					
87	0,0020	-2,0	ND				
88	0,0031	-0,39					
89	0,0010	-3,5	ND				
90	0,0020	-2,0	ND				
93	0,0043	1,4	ND				
95	0,0042	1,2	ND				
98	0,0093	8,8	Outlier				
100	0,0040	0,94	ND				
103	0,0030	-0,55					
109	0,0051	2,6	ND				
110	0,0023	-1,6	ND				
113	0,050	69	Outlier,ND				
116	0,0023	-1,5	ND				

Consensus statistics

Consensus median, pg/g	0,0034
Median all values pg/g	0,0046
Consensus mean, pg/g	0,0038
Standard deviation, pg/g	0,0018
Relative standard deviation, %	47
No. of values reported	43
No. of values removed	13
No. of reported non-detects	25
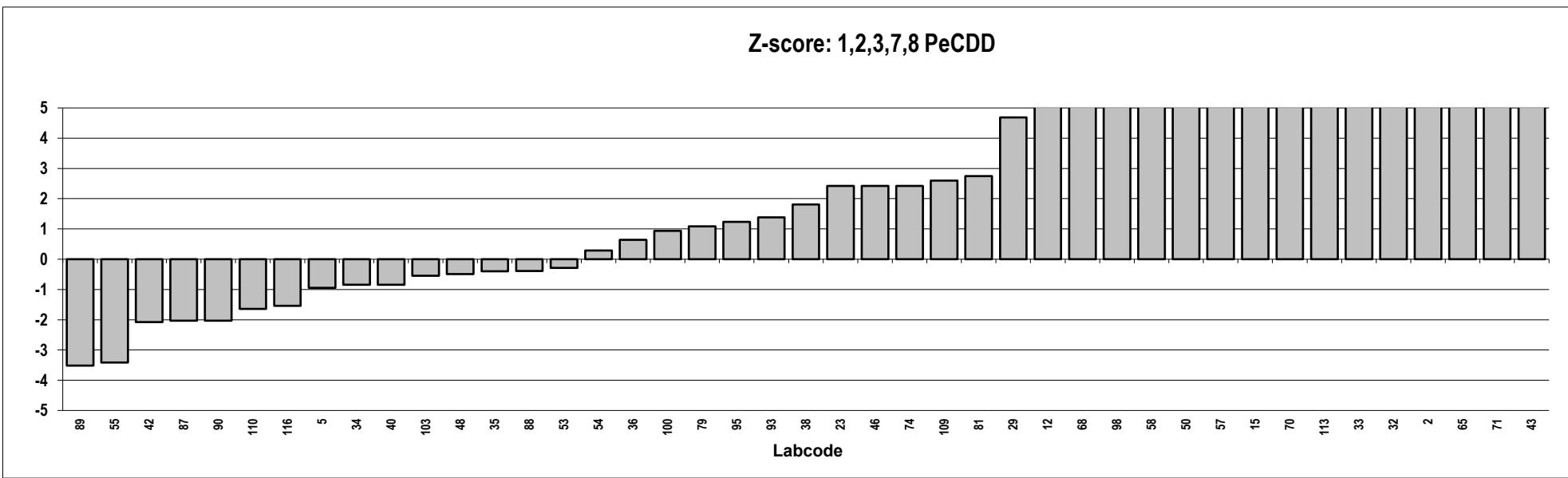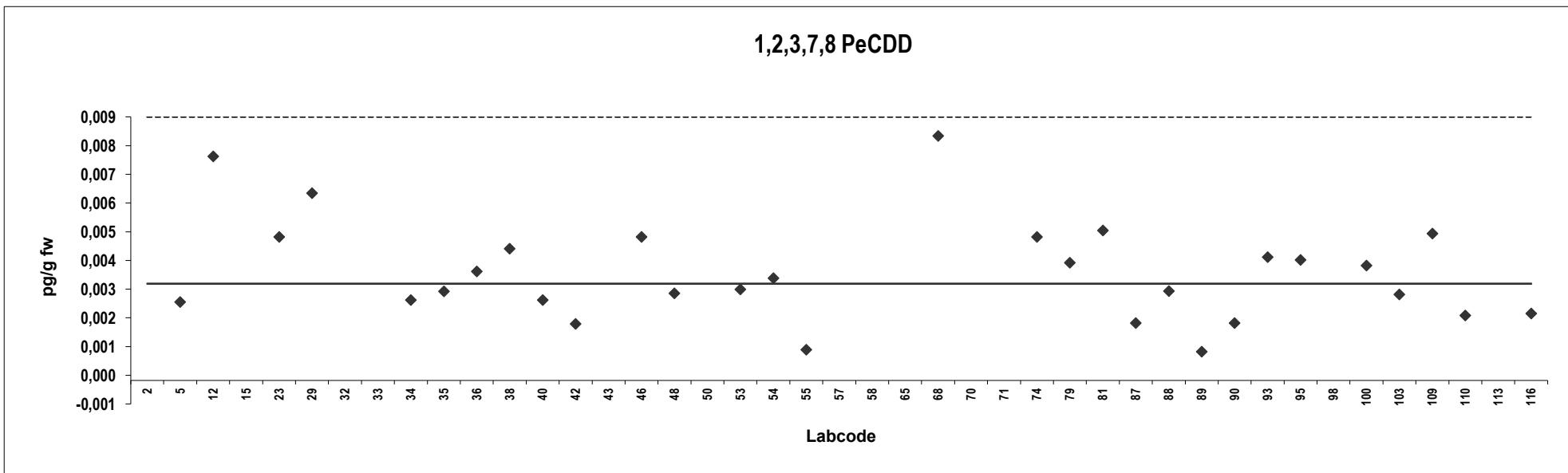
1,2,3,7,8 PeCDD

Z-score: 1,2,3,7,8 PeCDD

Sheep meat
Congener: 1,2,3,4,7,8 HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,11	143	Outlier,ND				
5	0,0021	-2,1					
12	0,0062	3,4					
15	0,034	41	Outlier				
23	0,0054	2,3	ND				
29	0,0055	2,4					
32	0,076	97	Outlier				
33	0,13	170	Outlier,ND				
34	0,0048	1,5					
35	0,0026	-1,5					
36	0,0036	-0,15					
38	0,0046	1,2	ND				
40	0,0022	-2,0					
42	0,0011	-3,5					
43	0,14	190	Outlier				
46	0,0050	1,7	ND				
48	0,0020	-2,3					
50	0,0099	8,3	ND				
53	0,0021	-2,2					
54	0,0087	6,8	ND				
55	0,0021	-2,1					
57	0,050	62	Outlier,ND				
58	0,0066	3,8					
65	0,12	155	Outlier,ND				
68	0,0029	-1,0					
70	0,050	62	Outlier,ND				
71	0,12	155	Outlier,ND				
74	0,0050	1,7	ND				
79	0,018	20	Outlier				
81	0,0038	0,15					
87	0,0030	-0,96	ND				
88	0,0024	-1,8					
89	0,00040	-4,5	ND				
90	0,0020	-2,3	ND				
93	0,0061	3,3					
95	0,0042	0,66	ND				
98	0,0082	6,0					
100	0,0030	-0,96	ND				
103	0,0045	1,1					
109	0,0051	1,9	ND				
110	0,0023	-2,0	ND				
113	0,050	62	Outlier,ND				
116	0,0029	-1,1	ND				

Consensus statistics

Consensus median, pg/g	0,0037
Median all values pg/g	0,0050
Consensus mean, pg/g	0,0041
Standard deviation, pg/g	0,0022
Relative standard deviation, %	55
No. of values reported	43
No. of values removed	11
No. of reported non-detects	21
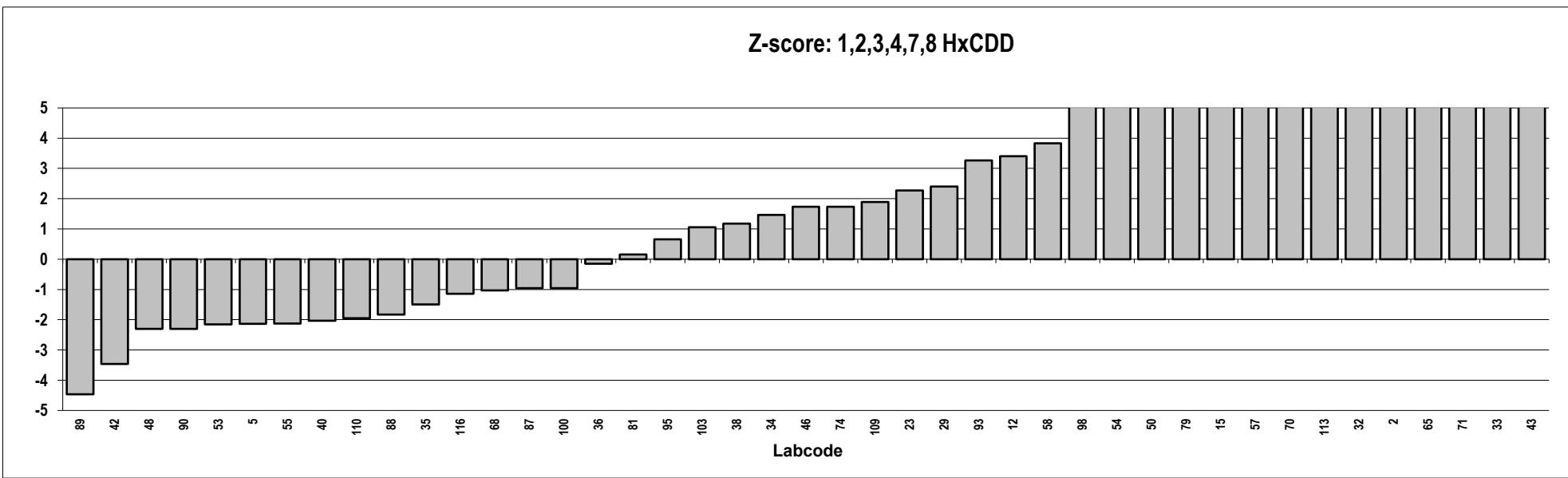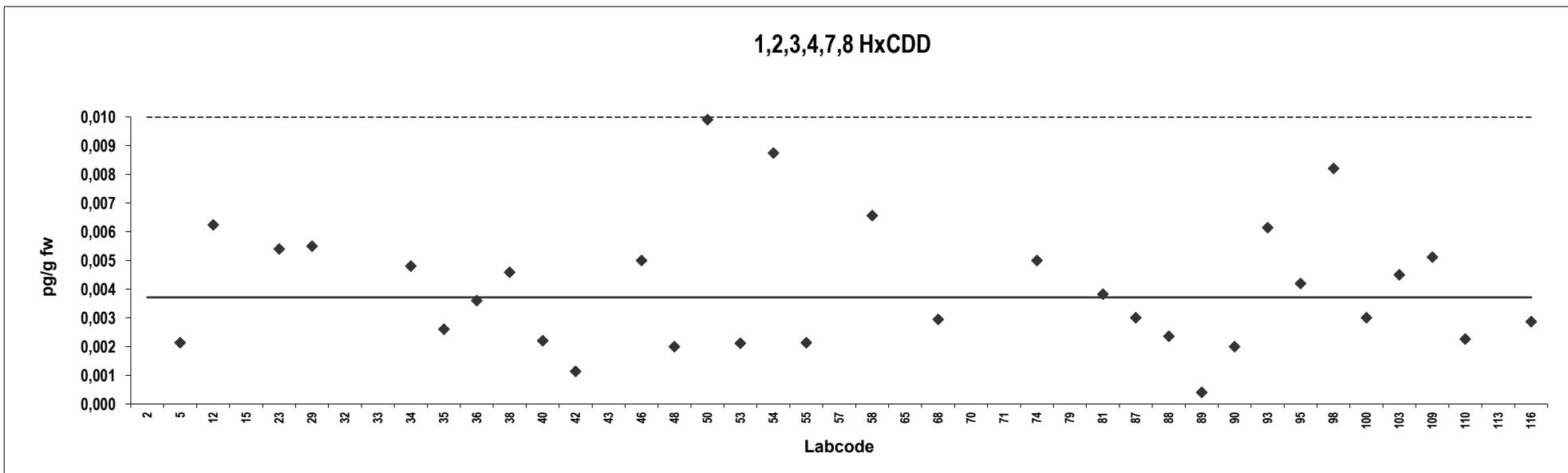
1,2,3,4,7,8 HxCDD

Z-score: 1,2,3,4,7,8 HxCDD

Sheep meat
Congener: 1,2,3,6,7,8 HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,11	120	Outlier,ND				
5	0,0045	0,091					
12	0,0059	1,7					
15	0,025	24	Outlier				
23	0,0052	0,91	ND				
29	0,0064	2,3					
32	0,10	113	Outlier				
33	0,13	143	Outlier,ND				
34	0,0023	-2,4	ND				
35	0,018	15	Outlier				
36	0,0076	3,6					
38	0,0046	0,22	ND				
40	0,0021	-2,7					
42	0,0028	-1,8					
43	0,15	164	Outlier				
46	0,0050	0,68	ND				
48	0,0035	-0,98					
50	0,0099	6,3	ND				
53	0,0026	-2,0					
54	0,0087	4,9	ND				
55	0,0039	-0,56					
57	0,050	52	Outlier,ND				
58	0,0062	2,1					
65	0,12	129	Outlier,ND				
68	0,0049	0,58					
70	0,050	52	Outlier,ND				
71	0,12	129	Outlier,ND				
74	0,0050	0,68	ND				
79	0,0043	-0,11					
81	0,0035	-1,0					
87	0,0030	-1,6	ND				
88	0,0032	-1,3					
89	0,00040	-4,5	ND				
90	0,0030	-1,6	ND				
93	0,0065	2,4					
95	0,0080	4,1					
98	0,0035	-1,0					
100	0,0030	-1,6					
103	0,0044	0,00					
109	0,0051	0,82	ND				
110	0,0023	-2,4	ND				
113	0,050	52	Outlier,ND				
116	0,013	9,6	Outlier				

Consensus statistics

Consensus median, pg/g	0,0044
Median all values pg/g	0,0051
Consensus mean, pg/g	0,0046
Standard deviation, pg/g	0,0021
Relative standard deviation, %	46
No. of values reported	43
No. of values removed	12
No. of reported non-detects	19

1,2,3,6,7,8 HxCDD

Z-score: 1,2,3,6,7,8 HxCDD
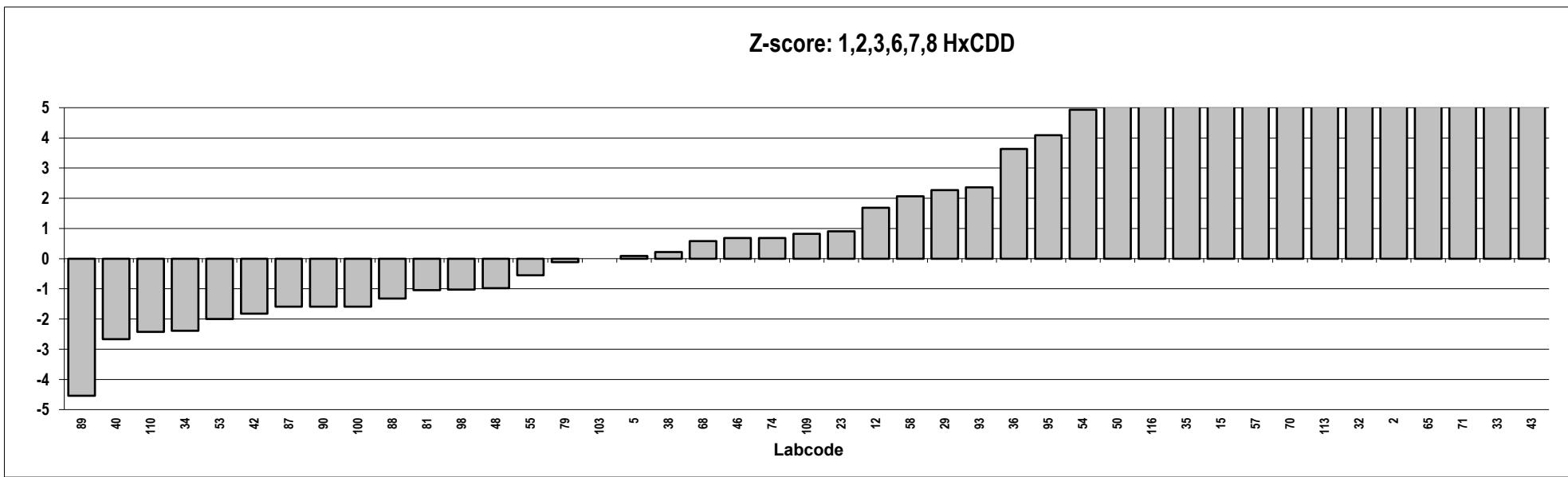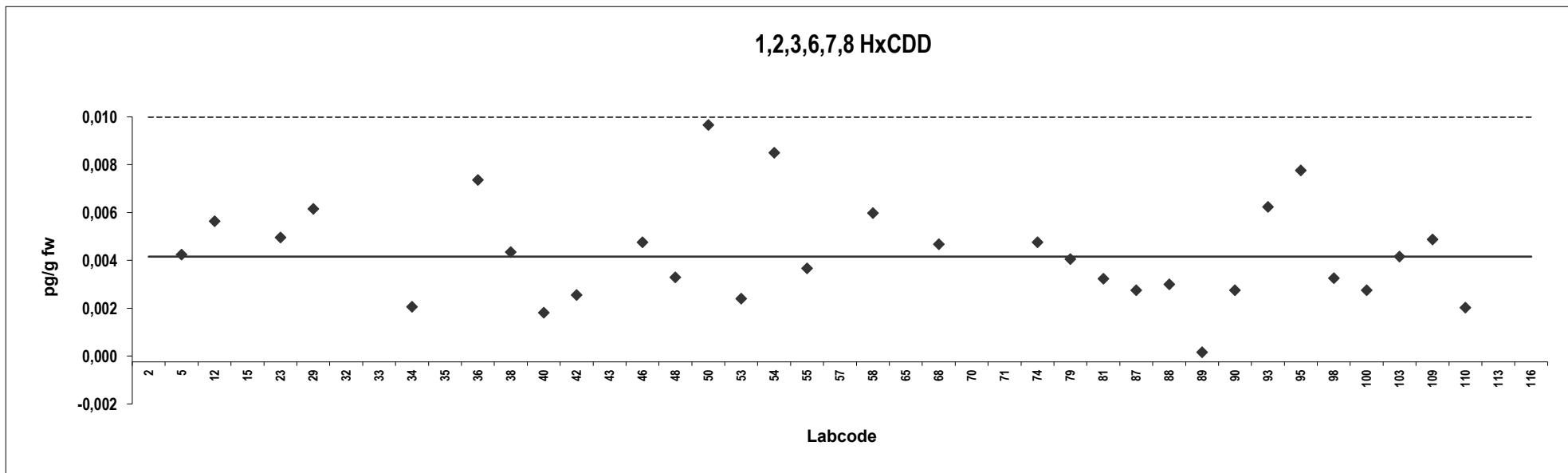
Sheep meat

Congener: 1,2,3,7,8,9 HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,11	178	Outlier,ND				
5	0,0016	-2,4	ND				
12	0,0044	2,3	ND				
15	0,055	86	Outlier				
23	0,0052	3,7	ND				
29	0,0026	-0,67	ND				
32	0,037	57	Outlier				
33	0,13	212	Outlier,ND				
34	0,0018	-2,0	ND				
35	0,0014	-2,7					
36	0,0010	-3,3	ND				
38	0,0046	2,7	ND				
40	0,0020	-1,6					
42	0,0010	-3,3	ND				
43	0,18	296	Outlier				
46	0,0050	3,3	ND				
48	0,0030	0,00					
50	0,0099	12	Outlier,ND				
53	0,0011	-3,2					
54	0,0071	6,9	ND				
55	0,0039	1,5					
57	0,050	78	Outlier,ND				
58	0,0063	5,4					
65	0,11	180	Outlier,ND				
68	0,0013	-2,8					
70	0,050	78	Outlier,ND				
71	0,11	180	Outlier,ND				
74	0,0050	3,3	ND				
79	0,0043	2,2					
81	0,0038	1,4					
87	0,0030	0,00	ND				
88	0,0015	-2,5					
89	0,00040	-4,3	ND				
90	0,0020	-1,7	ND				
93	0,0022	-1,3	ND				
95	0,0042	2,0	ND				
98	0,0086	9,3					
100	0,0030	0,00	ND				
103	0,0019	-1,8					
109	0,0051	3,5	ND				
110	0,0023	-1,2	ND				
113	0,050	78	Outlier,ND				
116	0,019	26	Outlier				

Consensus statistics

Consensus median, pg/g	0,0030
Median all values pg/g	0,0043
Consensus mean, pg/g	0,0032
Standard deviation, pg/g	0,0020
Relative standard deviation, %	61
No. of values reported	43
No. of values removed	12
No. of reported non-detects	27
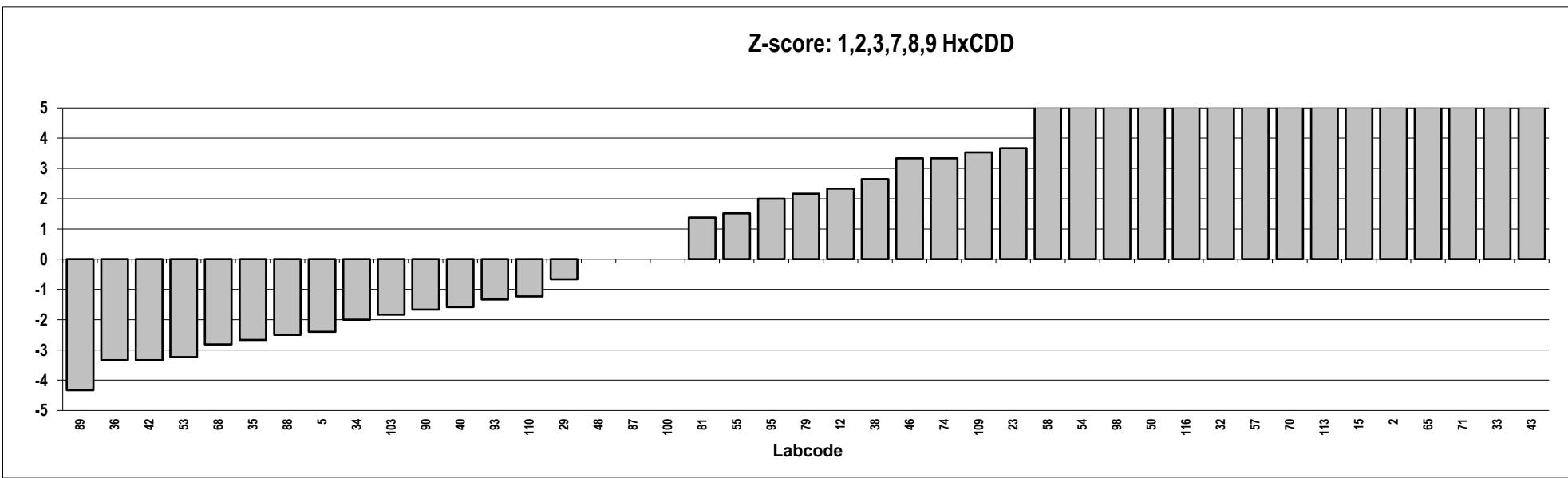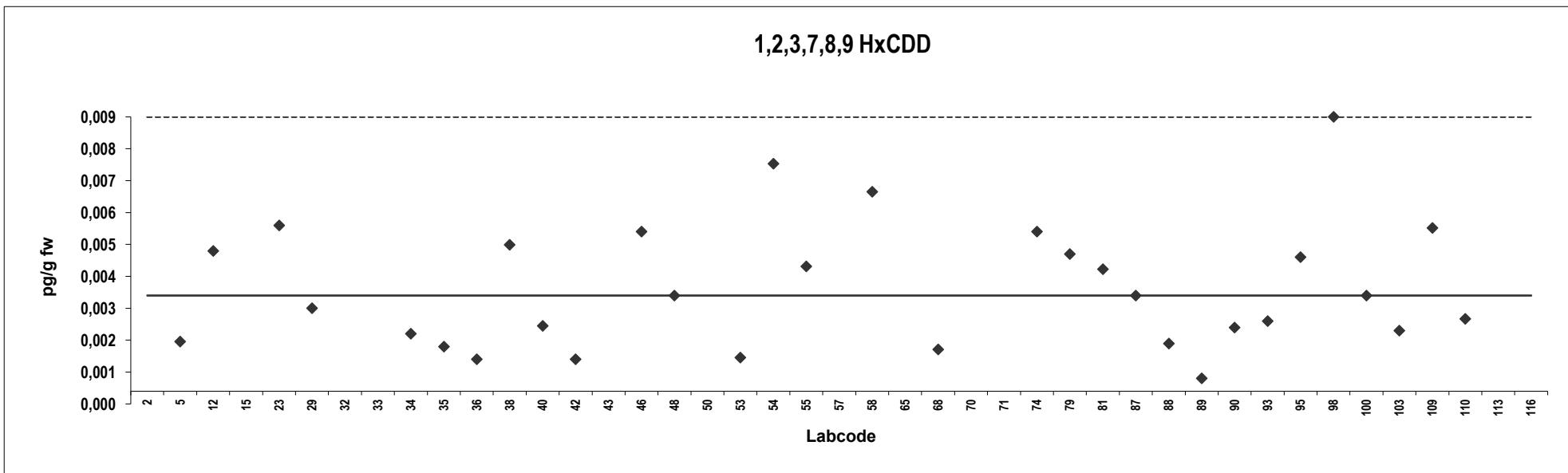
1,2,3,7,8,9 HxCDD

Z-score: 1,2,3,7,8,9 HxCDD

Sheep meat
Congener: 1,2,3,4,6,7,8 HpCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,16	76	Outlier,ND				
5	0,022	5,9					
12	0,018	4,1					
15	0,036	13	Outlier				
23	0,0061	-1,9	ND				
29	0,012	0,96					
32	0,61	301	Outlier				
33	0,13	61	Outlier,ND				
34	0,0084	-0,76					
35	0,022	6,0					
36	0,018	4,1					
38	0,0075	-1,2					
40	0,012	1,2					
42	0,0076	-1,2					
43	0,17	81	Outlier				
46	0,015	2,6	ND				
48	0,017	3,6					
50	0,0099	0,00	ND				
53	0,0053	-2,3					
54	0,0087	-0,59	ND				
55	0,0085	-0,69					
57	0,050	20	Outlier,ND				
58	0,0059	-2,0					
65	0,12	56	Outlier,ND				
68	0,034	12	Outlier				
70	0,050	20	Outlier,ND				
71	0,12	56	Outlier,ND				
74	0,015	2,6	ND				
79	0,014	2,2					
81	0,013	1,5					
87	0,0064	-1,8					
88	0,0067	-1,6					
89	0,014	1,8					
90	0,0059	-2,0					
93	0,042	16	Outlier				
95	0,089	40	Outlier				
98	0,014	2,1					
100	0,0050	-2,5					
103	0,0074	-1,3					
109	0,0087	-0,60					
110	0,018	4,1	ND				
113	0,050	20	Outlier,ND				
116	0,035	13	Outlier				

Consensus statistics

Consensus median, pg/g	0,0099
Median all values pg/g	0,015
Consensus mean, pg/g	0,011
Standard deviation, pg/g	0,0051
Relative standard deviation, %	44
No. of values reported	43
No. of values removed	14
No. of reported non-detects	13

1,2,3,4,6,7,8 HpCDD

Z-score: 1,2,3,4,6,7,8 HpCDD
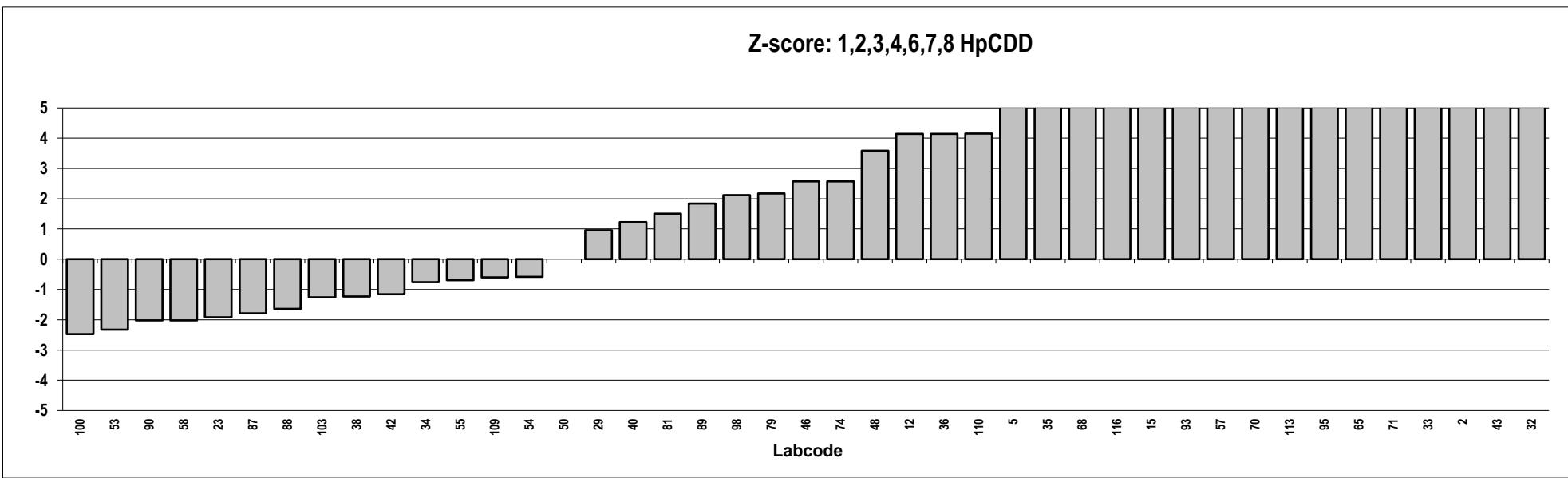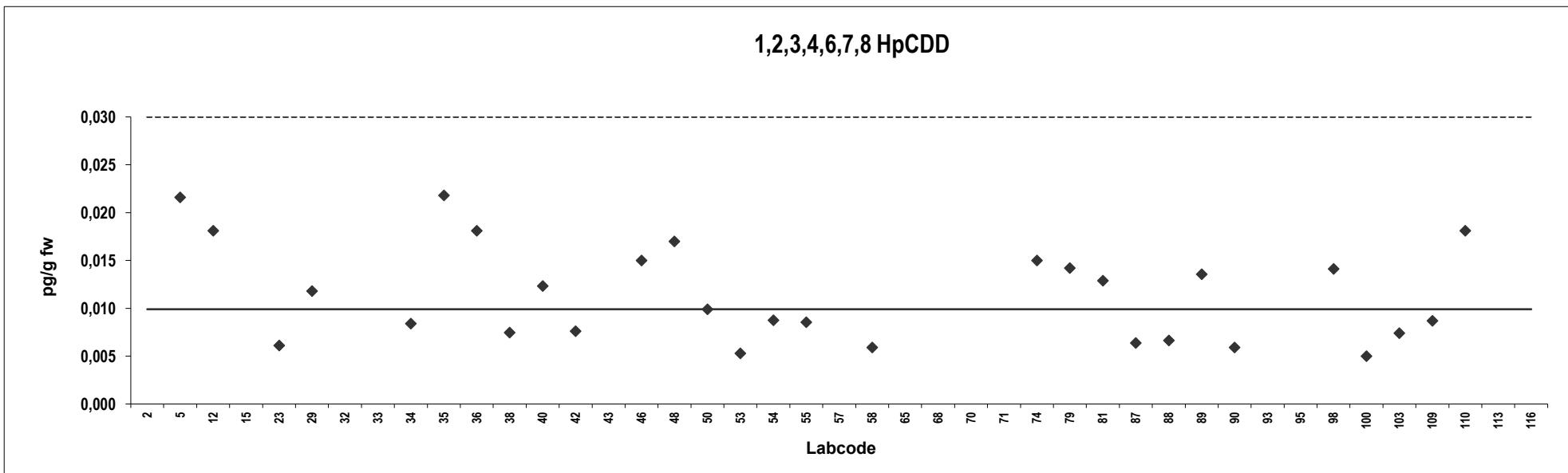
Sheep meat
Congener: OCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	2,4	400	Outlier,ND				
5	0,13	16	Outlier				
12	0,059	4,9					
15	0,11	13	Outlier				
23	0,013	-2,8	ND				
29	0,025	-0,74					
32	1,7	277	Outlier				
33	0,31	47	Outlier,ND				
34	0,019	-1,8					
35	0,055	4,2					
36	0,037	1,2					
38	0,019	-1,8					
40	0,056	4,5					
42	0,064	5,8					
43	0,36	56	Outlier				
46	0,050	3,4	ND				
48	0,050	3,4					
50	0,022	-1,3					
53	0,013	-2,9					
54	0,022	-1,3	ND				
55	0,032	0,41					
57	0,012	-3,0					
58	0,010	-3,3					
65	0,16	22	Outlier,ND				
68	0,10	13	Outlier				
70	2,0	333	Outlier,ND				
71	0,16	22	Outlier,ND				
74	0,050	3,4	ND				
79	0,039	1,6					
81	0,010	-3,3					
87	0,040	1,7					
88	0,027	-0,41					
89	0,040	1,7					
90	0,014	-2,6					
93	0,068	6,5					
95	0,16	22	Outlier				
98	0,011	-3,2					
100	0,0060	-4,0					
103	0,010	-3,3					
109	0,0077	-3,7	ND				
110	0,036	1,1	ND				
113	0,050	3,4	ND				
116	0,072	7,2					

Consensus statistics

Consensus median, pg/g	0,030
Median all values pg/g	0,040
Consensus mean, pg/g	0,032
Standard deviation, pg/g	0,020
Relative standard deviation, %	62
No. of values reported	43
No. of values removed	11
No. of reported non-detects	12
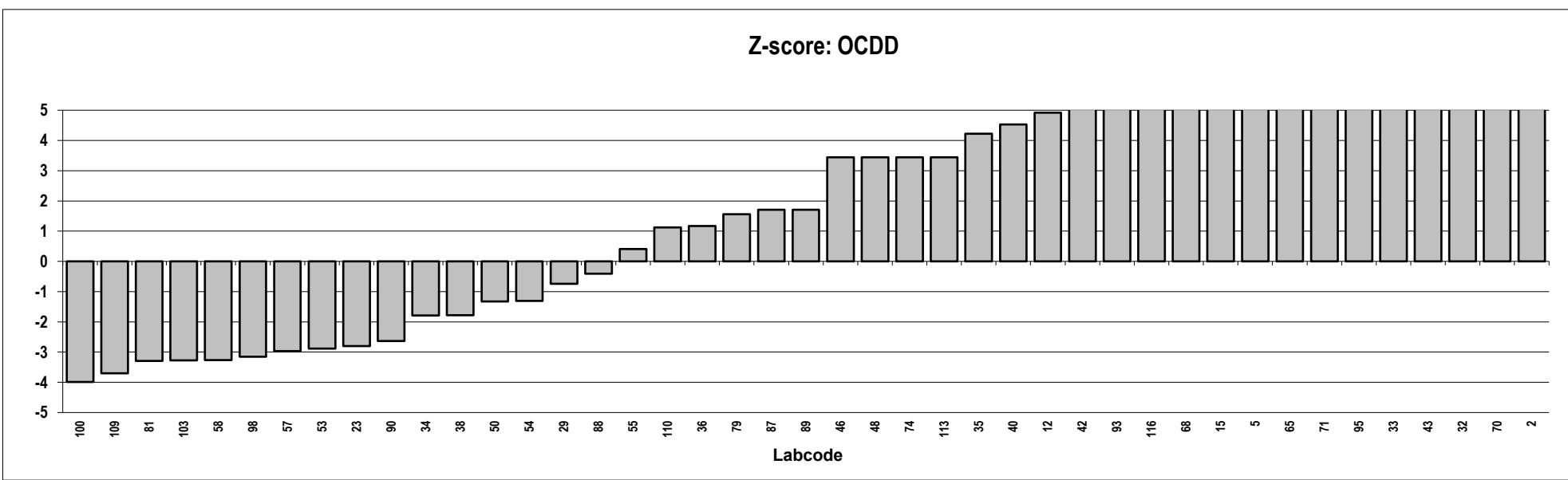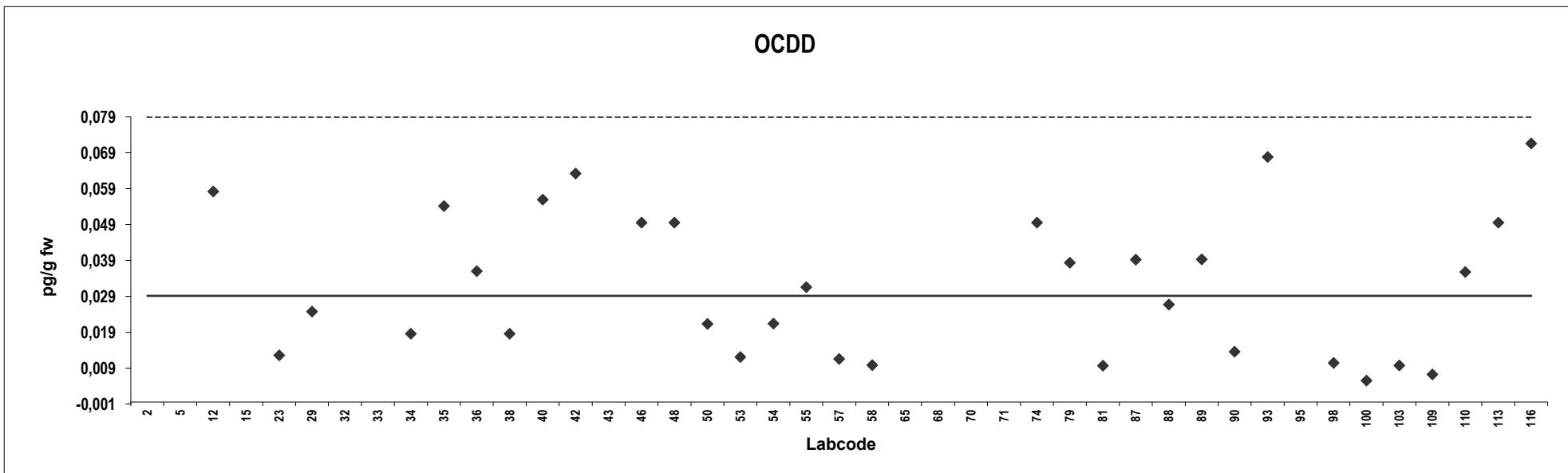
Sheep meat
Congener: 2,3,7,8 TCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,096	91	Outlier,ND				
5	0,0079	2,9					
12	0,0097	4,7					
15	0,0096	4,6					
23	0,0064	1,4	ND				
29	0,0065	1,5					
32	0,072	67	Outlier				
33	0,063	58	Outlier,ND				
34	0,0088	3,8					
35	0,013	8,1	Outlier				
36	0,0031	-1,9					
38	0,0046	-0,41	ND				
40	0,0038	-1,2					
42	0,0028	-2,2					
43	0,034	29	Outlier				
46	0,0050	0,00	ND				
48	0,0076	2,6					
50	0,0099	4,9	ND				
53	0,00053	-4,5	ND				
54	0,0017	-3,3	ND				
55	0,017	12	Outlier				
57	0,0060	1,0					
58	0,0069	1,9					
65	0,066	61	Outlier,ND				
68	0,0046	-0,42					
70	0,040	35	Outlier,ND				
71	0,066	61	Outlier,ND				
74	0,0050	0,00	ND				
79	0,0031	-1,9					
81	0,012	7,2					
87	0,0010	-4,0	ND				
88	0,0033	-1,7					
89	0,0047	-0,27					
90	0,0064	1,4					
93	0,0081	3,1					
95	0,014	9,0	Outlier				
98	0,0039	-1,1					
100	0,0050	0,00	ND				
103	0,0033	-1,7	ND				
109	0,0051	0,12	ND				
110	0,0036	-1,4	ND				
113	0,050	45	Outlier,ND				
116	0,0022	-2,8	ND				

Consensus statistics

Consensus median, pg/g	0,0050
Median all values pg/g	0,0064
Consensus mean, pg/g	0,0054
Standard deviation, pg/g	0,0028
Relative standard deviation, %	52
No. of values reported	43
No. of values removed	11
No. of reported non-detects	19

2,3,7,8 TCDF

Z-score: 2,3,7,8 TCDF
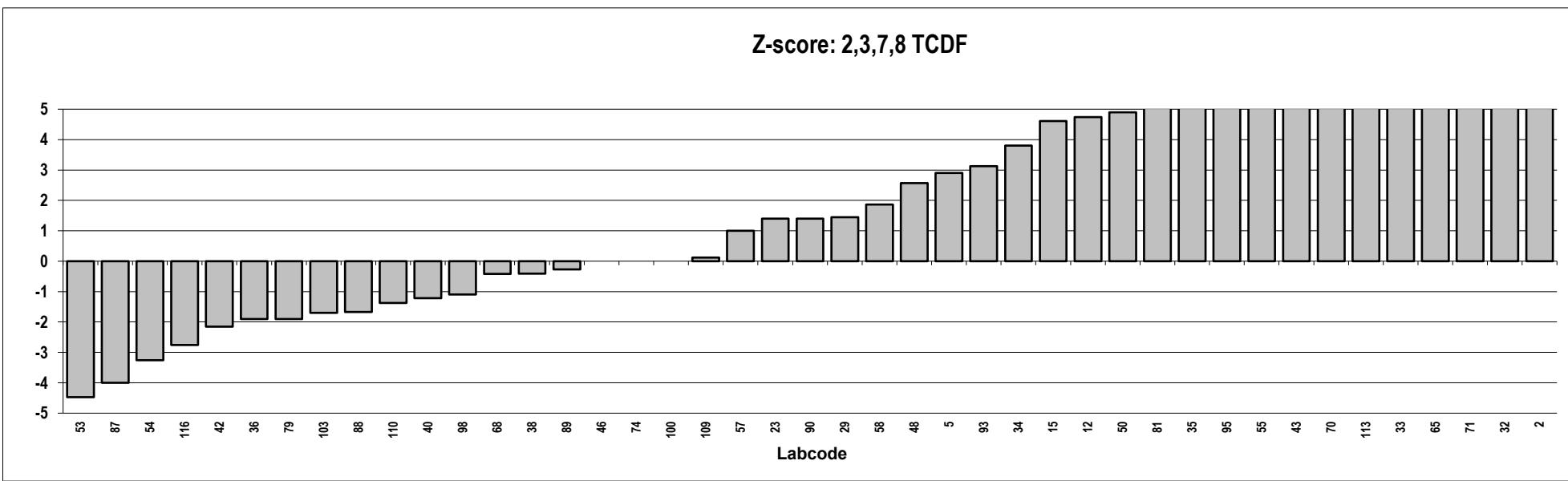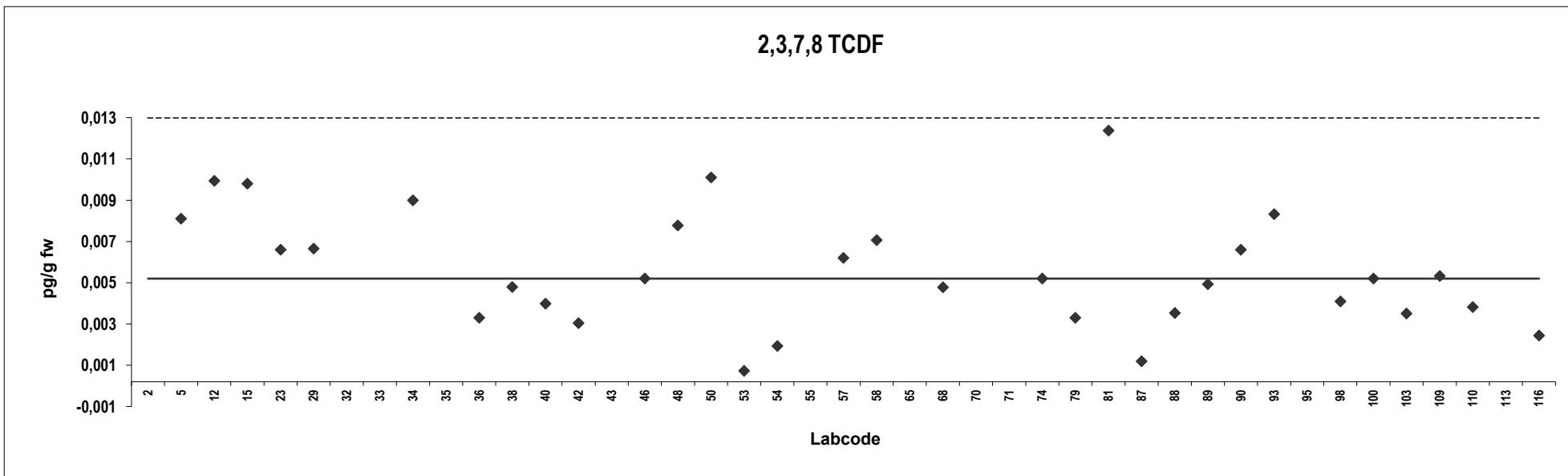
Sheep meat
Congener: 1,2,3,7,8 PeCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,067	75	Outlier,ND				
5	0,0021	-2,5	ND				
12	0,0041	-0,18					
15	0,0064	2,6					
23	0,0076	4,0	ND				
29	0,0084	5,0					
32	0,29	341	Outlier				
33	0,063	70	Outlier,ND				
34	0,0016	-3,1	ND				
35	0,0016	-3,1					
36	0,0010	-3,8					
38	0,0046	0,46	ND				
40	0,0038	-0,49					
42	0,0012	-3,5					
43	0,20	234	Outlier				
46	0,0050	0,95	ND				
48	0,0095	6,3					
50	0,0099	6,8	ND				
53	0,0011	-3,7					
54	0,0044	0,20	ND				
55	0,0046	0,50					
57	0,0010	-3,8					
58	0,0068	3,1					
65	0,084	95	Outlier,ND				
68	0,00065	-4,2	ND				
70	0,040	43	Outlier,ND				
71	0,084	95	Outlier,ND				
74	0,0050	0,95	ND				
79	0,0039	-0,36					
81	0,0070	3,3					
87	0,0020	-2,6	ND				
88	0,0051	1,1					
89	0,00070	-4,2	ND				
90	0,0042	0,00					
93	0,0057	1,8	ND				
95	0,0042	0,00	ND				
98	0,0099	6,8					
100	0,0040	-0,24	ND				
103	0,0020	-2,6	ND				
109	0,0051	1,1	ND				
110	0,0023	-2,3	ND				
113	0,050	55	Outlier,ND				
116	0,012	8,8	Outlier				

Consenus statistics	
Consensus median, pg/g	0,0042
Median all values pg/g	0,0050
Consensus mean, pg/g	0,0043
Standard deviation, pg/g	0,0027
Relative standard deviation, %	63
No. of values reported	43
No. of values removed	9
No. of reported non-detects	23

1,2,3,7,8 PeCDF

Z-score: 1,2,3,7,8 PeCDF
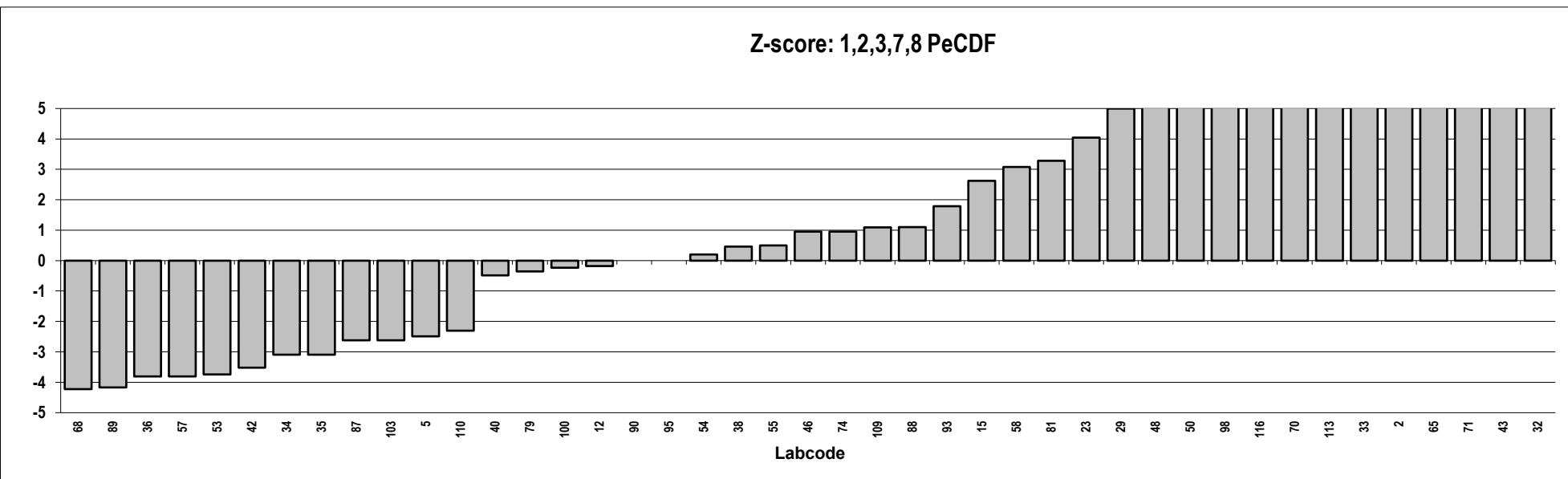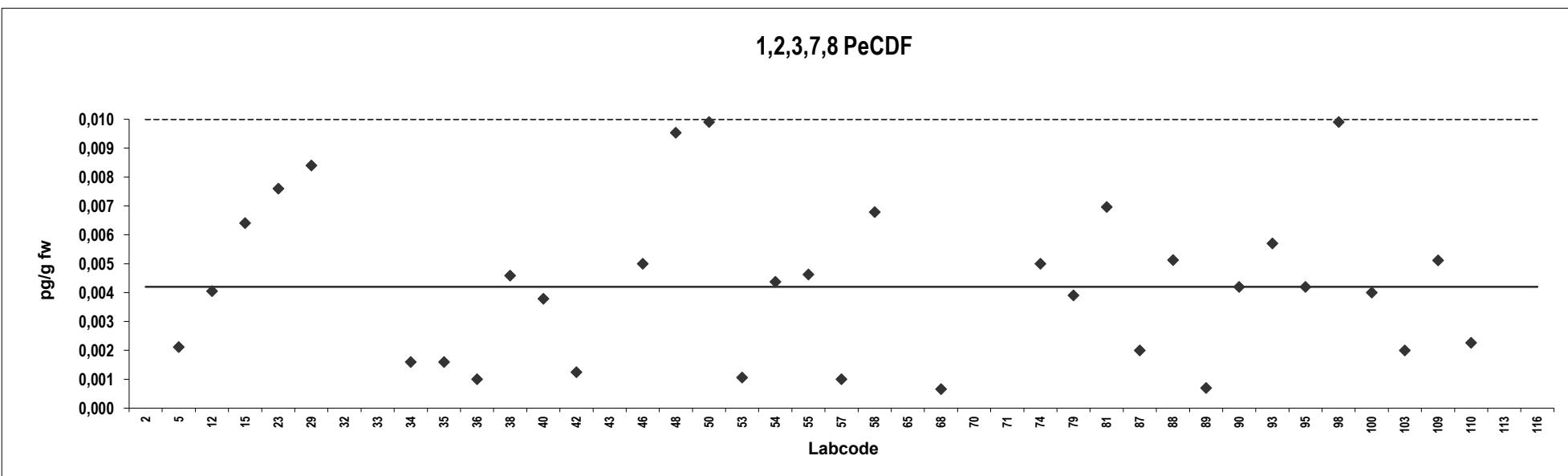
Sheep meat
Congener: 2,3,4,7,8 PeCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,065	49	Outlier,ND				
5	0,0056	-0,37					
12	0,0071	0,87					
15	0,0060	0,0020					
23	0,0053	-0,59	ND				
29	0,013	6,0	Outlier				
32	0,16	132	Outlier				
33	0,063	47	Outlier,ND				
34	0,0022	-3,2	ND				
35	0,0068	0,66					
36	0,0078	1,5					
38	0,0046	-1,2	ND				
40	0,0022	-3,2					
42	0,0047	-1,1					
43	0,098	77	Outlier				
46	0,0060	-0,0020					
48	0,0087	2,3					
50	0,0099	3,2	ND				
53	0,0065	0,43					
54	0,0044	-1,4	ND				
55	0,011	4,2					
57	0,0010	-4,2					
58	0,0064	0,37					
65	0,077	59	Outlier,ND				
68	0,0013	-3,9					
70	0,040	28	Outlier,ND				
71	0,077	59	Outlier,ND				
74	0,0060	-0,0020					
79	0,0088	2,3					
81	0,019	11	Outlier				
87	0,0022	-3,1					
88	0,0063	0,26					
89	0,0064	0,35					
90	0,0055	-0,42					
93	0,0084	2,0					
95	0,0080	1,7					
98	0,0062	0,16					
100	0,0060	-0,0020					
103	0,0050	-0,84					
109	0,0067	0,54					
110	0,0051	-0,78					
113	0,050	37	Outlier,ND				
116	0,013	6,0	Outlier				

Consensus statistics

Consensus median, pg/g	0,0060
Median all values pg/g	0,0065
Consensus mean, pg/g	0,0059
Standard deviation, pg/g	0,0023
Relative standard deviation, %	40
No. of values reported	43
No. of values removed	11
No. of reported non-detects	11

2,3,4,7,8 PeCDF

Z-score: 2,3,4,7,8 PeCDF
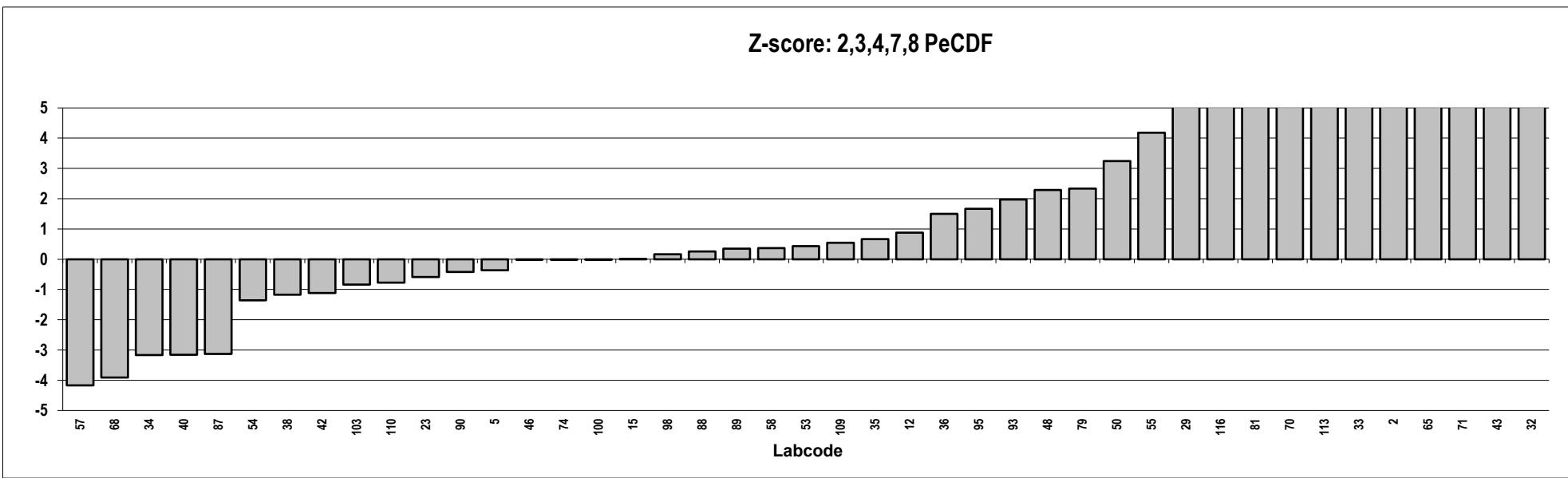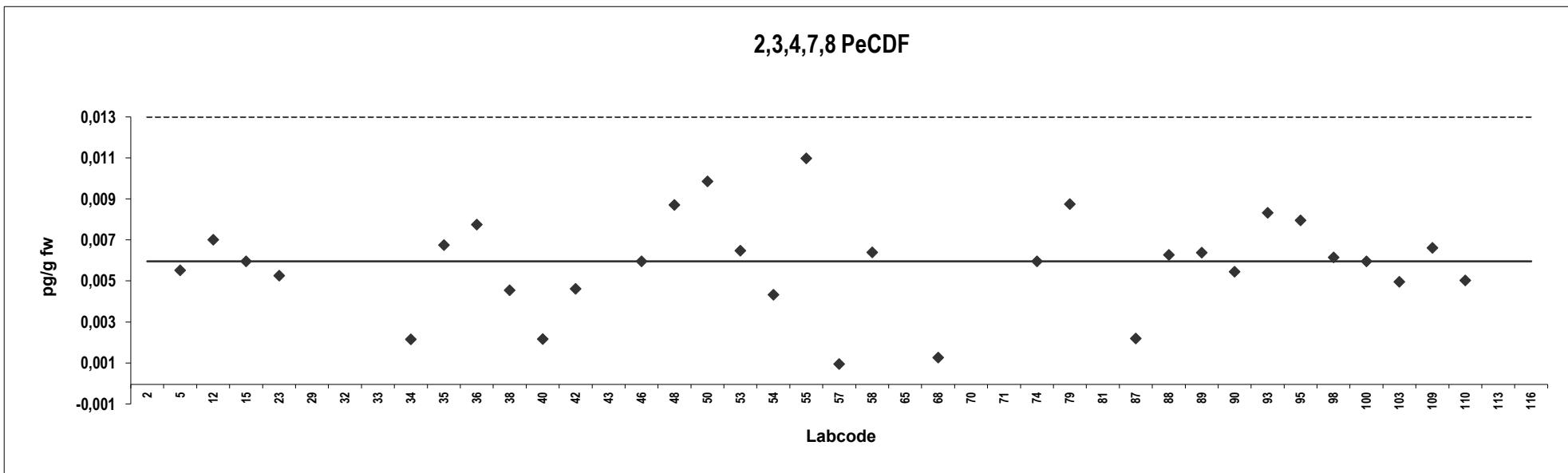
Sheep meat
Congener: 1,2,3,4,7,8 HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,062	64	Outlier,ND				
5	0,0043	-0,26					
12	0,0054	1,0					
15	0,0048	0,34					
23	0,0056	1,2	ND				
29	0,0079	3,8					
32	1,1	1204	Outlier				
33	0,13	139	Outlier,ND				
34	0,014	10	Outlier				
35	0,0015	-3,3					
36	0,0051	0,67					
38	0,0046	0,10	ND				
40	0,0041	-0,47					
42	0,093	98	Outlier				
43	0,11	117	Outlier				
46	0,0050	0,56	ND				
48	0,0040	-0,52					
50	0,0099	6,0	ND				
53	0,0025	-2,3					
54	0,0087	4,7	ND				
55	0,0014	-3,4	ND				
57	0,050	51	Outlier,ND				
58	0,0080	3,9					
65	0,17	182	Outlier,ND				
68	0,0020	-2,8					
70	0,050	51	Outlier,ND				
71	0,17	182	Outlier,ND				
74	0,0050	0,56	ND				
79	0,0047	0,22					
81	0,014	11	Outlier				
87	0,0030	-1,7	ND				
88	0,0057	1,3					
89	0,00050	-4,4	ND				
90	0,0045	0,00					
93	0,0067	2,4					
95	0,0042	-0,33	ND				
98	0,0039	-0,67					
100	0,0020	-2,8					
103	0,0028	-1,9					
109	0,0051	0,69	ND				
110	0,0023	-2,5	ND				
113	0,050	51	Outlier,ND				
116	0,0030	-1,7	ND				

Consensus statistics

Consensus median, pg/g	0,0045
Median all values pg/g	0,0051
Consensus mean, pg/g	0,0045
Standard deviation, pg/g	0,0022
Relative standard deviation, %	49
No. of values reported	43
No. of values removed	12
No. of reported non-detects	20

1,2,3,4,7,8 HxCDF

Z-score: 1,2,3,4,7,8 HxCDF
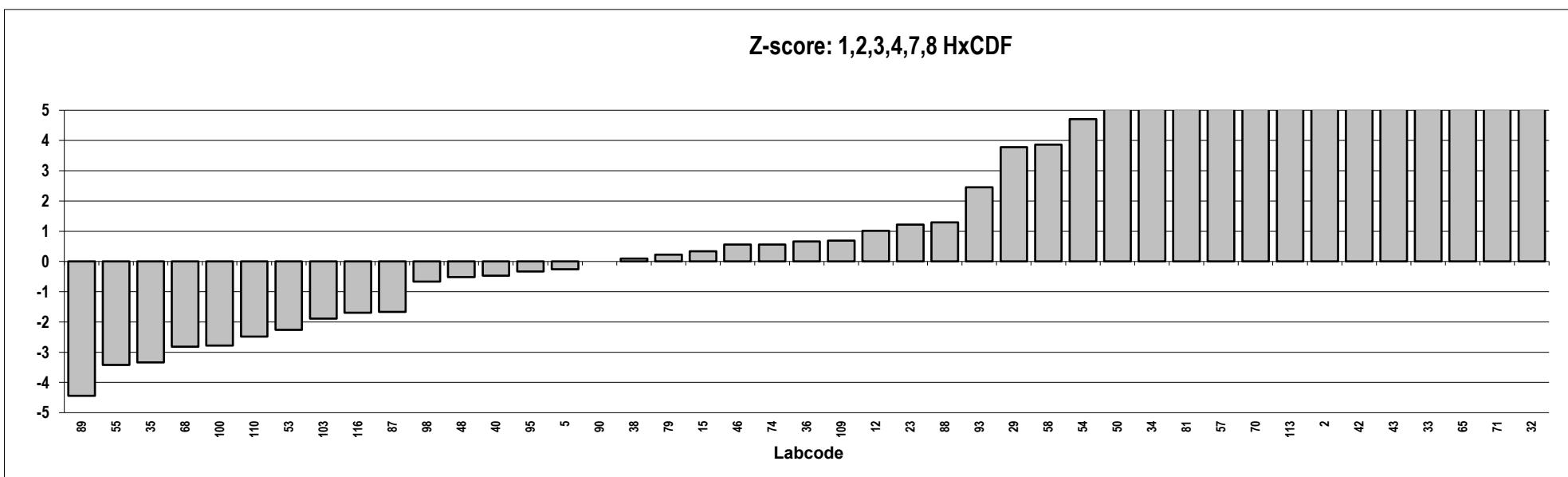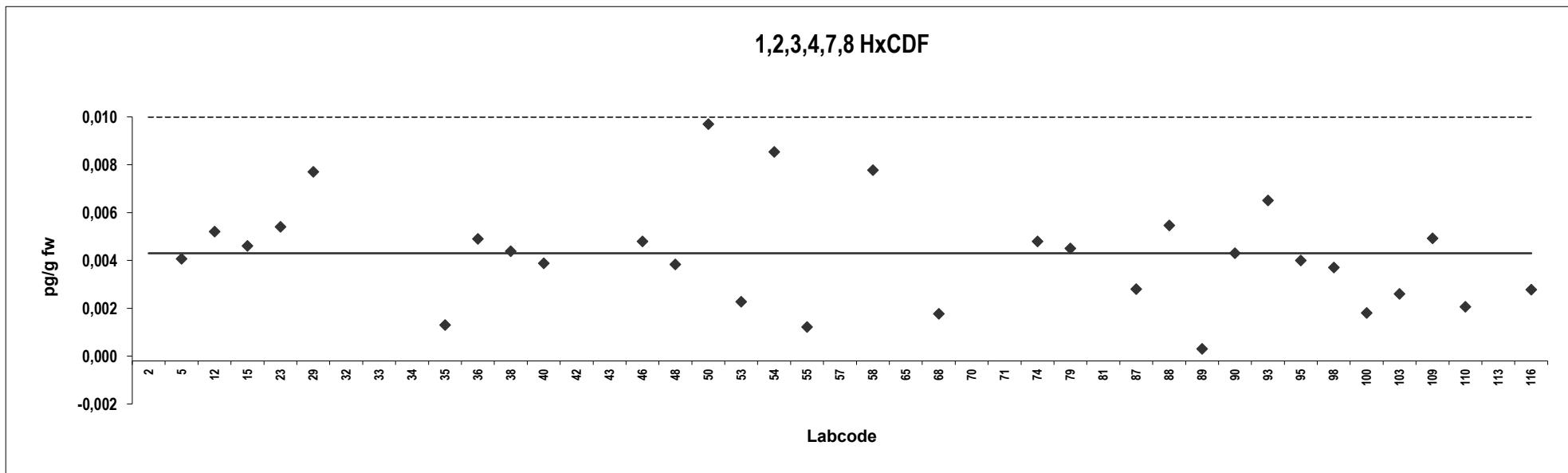
Sheep meat
Congener: 1,2,3,6,7,8 HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,065	80	Outlier,ND				
5	0,0019	-2,6					
12	0,0040	0,21	ND				
15	0,026	28	Outlier				
23	0,0065	3,5	ND				
29	0,0090	6,6					
32	0,54	703	Outlier				
33	0,13	164	Outlier,ND				
34	0,011	9,8	Outlier				
35	0,0026	-1,6					
36	0,0035	-0,44					
38	0,0046	0,97	ND				
40	0,0020	-2,4	ND				
42	0,0072	4,4					
43	0,12	146	Outlier				
46	0,0050	1,5	ND				
48	0,0043	0,63					
50	0,0099	7,9	ND				
53	0,0026	-1,6					
54	0,0087	6,4	ND				
55	0,0011	-3,6	ND				
57	0,050	60	Outlier,ND				
58	0,0084	5,9					
65	0,17	215	Outlier,ND				
68	0,0020	-2,4					
70	0,050	60	Outlier,ND				
71	0,17	215	Outlier,ND				
74	0,0050	1,5	ND				
79	0,0055	2,2					
81	0,0084	5,9					
87	0,0030	-1,1	ND				
88	0,0037	-0,21					
89	0,00050	-4,3	ND				
90	0,0027	-1,5					
93	0,0032	-0,84	ND				
95	0,0042	0,47	ND				
98	0,0069	4,0					
100	0,0020	-2,4					
103	0,0026	-1,6					
109	0,0051	1,7	ND				
110	0,0023	-2,1	ND				
113	0,050	60	Outlier,ND				
116	0,0029	-1,2	ND				

Consensus statistics

Consensus median, pg/g	0,0038
Median all values pg/g	0,0050
Consensus mean, pg/g	0,0044
Standard deviation, pg/g	0,0025
Relative standard deviation, %	57
No. of values reported	43
No. of values removed	11
No. of reported non-detects	23

1,2,3,6,7,8 HxCDF

Z-score: 1,2,3,6,7,8 HxCDF
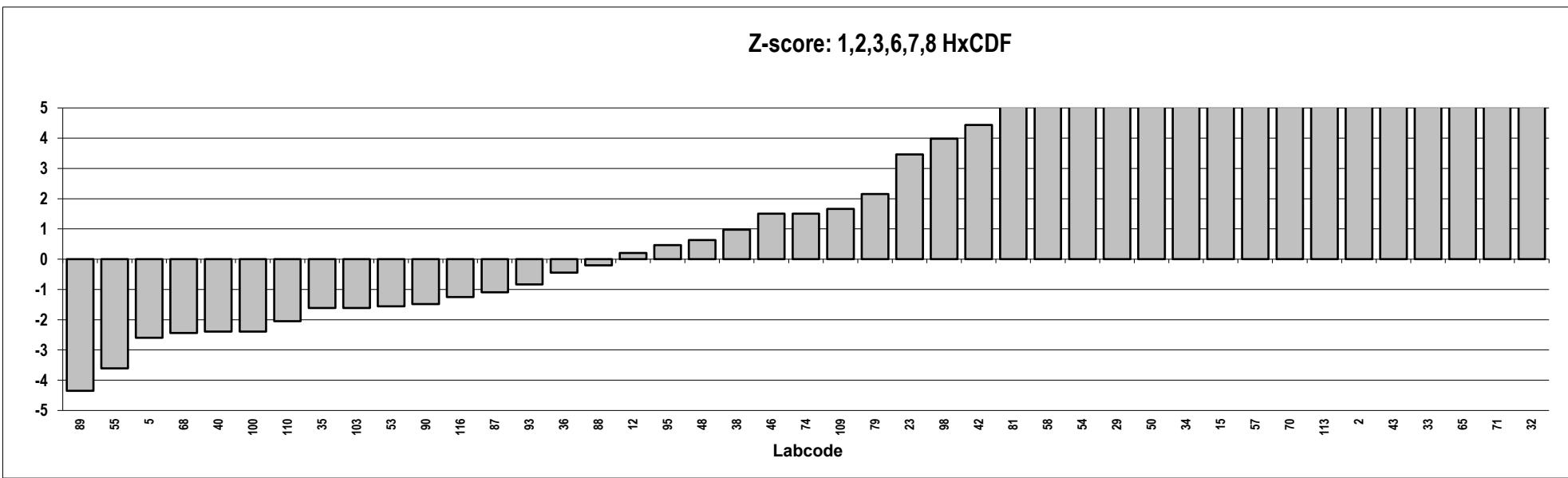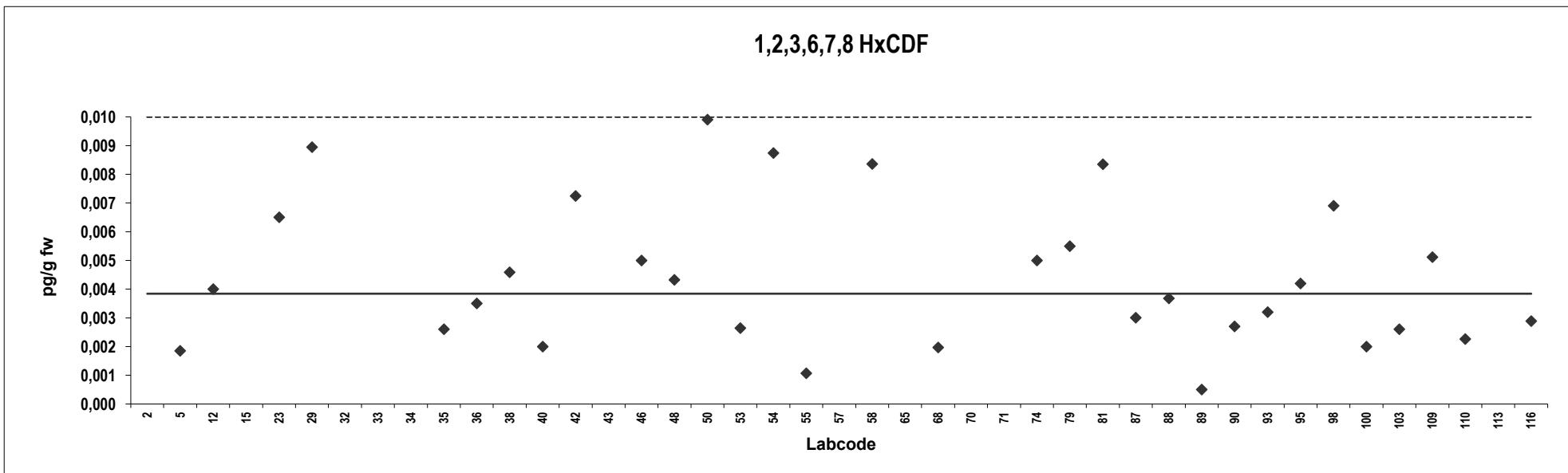
Sheep meat
Congener: 2,3,4,6,7,8 HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,10	142	Outlier,ND				
5	0,0023	-1,6	ND				
12	0,0076	6,1					
15	0,012	13	Outlier				
23	0,0044	1,5	ND				
29	0,0030	-0,59					
32	0,21	298	Outlier				
33	0,13	186	Outlier,ND				
34	0,0056	3,2					
35	0,0031	-0,44					
36	0,0026	-1,2					
38	0,0046	1,8	ND				
40	0,0048	2,0					
42	0,0032	-0,28					
43	0,12	168	Outlier				
46	0,0050	2,4	ND				
48	0,0034	0,064					
50	0,0099	9,6	Outlier,ND				
53	0,0018	-2,4					
54	0,0087	7,8	ND				
55	0,00071	-4,0	ND				
57	0,0030	-0,59					
58	0,0082	7,1					
65	0,17	239	Outlier,ND				
68	0,0029	-0,67					
70	0,050	69	Outlier,ND				
71	0,17	239	Outlier,ND				
74	0,0050	2,4	ND				
79	0,0047	1,9					
81	0,0073	5,7					
87	0,0030	-0,59	ND				
88	0,0036	0,33					
89	0,00050	-4,3	ND				
90	0,0018	-2,4					
93	0,0057	3,4					
95	0,0042	1,2	ND				
98	0,0034	0,00					
100	0,0020	-2,1					
103	0,0023	-1,6					
109	0,0051	2,5	ND				
110	0,0023	-1,7	ND				
113	0,050	69	Outlier,ND				
116	0,0027	-0,98	ND				

Consenus statistics

Consensus median, pg/g	0,0034
Median all values pg/g	0,0046
Consensus mean, pg/g	0,0039
Standard deviation, pg/g	0,0020
Relative standard deviation, %	52
No. of values reported	43
No. of values removed	10
No. of reported non-detects	20

2,3,4,6,7,8 HxCDF

Z-score: 2,3,4,6,7,8 HxCDF
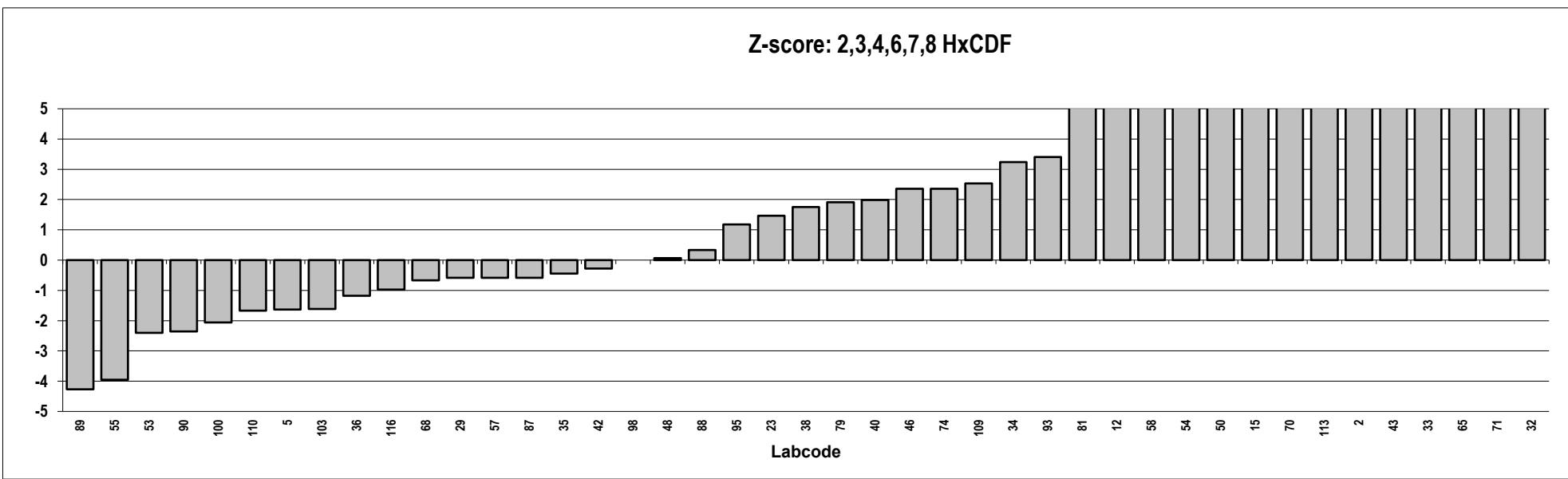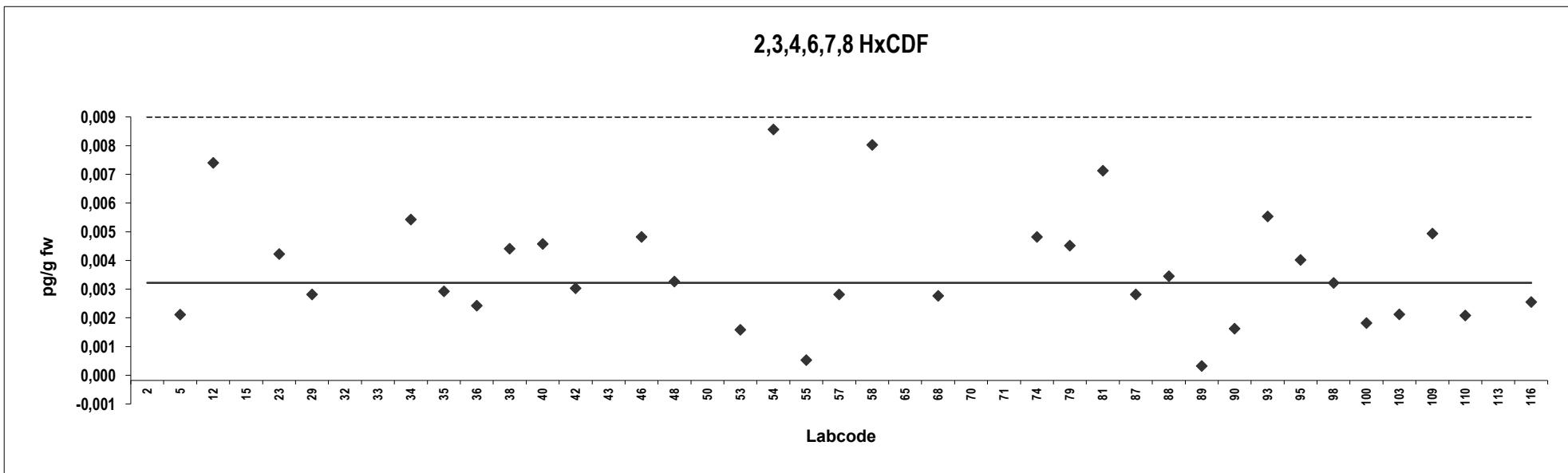
Sheep meat
Congener: 1,2,3,7,8,9 HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,089	173	Outlier,ND				
5	0,0014	-2,3	ND				
12	0,020	35	Outlier				
15	0,012	18	Outlier				
23	0,0025	0,00	ND				
29	0,0018	-1,3	ND				
32	0,081	157	Outlier				
33	0,13	255	Outlier,ND				
34	0,0013	-2,4	ND				
35	0,0078	11					
36	0,0010	-3,0	ND				
38	0,0046	4,2	ND				
40	0,0020	-1,0	ND				
42	0,0010	-3,0	ND				
43	0,16	314	Outlier				
46	0,0050	5,0	ND				
48	0,0031	1,2					
50	0,0099	15	Outlier,ND				
53	0,00053	-3,9	ND				
54	0,0087	12	Outlier,ND				
55	0,0018	-1,4					
57	0,050	95	Outlier,ND				
58	0,0090	13	Outlier				
65	0,18	351	Outlier,ND				
68	0,00098	-3,0	ND				
70	0,050	95	Outlier,ND				
71	0,18	351	Outlier,ND				
74	0,0050	5,0	ND				
79	0,0051	5,2					
81	0,0031	1,3					
87	0,0030	1,0	ND				
88	0,0032	1,4					
89	0,00080	-3,4	ND				
90	0,0020	-1,0					
93	0,0030	1,0	ND				
95	0,0042	3,4	ND				
98	0,0062	7,4					
100	0,0010	-3,0	ND				
103	0,0018	-1,4	ND				
109	0,0051	5,2	ND				
110	0,0023	-0,47	ND				
113	0,050	95	Outlier,ND				
116	0,0031	1,2	ND				

Consensus statistics

Consensus median, pg/g	0,0025
Median all values pg/g	0,0042
Consensus mean, pg/g	0,0029
Standard deviation, pg/g	0,0018
Relative standard deviation, %	63
No. of values reported	43
No. of values removed	14
No. of reported non-detects	30
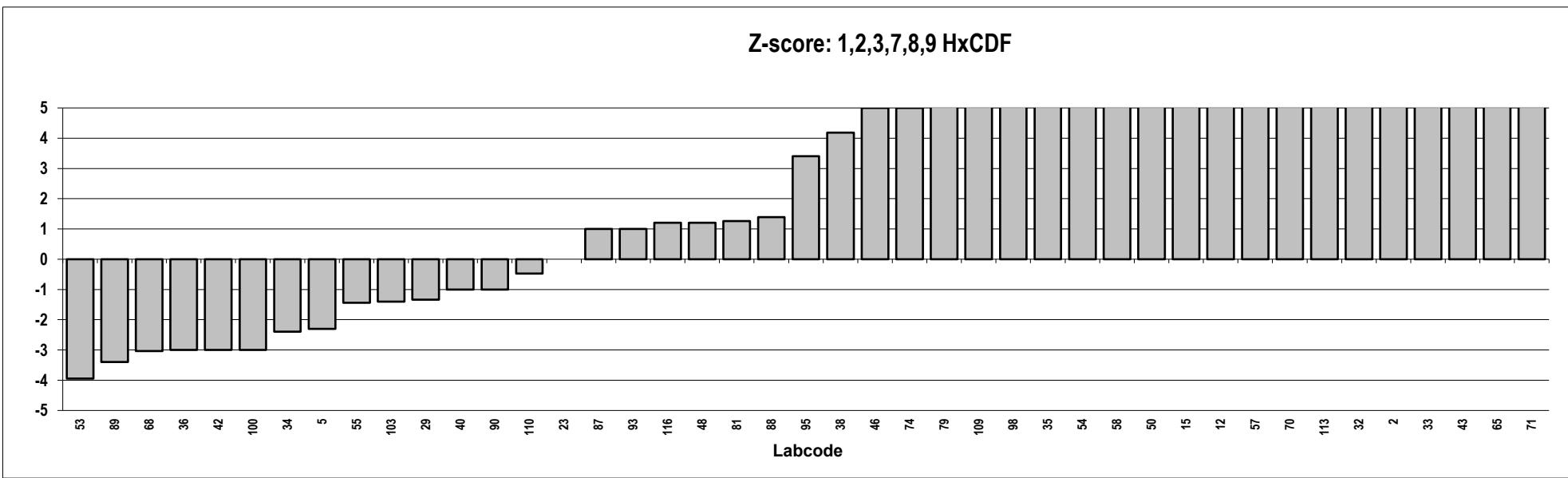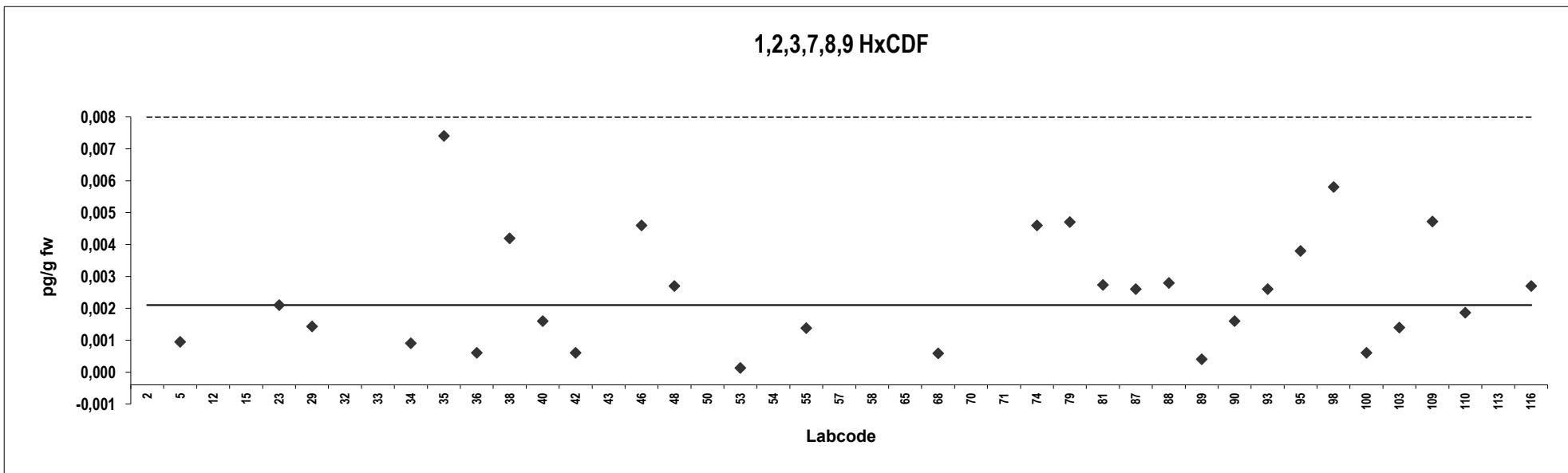
1,2,3,7,8,9 HxCDF

Z-score: 1,2,3,7,8,9 HxCDF

Sheep meat
Congener: 1,2,3,4,6,7,8 HpCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,10	95	Outlier,ND				
5	0,0042	-0,79					
12	0,029	24	Outlier				
15	0,0020	-3,0					
23	0,0083	3,3	ND				
29	0,0073	2,3					
32	2,4	2404	Outlier				
33	0,13	125	Outlier,ND				
34	0,013	7,7					
35	0,015	10	Outlier				
36	0,0044	-0,60					
38	0,0046	-0,41	ND				
40	0,0031	-1,9					
42	0,21	205	Outlier				
43	0,092	87	Outlier				
46	0,0050	0,00	ND				
48	0,0055	0,53					
50	0,0099	4,9	ND				
53	0,0037	-1,3					
54	0,0087	3,7	ND				
55	0,0018	-3,2					
57	0,0080	3,0					
58	0,0038	-1,2					
65	0,099	94	Outlier,ND				
68	0,010	5,3					
70	0,15	145	Outlier,ND				
71	0,099	94	Outlier,ND				
74	0,0050	0,00	ND				
79	0,011	5,7					
81	0,017	12	Outlier				
87	0,0050	0,00	ND				
88	0,0063	1,3					
89	0,0025	-2,5					
90	0,0037	-1,3					
93	0,0066	1,6					
95	0,0047	-0,30					
98	0,0056	0,60					
100	0,0010	-4,0	ND				
103	0,0022	-2,8					
109	0,0051	0,12	ND				
110	0,0045	-0,47	ND				
113	0,050	45	Outlier,ND				
116	0,010	5,3					

Consensus statistics

Consensus median, pg/g	0,0050
Median all values pg/g	0,0066
Consensus mean, pg/g	0,0057
Standard deviation, pg/g	0,0029
Relative standard deviation, %	52
No. of values reported	43
No. of values removed	12
No. of reported non-detects	16

1,2,3,4,6,7,8 HpCDF

Z-score: 1,2,3,4,6,7,8 HpCDF
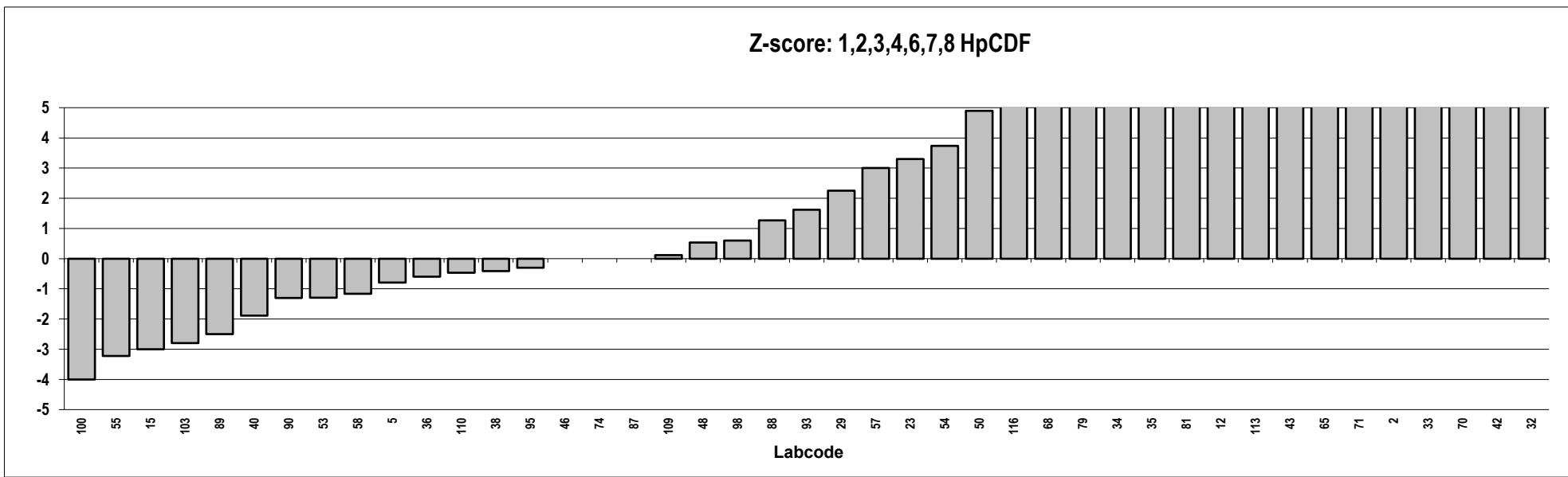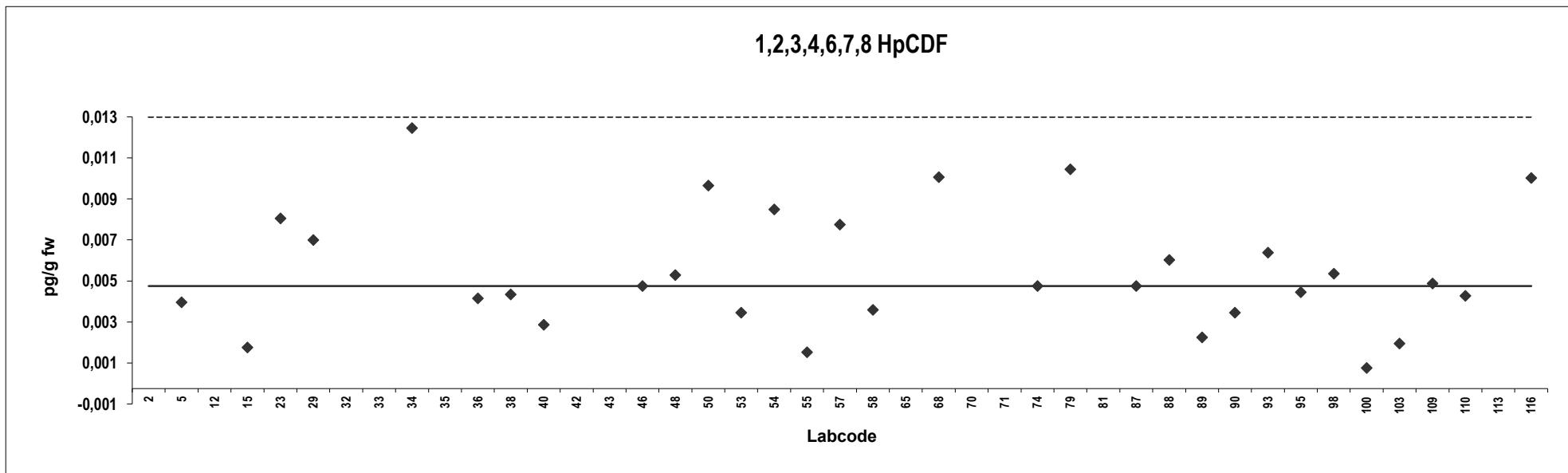
Sheep meat
Congener: 1,2,3,4,7,8,9 HpCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,16	185	Outlier,ND				
5	0,0012	-3,5	ND				
12	0,0042	0,024					
15	0,062	68	Outlier				
23	0,0039	-0,36	ND				
29	0,0023	-2,3					
32	0,25	294	Outlier				
33	0,13	150	Outlier,ND				
34	0,0044	0,24					
35	0,0035	-0,83					
36	0,00090	-3,9					
38	0,0046	0,46	ND				
40	0,0020	-2,6	ND				
42	0,011	8,1	Outlier				
43	0,13	144	Outlier				
46	0,0050	0,95	ND				
48	0,0020	-2,6					
50	0,0099	6,8	ND				
53	0,0019	-2,7					
54	0,0087	5,4	ND				
55	0,00071	-4,2	ND				
57	0,050	55	Outlier,ND				
58	0,0051	1,1					
65	0,10	114	Outlier,ND				
68	0,0059	2,0					
70	0,15	174	Outlier,ND				
71	0,10	114	Outlier,ND				
74	0,0050	0,95	ND				
79	0,0053	1,3					
81	0,0077	4,1					
87	0,0050	0,95	ND				
88	0,0029	-1,5					
89	0,00020	-4,8	ND				
90	0,0010	-3,8					
93	0,0036	-0,71	ND				
95	0,0042	0,00	ND				
98	0,0068	3,1					
100	0,0020	-2,6	ND				
103	0,00090	-3,9	ND				
109	0,0051	1,1	ND				
110	0,0045	0,39	ND				
113	0,050	55	Outlier,ND				
116	0,019	17	Outlier				

Consensus statistics

Consensus median, pg/g	0,0042
Median all values pg/g	0,0050
Consensus mean, pg/g	0,0039
Standard deviation, pg/g	0,0024
Relative standard deviation, %	62
No. of values reported	43
No. of values removed	12
No. of reported non-detects	24
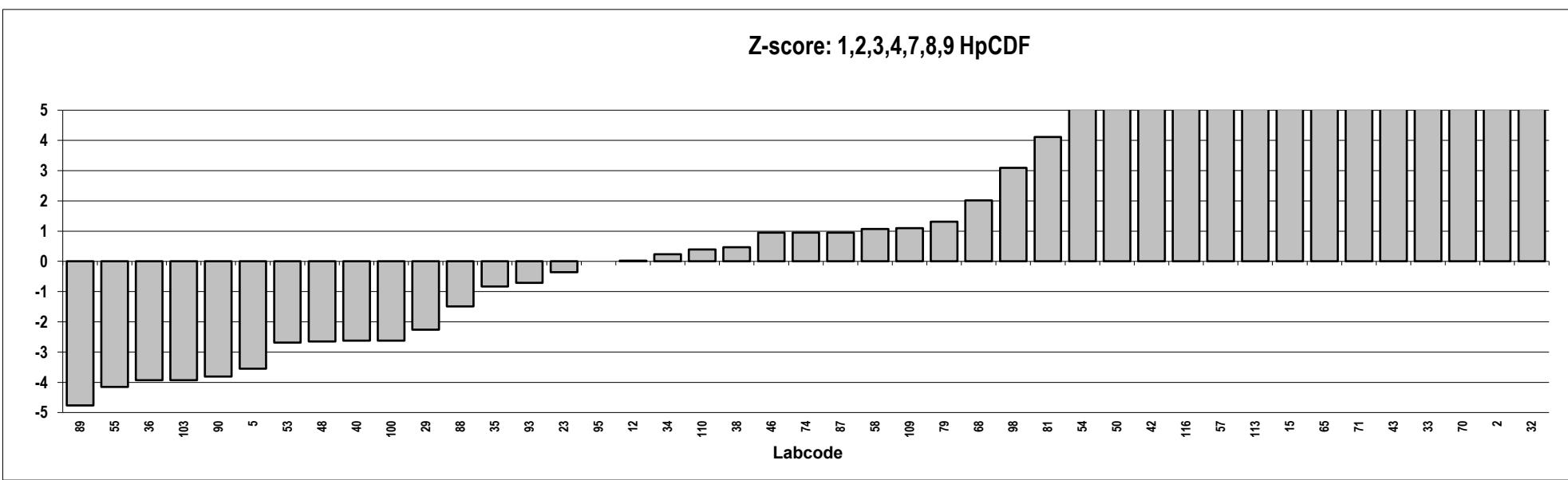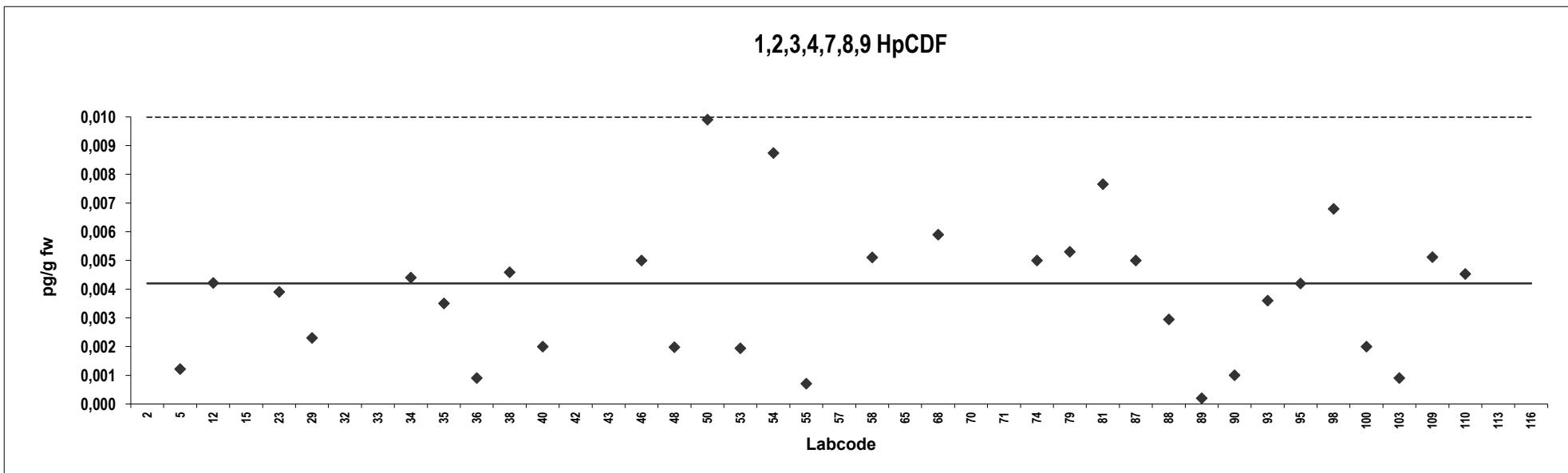
Sheep meat

Congener: OCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,21	107	Outlier,ND				
5	0,010	0,41					
12	1,3	670	Outlier				
15	0,12	61	Outlier				
23	0,0085	-0,45	ND				
29	0,0095	0,088					
32	0,93	495	Outlier				
33	0,31	161	Outlier,ND				
34	0,024	8,0					
35	0,0032	-3,3					
36	0,0022	-3,8					
38	0,0092	-0,088	ND				
40	0,017	4,2					
42	0,77	408	Outlier				
43	0,30	156	Outlier				
46	0,020	5,7	ND				
48	0,0050	-2,3					
50	0,020	5,7	ND				
53	0,0046	-2,5					
54	0,022	6,7	ND				
55	0,0021	-3,9	ND				
57	0,050	22	Outlier,ND				
58	0,011	0,86					
65	0,087	41	Outlier,ND				
68	0,049	21	Outlier				
70	2,0	1066	Outlier,ND				
71	0,087	41	Outlier,ND				
74	0,020	5,7	ND				
79	0,021	6,3					
81	0,018	4,7					
87	0,0050	-2,3	ND				
88	0,012	1,2					
89	0,0055	-2,1					
90	0,0078	-0,82					
93	0,0065	-1,5					
95	0,014	2,5	ND				
98	0,027	9,6					
100	0,0050	-2,3	ND				
103	0,0036	-3,1					
109	0,0077	-0,89	ND				
110	0,0091	-0,15	ND				
113	0,050	22	Outlier,ND				
116	0,036	14					

Consenus statistics	
Consensus median, pg/g	0,0093
Median all values pg/g	0,018
Consensus mean, pg/g	0,012
Standard deviation, pg/g	0,0084
Relative standard deviation, %	69
No. of values reported	43
No. of values removed	13
No. of reported non-detects	19

OCDF

Z-score: OCDF
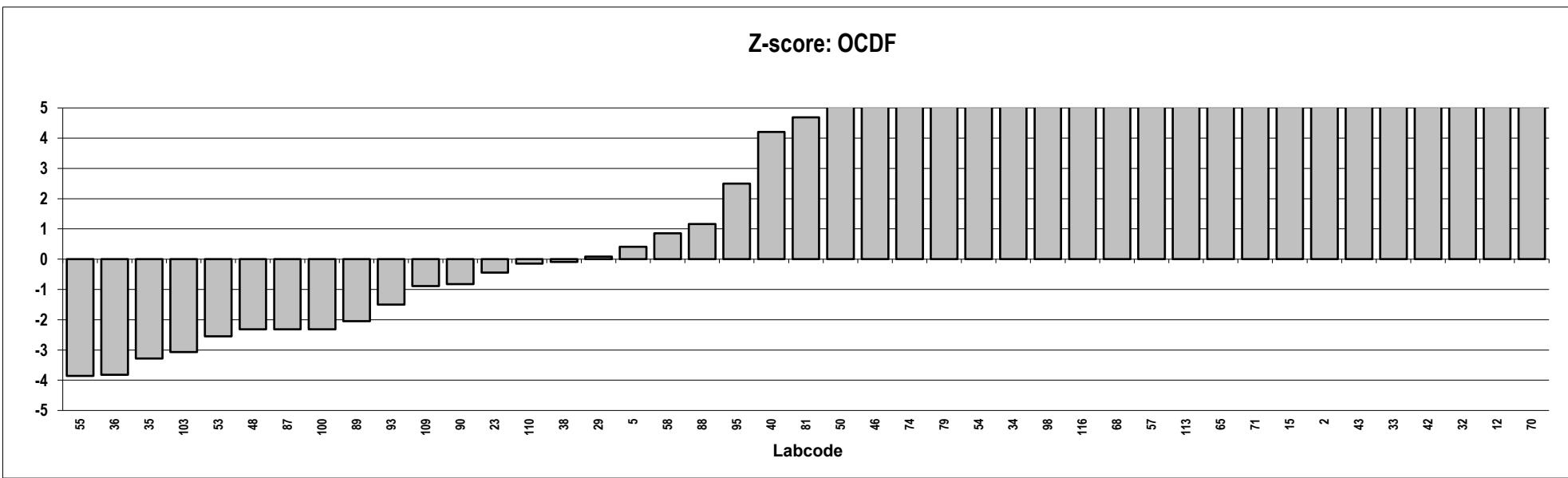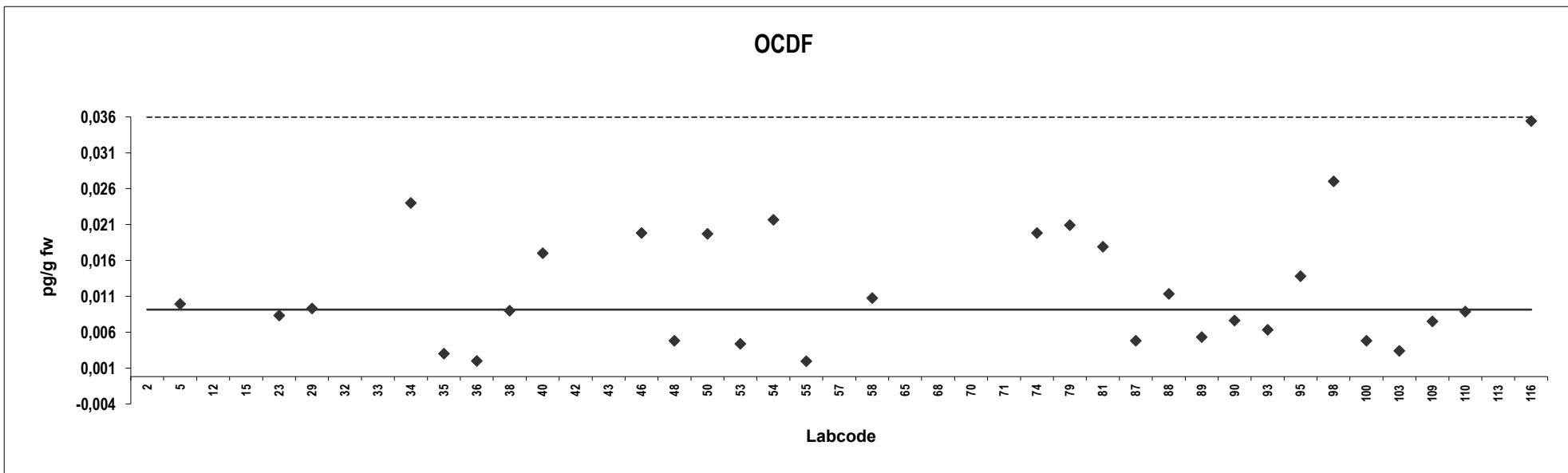
Sheep meat
Congener: PCB 77

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	3,6	42	Outlier,ND				
5	0,52	1,8					
12	0,30	-1,1					
15	0,42	0,47					
23	0,40	0,14					
29	0,63	3,2					
32	0,55	2,2					
33	2,0	21	Outlier,ND				
34	0,38	-0,053					
35	0,38	-0,073					
36	0,44	0,75					
38	0,25	-1,8					
40	0,26	-1,6					
42	0,41	0,33					
43	0,25	-1,7					
46	0,44	0,74					
48	0,63	3,2					
50	1,3	13	Outlier				
53	0,44	0,73					
54	0,25	-1,7					
55	0,28	-1,3					
57	0,49	1,4					
58	0,28	-1,3					
65	8,7	108	Outlier,ND				
68	0,42	0,41					
70	1,0	8,0	Outlier,ND				
71	8,7	108	Outlier,ND				
74	0,46	0,98					
79	0,38	-0,073					
81	0,43	0,57					
87	0,35	-0,48					
88	0,39	0,053					
89	0,29	-1,2					
90	0,36	-0,31					
93	0,32	-0,84					
95	1,8	18	Outlier				
98	0,52	1,8					
100	0,31	-1,0					
103	0,49	1,3					
109	0,31	-1,0					
110	0,39	0,079					
113	0,22	-2,1					
116	0,25	-1,8					

Consensus statistics

Consensus median, pg/g	0,38
Median all values pg/g	0,41
Consensus mean, pg/g	0,39
Standard deviation, pg/g	0,11
Relative standard deviation, %	28
No. of values reported	43
No. of values removed	7
No. of reported non-detects	5

PCB 77

Z-score: PCB 77
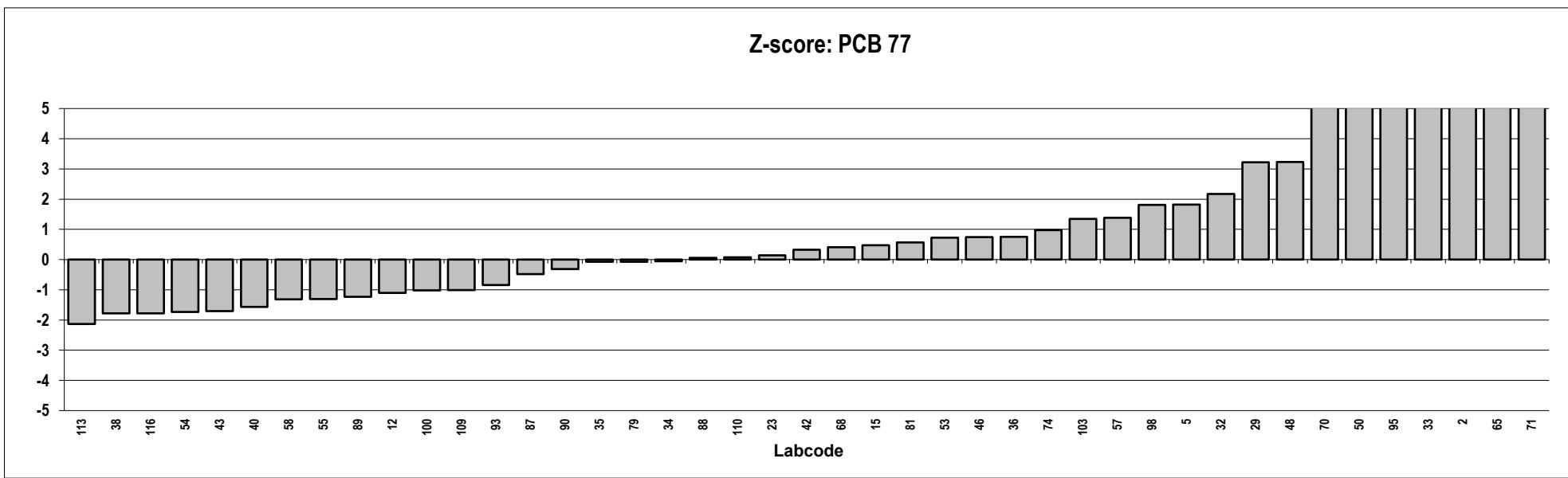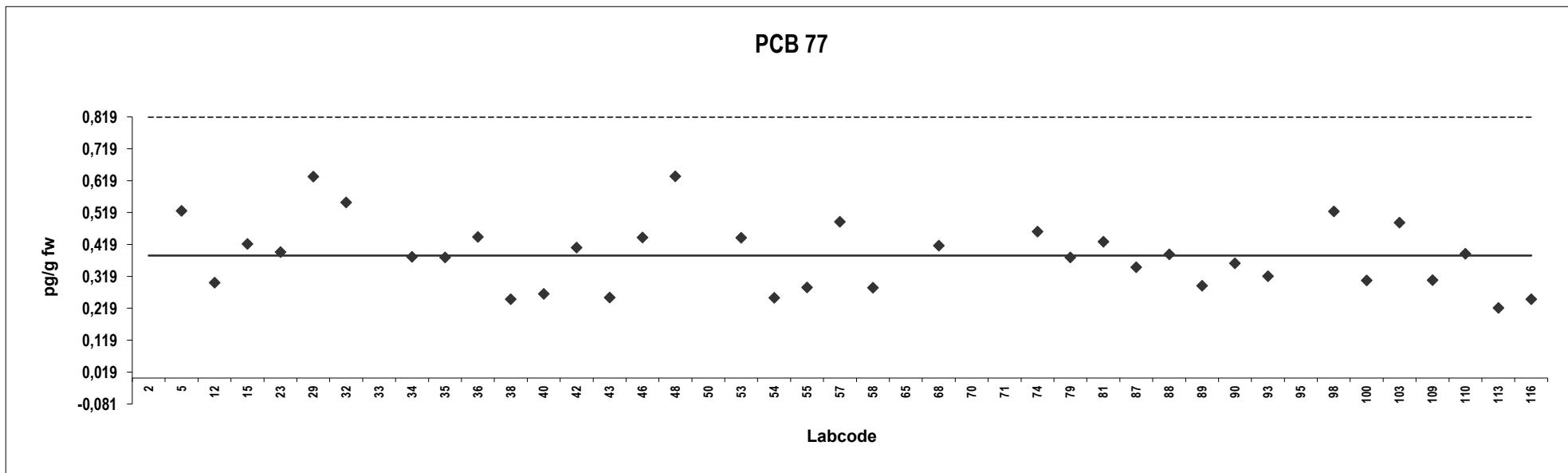
Sheep meat
Congener: PCB 126

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	3,3	205	Outlier,ND				
5	0,065	-0,85					
12	0,10	1,3					
15	0,056	-1,4					
23	0,067	-0,74					
29	0,13	3,5					
32	0,10	1,5					
33	2,0	122	Outlier,ND				
34	0,060	-1,2					
35	0,079	0,00					
36	0,095	1,0					
38	0,057	-1,4	ND				
40	0,071	-0,52					
42	0,074	-0,28					
43	0,080	0,087					
46	0,095	1,0					
48	0,070	-0,58					
50	0,12	2,5					
53	0,072	-0,45					
54	0,065	-0,85					
55	0,15	4,5					
57	0,10	1,4	ND				
58	0,072	-0,42					
65	3,6	226	Outlier,ND				
68	0,073	-0,36					
70	1,0	59	Outlier,ND				
71	3,6	226	Outlier,ND				
74	0,090	0,72					
79	0,079	0,00					
81	0,088	0,61					
87	0,10	1,4					
88	0,073	-0,33					
89	0,089	0,67					
90	0,083	0,27					
93	0,080	0,11					
95	0,32	15	Outlier				
98	0,16	5,2					
100	0,075	-0,24					
103	0,11	2,0					
109	0,070	-0,54					
110	0,080	0,058					
113	0,050	-1,8	ND				
116	0,071	-0,51					

Consensus statistics

Consensus median, pg/g	0,079
Median all values pg/g	0,080
Consensus mean, pg/g	0,085
Standard deviation, pg/g	0,024
Relative standard deviation, %	29
No. of values reported	43
No. of values removed	6
No. of reported non-detects	8

PCB 126

Z-score: PCB 126
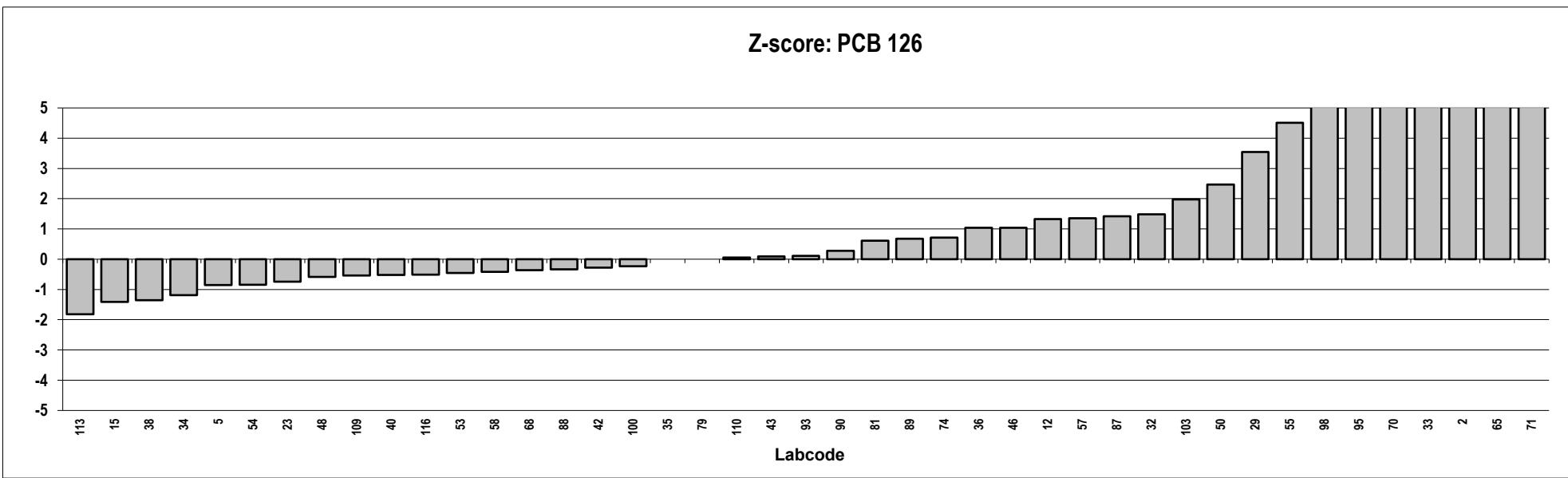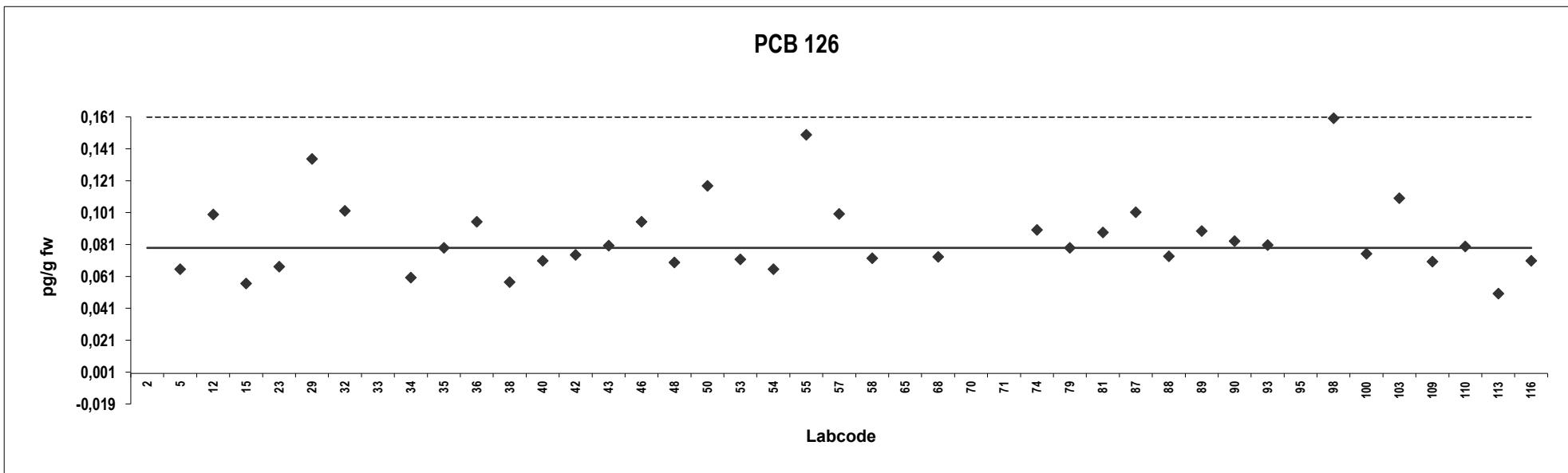
Sheep meat
Congener: PCB 169

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	1,9	258	Outlier,ND				
5	0,038	0,28					
12	0,039	0,37					
15	0,014	-3,1					
23	0,029	-1,1					
29	0,11	11	Outlier				
32	0,063	3,7					
33	2,0	272	Outlier,ND				
34	0,040	0,54					
35	0,032	-0,58					
36	0,048	1,6					
38	0,057	2,9	ND				
40	0,032	-0,63					
42	0,035	-0,095					
43	0,033	-0,44					
46	0,050	1,9	ND				
48	0,027	-1,3					
50	0,099	8,8	Outlier,ND				
53	0,033	-0,43					
54	0,032	-0,57					
55	0,066	4,1					
57	0,10	8,9	Outlier,ND				
58	0,026	-1,4					
65	3,6	499	Outlier,ND				
68	0,031	-0,65					
70	1,0	134	Outlier,ND				
71	3,6	499	Outlier,ND				
74	0,050	1,9	ND				
79	0,032	-0,58					
81	0,043	1,0					
87	0,050	1,9	ND				
88	0,037	0,074					
89	0,12	11	Outlier				
90	0,037	0,12					
93	0,035	-0,11					
95	0,063	3,7					
98	0,036	0,014					
100	0,036	-0,014					
103	0,042	0,76					
109	0,027	-1,3					
110	0,028	-1,1					
113	0,050	1,9	ND				
116	0,022	-2,0					

Consenus statistics

Consensus median, pg/g	0,036
Median all values pg/g	0,039
Consensus mean, pg/g	0,039
Standard deviation, pg/g	0,012
Relative standard deviation, %	31
No. of values reported	43
No. of values removed	9
No. of reported non-detects	12

PCB 169

Z-score: PCB 169
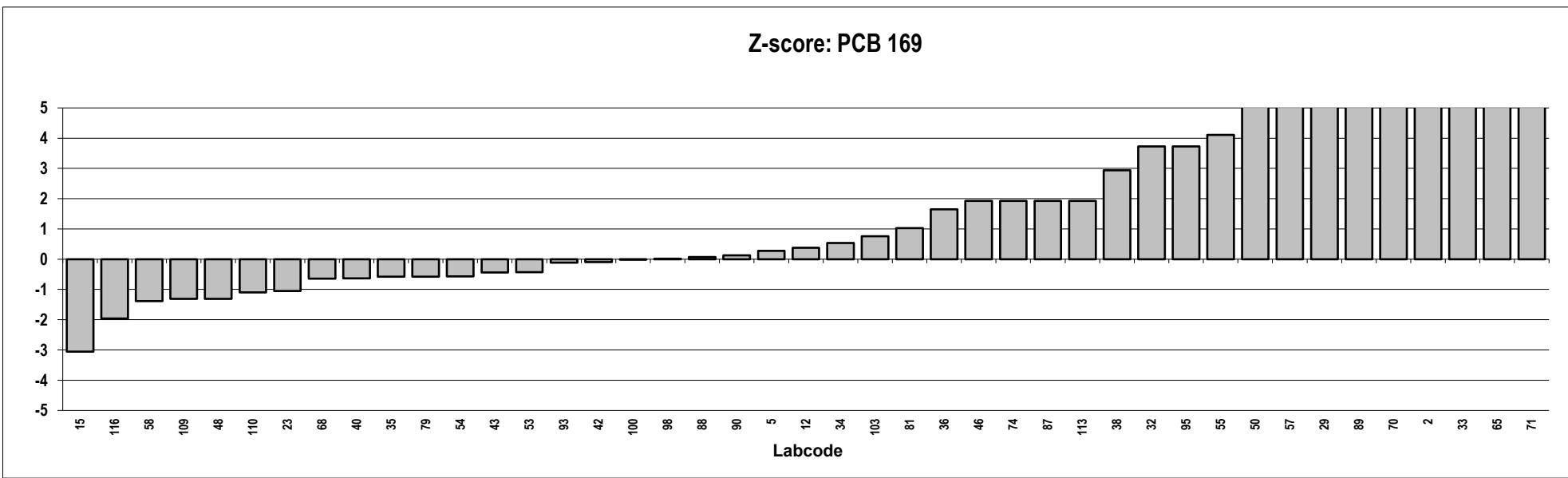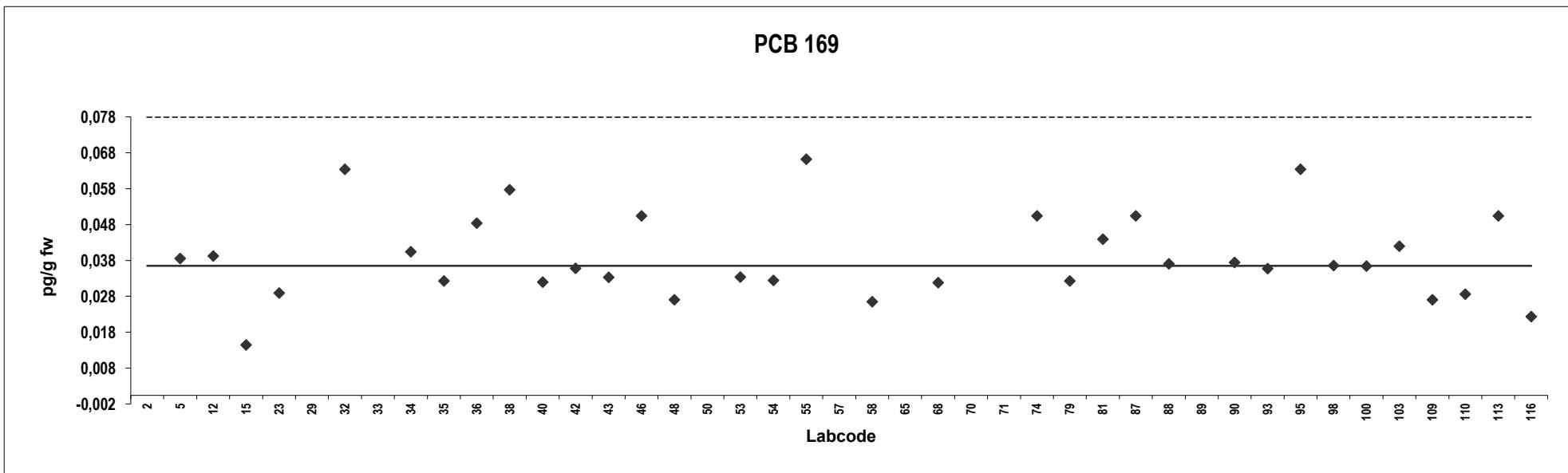
Sheep meat
Congener: PCB 81

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	4,2	1221	Outlier,ND				
5	0,0083	-2,6					
12	0,016	-0,24					
15	0,021	1,1					
23	0,020	0,84					
29	0,038	6,1					
32	0,10	25	Outlier				
33	2,0	579	Outlier,ND				
34	0,020	0,84					
35	0,015	-0,68					
36	0,022	1,4					
38	0,057	12	Outlier,ND				
40	0,016	-0,42					
42	0,017	0,0014					
43	0,022	1,6					
46	0,050	9,6	Outlier,ND				
48	0,014	-0,80					
50	0,099	24	Outlier,ND				
53	0,0063	-3,1					
54	0,0045	-3,7	ND				
55	0,012	-1,6					
57	0,25	68	Outlier				
58	0,014	-0,97					
65	8,4	2455	Outlier,ND				
68	0,022	1,5					
70	1,0	287	Outlier,ND				
71	8,4	2455	Outlier,ND				
74	0,050	9,6	Outlier,ND				
79	0,015	-0,68					
81	0,023	1,6					
87	0,050	9,6	Outlier,ND				
88	0,030	3,7					
89	0,048	8,9	Outlier				
90	0,019	0,55					
93	0,016	-0,29					
95	0,071	16	Outlier				
98	0,033	4,7					
100	0,014	-0,91					
103	0,021	1,1					
109	0,0056	-3,4					
110	0,018	0,29	ND				
113	0,050	9,6	Outlier,ND				
116	0,017	-0,0014					

Consensus statistics

Consensus median, pg/g	0,017
Median all values pg/g	0,022
Consensus mean, pg/g	0,018
Standard deviation, pg/g	0,0076
Relative standard deviation, %	42
No. of values reported	43
No. of values removed	15
No. of reported non-detects	13

PCB 81

Z-score: PCB 81
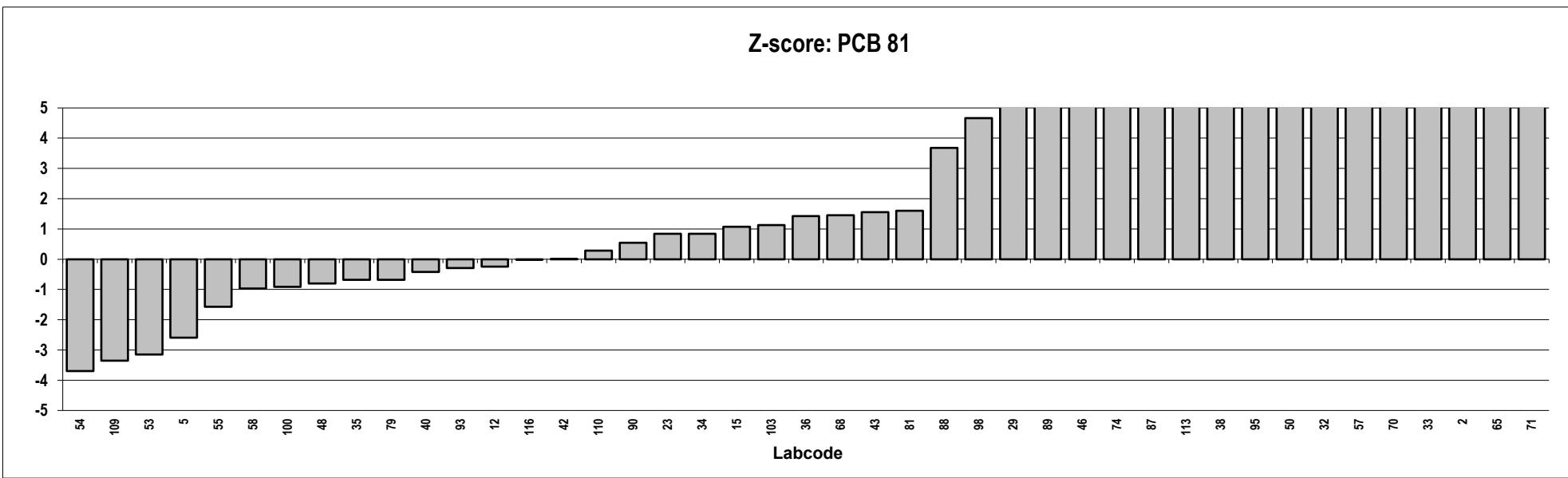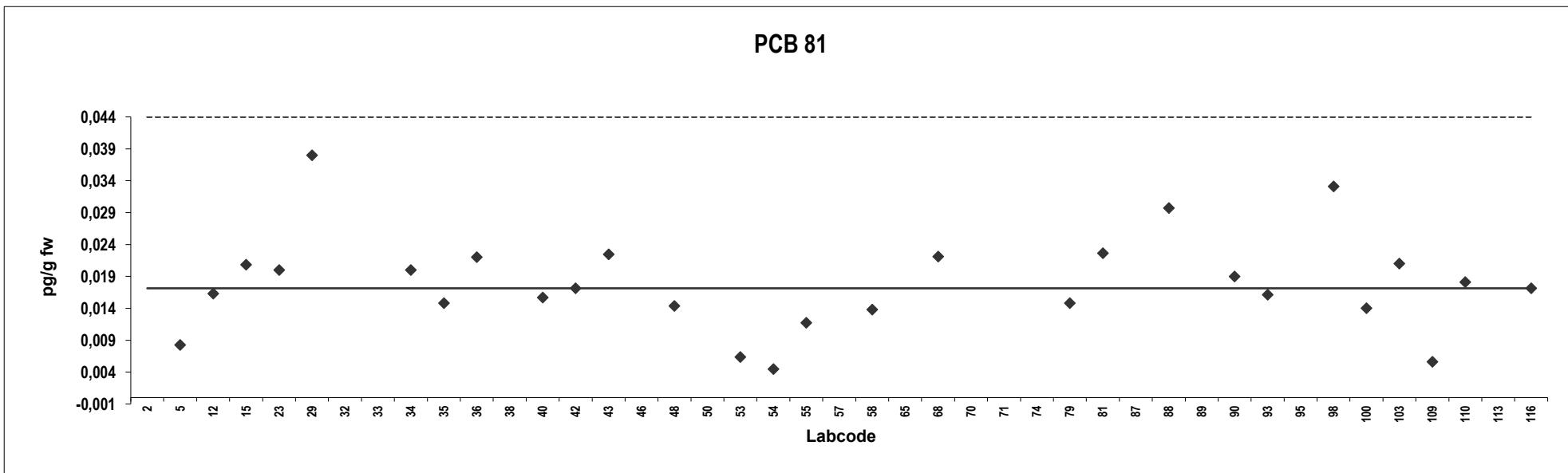
Sheep meat
Congener: PCB 105

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	3,3	0,061	ND				
5	3,5	0,37					
12	3,4	0,20					
15	2,2	-1,6					
23	3,6	0,44					
29	2,2	-1,6					
32	3,5	0,37					
33	3,8	0,83					
34	4,0	1,1					
35	3,2	-0,068					
36	3,4	0,14					
38	2,8	-0,64					
40	3,3	0,00					
42	3,2	-0,17					
43	2,9	-0,61					
46	3,8	0,83					
48	4,1	1,3					
50	6,0	4,2					
53	3,3	0,045					
54	2,4	-1,3					
55	3,2	-0,020					
57	8,2	7,6	Outlier				
58	2,8	-0,78					
65	3,7	0,74	ND				
68	3,1	-0,22					
70	5,0	2,7	ND				
71	3,7	0,74	ND				
74	3,8	0,77					
79	3,2	-0,068					
81	2,7	-0,84					
87	2,9	-0,60					
88	3,1	-0,22					
89	2,5	-1,1					
90	3,2	-0,17					
93	2,1	-1,8					
95	4,4	1,7					
98	4,0	1,2					
100	3,1	-0,32					
103	3,6	0,50					
109	3,1	-0,31					
110	5,8	4,0					
113	10	10	Outlier,ND				
116	2,4	-1,4					

Consenus statistics

Consensus median, pg/g	3,3
Median all values pg/g	3,3
Consensus mean, pg/g	3,4
Standard deviation, pg/g	0,84
Relative standard deviation, %	25
No. of values reported	43
No. of values removed	2
No. of reported non-detects	5

PCB 105

Z-score: PCB 105
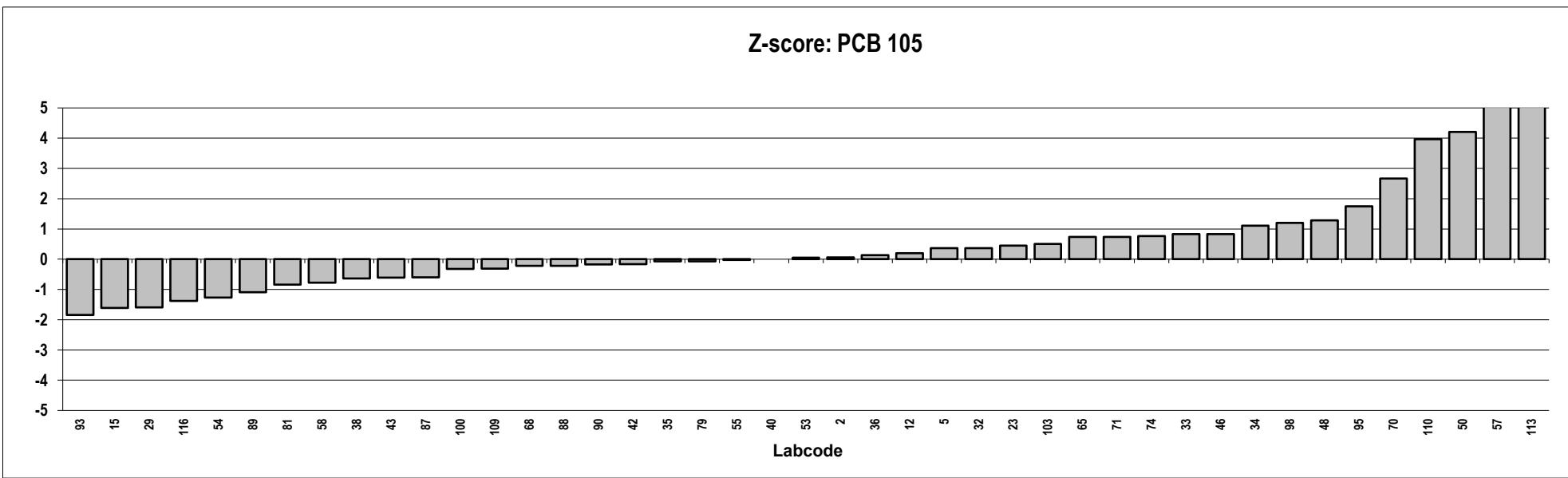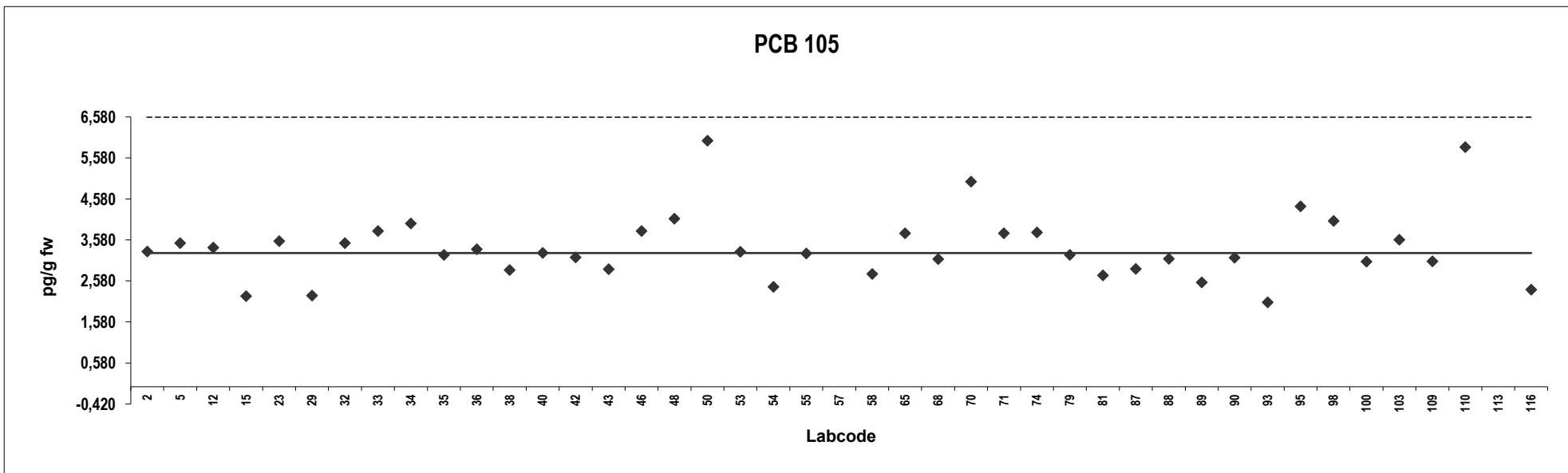
Sheep meat
Congener: PCB 114

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	2,7	31	Outlier,ND				
5	0,34	-0,49					
12	0,40	0,22					
15	0,23	-2,0					
23	1,1	9,5	Outlier,ND				
29	0,51	1,7					
32	0,20	-2,4					
33	2,0	21	Outlier,ND				
34	0,42	0,54					
35	0,37	-0,13					
36	0,45	0,92					
38	1,1	10	Outlier,ND				
40	0,39	0,10					
42	0,43	0,68					
43	0,38	-0,037					
46	0,43	0,67					
48	0,31	-0,93					
50	0,57	2,5					
53	0,38	-0,035					
54	0,33	-0,62					
55	0,40	0,22					
57	0,57	2,5					
58	0,30	-1,0					
65	3,6	43	Outlier,ND				
68	0,37	-0,060					
70	10	127	Outlier,ND				
71	3,6	43	Outlier,ND				
74	0,44	0,80					
79	0,37	-0,13					
81	0,39	0,18					
87	0,36	-0,26					
88	0,34	-0,56					
89	0,21	-2,2	ND				
90	0,44	0,80					
93	1,7	17	Outlier,ND				
95	0,50	1,6					
98	0,48	1,3					
100	0,38	0,035					
103	0,34	-0,54					
109	0,26	-1,5					
110	0,51	1,7					
113	10	127	Outlier,ND				
116	0,24	-1,9					

Consenus statistics

Consensus median, pg/g	0,38
Median all values pg/g	0,40
Consensus mean, pg/g	0,38
Standard deviation, pg/g	0,093
Relative standard deviation, %	24
No. of values reported	43
No. of values removed	9
No. of reported non-detects	10

PCB 114

Z-score: PCB 114
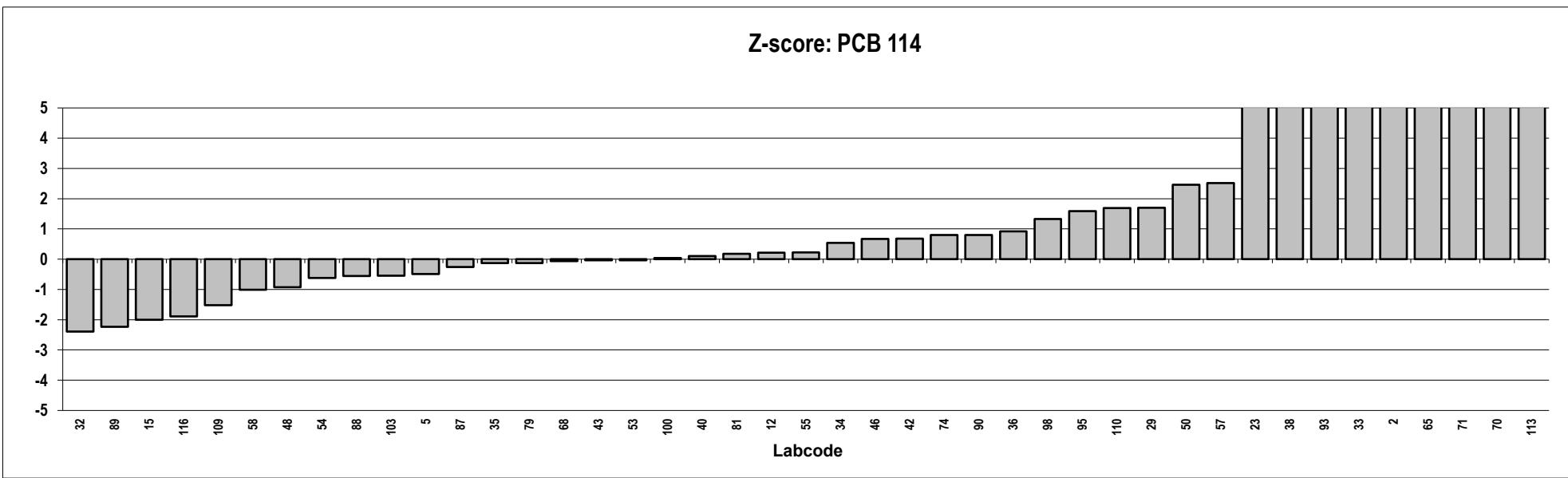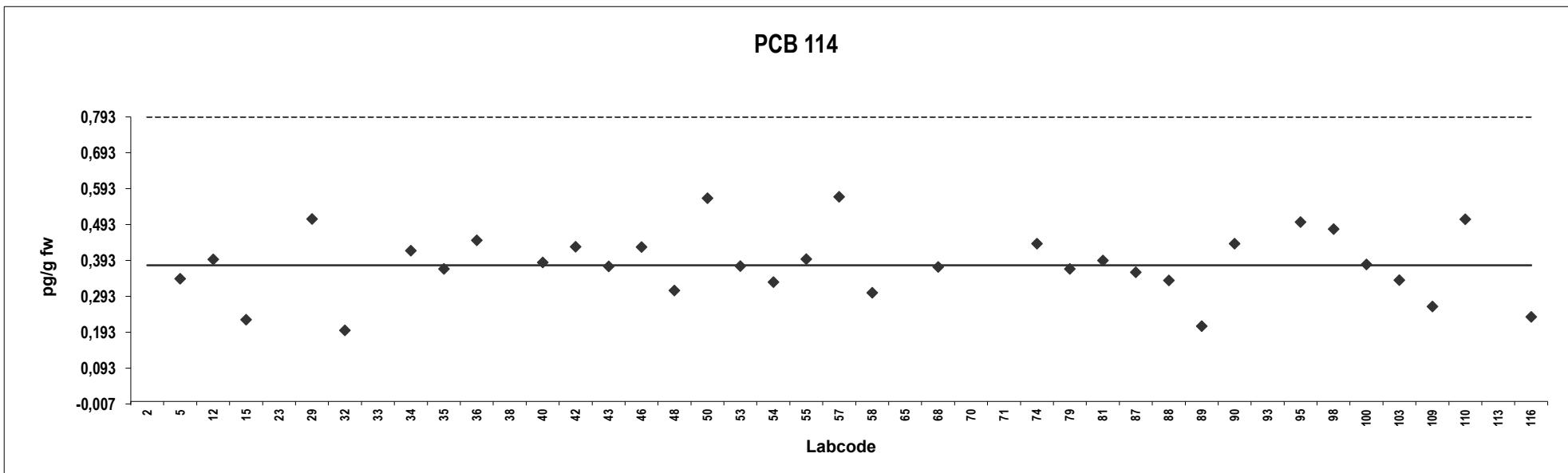
Sheep meat
Congener: PCB 118

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	10	-0,32	ND				
5	12	0,52					
12	11	0,10					
15	7,0	-1,7					
23	14	1,6					
29	6,2	-2,1					
32	11	-0,065					
33	13	1,1					
34	11	0,24					
35	11	0,16					
36	12	0,47					
38	10	-0,28					
40	10	-0,15					
42	14	1,5					
43	9,7	-0,47					
46	13	0,85					
48	15	1,9					
50	17	3,2					
53	11	0,063					
54	6,6	-1,9					
55	11	-0,0070					
57	21	4,6					
58	9,8	-0,43					
65	8,8	-0,91					
68	11	0,14					
70	20	4,4	ND				
71	8,8	-0,91					
74	13	0,94					
79	11	0,16					
81	11	0,33					
87	11	0,0070					
88	10	-0,11					
89	9,8	-0,41					
90	10	-0,27					
93	8,2	-1,2					
95	15	1,9					
98	9,0	-0,78					
100	9,8	-0,41					
103	12	0,53					
109	8,9	-0,83					
110	24	6,2	Outlier				
113	10	-0,32	ND				
116	8,4	-1,1					

Consenus statistics	
Consensus median, pg/g	11
Median all values pg/g	11
Consensus mean, pg/g	11
Standard deviation, pg/g	3,0
Relative standard deviation, %	27
No. of values reported	43
No. of values removed	1
No. of reported non-detects	3

PCB 118

Z-score: PCB 118
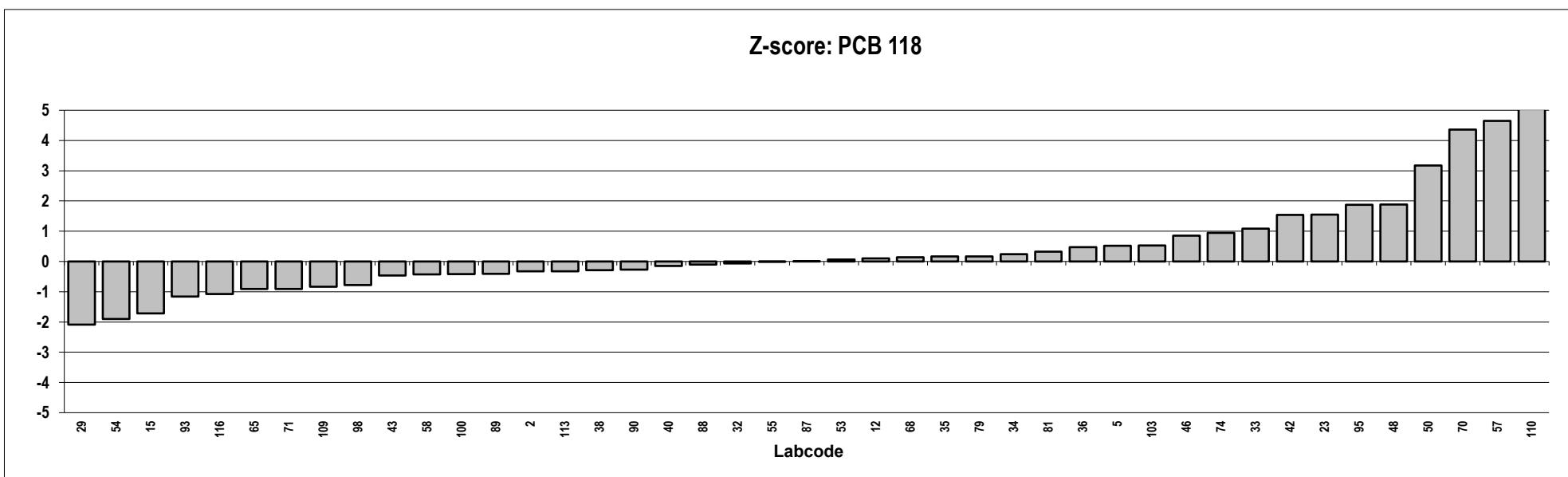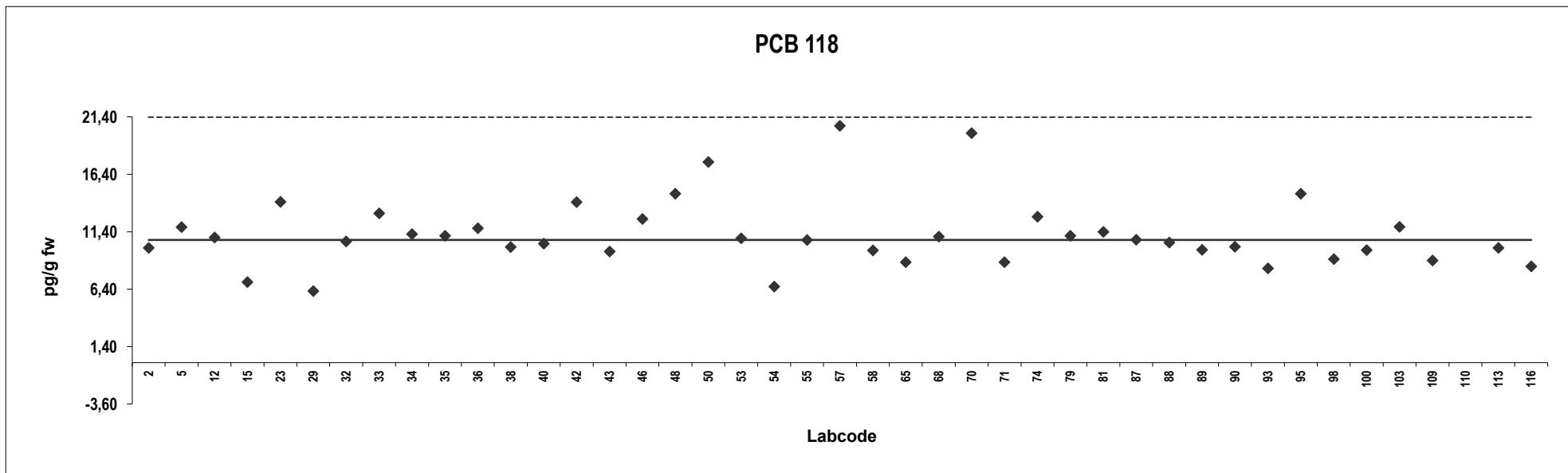
Sheep meat
Congener: PCB 123

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	2,4	72	Outlier,ND				
5	0,096	-1,9					
12	0,21	1,6					
15	0,064	-2,9					
23	3,7	114	Outlier,ND				
29	0,21	1,8					
32	0,13	-0,84					
33	2,0	60	Outlier,ND				
34	0,15	-0,16					
35	0,071	-2,7					
36	0,21	1,7					
38	1,1	32	Outlier,ND				
40	0,11	-1,4					
42	0,21	1,7					
43	0,35	6,4					
46	0,19	1,1					
48	0,28	4,1					
50	0,32	5,4					
53	0,16	0,16					
54	0,13	-0,80					
55	0,10	-1,6					
57	1,4	41	Outlier				
58	0,11	-1,6					
65	4,0	124	Outlier,ND				
68	0,089	-2,1					
70	5,0	156	Outlier,ND				
71	4,0	124	Outlier,ND				
74	0,19	1,1					
79	0,071	-2,7					
81	0,20	1,6					
87	0,14	-0,58					
88	0,11	-1,5					
89	0,19	1,1	ND				
90	0,17	0,49	ND				
93	1,9	56	Outlier,ND				
95	0,22	2,1					
98	0,31	4,9					
100	0,078	-2,5					
103	0,094	-2,0					
109	0,48	10	Outlier				
110	0,36	6,7	ND				
113	10	318	Outlier,ND				
116	0,079	-2,5					

Consenus statistics	
Consensus median, pg/g	0,15
Median all values pg/g	0,20
Consensus mean, pg/g	0,17
Standard deviation, pg/g	0,085
Relative standard deviation, %	50
No. of values reported	43
No. of values removed	11
No. of reported non-detects	12

PCB 123

Z-score: PCB 123
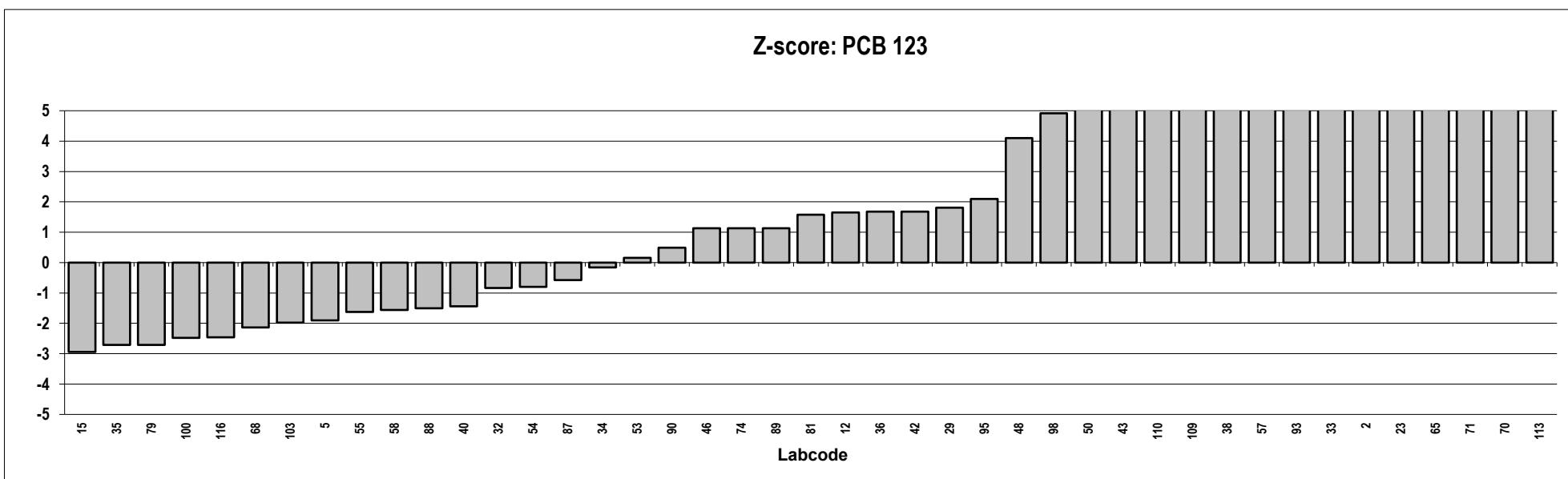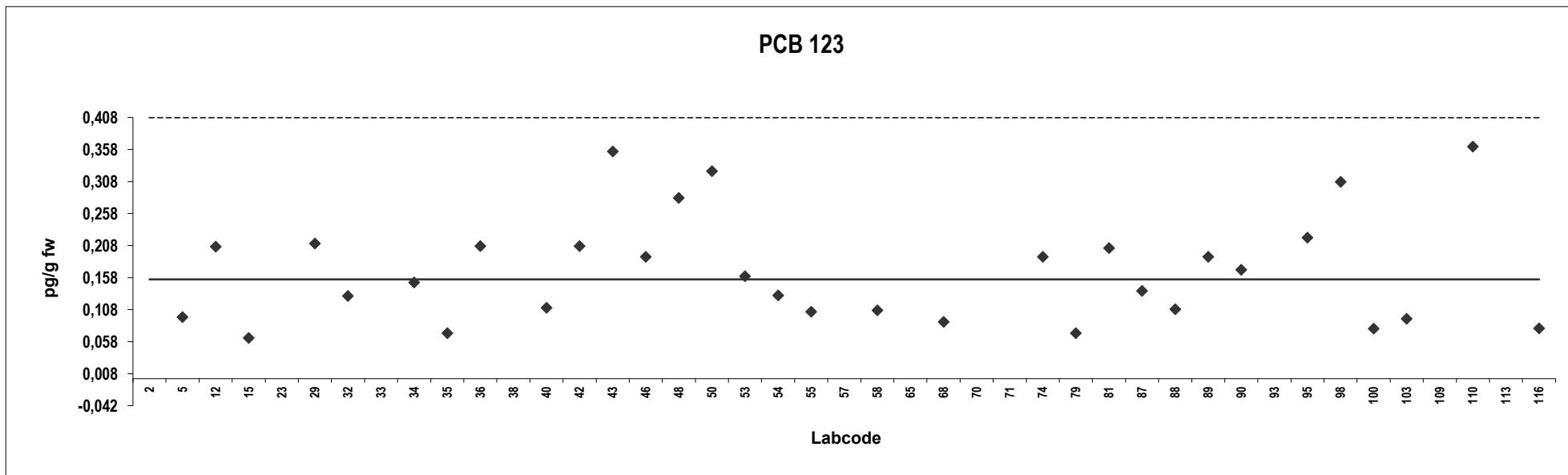
Sheep meat
Congener: PCB 156

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	2,1	-1,1	ND				
5	2,7	0,00					
12	2,9	0,37					
15	1,7	-1,9					
23	2,3	-0,72					
29	1,6	-2,1					
32	2,3	-0,68					
33	3,2	0,95					
34	3,0	0,48					
35	2,7	-0,034					
36	3,0	0,59					
38	2,3	-0,72					
40	2,5	-0,44					
42	2,8	0,13					
43	2,6	-0,22					
46	3,1	0,76					
48	3,1	0,80					
50	2,8	0,29					
53	2,7	0,069					
54	2,0	-1,3					
55	2,9	0,46					
57	3,4	1,2					
58	2,3	-0,65					
65	3,6	1,7	ND				
68	2,3	-0,77					
70	5,0	4,3	ND				
71	3,6	1,7	ND				
74	3,1	0,80					
79	2,7	-0,034					
81	2,6	-0,12					
87	2,6	-0,26					
88	2,8	0,17					
89	1,9	-1,4					
90	2,7	0,00					
93	2,2	-0,95					
95	3,4	1,3					
98	2,6	-0,25					
100	2,7	0,037					
103	2,8	0,23					
109	2,4	-0,45					
110	3,1	0,76					
113	10	14	Outlier,ND				
116	2,0	-1,3					

Consensus statistics	
Consensus median, pg/g	2,7
Median all values pg/g	2,7
Consensus mean, pg/g	2,7
Standard deviation, pg/g	0,60
Relative standard deviation, %	22
No. of values reported	43
No. of values removed	1
No. of reported non-detects	5

PCB 156

Z-score: PCB 156
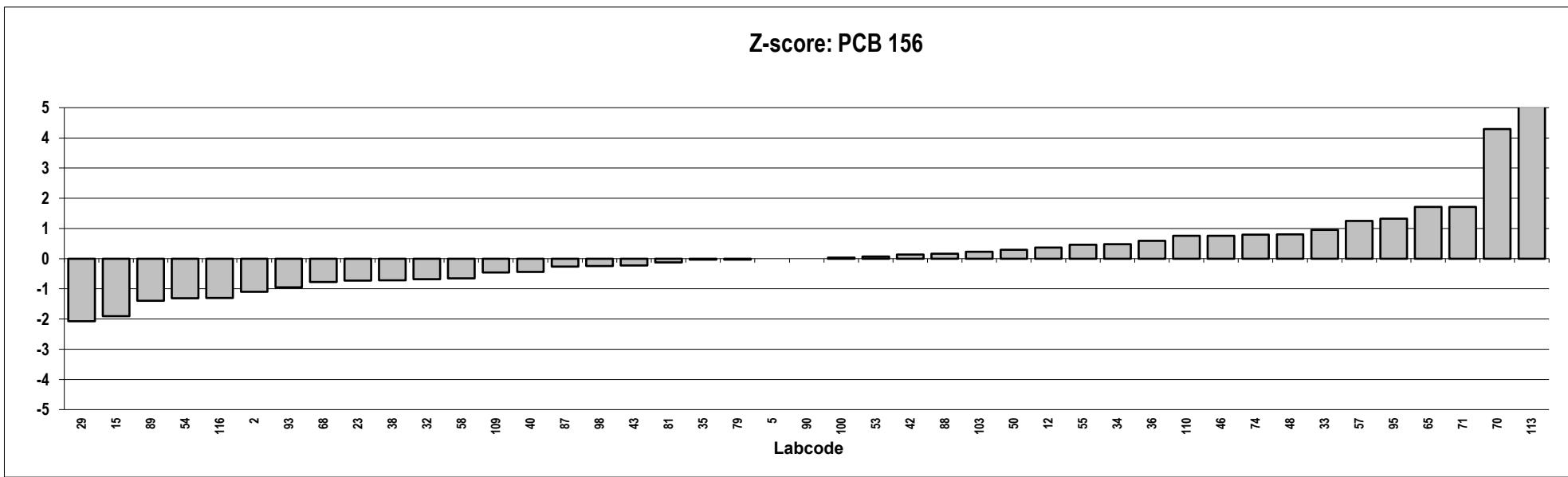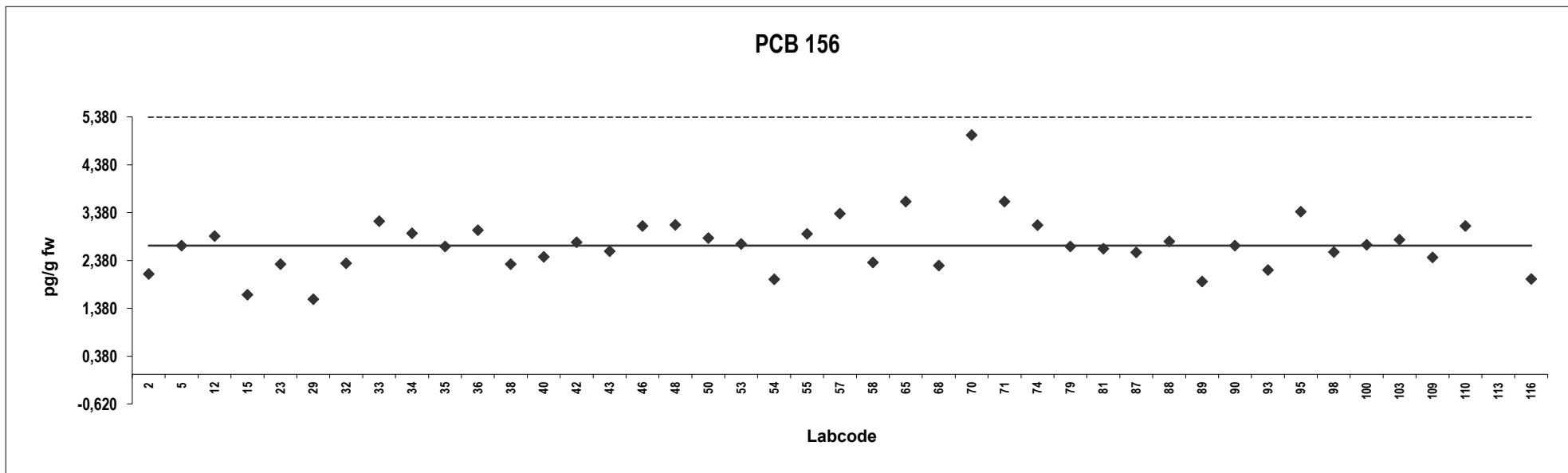
Sheep meat
Congener: PCB 157

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	2,1	16	Outlier,ND				
5	0,47	-0,34					
12	0,51	0,077					
15	0,24	-2,6					
23	1,7	12	Outlier,ND				
29	0,47	-0,34					
32	0,46	-0,42					
33	2,0	15	Outlier,ND				
34	0,61	1,1					
35	0,49	-0,077					
36	0,57	0,73					
38	1,1	6,5	Outlier,ND				
40	0,50	0,039					
42	0,52	0,24					
43	0,53	0,26					
46	0,56	0,60					
48	0,51	0,062					
50	0,41	-0,93					
53	0,52	0,22					
54	0,36	-1,4					
55	0,65	1,5					
57	0,49	-0,10					
58	0,43	-0,71					
65	3,6	31	Outlier,ND				
68	0,44	-0,58					
70	5,0	45	Outlier,ND				
71	3,6	31	Outlier,ND				
74	0,54	0,40					
79	0,49	-0,077					
81	0,51	0,15					
87	0,48	-0,20					
88	0,50	0,00					
89	0,29	-2,1	ND				
90	0,55	0,50					
93	0,70	2,0	ND				
95	0,59	0,90					
98	0,51	0,074					
100	0,50	-0,053					
103	0,50	-0,047					
109	0,43	-0,70					
110	0,53	0,29					
113	10	95	Outlier,ND				
116	0,37	-1,3					

Consensus statistics

Consensus median, pg/g	0,50
Median all values pg/g	0,51
Consensus mean, pg/g	0,49
Standard deviation, pg/g	0,089
Relative standard deviation, %	18
No. of values reported	43
No. of values removed	8
No. of reported non-detects	10

PCB 157

Labcode

pg/g fw

Z-score: PCB 157
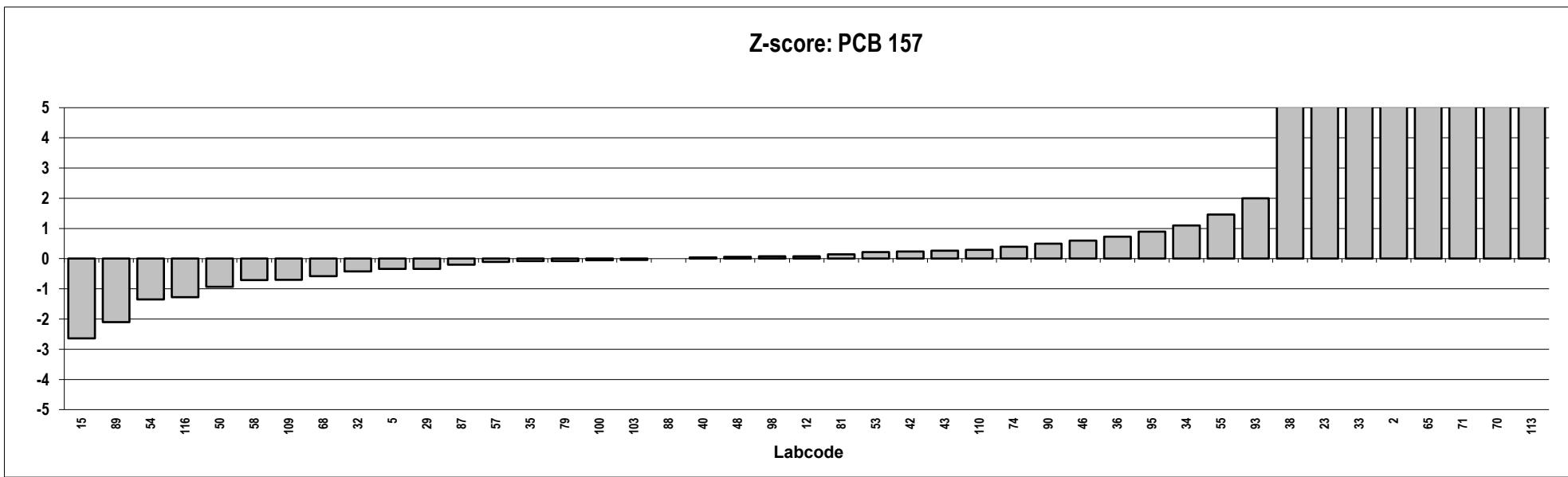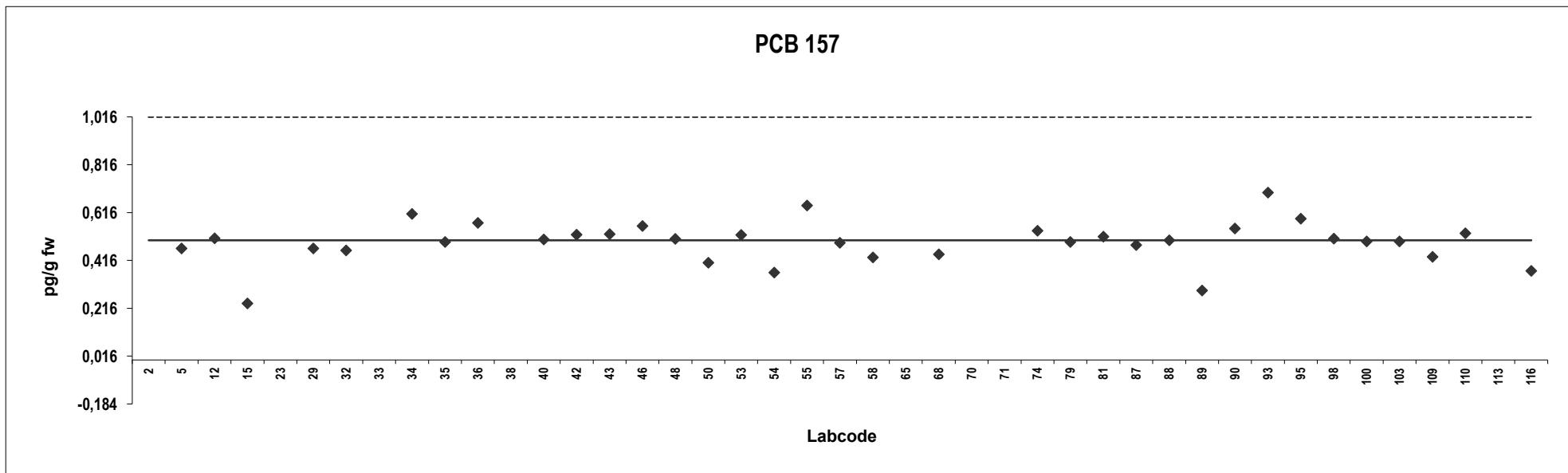
Labcode

Sheep meat
Congener: PCB 167

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	1,3	5,5	Outlier,ND				
5	0,59	-0,22					
12	0,62	-0,016					
15	0,46	-1,3					
23	2,3	14	Outlier,ND				
29	0,54	-0,62					
32	0,73	0,91					
33	2,0	11	Outlier,ND				
34	0,54	-0,63					
35	0,62	0,022					
36	0,72	0,78					
38	1,1	4,3	ND				
40	0,55	-0,54					
42	0,83	1,7					
43	0,47	-1,2					
46	0,79	1,4					
48	0,65	0,26					
50	0,63	0,11					
53	0,62	-0,014					
54	0,26	-2,9					
55	0,58	-0,32					
57	1,2	4,6					
58	0,47	-1,2					
65	3,7	25	Outlier,ND				
68	0,60	-0,12					
70	5,0	35	Outlier,ND				
71	3,7	25	Outlier,ND				
74	0,78	1,3					
79	0,62	0,022					
81	0,58	-0,34					
87	0,66	0,30					
88	0,54	-0,61					
89	0,37	-2,0	ND				
90	0,80	1,5					
93	0,70	0,66	ND				
95	1,0	3,1					
98	0,54	-0,64					
100	0,64	0,15					
103	0,62	0,014					
109	0,49	-1,1					
110	1,2	4,6					
113	10	76	Outlier,ND				
116	0,42	-1,6					

Consensus statistics

Consensus median, pg/g	0,62
Median all values pg/g	0,63
Consensus mean, pg/g	0,65
Standard deviation, pg/g	0,21
Relative standard deviation, %	32
No. of values reported	43
No. of values removed	7
No. of reported non-detects	10

PCB 167

Z-score: PCB 167
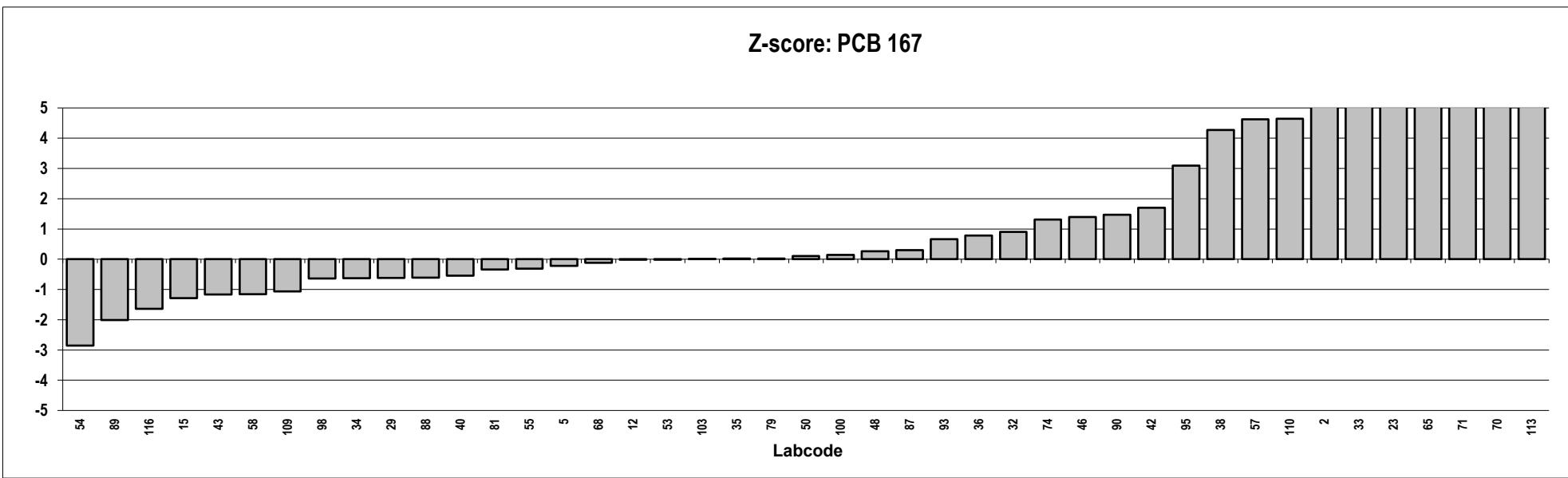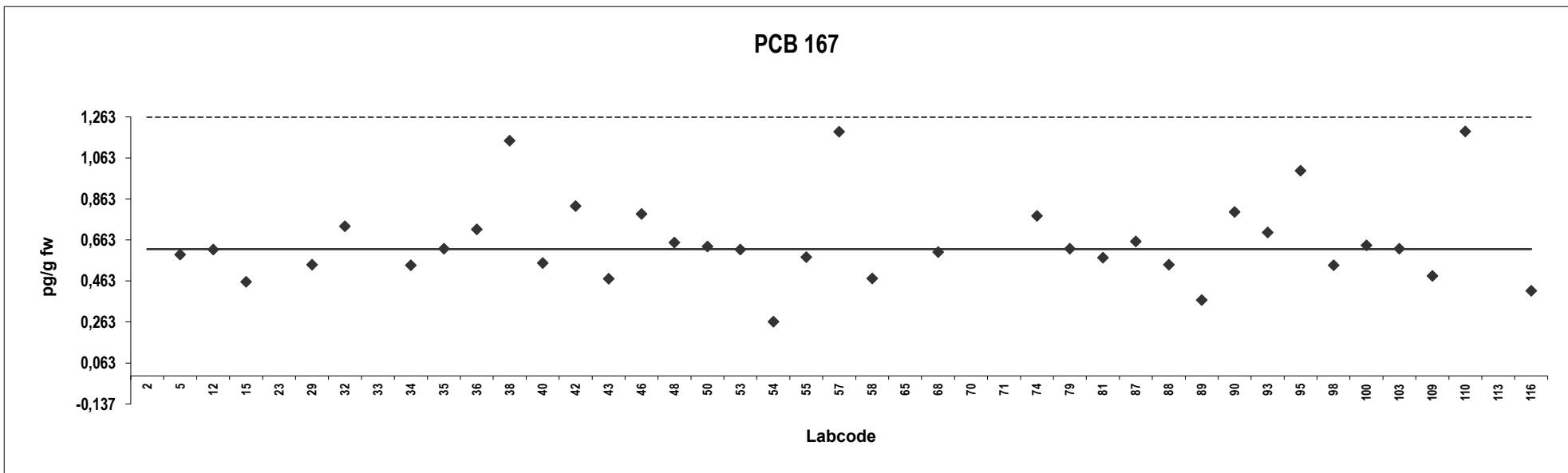
Sheep meat
Congener: PCB 189

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,93	11	Outlier,ND				
5	0,30	0,23					
12	0,28	-0,16					
15	0,12	-2,8					
23	1,2	16	Outlier,ND				
29	0,40	2,0					
32	0,24	-0,75					
33	2,0	30	Outlier,ND				
34	0,30	0,27					
35	0,26	-0,46					
36	0,31	0,44					
38	1,1	15	Outlier,ND				
40	0,24	-0,75					
42	0,44	2,7					
43	0,42	2,4					
46	0,31	0,44					
48	0,27	-0,28					
50	0,25	-0,68					
53	0,27	-0,19					
54	0,23	-0,96					
55	0,36	1,3					
57	0,79	8,9	Outlier				
58	0,22	-1,2					
65	2,3	35	Outlier,ND				
68	0,24	-0,86					
70	5,0	83	Outlier,ND				
71	2,3	35	Outlier,ND				
74	0,31	0,44					
79	0,26	-0,46					
81	0,31	0,42					
87	0,32	0,63					
88	0,28	0,00					
89	0,13	-2,7	ND				
90	0,53	4,3					
93	1,3	18	Outlier,ND				
95	0,34	0,97					
98	0,39	1,8					
100	0,26	-0,52					
103	0,30	0,25					
109	0,22	-1,2					
110	0,36	1,4	ND				
113	10	171	Outlier,ND				
116	0,20	-1,5					

Consenus statistics

Consensus median, pg/g	0,28
Median all values pg/g	0,31
Consensus mean, pg/g	0,29
Standard deviation, pg/g	0,083
Relative standard deviation, %	28
No. of values reported	43
No. of values removed	10
No. of reported non-detects	11

PCB 189

Z-score: PCB 189
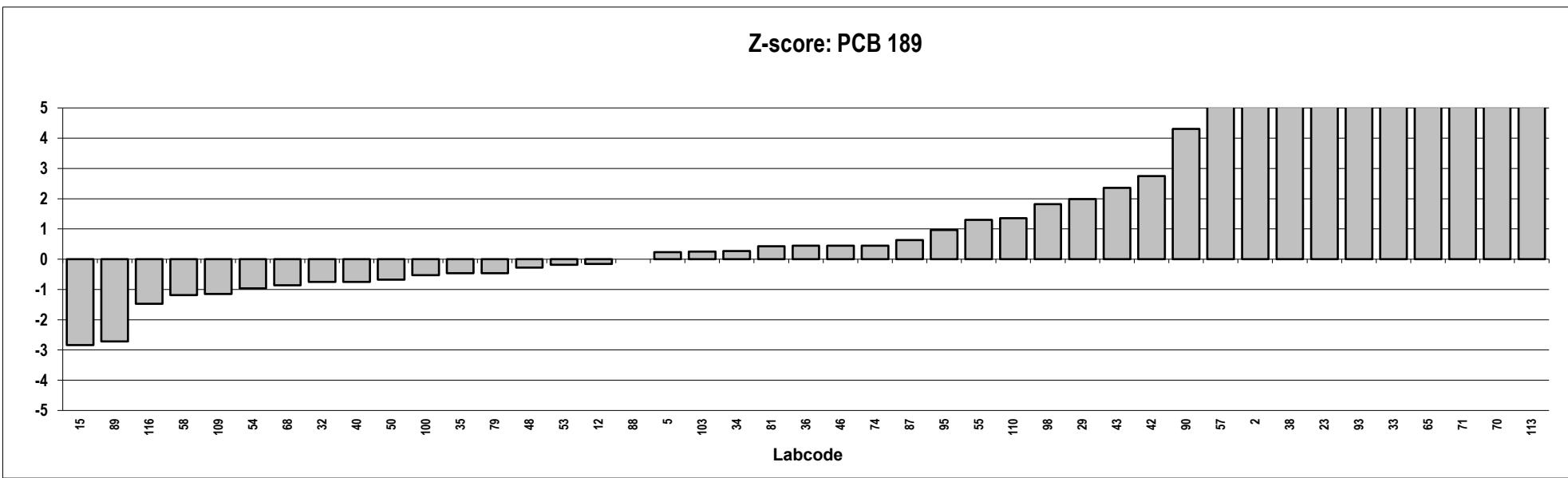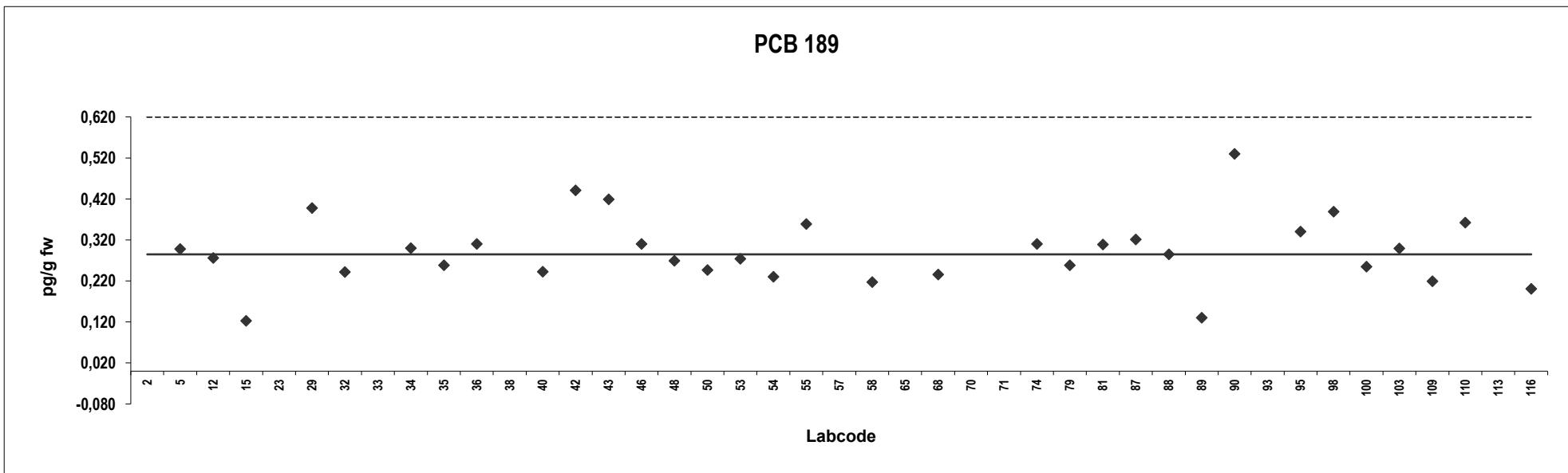
Sheep meat
Congener: PCB 28

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	11	-1,1					
5	24	3,5					
12	12	-0,68					
23	33	6,7	Outlier				
29	8,3	-2,0					
32	14	0,00					
33	25	4,0	ND				
34	12	-0,61					
35	20	2,2					
36	15	0,44					
38	12	-0,62					
40	11	-0,92					
42	24	3,5					
46	17	1,1					
48	14	-0,13					
50	64	18	Outlier				
53	22	2,8					
54	14	0,21					
55	11	-0,90					
57	36	8,0	Outlier				
58	19	2,0					
59	12	-0,66					
65	15	0,44					
68	17	1,1					
70	500	175	Outlier,ND				
74	17	1,1					
79	20	2,2					
87	15	0,37					
88	10	-1,3					
89	10	-1,4					
90	14	-0,14					
93	12	-0,82					
98	8,6	-1,9					
100	13	-0,36					
103	16	0,91					
109	28	5,0					
110	14	-0,14					
113	50	13	Outlier,ND				
116	14	0,046					

Consensus statistics

Consensus median, pg/g	14
Median all values pg/g	15
Consensus mean, pg/g	15
Standard deviation, pg/g	4,8
Relative standard deviation, %	32
No. of values reported	39
No. of values removed	5
No. of reported non-detects	3
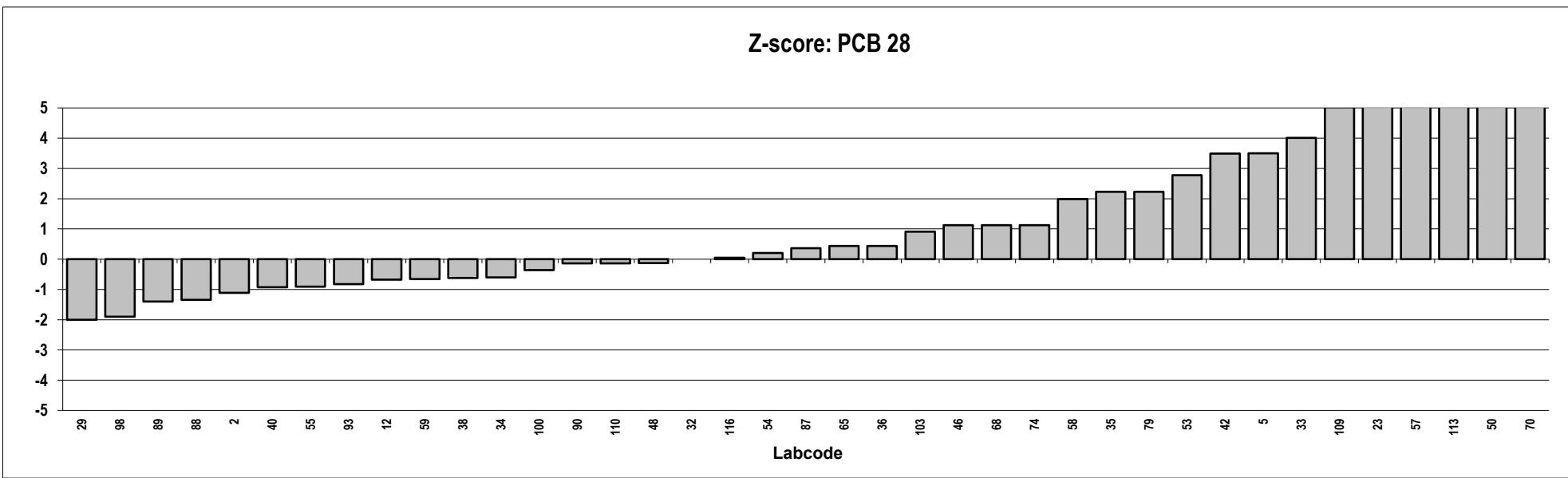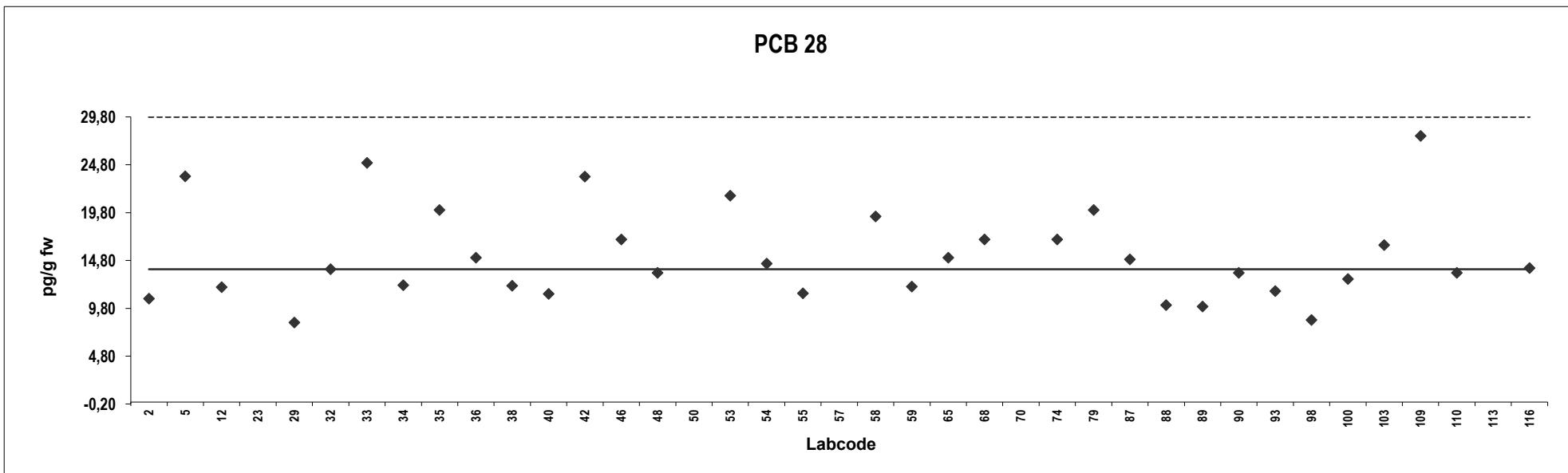
Sheep meat
Congener: PCB 52

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	19	-0,42					
5	29	2,1					
12	21	0,092					
23	41	4,8					
29	12	-2,0					
32	25	0,95					
33	27	1,5					
34	20	-0,25					
35	24	0,78					
36	25	1,1					
38	22	0,37					
40	21	-0,0047					
42	21	0,0047					
46	25	1,1					
48	21	0,044					
50	120	24	Outlier				
53	20	-0,14					
54	14	-1,6					
55	20	-0,20					
57	22	0,33					
58	20	-0,25					
59	20	-0,19					
65	17	-0,94					
68	20	-0,15					
70	500	116	Outlier,ND				
74	25	1,1					
79	24	0,78					
87	19	-0,37					
88	15	-1,3					
89	17	-0,79					
90	24	0,87					
93	20	-0,20					
98	15	-1,4					
100	19	-0,34					
103	23	0,53					
109	25	0,97					
110	24	0,87					
113	50	7,1	Outlier,ND				
116	15	-1,5					

Consensus statistics

Consensus median, pg/g	21
Median all values pg/g	21
Consensus mean, pg/g	21
Standard deviation, pg/g	5,0
Relative standard deviation, %	24
No. of values reported	39
No. of values removed	3
No. of reported non-detects	2

PCB 52

Z-score: PCB 52
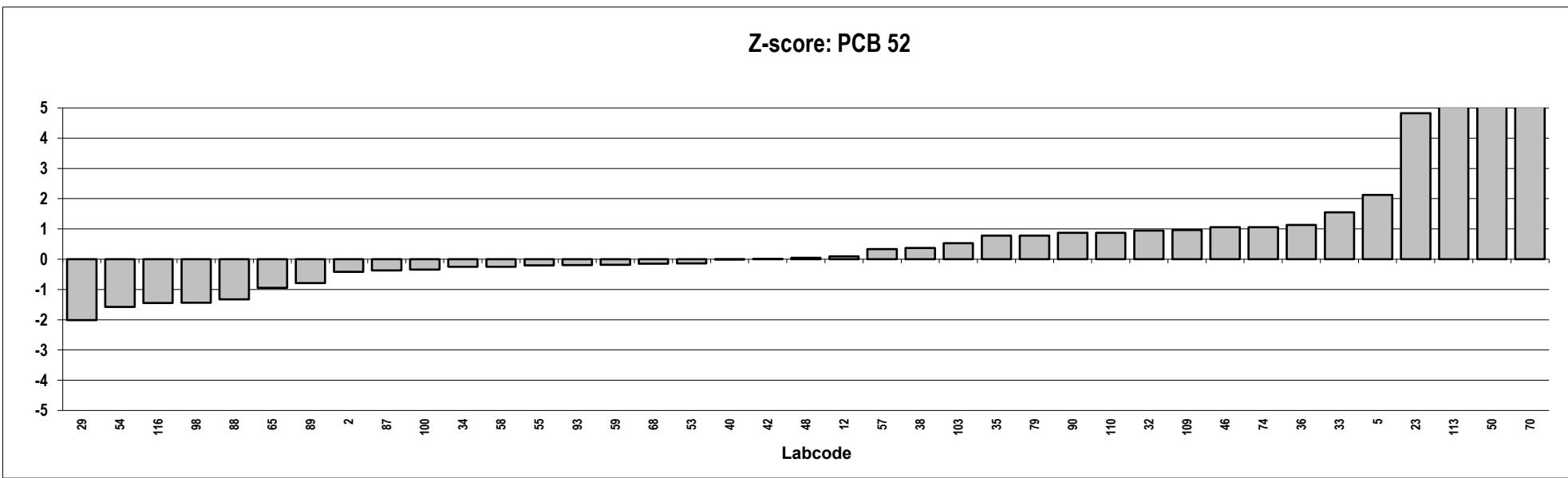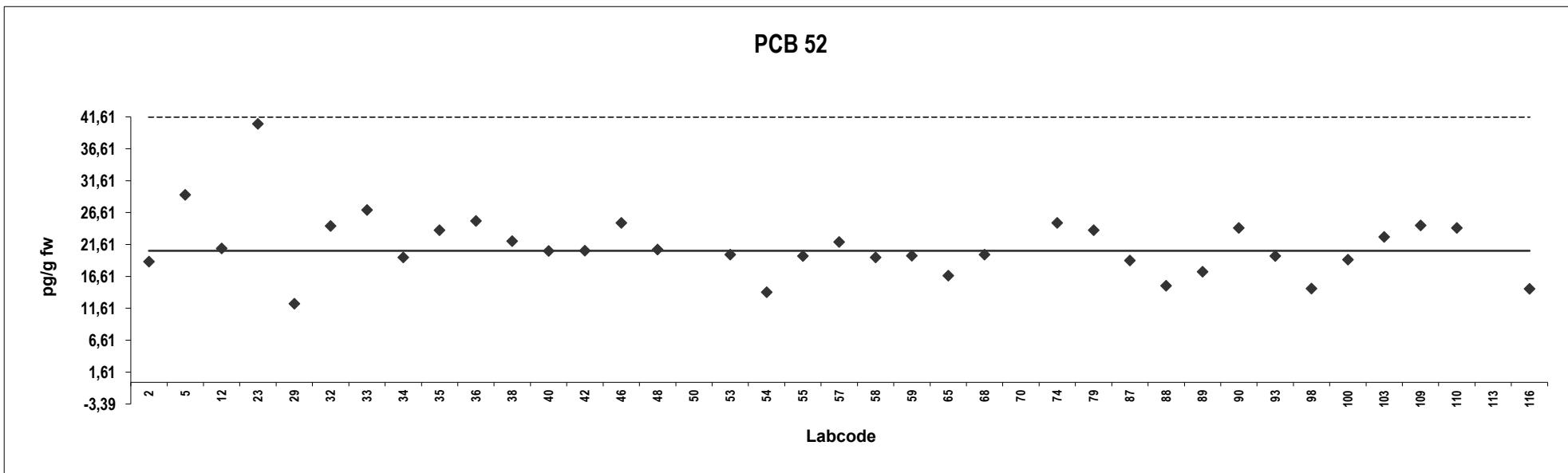
Sheep meat
Congener: PCB 101

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	21	-0,14					
5	34	2,7					
12	23	0,37					
23	42	4,5					
29	9,3	-2,9					
32	22	0,13					
33	28	1,4					
34	22	-0,046					
35	21	-0,10					
36	26	0,96					
38	21	-0,22					
40	21	-0,18					
42	26	0,90					
46	26	0,96					
48	24	0,50					
50	50	6,5	Outlier				
53	21	-0,22					
54	17	-1,1					
55	21	-0,072					
57	24	0,50					
58	21	-0,23					
59	23	0,17					
65	16	-1,3					
68	23	0,28					
70	500	110	Outlier,ND				
74	26	0,96					
79	21	-0,10					
87	22	0,046					
88	16	-1,3					
89	21	-0,28					
90	24	0,48					
93	16	-1,3					
98	14	-1,7					
100	21	-0,24					
103	28	1,4					
109	31	2,0					
110	41	4,3					
113	50	6,5	Outlier,ND				
116	17	-1,2					

Consenus statistics

Consensus median, pg/g	22
Median all values pg/g	22
Consensus mean, pg/g	23
Standard deviation, pg/g	6,4
Relative standard deviation, %	28
No. of values reported	39
No. of values removed	3
No. of reported non-detects	2

PCB 101

Z-score: PCB 101
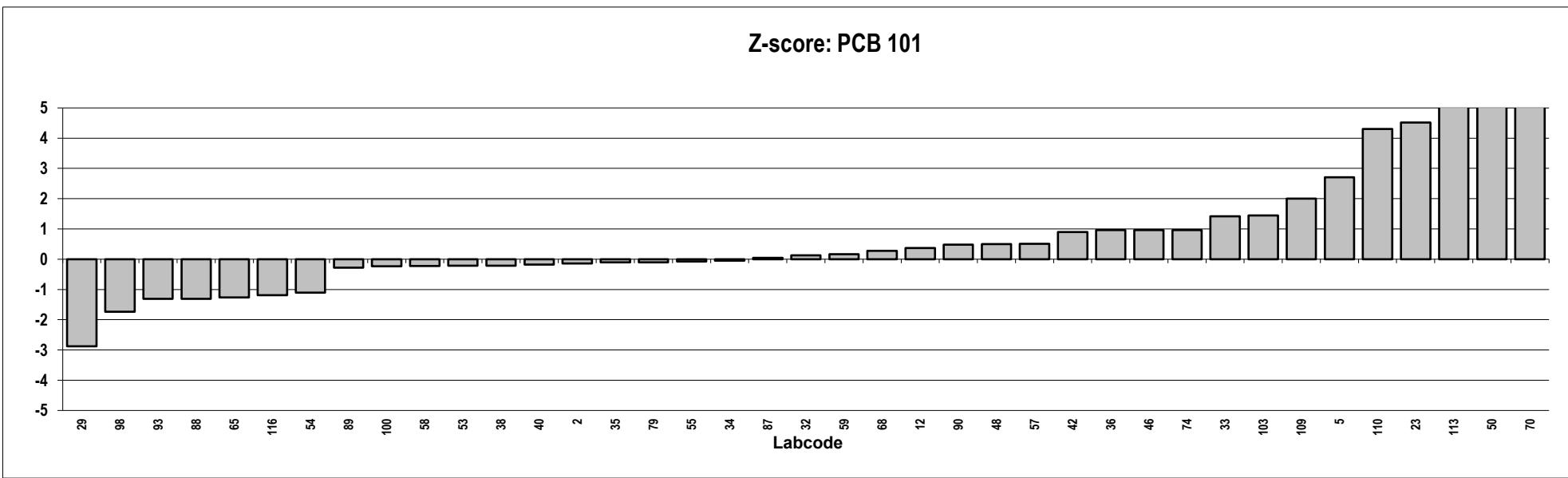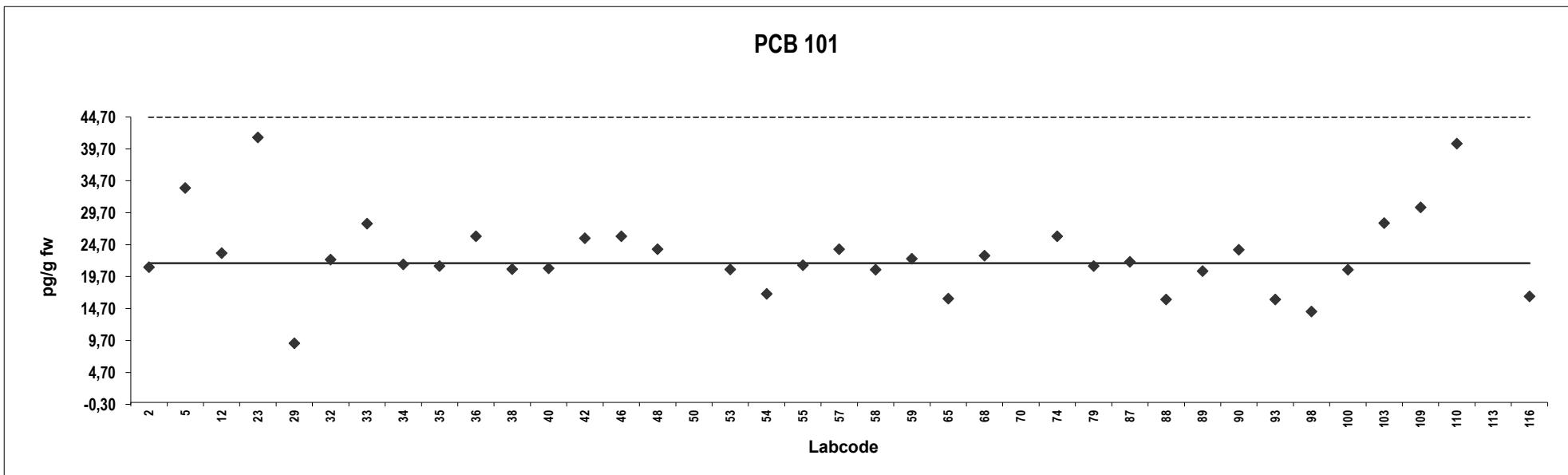
Sheep meat
Congener: PCB 138

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	14	0,00					
5	20	2,4					
12	15	0,36					
23	19	1,8					
29	11	-0,83					
32	18	1,6					
33	25	4,1	ND				
34	11	-1,2					
35	9,5	-1,5					
36	16	0,73					
38	8,4	-1,9					
40	12	-0,53					
42	16	0,90					
46	15	0,47					
48	18	1,6					
50	19	1,9					
53	13	-0,11					
54	11	-1,1					
55	14	0,075					
57	23	3,4					
58	12	-0,80					
59	13	-0,18					
65	18	1,6					
68	12	-0,62					
70	500	177	Outlier,ND				
74	16	0,84					
79	9,5	-1,5					
87	13	-0,29					
88	10	-1,3					
89	12	-0,66					
90	14	0,073					
93	11	-1,1					
98	11	-0,83					
100	14	0,092					
103	16	0,84					
109	17	1,1					
110	31	6,4	Outlier				
113	50	13	Outlier,ND				
116	9,9	-1,4					

Consensus statistics

Consensus median, pg/g	14
Median all values pg/g	14
Consensus mean, pg/g	14
Standard deviation, pg/g	3,9
Relative standard deviation, %	27
No. of values reported	39
No. of values removed	3
No. of reported non-detects	3

PCB 138

Z-score: PCB 138
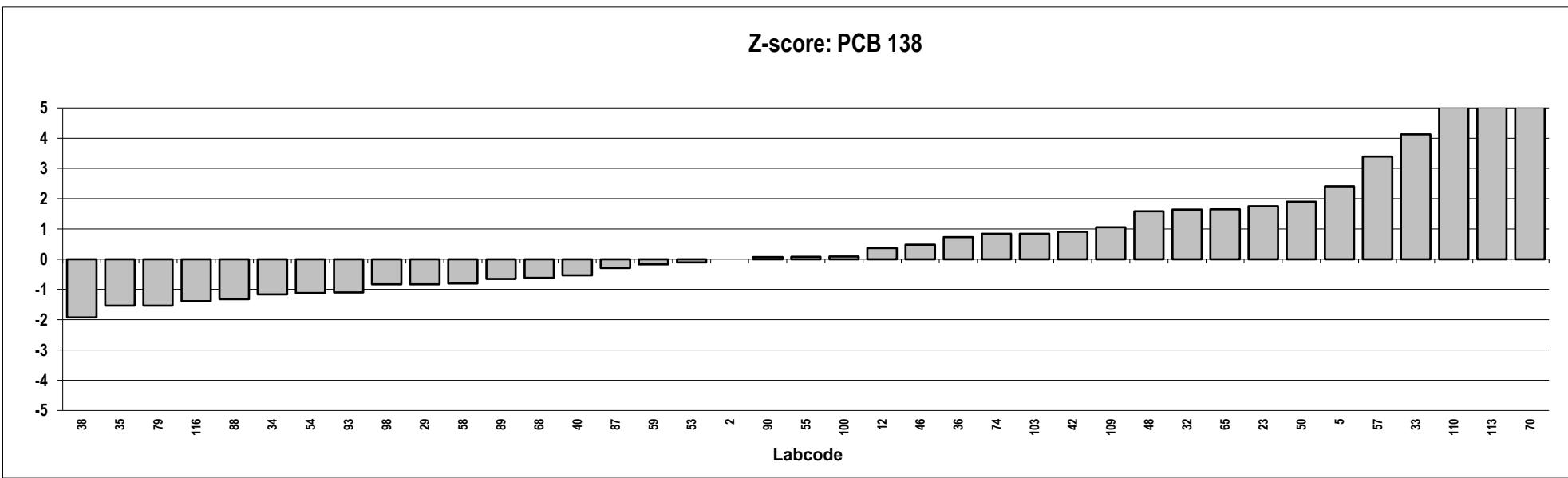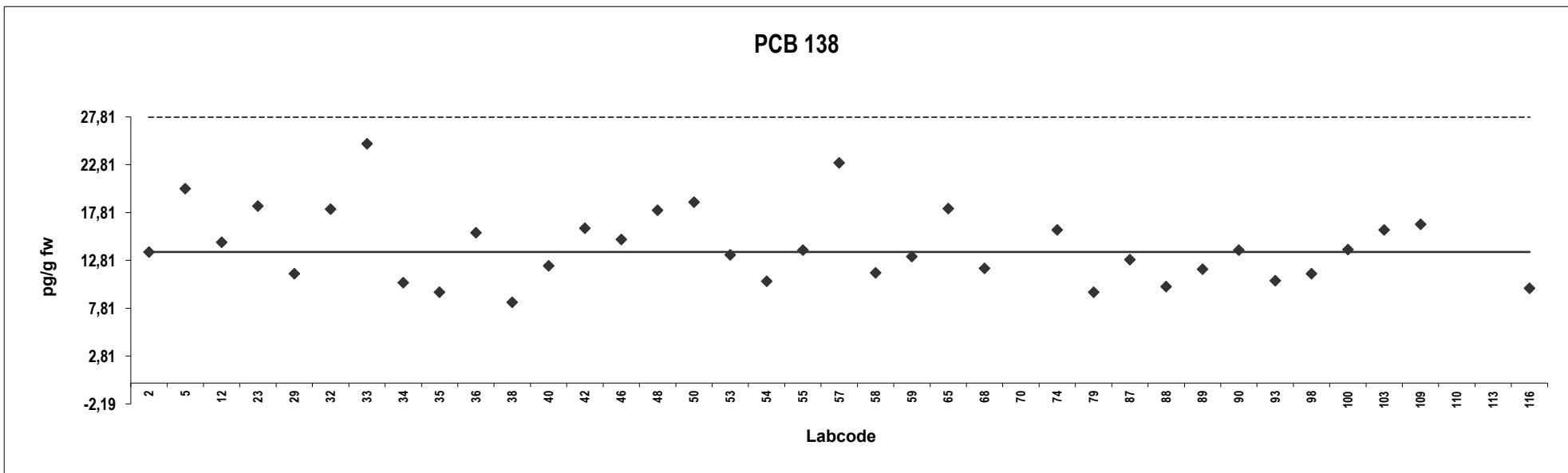
Sheep meat
Congener: PCB 153

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	66	3,7					
5	43	0,71					
12	43	0,71					
23	47	1,2					
29	19	-2,5					
32	37	-0,17					
33	54	2,1					
34	40	0,24					
35	36	-0,31					
36	38	-0,0020					
38	37	-0,076					
40	35	-0,35					
42	42	0,57					
46	42	0,54					
48	42	0,50					
50	48	1,3					
53	38	-0,0053					
54	28	-1,3					
55	44	0,78					
57	41	0,41					
58	37	-0,18					
59	38	0,0020					
65	27	-1,5					
68	37	-0,12					
70	500	61	Outlier,ND				
74	40	0,27					
79	36	-0,31					
87	40	0,26					
88	25	-1,7					
89	34	-0,58					
90	41	0,41					
93	28	-1,4					
98	19	-2,5					
100	41	0,43					
103	47	1,2					
109	23	-1,9					
110	94	7,4	Outlier				
113	50	1,6	ND				
116	28	-1,3					

Consensus statistics

Consensus median, pg/g	38
Median all values pg/g	40
Consensus mean, pg/g	38
Standard deviation, pg/g	9,4
Relative standard deviation, %	25
No. of values reported	39
No. of values removed	2
No. of reported non-detects	2

PCB 153

Z-score: PCB 153
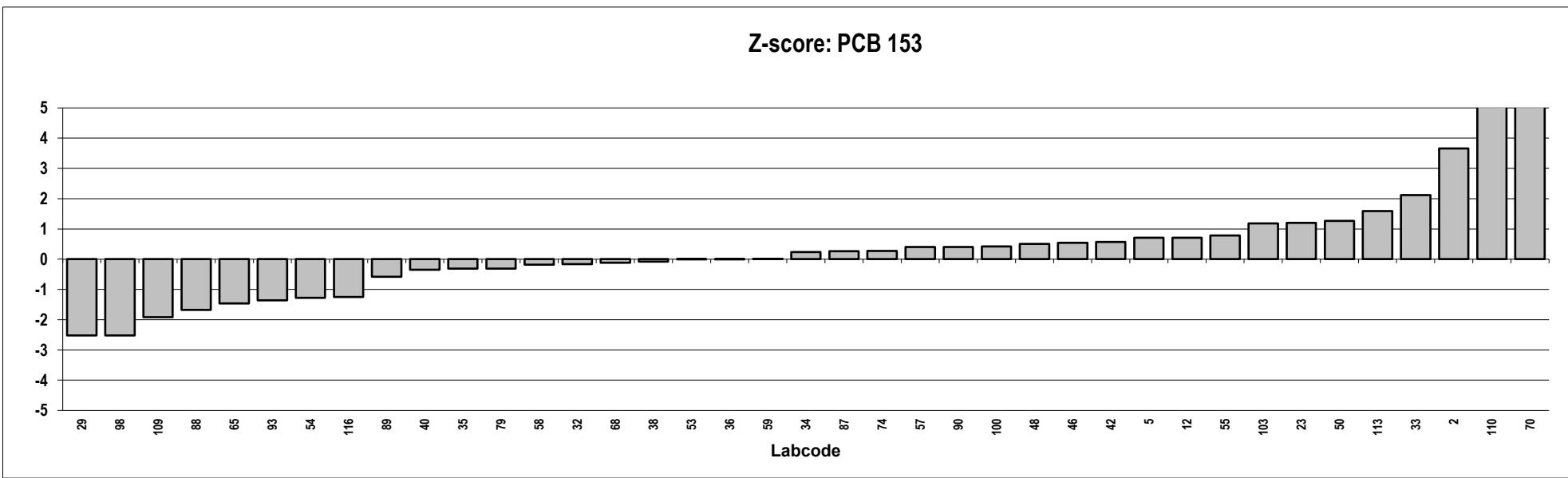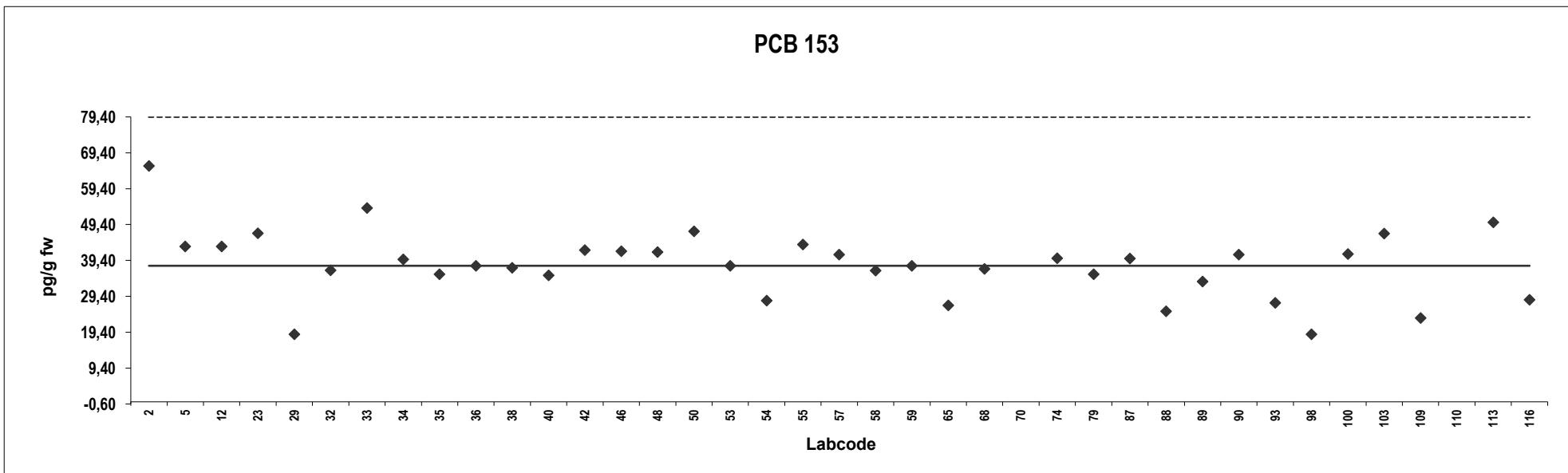
Sheep meat
Congener: PCB 180

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	15	0,42					
5	15	0,60					
12	15	0,64					
23	13	-0,36					
29	6,0	-2,8					
32	12	-0,49					
33	25	4,3	ND				
34	13	-0,33					
35	14	0,15					
36	16	0,75					
38	15	0,64					
40	12	-0,43					
42	14	0,17					
46	13	-0,18					
48	17	1,4					
50	17	1,2					
53	14	0,071					
54	9,4	-1,5					
55	14	0,32					
57	22	3,2					
58	13	-0,17					
59	13	-0,0039					
65	10	-1,1					
68	12	-0,55					
70	500	180	Outlier,ND				
74	13	-0,18					
79	14	0,15					
87	14	0,044					
88	8,7	-1,8					
89	12	-0,55					
90	14	0,34					
93	9,5	-1,5					
98	10	-1,2					
100	13	0,0039					
103	16	0,82					
109	11	-0,76					
110	17	1,5					
113	50	14	Outlier,ND				
116	10	-1,2					

Consensus statistics

Consensus median, pg/g	13
Median all values pg/g	14
Consensus mean, pg/g	14
Standard deviation, pg/g	3,4
Relative standard deviation, %	25
No. of values reported	39
No. of values removed	2
No. of reported non-detects	3

PCB 180

Z-score: PCB 180
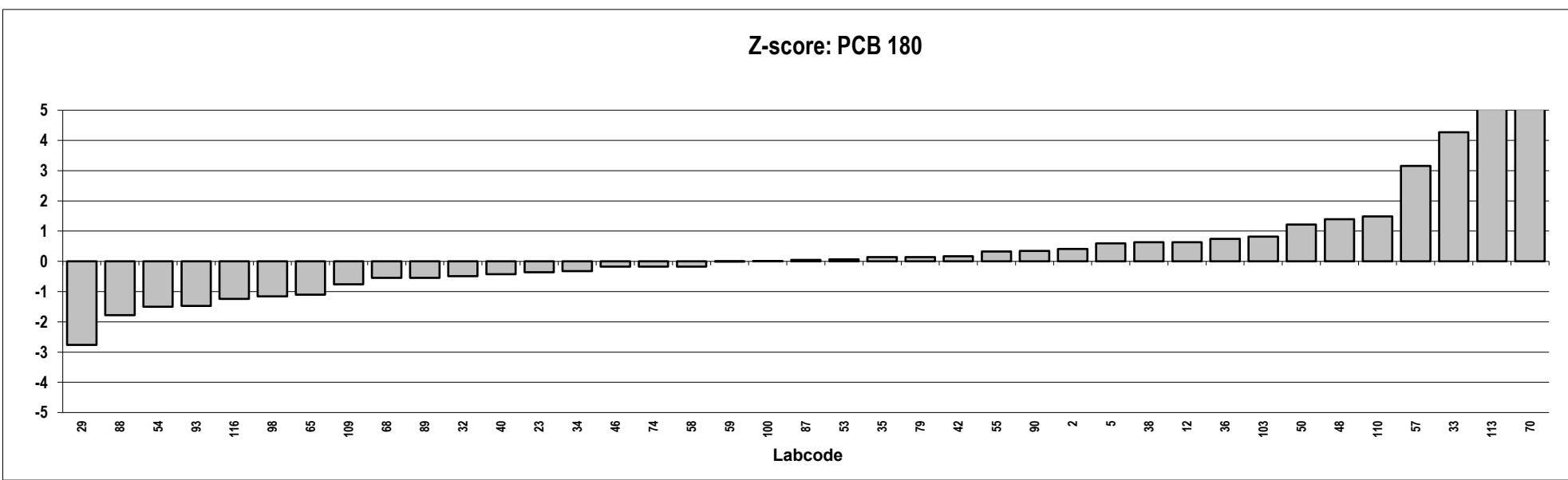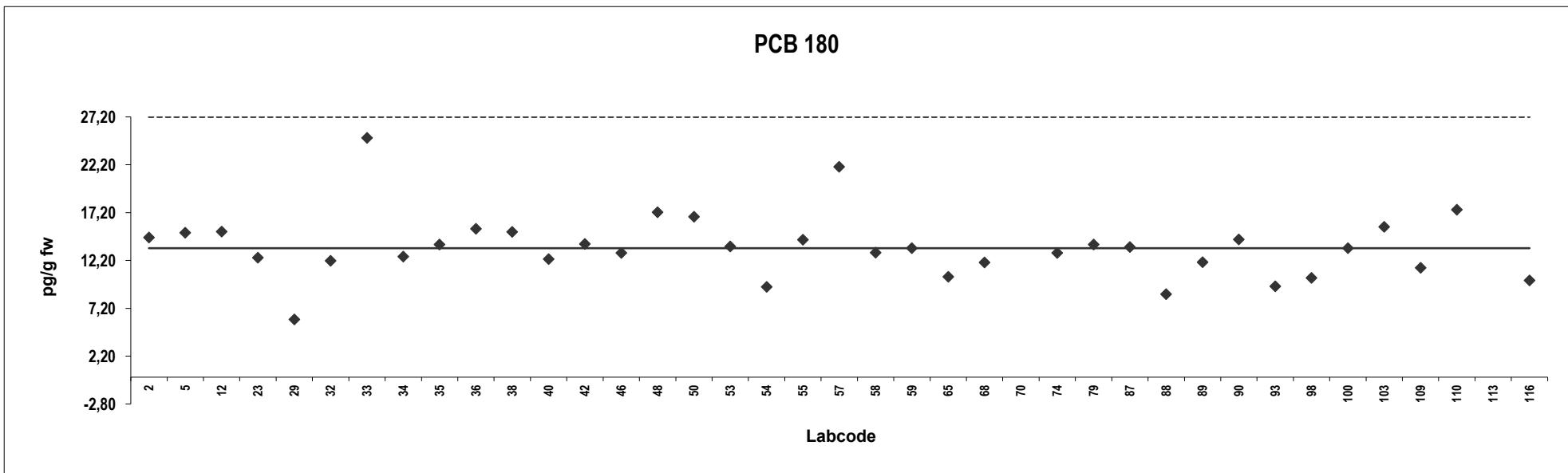
Sheep meat
Congener: PBDE 28

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,20	-0,96	ND				
23	0,76	10	Outlier,ND				
36	0,24	-0,15					
43	0,077	-3,4					
53	0,29	0,95					
55	0,29	0,94					
68	0,091	-3,2					
89	0,031	-4,4	ND				
90	0,043	-4,1					
98	0,27	0,48					
109	0,25	0,15					
110	0,45	4,2	ND				

Consenus statistics

Consensus median, pg/g	0,25
Median all values pg/g	0,25
Consensus mean, pg/g	0,20
Standard deviation, pg/g	0,13
Relative standard deviation, %	64
No. of values reported	12
No. of values removed	1
No. of reported non-detects	4

PBDE 28

Z-score: PBDE 28
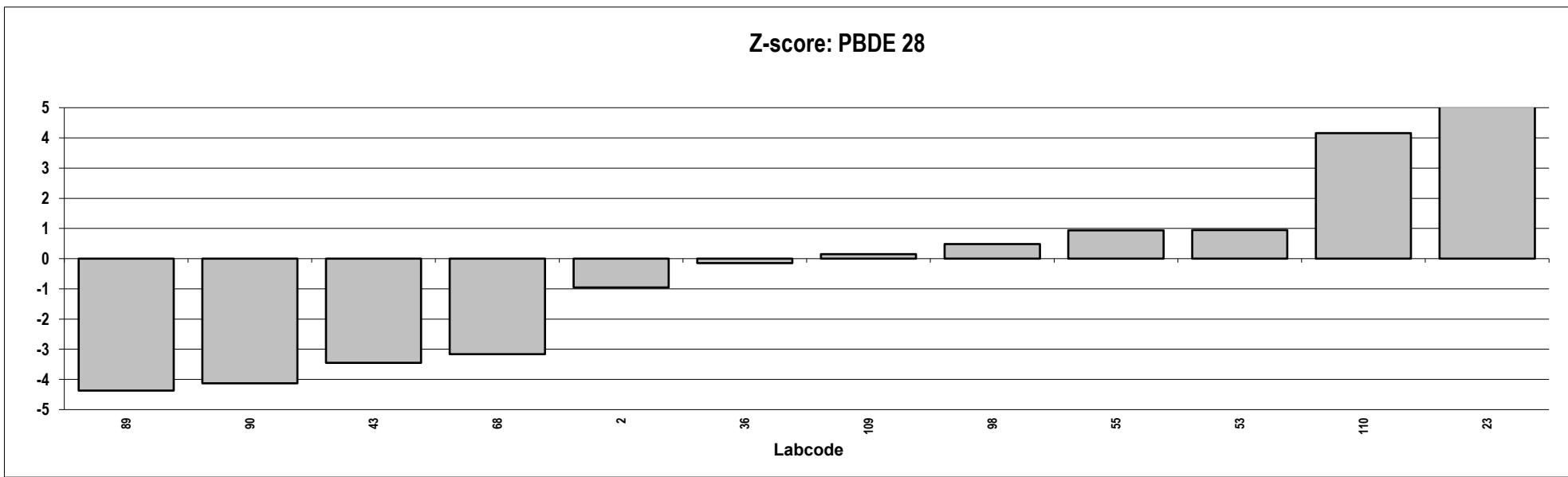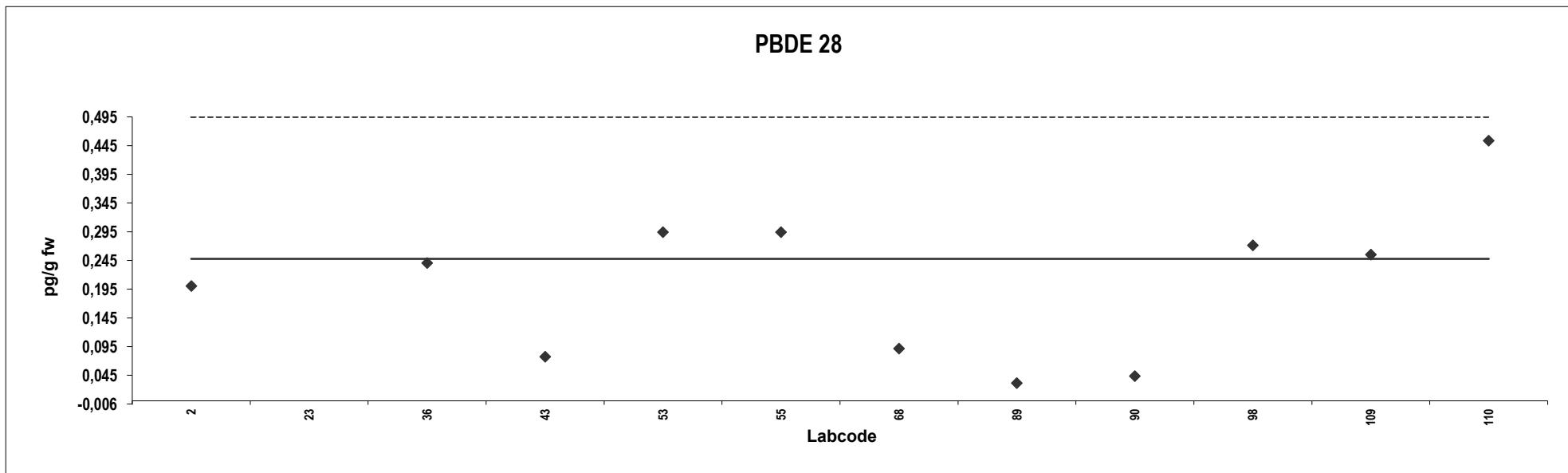
Sheep meat
Congener: PBDE 47

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	6,0	23	Outlier,ND				
23	3,3	10					
36	8,6	36	Outlier				
40	1,1	0,45					
43	0,71	-1,6					
53	2,1	4,9					
55	1,9	3,9					
68	0,79	-1,3					
89	0,73	-1,5					
90	0,96	-0,45					
98	0,71	-1,6					
109	4,4	16	Outlier				
110	2,7	7,6					

Consenus statistics

Consensus median, pg/g	1,1
Median all values pg/g	1,9
Consensus mean, pg/g	1,5
Standard deviation, pg/g	0,92
Relative standard deviation, %	62
No. of values reported	13
No. of values removed	3
No. of reported non-detects	1

PBDE 47

Z-score: PBDE 47

Sheep meat
Congener: PBDE 99

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	10	51	Outlier,ND				
23	1,2	1,8					
36	4,2	19	Outlier				
40	0,80	-0,52					
43	0,60	-1,6					
53	1,2	1,7					
55	0,89	0,00					
68	0,74	-0,83					
89	0,90	0,084					
90	1,0	0,75					
98	0,74	-0,84					
109	2,0	6,1	Outlier				
110	0,91	0,11	ND				

Consenus statistics

Consensus median, pg/g	0,89
Median all values pg/g	0,91
Consensus mean, pg/g	0,90
Standard deviation, pg/g	0,19
Relative standard deviation, %	22
No. of values reported	13
No. of values removed	3
No. of reported non-detects	2

PBDE 99

Z-score: PBDE 99

Sheep meat
Congener: PBDE 100

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	2,0	17	Outlier,ND				
23	0,78	3,7	ND				
36	1,6	13	Outlier				
40	0,40	-0,54					
43	0,29	-1,8					
53	0,45	0,059					
55	0,45	0,00					
68	0,30	-1,7					
89	0,54	1,0					
90	0,48	0,40					
98	0,36	-1,0					
109	0,63	2,1					
110	0,91	5,1	ND				

Consenus statistics

Consensus median, pg/g	0,45
Median all values pg/g	0,48
Consensus mean, pg/g	0,51
Standard deviation, pg/g	0,20
Relative standard deviation, %	38
No. of values reported	13
No. of values removed	2
No. of reported non-detects	3

PBDE 100

Z-score: PBDE 100
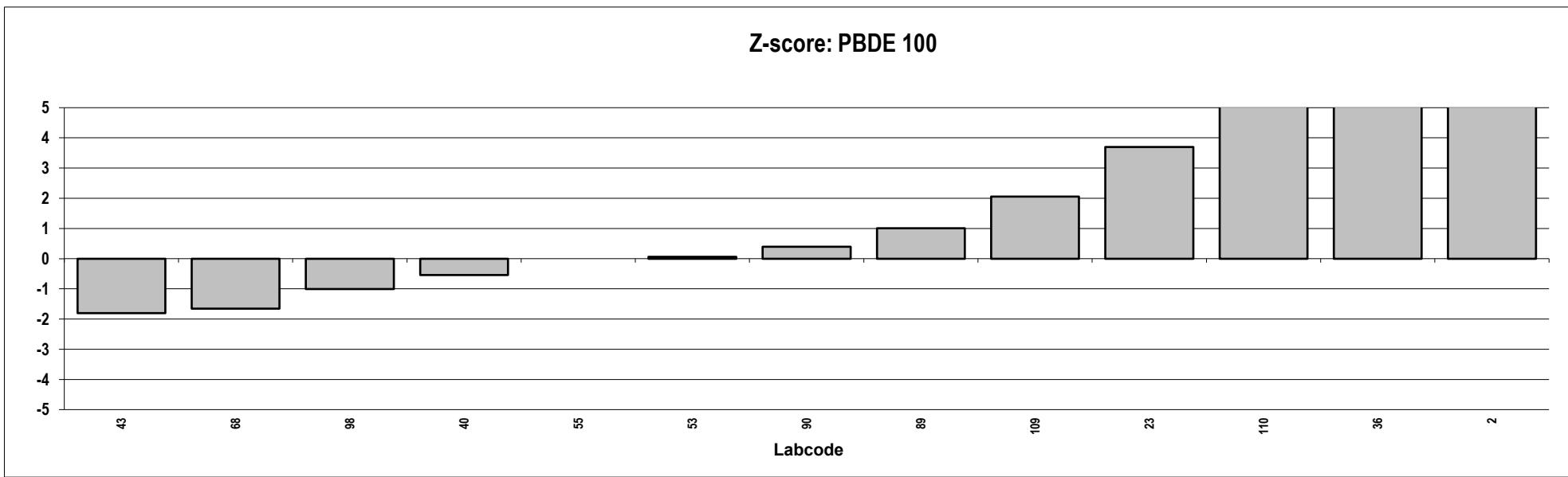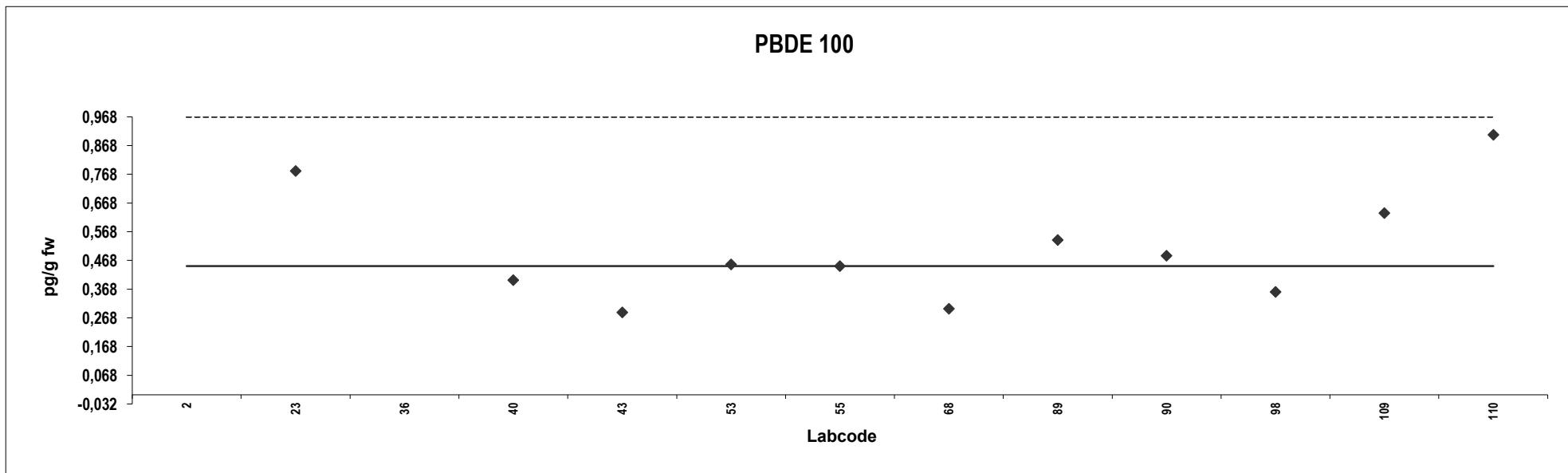
Sheep meat
Congener: PBDE 153

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	1,0	4,2	ND				
23	0,63	0,81					
36	0,56	0,16					
40	0,52	-0,16					
43	0,49	-0,49					
53	0,58	0,39					
55	0,50	-0,39					
68	0,38	-1,5					
89	0,40	-1,3					
90	0,75	1,9					
98	0,26	-2,6					
109	0,73	1,7					
110	0,58	0,39					

Consenus statistics

Consensus median, pg/g	0,54
Median all values pg/g	0,56
Consensus mean, pg/g	0,57
Standard deviation, pg/g	0,19
Relative standard deviation, %	33
No. of values reported	13
No. of values removed	0
No. of reported non-detects	1

PBDE 153
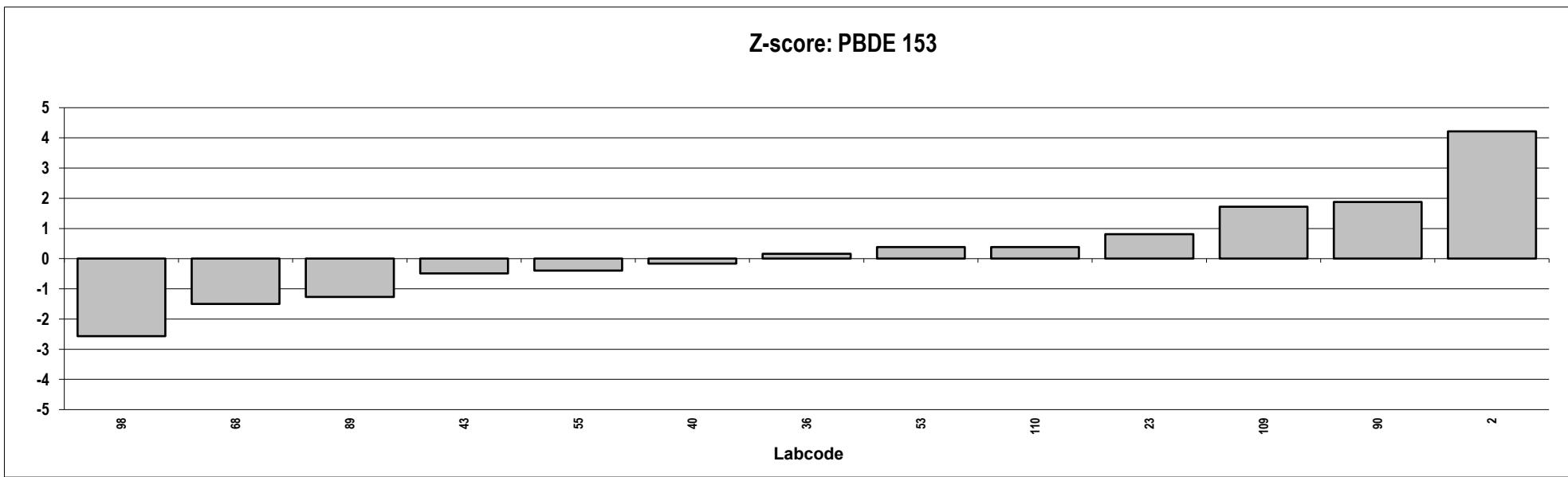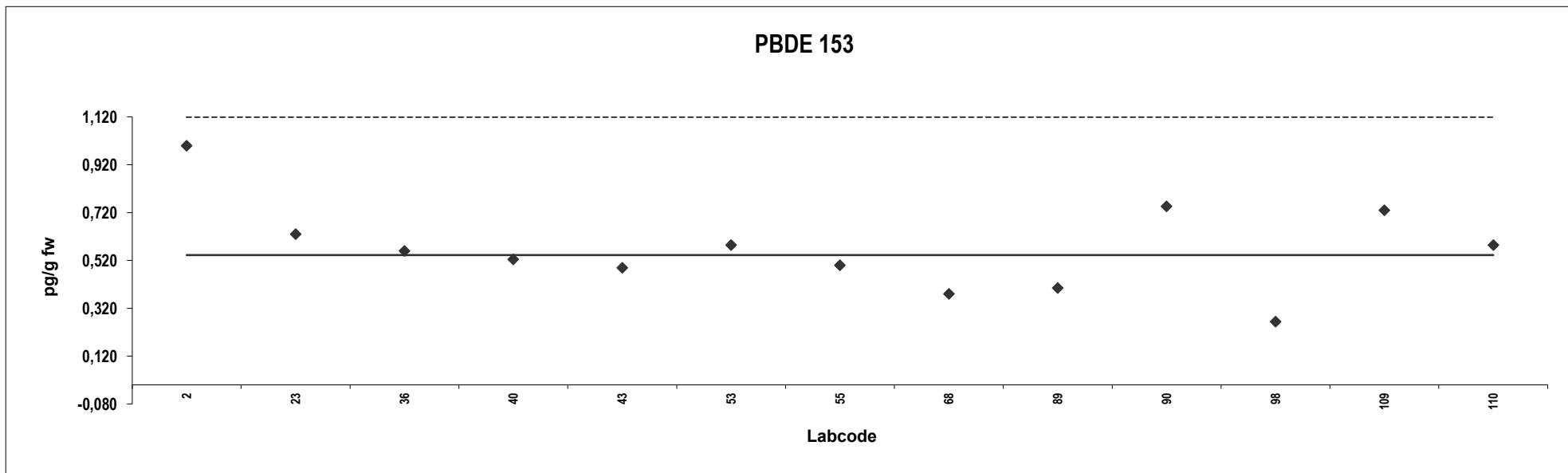
Z-score: PBDE 153

Sheep meat
Congener: PBDE 154

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	1,0	24	Outlier,ND				
23	0,70	15	Outlier,ND				
36	0,26	2,6					
40	0,17	0,0043					
43	0,15	-0,49					
53	0,19	0,43					
55	0,17	-0,0043					
68	0,15	-0,63					
89	0,16	-0,27					
90	0,37	5,8					
98	0,12	-1,4					
109	0,25	2,4					
110	0,45	8,2	Outlier,ND				

Consenus statistics

Consensus median, pg/g	0,17
Median all values pg/g	0,19
Consensus mean, pg/g	0,20
Standard deviation, pg/g	0,074
Relative standard deviation, %	37
No. of values reported	13
No. of values removed	3
No. of reported non-detects	3

PBDE 154

Z-score: PBDE 154

Sheep meat
Congener: PBDE 183

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	2,0	49	Outlier,ND				
23	0,47	7,8	ND				
40	0,28	2,5					
43	0,18	0,00					
53	0,27	2,2					
55	0,15	-0,89					
68	0,17	-0,38					
89	0,21	0,71					
90	0,67	13	Outlier				
98	0,076	-2,9					
109	1,1	25	Outlier				
110	0,45	7,3	ND				

Consenus statistics

Consensus median, pg/g	0,18
Median all values pg/g	0,27
Consensus mean, pg/g	0,25
Standard deviation, pg/g	0,13
Relative standard deviation, %	53
No. of values reported	12
No. of values removed	3
No. of reported non-detects	3

PBDE 183

Z-score: PBDE 183
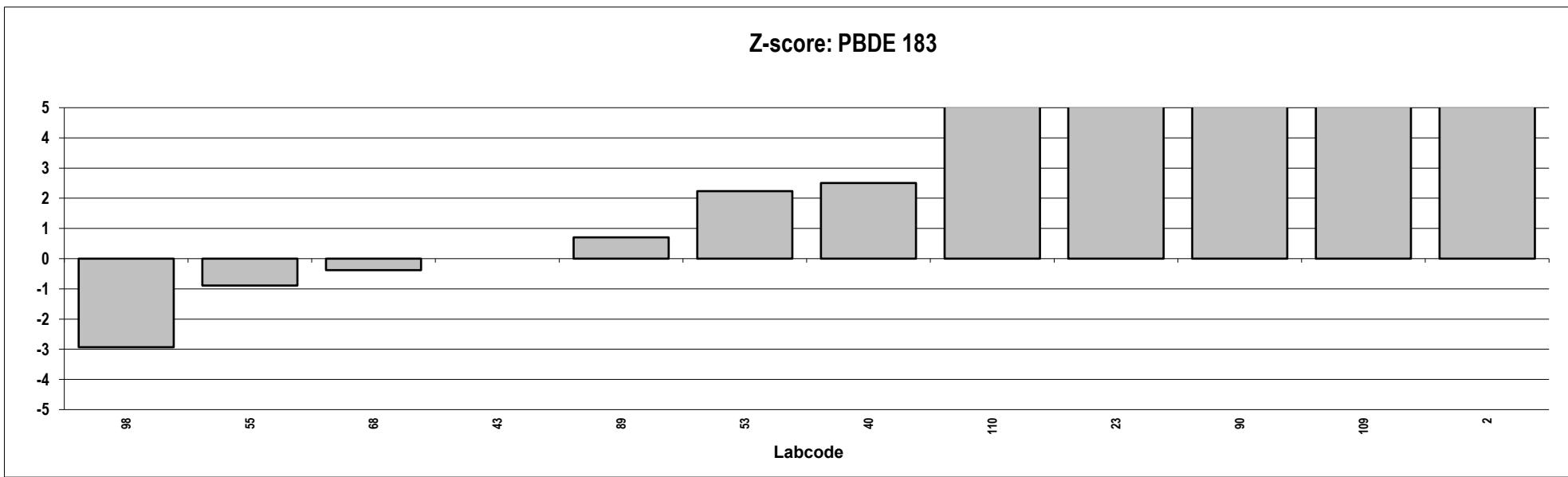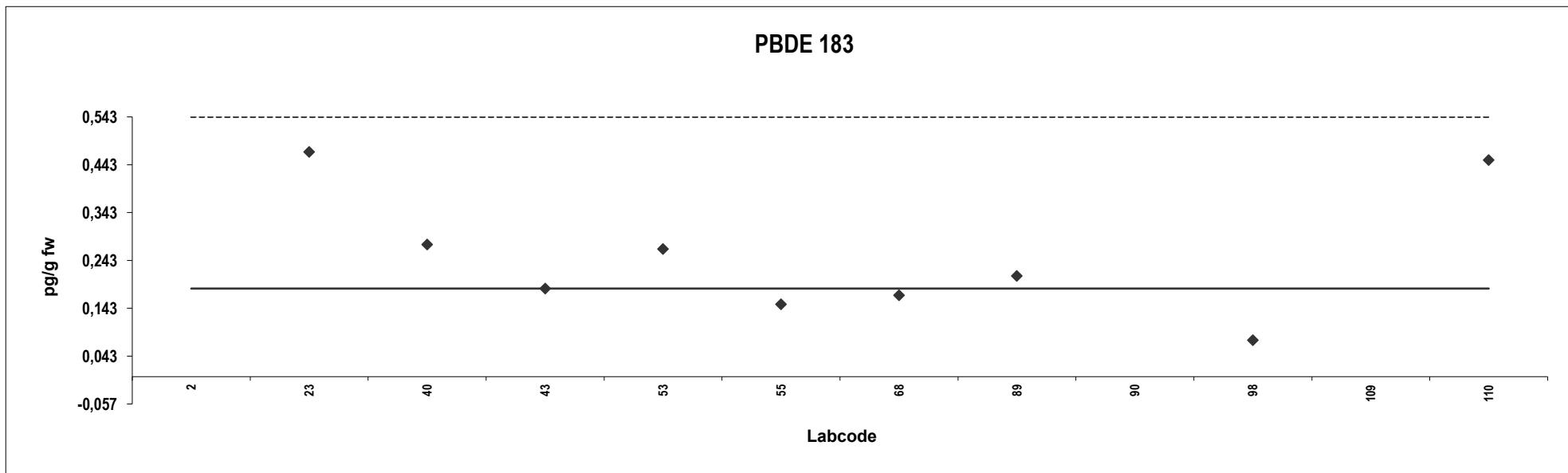
Sheep meat
Congener: PBDE 209

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	20	5,3	ND				
23	4,7	-2,6	ND				
43	12	1,1					
53	53	22	Outlier				
55	0,17	-4,9	ND				
89	41	16	Outlier				
90	7,6	-1,1					
110	36	14	Outlier,ND				

Consenus statistics

Consensus median, pg/g	9,7
Median all values pg/g	16
Consensus mean, pg/g	8,9
Standard deviation, pg/g	7,5
Relative standard deviation, %	85
No. of values reported	8
No. of values removed	3
No. of reported non-detects	4
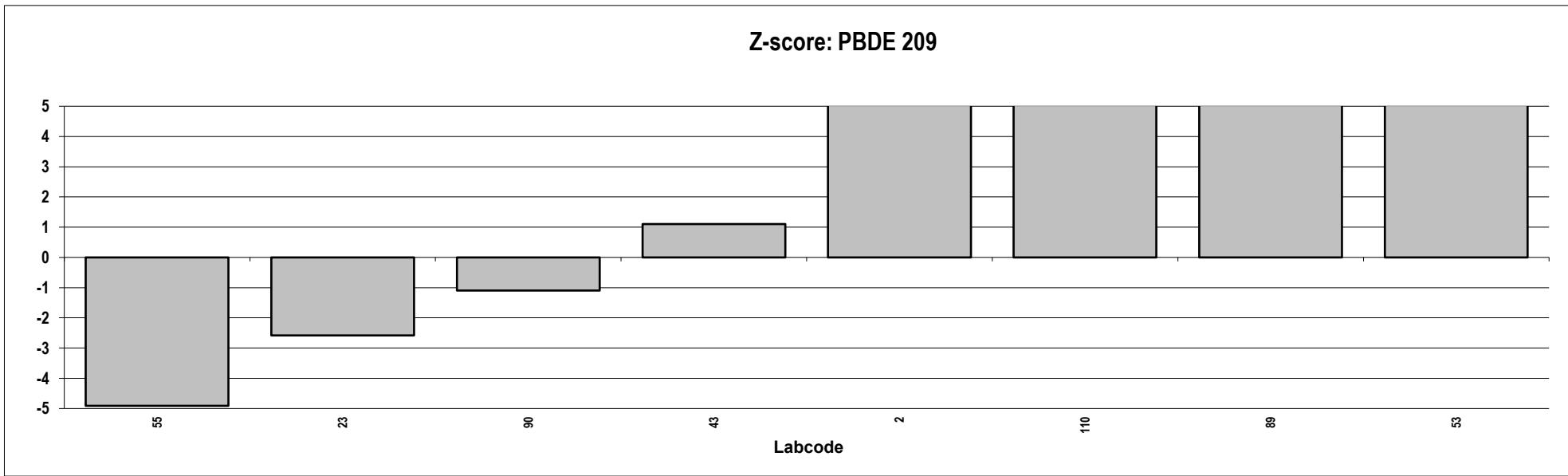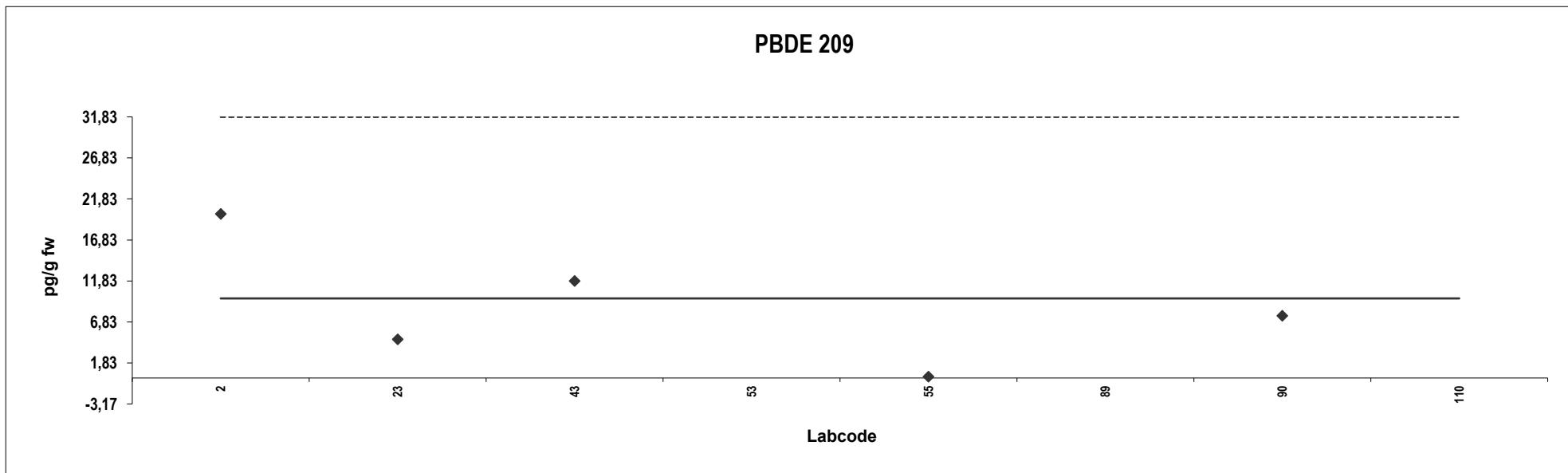
PBDE 209

Z-score: PBDE 209

Sheep meat
Congener: α-HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
23	100	412	Outlier,ND				
42	0,35	-3,6					
55	2,0	3,6					
89	5,0	16	ND				

Consenus statistics

Consensus median, pg/g	1,2
Median all values pg/g	3,5
Consensus mean, pg/g	2,5
Standard deviation, pg/g	2,4
Relative standard deviation, %	96
No. of values reported	4
No. of values removed	1
No. of reported non-detects	2

α-HBCD

Z-score: α-HBCD
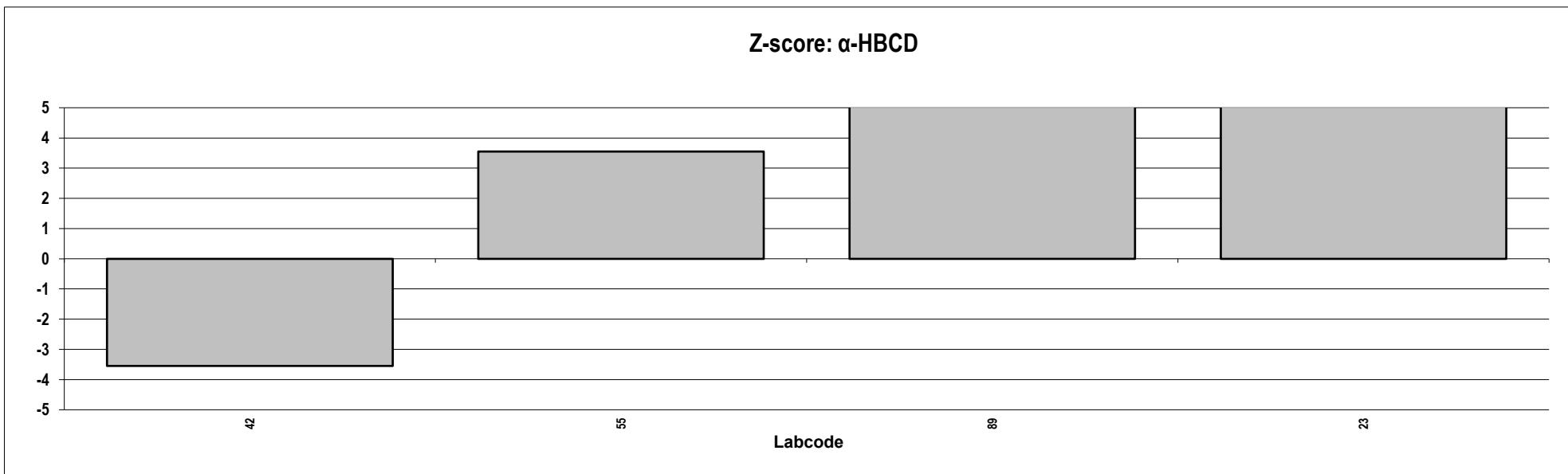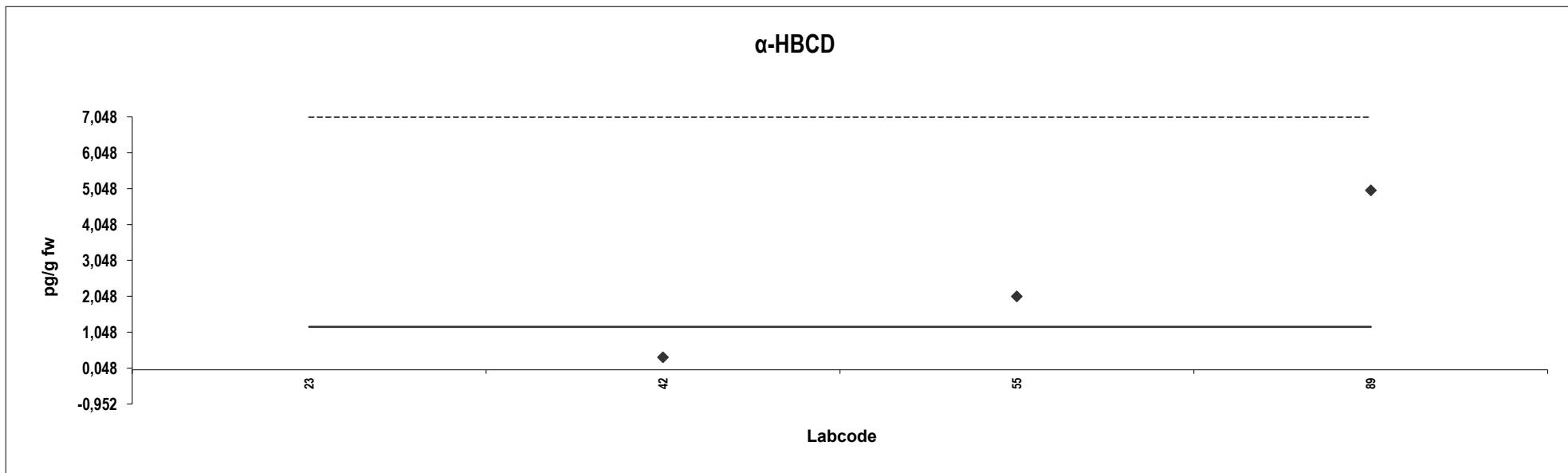
Sheep meat
Congener: β-HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
23	100	*	Outlier,ND				
42	0,11	*	ND				
55	1,5	*	ND				
89	5,0	*	ND				

Consensus statistics

Consensus median, pg/g	*
Median all values pg/g	3,250
Consensus mean, pg/g	2,203
Standard deviation, pg/g	2,5206
Relative standard deviation, %	114
No. of values reported	4
No. of values removed	1
No. of reported non-detects	4

*Could not calculate consensus median do to few reported results
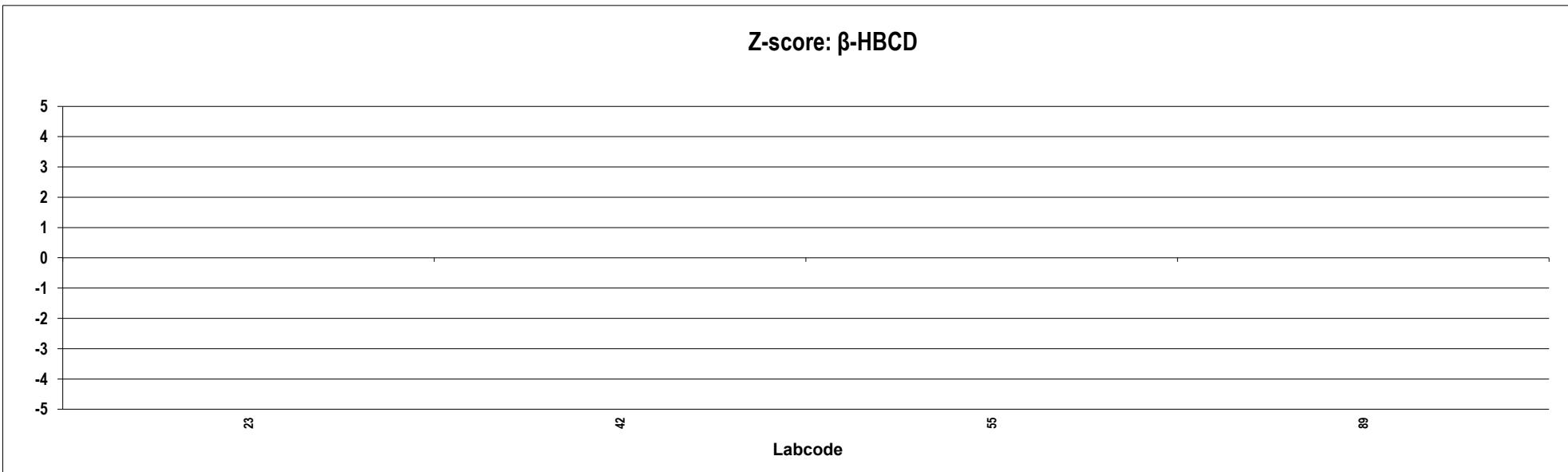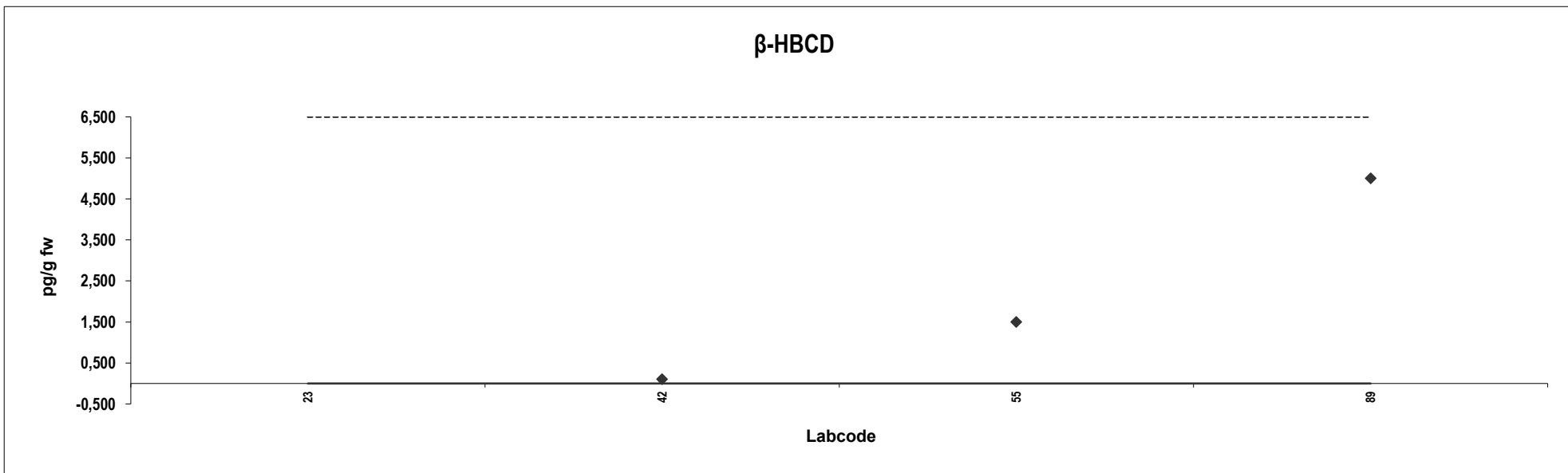
β-HBCD

pg/g fw

Labcode

Z-score: β-HBCD

Labcode

Sheep meat

Congener: γ-HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
23	100	5099	Outlier,ND				
42	0,098	0,00					
55	1,5	72	ND				
89	5,0	250	ND				

Consenus statistics

Consensus median, pg/g	0,098
Median all values pg/g	3,3
Consensus mean, pg/g	2,2
Standard deviation, pg/g	2,5
Relative standard deviation, %	115
No. of values reported	4
No. of values removed	1
No. of reported non-detects	3

γ-HBCD

pg/g fw

Labcode

Z-score: γ-HBCD
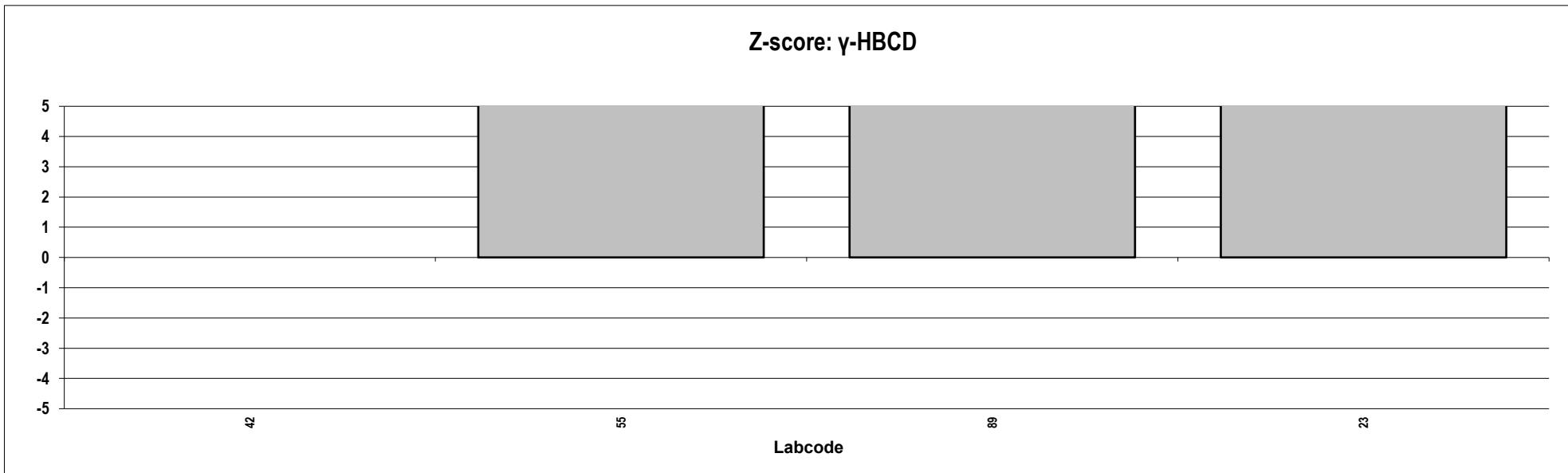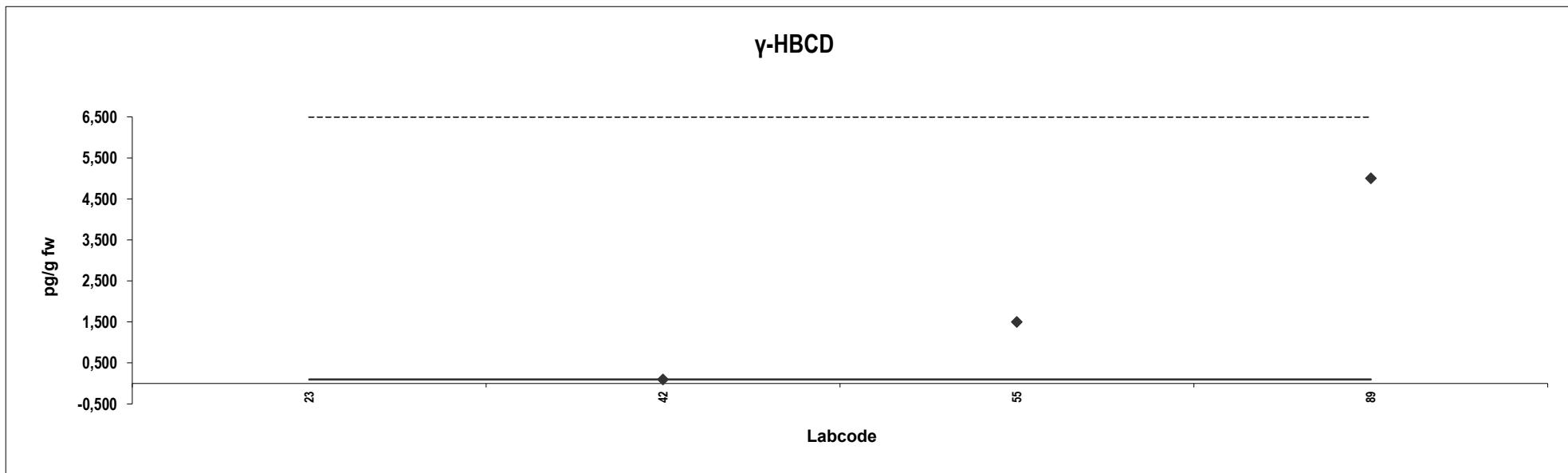
Labcode

Sheep meat

Congener: total HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
23	100	396	Outlier,ND				
42	0,45	-3,2					
55	2,0	3,2					
89	5,0	15	ND				

Consenus statistics

Consensus median, pg/g	1,2
Median all values pg/g	3,5
Consensus mean, pg/g	2,5
Standard deviation, pg/g	2,3
Relative standard deviation, %	93
No. of values reported	4
No. of values removed	1
No. of reported non-detects	2

total HBCD

Z-score: total HBCD
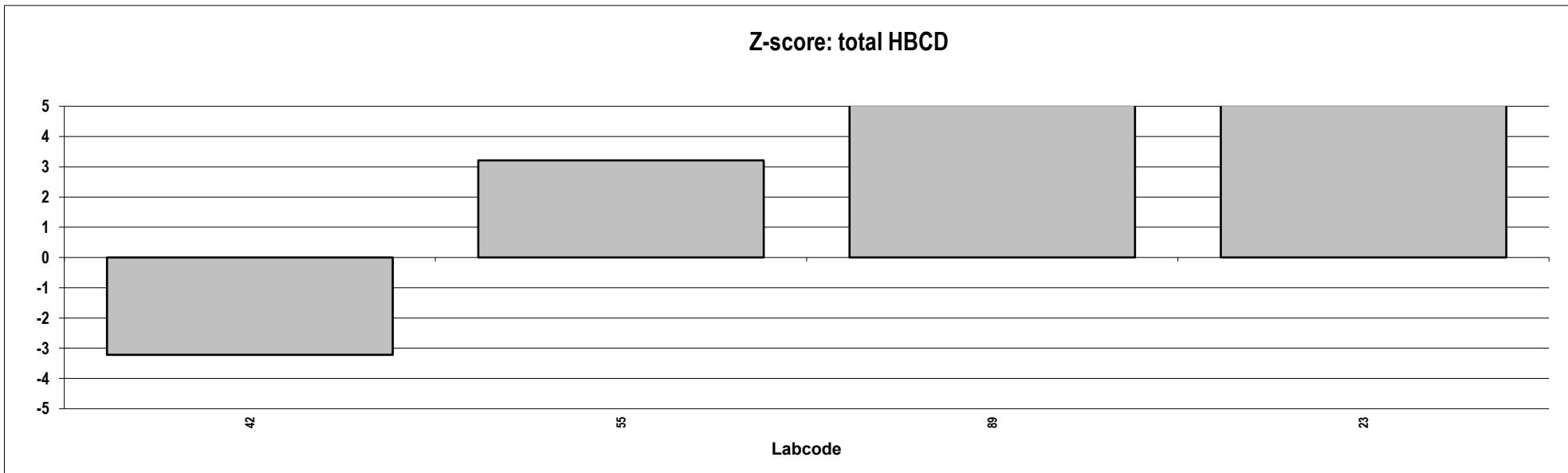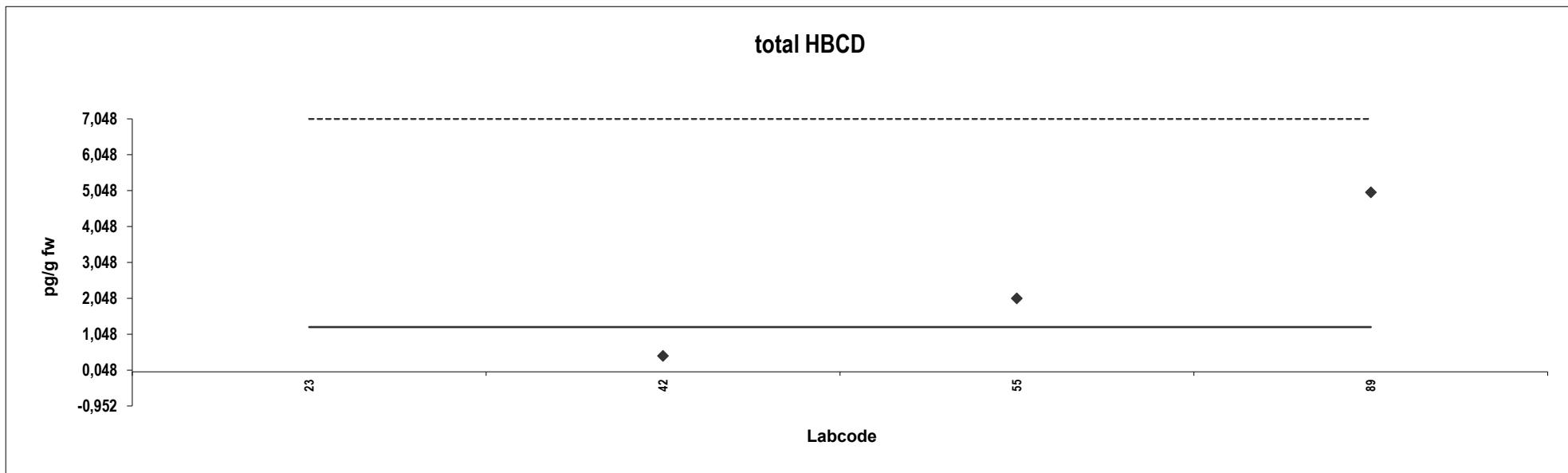
Appendix 3:

Presentation of results for
Herring-2021

Appendix 3: Presentation of results: Herring-2021

Statistic calculations for PCDDs, PCDFs and dioxin-like PCBs

For each congener, the outliers were removed and the consensus calculated according to the following procedure:
1. The median was calculated from all the reported data, using the detection limit as concentration for non-detected congeners.
2. Values exceeding 2 × this median were defined as outliers and removed from the data set.
3. Median, mean and standard deviation were re-calculated from the remaining data. This second median was called consensus.

Statistic calculations for indicator PCBs, PBDEs and HBCD

For each congener, the outliers were removed and the consensus calculated according to the following procedure:
1. The median was calculated from all the reported data, using the detection limit as concentration for non-detected congeners (NDs).
2. Values exceeding 2 × this median were defined as outliers and removed from the data set. The NDs were also removed.
3. Median, mean and standard deviation were re-calculated from the remaining data. This second median was called consensus.
4. For comparison, median, mean and standard deviation were also calculated without removing NDs.

The diagram shows the reported data up to approximately the limit for outliers (2 × the first median).

Z-Scores of individual congeners

Z-scores of each congener were calculated for each laboratory according to the following equation:

$$z = (x - X)/\sigma$$

where x = reported value; X = assigned value (consensus); σ = target value for standard deviation. A σ of 20% of the consensus was used, i.e. z-scores between +1 and -1 reflect a deviation of ± 20% from the consensus value.

Herring
Congener: 2,3,7,8 TCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,12	25	Outlier,ND	95	0,020	0,00	
5	0,021	0,20		97	0,031	2,8	ND
6	0,023	0,78		98	0,016	-0,90	
12	0,029	2,4		100	0,018	-0,50	
13	0,010	-2,5		103	0,019	-0,35	
15	0,014	-1,6		109	0,0067	-3,3	ND
16	0,020	0,00		110	0,017	-0,69	
23	0,018	-0,50		113	0,050	7,5	Outlier,ND
26	0,021	0,33		116	0,031	2,6	
29	0,016	-1,1		119	0,0044	-3,9	ND
32	0,019	-0,25		120	0,028	2,0	
33	0,063	11	Outlier,ND				
34	0,025	1,3					
35	0,020	-0,075					
36	0,011	-2,3					
38	0,017	-0,79					
40	0,020	0,11					
42	0,020	-0,047					
43	0,019	-0,13					
44	0,021	0,25					
45	0,022	0,52					
46	0,024	1,0					
47	0,020	0,00	ND				
48	0,018	-0,46					
50	0,016	-0,99					
53	0,023	0,87					
54	0,019	-0,34					
55	0,024	0,97					
57	0,016	-1,0					
58	0,016	-1,0					
59	0,020	0,00					
64	0,018	-0,50					
65	0,15	34	Outlier,ND				
68	0,019	-0,17					
70	0,040	5,0	ND				
71	0,15	34	Outlier,ND				
72	0,073	13	Outlier,ND				
74	0,025	1,3					
79	0,022	0,37					
81	0,029	2,4					
88	0,017	-0,65					
89	0,021	0,30					
90	0,021	0,25					
92	0,021	0,25					
93	0,038	4,5					

Consenus statistics

Consensus median, pg/g	0,020
Median all values pg/g	0,020
Consensus mean, pg/g	0,021
Standard deviation, pg/g	0,0065
Relative standard deviation, %	32
No. of values reported	56
No. of values removed	6
No. of reported non-detects	11

2,3,7,8 TCDD

Z-score: 2,3,7,8 TCDD
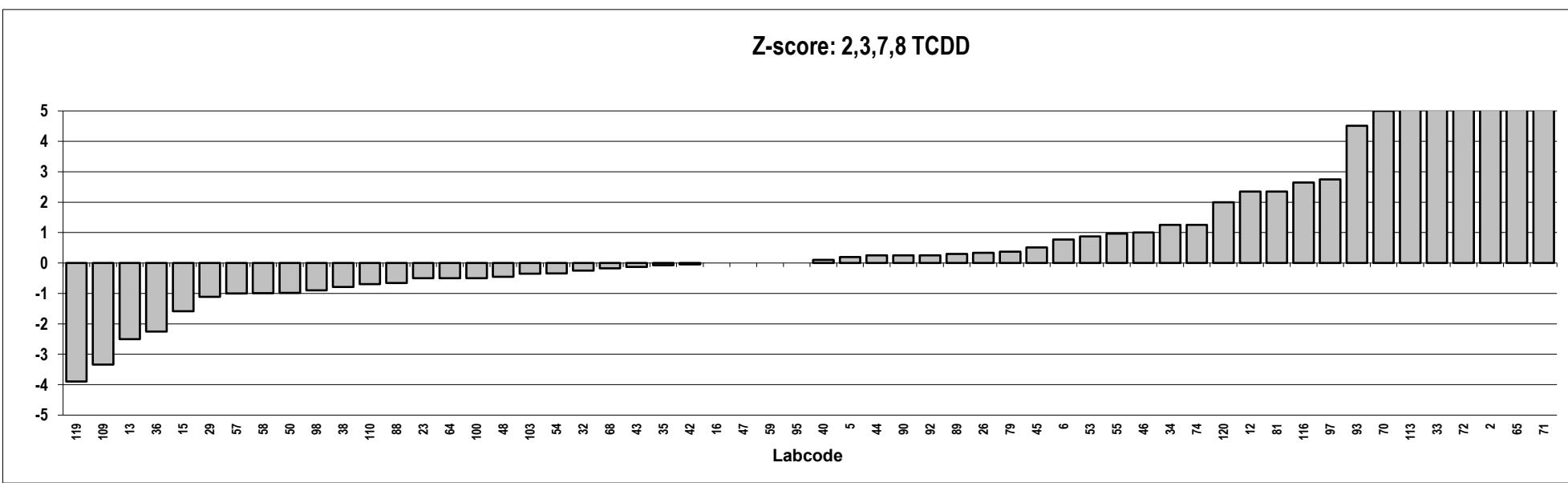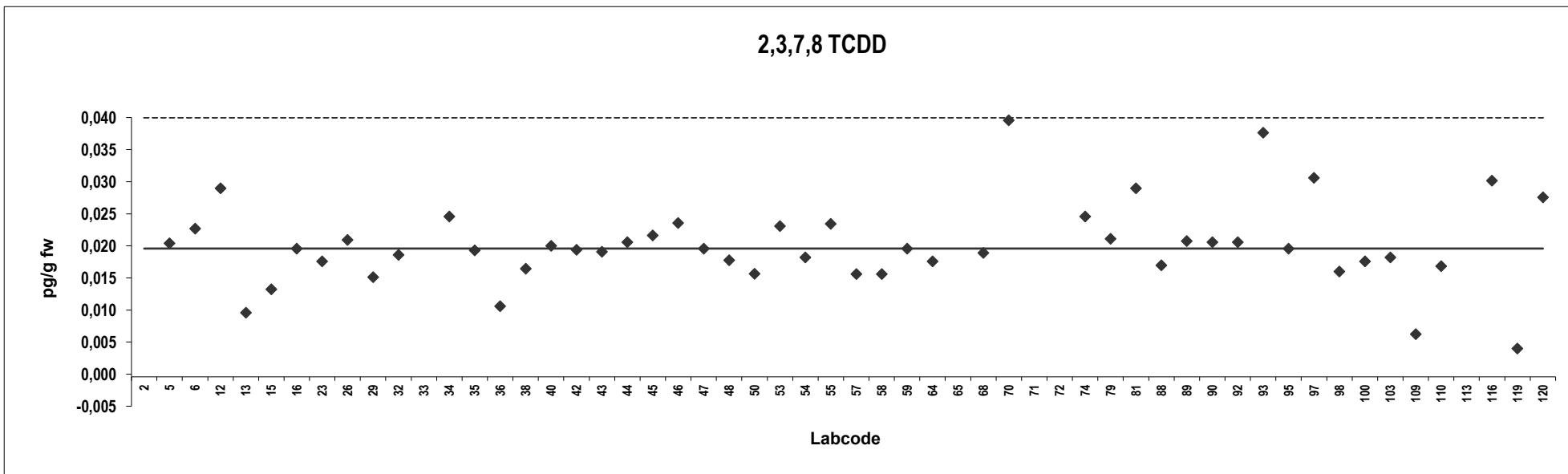
Herring
Congener: 1,2,3,7,8 PeCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,20	4		95	0,099	-0,27	
5	0,093	-0,54		97	0,14	1,5	
6	0,11	0,15		98	0,12	0,52	
12	0,12	0,93		100	0,099	-0,27	
13	0,015	-4,3	ND	103	0,11	0,27	
15	0,093	-0,55		109	0,099	-0,26	
16	0,10	-0,22		110	0,10	0,0089	
23	0,10	-0,22		113	0,10	-0,22	
26	0,11	0,35		116	0,093	-0,56	
29	0,11	0,47		119	0,046	-2,8	ND
32	0,23	6,1	Outlier	120	0,10	-0,028	
33	0,11	0,26					
34	0,12	0,50					
35	0,12	0,57					
36	0,11	0,020					
38	0,092	-0,60					
40	0,11	0,022					
42	0,12	0,71					
43	0,67	27	Outlier				
44	0,11	0,3					
45	0,12	0,72					
46	0,12	0,64					
47	0,11	0,26	ND				
48	0,088	-0,77					
50	0,080	-1,2					
53	0,11	0,20					
54	0,097	-0,37					
55	0,10	-0,0078					
57	0,087	-0,84					
58	0,12	0,55					
59	0,098	-0,31					
64	0,099	-0,27					
65	0,29	8,8	Outlier,ND				
68	0,095	-0,44					
70	0,093	-0,55					
71	0,29	8,8	Outlier,ND				
72	0,10	0,0078					
74	0,12	0,83					
79	0,13	1,1					
81	0,10	-0,015					
88	0,10	-0,029					
89	0,094	-0,53					
90	0,11	0,35					
92	0,036	-3,3					
93	0,11	0,087					

Consensus statistics

Consensus median, pg/g	0,10
Median all values pg/g	0,10
Consensus mean, pg/g	0,10
Standard deviation, pg/g	0,025
Relative standard deviation, %	24
No. of values reported	56
No. of values removed	4
No. of reported non-detects	5

1,2,3,7,8 PeCDD

pg/g fw

Labcode

Z-score: 1,2,3,7,8 PeCDD
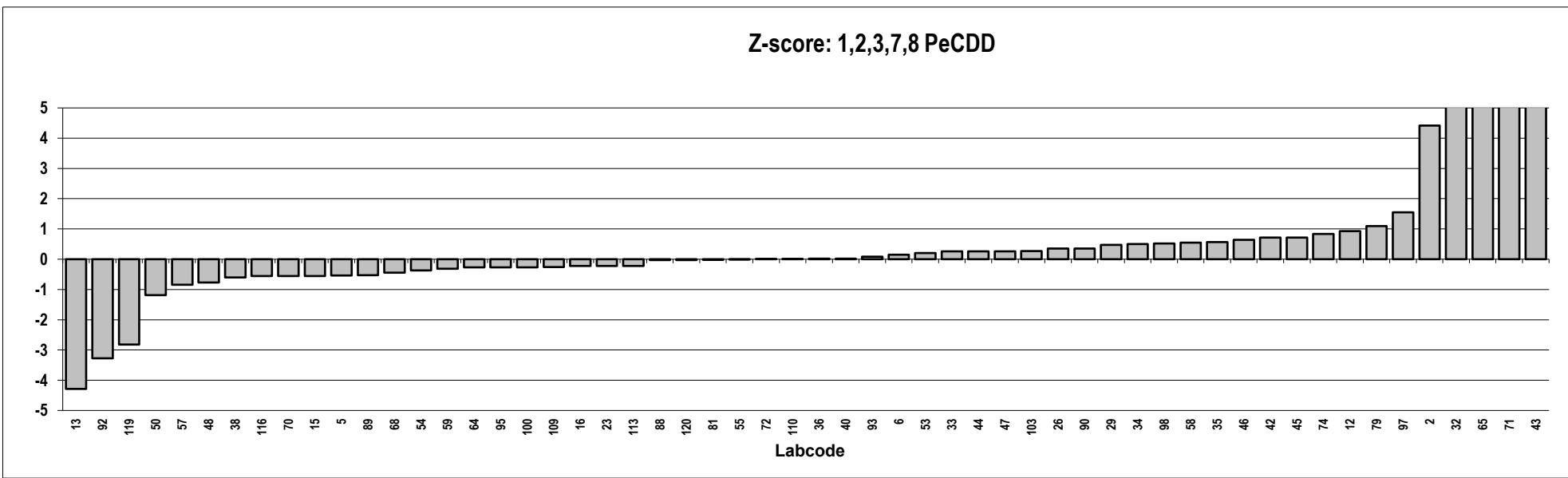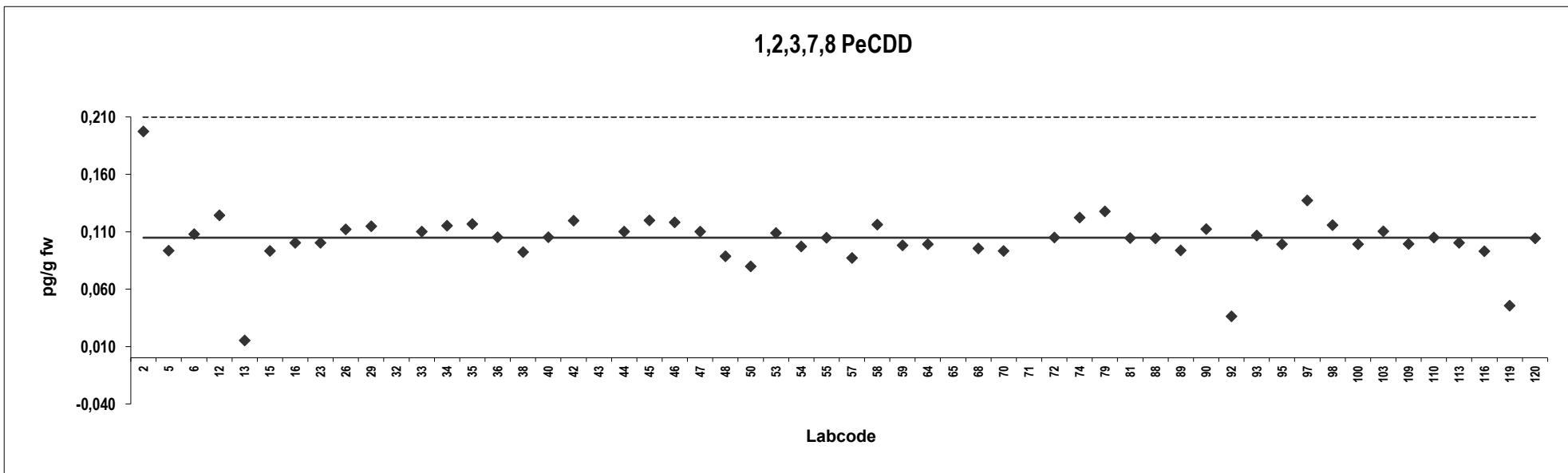
Labcode

Herring
Congener: 1,2,3,4,7,8 HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,082	14	Outlier,ND	95	0,026	1,0	
5	0,022	0,20		97	0,016	-1,3	ND
6	0,022	0,13		98	0,071	11	Outlier
12	0,027	1,2		100	0,025	0,81	
13	0,050	6,6	Outlier	103	0,024	0,67	
15	0,018	-0,92		109	0,010	-2,7	
16	0,018	-0,82		110	0,017	-1,0	
23	0,018	-0,82		113	0,050	6,6	Outlier,ND
26	0,032	2,5		116	0,032	2,5	
29	0,028	1,6		119	0,0094	-2,8	ND
32	0,024	0,57		120	0,054	7,5	Outlier
33	0,13	25	Outlier,ND				
34	0,024	0,57					
35	0,018	-0,73					
36	0,024	0,46					
38	0,017	-1,1					
40	0,021	-0,22					
42	0,018	-0,71					
43	0,13	25	Outlier				
44	0,022	0,11					
45	0,018	-0,80					
46	0,022	0,11					
47	0,050	6,6	Outlier,ND				
48	0,022	0,11					
50	0,017	-1,1					
53	0,019	-0,55					
54	0,022	-0,0065					
55	0,020	-0,38					
57	0,050	6,6	Outlier,ND				
58	0,023	0,30					
59	0,018	-0,82					
64	0,015	-1,5					
65	0,19	40	Outlier,ND				
68	0,022	0,00					
70	0,050	6,6	Outlier,ND				
71	0,19	40	Outlier,ND				
72	0,098	18	Outlier,ND				
74	0,022	0,11					
79	0,038	3,7					
81	0,020	-0,26					
88	0,022	0,14					
89	0,023	0,44					
90	0,019	-0,59					
92	0,036	3,4					
93	0,013	-1,9	ND				

Consenus statistics

Consensus median, pg/g	0,022
Median all values pg/g	0,022
Consensus mean, pg/g	0,021
Standard deviation, pg/g	0,0058
Relative standard deviation, %	27
No. of values reported	56
No. of values removed	13
No. of reported non-detects	12

1,2,3,4,7,8 HxCDD

Z-score: 1,2,3,4,7,8 HxCDD
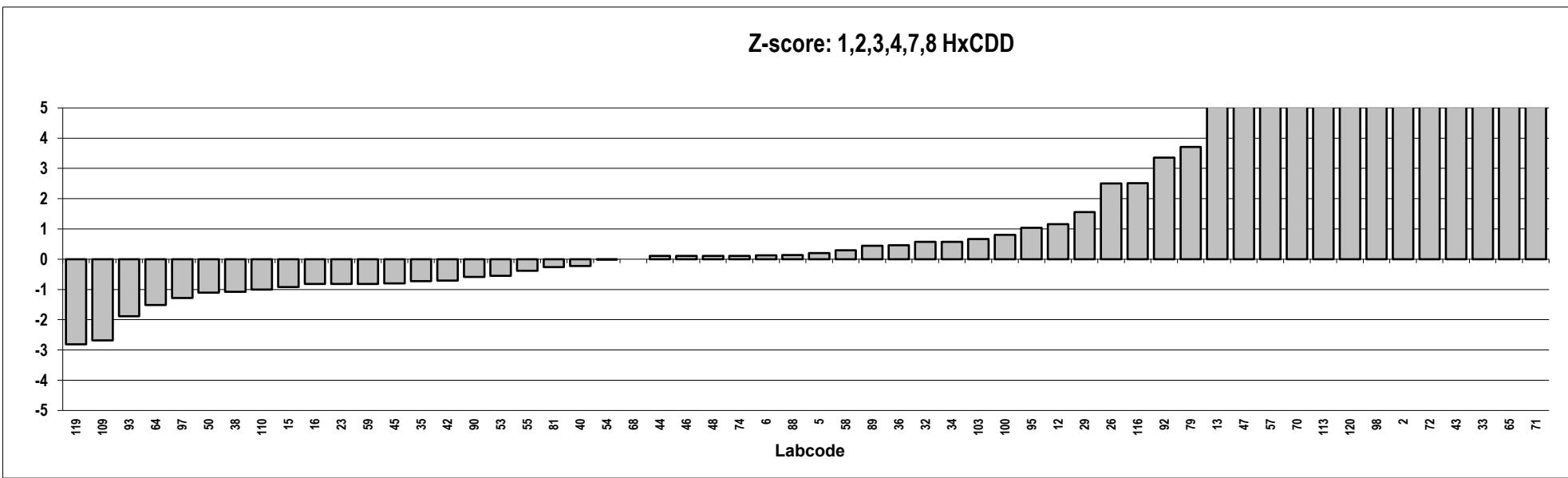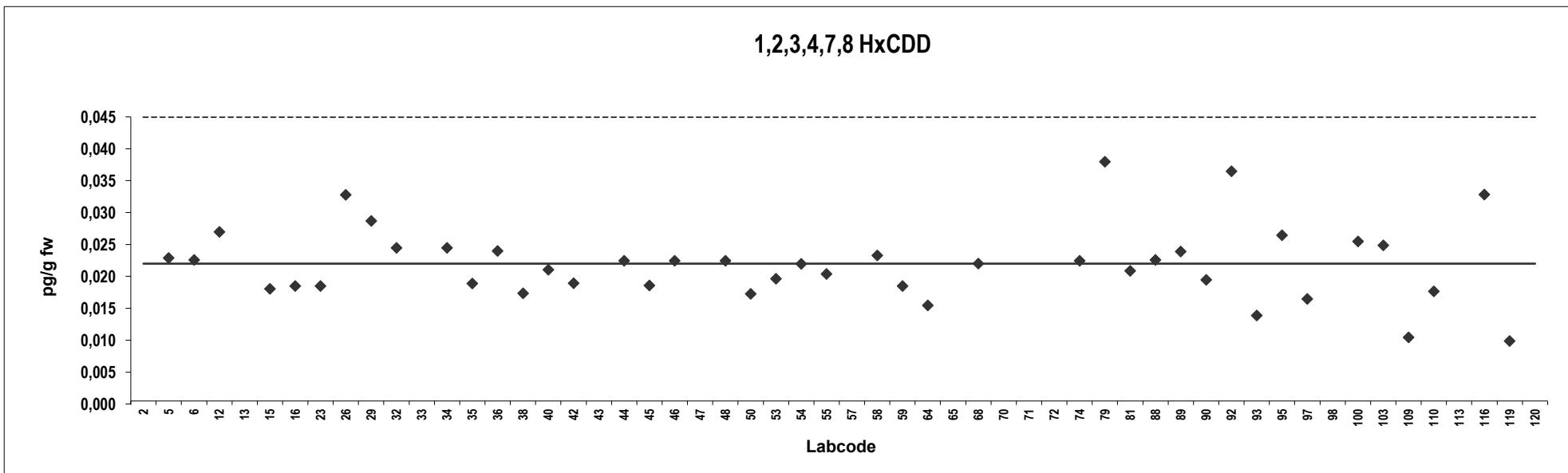
Herring
Congener: 1,2,3,6,7,8 HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,11	2,0	ND	95	0,091	0,76	
5	0,081	0,12		97	0,098	1,2	
6	0,090	0,66		98	0,068	-0,73	
12	0,087	0,48		100	0,085	0,38	
13	0,015	-4,1	ND	103	0,073	-0,39	
15	0,026	-3,4		109	0,073	-0,37	
16	0,084	0,31		110	0,072	-0,47	
23	0,076	-0,19		113	0,080	0,061	
26	0,084	0,31		116	0,053	-1,7	
29	0,064	-0,94		119	0,0064	-4,6	ND
32	0,081	0,12		120	0,071	-0,51	
33	0,13	3,2	ND				
34	0,11	2,0					
35	0,089	0,62					
36	0,10	1,5					
38	0,063	-0,99					
40	0,085	0,40					
42	0,074	-0,33					
43	0,21	8,1	Outlier				
44	0,081	0,12					
45	0,079	-0,023					
46	0,082	0,19					
47	0,10	1,3	ND				
48	0,064	-0,96					
50	0,064	-0,95					
53	0,079	0,00					
54	0,078	-0,077					
55	0,085	0,35					
57	0,069	-0,64					
58	0,066	-0,85					
59	0,069	-0,64					
64	0,071	-0,51					
65	0,19	7,1	Outlier,ND				
68	0,085	0,37					
70	0,060	-1,2					
71	0,19	7,1	Outlier,ND				
72	0,098	1,2	ND				
74	0,085	0,38					
79	0,082	0,21					
81	0,071	-0,50					
88	0,071	-0,52					
89	0,086	0,47					
90	0,068	-0,70					
92	0,074	-0,32					
93	0,090	0,69					

Consenus statistics

Consensus median, pg/g	0,079
Median all values pg/g	0,080
Consensus mean, pg/g	0,077
Standard deviation, pg/g	0,021
Relative standard deviation, %	27
No. of values reported	56
No. of values removed	3
No. of reported non-detects	8

1,2,3,6,7,8 HxCDD

Z-score: 1,2,3,6,7,8 HxCDD
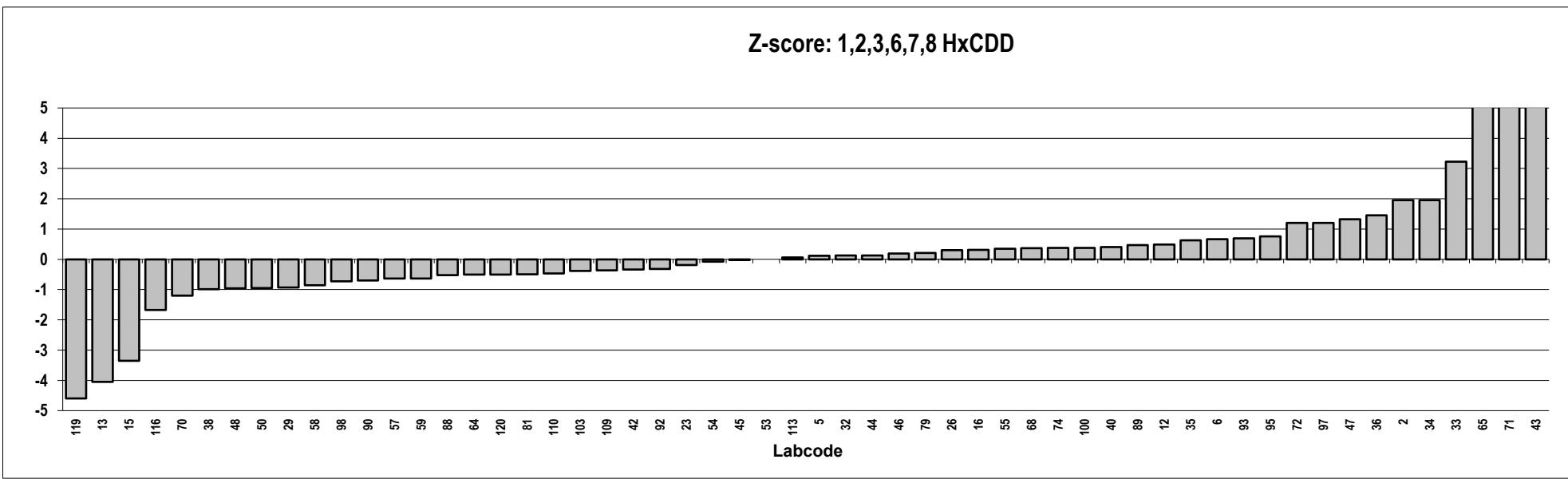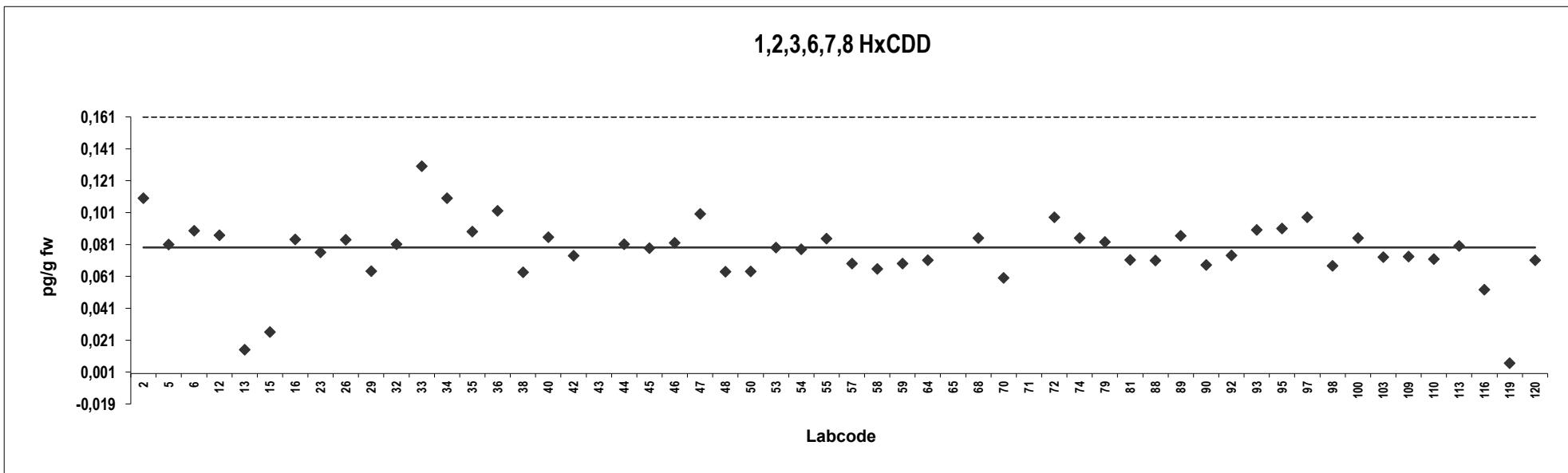
Herring
Congener: 1,2,3,7,8,9 HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,083	19	Outlier,ND	95	0,023	1,5	
5	0,019	0,37		97	0,016	-0,46	ND
6	0,020	0,68		98	0,021	1,0	
12	0,019	0,37		100	0,015	-0,74	
13	0,040	6,4	Outlier	103	0,016	-0,43	
15	0,018	0,17		109	0,019	0,48	
16	0,019	0,40		110	0,016	-0,50	
23	0,015	-0,74		113	0,050	9,2	Outlier,ND
26	0,022	1,2		116	0,024	1,7	
29	0,019	0,32		119	0,0077	-2,8	ND
32	0,020	0,68		120	0,0090	-2,4	
33	0,13	32	Outlier,ND				
34	0,015	-0,74					
35	0,0028	-4,2					
36	0,017	-0,14					
38	0,012	-1,6					
40	0,022	1,3					
42	0,016	-0,42					
43	0,17	42	Outlier				
44	0,034	4,7					
45	0,0081	-2,7	ND				
46	0,021	0,96					
47	0,050	9,2	Outlier,ND				
48	0,019	0,40					
50	0,013	-1,5	ND				
53	0,018	0,00					
54	0,017	-0,19					
55	0,024	1,9					
57	0,050	9,2	Outlier,ND				
58	0,0092	-2,4					
59	0,014	-1,0					
64	0,016	-0,46					
65	0,18	46	Outlier,ND				
68	0,022	1,2					
70	0,050	9,2	Outlier,ND				
71	0,18	46	Outlier,ND				
72	0,098	23	Outlier,ND				
74	0,022	1,2					
79	0,019	0,42					
81	0,017	-0,031					
88	0,016	-0,50					
89	0,017	-0,21					
90	0,016	-0,46					
92	0,037	5,5					
93	0,024	1,9					

Consenus statistics

Consensus median, pg/g	0,018
Median all values pg/g	0,019
Consensus mean, pg/g	0,018
Standard deviation, pg/g	0,0060
Relative standard deviation, %	34
No. of values reported	56
No. of values removed	11
No. of reported non-detects	13

1,2,3,7,8,9 HxCDD

Z-score: 1,2,3,7,8,9 HxCDD
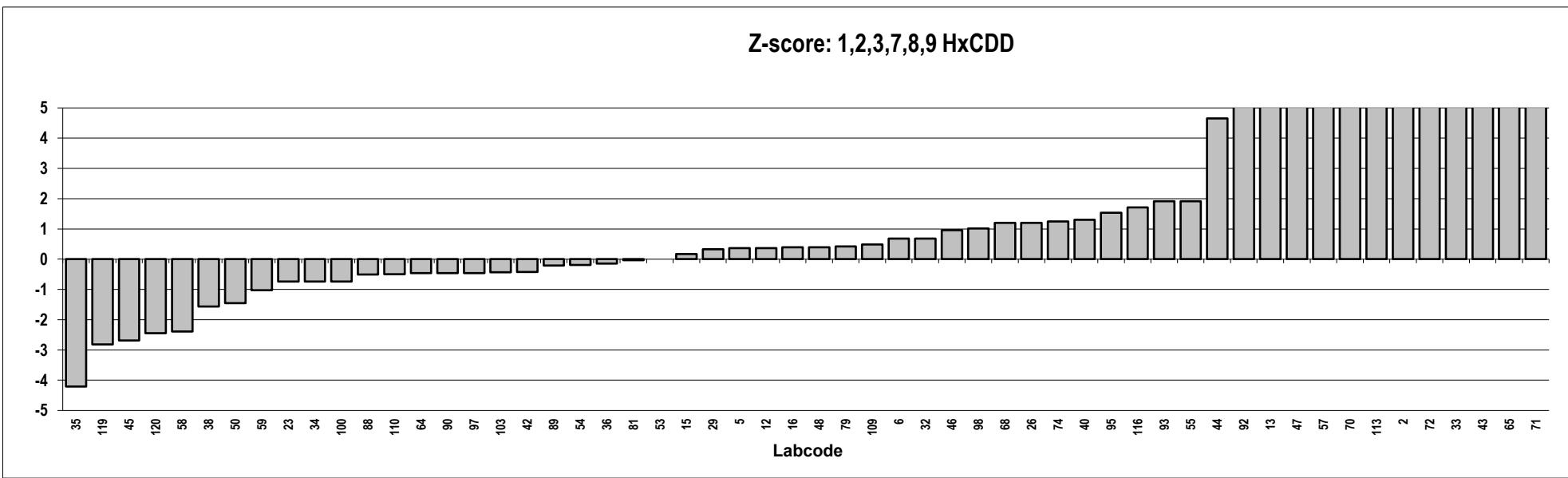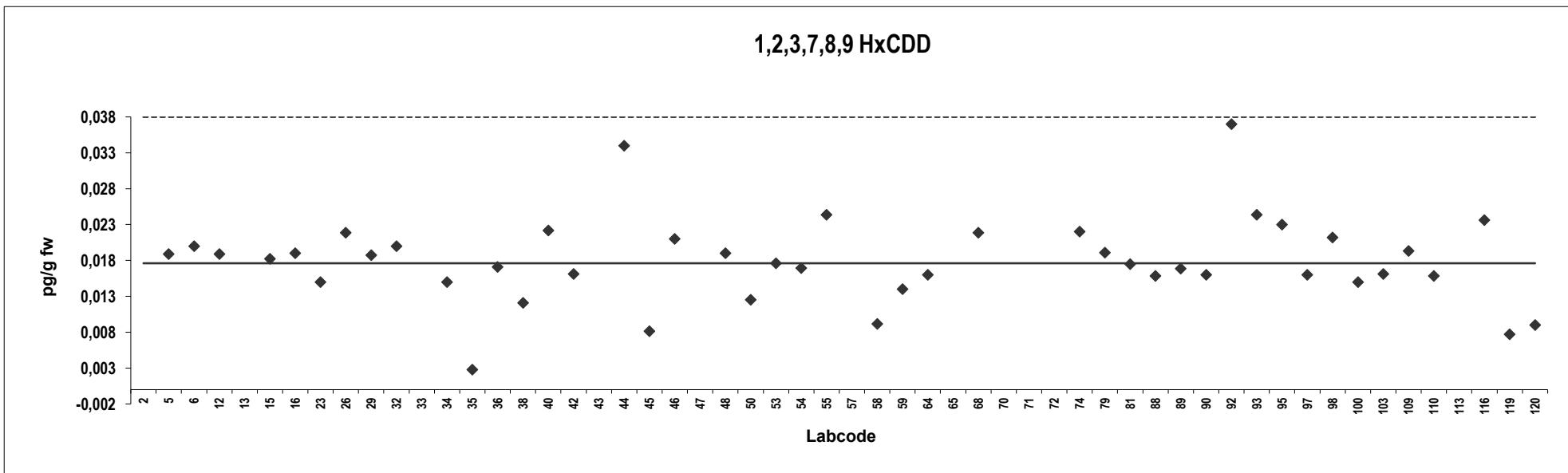
Herring
Congener: 1,2,3,4,6,7,8 HpCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,15	13	Outlier,ND	95	0,29	29	Outlier
5	0,048	0,66		97	0,020	-2,6	ND
6	0,039	-0,44		98	0,022	-2,4	
12	0,044	0,20		100	0,038	-0,52	
13	0,030	-1,5	ND	103	0,041	-0,14	
15	0,066	2,8		109	0,039	-0,44	
16	0,037	-0,63		110	0,035	-0,93	
23	0,039	-0,40		113	0,050	0,90	ND
26	0,054	1,3		116	0,038	-0,48	
29	0,059	1,9		119	0,015	-3,2	ND
32	0,042	-0,044		120	0,054	1,4	
33	0,13	10	Outlier,ND				
34	0,045	0,31					
35	0,045	0,30					
36	0,063	2,5					
38	0,037	-0,58					
40	0,055	1,45					
42	0,045	0,35					
43	0,17	15	Outlier				
44	0,051	1,0					
45	0,057	1,7					
46	0,052	1,1					
47	0,10	6,8	Outlier,ND				
48	0,040	-0,28					
50	0,043	0,12					
53	0,047	0,59					
54	0,035	-0,92					
55	0,054	1,4					
57	0,032	-1,2					
58	0,040	-0,245					
59	0,036	-0,75					
64	0,031	-1,3					
65	0,24	23	Outlier,ND				
68	0,043	0,044					
70	0,050	0,90	ND				
71	0,24	23	Outlier,ND				
72	0,098	6,6	Outlier,ND				
74	0,52	56	Outlier				
79	0,050	0,85					
81	0,042	-0,096					
88	0,039	-0,37					
89	0,052	1,1					
90	0,039	-0,40					
92	0,069	3,1					
93	0,29	29	Outlier				

Consensus statistics

Consensus median, pg/g	0,042
Median all values pg/g	0,045
Consensus mean, pg/g	0,044
Standard deviation, pg/g	0,011
Relative standard deviation, %	26
No. of values reported	56
No. of values removed	10
No. of reported non-detects	11

1,2,3,4,6,7,8 HpCDD

Z-score: 1,2,3,4,6,7,8 HpCDD
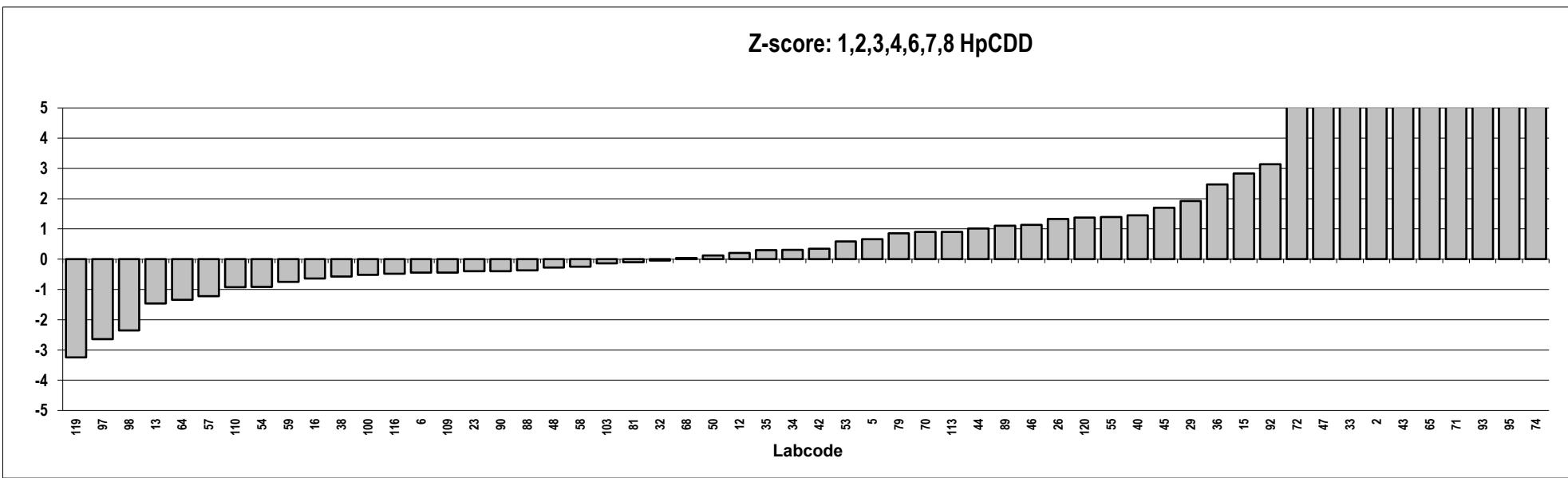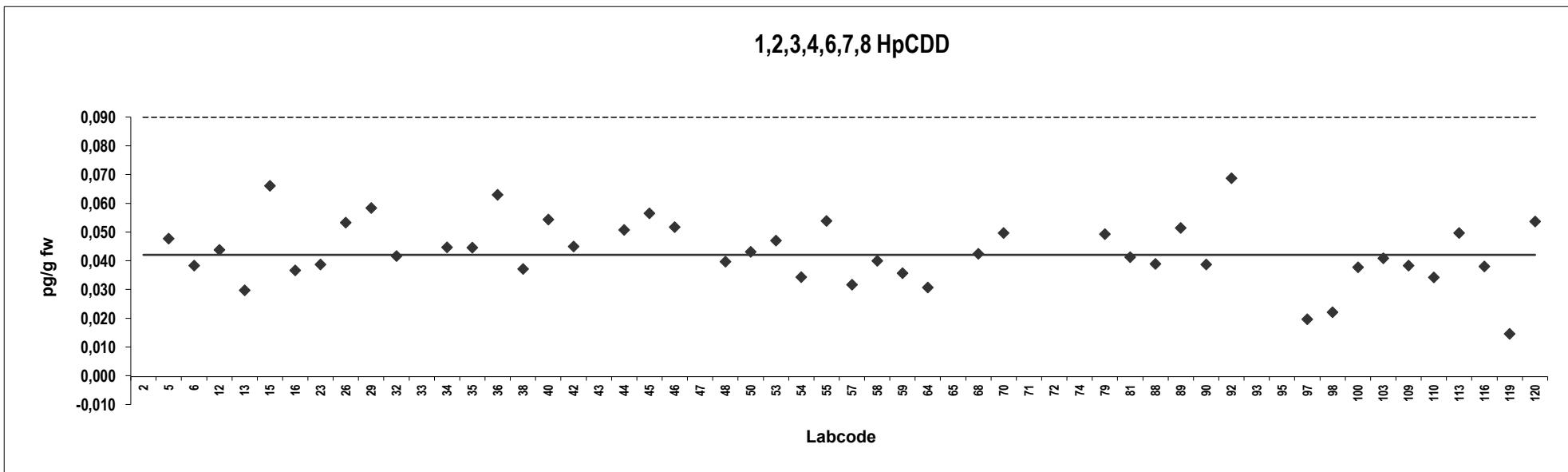
Herring
Congener: OCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,66	59	Outlier,ND	95	0,43	37	Outlier
5	0,050	-0,18		97	0,024	-2,7	ND
6	0,040	-1,1	ND	98	0,072	2,0	
12	0,044	-0,78		100	0,044	-0,73	
13	0,030	-2,1	ND	103	0,053	0,17	
15	0,10	5,2		109	0,027	-2,4	
16	0,030	-2,1		110	0,049	-0,24	ND
23	0,033	-1,8		113	0,050	-0,15	ND
26	0,065	1,3		116	0,091	3,8	
29	0,14	8,3	Outlier	119	0,020	-3,0	ND
32	0,065	1,3		120	0,079	2,7	
33	0,31	25	Outlier,ND				
34	0,043	-0,83					
35	0,067	1,5					
36	0,081	2,8					
38	0,027	-2,3					
40	0,12	6,4					
42	0,11	5,4					
43	0,50	43	Outlier				
44	0,082	3,0					
45	0,18	12	Outlier,ND				
46	0,12	6,4					
47	0,35	29	Outlier,ND				
48	0,053	0,15					
50	0,037	-1,4					
53	0,043	-0,86					
54	0,040	-1,1					
55	0,12	6,2					
57	0,090	3,7					
58	0,048	-0,33					
59	0,038	-1,3					
64	0,024	-2,7					
65	0,53	47	Outlier,ND				
68	0,099	4,6					
70	2,0	189	Outlier,ND				
71	0,53	47	Outlier,ND				
72	0,20	14	Outlier,ND				
74	0,10	5,0					
79	0,056	0,48					
81	0,063	1,1					
88	0,034	-1,7					
89	0,073	2,0					
90	0,033	-1,8					
92	0,079	2,7					
93	0,40	34	Outlier				

Consenus statistics

Consensus median, pg/g	0,052
Median all values pg/g	0,066
Consensus mean, pg/g	0,060
Standard deviation, pg/g	0,029
Relative standard deviation, %	48
No. of values reported	56
No. of values removed	12
No. of reported non-detects	14
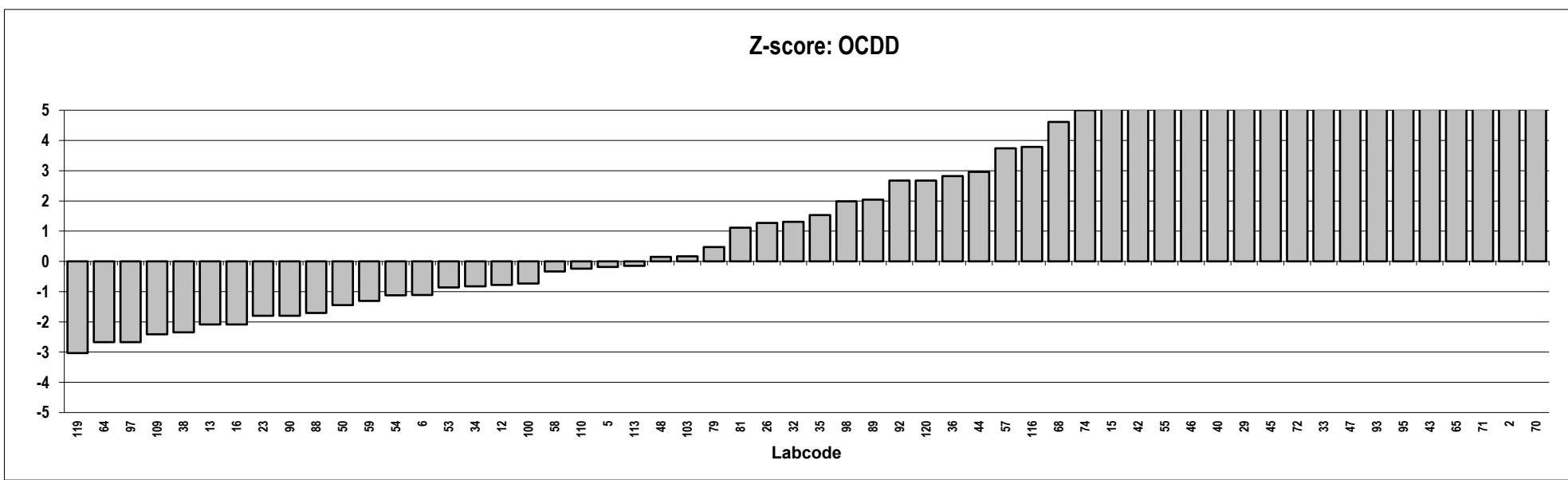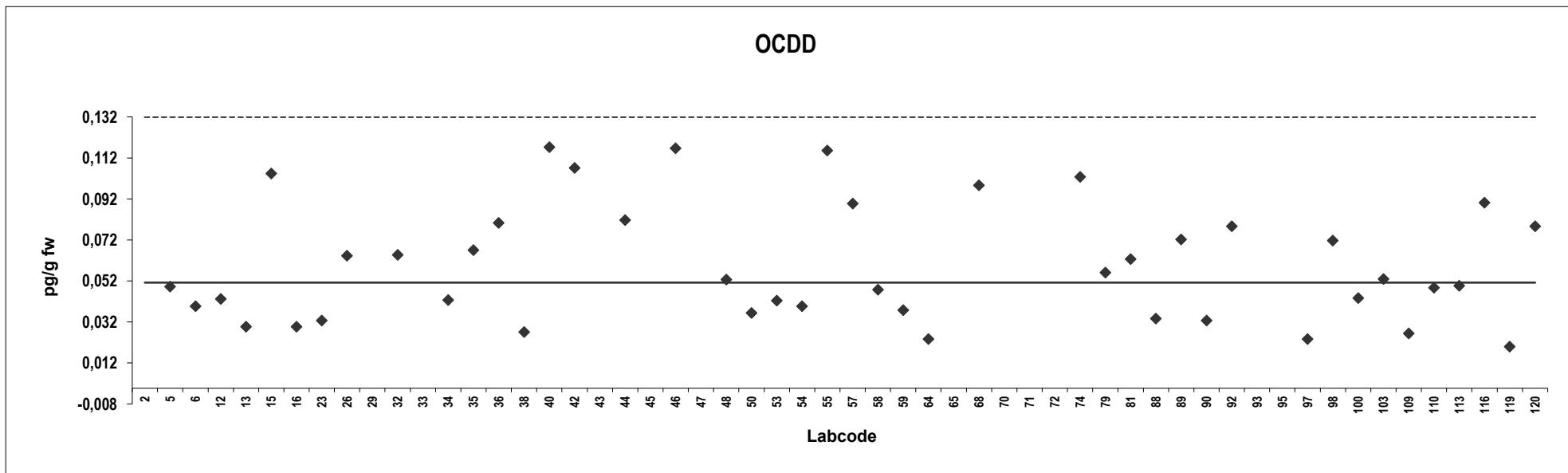
OCDD

Z-score: OCDD

Herring
Congener: 2,3,7,8 TCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,68	0,84		95	0,57	-0,11	
5	0,58	-0,0061		97	0,56	-0,16	
6	0,66	0,63		98	0,50	-0,67	
12	0,60	0,15		100	0,61	0,23	
13	0,61	0,23		103	0,74	1,4	
15	2,1	13	Outlier	109	0,46	-1,1	
16	0,61	0,23		110	0,51	-0,63	
23	0,59	0,020		113	0,61	0,23	
26	0,55	-0,25		116	0,42	-1,4	
29	0,74	1,3		119	0,34	-2,1	
32	0,41	-1,5		120	0,54	-0,37	
33	0,58	-0,023					
34	0,75	1,5					
35	0,60	0,15					
36	0,62	0,28					
38	0,52	-0,51					
40	0,62	0,29					
42	0,62	0,28					
43	0,69	0,95					
44	0,58	-0,0061					
45	0,61	0,26					
46	0,68	0,85					
47	0,58	-0,0061					
48	0,49	-0,77					
50	0,53	-0,45					
53	0,54	-0,39					
54	0,55	-0,29					
55	0,64	0,52					
57	0,44	-1,2					
58	0,55	-0,28					
59	0,53	-0,50					
64	0,55	-0,28					
65	0,79	1,8					
68	0,63	0,43					
70	0,52	-0,52					
71	0,79	1,8					
72	0,61	0,20					
74	0,67	0,75					
79	0,64	0,47					
81	0,59	0,063					
88	0,63	0,39					
89	0,56	-0,17					
90	0,57	-0,15					
92	0,49	-0,80					
93	0,58	0,00					

Consensus statistics

Consensus median, pg/g	0,58
Median all values pg/g	0,58
Consensus mean, pg/g	0,59
Standard deviation, pg/g	0,089
Relative standard deviation, %	15
No. of values reported	56
No. of values removed	1
No. of reported non-detects	0

2,3,7,8 TCDF

Z-score: 2,3,7,8 TCDF
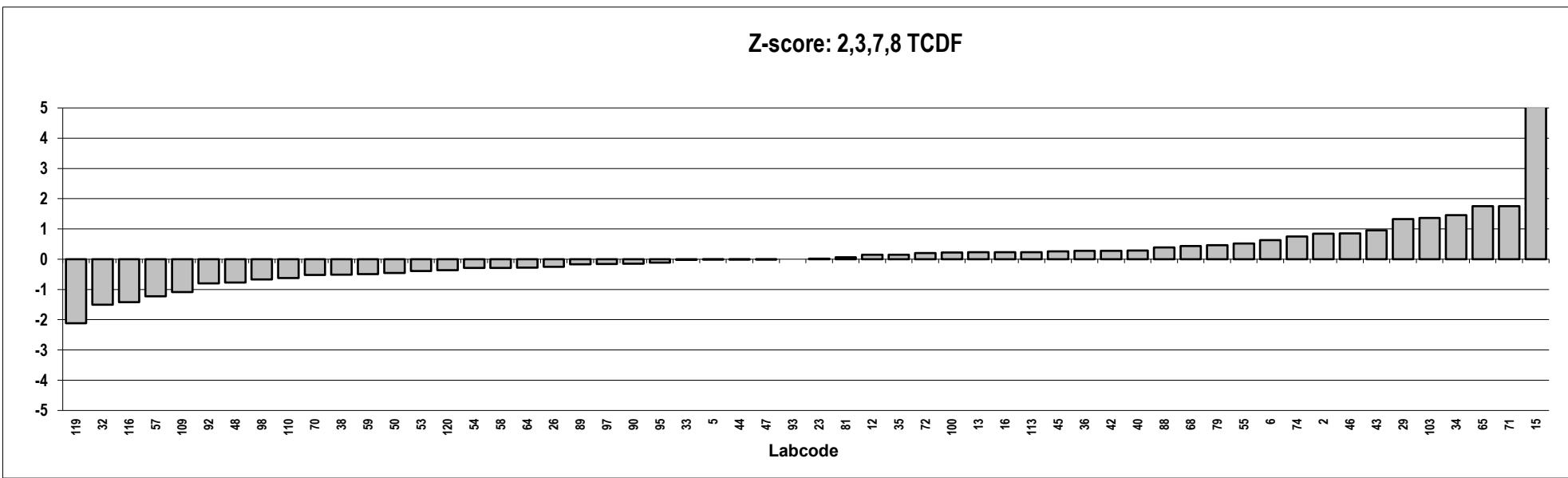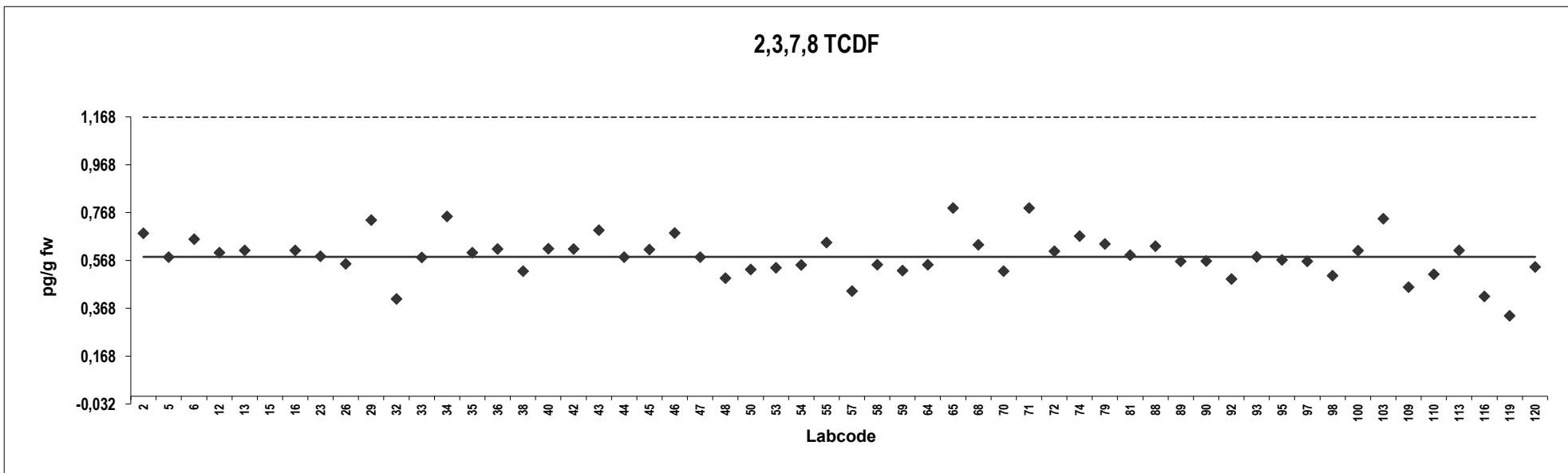
Herring
Congener: 1,2,3,7,8 PeCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,21	3,7	ND	95	0,12	-0,057	
5	0,13	0,19		97	0,11	-0,47	
6	0,13	0,19		98	0,13	0,50	
12	0,13	0,48		100	0,13	0,19	
13	0,19	2,83		103	0,11	-0,35	
15	0,14	0,79		109	0,091	-1,2	
16	0,12	-0,057		110	0,12	-0,11	
23	0,12	-0,057		113	0,11	-0,47	
26	0,12	-0,094		116	0,061	-2,5	
29	0,15	1,3		119	0,31	7,8	Outlier
32	0,097	-1,0		120	0,10	-0,76	
33	0,11	-0,47					
34	0,15	0,97					
35	0,13	0,35					
36	0,13	0,52					
38	0,098	-0,97					
40	0,13	0,21					
42	0,12	0,00					
43	0,29	7,1	Outlier				
44	0,12	-0,26					
45	0,12	-0,11					
46	0,14	0,93					
47	0,13	0,36	ND				
48	0,10	-0,84					
50	0,11	-0,42					
53	0,13	0,32					
54	0,12	0,14					
55	0,12	-0,12					
57	0,097	-1,0					
58	0,10	-0,72					
59	0,10	-0,80					
64	0,11	-0,47					
65	0,32	8,1	Outlier,ND				
68	0,18	2,5					
70	0,10	-0,88					
71	0,32	8,1	Outlier,ND				
72	0,17	2,0					
74	0,14	0,89					
79	0,14	0,74					
81	0,14	0,68					
88	0,12	0,030					
89	0,11	-0,60					
90	0,12	0,11					
92	0,25	5,3	Outlier				
93	0,15	1,3					

Consensus statistics

Consensus median, pg/g	0,12
Median all values pg/g	0,12
Consensus mean, pg/g	0,12
Standard deviation, pg/g	0,025
Relative standard deviation, %	20
No. of values reported	56
No. of values removed	5
No. of reported non-detects	4

1,2,3,7,8 PeCDF

Z-score: 1,2,3,7,8 PeCDF
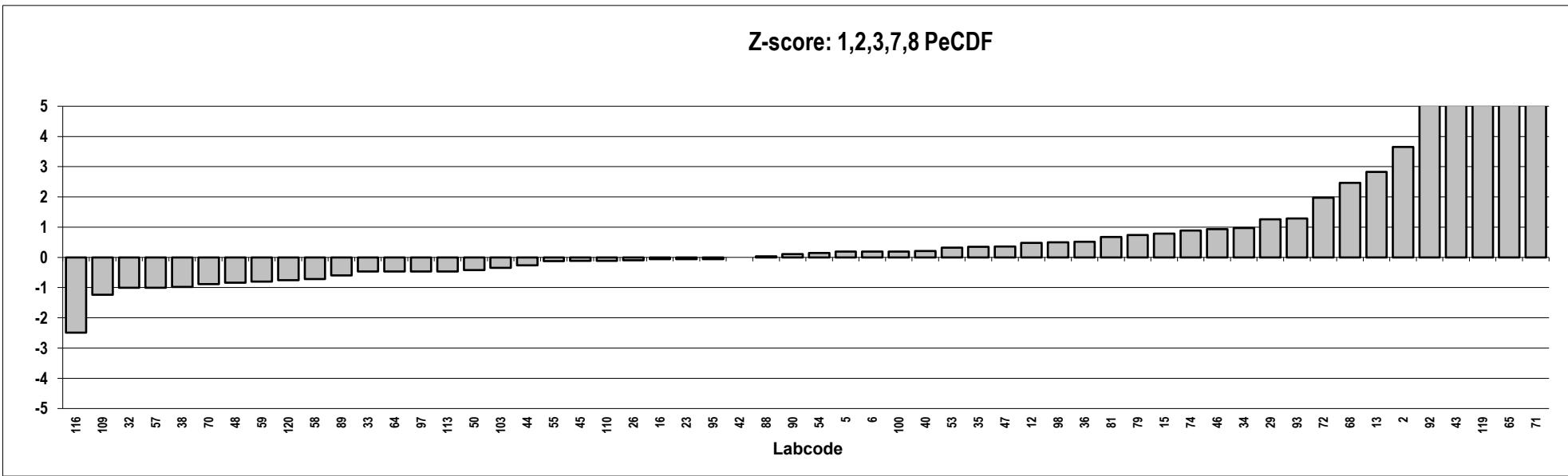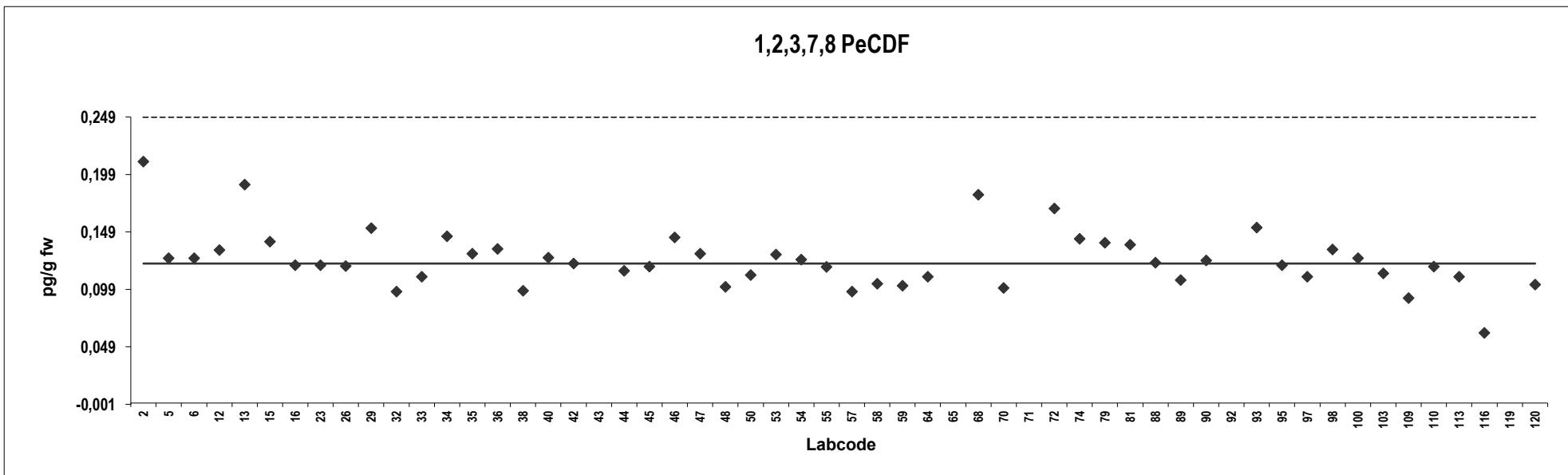
Herring
Congener: 2,3,4,7,8 PeCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,51	0,29		95	0,45	-0,29	
5	0,50	0,18		97	0,55	0,72	
6	0,52	0,45		98	0,47	-0,12	
12	0,47	-0,062		100	0,53	0,54	
13	0,55	0,75		103	0,45	-0,34	
15	0,43	-0,50		109	0,41	-0,67	
16	0,48	0,022		110	0,45	-0,31	
23	0,48	0,022		113	0,44	-0,40	
26	0,50	0,21		116	0,33	-1,5	
29	0,54	0,66		119	0,30	-1,9	
32	0,46	-0,18		120	0,46	-0,19	
33	0,49	0,13					
34	0,67	2,0					
35	0,49	0,078					
36	0,44	-0,43					
38	0,41	-0,74					
40	0,51	0,32					
42	0,49	0,11					
43	0,60	1,2					
44	0,43	-0,52					
45	0,53	0,51					
46	0,55	0,74					
47	0,51	0,30					
48	0,41	-0,75					
50	0,43	-0,49					
53	0,49	0,13					
54	0,47	-0,033					
55	0,51	0,32					
57	0,41	-0,71					
58	0,42	-0,59					
59	0,47	-0,094					
64	0,47	-0,083					
65	0,55	0,78	ND				
68	0,64	1,7					
70	0,45	-0,25					
71	0,55	0,78	ND				
72	0,49	0,17					
74	0,56	0,88					
79	0,54	0,70					
81	0,48	-0,022					
88	0,44	-0,40					
89	0,47	-0,038					
90	0,45	-0,31					
92	0,43	-0,50					
93	0,52	0,48					

Consensus statistics

Consensus median, pg/g	0,48
Median all values pg/g	0,48
Consensus mean, pg/g	0,48
Standard deviation, pg/g	0,064
Relative standard deviation, %	13
No. of values reported	56
No. of values removed	0
No. of reported non-detects	2

2,3,4,7,8 PeCDF

Z-score: 2,3,4,7,8 PeCDF
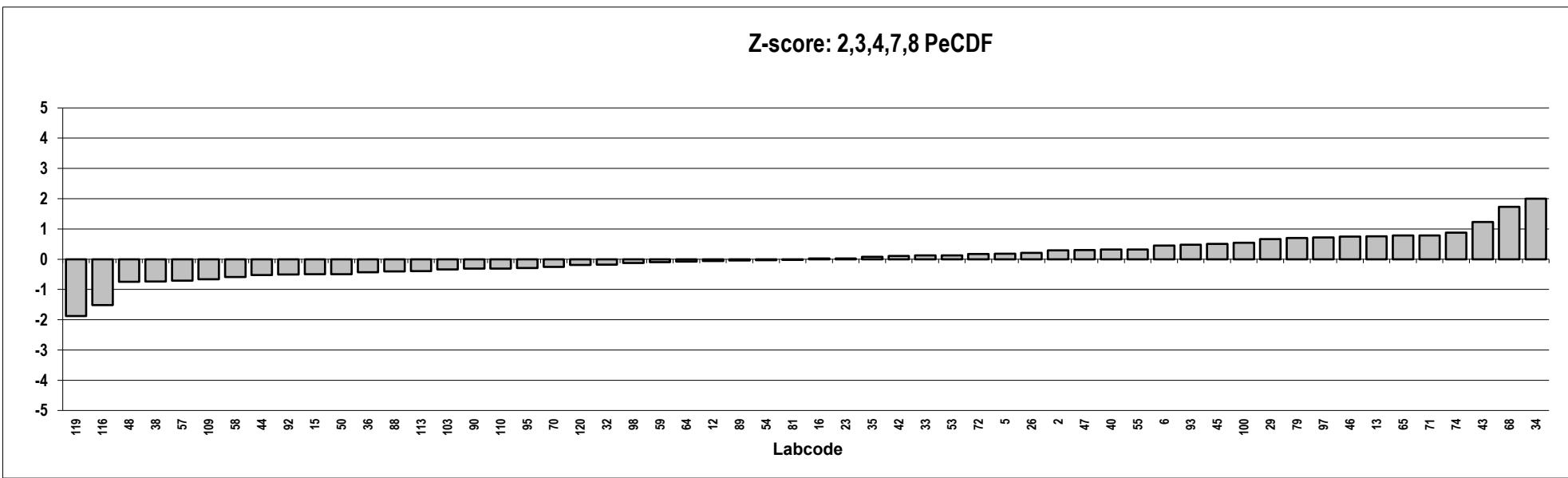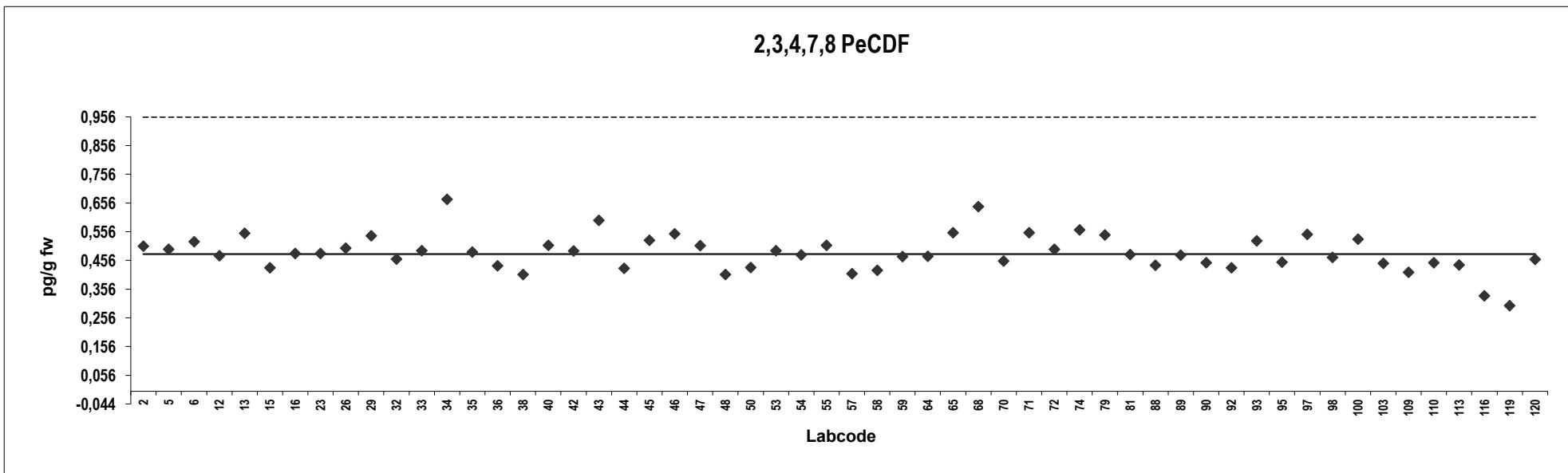
Herring
Congener: 1,2,3,4,7,8 HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,070	3,5	ND	95	0,039	-0,24	
5	0,039	-0,21		97	0,053	1,5	
6	0,041	0,026		98	0,038	-0,34	
12	0,046	0,61		100	0,035	-0,73	
13	0,015	-3,2	ND	103	0,035	-0,69	
15	0,018	-2,8		109	0,031	-1,2	
16	0,038	-0,36		110	0,039	-0,28	
23	0,036	-0,61		113	0,050	1,1	ND
26	0,045	0,45		116	0,053	1,5	
29	0,047	0,73		119	0,011	-3,6	ND
32	0,045	0,49		120	0,035	-0,73	
33	0,13	11	Outlier,ND				
34	0,062	2,6					
35	0,034	-0,84					
36	0,048	0,84					
38	0,029	-1,4					
40	0,042	0,070					
42	0,17	15	Outlier				
43	0,13	11	Outlier				
44	0,044	0,37					
45	0,041	-0,0018					
46	0,046	0,61					
47	0,080	4,8	ND				
48	0,039	-0,26					
50	0,031	-1,2					
53	0,045	0,49					
54	0,042	0,076					
55	0,043	0,22					
57	0,040	-0,12					
58	0,037	-0,50					
59	0,037	-0,49					
64	0,036	-0,61					
65	0,28	29	Outlier,ND				
68	0,059	2,2					
70	0,052	1,3					
71	0,28	29	Outlier,ND				
72	0,098	7,0	Outlier,ND				
74	0,047	0,73					
79	0,042	0,063					
81	0,080	4,8					
88	0,041	-0,041					
89	0,040	-0,069					
90	0,043	0,25					
92	0,041	0,0018					
93	0,037	-0,48					

Consenus statistics

Consensus median, pg/g	0,041
Median all values pg/g	0,042
Consensus mean, pg/g	0,042
Standard deviation, pg/g	0,013
Relative standard deviation, %	30
No. of values reported	56
No. of values removed	6
No. of reported non-detects	9

1,2,3,4,7,8 HxCDF

Z-score: 1,2,3,4,7,8 HxCDF
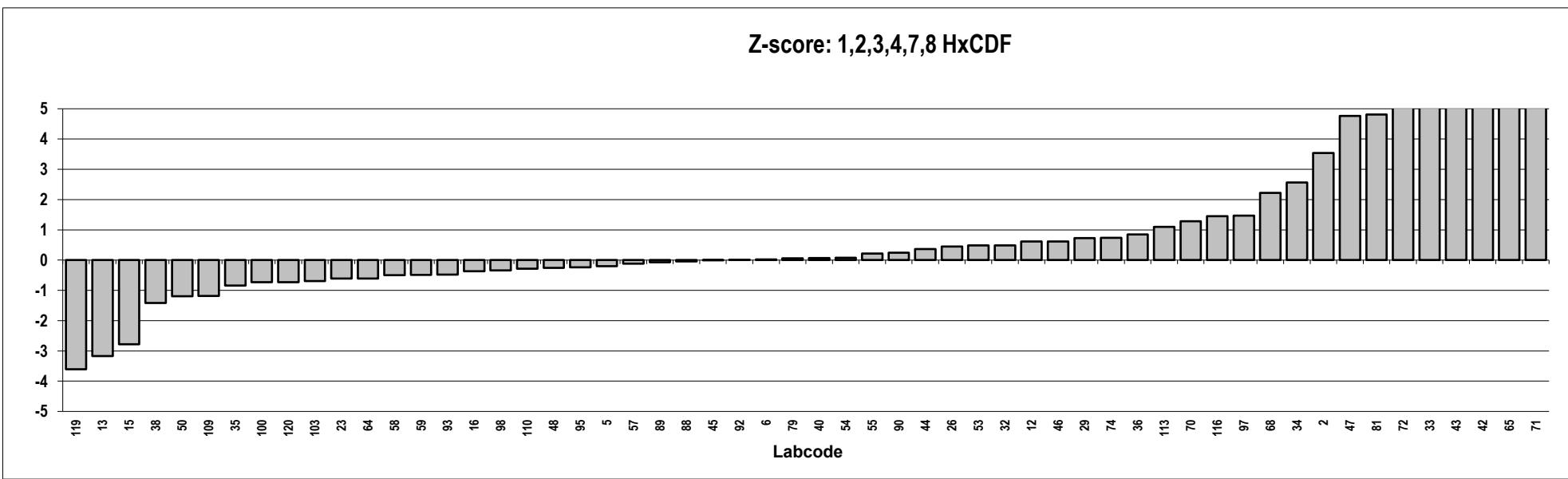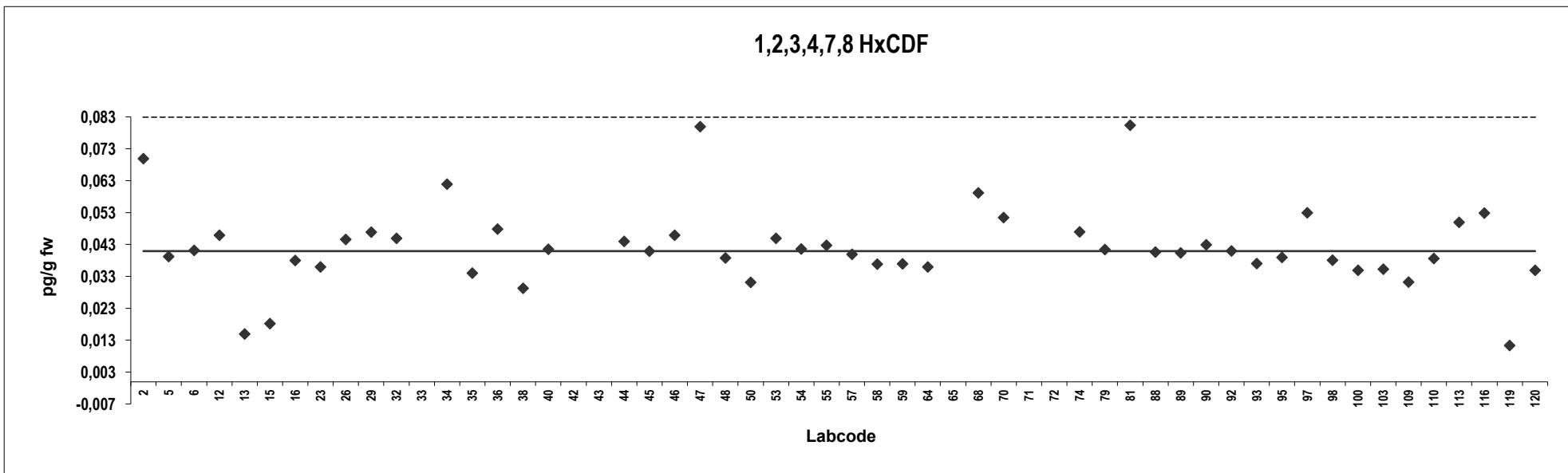
Herring
Congener: 1,2,3,6,7,8 HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,067	3,2	ND	95	0,035	-0,71	
5	0,040	-0,046		97	0,065	3,0	
6	0,037	-0,41		98	0,044	0,43	
12	0,049	0,95		100	0,038	-0,34	
13	0,015	-3,2	ND	103	0,045	0,47	
15	0,030	-1,3		109	0,028	-1,6	
16	0,044	0,40		110	0,042	0,15	
23	0,036	-0,59		113	0,050	1,1	ND
26	0,048	0,83		116	0,040	-0,12	
29	0,044	0,44		119	0,013	-3,5	ND
32	0,058	2,1		120	0,032	-1,1	
33	0,13	11	Outlier,ND				
34	0,053	1,5					
35	0,028	-1,5					
36	0,038	-0,36					
38	0,036	-0,58					
40	0,040	-0,098					
42	0,043	0,31					
43	0,14	12	Outlier				
44	0,046	0,64					
45	0,039	-0,26					
46	0,046	0,64					
47	0,050	1,1	ND				
48	0,040	-0,093					
50	0,044	0,34					
53	0,044	0,37					
54	0,039	-0,27					
55	0,041	0,00					
57	0,031	-1,20					
58	0,037	-0,48					
59	0,035	-0,71					
64	0,038	-0,34					
65	0,21	21	Outlier,ND				
68	0,043	0,24					
70	0,050	1,1	ND				
71	0,21	21	Outlier,ND				
72	0,098	7,0	Outlier,ND				
74	0,047	0,76					
79	0,042	0,17					
81	0,051	1,3					
88	0,043	0,26					
89	0,036	-0,54					
90	0,039	-0,22					
92	0,061	2,5					
93	0,040	-0,11					

Consenus statistics

Consensus median, pg/g	0,041
Median all values pg/g	0,042
Consensus mean, pg/g	0,042
Standard deviation, pg/g	0,010
Relative standard deviation, %	24
No. of values reported	56
No. of values removed	5
No. of reported non-detects	10

1,2,3,6,7,8 HxCDF

Z-score: 1,2,3,6,7,8 HxCDF
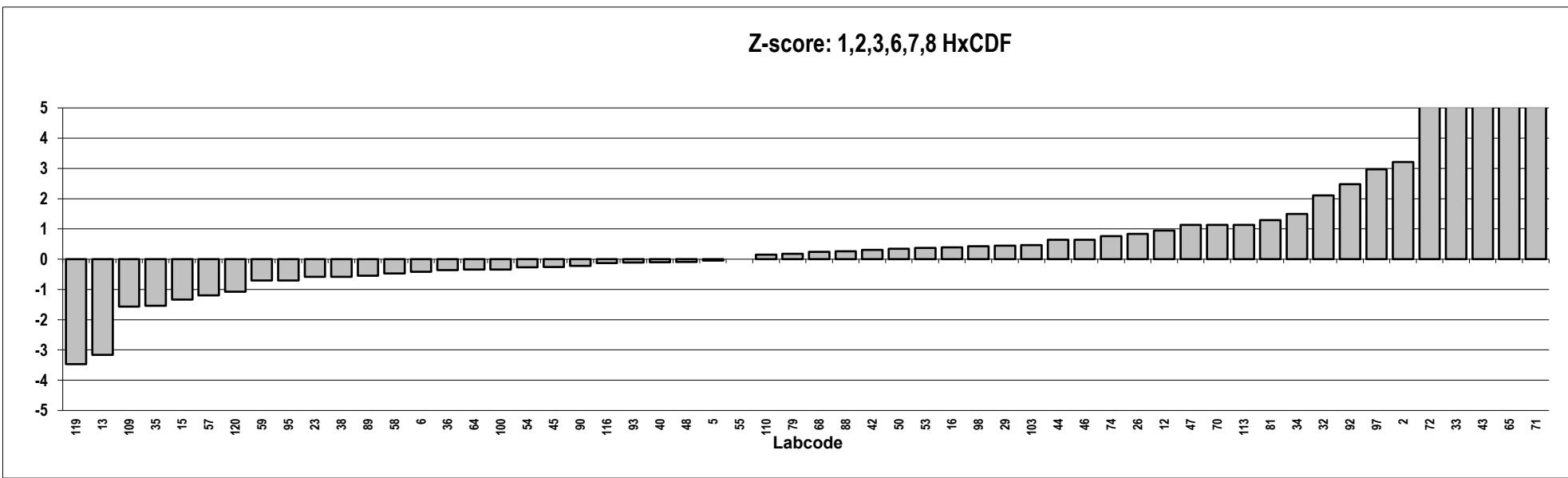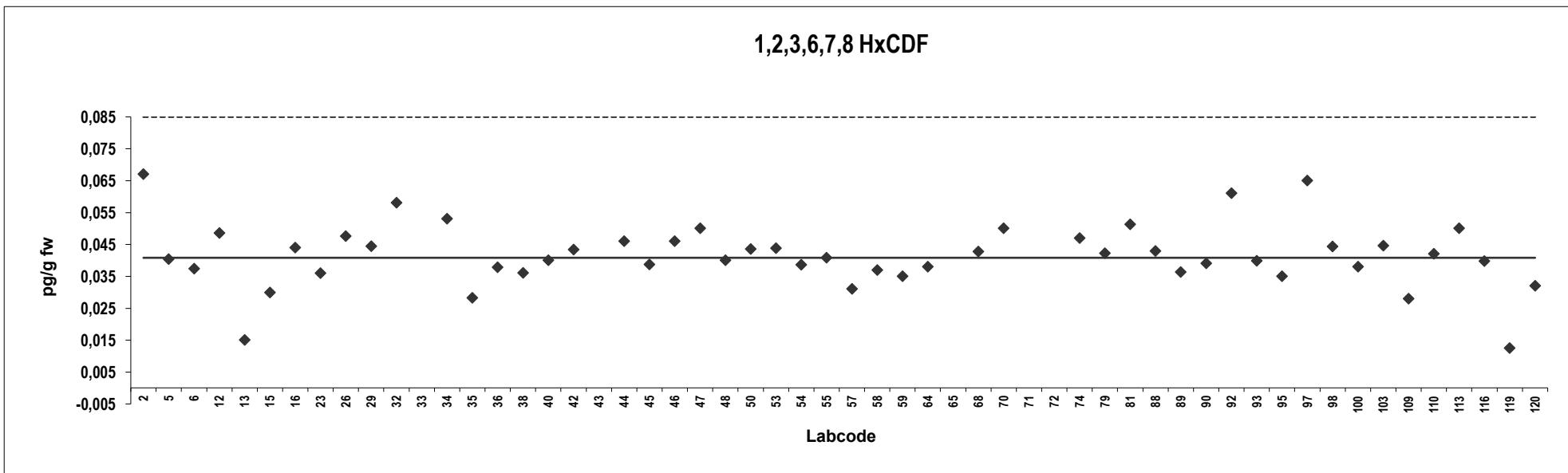
Herring
Congener: 2,3,4,6,7,8 HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,074	0,64	ND	95	0,061	-0,35	
5	0,064	-0,15		97	0,079	1,0	
6	0,064	-0,13		98	0,066	0,00	
12	0,073	0,53		100	0,064	-0,12	
13	0,015	-3,9	ND	103	0,057	-0,69	
15	0,039	-2,0		109	0,073	0,58	
16	0,063	-0,20		110	0,056	-0,74	
23	0,057	-0,66		113	0,050	-1,2	ND
26	0,067	0,12		116	0,066	0,021	
29	0,067	0,14		119	0,050	-1,2	
32	0,069	0,26		120	0,067	0,11	
33	0,13	4,9	ND				
34	0,083	1,3					
35	0,075	0,71					
36	0,073	0,58					
38	0,049	-1,3					
40	0,073	0,58					
42	0,064	-0,087					
43	0,16	6,9	Outlier				
44	0,064	-0,12					
45	0,072	0,52					
46	0,072	0,49					
47	0,080	1,1	ND				
48	0,054	-0,89					
50	0,056	-0,73					
53	0,068	0,19					
54	0,063	-0,23					
55	0,078	0,91					
57	0,085	1,5					
58	0,075	0,70					
59	0,056	-0,73					
64	0,058	-0,58					
65	0,23	12	Outlier,ND				
68	0,073	0,55					
70	0,053	-1,0					
71	0,23	12	Outlier,ND				
72	0,098	2,5	ND				
74	0,073	0,56					
79	0,071	0,40					
81	0,062	-0,29					
88	0,058	-0,55					
89	0,061	-0,37					
90	0,056	-0,73					
92	0,12	4,1					
93	0,051	-1,1					

Consensus statistics

Consensus median, pg/g	0,066
Median all values pg/g	0,066
Consensus mean, pg/g	0,067
Standard deviation, pg/g	0,017
Relative standard deviation, %	26
No. of values reported	56
No. of values removed	3
No. of reported non-detects	8

2,3,4,6,7,8 HxCDF

Z-score: 2,3,4,6,7,8 HxCDF
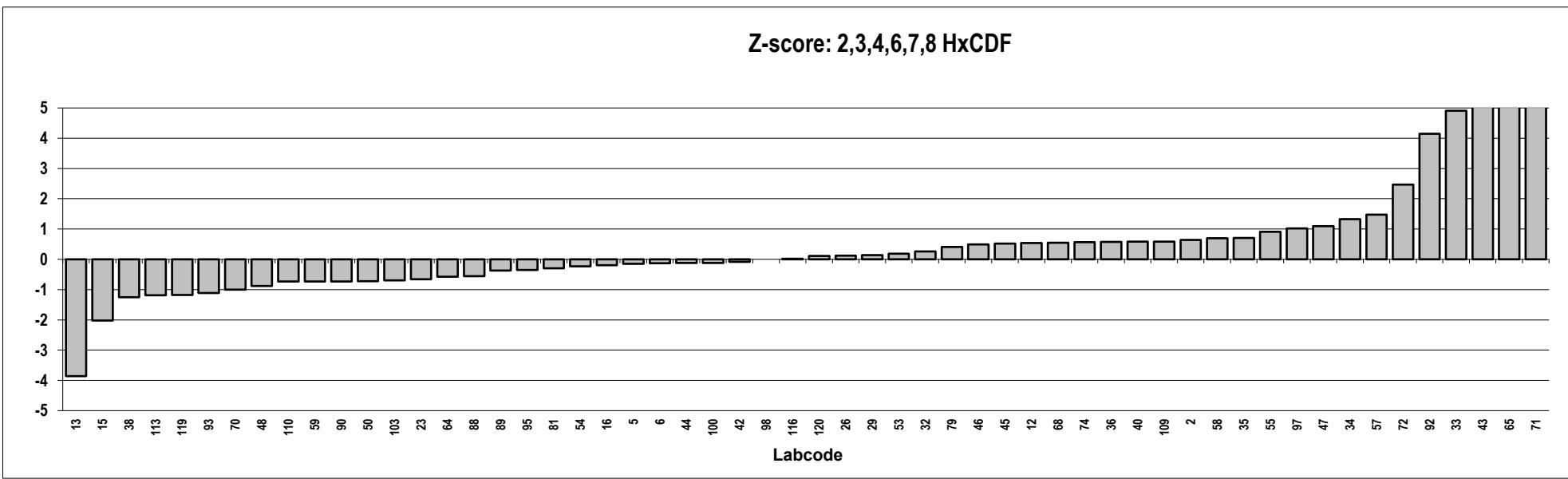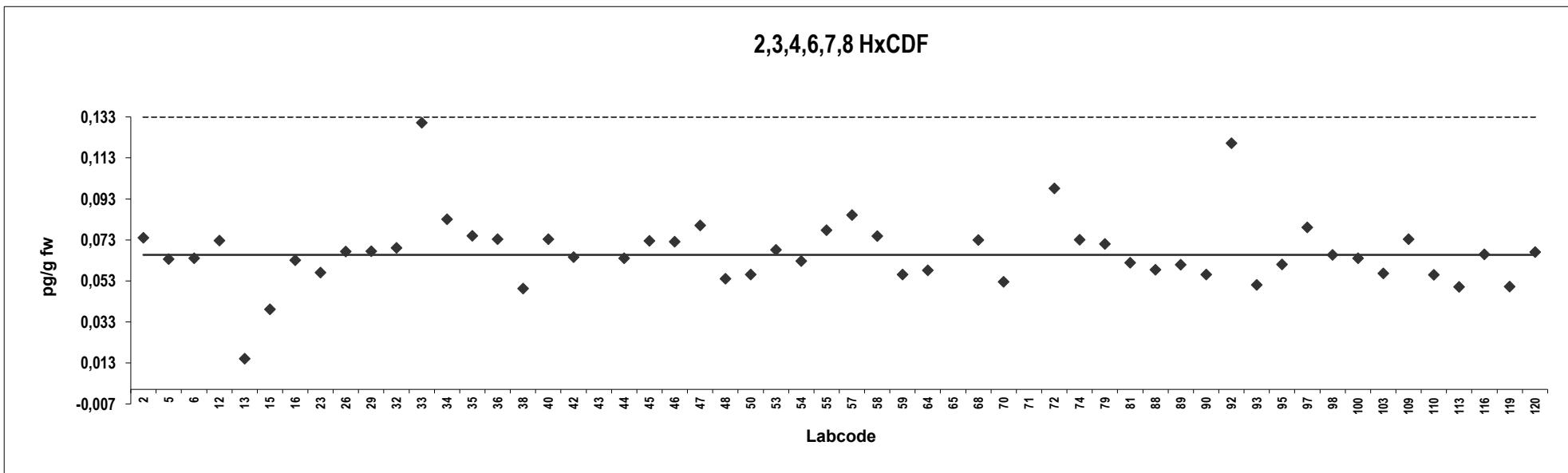
Herring
Congener: 1,2,3,7,8,9 HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,22	217	Outlier	95	0,013	8,0	ND
5	0,0029	-2,1		97	0,013	8,0	ND
6	0,010	5,0		98	0,075	70	Outlier
12	0,013	7,8		100	0,0030	-2,0	ND
13	0,070	65	Outlier	103	0,0050	0,00	ND
15	0,0020	-3,0		109	0,011	5,7	
16	0,0060	1,0	ND	110	0,0031	-1,9	ND
23	0,0040	-1,0	ND	113	0,060	55	Outlier
26	0,0049	-0,12	ND	116	0,0074	2,4	ND
29	0,0059	0,94		119	0,013	7,9	ND
32	0,042	37	Outlier	120	0,030	25	Outlier,ND
33	0,13	125	Outlier,ND				
34	0,0011	-3,9	ND				
35	0,0039	-1,1					
36	0,0043	-0,70					
38	0,0052	0,17	ND				
40	0,0020	-3,0	ND				
42	0,0020	-3,0	ND				
43	0,15	147	Outlier				
44	0,015	10					
45	0,0061	1,1	ND				
46	0,0050	0,00	ND				
47	0,050	45	Outlier,ND				
48	0,010	5,0					
50	0,013	7,5	ND				
53	0,0023	-2,7					
54	0,012	6,5	ND				
55	0,0015	-3,5	ND				
57	0,050	45	Outlier,ND				
58	0,012	6,8					
59	0,0050	0,00	ND				
64	0,0040	-1,0	ND				
65	0,22	214	Outlier,ND				
68	0,013	8,3					
70	0,050	45	Outlier,ND				
71	0,22	214	Outlier,ND				
72	0,098	93	Outlier,ND				
74	0,0050	0,00	ND				
79	0,0067	1,7					
81	0,0097	4,7					
88	0,0041	-0,89					
89	0,0020	-3,0	ND				
90	0,0020	-3,0	ND				
92	0,026	21	Outlier				
93	0,014	9,0	ND				

Consensus statistics

Consensus median, pg/g	0,0050
Median all values pg/g	0,0099
Consensus mean, pg/g	0,0067
Standard deviation, pg/g	0,0043
Relative standard deviation, %	63
No. of values reported	56
No. of values removed	15
No. of reported non-detects	33
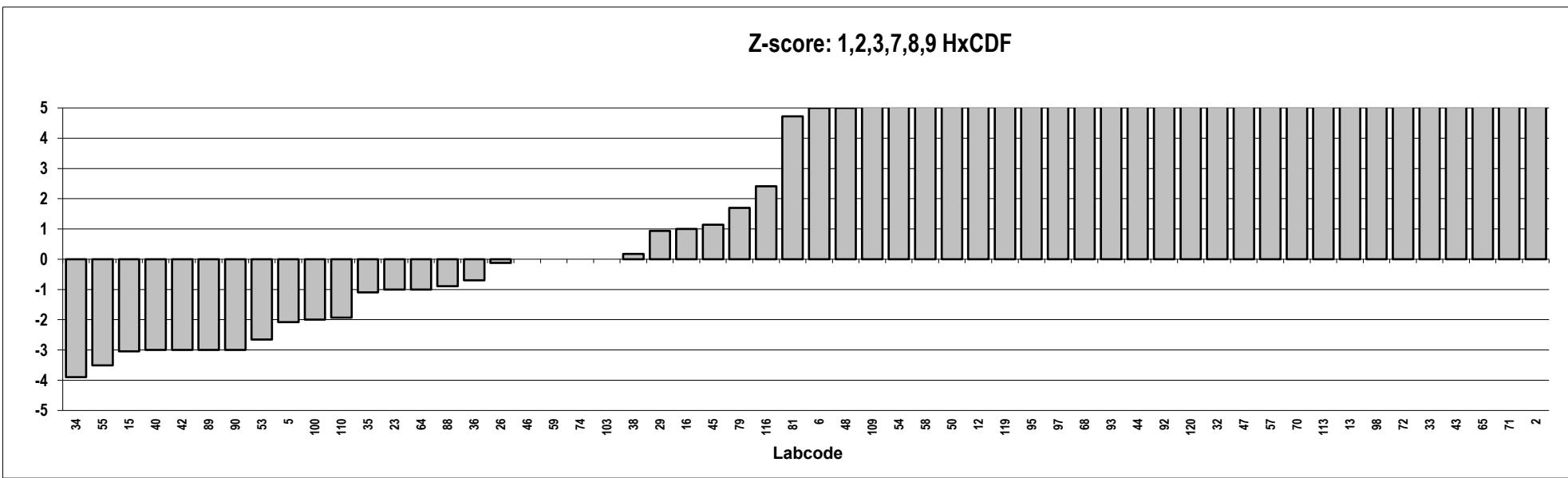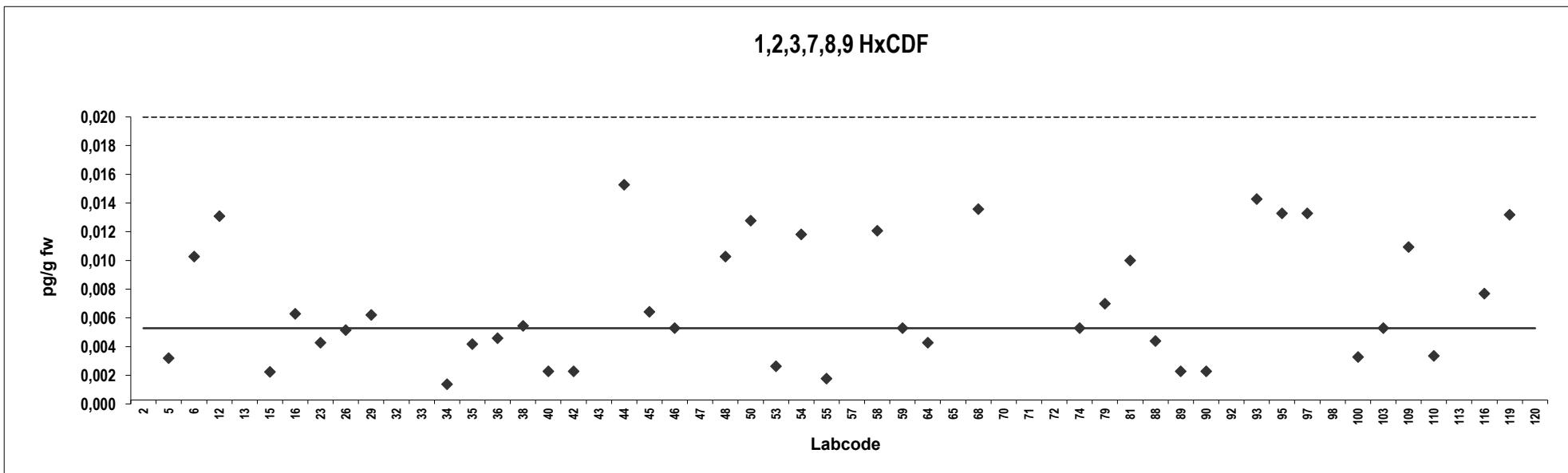
1,2,3,7,8,9 HxCDF

Z-score: 1,2,3,7,8,9 HxCDF

Herring
Congener: 1,2,3,4,6,7,8 HpCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,052	4,6	ND	95	0,022	-0,93	
5	0,031	0,80		97	0,038	2,0	
6	0,021	-1,1		98	0,021	-1,1	
12	0,029	0,33		100	0,025	-0,37	
13	0,030	0,56	ND	103	0,021	-1,1	
15	0,021	-1,1		109	0,028	0,18	
16	0,025	-0,37		110	0,020	-1,3	
23	0,024	-0,56		113	0,050	4,3	ND
26	0,028	0,16		116	0,025	-0,37	
29	0,035	1,6		119	0,0045	-4,2	ND
32	0,054	5,0		120	0,020	-1,3	
33	0,13	19	Outlier,ND				
34	0,030	0,56					
35	0,037	1,9					
36	0,027	-0,019					
38	0,017	-1,8					
40	0,037	1,8					
42	0,28	47	Outlier				
43	0,058	5,8	Outlier				
44	0,028	0,19					
45	0,036	1,7					
46	0,026	-0,19					
47	0,20	32	Outlier,ND				
48	0,029	0,45					
50	0,027	-0,054					
53	0,023	-0,65					
54	0,021	-1,2					
55	0,019	-1,5					
57	0,042	2,8					
58	0,018	-1,7					
59	0,027	0,00					
64	0,023	-0,74					
65	0,30	51	Outlier,ND				
68	0,037	1,8					
70	0,15	23	Outlier,ND				
71	0,30	51	Outlier,ND				
72	0,098	13	Outlier,ND				
74	0,028	0,19					
79	0,037	1,9					
81	0,047	3,6					
88	0,029	0,32					
89	0,020	-1,2					
90	0,026	-0,19					
92	0,028	0,19					
93	0,063	6,7	Outlier				

Consenus statistics

Consensus median, pg/g	0,027
Median all values pg/g	0,028
Consensus mean, pg/g	0,029
Standard deviation, pg/g	0,0096
Relative standard deviation, %	34
No. of values reported	56
No. of values removed	9
No. of reported non-detects	10

1,2,3,4,6,7,8 HpCDF

Z-score: 1,2,3,4,6,7,8 HpCDF
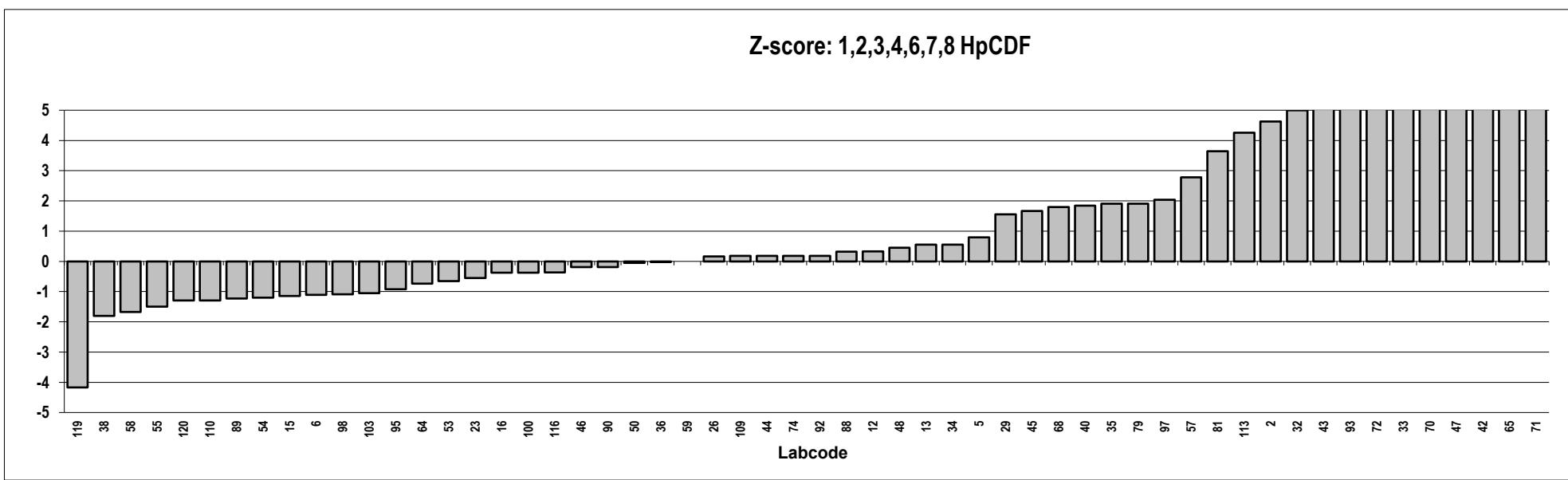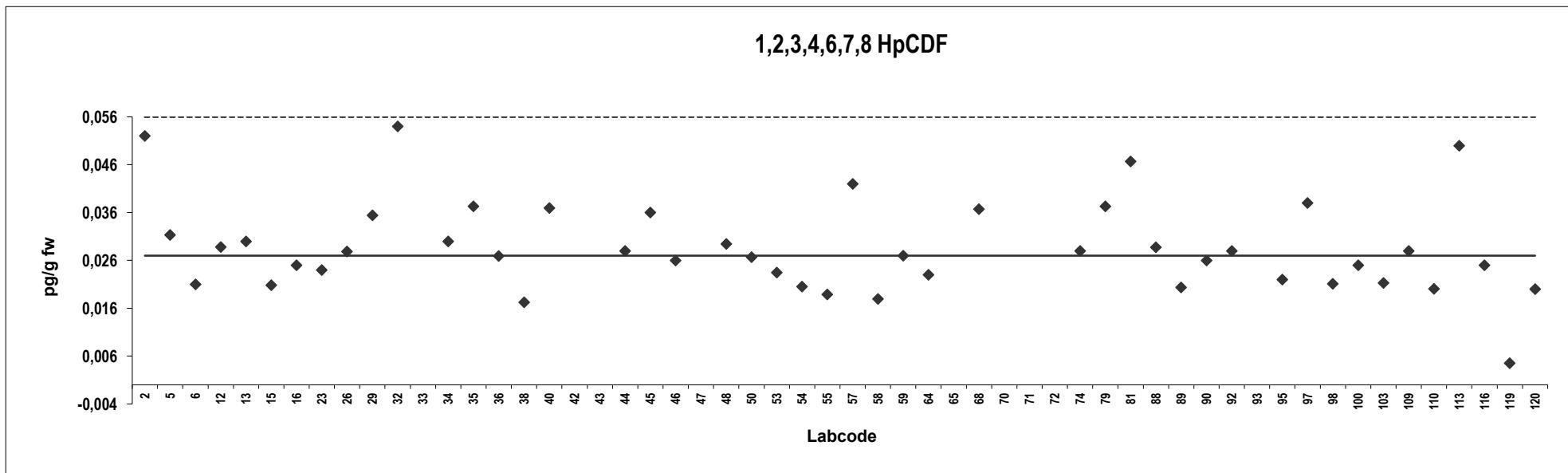
Herring
Congener: 1,2,3,4,7,8,9 HpCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,094	73	Outlier,ND	95	0,0053	-0,60	ND
5	0,0024	-3,0		97	0,023	14	Outlier,ND
6	0,0060	-0,017	ND	98	0,013	5,9	
12	0,0036	-2,0		100	0,0090	2,5	ND
13	0,030	20	Outlier,ND	103	0,0050	-0,85	ND
15	0,018	9,6		109	0,013	6,1	
16	0,0060	-0,017	ND	110	0,0061	0,088	ND
23	0,0059	-0,10	ND	113	0,050	37	Outlier,ND
26	0,0060	0,017	ND	116	0,010	3,6	ND
29	0,013	6,1		119	0,0079	1,6	ND
32	0,010	3,3	ND	120	0,030	20	Outlier,ND
33	0,13	103	Outlier,ND				
34	0,00090	-4,3	ND				
35	0,017	8,9					
36	0,0024	-3,0					
38	0,0052	-0,71	ND				
40	0,0039	-1,8					
42	0,015	7,2					
43	0,043	31	Outlier				
44	0,0080	1,6					
45	0,0045	-1,3	ND				
46	0,0050	-0,85	ND				
47	0,10	78	Outlier,ND				
48	0,015	7,5					
50	0,013	5,4	ND				
53	0,0039	-1,8					
54	0,012	4,6	ND				
55	0,0025	-2,9	ND				
57	0,050	37	Outlier,ND				
58	0,011	4,2					
59	0,0050	-0,85	ND				
64	0,0030	-2,5	ND				
65	0,29	237	Outlier,ND				
68	0,0082	1,8					
70	0,15	120	Outlier,ND				
71	0,29	237	Outlier,ND				
72	0,098	76	Outlier,ND				
74	0,0050	-0,85	ND				
79	0,0063	0,23					
81	0,016	8,1					
88	0,0036	-2,0					
89	0,00070	-4,4	ND				
90	0,0060	-0,017	ND				
92	0,020	12	Outlier				
93	0,016	8,4	ND				

Consensus statistics

Consensus median, pg/g	0,0060
Median all values pg/g	0,0095
Consensus mean, pg/g	0,0078
Standard deviation, pg/g	0,0047
Relative standard deviation, %	60
No. of values reported	56
No. of values removed	14
No. of reported non-detects	36

1,2,3,4,7,8,9 HpCDF

Z-score: 1,2,3,4,7,8,9 HpCDF
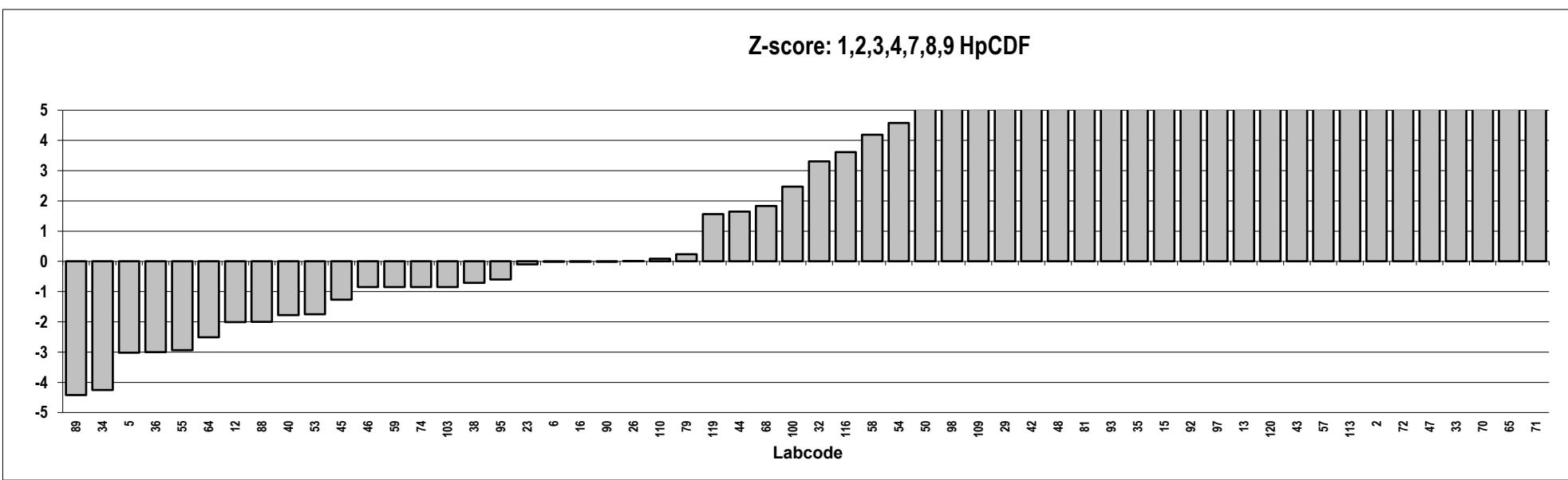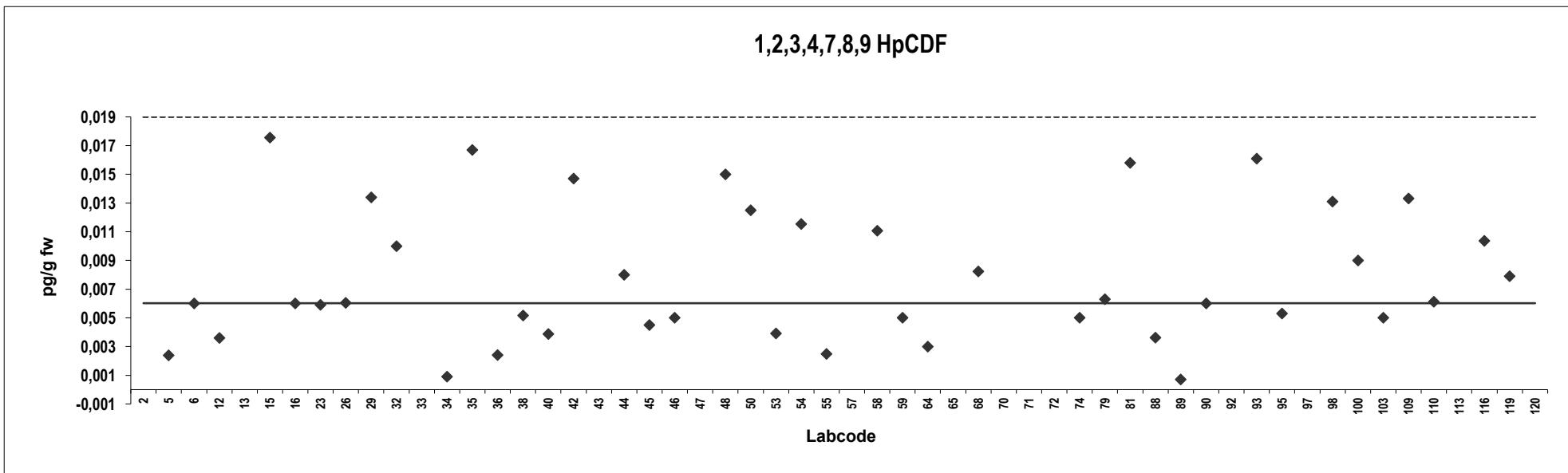
Herring
Congener: OCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	0,097	31	Outlier,ND	95	0,015	0,53	
5	0,011	-1,0		97	0,027	5,0	ND
6	0,0050	-3,2	ND	98	0,049	13	Outlier
12	0,045	12	Outlier	100	0,0080	-2,1	ND
13	0,030	6,1	ND	103	0,0050	-3,2	ND
15	0,062	18	Outlier	109	0,020	2,4	
16	0,020	2,4	ND	110	0,012	-0,48	
23	0,013	-0,21	ND	113	0,050	13	Outlier,ND
26	0,016	0,76		116	0,053	14	Outlier
29	0,047	12	Outlier	119	0,0051	-3,1	ND
32	0,0090	-1,7	ND	120	0,061	17	Outlier,ND
33	0,31	109	Outlier,ND				
34	0,015	0,53					
35	0,028	5,4					
36	0,0094	-1,5					
38	0,010	-1,2	ND				
40	0,019	1,9					
42	0,93	339	Outlier				
43	0,29	102	Outlier				
44	0,015	0,53					
45	0,016	0,90	ND				
46	0,022	3,1					
47	0,26	91	Outlier,ND				
48	0,010	-1,3					
50	0,025	4,2	ND				
53	0,011	-1,1					
54	0,029	5,6	ND				
55	0,021	2,9					
57	0,047	12	Outlier				
58	0,014	0,21					
59	0,0050	-3,2	ND				
64	0,0070	-2,4	ND				
65	0,24	85	Outlier,ND				
68	0,012	-0,56					
70	2,0	732	Outlier,ND				
71	0,24	85	Outlier,ND				
72	0,20	67	Outlier,ND				
74	0,24	83	Outlier				
79	0,015	0,53					
81	0,028	5,3					
88	0,011	-0,99					
89	0,0089	-1,7					
90	0,012	-0,58					
92	0,042	10	Outlier				
93	0,043	11	Outlier				

Consenus statistics

Consensus median, pg/g	0,014
Median all values pg/g	0,021
Consensus mean, pg/g	0,015
Standard deviation, pg/g	0,0074
Relative standard deviation, %	49
No. of values reported	56
No. of values removed	20
No. of reported non-detects	25

OCDF

Z-score: OCDF
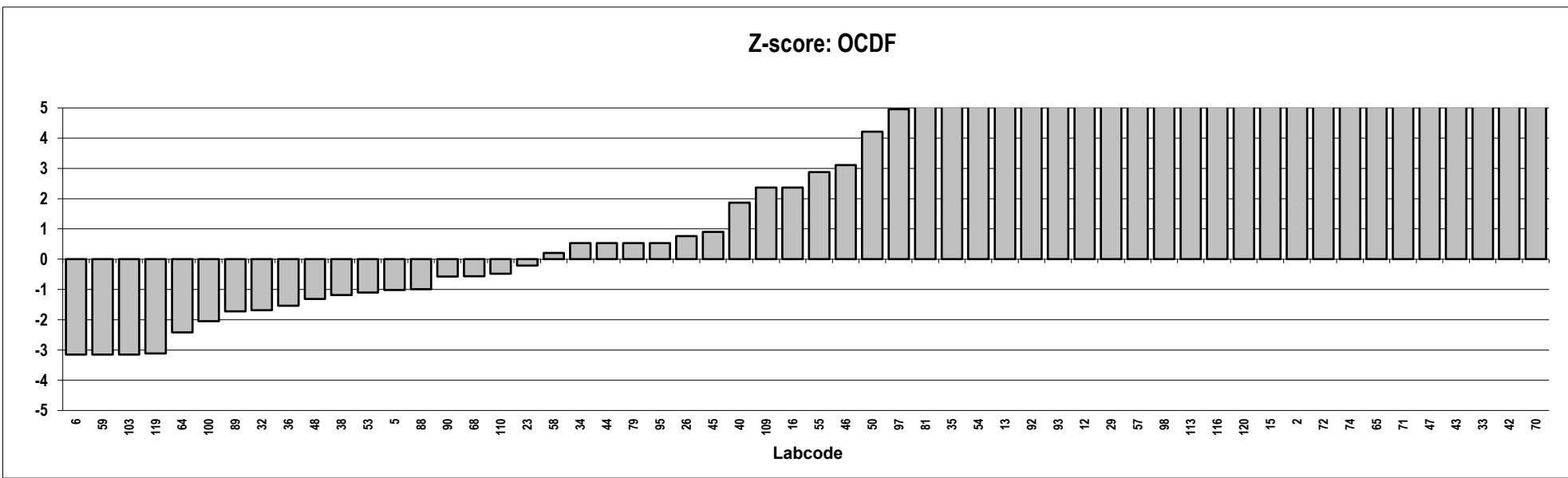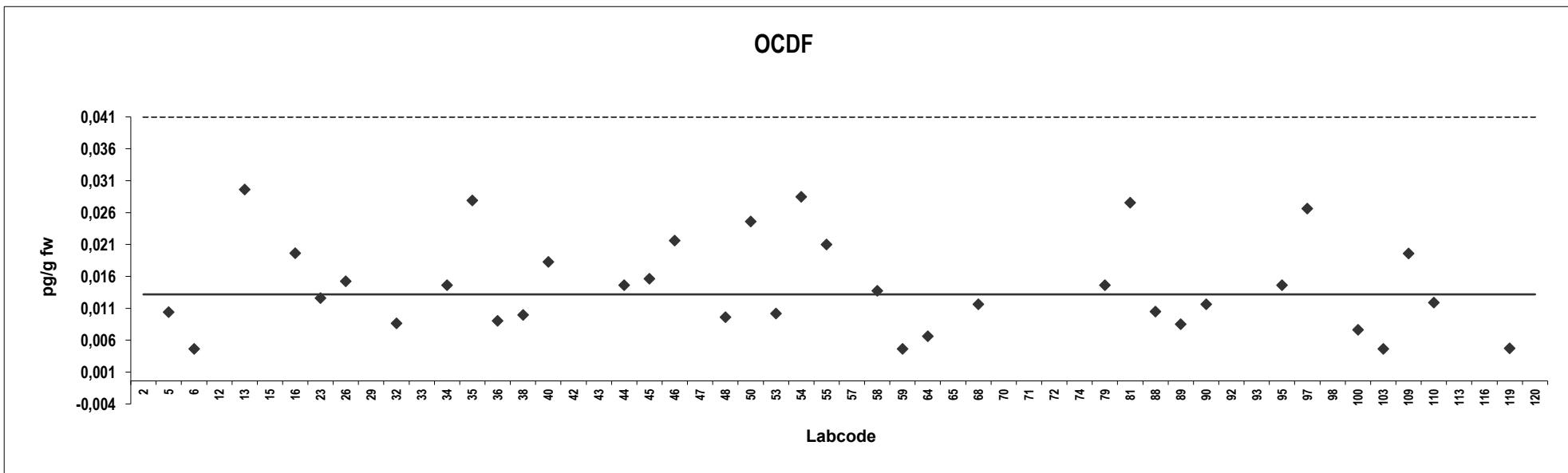
Herring
Congener: PCB 77

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	12	2,0		95	9,4	0,70	
5	11	1,6		97	9,7	0,86	
6	7,6	-0,40		98	9,6	0,81	
12	8,0	-0,13		100	7,8	-0,25	
13	8,0	-0,17		103	7,9	-0,22	
15	7,9	-0,19		109	6,9	-0,82	
16	8,2	-0,029		110	7,9	-0,21	
23	8,3	0,0017		113	7,3	-0,59	
26	7,8	-0,25		116	6,0	-1,4	
29	13	2,6		119	8,9	0,39	
32	6,2	-1,2		120	7,8	-0,27	
33	8,5	0,15					
34	8,2	-0,010					
35	8,5	0,13					
36	8,0	-0,17					
38	7,7	-0,31					
40	8,4	0,080					
42	9,6	0,84					
43	6,0	-1,4					
44	7,5	-0,43					
45	10	1,0					
46	9,0	0,43					
47	9,2	0,59					
48	8,7	0,30					
50	8,5	0,14					
53	9,5	0,78					
54	8,2	-0,0017					
55	8,4	0,069					
57	5,4	-1,7					
58	8,2	-0,043					
59	8,7	0,28					
64	8,4	0,093					
65	8,1	-0,12					
68	9,7	0,90					
70	9,2	0,58					
71	8,1	-0,12					
72	8,9	0,39					
74	9,0	0,46					
79	8,5	0,13					
81	8,6	0,23					
88	8,4	0,085					
89	7,3	-0,59					
90	7,6	-0,37					
92	7,1	-0,70					
93	7,6	-0,38					

Consensus statistics

Consensus median, pg/g	8,2
Median all values pg/g	8,2
Consensus mean, pg/g	8,4
Standard deviation, pg/g	1,2
Relative standard deviation, %	15
No. of values reported	56
No. of values removed	0
No. of reported non-detects	0

PCB 77

Z-score: PCB 77
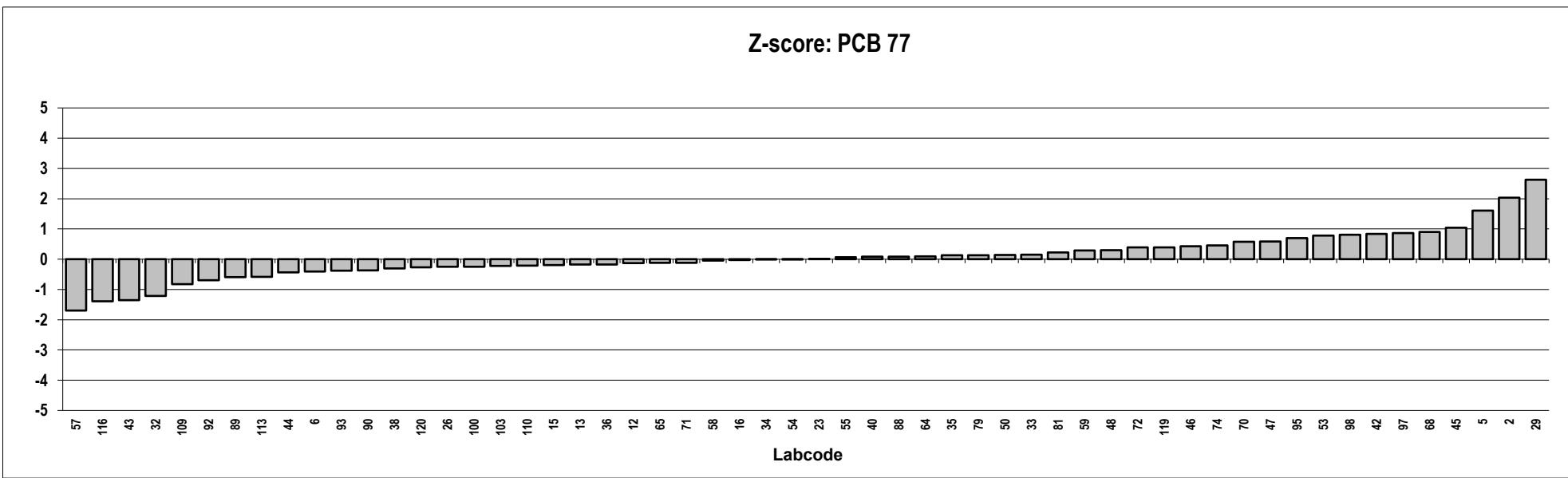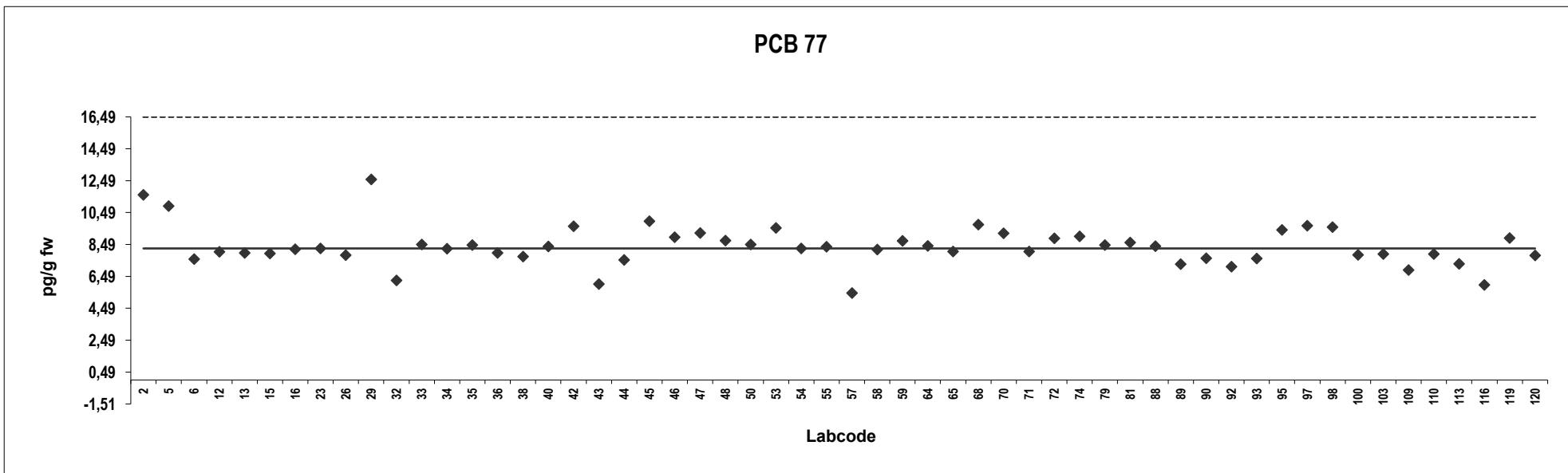
Herring
Congener: PCB 126

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	13	22	Outlier	95	2,9	0,80	
5	2,1	-0,84		97	2,7	0,48	
6	2,2	-0,56		98	3,2	1,4	
12	3,0	0,90		100	2,5	-0,0027	
13	2,1	-0,72		103	2,4	-0,15	
15	1,9	-1,1		109	2,0	-0,92	
16	2,5	-0,0027		110	2,4	-0,23	
23	2,4	-0,20		113	2,2	-0,68	
26	2,3	-0,33		116	1,8	-1,5	
29	3,0	1,0		119	25	45	Outlier
32	2,0	-0,92		120	2,3	-0,34	
33	2,2	-0,60					
34	1,8	-1,4					
35	2,6	0,11					
36	2,8	0,60					
38	2,6	0,17					
40	2,9	0,74					
42	2,6	0,26					
43	2,4	-0,26					
44	2,4	-0,14					
45	2,8	0,54					
46	2,6	0,26					
47	2,1	-0,86					
48	2,5	0,012					
50	2,9	0,83					
53	2,9	0,72					
54	2,5	0,0027					
55	3,6	2,2					
57	1,8	-1,3					
58	2,5	0,089					
59	2,7	0,41					
64	2,6	0,20					
65	2,8	0,60	ND				
68	3,0	0,95					
70	2,1	-0,76					
71	2,8	0,60	ND				
72	2,6	0,16					
74	2,6	0,24					
79	2,6	0,11					
81	2,3	-0,49					
88	2,5	0,044					
89	2,4	-0,17					
90	2,3	-0,42					
92	2,5	-0,0027					
93	2,4	-0,15					

Consensus statistics

Consensus median, pg/g	2,5
Median all values pg/g	2,5
Consensus mean, pg/g	2,5
Standard deviation, pg/g	0,36
Relative standard deviation, %	14
No. of values reported	56
No. of values removed	2
No. of reported non-detects	2

PCB 126

Z-score: PCB 126
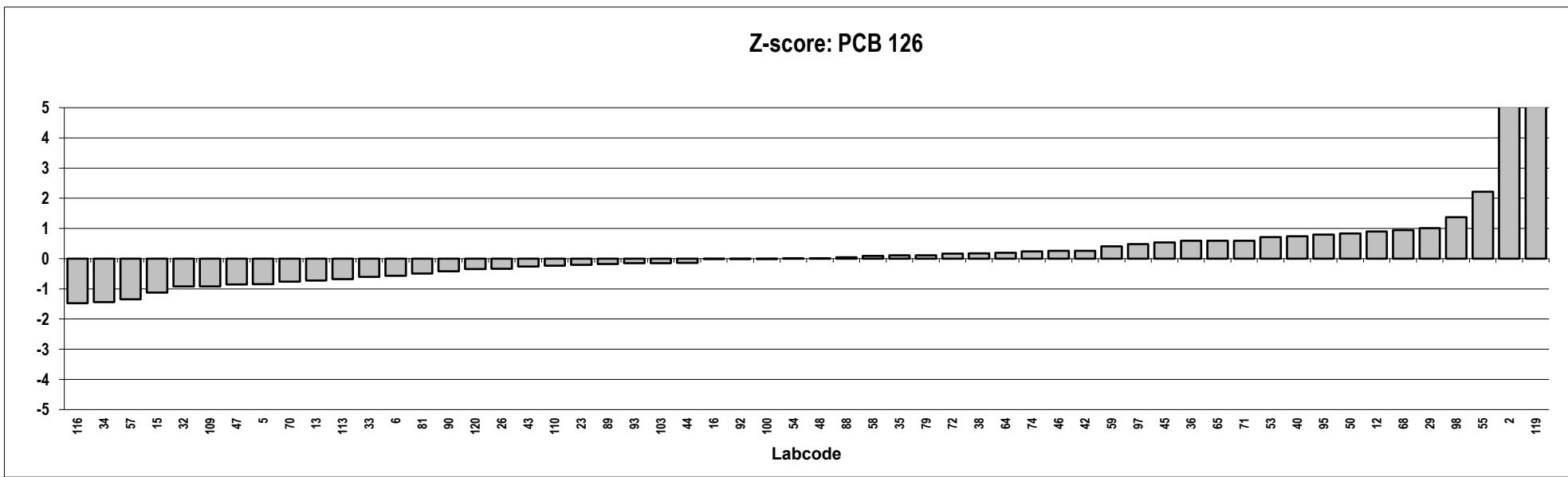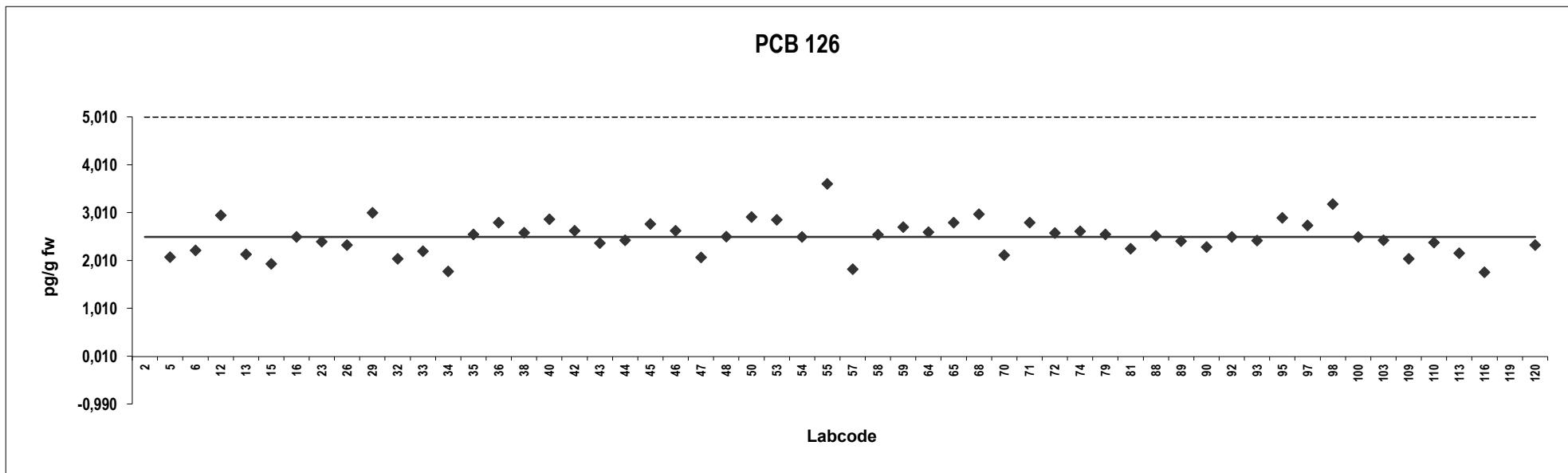
Herring
Congener: PCB 169

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	1,2	-0,91	ND	95	1,4	-0,23	
5	1,2	-0,84		97	1,7	0,65	
6	1,4	-0,20		98	1,5	-0,013	
12	1,5	0,14		100	1,4	-0,13	
13	1,7	0,86		103	1,5	0,15	
15	1,4	-0,25		109	1,3	-0,73	
16	1,5	0,11		110	1,3	-0,52	
23	1,5	0,11		113	1,3	-0,64	
26	1,5	0,19		116	1,0	-1,5	
29	2,4	3,1		119	1,5	0,21	
32	1,3	-0,62		120	1,4	-0,30	
33	2,0	1,8	ND				
34	1,4	-0,16					
35	1,4	-0,14					
36	1,7	0,62					
38	1,2	-0,90					
40	1,4	-0,27					
42	1,4	-0,13					
43	1,2	-0,78					
44	1,6	0,31					
45	1,5	0,10					
46	1,7	0,69					
47	1,5	0,013					
48	1,3	-0,68					
50	1,5	0,098					
53	1,5	-0,034					
54	1,5	0,18					
55	1,4	-0,31					
57	1,1	-1,3					
58	1,4	-0,37					
59	1,5	0,20					
64	1,4	-0,23					
65	1,9	1,5	ND				
68	1,7	0,81					
70	1,5	0,11					
71	1,9	1,5	ND				
72	1,6	0,29					
74	1,6	0,55					
79	1,4	-0,14					
81	1,7	0,93					
88	1,5	0,21					
89	1,4	-0,27					
90	1,3	-0,47					
92	1,6	0,45					
93	1,5	0,026					

Consenus statistics

Consensus median, pg/g	1,5
Median all values pg/g	1,5
Consensus mean, pg/g	1,5
Standard deviation, pg/g	0,22
Relative standard deviation, %	15
No. of values reported	56
No. of values removed	0
No. of reported non-detects	4

PCB 169

pg/g fw

Labcode

Z-score: PCB 169
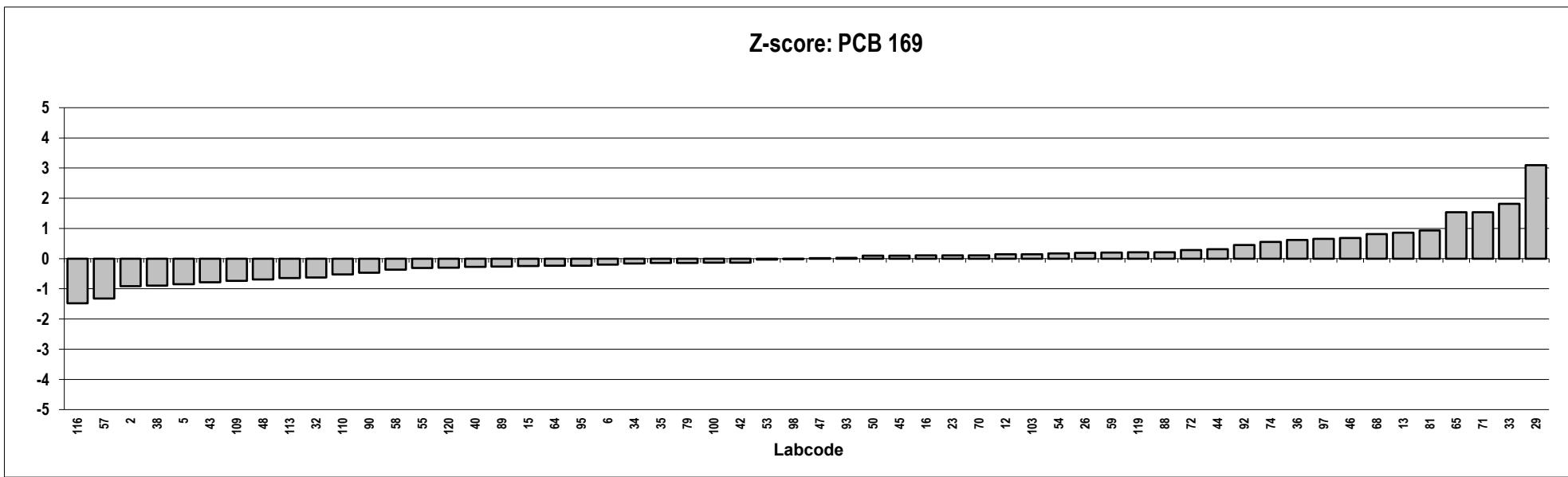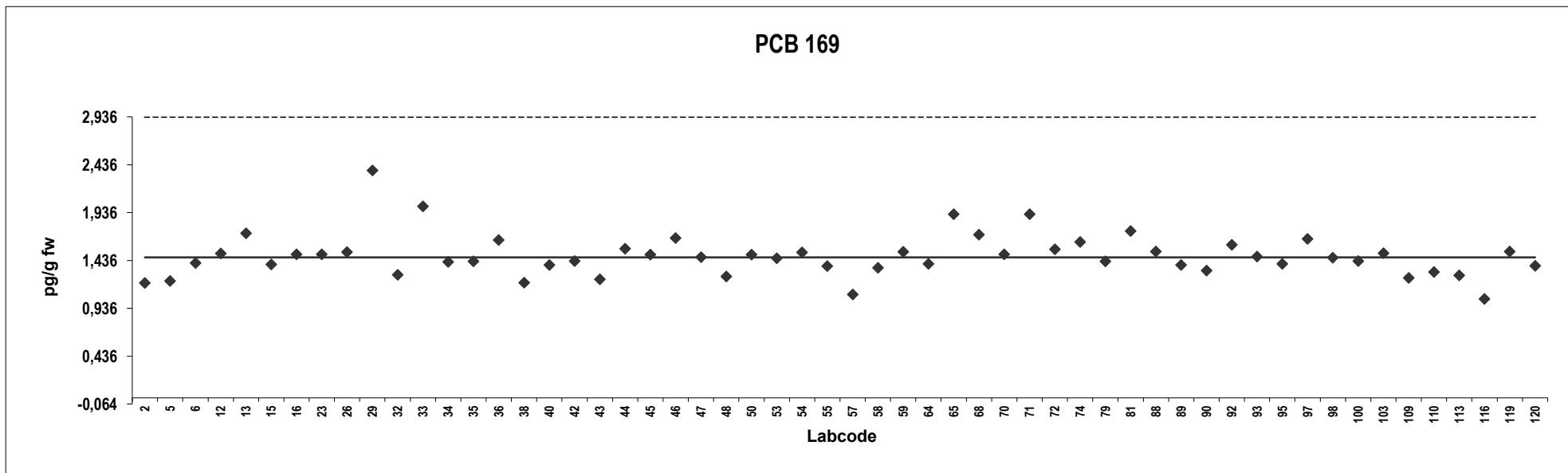
Labcode

Herring
Congener: PCB 81

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	2,0	43	Outlier,ND	95	0,26	1,3	
5	0,32	2,7		97	0,29	1,9	
6	0,20	-0,19	ND	98	1,1	21	Outlier
12	0,24	0,84		100	0,23	0,44	
13	5,5	127	Outlier	103	0,17	-0,86	
15	3,4	76	Outlier	109	0,23	0,53	
16	0,22	0,29		110	0,19	-0,45	
23	0,21	-0,070		113	0,19	-0,43	
26	0,24	0,81		116	0,16	-1,1	
29	0,98	18	Outlier	119	0,18	-0,70	ND
32	2,5	55	Outlier	120	0,28	1,7	
33	2,0	43	Outlier,ND				
34	0,21	0,051					
35	0,21	0,00					
36	0,23	0,56					
38	0,092	-2,8					
40	0,19	-0,52					
42	0,23	0,63					
43	6,0	139	Outlier				
44	0,19	-0,53					
45	0,47	6,3	Outlier				
46	0,25	1,0					
47	1,0	19	Outlier,ND				
48	0,12	-2,2					
50	0,19	-0,33					
53	0,066	-3,4					
54	0,20	-0,30					
55	0,17	-0,95					
57	0,11	-2,4					
58	0,15	-1,4					
59	0,22	0,19					
64	0,21	0,051					
65	2,4	52	Outlier,ND				
68	0,22	0,36					
70	1,0	19	Outlier,ND				
71	2,4	52	Outlier,ND				
72	0,20	-0,30					
74	0,24	0,77					
79	0,21	0,00					
81	0,049	-3,8					
88	0,20	-0,079					
89	0,27	1,4					
90	0,19	-0,45					
92	0,21	0,051					
93	0,24	0,89					

Consensus statistics

Consensus median, pg/g	0,21
Median all values pg/g	0,22
Consensus mean, pg/g	0,20
Standard deviation, pg/g	0,055
Relative standard deviation, %	27
No. of values reported	56
No. of values removed	13
No. of reported non-detects	8

PCB 81

Z-score: PCB 81
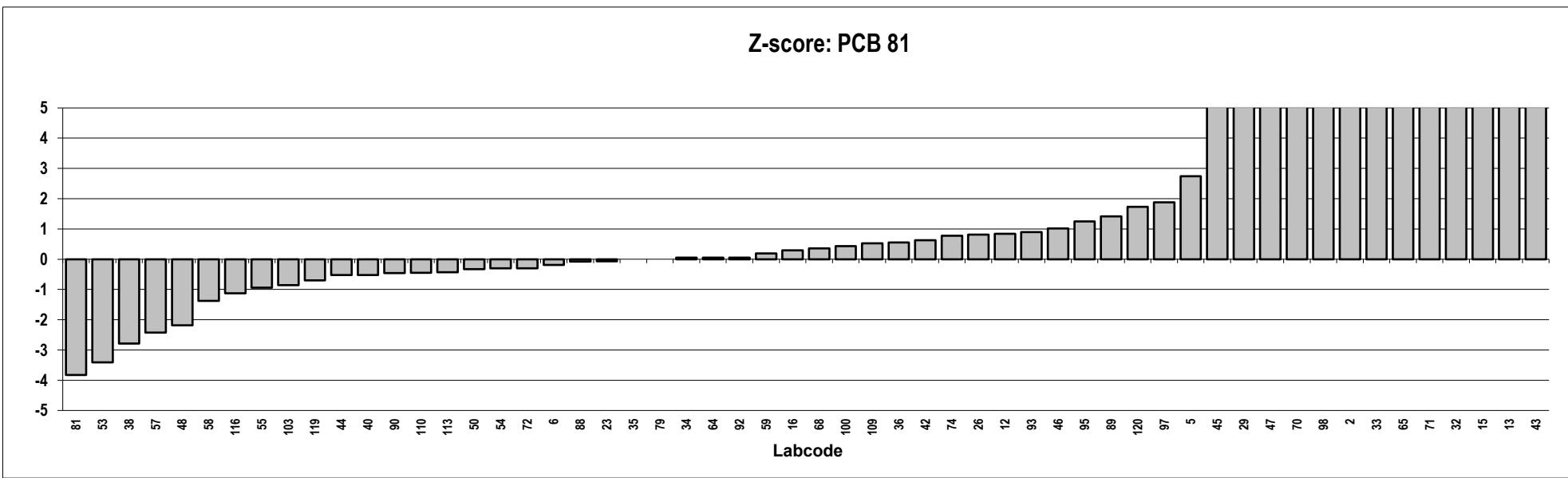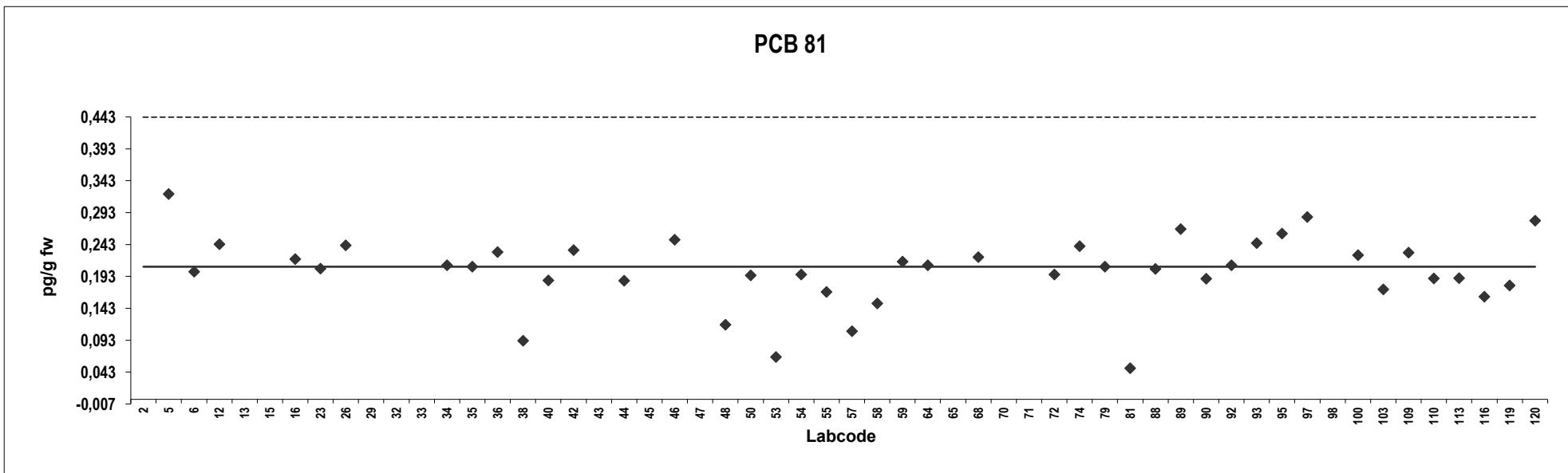
Herring
Congener: PCB 105

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	181	0,44		95	147	-0,58	
5	159	-0,22		97	127	-1,2	
6	155	-0,34		98	181	0,43	
12	173	0,20		100	154	-0,37	
13	142	-0,72		103	167	0,032	
15	161	-0,17		109	152	-0,44	
16	170	0,11		110	170	0,11	
23	160	-0,19		113	164	-0,055	
26	159	-0,22		116	125	-1,2	
29	179	0,38		119	186	0,59	
32	153	-0,40		120	138	-0,85	
33	170	0,11					
34	177	0,32					
35	165	-0,032					
36	153	-0,40					
38	173	0,20					
40	174	0,24					
42	179	0,39					
43	130	-1,1					
44	172	0,17					
45	178	0,35					
46	170	0,11					
47	188	0,65					
48	180	0,43					
50	170	0,13					
53	176	0,30					
54	147	-0,57					
55	177	0,32					
57	117	-1,5					
58	173	0,21					
59	177	0,32					
64	173	0,20					
65	142	-0,72					
68	191	0,75					
70	163	-0,098					
71	142	-0,72					
72	179	0,40					
74	168	0,053					
79	165	-0,032					
81	144	-0,67					
88	172	0,16					
89	144	-0,67					
90	152	-0,43					
92	160	-0,19					
93	133	-1,0					

Consensus statistics

Consensus median, pg/g	166
Median all values pg/g	166
Consensus mean, pg/g	162
Standard deviation, pg/g	17
Relative standard deviation, %	11
No. of values reported	56
No. of values removed	0
No. of reported non-detects	0

PCB 105

Z-score: PCB 105
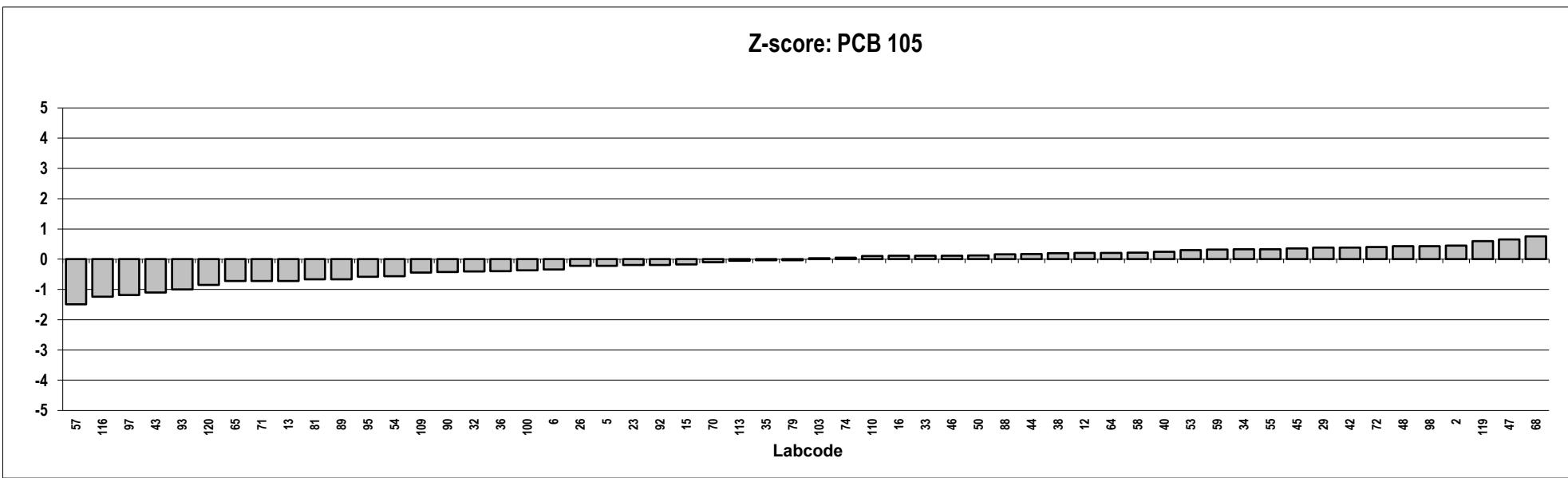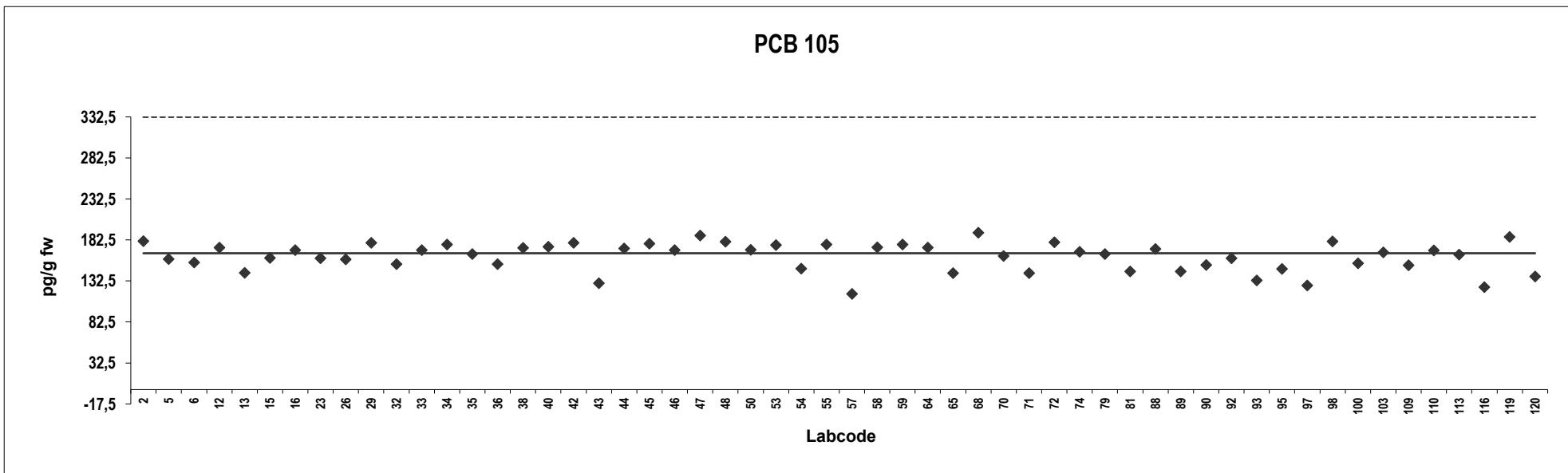
Herring
Congener: PCB 114

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	8,7	0,076		95	9,6	0,59	
5	8,8	0,099		97	6,4	-1,3	
6	8,1	-0,31		98	9,6	0,62	
12	9,9	0,75		100	10	0,89	
13	8,1	-0,30		103	7,7	-0,50	
15	8,9	0,17		109	7,9	-0,42	
16	8,2	-0,22		110	8,6	0,0022	
23	7,4	-0,72		113	10	0,83	ND
26	9,8	0,70		116	6,2	-1,4	
29	9,0	0,23		119	9,6	0,57	
32	4,1	-2,6		120	18	5,2	Outlier
33	9,4	0,48					
34	8,4	-0,082					
35	8,3	-0,14					
36	10	1,1					
38	8,5	-0,020					
40	8,5	-0,064					
42	12	1,8					
43	9,0	0,24					
44	9,6	0,57					
45	8,6	0,00					
46	8,3	-0,16					
47	10	0,83	ND				
48	6,9	-1,0					
50	8,6	0,028					
53	7,1	-0,89					
54	16	4,4					
55	8,3	-0,14					
57	8,1	-0,29					
58	9,3	0,39					
59	10	0,80					
64	8,6	0,012					
65	7,5	-0,64					
68	10	0,97					
70	14	3,1					
71	7,5	-0,64					
72	7,6	-0,58					
74	8,4	-0,10					
79	8,3	-0,14					
81	8,3	-0,14					
88	8,5	-0,063					
89	22	7,8	Outlier				
90	7,2	-0,81					
92	10	0,83					
93	21	7,1	Outlier,ND				

Consensus statistics

Consensus median, pg/g	8,6
Median all values pg/g	8,6
Consensus mean, pg/g	8,8
Standard deviation, pg/g	1,8
Relative standard deviation, %	20
No. of values reported	56
No. of values removed	3
No. of reported non-detects	3

PCB 114

Labcode

Z-score: PCB 114
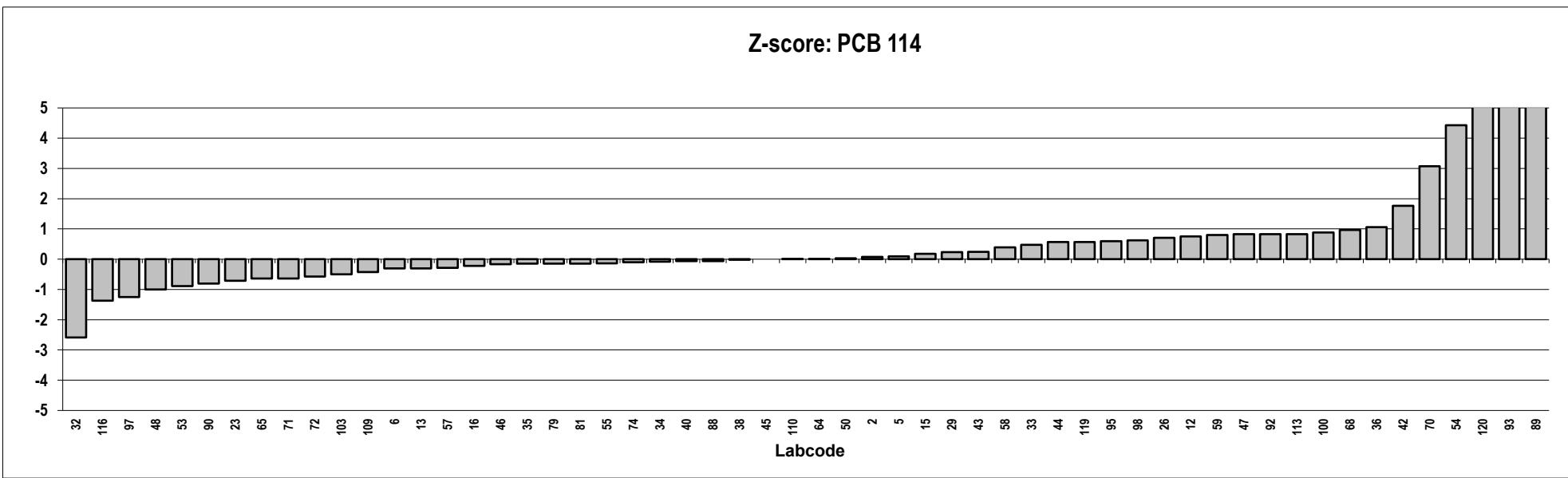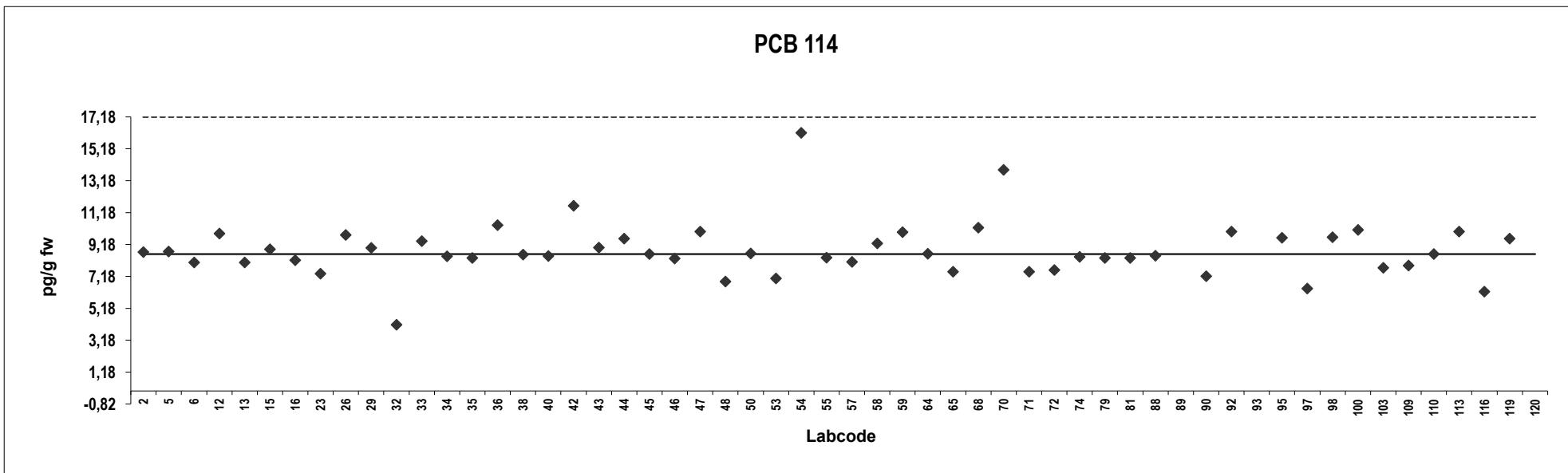
Labcode

Herring
Congener: PCB 118

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	621	0,83		95	511	-0,21	
5	536	0,028		97	395	-1,3	
6	493	-0,38		98	461	-0,67	
12	533	0,00		100	462	-0,67	
13	477	-0,53		103	530	-0,028	
15	498	-0,33		109	448	-0,80	
16	560	0,25		110	584	0,48	
23	545	0,11		113	531	-0,020	
26	536	0,029		116	409	-1,2	
29	562	0,27		119	492	-0,38	
32	482	-0,48		120	448	-0,80	
33	540	0,066					
34	589	0,53					
35	534	0,0058					
36	495	-0,36					
38	566	0,31					
40	543	0,095					
42	604	0,67					
43	458	-0,71					
44	537	0,038					
45	554	0,19					
46	533	0,00					
47	652	1,1					
48	565	0,30					
50	503	-0,28					
53	550	0,16					
54	421	-1,0					
55	552	0,17					
57	367	-2					
58	543	0,093					
59	573	0,38					
64	563	0,28					
65	474	-0,55					
68	614	0,76					
70	428	-0,99					
71	474	-0,55					
72	569	0,34					
74	531	-0,019					
79	534	0,0058					
81	570	0,35					
88	550	0,16					
89	474	-0,56					
90	482	-0,48					
92	500	-0,31					
93	439	-0,88					

Consensus statistics

Consensus median, pg/g	533
Median all values pg/g	533
Consensus mean, pg/g	518
Standard deviation, pg/g	59
Relative standard deviation, %	11
No. of values reported	56
No. of values removed	0
No. of reported non-detects	0

PCB 118

Z-score: PCB 118
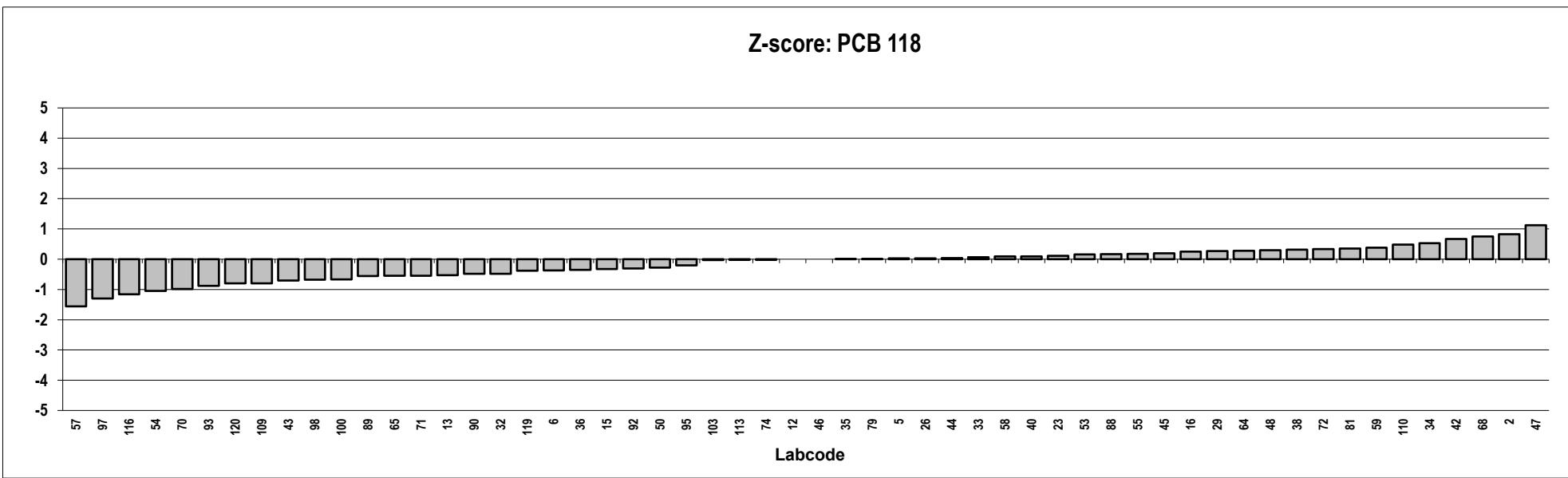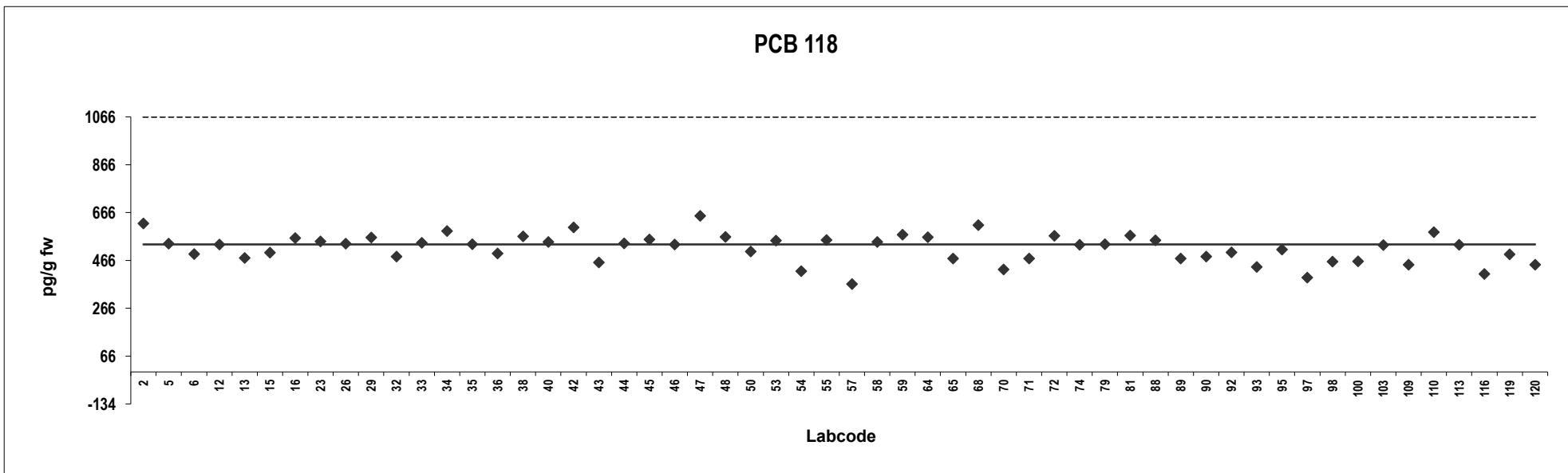
Herring
Congener: PCB 123

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	1,7	-3,3	ND	95	5,6	0,68	
5	6,9	2,0		97	4,3	-0,63	
6	3,4	-1,6		98	31	26	Outlier
12	7,3	2,4		100	3,9	-1,1	
13	66	62	Outlier	103	5,6	0,72	
15	83	79	Outlier	109	83	79	Outlier
16	4,5	-0,44		110	3,9	-1,0	
23	7,8	2,9	ND	113	10	5,1	ND
26	4,3	-0,61		116	3,1	-1,9	
29	29	25	Outlier	119	4,6	-0,37	
32	12	7,0	Outlier	120	4,7	-0,29	
33	3,2	-1,8					
34	9,4	4,5					
35	2,9	-2,1					
36	6,0	1,1					
38	9,9	5,0					
40	5,2	0,3					
42	23	19	Outlier				
43	83	79	Outlier				
44	5,2	0,30					
45	34	29	Outlier				
46	6,3	1,4					
47	8,0	3,1	ND				
48	9,0	4,1					
50	2,8	-2,2					
53	6,7	1,8					
54	4,3	-0,68					
55	5,7	0,75					
57	16	12	Outlier				
58	5,2	0,25					
59	13	8,5	Outlier				
64	3,9	-1,0					
65	3,1	-1,9	ND				
68	3,9	-1,1					
70	5,0	0,069	ND				
71	3,1	-1,9	ND				
72	22	17	Outlier				
74	6,2	1,3					
79	2,9	-2,1					
81	7,1	2,2					
88	4,9	0,00					
89	3,4	-1,6	ND				
90	4,7	-0,25					
92	10	5,1					
93	22	17	Outlier,ND				

Consensus statistics

Consensus median, pg/g	4,9
Median all values pg/g	5,7
Consensus mean, pg/g	5,3
Standard deviation, pg/g	2,1
Relative standard deviation, %	40
No. of values reported	56
No. of values removed	13
No. of reported non-detects	9

PCB 123

Labcode

pg/g fw

Z-score: PCB 123
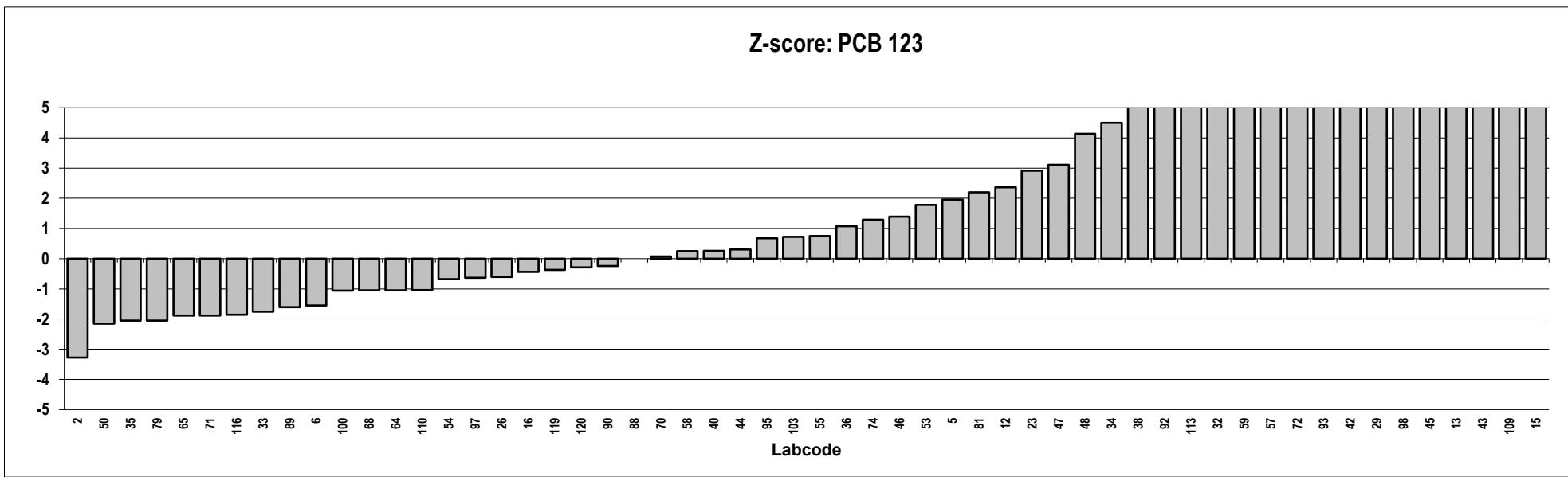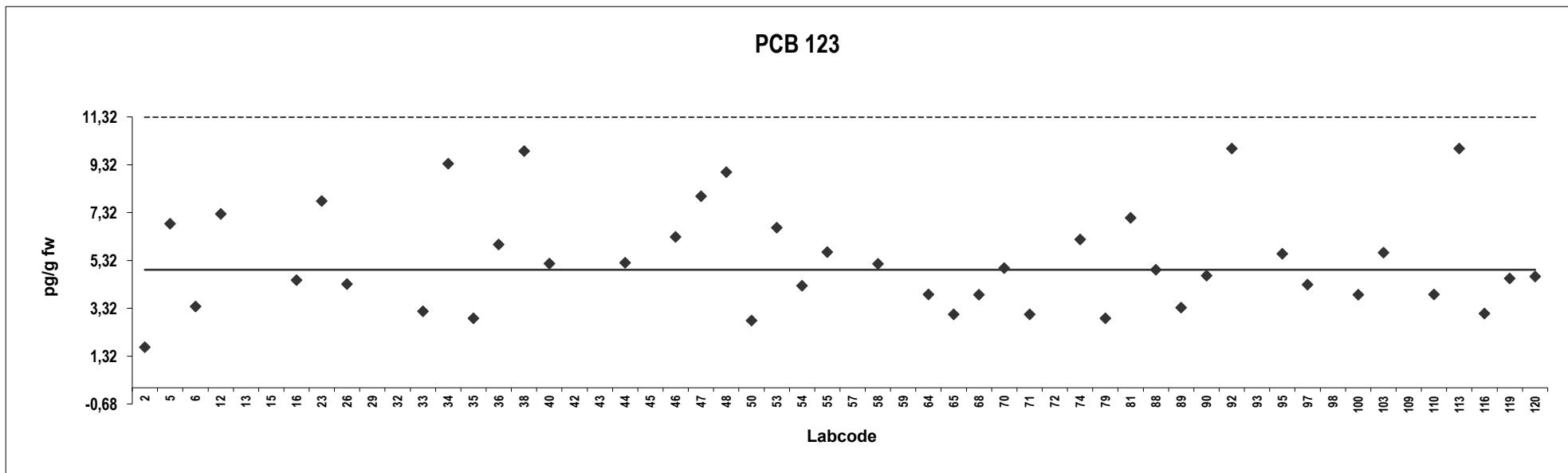
Labcode

Herring
Congener: PCB 156

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	44	-0,25		95	47	0,043	
5	44	-0,27		97	36	-1,1	
6	47	0,062		98	46	-0,050	
12	49	0,32		100	47	0,054	
13	48	0,15		103	48	0,17	
15	44	-0,22		109	43	-0,33	
16	48	0,18		110	50	0,35	
23	44	-0,25		113	48	0,16	
26	46	-0,055		116	35	-1,3	
29	51	0,49		119	39	-0,78	
32	41	-0,58		120	41	-0,56	
33	49	0,29					
34	42	-0,48					
35	46	-0,043					
36	51	0,47					
38	44	-0,23					
40	45	-0,14					
42	49	0,26					
43	42	-0,48					
44	43	-0,31					
45	49	0,31					
46	48	0,18					
47	59	1,3					
48	50	0,44					
50	48	0,23					
53	48	0,13					
54	41	-0,61					
55	48	0,20					
57	41	-0,60					
58	45	-0,094					
59	53	0,69					
64	47	0,075					
65	56	1,0					
68	45	-0,12					
70	47	0,061					
71	56	1,0					
72	49	0,31					
74	49	0,24					
79	46	-0,043					
81	45	-0,17					
88	51	0,46					
89	44	-0,30					
90	43	-0,35					
92	40	-0,68					
93	40	-0,73					

Consenus statistics

Consensus median, pg/g	46
Median all values pg/g	46
Consensus mean, pg/g	46
Standard deviation, pg/g	4,5
Relative standard deviation, %	9,8
No. of values reported	56
No. of values removed	0
No. of reported non-detects	0

PCB 156

Z-score: PCB 156
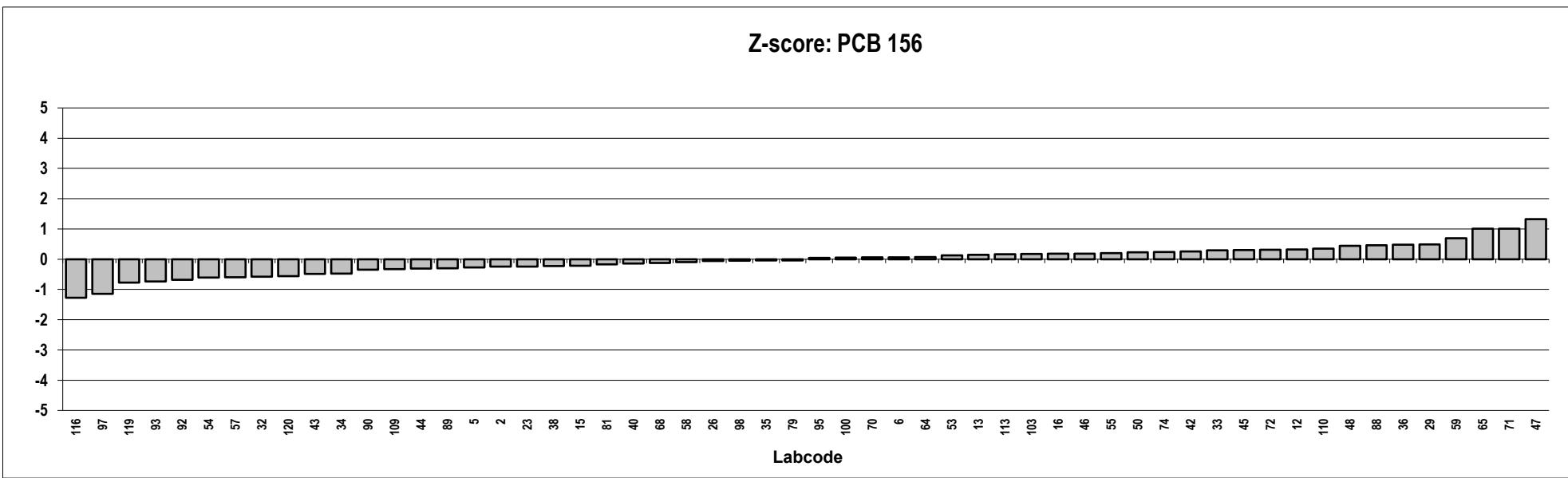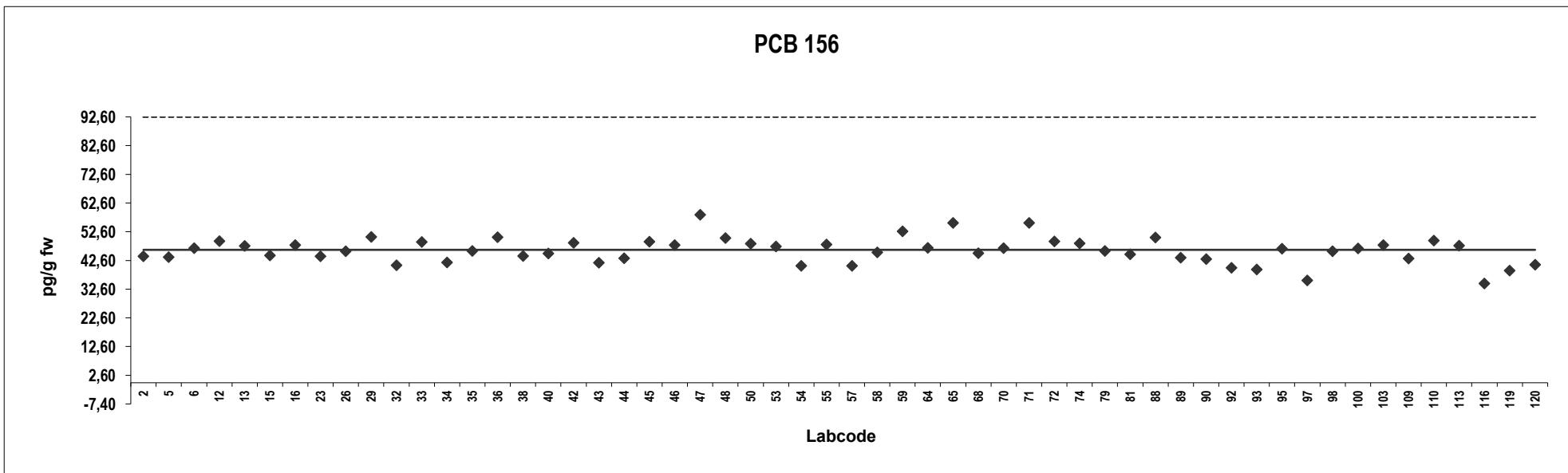
Herring
Congener: PCB 157

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	17	0,24		95	16	-0,080	
5	15	-0,30		97	9,6	-1,9	
6	16	-0,042		98	15	-0,19	
12	16	0,21		100	16	0,14	
13	17	0,43		103	15	-0,17	
15	17	0,43		109	13	-0,91	
16	17	0,40		110	16	0,10	
23	14	-0,56		113	16	0,12	
26	15	-0,23		116	12	-1,3	
29	17	0,55		119	12	-1,2	
32	12	-1,2		120	16	0,015	
33	16	0,079					
34	19	0,90					
35	16	0,13					
36	16	0,21					
38	15	-0,38					
40	16	-0,029					
42	16	0,083					
43	14	-0,58					
44	17	0,33					
45	16	-0,023					
46	16	0,11					
47	15	-0,16					
48	15	-0,17					
50	16	0,22					
53	17	0,33					
54	15	-0,34					
55	16	-0,071					
57	12	-1,1					
58	15	-0,10					
59	18	0,68					
64	16	0,079					
65	56	13	Outlier				
68	16	-0,015					
70	16	0,091					
71	56	13	Outlier				
72	17	0,25					
74	17	0,33					
79	16	0,13					
81	15	-0,27					
88	17	0,35					
89	15	-0,35					
90	14	-0,46					
92	20	1,3					
93	14	-0,68					

Consensus statistics

Consensus median, pg/g	16
Median all values pg/g	16
Consensus mean, pg/g	15
Standard deviation, pg/g	1,8
Relative standard deviation, %	11
No. of values reported	56
No. of values removed	2
No. of reported non-detects	0

PCB 157

Z-score: PCB 157
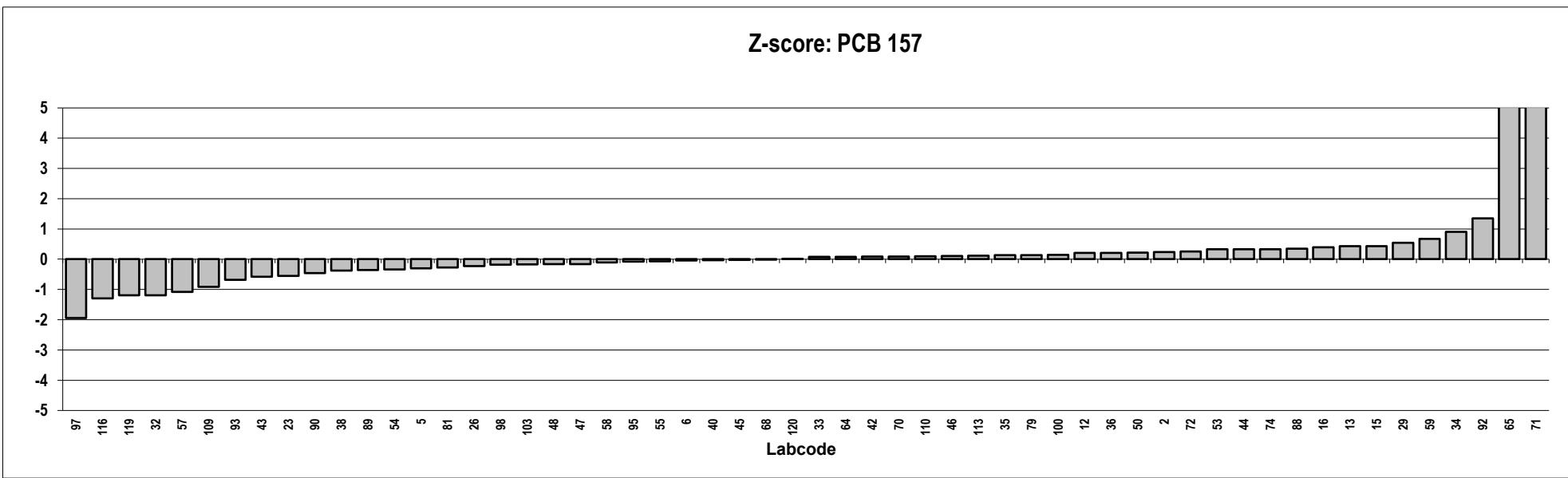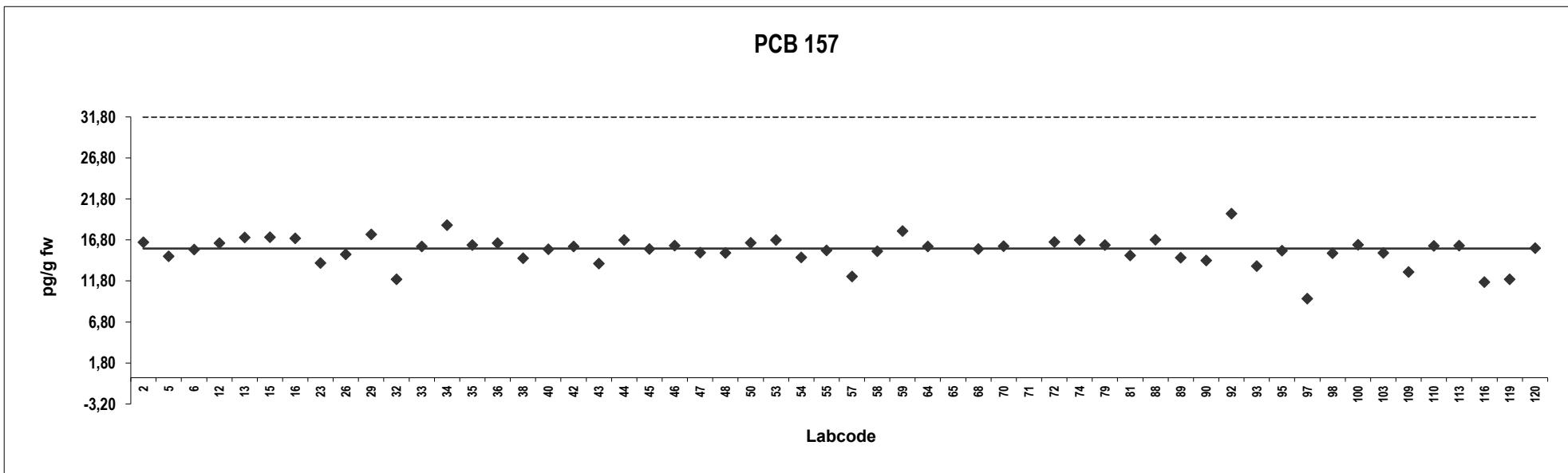
Herring
Congener: PCB 167

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	28	0,53		95	19	-1,2	
5	21	-0,82		97	18	-1,3	
6	24	-0,23		98	25	0,047	
12	27	0,32		100	26	0,22	
13	28	0,58		103	25	-0,021	
15	26	0,28		109	23	-0,42	
16	26	0,18		110	25	-0,054	
23	25	-0,023		113	31	1,2	
26	25	0,0012		116	18	-1,4	
29	29	0,69		119	22	-0,68	
32	24	-0,19		120	54	5,7	Outlier
33	29	0,77					
34	27	0,38					
35	26	0,22					
36	23	-0,48					
38	25	-0,017					
40	26	0,23					
42	25	-0,0012					
43	17	-1,6					
44	25	-0,0031					
45	28	0,58					
46	29	0,77					
47	33	1,5					
48	28	0,64					
50	24	-0,29					
53	27	0,37					
54	32	1,4					
55	27	0,28					
57	24	-0,31					
58	23	-0,37					
59	22	-0,55					
64	27	0,38					
65	22	-0,63					
68	26	0,18					
70	24	-0,24					
71	22	-0,63					
72	132	21	Outlier				
74	29	0,67					
79	26	0,22					
81	25	-0,10					
88	29	0,71					
89	22	-0,58					
90	26	0,096					
92	20	-1,0					
93	25	-0,083					

Consensus statistics

Consensus median, pg/g	25
Median all values pg/g	25
Consensus mean, pg/g	25
Standard deviation, pg/g	3,3
Relative standard deviation, %	13
No. of values reported	56
No. of values removed	2
No. of reported non-detects	0

PCB 167

Z-score: PCB 167
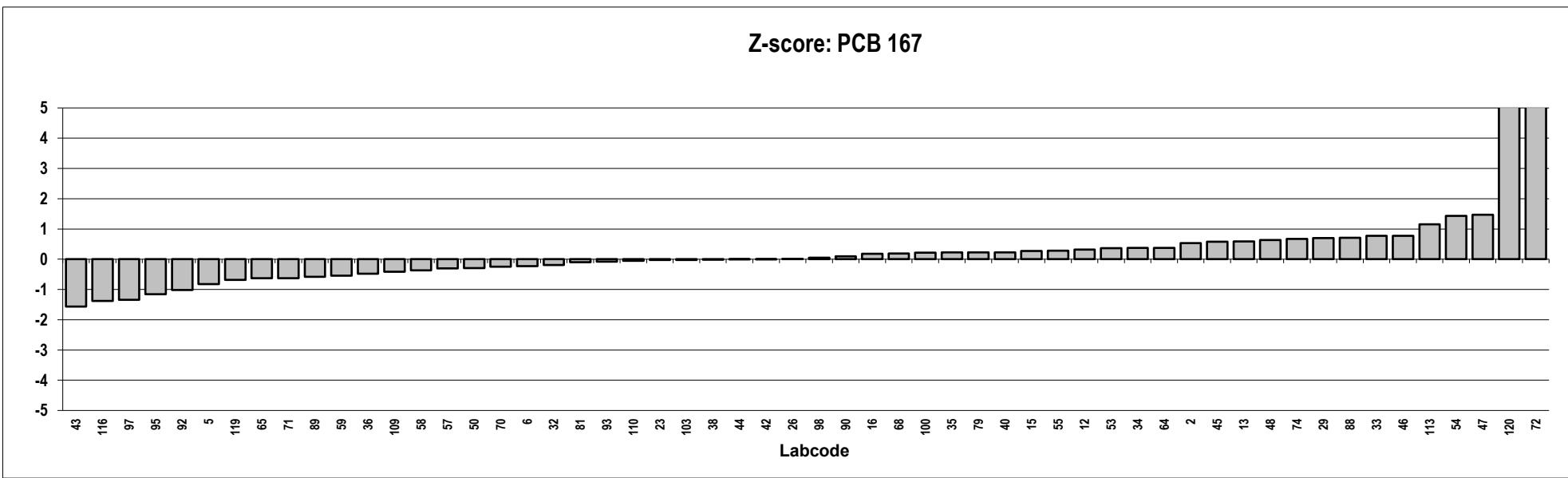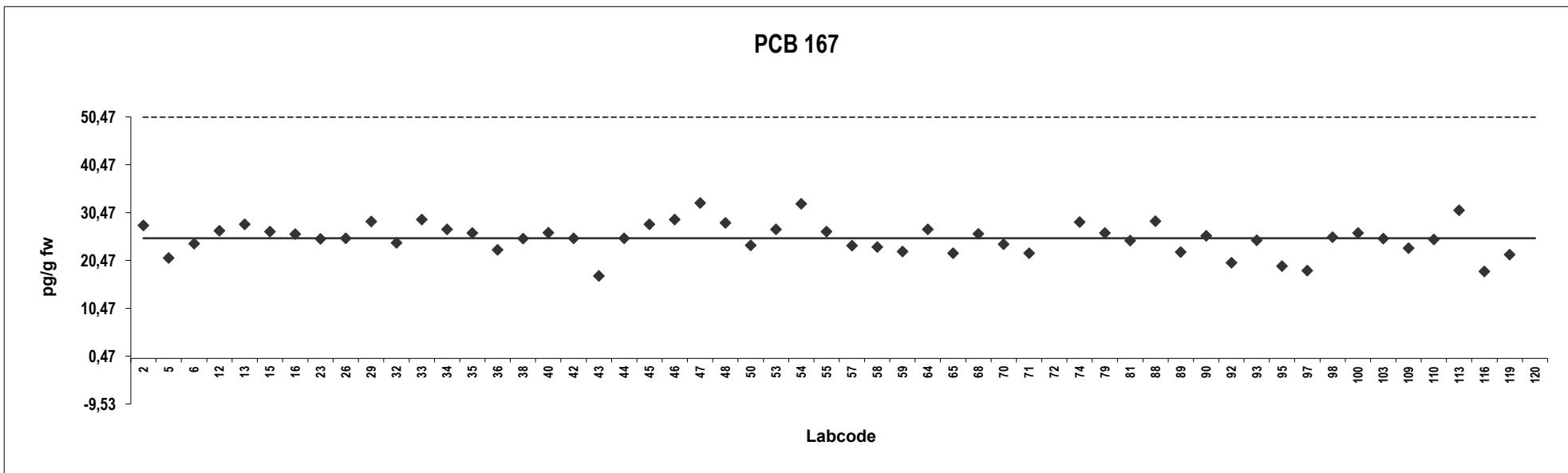
Herring
Congener: PCB 189

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	5,1	-0,19	ND	95	5,4	0,090	
5	4,9	-0,35		97	4,1	-1,1	
6	5,2	-0,11		98	5,1	-0,16	
12	5,0	-0,31		100	5,0	-0,27	
13	5,6	0,27		103	6,2	0,83	
15	5,2	-0,11		109	4,7	-0,59	
16	5,3	-0,0039		110	5,2	-0,080	
23	4,8	-0,52		113	10	4,4	ND
26	5,6	0,25		116	3,9	-1,3	
29	6,0	0,66		119	4,7	-0,55	
32	4,8	-0,50		120	18	12	Outlier
33	5,8	0,47					
34	5,2	-0,15					
35	5,3	0,00					
36	5,3	-0,042					
38	5,1	-0,19					
40	5,3	-0,017					
42	5,6	0,30					
43	7,1	1,6					
44	5,6	0,30					
45	5,6	0,28					
46	6,2	0,84					
47	10	4,4	ND				
48	5,2	-0,13					
50	5,4	0,061					
53	5,7	0,35					
54	4,9	-0,39					
55	5,5	0,14					
57	4,7	-0,57					
58	5,1	-0,18					
59	5,9	0,54					
64	5,4	0,090					
65	4,8	-0,52					
68	6,0	0,70					
70	5,2	-0,15					
71	4,8	-0,52					
72	6,3	0,89					
74	6,1	0,75					
79	5,3	0,00					
81	6,4	1,1					
88	5,9	0,53					
89	5,3	-0,029					
90	5,5	0,2					
92	10	4,4					
93	7,7	2,3	ND				

Consensus statistics	
Consensus median, pg/g	5,3
Median all values pg/g	5,3
Consensus mean, pg/g	5,6
Standard deviation, pg/g	1,2
Relative standard deviation, %	22
No. of values reported	56
No. of values removed	1
No. of reported non-detects	4

PCB 189

pg/g fw

Labcode

Z-score: PCB 189
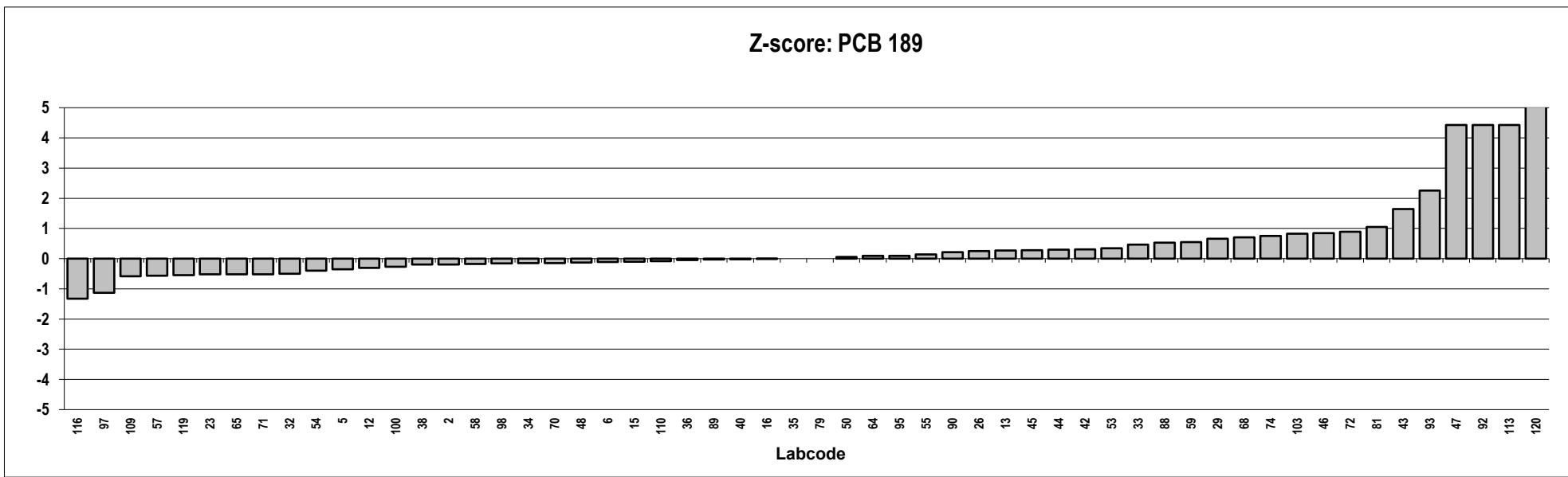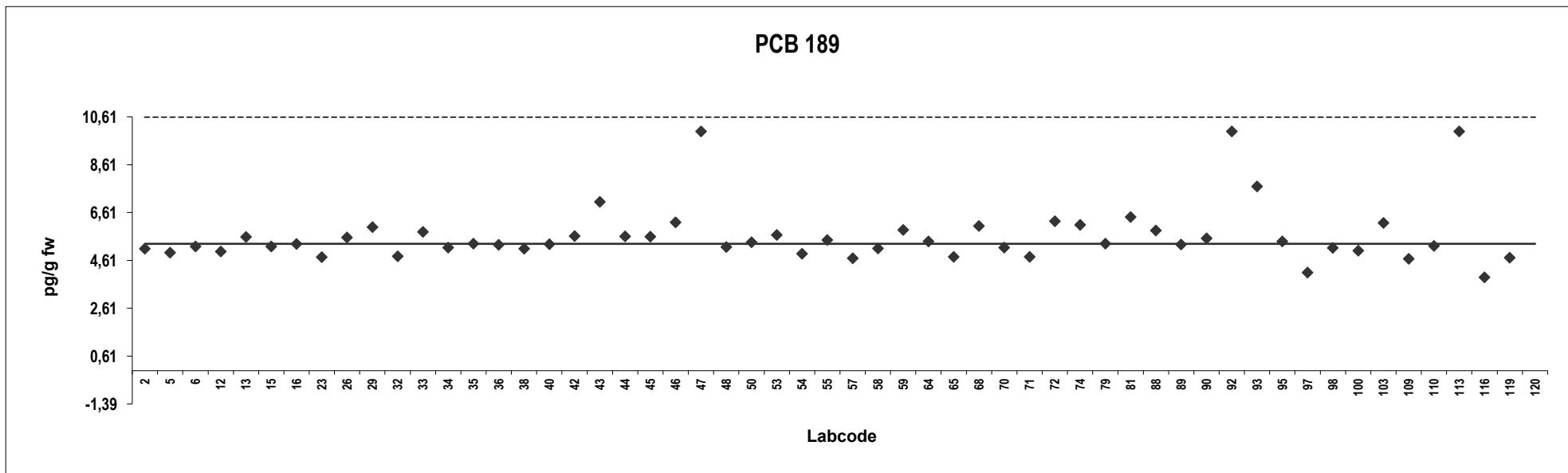
Labcode

Herring
Congener: PCB 28

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	196	0,68		116	182	0,29	
5	204	0,91		119	142	-0,88	
12	133	-1,1		120	183	0,30	
16	190	0,51					
23	235	1,8					
26	171	-0,050					
29	185	0,35					
32	133	-1,1					
33	200	0,80					
34	126	-1,3					
35	133	-1,1					
36	109	-1,8					
38	158	-0,41					
40	163	-0,28					
42	350	5,1					
44	177	0,13					
45	173	0,00					
46	177	0,13					
47	200	0,80	ND				
48	200	0,78					
50	228	1,6					
53	237	1,9					
54	246	2,1					
55	163	-0,27					
57	88	-2,4					
58	246	2,1					
59	165	-0,21					
65	139	-0,97					
68	211	1,1					
70	500	9,5	Outlier,ND				
72	179	0,17					
74	175	0,072					
79	133	-1,1					
88	138	-1,0					
89	146	-0,76					
90	175	0,072					
92	150	-0,65					
93	157	-0,45					
97	120	-1,5					
98	148	-0,72					
100	185	0,37					
103	203	0,87					
109	376	5,9	Outlier				
110	172	-0,019					
113	167	-0,15					

Consenus statistics

Consensus median, pg/g	173
Median all values pg/g	175
Consensus mean, pg/g	176
Standard deviation, pg/g	44
Relative standard deviation, %	25
No. of values reported	48
No. of values removed	2
No. of reported non-detects	2

PCB 28

Z-score: PCB 28
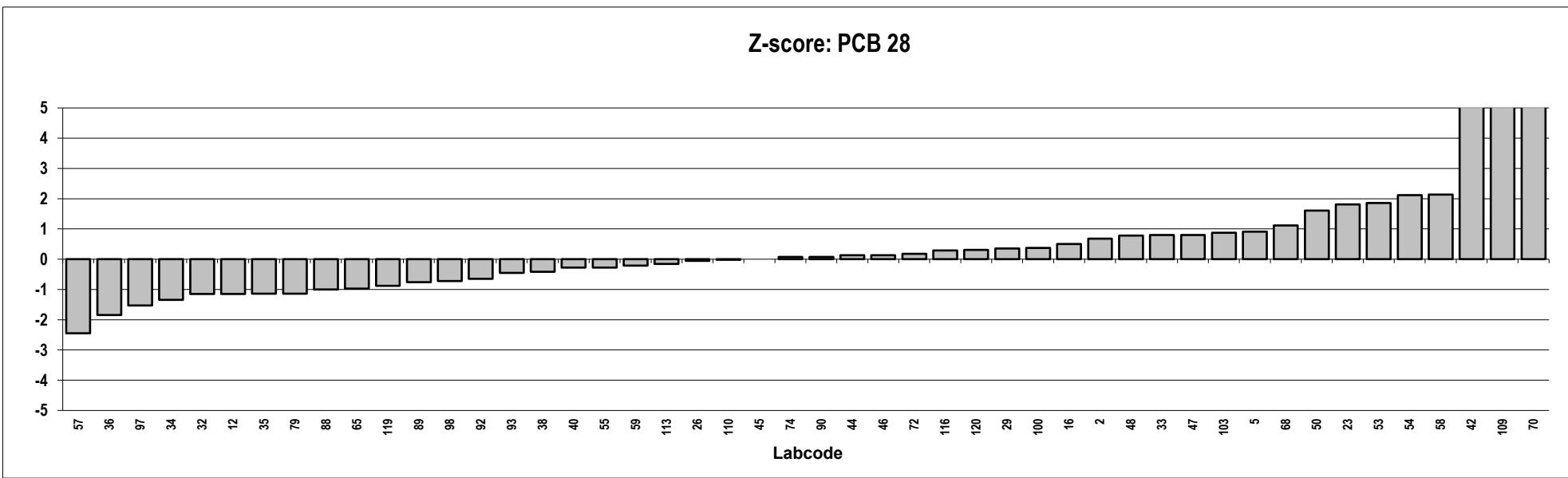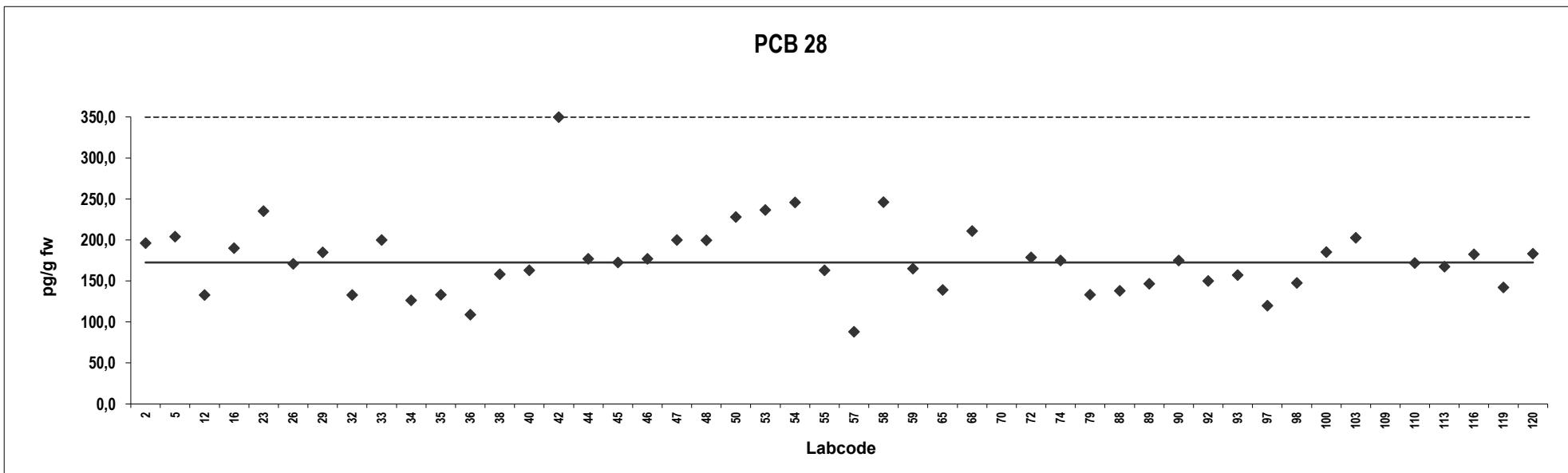
Herring
Congener: PCB 52

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	508	0,64		116	317	-1,5	
5	482	0,36		119	439	-0,1	
12	453	0,033		120	450	0,00	
16	530	0,89					
23	475	0,28					
26	477	0,30					
29	501	0,57					
32	381	-0,76					
33	520	0,78					
34	409	-0,45					
35	469	0,21					
36	434	-0,18					
38	521	0,79					
40	447	-0,029					
42	508	0,65					
44	414	-0,40					
45	494	0,48					
46	463	0,14					
47	450	-0,0044					
48	453	0,031					
50	535	0,95					
53	447	-0,029					
54	373	-0,85					
55	416	-0,37					
57	73	-4,2					
58	480	0,33					
59	435	-0,16					
65	333	-1,3					
68	445	-0,056					
70	500	0,56	ND				
72	478	0,31					
74	456	0,067					
79	469	0,21					
88	369	-0,90					
89	410	-0,45					
90	474	0,27					
92	420	-0,33					
93	427	-0,26					
97	384	-0,73					
98	496	0,51					
100	440	-0,12					
103	447	-0,032					
109	585	1,5					
110	447	-0,028					
113	477	0,30					

Consensus statistics

|	
Consensus median, pg/g	450
Median all values pg/g	451
Consensus mean, pg/g	446
Standard deviation, pg/g	75
Relative standard deviation, %	17
No. of values reported	48
No. of values removed	0
No. of reported non-detects	1

PCB 52

Z-score: PCB 52
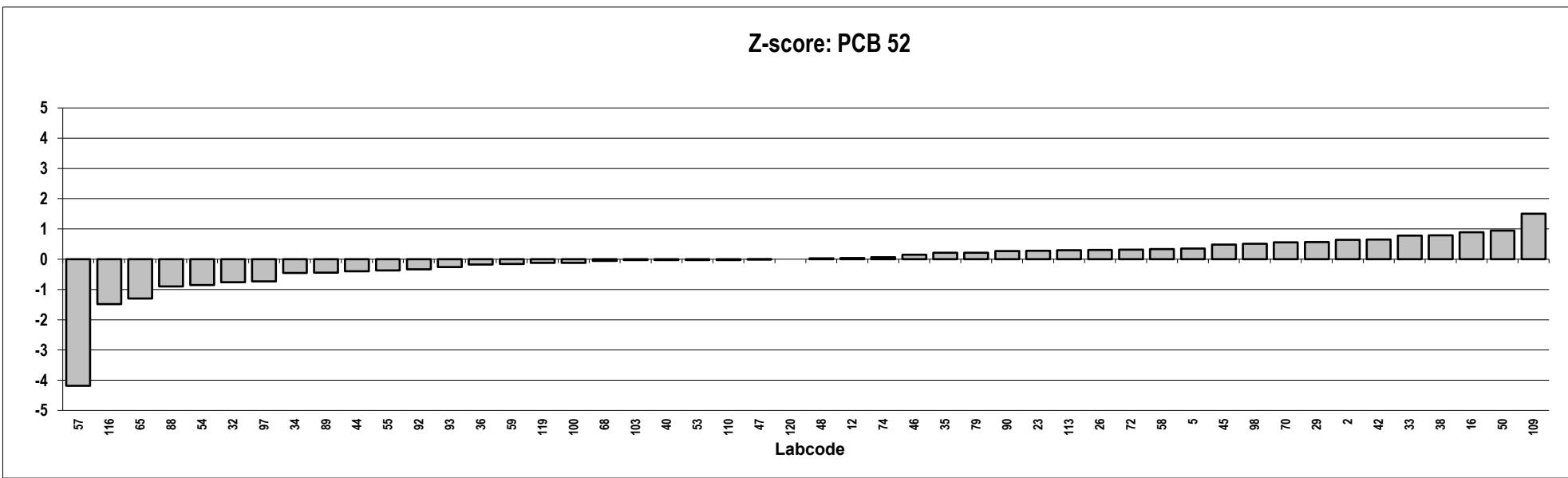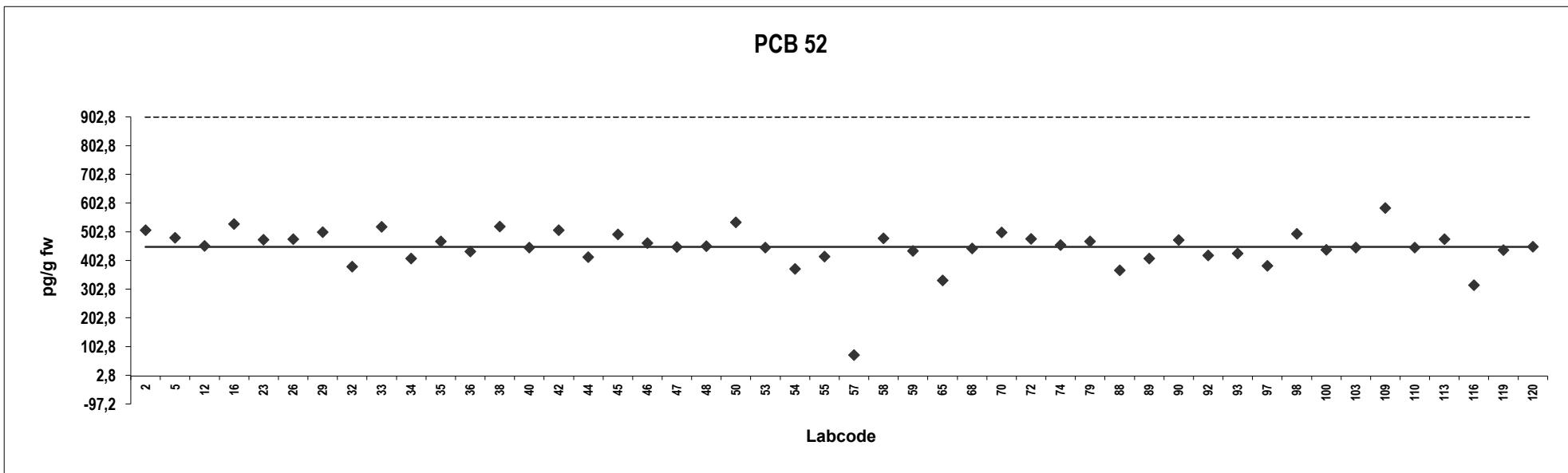
Herring
Congener: PCB 101

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	1020	1,3		116	582	-1,4	
5	953	0,93		119	721	-0,51	
12	773	-0,19		120	760	-0,27	
16	910	0,66					
23	940	0,85					
26	831	0,17					
29	725	-0,48					
32	758	-0,28					
33	930	0,79					
34	685	-0,74					
35	859	0,35					
36	802	-0,0076					
38	804	0,0076					
40	802	-0,0091					
42	902	0,61					
44	724	-0,49					
45	894	0,57					
46	812	0,055					
47	926	0,76					
48	796	-0,042					
50	886	0,52					
53	811	0,047					
54	684	-0,74					
55	807	0,024					
57	275	-3,3					
58	837	0,21					
59	726	-0,48					
65	675	-0,80					
68	822	0,12					
70	767	-0,22					
72	884	0,51					
74	794	-0,057					
79	859	0,35					
88	668	-0,84					
89	717	-0,54					
90	845	0,26					
92	790	-0,082					
93	659	-0,90					
97	777	-0,17					
98	829	0,16					
100	781	-0,14					
103	860	0,35					
109	1083	1,7					
110	861	0,36					
113	771	-0,20					

Consensus statistics

Consensus median, pg/g	803
Median all values pg/g	803
Consensus mean, pg/g	800
Standard deviation, pg/g	123
Relative standard deviation, %	15
No. of values reported	48
No. of values removed	0
No. of reported non-detects	0

PCB 101

Z-score: PCB 101
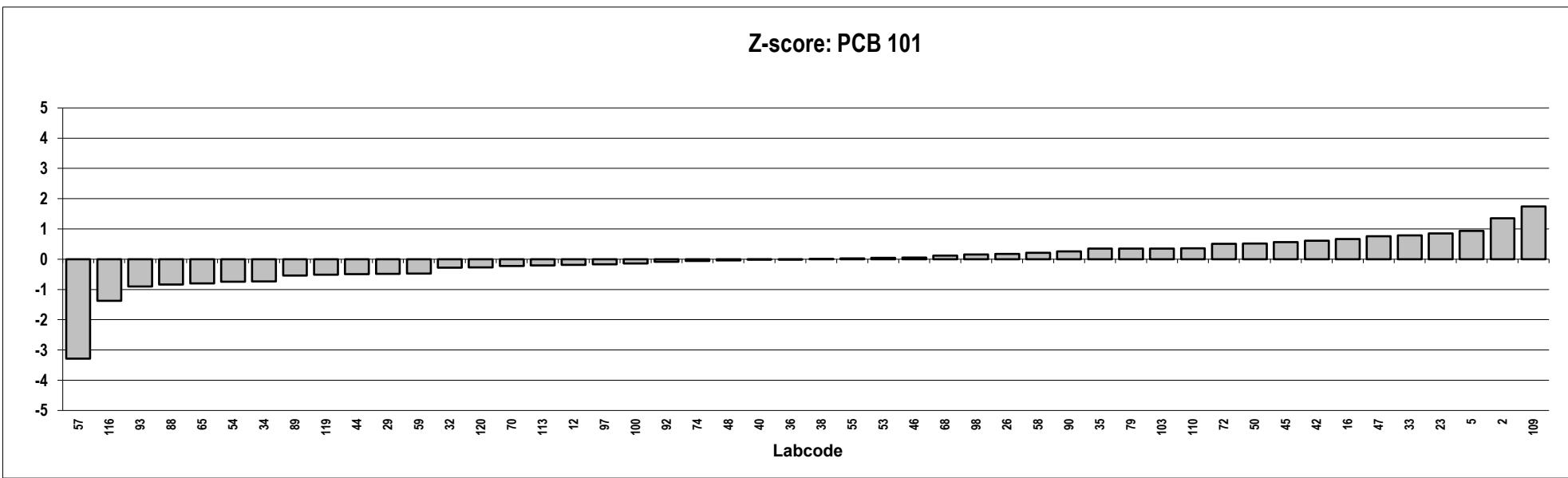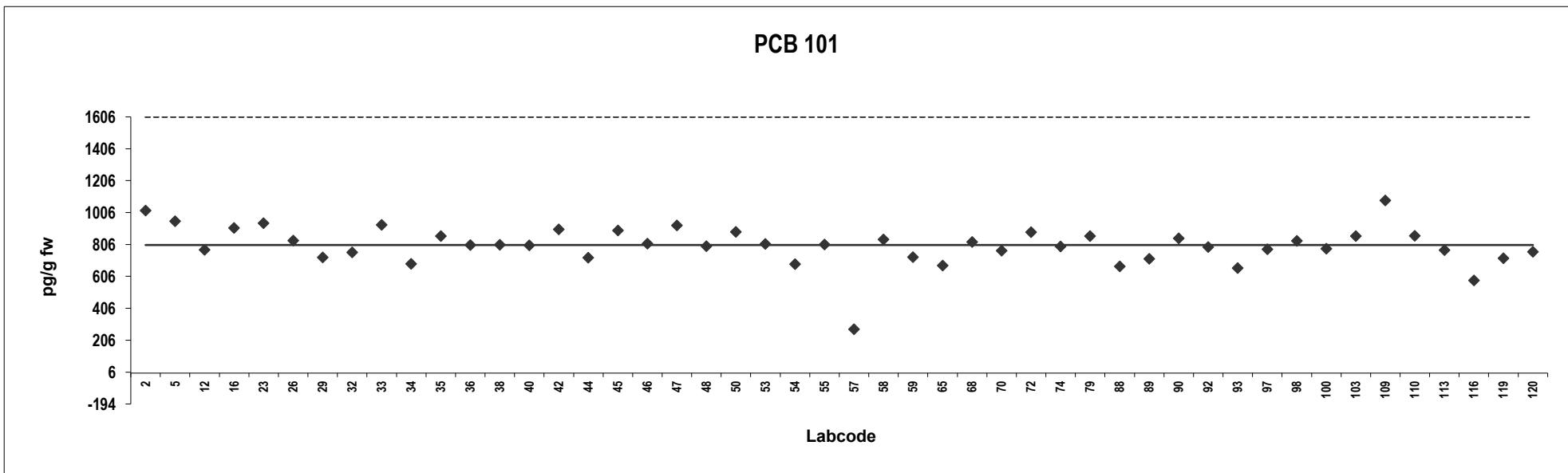
Herring
Congener: PCB 138

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	895	-0,31		116	682	-1,4	
5	1006	0,27		119	1009	0,29	
12	1010	0,29		120	1144	1,0	
16	950	-0,020					
23	1000	0,24					
26	964	0,053					
29	1405	2,4					
32	908	-0,24					
33	1000	0,24					
34	788	-0,87					
35	808	-0,76					
36	963	0,048					
38	742	-1,1					
40	898	-0,29					
42	1182	1,2					
44	1130	0,92					
45	1501	2,9					
46	911	-0,22					
47	997	0,23					
48	906	-0,25					
50	1019	0,34					
53	953	-0,0053					
54	900	-0,28					
55	1010	0,30					
57	821	-0,70					
58	927	-0,14					
59	909	-0,24					
65	1145	1,0					
68	880	-0,39					
70	884	-0,36					
72	1402	2,3					
74	915	-0,20					
79	808	-0,76					
88	723	-1,2					
89	803	-0,79					
90	914	-0,21					
92	970	0,085					
93	783	-0,90					
97	896	-0,30					
98	1405	2,4					
100	955	0,0053					
103	961	0,038					
109	1146	1,0					
110	967	0,069					
113	1022	0,36					

Consensus statistics

Consensus median, pg/g	954
Median all values pg/g	954
Consensus mean, pg/g	977
Standard deviation, pg/g	175
Relative standard deviation, %	18
No. of values reported	48
No. of values removed	0
No. of reported non-detects	0

PCB 138

Z-score: PCB 138
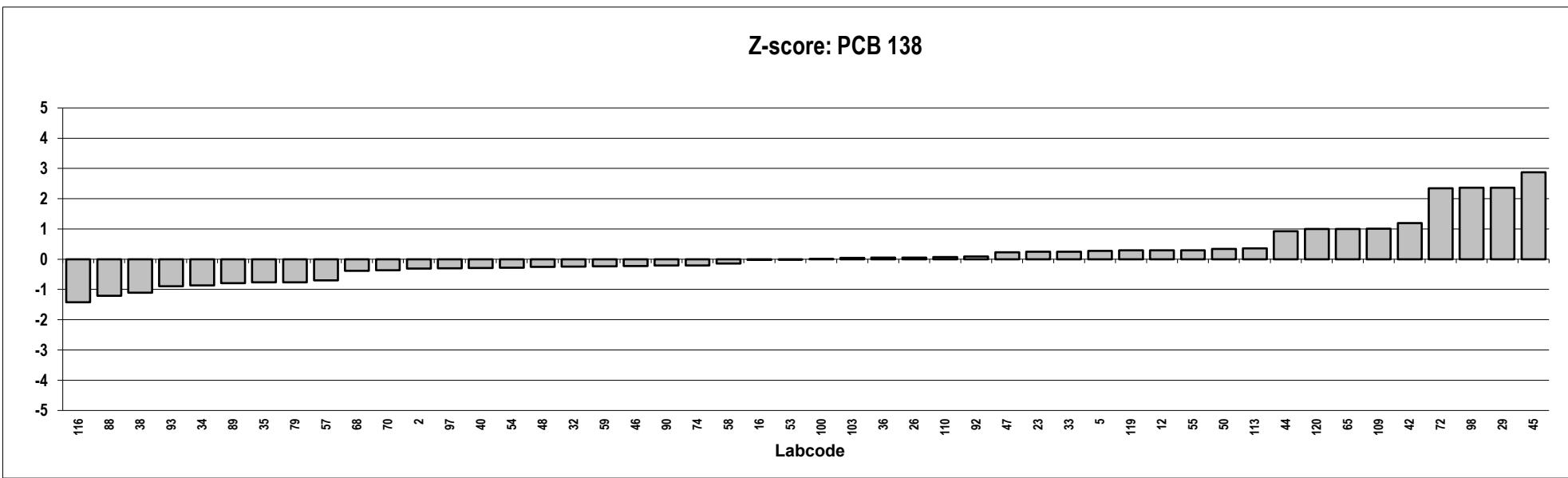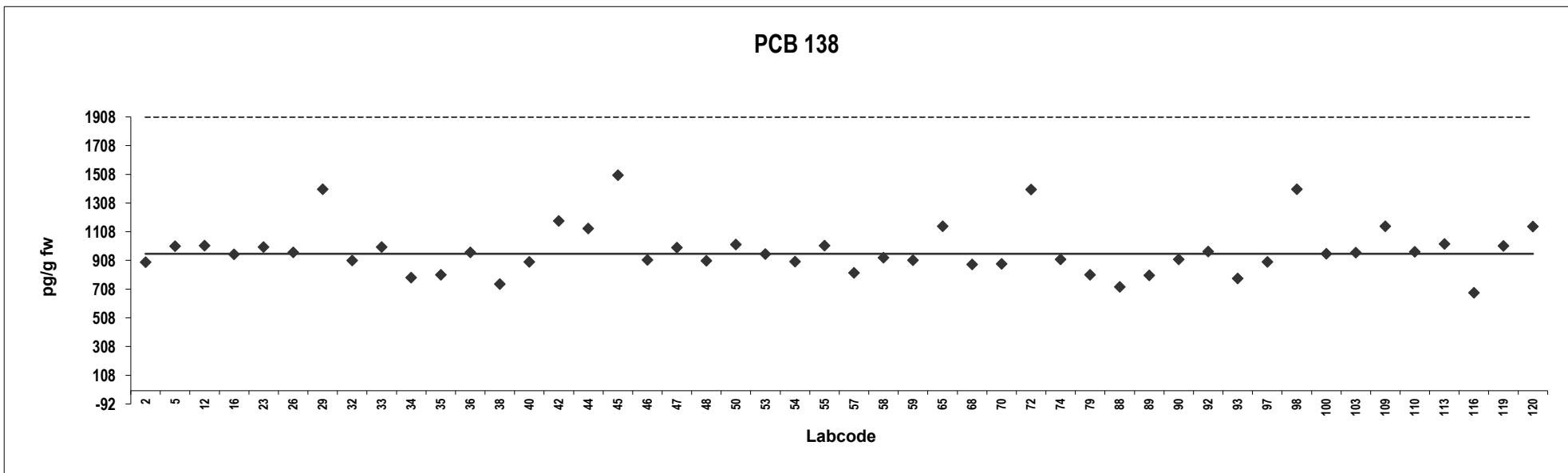
Herring
Congener: PCB 153

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	2430	3,1		116	1064	-1,4	
5	1357	-0,46		119	1313	-0,61	
12	1510	0,047		120	1644	0,49	
16	1800	1,0					
23	1500	0,013					
26	1482	-0,047					
29	1653	0,53					
32	1358	-0,46					
33	1700	0,68					
34	1653	0,52					
35	1471	-0,084					
36	1330	-0,55					
38	1657	0,54					
40	1470	-0,088					
42	1803	1,0					
44	1270	-0,76					
45	1657	0,54					
46	1380	-0,39					
47	1889	1,3					
48	1532	0,12					
50	1560	0,22					
53	1429	-0,22					
54	1267	-0,77					
55	1627	0,44					
57	820	-2,3					
58	1602	0,36					
59	1403	-0,31					
65	1204	-0,97					
68	1588	0,31					
70	1410	-0,29					
72	1468	-0,094					
74	1390	-0,35					
79	1471	-0,084					
88	1120	-1,3					
89	1290	-0,69					
90	1492	-0,013					
92	1600	0,35					
93	1270	-0,76					
97	1393	-0,34					
98	1562	0,22					
100	1531	0,12					
103	1655	0,53					
109	1838	1,1					
110	1558	0,21					
113	1512	0,053					

Consenus statistics

|	
Consensus median, pg/g	1496
Median all values pg/g	1496
Consensus mean, pg/g	1500
Standard deviation, pg/g	244
Relative standard deviation, %	16
No. of values reported	48
No. of values removed	0
No. of reported non-detects	0

PCB 153

Z-score: PCB 153
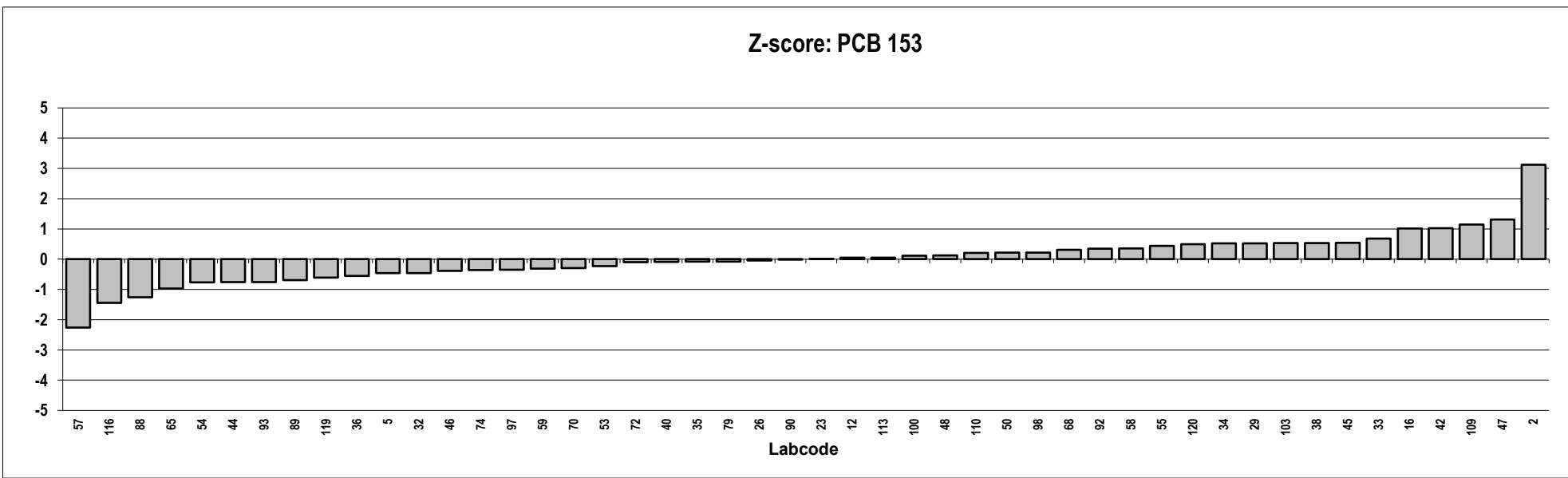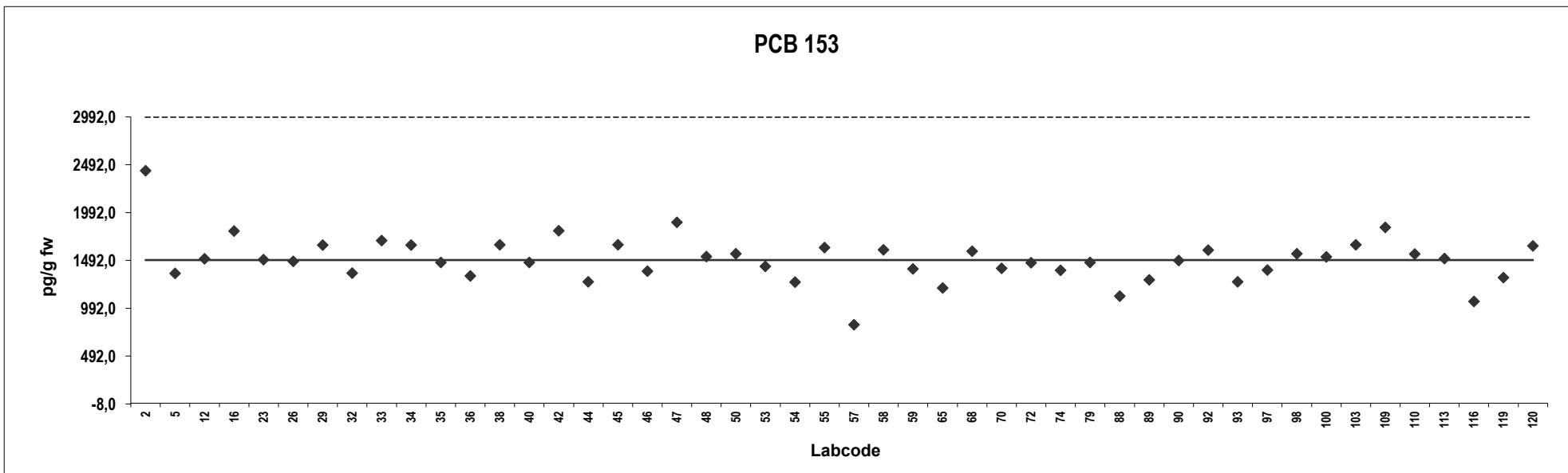
Herring
Congener: PCB 180

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	193	-1,4		116	205	-1,2	
5	266	-0,045		119	232	-0,68	
12	279	0,20		120	265	-0,064	
16	300	0,59					
23	275	0,12					
26	240	-0,54					
29	296	0,51					
32	239	-0,55					
33	310	0,77					
34	237	-0,59					
35	303	0,65					
36	283	0,27					
38	336	1,3					
40	272	0,065					
42	289	0,39					
44	272	0,067					
45	323	1,0					
46	228	-0,75					
47	273	0,087					
48	268	-0,015					
50	276	0,15					
53	279	0,21					
54	221	-0,87					
55	278	0,17					
57	208	-1,1					
58	289	0,39					
59	254	-0,27					
65	196	-1,3					
68	285	0,31					
70	500	4,3	ND				
72	236	-0,60					
74	232	-0,68					
79	303	0,65					
88	214	-1,0					
89	207	-1,1					
90	246	-0,42					
92	240	-0,53					
93	208	-1,1					
97	213	-1,0					
98	297	0,53					
100	268	0,00					
103	276	0,14					
109	323	1,0					
110	252	-0,30					
113	282	0,25					

Consensus statistics

Consensus median, pg/g	268
Median all values pg/g	270
Consensus mean, pg/g	266
Standard deviation, pg/g	50
Relative standard deviation, %	19
No. of values reported	48
No. of values removed	0
No. of reported non-detects	1

PCB 180

Z-score: PCB 180
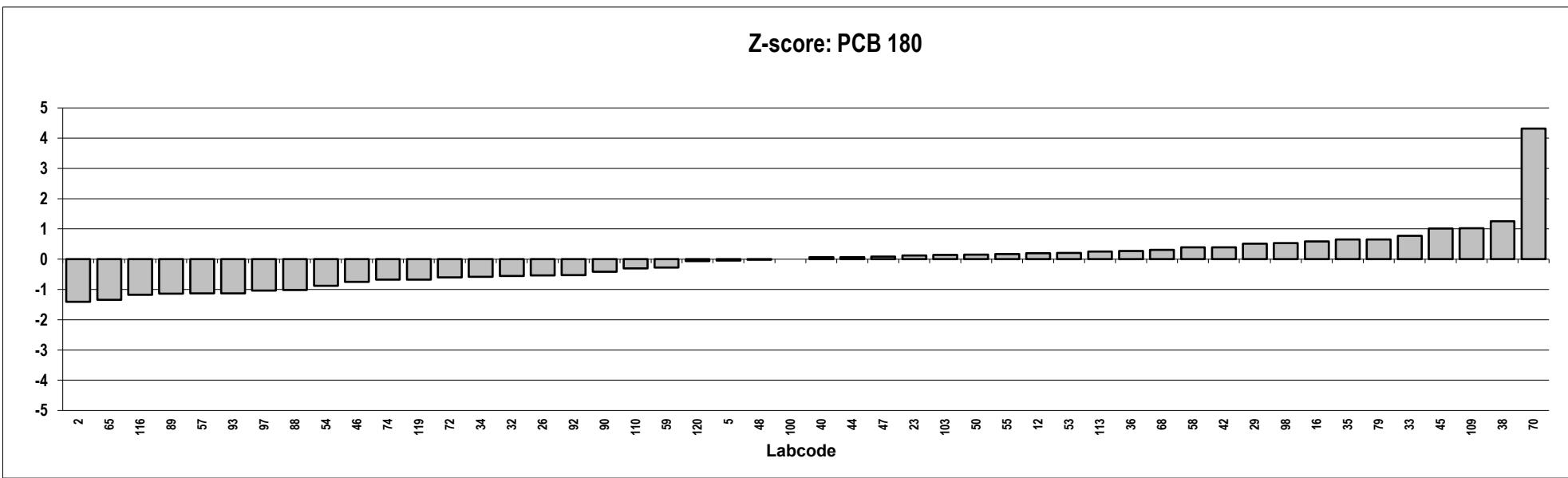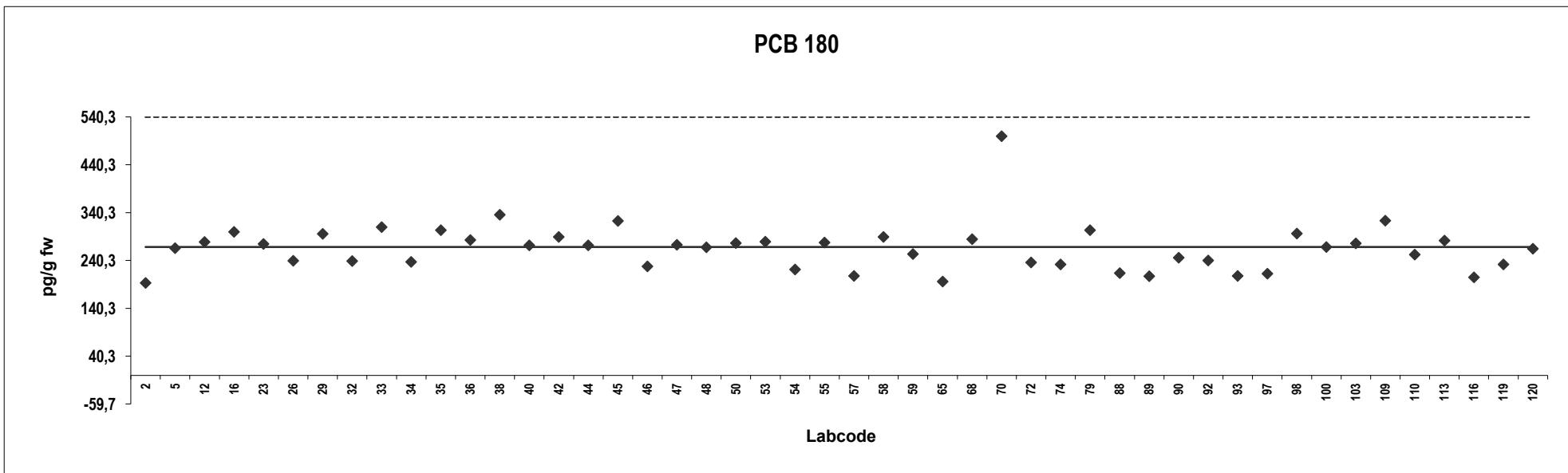
Herring
Congener: PBDE 28

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	16	0,92					
5	14	0,060					
6	11	-0,88					
23	14	0,25					
36	12	-0,50					
43	17	1,3					
44	15	0,73					
45	21	2,9					
53	7,0	-2,4					
55	15	0,52					
68	14	0,25					
89	9,4	-1,5					
90	11	-0,73					
92	12	-0,50					
97	9,0	-1,6					
98	13	0,00					
109	14	0,28					
110	12	-0,45					
119	12	-0,43					

Consenus statistics

Consensus median, pg/g	13
Median all values pg/g	13
Consensus mean, pg/g	13
Standard deviation, pg/g	3,1
Relative standard deviation, %	24
No. of values reported	19
No. of values removed	0
No. of reported non-detects	0

PBDE 28

Z-score: PBDE 28
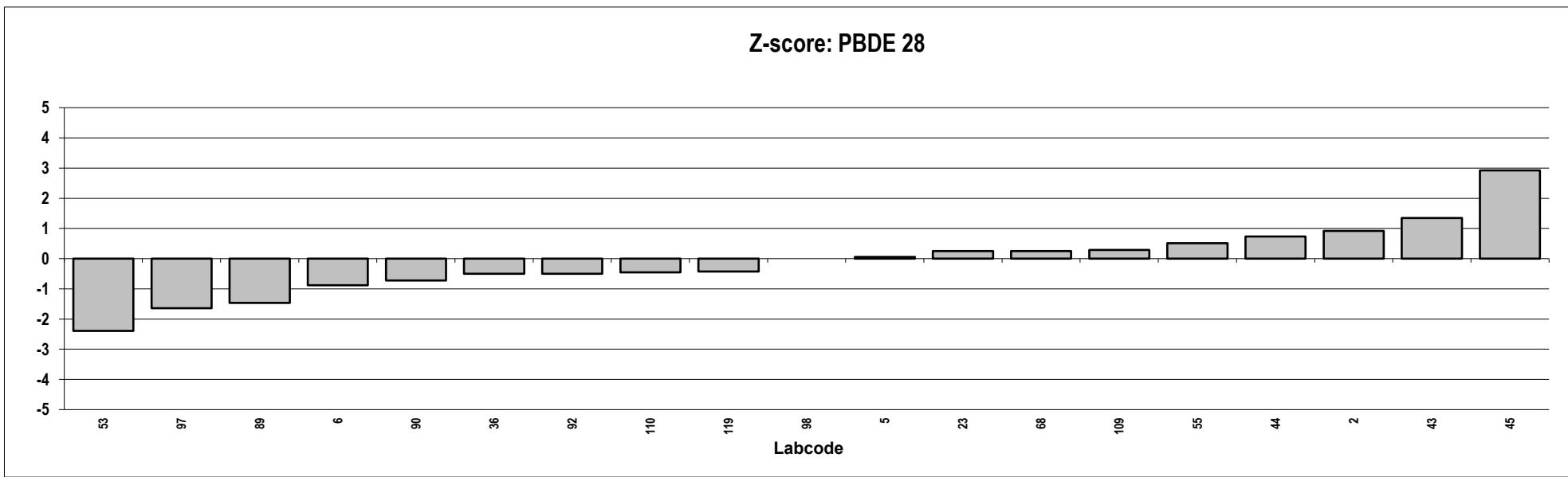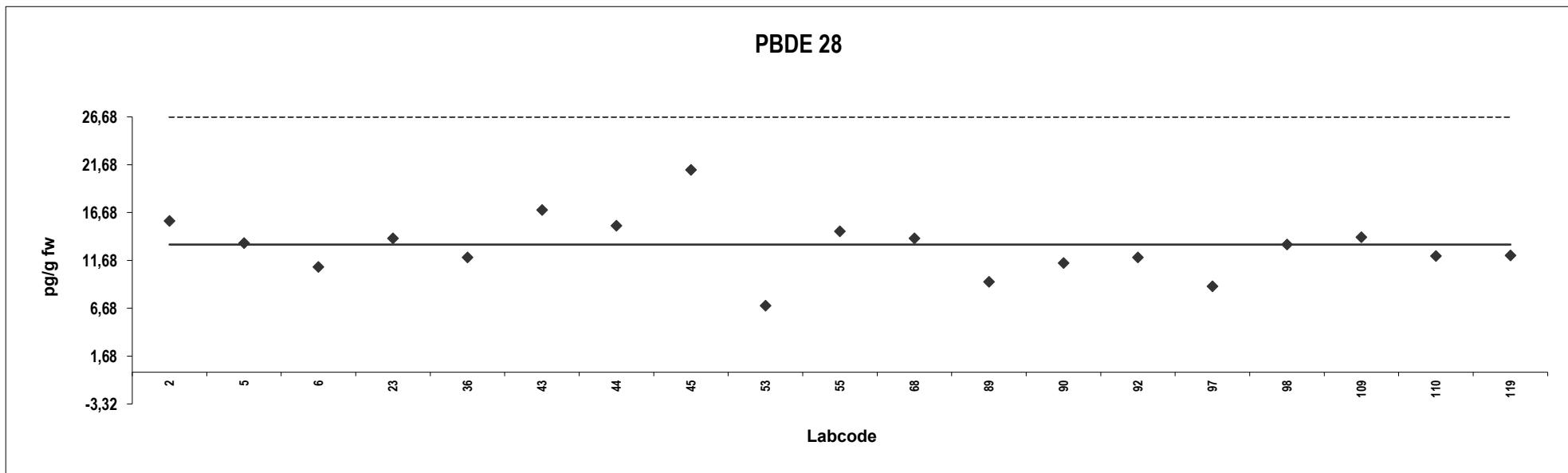
Herring
Congener: PBDE 47

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	310	1,3					
5	255	0,14					
6	246	-0,040					
23	280	0,65					
36	238	-0,20					
40	239	-0,17					
43	225	-0,47					
44	257	0,18					
45	362	2,3					
53	220	-0,56					
55	240	-0,16					
68	288	0,81					
89	210	-0,77					
90	243	-0,10					
92	250	0,040					
97	207	-0,83					
98	323	1,5					
109	279	0,62					
110	252	0,078					
119	164	-1,7					

Consenus statistics

Consensus median, pg/g	248
Median all values pg/g	248
Consensus mean, pg/g	254
Standard deviation, pg/g	44
Relative standard deviation, %	17
No. of values reported	20
No. of values removed	0
No. of reported non-detects	0

PBDE 47

Z-score: PBDE 47
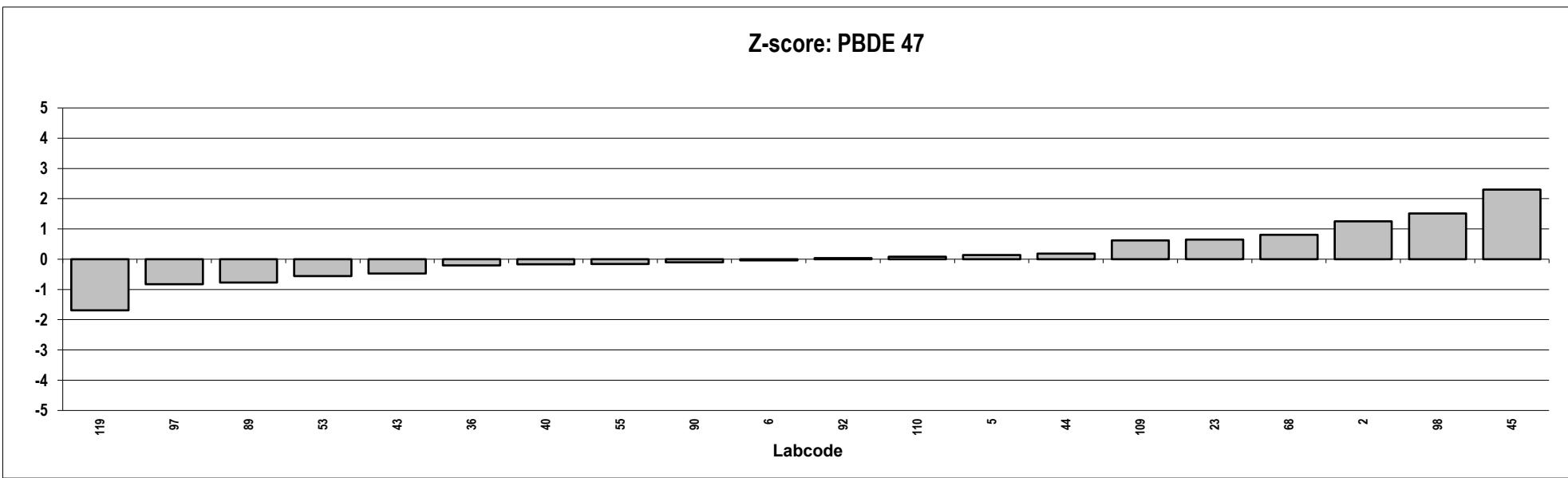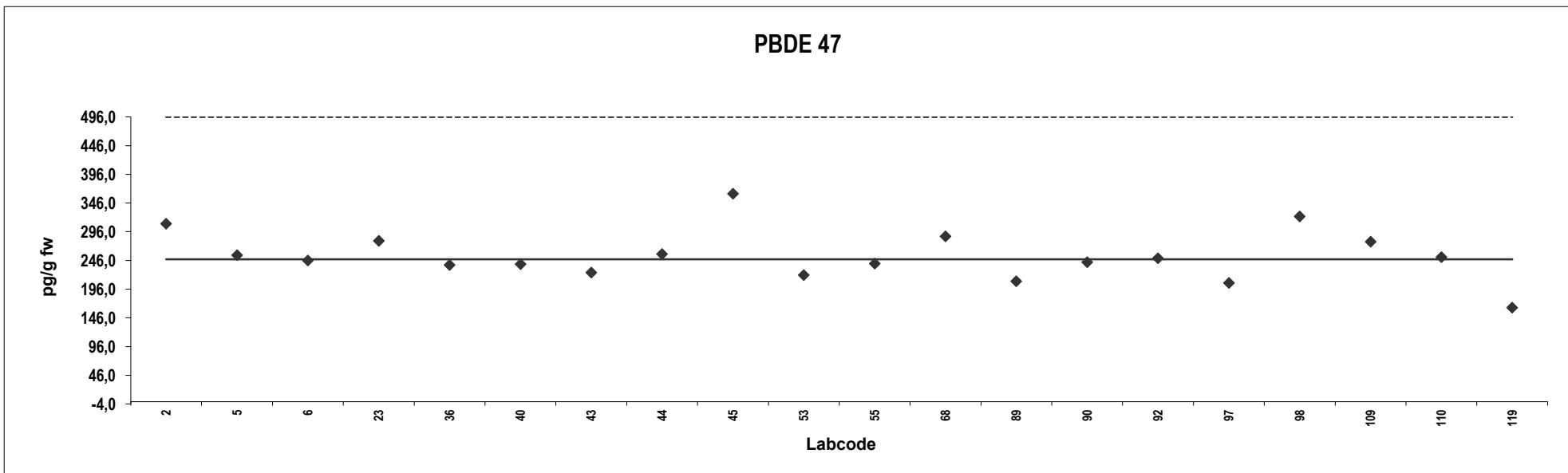
Herring
Congener: PBDE 99

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	27	0,19					
5	23	-0,62					
6	26	0,058					
23	25	-0,23					
36	25	-0,12					
40	24	-0,29					
43	14	-2,3					
44	26	0,00					
45	45	3,7					
53	19	-1,3					
55	28	0,36					
68	29	0,64					
89	21	-0,98					
90	23	-0,49					
92	36	2,0					
97	2,3	-4,5	ND				
98	32	1,2					
109	27	0,24					
110	23	-0,53					
119	27	0,19					

Consensus statistics

Consensus median, pg/g	26
Median all values pg/g	25
Consensus mean, pg/g	25
Standard deviation, pg/g	8,3
Relative standard deviation, %	33
No. of values reported	20
No. of values removed	0
No. of reported non-detects	1

PBDE 99

Z-score: PBDE 99
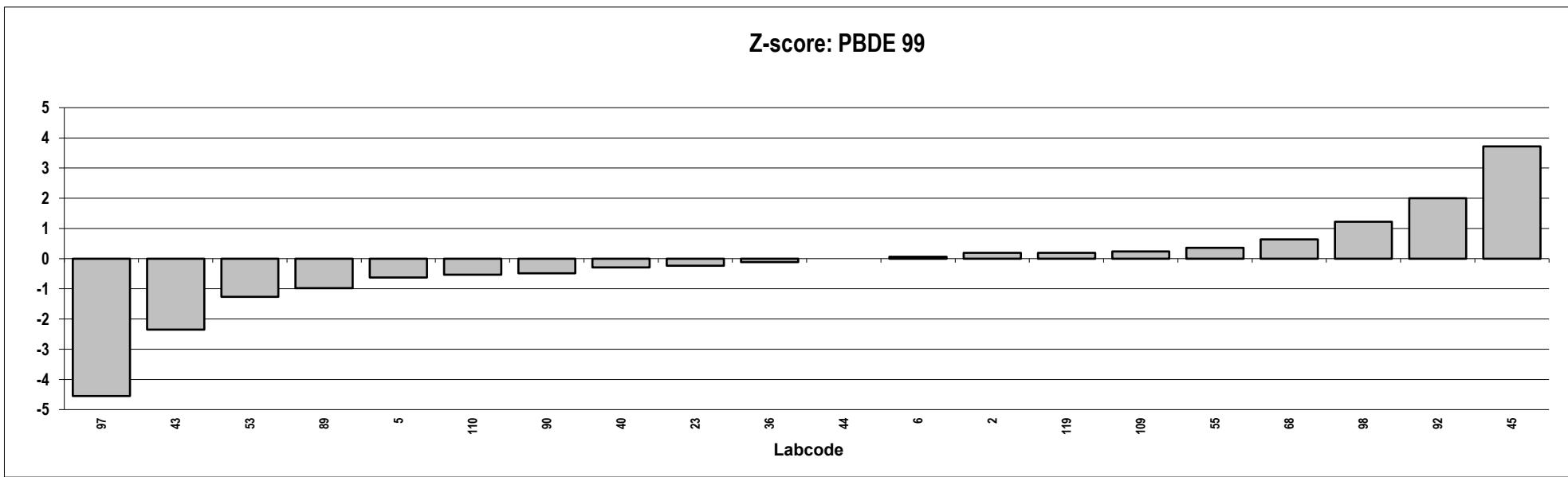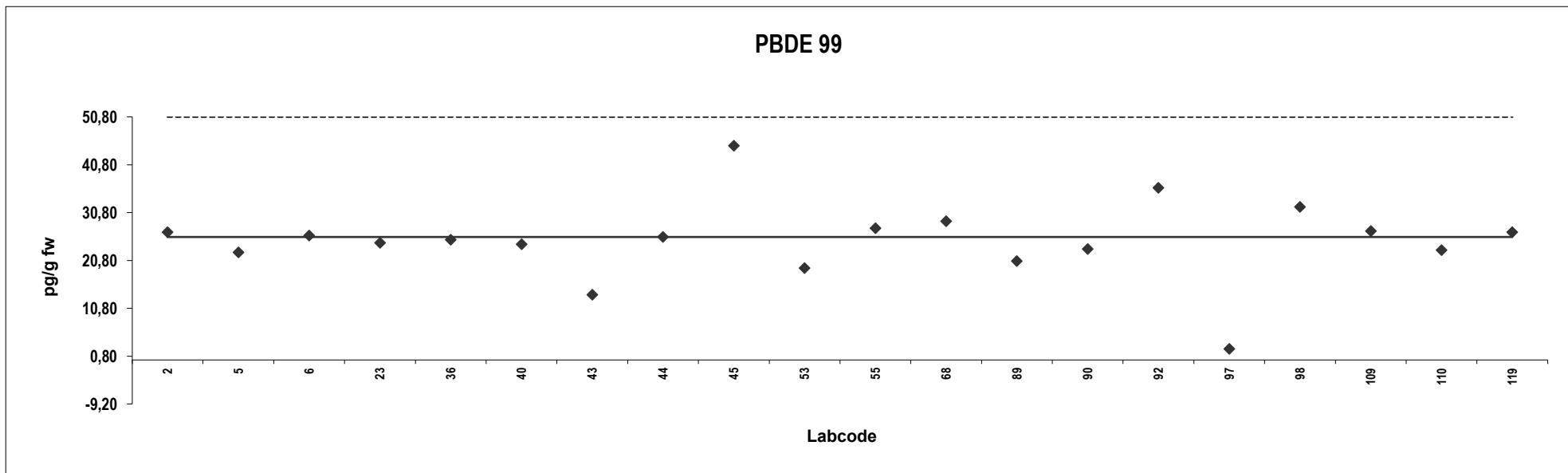
Herring
Congener: PBDE 100

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	118	0,84					
5	101	0,0023					
6	104	0,15					
23	120	0,94					
36	96	-0,26					
40	115	0,70					
43	79	-1,1					
44	106	0,25					
45	102	0,053					
53	92	-0,42					
55	122	1,0					
68	114	0,65					
89	87	-0,67					
90	99	-0,077					
92	100	-0,047					
97	71	-1,5					
98	178	3,8					
109	101	-0,0023					
110	97	-0,20					
119	91	-0,52					

Consensus statistics

Consensus median, pg/g	101
Median all values pg/g	101
Consensus mean, pg/g	105
Standard deviation, pg/g	22
Relative standard deviation, %	21
No. of values reported	20
No. of values removed	0
No. of reported non-detects	0

PBDE 100

Labcode

Z-score: PBDE 100
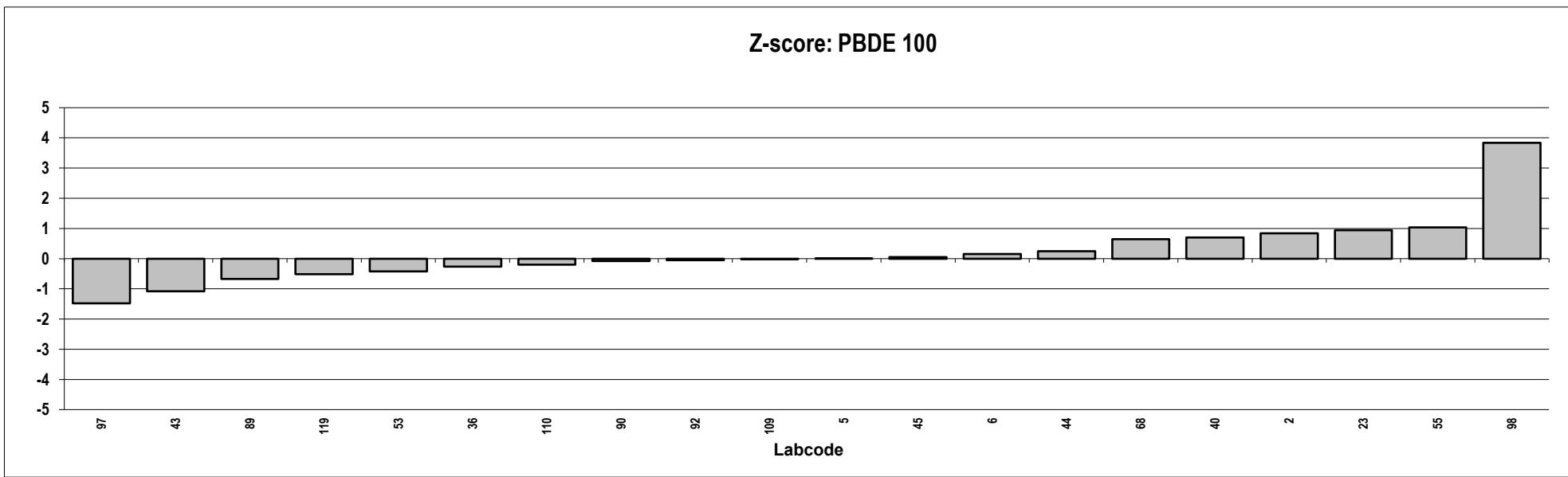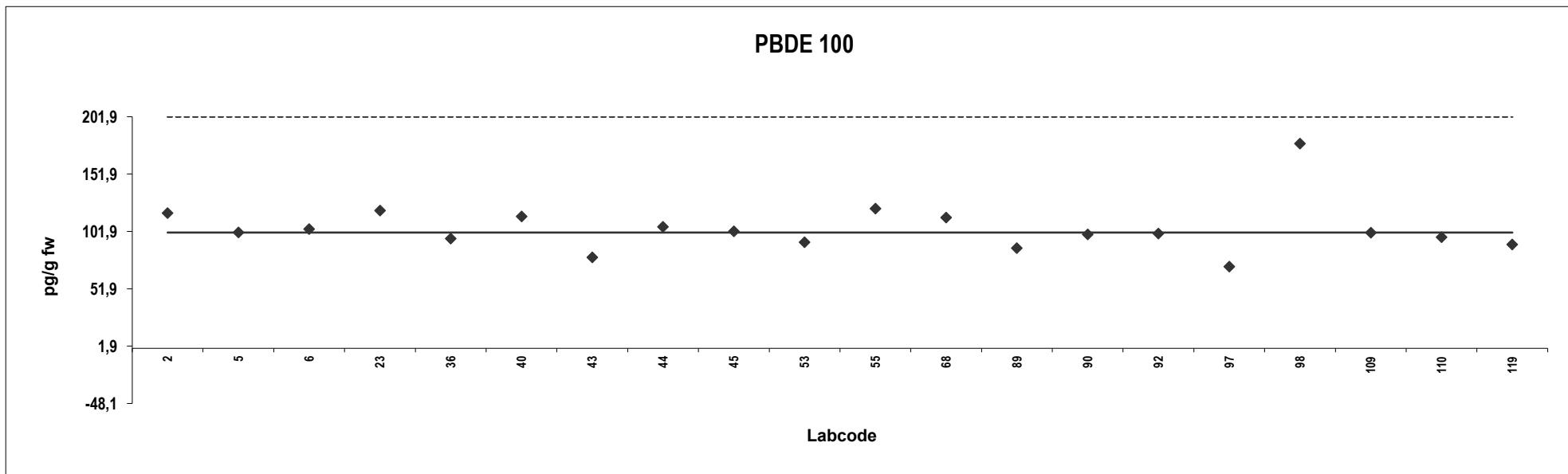
Labcode

Herring
Congener: PBDE 153

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	7,0	-0,21					
5	17	6,7	Outlier				
6	6,7	-0,42					
23	11	2,5					
36	7,1	-0,13					
40	7,3	0,0067					
43	11	2,3					
44	7,8	0,36					
45	8,6	0,88	ND				
53	7,3	-0,0067					
55	7,6	0,19					
68	8,0	0,47					
89	5,3	-1,4					
90	6,5	-0,56					
92	7,4	0,059					
97	4,2	-2,1					
98	4,4	-2,0					
109	8,1	0,52					
110	6,9	-0,31					
119	8,6	0,91					

Consensus statistics

Consensus median, pg/g	7,3
Median all values pg/g	7,4
Consensus mean, pg/g	7,4
Standard deviation, pg/g	1,7
Relative standard deviation, %	23
No. of values reported	20
No. of values removed	1
No. of reported non-detects	1

PBDE 153
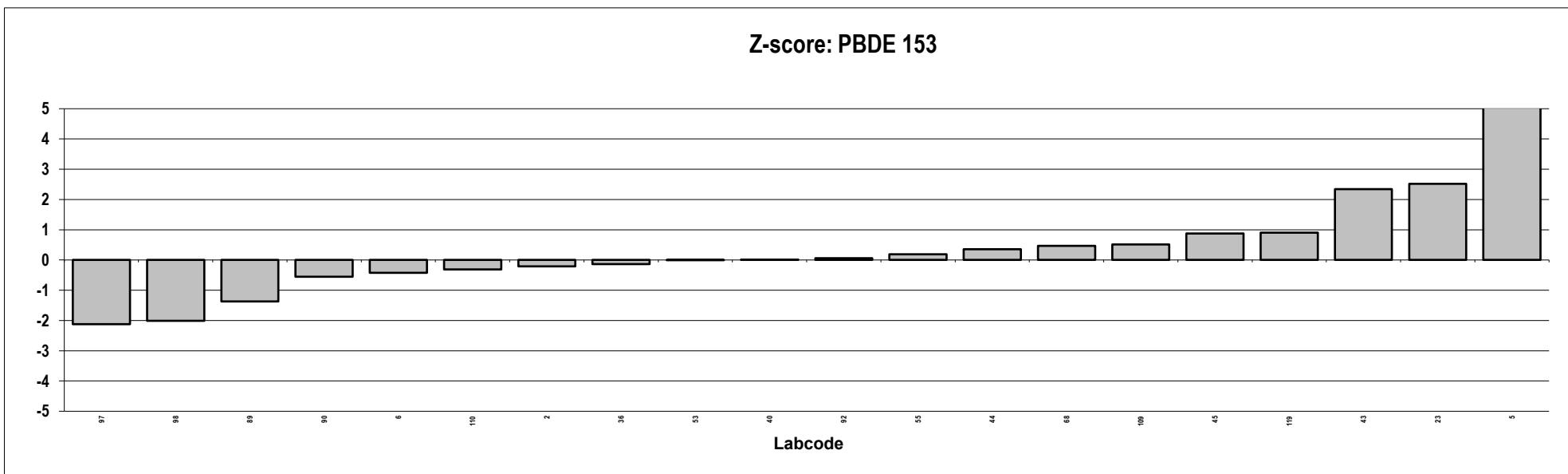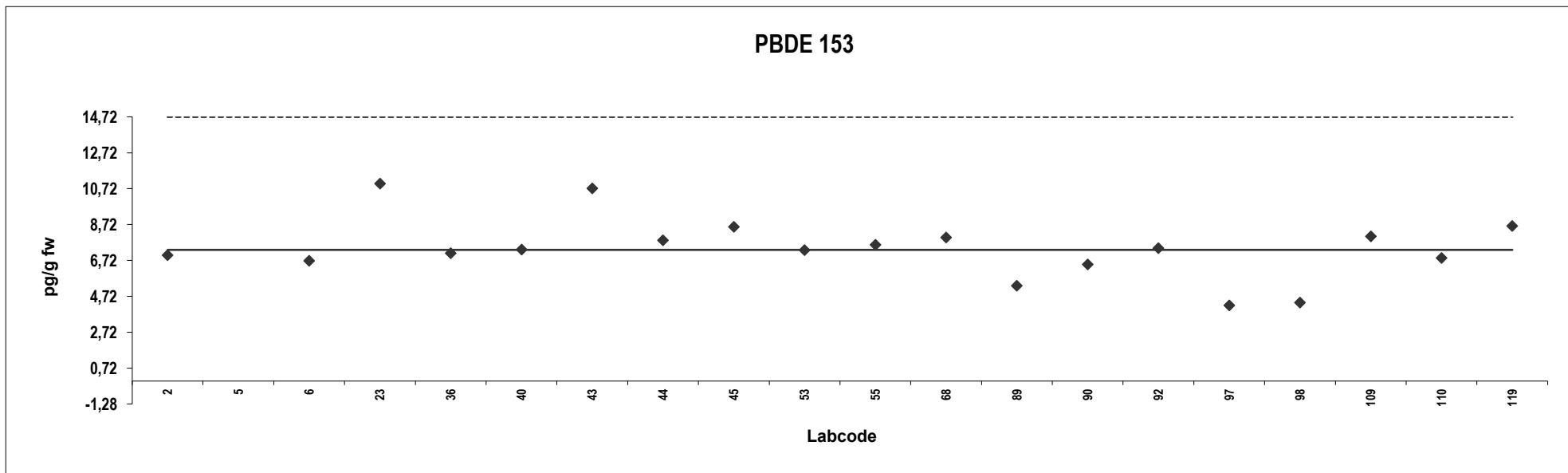
Z-score: PBDE 153

Herring
Congener: PBDE 154

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	33	0,016					
5	48	2,3					
6	70	5,6	Outlier				
23	28	-0,82					
36	27	-0,84					
40	23	-1,5					
43	81	7,3	Outlier				
44	32	-0,091					
45	42	1,5					
53	31	-0,34					
55	34	0,21					
68	39	0,93					
89	39	0,87					
90	41	1,3					
92	29	-0,59					
97	41	1,3					
98	26	-1,1					
109	33	-0,016					
110	14	-2,9					
119	39	0,90					

Consenus statistics

Consensus median, pg/g	33
Median all values pg/g	34
Consensus mean, pg/g	33
Standard deviation, pg/g	8,2
Relative standard deviation, %	25
No. of values reported	20
No. of values removed	2
No. of reported non-detects	0

PBDE 154

Z-score: PBDE 154
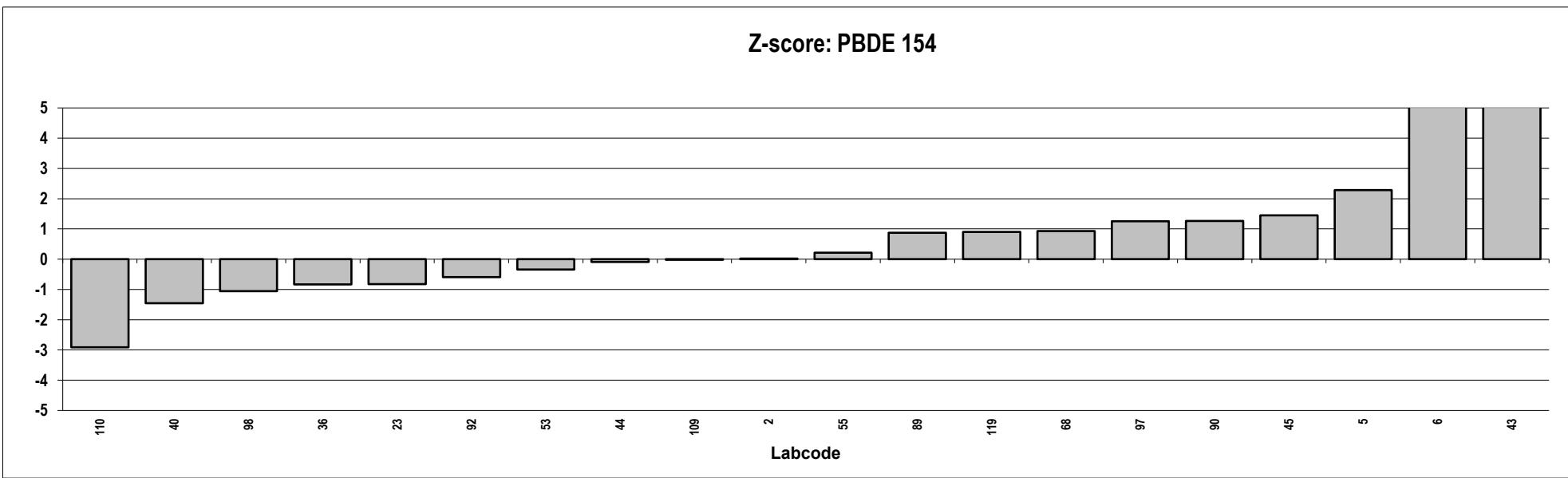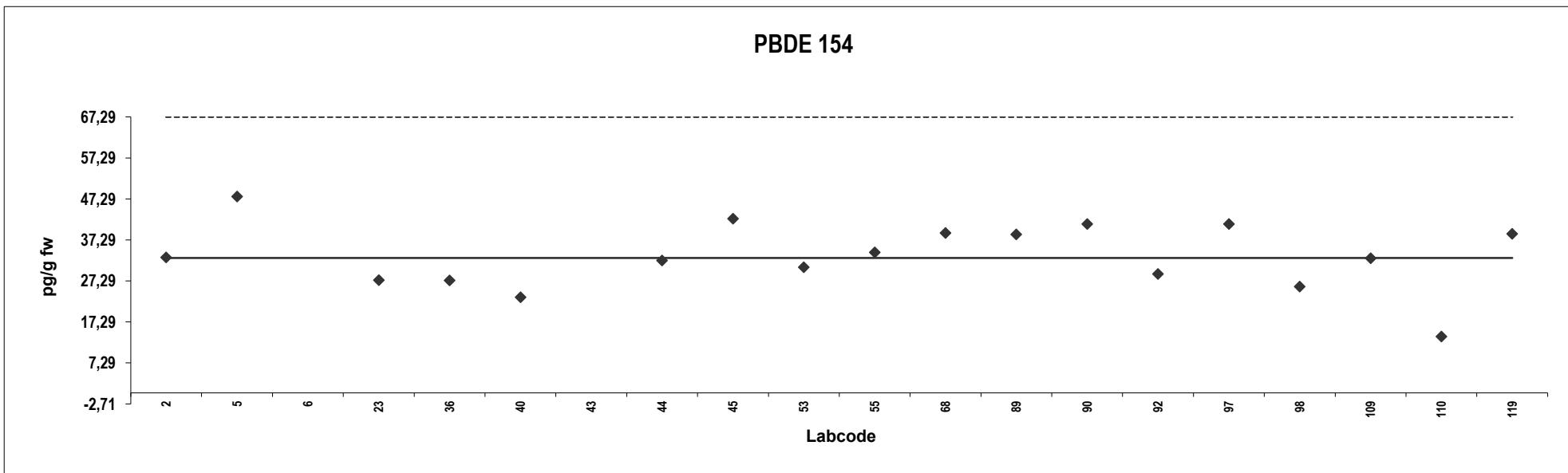
Herring
Congener: PBDE 183

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	2,0	0,61	ND				
6	3,3	4,2					
23	2,1	0,89					
40	1,6	-0,48					
43	1,0	-2,09					
44	2,5	2,0					
45	1,6	-0,57	ND				
53	1,7	-0,13					
55	1,8	0,027					
68	1,6	-0,52					
89	1,6	-0,66					
90	3,0	3,4					
92	1,9	0,41	ND				
97	1,5	-0,89	ND				
98	0,67	-3,1					
109	1,8	-0,027					
110	1,9	0,43					
119	2,9	3,2					

Consenus statistics

Consensus median, pg/g	1,8
Median all values pg/g	1,8
Consensus mean, pg/g	1,9
Standard deviation, pg/g	0,66
Relative standard deviation, %	35
No. of values reported	18
No. of values removed	0
No. of reported non-detects	4

PBDE 183

Z-score: PBDE 183
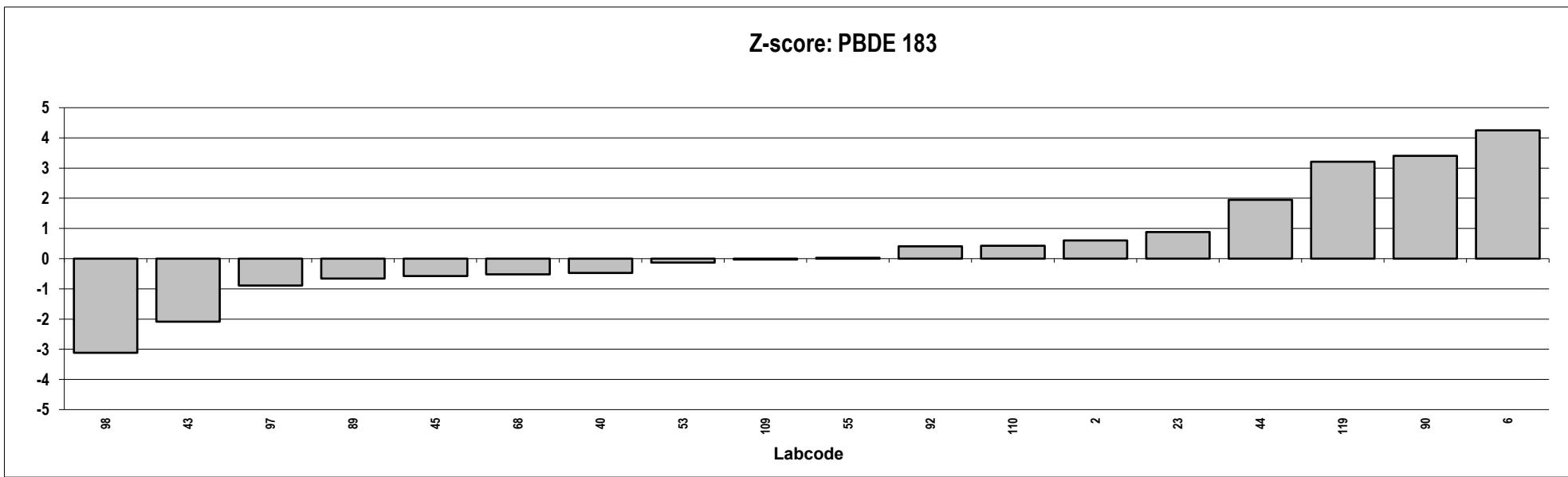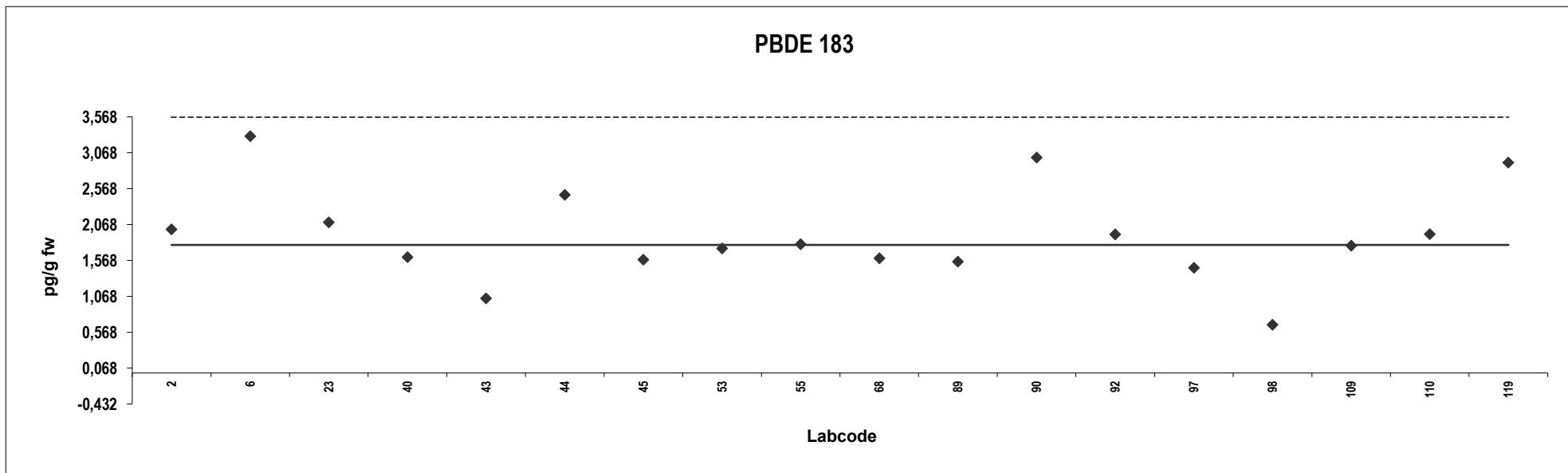
Herring
Congener: PBDE 209

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	20	-1,3	ND				
6	90	11	Outlier,ND				
23	34	1,2					
43	12	-2,9					
44	79	9,5	Outlier				
53	132	19	Outlier				
55	0,44	-4,9	ND				
89	47	3,6					
90	8,0	-3,5					
92	4,0	-4,3	ND				
97	264	43	Outlier				
110	49	4,0	ND				
119	27	0,00					

Consenus statistics

Consensus median, pg/g	27
Median all values pg/g	34
Consensus mean, pg/g	22
Standard deviation, pg/g	18
Relative standard deviation, %	81
No. of values reported	13
No. of values removed	4
No. of reported non-detects	5

PBDE 209

Z-score: PBDE 209
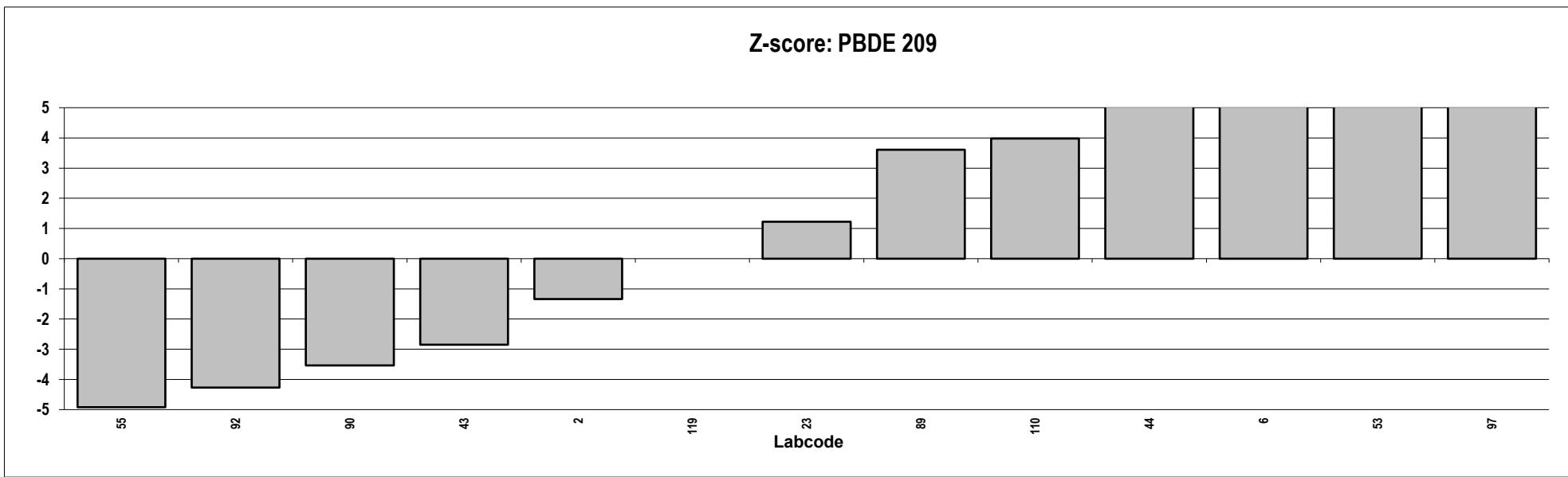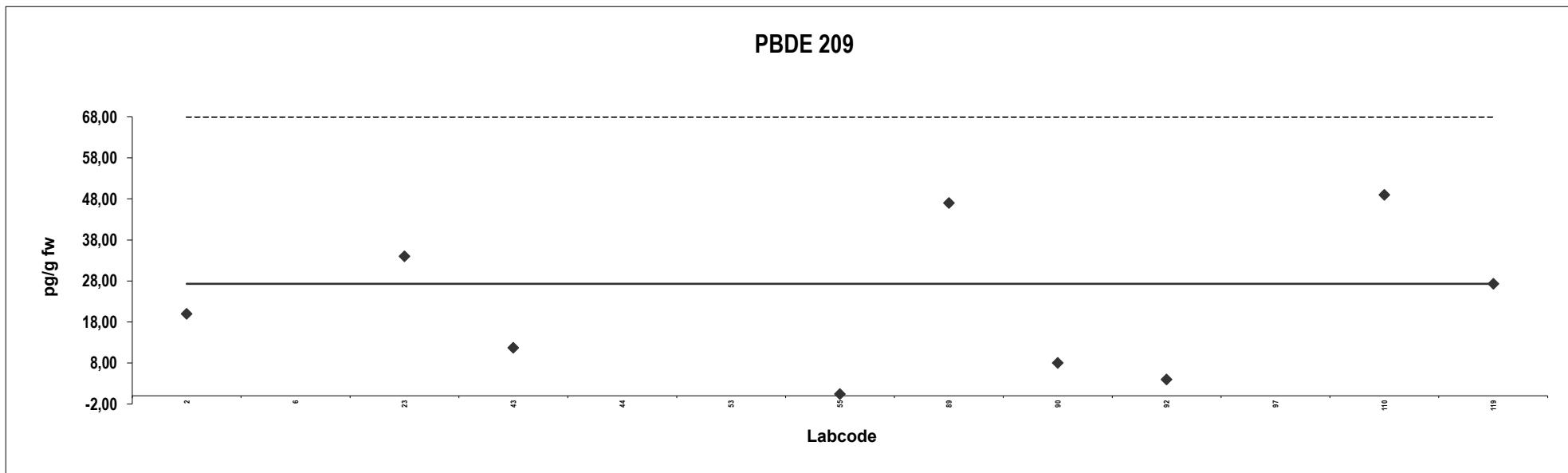
Herring

Congener: α-HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
5	87	-1,2					
23	128	0,55					
42	122	0,30					
55	125	0,44					
89	108	-0,30					
119	78	-1,6					

Consenus statistics

Consensus median, pg/g	115
Median all values pg/g	115
Consensus mean, pg/g	108
Standard deviation, pg/g	21
Relative standard deviation, %	20
No. of values reported	6
No. of values removed	0
No. of reported non-detects	0
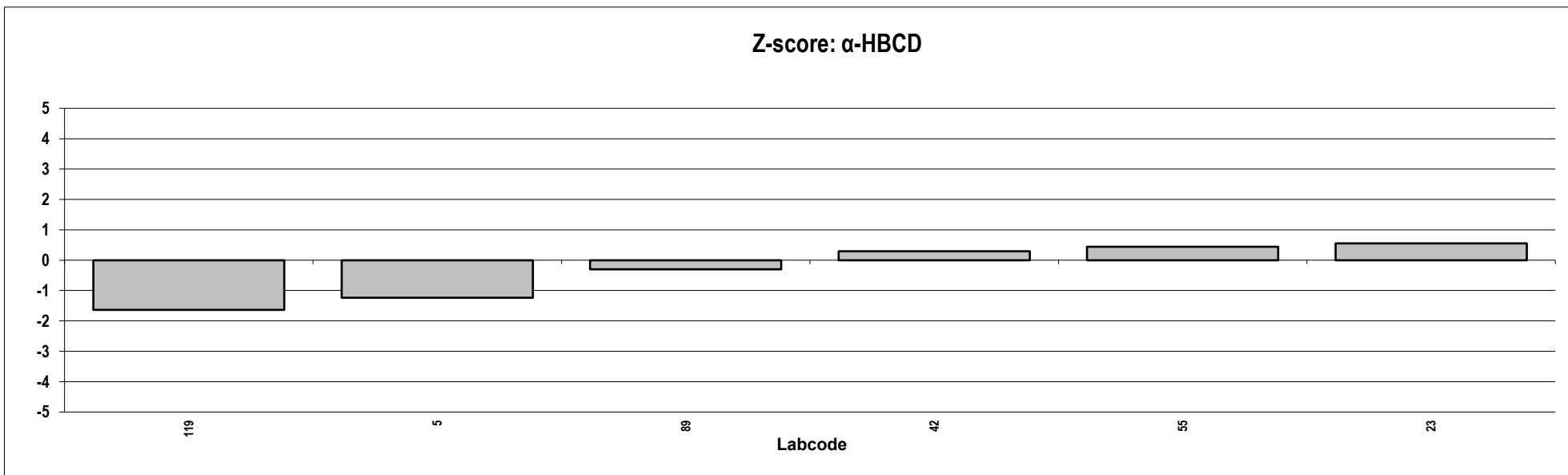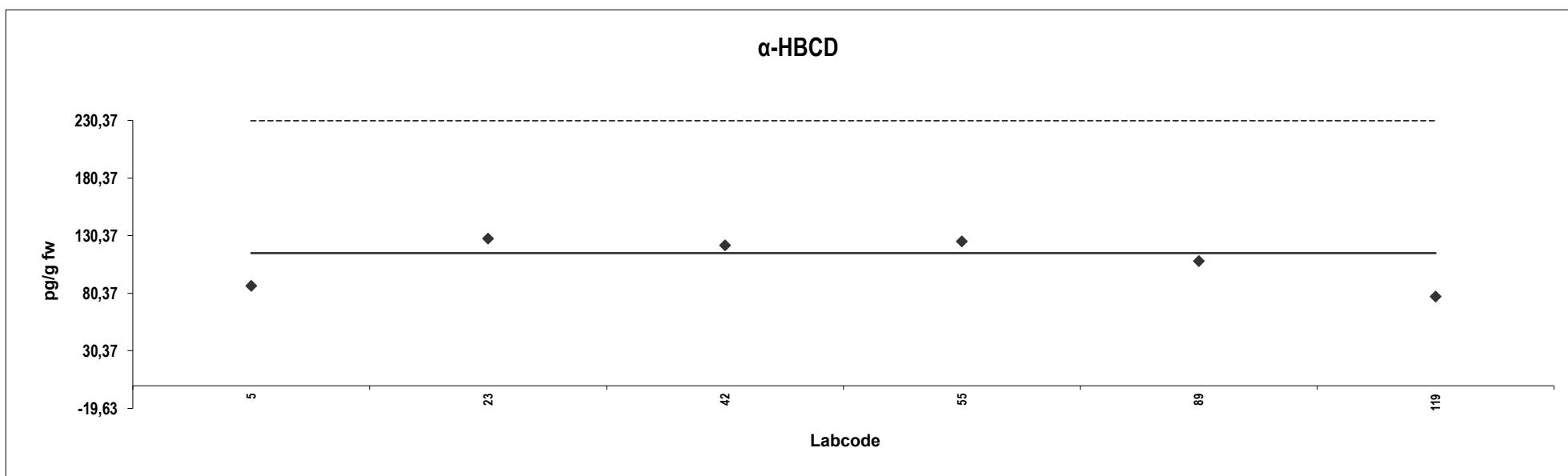
Herring
Congener: β-HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
23	100	382	Outlier,ND				
42	1,3	0,00					
55	1,0	-1,1	ND				
89	5,0	14	ND				
119	10	34	ND				

Consenus statistics

Consensus median, pg/g	1,3
Median all values pg/g	5,0
Consensus mean, pg/g	4,3
Standard deviation, pg/g	4,2
Relative standard deviation, %	97
No. of values reported	5
No. of values removed	1
No. of reported non-detects	4
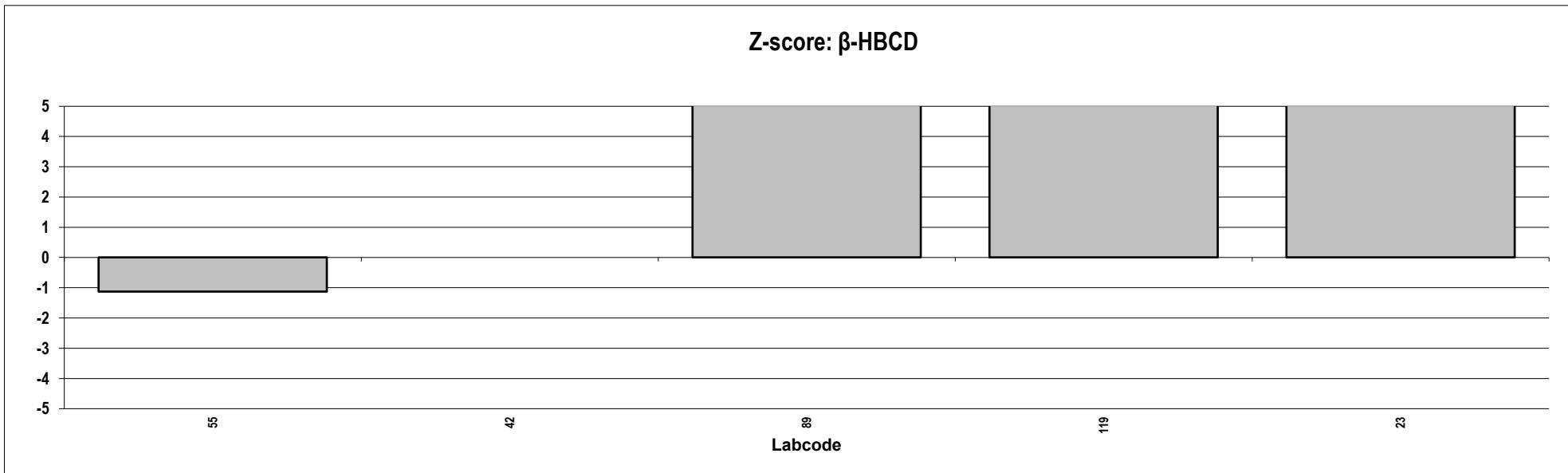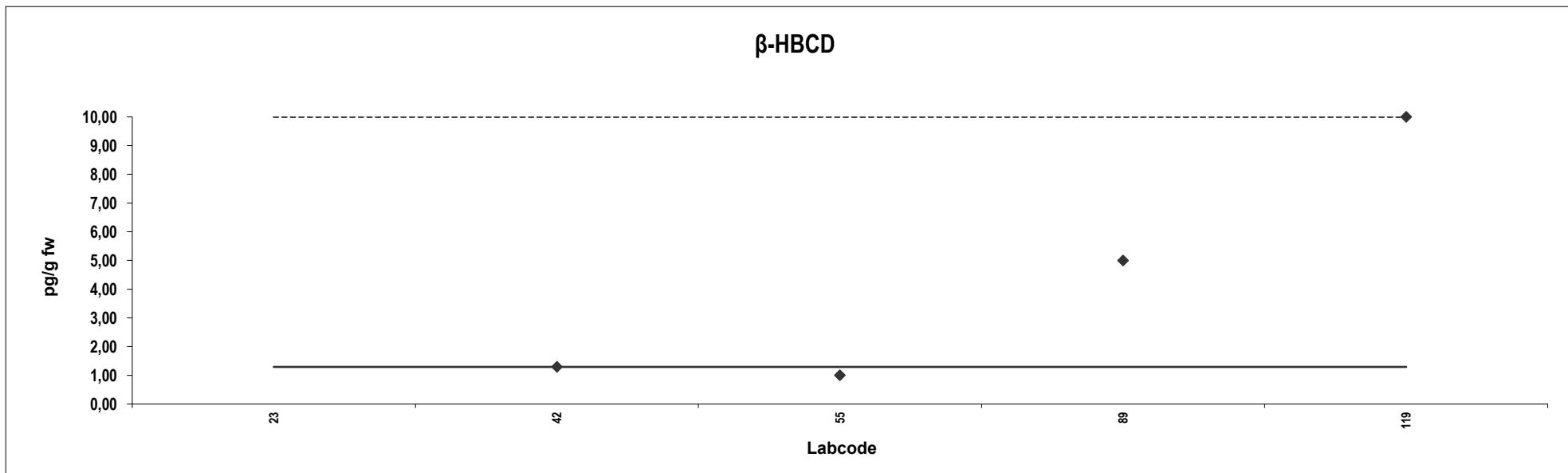
β-HBCD

Z-score: β-HBCD

Herring

Congener: γ-HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
23	100	99	Outlier,ND				
42	2,3	-2,6					
55	1,0	-4,0	ND				
89	7,3	2,6					
119	36	32	Outlier				

Consenus statistics

Consensus median, pg/g	4,8
Median all values pg/g	7,3
Consensus mean, pg/g	3,5
Standard deviation, pg/g	3,3
Relative standard deviation, %	94
No. of values reported	5
No. of values removed	2
No. of reported non-detects	2

γ-HBCD

Z-score: γ-HBCD
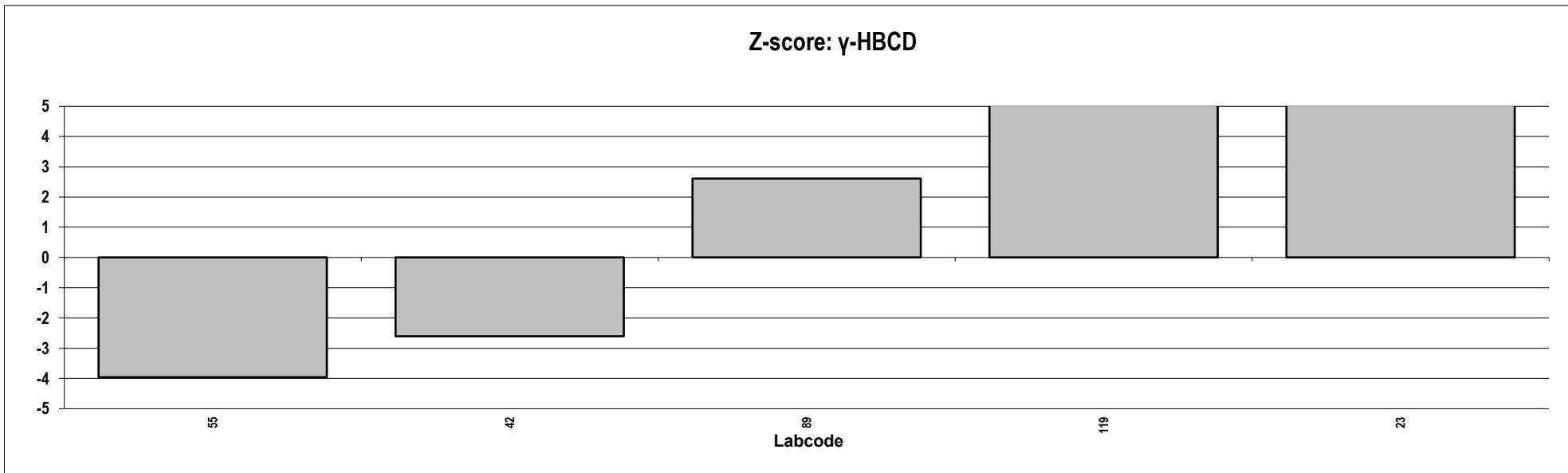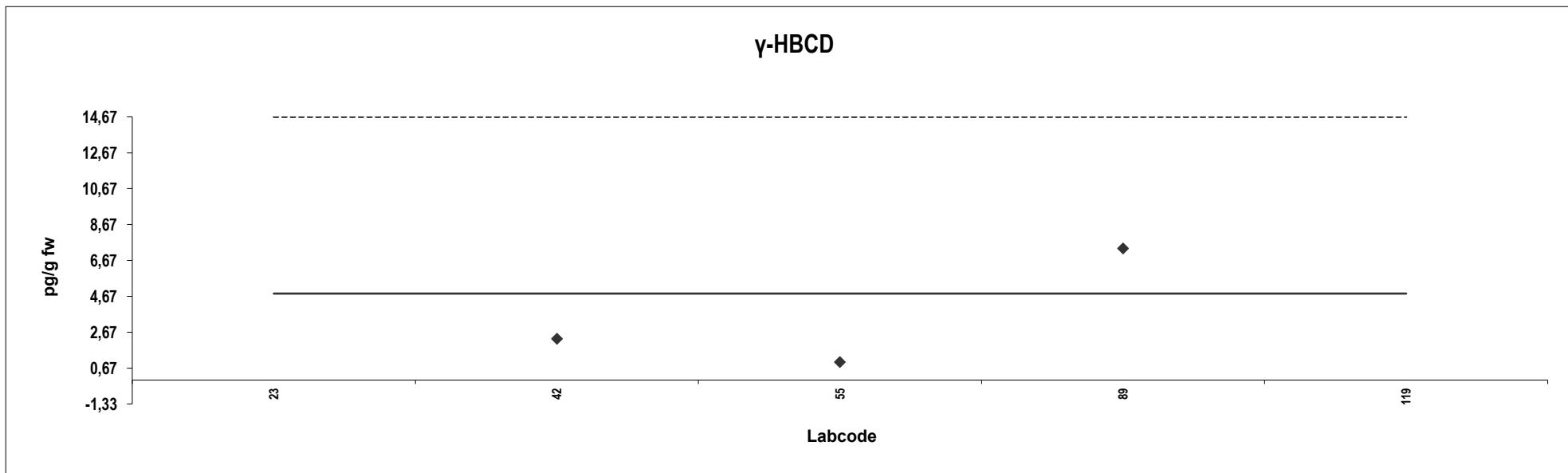
Herring

Congener: total HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
5	87	-1,5					
23	128	0,099					
42	126	0,010					
55	125	0,00					
119	113	-0,49					

Consenus statistics	
Consensus median, pg/g	125
Median all values pg/g	125
Consensus mean, pg/g	116
Standard deviation, pg/g	17
Relative standard deviation, %	15
No. of values reported	5
No. of values removed	0
No. of reported non-detects	0

total HBCD

Labcode

Z-score: total HBCD

Labcode
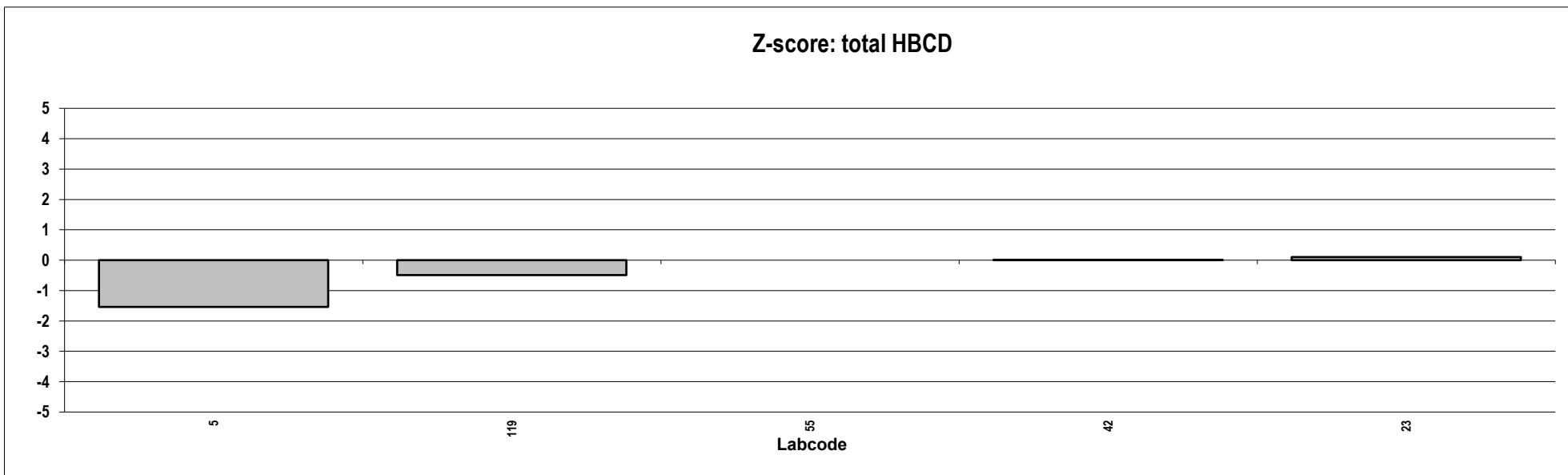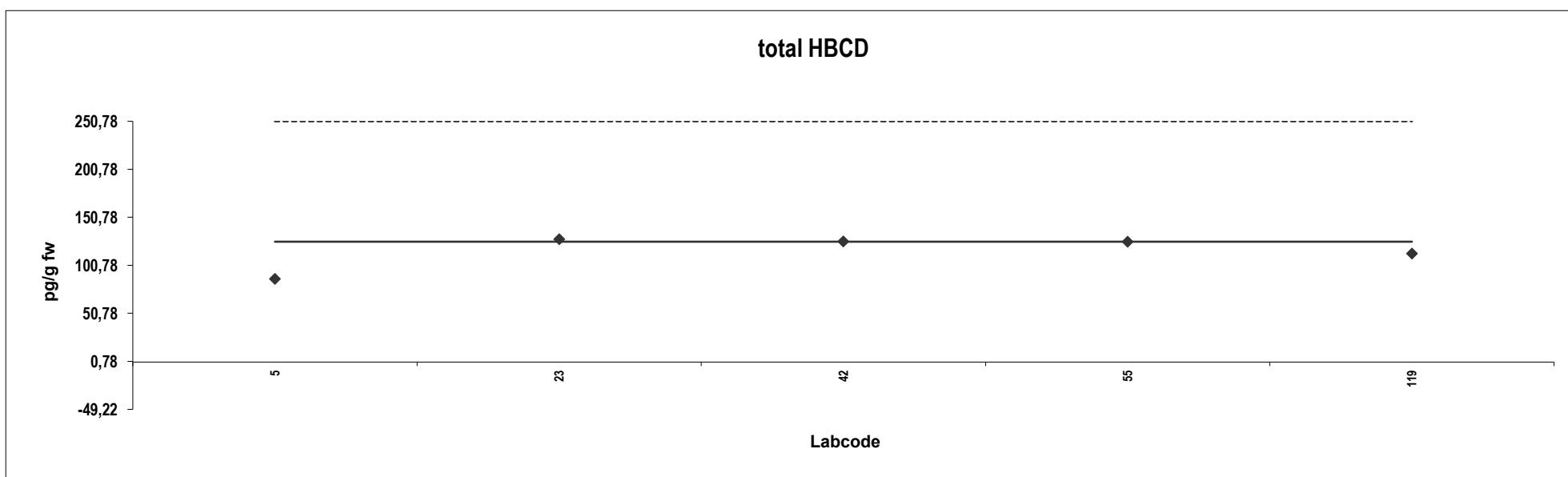
Appendix 4:

Presentation of results for
Fish oil-2021

Appendix 4: Presentation of results: Fish oil-2021

Statistic calculations for PCDDs, PCDFs and dioxin-like PCBs

For each congener, the outliers were removed and the consensus calculated according to the following procedure:
1. The median was calculated from all the reported data, using the detection limit as concentration for non-detected congeners.
2. Values exceeding 2 × this median were defined as outliers and removed from the data set.
3. Median, mean and standard deviation were re-calculated from the remaining data. This second median was called consensus.

Statistic calculations for indicator PCBs, PBDEs and HBCD

For each congener, the outliers were removed and the consensus calculated according to the following procedure:
1. The median was calculated from all the reported data, using the detection limit as concentration for non-detected congeners (NDs).
2. Values exceeding 2 × this median were defined as outliers and removed from the data set. The NDs were also removed.
3. Median, mean and standard deviation were re-calculated from the remaining data. This second median was called consensus.
4. For comparison, median, mean and standard deviation were also calculated without removing NDs.

The diagram shows the reported data up to approximately the limit for outliers (2 × the first median).

Z-Scores of individual congeners

Z-scores of each congener were calculated for each laboratory according to the following equation:

$$z = (x - X)/\sigma$$

where x = reported value; X = assigned value (consensus); σ = target value for standard deviation. A σ of 20% of the consensus was used, i.e. z-scores between +1 and -1 reflect a deviation of ± 20% from the consensus value.

Fish oil
Congener: 2,3,7,8 TCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	0,11	-2,4		116	0,048	-3,9	ND
2	0,23	0,34		119	0,23	0,18	
5	0,21	-0,16					
6	0,17	-1,0					
9	0,20	-0,35					
12	0,28	1,3					
13	0,0060	-4,9	ND				
15	0,53	7,2	Outlier				
19	0,21	-0,16					
29	0,17	-1,1					
32	0,13	-2,0					
33	0,21	-0,18					
34	0,20	-0,46					
35	0,24	0,48					
38	0,16	-1,3					
40	0,21	-0,25					
42	0,22	0,051					
46	0,27	1,3					
48	0,22	0,058					
50	0,19	-0,53					
53	0,23	0,28					
54	0,25	0,63					
55	0,18	-0,95					
57	0,26	0,96					
58	0,24	0,47					
59	0,22	-0,047					
68	0,22	0,066					
70	0,23	0,34					
72	0,23	0,16					
74	0,26	0,87					
79	0,25	0,69					
81	0,21	-0,12					
88	0,18	-0,80					
89	0,25	0,70					
90	0,22	0,091					
92	0,032	-4,3					
93	0,22	-0,022					
95	0,22	0,045					
97	0,28	1,5					
98	0,17	-1,2					
100	0,22	0,022					
103	0,25	0,79					
109	0,17	-1,1					
110	0,17	-0,99					
113	0,26	0,85					

Consensus statistics

Consensus median, pg/g	0,22
Median all values pg/g	0,22
Consensus mean, pg/g	0,20
Standard deviation, pg/g	0,059
Relative standard deviation, %	29
No. of values reported	47
No. of values removed	1
No. of reported non-detects	2

2,3,7,8 TCDD

Z-score: 2,3,7,8 TCDD
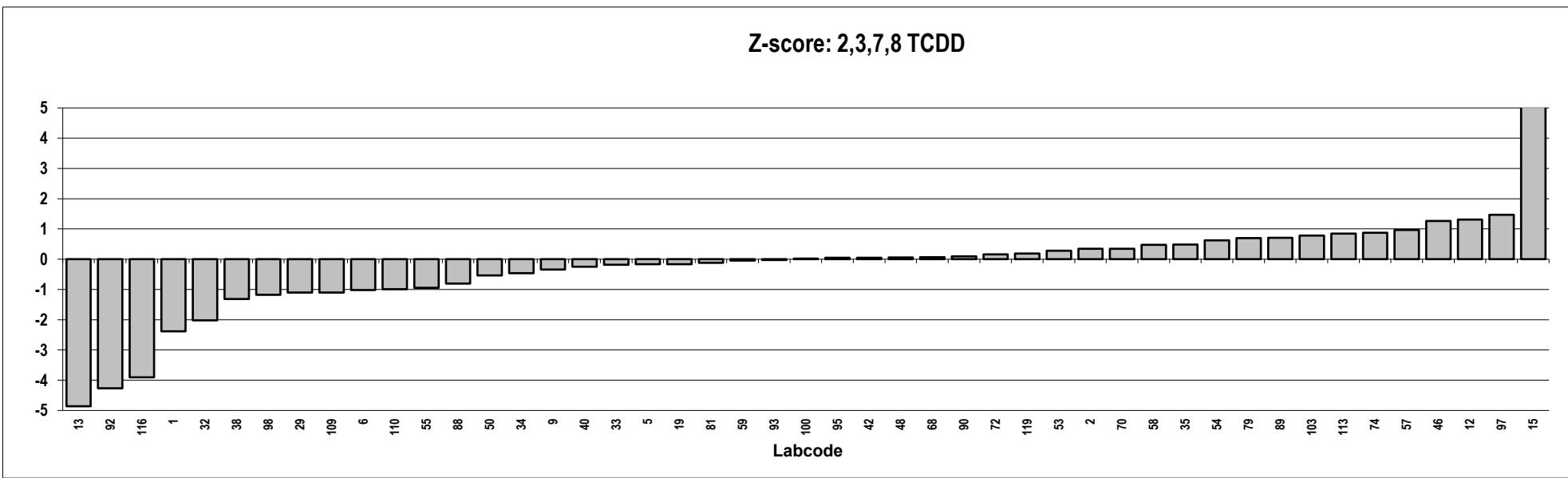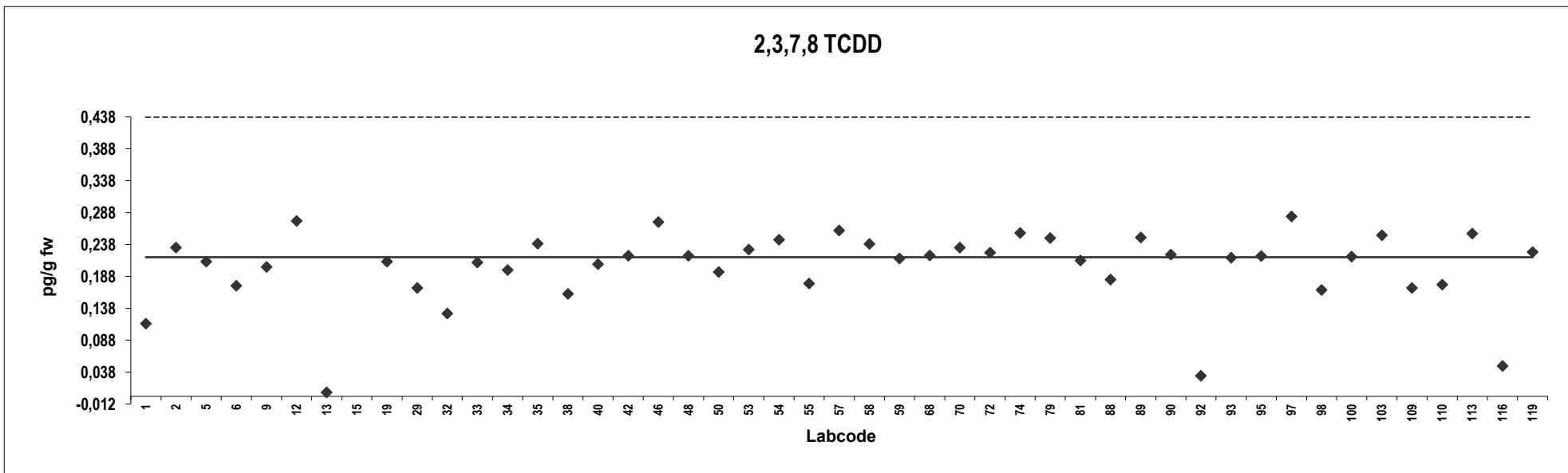
Fish oil
Congener: 1,2,3,7,8 PeCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	0,36	-2,4		116	0,32	-2,7	
2	0,70	0,11		119	0,48	-1,5	
5	0,71	0,25					
6	0,59	-0,63					
9	0,71	0,21					
12	0,97	2,1					
13	0,83	1,1					
15	0,67	-0,075					
19	0,69	0,096					
29	0,67	-0,075					
32	0,77	0,65					
33	0,70	0,15					
34	0,75	0,54					
35	1,0	2,6					
38	0,59	-0,65					
40	0,40	-2,0					
42	0,93	1,8					
46	0,79	0,80					
48	0,76	0,59					
50	0,60	-0,61					
53	0,75	0,49					
54	0,65	-0,24					
55	0,67	-0,037					
57	0,61	-0,51					
58	0,94	1,9					
59	0,59	-0,66					
68	0,55	-0,93					
70	0,64	-0,32					
72	0,71	0,24					
74	0,78	0,73					
79	0,92	1,8					
81	0,75	0,55					
88	0,61	-0,50					
89	0,66	-0,17					
90	619	4547	Outlier				
92	0,085	-4,4					
93	0,70	0,15					
95	0,66	-0,15					
97	0,79	0,77					
98	0,53	-1,1					
100	0,65	-0,23					
103	0,65	-0,25					
109	0,84	1,2					
110	0,49	-1,4					
113	0,69	0,037					

Consensus statistics

Consensus median, pg/g	0,68
Median all values pg/g	0,69
Consensus mean, pg/g	0,67
Standard deviation, pg/g	0,17
Relative standard deviation, %	26
No. of values reported	47
No. of values removed	1
No. of reported non-detects	0

1,2,3,7,8 PeCDD

pg/g fw

Labcode

Z-score: 1,2,3,7,8 PeCDD
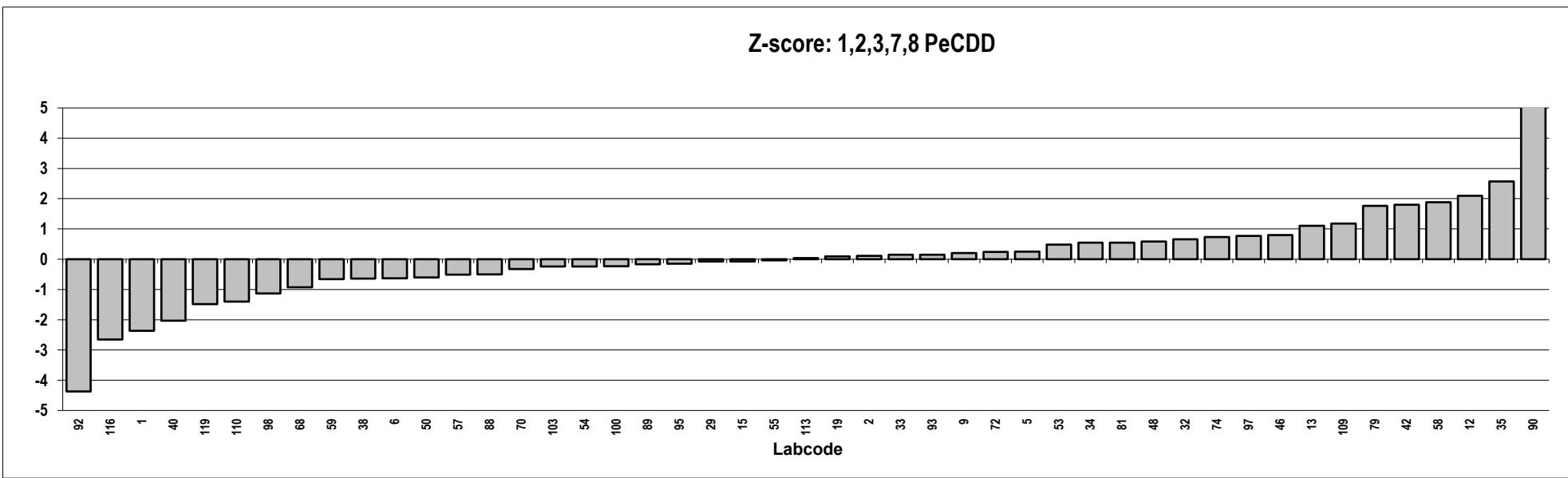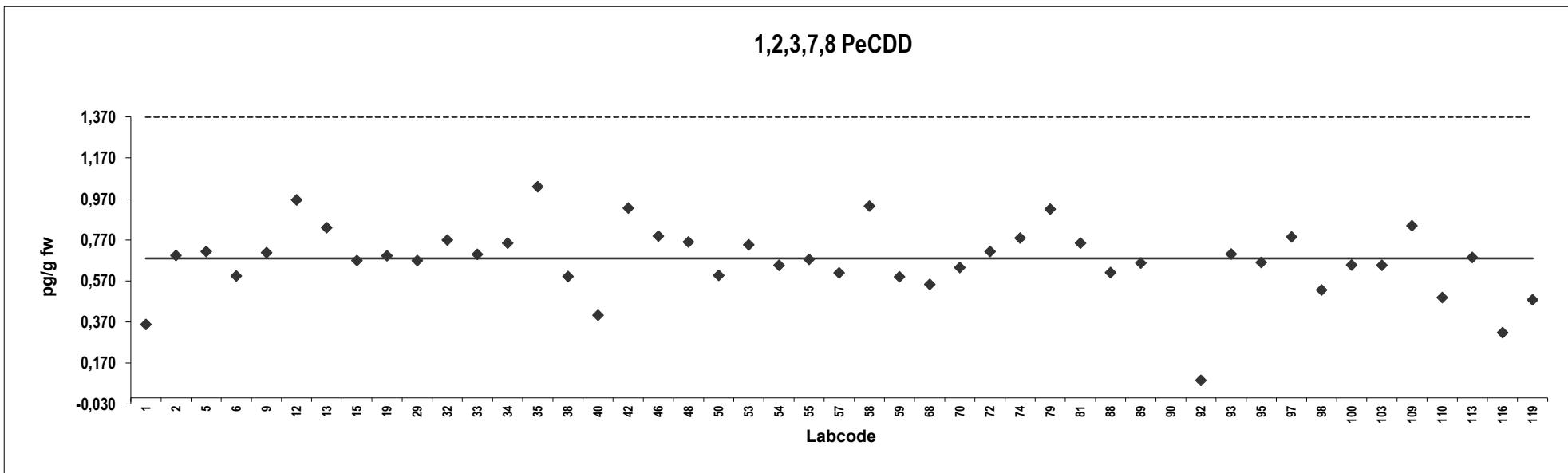
Labcode

Fish oil

Congener: 1,2,3,4,7,8 HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	0,22	4,9		116	0,30	8,3	Outlier
2	0,14	1,1		119	0,11	-0,14	
5	0,12	0,22					
6	0,11	0,075					
9	0,16	1,9					
12	0,17	2,3					
13	0,11	-0,14					
15	0,023	-4,0					
19	0,14	1,2					
29	0,12	0,20					
32	0,13	0,57					
33	0,17	2,5	ND				
34	0,074	-1,7					
35	0,11	-0,075					
38	0,082	-1,4					
40	0,083	-1,3					
42	0,087	-1,2					
46	0,10	-0,45					
48	0,15	1,7					
50	0,11	-0,19					
53	0,13	0,79					
54	0,17	2,7	ND				
55	0,075	-1,7					
57	0,050	-2,8	ND				
58	0,27	6,8	Outlier				
59	0,095	-0,80					
68	0,11	-0,34					
70	0,11	-0,093					
72	0,16	2,3	ND				
74	0,10	-0,53					
79	0,34	9,9	Outlier				
81	0,097	-0,72					
88	0,10	-0,39					
89	0,13	0,74					
90	0,15	1,6					
92	0,17	2,5					
93	0,10	-0,47					
95	0,13	0,75					
97	0,12	0,48					
98	0,11	-0,27					
100	0,094	-0,84					
103	0,17	2,4					
109	0,11	-0,14					
110	0,20	3,9					
113	0,12	0,31					

Consensus statistics

|	
Consensus median, pg/g	0,11
Median all values pg/g	0,12
Consensus mean, pg/g	0,12
Standard deviation, pg/g	0,038
Relative standard deviation, %	31
No. of values reported	47
No. of values removed	3
No. of reported non-detects	4

1,2,3,4,7,8 HxCDD

Z-score: 1,2,3,4,7,8 HxCDD
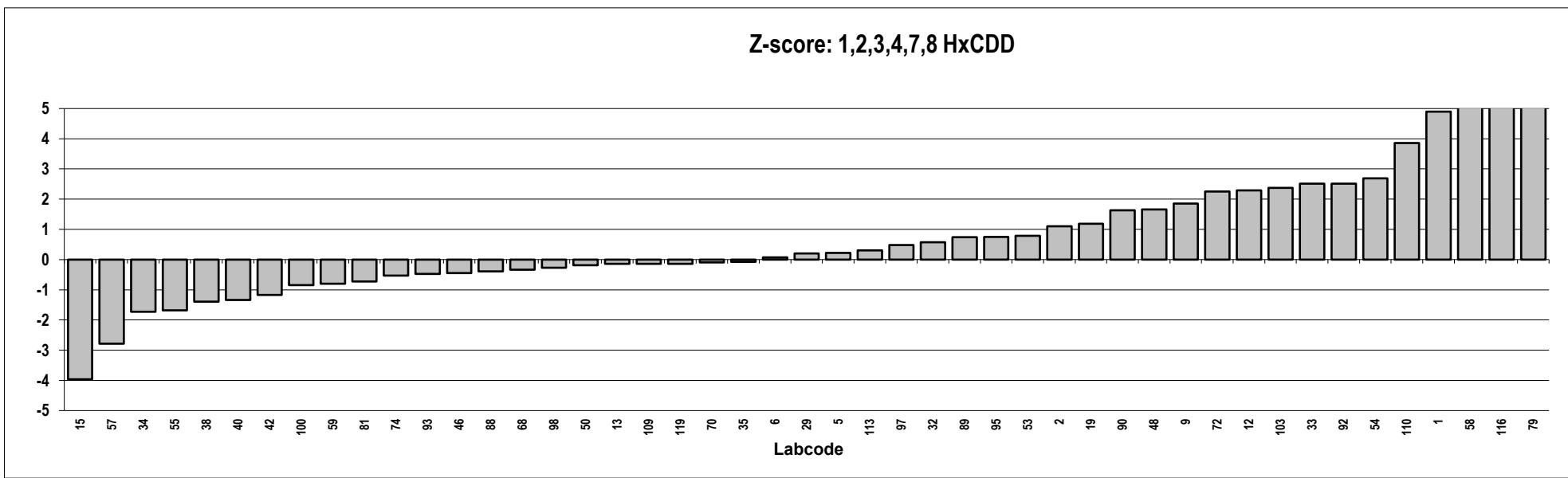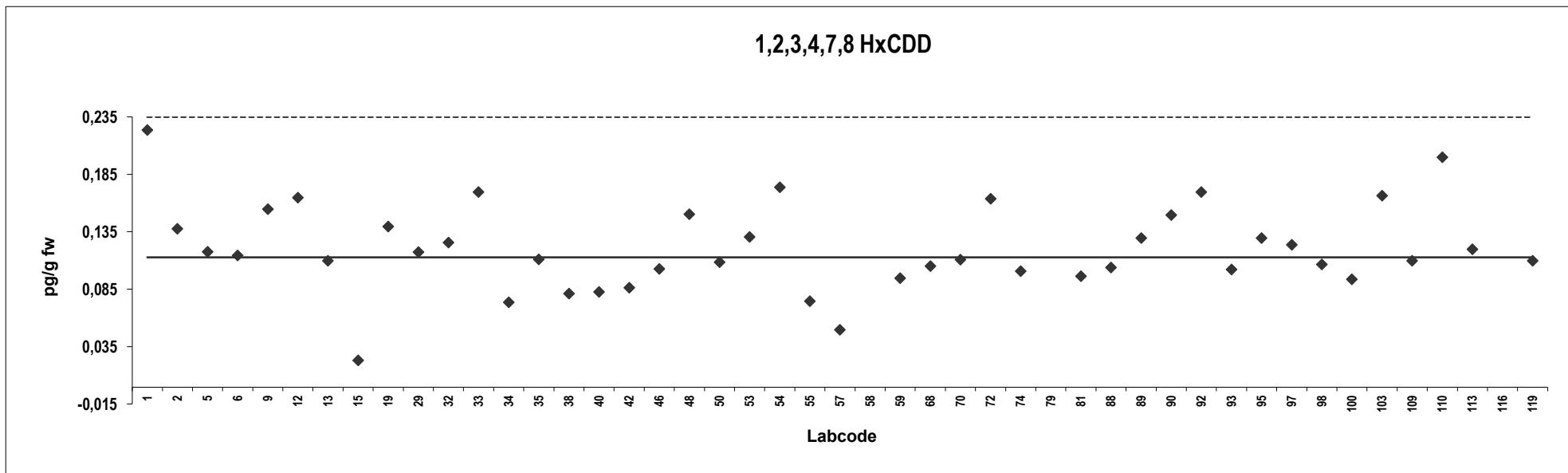
Fish oil
Congener: 1,2,3,6,7,8 HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	0,68	0,76		116	0,68	0,75	
2	0,54	-0,38		119	0,46	-1,1	
5	0,67	0,67					
6	0,56	-0,26					
9	0,77	1,6					
12	0,60	0,094					
13	0,48	-0,92					
15	0,31	-2,4					
19	0,68	0,80					
29	0,59	0,035					
32	0,63	0,31					
33	0,63	0,36					
34	0,58	-0,051					
35	0,78	1,6					
38	0,48	-0,92					
40	0,57	-0,17					
42	0,61	0,17					
46	0,61	0,21					
48	0,57	-0,14					
50	0,58	-0,066					
53	0,65	0,57					
54	0,56	-0,21					
55	0,51	-0,65					
57	0,61	0,19					
58	0,51	-0,70					
59	0,51	-0,67					
68	0,71	1,0					
70	0,61	0,22					
72	0,51	-0,63					
74	0,62	0,23					
79	0,65	0,54					
81	0,63	0,33					
88	0,51	-0,68					
89	0,68	0,82					
90	0,54	-0,38					
92	0,12	-4,0					
93	0,52	-0,59					
95	0,61	0,19					
97	0,68	0,81					
98	0,54	-0,43					
100	0,59	0,00					
103	0,64	0,42					
109	0,47	-1,0					
110	0,56	-0,20					
113	0,59	-0,026					

Consenus statistics

Consensus median, pg/g	0,59
Median all values pg/g	0,59
Consensus mean, pg/g	0,58
Standard deviation, pg/g	0,11
Relative standard deviation, %	19
No. of values reported	47
No. of values removed	0
No. of reported non-detects	0

1,2,3,6,7,8 HxCDD

pg/g fw

Labcode

Z-score: 1,2,3,6,7,8 HxCDD
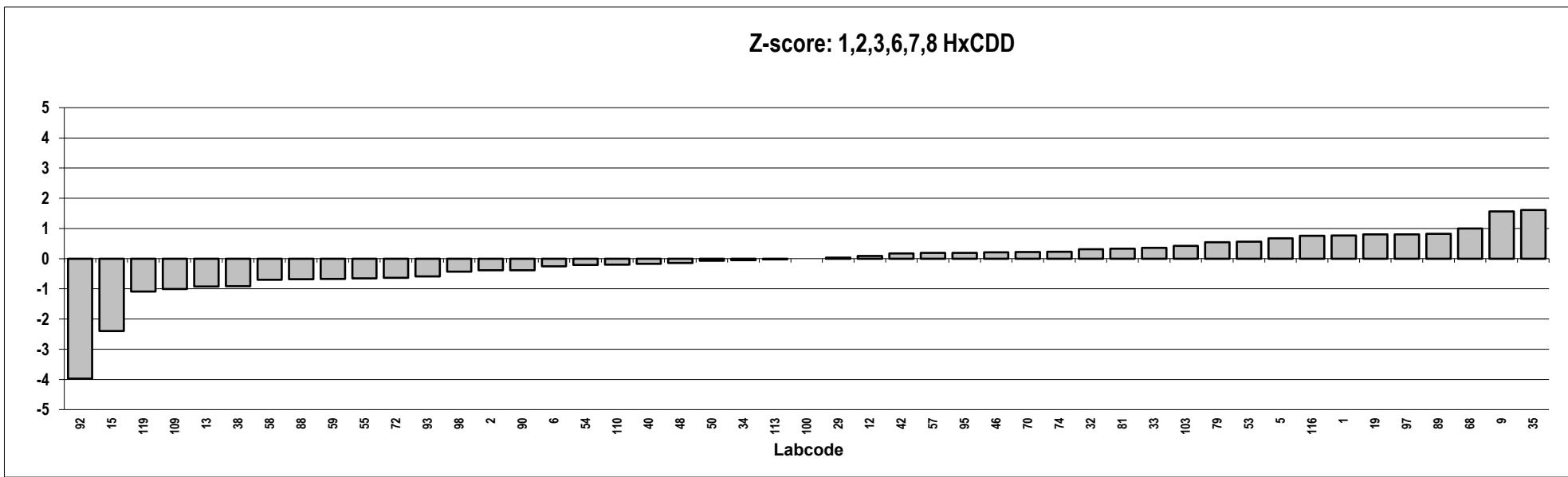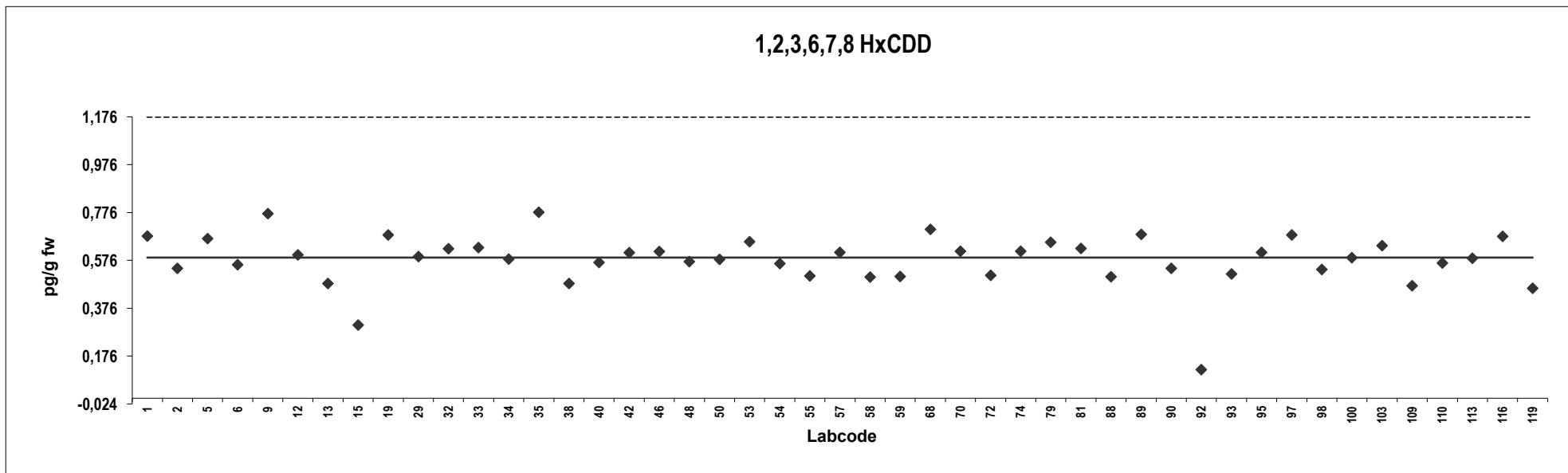
Labcode

Fish oil
Congener: 1,2,3,7,8,9 HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	0,14	-0,55		116	0,077	-2,5	ND
2	0,28	4,1		119	0,15	-0,21	
5	0,13	-0,69					
6	0,18	0,76					
9	0,24	2,6					
12	0,18	0,90					
13	0,015	-4,5	ND				
15	0,20	1,4					
19	0,14	-0,43					
29	0,16	0,089					
32	0,17	0,47					
33	0,17	0,51	ND				
34	0,10	-1,8					
35	0,18	0,97					
38	0,12	-0,98					
40	0,16	0,095					
42	0,13	-0,92					
46	0,17	0,51					
48	0,19	1,1					
50	0,11	-1,4					
53	0,16	0,14					
54	0,14	-0,40	ND				
55	0,19	1,2					
57	0,050	-3,4	ND				
58	0,14	-0,44					
59	0,13	-0,85					
68	0,16	0,23					
70	0,093	-2,0					
72	0,17	0,51					
74	0,16	0,22					
79	0,17	0,54					
81	0,15	0,013					
88	0,12	-1,1					
89	0,16	0,20					
90	0,13	-0,79					
92	0,097	-1,9					
93	0,15	-0,013					
95	0,13	-0,79					
97	0,054	-3,3	ND				
98	0,15	-0,29					
100	0,16	0,086					
103	0,17	0,44					
109	0,43	8,9	Outlier				
110	0,19	1,3					
113	0,12	-1,3					

Consensus statistics

|	
Consensus median, pg/g	0,15
Median all values pg/g	0,15
Consensus mean, pg/g	0,15
Standard deviation, pg/g	0,046
Relative standard deviation, %	31
No. of values reported	47
No. of values removed	1
No. of reported non-detects	6

1,2,3,7,8,9 HxCDD

Z-score: 1,2,3,7,8,9 HxCDD
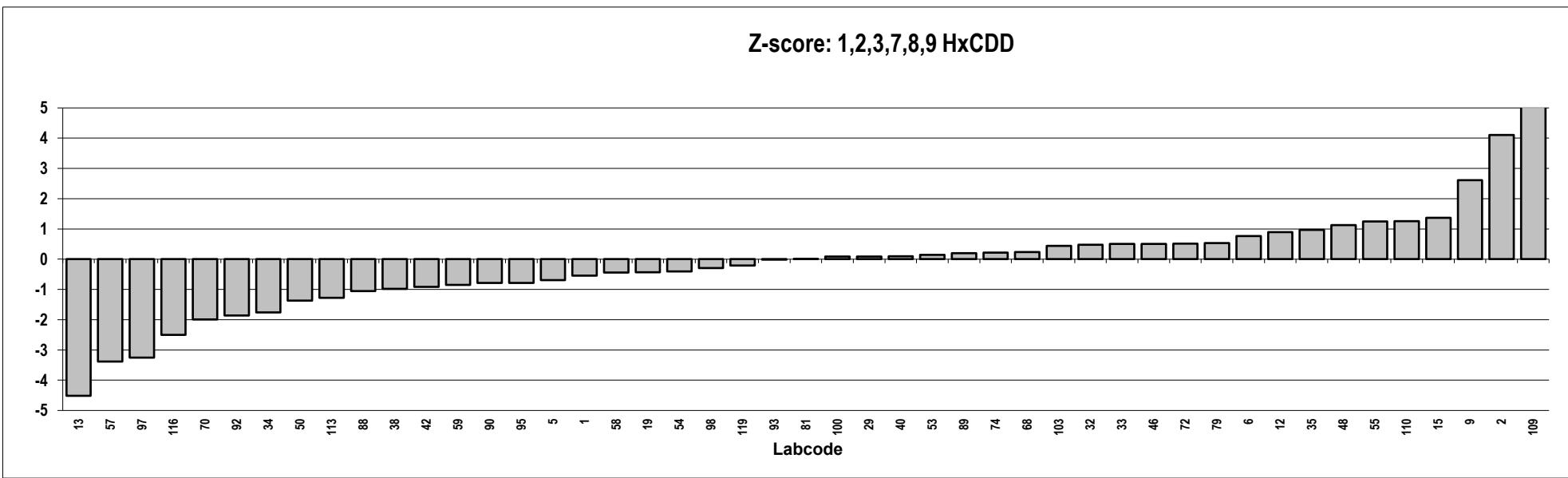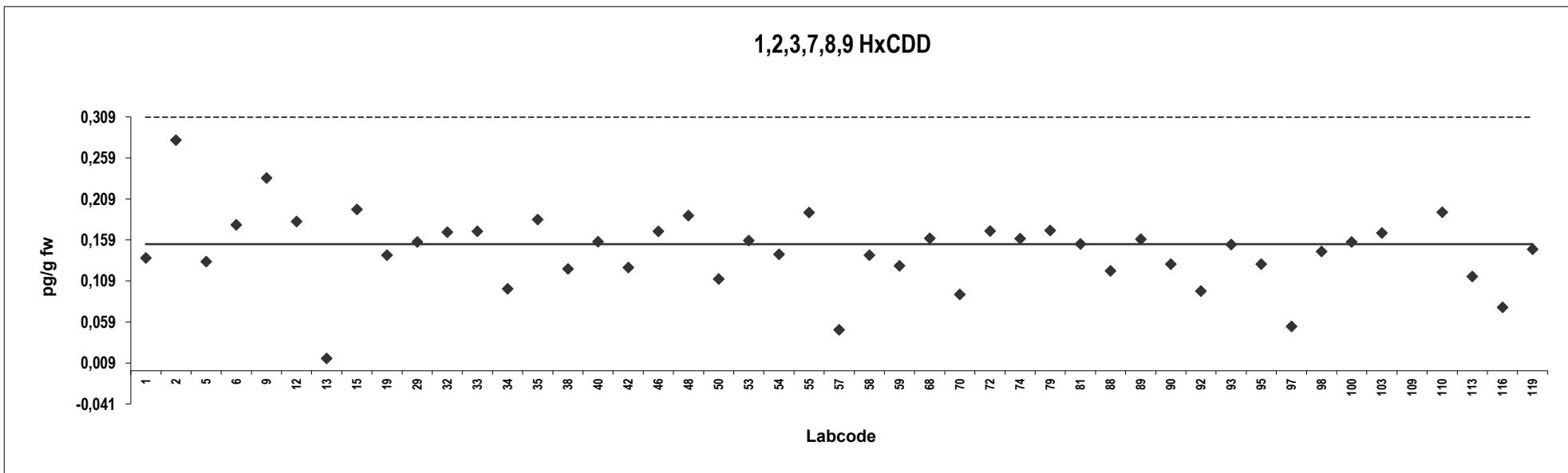
Fish oil
Congener: 1,2,3,4,6,7,8 HpCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	0,13	-2,7		116	0,078	-3,6	ND
2	0,67	6,7	Outlier	119	0,32	0,62	
5	0,29	0,13					
6	0,25	-0,61					
9	0,37	1,5					
12	0,29	0,038					
13	0,030	-4,5	ND				
15	0,13	-2,8					
19	0,29	0,038					
29	0,23	-0,92					
32	0,31	0,46					
33	0,31	0,44					
34	0,18	-1,9					
35	0,31	0,40					
38	0,22	-1,1					
40	0,28	0,00					
42	0,30	0,20					
46	0,32	0,65					
48	0,31	0,37					
50	0,33	0,77					
53	0,35	1,1					
54	0,26	-0,40					
55	0,31	0,45					
57	0,24	-0,79					
58	0,079	-3,6					
59	0,25	-0,68					
68	0,30	0,27					
70	0,31	0,42					
72	0,25	-0,57					
74	0,32	0,60					
79	0,42	2,3					
81	0,27	-0,18					
88	0,26	-0,45					
89	0,34	0,94					
90	0,29	0,038					
92	0,18	-1,8					
93	0,27	-0,20					
95	0,32	0,62					
97	0,082	-3,6	ND				
98	0,21	-1,3					
100	0,26	-0,44					
103	0,30	0,33					
109	0,16	-2,2					
110	0,66	6,6	Outlier,ND				
113	0,23	-0,96					

Consensus statistics

Consensus median, pg/g	0,28
Median all values pg/g	0,29
Consensus mean, pg/g	0,26
Standard deviation, pg/g	0,084
Relative standard deviation, %	33
No. of values reported	47
No. of values removed	2
No. of reported non-detects	4

1,2,3,4,6,7,8 HpCDD

Z-score: 1,2,3,4,6,7,8 HpCDD
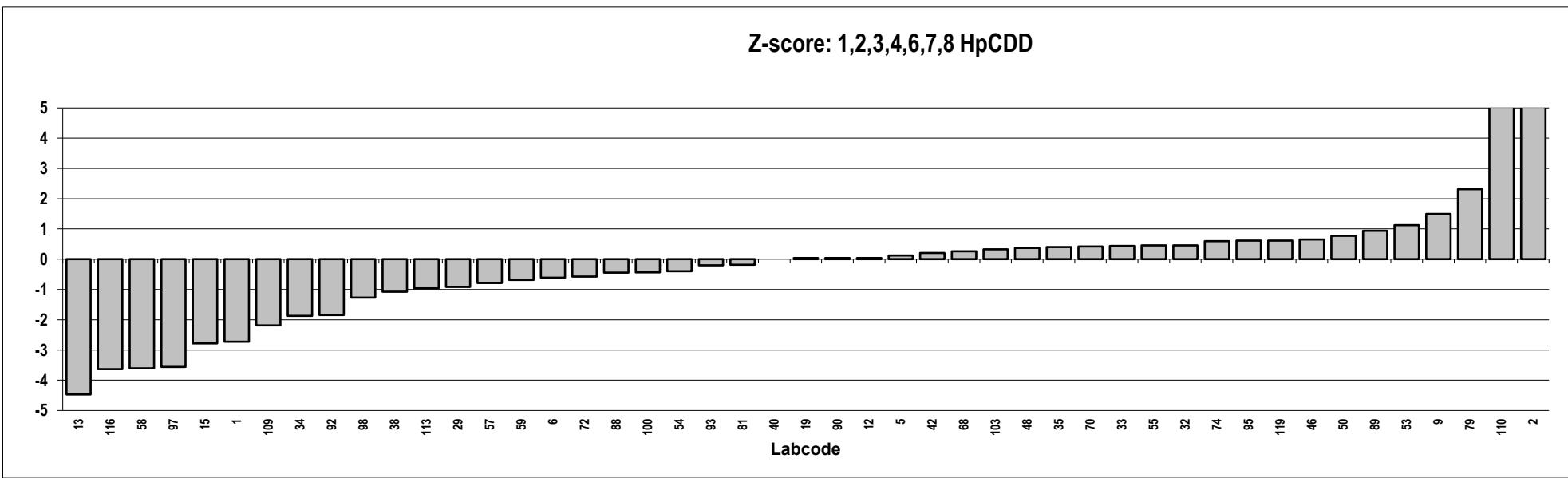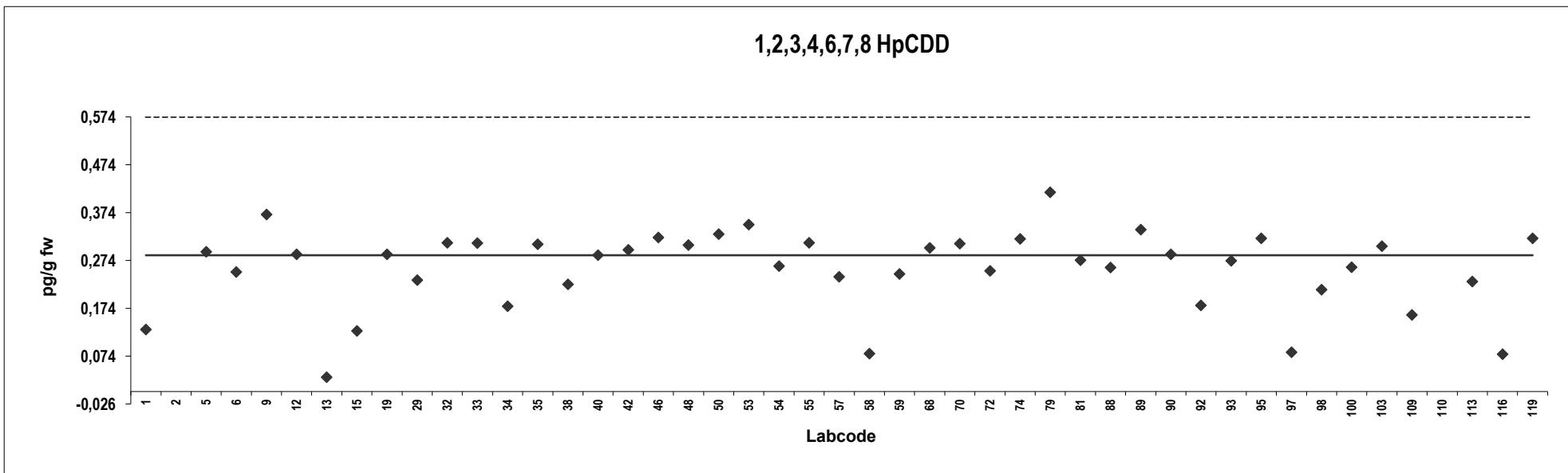
Fish oil
Congener: OCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	0,33	1,5		116	0,11	-2,8	ND
2	0,80	11	Outlier	119	0,23	-0,55	
5	0,19	-1,3					
6	0,20	-1,1	ND				
9	0,37	2,3					
12	0,17	-1,7					
13	0,030	-4,4	ND				
15	0,88	12	Outlier				
19	0,19	-1,2					
29	0,20	-1,1					
32	0,35	1,9					
33	0,42	3,3	ND				
34	0,19	-1,2					
35	0,44	3,7					
38	0,13	-2,4					
40	0,51	5,1					
42	0,61	7,0	Outlier				
46	0,25	-0,079					
48	0,25	-0,12					
50	0,31	1,2					
53	0,38	2,4					
54	0,44	3,6	ND				
55	0,29	0,69					
57	0,54	5,6					
58	0,38	2,5					
59	0,28	0,55					
68	0,30	0,91					
70	2,0	34	Outlier,ND				
72	0,33	1,5	ND				
74	0,26	0,079					
79	0,46	4,1					
81	0,20	-1,0					
88	0,17	-1,6					
89	0,41	3,0					
90	0,33	1,5					
92	0,33	1,5					
93	0,18	-1,4					
95	0,23	-0,47					
97	0,13	-2,4	ND				
98	0,18	-1,4					
100	0,24	-0,30					
103	0,29	0,74					
109	0,15	-2,0					
110	1,3	21	Outlier,ND				
113	0,16	-1,9					

Consenus statistics

Consensus median, pg/g	0,25
Median all values pg/g	0,29
Consensus mean, pg/g	0,27
Standard deviation, pg/g	0,12
Relative standard deviation, %	42
No. of values reported	47
No. of values removed	5
No. of reported non-detects	9

OCDD

Z-score: OCDD
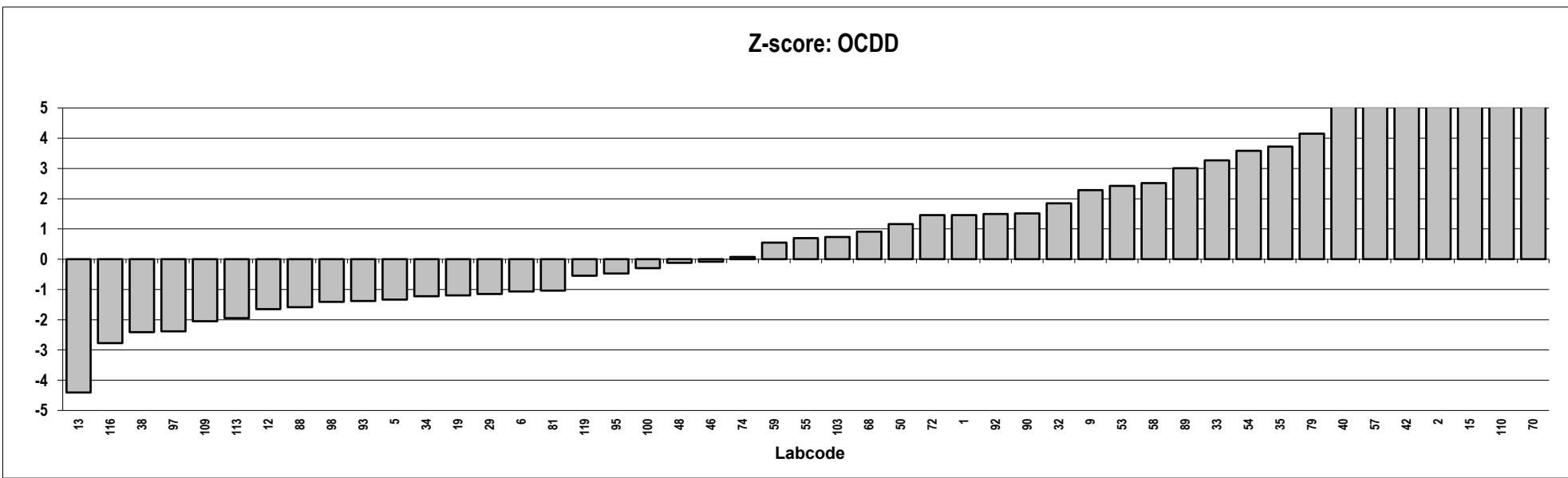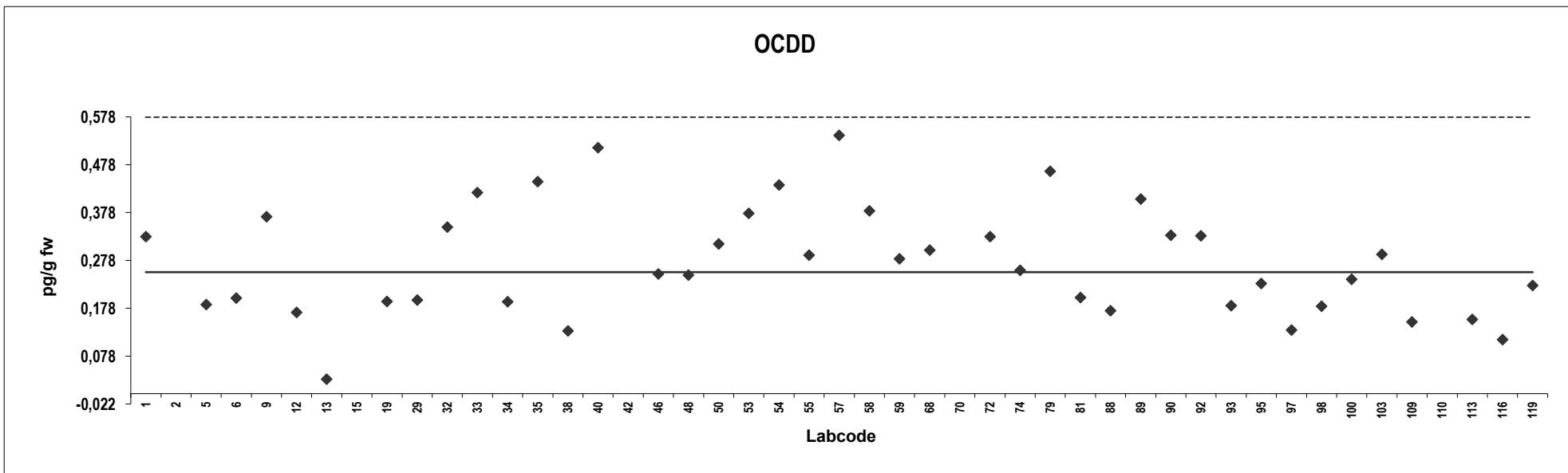
Fish oil

Congener: 2,3,7,8 TCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	6,9	-1,3		116	8,8	-0,26	
2	9,9	0,29		119	7,6	-0,91	
5	11	0,63					
6	9,5	0,10					
9	11	0,85					
12	11	0,74					
13	8,8	-0,30					
15	51	22	Outlier				
19	9,7	0,22					
29	10	0,40					
32	9,6	0,12					
33	8,0	-0,71					
34	10	0,38					
35	10	0,40					
38	8,6	-0,36					
40	9,5	0,071					
42	9,9	0,30					
46	11	0,63					
48	7,9	-0,78					
50	9,1	-0,13					
53	8,3	-0,57					
54	9,0	-0,19					
55	9,4	0,042					
57	9,1	-0,10					
58	8,2	-0,61					
59	8,0	-0,73					
68	9,5	0,073					
70	9,6	0,14					
72	8,9	-0,25					
74	10	0,58					
79	10	0,34					
81	8,7	-0,32					
88	9,3	-0,0071					
89	9,8	0,28					
90	9,0	-0,16					
92	0,64	-4,7					
93	9,1	-0,12					
95	8,9	-0,23					
97	9,3	0,0071					
98	8,0	-0,73					
100	10	0,41					
103	15	2,9					
109	8,8	-0,29					
110	8,5	-0,45					
113	9,5	0,077					

Consensus statistics

Consensus median, pg/g	9,3
Median all values pg/g	9,3
Consensus mean, pg/g	9,2
Standard deviation, pg/g	1,7
Relative standard deviation, %	19
No. of values reported	47
No. of values removed	1
No. of reported non-detects	0

2,3,7,8 TCDF

Z-score: 2,3,7,8 TCDF
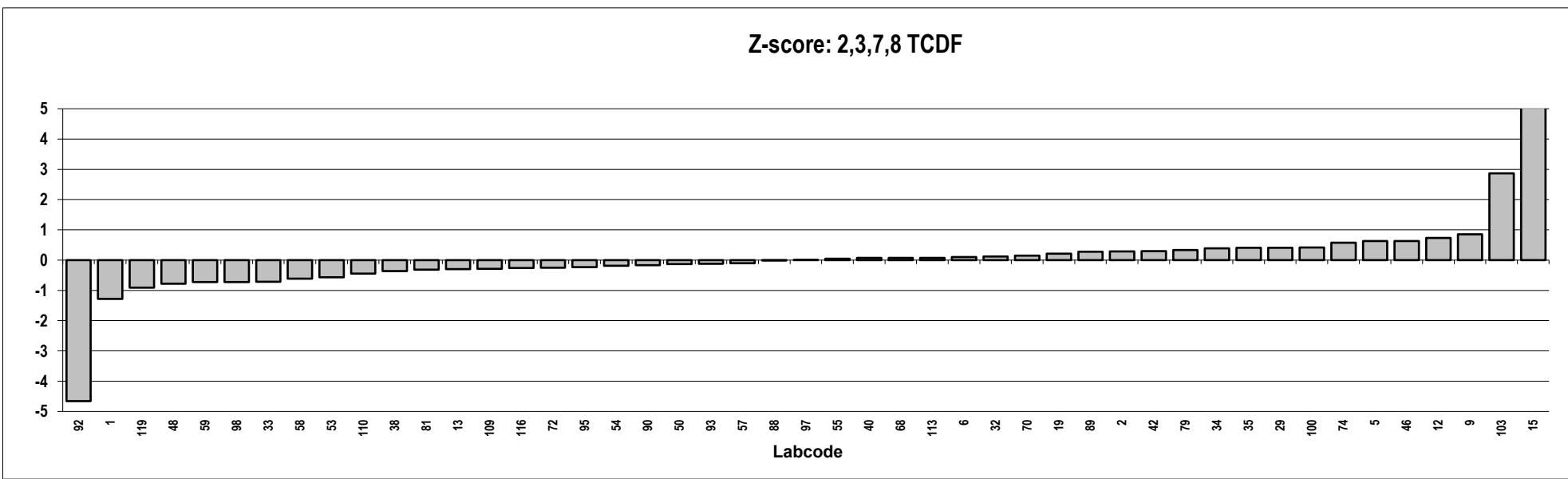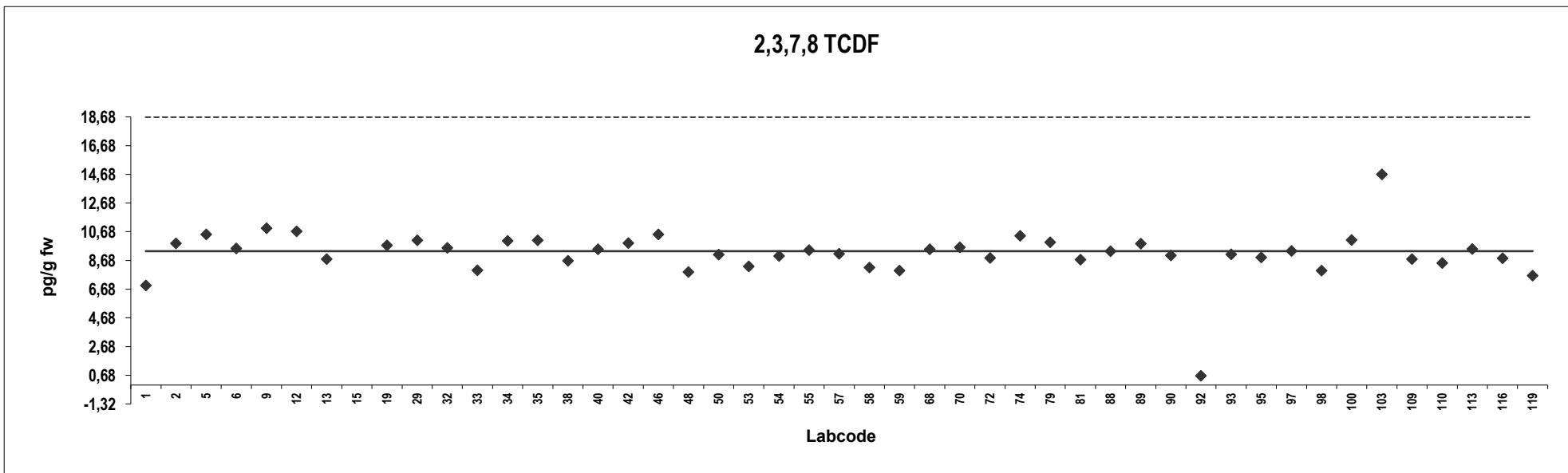
Fish oil
Congener: 1,2,3,7,8 PeCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	1,4	0,19		116	1,6	1,1	
2	1,5	0,59		119	1,1	-0,92	
5	1,4	0,25					
6	1,3	0,021					
9	1,4	0,36					
12	1,3	0,060					
13	1,4	0,40					
15	3,3	7,4	Outlier				
19	1,3	-0,091					
29	1,5	0,69					
32	1,2	-0,48					
33	1,4	0,29					
34	1,6	0,90					
35	1,5	0,63					
38	1,1	-1,0					
40	1,3	-0,27					
42	1,3	0,023					
46	1,4	0,29					
48	1,2	-0,55					
50	1,7	1,2					
53	1,4	0,21					
54	1,3	-0,021					
55	1,2	-0,37					
57	1,3	-0,053					
58	1,2	-0,30					
59	1,1	-0,94					
68	1,5	0,61					
70	1,2	-0,32					
72	1,4	0,34					
74	1,4	0,29					
79	1,5	0,53					
81	1,3	0,055					
88	1,2	-0,41					
89	1,2	-0,40					
90	1,3	-0,053					
92	0,22	-4,2					
93	1,2	-0,34					
95	1,3	-0,091					
97	1,3	-0,20					
98	1,3	-0,078					
100	1,4	0,29					
103	1,3	-0,20					
109	1,2	-0,58					
110	1,3	-0,24					
113	1,4	0,32					

Consensus statistics

Consensus median, pg/g	1,3
Median all values pg/g	1,3
Consensus mean, pg/g	1,3
Standard deviation, pg/g	0,21
Relative standard deviation, %	16
No. of values reported	47
No. of values removed	1
No. of reported non-detects	0

1,2,3,7,8 PeCDF

Z-score: 1,2,3,7,8 PeCDF
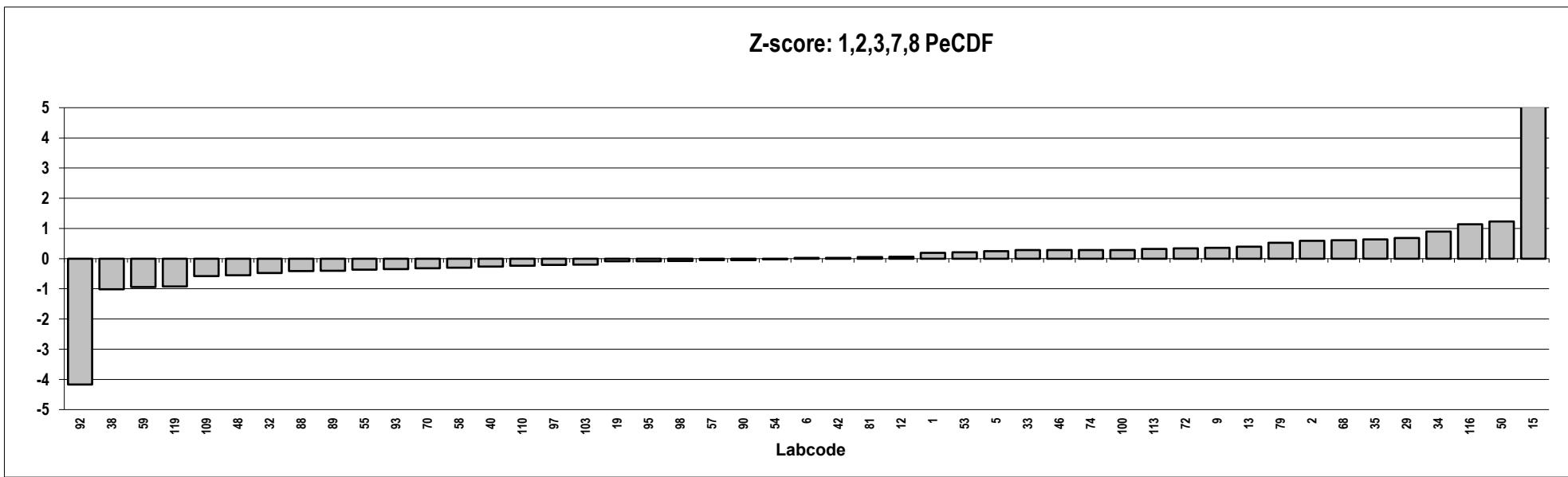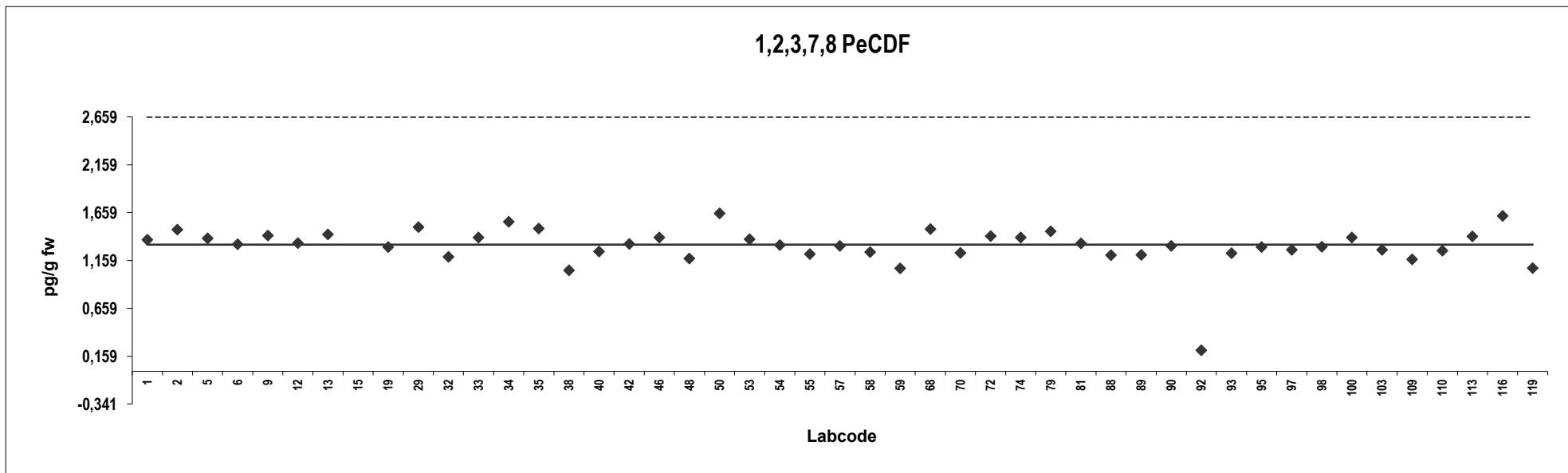
Fish oil
Congener: 2,3,4,7,8 PeCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	4,1	-0,12		116	4,2	-0,033	
2	3,9	-0,38		119	3,8	-0,49	
5	4,8	0,61					
6	4,3	0,12					
9	4,7	0,52					
12	4,3	0,12					
13	4,4	0,15					
15	20	18	Outlier				
19	4,6	0,48					
29	4,4	0,15					
32	4,4	0,25					
33	3,9	-0,39					
34	5,7	1,8					
35	4,7	0,51					
38	3,4	-0,95					
40	4,4	0,18					
42	4,8	0,63					
46	4,3	0,092					
48	3,6	-0,79					
50	4,1	-0,21					
53	4,3	0,025					
54	4,1	-0,13					
55	4,0	-0,30					
57	4,1	-0,13					
58	4,6	0,48					
59	3,6	-0,76					
68	4,8	0,68					
70	5,0	0,87					
72	4,0	-0,29					
74	4,4	0,16					
79	4,8	0,64					
81	4,2	-0,096					
88	3,9	-0,38					
89	4,6	0,38					
90	3,9	-0,41					
92	0,24	-4,7					
93	4,7	0,55					
95	4,1	-0,16					
97	4,6	0,43					
98	4,2	-0,025					
100	5,0	0,86					
103	4,1	-0,15					
109	3,9	-0,38					
110	3,8	-0,50					
113	4,0	-0,27					

Consensus statistics

Consensus median, pg/g	4,2
Median all values pg/g	4,3
Consensus mean, pg/g	4,2
Standard deviation, pg/g	0,74
Relative standard deviation, %	17
No. of values reported	47
No. of values removed	1
No. of reported non-detects	0

2,3,4,7,8 PeCDF

Z-score: 2,3,4,7,8 PeCDF
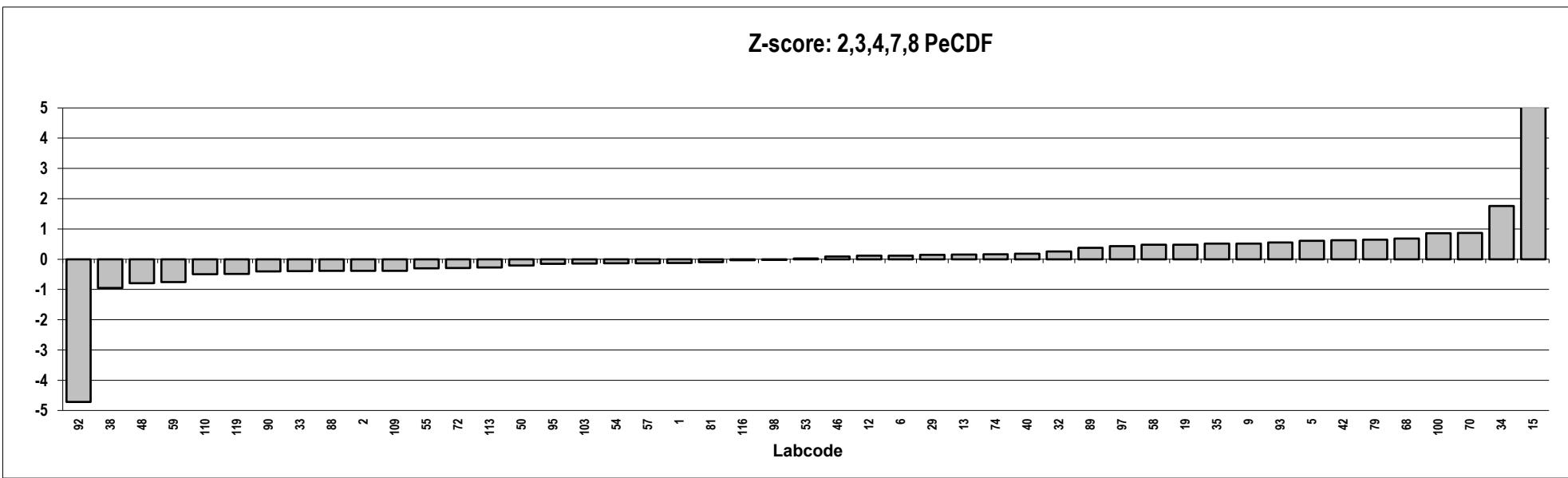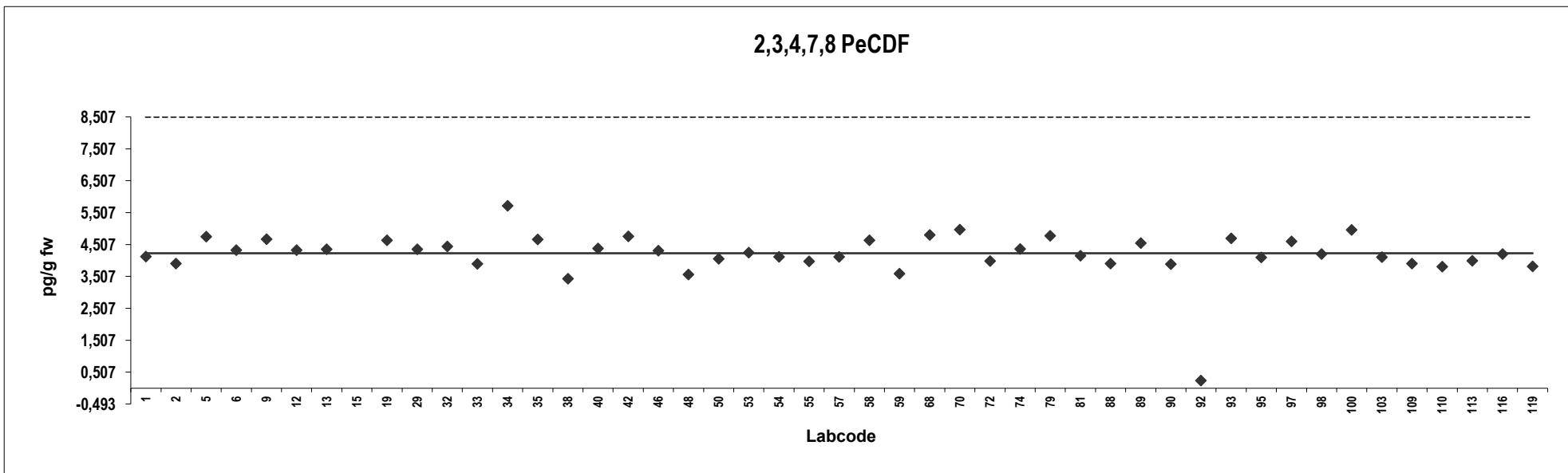
Fish oil
Congener: 1,2,3,4,7,8 HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	0,24	-1,6		116	1,2	11	Outlier
2	0,32	-0,45		119	0,41	0,77	
5	0,36	0,029					
6	0,35	-0,12					
9	0,39	0,48					
12	0,39	0,44					
13	0,30	-0,79					
15	0,18	-2,5					
19	0,36	0,071					
29	0,34	-0,20					
32	0,33	-0,31					
33	0,36	0,057					
34	0,30	-0,86					
35	0,35	-0,072					
38	0,28	-1,0					
40	0,35	-0,13					
42	1,0	9,3	Outlier				
46	0,39	0,45					
48	0,37	0,16					
50	0,31	-0,65					
53	0,40	0,69					
54	0,35	-0,059					
55	0,26	-1,4					
57	0,40	0,62					
58	0,36	0,097					
59	0,29	-1,0					
68	0,53	2,5					
70	0,40	0,65					
72	0,36	0,12					
74	0,37	0,25					
79	0,37	0,14					
81	1,1	10	Outlier				
88	0,32	-0,48					
89	0,37	0,24					
90	0,39	0,49					
92	0,075	-3,9					
93	0,49	1,8					
95	0,32	-0,50					
97	0,38	0,35					
98	0,35	-0,030					
100	0,32	-0,50					
103	0,37	0,18					
109	0,38	0,34					
110	0,35	-0,029					
113	0,35	-0,15					

Consensus statistics

|	
Consensus median, pg/g	0,36
Median all values pg/g	0,36
Consensus mean, pg/g	0,35
Standard deviation, pg/g	0,071
Relative standard deviation, %	21
No. of values reported	47
No. of values removed	3
No. of reported non-detects	0

1,2,3,4,7,8 HxCDF

Z-score: 1,2,3,4,7,8 HxCDF
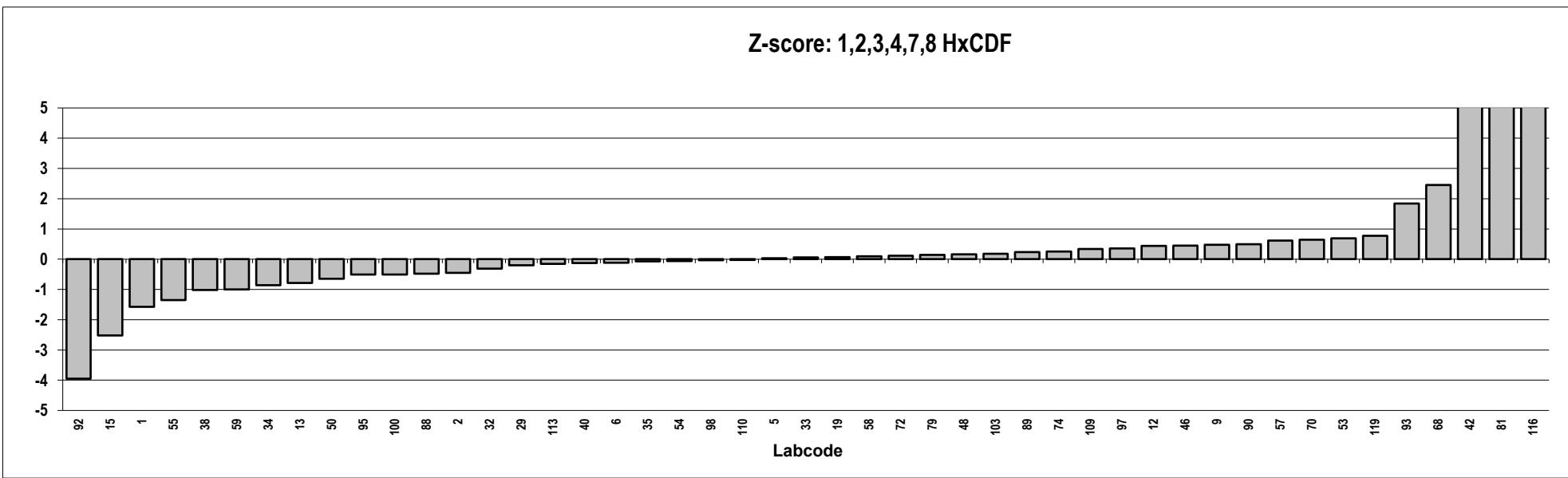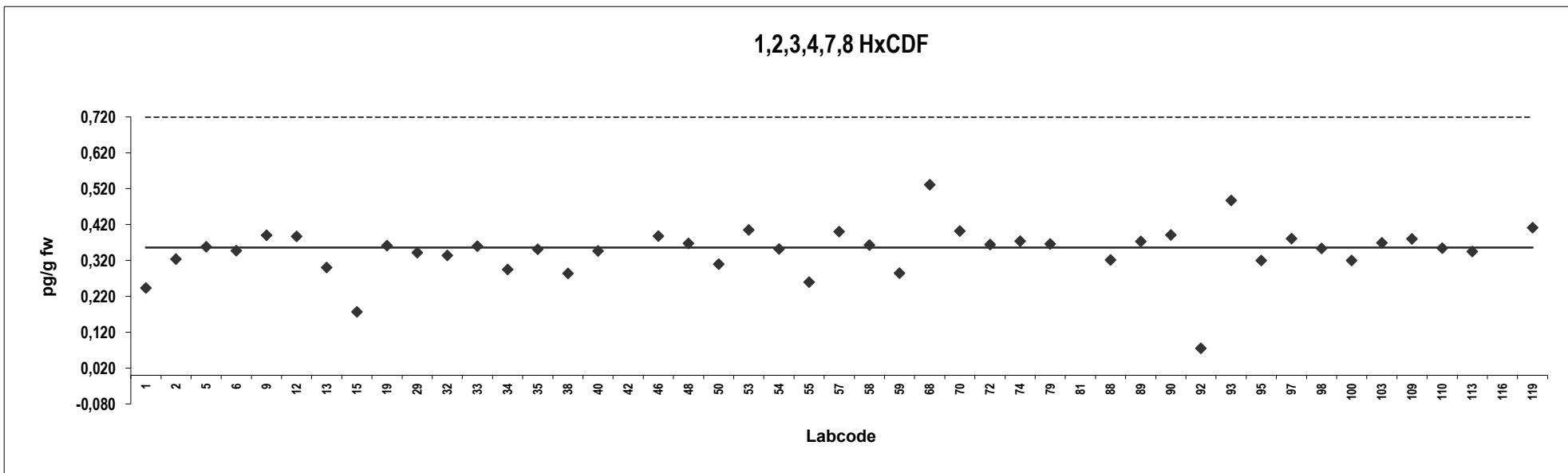
Fish oil
Congener: 1,2,3,6,7,8 HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	0,34	-1,5		116	0,79	3,1	
2	0,53	0,39		119	0,46	-0,33	
5	0,51	0,21					
6	0,46	-0,28					
9	0,48	-0,037					
12	0,51	0,25					
13	0,52	0,33					
15	0,14	-3,6					
19	0,52	0,31					
29	0,45	-0,35					
32	0,57	0,80					
33	0,46	-0,28					
34	0,63	1,4					
35	0,49	0,034					
38	0,44	-0,44					
40	0,47	-0,13					
42	0,50	0,11					
46	0,52	0,32					
48	0,45	-0,37					
50	0,45	-0,37					
53	0,54	0,49					
54	0,50	0,12					
55	0,43	-0,61					
57	0,35	-1,4					
58	0,47	-0,20					
59	0,42	-0,69					
68	0,50	0,17					
70	0,47	-0,17					
72	0,51	0,19					
74	0,50	0,13					
79	0,54	0,56					
81	0,67	1,9					
88	0,47	-0,23					
89	0,46	-0,31					
90	0,47	-0,20					
92	0,041	-4,6					
93	0,52	0,33					
95	0,46	-0,28					
97	0,50	0,11					
98	0,49	0,057					
100	0,46	-0,32					
103	0,49	0,00					
109	0,58	0,95					
110	0,51	0,24					
113	0,45	-0,44					

Consensus statistics

|	
Consensus median, pg/g	0,49
Median all values pg/g	0,49
Consensus mean, pg/g	0,48
Standard deviation, pg/g	0,11
Relative standard deviation, %	23
No. of values reported	47
No. of values removed	0
No. of reported non-detects	0

1,2,3,6,7,8 HxCDF

Z-score: 1,2,3,6,7,8 HxCDF
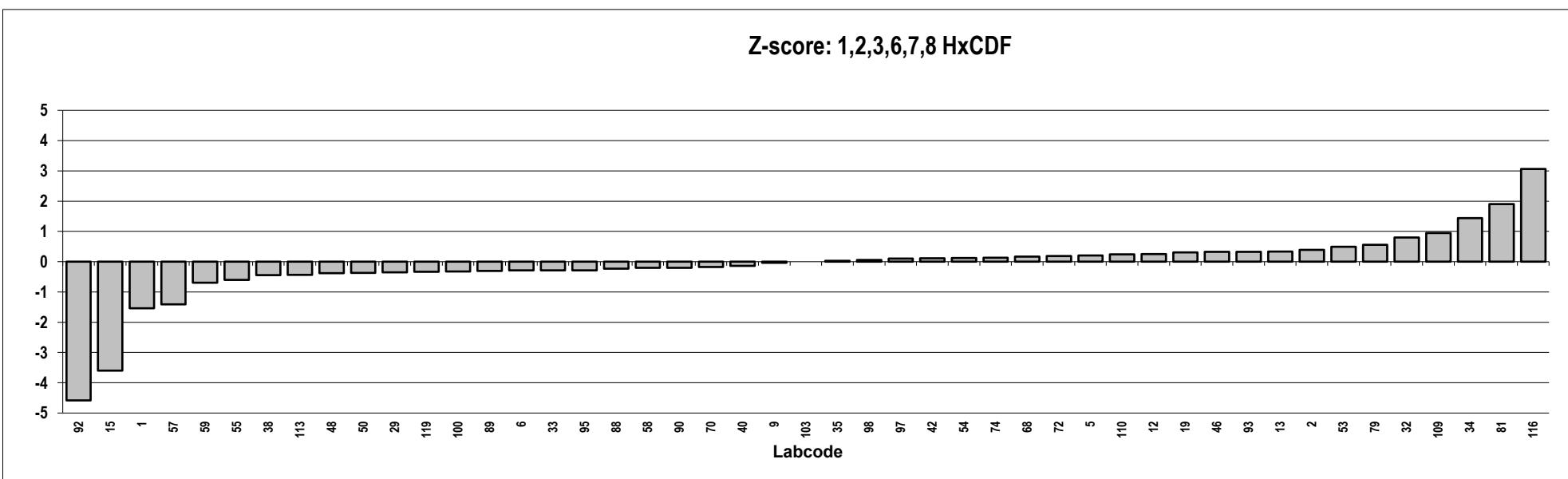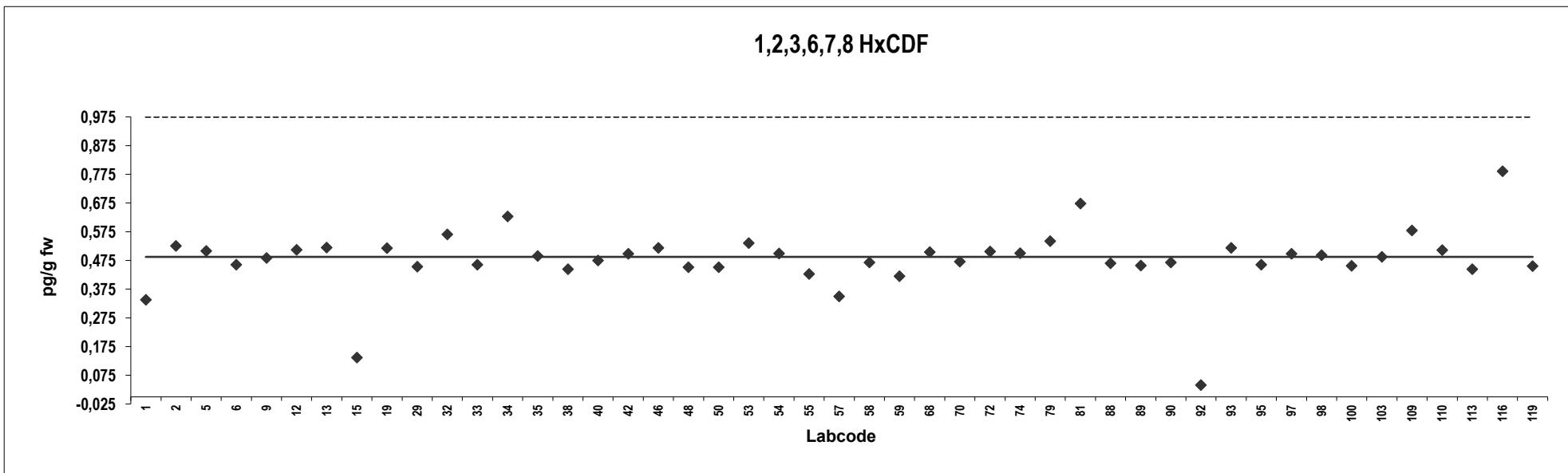
Fish oil
Congener: 2,3,4,6,7,8 HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	0,68	1,3		116	0,67	1,1	
2	0,54	-0,089		119	0,60	0,54	
5	0,57	0,25					
6	0,58	0,36					
9	0,60	0,51					
12	0,64	0,84					
13	0,50	-0,41					
15	0,21	-3,1					
19	0,59	0,44					
29	0,54	0,00					
32	0,56	0,15					
33	0,49	-0,50					
34	0,56	0,16					
35	0,67	1,2					
38	0,47	-0,71					
40	0,58	0,29					
42	0,51	-0,35					
46	0,56	0,10					
48	0,50	-0,37					
50	0,42	-1,1					
53	0,59	0,39					
54	0,60	0,50					
55	0,58	0,36					
57	0,40	-1,3					
58	0,77	2,1					
59	0,44	-1,0					
68	0,57	0,24					
70	0,52	-0,21					
72	0,49	-0,55					
74	0,54	-0,080					
79	0,65	0,98					
81	0,60	0,54					
88	0,49	-0,48					
89	0,54	-0,074					
90	0,50	-0,43					
92	0,15	-3,6					
93	0,52	-0,24					
95	0,53	-0,13					
97	0,74	1,7					
98	0,58	0,35					
100	0,56	0,12					
103	0,50	-0,40					
109	0,38	-1,5					
110	0,51	-0,29					
113	0,010	-4,9					

Consensus statistics

Consensus median, pg/g	0,54
Median all values pg/g	0,54
Consensus mean, pg/g	0,53
Standard deviation, pg/g	0,13
Relative standard deviation, %	25
No. of values reported	47
No. of values removed	0
No. of reported non-detects	0

2,3,4,6,7,8 HxCDF

Z-score: 2,3,4,6,7,8 HxCDF
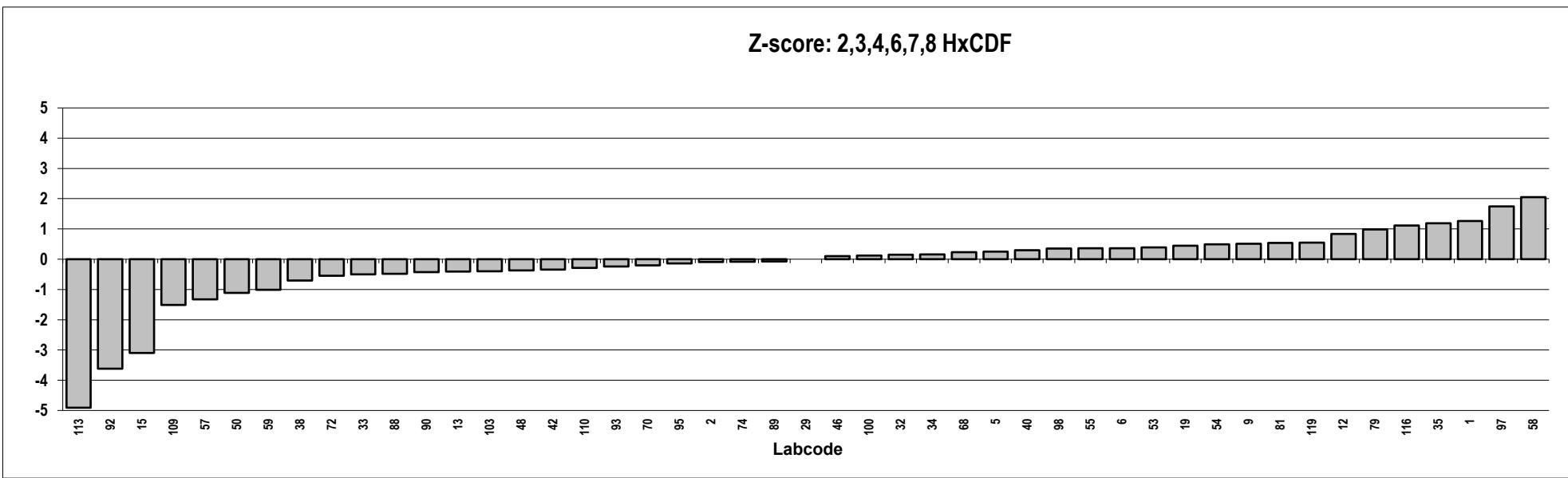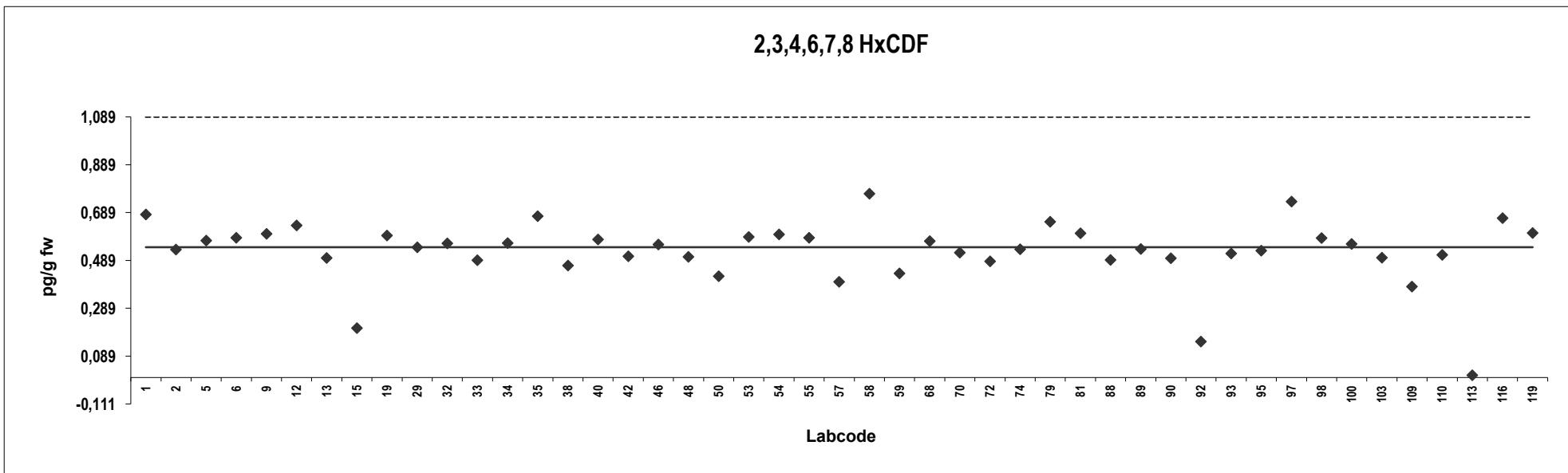
Fish oil
Congener: 1,2,3,7,8,9 HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	0,043	0,50	ND	116	0,085	5,9	ND
2	0,14	13	Outlier	119	0,014	-3,2	
5	0,018	-2,7					
6	0,070	4,0	ND				
9	0,010	-3,7	ND				
12	0,089	6,4					
13	0,015	-3,1	ND				
15	0,020	-2,4					
19	0,075	4,6	ND				
29	0,015	-3,1					
32	0,16	15	Outlier,ND				
33	0,17	17	Outlier,ND				
34	0,038	-0,14					
35	0,069	3,8					
38	0,039	0,00	ND				
40	0,020	-2,4					
42	0,015	-3,1	ND				
46	0,020	-2,4	ND				
48	0,078	5,0					
50	0,062	2,9	ND				
53	0,024	-2,0					
54	0,17	17	Outlier,ND				
55	0,067	3,6					
57	0,050	1,4	ND				
58	0,15	14	Outlier				
59	0,018	-2,7	ND				
68	0,049	1,3					
70	0,050	1,4	ND				
72	0,16	16	Outlier,ND				
74	0,020	-2,4	ND				
79	0,085	5,9					
81	0,14	12	Outlier				
88	0,034	-0,63					
89	0,018	-2,7	ND				
90	0,030	-1,2	ND				
92	0,14	13	Outlier				
93	0,054	1,9					
95	0,060	2,7	ND				
97	0,061	2,8	ND				
98	0,21	22	Outlier				
100	0,030	-1,2	ND				
103	0,030	-1,2	ND				
109	0,10	7,8	ND				
110	0,083	5,6	ND				
113	0,59	70	Outlier				

Consensus statistics

|	
Consensus median, pg/g	0,039
Median all values pg/g	0,054
Consensus mean, pg/g	0,045
Standard deviation, pg/g	0,026
Relative standard deviation, %	59
No. of values reported	47
No. of values removed	10
No. of reported non-detects	26

1,2,3,7,8,9 HxCDF

Z-score: 1,2,3,7,8,9 HxCDF
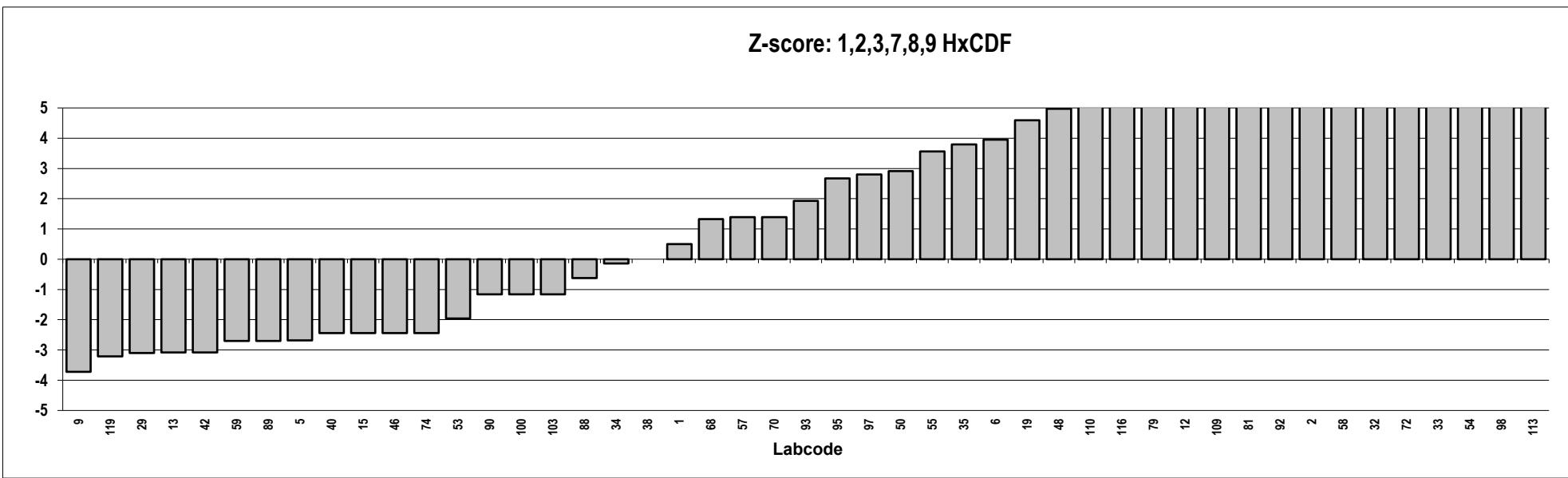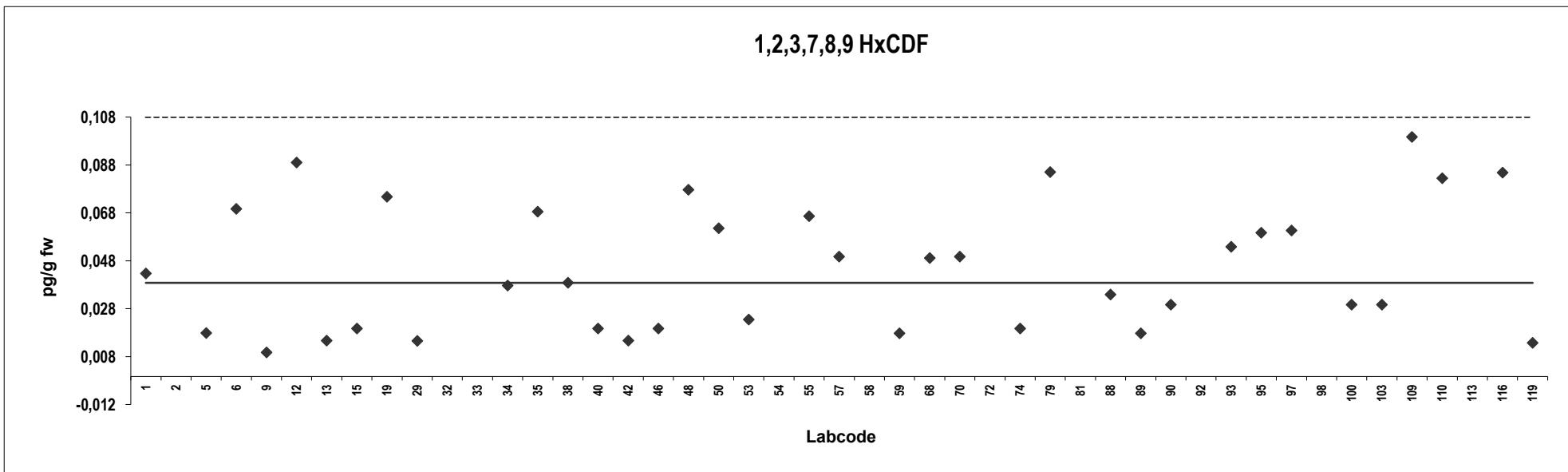
Fish oil
Congener: 1,2,3,4,6,7,8 HpCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	0,72	13	Outlier	116	0,25	1,1	
2	0,33	3,1		119	0,22	0,36	
5	0,23	0,68					
6	0,22	0,47					
9	0,26	1,4					
12	0,22	0,43					
13	0,22	0,41					
15	0,19	-0,42					
19	0,20	0,012					
29	0,18	-0,61					
32	0,16	-1,1					
33	0,24	0,90					
34	0,18	-0,60					
35	0,37	4,0					
38	0,15	-1,3					
40	0,17	-0,77					
42	1,7	38	Outlier				
46	0,22	0,28					
48	0,25	1,1					
50	0,19	-0,30					
53	0,23	0,75					
54	0,22	0,49					
55	0,12	-2,2					
57	0,090	-2,8					
58	0,097	-2,6					
59	0,17	-0,72					
68	0,23	0,75					
70	0,17	-0,77					
72	0,16	-0,96					
74	0,20	-0,14					
79	0,33	3,2					
81	0,45	6,0	Outlier				
88	0,24	0,79					
89	0,19	-0,42					
90	0,20	-0,012					
92	0,052	-3,7					
93	0,26	1,4					
95	0,19	-0,33					
97	0,056	-3,6	ND				
98	0,14	-1,6					
100	0,21	0,037					
103	0,25	1,2					
109	0,19	-0,33					
110	0,21	0,23					
113	0,14	-1,7					

Consensus statistics

|	
Consensus median, pg/g	0,20
Median all values pg/g	0,21
Consensus mean, pg/g	0,20
Standard deviation, pg/g	0,064
Relative standard deviation, %	32
No. of values reported	47
No. of values removed	3
No. of reported non-detects	1

1,2,3,4,6,7,8 HpCDF

Z-score: 1,2,3,4,6,7,8 HpCDF
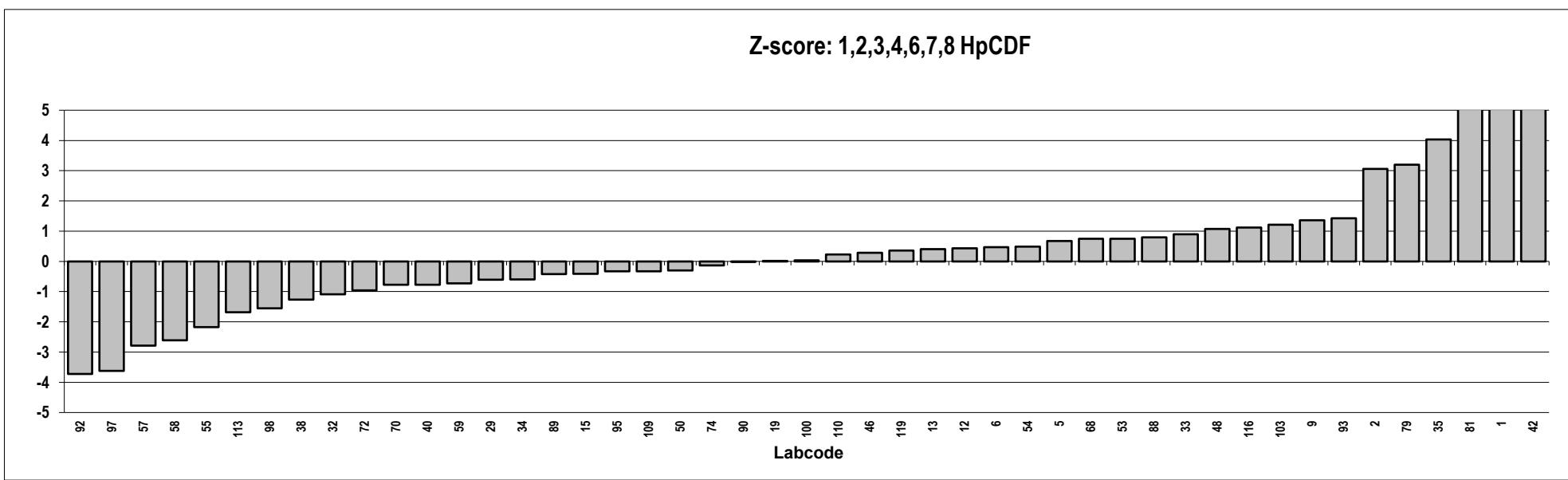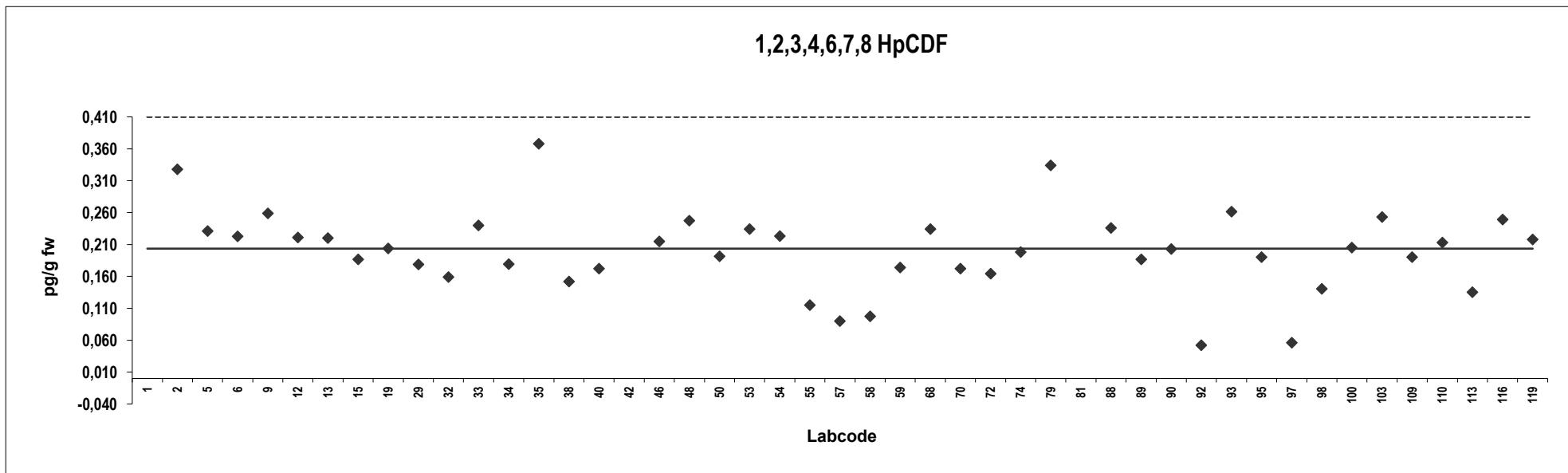
Fish oil
Congener: 1,2,3,4,7,8,9 HpCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	0,073	5,5	ND	116	0,33	43	Outlier
2	0,067	4,7		119	0,0080	-3,8	
5	0,025	-1,4					
6	0,040	0,78	ND				
9	0,020	-2,1	ND				
12	0,0040	-4,4	ND				
13	0,030	-0,66	ND				
15	0,087	7,5					
19	0,075	5,8	ND				
29	0,016	-2,7					
32	0,097	9,0	Outlier,ND				
33	0,17	20	Outlier,ND				
34	0,015	-2,8					
35	0,086	7,5					
38	0,039	0,65	ND				
40	0,030	-0,71					
42	0,099	9,4	Outlier				
46	0,025	-1,4					
48	0,044	1,4					
50	0,062	3,9	ND				
53	0,044	1,3					
54	0,17	20	Outlier,ND				
55	0,0080	-3,8	ND				
57	0,050	2,2	ND				
58	0,13	14	Outlier				
59	0,022	-1,8					
68	0,043	1,2					
70	0,15	17	Outlier,ND				
72	0,16	19	Outlier,ND				
74	0,027	-1,1					
79	0,067	4,7					
81	0,16	18	Outlier				
88	0,050	2,2					
89	0,0040	-4,4	ND				
90	0,040	0,78	ND				
92	0,12	12	Outlier				
93	0,030	-0,65	ND				
95	0,040	0,78	ND				
97	0,075	5,8	ND				
98	0,021	-2,0					
100	0,10	10	Outlier,ND				
103	0,030	-0,66	ND				
109	0,10	9,5	Outlier,ND				
110	0,17	19	Outlier,ND				
113	0,020	-2,1					

Consensus statistics

|	
Consensus median, pg/g	0,035
Median all values pg/g	0,044
Consensus mean, pg/g	0,039
Standard deviation, pg/g	0,024
Relative standard deviation, %	61
No. of values reported	47
No. of values removed	13
No. of reported non-detects	24

1,2,3,4,7,8,9 HpCDF

Z-score: 1,2,3,4,7,8,9 HpCDF
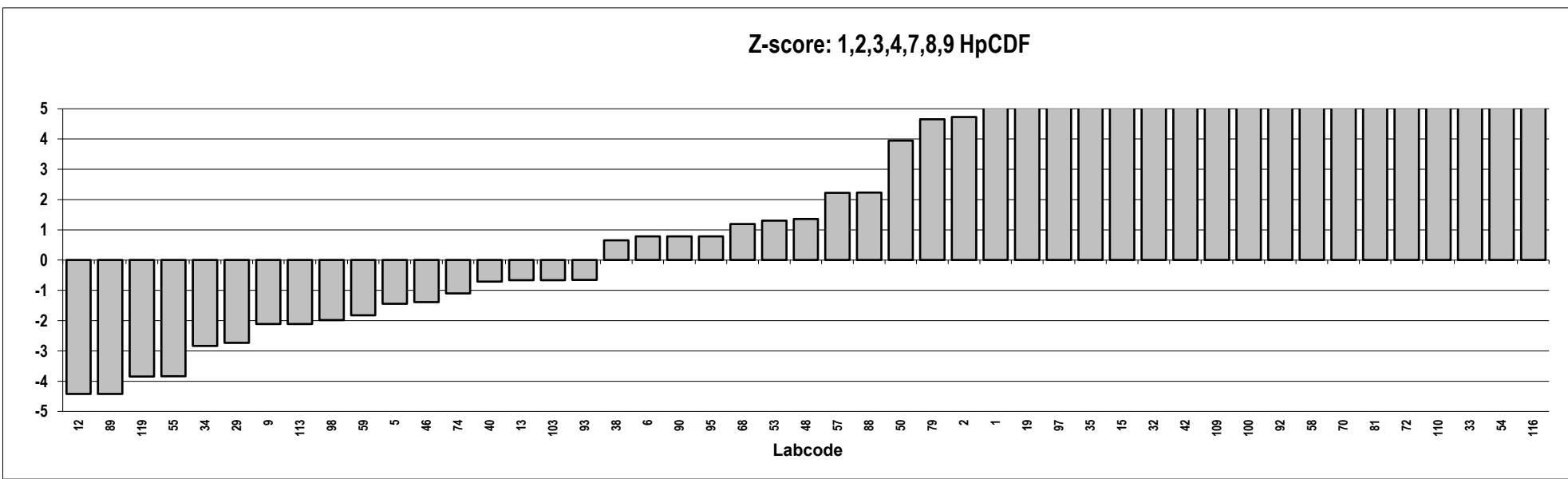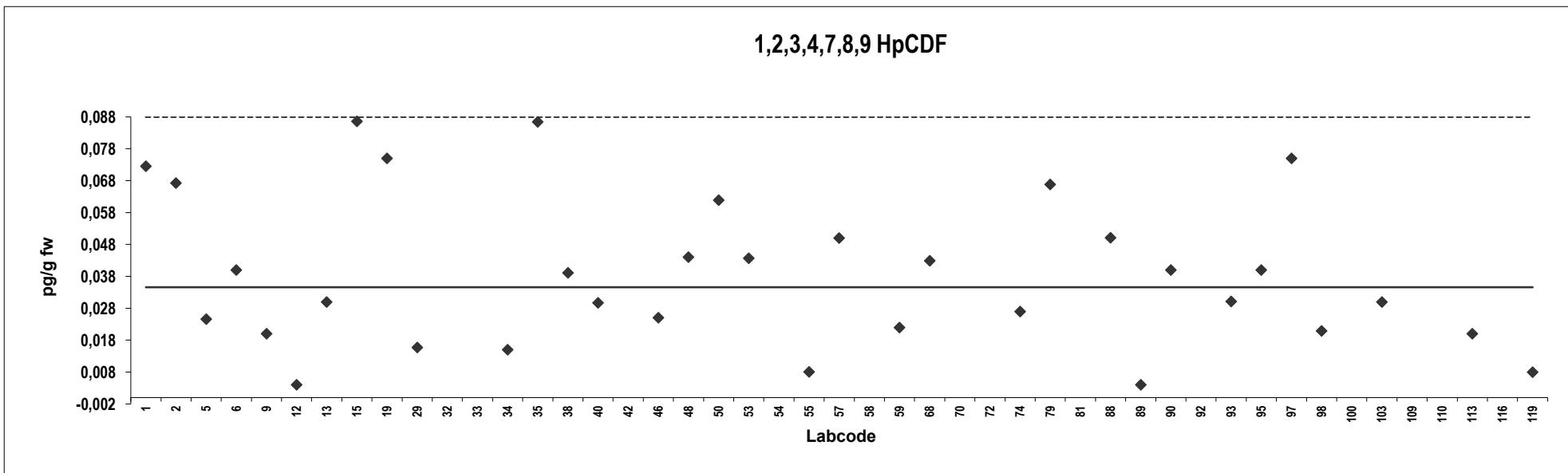
Fish oil
Congener: OCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	0,056	-0,79	ND	116	0,35	22	Outlier
2	0,22	12	Outlier,ND	119	0,0040	-4,7	ND
5	0,022	-3,4					
6	0,020	-3,5	ND				
9	0,21	11	Outlier				
12	0,16	7,2					
13	0,030	-2,7	ND				
15	0,43	27	Outlier				
19	0,15	6,3	ND				
29	0,042	-1,8					
32	0,075	0,63	ND				
33	0,42	27	Outlier,ND				
34	0,10	2,6					
35	0,055	-0,86					
38	0,078	0,86	ND				
40	0,021	-3,4					
42	5,6	414	Outlier				
46	0,045	-1,6					
48	0,068	0,11					
50	0,12	4,3	ND				
53	0,075	0,66					
54	0,17	8,1	ND				
55	0,059	-0,58					
57	0,10	2,5	ND				
58	0,19	9,4					
59	0,055	-0,87					
68	0,12	4,0					
70	2,0	145	Outlier,ND				
72	0,33	20	Outlier,ND				
74	0,044	-1,7					
79	0,15	6,0					
81	0,21	11	Outlier				
88	0,054	-0,96					
89	0,065	-0,11					
90	0,070	0,26	ND				
92	0,28	16	Outlier				
93	0,042	-1,8					
95	0,10	2,5	ND				
97	0,10	2,7	ND				
98	0,031	-2,7					
100	0,055	-0,87	ND				
103	0,12	4,0					
109	0,18	8,5					
110	0,33	20	Outlier,ND				
113	0,050	-1,2	ND				

Consenus statistics

Consensus median, pg/g	0,067
Median all values pg/g	0,10
Consensus mean, pg/g	0,080
Standard deviation, pg/g	0,050
Relative standard deviation, %	62
No. of values reported	47
No. of values removed	11
No. of reported non-detects	20
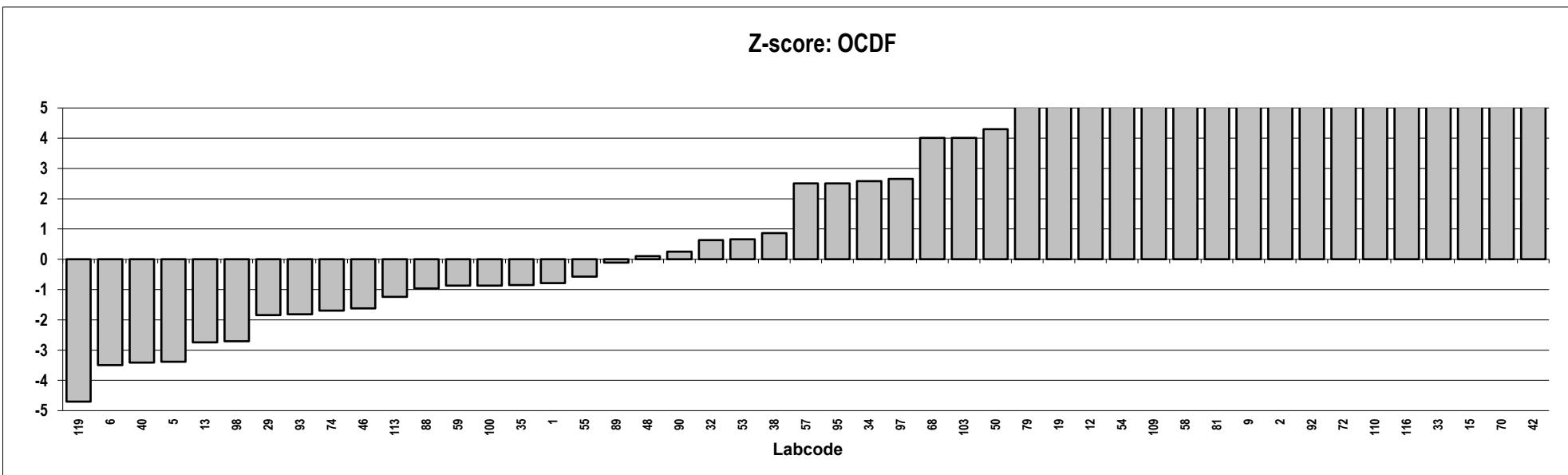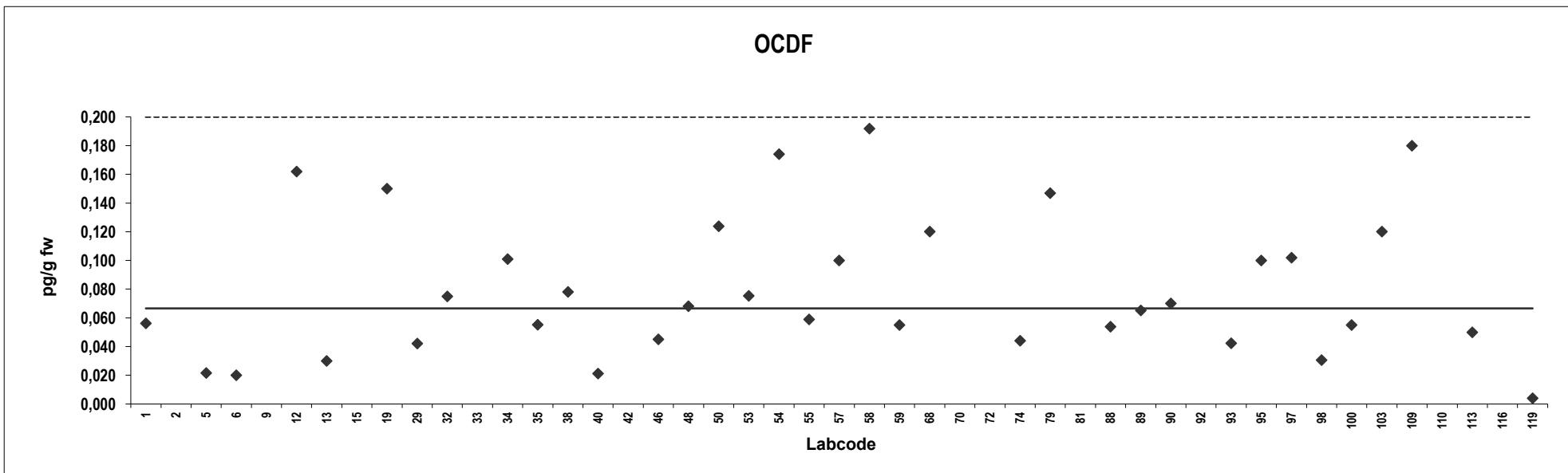
Fish oil

Congener: PCB 77

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	64	-0,92		116	79	0,029	
2	97	1,2		119	58	-1,3	
5	96	1,1					
6	71	-0,46					
9	102	1,5					
12	79	0,032					
13	78	-0,052					
15	69	-0,61					
19	82	0,20					
29	131	3,4					
32	79	0,027					
33	79	0,039					
34	71	-0,50					
35	84	0,36					
38	68	-0,64					
40	75	-0,20					
42	88	0,63					
46	79	0,020					
48	78	-0,034					
50	81	0,19					
53	88	0,64					
54	78	0,00					
55	81	0,16					
57	71	-0,46					
58	79	0,048					
59	83	0,28					
68	78	-0,0017					
70	80	0,082					
72	72	-0,43					
74	79	0,039					
79	84	0,36					
81	84	0,38					
88	80	0,12					
89	74	-0,27					
90	72	-0,41					
92	20	-3,7					
93	66	-0,79					
95	75	-0,24					
97	89	0,70					
98	75	-0,23					
100	75	-0,20					
103	76	-0,13					
109	76	-0,18					
110	70	-0,55					
113	76	-0,15					

Consensus statistics

Consensus median, pg/g	78
Median all values pg/g	78
Consensus mean, pg/g	78
Standard deviation, pg/g	14
Relative standard deviation, %	18
No. of values reported	47
No. of values removed	0
No. of reported non-detects	0

PCB 77
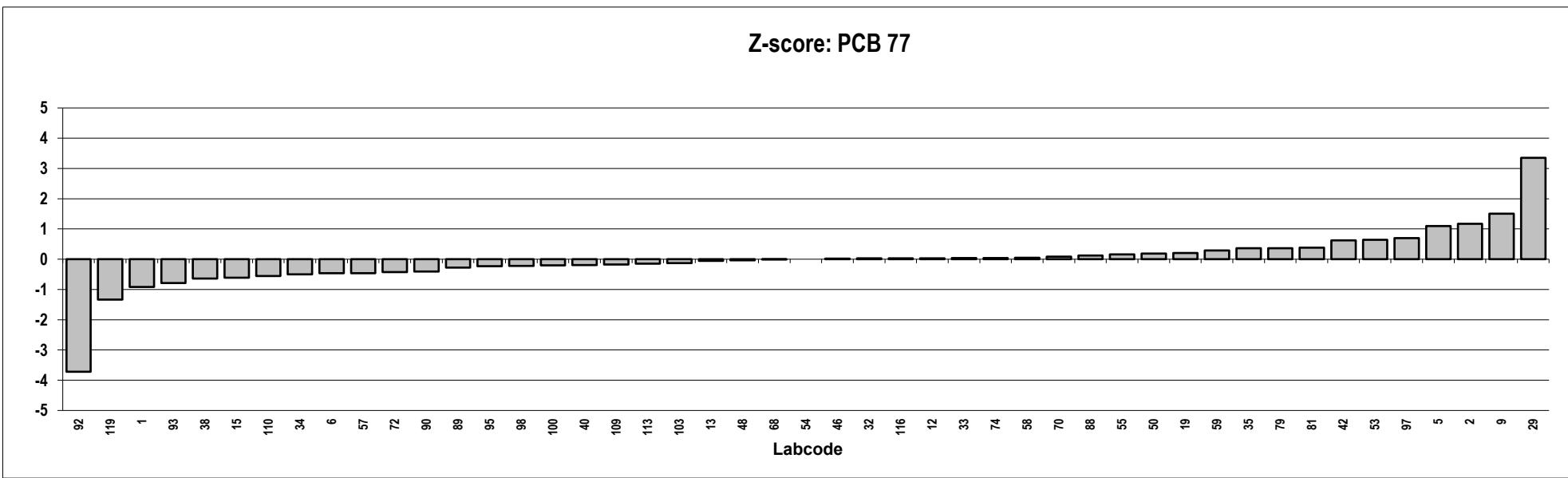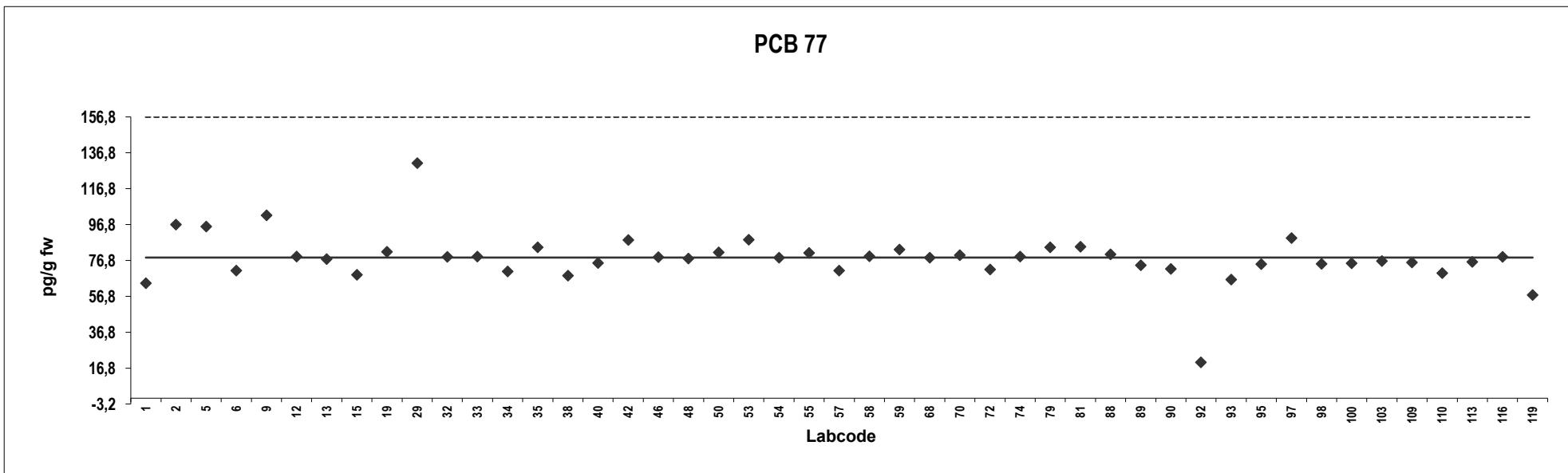
Fish oil
Congener: PCB 126

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	31	-0,92		116	36	-0,26	
2	130	12	Outlier	119	151	15	Outlier
5	41	0,27					
6	34	-0,53					
9	40	0,19					
12	49	1,4					
13	30	-1,1					
15	39	0,023					
19	38	-0,026					
29	39	0,097					
32	38	-0,077					
33	33	-0,71					
34	27	-1,5					
35	39	0,12					
38	45	0,78					
40	36	-0,36					
42	40	0,25					
46	37	-0,18					
48	39	0,11					
50	42	0,46					
53	42	0,51					
54	39	0,086					
55	50	1,5					
57	40	0,18					
58	39	0,12					
59	41	0,35					
68	36	-0,35					
70	35	-0,40					
72	37	-0,21					
74	39	0,00					
79	39	0,12					
81	35	-0,49					
88	39	0,097					
89	39	0,070					
90	35	-0,49					
92	3	-4,6					
93	35	-0,46					
95	41	0,29					
97	41	0,38					
98	47	1,1					
100	38	-0,052					
103	35	-0,44					
109	34	-0,56					
110	37	-0,16					
113	36	-0,28					

Consensus statistics

Consensus median, pg/g	39
Median all values pg/g	39
Consensus mean, pg/g	38
Standard deviation, pg/g	6,8
Relative standard deviation, %	18
No. of values reported	47
No. of values removed	2
No. of reported non-detects	0

PCB 126

Z-score: PCB 126
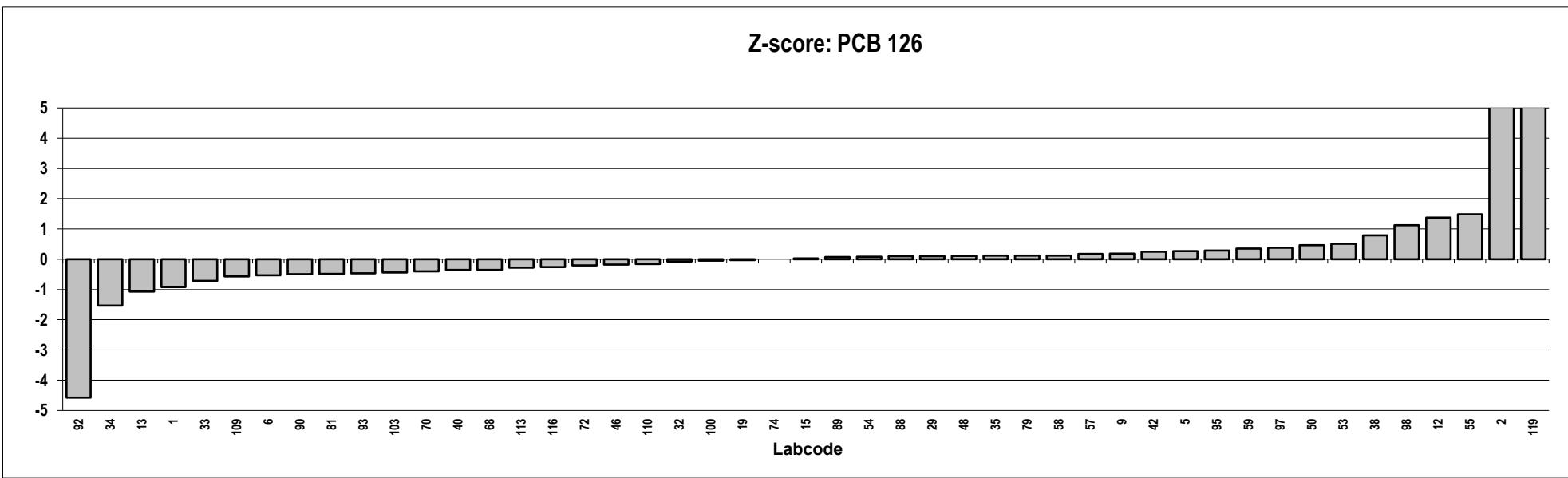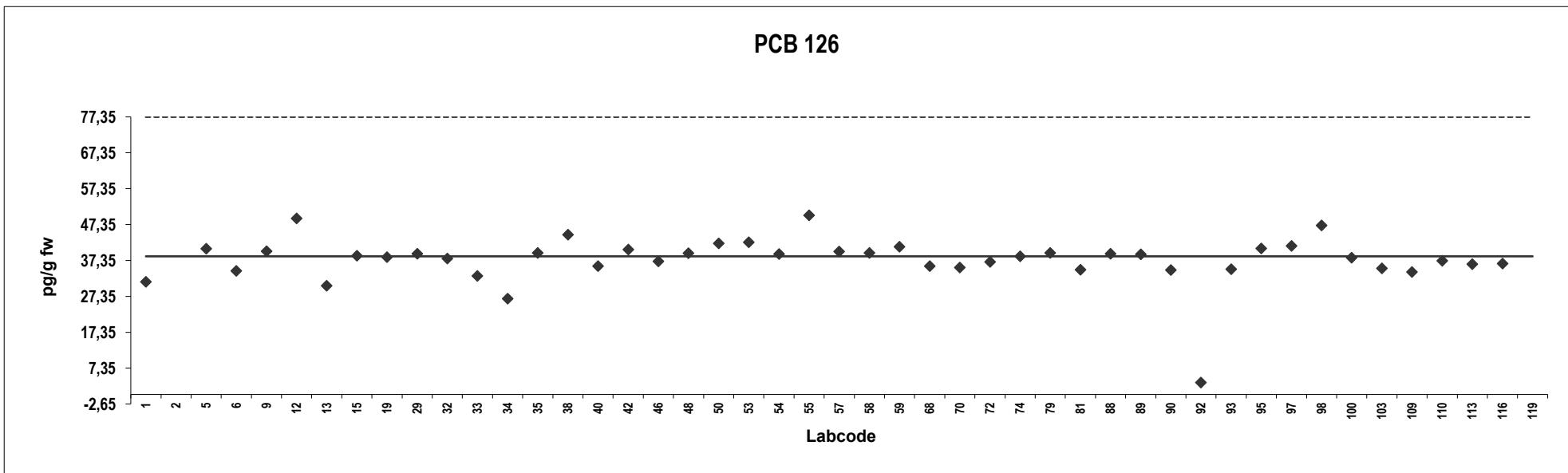
Fish oil

Congener: PCB 169

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	11	-1,9		116	18	0,020	
2	20	0,49		119	16	-0,76	
5	17	-0,36					
6	18	-0,21					
9	25	1,7					
12	20	0,40					
13	18	0,00					
15	15	-0,85					
19	20	0,32					
29	24	1,5					
32	14	-1,3					
33	18	-0,11					
34	20	0,35					
35	19	0,15					
38	15	-0,97					
40	16	-0,69					
42	19	0,15					
46	21	0,65					
48	15	-0,83					
50	24	1,5					
53	18	-0,21					
54	19	0,18					
55	20	0,38					
57	13	-1,4					
58	17	-0,52					
59	19	0,15					
68	17	-0,27					
70	19	0,11					
72	18	-0,073					
74	22	0,89					
79	19	0,15					
81	19	0,11					
88	20	0,42					
89	18	-0,034					
90	17	-0,46					
92	1,2	-4,7					
93	17	-0,46					
95	19	0,052					
97	21	0,81					
98	20	0,51					
100	19	0,024					
103	18	-0,043					
109	11	-1,9					
110	18	-0,19					
113	17	-0,35					

Consenus statistics

Consensus median, pg/g	18
Median all values pg/g	18
Consensus mean, pg/g	18
Standard deviation, pg/g	3,7
Relative standard deviation, %	21
No. of values reported	47
No. of values removed	0
No. of reported non-detects	0

PCB 169

Z-score: PCB 169
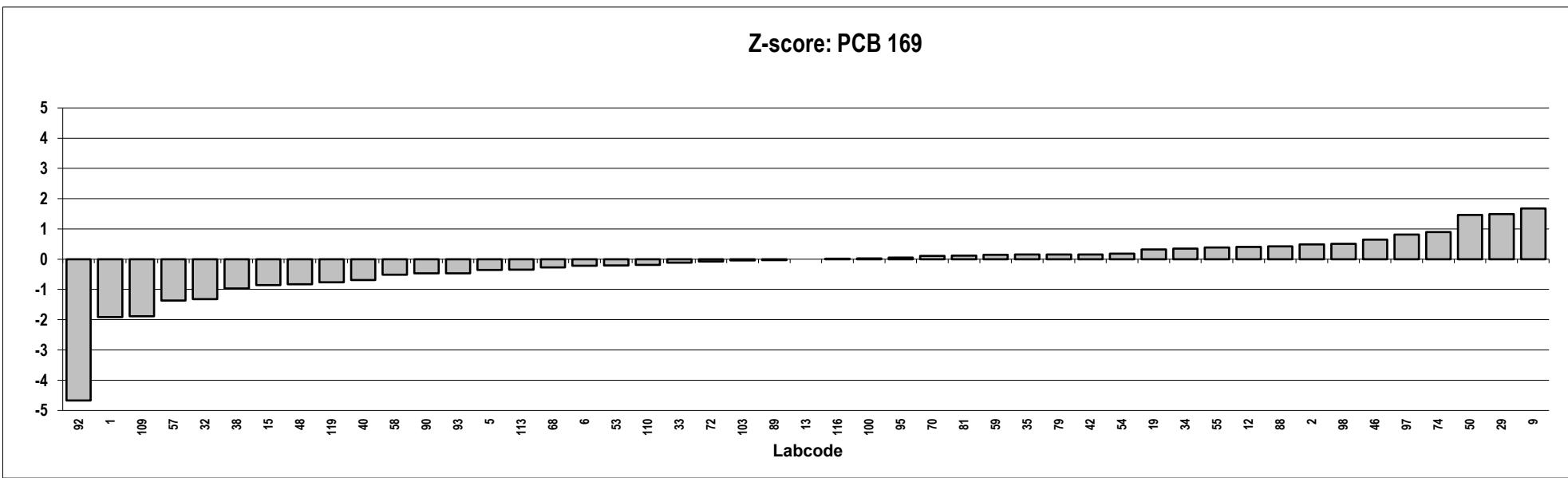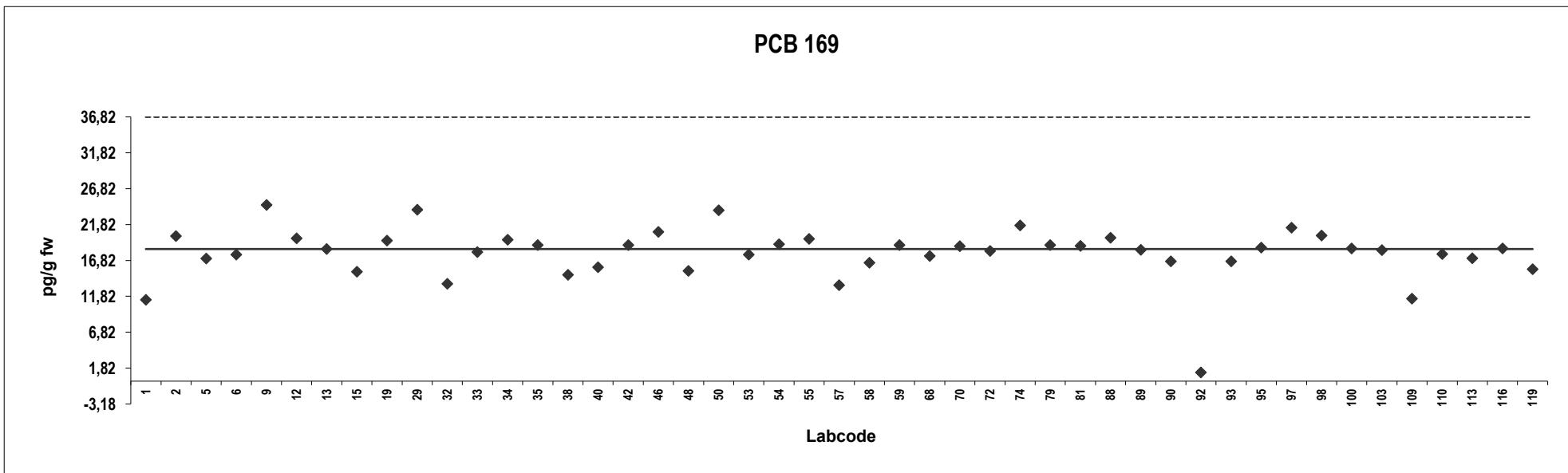
Fish oil
Congener: PCB 81

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	1,9	-1,6		116	2,8	0,00	
2	58	99	Outlier	119	0,90	-3,4	ND
5	5,8	5,3					
6	2,9	0,20					
9	4,1	2,3					
12	3,6	1,4					
13	68	116	Outlier				
15	55	92	Outlier				
19	3,3	0,91	ND				
29	16	24	Outlier				
32	20	30	Outlier				
33	8,0	9,2	Outlier,ND				
34	2,4	-0,69					
35	3,0	0,26					
38	1,6	-2,2					
40	2,0	-1,5					
42	3,0	0,24					
46	3,1	0,57					
48	2,2	-1,1					
50	2,9	0,13					
53	2,3	-0,85					
54	2,8	-0,084					
55	2,4	-0,71					
57	12	16	Outlier				
58	1,6	-2,2					
59	3,2	0,69					
68	2,3	-0,90					
70	2,6	-0,32					
72	2,6	-0,41					
74	3,1	0,54					
79	3,0	0,26					
81	1,2	-2,8					
88	2,8	0,040					
89	3,3	0,87					
90	2,7	-0,17					
92	1,1	-3,0					
93	3,0	0,26					
95	3,0	0,32					
97	3,3	0,89					
98	17	25	Outlier				
100	3,2	0,62					
103	2,6	-0,44					
109	1,7	-2,0					
110	2,6	-0,35					
113	3,0	0,24					

Consenus statistics

Consensus median, pg/g	2,8
Median all values pg/g	3,0
Consensus mean, pg/g	2,7
Standard deviation, pg/g	0,87
Relative standard deviation, %	32
No. of values reported	47
No. of values removed	8
No. of reported non-detects	3

PCB 81

Z-score: PCB 81
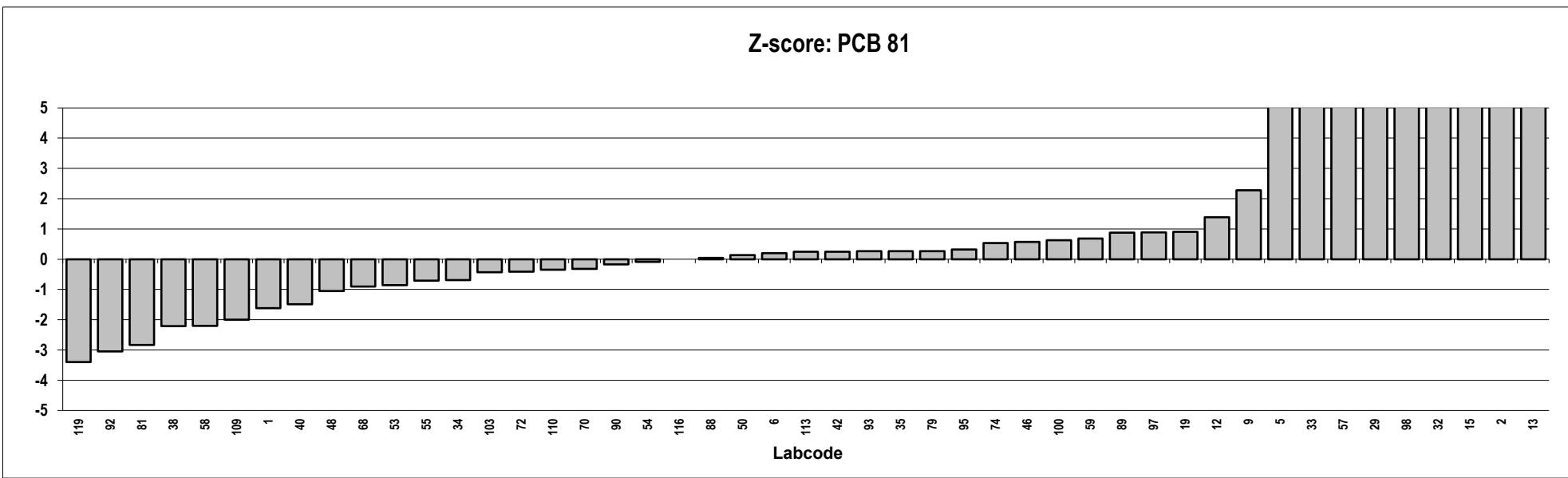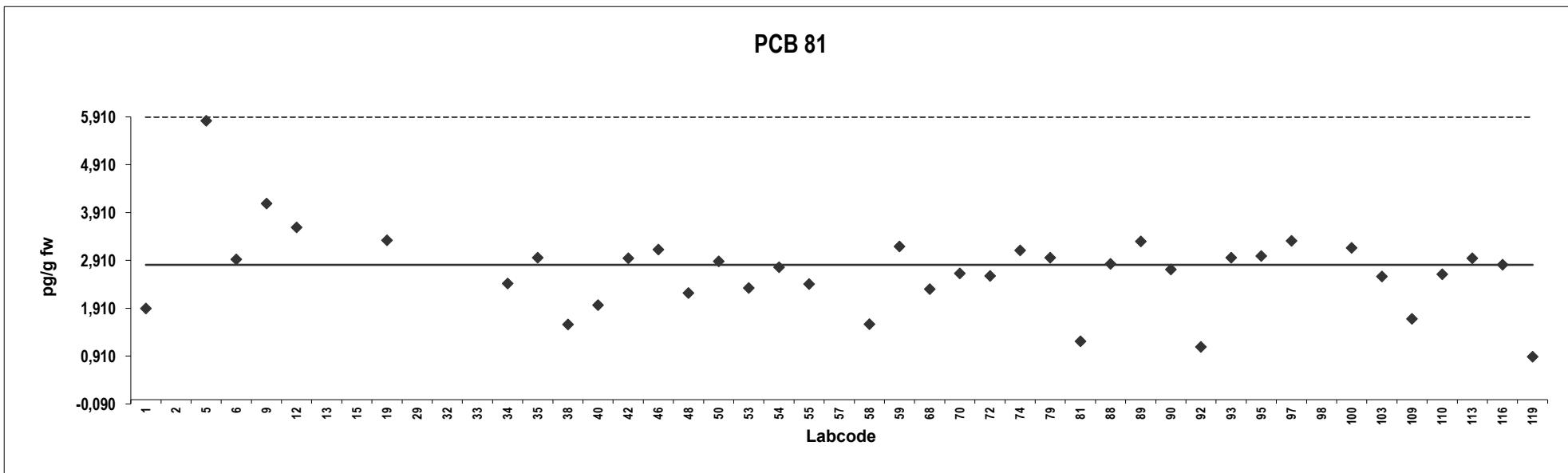
Fish oil
Congener: PCB 105

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	2376	-0,62		116	2919	0,38	
2	3300	1,1		119	2849	0,25	
5	2977	0,49					
6	2648	-0,12					
9	3022	0,57					
12	2970	0,47					
13	2236	-0,88					
15	2447	-0,49					
19	2750	0,067					
29	2713	0,00					
32	2536	-0,33					
33	2600	-0,21					
34	1860	-1,6					
35	2809	0,18					
38	2957	0,45					
40	2838	0,23					
42	2859	0,27					
46	2670	-0,080					
48	2763	0,092					
50	2830	0,21					
53	2840	0,23					
54	2229	-0,89					
55	2855	0,26					
57	2861	0,27					
58	2918	0,38					
59	2905	0,35					
68	2621	-0,17					
70	2766	0,097					
72	2688	-0,046					
74	2700	-0,025					
79	2809	0,18					
81	2456	-0,47					
88	2963	0,46					
89	2615	-0,18					
90	2440	-0,50					
92	2800	0,16					
93	2120	-1,1					
95	2537	-0,33					
97	2422	-0,54					
98	2627	-0,16					
100	2503	-0,39					
103	2707	-0,012					
109	2632	-0,15					
110	2734	0,039					
113	2694	-0,035					

Consenus statistics	
Consensus median, pg/g	2713
Median all values pg/g	2713
Consensus mean, pg/g	2689
Standard deviation, pg/g	258
Relative standard deviation, %	9,6
No. of values reported	47
No. of values removed	0
No. of reported non-detects	0

PCB 105

Z-score: PCB 105
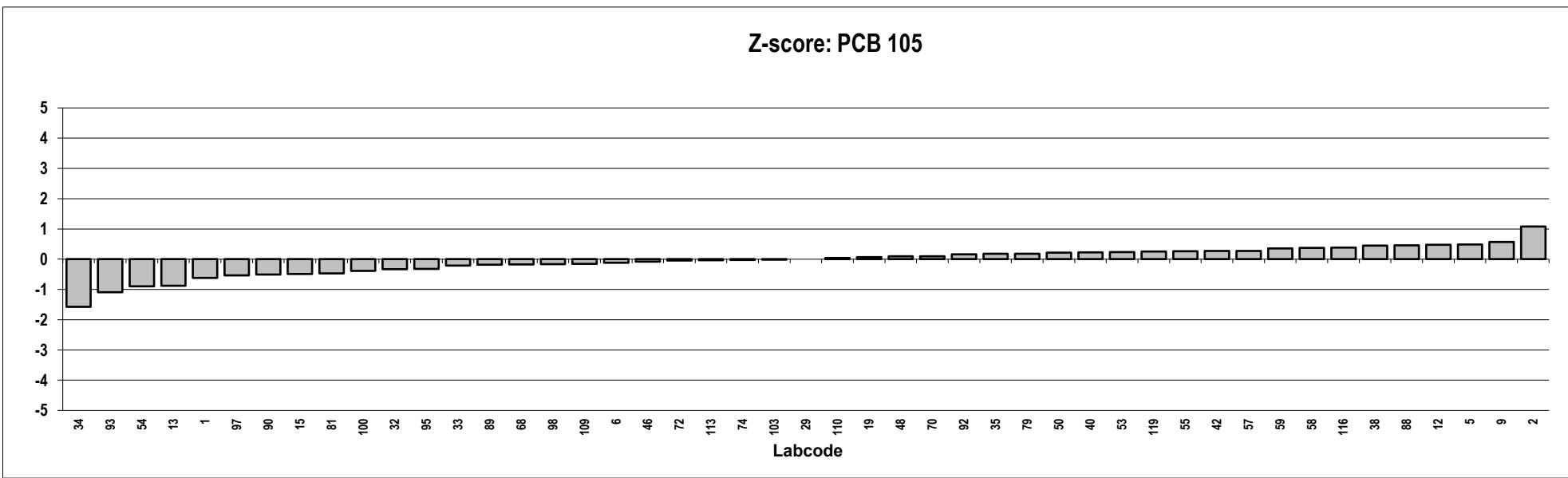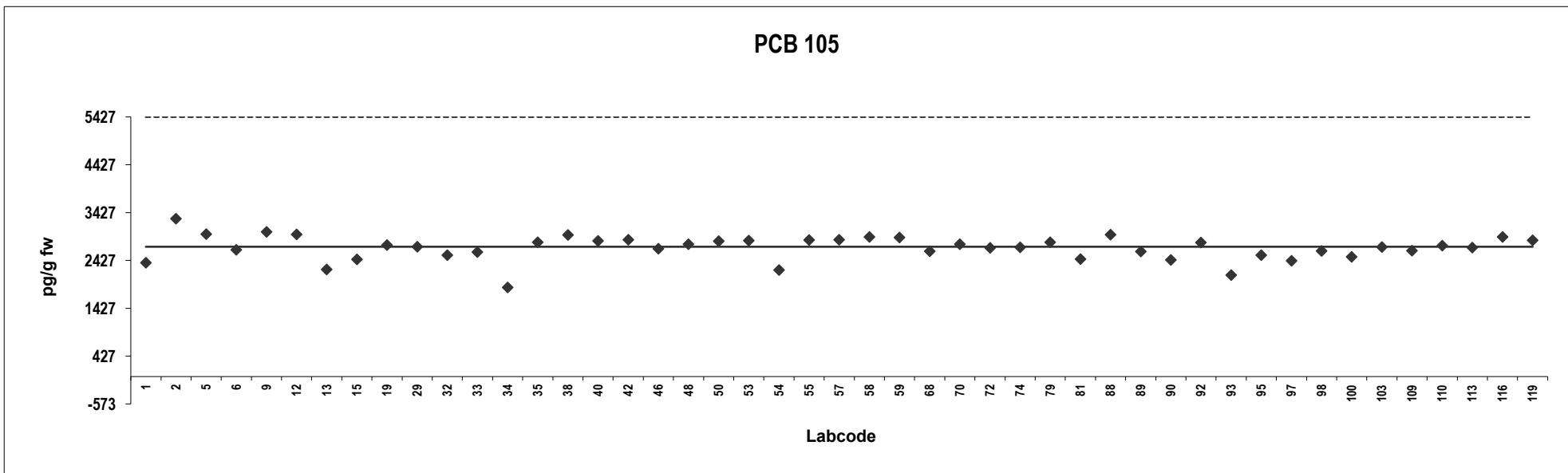
Fish oil
Congener: PCB 114

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	166	-0,093		116	171	0,073	
2	166	-0,088		119	190	0,62	
5	204	1,0					
6	153	-0,46					
9	207	1,1					
12	190	0,62					
13	112	-1,7					
15	179	0,29					
19	265	2,8					
29	181	0,35					
32	141	-0,84					
33	130	-1,2					
34	97	-2,1					
35	167	-0,050					
38	143	-0,76					
40	158	-0,33					
42	193	0,71					
46	190	0,62					
48	175	0,17					
50	169	-0,0023					
53	127	-1,2					
54	219	1,5					
55	174	0,16					
57	146	-0,67					
58	182	0,38					
59	196	0,80					
68	168	-0,037					
70	224	1,6					
72	143	-0,77					
74	189	0,59					
79	167	-0,050					
81	168	-0,036					
88	172	0,081					
89	216	1,4					
90	147	-0,65					
92	130	-1,2					
93	201	0,95					
95	179	0,30					
97	140	-0,85					
98	180	0,34					
100	180	0,33					
103	148	-0,61					
109	169	0,00					
110	153	-0,49					
113	154	-0,44					

Consensus statistics

Consensus median, pg/g	169
Median all values pg/g	169
Consensus mean, pg/g	171
Standard deviation, pg/g	31
Relative standard deviation, %	18
No. of values reported	47
No. of values removed	0
No. of reported non-detects	0

PCB 114

Z-score: PCB 114
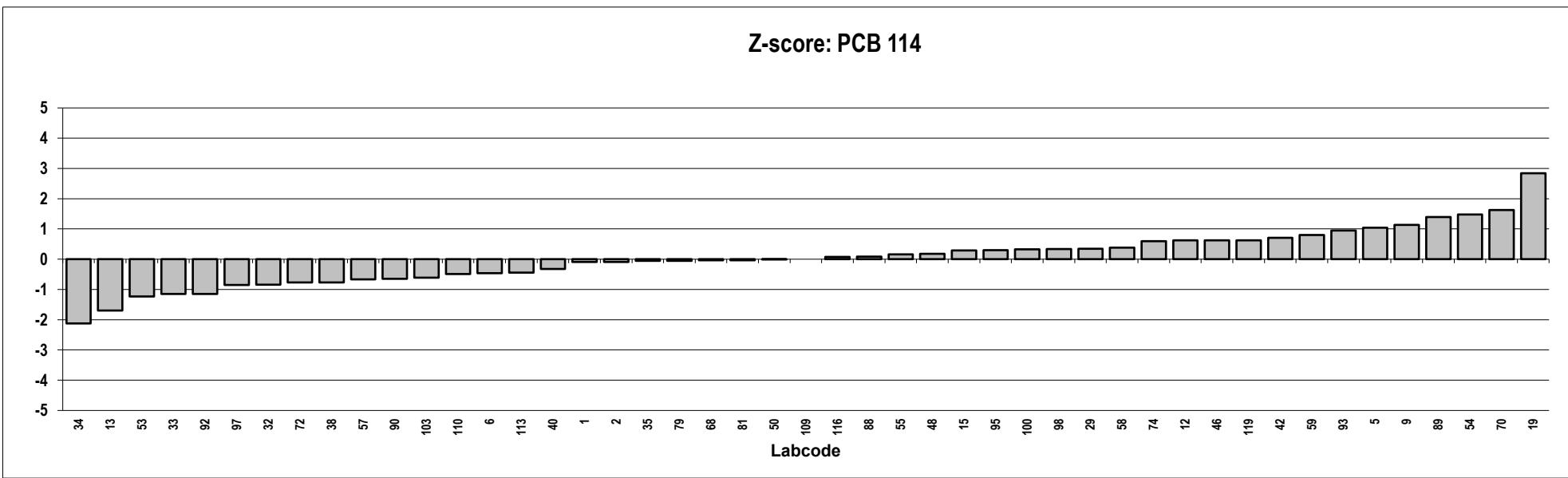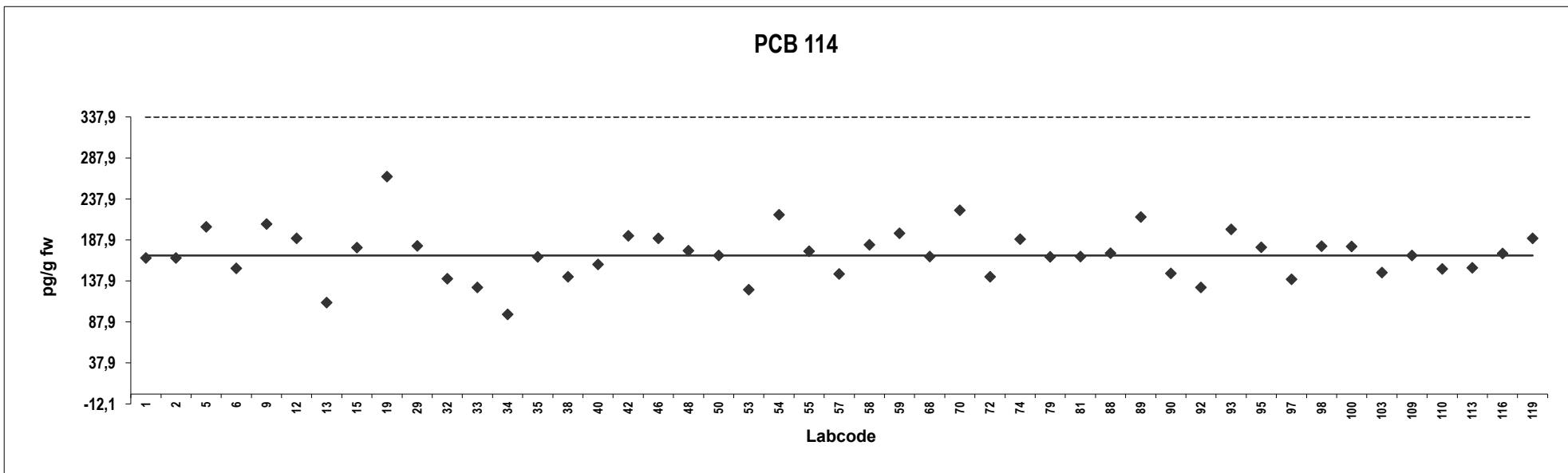
Fish oil

Congener: PCB 118

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	7282	-0,75		116	9049	0,28	
2	10800	1,3		119	8866	0,17	
5	9915	0,78					
6	7281	-0,75					
9	9244	0,39					
12	8650	0,047					
13	8046	-0,31					
15	7095	-0,86					
19	8220	-0,20					
29	8570	0,00					
32	7739	-0,48					
33	8500	-0,041					
34	9700	0,66					
35	8803	0,14					
38	9209	0,37					
40	8260	-0,18					
42	9464	0,52					
46	7760	-0,47					
48	8850	0,16					
50	9529	0,56					
53	8853	0,17					
54	7901	-0,39					
55	8932	0,21					
57	7862	-0,41					
58	9323	0,44					
59	9175	0,35					
68	8253	-0,18					
70	7254	-0,77					
72	8724	0,09					
74	7840	-0,43					
79	8803	0,14					
81	9191	0,36					
88	9204	0,37					
89	8219	-0,20					
90	7440	-0,66					
92	8700	0,076					
93	6620	-1,1					
95	9455	0,52					
97	7005	-0,91					
98	8638	0,040					
100	7584	-0,58					
103	8479	-0,053					
109	7260	-0,76					
110	8421	-0,087					
113	8220	-0,20					

Consensus statistics

Consensus median, pg/g	8570
Median all values pg/g	8570
Consensus mean, pg/g	8472
Standard deviation, pg/g	867
Relative standard deviation, %	10
No. of values reported	47
No. of values removed	0
No. of reported non-detects	0

PCB 118

Z-score: PCB 118
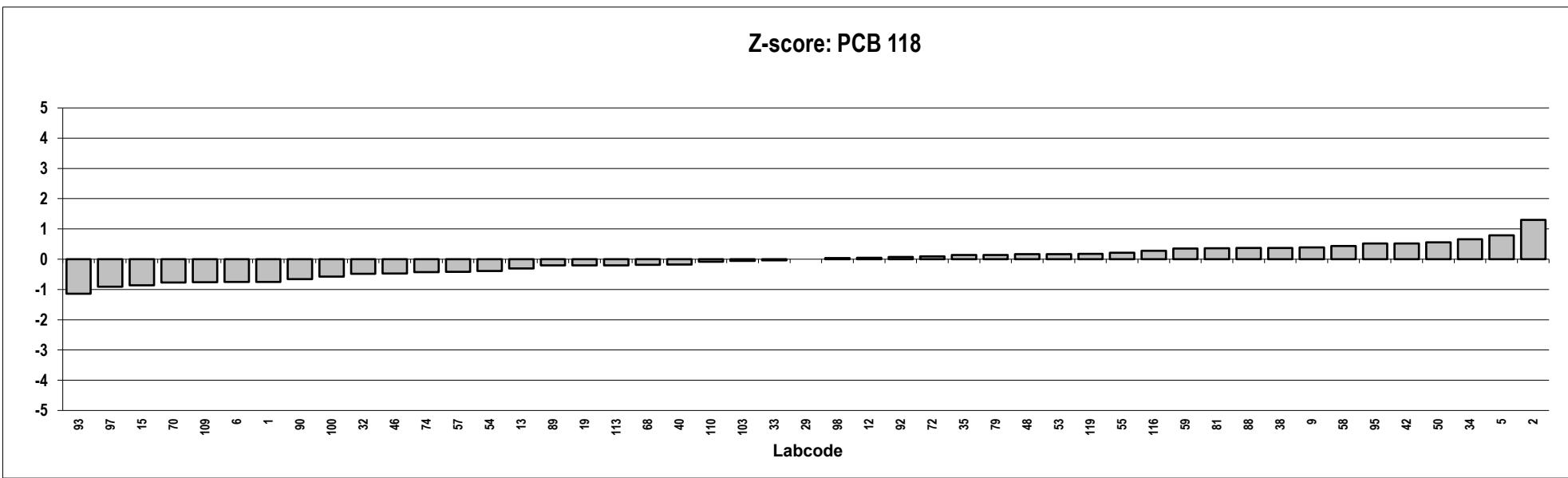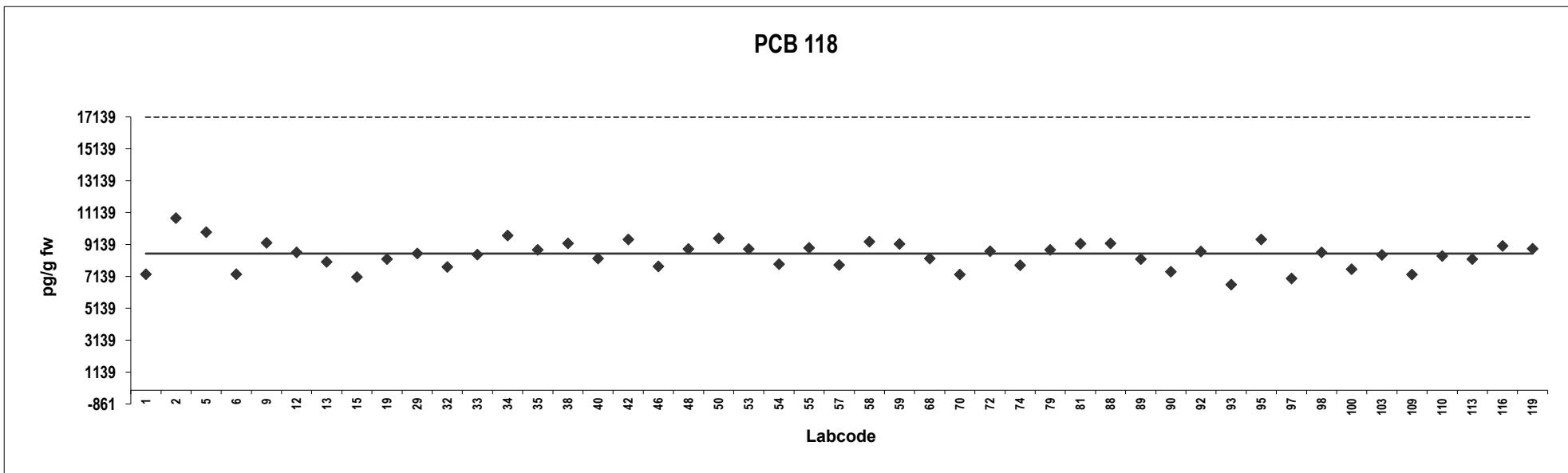
Fish oil

Congener: PCB 123

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	92	-0,42		116	80	-1,0	
2	105	0,25		119	286	9,3	Outlier
5	130	1,5					
6	70	-1,5					
9	116	0,80					
12	120	1,0					
13	920	41	Outlier				
15	81	-0,94					
19	119	0,95					
29	329	11	Outlier				
32	215	5,7	Outlier				
33	100	0,00	ND				
34	141	2,1					
35	68	-1,6					
38	160	3,0					
40	51	-2,4					
42	293	9,7	Outlier				
46	114	0,70					
48	154	2,7					
50	96	-0,21					
53	96	-0,19					
54	100	0,0030					
55	135	1,8					
57	289	9,4	Outlier				
58	107	0,35					
59	171	3,6					
68	52	-2,4					
70	85	-0,76					
72	105	0,27					
74	122	1,1					
79	68	-1,6					
81	138	1,9					
88	109	0,46					
89	85	-0,73					
90	93	-0,35					
92	100	0,00					
93	83	-0,86					
95	126	1,3					
97	81	-0,94					
98	320	11	Outlier				
100	81	-0,96					
103	102	0,076					
109	1046	47	Outlier				
110	84	-0,79					
113	84	-0,80					

Consensus statistics

Consensus median, pg/g	100
Median all values pg/g	105
Consensus mean, pg/g	103
Standard deviation, pg/g	28
Relative standard deviation, %	27
No. of values reported	47
No. of values removed	8
No. of reported non-detects	1

PCB 123

Z-score: PCB 123
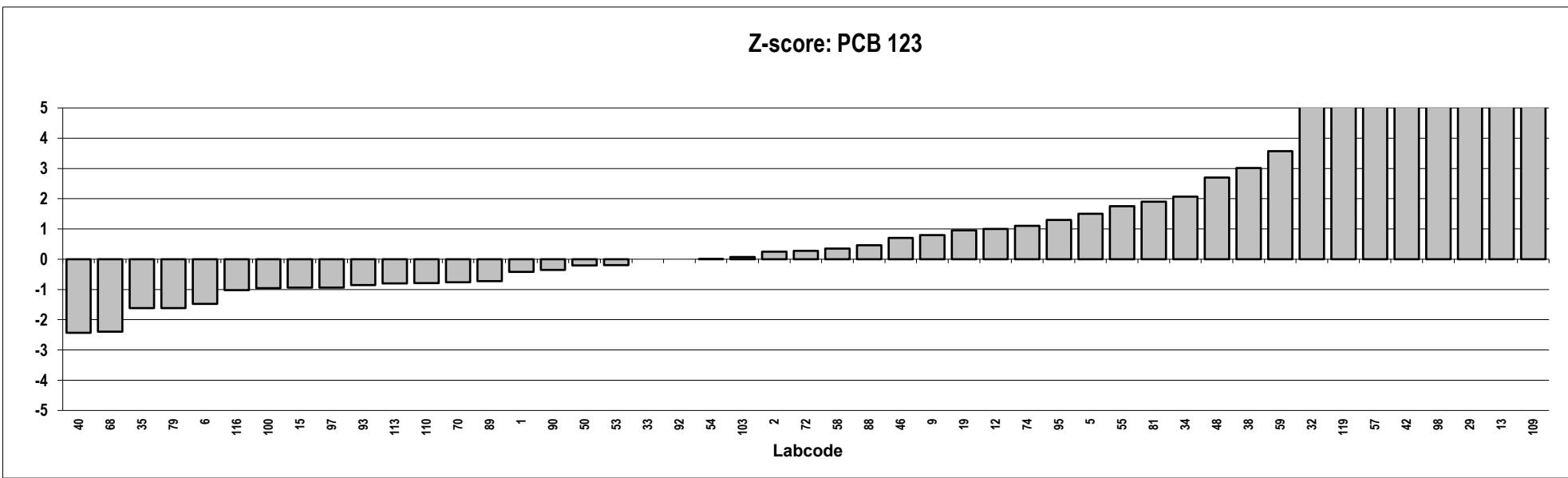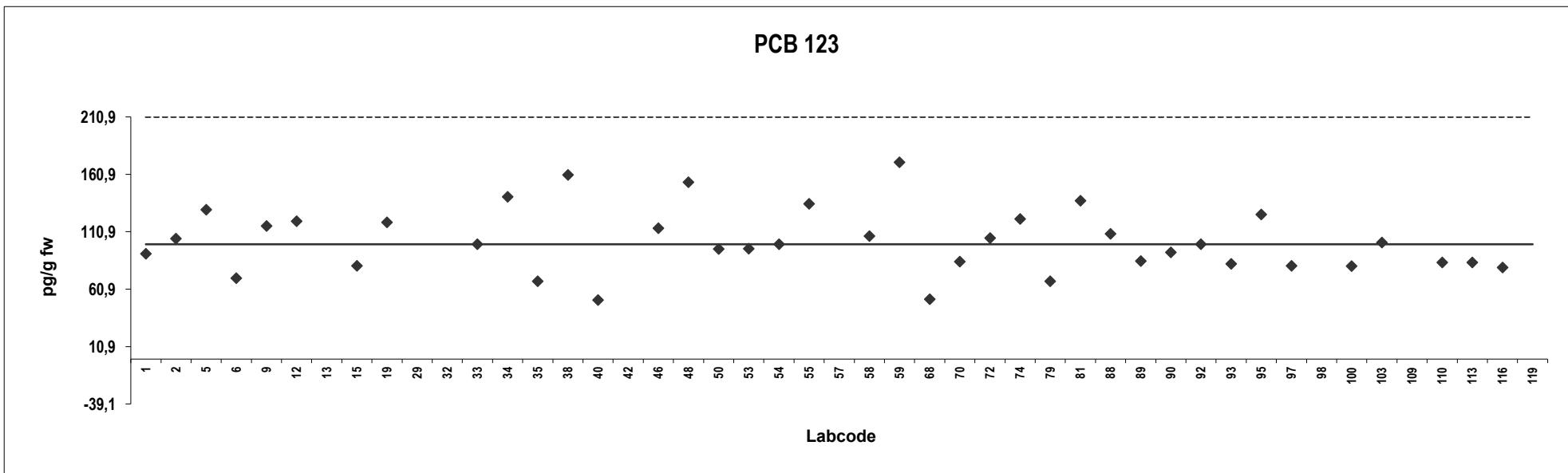
Fish oil
Congener: PCB 156

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	555	-0,67		116	670	0,23	
2	697	0,44		119	503	-1,1	
5	663	0,18					
6	632	-0,063					
9	751	0,86					
12	617	-0,18					
13	597	-0,34					
15	584	-0,43					
19	679	0,30					
29	668	0,22					
32	555	-0,66					
33	650	0,077					
34	576	-0,50					
35	642	0,018					
38	628	-0,094					
40	581	-0,46					
42	668	0,22					
46	651	0,085					
48	627	-0,10					
50	677	0,29					
53	646	0,043					
54	531	-0,85					
55	661	0,16					
57	656	0,12					
58	640	0,00					
59	728	0,69					
68	471	-1,3					
70	693	0,41					
72	640	-0,0046					
74	659	0,15					
79	642	0,018					
81	605	-0,28					
88	688	0,37					
89	641	0,0070					
90	568	-0,56					
92	690	0,39					
93	546	-0,74					
95	593	-0,37					
97	541	-0,78					
98	604	-0,28					
100	646	0,046					
103	607	-0,26					
109	585	-0,43					
110	638	-0,020					
113	643	0,024					

Consensus statistics

Consensus median, pg/g	640
Median all values pg/g	640
Consensus mean, pg/g	626
Standard deviation, pg/g	57
Relative standard deviation, %	9,1
No. of values reported	47
No. of values removed	0
No. of reported non-detects	0

PCB 156

Z-score: PCB 156
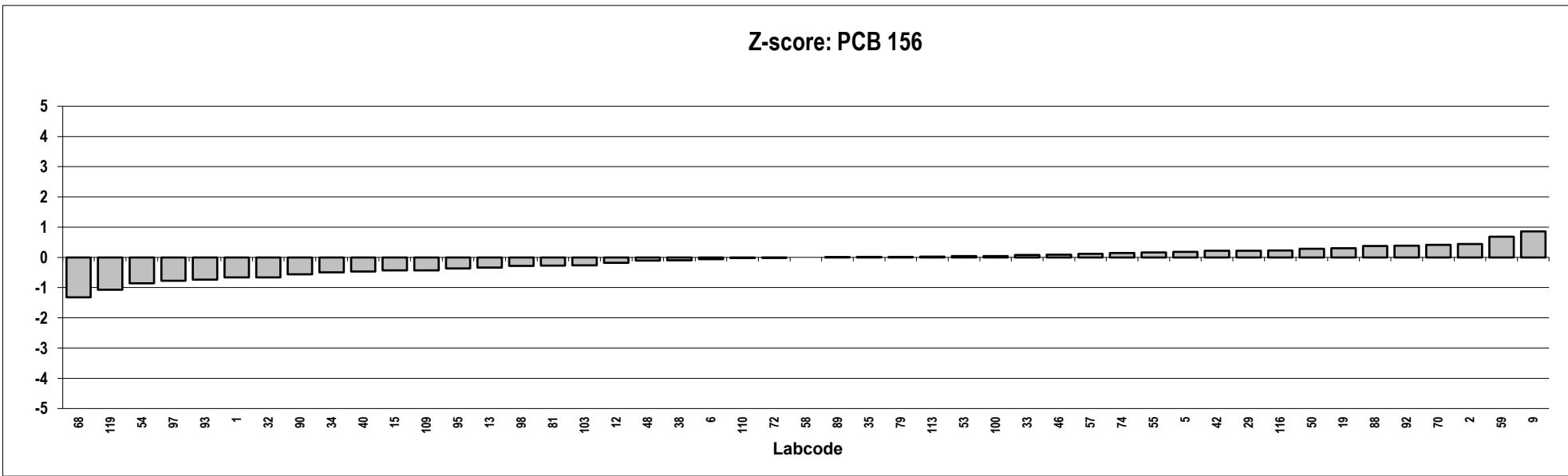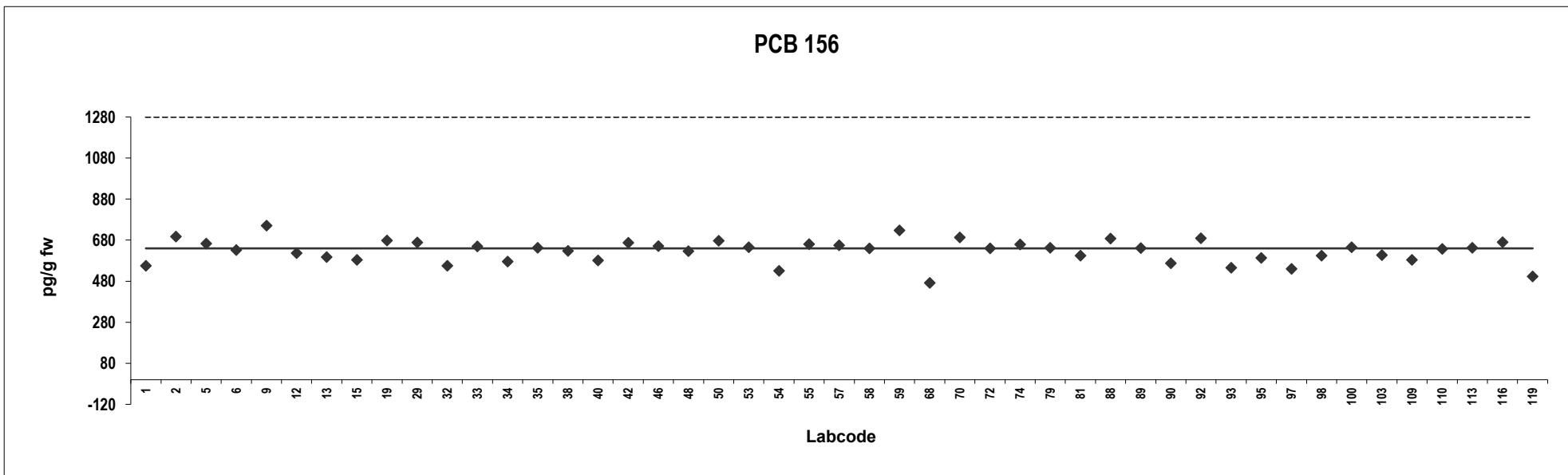
Fish oil

Congener: PCB 157

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	180	-0,60		116	212	0,19	
2	220	0,38		119	191	-0,33	
5	228	0,57					
6	205	0,00					
9	247	1,0					
12	211	0,16					
13	183	-0,52					
15	194	-0,25					
19	207	0,059					
29	218	0,33					
32	172	-0,79					
33	210	0,13					
34	228	0,58					
35	215	0,25					
38	199	-0,14					
40	208	0,082					
42	222	0,43					
46	203	-0,039					
48	197	-0,19					
50	210	0,12					
53	205	0,0039					
54	193	-0,27					
55	211	0,17					
57	178	-0,65					
58	204	-0,021					
59	233	0,70					
68	182	-0,55					
70	226	0,52					
72	213	0,21					
74	208	0,083					
79	215	0,25					
81	199	-0,14					
88	215	0,25					
89	192	-0,30					
90	170	-0,85					
92	230	0,62					
93	192	-0,31					
95	193	-0,28					
97	140	-1,6					
98	201	-0,087					
100	203	-0,039					
103	191	-0,33					
109	170	-0,84					
110	198	-0,16					
113	217	0,31					

Consensus statistics

Consensus median, pg/g	205
Median all values pg/g	205
Consensus mean, pg/g	203
Standard deviation, pg/g	19
Relative standard deviation, %	9,6
No. of values reported	47
No. of values removed	0
No. of reported non-detects	0

PCB 157

Z-score: PCB 157
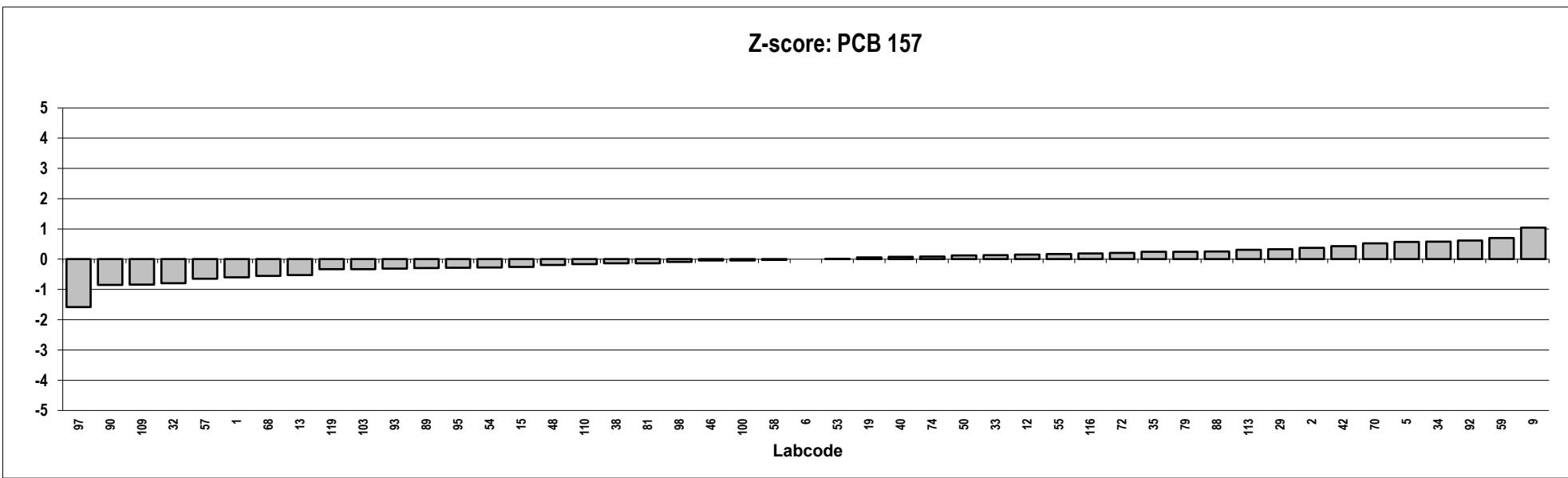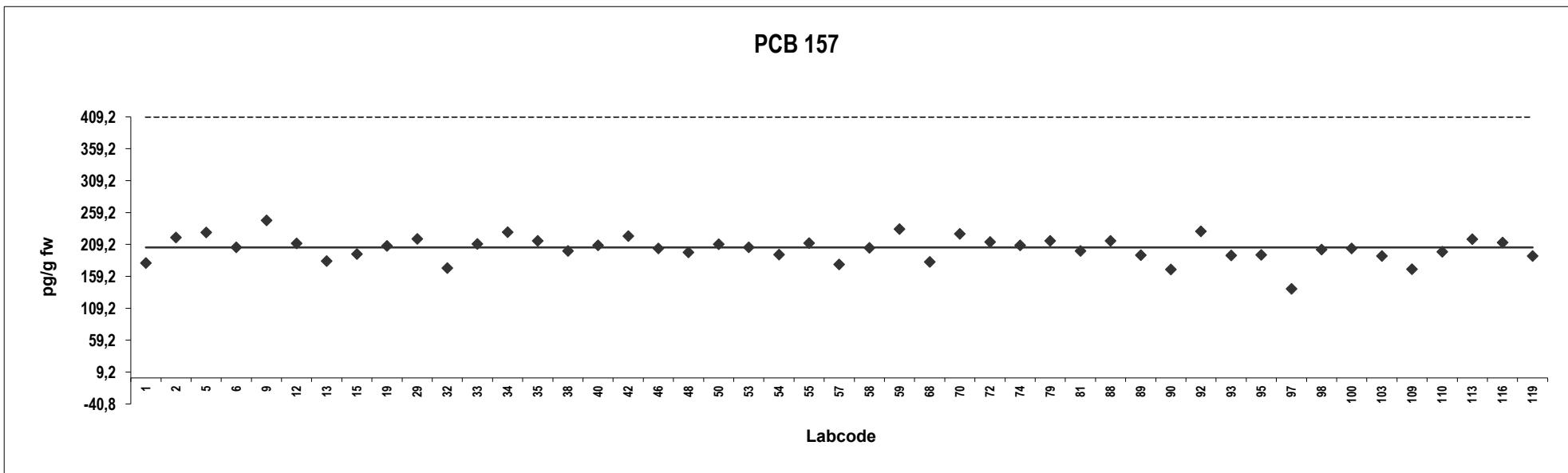
Fish oil
Congener: PCB 167

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	319	-0,64		116	373	0,096	
2	432	0,90		119	358	-0,11	
5	385	0,26					
6	356	-0,13					
9	440	1,0					
12	393	0,37					
13	358	-0,11					
15	362	-0,055					
19	384	0,25					
29	388	0,30					
32	366	0,0045					
33	390	0,33					
34	403	0,51					
35	396	0,42					
38	392	0,36					
40	365	-0,0045					
42	362	-0,050					
46	378	0,17					
48	363	-0,044					
50	349	-0,23					
53	387	0,29					
54	411	0,61					
55	387	0,28					
57	376	0,13					
58	355	-0,15					
59	315	-0,69					
68	337	-0,40					
70	365	-0,011					
72	1466	15	Outlier				
74	375	0,13					
79	396	0,42					
81	359	-0,092					
88	422	0,77					
89	358	-0,10					
90	354	-0,16					
92	390	0,33					
93	344	-0,30					
95	286	-1,1					
97	302	-0,87					
98	351	-0,20					
100	382	0,22					
103	344	-0,29					
109	338	-0,39					
110	356	-0,13					
113	390	0,33					

Consensus statistics

Consensus median, pg/g	366
Median all values pg/g	366
Consensus mean, pg/g	369
Standard deviation, pg/g	31
Relative standard deviation, %	8,3
No. of values reported	47
No. of values removed	1
No. of reported non-detects	0

PCB 167

Z-score: PCB 167
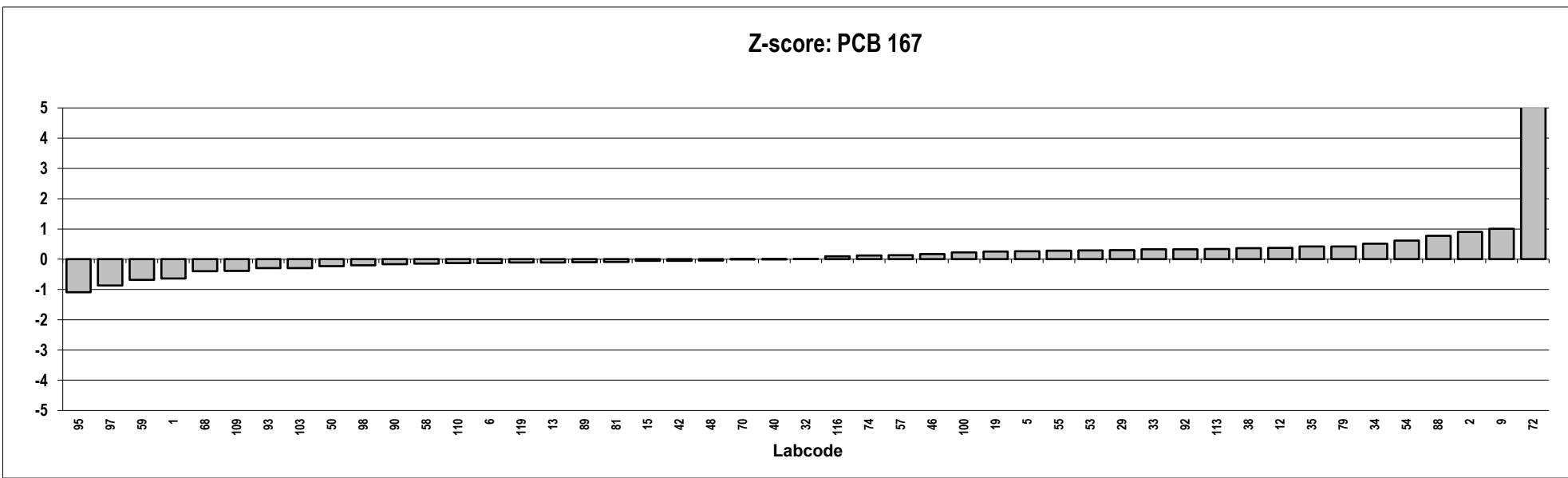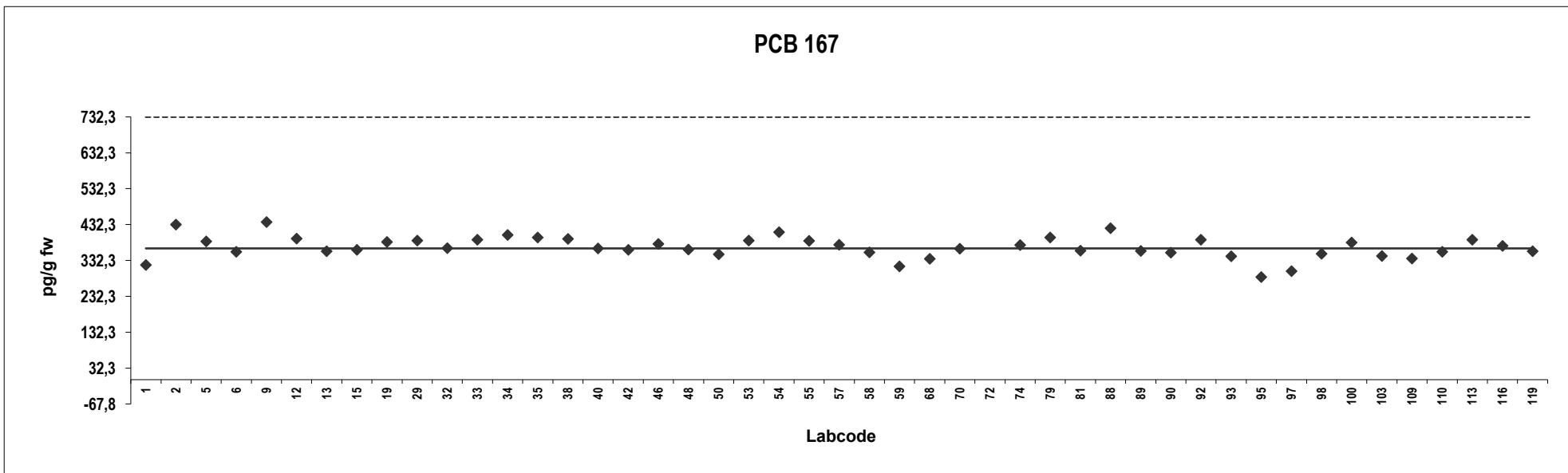
Fish oil

Congener: PCB 189

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	49	-0,57		116	58	0,19	
2	64	0,78		119	46	-0,86	
5	59	0,28					
6	54	-0,19					
9	63	0,62					
12	55	-0,076					
13	47	-0,76					
15	53	-0,28					
19	59	0,28					
29	60	0,34					
32	47	-0,82					
33	56	0,02					
34	59	0,25					
35	57	0,16					
38	50	-0,53					
40	50	-0,49					
42	57	0,13					
46	60	0,39					
48	49	-0,60					
50	60	0,34					
53	59	0,28					
54	54	-0,16					
55	61	0,50					
57	52	-0,29					
58	56	0,00					
59	62	0,53					
68	53	-0,24					
70	56	0,022					
72	51	-0,40					
74	59	0,28					
79	57	0,16					
81	62	0,55					
88	62	0,55					
89	53	-0,29					
90	54	-0,16					
92	70	1,3					
93	52	-0,33					
95	55	-0,094					
97	45	-0,98					
98	58	0,20					
100	53	-0,29					
103	59	0,26					
109	49	-0,60					
110	55	-0,031					
113	53	-0,21					

Consensus statistics

Consensus median, pg/g	56
Median all values pg/g	56
Consensus mean, pg/g	56
Standard deviation, pg/g	5,2
Relative standard deviation, %	9,4
No. of values reported	47
No. of values removed	0
No. of reported non-detects	0

PCB 189

Z-score: PCB 189
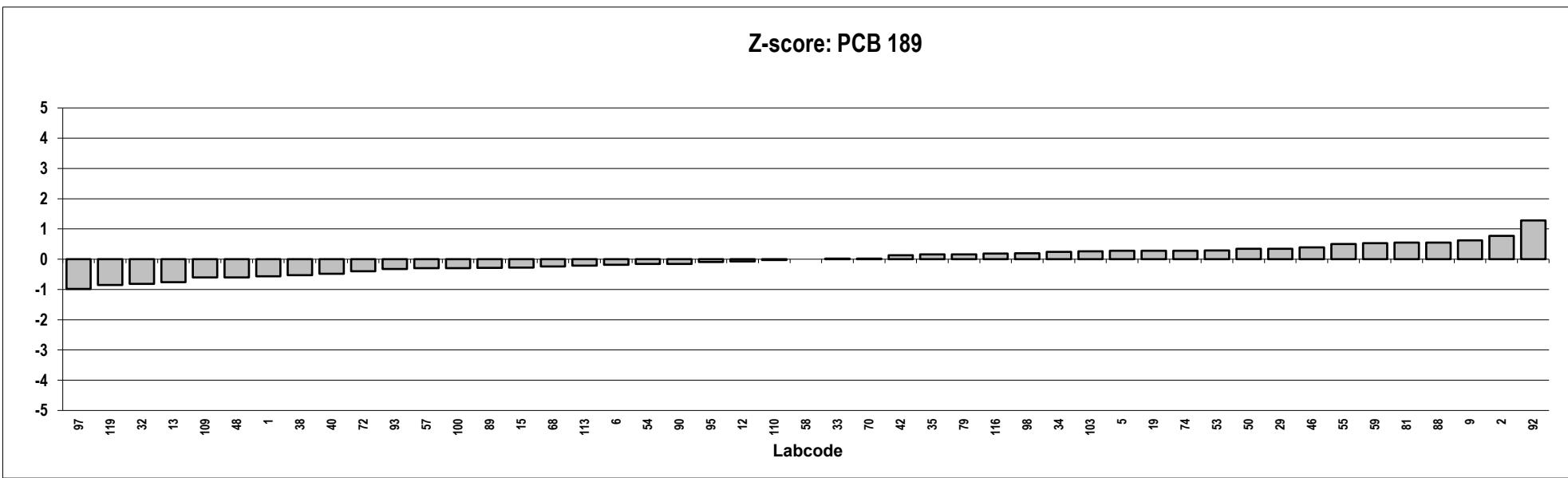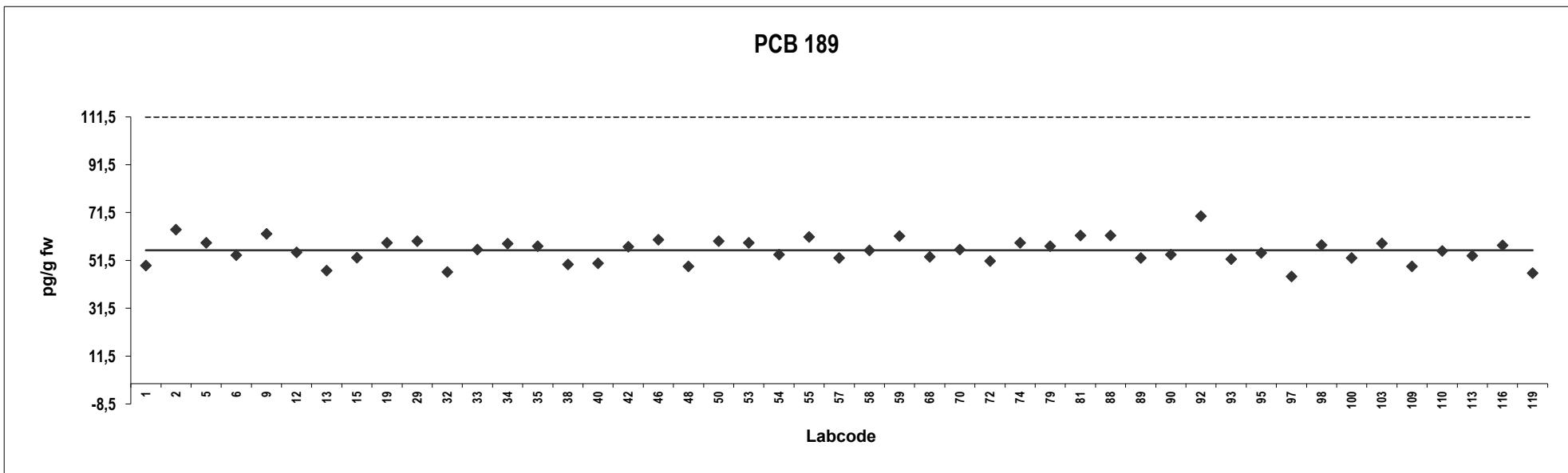
Fish oil
Congener: PCB 28

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	2520	0,94					
5	2839	1,7					
9	3545	3,4					
12	1470	-1,5					
19	2520	0,94					
29	2444	0,76					
32	1887	-0,55					
33	2400	0,65					
34	984	-2,7					
35	1707	-0,98					
38	2105	-0,042					
40	1949	-0,41					
42	4412	5,4	Outlier				
46	2010	-0,27					
48	1898	-0,53					
50	2640	1,2					
53	3164	2,5					
54	2970	2,0					
55	2005	-0,28					
57	5484	7,9	Outlier				
58	3198	2,5					
59	2123	0,00					
68	2015	-0,25					
70	2259	0,32					
72	2258	0,32					
74	2060	-0,15					
79	1707	-0,98					
88	2244	0,29					
89	2051	-0,17					
90	2170	0,11					
92	2400	0,65					
93	1740	-0,90					
95	4,2	-5,0					
97	1800	-0,76					
98	2150	0,065					
100	2478	0,84					
103	2247	0,29					
109	6491	10	Outlier				
110	2060	-0,15					
113	2081	-0,097					
116	3365	2,9					
119	2080	-0,10					

Consenus statistics

Consensus median, pg/g	2123
Median all values pg/g	2160
Consensus mean, pg/g	2194
Standard deviation, pg/g	626
Relative standard deviation, %	29
No. of values reported	42
No. of values removed	3
No. of reported non-detects	0

PCB 28

Z-score: PCB 28
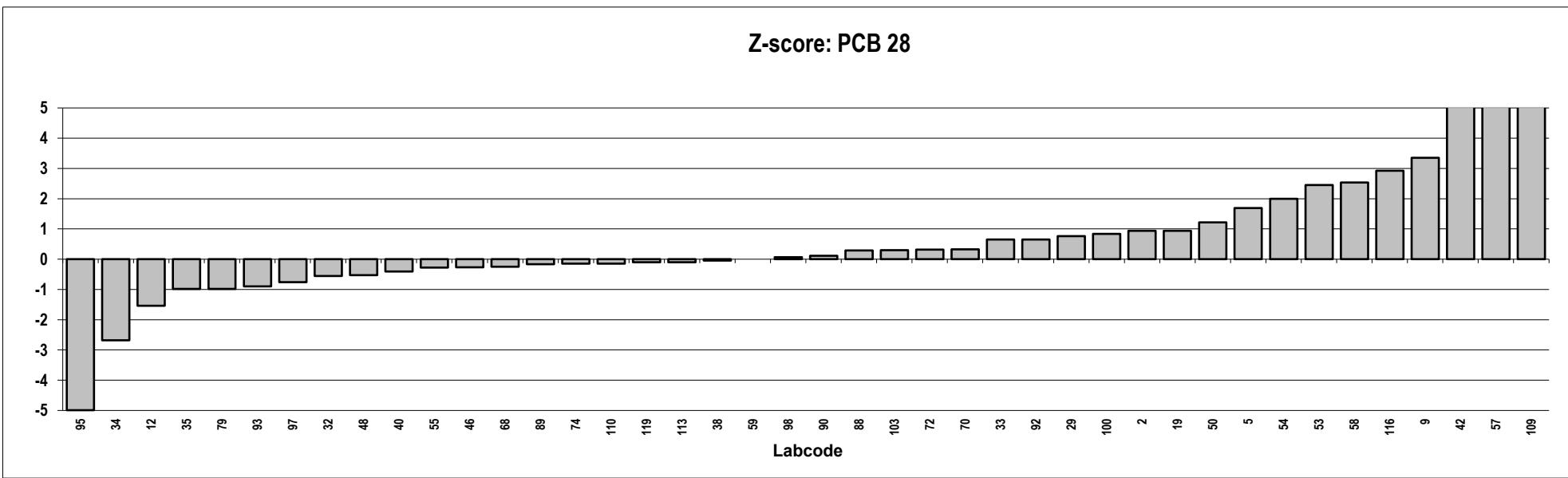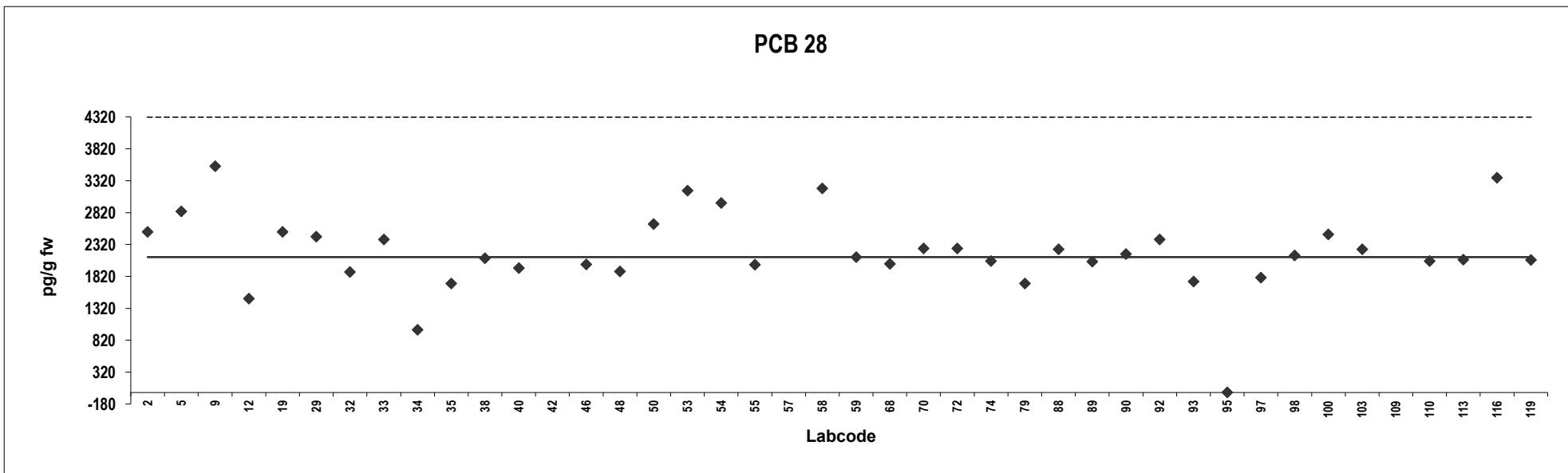
Fish oil

Congener: PCB 52

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	5930	-0,63					
5	8862	1,5					
9	8090	0,97					
12	7130	0,26					
19	7200	0,31					
29	7117	0,25					
32	6200	-0,43					
33	7800	0,75					
34	7240	0,34					
35	6739	-0,029					
38	7816	0,76					
40	6663	-0,085					
42	7902	0,83					
46	6170	-0,45					
48	6714	-0,048					
50	8164	1,0					
53	6869	0,066					
54	6225	-0,41					
55	6570	-0,15					
57	7016	0,17					
58	6324	-0,34					
59	6662	-0,086					
68	6119	-0,49					
70	6703	-0,056					
72	6191	-0,43					
74	6240	-0,40					
79	6739	-0,029					
88	7369	0,44					
89	7099	0,24					
90	6940	0,12					
92	7400	0,46					
93	6120	-0,49					
95	7,0	-5,0					
97	6413	-0,27					
98	6782	0,0020					
100	6776	-0,0020					
103	6428	-0,26					
109	8606	1,3					
110	6903	0,091					
113	7108	0,24					
116	6473	-0,23					
119	7460	0,50					

Consenus statistics

Consensus median, pg/g	6779
Median all values pg/g	6779
Consensus mean, pg/g	6792
Standard deviation, pg/g	1274
Relative standard deviation, %	19
No. of values reported	42
No. of values removed	0
No. of reported non-detects	0

PCB 52

Z-score: PCB 52
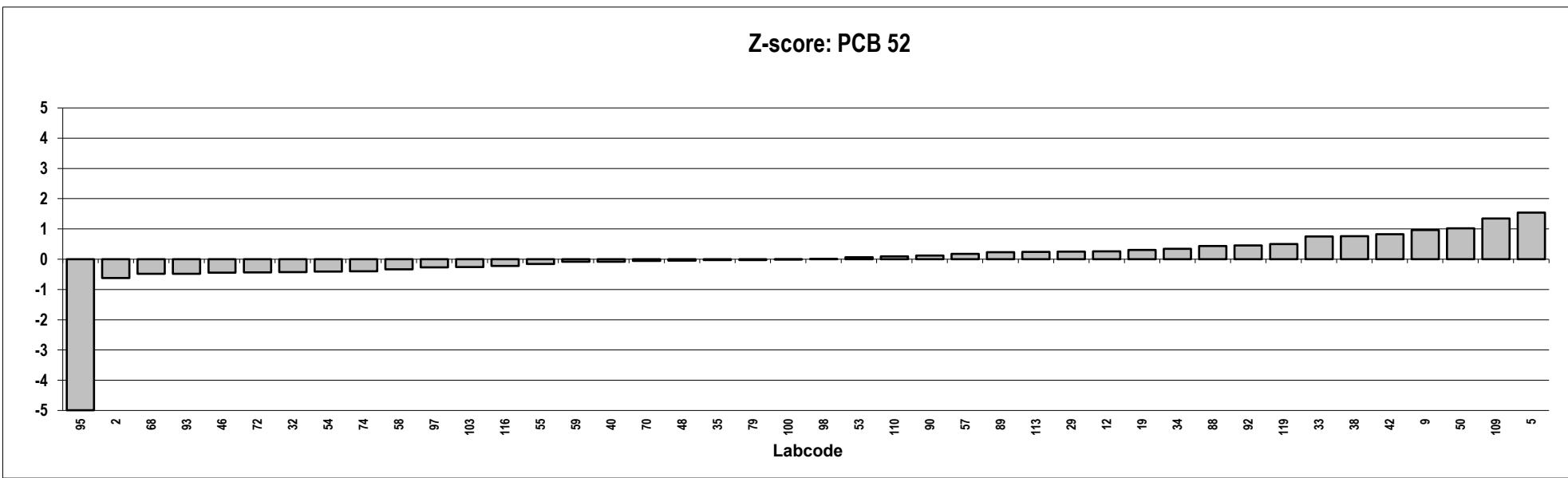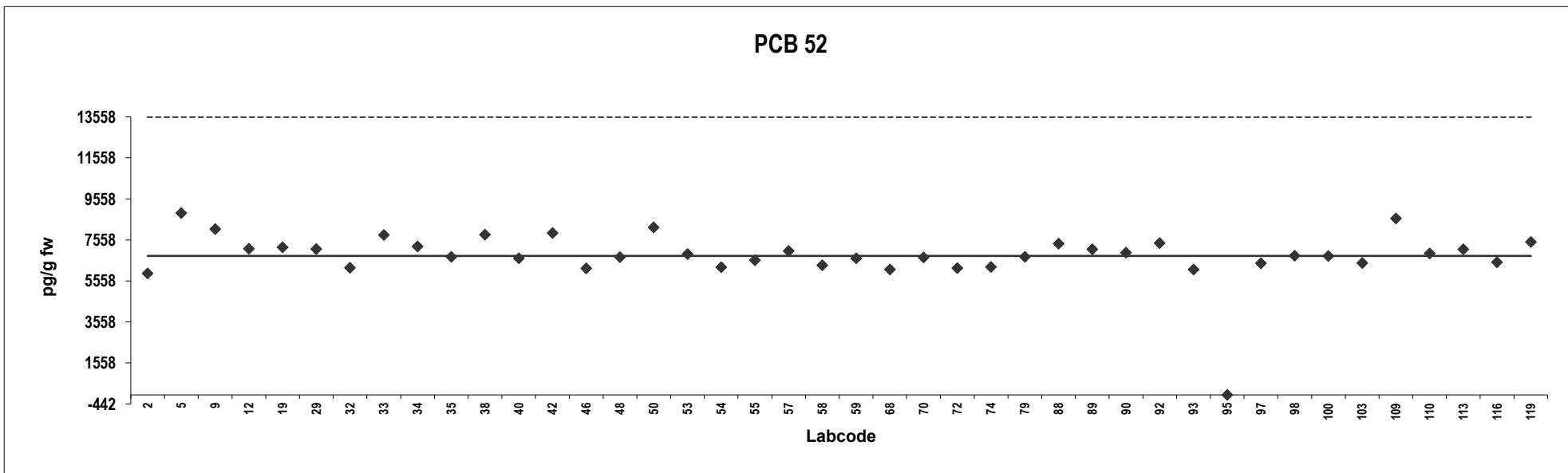
Fish oil
Congener: PCB 101

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	12100	0,95					
5	12650	1,2					
9	10360	0,098					
12	10400	0,12					
19	10300	0,068					
29	9435	-0,36					
32	9356	-0,40					
33	12000	0,90					
34	8920	-0,61					
35	10139	-0,011					
38	10025	-0,067					
40	9672	-0,24					
42	11807	0,81					
46	8960	-0,59					
48	10643	0,24					
50	11501	0,66					
53	9863	-0,15					
54	9345	-0,40					
55	10113	-0,024					
57	6460	-1,8					
58	10298	0,067					
59	9194	-0,48					
68	9136	-0,50					
70	10462	0,15					
72	10239	0,038					
74	9190	-0,48					
79	10139	-0,011					
88	10834	0,33					
89	10164	0,0012					
90	10200	0,019					
92	5900	-2,1					
93	7690	-1,2					
95	10	-5,0					
97	10607	0,22					
98	10159	-0,0012					
100	9876	-0,14					
103	10723	0,28					
109	17020	3,4					
110	10520	0,18					
113	10240	0,039					
116	10222	0,030					
119	7780	-1,2					

Consenus statistics

Consensus median, pg/g	10161
Median all values pg/g	10161
Consensus mean, pg/g	9873
Standard deviation, pg/g	2305
Relative standard deviation, %	23
No. of values reported	42
No. of values removed	0
No. of reported non-detects	0

PCB 101

Z-score: PCB 101
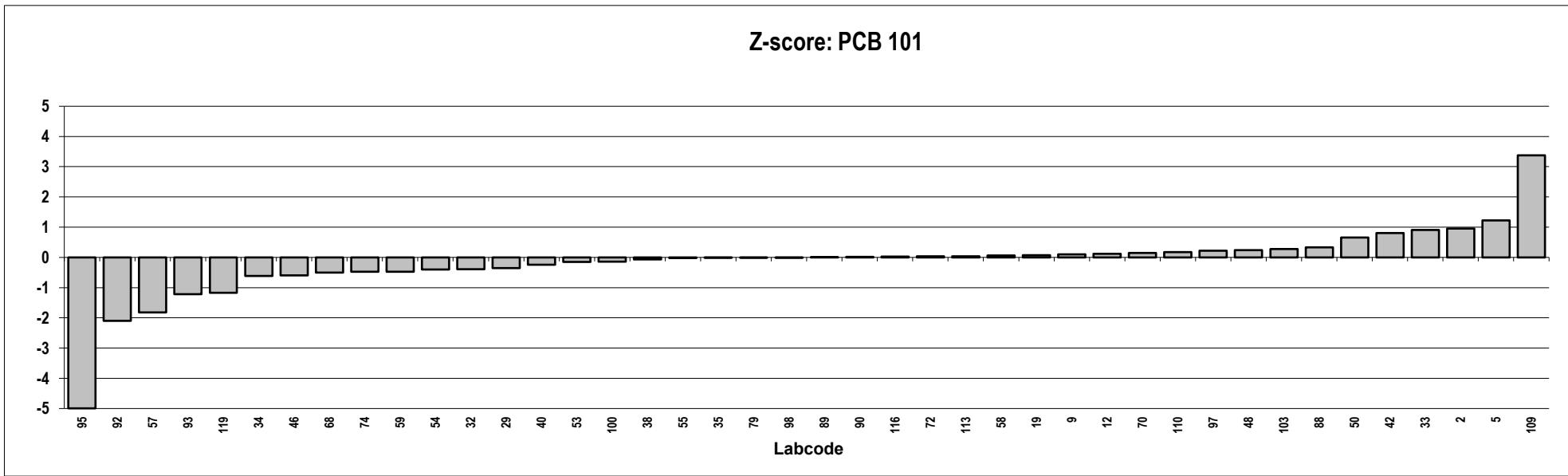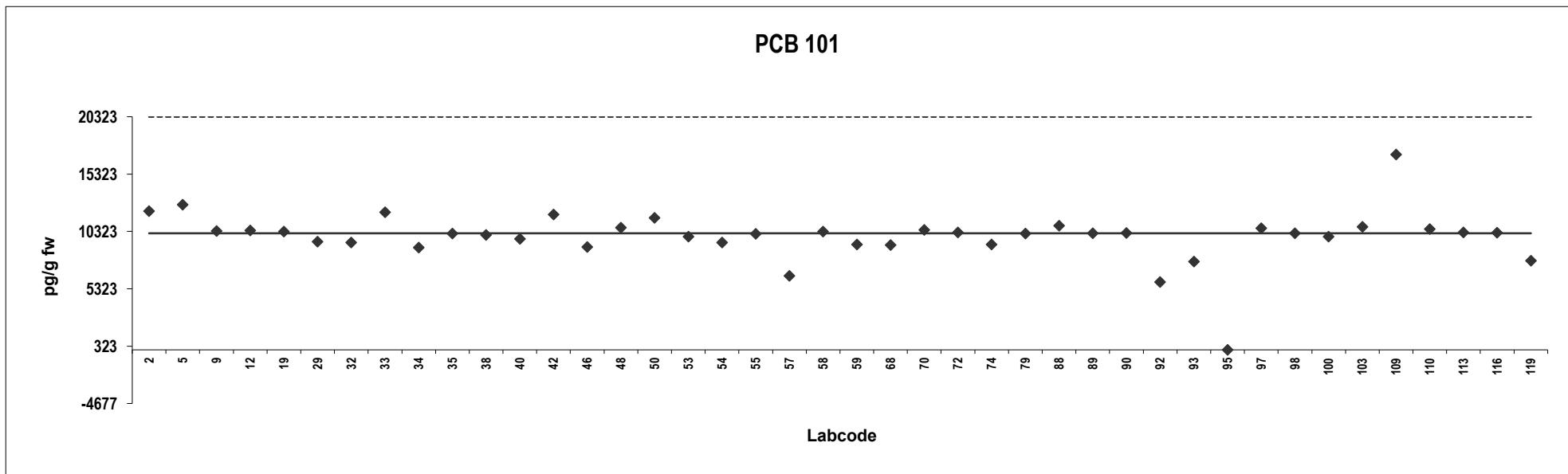
Fish oil

Congener: PCB 138

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	10700	-0,30					
5	13800	1,1					
9	12910	0,67					
12	12400	0,44					
19	10800	-0,26					
29	15470	1,8					
32	9598	-0,79					
33	13000	0,71					
34	10889	-0,22					
35	16328	2,2					
38	9318	-0,91					
40	10846	-0,24					
42	12108	0,32					
46	10000	-0,61					
48	9244	-0,94					
50	12821	0,63					
53	11116	-0,12					
54	11096	-0,13					
55	12061	0,30					
57	11049	-0,15					
58	11373	-0,0069					
59	11404	0,0069					
68	10094	-0,57					
70	10795	-0,26					
72	14894	1,5					
74	10100	-0,57					
79	16328	2,2					
88	12706	0,58					
89	10919	-0,21					
90	11000	-0,17					
92	13000	0,71					
93	9270	-0,93					
95	12	-5,0					
97	11739	0,15					
98	13804	1,1					
100	11810	0,19					
103	11865	0,21					
109	17302	2,6					
110	11118	-0,12					
113	12892	0,66					
116	14160	1,2					
119	11200	-0,083					

Consenus statistics

Consensus median, pg/g	11388
Median all values pg/g	11388
Consensus mean, pg/g	11746
Standard deviation, pg/g	2689
Relative standard deviation, %	23
No. of values reported	42
No. of values removed	0
No. of reported non-detects	0

PCB 138

Z-score: PCB 138
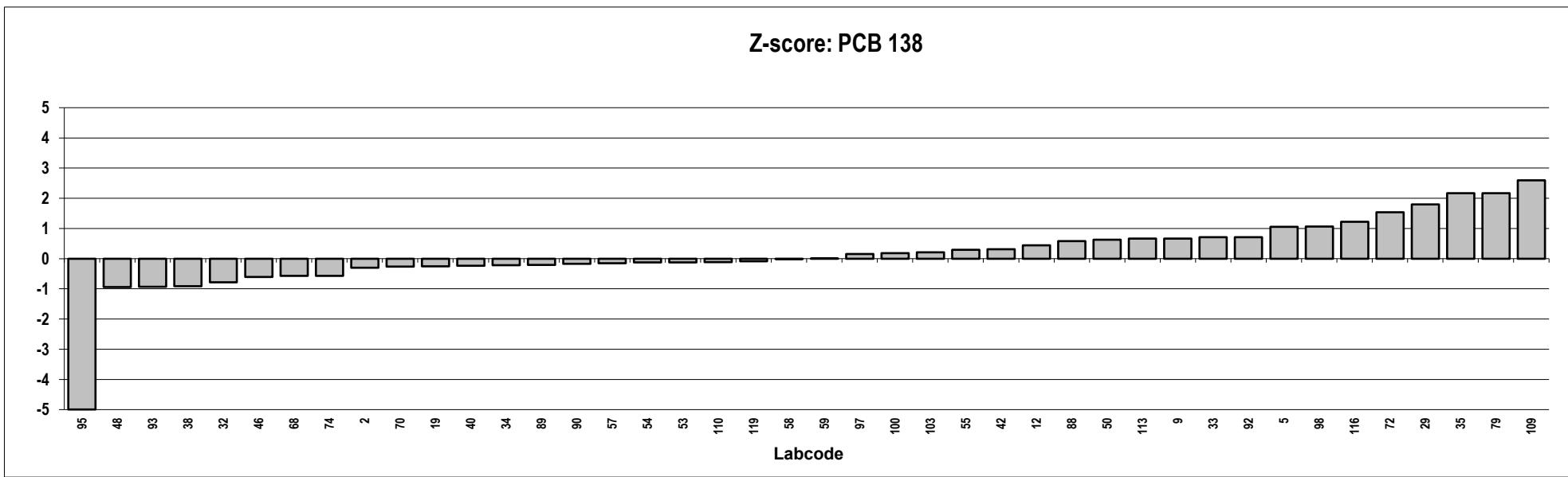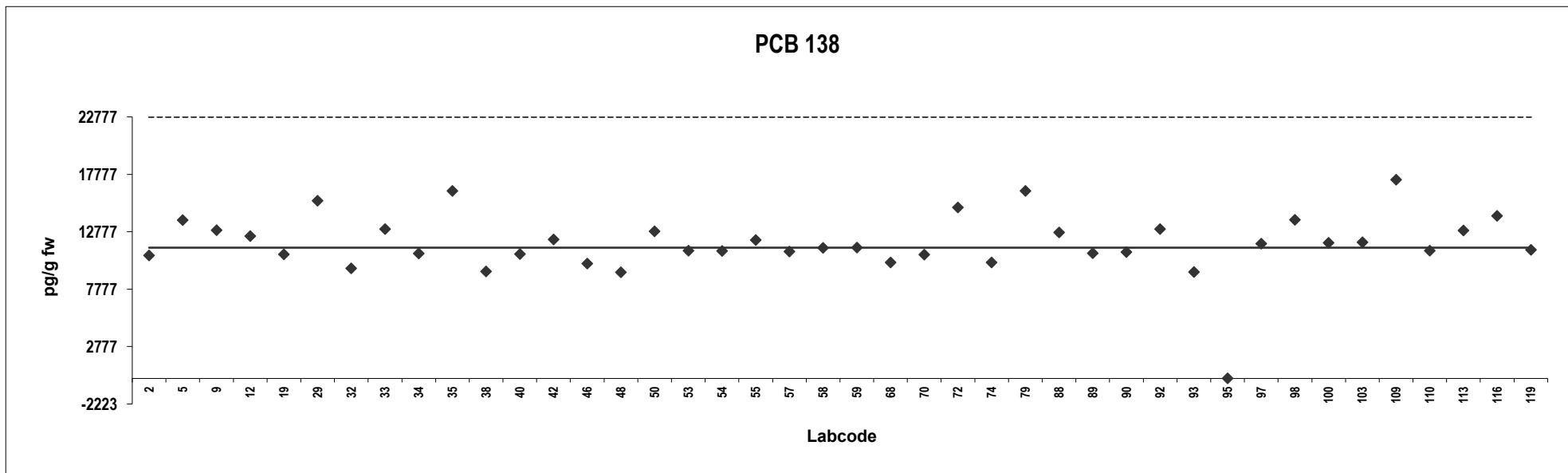
Fish oil

Congener: PCB 153

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	24700	2,5					
5	16950	0,12					
9	23720	2,2					
12	18100	0,47					
19	16100	-0,14					
29	18835	0,69					
32	14302	-0,68					
33	18000	0,44					
34	18551	0,60					
35	16323	-0,069					
38	18363	0,55					
40	15889	-0,20					
42	18217	0,50					
46	14300	-0,68					
48	14184	-0,72					
50	18147	0,48					
53	15244	-0,40					
54	18818	0,68					
55	18367	0,55					
57	13790	-0,83					
58	17115	0,17					
59	15705	-0,26					
68	15578	-0,29					
70	17073	0,16					
72	14417	-0,64					
74	14400	-0,65					
79	16323	-0,069					
88	16937	0,12					
89	15778	-0,23					
90	16100	-0,14					
92	19000	0,74					
93	13700	-0,86					
95	16	-5,0					
97	15885	-0,20					
98	17261	0,21					
100	16780	0,069					
103	16948	0,12					
109	957	-4,7					
110	16895	0,10					
113	17004	0,14					
116	14011	-0,77					
119	14300	-0,68					

Consensus statistics

Consensus median, pg/g	16552
Median all values pg/g	16552
Consensus mean, pg/g	16026
Standard deviation, pg/g	4188
Relative standard deviation, %	26
No. of values reported	42
No. of values removed	0
No. of reported non-detects	0

PCB 153

Z-score: PCB 153
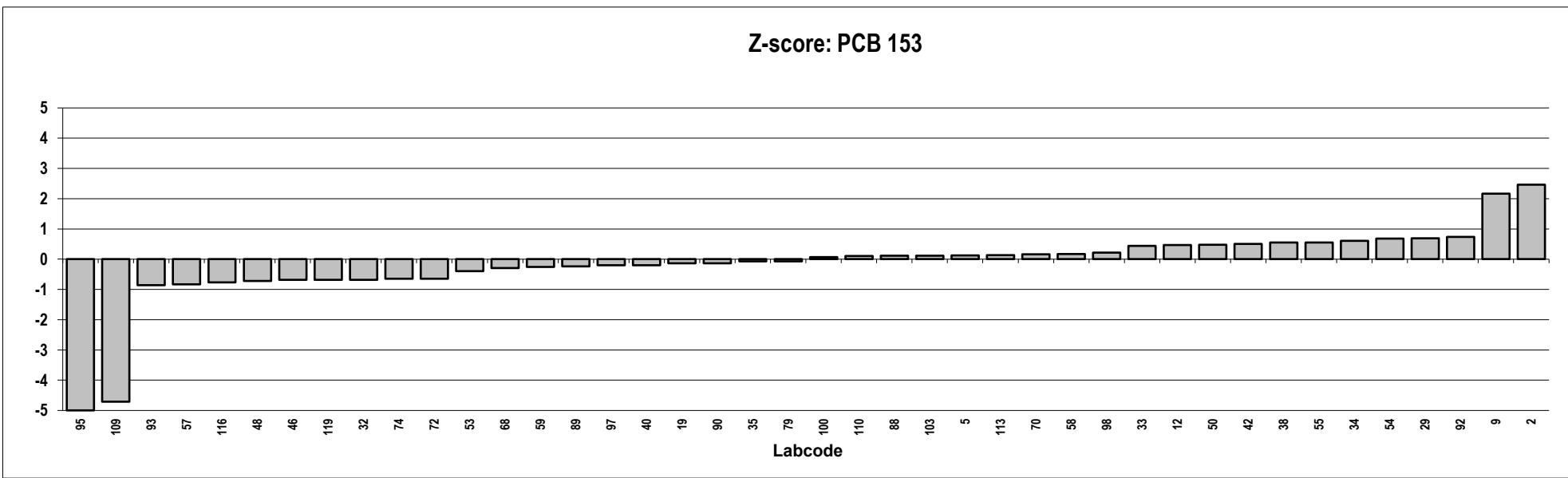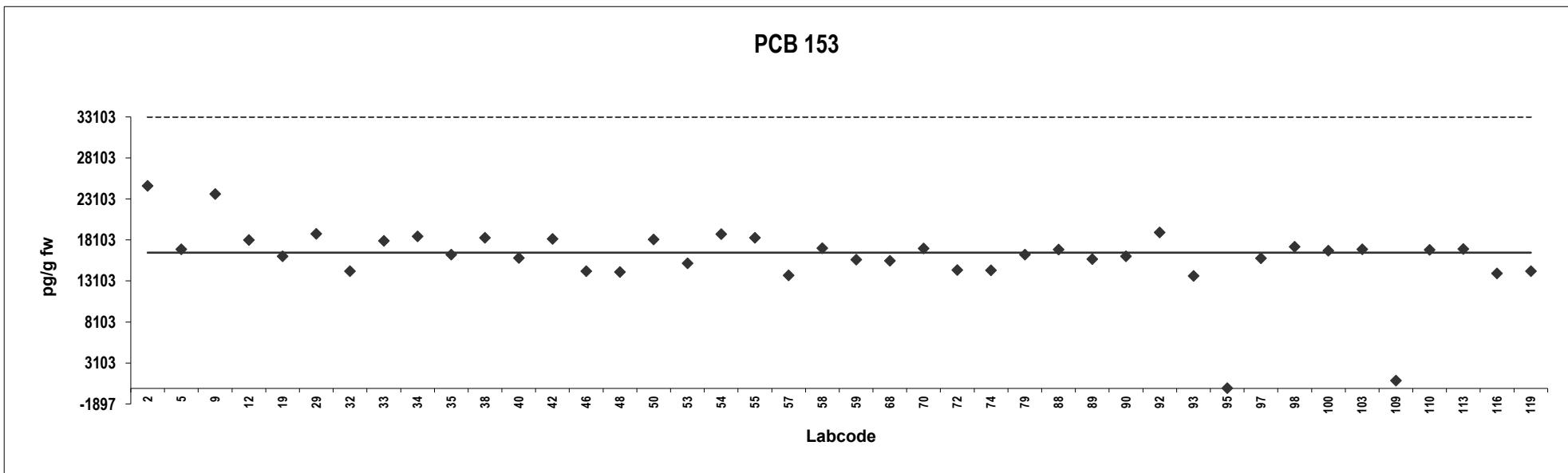
Fish oil

Congener: PCB 180

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	3400	-0,29					
5	4312	0,97					
9	4570	1,3					
12	3970	0,50					
19	3500	-0,15					
29	3837	0,31					
32	3306	-0,42					
33	4000	0,54					
34	3049	-0,78					
35	4034	0,58					
38	4665	1,5					
40	3606	-0,0068					
42	3661	0,069					
46	3060	-0,76					
48	3156	-0,63					
50	3798	0,26					
53	3686	0,10					
54	3098	-0,71					
55	3711	0,14					
57	4349	1,0					
58	4125	0,71					
59	3649	0,052					
68	3480	-0,18					
70	3646	0,048					
72	3051	-0,78					
74	3110	-0,69					
79	4034	0,58					
88	4008	0,55					
89	3190	-0,58					
90	3340	-0,38					
92	3700	0,12					
93	2680	-1,3					
95	3,9	-5,0					
97	3239	-0,52					
98	3568	-0,060					
100	3616	0,0068					
103	3523	-0,12					
109	902	-3,8					
110	3451	-0,22					
113	3862	0,35					
116	3898	0,40					
119	3190	-0,58					

Consenus statistics

Consensus median, pg/g	3611
Median all values pg/g	3611
Consensus mean, pg/g	3477
Standard deviation, pg/g	816
Relative standard deviation, %	23
No. of values reported	42
No. of values removed	0
No. of reported non-detects	0

PCB 180

Z-score: PCB 180
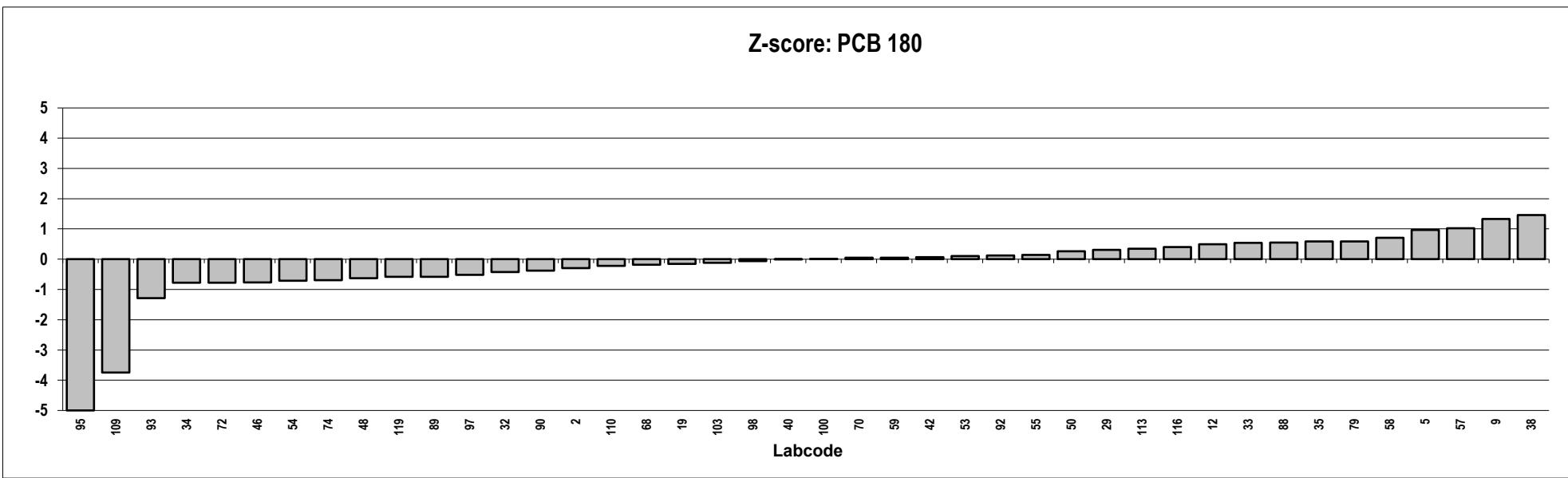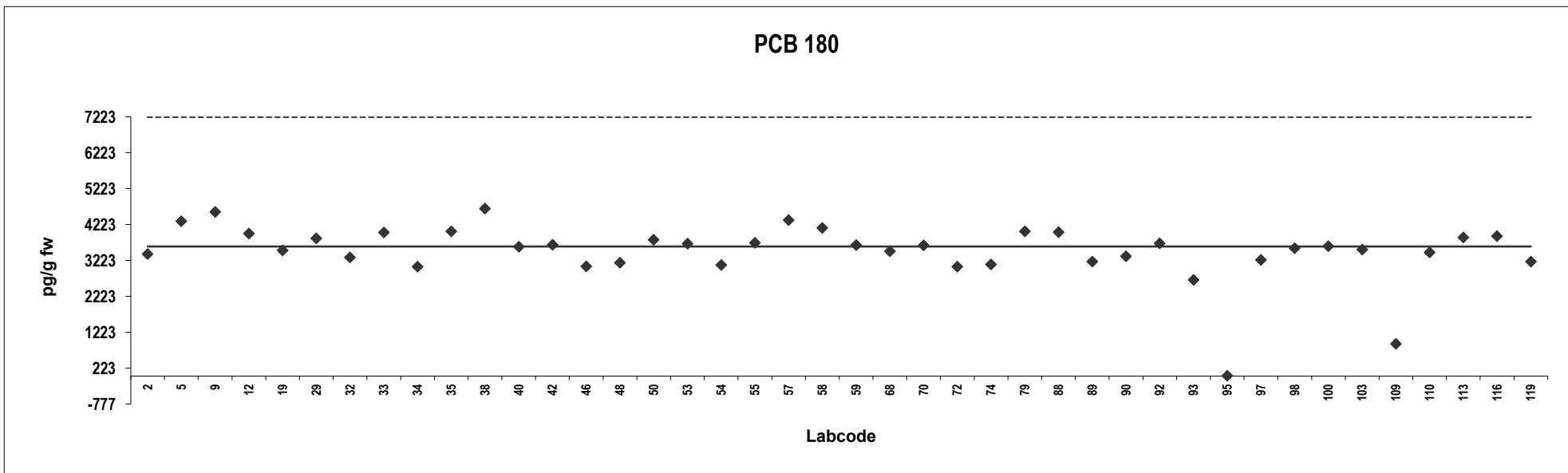
Fish oil

Congener: PBDE 28

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	117	-1,3					
2	238	2,5					
5	168	0,30					
6	149	-0,30					
19	203	1,4					
53	150	-0,27					
55	182	0,73					
68	169	0,33					
89	142	-0,53					
90	153	-0,18					
92	200	1,3					
97	139	-0,62					
98	104	-1,7					
109	164	0,18					
110	188	0,92					
119	108	-1,6					

Consensus statistics

Consensus median, pg/g	159
Median all values pg/g	159
Consensus mean, pg/g	161
Standard deviation, pg/g	36
Relative standard deviation, %	23
No. of values reported	16
No. of values removed	0
No. of reported non-detects	0

PBDE 28

Z-score: PBDE 28
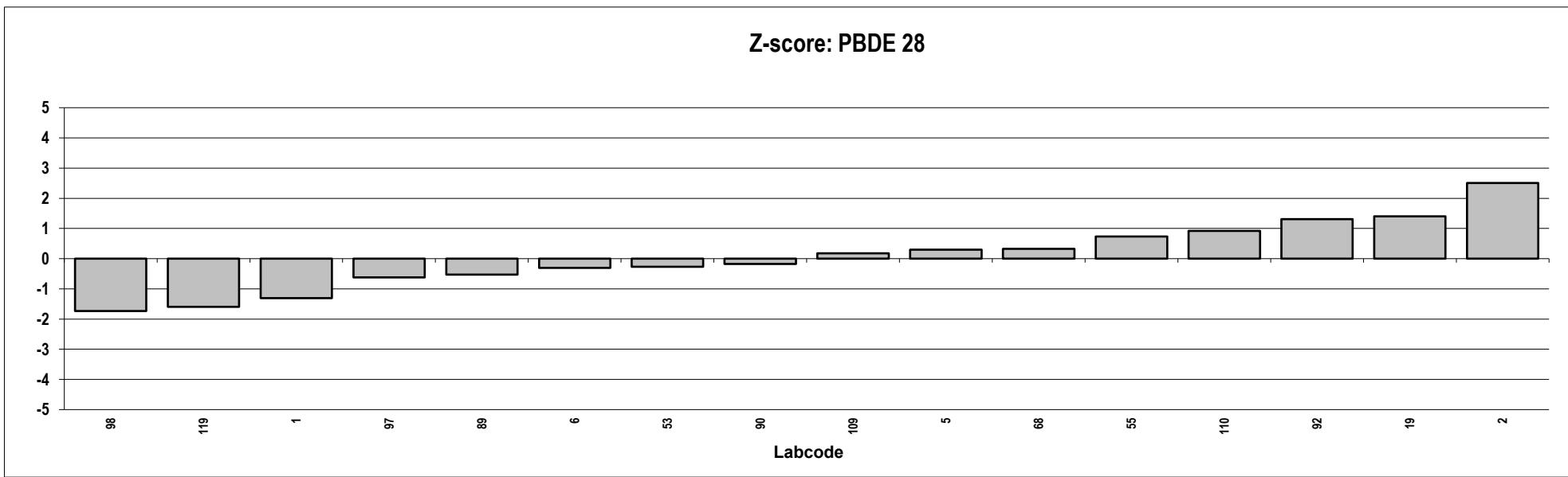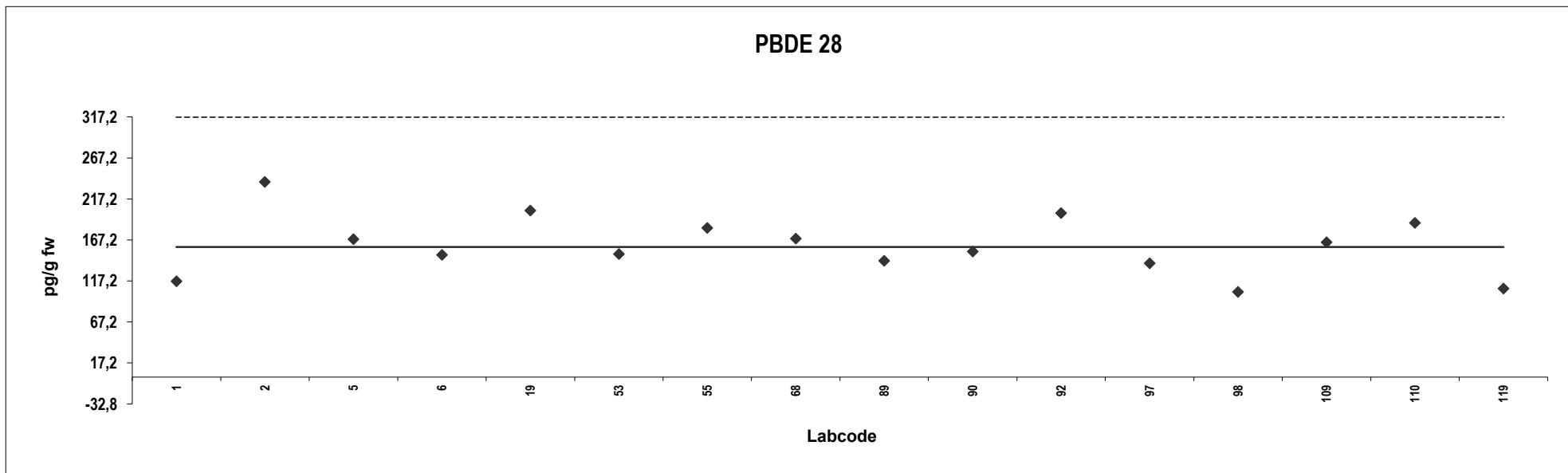
Fish oil
Congener: PBDE 47

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	2530	-0,020					
2	3190	1,3					
5	2750	0,41					
6	2506	-0,067					
19	2670	0,26					
40	2367	-0,34					
53	2533	-0,014					
55	2481	-0,12					
68	2481	-0,12					
89	2407	-0,26					
90	2540	0,00					
92	3000	0,91					
97	2625	0,17					
98	2893	0,70					
109	2881	0,67					
110	2772	0,46					
119	2179	-0,71					

Consenus statistics

Consensus median, pg/g	2540
Median all values pg/g	2540
Consensus mean, pg/g	2636
Standard deviation, pg/g	253
Relative standard deviation, %	9,6
No. of values reported	17
No. of values removed	0
No. of reported non-detects	0

PBDE 47

Z-score: PBDE 47
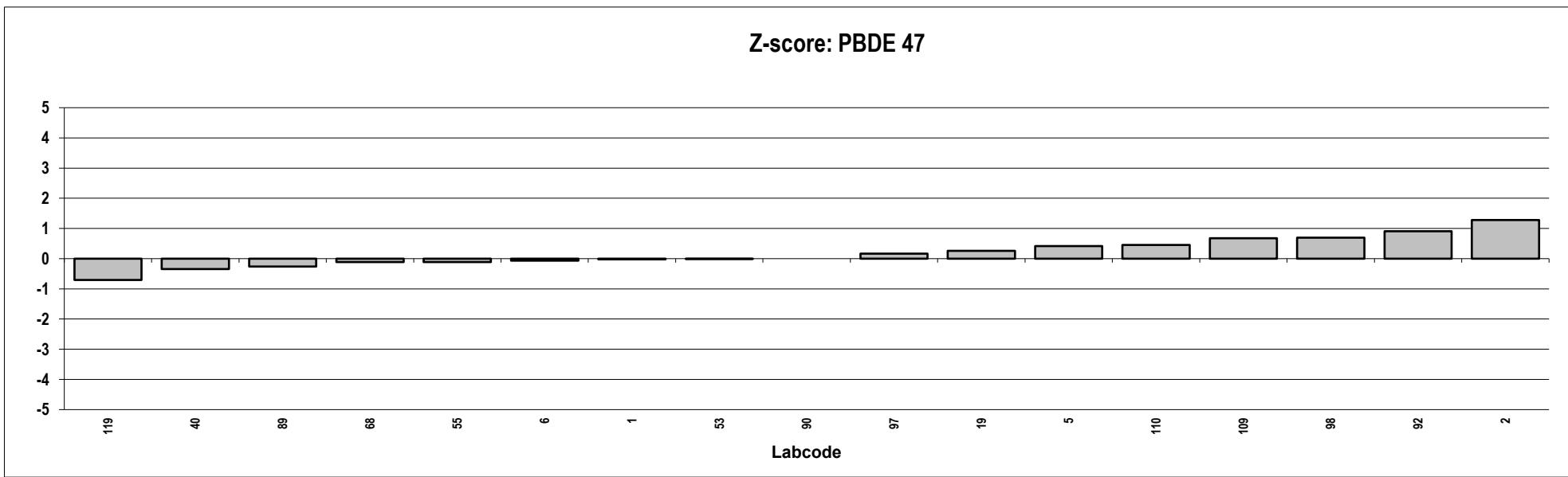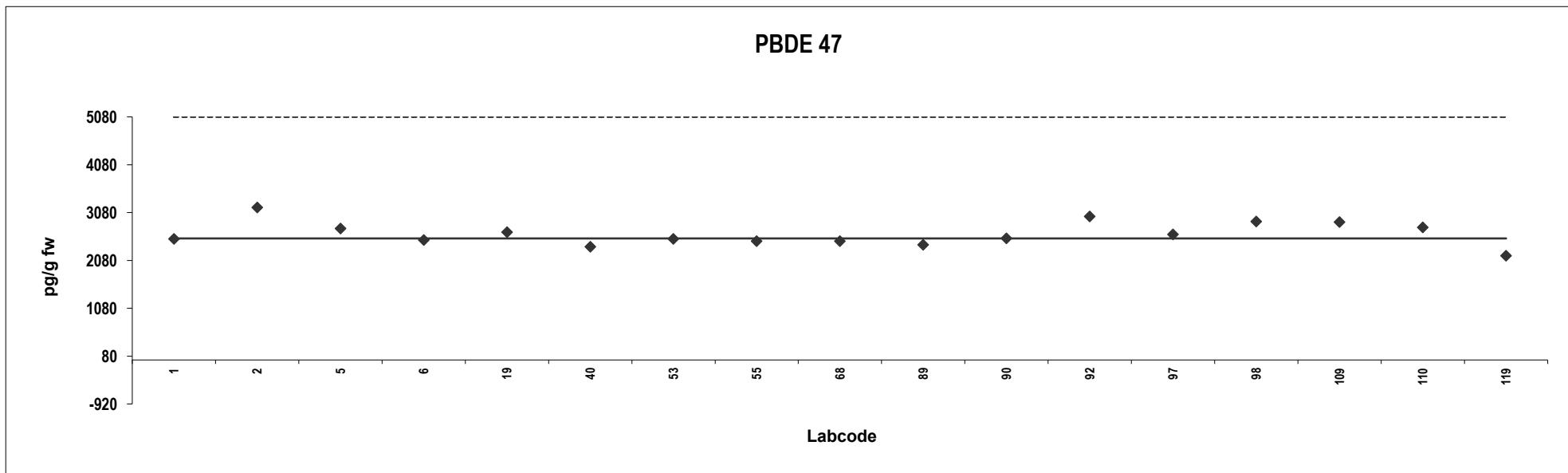
Fish oil
Congener: PBDE 99

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	122	-1,2					
2	178	0,56					
5	171	0,34					
6	169	0,28					
19	172	0,38					
40	149	-0,34					
53	135	-0,78					
55	182	0,70					
68	160	0,00					
89	146	-0,44					
90	158	-0,063					
92	260	3,1					
97	116	-1,4					
98	148	-0,39					
109	201	1,3					
110	178	0,58					
119	146	-0,44					

Consenus statistics

Consensus median, pg/g	160
Median all values pg/g	160
Consensus mean, pg/g	164
Standard deviation, pg/g	33
Relative standard deviation, %	20
No. of values reported	17
No. of values removed	0
No. of reported non-detects	0

PBDE 99

Z-score: PBDE 99
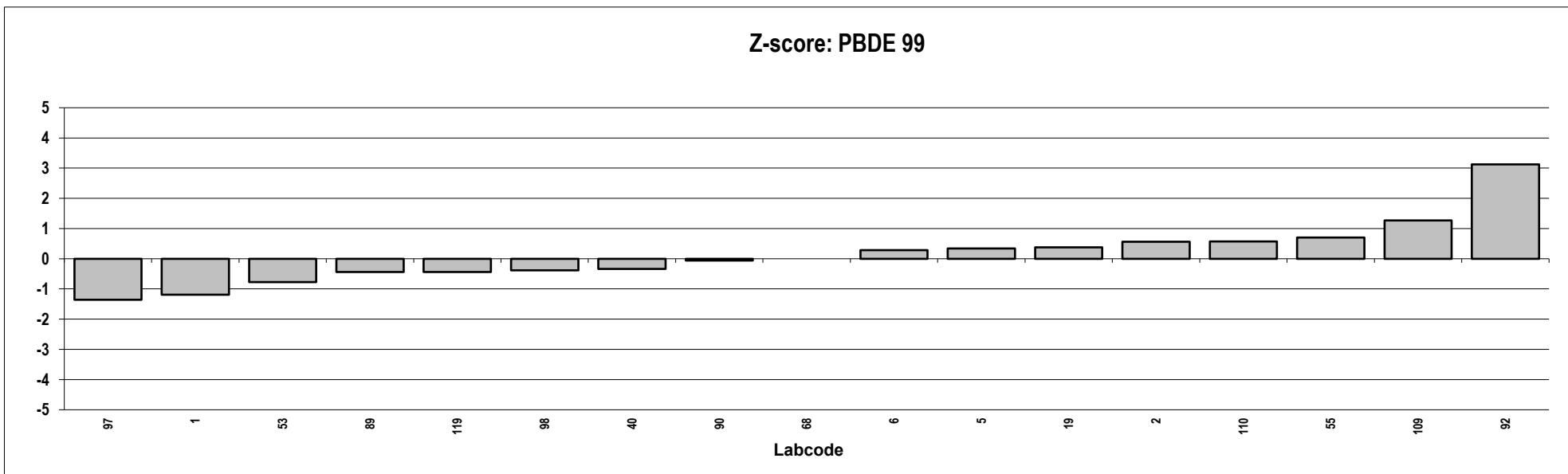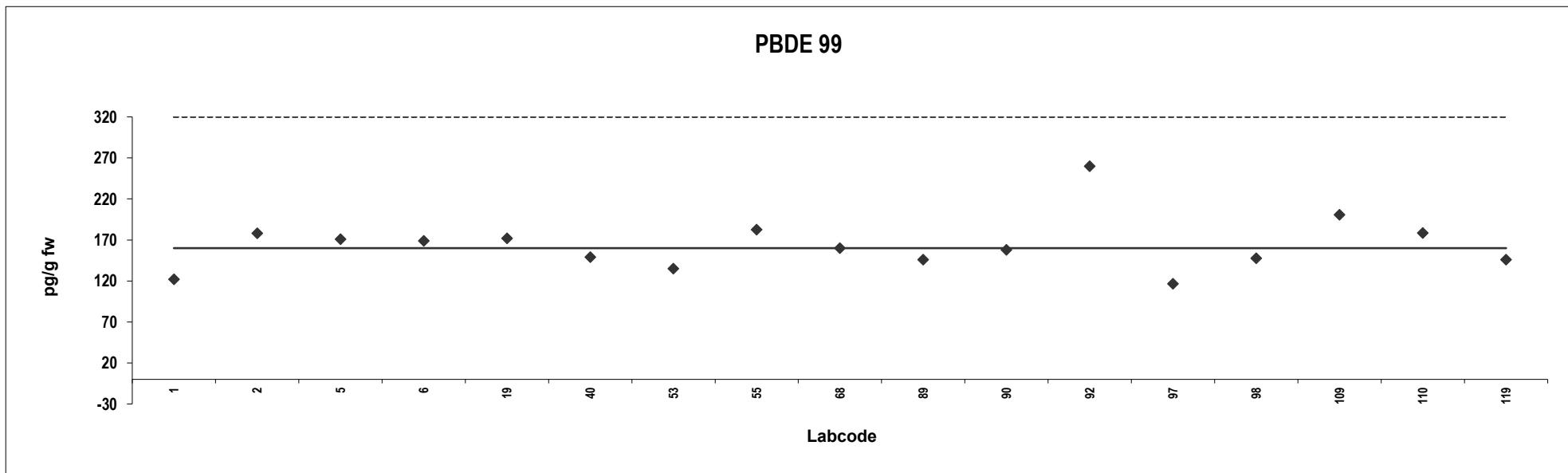
Fish oil

Congener: PBDE 100

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	560	-0,33					
2	685	0,72					
5	599	0,00					
6	577	-0,18					
19	626	0,23					
40	640	0,34					
53	572	-0,23					
55	668	0,58					
68	599	0,00					
89	528	-0,60					
90	555	-0,37					
92	690	0,76					
97	337	-2,2					
98	797	1,6					
109	568	-0,26					
110	620	0,17					
119	522	-0,64					

Consenus statistics

Consensus median, pg/g	599
Median all values pg/g	599
Consensus mean, pg/g	597
Standard deviation, pg/g	96
Relative standard deviation, %	16
No. of values reported	17
No. of values removed	0
No. of reported non-detects	0

PBDE 100

Z-score: PBDE 100
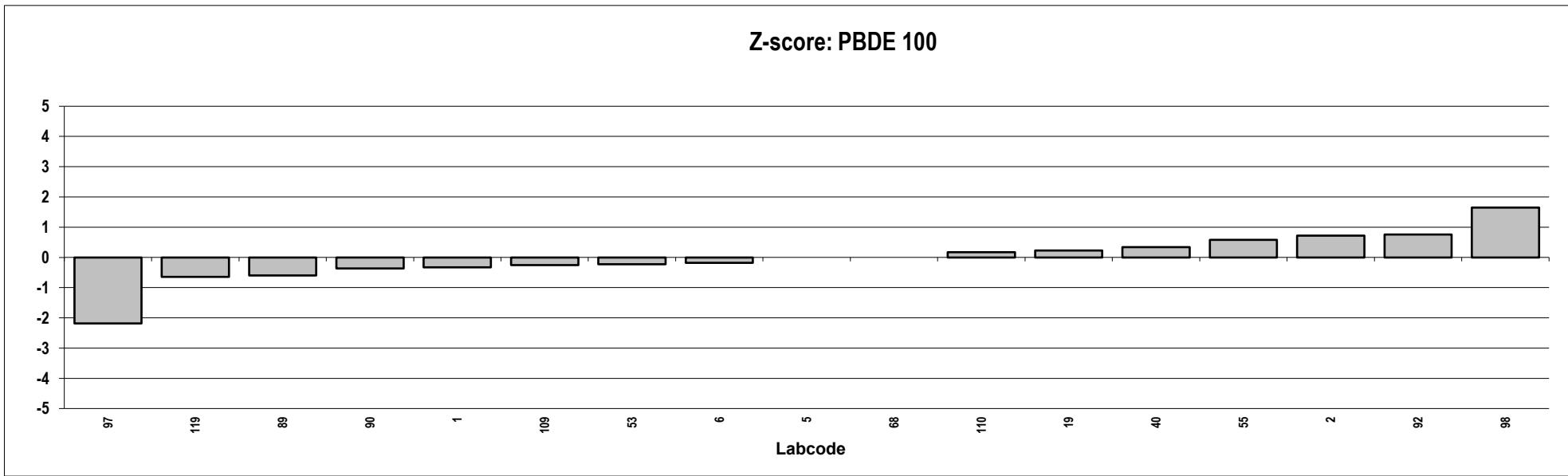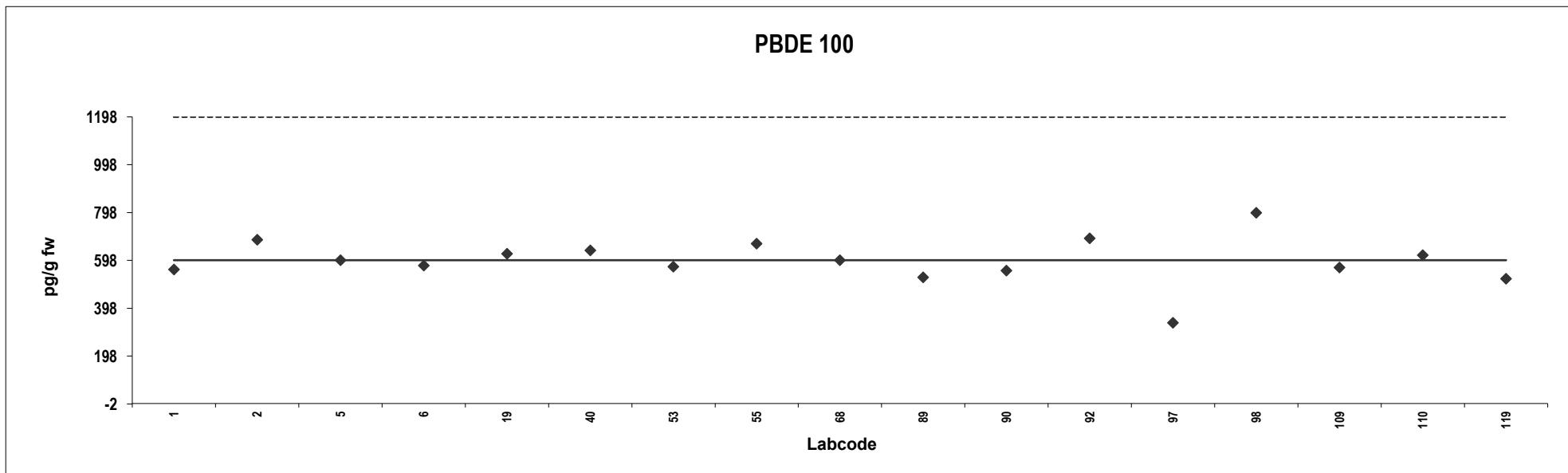
Fish oil
Congener: PBDE 153

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	46	-0,31					
2	46	-0,34					
5	79	3,1					
6	47	-0,20					
19	48	-0,061					
40	51	0,19					
53	50	0,15					
55	51	0,18					
68	46	-0,31					
89	42	-0,75					
90	49	0,00					
92	93	4,5					
97	43	-0,62					
98	19	-3,0					
109	55	0,60					
110	51	0,21					
119	68	2,0					

Consensus statistics

Consensus median, pg/g	49
Median all values pg/g	49
Consensus mean, pg/g	52
Standard deviation, pg/g	16
Relative standard deviation, %	31
No. of values reported	17
No. of values removed	0
No. of reported non-detects	0

PBDE 153
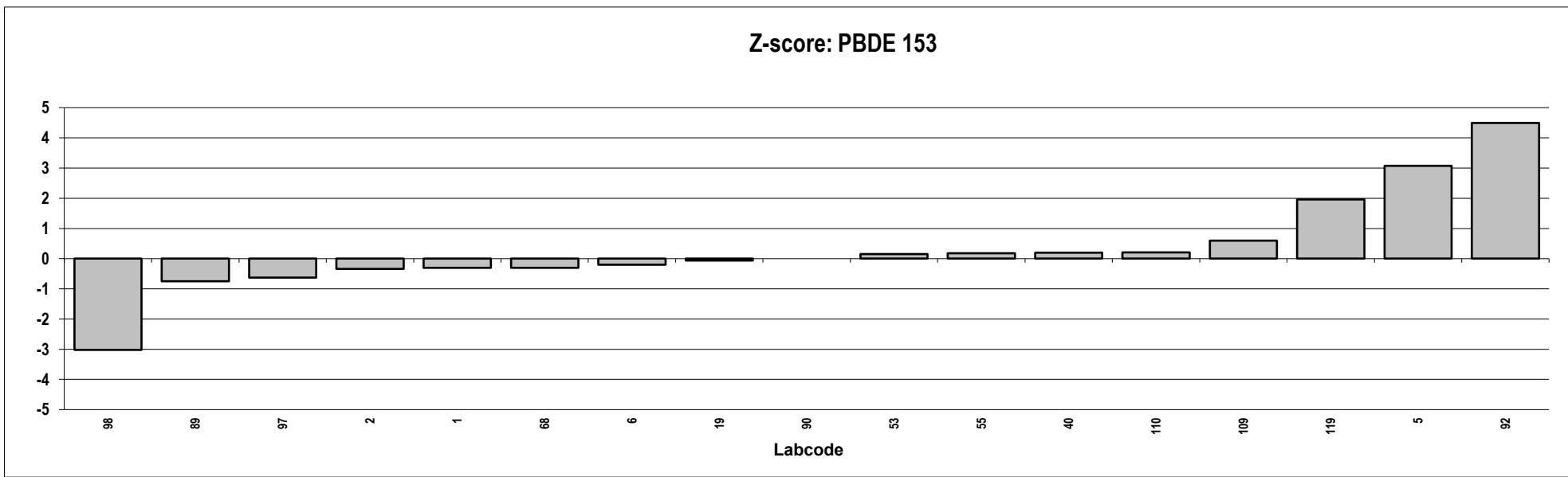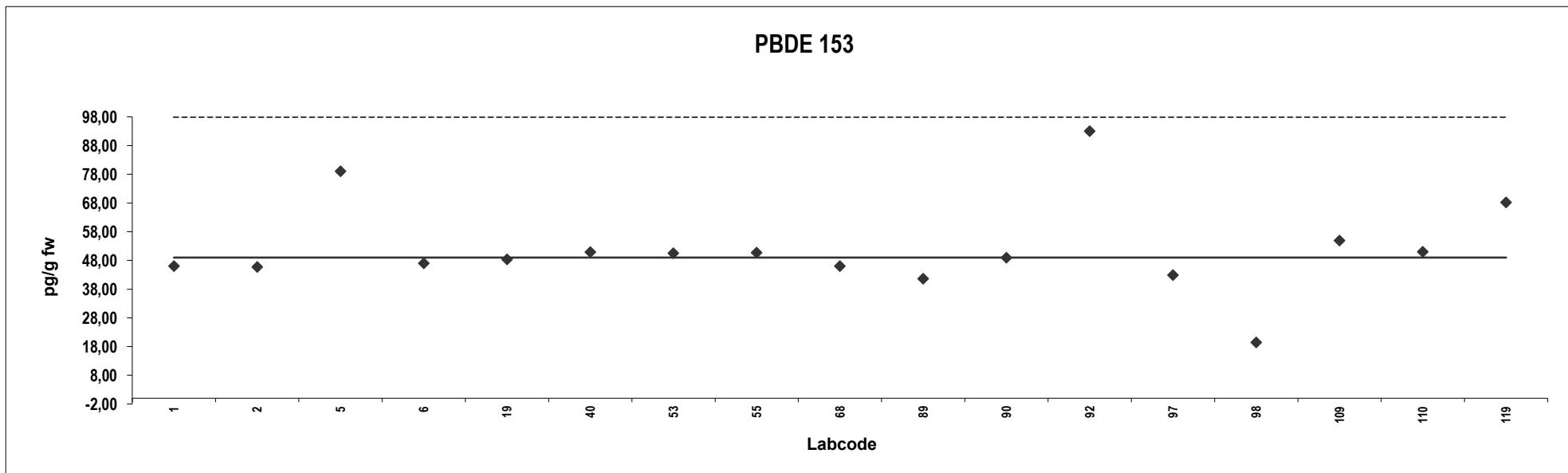
Z-score: PBDE 153

Fish oil
Congener: PBDE 154

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	490	0,42					
2	547	1,1					
5	537	0,94					
6	417	-0,39					
19	394	-0,64					
40	358	-1,0					
53	436	-0,18					
55	478	0,29					
68	428	-0,27					
89	543	1,0					
90	452	0,00					
92	460	0,088					
97	506	0,60					
98	319	-1,5					
109	397	-0,61					
110	197	-2,8					
119	454	0,022					

Consenus statistics

Consensus median, pg/g	452
Median all values pg/g	452
Consensus mean, pg/g	436
Standard deviation, pg/g	88
Relative standard deviation, %	20
No. of values reported	17
No. of values removed	0
No. of reported non-detects	0

PBDE 154

Z-score: PBDE 154
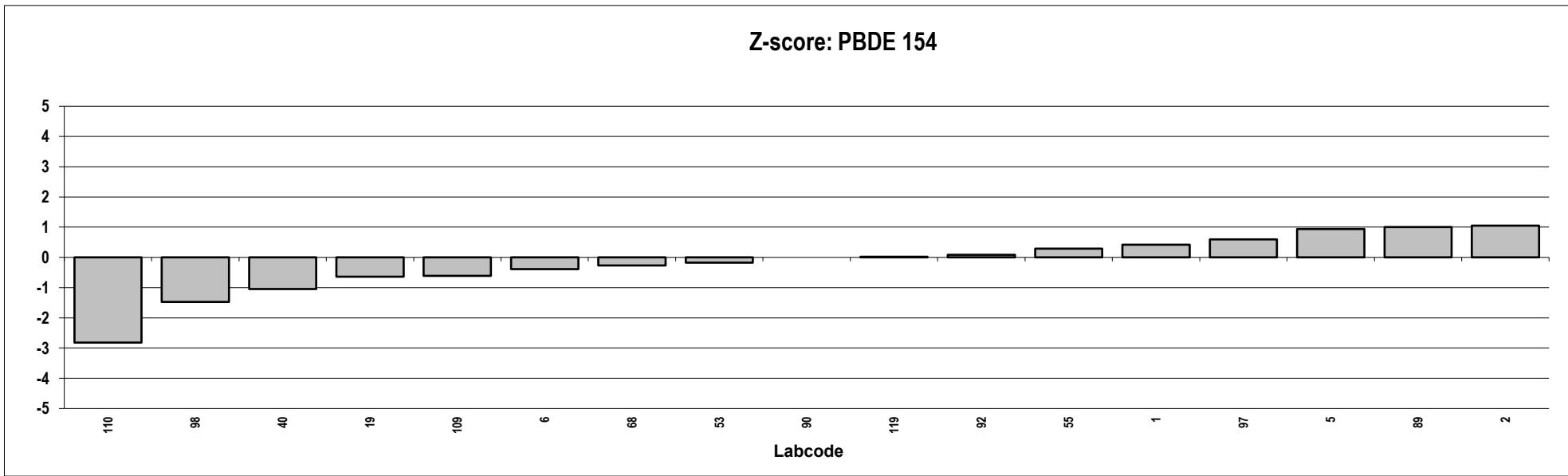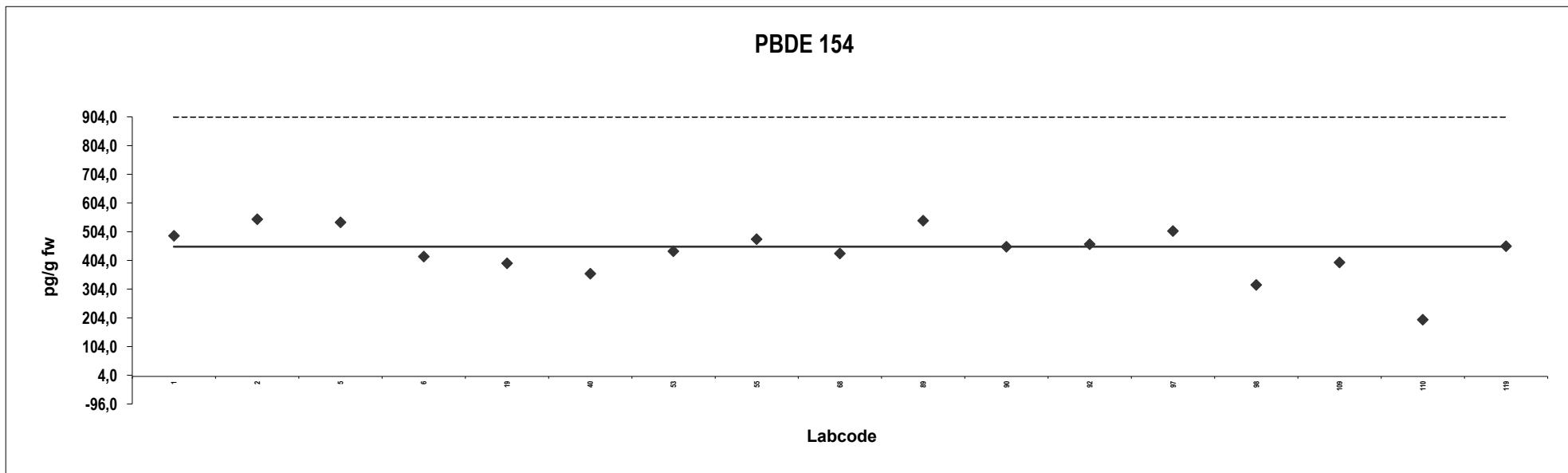
Fish oil
Congener: PBDE 183

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	2,3	-3,4	ND				
2	9,0	1,3					
6	7,6	0,29					
19	80	51	Outlier,ND				
40	5,7	-1,0					
53	8,0	0,60					
55	5,5	-1,2					
68	7,1	-0,056					
89	8,3	0,77					
90	20	8,9	Outlier				
92	23	11	Outlier,ND				
97	4,6	-1,8	ND				
98	6,5	-0,45					
109	57	35	Outlier				
110	9,9	1,9	ND				
119	7,2	0,00					

Consenus statistics

Consensus median, pg/g	7,2
Median all values pg/g	7,8
Consensus mean, pg/g	6,8
Standard deviation, pg/g	2,1
Relative standard deviation, %	30
No. of values reported	16
No. of values removed	4
No. of reported non-detects	5

PBDE 183

Z-score: PBDE 183
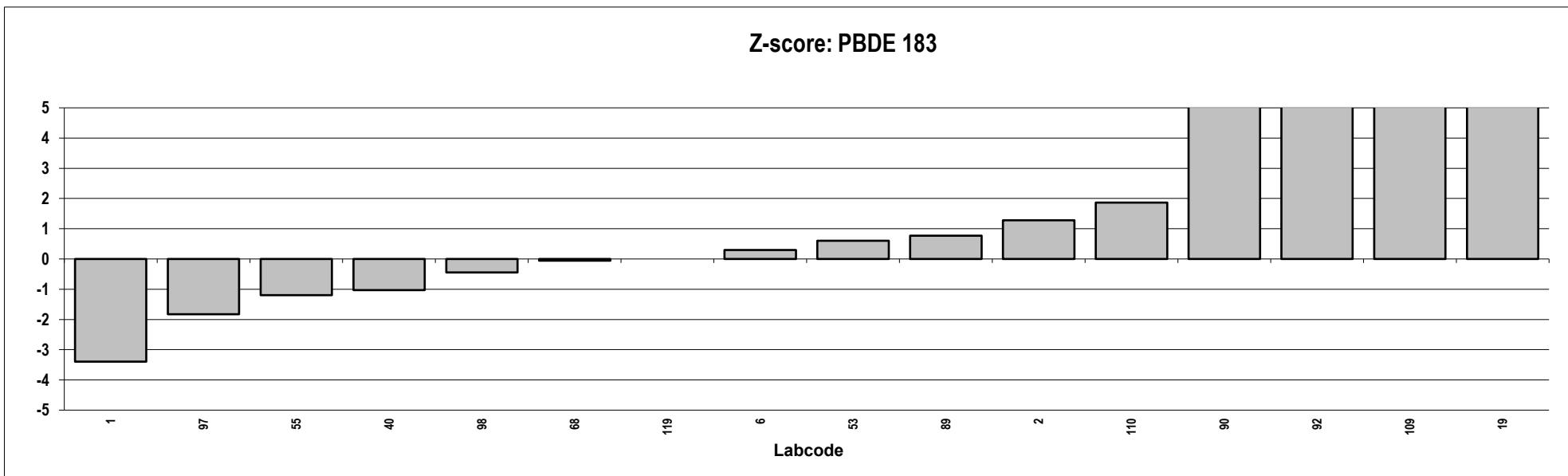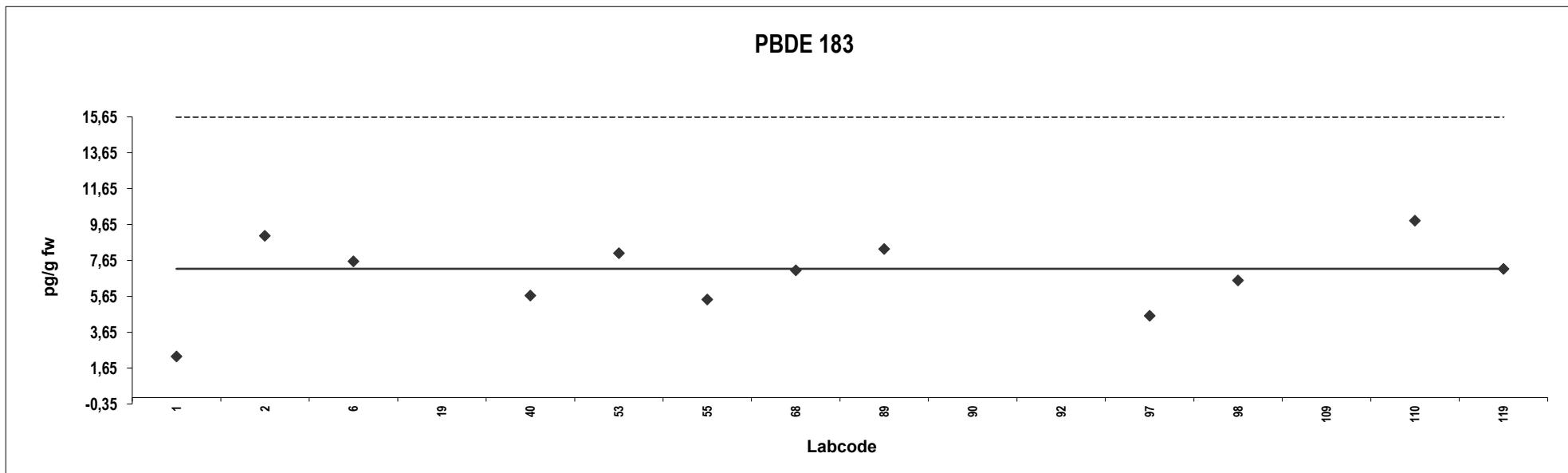
Fish oil
Congener: PBDE 209

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
2	25	-3,2	ND				
6	600	39	Outlier,ND				
53	202	9,8	Outlier				
55	1,8	-4,9	ND				
90	68	0,00					
92	47	-1,6	ND				
97	377	23	Outlier				
110	789	53	Outlier,ND				
119	18	-3,7	ND				

Consenus statistics	
Consensus median, pg/g	68
Median all values pg/g	68
Consensus mean, pg/g	32
Standard deviation, pg/g	26
Relative standard deviation, %	81
No. of values reported	9
No. of values removed	4
No. of reported non-detects	6
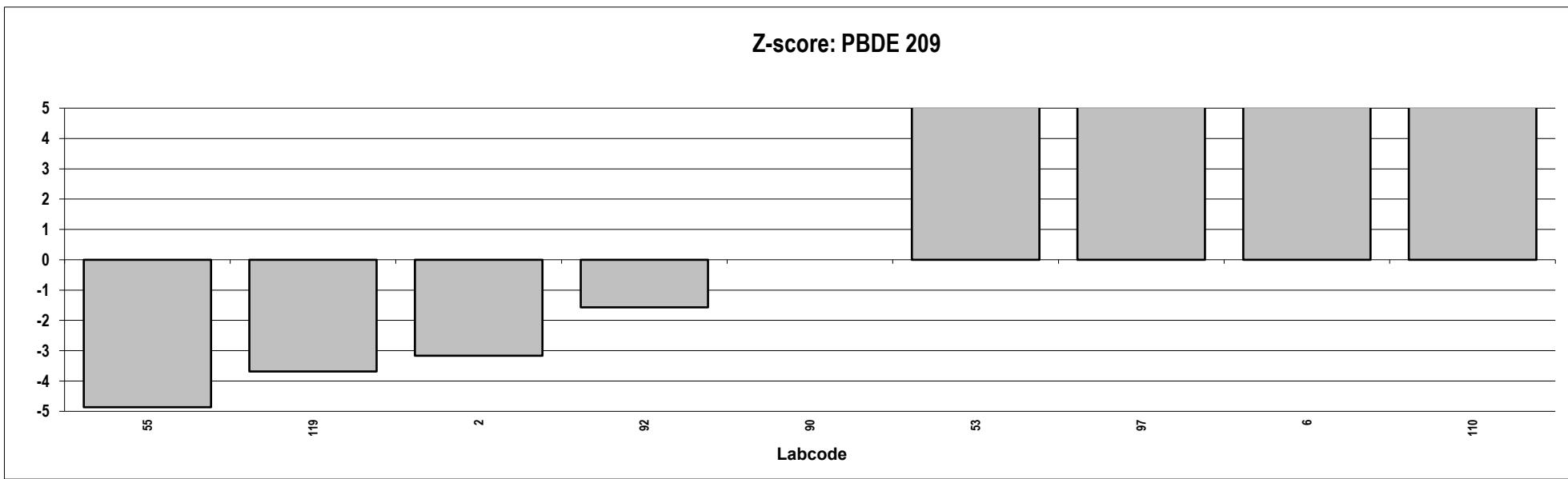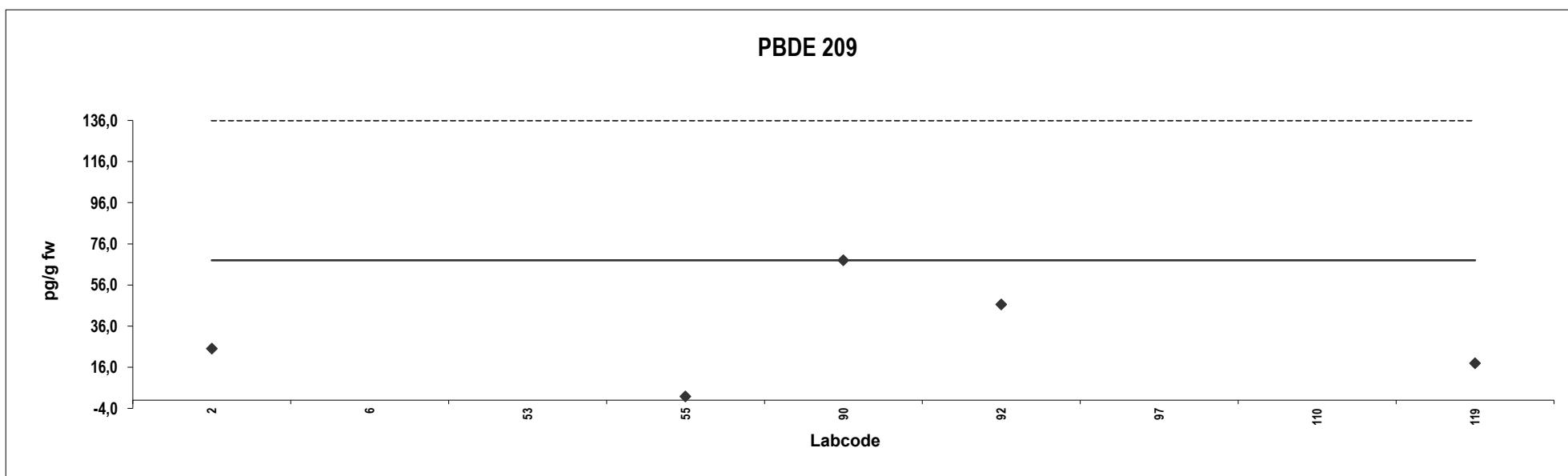
PBDE 209

Z-score: PBDE 209

Fish oil

Congener: α-HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
5	1800	-0,74					
42	2161	0,11					
55	2921	1,9					
89	2066	-0,11					

Consenus statistics

Consensus median, pg/g	2113
Median all values pg/g	2113
Consensus mean, pg/g	2237
Standard deviation, pg/g	481
Relative standard deviation, %	21
No. of values reported	4
No. of values removed	0
No. of reported non-detects	0

α-HBCD

Z-score: α-HBCD
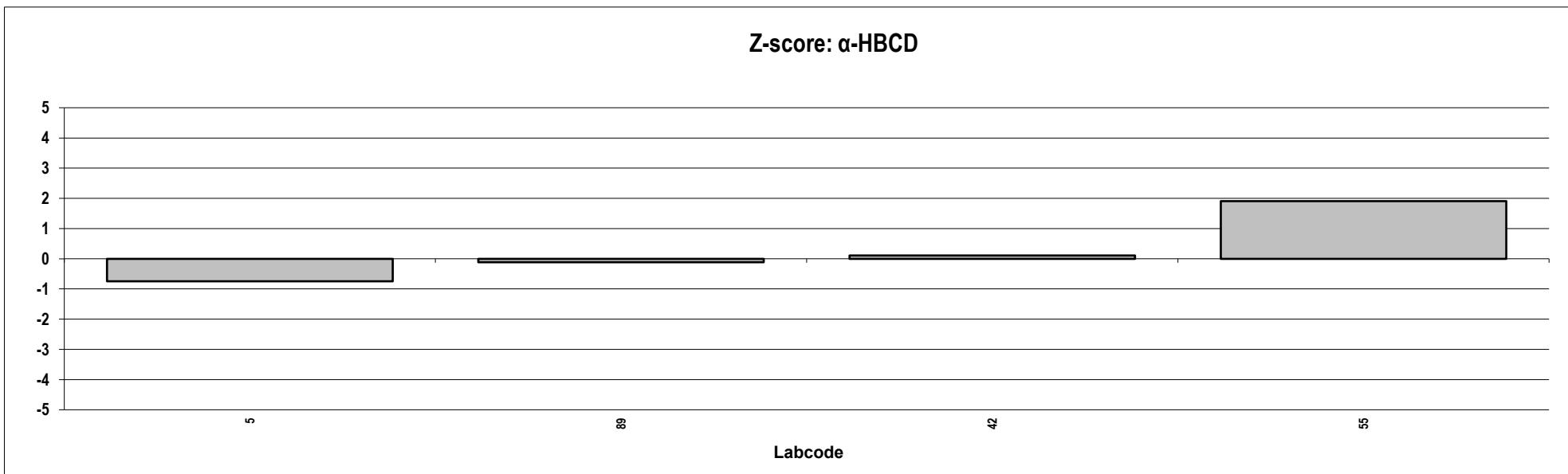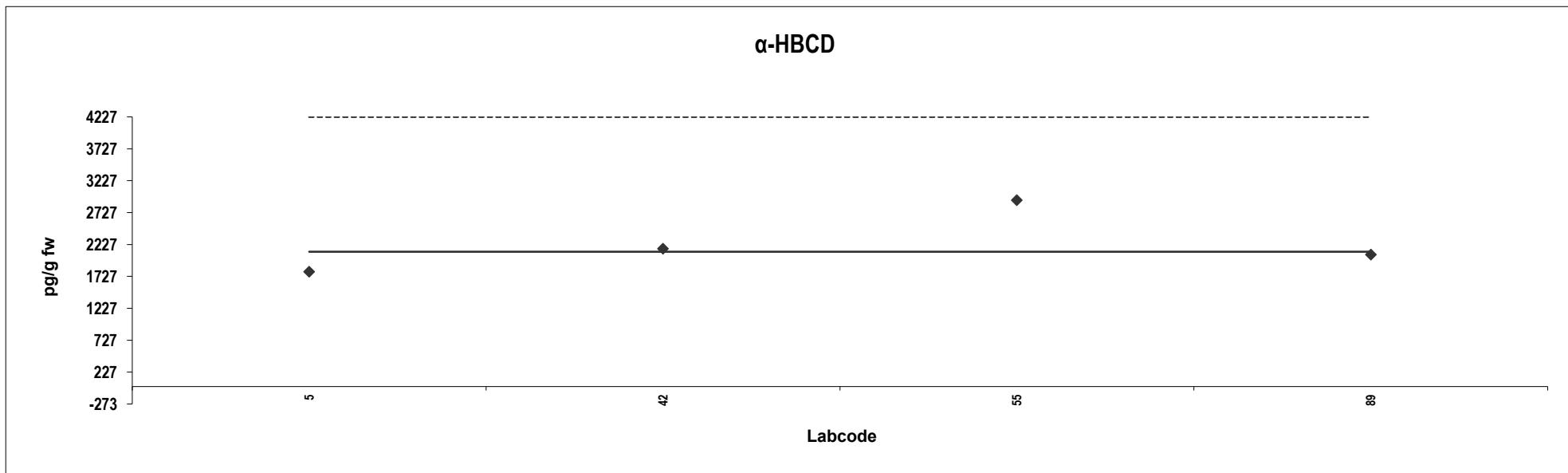
Fish oil

Congener: β-HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
42	0,80	-4,4	ND				
55	6,4	0,00					
89	5,0	-1,1	ND				

Consenus statistics

Consensus median, pg/g	6,4
Median all values pg/g	5,0
Consensus mean, pg/g	4,1
Standard deviation, pg/g	2,9
Relative standard deviation, %	71
No. of values reported	3
No. of values removed	0
No. of reported non-detects	2

β-HBCD

Z-score: β-HBCD
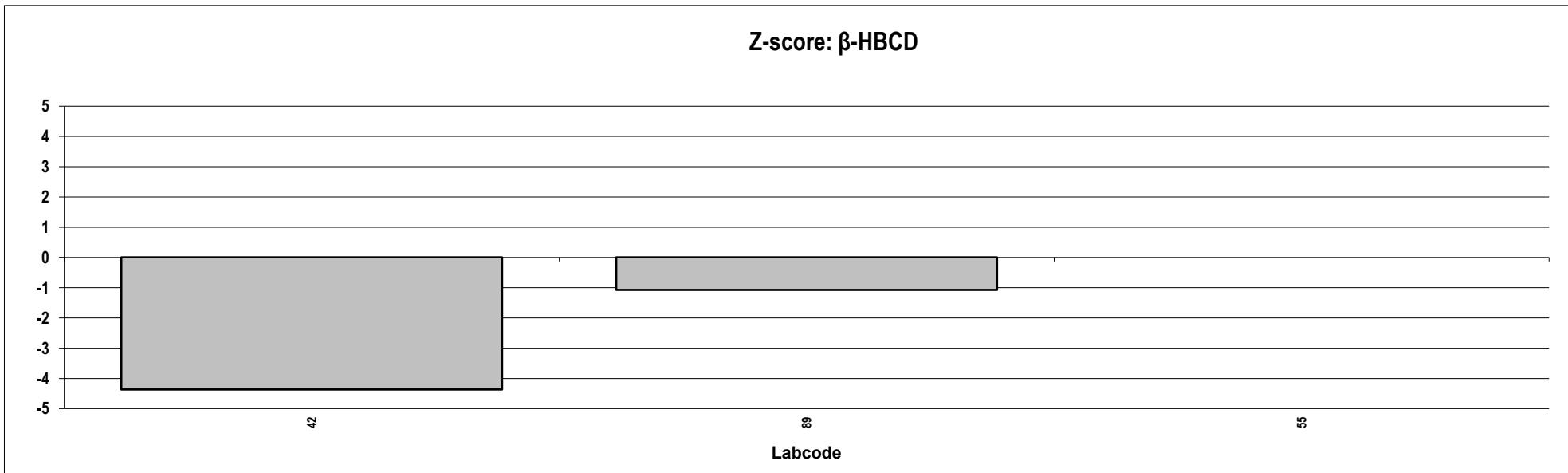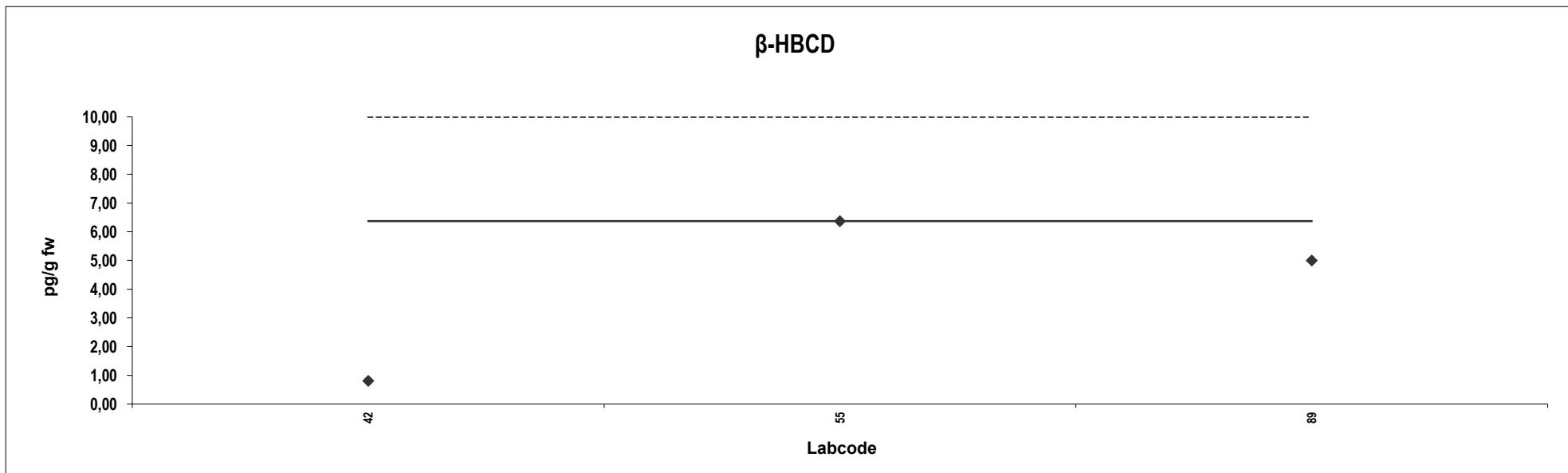
Fish oil

Congener: γ-HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
42	32	-0,56					
55	36	0,00					
89	70	4,7					

Consenus statistics

Consensus median, pg/g	36
Median all values pg/g	36
Consensus mean, pg/g	46
Standard deviation, pg/g	21
Relative standard deviation, %	46
No. of values reported	3
No. of values removed	0
No. of reported non-detects	0

γ-HBCD

Z-score: γ-HBCD
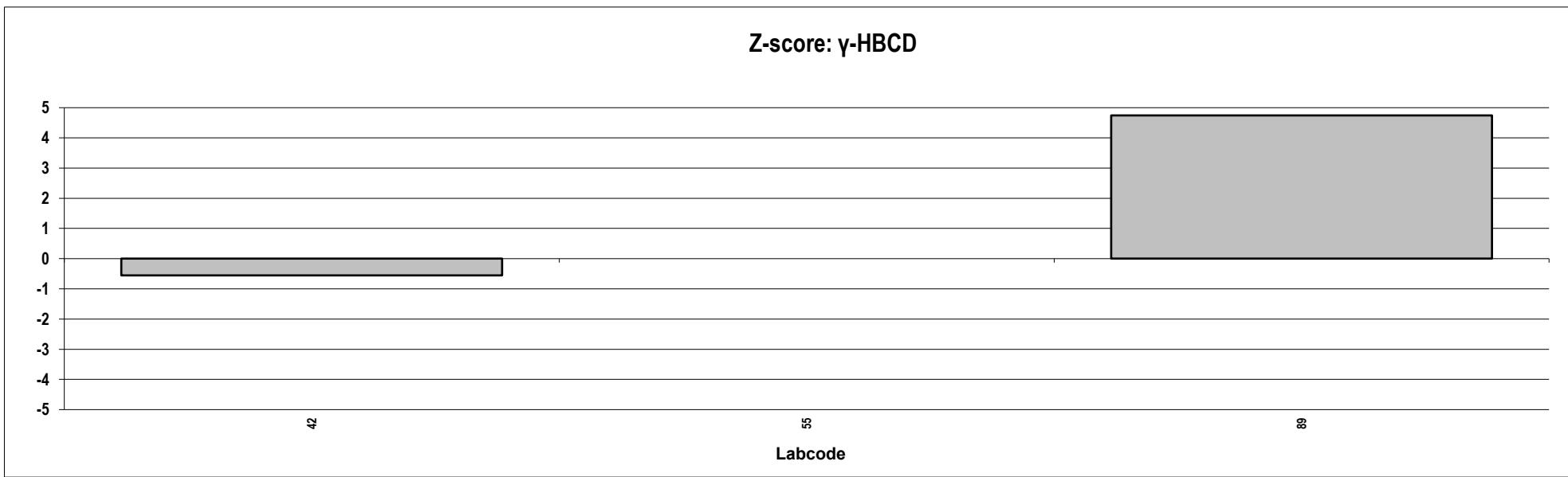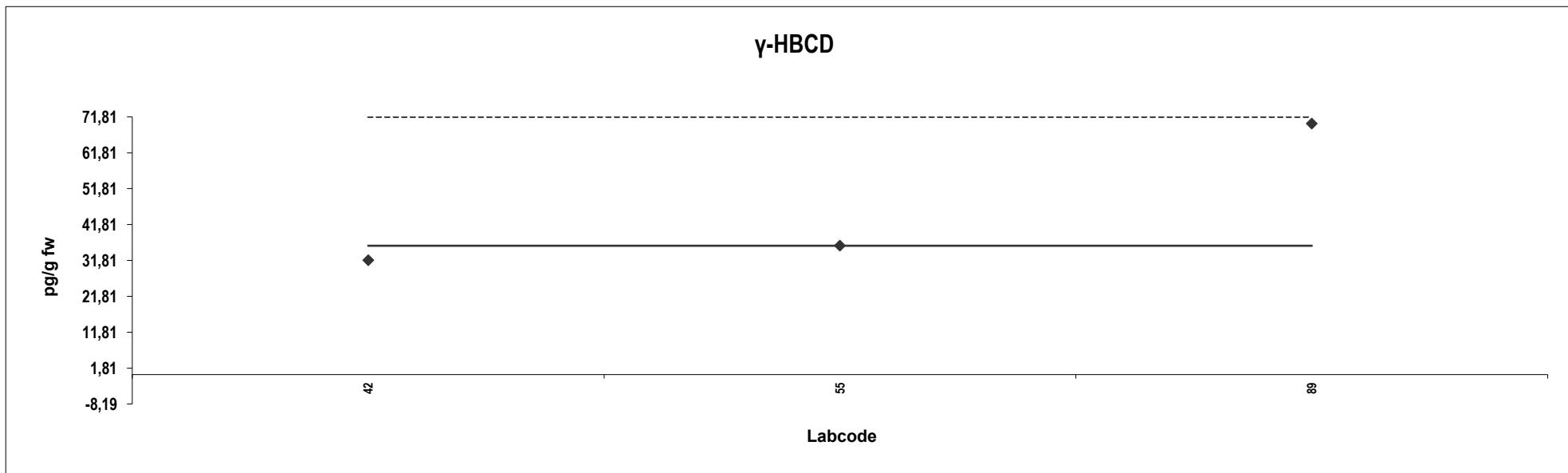
Fish oil
Congener: total HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
5	1800	-0,90					
42	2193	0,00					
55	2963	1,8					

Consenus statistics

Consensus median, pg/g	2193
Median all values pg/g	2193
Consensus mean, pg/g	2319
Standard deviation, pg/g	592
Relative standard deviation, %	26
No. of values reported	3
No. of values removed	0
No. of reported non-detects	0

total HBCD

Z-score: total HBCD
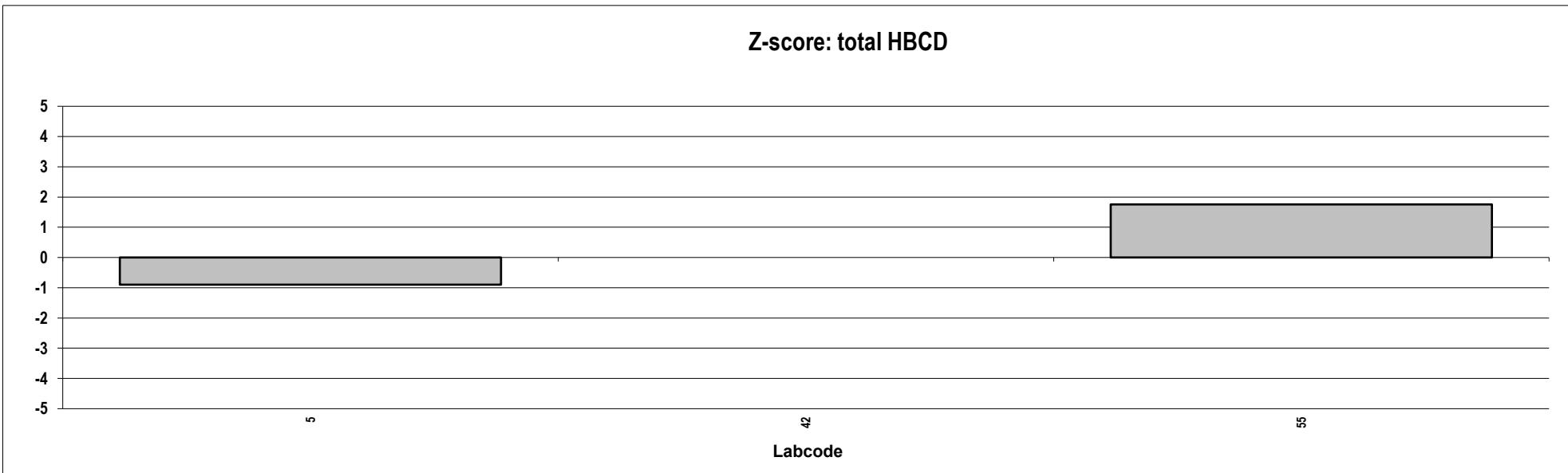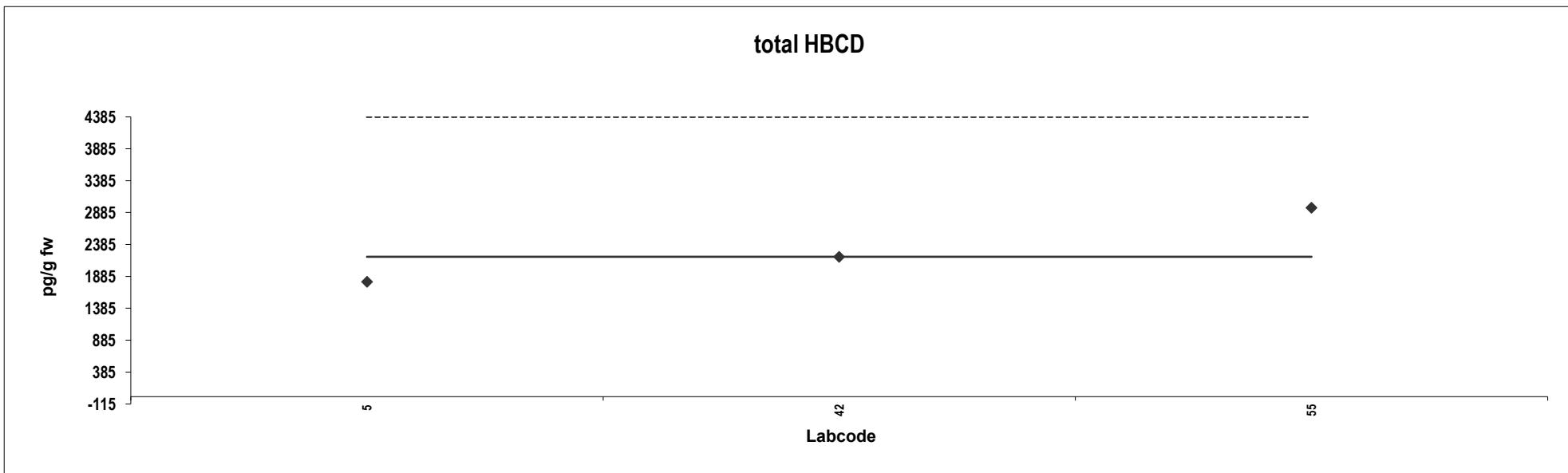
Appendix 5:

Presentation of results for
Perch-2021

Appendix 5: Presentation of results: Perch-2021

Statistic calculations for PFASs

For each congener, the outliers were removed and the consensus calculated according to the following procedure:

1. The median was calculated from all the reported data, using the detection limit as concentration for non-detected congeners (NDs).
2. Values exceeding 2 × this median were defined as outliers and removed from the data set. The NDs were also removed.
3. Median, mean and standard deviation were re-calculated from the remaining data. This second median was called consensus.
4. For comparison, median, mean and standard deviation were also calculated without removing NDs.

The diagram shows the reported data up to approximately the limit for outliers (2 × the first median).

Z-Scores of individual congeners

Z-scores of each congener were calculated for each laboratory according to the following equation:

$$z = (x - X)/\sigma$$

where x = reported value; X = assigned value (consensus); σ = target value for standard deviation. A σ of 20% of the consensus was used, i.e. z-scores between +1 and -1 reflect a deviation of ± 20% from the consensus value.

Perch
PFOS

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	13776	-0,44					
5	22640	2,5					
6	13500	-0,53					
23	12800	-0,76					
36	19100	1,3					
40	12559	-0,84					
42	13505	-0,53					
44	15100	0,000					
53	15131	0,010					
55	15704	0,20					
57	30773	5,2	Outlier				
65	15000	-0,033					
90	16340	0,41					
109	9826	-1,7					
113	15818	0,24					
119	20800	1,9					

Consensus statistics

Consensus median, pg/g	15100
Median all values pg/g	15115
Consensus mean, pg/g	15440
Standard deviation, pg/g	3300
Relative standard deviation, %	21
No. of values reported	16
No. of values removed	1
No. of reported non-detects	0

PFOS

Z-score: PFOS
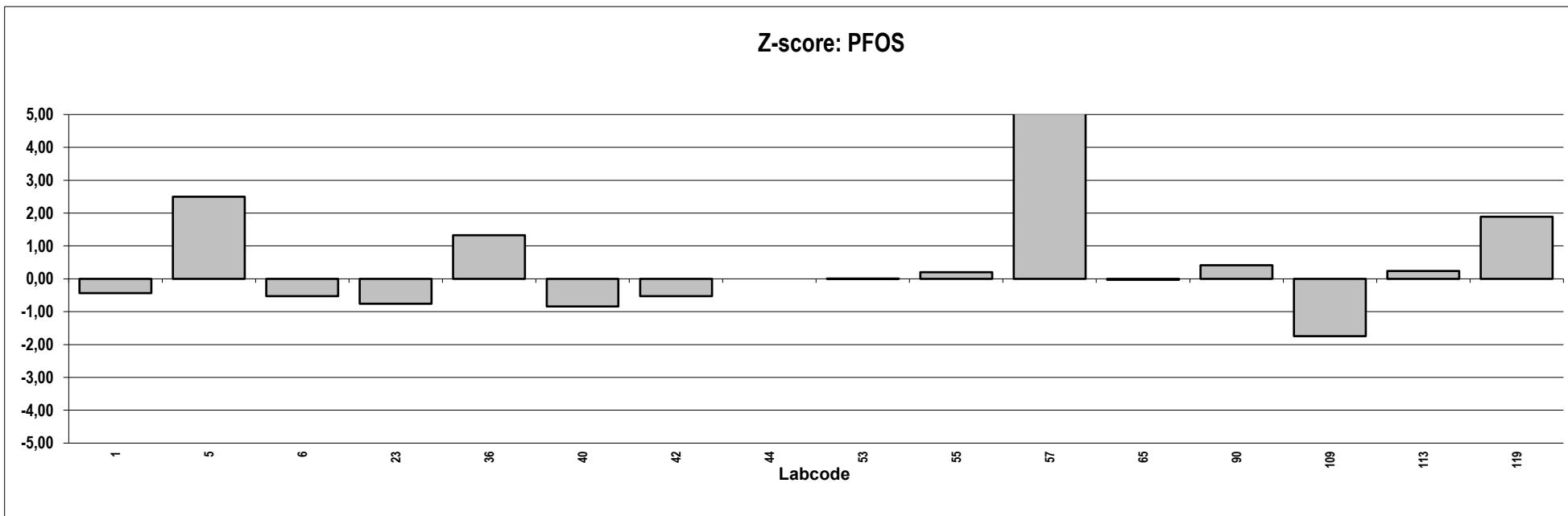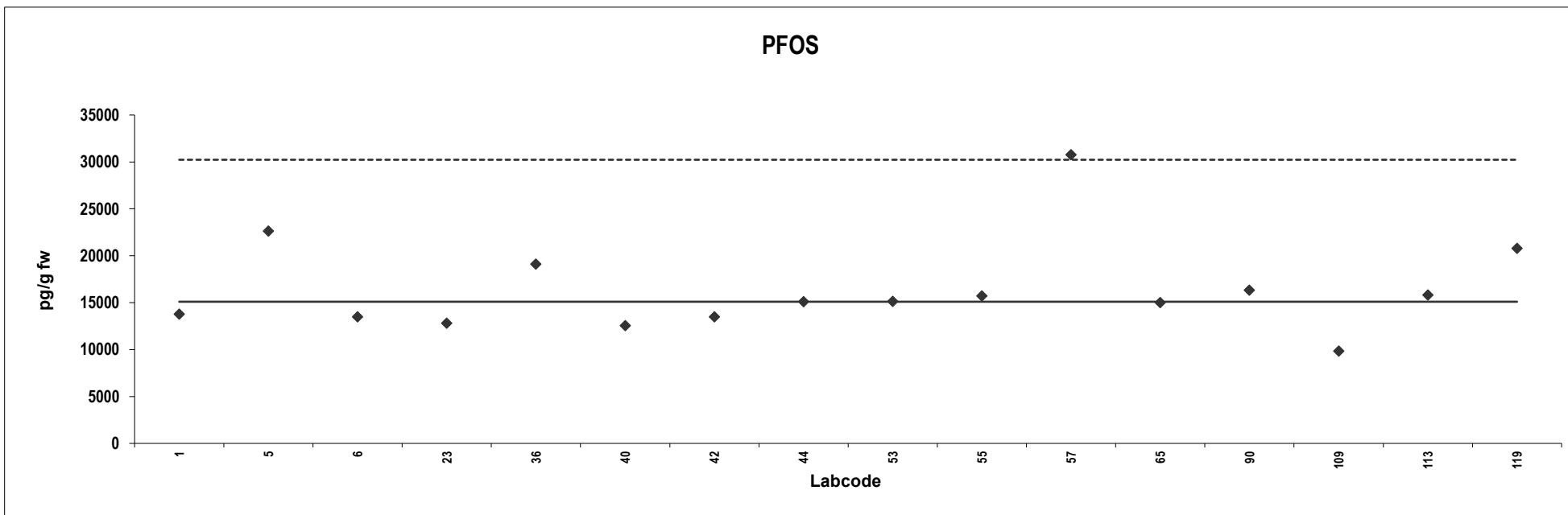
Perch
PFHxS

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	43	0,64	ND				
5	38	0,00					
6	100	8,1	ND				
23	30	-1,1	ND				
36	81	5,6					
40	31	-0,93					
42	128	12					
44	100	8,1	ND				
53	109	9,3					
55	34	-0,50					
57	200	21	Outlier, ND				
65	500	61	Outlier, ND				
90	29	-1,2					
113	38	-0,013					
119	78	5,3					

Consensus statistics

Consensus median, pg/g	38
Median all values pg/g	78
Consensus mean, pg/g	63
Standard deviation, pg/g	37
Relative standard deviation, %	59
No. of values reported	15
No. of values removed	6
No. of reported non-detects	6
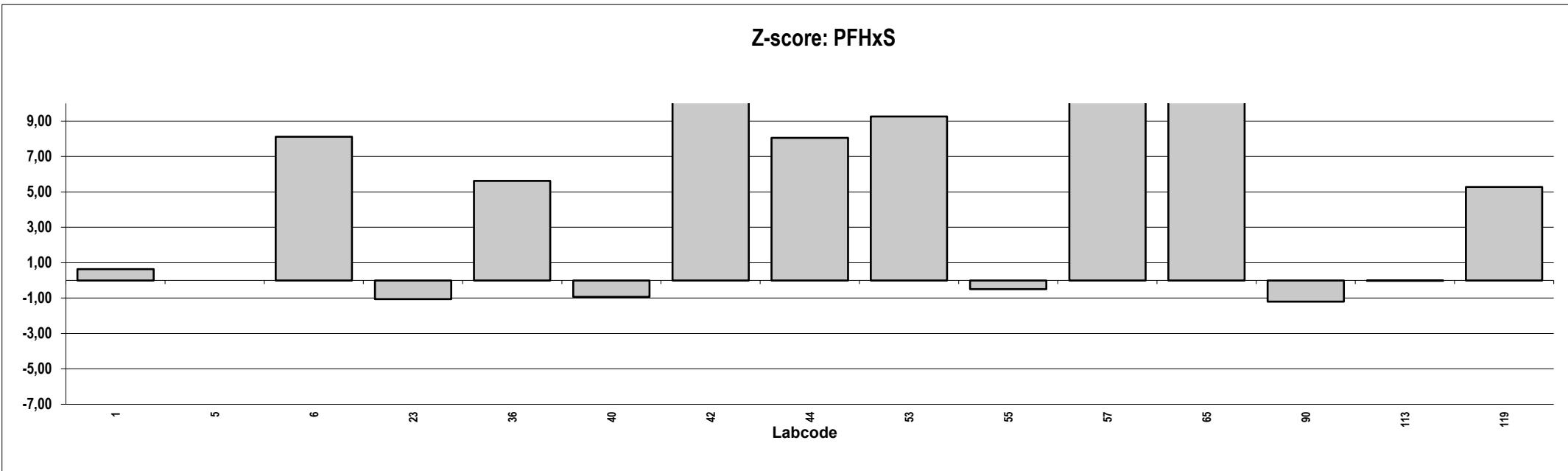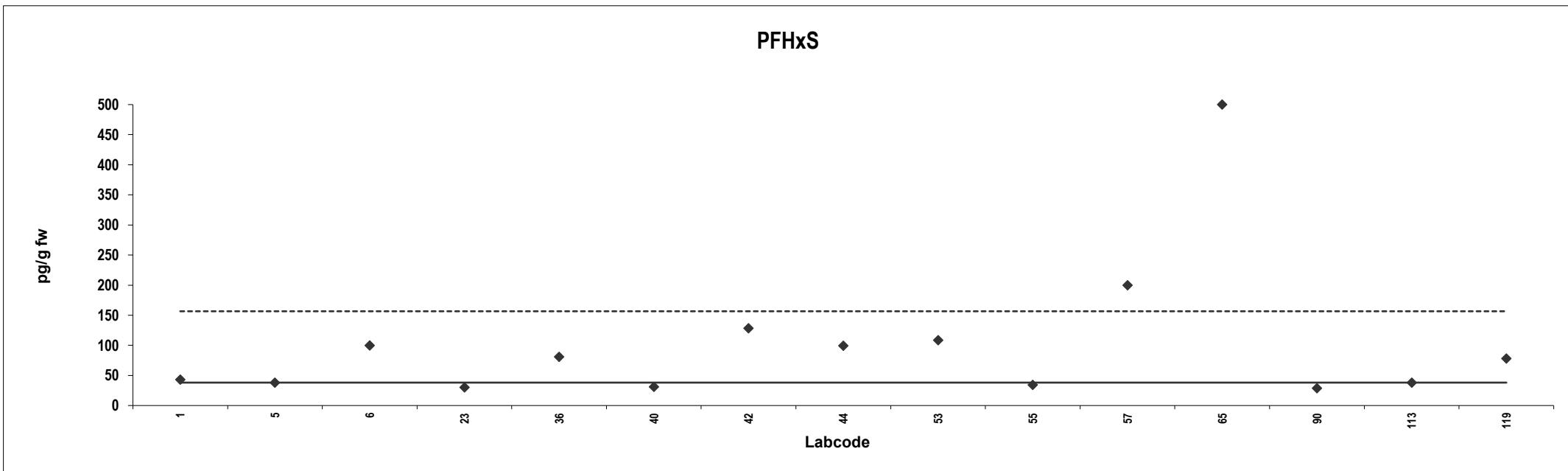
Perch

PFOA

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	57	3,1	ND				
5	42	0,88					
6	100	9,1	ND				
23	30	-0,76	ND				
36	110	11	Outlier				
40	15	-2,9	ND				
42	46	1,5	ND				
44	100	9,1	ND				
53	63	3,8	ND				
55	5,0	-4,3	ND				
57	200	23	ND, outlier				
65	500	66	ND, outlier				
90	18	-2,5					
109	150	16	ND, outlier				
113	30	-0,76					
119	41	0,76					

Consensus statistics

Consensus median, pg/g	35
Median all values pg/g	51
Consensus mean, pg/g	33
Standard deviation, pg/g	11
Relative standard deviation, %	34
No. of values reported	16
No. of values removed	12
No. of reported non-detects	11

PFOA

Z-score: PFOA
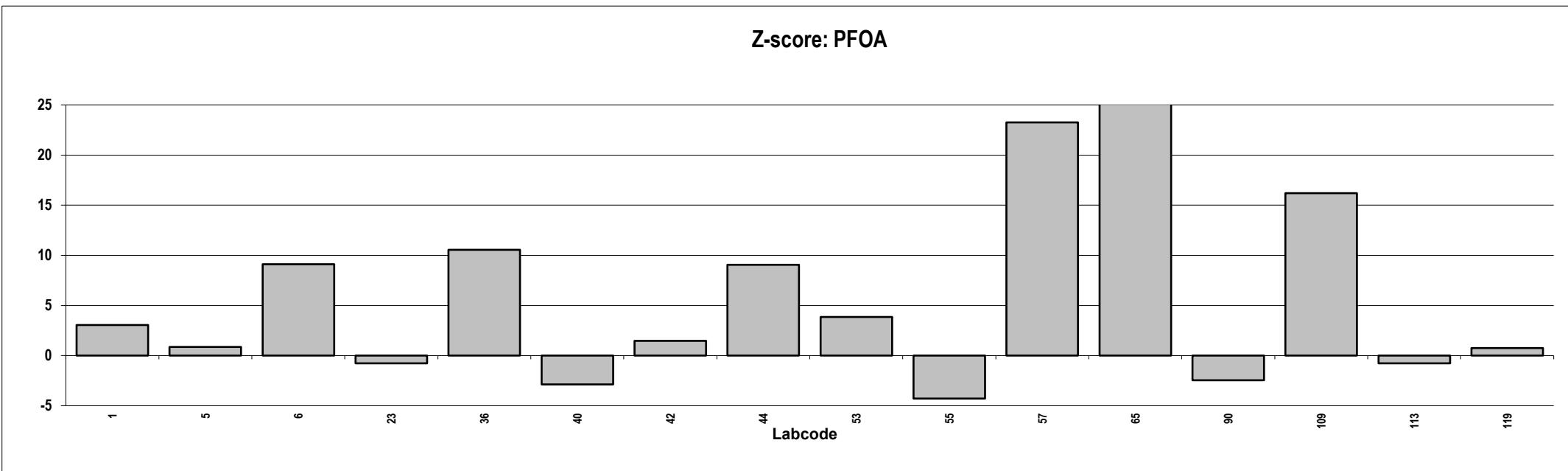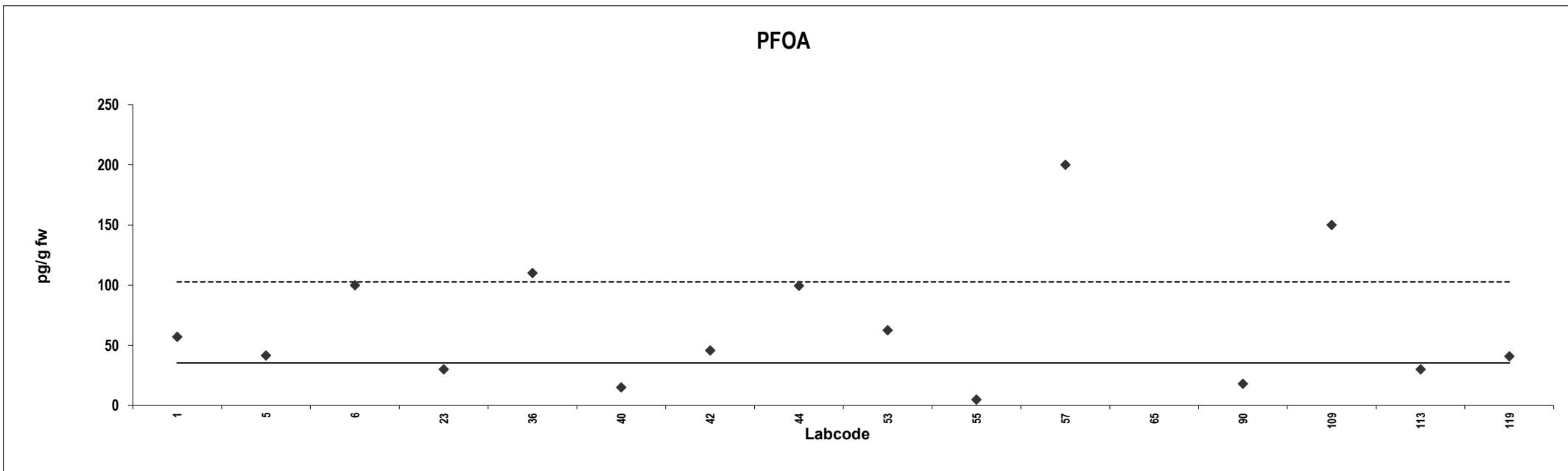
Perch

PFNA

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	114	0,48	ND				
5	106	0,096					
6	118	0,67					
23	59	-2,2					
36	100	-0,19	ND				
40	98	-0,28					
42	90	-0,67					
44	100	-0,22	ND				
53	127	1,1					
55	100	-0,20					
57	200	4,6	ND				
65	500	19	ND, outlier				
90	102	-0,096					
113	132	1,3					
119	111	0,34					

Consensus statistics

Consensus median, pg/g	106
Median all values pg/g	106
Consensus mean, pg/g	104
Standard deviation, pg/g	21
Relative standard deviation, %	20
No. of values reported	15
No. of values removed	5
No. of reported non-detects	5

PFNA

Z-score: PFNA
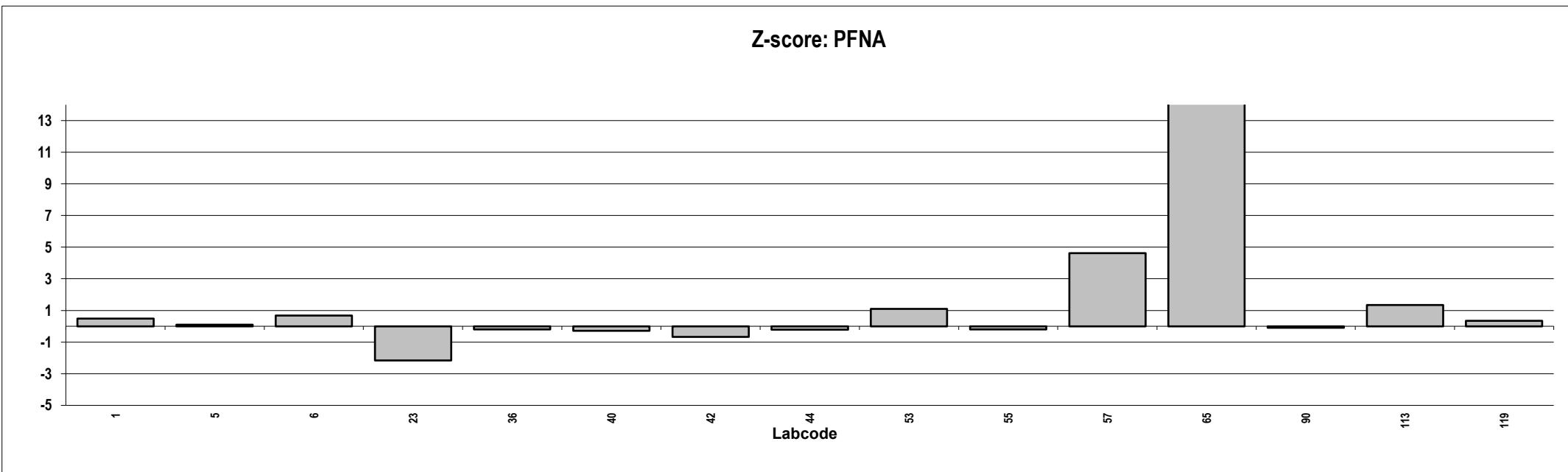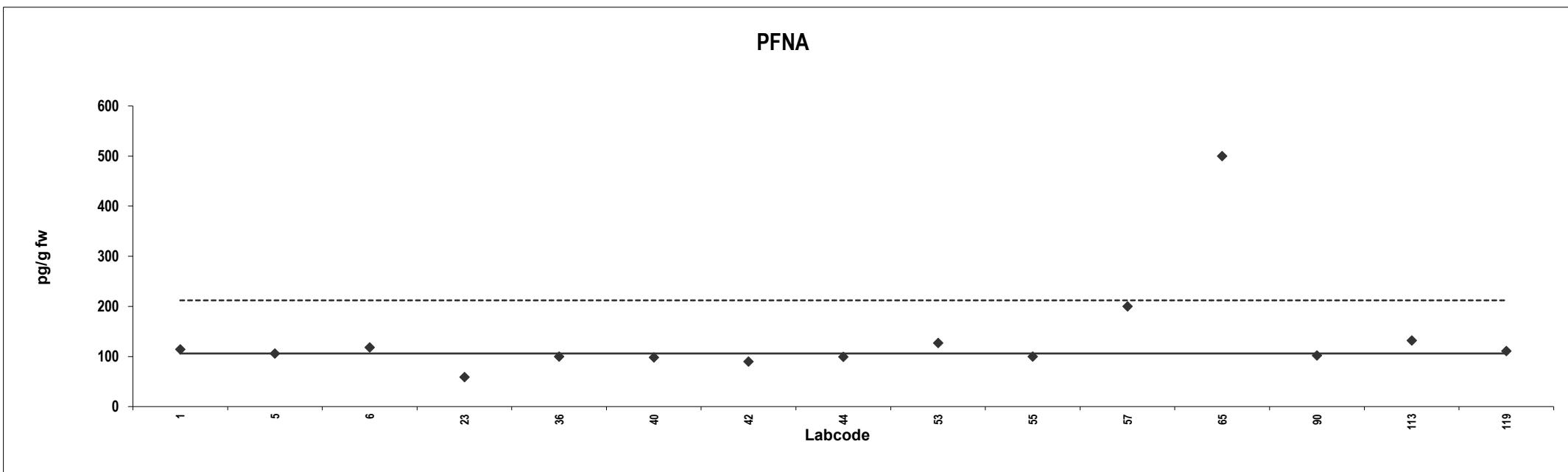
Perch

PFDA

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	917	2,1					
5	729	0,67					
6	653	0,079					
23	660	0,13					
36	0,56	-5,0	Outlier*				
40	550	-0,73					
42	568	-0,58					
44	562	-0,63					
53	421	-1,7					
55	649	0,046					
57	826	1,4					
65	540	-0,80					
90	637	-0,046					
113	650	0,056					
119	564	-0,61					

Consensus statistics

Consensus median, pg/g	637
Median all values pg/g	637
Consensus mean, pg/g	632
Standard deviation, pg/g	122
Relative standard deviation, %	19
No. of values reported	15
No. of values removed	0
No. of reported non-detects	0

PFDA

Z-score: PFDA
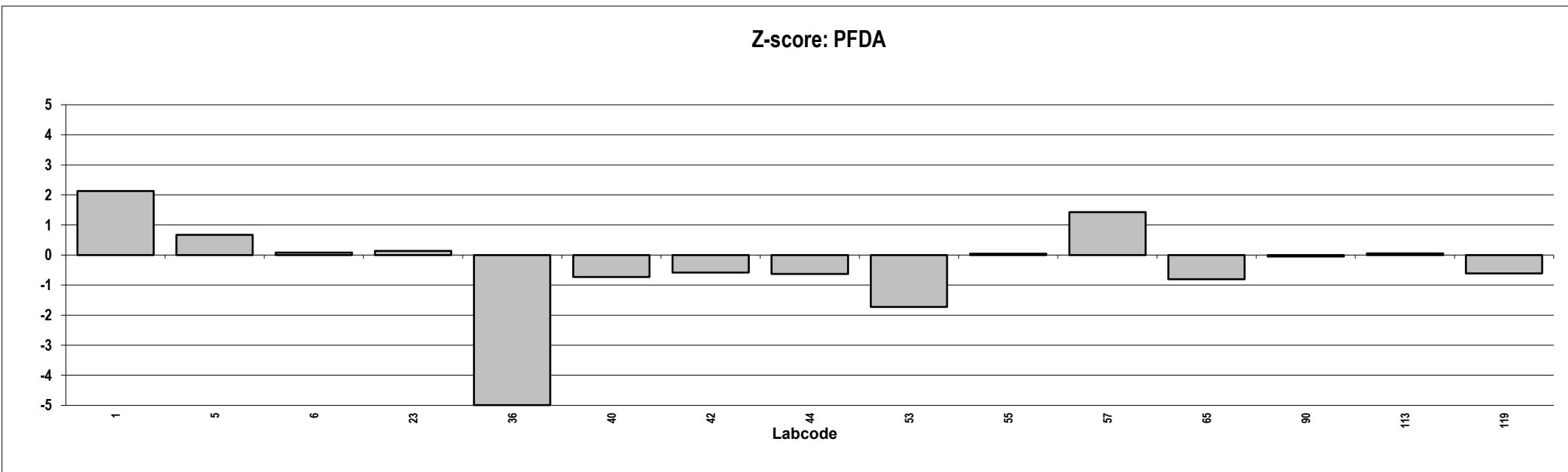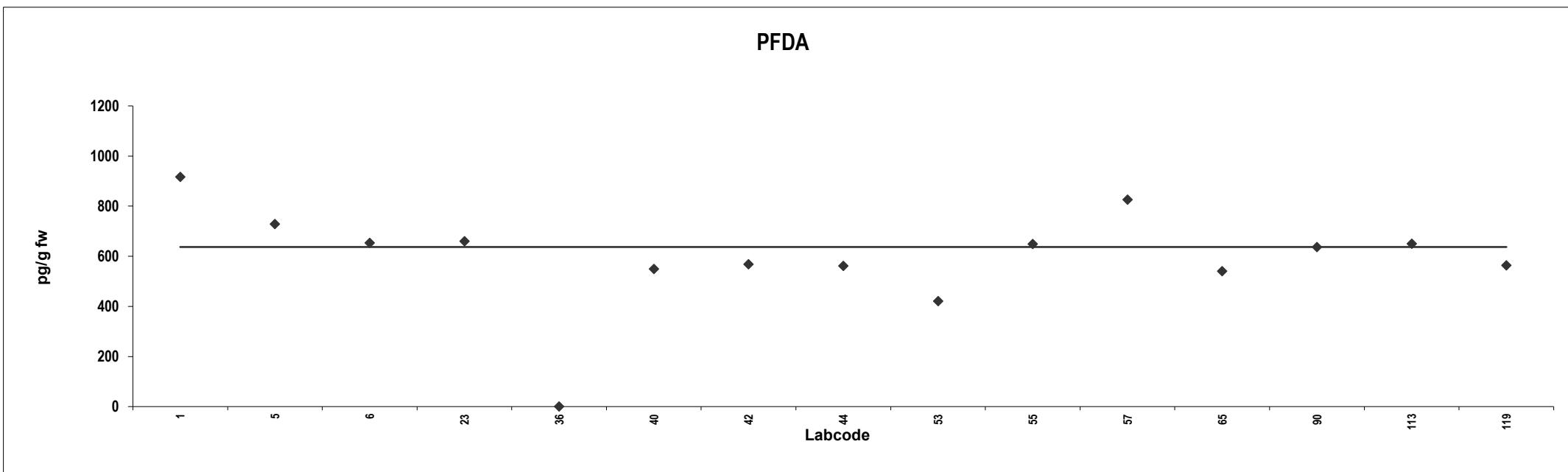
Perch

PFUnDA

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
1	358	0,064					
5	444	1,3					
6	426	1,0					
23	39	-4,4					
36	515	2,3					
40	294	-0,84					
42	344	-0,13					
44	349	-0,064					
53	334	-0,27					
55	359	0,079					
57	240	-1,6					
65	500	2,1	ND				
90	358	0,064					
113	412	0,83					
119	346	-0,11					

Consensus statistics	
Consensus median, pg/g	354
Median all values pg/g	358
Consensus mean, pg/g	344
Standard deviation, pg/g	110
Relative standard deviation, %	32
No. of values reported	15
No. of values removed	2
No. of reported non-detects	1

**PFUnDA**

Z-score: PFUnDA
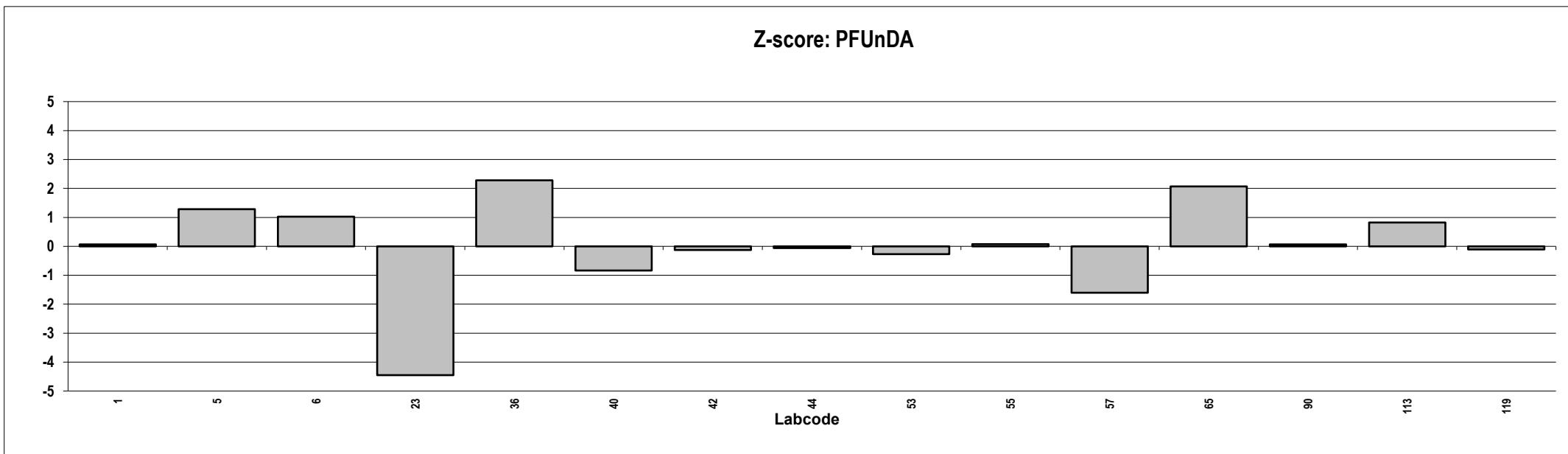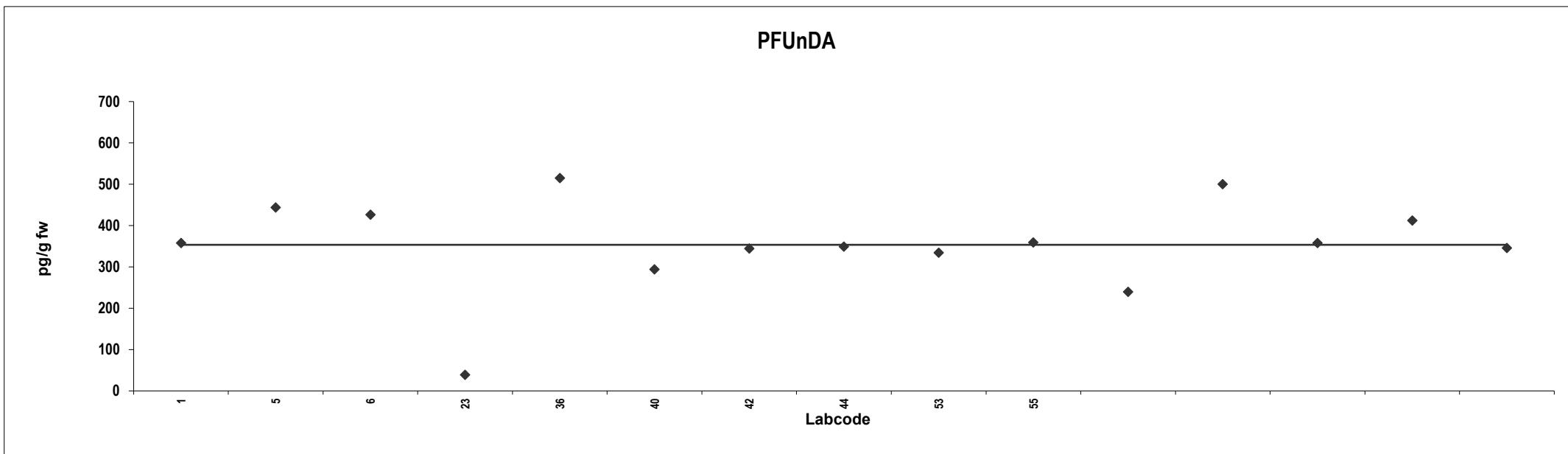
Appendix 6:

Presentation of results
for lipid determination

Presentation of results for lipid determination

Removal of outliers and calculation of consensus were done by the following procedure:

1. The mean was calculated from all the reported data.
2. Values outside a range of ± 2 × the standard deviation of this mean were defined as outliers and removed from the data set.
3. Mean, standard deviation and median were re-calculated from the remaining data. This mean was called consensus.

The diagram shows the reported data with consensus and consensus ± the new standard deviation × 2.
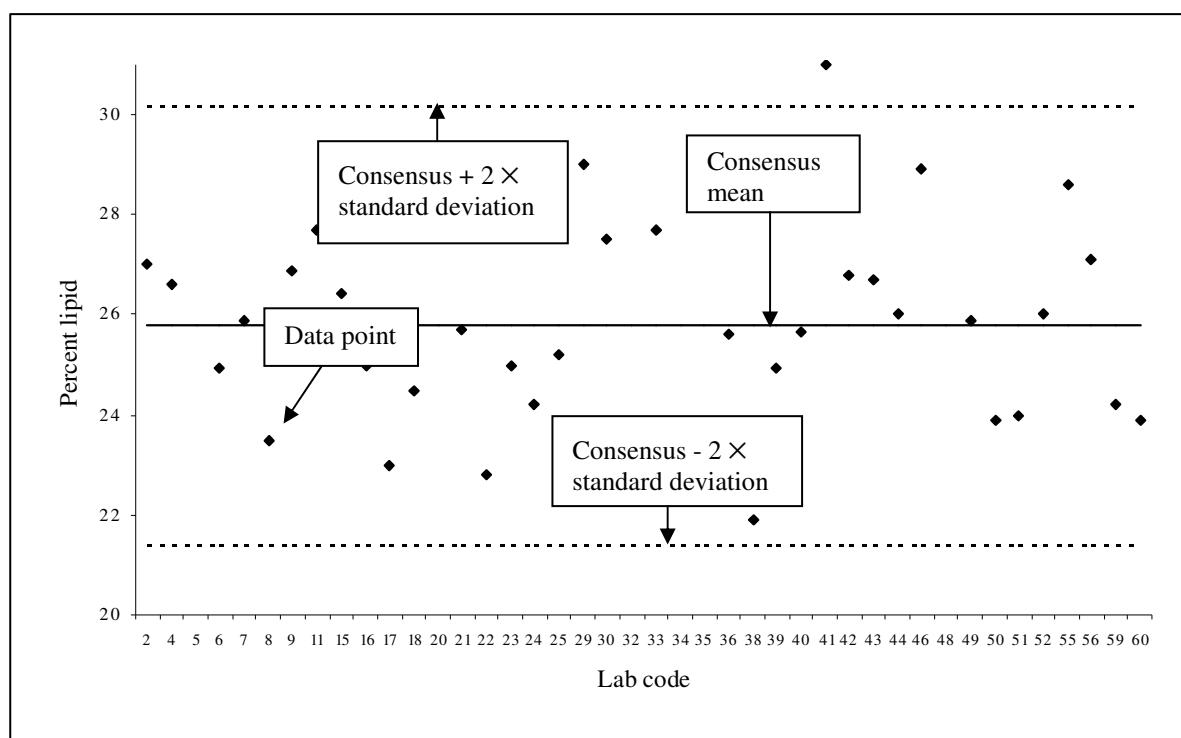
Z-Scores of lipid content

Z-scores of lipid content were calculated for each laboratory according to the following equation:

$$z = (x - X)/\sigma$$

where x = reported value; X = assigned value (consensus); σ = target value for standard deviation. A σ of 20% of the consensus was used, i.e. z-scores between +1 and -1 reflect a deviation of ± 20% from the consensus value.

Lipid determination for Sheep meat

Lab code	% lipid	Z-score	Notes	Lab code	% lipid	Z-score	Notes
2	4,6	-0,21					
5	4,0	-0,81					
12	5,3	0,57					
23	4,9	0,15					
29	2,3	-2,6					
32	4,5	-0,27					
33	5,1	0,37					
34	7,4	2,8					
35	5,4	0,66					
36	5,0	0,20					
38	18	13	outlier				
40	5,4	0,67					
42	4,8	-0,0067					
43	17	12	outlier				
46	4,4	-0,38					
48	4,6	-0,20					
50	5,4	0,66					
53	4,3	-0,47					
54	5,6	0,85					
55	5,3	0,62					
57	5,4	0,62					
58	4,6	-0,20					
59	4,7	-0,063					
65	4,8	0,043					
68	4,6	-0,17					
70	5,9	1,2					
71	4,8	0,043					
74	4,4	-0,38					
79	5,5	0,75					
81	0,043	-5,0					
87	6,1	1,4					
88	4,6	-0,18					
89	4,4	-0,38					
90	4,9	0,19					
93	3,2	-1,6					
95	4,7	-0,063					
98	10	5,6					
100	5,0	0,25					
103	4,3	-0,50					
109	5,1	0,38					
110	4,5	-0,23					
113	1,8	-3,1					
116	3,6	-1,2					

Mean	Standard deviation	Relative standard deviation	Median
4,8	1,5	31	4,8

Lipid determination for Herring

Lab code	% lipid	Z-score	Notes	Lab code	% lipid	Z-score	Notes
2	6,1	0,020		110	5,7	-0,30	
5	2,5	-3,0		113	5,7	-0,37	
6	6,5	0,33		116	4,9	-0,96	
12	6,0	-0,13		119	1,9	-3,5	
13	9,3	2,6		120	8,6	2,0	
16	5,9	-0,17					
23	6,7	0,49					
26	14	6,7					
29	6,4	0,22					
32	5,8	-0,25					
33	6,3	0,15					
34	8,8	2,2					
35	6,2	0,052					
36	5,9	-0,17					
38	25	15	outlier				
40	7,8	1,4					
42	5,8	-0,25					
43	25	15	outlier				
44	6,6	0,40					
45	5,0	-0,91					
46	5,6	-0,41					
47	5,8	-0,23					
48	6,2	0,061					
50	6,6	0,37					
53	5,3	-0,64					
54	6,6	0,41					
55	6,8	0,53					
57	6,1	0,012					
58	6,6	0,43					
59	5,7	-0,33					
65	5,9	-0,17					
68	6,6	0,40					
70	5,9	-0,14					
71	5,9	-0,17					
74	5,6	-0,41					
79	6,7	0,47					
81	0,053	-5,0					
88	6,1	-0,046					
89	5,5	-0,50					
90	6,0	-0,10					
93	5,8	-0,27					
95	5,8	-0,25					
97	4,9	-0,96					
100	6,3	0,16					
103	5,7	-0,35					
109	6,7	0,45					

Mean	Standard deviation	Relative standard deviation	Median
6,1	1,9	31	6,0

Lipid determination for Fish oil

Lab code	% lipid	Z-score	Notes	Lab code	% lipid	Z-score	Notes
1	100	0,014					
2	99	-0,026					
5	100	0,014					
6	100	0,014					
9	100	0,0020					
12	100	0,014					
13	100	0,014					
19	100	0,014					
29	96	-0,19					
32	100	0,0041					
34	100	0,014					
35	100	0,014					
38	100	0,014					
40	100	0,014					
42	99	-0,023					
46	100	0,014					
48	100	0,014					
50	100	0,014					
53	100	0,014					
54	100	0,014					
55	100	0,014					
57	96	-0,18					
58	100	0,014					
59	100	0,014					
68	100	0,014					
70	100	0,0061					
74	100	0,014					
79	100	0,014					
81	0,99	-5,0	outlier				
88	100	0,014					
89	100	0,014					
90	100	0,014					
93	100	0,014					
95	100	0,014					
97	100	0,014					
100	100	-0,00096					
103	100	0,014					
109	100	0,014					
110	100	-0,0060					
113	100	0,0091					
116	99	-0,026					
119	100	0,014					

| Mean	Standard deviation	Relative standard deviation	Median
100	0,86	0,86	100,0

Lipid determination; Sheep meat
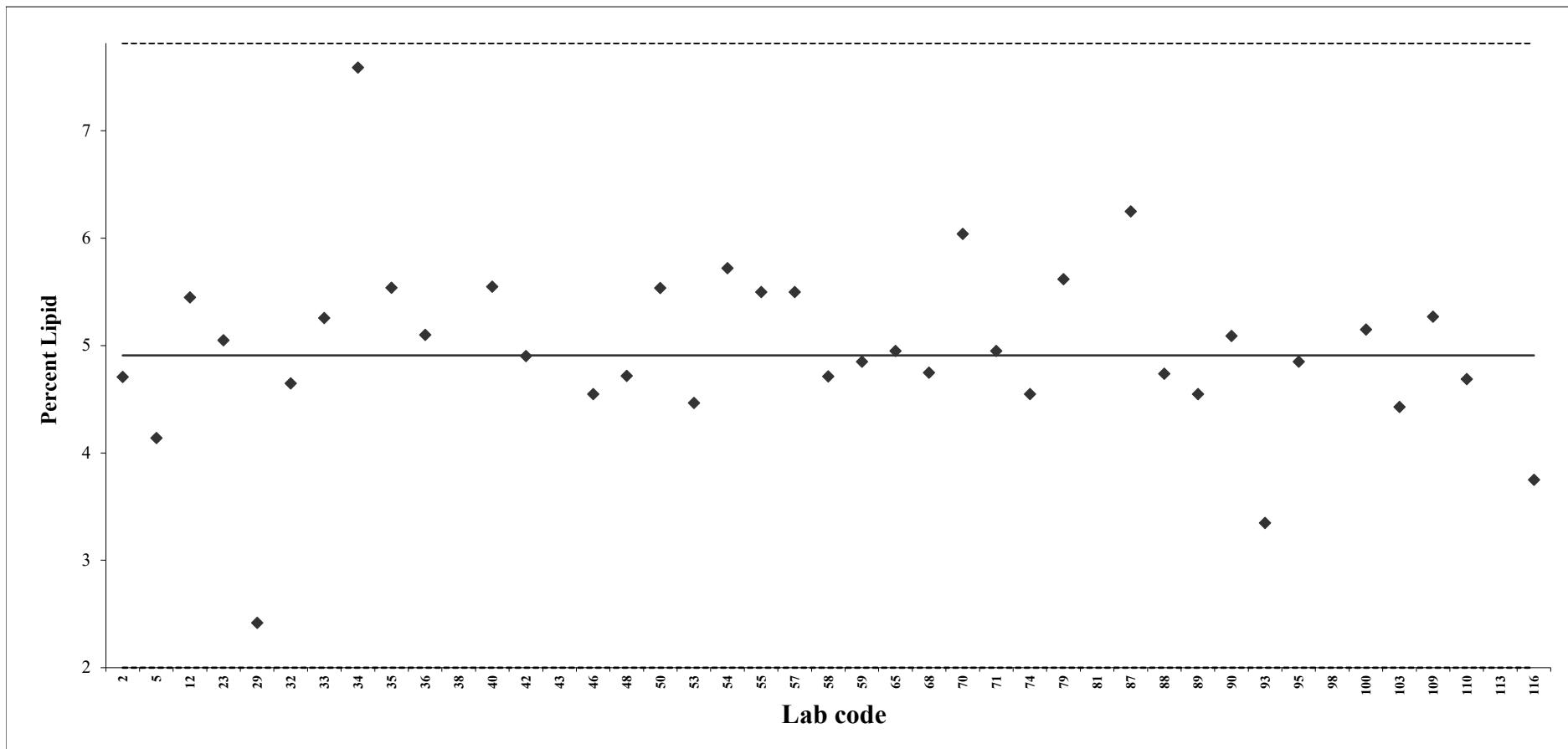
Lipid determination; Herring
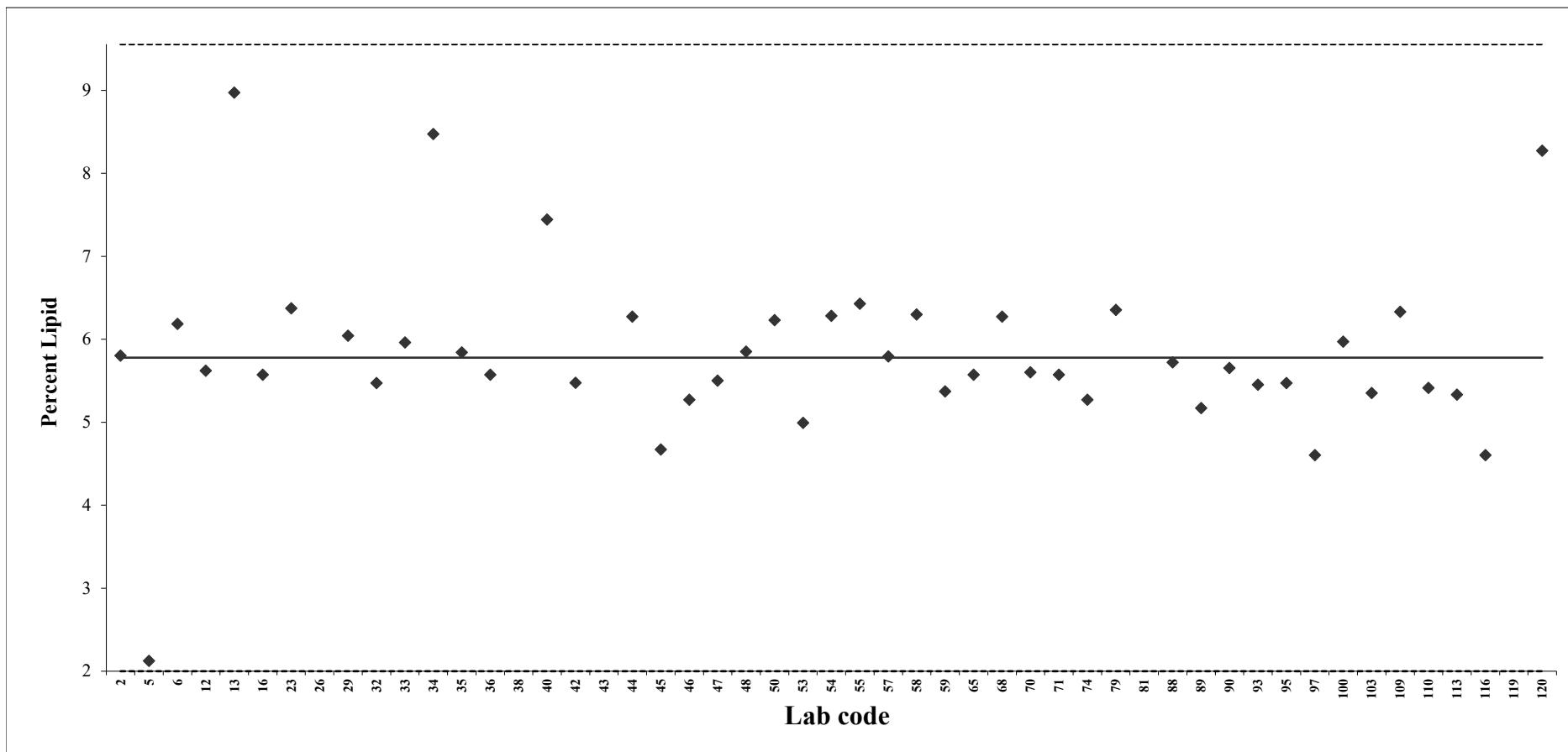
# Lipid determination; Fish oil
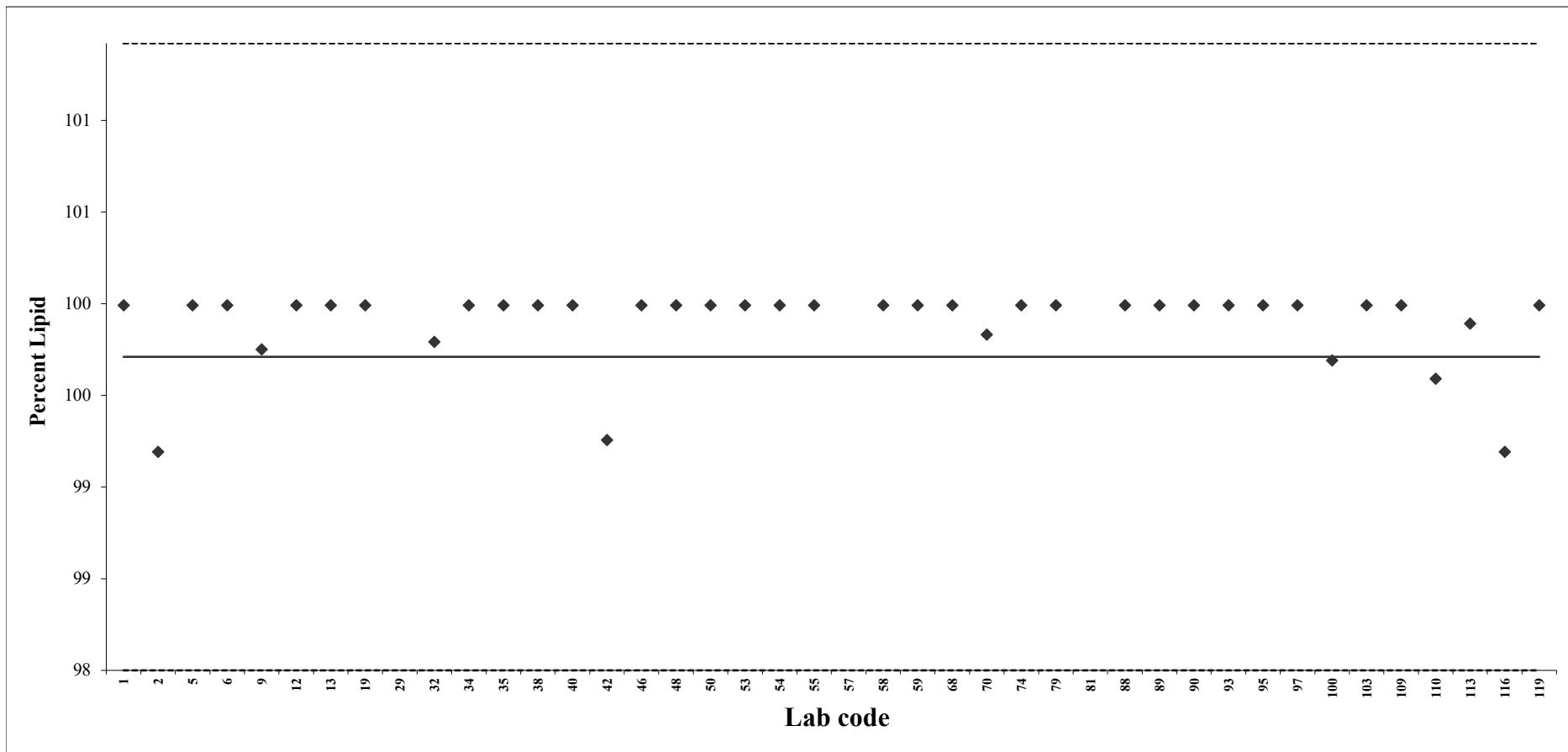
Z-score lipid determination; Sheep meat
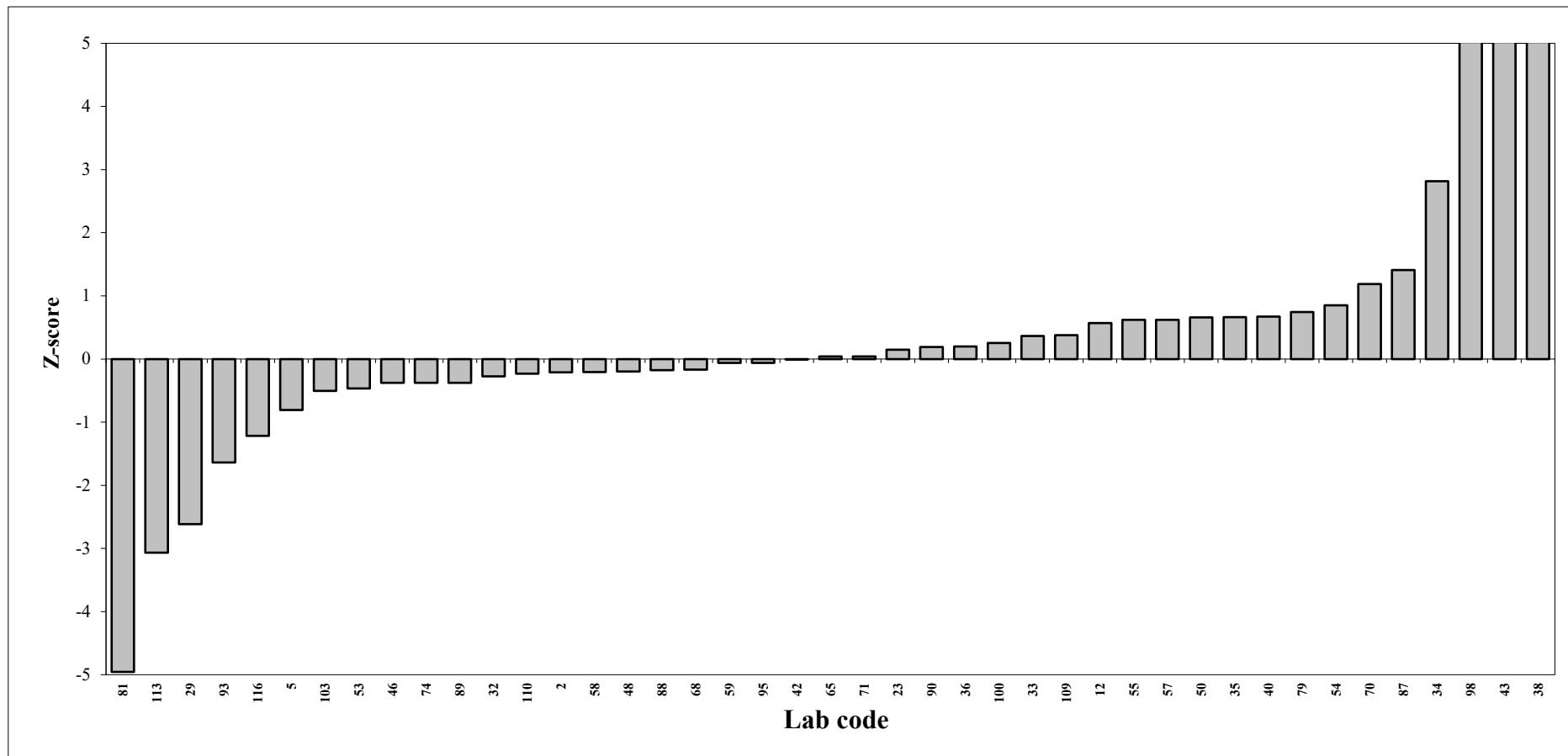
Z-score lipid determination; Herring

Z-score (y-axis)

Lab code (x-axis): 81, 119, 5, 97, 116, 45, 53, 89, 46, 74, 113, 103, 59, 110, 93, 32, 95, 42, 47, 16, 36, 65, 71, 70, 12, 90, 88, 57, 2, 35, 48, 33, 100, 29, 6, 50, 44, 68, 54, 58, 109, 79, 23, 55, 40, 120, 34, 13, 26, 38, 43
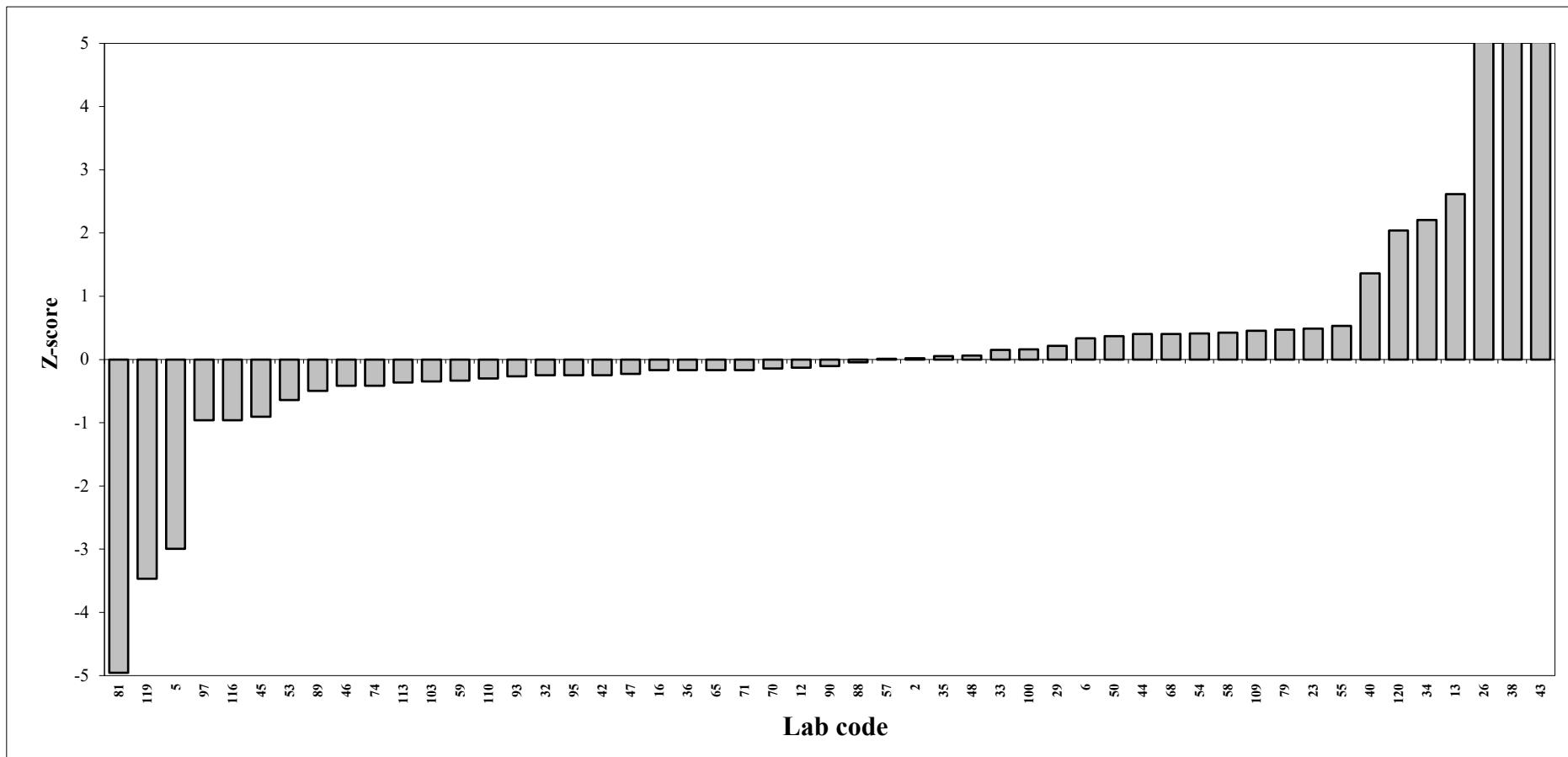
Z-score lipid determination; Fish oil
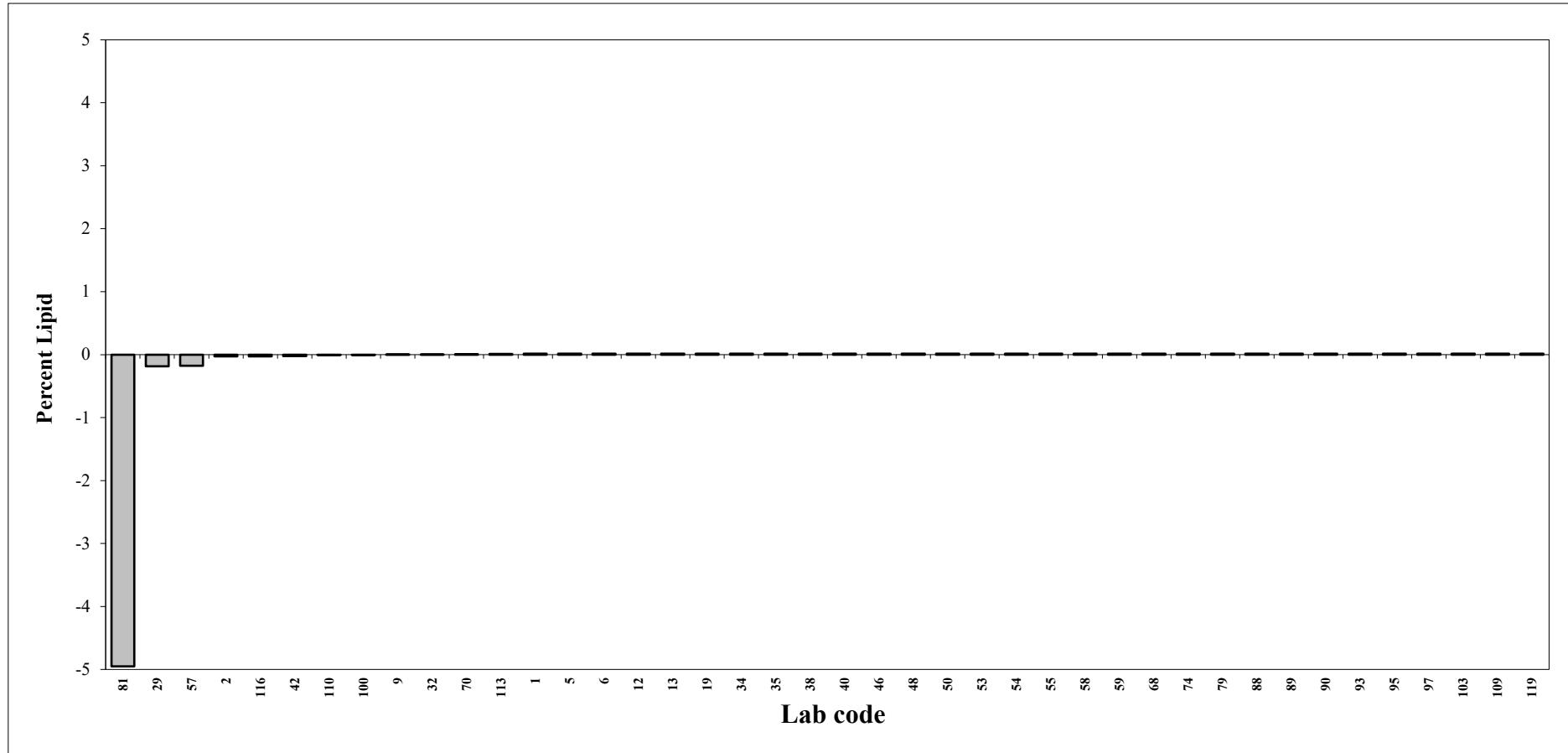
FHI
Folkehelseinstituttet