

REPORT

2023

INTERLABORATORY COMPARISON
ON POPs IN FOOD 2022:

The twenty-third round of an
international study

Interlaboratory Comparison on POPs in Food 2022

The twenty-third round of an international study

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Interlaboratory Study on POPs in Food
The twenty-third round of an international study

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Summary

The 23rd round of the Interlaboratory Comparison on POPs in Food was conducted in 2022 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 2022-round of the study was performed on unfortified homogenates of Veal, Halibut and Fish oil. An unfortified homogenate of fish 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 46 laboratories worldwide in February 2022, and results were returned from 45 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 January 2023, and the deadline for commenting on the published results was set to February 15th, 2023.

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 Fish 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 Fish, 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: WHO₂₀₀₆TEQs as opposed to WHO₁₉₉₈TEQs 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 Veal, Halibut 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 except for 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 (3,3 pg TE/g fw, WHO₂₀₀₆TEFs). For this sample, Z-scores within ± 1 were obtained by 89 % of the participating laboratories, and Z-scores within ± 2 were achieved by 95 % 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 Veal, with a consensus

total TEQ of 0.62 pg TE/g fw (WHO₂₀₀₆TEFs). For this sample 75 % of the participants achieved Z-scores within ± 1 , and 88 % achieved Z-scores within ± 2 .

For the sample of Halibut, which on beforehand was assumed to be the sample with lowest level of contamination (total TEQ=0.48 pg TE/g, WHO₂₀₀₆TEFs, fresh weight), Z-scores within ± 1 were obtained by 59 % of the reporting participants on fresh weight basis, and Z-scores within ± 2 was achieved by 88 % of the participants.

The relative standard deviation (RSD) calculated for the total TEQ after removal of outliers was 11% for the sample that had the highest levels of contamination (Fish oil). For the lower contaminated Veal and Halibut-sample, the corresponding RSD was 15 and 18 %. 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, 29-36 laboratories reported results for the six indicator PCBs. The total consensus concentrations on fresh weight basis for six indicator PCBs were 3470 pg/g (18 %) in Veal, 3752 pg/g (16 %) in Halibut and 17992 pg/g (11 %) in Fish oil, with total RSDs given in parentheses.

13-19 laboratories reported concentrations for all seven of the tetra- to hepta-PBDEs and 10-13 laboratories reported concentrations for PBDE-209. The consensus concentrations of the sum of the PBDEs with PBDE-209 excluded, were on fresh weight basis 66 (20 %), 300 (26 %) and 1377 (19 %) pg/g in Veal, Halibut and Fish oil, respectively, with total RSDs given in parentheses. The consensus concentrations for PBDE-209 were 5.0 (n=10, RSD=72 %), 6.5 (n=13, RSD=84 %) and 54 (n=11, RSD=81 %) pg/g fresh weight in Veal, Halibut and Fish oil, respectively.

The consensus concentrations calculated for HBCDs are indicative, as only a few laboratories reported results (n=4-7).

14-16 laboratories reported results for the different PFASs in the sample of Fish. The sample was known to be contaminated with PFOS (consensus concentration 42000 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 293 pg/g fw), 43 % of the participants obtained z-scores ≤ 1 , and for PFUnDA (consensus concentration was 417 pg/g fw) 36 % 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 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, PFHxS 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 23rd round of the world-wide interlaboratory comparison study on dioxin-like compounds, eight PBDEs, six indicator PCBs and HBCD in food, organized by the Department of Food 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 2022, when the samples were shipped to the laboratories for analysis, until the reporting deadline in September 2022, 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 January 2023.

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 45 laboratories that submitted results, and thereby contributed to the study results, are presented in Table 1.

Table 1. Participants that reported results in the 23rd round of the Interlaboratory Comparison on POP's in Food 2022.

ALS Czech Republic Pardubice, Czech Republic	Arkansas Laboratory (ARKL) Office of Regulatory Affairs Jefferson, Arkansas, United States of America
Australian Ultra Trace Laboratory National Measurement Institute - North Ryde Sydney, Australia	Canadian Food Inspection Agency (CFIA) Calgary, Alberta, Canada
CARSO-LSEHL Vénissieux, France	Central Laboratory of Residue Analysis of Pesticides and Heavy Metals in Foods Giza, Arabic Republic of Egypt (ARE)

Chemisches und Veterinäruntersuchungsamt (CVUA) Freiburg Freiburg, Germany	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 Beijing, China	Environmental Laboratory – IQS Barcelona, Spain
Eurofins GfA Lab Service GmbH Hamburg, Germany	Finnish Institute for Health and Welfare Environmental Health Unit/Chemical Risks team Kuopio, Finland
Havforskningsinstituttet (Institute of Marine Research) Bergen, Norway	Health Canada, British Columbia Food Laboratory, Regulatory Operations and Regions Branch Burnaby, Canada
Hong Kong SAR Government Government Laboratory Additives, Contaminants and Composition Section Hong Kong, China	Hubei Provincial Centre for Disease Control and Prevention Wuhan, China
Istituto Zooprofilattico Sperimentale Lombardia Emilia Romagna-Bologna Bologna, Italy	Japan Food Research Laboratories Nagayama Tama-city, Tokyo, Japan
JenaBios GmbH Jena, Germany	La Drôme Laboratoire Valence, France
Laboratoire de l'Environnement et de l'Alimentation de la Vendée La Roche Sur Yon, France	Landesuntersuchungsamt Institut für Lebensmittelchemie Speyer, 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	Pacific Rim Laboratories Inc. Surrey BC, Canada
SGS Analytics Germany GmbH Jena, Germany	SGS Institut Fresenius GmbH Bayreuth, Germany
SGS Institut Fresenius GmbH Berlin, Germany	SGS Taiwan Ltd. New Taipei City, Taiwan (R.O.C.)
Shanghai Academy of Agricultural Sciences (Shanghai Co-Elite Agro-food Testing Technical Service Co., Ltd.) Shanghai, China	Shanghai Municipal Center for Disease Control and Prevention Shanghai, China
Shimadzu Techno-Research, Inc. Environment Division Kyoto, Japan	Sintef Industri Avd. for Bioteknologi og Nanomedisin Trondheim, Norway

Super Micro Mass Research & Technology Center Cheng Shiu University Niasong District, Kaohsiung City, Taiwan	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
WESSLING GmbH Altenberge, Germany	Worthies Engineering Consultants Corp. Environmental & Ultra Trace Testing Lab Taichung, Taiwan
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 Veal, Halibut and Fish oil.

The laboratories were to report the concentration of each detected congener (e.g. $S/N \geq 3$) 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/ μ l for tetra:penta-hexa-hepta:octa chlorinated dibenzo-p-dioxins/-dibenzo furans respectively)
- 2) Four non-ortho PCBs (10 pg/ μ l)
- 3) Eight mono-ortho PCBs (100 pg/ μ l)
- 4) Eight PBDEs (100 pg/ μ l)
- 5) Six indicator PCBs (100 pg/ μ l)
- 6) α -HBCD (500 pg/ μ l)

The test materials consisted of homogenates of Veal, Halibut 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 23rd 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 Fish caught in an area well known to be contaminated by PFOS. As for the other matrices, the Fish 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. $S/N \geq 3$) in the Fish 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 January 2023.

Collection, preparation, and distribution of samples

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

- Veal (~100 g)
- Halibut Filet (~80 g)
- Fish oil (~50 g)
- Fish (~25 g)

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

The Veal was a kind donation from Dr. Ron Hoogenboom at the [Wageningen University & Research](#). The Halibut-sample was made from Halibut fished along the coast along the north of Norway, and the Fish oil was a kind gift from Vedde AS, a Norwegian producer of fish oil. The Fish-sample was Perch from a lake in Sweden called Fysingen and given to us by the Department of Environmental Research and Monitoring at the Swedish Museum of Natural History, and mixed with fish-material known to be low contaminated by PFASs.

The Veal arrived as whole peaces of meat. The material was grinded, pooled, mixed and homogenized before distribution into sub-samples.

The Halibut 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 contaminated fish material arrived as whole, frozen fishes of Perch. The Perches were filleted before they were mixed with commercial available non-toxic fish-material, pooled and homogenized.

Sub-samples of at least 100 g of Veal (Veal-2022), 80 g of Halibut (Halibut-2022), 50 g of Fish oil (Fish oil-2022) and 25 g of Fish (Fish-2022) 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 $\pm 50\%$ 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 $\pm 2 \cdot SD$.

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 (WHO₂₀₀₆TEFs), 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 $\pm 20\%$ from the consensus value.

The final report and certificate

The draft of the final report was prepared by the coordinators and published electronically in January 2023.

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 March 2023.

Coordination

The study was initiated and carried out by the Department of Food Safety, Norwegian Institute of Public Health, Oslo, Norway. Members of the coordination committee were:

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Cathrine Thomsen, Department Director
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Results

Presentation in the report

Forty-five 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, HBCD and PFAS 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 TEQ₂₀₀₆-values.

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

Summarizing comments on results

PCDDs/PCDFs

Analyte solution-2022

Concentrations of PCDDs/PCDFs were reported by 36 laboratories. The average RSD for the 17 congeners was 6.7 % ranging from 5.6 % for 2,3,7,8-TCDD to 9.5 % for 1,2,3,4,7,8-HxCDD. The calculation of Z-scores for the TEQs (target 12.5 pg TEQ/ μ L based on TEF₂₀₀₆-values) of the PCDD/PCDF standard solution showed that 100 % 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.

Veal-2022

For the sample of Veal, PCDD/PCDF results from 31-32 laboratories were received. From these results, the calculated consensus TEQ (PCDD/PCDF TEQ based on WHO₂₀₀₆-TEFs) was 0.31 pg TE/g fresh weight and 6.1 pg TE/g lipid weight.

The average RSD was 38 %, ranging from 27-48 % for 2,3,4,7,8-PeCDF and 1,2,3,7,8,9-HxCDF respectively. Z-scores for the TEQs within ± 1 were obtained by 72 % of the laboratories and 91 % of the laboratories had Z-scores within ± 2 (fresh weight basis).

Halibut-2022

PCDD/PCDF concentrations in the Halibut sample were reported by 41 laboratories. The consensus TEQ was 0.13 pg TEQ/g fresh weight, and 2.5 pg TEQ/g lipid weight (PCDD/PCDF TEQ based on WHO₂₀₀₆TEFs). The average RSD was 32 % ranging from 26-68 % (2,3,7,8-TCDF and 1,2,3,4,6,7,8,9-OCDF respectively). Z-scores were within ± 1 for 63 % of the laboratories and within ± 2 for 78 % of the laboratories (fresh weight basis).

Fish oil-2022

PCDD/PCDF concentrations in the sample of Fish oil were determined by 36-37 laboratories. The consensus TEQ for PCDD/PCDF based on WHO₂₀₀₆TEFs was 3.3 pg TEQ/g both on fresh weight and lipid weight basis (PCDD/PCDF TEQ based on WHO₂₀₀₆TEFs). The average RSD was 38 % ranging from 17-64 % (2,3,4,7,8-PeCDF and 1,2,3,7,8,9-HxCDF respectively). Z-scores for PCDD/PCDF TEQ within ± 1 were obtained by 81 % of the laboratories and 86 % had Z-scores within ± 2 (fresh weight basis).

*Dioxin-like PCBs***Analyte solution-2022**

The 12 dioxin-like PCBs in the analyte solution were analyzed and reported by 35-36 laboratories. The RSDs for the different congeners were ranging from 4.8 % for PCB-156 to 6.8 % for PCB-118, with an average of 5.7 %.

Veal-2022

Dioxin-like PCB concentrations in the sample of Veal were reported from 32 laboratories. The concentrations of the 12 congeners varied between 0.074 pg/g fresh weight (PCB-81) and 156 pg/g fresh weight (PCB-118). The average RSD for concentrations of individual dioxin-like PCB congeners was 37 % ranging from 34 % for PCB-157 to 45 % for PCB-123.

The dioxin-like PCBs contribute 50 % to the total TEQ (WHO TEF₂₀₀₆) in the sample with PCB-126 as the main contributor (44 %).

Halibut-2022

Of the participating laboratories, 41 measured and reported dioxin-like PCB concentrations in the Halibut sample. The concentrations ranged from 0.32 pg/g fresh weight for PCB-81 to 550 pg/g fresh weight for PCB-118. The average RSD for concentrations of individual dioxin-like PCB congeners on fresh weight basis was 32 % ranging from 26 % for PCB-114 to 46 % for PCB-123.

The dioxin-like PCBs contribute to about 73 % of the total TEQ in the sample with PCB-126 as the main contributor (63 %).

Fish oil-2022

Dioxin-like PCBs in Fish oil were reported by 37 laboratories. Levels were ranging from 1.5 pg/g fresh weight for PCB-81 to 2890 pg/g fresh weight for PCB-118. The average RSD for concentrations of individual dioxin-like PCB congeners on fresh weight basis was 26 % ranging from 21 % for PCB-118 to 41 % for PCB-123.

The contribution of the dioxin-like PCBs to the total TEQ was about 59 % with PCB-126 as the main contributor (50 % of total TEQ).

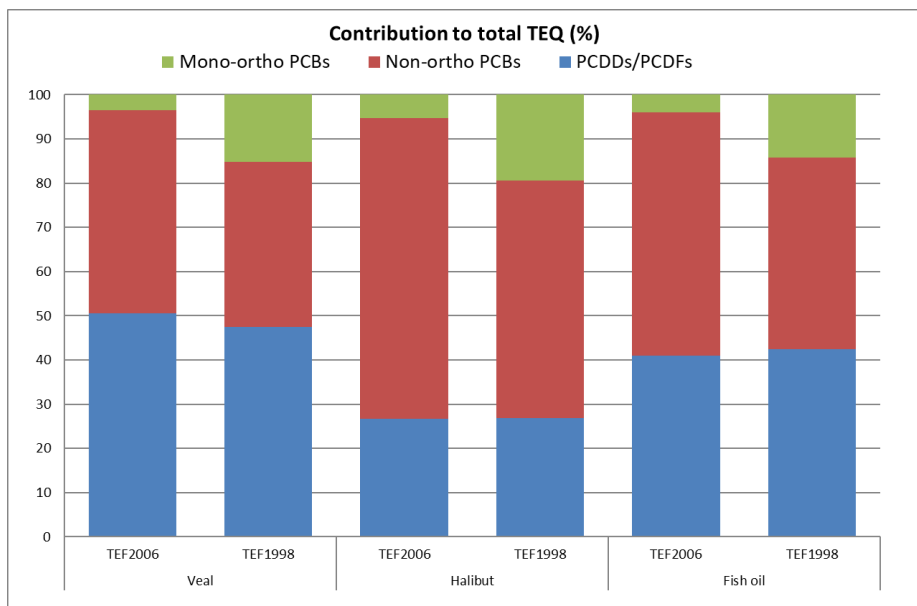
Total TEQ

The total TEQ for the sample of Veal was 0.62 pg TEQ/g fresh weight and 12 pg TEQ/g lipid weight (WHO TEF₂₀₀₆). The total TEQ of the Halibut-sample was 0.48 pg TEQ/g fresh weight and 9.2 pg TEQ/g lipid weight, and the Fish oil contained 3.3 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 15 % for the sample of Veal, 18 % for Halibut and 11 % for Fish oil.

In Figure 1 the percentage contribution to the TEQ-values for the three groups of compounds is depicted based on WHO TEF₂₀₀₆ and WHO TEF₁₉₉₈, respectively. For the selection of food-items included in this study the dioxin-like PCBs contributed from 49 % to 73 % to the total TEQ (using WHO TEF₂₀₀₆), 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 WHO₂₀₀₆ TEFs and WHO₁₉₉₈ TEFs, in the three food samples.



Indicator PCBs

Analyte solution-2022

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

Veal-2022

For the sample of Veal, results for indicator PCBs were received from 29 laboratories. The consensus concentrations varied between 50 pg/g fresh weight (PCB-28) and 1600 pg/g fresh weight (PCB-153). The RSDs were ranging from 31 to 41 % for PCB-52 and PCB-28 respectively, with an average of 36 % for all indicator PCBs. The consensus median for the sum of indicator PCBs was 3470 pg/g fresh weight.

Halibut-2022

Within the deadline, 36 laboratories reported results for indicator PCBs in the Halibut sample. The consensus concentrations ranged from 159 pg/g fresh weight (PCB-28) to 1260 pg/g fresh weight (PCB-153) with a consensus median for the sum of indicator PCBs of 3752 pg/g fresh weight. The average RSD was 34 %, ranging from 29 to 39 % for PCB-180 and PCB-153 respectively.

Fish oil-2022

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-2022

The tri- to hepta-PBDE standard solution was analyzed by 19 laboratories and 16 laboratories reported values for PBDE-209. The RSDs were between 5.2-14 % for all congeners.

Veal-2022

The PBDE concentrations in Veal were reported by 13-14 laboratories, except for PBDE-209 for which 10 results were received. The consensus concentrations were in the range of 0.24 pg/g fresh weight for PBDE-28 to 24 pg/g fresh weight for PBDE-47. The consensus concentration for PBDE-209 was 61 pg/g fresh weight. The sum of tri- to hepta-PBDEs was 66 pg/g fresh weight. The range of RSDs on fresh weight basis was 34-72 %, with an average of 48 % including PBDE-209.

Halibut-2022

Within the deadline, 18-19 laboratories had reported results for tri- to hepta-PBDEs in Halibut and 13 laboratories had reported results for PBDE-209. The consensus concentrations varied between 1.2 pg/g fresh weight (PBDE-183) and 186 pg/g fresh weight (PBDE-47). The concentration for PBDE-209 was 6.5 pg/g fresh weight. The sum of tri- to hepta-PBDEs was 300 pg/g fresh weight. The RSD calculated from the concentrations on fresh weight ranged from 35-45 %, with an average of 48 % for PBDEs including PBDE-209.

Fish oil-2022

14-15 laboratories reported results for tri- to hepta-PBDEs in Fish oil, and 11 reported results for PBDE-209. The concentrations varied between 3.0 pg/g fresh weight (PBDE-183) and 861 pg/g (PBDE-47). The concentration for PBDE-209 was 54 pg/g. The sum of tri- to hepta-PBDEs was 1430 pg/g fresh weight. The RSDs for the individual congeners were ranging from 31 to 40 % with an average of 41 % including PBDE-209.

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 6 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 16 pg/g fresh weight for the sample of Veal, 68 pg/g for the Halibut and 610 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 Fish 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 42917 pg/g fresh weight, with PFOS as the main contributor (42000 pg/g fw, n=16). The concentration of PFUnDA in the sample was 417 pg/g fw, while the concentration of PFDA was 293 pg/g fw. The consensus values for PFHxS, PFOA and PFNA are only indicative due to many reported non-detects (55 pg/g fw, 35 pg/g fw and 118 pg/g fw respectively).

Lipid content

The mean and RSDs (in parentheses) for the lipid contents of the food samples were calculated to be 5.1 % (RSD=16 %) for the sample of Veal, 5.3 % (RSD=22 %) for the Halibut sample and 100 % (0.19 %) for the sample of Fish oil.

Acknowledgements

The laboratories are acknowledged for their participation in this interlaboratory comparison and in their interest in its overall objectives, thereby making it clear that they value good analytical performance. All the individual analysts are acknowledged for their contributions to the results.

We thank Suzanne Faxnel at the Swedish Museum of Natural History for the Fish-sample, Dr. Ron Hoogenboom at the University of Research in Wageningen for providing us with the sample of veal and Vedde AS. for the kind gift of Fish oil and Cambridge Isotope Laboratories, Inc. for providing the standard solutions for this interlaboratory study.

Appendix A:

Participant's affiliations
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Appendix B:

Study announcement and
instructions for participants

Announcement for Interlaboratory Comparison on POPs in Food 2022

Introduction

We hereby announce the 23rd 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 Department of Food Safety at the Norwegian Institute of Public Health, Oslo, Norway. The study is scheduled to take place from April to August 2022.

A draft report will be available by October 2022, and the final report will be available to the participants by December 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 Fish 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:

- Veal (labelled “Veal-2022”) ~100 g
- Halibut filet (labelled “Halibut-2022”) ~70 g
- Fish oil (labelled “Fish oil-2022”) ~50 g

- Fish (PFASs only) (labelled “Fish-2022”)

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 2022
Return of registration form	April 30th, 2022
Shipment of test material	From April 01th, 2022
Confirmation of receipt of test material by participant	Within 7 days after receipt
Reporting of test results	August 01st, 2022
Publication of draft report on website	October 2022

Final report available to all participants

December 2022**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 10 500 NOK, in two food items 12 700 NOK, 14 900 NOK for three food items and for the complete set of all four food items 15 900 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

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Interlaboratory Comparison on Dioxins in Food 2022

Instructions for participants

April 2022

1. Introduction

This is the 23rd Round of the Interlaboratory Comparison Study on the Determination of POPs in Food organised by the Section for Food Safety, 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:

- Veal (Veal-2022)
- Halibut filet (Halibut-2022)
- Fish oil (Fish oil-2022)

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:

- Fish (Fish-2022)

2. Participants

A list of participants is attached. 46 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 of veal
- approx. 70 g halibut
- approx. 50 g fish oil
- approx. 25 g fish (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

Veal	Veal-2022
Halibut	Halibut-2022
Fish oil	Fish oil-2022
Fish (PFAS only)	Fish-2022

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:

- Veal: 5-10 %
- Halibut: 5-10 %
- Fish oil: 95-99 %

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 fish-sample designated for the analysis of PFAS.

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-2022” for PFASs.

Laboratories must report one concentration on fresh weight basis for each congener which is detected ($S/N \geq 3$), **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 August 01th, 2022 to enable us to prepare the draft report to be published by the end of October 2022. 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 the end of October 2022. 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 December 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 October. 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

Norwegian Institute of Public Health

- NOK 10 500 for one food item
- NOK 12 700 for two food items
- NOK 14 900 for three food items.
- NOK 15 900 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	February 2022
Return of registration form	March 30th, 2022
Shipment of test material	From April 01th, 2022
Confirmation of receipt of test material by participant	Within 7 days after receipt
Reporting of test results	July 01st, 2021
Publication of draft report on web-site	September 2022
Final report available to all participants	December 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

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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
<i>chlorinated dibenzo-p-dioxiner</i>		
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
<i>Chlorinated dibenzofuraner</i>		
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
<i>non-ortho substituted PCBs</i>		
PCB 77	0.0001	0.0001
PCB 81	0.0001	0.0003
PCB 126	0.1	0.1
PCB 169	0.01	0.03
<i>mono-ortho substituted PCBs</i>		
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 homogeneity 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 $\pm 20 \%$ 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 $RSD^2_{\text{inhomogeneity}} = RSD^2_{\text{between}} - RSD^2_{\text{within}}$ 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

¹G. 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

Consensus of TEQ values

Consensus statistics

Laboratories' reported TEQs

Laboratories' Z-scores

Z-score plots

Consensus of congener concentrations

	Veal		Halibut		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	0,16	3,1	0,015	0,29	0,090	0,090
1,2,3,7,8-PeCDD	0,045	0,88	0,020	0,39	0,29	0,29
1,2,3,4,7,8-HxCDD	0,015	0,30	0,0045	0,087	0,052	0,052
1,2,3,6,7,8-HxCDD	0,047	0,93	0,023	0,44	0,18	0,18
1,2,3,7,8,9-HxCDD	0,014	0,28	0,0051	0,098	0,052	0,052
1,2,3,4,6,7,8-HpCDD	0,051	1,0	0,025	0,47	0,090	0,090
1,2,3,4,6,7,8,9-OCDD	0,070	1,4	0,042	0,81	0,063	0,063
2,3,7,8-TCDF	0,015	0,30	0,44	8,4	4,2	4,2
1,2,3,7,8-PeCDF	0,012	0,24	0,059	1,1	0,45	0,45
2,3,4,7,8-PeCDF	0,19	3,7	0,12	2,4	1,5	1,5
1,2,3,4,7,8-HxCDF	0,28	5,5	0,015	0,29	0,11	0,11
1,2,3,6,7,8-HxCDF	0,083	1,6	0,017	0,33	0,15	0,15
2,3,4,6,7,8-HxCDF	0,037	0,72	0,019	0,36	0,16	0,16
1,2,3,7,8,9-HxCDF	0,0025	0,049	0,0026	0,050	0,019	0,019
1,2,3,4,6,7,8-HpCDF	0,051	1,0	0,010	0,20	0,059	0,059
1,2,3,4,7,8,9-HpCDF	0,0091	0,18	0,0033	0,063	0,020	0,020
1,2,3,4,6,7,8,9-OCDF	0,022	0,43	0,0084	0,16	0,028	0,028
PCB-77	1,6	31	7,5	144	45	45
PCB-126	2,7	54	3,0	57	16	16
PCB-169	0,41	8,0	0,87	17	5,6	5,6
PCB-81	0,21	4,0	0,32	6,2	1,5	1,5
PCB-105	73	1435	168	3234	960	960
PCB-114	7,3	143	11	207	56	56
PCB-118	486	9482	550	10557	2890	2890
PCB-123	7,6	148	6,8	130	38	38
PCB-156	86	1687	51	987	204	204
PCB-157	17	330	14	274	67	67
PCB-167	49	966	33	630	135	135
PCB-189	14	273	4,4	84	16	16

fw. - fresh weight

lw. - lipid weight

Consensus of congener concentrations

	Veal		Halibut		Fish oil	
	pg/g fw.	pg/g lw.	pg/g fw.	pg/g lw.	pg/g fw.	pg/g lw.
PCB- 28	50	980	159	3052	1035	1035
PCB- 52	90	1761	414	7937	2951	2951
PCB- 101	145	2830	811	15560	3921	3921
PCB- 138	952	18600	810	15547	3669	3669
PCB- 153	1600	31250	1260	24180	5331	5331
PCB- 180	633	12354	299	5730	1085	1085
PBDE- 28	0,24	4,7	10	198	75	75
PBDE- 47	24	464	186	3564	861	861
PBDE- 99	21	409	20	384	81	81
PBDE- 100	6,1	119	39	749	174	174
PBDE- 153	9,5	186	8,3	159	22	22
PBDE- 154	4,3	85	35	672	160	160
PBDE- 183	0,98	19	1,2	24	3,0	3,0
PBDE- 209	5,0	98	6,5	125	54	54
α-HBCD	73	1421	68*	1299*	607	607
β-HBCD	23	449	**	**	**	**
γ-HBCD	3,5	68	2,2*	42	16*	16*
Tot HBCD	16	311	68*	1299*	610	610
Sum PCB	3470	67776	3752	72006	17992	17992
Sum BDE without 209	66	1287	300	5749	1377	1377
Sum BDE	71	1385	306	5874	1430	1430

fw. - fresh weight

lw. - lipid weight

* : Indicative value due to few reported values

**unable to calculate consensus value due to few submitted results

Fish-2022: PFAS, consensus values

	Fish pg/g fw.
PFOS	42000
PFHxS	55
PFOA	35
PFNA	118
PFDA	293
PFUnDA	417
Sum PFAS	42917

fw. - fresh weight

Consensus of TEQs

TEF₂₀₀₆

	Veal		Halibut		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	0,16	3,1	0,015	0,29	0,090	0,090
1,2,3,7,8-PeCDD	0,045	0,88	0,020	0,39	0,29	0,29
1,2,3,4,7,8-HxCDD	0,0015	0,030	0,00045	0,0087	0,0052	0,0052
1,2,3,6,7,8-HxCDD	0,0047	0,093	0,0023	0,044	0,018	0,018
1,2,3,7,8,9-HxCDD	0,0014	0,028	0,00051	0,0098	0,0052	0,0052
1,2,3,4,6,7,8-HpCDD	0,00051	0,010	0,00025	0,0047	0,00090	0,00090
1,2,3,4,6,7,8,9-OCDD	0,000021	0,00041	0,000013	0,00024	0,000019	0,000019
2,3,7,8-TCDF	0,0015	0,030	0,044	0,84	0,42	0,42
1,2,3,7,8-PeCDF	0,00037	0,0073	0,0018	0,034	0,013	0,013
2,3,4,7,8-PeCDF	0,057	1,1	0,037	0,71	0,45	0,45
1,2,3,4,7,8-HxCDF	0,028	0,55	0,0015	0,029	0,011	0,011
1,2,3,6,7,8-HxCDF	0,0083	0,16	0,0017	0,033	0,015	0,015
2,3,4,6,7,8-HxCDF	0,0037	0,072	0,0019	0,036	0,016	0,016
1,2,3,7,8,9-HxCDF	0,00025	0,0049	0,00026	0,0050	0,0019	0,0019
1,2,3,4,6,7,8-HpCDF	0,00051	0,010	0,00010	0,0020	0,00059	0,00059
1,2,3,4,7,8,9-HpCDF	0,000091	0,0018	0,000033	0,00063	0,00020	0,00020
1,2,3,4,6,7,8,9-OCDF	0,0000066	0,00013	0,0000025	0,000048	0,0000083	0,0000083
PCB-77	0,00016	0,0031	0,00075	0,014	0,0045	0,0045
PCB-126	0,27	5,4	0,30	5,7	1,6	1,6
PCB-169	0,012	0,24	0,026	0,50	0,17	0,17
PCB-81	0,000062	0,0012	0,000097	0,0019	0,00045	0,00045
PCB-105	0,0022	0,043	0,0051	0,097	0,029	0,029
PCB-114	0,00022	0,0043	0,00032	0,0062	0,0017	0,0017
PCB-118	0,015	0,28	0,017	0,32	0,087	0,087
PCB-123	0,00023	0,0044	0,00020	0,0039	0,0011	0,0011
PCB-156	0,0026	0,051	0,0015	0,030	0,0061	0,0061
PCB-157	0,00051	0,0099	0,00043	0,0082	0,0020	0,0020
PCB-167	0,0015	0,029	0,00099	0,019	0,0041	0,0041
PCB-189	0,00042	0,0082	0,00013	0,0025	0,00049	0,00049
PCDDs/PCDFs	0,31	6,1	0,13	2,5	1,3	1,3
Non-ortho PCBs	0,29	5,6	0,32	6,2	1,8	1,8
Mono-ortho PCBs	0,022	0,43	0,025	0,48	0,13	0,13
Total TEQ	0,62	12	0,48	9,2	3,3	3,3

fw. - fresh weight

lw. - lipid weight

Consensus of TEQs

TEF₁₉₉₈

	Veal		Halibut		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	0,16	3,1	0,015	0,29	0,090	0,090
1,2,3,7,8-PeCDD	0,045	0,88	0,020	0,39	0,29	0,29
1,2,3,4,7,8-HxCDD	0,0015	0,030	0,00045	0,0087	0,0052	0,0052
1,2,3,6,7,8-HxCDD	0,0047	0,093	0,0023	0,044	0,018	0,018
1,2,3,7,8,9-HxCDD	0,0014	0,028	0,00051	0,0098	0,0052	0,0052
1,2,3,4,6,7,8-HpCDD	0,00051	0,010	0,00025	0,0047	0,00090	0,00090
1,2,3,4,6,7,8,9-OCDD	0,0000070	0,00014	0,0000042	0,000081	0,0000063	0,0000063
2,3,7,8-TCDF	0,0015	0,030	0,044	0,84	0,42	0,42
1,2,3,7,8-PeCDF	0,00062	0,012	0,0030	0,057	0,022	0,022
2,3,4,7,8-PeCDF	0,095	1,9	0,062	1,2	0,75	0,75
1,2,3,4,7,8-HxCDF	0,028	0,55	0,0015	0,029	0,011	0,011
1,2,3,6,7,8-HxCDF	0,0083	0,16	0,0017	0,033	0,015	0,015
2,3,4,6,7,8-HxCDF	0,0037	0,072	0,0019	0,036	0,016	0,016
1,2,3,7,8,9-HxCDF	0,00025	0,0049	0,00026	0,0050	0,0019	0,0019
1,2,3,4,6,7,8-HpCDF	0,00051	0,010	0,00010	0,0020	0,00059	0,00059
1,2,3,4,7,8,9-HpCDF	0,000091	0,0018	0,000033	0,00063	0,00020	0,00020
1,2,3,4,6,7,8,9-OCDF	0,0000022	0,000043	0,00000084	0,000016	0,0000028	0,0000028
PCB-77	0,00016	0,0031	0,00075	0,014	0,0045	0,0045
PCB-126	0,27	5,4	0,30	5,7	1,6	1,6
PCB-169	0,0041	0,080	0,0087	0,17	0,056	0,056
PCB-81	0,000021	0,00040	0,000032	0,00062	0,00015	0,00015
PCB-105	0,0073	0,14	0,017	0,32	0,096	0,096
PCB-114	0,0037	0,071	0,0054	0,10	0,028	0,028
PCB-118	0,049	0,95	0,055	1,1	0,29	0,29
PCB-123	0,00076	0,015	0,00068	0,013	0,0038	0,0038
PCB-156	0,043	0,84	0,026	0,49	0,10	0,10
PCB-157	0,0084	0,16	0,0071	0,14	0,033	0,033
PCB-167	0,00049	0,0097	0,00033	0,0063	0,0014	0,0014
PCB-189	0,0014	0,027	0,00044	0,0084	0,0016	0,0016
PCDDs/PCDFs	0,35	6,9	0,15	3,0	1,7	1,7
Non-ortho PCBs	0,28	5,5	0,31	5,9	1,7	1,7
Mono-ortho PCBs	0,11	2,2	0,11	2,1	0,55	0,55
Total TEQ	0,74	15	0,57	11	3,9	3,9

fw. - fresh weight

lw. - lipid weight

Consensus statistics

2022

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	2,0	2,0	2,0	0,11	5,6	36	0
1,2,3,7,8-PeCDD	5,0	5,0	5,0	5,0	0,31	6,2	36	0
1,2,3,4,7,8-HxCDD	5,0	5,0	5,0	5,0	0,47	9,5	36	0
1,2,3,6,7,8-HxCDD	5,0	4,9	4,9	4,9	0,32	6,6	36	0
1,2,3,7,8,9-HxCDD	5,0	4,9	4,9	5,0	0,33	6,7	36	0
1,2,3,4,6,7,8-HpCDD	5,0	4,9	4,9	5,0	0,29	5,9	36	1
1,2,3,4,6,7,8,9-OCDD	10	9,9	9,9	9,8	0,61	6,2	36	0
2,3,7,8-TCDF	2,0	2,0	2,0	2,0	0,11	5,6	36	0
1,2,3,7,8-PeCDF	5,0	5,0	5,0	5,0	0,33	6,6	36	0
2,3,4,7,8-PeCDF	5,0	4,9	4,9	4,9	0,33	6,7	36	0
1,2,3,4,7,8-HxCDF	5,0	4,9	4,9	5,0	0,39	7,9	36	0
1,2,3,6,7,8-HxCDF	5,0	4,9	4,9	5,0	0,33	6,6	36	0
2,3,4,6,7,8-HxCDF	5,0	4,9	4,9	5,0	0,33	6,7	36	0
1,2,3,7,8,9-HxCDF	5,0	5,0	5,0	5,1	0,27	5,4	36	0
1,2,3,4,6,7,8-HpCDF	5,0	5,0	5,0	5,0	0,42	8,5	36	1
1,2,3,4,7,8,9-HpCDF	5,0	5,0	5,0	4,9	0,31	6,3	36	1
1,2,3,4,6,7,8,9-OCDF	10	10	10	9,9	0,63	6,3	36	0
PCB-77	10	10	10	10	0,60	6,0	36	0
PCB-126	10	10	10	9,9	0,67	6,8	36	0
PCB-169	10	10	10	9,8	0,60	6,1	36	0
PCB-81	10	10	10	10	0,56	5,6	36	0
PCB-105	100	99	99	100	5,2	5,2	35	0
PCB-114	100	99	99	98	5,0	5,1	35	0
PCB-118	100	101	101	101	5,7	5,6	35	0
PCB-123	100	100	100	101	6,0	6,0	35	0
PCB-156	100	101	101	101	4,8	4,8	35	0
PCB-157	100	100	100	99	5,5	5,5	35	0
PCB-167	100	100	100	100	5,6	5,6	35	0
PCB-189	100	100	100	100	5,6	5,6	35	0

Consensus statistics

2022

Analyte solution

	Target value pg/ μ l	Median, pg/ μ l all values	Median, pg/ μ l outliers removed	Mean, pg/ μ l all values	Mean, pg/ μ l outliers removed
PCB-28	100	100	100	100	100
PCB-52	100	98	98	98	98
PCB-101	100	99	99	98	98
PCB-138	100	98	98	99	99
PCB-153	100	99	99	98	98
PCB-180	100	99	99	98	98
PBDE-28	25	25	25	25	25
PBDE-47	25	25	25	25	25
PBDE-99	25	25	25	25	25
PBDE-100	25	25	25	25	25
PBDE-153	25	25	25	24	24
PBDE-154	25	25	25	25	25
PBDE-183	25	25	25	25	25
PBDE-209	100	95	96	87	93
α -HBCD *	500	507	507	550	550

	Relative standard deviation, % all values	Relative standard deviation, % outliers removed	No. of values reported values	No. of reported outliers
PCB-28	6,6	6,6	33	0
PCB-52	4,9	4,9	34	0
PCB-101	6,7	6,7	34	0
PCB-138	6,1	6,1	34	0
PCB-153	6,0	6,0	34	0
PCB-180	6,9	6,9	34	0
PBDE-28	8,1	8,1	19	0
PBDE-47	5,2	5,2	19	0
PBDE-99	8,8	8,8	19	0
PBDE-100	9,3	9,3	19	0
PBDE-153	7,6	7,6	19	0
PBDE-154	6,2	6,2	19	0
PBDE-183	13	13	19	0
PBDE-209	31	14	16	1
α -HBCD *	15	15	6	0

NDs: Non-detects

* : Indicative value due to few reported values

Consensus statistics

2022

Veal, 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	0,16	0,16	0,15	0,044	29	32	0	1
1,2,3,7,8-PeCDD	0,045	0,045	0,042	0,014	34	32	0	2
1,2,3,4,7,8-HxCDD	0,015	0,016	0,015	0,0065	42	32	1	2
1,2,3,6,7,8-HxCDD	0,047	0,047	0,046	0,018	38	32	0	2
1,2,3,7,8,9-HxCDD	0,014	0,015	0,014	0,0054	39	32	2	4
1,2,3,4,6,7,8-HpCDD	0,051	0,051	0,051	0,019	36	32	0	2
1,2,3,4,6,7,8,9-OCDD	0,070	0,070	0,069	0,027	40	32	0	3
2,3,7,8-TCDF	0,015	0,016	0,016	0,0070	44	32	2	3
1,2,3,7,8-PeCDF	0,012	0,012	0,012	0,0046	38	32	1	4
2,3,4,7,8-PeCDF	0,19	0,19	0,18	0,049	27	32	0	1
1,2,3,4,7,8-HxCDF	0,28	0,28	0,26	0,087	33	32	0	0
1,2,3,6,7,8-HxCDF	0,083	0,083	0,076	0,027	36	32	0	2
2,3,4,6,7,8-HxCDF	0,037	0,037	0,036	0,013	36	32	0	2
1,2,3,7,8,9-HxCDF	0,0025	0,0030	0,0026	0,0012	48	31	10	18
1,2,3,4,6,7,8-HpCDF	0,051	0,051	0,053	0,021	40	32	0	2
1,2,3,4,7,8,9-HpCDF	0,0091	0,0098	0,0083	0,0039	46	32	3	4
1,2,3,4,6,7,8,9-OCDF	0,022	0,024	0,023	0,0092	40	32	5	4
PCB-77	1,6	1,6	1,4	0,55	38	32	2	1
PCB-126	2,7	2,7	2,6	0,93	36	32	0	0
PCB-169	0,41	0,41	0,39	0,15	38	32	0	1
PCB-81	0,21	0,22	0,19	0,074	38	32	3	1
PCB-105	73	73	68	24	35	32	0	0
PCB-114	7,3	7,3	6,9	2,4	35	32	0	1
PCB-118	486	486	446	156	35	32	0	0
PCB-123	7,6	7,6	6,8	3,0	45	32	1	1
PCB-156	86	86	78	28	36	32	0	0
PCB-157	17	17	15	5,2	34	32	0	1
PCB-167	49	49	44	15	35	32	0	0
PCB-189	14	14	12	4,8	39	32	0	1

Consensus statistics

Veal, fresh weight

2022

	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	50	50	50	50	48	48
PCB-52	90	90	90	90	85	85
PCB-101	145	145	145	149	138	138
PCB-138	952	952	952	906	906	906
PCB-153	1600	1600	1600	1401	1401	1401
PCB-180	633	633	633	565	565	565
PBDE-28	0,42	0,24	0,24	6,9	0,30	0,25
PBDE-47	24	24	24	27	21	21
PBDE-99	21	21	21	19	19	19
PBDE-100	6,1	6,1	6,1	7,3	5,6	5,6
PBDE-153	9,5	9,5	9,5	8,6	8,6	8,6
PBDE-154	4,4	4,3	4,3	5,8	3,8	3,8
PBDE-183	0,98	0,98	0,98	0,94	0,94	0,94
PBDE-209	8,4	5,0	5,0	18	5,7	5,7
α -HBCD *	100	56	73	151	64	73
β -HBCD *	62	23	23	158	44	23
γ -HBCD *	100	10	3,5	277	38	3,5
Tot HBCD *	100	30	16	314	49	16

	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	47	40	41	29	1	1
PCB-52	42	31	31	29	1	0
PCB-101	53	36	36	29	1	0
PCB-138	38	38	38	29	0	0
PCB-153	35	35	35	29	0	0
PCB-180	36	36	36	29	0	0
PBDE-28	321	77	61	13	5	2
PBDE-47	87	41	41	14	1	0
PBDE-99	48	48	48	14	0	0
PBDE-100	91	34	34	14	1	0
PBDE-153	44	44	44	14	0	0
PBDE-154	126	41	41	13	1	0
PBDE-183	47	47	47	13	0	0
PBDE-209	134	72	72	10	3	1
α -HBCD *	134	97	117	5	1	3
β -HBCD *	146	110	**	4	1	3
γ -HBCD *	124	143	**	5	2	3
Tot HBCD *	126	93	**	5	2	3

NDs: Non-detects

* : Indicative value due to few reported values

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

Consensus statistics

2022

Halibut, 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	0,015	0,015	0,015	0,0047	31	41	3	7
1,2,3,7,8-PeCDD	0,020	0,023	0,022	0,0066	31	41	6	5
1,2,3,4,7,8-HxCDD	0,0045	0,0052	0,0047	0,0024	51	40	8	13
1,2,3,6,7,8-HxCDD	0,023	0,024	0,024	0,0083	35	41	3	4
1,2,3,7,8,9-HxCDD	0,0051	0,0057	0,0052	0,0021	41	40	7	16
1,2,3,4,6,7,8-HpCDD	0,025	0,025	0,026	0,011	42	41	4	6
1,2,3,4,6,7,8,9-OCDD	0,042	0,050	0,045	0,021	46	41	8	7
2,3,7,8-TCDF	0,44	0,44	0,42	0,11	26	41	0	0
1,2,3,7,8-PeCDF	0,059	0,059	0,058	0,017	30	41	0	4
2,3,4,7,8-PeCDF	0,12	0,12	0,12	0,035	28	41	1	2
1,2,3,4,7,8-HxCDF	0,015	0,016	0,016	0,0065	40	41	3	4
1,2,3,6,7,8-HxCDF	0,017	0,018	0,017	0,0067	39	41	3	5
2,3,4,6,7,8-HxCDF	0,019	0,019	0,020	0,0072	36	41	3	4
1,2,3,7,8,9-HxCDF	0,0026	0,0038	0,0030	0,0018	60	40	13	23
1,2,3,4,6,7,8-HpCDF	0,010	0,012	0,011	0,0042	40	41	12	7
1,2,3,4,7,8,9-HpCDF	0,0033	0,0042	0,0037	0,0019	51	40	8	23
1,2,3,4,6,7,8,9-OCDF	0,0084	0,015	0,010	0,0069	68	40	11	17
PCB-77	7,5	7,5	7,2	2,8	39	41	0	0
PCB-126	3,0	3,0	2,8	0,98	35	41	0	0
PCB-169	0,87	0,89	0,81	0,28	34	41	1	0
PCB-81	0,32	0,34	0,32	0,11	33	41	4	2
PCB-105	168	168	154	47	31	41	0	0
PCB-114	11	11	10	2,6	26	41	0	1
PCB-118	550	550	516	149	29	41	0	0
PCB-123	6,8	7,1	6,7	3,1	46	41	6	2
PCB-156	51	52	48	13,9	29	41	1	1
PCB-157	14	14	14	3,9	29	41	0	1
PCB-167	33	33	31	8,6	28	41	1	1
PCB-189	4,4	4,5	4,2	1,1	26	41	2	2

Consensus statistics

2022

Halibut, 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	160	156	159	155	142	145
PCB-52	414	414	414	381	381	381
PCB-101	811	811	811	733	733	733
PCB-138	810	810	810	802	802	802
PCB-153	1260	1260	1260	1161	1161	1161
PCB-180	299	297	299	302	284	291
PBDE-28	10	10	10	12	11	11
PBDE-47	186	186	186	166	166	166
PBDE-99	20	20	20	24	19	19
PBDE-100	39	39	39	34	34	34
PBDE-153	8,3	8,3	8,3	8,6	8,1	8,1
PBDE-154	35	35	35	32	32	32
PBDE-183	1,2	1,2	1,2	1,6	1,2	1,2
PBDE-209	1,5	7,0	6,5	47	9,3	9,6
α -HBCD *	78	68	68	1194	71	71
β -HBCD *	1505	10	**	2004	1005	**
γ -HBCD *	10	5,0	2,2	1603	5,7	2,2
Tot HBCD *	78	68	68	2623	72	72

	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	47	36	34	36	2	1
PCB-52	33	33	33	36	0	0
PCB-101	34	34	34	36	0	0
PCB-138	33	33	33	36	0	0
PCB-153	39	39	39	36	0	0
PCB-180	46	33	29	36	1	1
PBDE-28	57	43	43	19	1	0
PBDE-47	44	44	44	19	0	0
PBDE-99	101	35	35	19	1	0
PBDE-100	45	45	45	19	0	0
PBDE-153	45	39	39	18	1	0
PBDE-154	45	45	45	19	0	0
PBDE-183	86	45	45	18	2	2
PBDE-209	143	81	84	13	4	3
α -HBCD *	168	14	14	7	2	2
β -HBCD *	122	172	**	4	1	4
γ -HBCD *	143	69	**	5	2	4
Tot HBCD *	212	13	13	7	2	2

NDs: Non-detects

* : Indicative value due to few reported values

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

Consensus statistics

2022

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	0,090	0,090	0,096	0,029	30	37	1	2
1,2,3,7,8-PeCDD	0,29	0,29	0,30	0,075	25	37	1	1
1,2,3,4,7,8-HxCDD	0,052	0,055	0,053	0,022	41	37	5	8
1,2,3,6,7,8-HxCDD	0,18	0,18	0,18	0,050	28	37	0	3
1,2,3,7,8,9-HxCDD	0,052	0,054	0,057	0,020	35	37	5	8
1,2,3,4,6,7,8-HpCDD	0,090	0,10	0,096	0,046	48	37	8	5
1,2,3,4,6,7,8,9-OCDD	0,063	0,083	0,066	0,030	45	36	14	11
2,3,7,8-TCDF	4,2	4,2	4,1	0,73	18	37	1	0
1,2,3,7,8-PeCDF	0,45	0,45	0,43	0,12	28	37	0	1
2,3,4,7,8-PeCDF	1,5	1,5	1,5	0,27	17	37	1	0
1,2,3,4,7,8-HxCDF	0,11	0,11	0,11	0,036	33	37	1	5
1,2,3,6,7,8-HxCDF	0,15	0,15	0,16	0,053	33	37	0	3
2,3,4,6,7,8-HxCDF	0,16	0,16	0,17	0,053	32	37	1	4
1,2,3,7,8,9-HxCDF	0,019	0,026	0,022	0,014	64	36	10	21
1,2,3,4,6,7,8-HpCDF	0,059	0,069	0,063	0,028	44	37	7	7
1,2,3,4,7,8,9-HpCDF	0,020	0,033	0,026	0,016	63	36	10	23
1,2,3,4,6,7,8,9-OCDF	0,028	0,048	0,032	0,020	63	36	14	19
PCB-77	45	45	44	9,3	21	37	0	0
PCB-126	16	16	15	3,9	25	37	0	0
PCB-169	5,6	5,7	5,5	1,4	25	37	1	1
PCB-81	1,5	1,6	1,4	0,39	27	37	4	2
PCB-105	960	960	951	196	21	37	0	0
PCB-114	56	56	56	16	28	37	0	1
PCB-118	2890	2890	2815	584	21	37	0	0
PCB-123	38	38	39	16	41	37	4	2
PCB-156	204	204	201	46	23	37	0	0
PCB-157	67	67	66	15	23	37	0	0
PCB-167	135	135	133	32	24	37	0	0
PCB-189	16	16	16	4,7	29	37	1	1

Consensus statistics

Fish oil, fresh weight

2022

	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	1039	1035	1035	1155	1083	1083
PCB-52	2951	2951	2951	2951	2951	2951
PCB-101	3921	3921	3921	3823	3823	3823
PCB-138	3669	3669	3669	3738	3738	3738
PCB-153	5331	5331	5331	5232	5232	5232
PCB-180	1083	1083	1085	1074	1074	1076
PBDE-28	76	75	75	99	76	76
PBDE-47	861	861	861	782	782	782
PBDE-99	81	81	81	85	78	78
PBDE-100	174	174	174	160	160	160
PBDE-153	22	22	22	26	22	22
PBDE-154	160	160	160	169	169	169
PBDE-183	3,3	2,8	3,0	9,1	2,9	3,1
PBDE-209	84	12	54	347	34	56
α -HBCD *	607	607	607	598	598	598
β -HBCD *	10	10	**	8,3	8,3	**
γ -HBCD *	16	16	16	17	17	17
Tot HBCD *	610	610	610	609	609	609

	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	39	31	31	36	2	0
PCB-52	19	19	19	36	0	0
PCB-101	23	23	23	36	0	0
PCB-138	24	24	24	36	0	0
PCB-153	24	24	24	36	0	0
PCB-180	25	25	25	36	0	1
PBDE-28	94	35	35	15	1	0
PBDE-47	31	31	31	15	0	0
PBDE-99	42	33	33	15	1	0
PBDE-100	33	33	33	15	0	0
PBDE-153	62	34	34	14	1	0
PBDE-154	37	37	37	15	0	0
PBDE-183	211	53	40	14	3	2
PBDE-209	155	123	81	11	4	5
α -HBCD *	17	17	17	6	0	0
β -HBCD *	35	35	**	3	0	3
γ -HBCD *	30	30	30	4	0	0
Tot HBCD *	16	16	16	6	0	0

NDs: Non-detects

* : Indicative value due to few reported values

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

Consensus statistics

Fish, 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	41951	41951	42000	39605	39605	42246
PFHxS	58	55	55	160	57	60
PFOA	46	35	35	87	32	35
PFNA	119	111	118	185	100	111
PFDA	293	275	293	311	283	308
PFUnDA	446	417	417	551	422	456

	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	32	32	17	16	1	0
PFHxS	159	46	21	14	1	6
PFOA	96	46	16	14	2	6
PFNA	131	47	19	14	0	5
PFDA	48	40	23	14	2	2
PFUnDA	72	45	33	14	2	2

NDs: Non-detects

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
Veal, fresh weight							
PCDD/PCDF TEQ	0,31	0,33	0,077	23	0,050	0,39	32
Non-ortho PCB TEQ	0,29	0,27	0,097	36	0,026	0,47	32
Mono-ortho PCB TEQ	0,022	0,020	0,0069	34	0,00000068	0,032	32
Total TEQ	0,61	0,59	0,17	29	0,12	0,87	32
Sum indicator PCB	3535	3161	1087	34	3,3	5102	29
Sum PBDE without PBDE-209	67,1	74	60	80	0,048	265	14
Halibut, fresh weight							
PCDD/PCDF TEQ	0,13	0,17	0,045	27	0,049	0,31	41
Non-ortho PCB TEQ	0,32	0,31	0,10	33	0,028	0,50	41
Mono-ortho PCB TEQ	0,025	0,024	0,0068	29	0,00000074	0,034	41
Total TEQ	0,48	0,47	0,13	28	0,091	0,71	41
Sum indicator PCB	3710	3533	1100	31	3,5	5157	36
Sum PBDE without PBDE-209	303	277	123	45	0,21	573	19
Fish oil, fresh weight							
PCDD/PCDF TEQ	1,4	1,8	0,66	36	0,48	5,1	37
Non-ortho PCB TEQ	1,8	1,7	0,39	22	0,16	2,4	37
Mono-ortho PCB TEQ	0,13	0,13	0,027	21	0,00000040	0,19	37
Total TEQ	3,3	3,4	0,82	24	0,64	6,9	37
Sum indicator PCB	18286	17973	3767	21	16	27000	36
Sum PBDE without PBDE-209	1419	1328	375	28	1,2	1588	15

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
Veal, fresh weight							
PCDD/PCDF TEQ	0,35	0,33	0,085	26	0,062	0,45	32
Non-ortho PCB TEQ	0,28	0,26	0,095	36	0,026	0,46	32
Mono-ortho PCB TEQ	0,11	0,10	0,036	34	0,0000034	0,15	32
Total TEQ	0,73	0,70	0,20	29	0,16	1,0	32
Sum indicator PCB	3535	3161	1087	34	3,3	5102	29
Sum PBDE without PBDE-209	67	74	60	80	0,048	265	14
Halibut, fresh weight							
PCDD/PCDF TEQ	0,16	0,17	0,050	30	0,058	0,33	41
Non-ortho PCB TEQ	0,31	0,29	0,099	34	0,027	0,47	41
Mono-ortho PCB TEQ	0,11	0,11	0,031	29	0,000003	0,17	41
Total TEQ	0,58	0,56	0,15	27	0,097	0,82	41
Sum indicator PCB	3710	3533	1100	31	3,5	5157	36
Sum PBDE without PBDE-209	303	277	123	45	0,21	573	19
Fish oil, fresh weight							
PCDD/PCDF TEQ	1,7	1,8	0,70	38	0,57	5,5	37
Non-ortho PCB TEQ	1,7	1,6	0,39	24	0,16	2,2	37
Mono-ortho PCB TEQ	0,56	0,55	0,11	21	0,000017	0,84	37
Total TEQ	3,9	4,0	0,88	22	0,73	7,6	37
Sum indicator PCB	18286	17973	3767	21	16	27000	36
Sum PBDE without PBDE-209	1419	1328	375	28	1,2	1588	15

Laboratories' Z-scores: Analyte solution

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-ortho PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
1							
2							
3	0,0091	0,028	-0,17	-0,084	-0,10	-0,063	0,16
4	-0,048	-0,032	-0,20	-0,046	0,023		
5	-0,16	-0,19	0,058	-0,11	0,22	0,52	0,10
6							
7							
8							
9							
10	-0,25	-0,27	-0,069	0,26	0,15		
11							
12						0,24	0,29
13						-0,0018	-0,0028
14	-0,10	-0,11	-0,010	-0,27			
15							
16							
17							
18							
19	0,10	0,14	-0,23	0,044	-0,22	-0,31	-0,27
20	-0,25	-0,20	-0,67	-0,50	0,093		
21	0,11	0,14	-0,16	0,087	-0,36		
22							
23	-0,39	-0,35	-0,80	-0,19	-0,11	-0,085	0,0058
24							
25	-0,052	-0,051	-0,068	0,19	0,0011		
26							
27							
28							
29	0,044	0,065	-0,15	-0,16			
30							
31							
32	-0,20	-0,22	-0,0055	-0,12	-0,39	-1,4	-0,99
33							
34	-0,065	-0,074	0,020	0,051	0,14		
35	0,51	0,50	0,59	0,49	-0,033	-0,032	-0,049
36							
37							
38							
39							
40	-0,12	-0,15	0,11	0,045	0,11	-0,12	-0,099
41	-0,17	-0,21	0,16	-0,15	-0,22	-1,8	-0,043
42	-0,38	-0,33	-0,82	-0,27	-0,61	-0,61	-0,61
43							
44							
45	0,13	0,13	0,088	0,10		0,18	0,18
46	-0,28	-0,27	-0,35	-0,023	0,096		
47							
48							
49							
50							
51							
52	-0,019	0,0096	-0,30	-0,15	0,38		
53							
54							
55							
56							
57							
58							
59	0,071	0,062	0,15	-0,0087	-0,0057		
60							
61							
62	0,078	0,059	0,26	-0,048	-0,73	-1,6	0,35
63							
64	-0,0051	0,028	-0,32	-0,0092	-0,25	0,037	0,0017
65							
66							
67							
68							
69							
70							

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							
72	-0,0080	-0,0060	-0,037	0,50	-0,0078		
73							
74							
75	-0,016	-0,0099	-0,071	0,000075	0,049		
76							
77							
78	0,36	0,39	0,16	0,34	0,35	-0,20	-0,058
79							
80							
81	-0,27	-0,28	-0,20	-0,076	-0,36		
82							
83							
84							
85	-0,49	-0,57	0,25	0,032	-0,42		
86							
87	-0,11	-0,088	-0,35	-0,23	0,16	-1,7	0,094
88							
89	0,60	0,64	0,22	0,037	-0,047		
90							
91							
92							
93							
94							
95							
96	0,018	0,0015	0,17	0,18	0,18	-1,7	0,055
97							
98	-0,019	-0,015	-0,055	-0,063	0,090		
99							
100							
101							
102							
103							
104							
105							
106							
107							
108							
109	0,024	0,017	0,088	0,020	-0,043	0,12	0,085
110							
111	0,48	0,52	0,12	0,060	0,12		
112							
113							
114							
115					-0,0014	0,039	-0,017
116	0,088	0,077	0,28		-0,045		
117							
118							
119							
120	0,13	0,14	0,016	0,17	0,48		

Laboratories' Z-scores: Veal, fresh weight

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-ortho PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
1							
2							
3	0,33	0,73	-0,13	0,76	0,86	-0,20	0,17
4	0,21	0,19	0,25	-0,073	0,43		
5	0,12	-0,14	0,37	0,62	0,68	0,39	0,36
6							
7	-2,8	-1,0	-4,5	-5,0	0,80		
8							
9							
10	-0,53	-0,87	-0,24	0,36	0,094		
11							
12							
13							
14							
15							
16							
17							
18							
19	-4,0	-4,2	-3,8	-3,5	-3,6	-2,6	-3,3
20	-0,19	-0,51	0,21	-0,77	-0,63		
21							
22							
23	-0,028	-0,075	0,021	-0,0049	0,095	0,71	0,31
24							
25	0,92	1,1	0,82	0,11	-0,53		
26							
27							
28							
29	-0,49	0,33	-1,4	-0,37			
30							
31	0,13	-0,17	0,44	0,40	0,54		
32	-0,0076	-0,047	0,069	-0,43	-1,3	-5,0	-5,0
33							
34							
35	2,0	0,89	3,1	2,1	0,55	0,048	0,052
36							
37							
38							
39							
40	-0,12	-0,64	0,43	0,27	-0,0081	2,5	0,026
41							
42	1,2	0,42	2,0	0,72	0,81	0,065	0,31
43							
44							
45	-0,46	-0,19	-0,78	-0,17		3,8	-1,5
46	0,63	0,39	0,91	0,35	0,24		
47							
48							
49							
50							
51							
52							
53							
54	-1,9	-1,4	-2,4	-2,3	-2,3		
55							
56							
57							
58							
59	0,97	1,1	0,85	0,22	-0,45		
60							
61							
62	0,61	0,24	1,1	0,14	0,38	-0,32	0,036
63							
64	0,54	0,51	0,58	0,51	-0,16	1,4	0,023
65							
66							
67							
68							
69							
70							

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

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-ortho PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
71							
72	-0,26	-0,46	-0,025	-0,35	-0,22		
73							
74	-0,42	-0,85	-0,026	0,59	0,094		
75							
76							
77							
78							
79							
80							
81	-2,2	-2,0	-2,4	-2,6	-2,7		
82							
83							
84							
85	-0,14	0,20	-0,51	-0,15	-5,0		
86							
87	0,65	1,2	0,13	-0,057	0,53	-0,23	0,13
88							
89	1,5	0,89	2,3	0,35	0,49		
90							
91							
92							
93							
94							
95							
96	-0,34	-0,24	-0,55	1,1	2,4	1,9	2,4
97							
98	-0,75	-1,1	-0,36	-0,78	-0,29		
99							
100							
101							
102							
103							
104	0,11	0,30	-0,082	-0,019			
105							
106							
107							
108							
109	-0,36	0,25	-0,97	-1,1	-1,7	14	15
110							
111	-3,9	-3,8	-4,1	-4,5	-2,9		
112							
113							
114							
115							
116							
117							
118							
119							
120							

Laboratories' Z-scores: Veal, lipid weight

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-ortho PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
1							
2							
3	0,46	0,86	-0,017	0,90	1,0	-0,084	0,29
4	0,55	0,53	0,59	0,25	0,78		
5	-0,32	-0,56	-0,093	0,14	0,19	-0,070	-0,10
6							
7	-3,1	-1,5	-4,6	-5,0	0,12		
8							
9							
10	-0,87	-1,2	-0,60	-0,042	-0,29		
11							
12							
13							
14							
15							
16							
17							
18							
19	-3,4	-3,7	-3,1	-2,6	-2,8	-1,2	-2,3
20							
21							
22							
23	-0,0089	-0,056	0,040	0,015	0,11	0,74	0,33
24							
25	1,5	1,6	1,3	0,57	-0,14		
26							
27							
28							
29	1,3	2,5	0,073	1,5			
30							
31	0,15	-0,15	0,47	0,42	0,56		
32	1,2	1,2	1,3	0,70	-0,40	-5,0	-5,0
33							
34							
35	1,7	0,68	2,8	1,9	0,35	-0,13	-0,13
36							
37							
38							
39							
40	0,0091	-0,53	0,57	0,41	0,12	2,7	0,16
41							
42	1,6	0,79	2,5	1,1	1,2	0,41	0,68
43							
44							
45	-1,4	-1,2	-1,7	-1,2		2,0	-2,3
46	0,44	0,20	0,71	0,16	0,066		
47							
48							
49							
50							
51							
52							
53							
54	0,13	0,96	-0,71	-0,57	-0,50		
55							
56							
57							
58							
59	1,5	1,7	1,4	0,69	-0,046		
60							
61							
62	0,061	-0,28	0,47	-0,37	-0,15	-0,78	-0,46
63							
64	0,74	0,70	0,78	0,71	0,017	1,6	0,20
65							
66							
67							
68							
69							
70							

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

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-ortho PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
71							
72	-0,33	-0,53	-0,10	-0,42	-0,29		
73							
74	-0,69	-1,1	-0,32	0,26	-0,21		
75							
76							
77							
78							
79							
80							
81	1,9	2,3	1,5	0,93	0,71		
82							
83							
84							
85	-0,026	0,32	-0,40	-0,030	-5,0		
86							
87	-1,0	-0,64	-1,4	-1,5	-1,1	-1,6	-1,4
88							
89	0,85	0,29	1,5	-0,19	-0,071		
90							
91							
92							
93							
94							
95							
96	-1,0	-0,94	-1,2	0,20	1,3	0,86	1,3
97							
98	-0,75	-1,1	-0,36	-0,78	-0,29		
99							
100							
101							
102							
103							
104	0,036	0,22	-0,16	-0,095			
105							
106							
107							
108							
109	-1,2	-0,69	-1,7	-1,8	-2,3	11	12
110							
111	-4,2	-4,0	-4,3	-4,6	-3,4		
112							
113							
114							
115							
116							
117							
118							
119							
120							

Laboratories' Z-scores: Halibut, fresh weight

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-ortho PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
1							
2							
3	-1,5	-0,76	-1,9	-1,2	-0,77		-2,2
4	0,23	0,84	0,021	-0,096	0,22		
5							
6							
7	-4,0	-2,5	-4,6	-5,0	-0,065		
8							
9							
10	-0,11	-0,20	-0,14	0,75	0,22		
11							
12							
13	-0,066	0,25	-0,19	-0,11		2,6	-0,022
14	0,031	0,45	-0,077	-0,71		0,35	0,22
15							
16							
17							
18							
19	-3,6	-3,1	-3,8	-3,9	-4,0	-3,8	-3,9
20	-1,4	2,3	-2,9	-0,49	-0,58		
21	2,5	7,0	0,79	0,92	0,18		
22							
23	-0,51	-0,34	-0,59	-0,43	-0,11	0,27	-0,031
24							
25	0,66	1,4	0,41	0,31	-0,17		
26							
27							
28							
29	-1,5	0,19	-2,2	-1,1			
30							
31	0,19	-0,12	0,28	0,60	0,33		
32	-1,1	-0,84	-1,1	-1,2	-1,5	-5,0	-5,0
33							
34							
35	0,059	0,71	-0,18	-0,12	0,61	0,49	0,36
36							
37							
38							
39							
40	0,11	-0,083	0,17	0,43	0,042	0,98	0,065
41	1,5	1,2	1,6	0,54	-1,3		4,6
42	1,9	0,24	2,7	0,66	1,1	0,14	0,20
43							
44							
45	0,27	0,16	0,25	0,99		2,7	-0,42
46	0,39	0,14	0,48	0,47	0,52		
47							
48							
49							
50							
51	-0,29	-0,24	-0,31	-0,34			
52	0,29	0,44	0,22	0,46	1,3		
53							
54	-2,7	1,4	-4,3	-3,9	-4,16		
55							
56							
57							
58							
59	0,66	1,4	0,38	0,32	-0,18		
60							
61							
62	1,4	2,5	1,1	0,19	0,42		0,24
63							
64	1,8	3,6	1,2	0,33	-0,14	2,0	0,53
65							
66							
67							
68	0,75	2,7	0,043	-0,041	-0,28	-0,20	-0,18
69							
70							

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

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-ortho PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
71							
72	-0,26	-0,20	-0,33	0,31	-0,045		
73							
74	0,34	0,24	0,33	1,1	0,28		
75	-0,19	-0,14	-0,22	-0,13	-0,40		
76							
77							
78	2,1	4,5	1,5	-1,2	-0,54	-0,67	-0,69
79							
80							
81	-0,69	-0,55	-0,73	-0,89	-0,90		
82							
83							
84							
85	-1,3	0,0055	-1,9	-0,37	-5,0		
86							
87	1,2	2,1	0,86	0,25	0,83		0,41
88							
89	0,79	0,19	1,1	0,28	0,70		
90							
91							
92							
93							
94							
95							
96	-0,72	-1,0	-0,77	1,5	1,9		0,14
97							
98	-1,0	-1,3	-0,89	-1,3	-0,50		
99							
100							
101							
102							
103							
104	0,14	0,14	0,18	-0,36			
105							
106							
107							
108							
109	1,3	-0,29	1,9	1,7	1,8	-3,0	-3,0
110							
111	-0,43	-0,22	-0,47	-0,96	-1,1		
112							
113							
114							
115					0,14		1,7
116							
117							
118							
119							
120	0,067	0,53	-0,14	0,37	0,68		

Laboratories' Z-scores: Halibut, lipid weight

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-ortho PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
1							
2							
3	1,4	2,9	0,82	2,1	2,9		0,20
4	0,22	0,82	0,0049	-0,11	0,21		
5							
6							
7	-4,1	-2,8	-4,6	-5,0	-0,57		
8							
9							
10	-1,7	-1,7	-1,7	-1,1	-1,5		
11							
12							
13	-0,056	0,26	-0,18	-0,097		2,7	-0,013
14	0,16	0,59	0,048	-0,60		0,49	0,35
15							
16							
17							
18							
19	-2,7	-1,9	-3,1	-3,2	-3,3	-3,0	-3,2
20							
21							
22							
23	-0,32	-0,14	-0,40	-0,23	0,098	0,49	0,18
24							
25	1,8	2,7	1,5	1,4	0,81		
26							
27							
28							
29	3,4	7,5	1,8	4,4			
30							
31	0,24	-0,071	0,33	0,66	0,38		
32	0,54	0,86	0,43	0,32	-0,083	-5,0	-5,0
33							
34							
35	-0,47	0,11	-0,69	-0,63	0,024	-0,087	-0,20
36							
37							
38							
39							
40	0,13	-0,063	0,19	0,45	0,061	1,0	0,083
41	3,2	3,0	3,4	2,1	-0,31		7,2
42	3,7	1,6	4,7	2,2	2,7	1,5	1,6
43							
44							
45	-1,5	-1,5	-1,5	-0,97		0,20	-1,9
46	-0,24	-0,46	-0,16	-0,17	-0,13		
47							
48							
49							
50							
51							
52	0,52	0,67	0,44	0,69	1,6		
53							
54							
55							
56							
57							
58							
59	-1,1	-0,59	-1,3	-1,4	-1,7		
60							
61							
62	1,4	2,4	1,0	0,18	0,41		0,23
63							
64	1,5	3,3	0,97	0,15	-0,31	1,7	0,34
65							
66							
67							
68							
69							
70							

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

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-ortho PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
71							
72	-0,43	-0,37	-0,50	0,13	-0,22		
73							
74	-0,45	-0,54	-0,46	0,19	-0,50		
75	-0,42	-0,38	-0,45	-0,36	-0,63		
76							
77							
78	1,7	3,8	1,0	-1,4	-0,85	-0,96	-0,99
79							
80							
81	0,10	0,27	0,058	-0,14	-0,15		
82							
83							
84							
85							
86							
87	-1,2	-0,63	-1,4	-1,7	-1,4		-1,7
88							
89	0,11	-0,42	0,35	-0,33	0,036		
90							
91							
92							
93							
94							
95							
96	-1,5	-1,8	-1,5	0,32	0,63		-0,79
97							
98	-0,80	-1,1	-0,66	-1,1	-0,25		
99							
100							
101							
102							
103							
104	0,051	0,057	0,087	-0,44			
105							
106							
107							
108							
109	-0,37	-1,5	0,064	-0,082	0,0083	-3,5	-3,5
110							
111	0,95	1,2	0,90	0,27	0,084		
112							
113							
114							
115					0,19		1,8
116							
117							
118							
119							
120	0,19	0,66	-0,022	0,50	0,81		

Laboratories' Z-scores: Fish oil, fresh weight

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-ortho PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
1							
2							
3	-0,26	-0,14	-0,39	0,29	0,62		0,15
4	-0,031	0,30	-0,26	-0,23	0,038		
5							
6							
7	-4,0	-3,2	-4,6	-5,0	0,24		
8							
9							
10	-0,28	-0,31	-0,32	0,58	0,24		
11							
12							
13	-0,0092	-0,23	0,15	0,056		2,7	0,27
14							
15							
16							
17							
18							
19	0,86	0,21	1,4	-0,18	-0,65	0,13	0,25
20	-0,66	2,5	-3,0	-0,42	-0,53		
21	0,72	1,0	0,52	0,19	-0,36		
22							
23	-0,16	-0,043	-0,23	-0,36	-0,056	0,032	0,18
24							
25	0,10	0,10	0,12	-0,15	-0,50		
26							
27							
28							
29	-0,23	0,79	-0,92	-1,2			
30							
31	-0,0075	-0,33	0,21	0,38	0,21		
32	0,18	0,34	0,068	0,011	-0,33	-5,0	-5,0
33							
34	0,21	0,38	0,087	0,12	0,073		
35	-0,15	0,11	-0,33	-0,32	0,27	0,98	0,024
36							
37							
38							
39							
40	0,014	-0,045	0,046	0,17	0,15	2,8	0,24
41							
42	0,84	-0,093	1,6	0,31	0,53	-0,18	-0,019
43							
44							
45							
46	0,40	0,69	0,21	0,097	0,35		
47							
48							
49							
50							
51							
52							
53							
54	-0,32	-0,083	-0,54	0,18	0,40		
55							
56							
57							
58							
59	0,16	0,084	0,24	-0,12	-0,47		
60							
61							
62							
63							
64	0,83	1,5	0,35	0,11	-0,17	0,22	0,051
65							
66							
67							
68	1,4	2,1	0,79	2,3	2,5	6,4	0,70
69							
70							

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

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-ortho PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
71							
72	-0,40	-0,46	-0,39	0,0087	-0,39		
73							
74	-0,25	-0,53	-0,095	0,54	0,16		
75	0,18	0,23	0,14	0,37	-0,13		
76							
77							
78	0,33	0,30	0,41	-0,35	0,064	-0,52	-0,37
79							
80							
81	5,6	14	-0,29	-0,70	-0,59		
82							
83							
84							
85	0,13	0,76	-0,25	-1,1	-5,0		
86							
87	0,84	2,1	-0,052	-0,12	0,36		-0,044
88							
89	0,65	0,35	0,85	0,81	0,52		
90							
91							
92							
93							
94							
95							
96	-0,27	0,46	-0,92	1,2	1,6		-0,021
97							
98	0,027	-0,19	0,20	-0,11	-0,19		
99							
100							
101							
102							
103							
104	-0,31	-0,16	-0,42	-0,32	0,76		
105							
106							
107							
108							
109	-0,43	-0,68	-0,26	-0,14	-0,50	0,26	0,16
110							
111	-1,2	-0,37	-1,9	-0,50	0,30		
112							
113							
114							
115					0,34		0,77
116	0,20	0,54	-0,071	0,46	-0,11		
117							
118							
119							
120	-0,25	-0,13	-0,37	0,16	0,091		

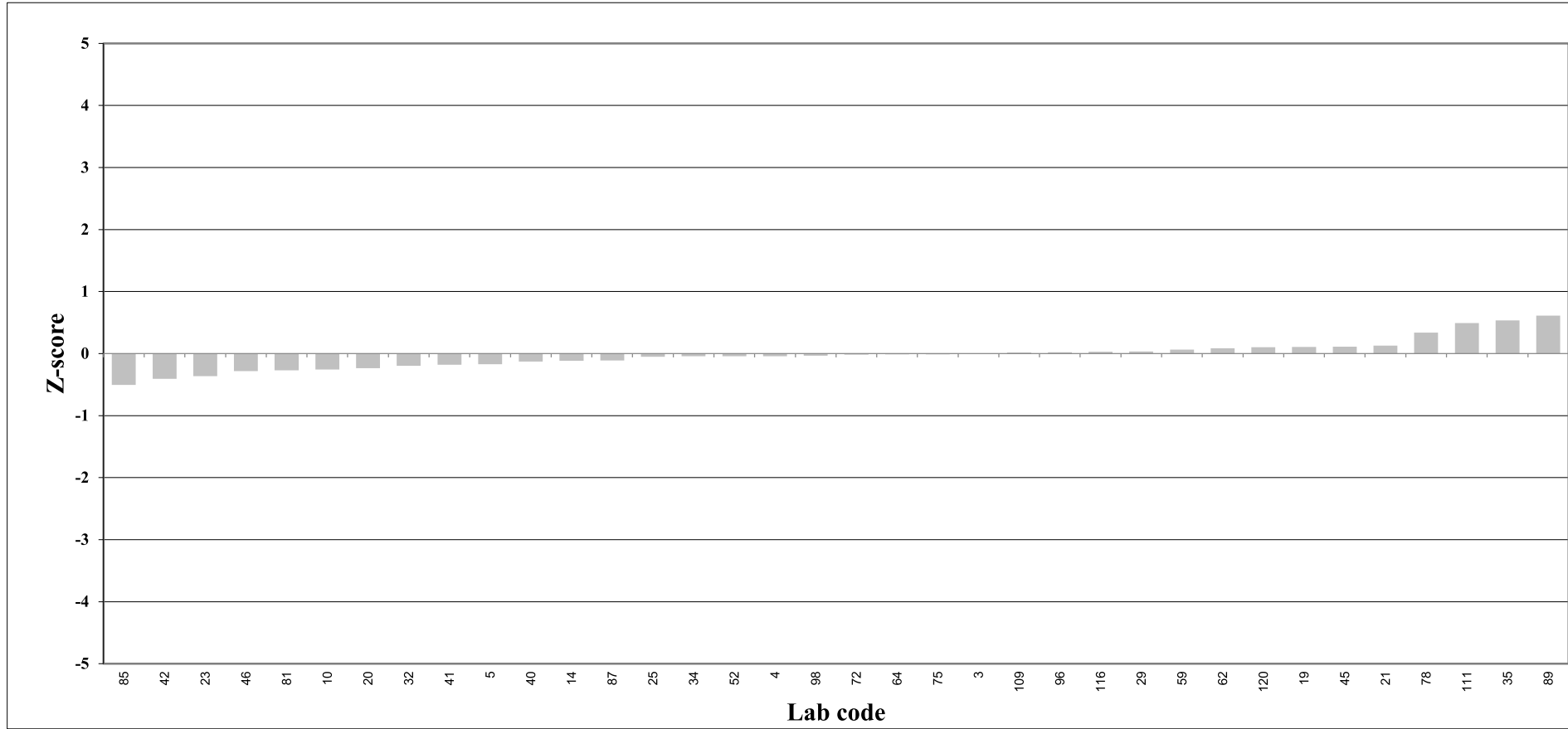
Laboratories' Z-scores: Fish oil, lipid weight

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-ortho PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
1							
2							
3	-0,26	-0,14	-0,39	0,29	0,62		0,15
4	-0,031	0,30	-0,26	-0,23	0,038		
5							
6							
7	-4,0	-3,2	-4,6	-5,0	0,32		
8							
9							
10	-0,28	-0,31	-0,32	0,58	0,24		
11							
12							
13	-0,0092	-0,23	0,15	0,056		2,7	0,27
14							
15							
16							
17							
18							
19	0,86	0,21	1,4	-0,18	-0,65	0,13	0,25
20							
21							
22							
23	-0,16	-0,043	-0,23	-0,36	-0,056	0,032	0,18
24							
25	0,10	0,10	0,12	-0,15	-0,50		
26							
27							
28							
29	-0,22	0,81	-0,91	-1,2			
30							
31	-0,0075	-0,33	0,21	0,38	0,21		
32	0,18	0,34	0,068	0,011	-0,33	-5,0	-5,0
33							
34	0,21	0,38	0,087	0,12	0,073		
35	-0,15	0,11	-0,33	-0,32	0,27	0,98	0,024
36							
37							
38							
39							
40	0,023	-0,035	0,056	0,18	0,16		0,25
41							
42	0,89	-0,053	1,6	0,35	0,58	-0,14	0,021
43							
44							
45							
46	0,42	0,71	0,23	0,11	0,36		
47							
48							
49							
50							
51							
52							
53							
54							
55							
56							
57							
58							
59	0,16	0,084	0,24	-0,12	-0,47		
60							
61							
62							
63							
64	0,83	1,5	0,35	0,11	-0,17	0,22	0,051
65							
66							
67							
68							
69							
70							

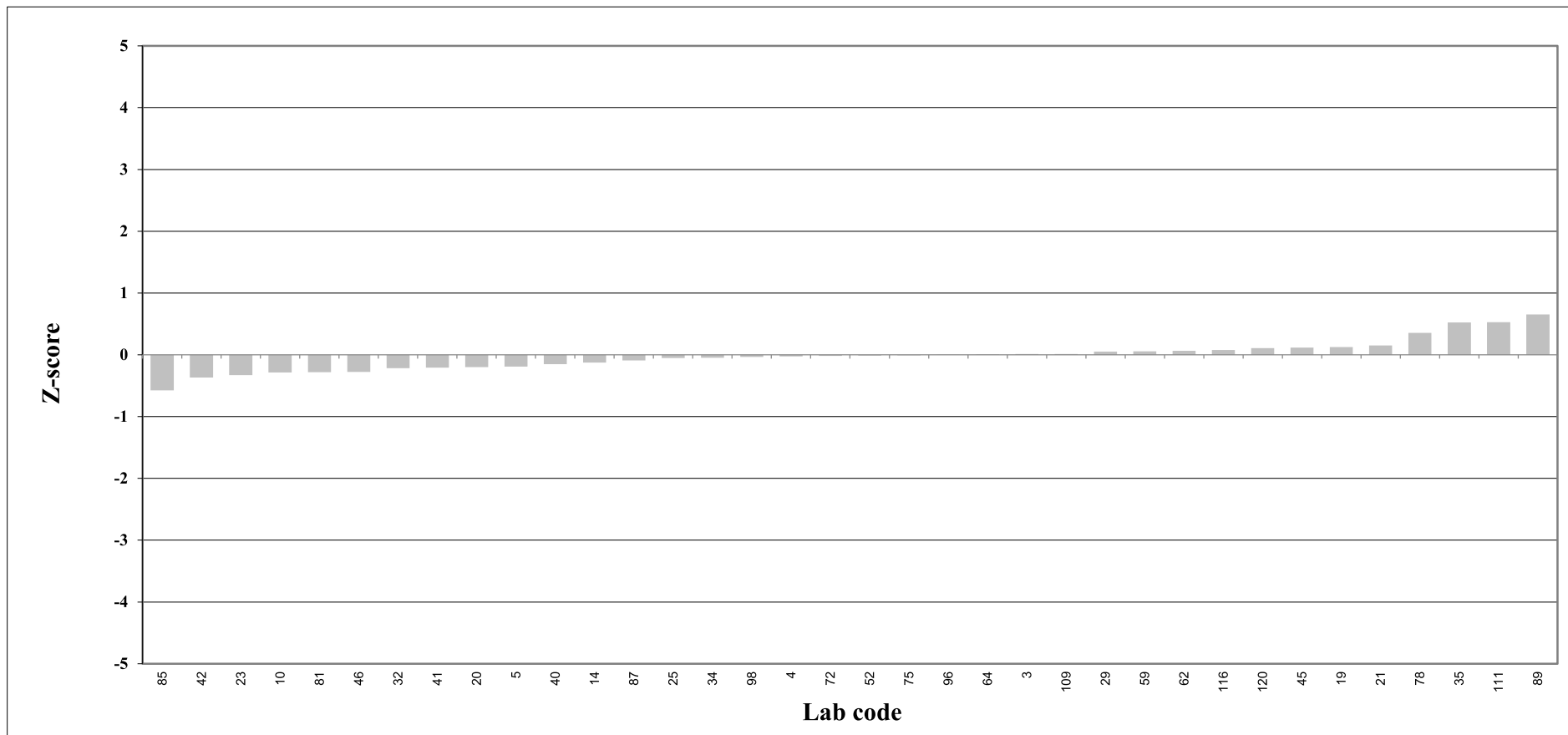
Laboratories' Z-scores: Fish oil, lipid weight (continued)

LAB CODE	Sum TE Total TEQ	Sum TE PCDD/PCDF	Sum TE non-ortho PCB	Sum TE mono-ortho PCB	Sum Indicator PCB	Sum PBDE Sum with 209	Sum PBDE Sum without 209
71							
72	-0,39	-0,45	-0,38	0,019	-0,38		
73							
74	-0,25	-0,53	-0,095	0,54	0,16		
75	0,18	0,23	0,14	0,37	-0,13		
76							
77							
78	0,33	0,30	0,41	-0,35	0,064	-0,52	-0,37
79							
80							
81	5,6	14	-0,29	-0,70	-0,59		
82							
83							
84							
85	0,13	0,76	-0,25	-1,1	-5,0		
86							
87	0,96	2,3	0,049	-0,020	0,47		0,057
88							
89	0,65	0,35	0,85	0,81	0,52		
90							
91							
92							
93							
94							
95							
96	-0,27	0,46	-0,92	1,2	1,6		-0,021
97							
98	0,056	-0,16	0,23	-0,079	-0,16		
99							
100							
101							
102							
103							
104	-0,31	-0,16	-0,42	-0,32	0,76		
105							
106							
107							
108							
109	-0,43	-0,68	-0,26	-0,14	-0,50	0,26	0,16
110							
111	-1,2	-0,37	-1,9	-0,50	0,30		
112							
113							
114							
115					0,34		0,77
116	0,21	0,55	-0,061	0,47	-0,097		
117							
118							
119							
120	-0,25	-0,13	-0,37	0,16	0,091		

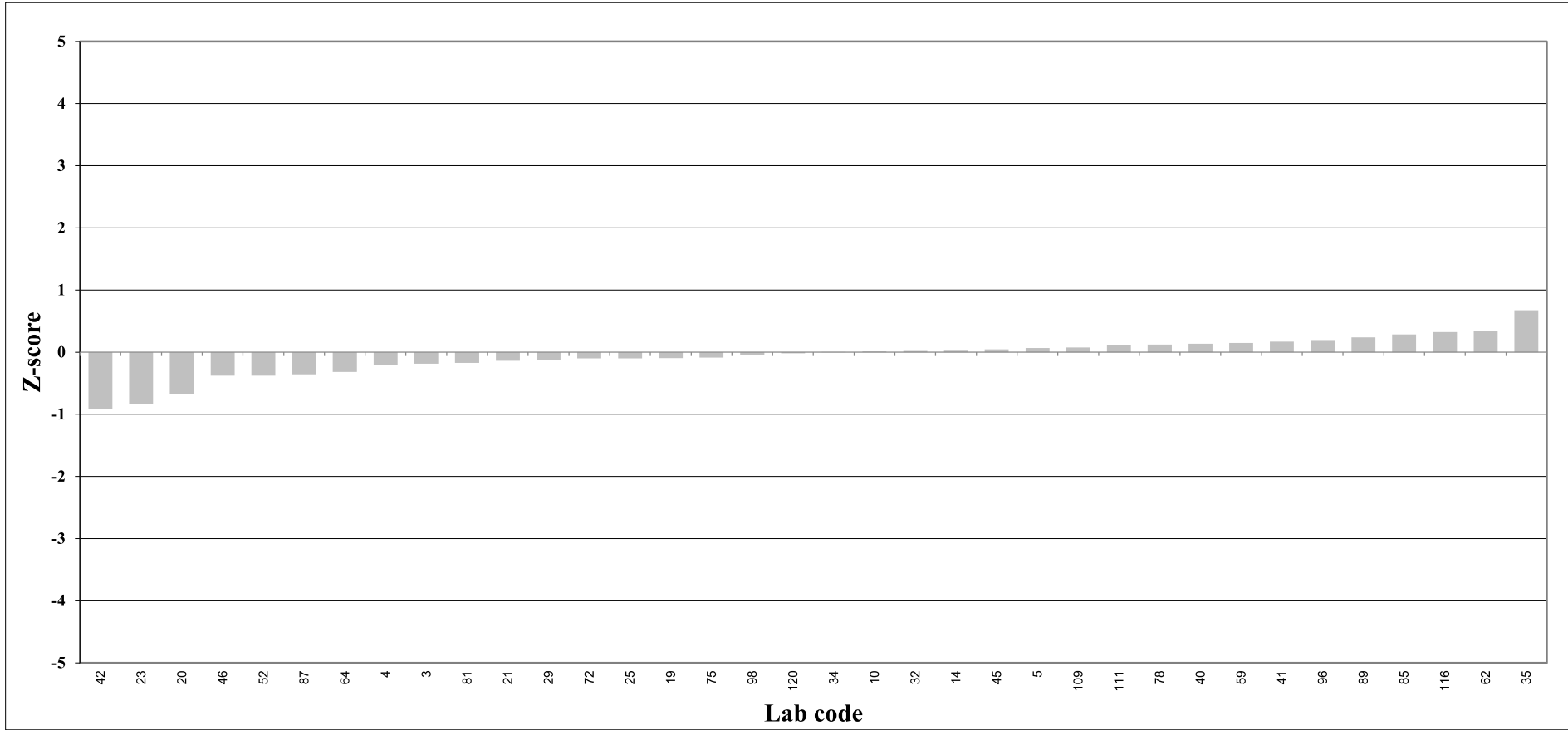
Z-score analyte solution; total TEQ



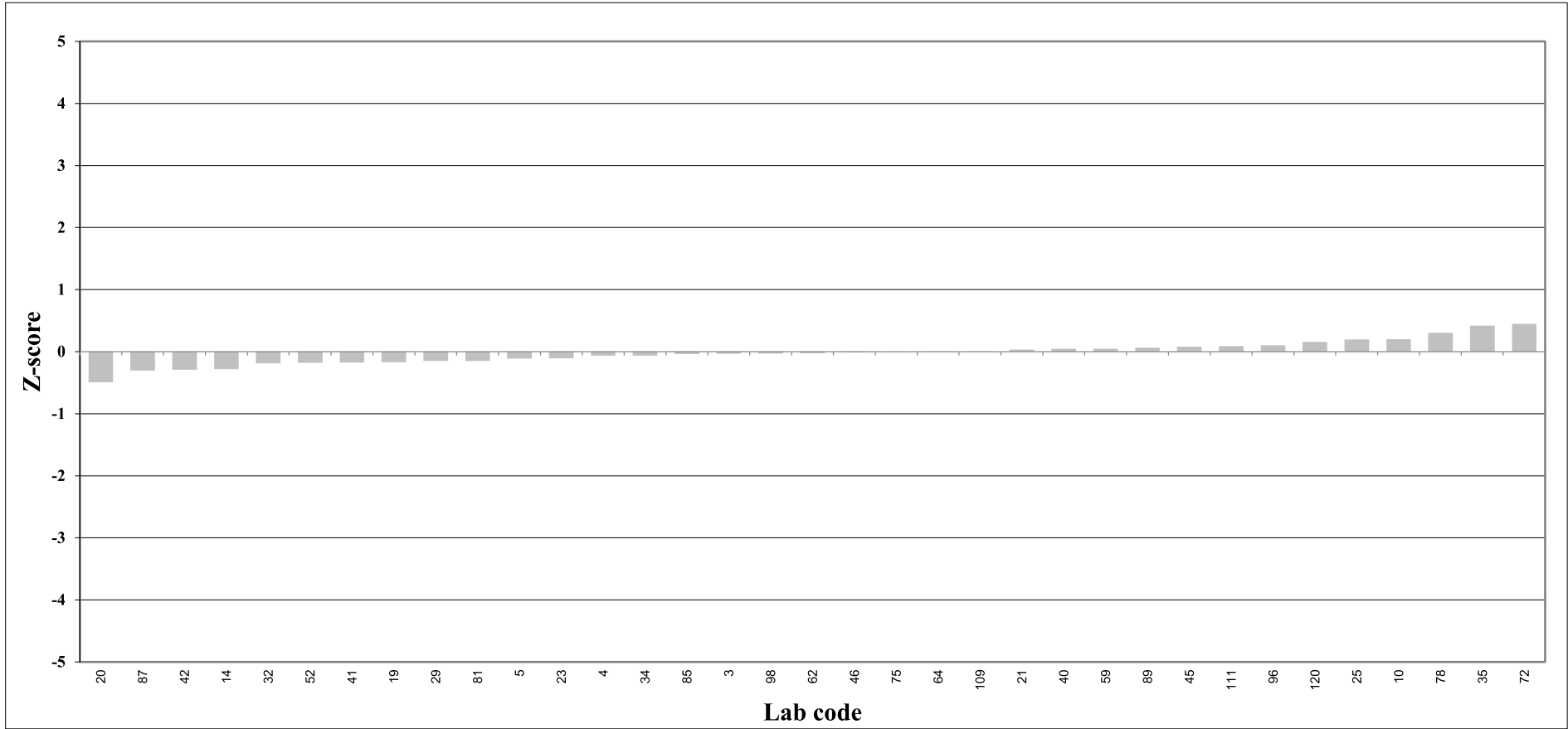
Z-score analyte solution; PCDD/PCDF TEQ



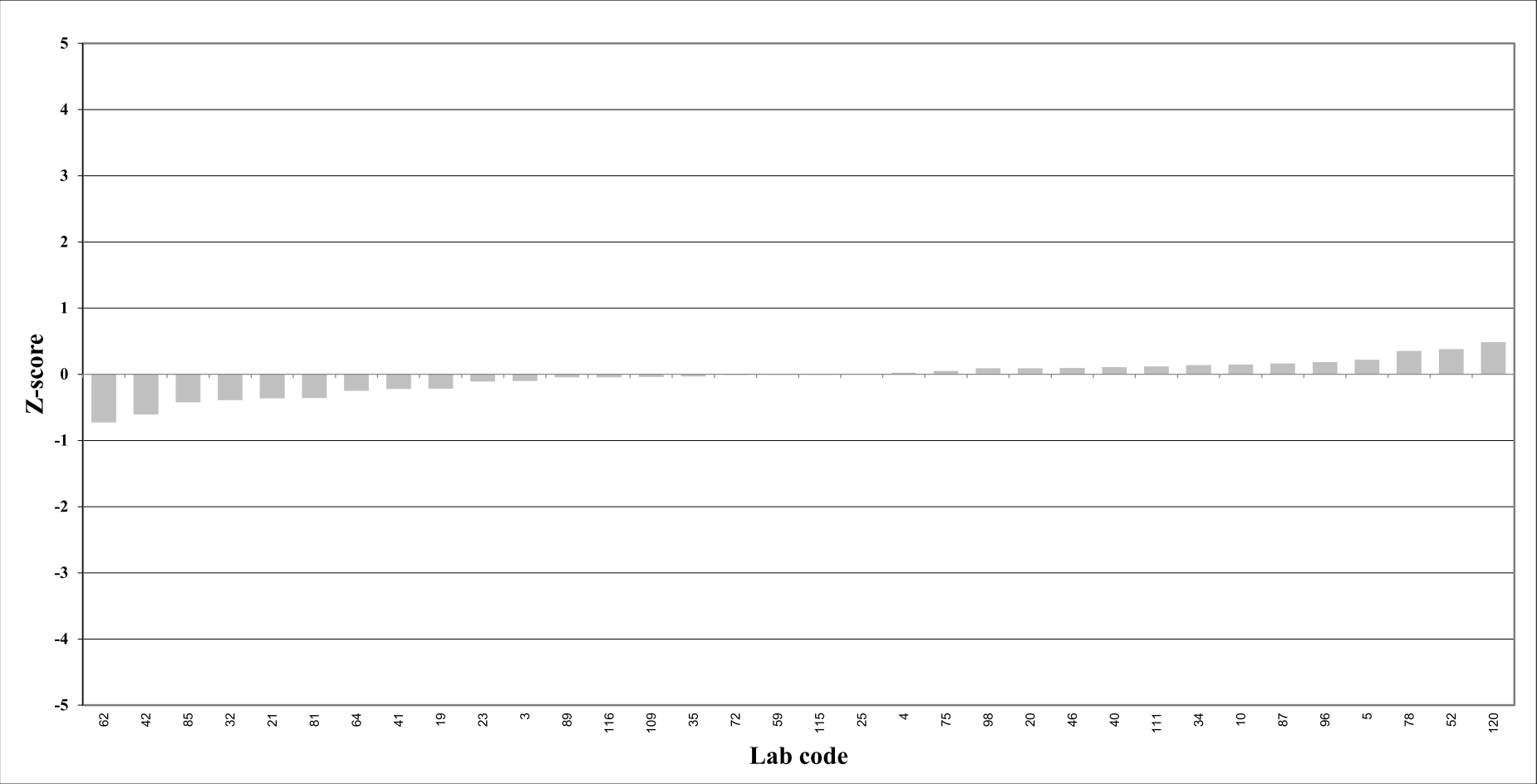
Z-score analyte solution; non-ortho PCB TEQ



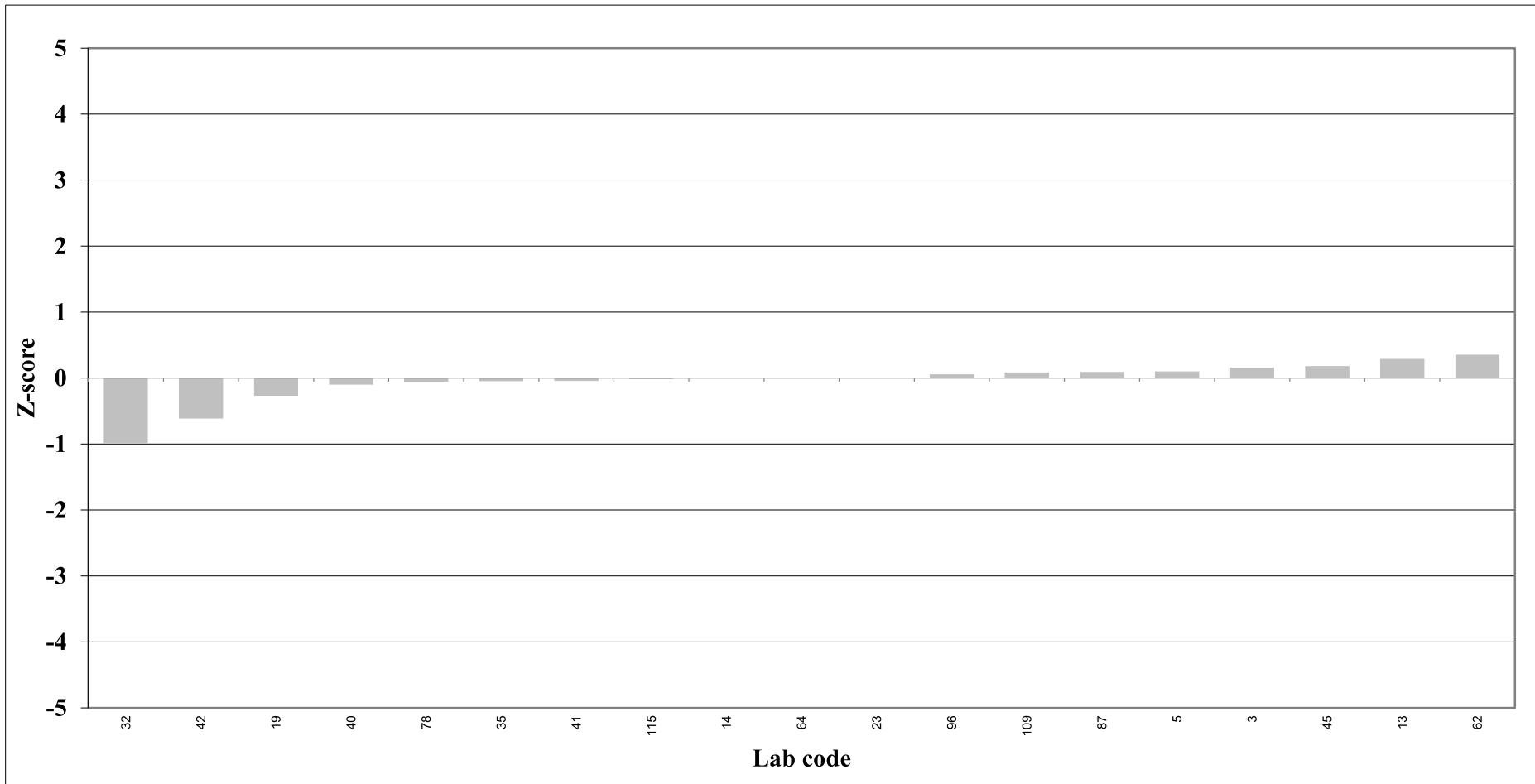
Z-score analyte solution; mono-ortho PCB TEQ



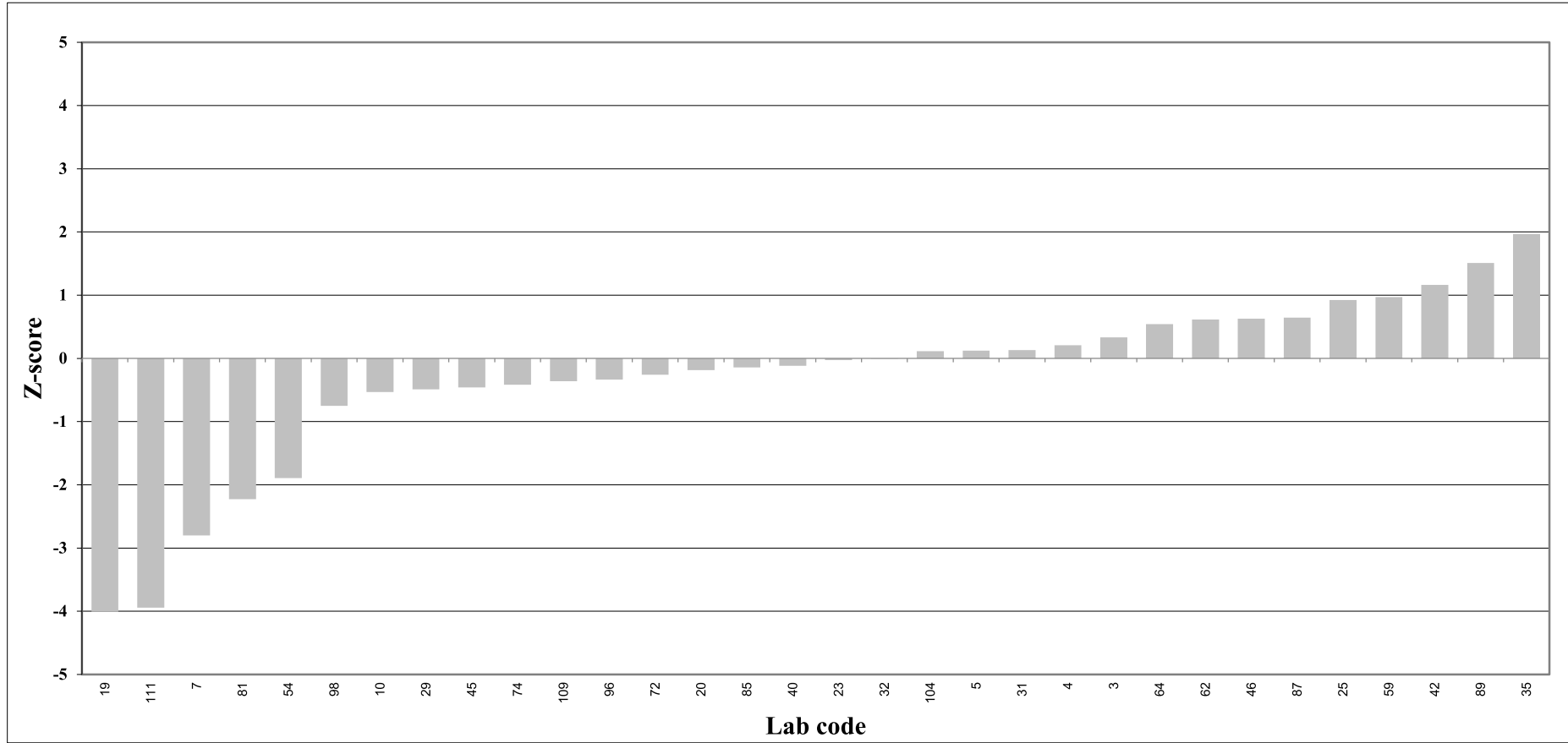
Z-score analyte solution; sum indicator PCB



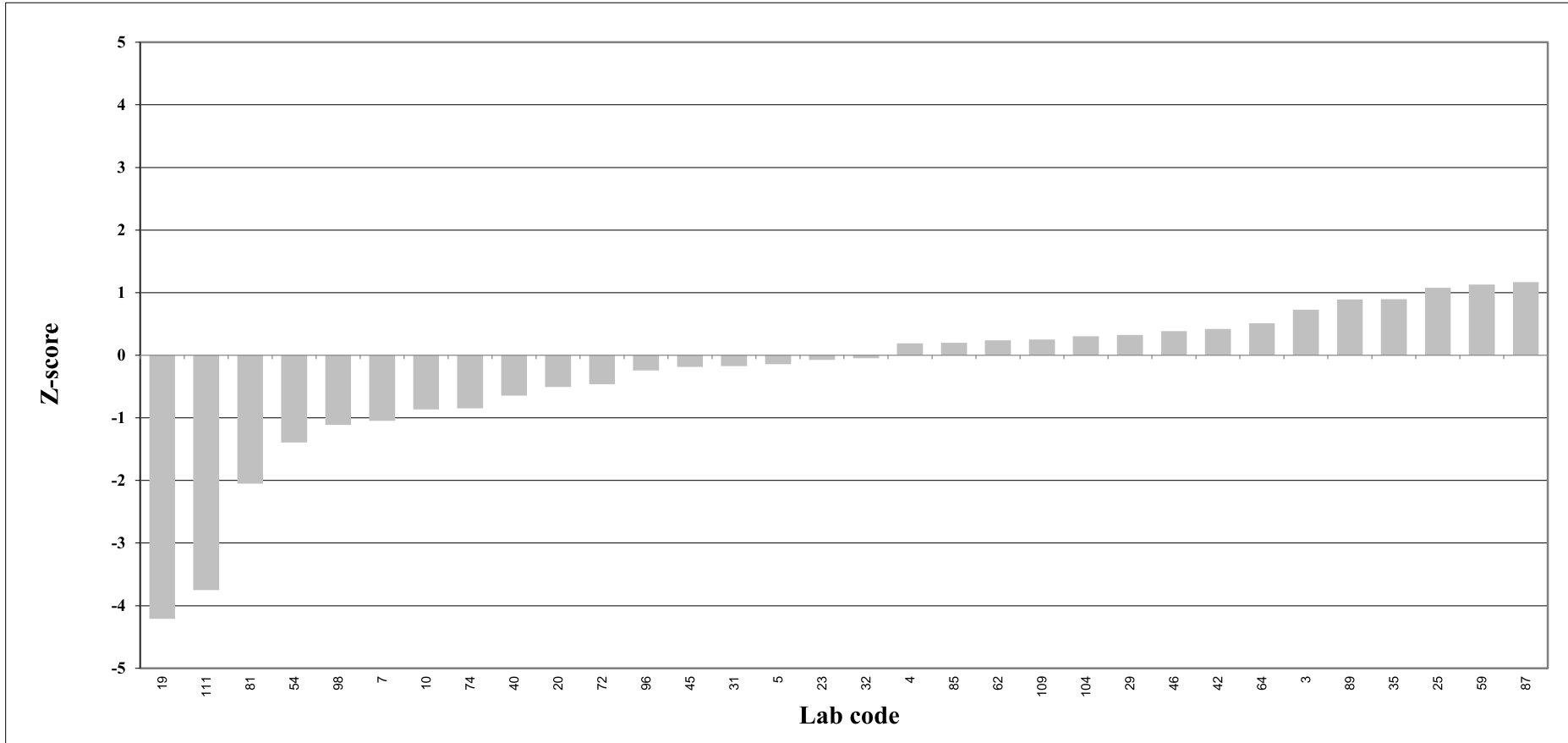
Z-score analyte solution; sum PBDE without PBDE-209



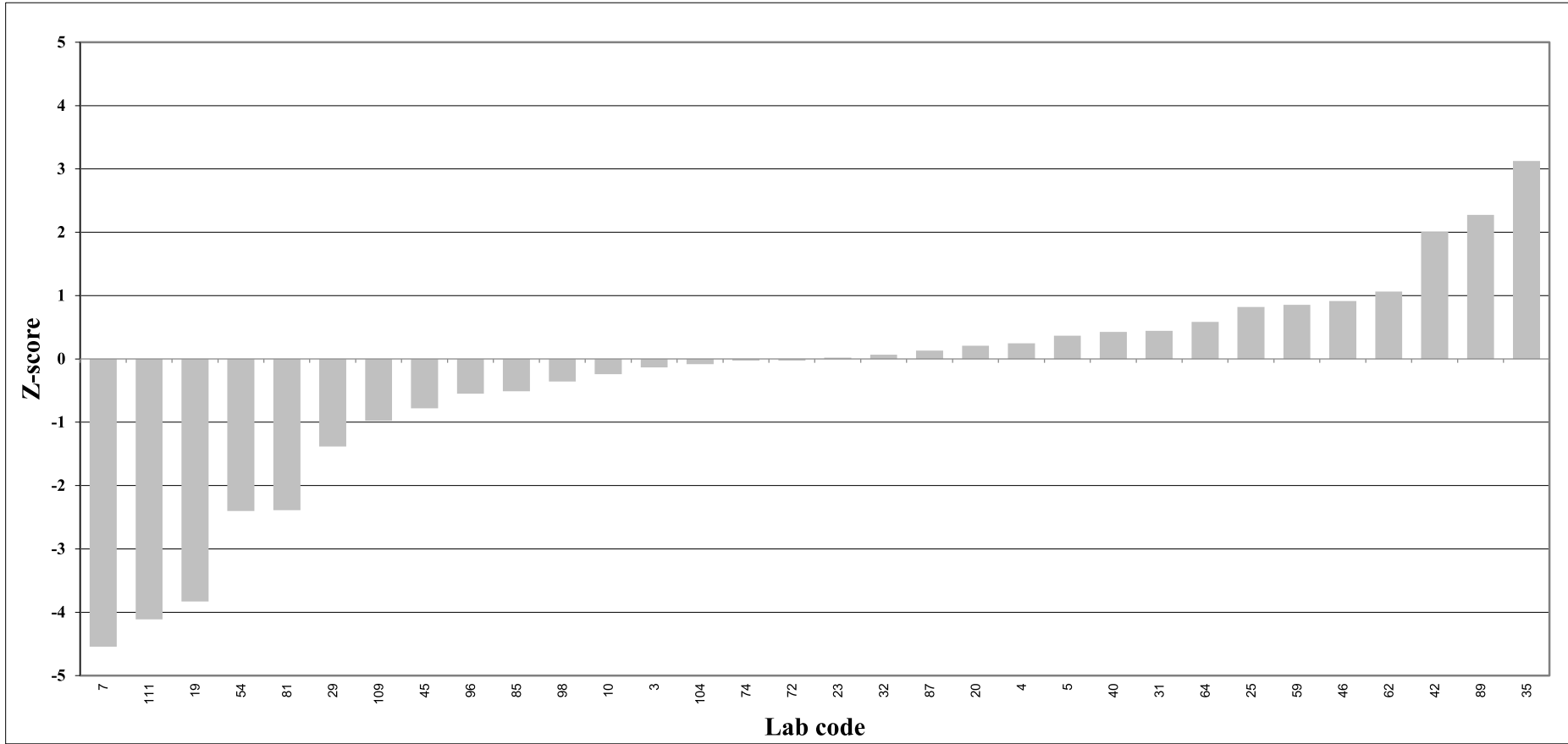
Z-score Veal, fresh weight; total TEQ



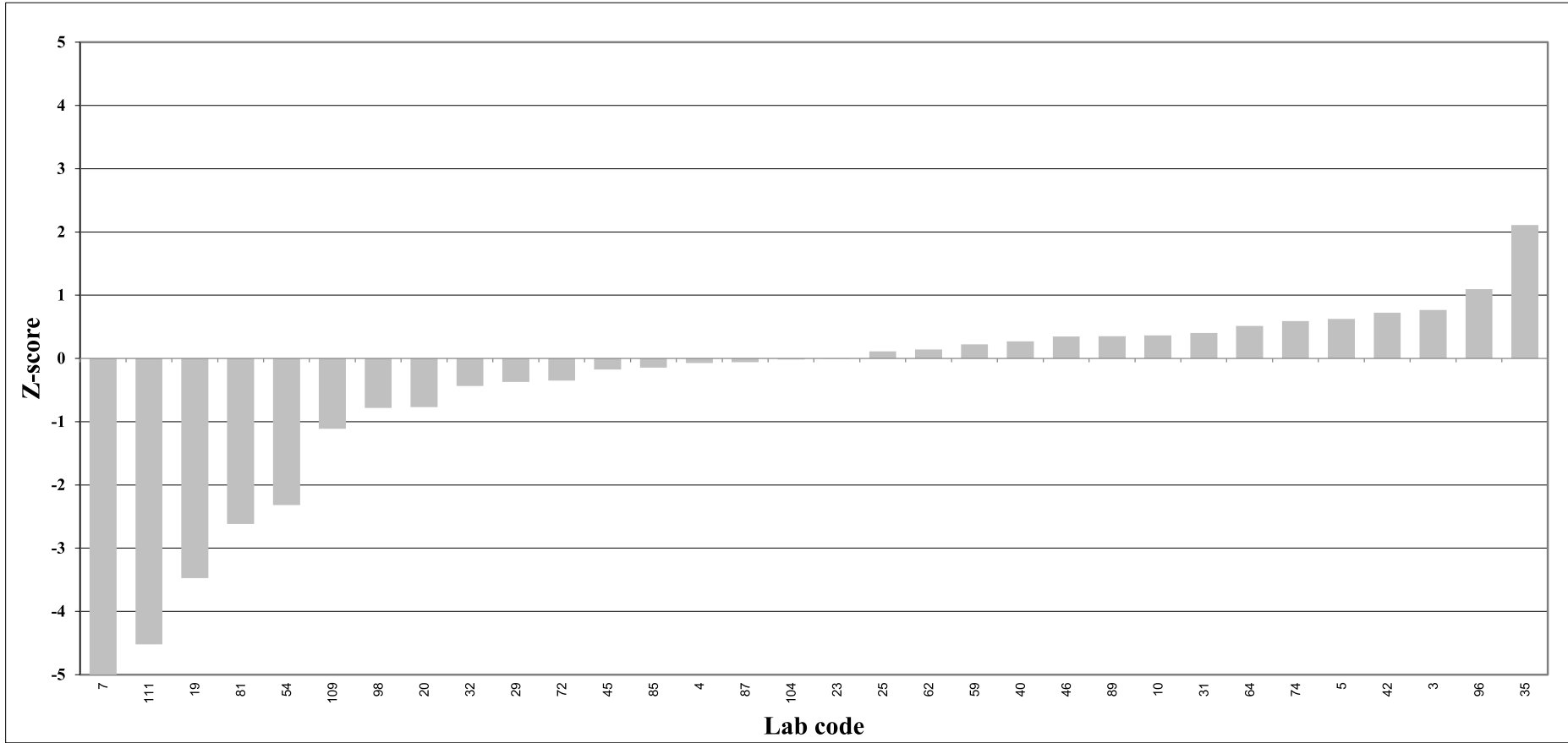
Z-score Veal, fresh weight; PCDD/PCDF TEQ



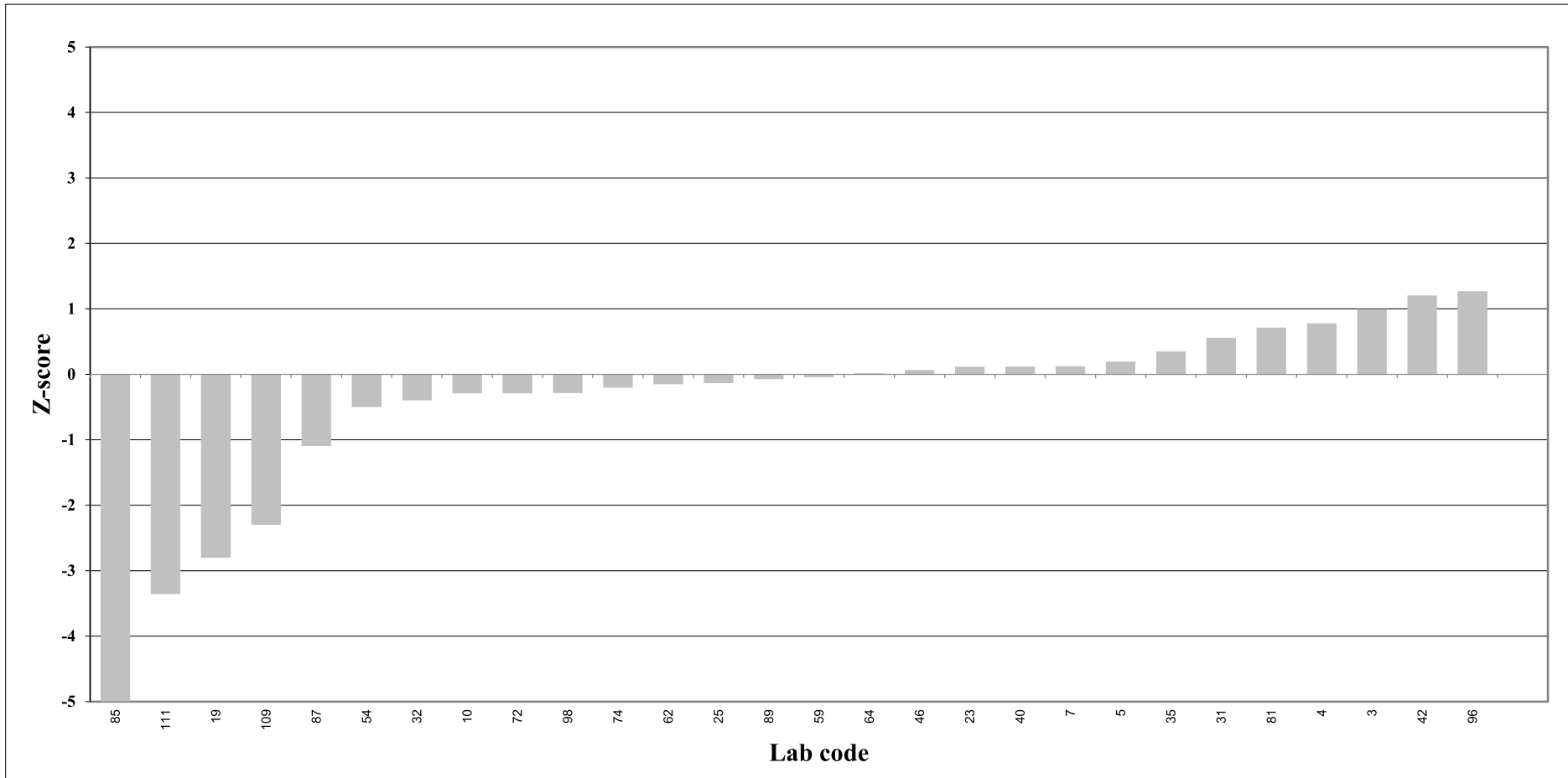
Z-score Veal, fresh weight; non-ortho PCB TEQ



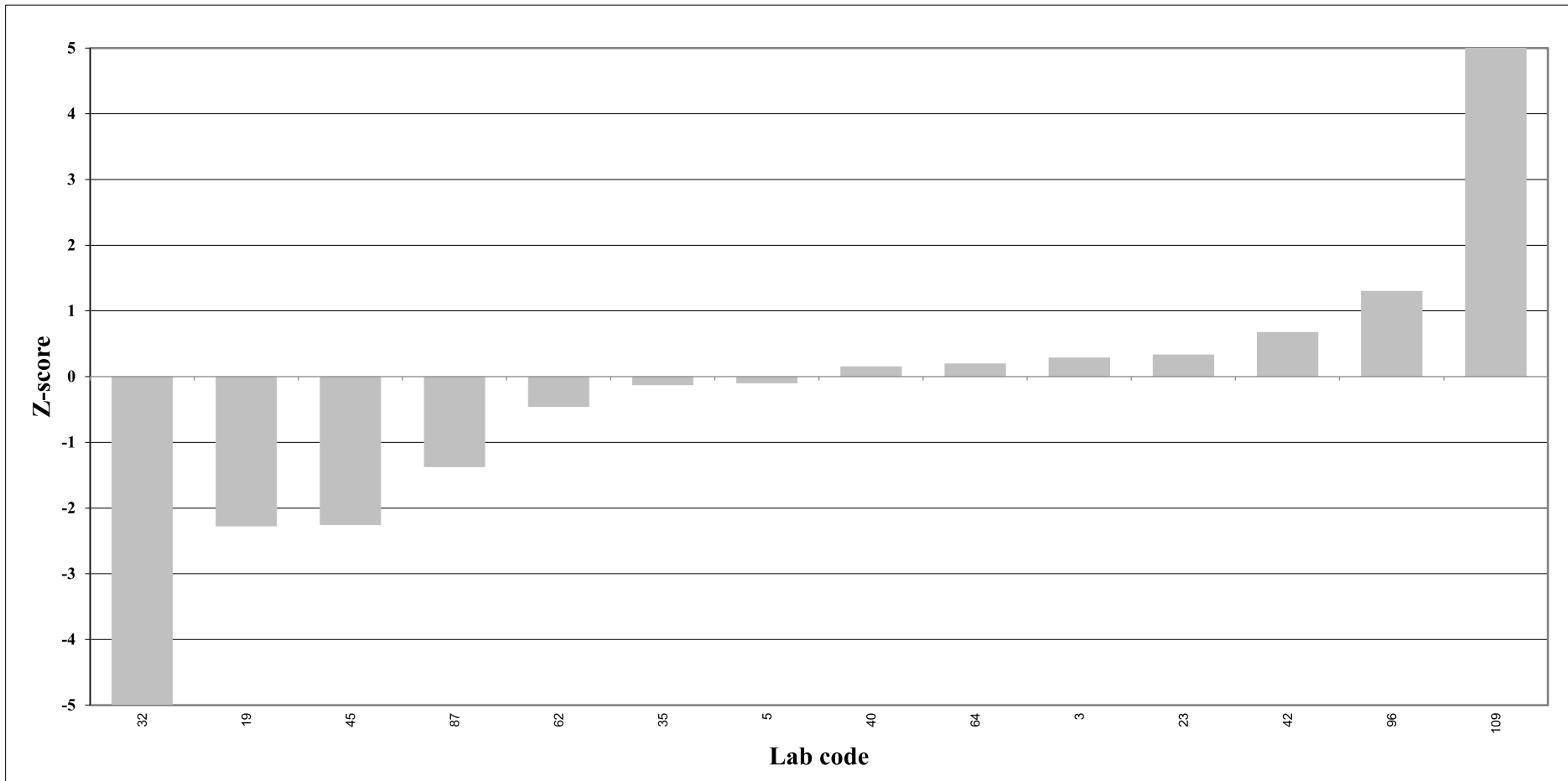
Z-score Veal, fresh weight; mono-ortho PCB TEQ



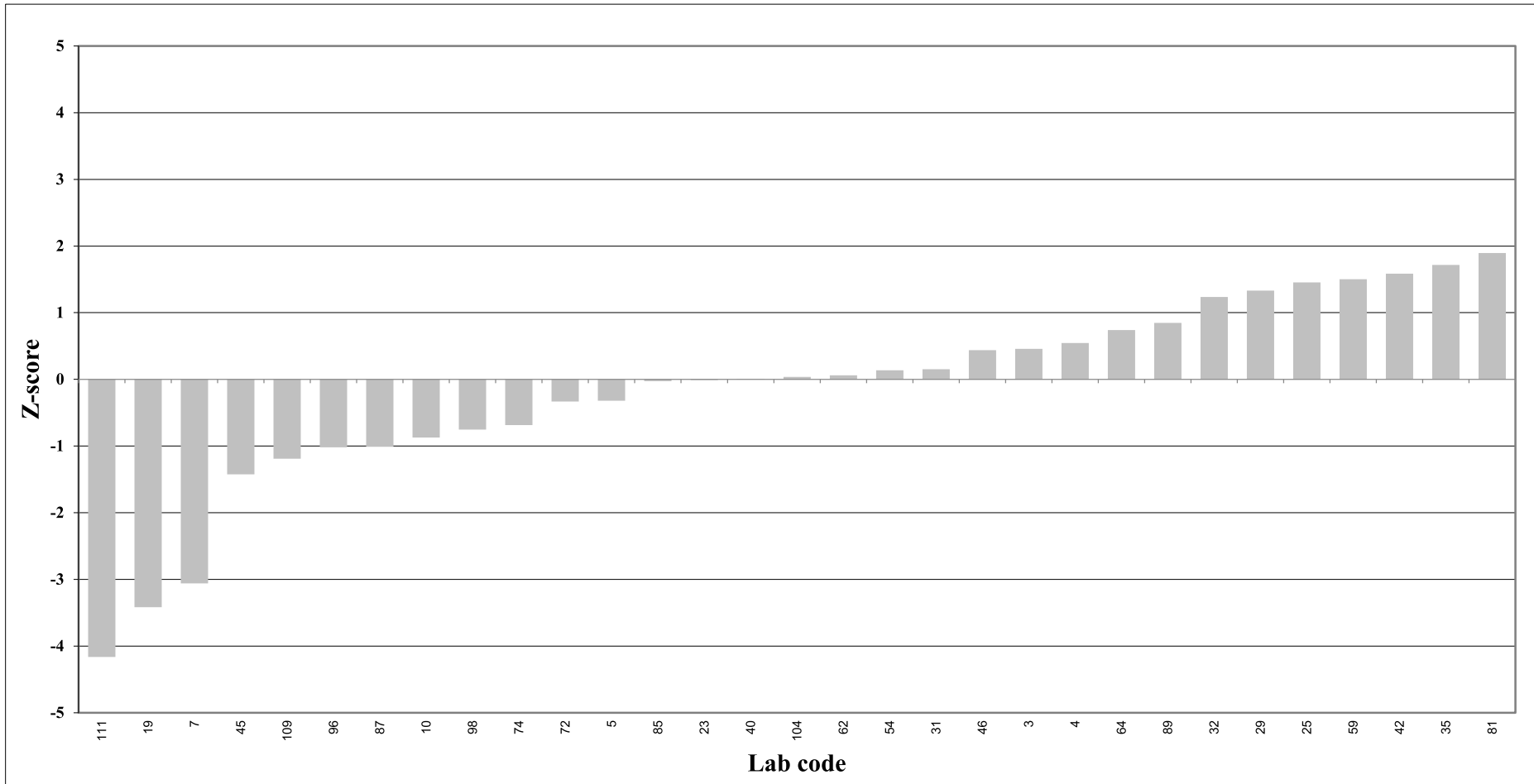
Z-score Veal, fresh weight; sum indicator PCB



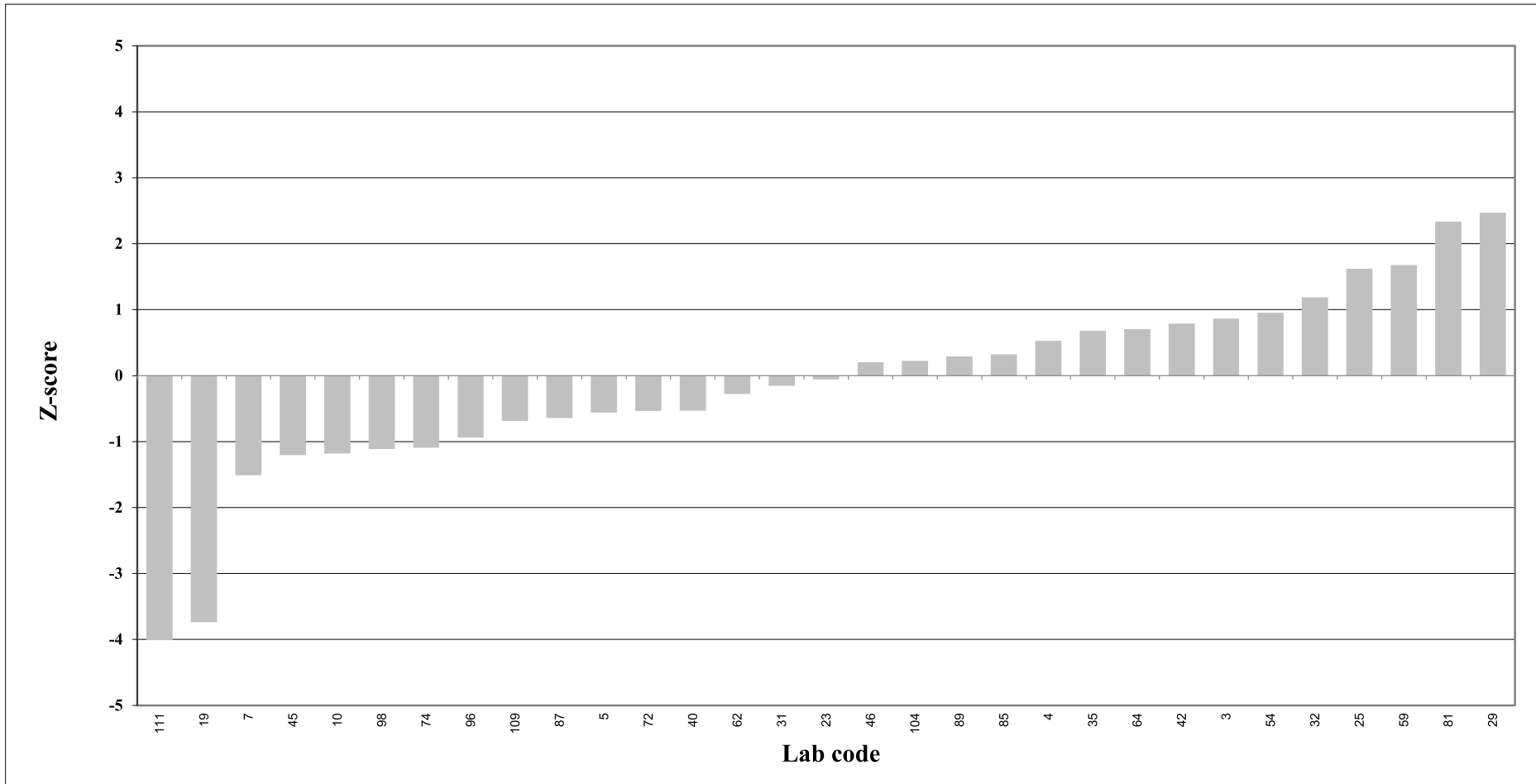
Z-score Veal, fresh weight; sum PBDE without PBDE-209



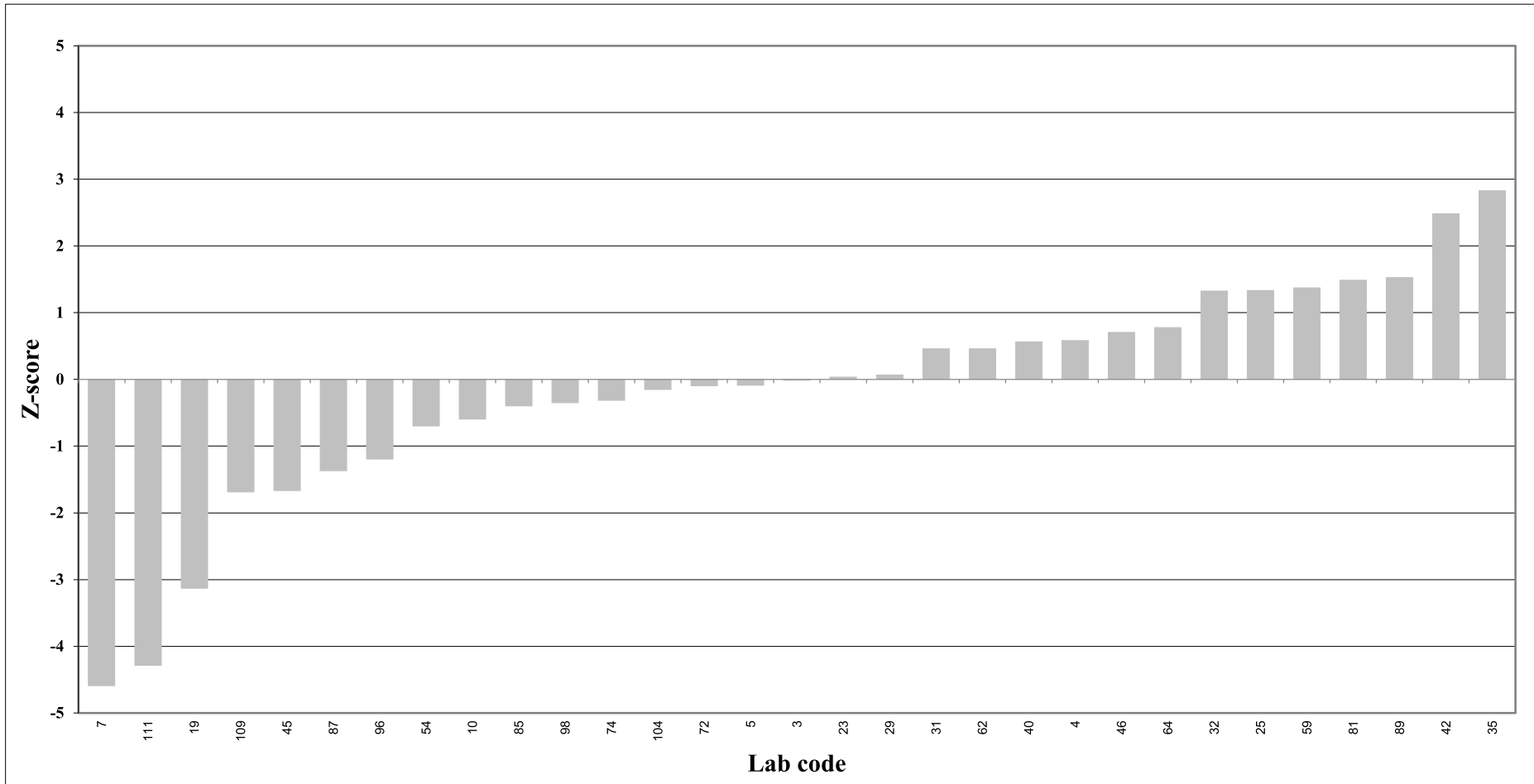
Z-score Veal, lipid weight; total TEQ



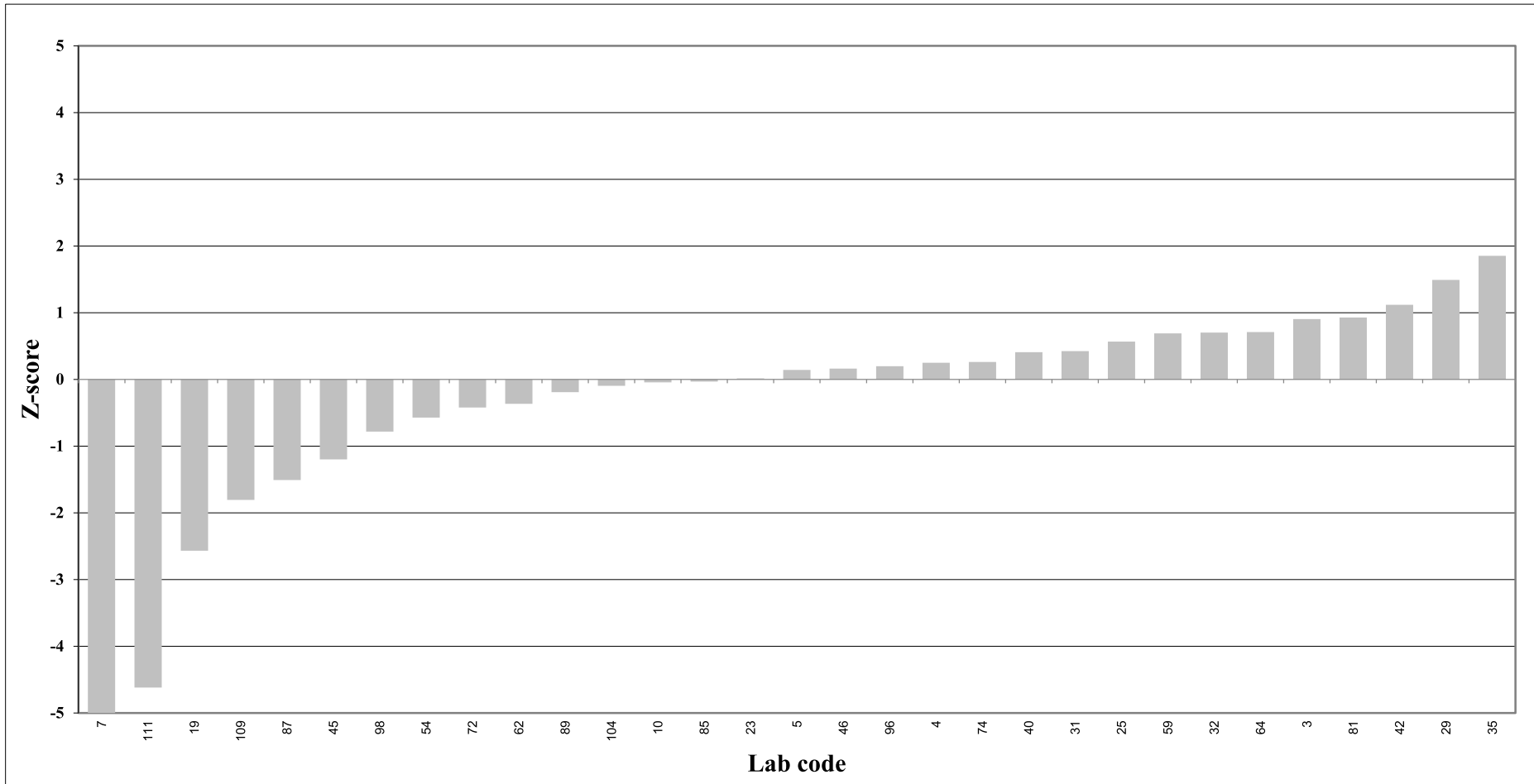
Z-score Veal, lipid weight; PCDD/PCDF TEQ



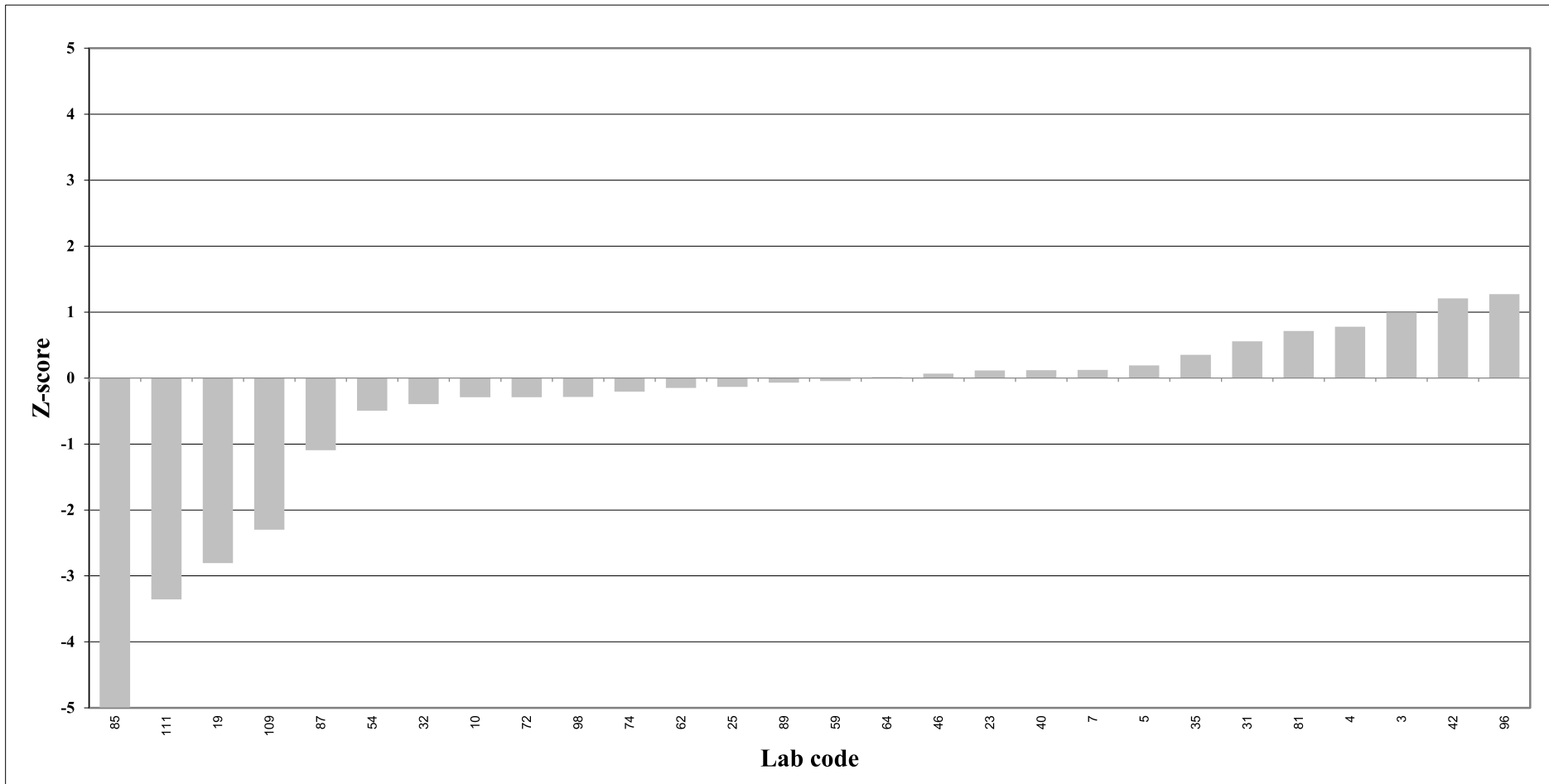
Z-score Veal, lipid weight; non-ortho PCB TEQ



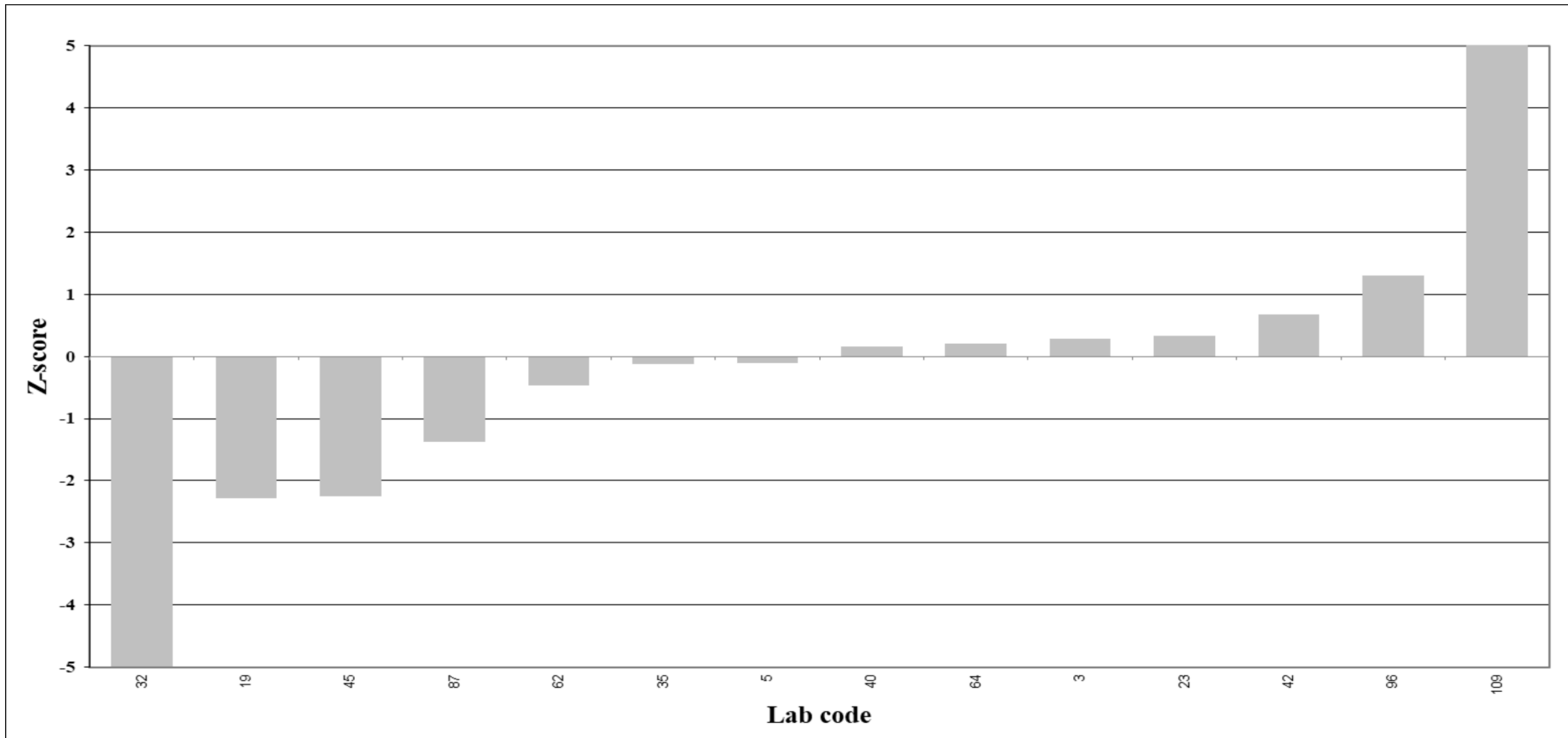
Z-score Veal, lipid weight; mono-ortho PCB TEQ



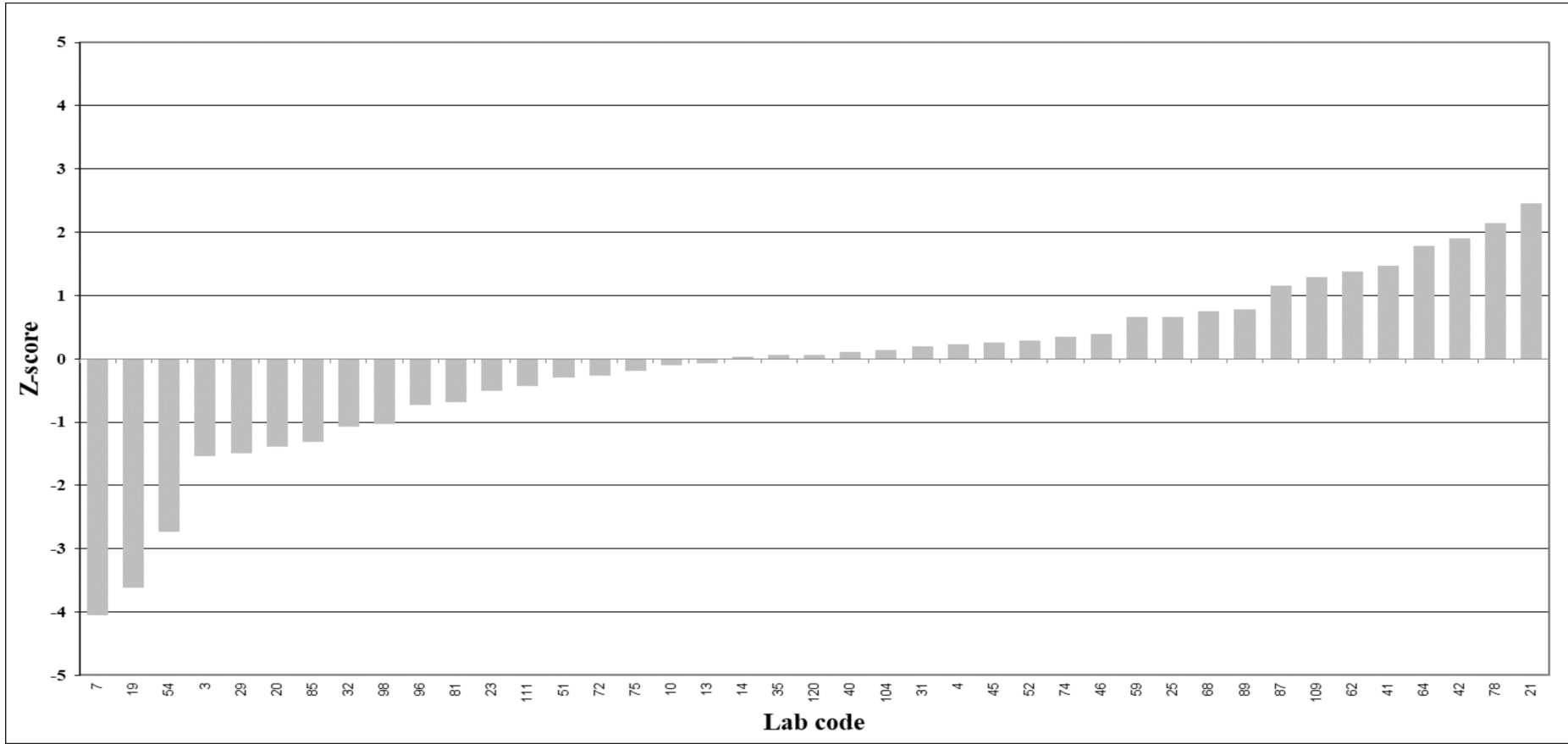
Z-score Veal, lipid weight; sum indicator PCB



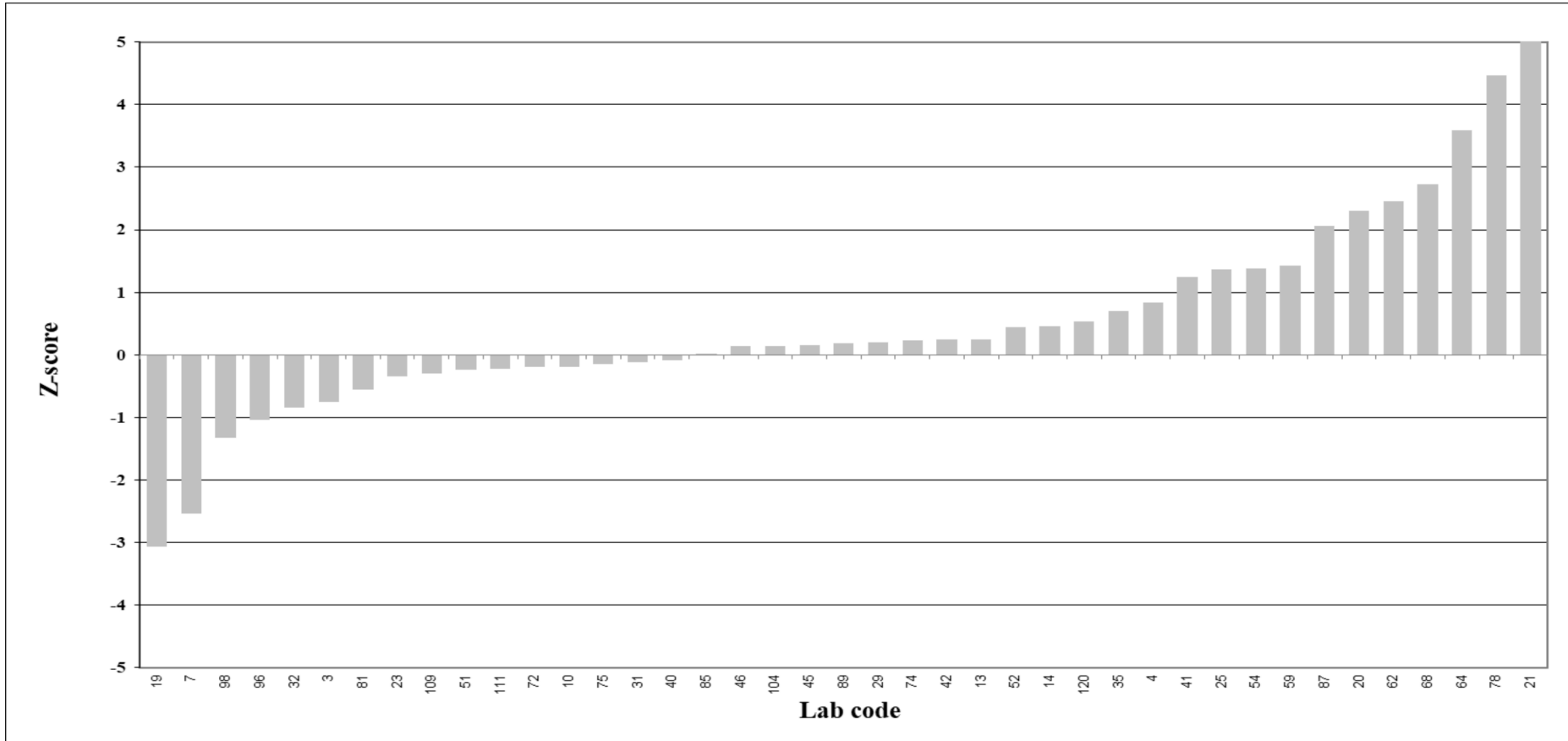
Z-score Veal, lipid weight; sum PBDE without PBDE-209



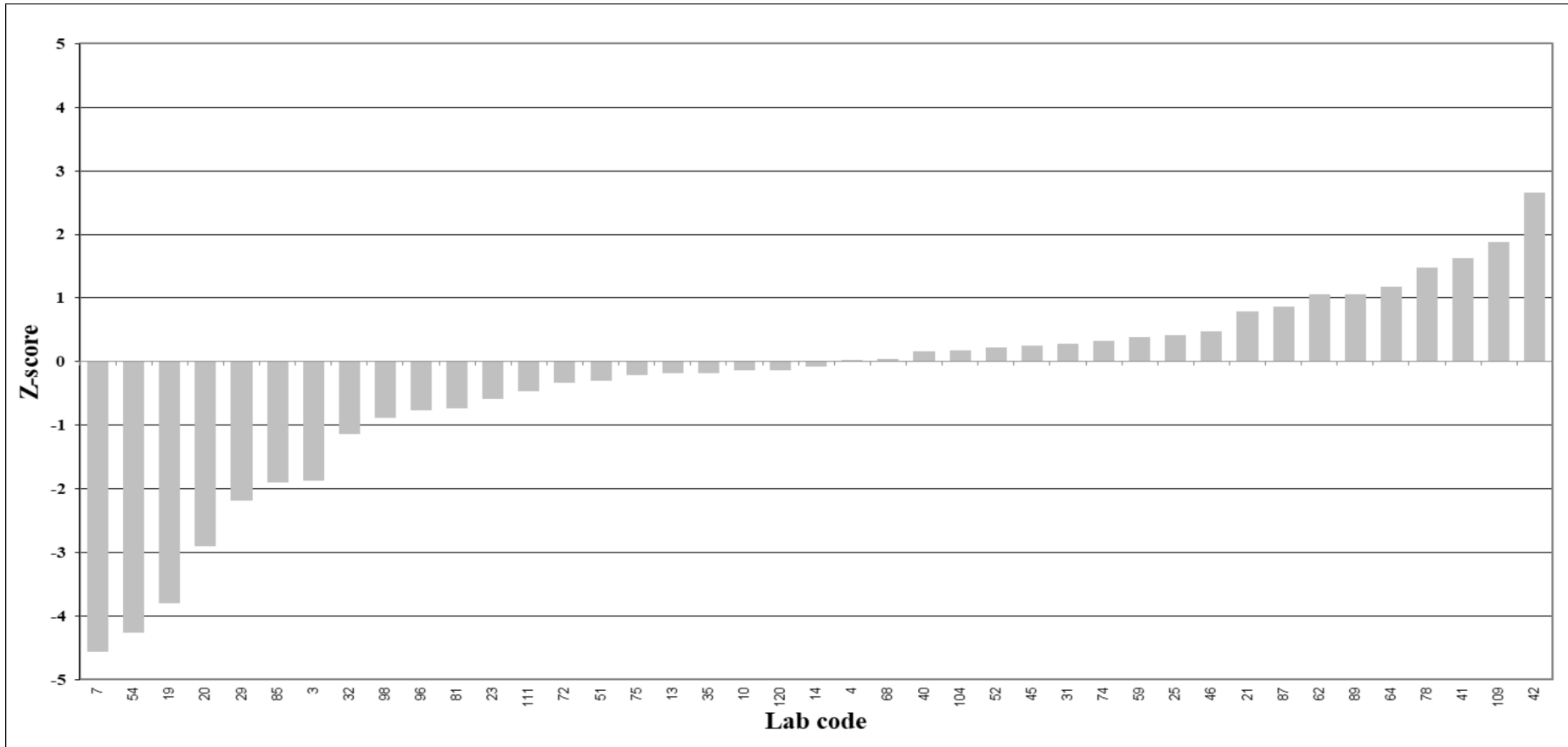
Z-score Halibut, fresh weight; total TEQ



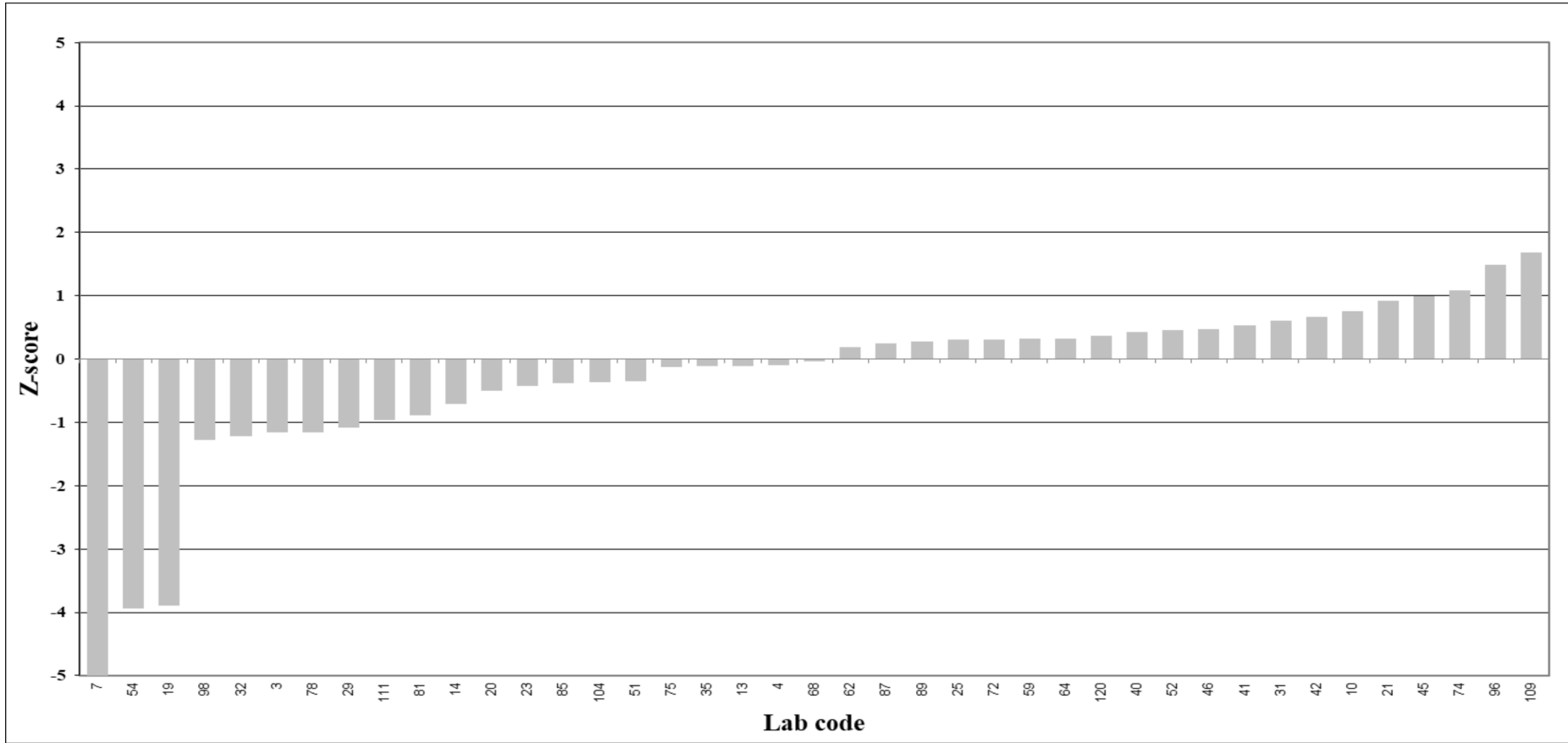
Z-score Halibut, fresh weight; PCDD/PCDF TEQ



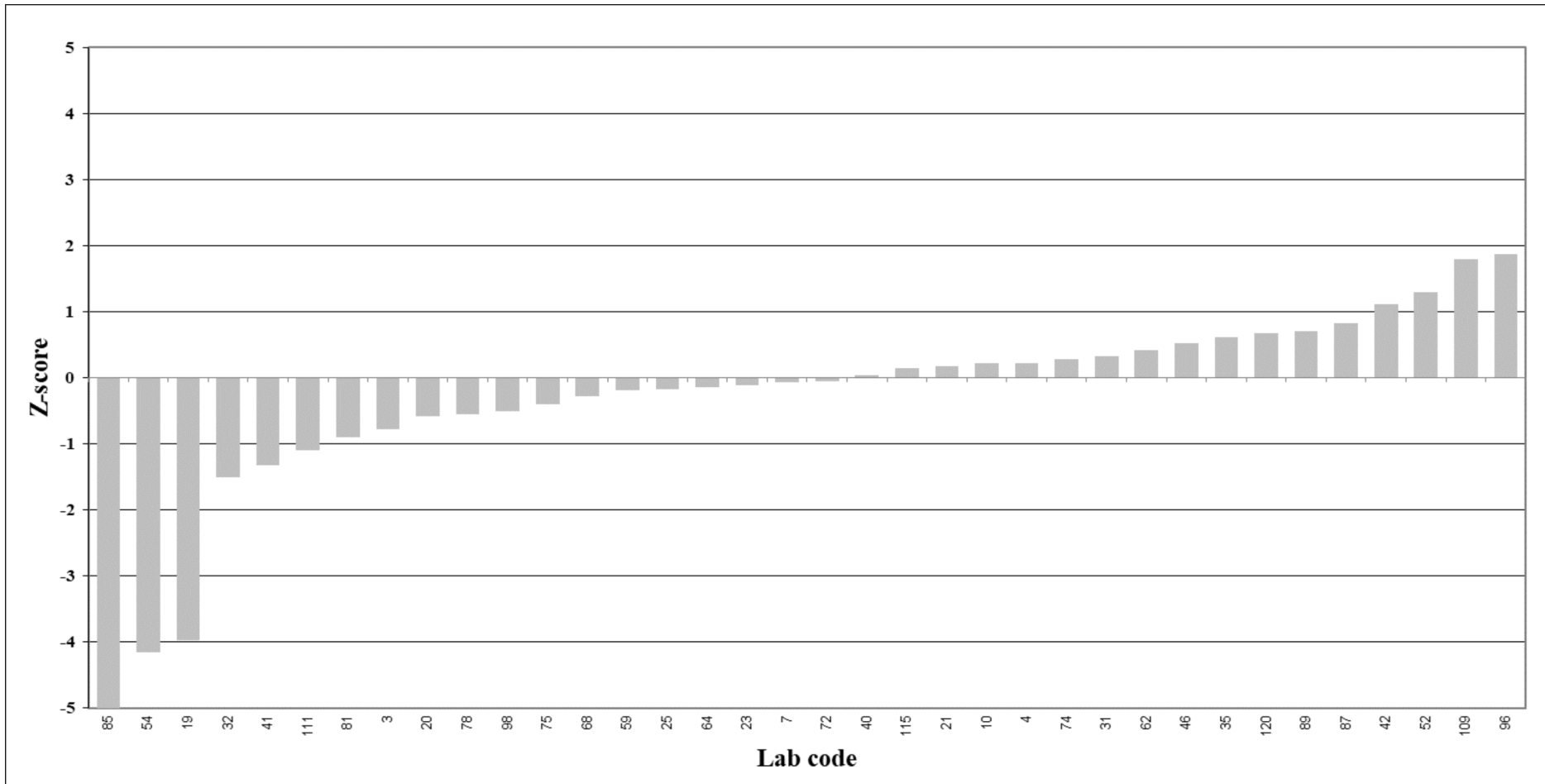
Z-score Halibut, fresh weight; non-ortho PCB TEQ



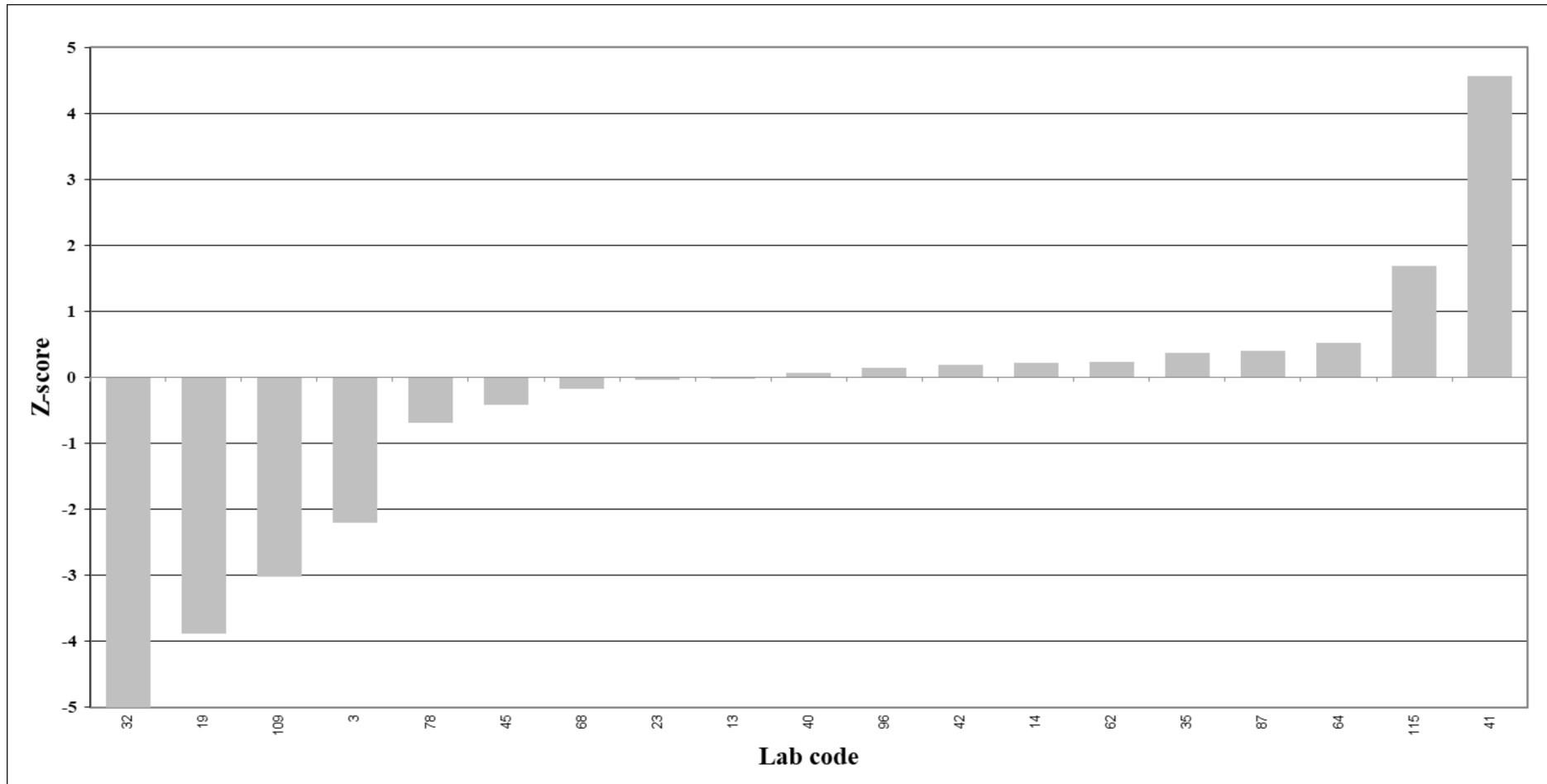
Z-score Halibut, fresh weight; mono-ortho PCB TEQ



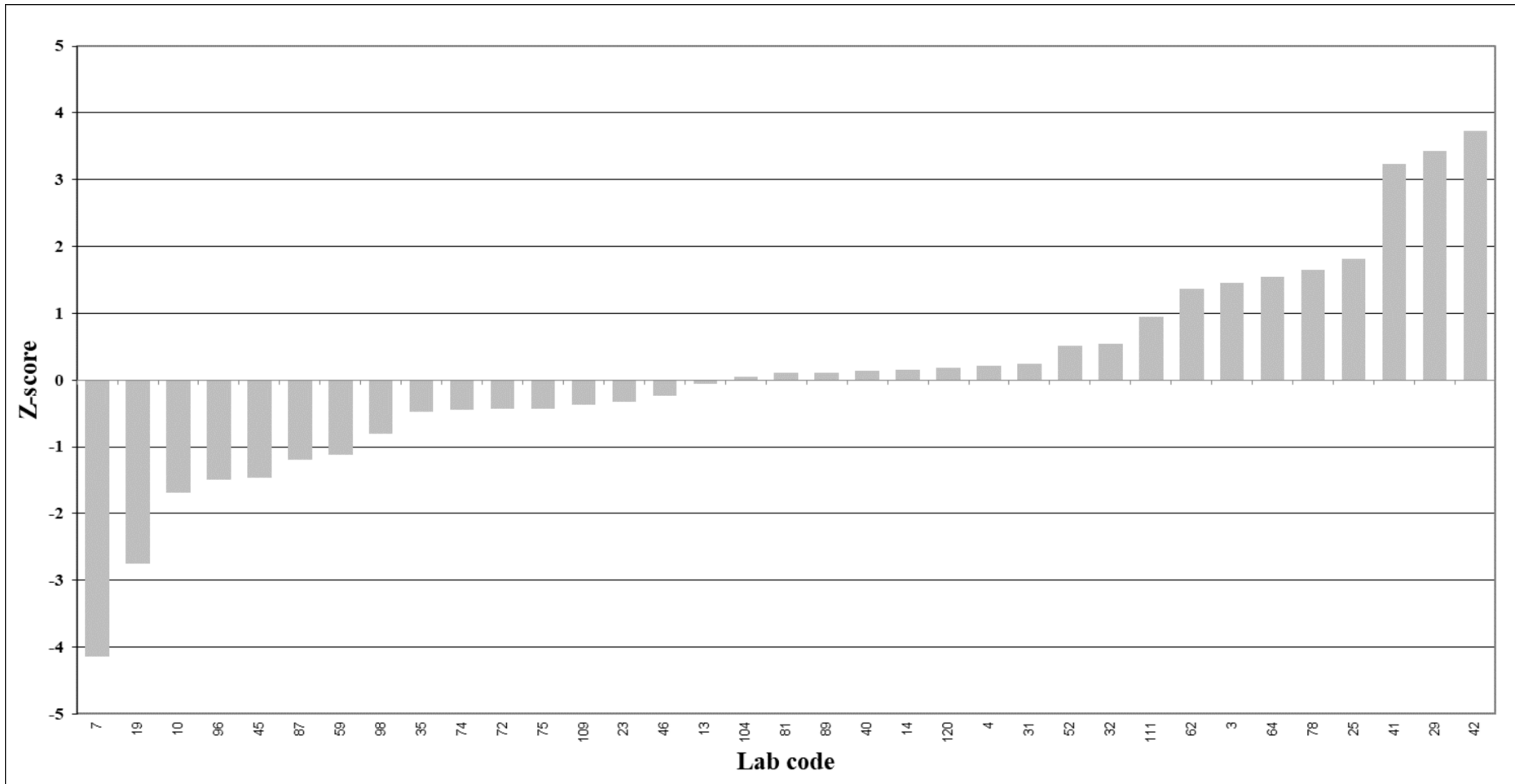
Z-score Halibut, fresh weight; sum indicator PCB



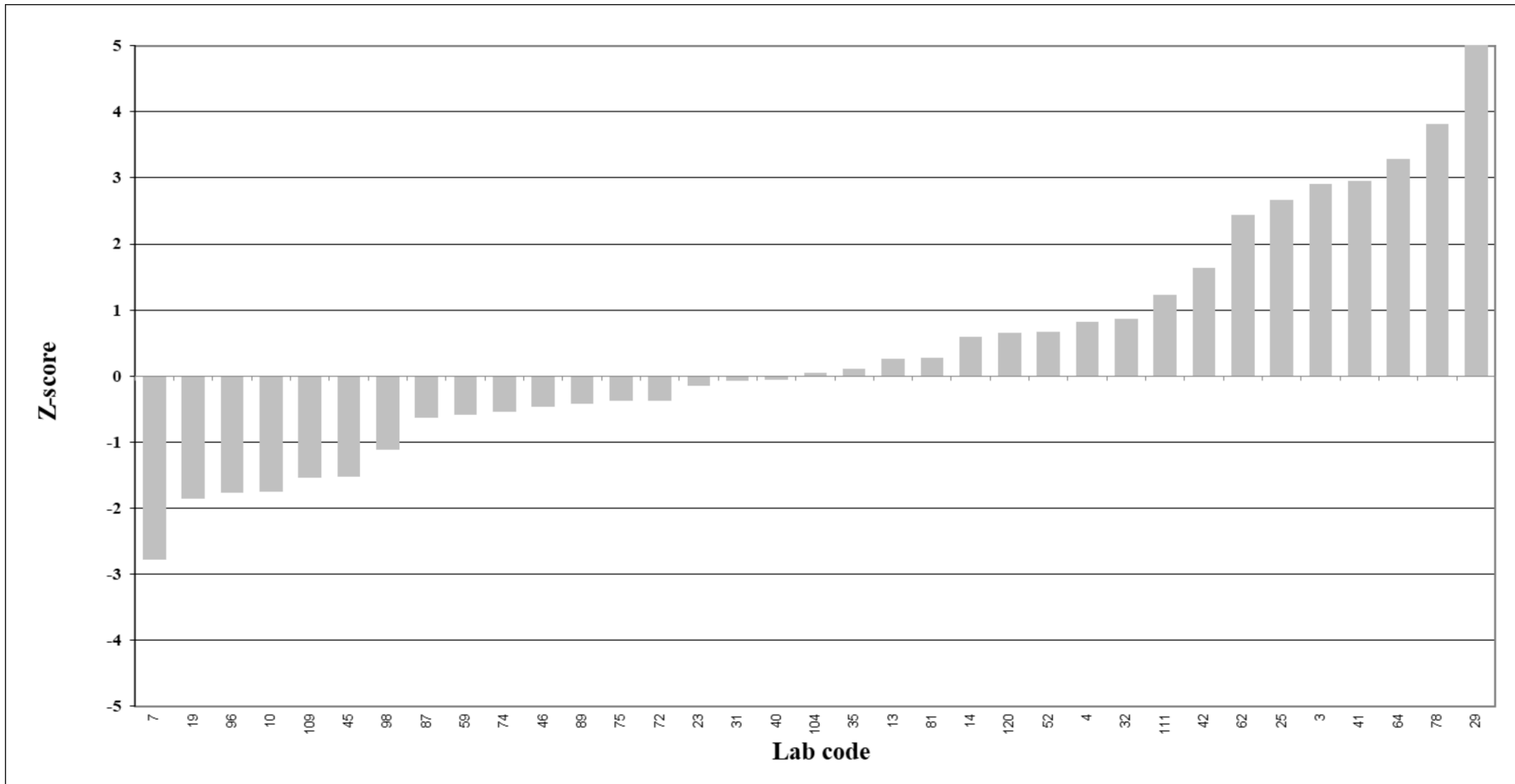
Z-score Halibut, fresh weight; sum PBDE without PBDE-209



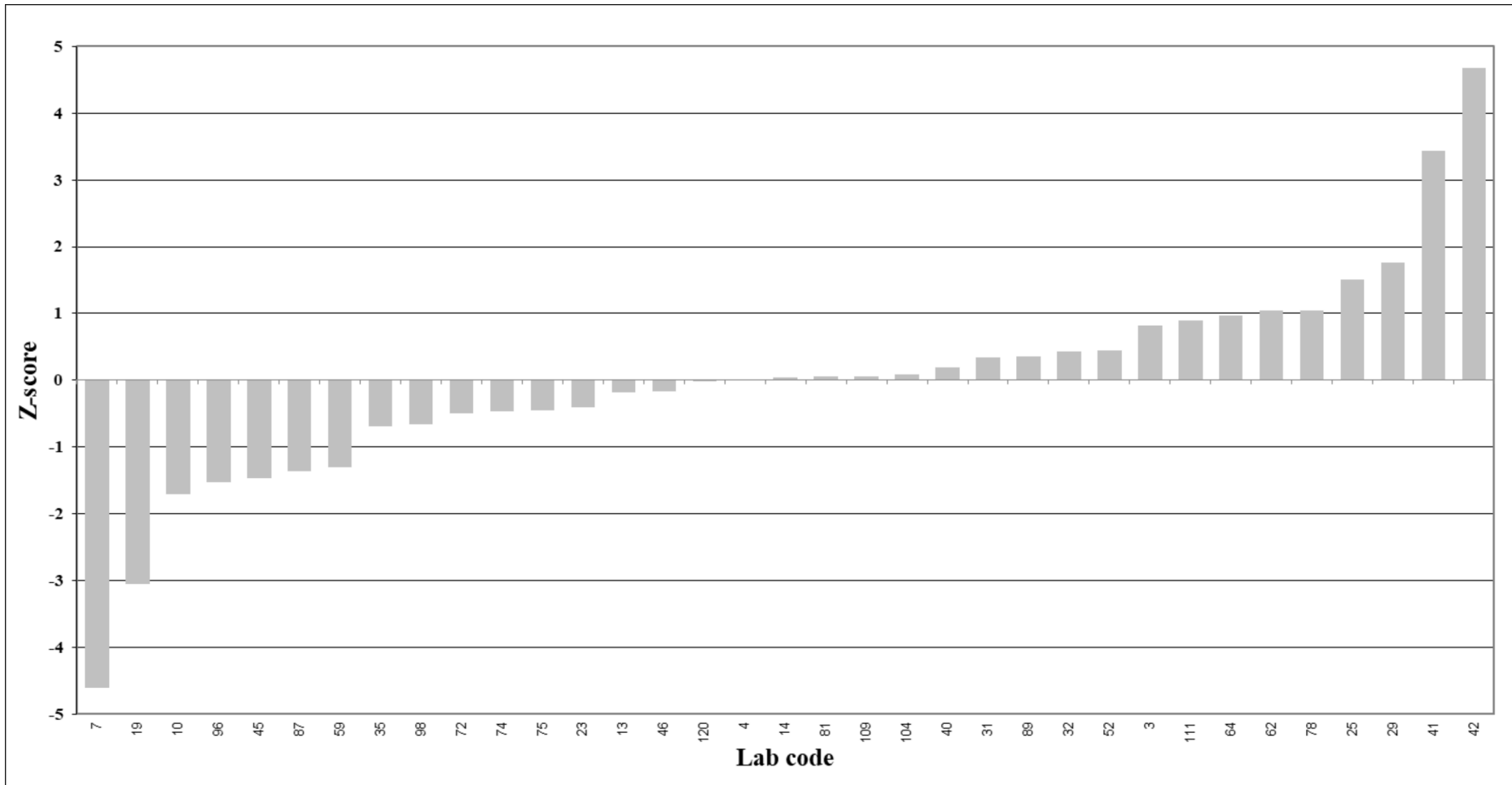
Z-score Halibut, lipid weight; total TEQ



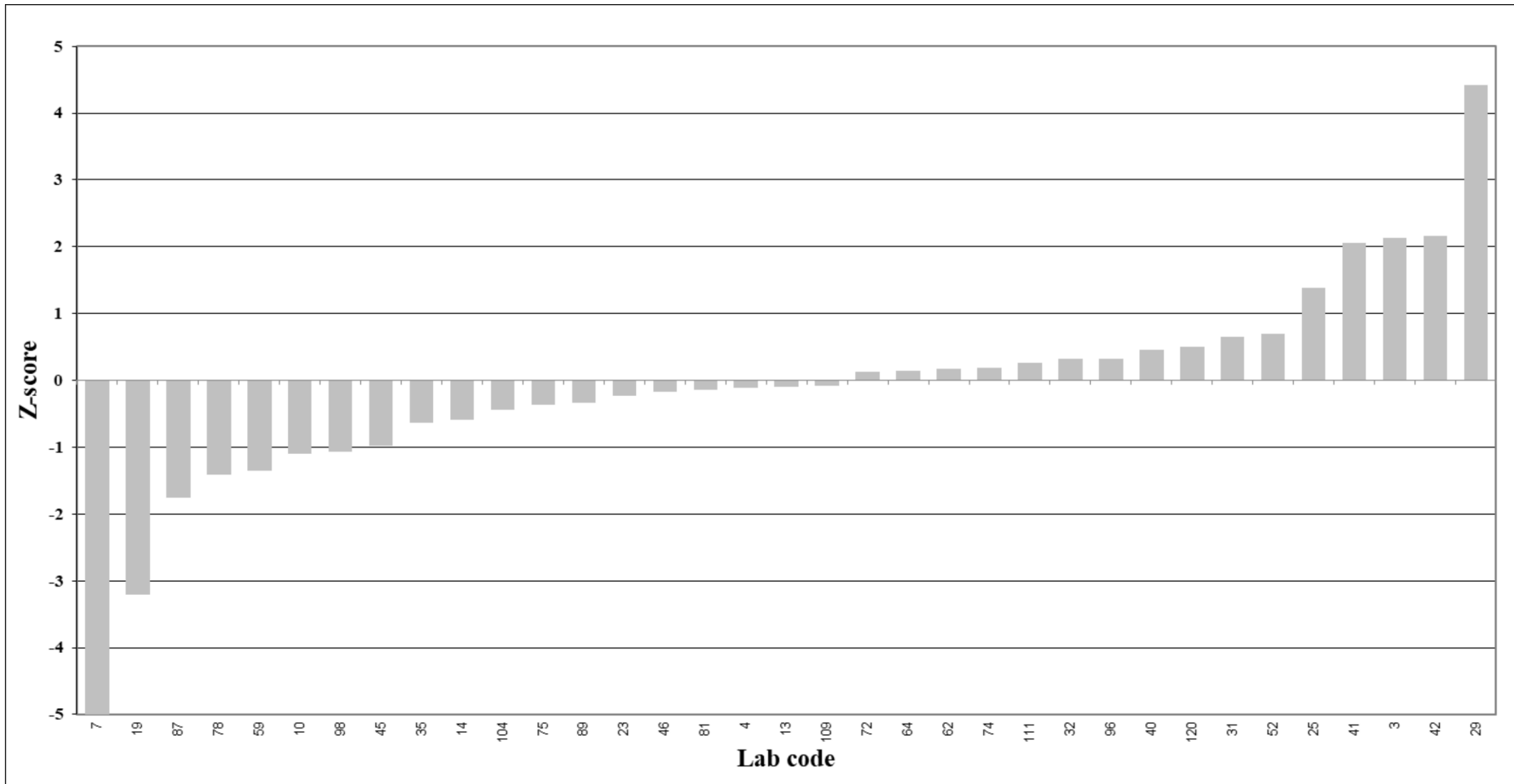
Z-score Halibut, lipid weight; PCDD/PCDF TEQ



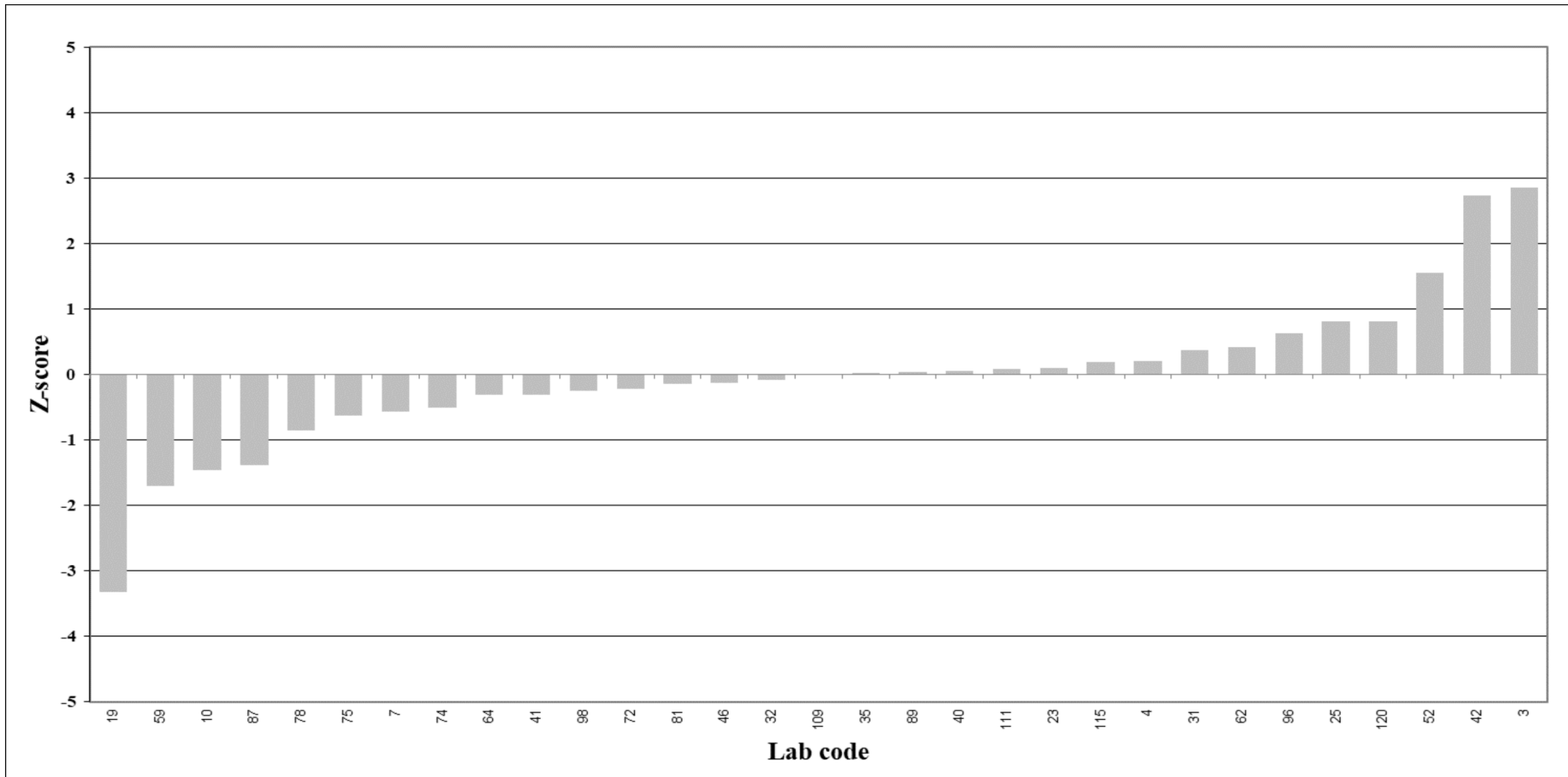
Z-score Halibut, lipid weight; non-ortho PCB TEQ



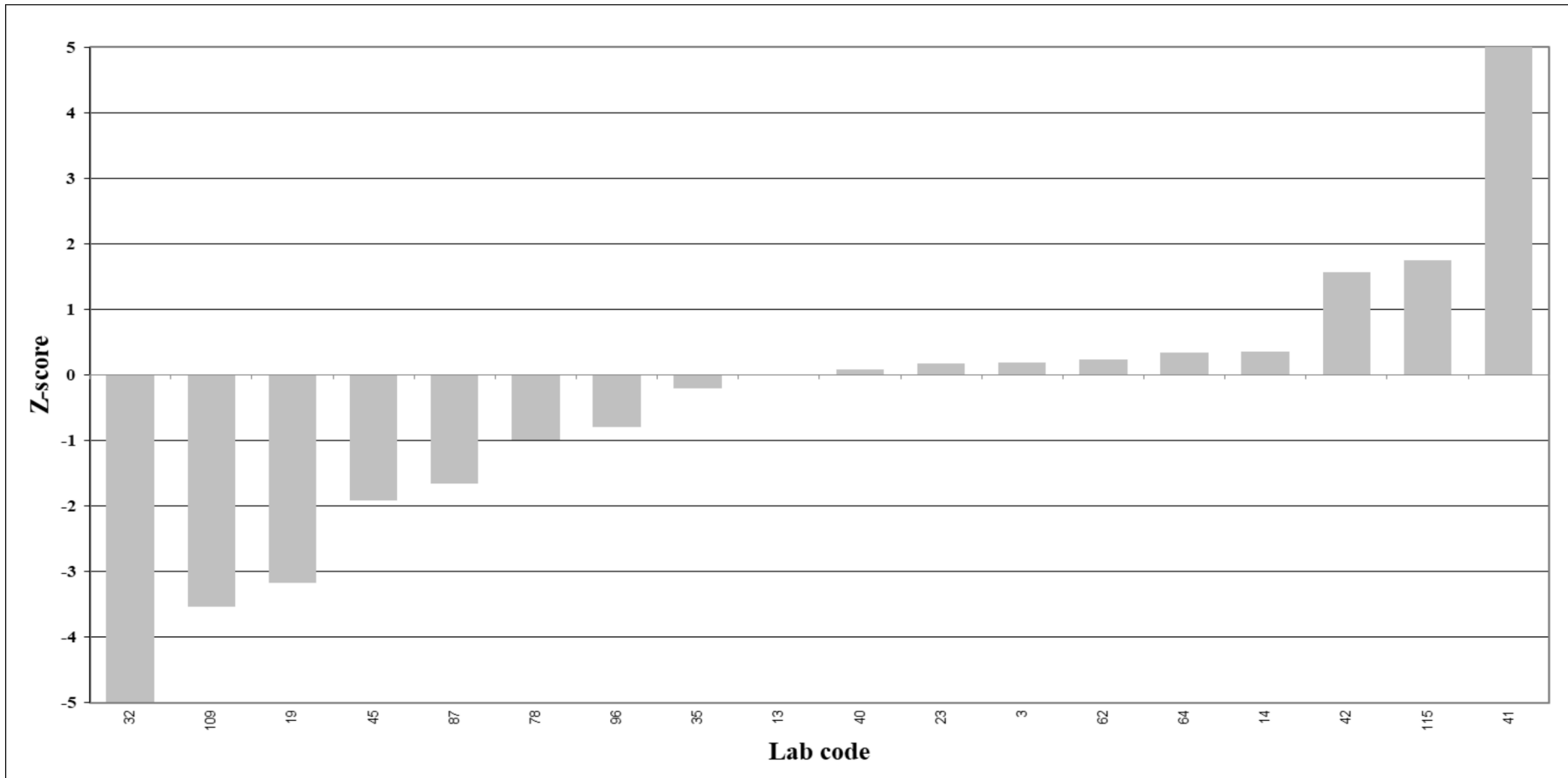
Z-score Halibut, lipid weight; mono-ortho PCB TEQ



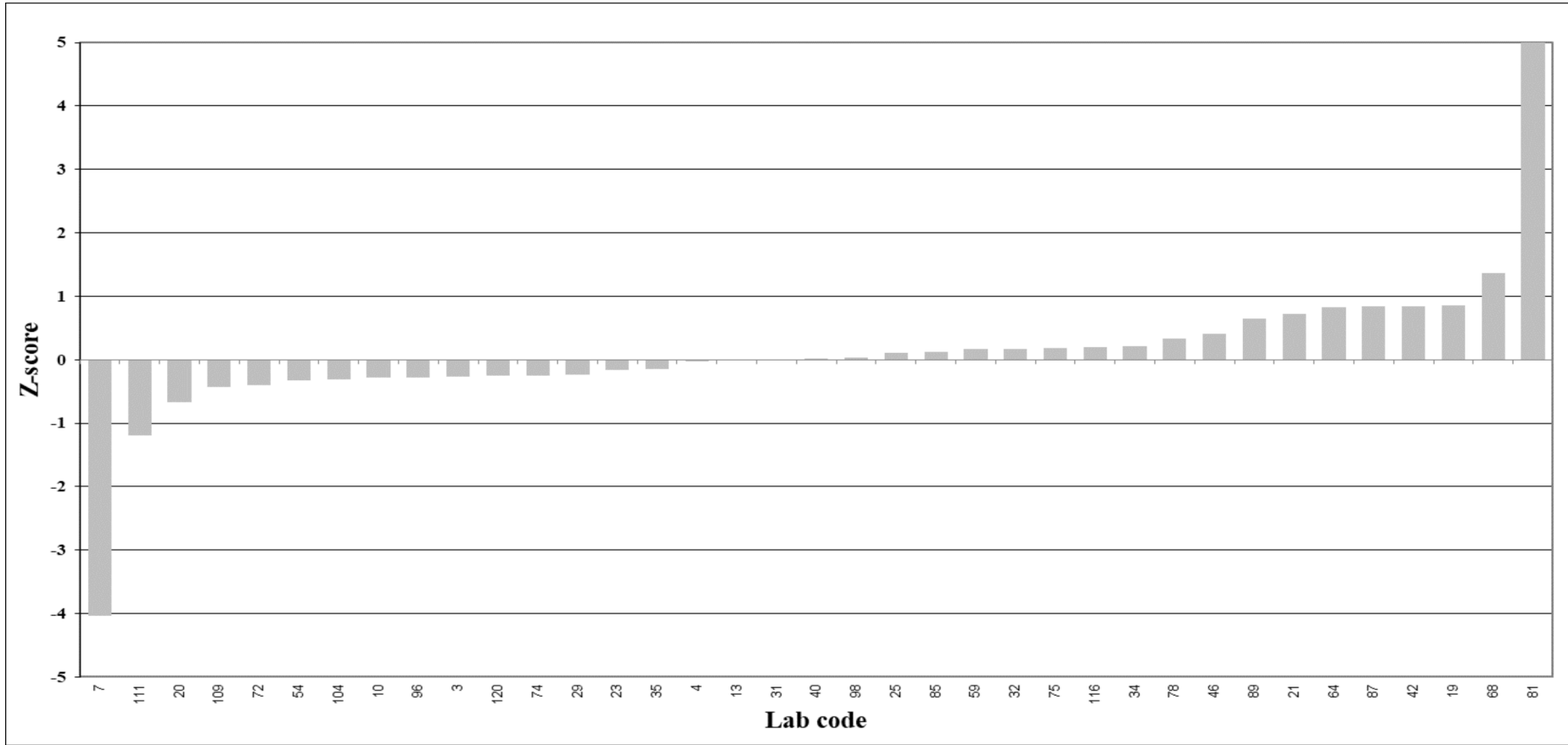
Z-score Halibut, lipid weight; sum indicator PCB



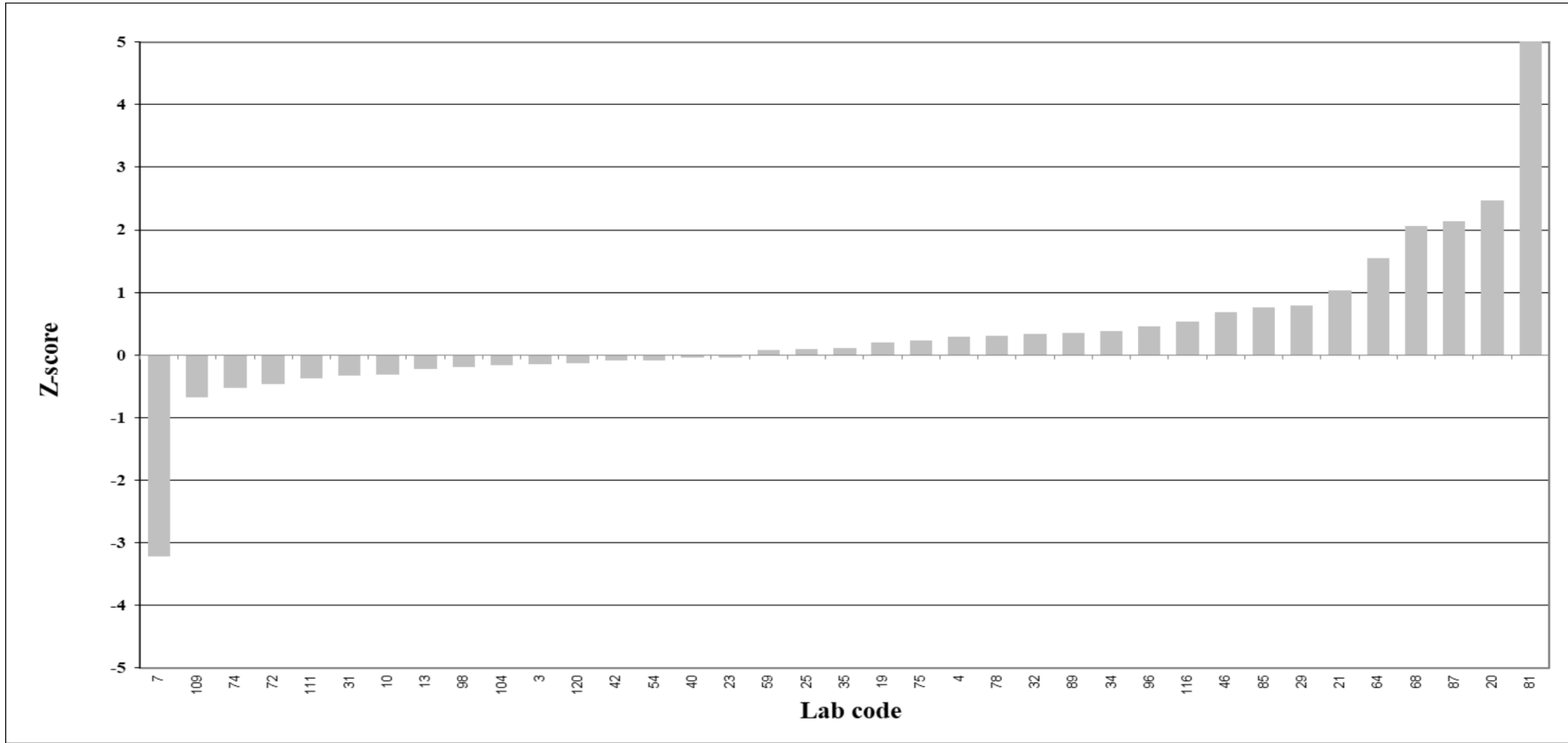
Z-score Halibut, lipid weight; sum PBDE without PBDE-209



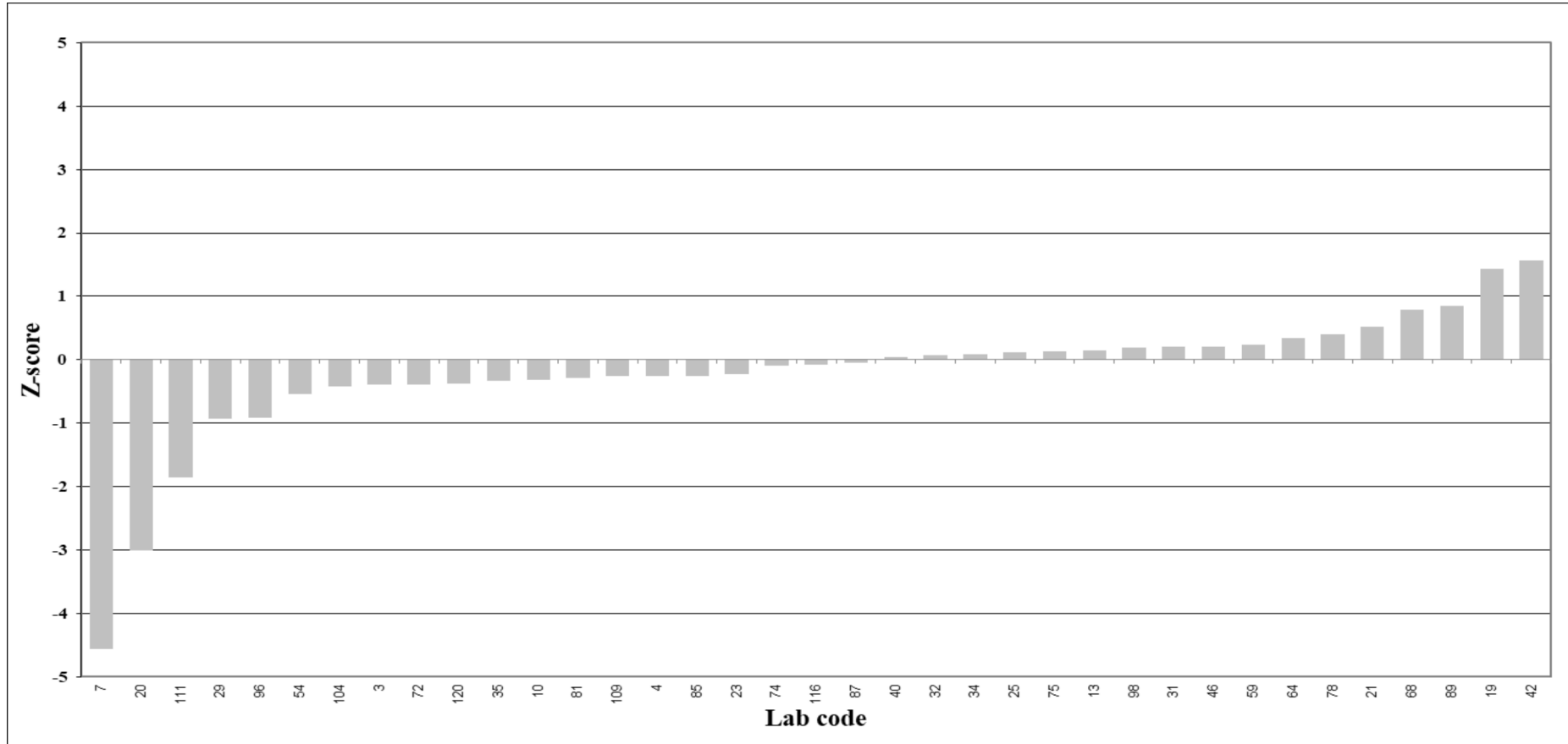
Z-score Fish oil, fresh weight; total TEQ



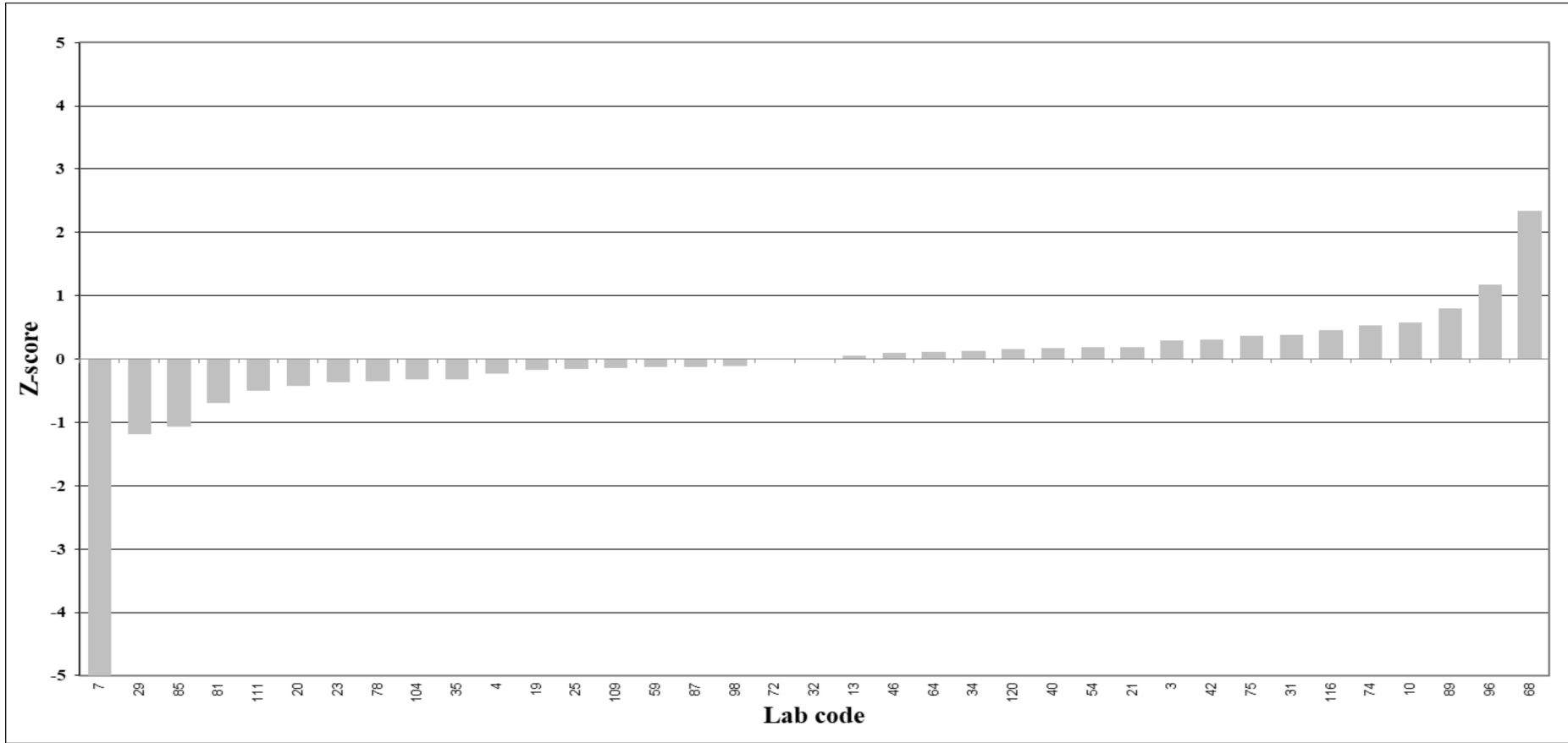
Z-score Fish oil, fresh weight; PCDD/PCDF TEQ



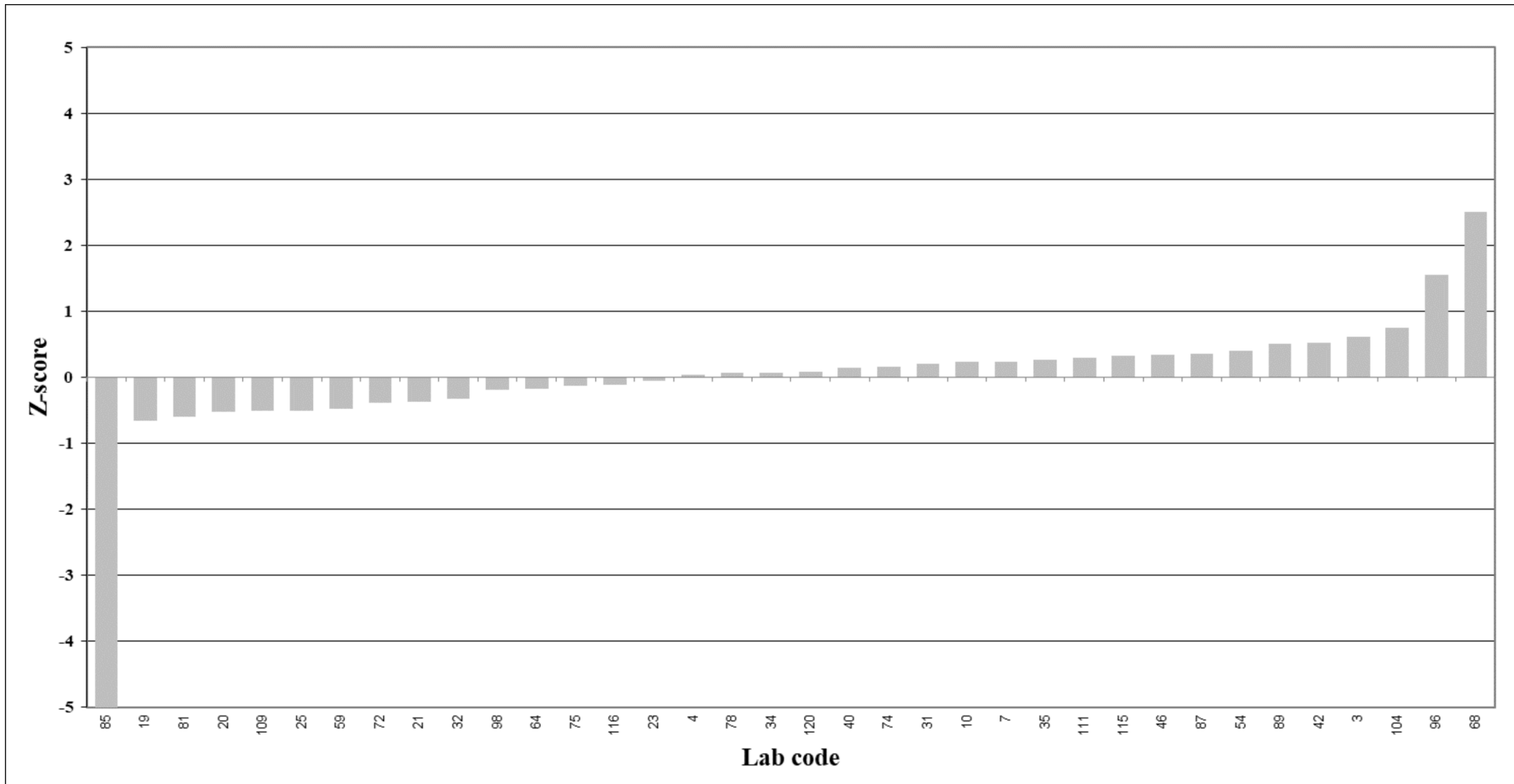
Z-score Fish oil, fresh weight; non-ortho PCB TEQ



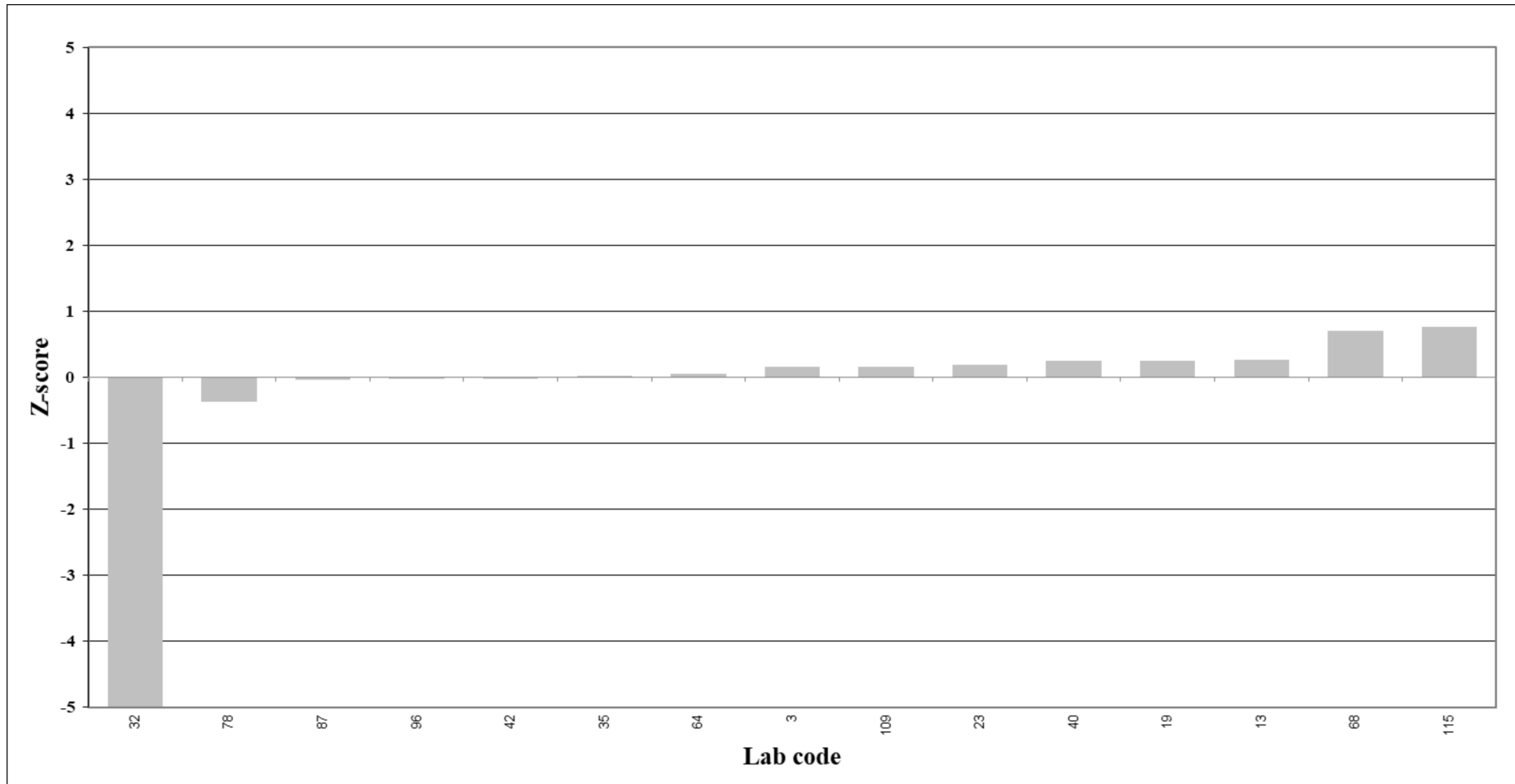
Z-score Fish oil; mono-ortho PCB TEQ



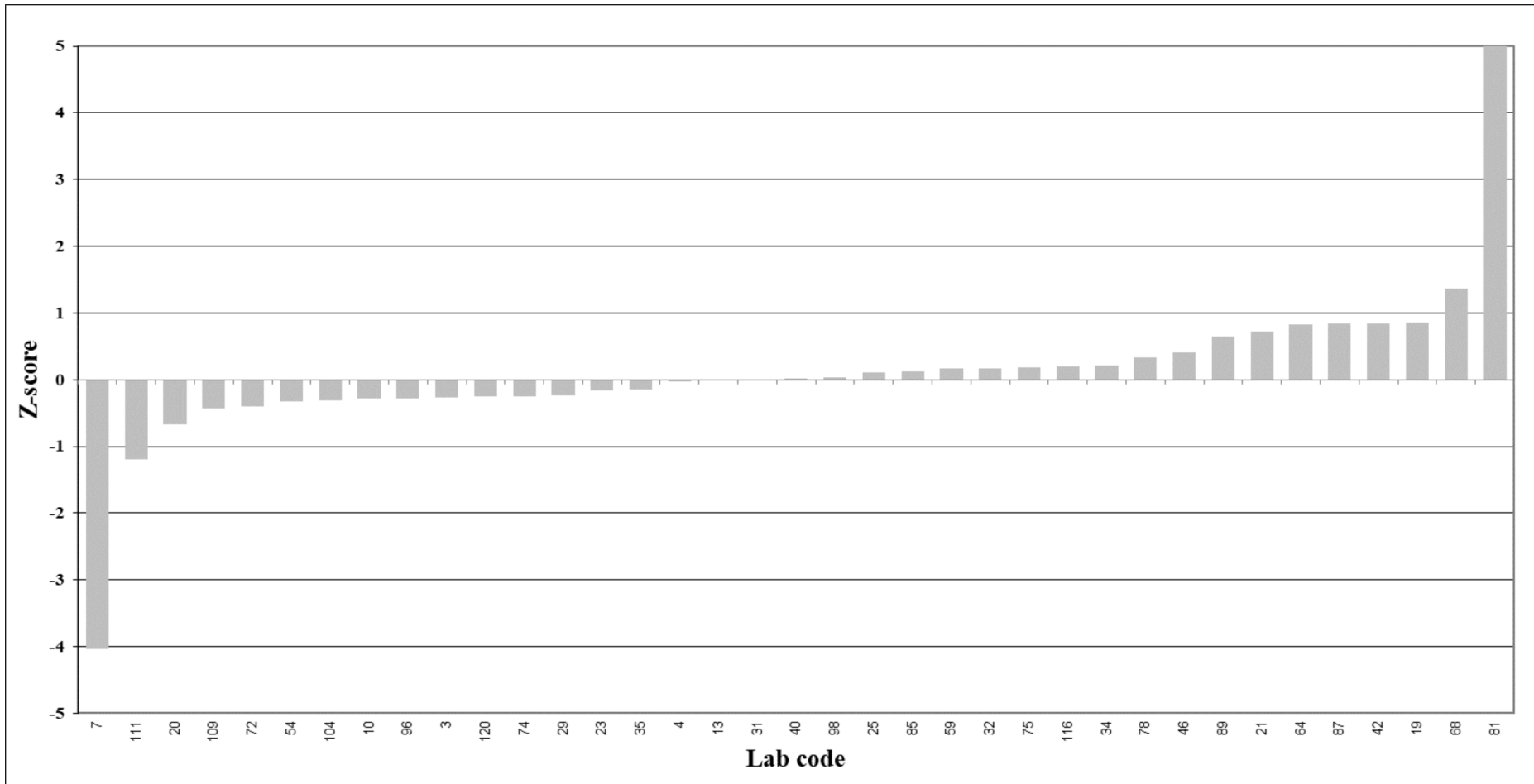
Z-score Fish oil, fresh weight; sum indicator PCB



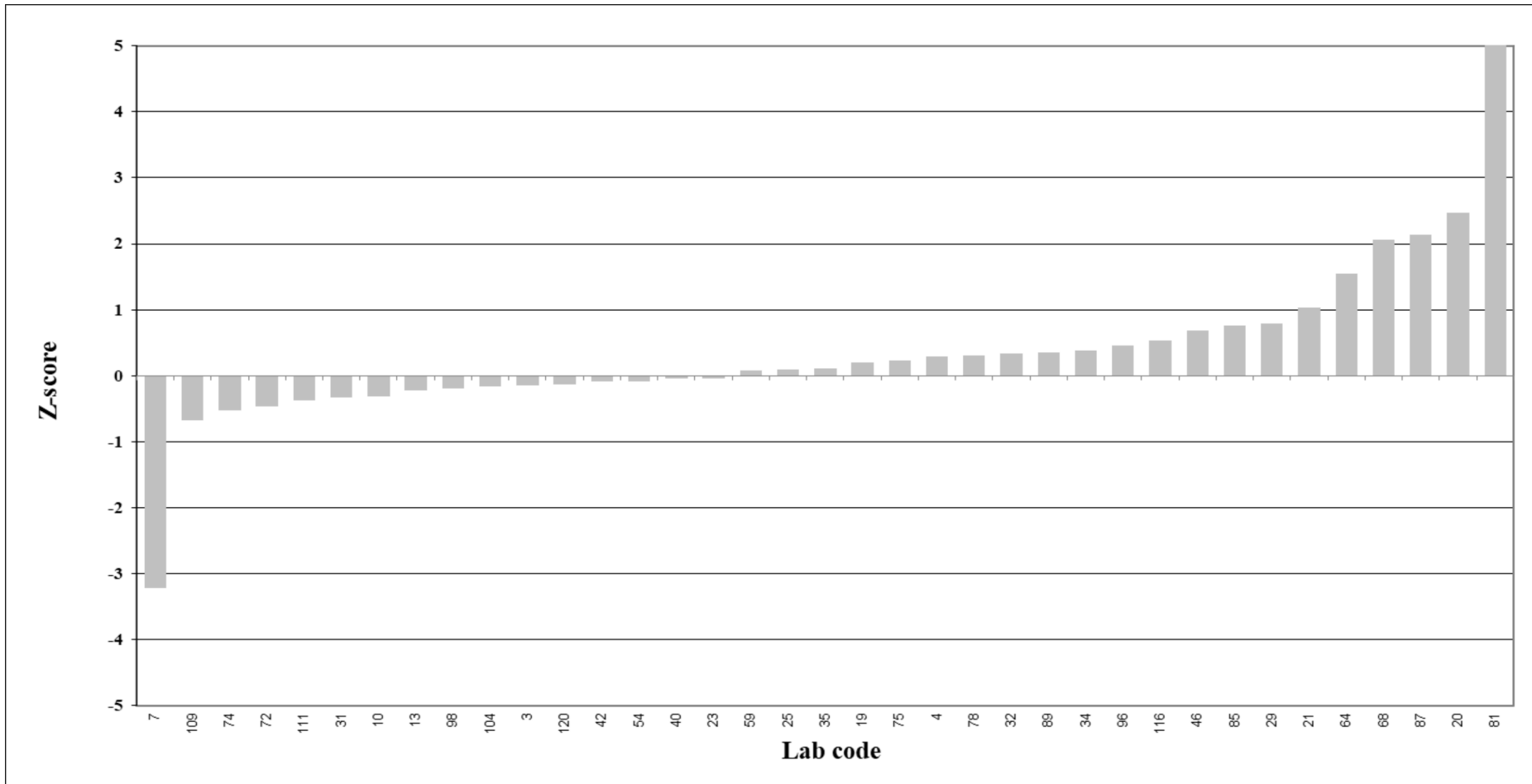
Z-score Fish oil, fresh weight; sum PBDE without PBDE-209



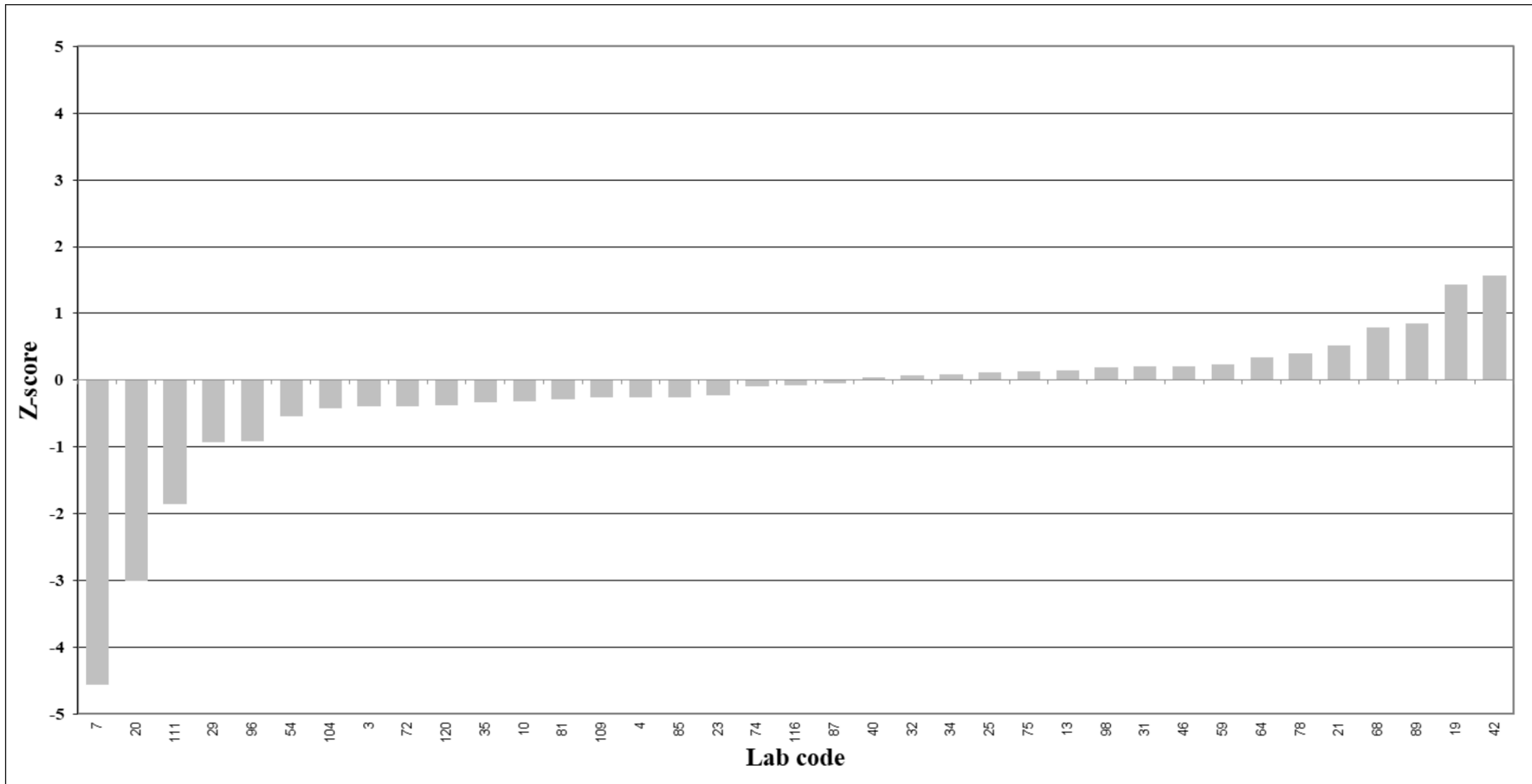
Z-score Fish oil, lipid weight; total TEQ



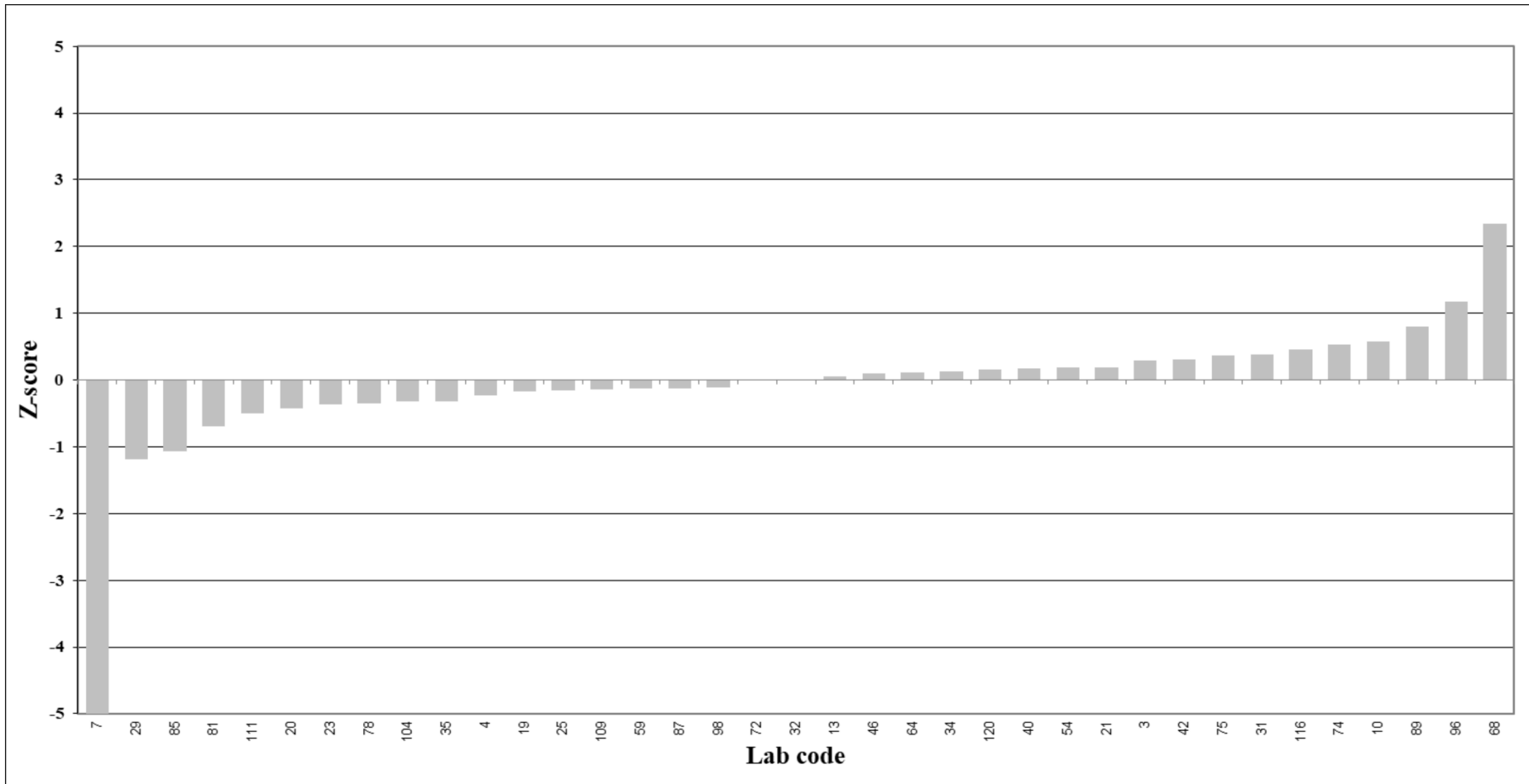
Z-score Fish oil, lipid weight; PCDD/PCDF TEQ



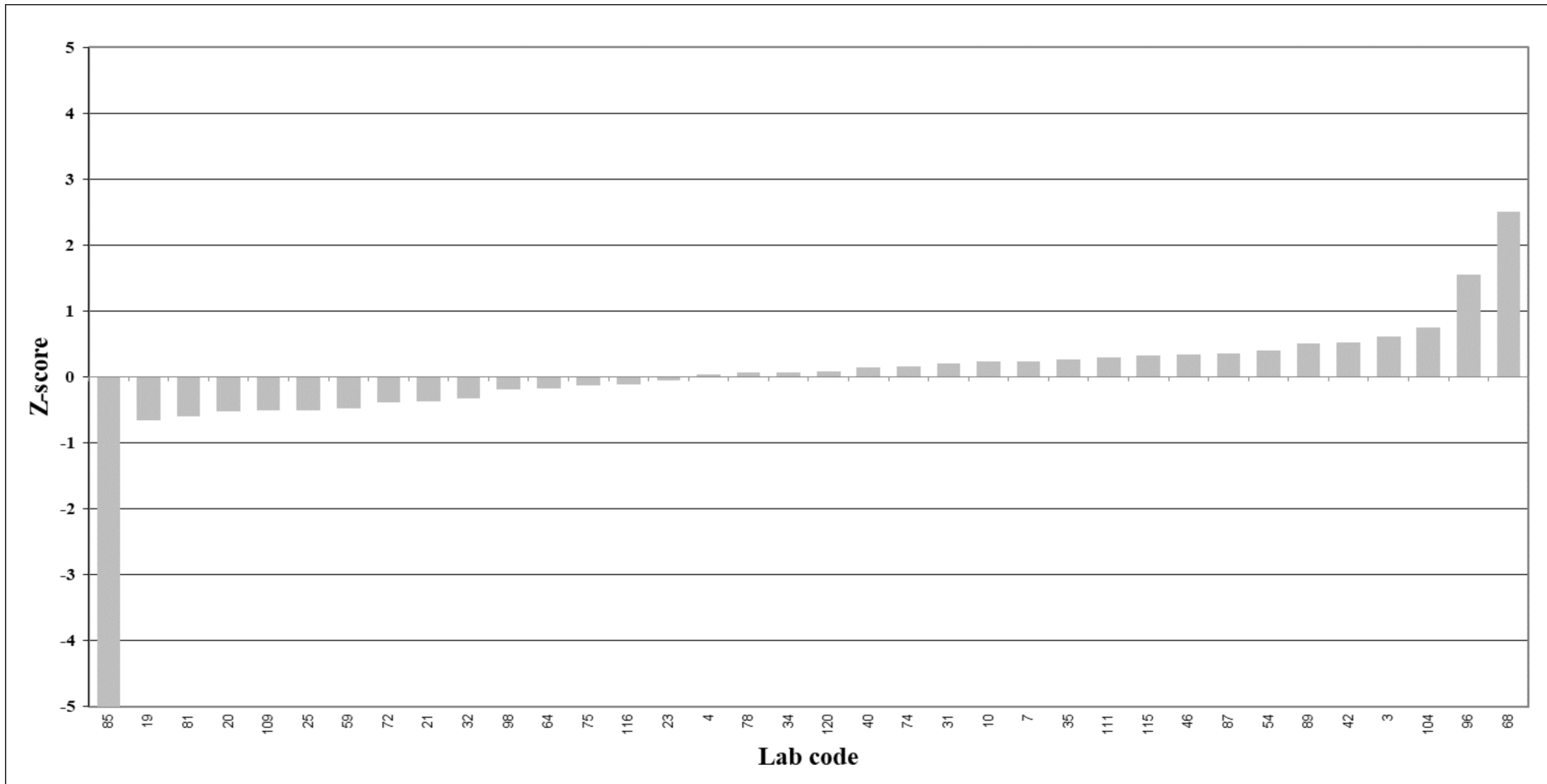
Z-score Fish oil, lipid weight; non-ortho PCB TEQ



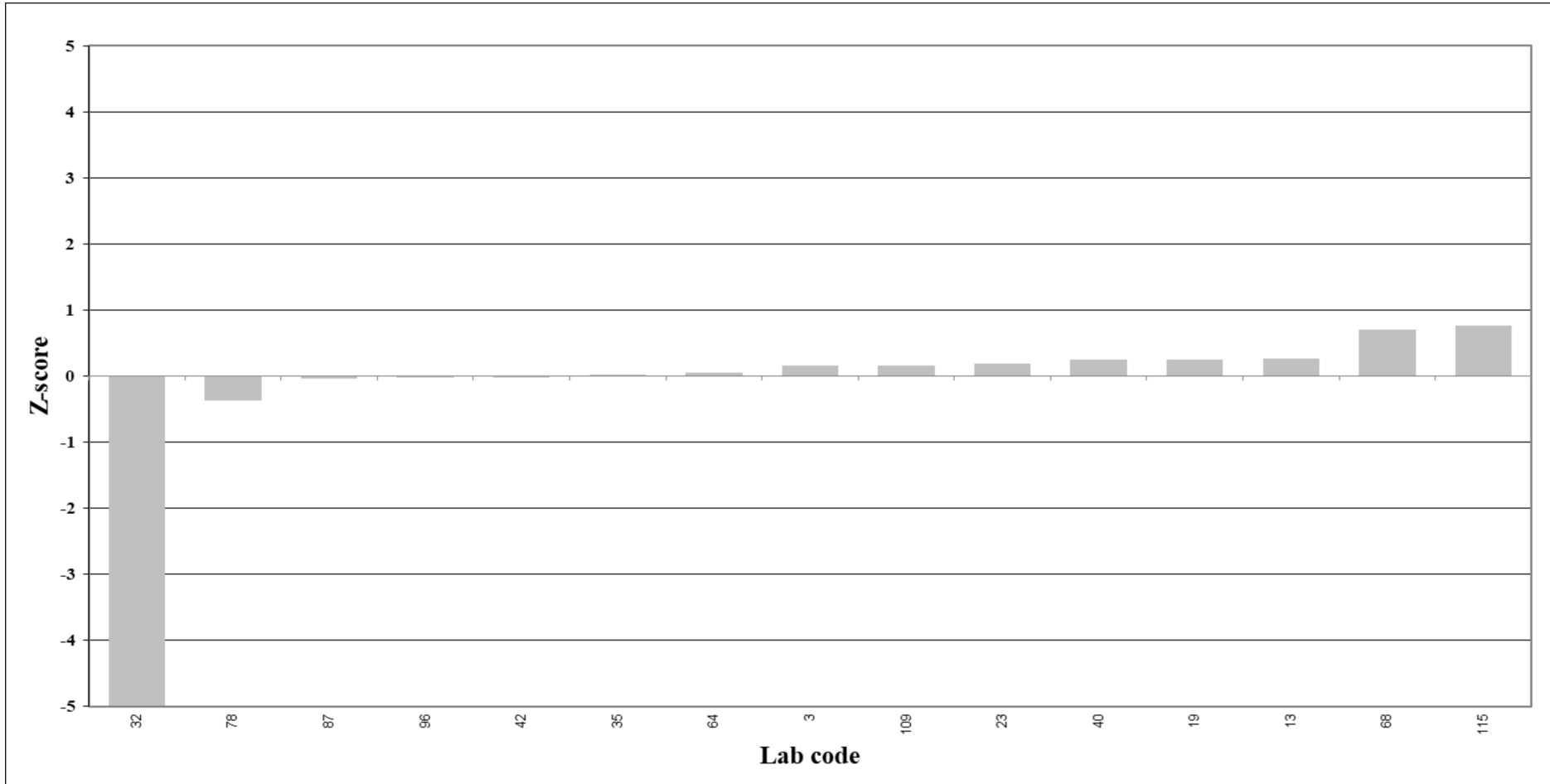
Z-score Fish oil, lipid weight; mono-ortho PCB TEQ



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

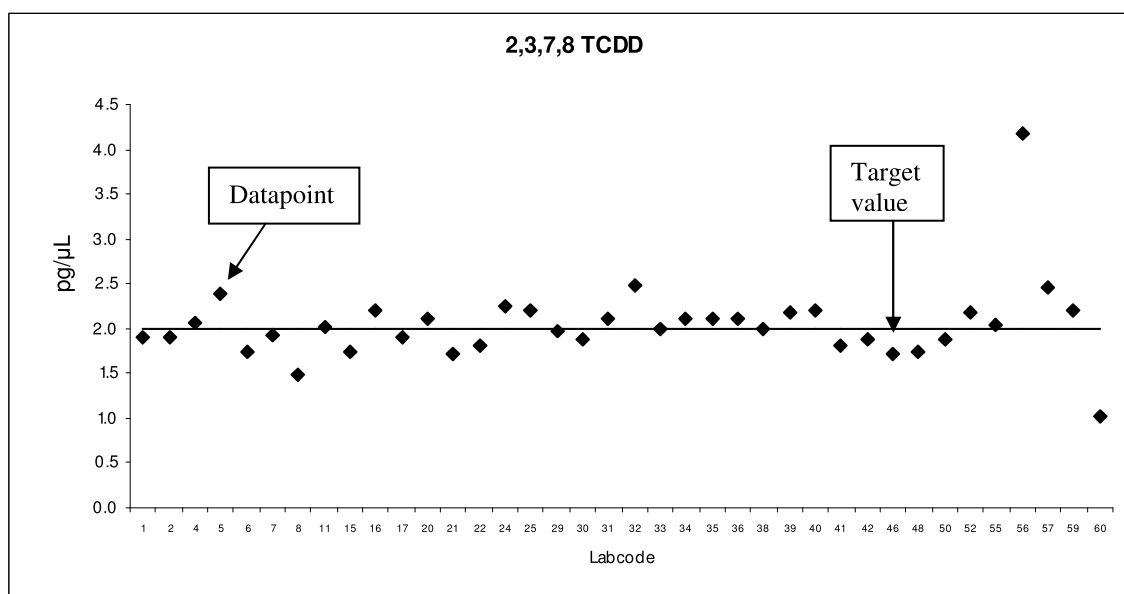
- PCDDs/PCDFs at concentrations of 2:5:10 pg/ μ l for tetra:penta-hexa-hepta:octa chlorinated dibenzodioxins/furans respectively.
- Non-ortho PCBs at concentration of 10 pg/ μ l.
- Mono-ortho PCBs and indicator PCBs at concentration of 100 pg/ μ l.
- PBDE at a concentration of 25 pg/ μ l, except BDE-209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

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 $\pm 20\%$ from the consensus value.

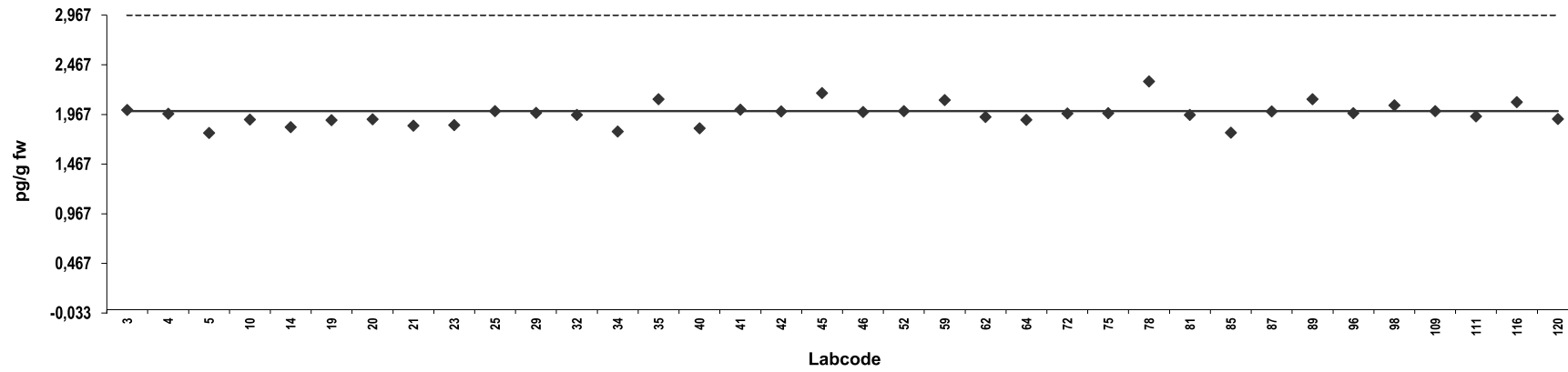
Analyte solution
Congener: 2,3,7,8-TCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	2,0	0,082					
4	2,0	-0,0081					
5	1,8	-0,50					
10	1,9	-0,16					
14	1,8	-0,35					
19	1,9	-0,17					
20	1,9	-0,15					
21	1,9	-0,31					
23	1,9	-0,30					
25	2,0	0,056					
29	2,0	0,013					
32	2,0	-0,045					
34	1,8	-0,47					
35	2,1	0,36					
40	1,8	-0,38					
41	2,0	0,092					
42	2,0	0,046					
45	2,2	0,51					
46	2,0	0,034					
52	2,0	0,06					
59	2,1	0,33					
62	1,9	-0,095					
64	1,9	-0,17					
72	2,0	-0,0058					
75	2,0	0,0068					
78	2,3	0,81					
81	2,0	-0,045					
85	1,8	-0,49					
87	2,0	0,048					
89	2,1	0,36					
96	2,0	0,0058					
98	2,1	0,21					
109	2,0	0,053					
111	1,9	-0,078					
116	2,1	0,28					
120	1,9	-0,15					

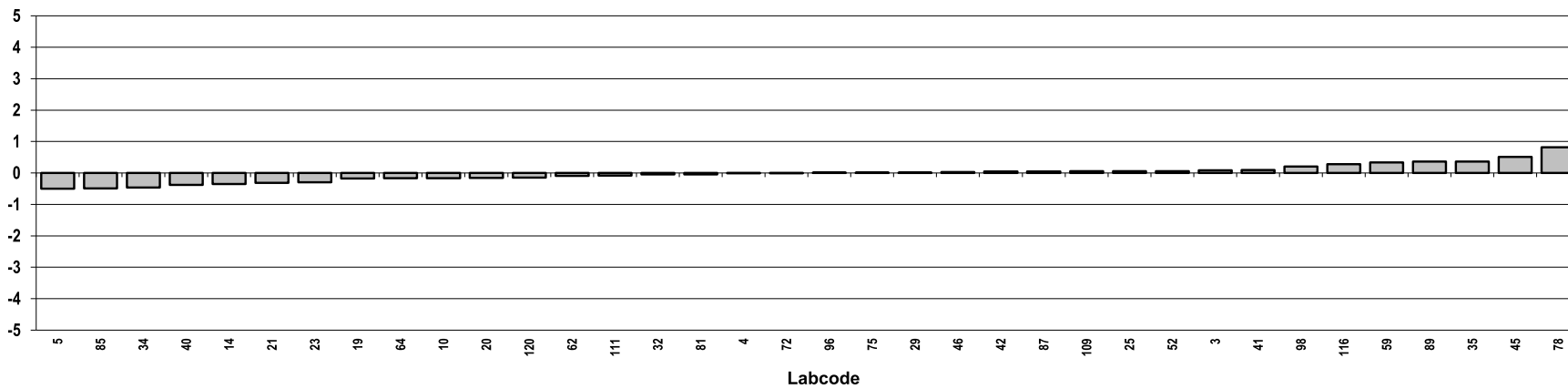
Consensus statistics

Consensus median, pg/g	2,0
Median all values pg/g	2,0
Consensus mean, pg/g	2,0
Standard deviation, pg/g	0,11
Relative standard deviation, %	5,6
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

2,3,7,8-TCDD



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



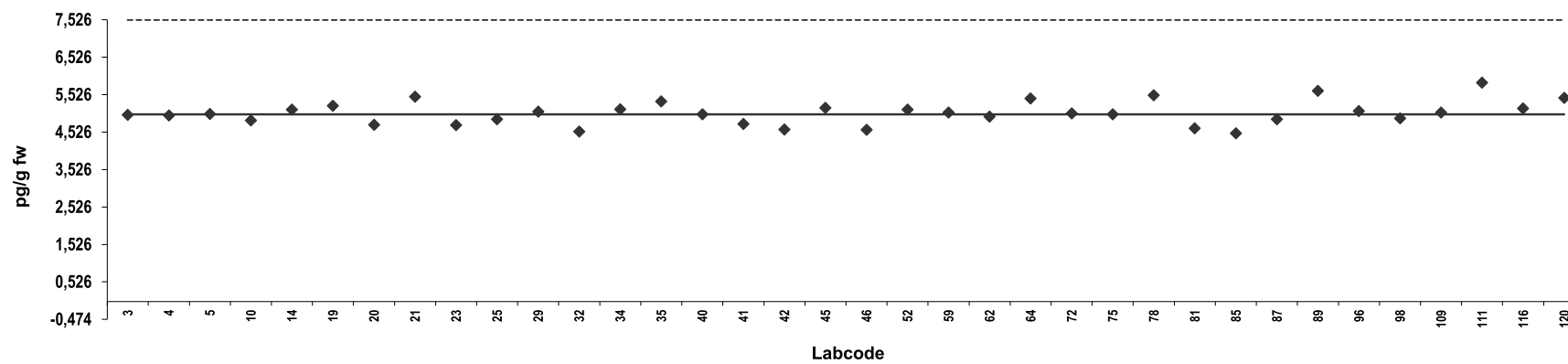
Analyte solution
Congener: 1,2,3,7,8-PeCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	5,0	-0,027					
4	5,0	-0,047					
5	5,0	-0,0073					
10	4,8	-0,18					
14	5,1	0,11					
19	5,2	0,21					
20	4,7	-0,29					
21	5,5	0,45					
23	4,7	-0,31					
25	4,9	-0,15					
29	5,1	0,052					
32	4,5	-0,48					
34	5,1	0,11					
35	5,3	0,32					
40	5,0	-0,012					
41	4,7	-0,27					
42	4,6	-0,42					
45	5,2	0,16					
46	4,6	-0,43					
52	5,1	0,11					
59	5,1	0,033					
62	4,9	-0,077					
64	5,4	0,41					
72	5,0	0,0073					
75	5,0	-0,018					
78	5,5	0,49					
81	4,6	-0,39					
85	4,5	-0,52					
87	4,9	-0,15					
89	5,6	0,61					
96	5,1	0,072					
98	4,9	-0,13					
109	5,1	0,034					
111	5,8	0,83					
116	5,2	0,14					
120	5,4	0,42					

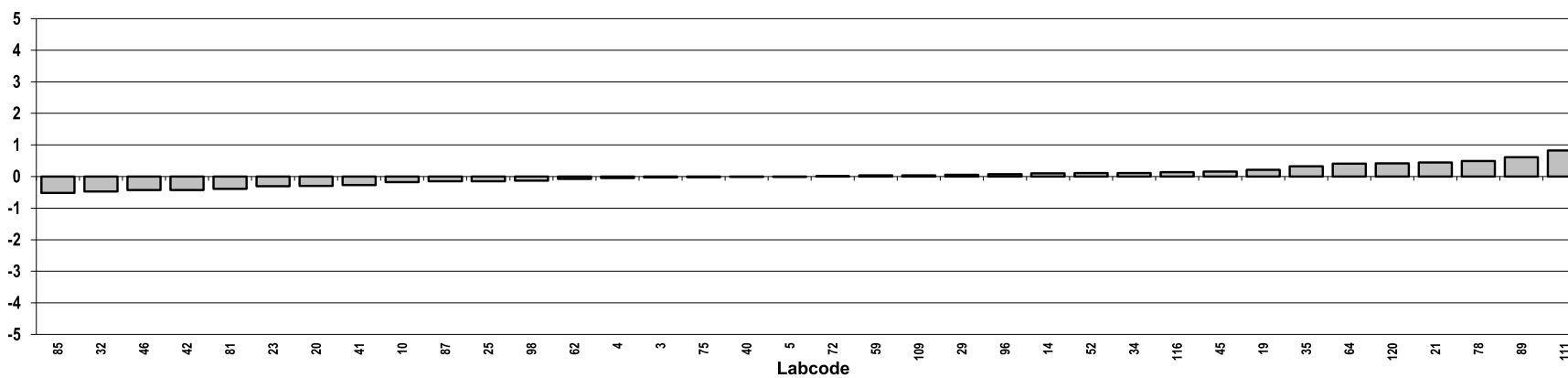
Consensus statistics

Consensus median, pg/g	5,0
Median all values pg/g	5,0
Consensus mean, pg/g	5,0
Standard deviation, pg/g	0,31
Relative standard deviation, %	6,2
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

1,2,3,7,8-PeCDD



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



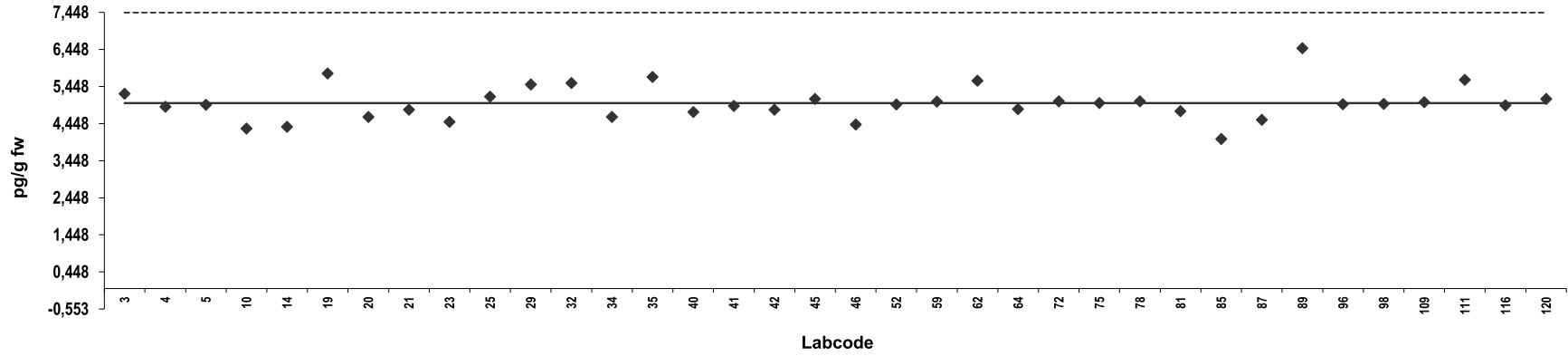
Analyte solution
Congener: 1,2,3,4,7,8-HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	5,3	0,29					
4	4,9	-0,064					
5	5,0	-0,0064					
10	4,3	-0,66					
14	4,4	-0,61					
19	5,8	0,84					
20	4,6	-0,34					
21	4,8	-0,15					
23	4,5	-0,48					
25	5,2	0,21					
29	5,5	0,54					
32	5,5	0,58					
34	4,6	-0,34					
35	5,7	0,74					
40	4,8	-0,21					
41	4,9	-0,043					
42	4,8	-0,14					
45	5,1	0,15					
46	4,4	-0,54					
52	5,0	-0,0050					
59	5,0	0,076					
62	5,6	0,64					
64	4,8	-0,13					
72	5,1	0,088					
75	5,0	0,037					
78	5,1	0,086					
81	4,8	-0,19					
85	4,0	-0,94					
87	4,5	-0,42					
89	6,5	1,5					
96	5,0	0,0050					
98	5,0	0,014					
109	5,0	0,062					
111	5,6	0,66					
116	4,9	-0,025					
120	5,1	0,15					

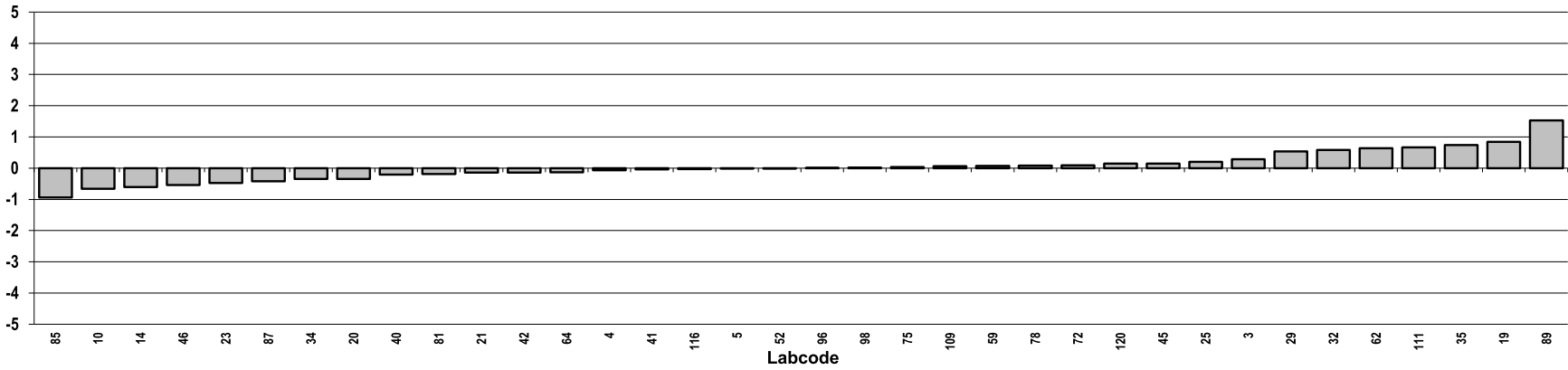
Consensus statistics

Consensus median, pg/g	5,0
Median all values pg/g	5,0
Consensus mean, pg/g	5,0
Standard deviation, pg/g	0,47
Relative standard deviation, %	9,5
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

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



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



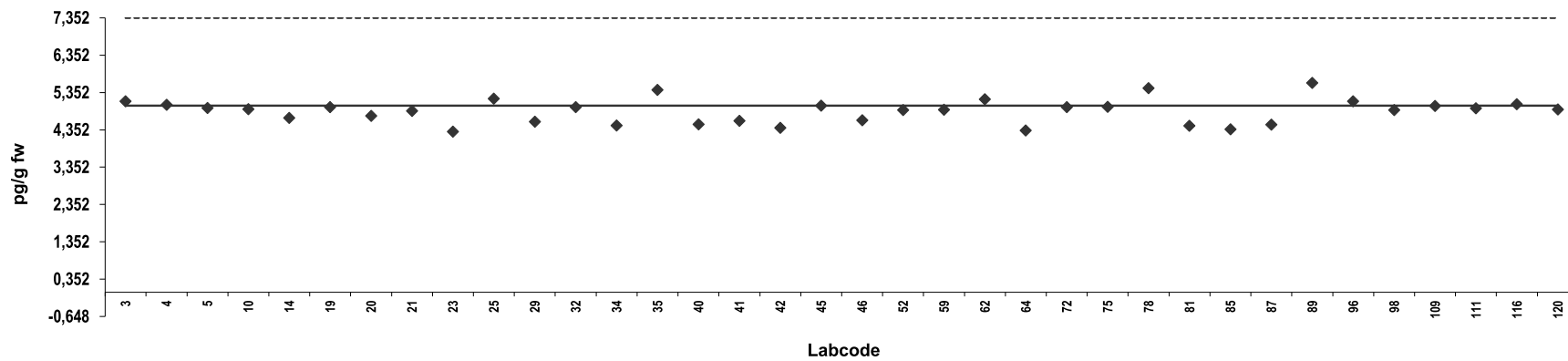
Analyte solution
Congener: 1,2,3,6,7,8-HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	5,1	0,22					
4	5,0	0,13					
5	4,9	0,040					
10	4,9	0,0043					
14	4,7	-0,24					
19	5,0	0,060					
20	4,7	-0,18					
21	4,9	-0,044					
23	4,3	-0,61					
25	5,2	0,29					
29	4,6	-0,34					
32	5,0	0,060					
34	4,5	-0,44					
35	5,4	0,53					
40	4,5	-0,41					
41	4,6	-0,31					
42	4,4	-0,50					
45	5,0	0,099					
46	4,6	-0,30					
52	4,9	-0,021					
59	4,9	-0,011					
62	5,2	0,27					
64	4,3	-0,58					
72	5,0	0,063					
75	5,0	0,067					
78	5,5	0,58					
81	4,5	-0,45					
85	4,4	-0,55					
87	4,5	-0,42					
89	5,6	0,72					
96	5,1	0,22					
98	4,9	-0,020					
109	5,0	0,095					
111	4,9	0,030					
116	5,0	0,14					
120	4,9	0,00					

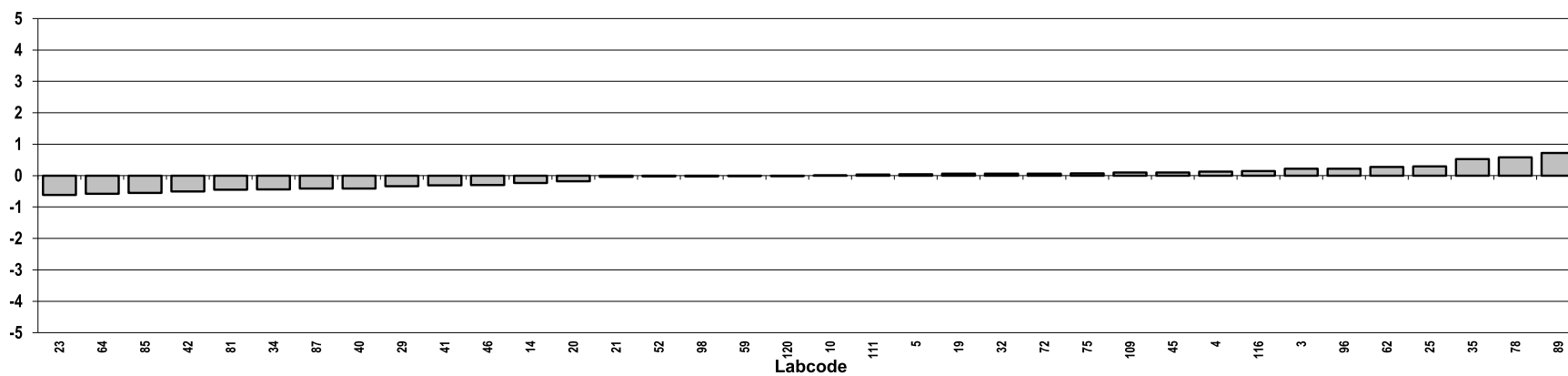
Consensus statistics

Consensus median, pg/g	4,9
Median all values pg/g	4,9
Consensus mean, pg/g	4,9
Standard deviation, pg/g	0,32
Relative standard deviation, %	6,6
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

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



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



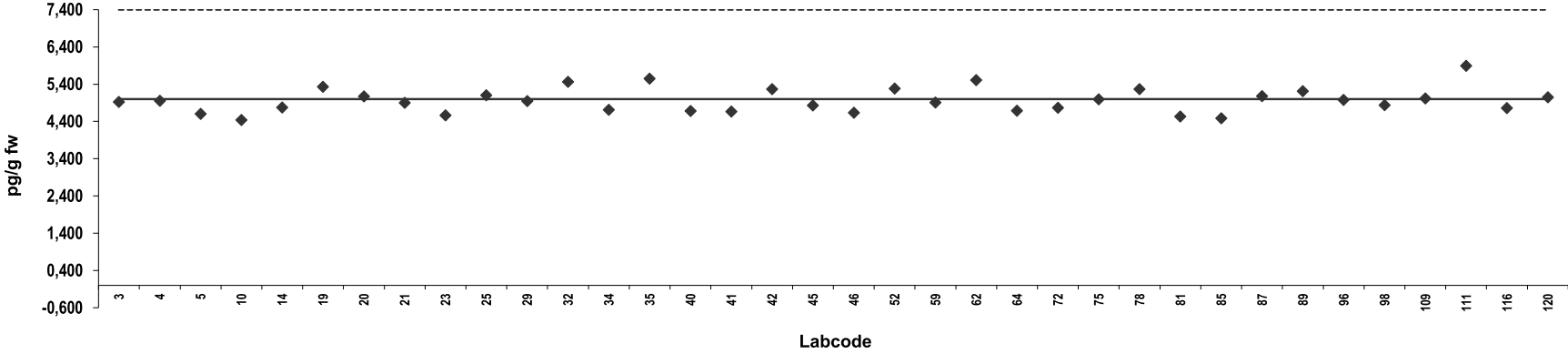
Analyte solution
Congener: 1,2,3,7,8,9-HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	4,9	-0,014					
4	5,0	0,019					
5	4,6	-0,34					
10	4,4	-0,50					
14	4,8	-0,16					
19	5,3	0,40					
20	5,1	0,14					
21	4,9	-0,037					
23	4,6	-0,38					
25	5,1	0,17					
29	4,9	0,014					
32	5,5	0,53					
34	4,7	-0,22					
35	5,6	0,62					
40	4,7	-0,26					
41	4,7	-0,27					
42	5,3	0,34					
45	4,8	-0,11					
46	4,6	-0,30					
52	5,3	0,35					
59	4,9	-0,024					
62	5,5	0,58					
64	4,7	-0,25					
72	4,8	-0,17					
75	5,0	0,060					
78	5,3	0,34					
81	4,5	-0,41					
85	4,5	-0,46					
87	5,1	0,15					
89	5,2	0,28					
96	5,0	0,047					
98	4,8	-0,094					
109	5,0	0,088					
111	5,9	0,98					
116	4,8	-0,18					
120	5,0	0,12					

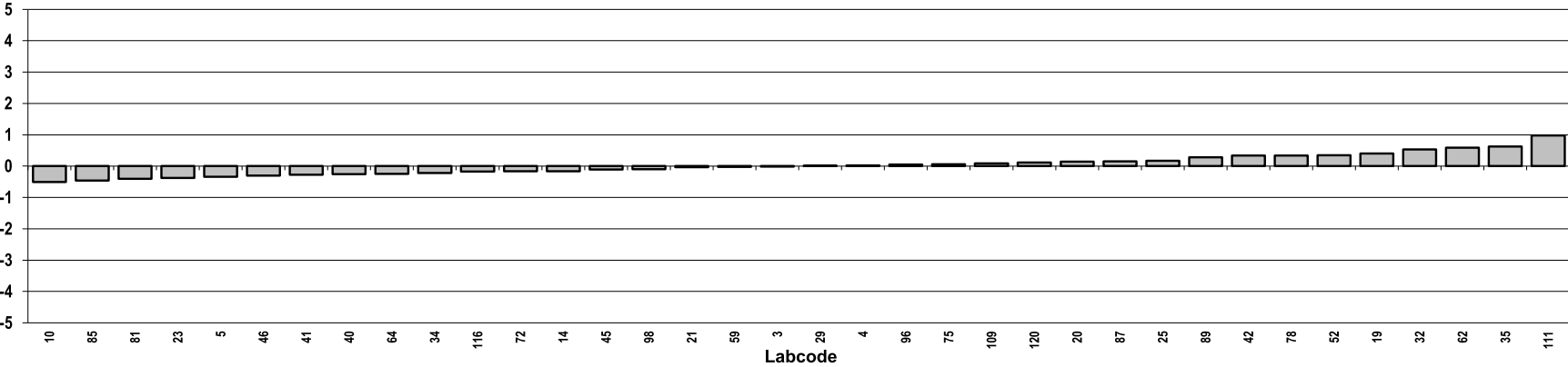
Consensus statistics

Consensus median, pg/g	4,9
Median all values pg/g	4,9
Consensus mean, pg/g	5,0
Standard deviation, pg/g	0,33
Relative standard deviation, %	6,7
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

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



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



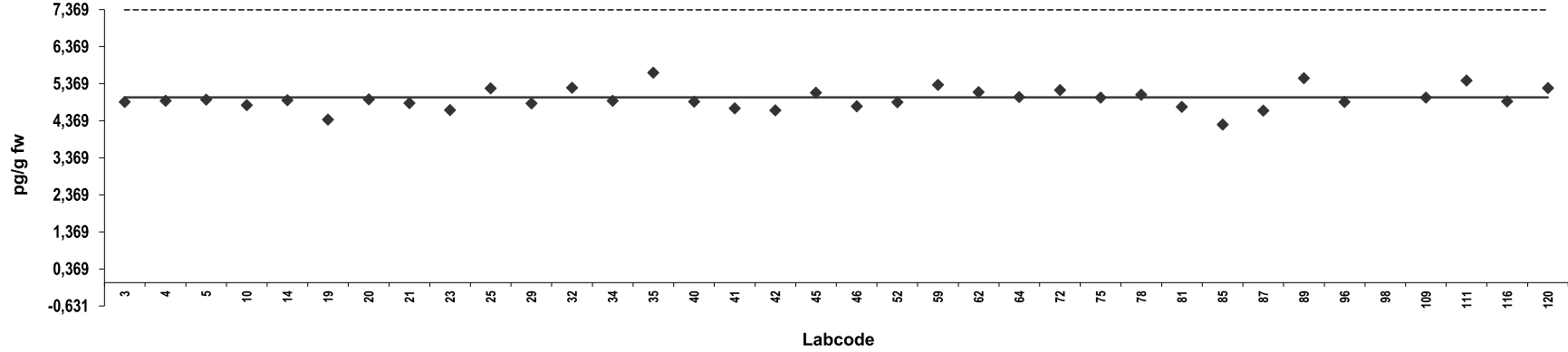
Analyte solution
Congener: 1,2,3,4,6,7,8-HpCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	4,9	-0,025					
4	4,9	0,00					
5	4,9	0,036					
10	4,8	-0,11					
14	4,9	0,015					
19	4,4	-0,51					
20	4,9	0,044					
21	4,8	-0,06					
23	4,7	-0,25					
25	5,2	0,34					
29	4,8	-0,066					
32	5,3	0,36					
34	4,9	-0,00082					
35	5,7	0,77					
40	4,9	-0,024					
41	4,7	-0,20					
42	4,6	-0,26					
45	5,1	0,23					
46	4,8	-0,15					
52	4,9	-0,036					
59	5,3	0,44					
62	5,1	0,24					
64	5,0	0,11					
72	5,2	0,29					
75	5,0	0,094					
78	5,1	0,17					
81	4,7	-0,17					
85	4,3	-0,65					
87	4,6	-0,27					
89	5,5	0,63					
96	4,9	-0,025					
98	10	5,6	Outlier				
109	5,0	0,087					
111	5,5	0,56					
116	4,9	-0,015					
120	5,3	0,36					

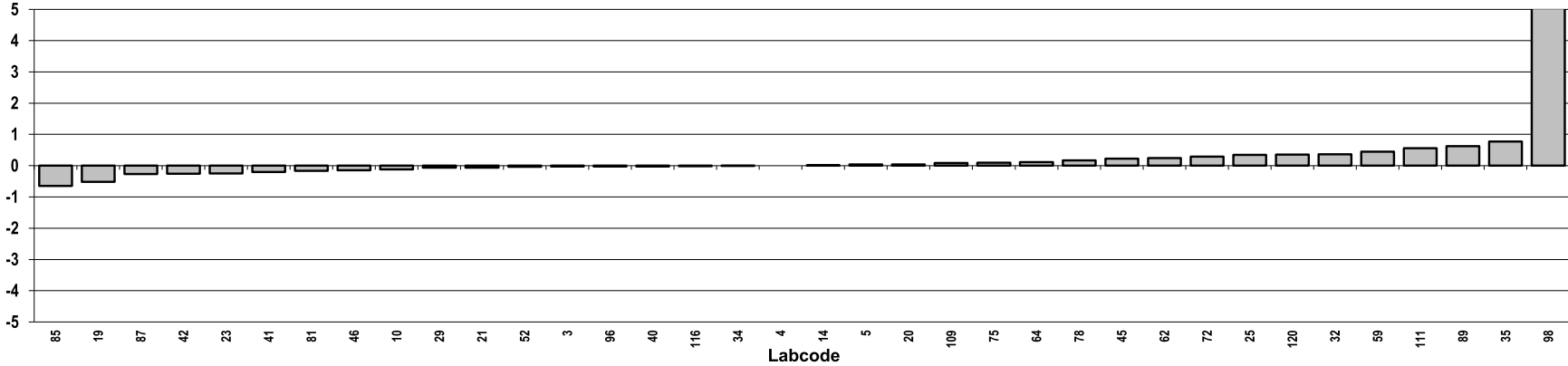
Consensus statistics

Consensus median, pg/g	4,9
Median all values pg/g	4,9
Consensus mean, pg/g	5,0
Standard deviation, pg/g	0,29
Relative standard deviation, %	5,9
No. of values reported	36
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



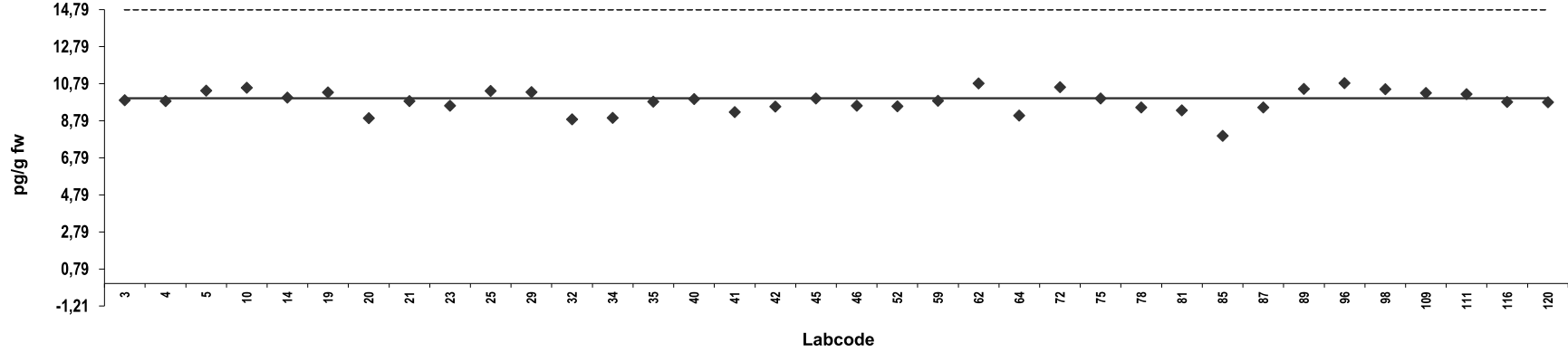
Analyte solution
Congener: OCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	9,9	0,017					
4	9,9	-0,0014					
5	10	0,28					
10	11	0,36					
14	10	0,091					
19	10	0,23					
20	8,9	-0,47					
21	9,8	-0,0088					
23	9,6	-0,13					
25	10	0,28					
29	10	0,24					
32	8,9	-0,51					
34	8,9	-0,47					
35	9,8	-0,024					
40	10	0,052					
41	9,3	-0,31					
42	9,5	-0,16					
45	10	0,064					
46	9,6	-0,13					
52	9,6	-0,15					
59	9,9	0,0014					
62	11	0,48					
64	9,1	-0,40					
72	11	0,37					
75	10	0,065					
78	9,5	-0,18					
81	9,3	-0,26					
85	8,0	-0,95					
87	9,5	-0,18					
89	11	0,33					
96	11	0,49					
98	10	0,32					
109	10	0,22					
111	10	0,19					
116	9,8	-0,029					
120	9,8	-0,038					

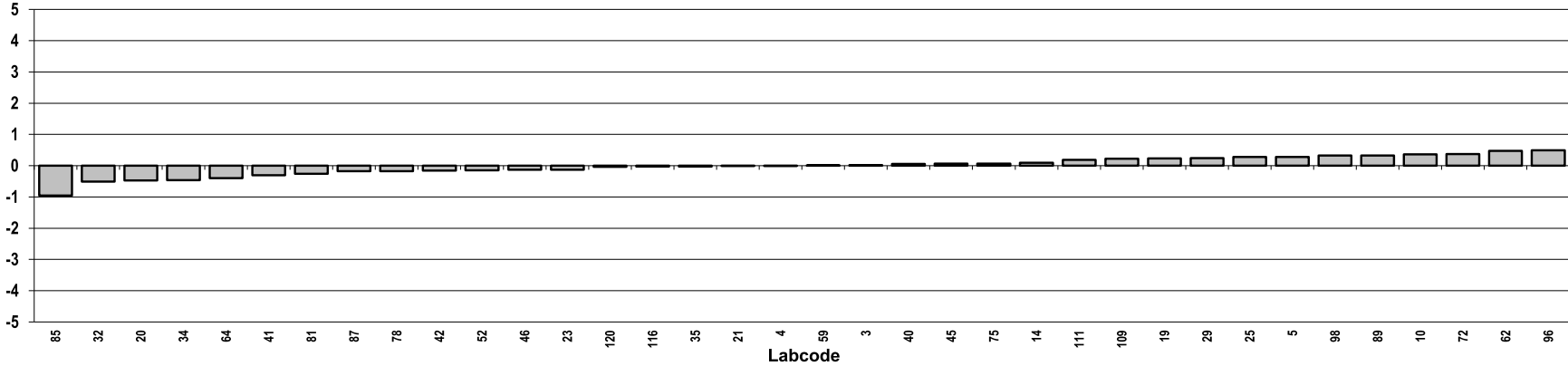
Consensus statistics

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	36
No. of values removed	0
No. of reported non-detects	0

OCDD



Z-score: OCDD



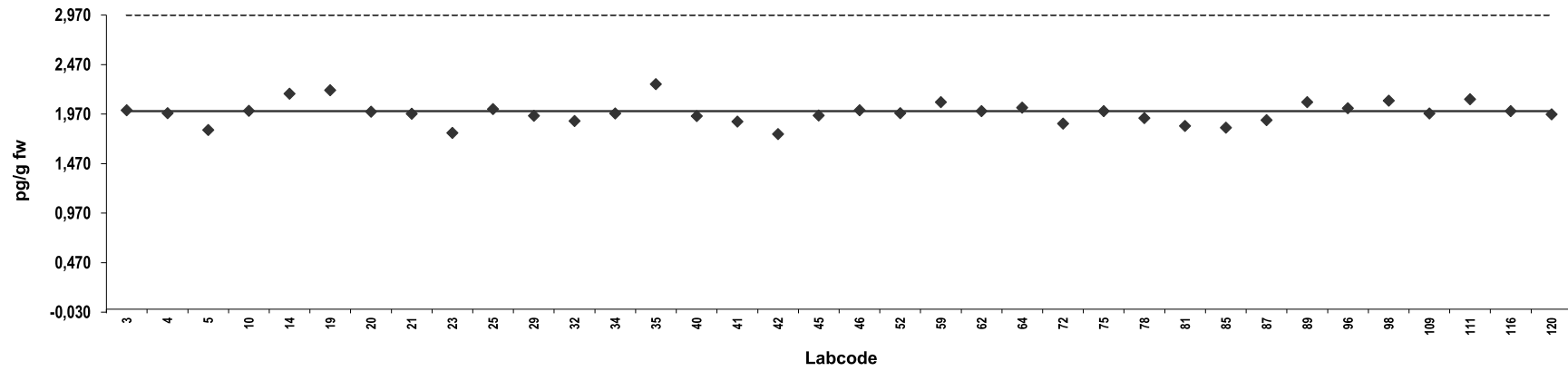
Analyte solution
Congener: 2,3,7,8-TCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	2,0	0,076					
4	2,0	0,00					
5	1,8	-0,43					
10	2,0	0,061					
14	2,2	0,49					
19	2,2	0,58					
20	2,0	0,038					
21	2,0	-0,015					
23	1,8	-0,51					
25	2,0	0,10					
29	2,0	-0,066					
32	1,9	-0,20					
34	2,0	-0,0090					
35	2,3	0,74					
40	2,0	-0,074					
41	1,9	-0,21					
42	1,8	-0,54					
45	2,0	-0,062					
46	2,0	0,071					
52	2,0	0,00					
59	2,1	0,28					
62	2,0	0,051					
64	2,0	0,14					
72	1,9	-0,27					
75	2,0	0,048					
78	1,9	-0,13					
81	1,9	-0,33					
85	1,8	-0,37					
87	1,9	-0,18					
89	2,1	0,28					
96	2,0	0,13					
98	2,1	0,32					
109	2,0	-0,011					
111	2,1	0,35					
116	2,0	0,051					
120	2,0	-0,028					

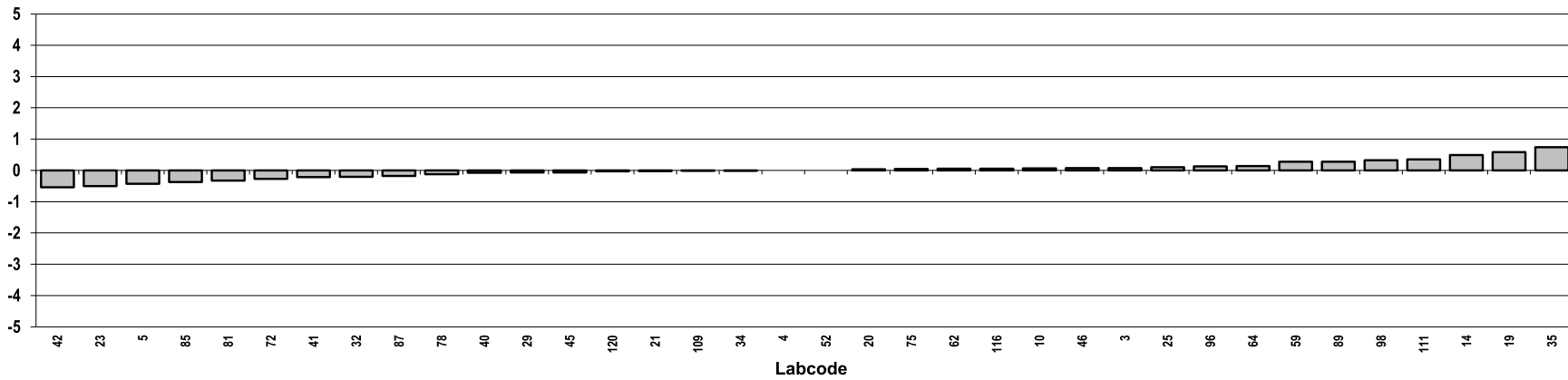
Consensus statistics

Consensus median, pg/g	2,0
Median all values pg/g	2,0
Consensus mean, pg/g	2,0
Standard deviation, pg/g	0,11
Relative standard deviation, %	5,6
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

2,3,7,8-TCDF



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



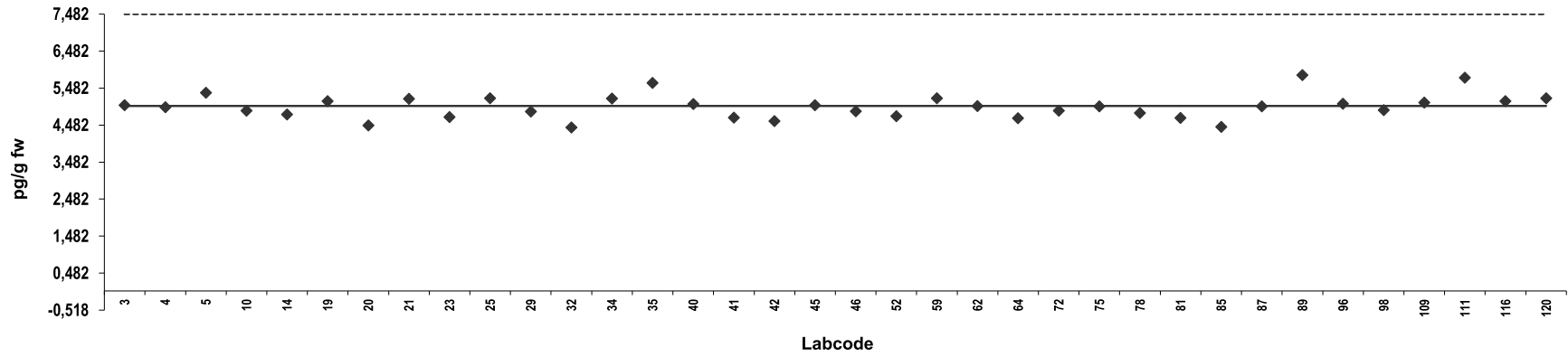
Analyte solution
Congener: 1,2,3,7,8-PeCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	5,0	0,032					
4	5,0	-0,023					
5	5,4	0,37					
10	4,9	-0,11					
14	4,8	-0,22					
19	5,1	0,14					
20	4,5	-0,52					
21	5,2	0,21					
23	4,7	-0,29					
25	5,2	0,22					
29	4,8	-0,14					
32	4,4	-0,57					
34	5,2	0,21					
35	5,6	0,64					
40	5,0	0,062					
41	4,7	-0,30					
42	4,6	-0,40					
45	5,0	0,030					
46	4,9	-0,13					
52	4,7	-0,27					
59	5,2	0,22					
62	5,0	0,012					
64	4,7	-0,32					
72	4,9	-0,12					
75	5,0	0,00043					
78	4,8	-0,18					
81	4,7	-0,31					
85	4,4	-0,55					
87	5,0	-0,00043					
89	5,8	0,84					
96	5,1	0,072					
98	4,9	-0,098					
109	5,1	0,10					
111	5,8	0,78					
116	5,1	0,14					
120	5,2	0,22					

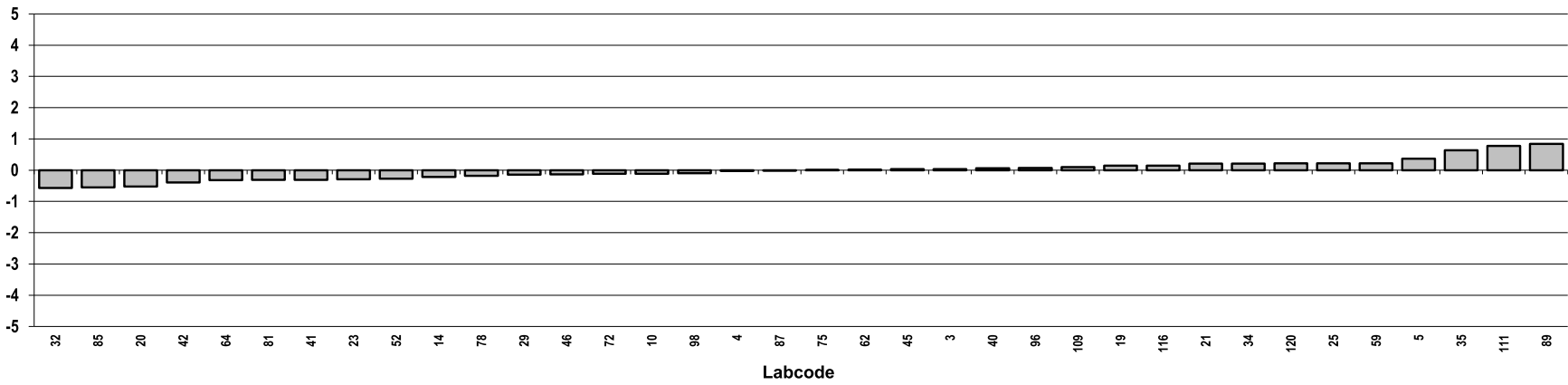
Consensus statistics

Consensus median, pg/g	5,0
Median all values pg/g	5,0
Consensus mean, pg/g	5,0
Standard deviation, pg/g	0,33
Relative standard deviation, %	6,6
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

1,2,3,7,8-PeCDF



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



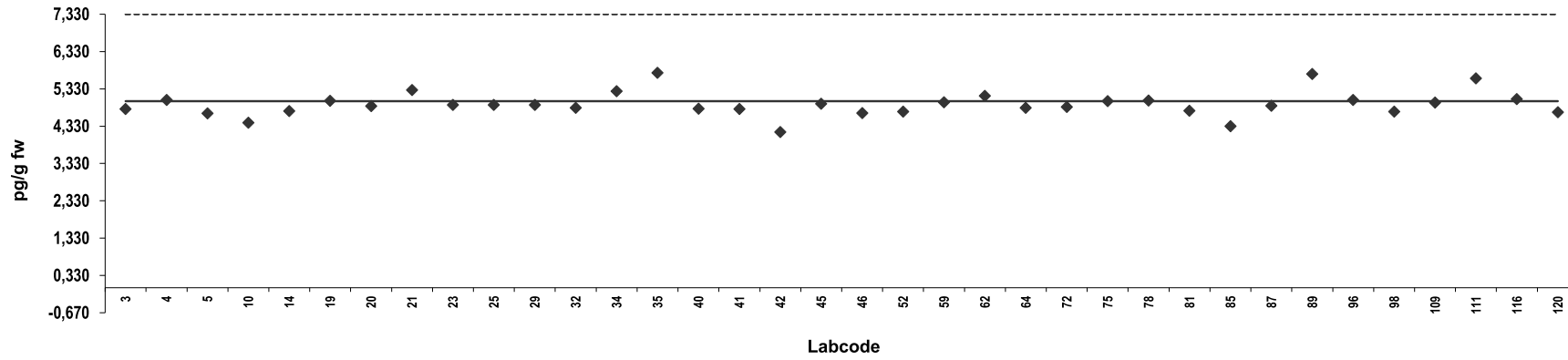
Analyte solution
Congener: 2,3,4,7,8-PeCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	4,8	-0,099					
4	5,0	0,15					
5	4,7	-0,22					
10	4,4	-0,47					
14	4,7	-0,15					
19	5,0	0,13					
20	4,9	-0,021					
21	5,3	0,42					
23	4,9	0,014					
25	4,9	0,014					
29	4,9	0,014					
32	4,8	-0,068					
34	5,3	0,39					
35	5,8	0,89					
40	4,8	-0,088					
41	4,8	-0,10					
42	4,2	-0,73					
45	4,9	0,04					
46	4,7	-0,21					
52	4,7	-0,17					
59	5,0	0,085					
62	5,1	0,26					
64	4,8	-0,069					
72	4,8	-0,043					
75	5,0	0,12					
78	5,0	0,14					
81	4,7	-0,15					
85	4,3	-0,57					
87	4,9	-0,014					
89	5,7	0,86					
96	5,0	0,15					
98	4,7	-0,17					
109	5,0	0,075					
111	5,6	0,74					
116	5,1	0,18					
120	4,7	-0,19					

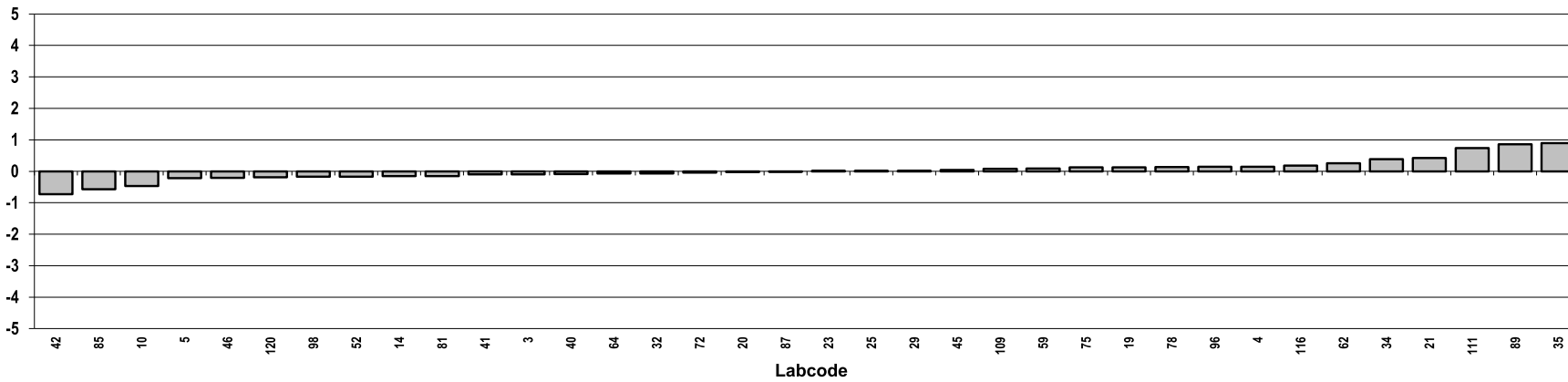
Consensus statistics

Consensus median, pg/g	4,9
Median all values pg/g	4,9
Consensus mean, pg/g	4,9
Standard deviation, pg/g	0,33
Relative standard deviation, %	6,7
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

2,3,4,7,8-PeCDF



Z-score: 2,3,4,7,8-PeCDF



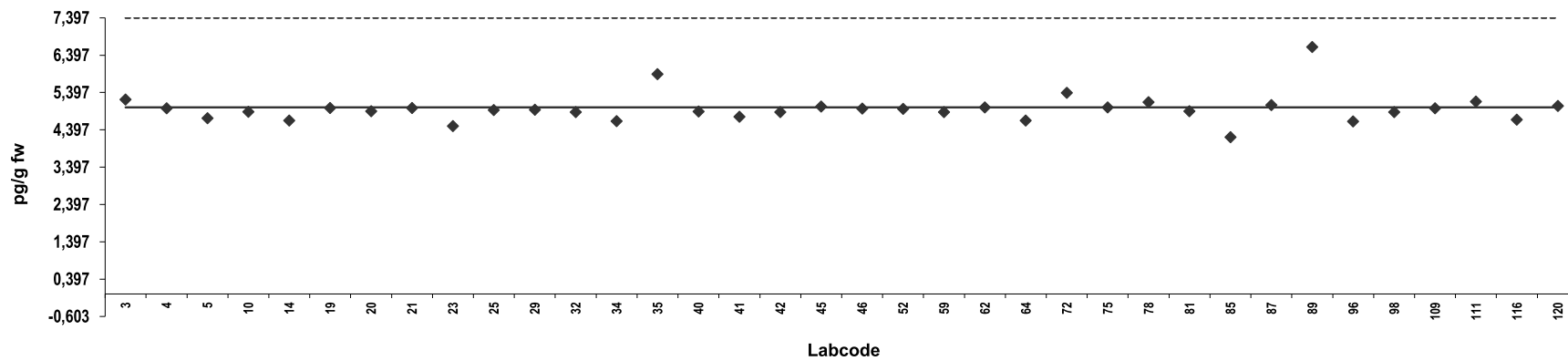
Analyte solution
Congener: 1,2,3,4,7,8-HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	5,2	0,28					
4	5,0	0,044					
5	4,7	-0,22					
10	4,9	-0,050					
14	4,7	-0,29					
19	5,0	0,049					
20	4,9	-0,039					
21	5,0	0,054					
23	4,5	-0,44					
25	4,9	-0,0015					
29	4,9	0,0015					
32	4,9	-0,062					
34	4,6	-0,31					
35	5,9	0,97					
40	4,9	-0,044					
41	4,7	-0,18					
42	4,9	-0,057					
45	5,0	0,088					
46	5,0	0,035					
52	5,0	0,029					
59	4,9	-0,062					
62	5,0	0,069					
64	4,6	-0,29					
72	5,4	0,46					
75	5,0	0,066					
78	5,1	0,21					
81	4,9	0,0					
85	4,2	-0,74					
87	5,1	0,13					
89	6,6	1,7					
96	4,6	-0,32					
98	4,9	-0,061					
109	5,0	0,045					
111	5,2	0,23					
116	4,7	-0,27					
120	5,0	0,11					

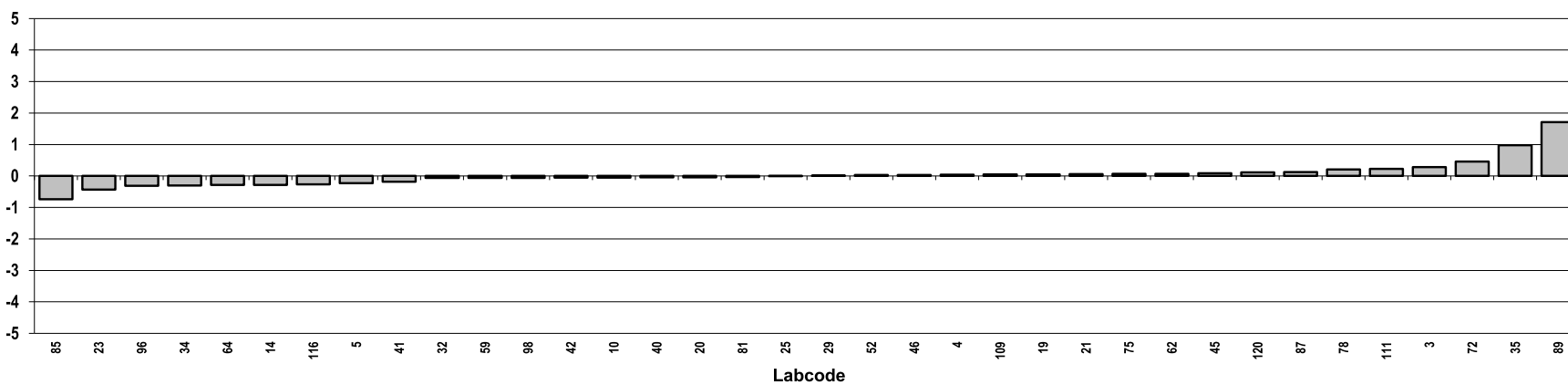
Consensus statistics

Consensus median, pg/g	4,9
Median all values pg/g	4,9
Consensus mean, pg/g	5,0
Standard deviation, pg/g	0,39
Relative standard deviation, %	7,9
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

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



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



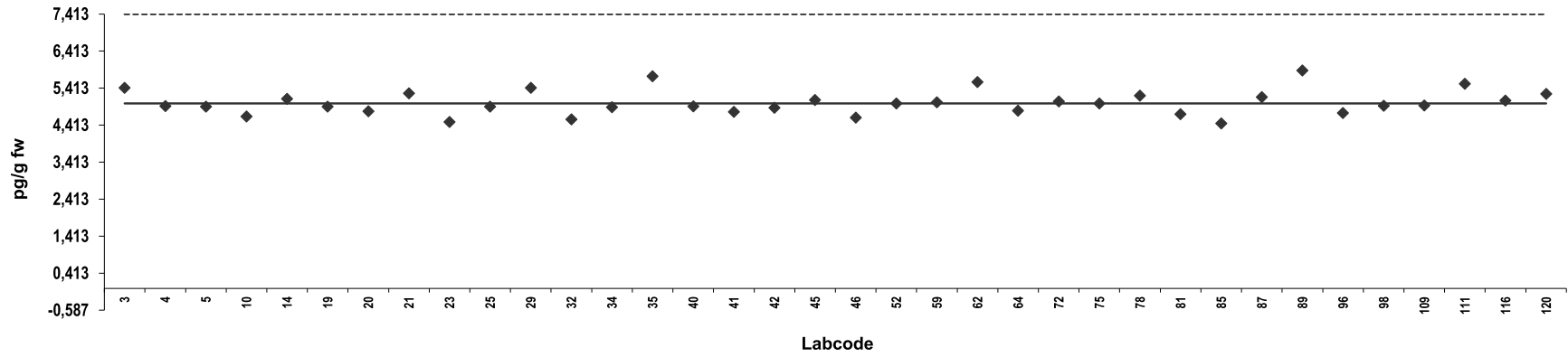
Analyte solution
Congener: 1,2,3,6,7,8-HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	5,4	0,48					
4	4,9	-0,016					
5	4,9	-0,033					
10	4,6	-0,30					
14	5,1	0,18					
19	4,9	-0,033					
20	4,8	-0,16					
21	5,3	0,34					
23	4,5	-0,45					
25	4,9	-0,033					
29	5,4	0,49					
32	4,6	-0,38					
34	4,9	-0,042					
35	5,7	0,80					
40	4,9	-0,019					
41	4,8	-0,17					
42	4,9	-0,063					
45	5,1	0,15					
46	4,6	-0,33					
52	5,0	0,058					
59	5,0	0,089					
62	5,6	0,65					
64	4,8	-0,14					
72	5,1	0,11					
75	5,0	0,057					
78	5,2	0,27					
81	4,7	-0,24					
85	4,5	-0,48					
87	5,2	0,23					
89	5,9	0,96					
96	4,7	-0,20					
98	4,9	-0,0056					
109	4,9	0,0056					
111	5,5	0,59					
116	5,1	0,14					
120	5,3	0,32					

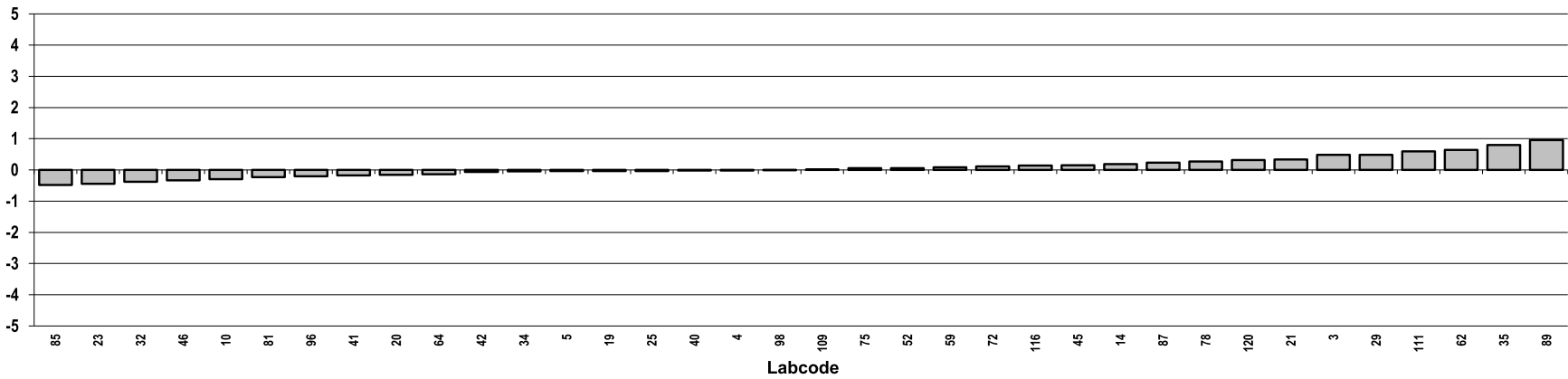
Consensus statistics

Consensus median, pg/g	4,9
Median all values pg/g	4,9
Consensus mean, pg/g	5,0
Standard deviation, pg/g	0,33
Relative standard deviation, %	6,6
No. of values reported	36
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



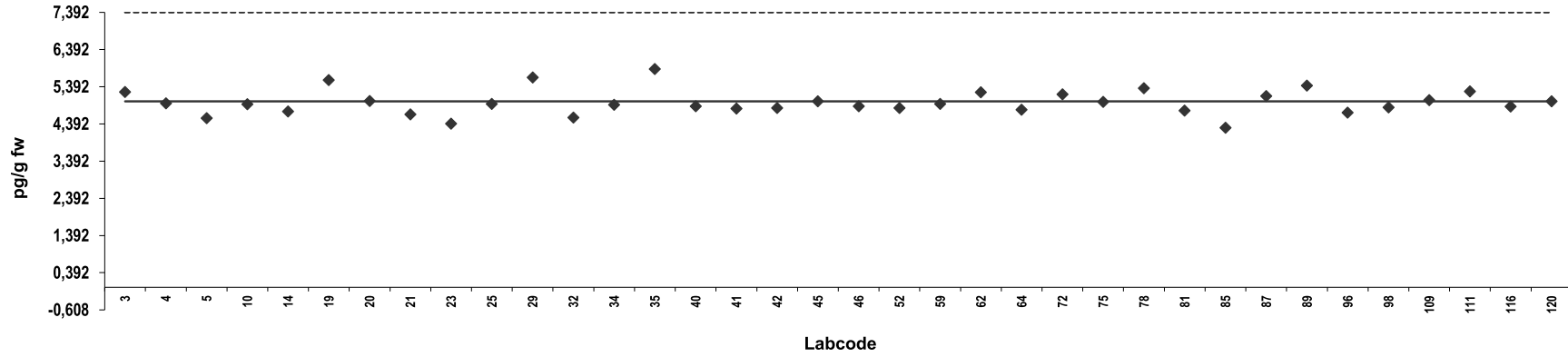
Analyte solution
Congener: 2,3,4,6,7,8-HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	5,3	0,33					
4	4,9	0,020					
5	4,6	-0,38					
10	4,9	-0,0018					
14	4,7	-0,21					
19	5,6	0,65					
20	5,0	0,082					
21	4,7	-0,28					
23	4,4	-0,54					
25	4,9	0,0018					
29	5,6	0,73					
32	4,6	-0,37					
34	4,9	-0,017					
35	5,9	0,95					
40	4,9	-0,061					
41	4,8	-0,12					
42	4,8	-0,11					
45	5,0	0,072					
46	4,9	-0,062					
52	4,8	-0,11					
59	4,9	0,0018					
62	5,2	0,32					
64	4,8	-0,15					
72	5,2	0,26					
75	5,0	0,06					
78	5,4	0,43					
81	4,8	-0,18					
85	4,3	-0,65					
87	5,1	0,22					
89	5,4	0,50					
96	4,7	-0,23					
98	4,8	-0,088					
109	5,0	0,10					
111	5,3	0,35					
116	4,9	-0,069					
120	5,0	0,075					

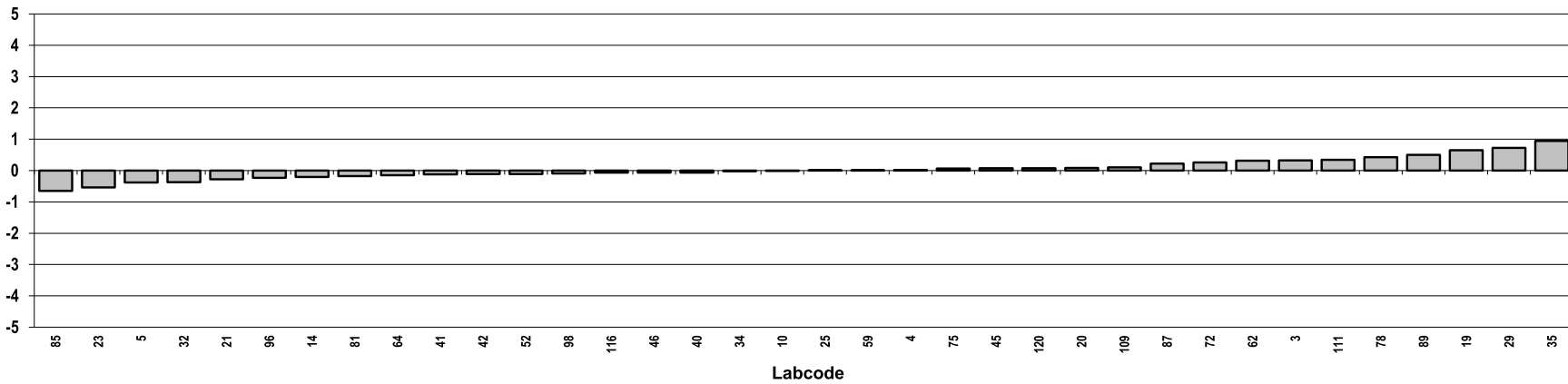
Consensus statistics

Consensus median, pg/g	4,9
Median all values pg/g	4,9
Consensus mean, pg/g	5,0
Standard deviation, pg/g	0,33
Relative standard deviation, %	6,7
No. of values reported	36
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



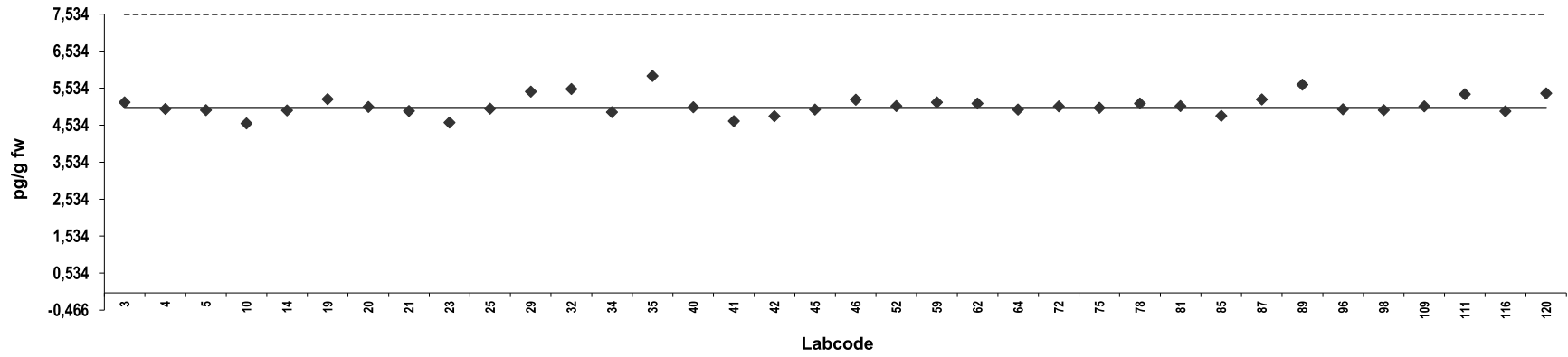
Analyte solution
Congener: 1,2,3,7,8,9-HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	5,2	0,13					
4	5,0	-0,054					
5	4,9	-0,082					
10	4,6	-0,44					
14	4,9	-0,093					
19	5,2	0,22					
20	5,0	0,0032					
21	4,9	-0,11					
23	4,6	-0,42					
25	5,0	-0,043					
29	5,4	0,42					
32	5,5	0,49					
34	4,9	-0,13					
35	5,9	0,83					
40	5,0	-0,0032					
41	4,6	-0,38					
42	4,8	-0,25					
45	5,0	-0,071					
46	5,2	0,20					
52	5,1	0,027					
59	5,2	0,13					
62	5,1	0,097					
64	5,0	-0,070					
72	5,0	0,020					
75	5,0	-0,020					
78	5,1	0,097					
81	5,1	0,027					
85	4,8	-0,24					
87	5,2	0,21					
89	5,6	0,60					
96	5,0	-0,062					
98	4,9	-0,079					
109	5,0	0,018					
111	5,4	0,34					
116	4,9	-0,11					
120	5,4	0,37					

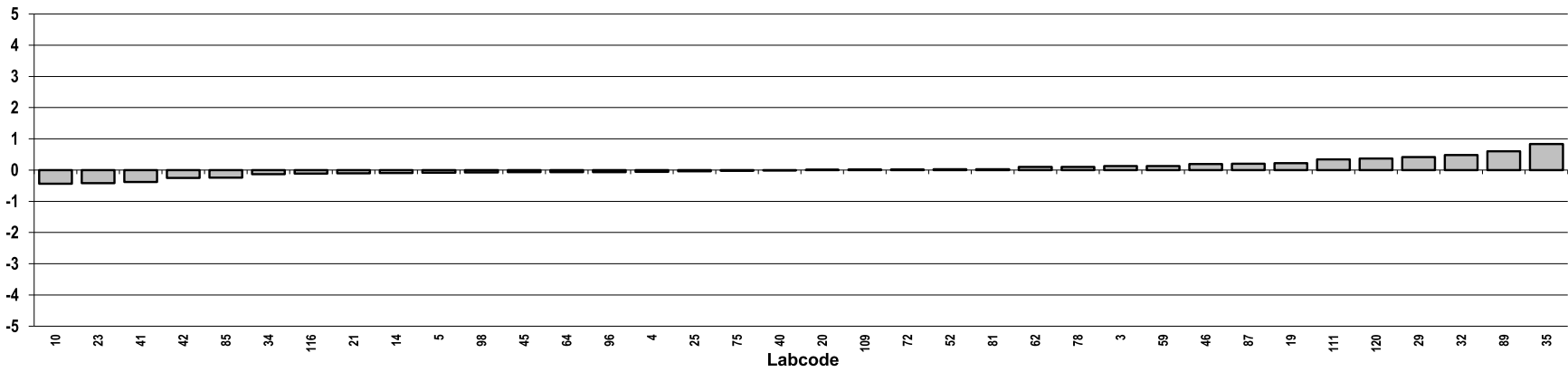
Consensus statistics

Consensus median, pg/g	5,0
Median all values pg/g	5,0
Consensus mean, pg/g	5,1
Standard deviation, pg/g	0,27
Relative standard deviation, %	5,4
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

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



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



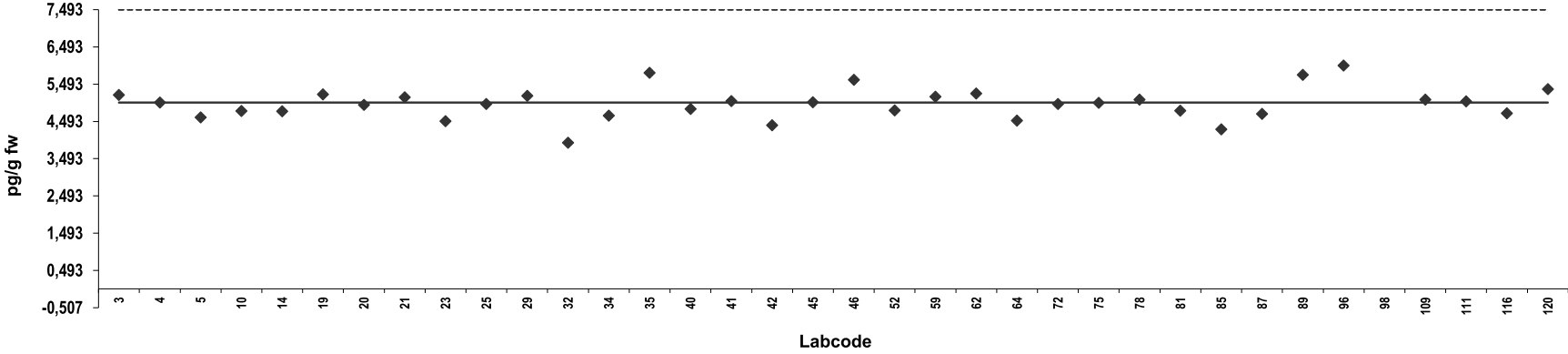
Analyte solution
Congener: 1,2,3,4,6,7,8-HpCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	5,2	0,21					
4	5,0	0,013					
5	4,6	-0,39					
10	4,8	-0,21					
14	4,8	-0,23					
19	5,2	0,23					
20	4,9	-0,051					
21	5,1	0,15					
23	4,5	-0,49					
25	5,0	-0,029					
29	5,2	0,19					
32	3,9	-1,1					
34	4,6	-0,34					
35	5,8	0,81					
40	4,8	-0,16					
41	5,0	0,053					
42	4,4	-0,60					
45	5,0	0,022					
46	5,6	0,63					
52	4,8	-0,20					
59	5,2	0,17					
62	5,2	0,25					
64	4,5	-0,47					
72	5,0	-0,029					
75	5,0	0,00					
78	5,1	0,091					
81	4,8	-0,21					
85	4,3	-0,71					
87	4,7	-0,29					
89	5,7	0,75					
96	6,0	1,0					
98	10	5,4	Outlier				
109	5,1	0,086					
111	5,0	0,040					
116	4,7	-0,28					
120	5,4	0,37					

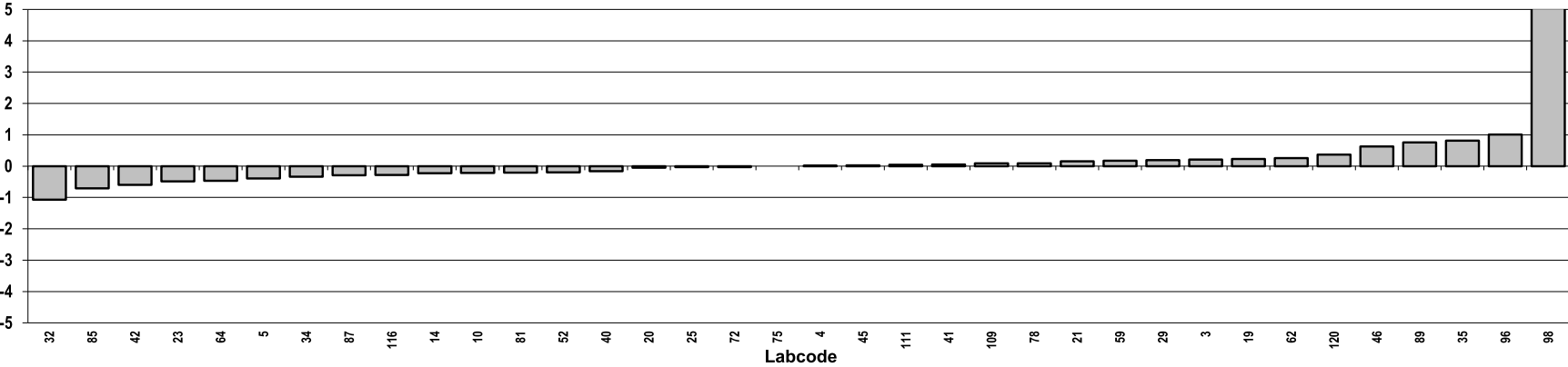
Consensus statistics

Consensus median, pg/g	5,0
Median all values pg/g	5,0
Consensus mean, pg/g	5,0
Standard deviation, pg/g	0,42
Relative standard deviation, %	8,5
No. of values reported	36
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



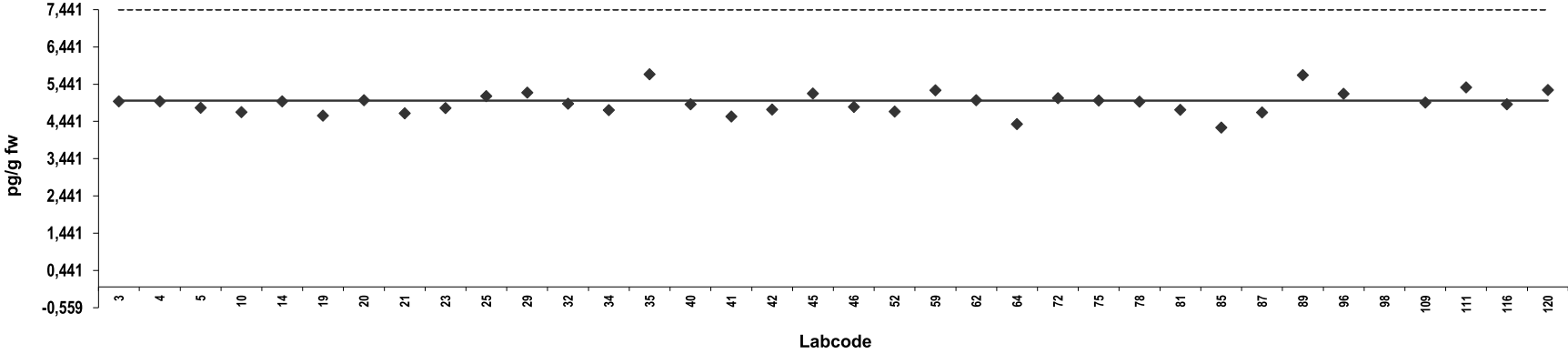
Analyte solution
Congener: 1,2,3,4,7,8,9-HpCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	5,0	0,028					
4	5,0	0,029					
5	4,8	-0,14					
10	4,7	-0,26					
14	5,0	0,025					
19	4,6	-0,36					
20	5,0	0,059					
21	4,7	-0,29					
23	4,8	-0,15					
25	5,1	0,17					
29	5,2	0,27					
32	4,9	-0,032					
34	4,7	-0,21					
35	5,7	0,77					
40	4,9	-0,047					
41	4,6	-0,38					
42	4,8	-0,20					
45	5,2	0,25					
46	4,8	-0,13					
52	4,7	-0,24					
59	5,3	0,33					
62	5,0	0,059					
64	4,4	-0,59					
72	5,1	0,11					
75	5,0	0,054					
78	5,0	0,018					
81	4,8	-0,20					
85	4,3	-0,68					
87	4,7	-0,27					
89	5,7	0,74					
96	5,2	0,23					
98	10	5,44	Outlier				
109	5,0	0,00					
111	5,4	0,40					
116	4,9	-0,052					
120	5,3	0,34					

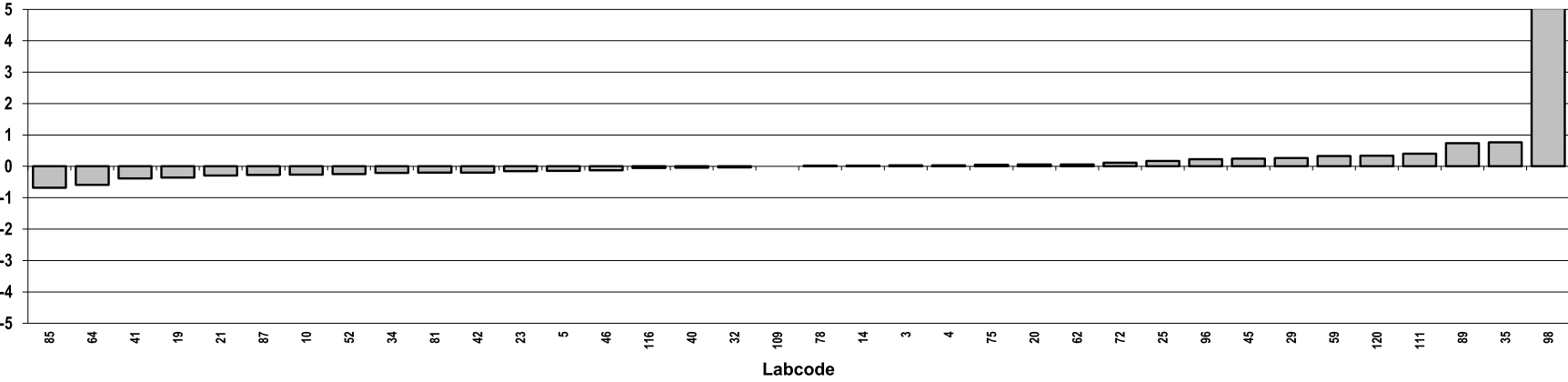
Consensus statistics

Consensus median, pg/g	5,0
Median all values pg/g	5,0
Consensus mean, pg/g	4,9
Standard deviation, pg/g	0,31
Relative standard deviation, %	6,3
No. of values reported	36
No. of values removed	1
No. of reported non-detects	0

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



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



Analyte solution

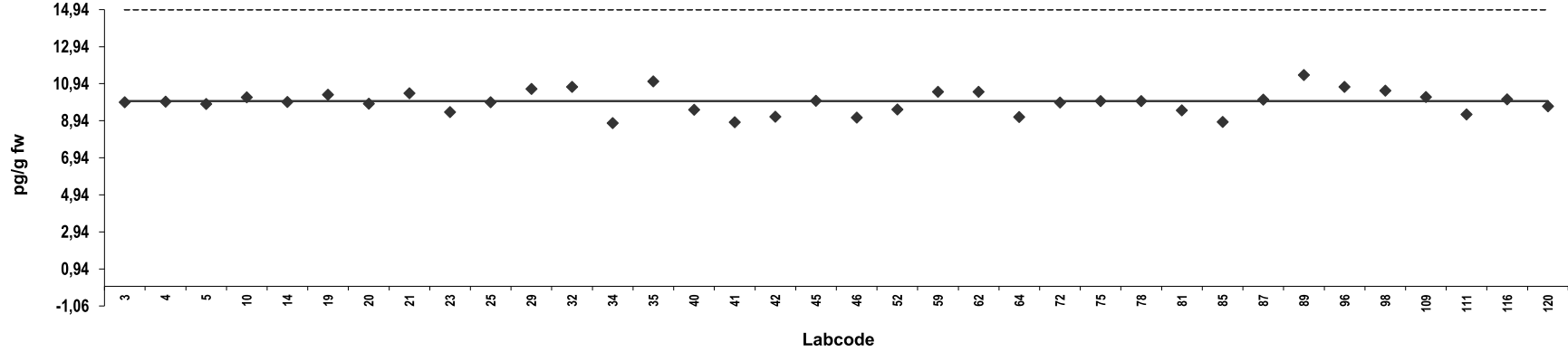
Congener: OCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	9,9	-0,0096					
4	10	0,0020					
5	9,9	-0,055					
10	10	0,12					
14	10	-0,0020					
19	10	0,20					
20	9,9	-0,052					
21	10	0,24					
23	9,4	-0,28					
25	9,9	-0,015					
29	11	0,35					
32	11	0,41					
34	8,8	-0,58					
35	11	0,56					
40	9,5	-0,22					
41	8,9	-0,55					
42	9,2	-0,40					
45	10	0,025					
46	9,1	-0,42					
52	9,5	-0,21					
59	11	0,27					
62	11	0,27					
64	9,1	-0,41					
72	9,9	-0,018					
75	10	0,022					
78	10	0,021					
81	9,5	-0,23					
85	8,9	-0,54					
87	10	0,058					
89	11	0,72					
96	11	0,40					
98	11	0,30					
109	10	0,13					
111	9,3	-0,34					
116	10	0,071					
120	9,7	-0,12					

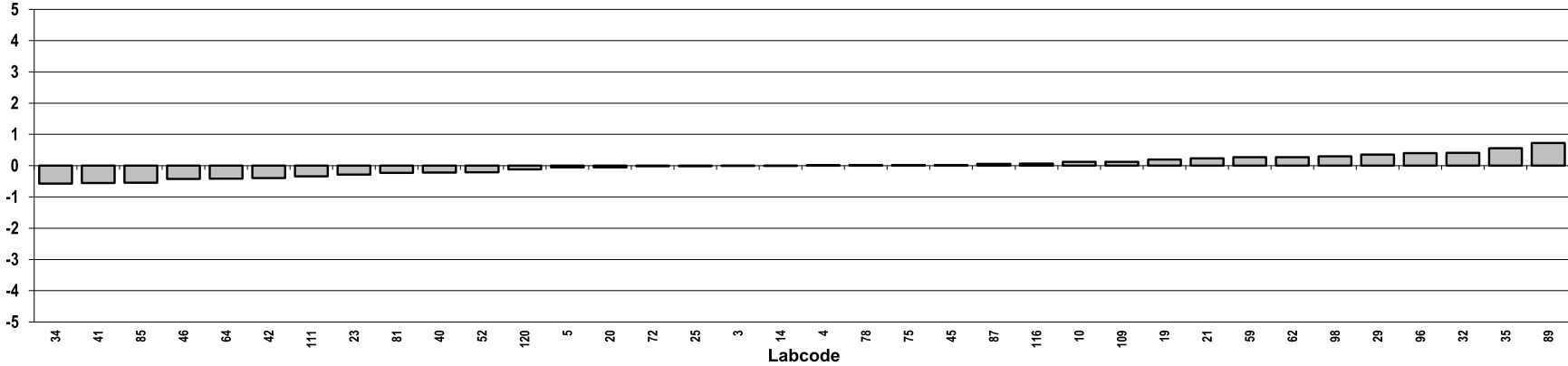
Consensus statistics

Consensus median, pg/g	10
Median all values pg/g	10
Consensus mean, pg/g	9,9
Standard deviation, pg/g	0,63
Relative standard deviation, %	6,3
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

OCDF



Z-score: OCDF



Analyte solution

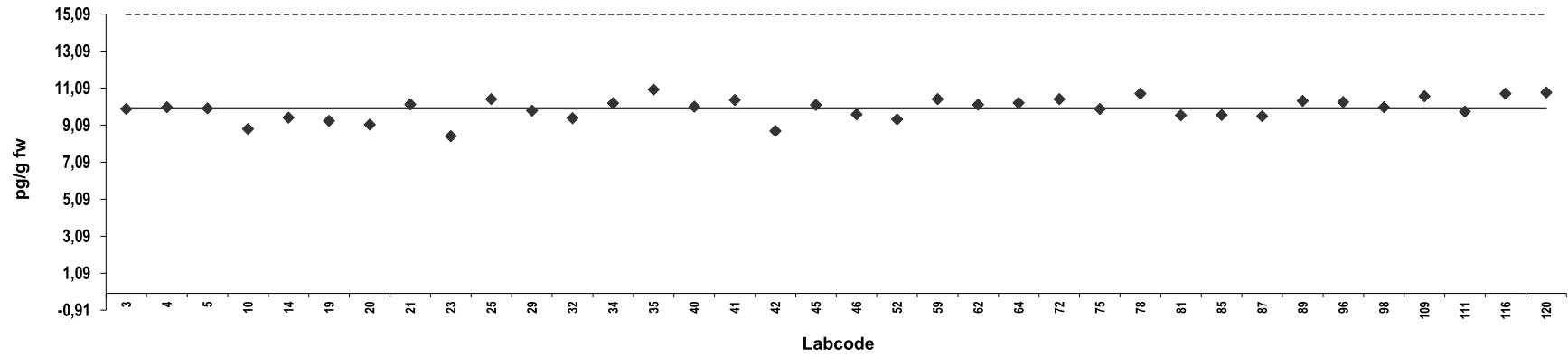
Congener: PCB-77

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	10	-0,050					
4	10	0,00060					
5	10	-0,030					
10	8,9	-0,59					
14	9,5	-0,28					
19	9,3	-0,37					
20	9,1	-0,47					
21	10	0,078					
23	8,5	-0,78					
25	11	0,22					
29	9,9	-0,091					
32	9,5	-0,29					
34	10	0,11					
35	11	0,47					
40	10	0,015					
41	10	0,19					
42	8,8	-0,64					
45	10	0,060					
46	9,7	-0,20					
52	9,4	-0,33					
59	11	0,22					
62	10	0,069					
64	10	0,11					
72	11	0,22					
75	10	-0,046					
78	11	0,37					
81	9,6	-0,22					
85	9,6	-0,21					
87	9,6	-0,24					
89	10	0,17					
96	10	0,14					
98	10	-0,00060					
109	11	0,29					
111	9,8	-0,12					
116	11	0,37					
120	11	0,39					

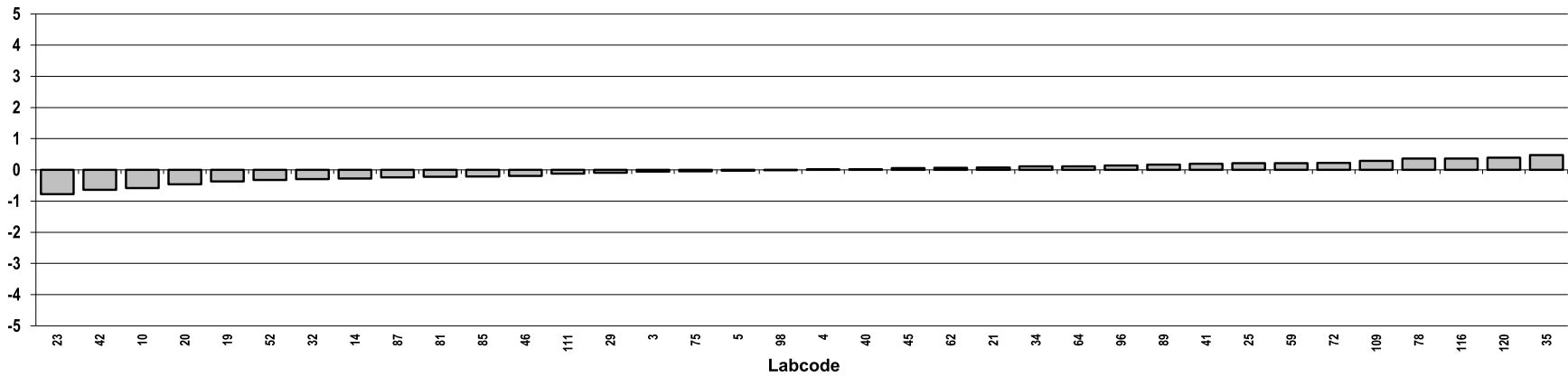
Consensus statistics

Consensus median, pg/g	10
Median all values pg/g	10
Consensus mean, pg/g	10
Standard deviation, pg/g	0,60
Relative standard deviation, %	6,0
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

PCB-77



Z-score: PCB-77



Analyte solution

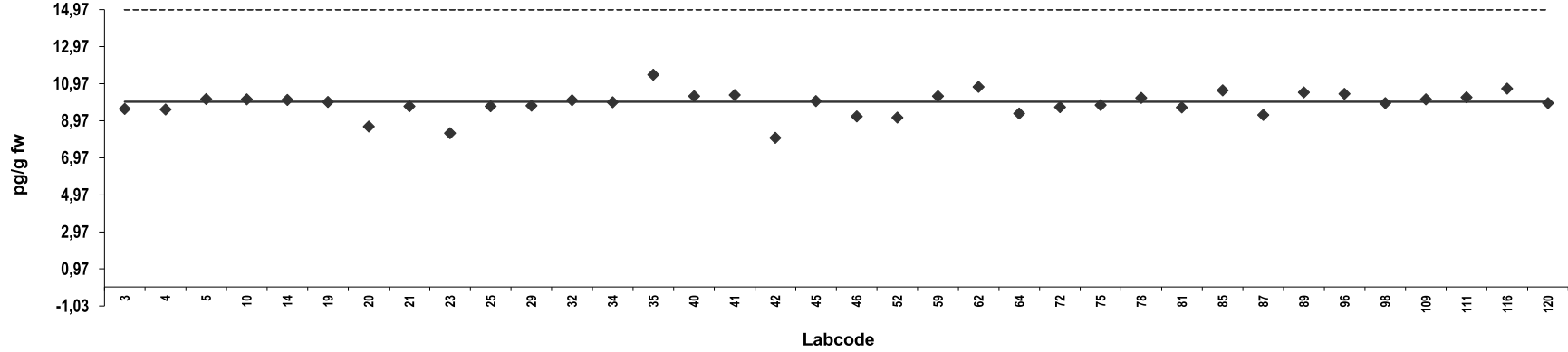
Congener: PCB-126

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	9,6	-0,18					
4	9,6	-0,20					
5	10	0,079					
10	10	0,074					
14	10	0,056					
19	10,0	0,0040					
20	8,7	-0,66					
21	9,8	-0,11					
23	8,3	-0,84					
25	9,8	-0,11					
29	9,8	-0,10					
32	10	0,049					
34	10,0	-0,0040					
35	11	0,74					
40	10	0,16					
41	10	0,19					
42	8,0	-0,97					
45	10	0,029					
46	9,2	-0,39					
52	9,1	-0,42					
59	10	0,16					
62	11	0,41					
64	9,4	-0,31					
72	9,7	-0,14					
75	9,8	-0,087					
78	10	0,11					
81	9,7	-0,15					
85	11	0,32					
87	9,3	-0,35					
89	11	0,26					
96	10	0,22					
98	9,9	-0,029					
109	10	0,073					
111	10	0,13					
116	11	0,36					
120	9,9	-0,032					

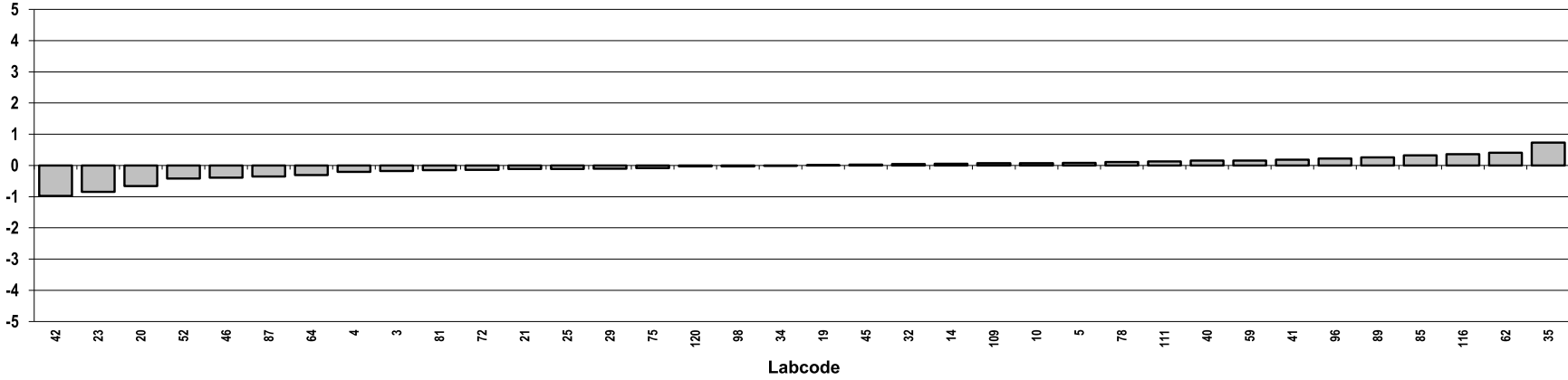
Consensus statistics

Consensus median, pg/g	10
Median all values pg/g	10
Consensus mean, pg/g	9,9
Standard deviation, pg/g	0,67
Relative standard deviation, %	6,8
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

PCB-126



Z-score: PCB-126



Analyte solution

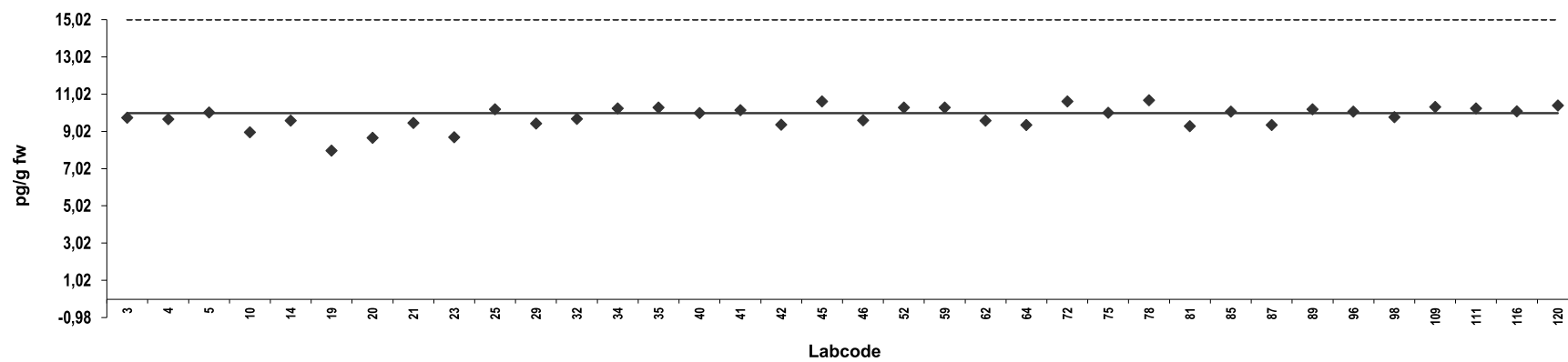
Congener: PCB-169

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	9,8	-0,13					
4	9,7	-0,17					
5	10	0,013					
10	9,0	-0,52					
14	9,6	-0,21					
19	8,0	-1,01					
20	8,7	-0,67					
21	9,5	-0,27					
23	8,7	-0,66					
25	10	0,093					
29	9,4	-0,29					
32	9,7	-0,16					
34	10	0,12					
35	10	0,14					
40	10	-0,0013					
41	10	0,072					
42	9,4	-0,32					
45	11	0,31					
46	9,6	-0,20					
52	10	0,14					
59	10	0,14					
62	9,6	-0,21					
64	9,4	-0,33					
72	11	0,31					
75	10	0,0013					
78	11	0,34					
81	9,3	-0,36					
85	10	0,033					
87	9,4	-0,33					
89	10	0,093					
96	10	0,033					
98	9,8	-0,12					
109	10	0,16					
111	10	0,12					
116	10	0,043					
120	10	0,20					

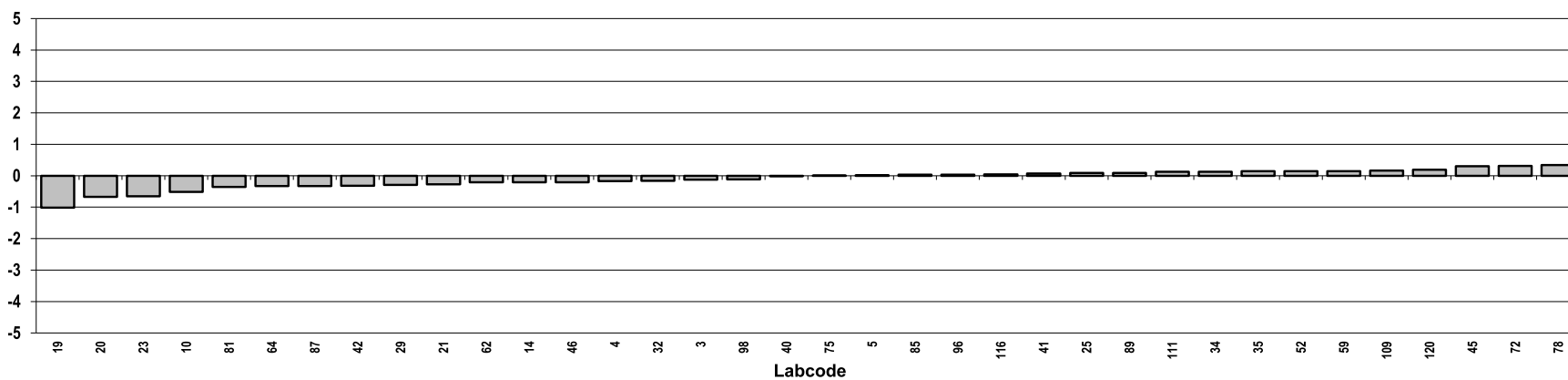
Consensus statistics

Consensus median, pg/g	10
Median all values pg/g	10
Consensus mean, pg/g	9,8
Standard deviation, pg/g	0,60
Relative standard deviation, %	6,1
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

PCB-169



Z-score: PCB-169



Analyte solution

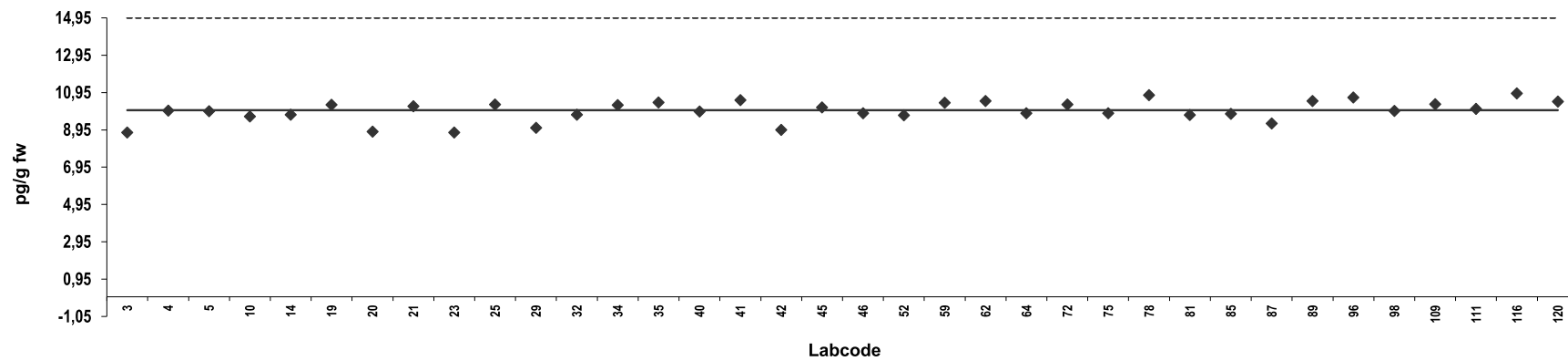
Congener: PCB-81

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	8,8	-0,58					
4	10	0,0044					
5	10	-0,0070					
10	9,7	-0,15					
14	9,8	-0,10					
19	10	0,16					
20	8,9	-0,56					
21	10	0,13					
23	8,8	-0,58					
25	10	0,17					
29	9,1	-0,46					
32	9,8	-0,10					
34	10	0,16					
35	10	0,23					
40	9,9	-0,020					
41	11	0,29					
42	8,9	-0,51					
45	10	0,094					
46	9,8	-0,062					
52	9,7	-0,12					
59	10	0,22					
62	11	0,27					
64	9,8	-0,062					
72	10	0,17					
75	9,8	-0,062					
78	11	0,42					
81	9,7	-0,11					
85	9,8	-0,082					
87	9,3	-0,34					
89	11	0,27					
96	11	0,36					
98	10	-0,0044					
109	10	0,18					
111	10	0,051					
116	11	0,47					
120	10	0,25					

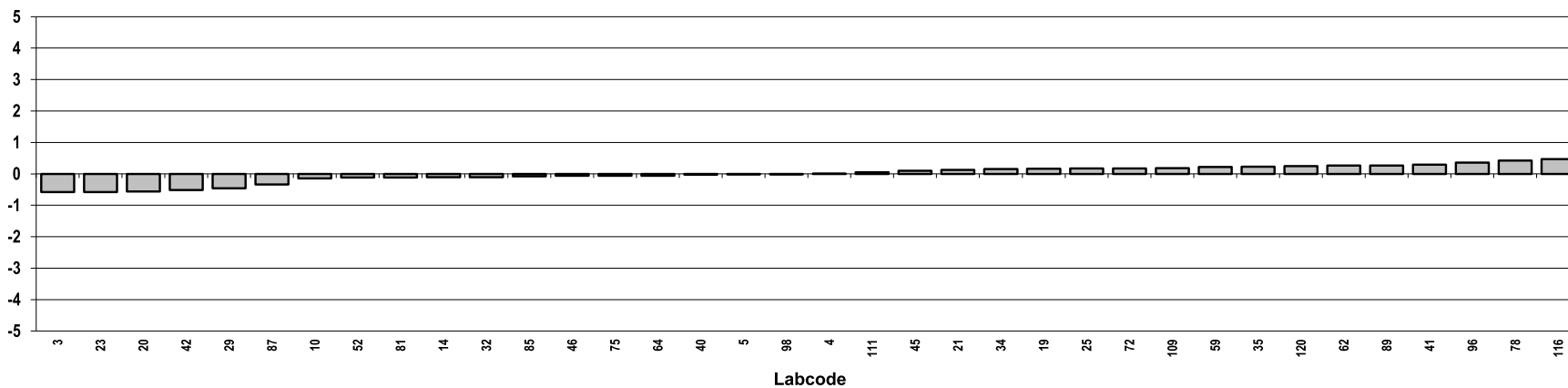
Consensus statistics

Consensus median, pg/g	10
Median all values pg/g	10
Consensus mean, pg/g	10
Standard deviation, pg/g	0,56
Relative standard deviation, %	5,6
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

PCB-81



Z-score: PCB-81



Analyte solution

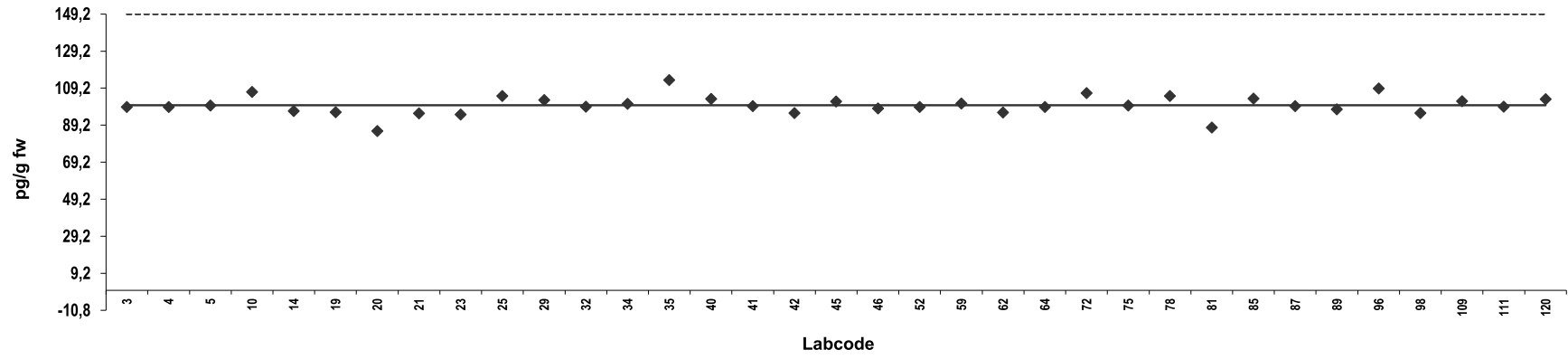
Congener: PCB-105

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	99	-0,019					
4	99	-0,023					
5	100	0,016					
10	107	0,39					
14	97	-0,13					
19	96	-0,16					
20	86	-0,67					
21	96	-0,20					
23	95	-0,23					
25	105	0,28					
29	103	0,17					
32	99	-0,011					
34	101	0,063					
35	114	0,71					
40	103	0,20					
41	99	0,00					
42	96	-0,19					
45	102	0,13					
46	98	-0,062					
52	99	-0,019					
59	101	0,076					
62	96	-0,17					
64	99	-0,019					
72	107	0,36					
75	100	0,020					
78	105	0,28					
81	88	-0,58					
85	104	0,21					
87	100	0,0037					
89	98	-0,084					
96	109	0,49					
98	96	-0,19					
109	102	0,14					
111	99	-0,016					
120	103	0,19					

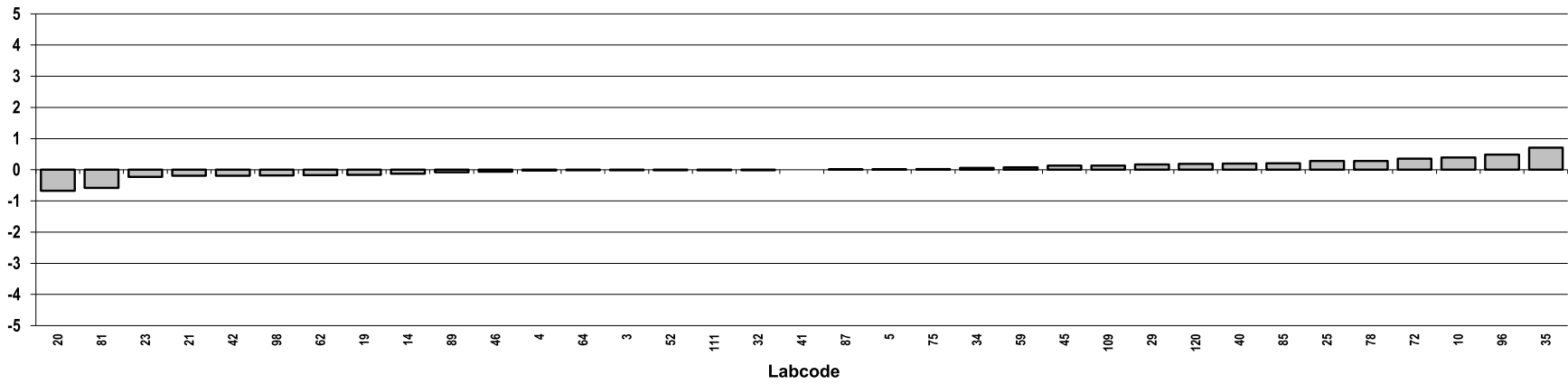
Consensus statistics

Consensus median, pg/g	99
Median all values pg/g	99
Consensus mean, pg/g	100
Standard deviation, pg/g	5,2
Relative standard deviation, %	5,2
No. of values reported	35
No. of values removed	0
No. of reported non-detects	0

PCB-105



Z-score: PCB-105



Analyte solution

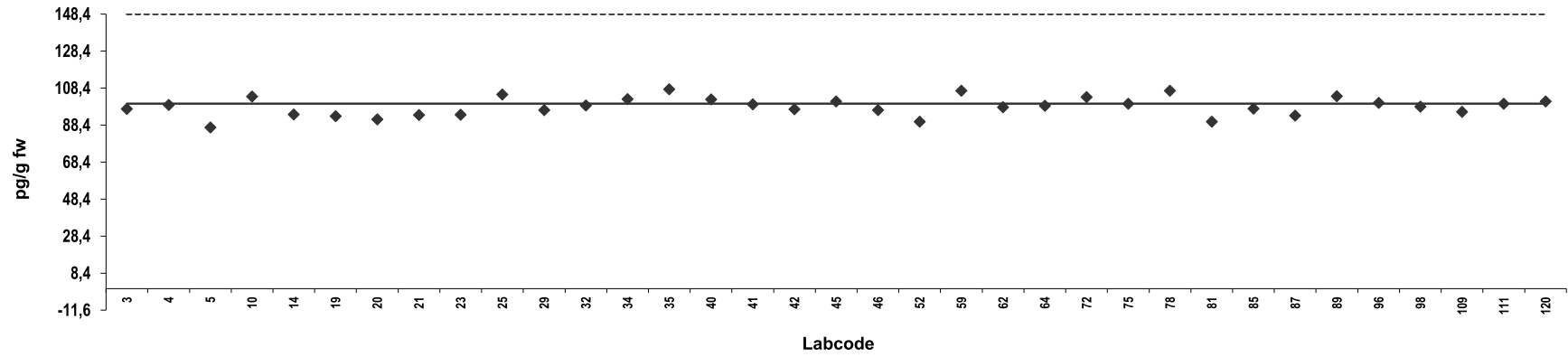
Congener: PCB-114

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	97	-0,087					
4	99	0,020					
5	87	-0,60					
10	104	0,25					
14	94	-0,24					
19	93	-0,28					
20	92	-0,37					
21	94	-0,26					
23	94	-0,25					
25	105	0,31					
29	96	-0,12					
32	99	0,0057					
34	102	0,18					
35	108	0,45					
40	102	0,17					
41	100	0,038					
42	97	-0,097					
45	101	0,12					
46	96	-0,12					
52	90	-0,44					
59	107	0,41					
62	98	-0,042					
64	99	0,00					
72	103	0,23					
75	100	0,055					
78	107	0,41					
81	90	-0,44					
85	97	-0,082					
87	94	-0,27					
89	104	0,26					
96	100	0,073					
98	98	-0,026					
109	96	-0,17					
111	100	0,049					
120	101	0,12					

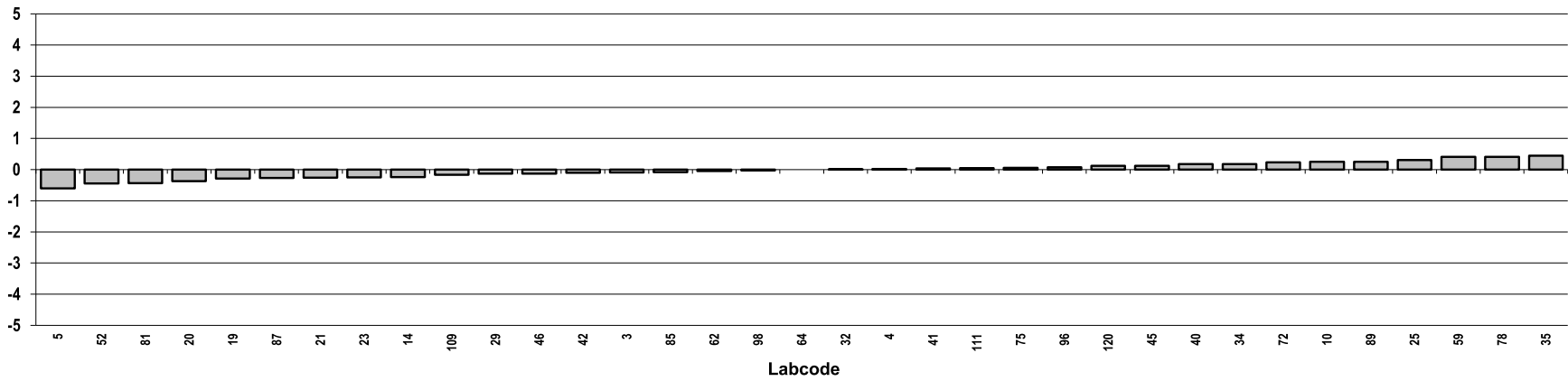
Consensus statistics

Consensus median, pg/g	99
Median all values pg/g	99
Consensus mean, pg/g	98
Standard deviation, pg/g	5,0
Relative standard deviation, %	5,1
No. of values reported	35
No. of values removed	0
No. of reported non-detects	0

PCB-114



Z-score: PCB-114



Analyte solution

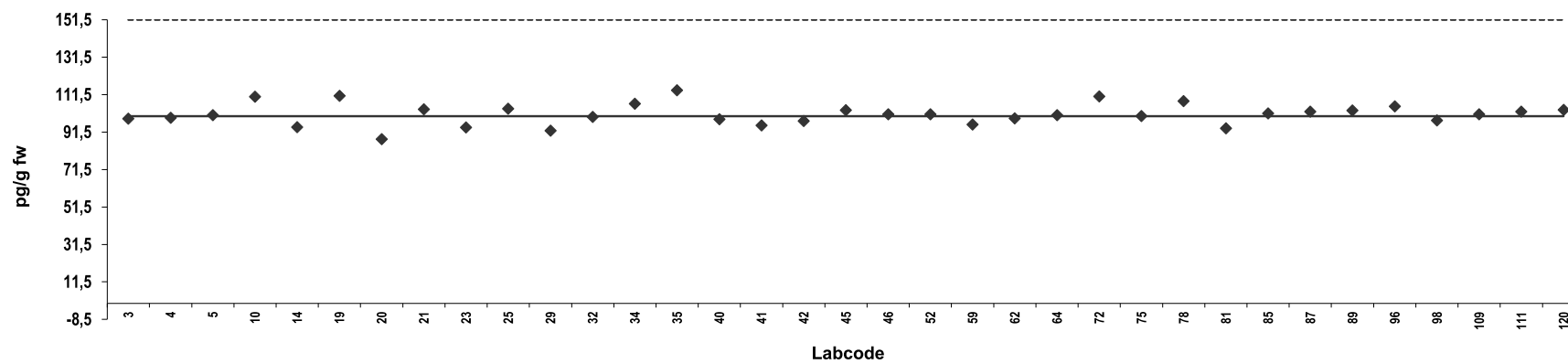
Congener: PCB-118

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	99	-0,12					
4	99	-0,093					
5	101	-0,025					
10	110	0,47					
14	94	-0,34					
19	111	0,49					
20	88	-0,65					
21	104	0,13					
23	94	-0,35					
25	104	0,15					
29	92	-0,43					
32	100	-0,066					
34	107	0,28					
35	114	0,63					
40	98	-0,13					
41	95	-0,29					
42	97	-0,18					
45	103	0,11					
46	101	0,0028					
52	101	0,00					
59	96	-0,27					
62	99	-0,10					
64	101	-0,023					
72	111	0,47					
75	100	-0,046					
78	108	0,35					
81	94	-0,37					
85	102	0,026					
87	102	0,071					
89	103	0,099					
96	105	0,21					
98	98	-0,16					
109	101	0,0044					
111	102	0,073					
120	103	0,12					

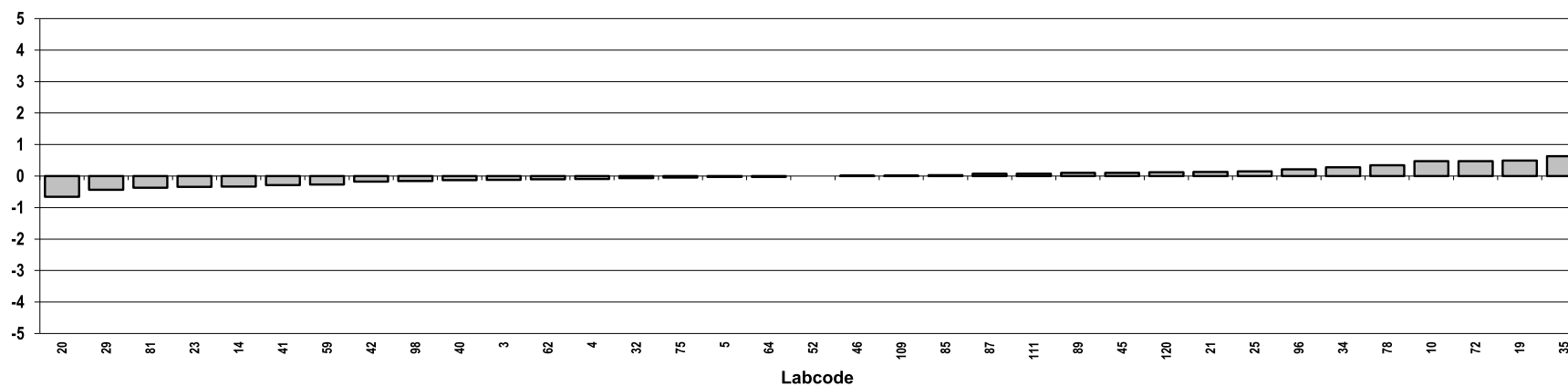
Consensus statistics

Consensus median, pg/g	101
Median all values pg/g	101
Consensus mean, pg/g	101
Standard deviation, pg/g	5,7
Relative standard deviation, %	5,6
No. of values reported	35
No. of values removed	0
No. of reported non-detects	0

PCB-118



Z-score: PCB-118



Analyte solution

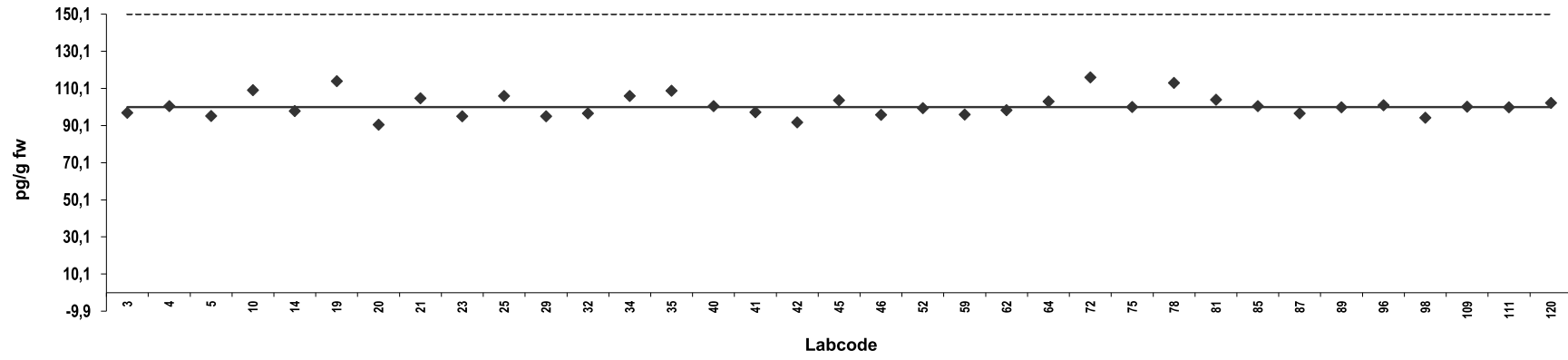
Congener: PCB-123

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	97	-0,16					
4	100	0,020					
5	95	-0,24					
10	109	0,45					
14	98	-0,11					
19	114	0,70					
20	91	-0,48					
21	105	0,24					
23	95	-0,25					
25	106	0,30					
29	95	-0,25					
32	97	-0,17					
34	106	0,29					
35	109	0,44					
40	101	0,027					
41	97	-0,14					
42	92	-0,41					
45	104	0,18					
46	96	-0,21					
52	100	-0,027					
59	96	-0,20					
62	98	-0,08					
64	103	0,15					
72	116	0,80					
75	100	0,00					
78	113	0,65					
81	104	0,20					
85	101	0,027					
87	97	-0,17					
89	100	-0,0071					
96	101	0,045					
98	94	-0,29					
109	100	0,011					
111	100	-0,0059					
120	102	0,11					

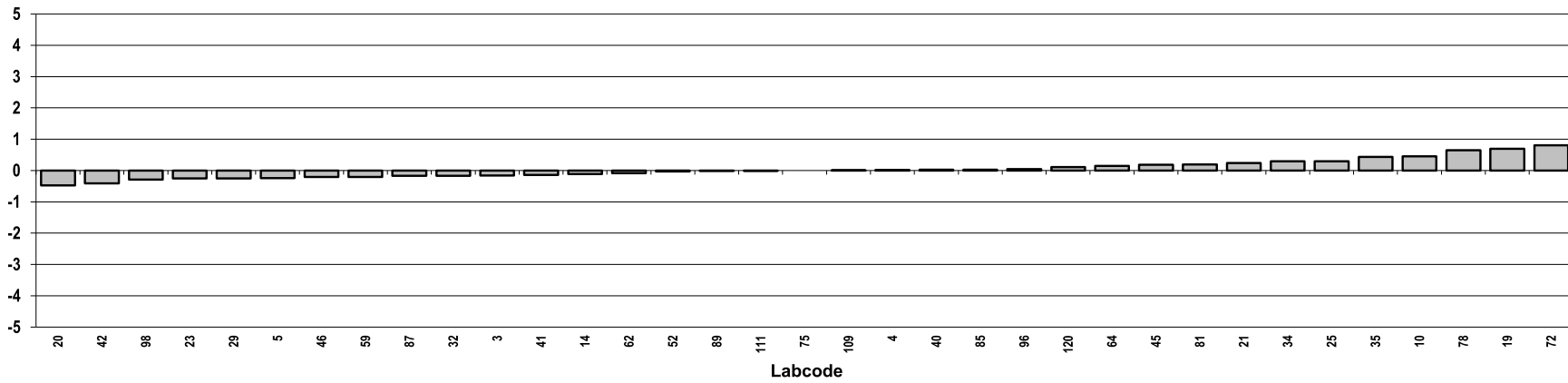
Consensus statistics

Consensus median, pg/g	100
Median all values pg/g	100
Consensus mean, pg/g	101
Standard deviation, pg/g	6,0
Relative standard deviation, %	6,0
No. of values reported	35
No. of values removed	0
No. of reported non-detects	0

PCB-123



Z-score: PCB-123



Analyte solution

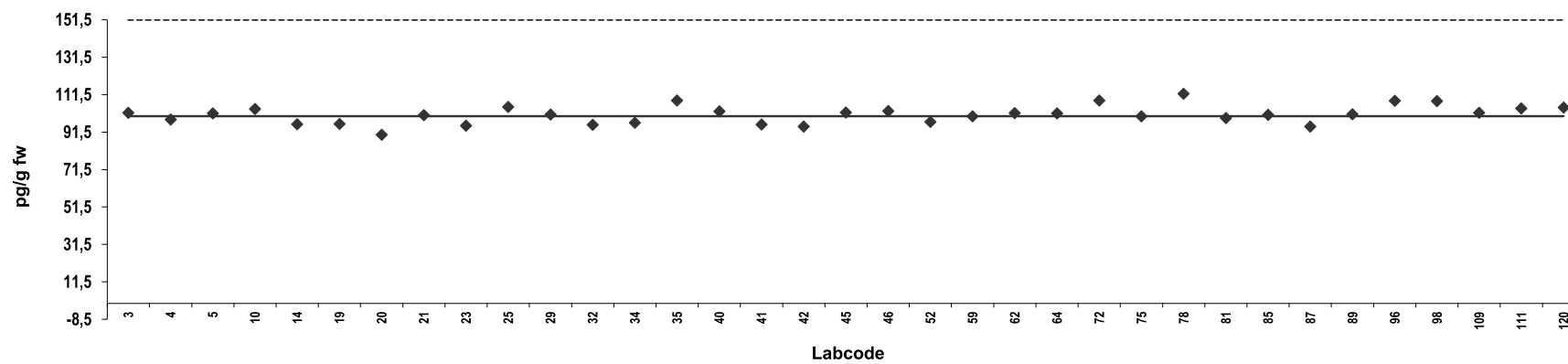
Congener: PCB-156

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	102	0,040					
4	98	-0,14					
5	102	0,025					
10	104	0,14					
14	96	-0,26					
19	96	-0,26					
20	90	-0,54					
21	100	-0,025					
23	95	-0,30					
25	105	0,20					
29	101	-0,0082					
32	95	-0,28					
34	96	-0,22					
35	108	0,36					
40	103	0,079					
41	96	-0,27					
42	94	-0,32					
45	102	0,046					
46	103	0,085					
52	97	-0,20					
59	100	-0,050					
62	102	0,030					
64	102	0,028					
72	108	0,36					
75	100	-0,052					
78	112	0,54					
81	99	-0,099					
85	101	-0,013					
87	95	-0,32					
89	101	0,00					
96	108	0,36					
98	108	0,35					
109	102	0,039					
111	104	0,15					
120	105	0,18					

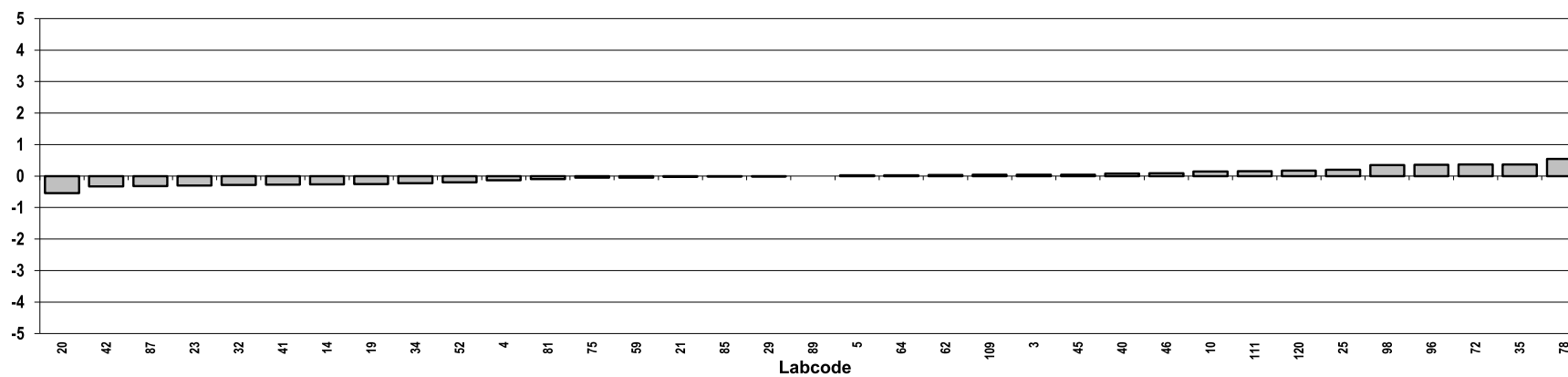
Consensus statistics

Consensus median, pg/g	101
Median all values pg/g	101
Consensus mean, pg/g	101
Standard deviation, pg/g	4,8
Relative standard deviation, %	4,8
No. of values reported	35
No. of values removed	0
No. of reported non-detects	0

PCB-156



Z-score: PCB-156



Analyte solution

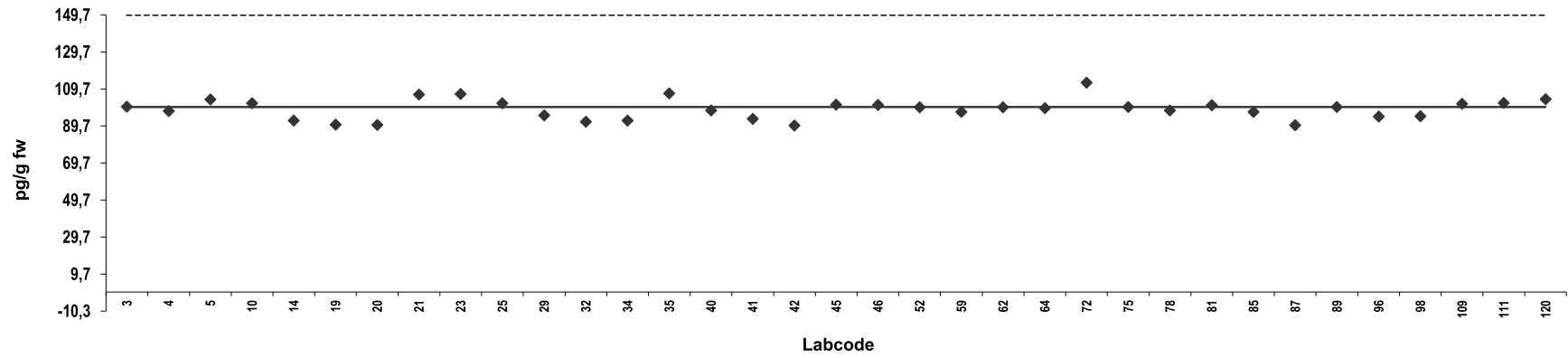
Congener: PCB-157

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	100	0,020					
4	98	-0,10					
5	104	0,22					
10	102	0,11					
14	93	-0,36					
19	90	-0,47					
20	90	-0,47					
21	107	0,35					
23	107	0,36					
25	102	0,11					
29	95	-0,22					
32	92	-0,39					
34	93	-0,36					
35	107	0,38					
40	98	-0,087					
41	94	-0,31					
42	90	-0,49					
45	101	0,070					
46	101	0,062					
52	100	0,0050					
59	97	-0,12					
62	100	0,00					
64	99	-0,023					
72	113	0,67					
75	100	0,0081					
78	98	-0,085					
81	101	0,060					
85	97	-0,12					
87	90	-0,48					
89	100	0,010					
96	95	-0,25					
98	95	-0,24					
109	102	0,10					
111	102	0,12					
120	104	0,22					

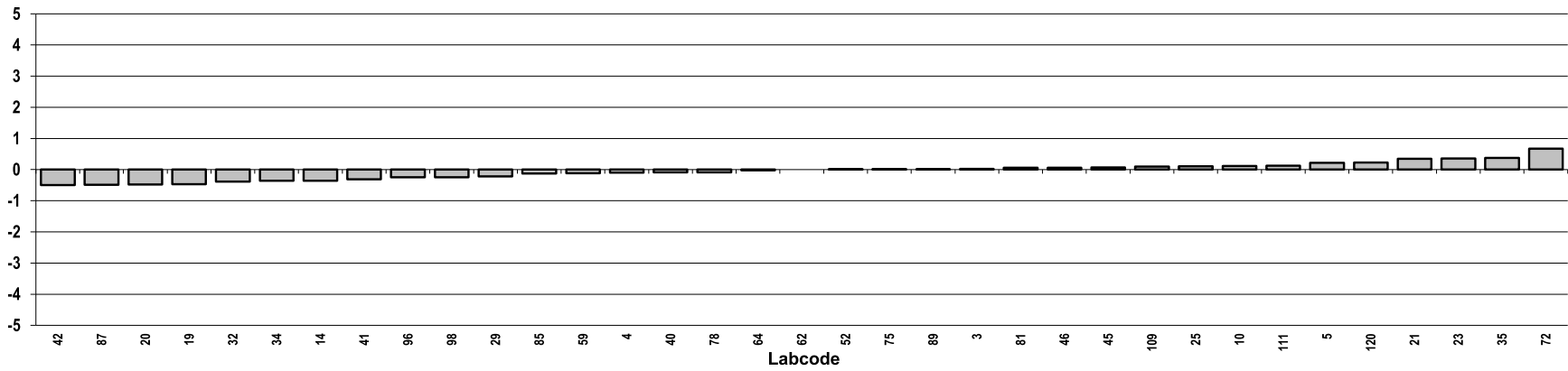
Consensus statistics

Consensus median, pg/g	100
Median all values pg/g	100
Consensus mean, pg/g	99
Standard deviation, pg/g	5,5
Relative standard deviation, %	5,5
No. of values reported	35
No. of values removed	0
No. of reported non-detects	0

PCB-157



Z-score: PCB-157



Analyte solution

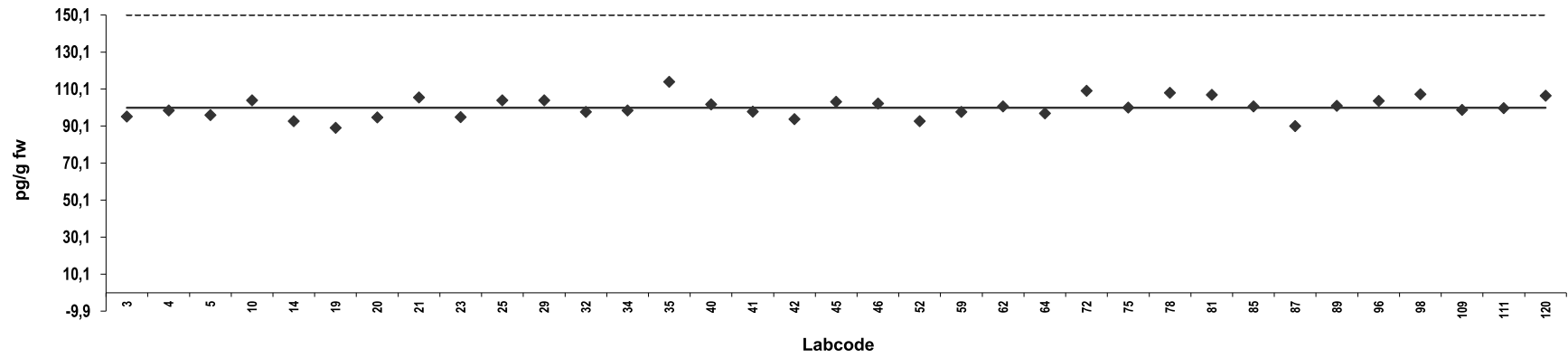
Congener: PCB-167

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	95	-0,24					
4	99	-0,078					
5	96	-0,20					
10	104	0,20					
14	93	-0,37					
19	89	-0,55					
20	95	-0,26					
21	106	0,27					
23	95	-0,25					
25	104	0,20					
29	104	0,19					
32	98	-0,11					
34	99	-0,077					
35	114	0,70					
40	102	0,085					
41	98	-0,11					
42	94	-0,31					
45	103	0,15					
46	102	0,11					
52	93	-0,37					
59	98	-0,12					
62	101	0,032					
64	97	-0,16					
72	109	0,46					
75	100	0,00					
78	108	0,40					
81	107	0,35					
85	101	0,033					
87	90	-0,50					
89	101	0,047					
96	104	0,18					
98	107	0,36					
109	99	-0,059					
111	100	-0,011					
120	107	0,32					

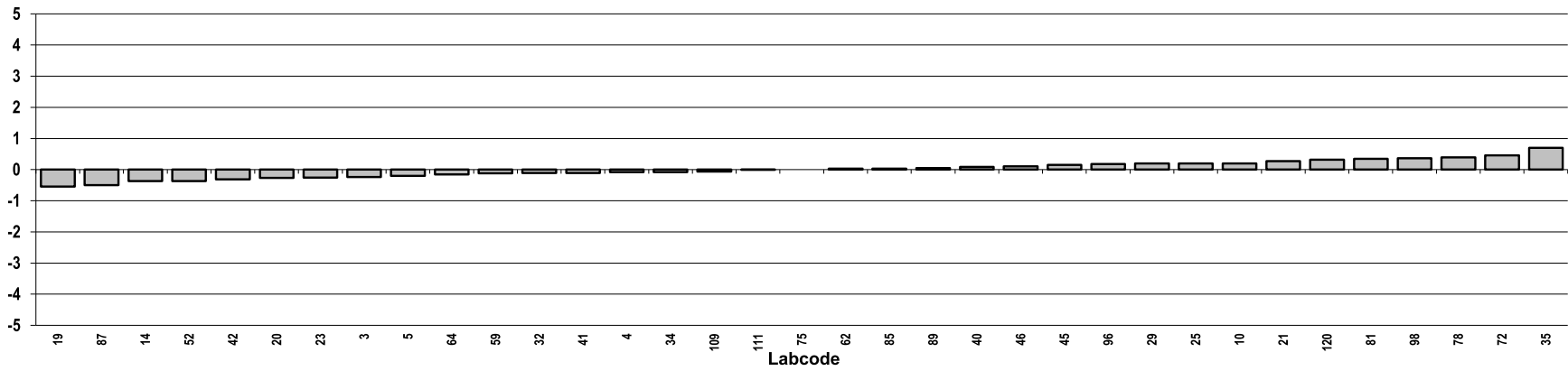
Consensus statistics

Consensus median, pg/g	100
Median all values pg/g	100
Consensus mean, pg/g	100
Standard deviation, pg/g	5,6
Relative standard deviation, %	5,6
No. of values reported	35
No. of values removed	0
No. of reported non-detects	0

PCB-167



Z-score: PCB-167



Analyte solution

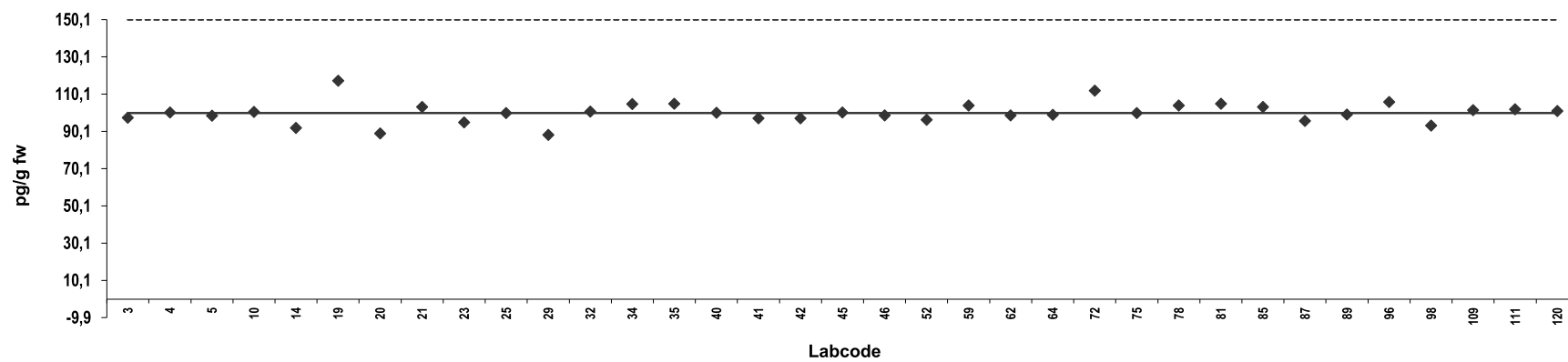
Congener: PCB-189

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	98	-0,13					
4	100	0,0089					
5	99	-0,075					
10	101	0,022					
14	92	-0,41					
19	117	0,86					
20	89	-0,55					
21	103	0,16					
23	95	-0,25					
25	100	-0,0049					
29	88	-0,59					
32	101	0,035					
34	105	0,23					
35	105	0,25					
40	100	0,00					
41	97	-0,14					
42	97	-0,15					
45	100	0,012					
46	99	-0,068					
52	96	-0,18					
59	104	0,19					
62	99	-0,070					
64	99	-0,050					
72	112	0,60					
75	100	-0,0033					
78	104	0,19					
81	105	0,24					
85	103	0,16					
87	96	-0,21					
89	99	-0,045					
96	106	0,29					
98	93	-0,34					
109	101	0,069					
111	102	0,092					
120	101	0,052					

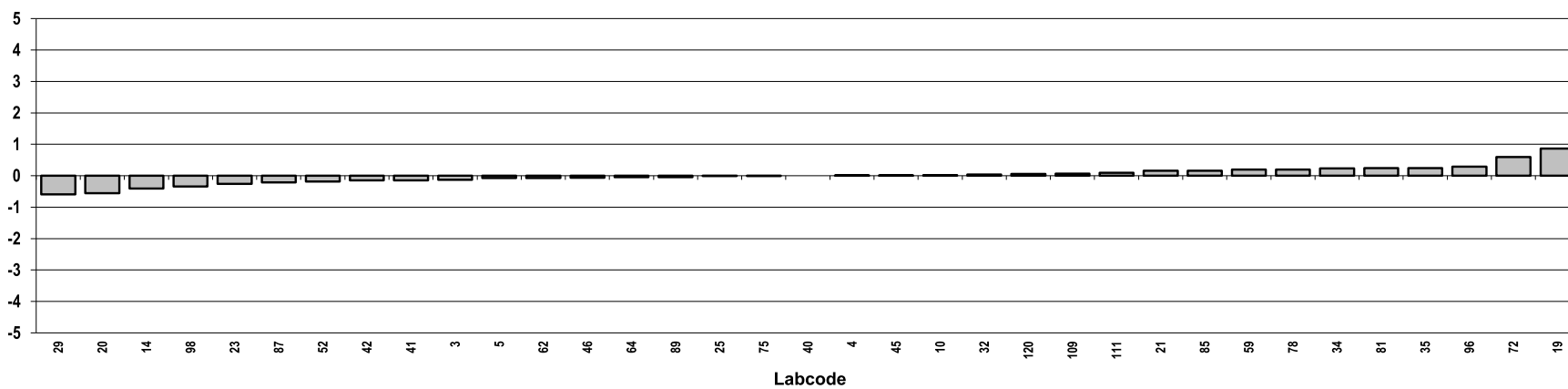
Consensus statistics

Consensus median, pg/g	100
Median all values pg/g	100
Consensus mean, pg/g	100
Standard deviation, pg/g	5,6
Relative standard deviation, %	5,6
No. of values reported	35
No. of values removed	0
No. of reported non-detects	0

PCB-189



Z-score: PCB-189



Analyte solution

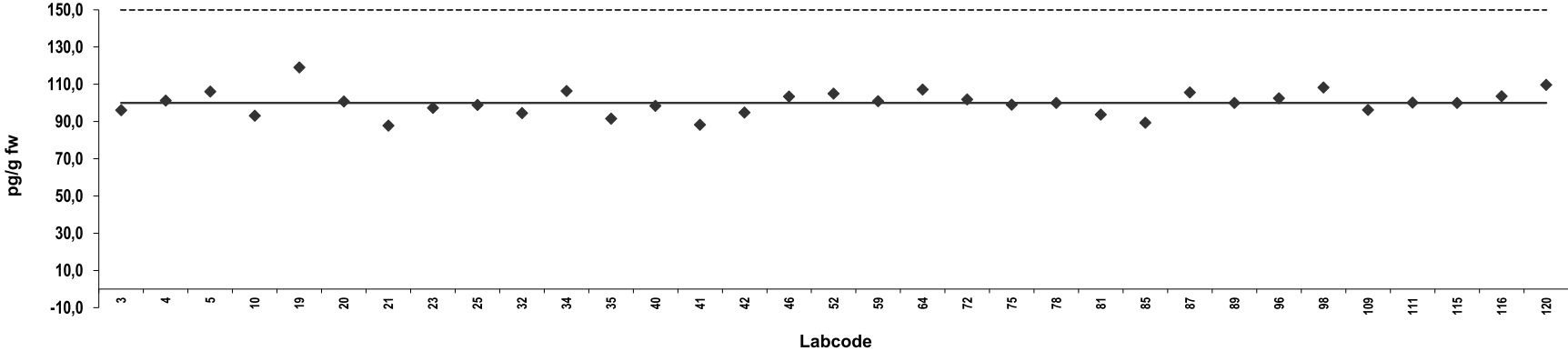
Congener: PCB-28

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	96	-0,20					
4	101	0,059					
5	106	0,31					
10	93	-0,35					
19	119	0,95					
20	101	0,035					
21	88	-0,61					
23	97	-0,13					
25	99	-0,055					
32	95	-0,27					
34	106	0,32					
35	92	-0,42					
40	98	-0,078					
41	88	-0,59					
42	95	-0,26					
46	103	0,17					
52	105	0,25					
59	101	0,050					
64	107	0,36					
72	102	0,096					
75	99	-0,044					
78	100	0,00					
81	94	-0,31					
85	89	-0,53					
87	106	0,28					
89	100	0,00					
96	102	0,12					
98	108	0,41					
109	96	-0,19					
111	100	0,0086					
115	100	0,00					
116	104	0,18					
120	110	0,48					

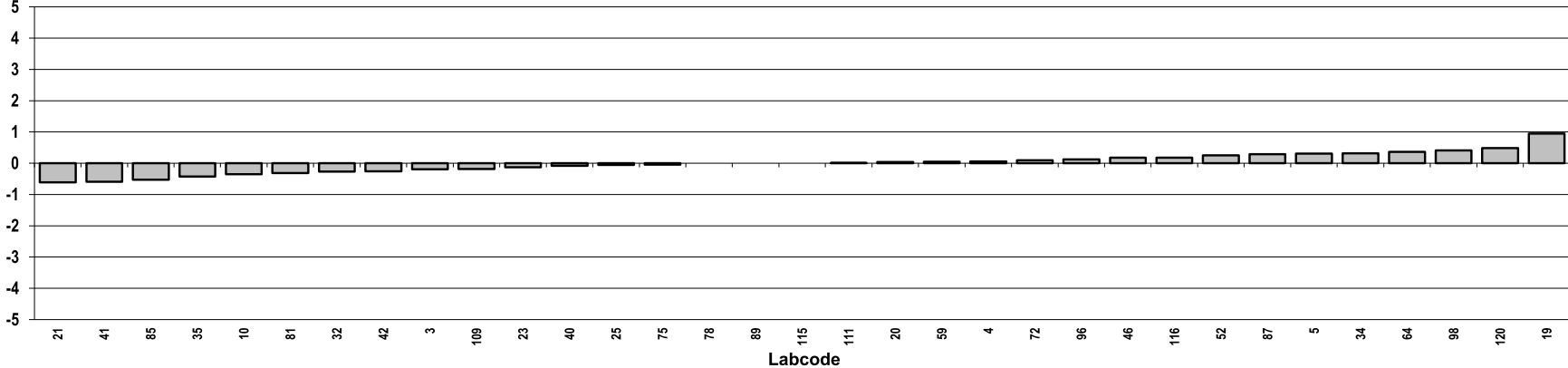
Consensus statistics

Consensus median, pg/g	100
Median all values pg/g	100
Consensus mean, pg/g	100
Standard deviation, pg/g	6,6
Relative standard deviation, %	6,6
No. of values reported	33
No. of values removed	0
No. of reported non-detects	0

PCB-28



Z-score: PCB-28



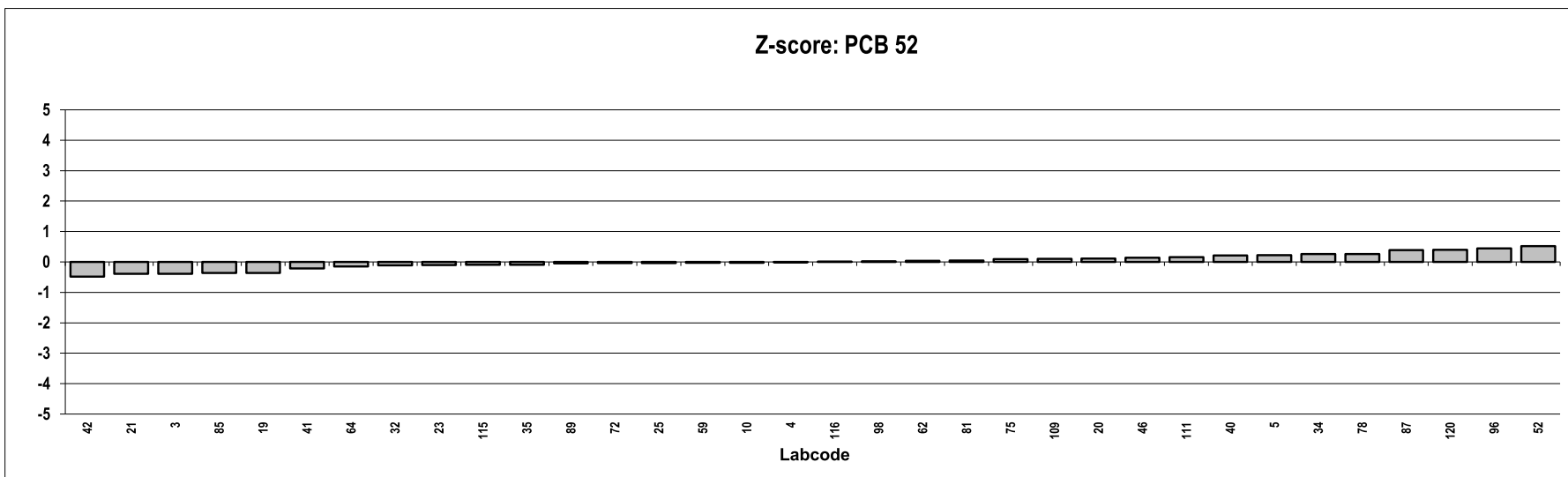
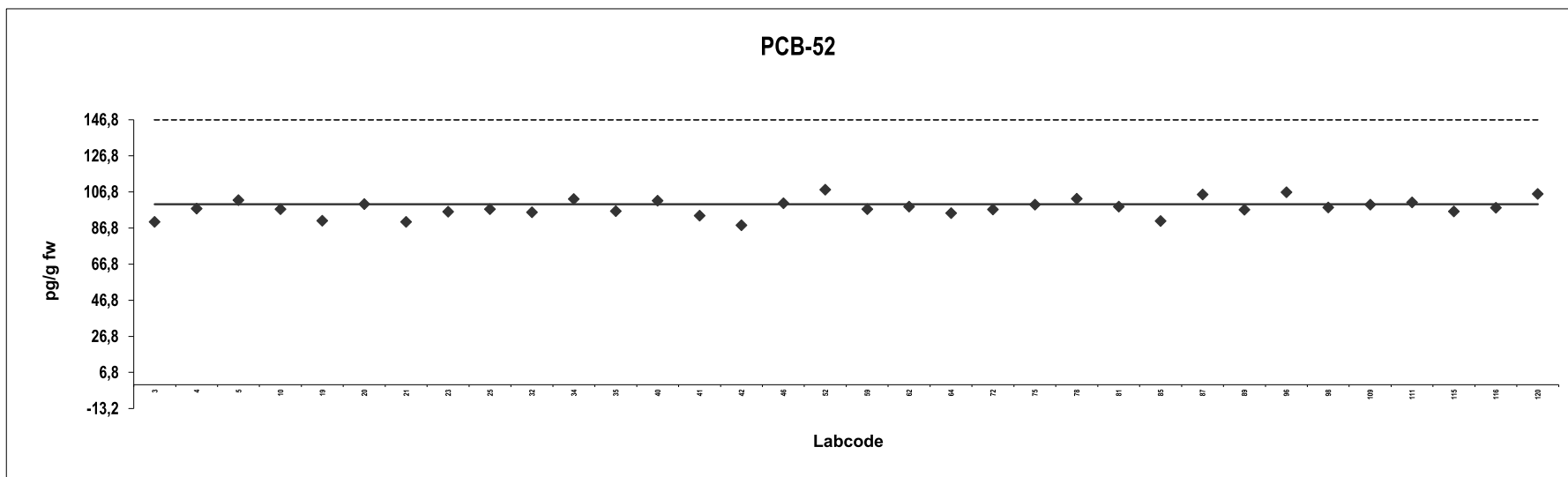
Analyte solution

Congener: PCB-52

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	90	-0,39					
4	98	-0,012					
5	102	0,23					
10	97	-0,028					
19	91	-0,36					
20	100	0,11					
21	90	-0,39					
23	96	-0,10					
25	97	-0,034					
32	96	-0,12					
34	103	0,26					
35	96	-0,090					
40	102	0,21					
41	94	-0,22					
42	88	-0,49					
46	101	0,14					
52	108	0,52					
59	97	-0,029					
62	99	0,037					
64	95	-0,14					
72	97	-0,036					
75	100	0,093					
78	103	0,26					
81	99	0,042					
85	91	-0,37					
87	105	0,39					
89	97	-0,045					
96	107	0,45					
98	98	0,017					
109	100	0,10					
111	101	0,16					
115	96	-0,096					
116	98	0,012					
120	106	0,40					

Consensus statistics

Consensus median, pg/g	98
Median all values pg/g	98
Consensus mean, pg/g	98
Standard deviation, pg/g	4,8
Relative standard deviation, %	4,9
No. of values reported	34
No. of values removed	0
No. of reported non-detects	0



Analyte solution

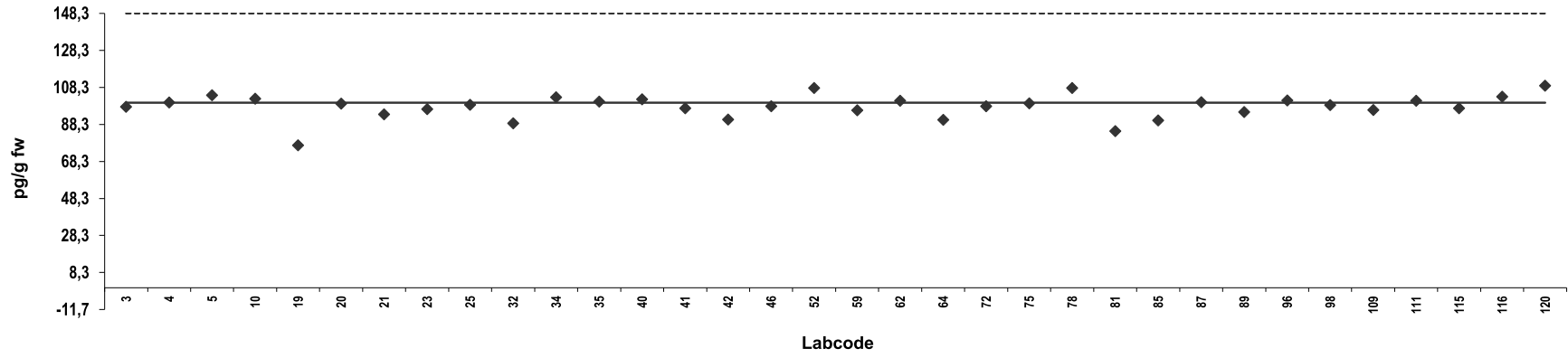
Congener: PCB-101

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	98	-0,057					
4	100	0,061					
5	104	0,27					
10	102	0,16					
19	77	-1,1					
20	100	0,034					
21	94	-0,26					
23	97	-0,11					
25	99	0,0032					
32	89	-0,50					
34	103	0,21					
35	101	0,091					
40	102	0,15					
41	97	-0,094					
42	91	-0,40					
46	98	-0,038					
52	108	0,46					
59	96	-0,15					
62	101	0,11					
64	91	-0,41					
72	98	-0,035					
75	100	0,044					
78	108	0,46					
81	85	-0,72					
85	90	-0,43					
87	100	0,074					
89	95	-0,20					
96	101	0,12					
98	99	-0,0032					
109	96	-0,14					
111	101	0,12					
115	97	-0,093					
116	103	0,22					
120	109	0,52					

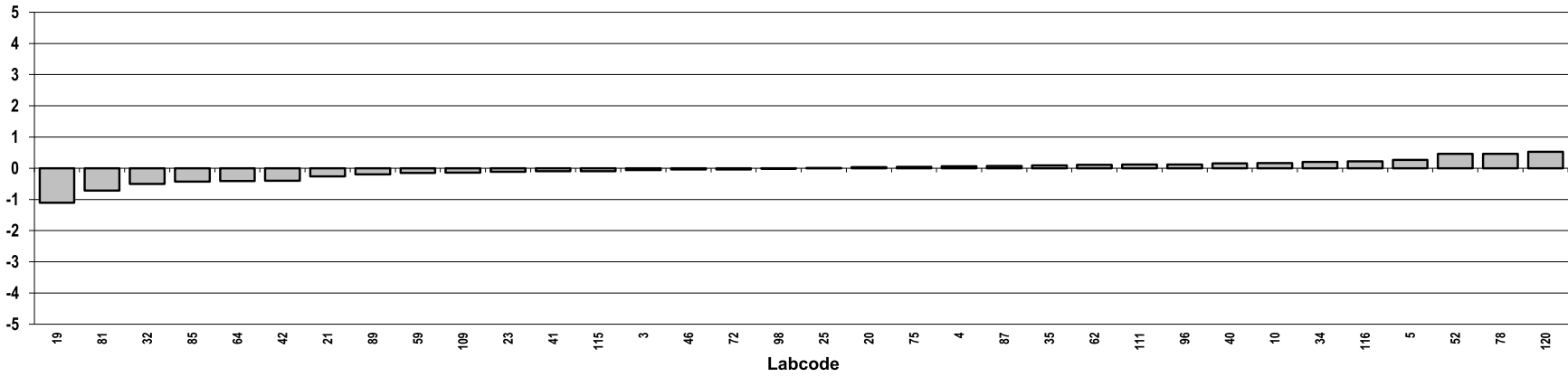
Consensus statistics

Consensus median, pg/g	99
Median all values pg/g	99
Consensus mean, pg/g	98
Standard deviation, pg/g	6,5
Relative standard deviation, %	6,7
No. of values reported	34
No. of values removed	0
No. of reported non-detects	0

PCB-101



Z-score: PCB 101



Analyte solution

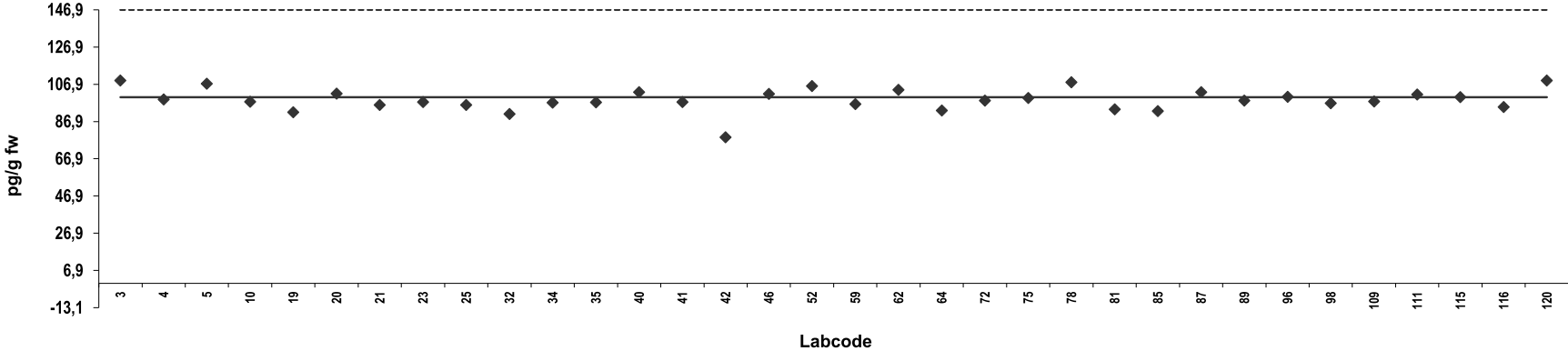
Congener: PCB-138

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	109	0,56					
4	99	0,045					
5	107	0,47					
10	98	-0,019					
19	92	-0,30					
20	102	0,20					
21	96	-0,11					
23	97	-0,028					
25	96	-0,11					
32	91	-0,35					
34	97	-0,043					
35	97	-0,035					
40	103	0,24					
41	97	-0,025					
42	78	-1,0					
46	102	0,20					
52	106	0,41					
59	96	-0,085					
62	104	0,31					
64	93	-0,26					
72	98	0,014					
75	100	0,085					
78	108	0,51					
81	94	-0,23					
85	93	-0,28					
87	103	0,24					
89	98	0,012					
96	100	0,11					
98	97	-0,062					
109	98	-0,012					
111	101	0,18					
115	100	0,10					
116	95	-0,17					
120	109	0,56					

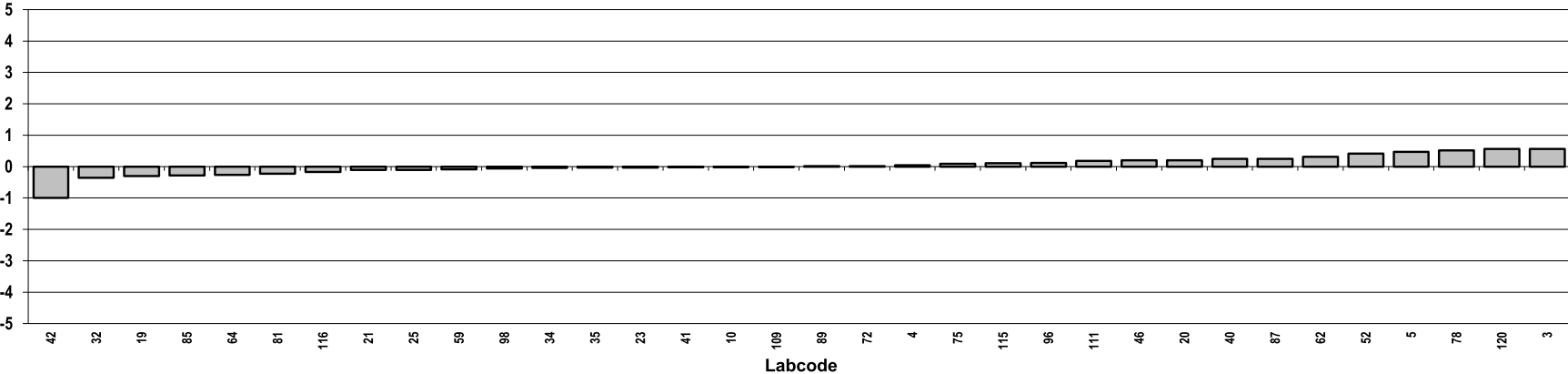
Consensus statistics

Consensus median, pg/g	98
Median all values pg/g	98
Consensus mean, pg/g	99
Standard deviation, pg/g	6,0
Relative standard deviation, %	6,1
No. of values reported	34
No. of values removed	0
No. of reported non-detects	0

PCB-138



Z-score: PCB-138



Analyte solution

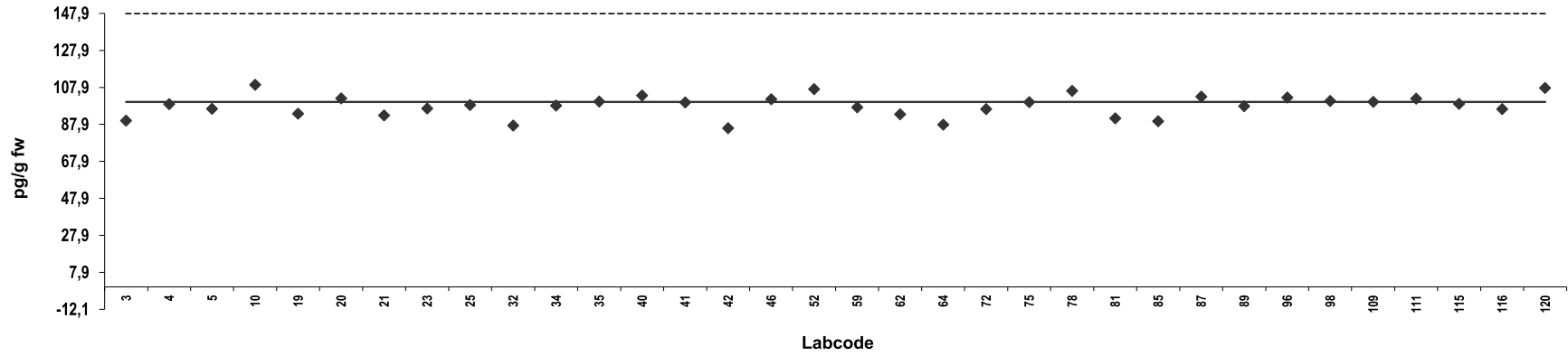
Congener: PCB-153

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	90	-0,44					
4	99	0,0091					
5	96	-0,12					
10	109	0,54					
19	94	-0,25					
20	102	0,17					
21	93	-0,30					
23	97	-0,11					
25	98	-0,0091					
32	87	-0,57					
34	98	-0,029					
35	100	0,086					
40	103	0,25					
41	100	0,061					
42	86	-0,65					
46	101	0,15					
52	107	0,43					
59	97	-0,080					
62	93	-0,26					
64	88	-0,55					
72	96	-0,12					
75	100	0,063					
78	106	0,38					
81	91	-0,38					
85	90	-0,46					
87	103	0,22					
89	98	-0,045					
96	102	0,19					
98	101	0,099					
109	100	0,071					
111	102	0,16					
115	99	0,021					
116	96	-0,13					
120	108	0,45					

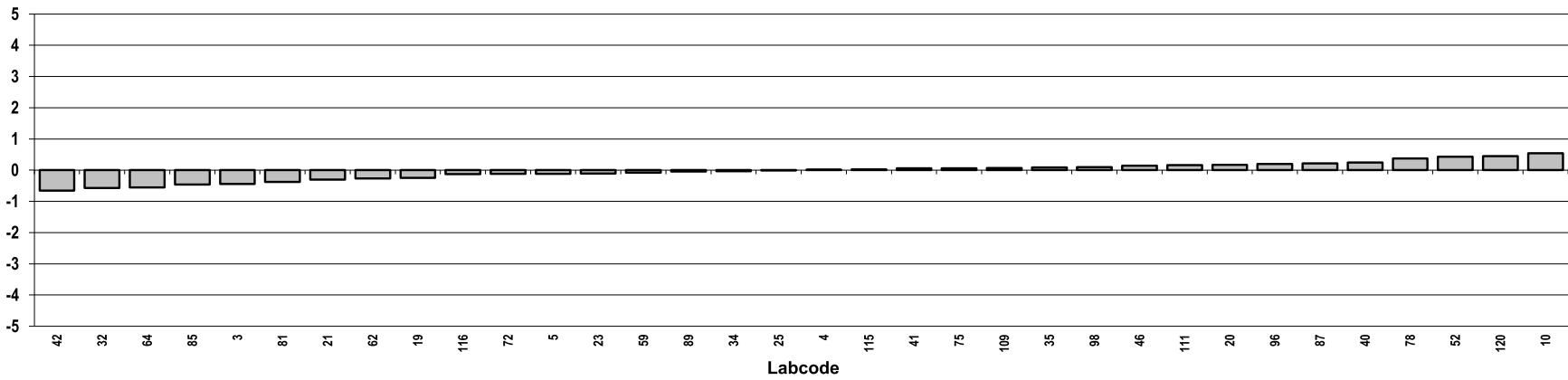
Consensus statistics

Consensus median, pg/g	99
Median all values pg/g	99
Consensus mean, pg/g	98
Standard deviation, pg/g	5,9
Relative standard deviation, %	6,0
No. of values reported	34
No. of values removed	0
No. of reported non-detects	0

PCB-153



Z-score: PCB-153



Analyte solution

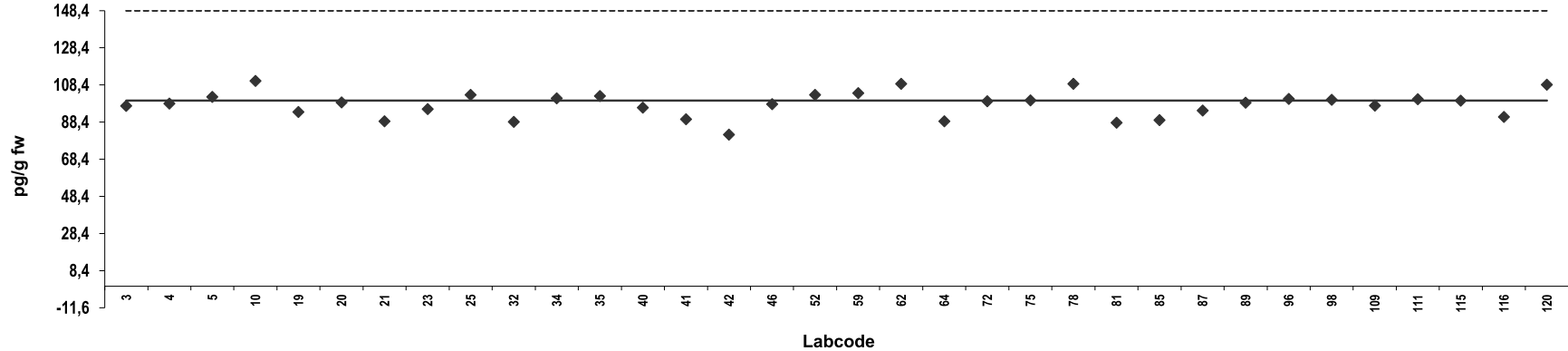
Congener: PCB-180

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	97	-0,092					
4	98	-0,026					
5	102	0,16					
10	111	0,59					
19	94	-0,25					
20	99	0,0063					
21	89	-0,51					
23	95	-0,18					
25	103	0,21					
32	88	-0,53					
34	101	0,11					
35	102	0,18					
40	96	-0,14					
41	90	-0,45					
42	82	-0,88					
46	98	-0,042					
52	103	0,21					
59	104	0,26					
62	109	0,51					
64	89	-0,51					
72	100	0,033					
75	100	0,056					
78	109	0,51					
81	88	-0,55					
85	89	-0,48					
87	95	-0,22					
89	99	-0,0063					
96	101	0,097					
98	100	0,072					
109	97	-0,083					
111	101	0,090					
115	100	0,054					
116	91	-0,39					
120	108	0,48					

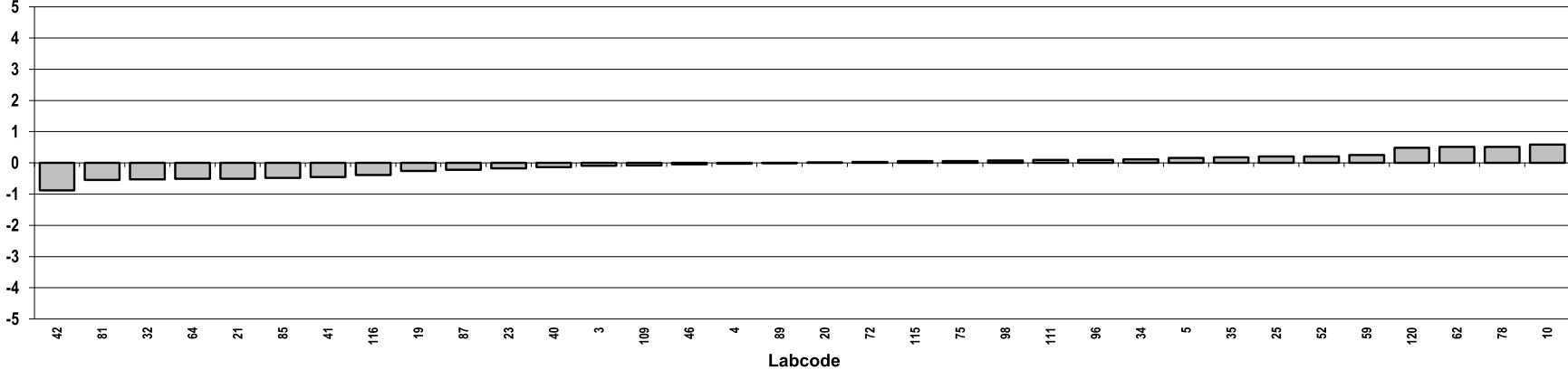
Consensus statistics

Consensus median, pg/g	99
Median all values pg/g	99
Consensus mean, pg/g	98
Standard deviation, pg/g	6,8
Relative standard deviation, %	6,9
No. of values reported	34
No. of values removed	0
No. of reported non-detects	0

PCB-180



Z-score: PCB-180



Analyte solution

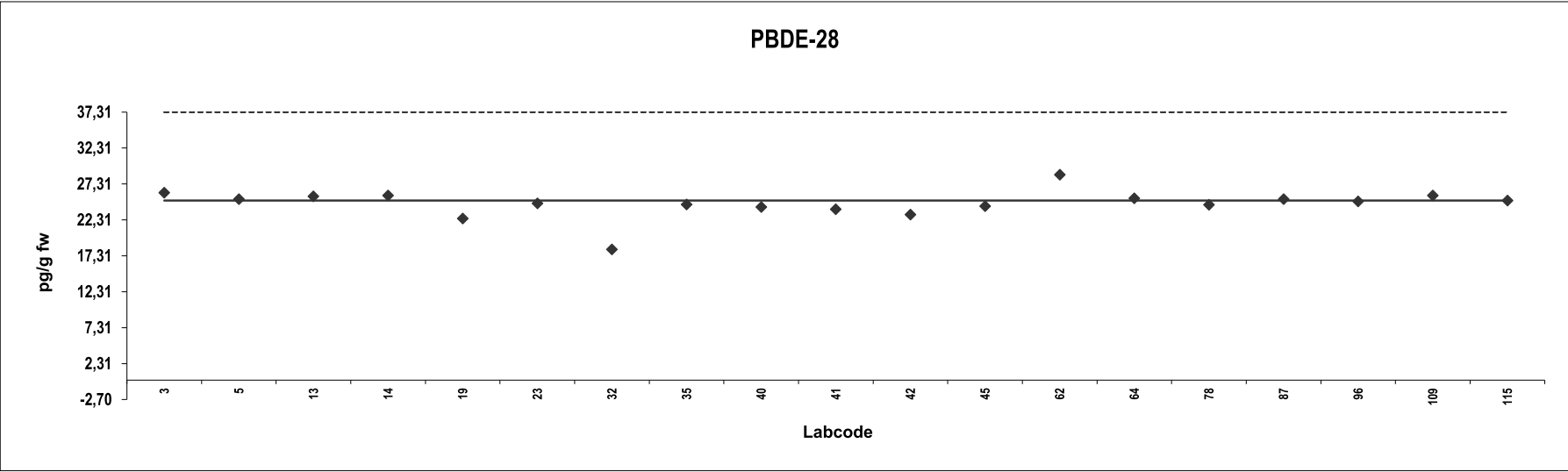
Congener: PBDE-28

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	26	0,25					
5	25	0,066					
13	26	0,15					
14	26	0,17					
19	23	-0,48					
23	25	-0,054					
32	18	-1,3					
35	24	-0,082					
40	24	-0,16					
41	24	-0,22					
42	23	-0,37					
45	24	-0,13					
62	29	0,75					
64	25	0,087					
78	24	-0,094					
87	25	0,066					
96	25	0,00					
109	26	0,17					
115	25	0,026					

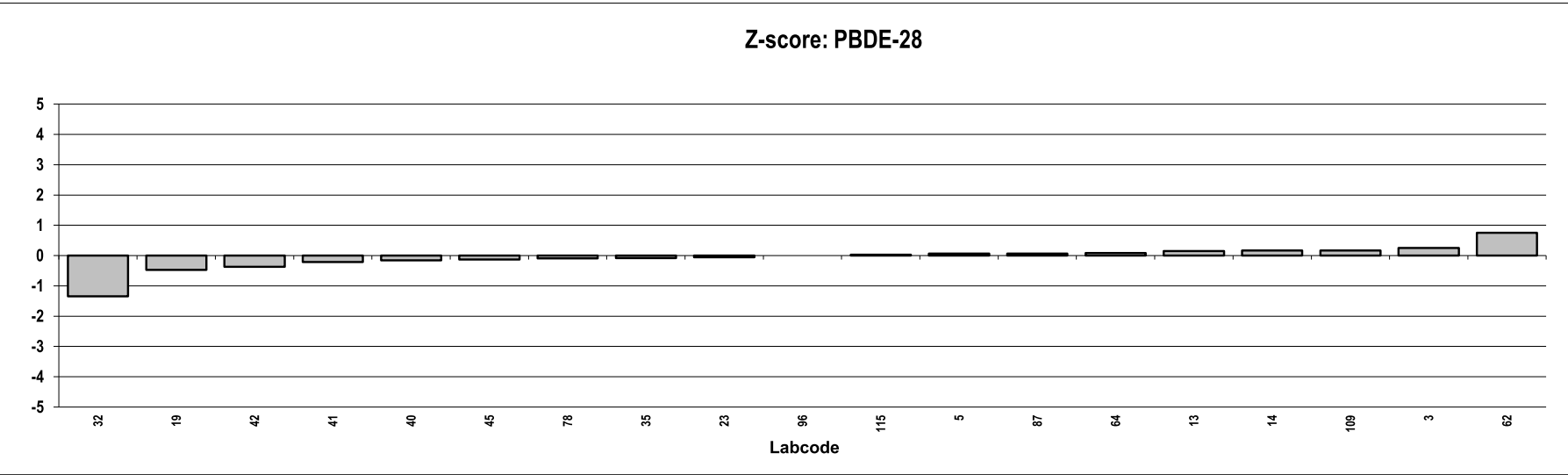
Consensus statistics

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, %	8,1
No. of values reported	19
No. of values removed	0
No. of reported non-detects	0

PBDE-28



Z-score: PBDE-28



Analyte solution

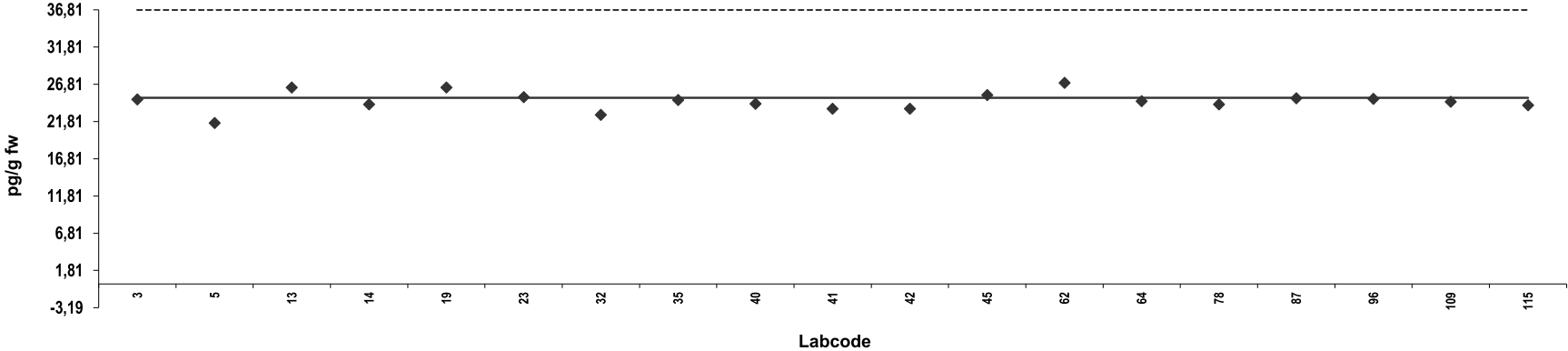
Congener: PBDE-47

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	25	0,052					
5	22	-0,60					
13	26	0,38					
14	24	-0,090					
19	26	0,38					
23	25	0,11					
32	23	-0,38					
35	25	0,036					
40	24	-0,071					
41	24	-0,21					
42	24	-0,21					
45	25	0,17					
62	27	0,50					
64	25	0,00					
78	24	-0,090					
87	25	0,081					
96	25	0,061					
109	24	-0,017					
115	24	-0,11					

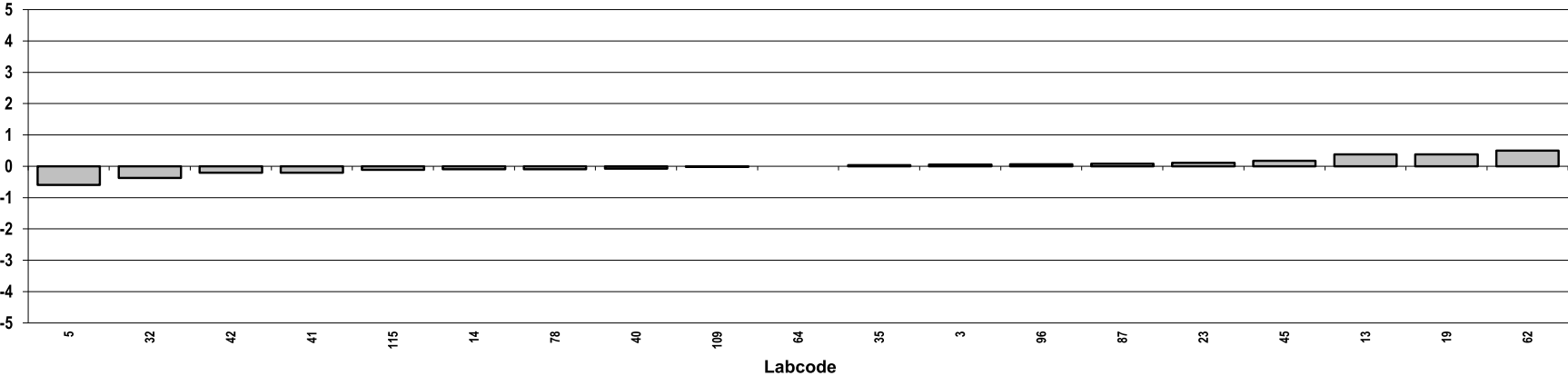
Consensus statistics

Consensus median, pg/g	25
Median all values pg/g	25
Consensus mean, pg/g	25
Standard deviation, pg/g	1,3
Relative standard deviation, %	5,2
No. of values reported	19
No. of values removed	0
No. of reported non-detects	0

PBDE-47



Z-score: PBDE-47



Analyte solution

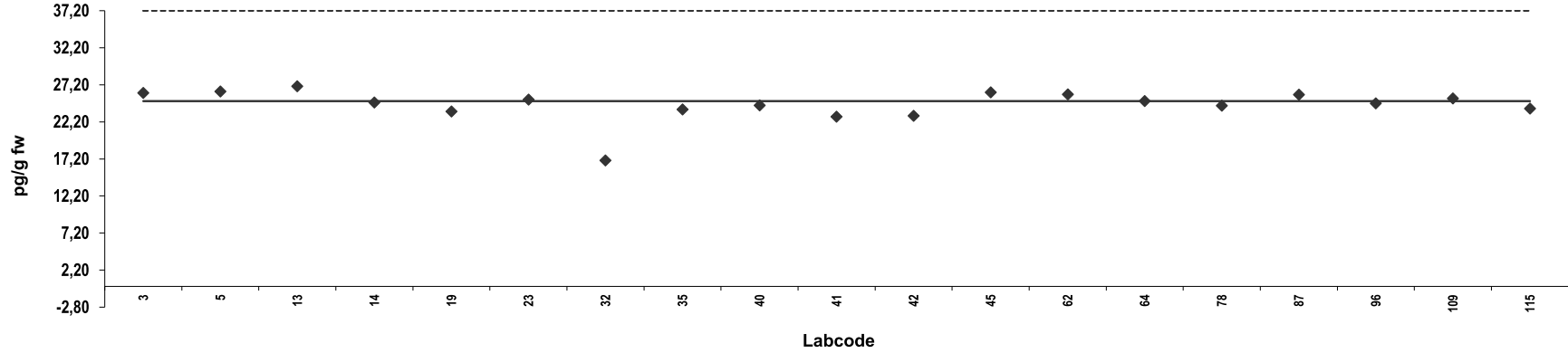
Congener: PBDE-99

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	26	0,26					
5	26	0,30					
13	27	0,44					
14	25	0,00					
19	24	-0,24					
23	25	0,081					
32	17	-1,6					
35	24	-0,19					
40	24	-0,075					
41	23	-0,38					
42	23	-0,36					
45	26	0,28					
62	26	0,22					
64	25	0,045					
78	24	-0,081					
87	26	0,22					
96	25	-0,024					
109	25	0,12					
115	24	-0,16					

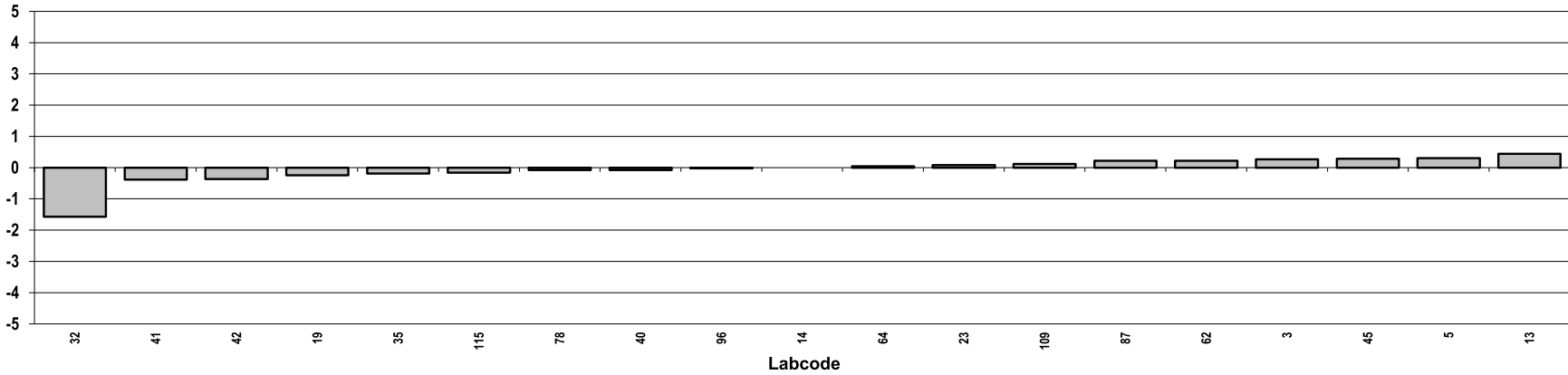
Consensus statistics

Consensus median, pg/g	25
Median all values pg/g	25
Consensus mean, pg/g	25
Standard deviation, pg/g	2,1
Relative standard deviation, %	8,8
No. of values reported	19
No. of values removed	0
No. of reported non-detects	0

PBDE-99



Z-score: PBDE-99



Analyte solution

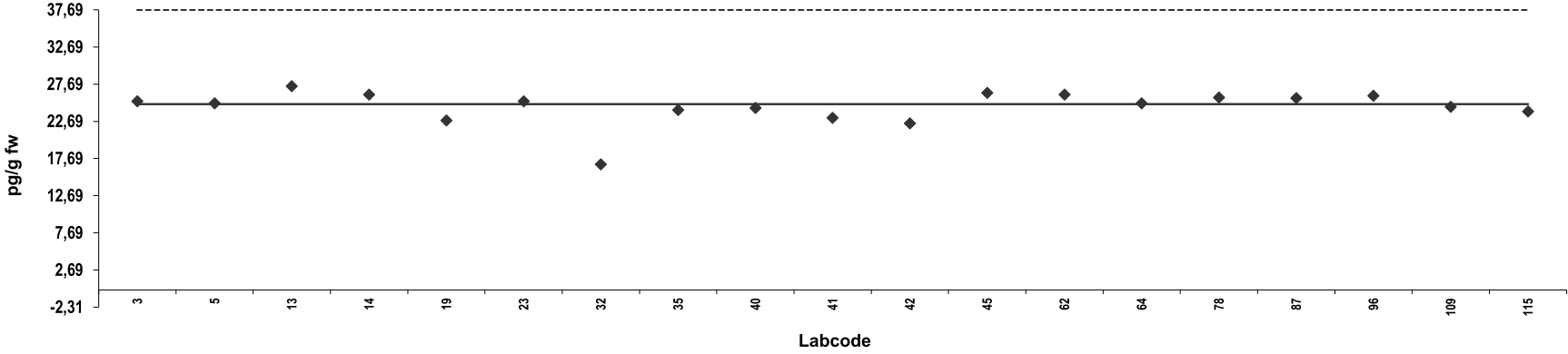
Congener: PBDE-100

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	25	0,055					
5	25	-0,0051					
13	27	0,45					
14	26	0,23					
19	23	-0,46					
23	25	0,055					
32	17	-1,6					
35	24	-0,19					
40	24	-0,13					
41	23	-0,39					
42	22	-0,54					
45	27	0,28					
62	26	0,23					
64	25	0,00					
78	26	0,15					
87	26	0,14					
96	26	0,20					
109	25	-0,095					
115	24	-0,22					

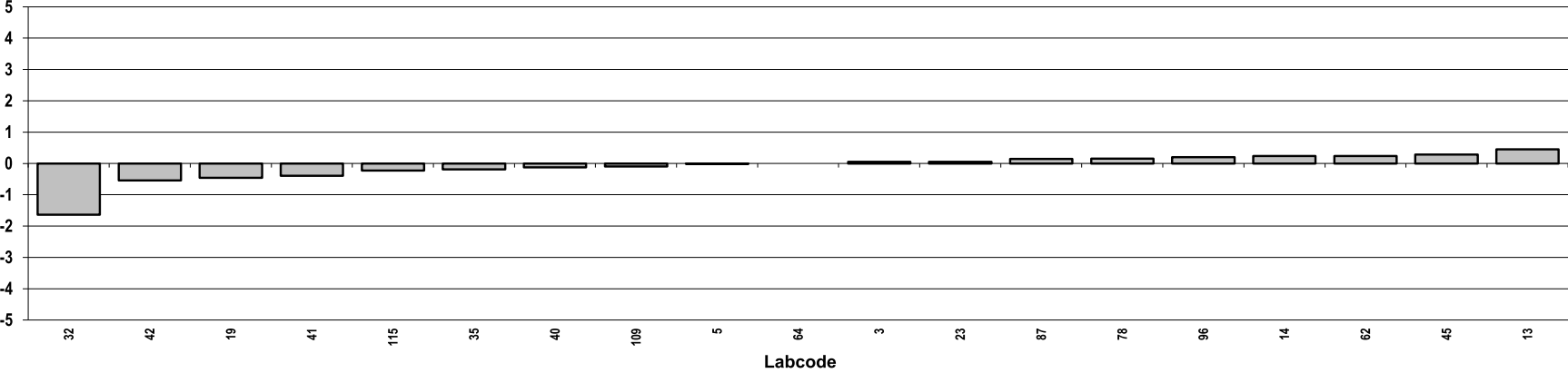
Consensus statistics

Consensus median, pg/g	25
Median all values pg/g	25
Consensus mean, pg/g	25
Standard deviation, pg/g	2,3
Relative standard deviation, %	9,3
No. of values reported	19
No. of values removed	0
No. of reported non-detects	0

PBDE-100



Z-score: PBDE-100



Analyte solution

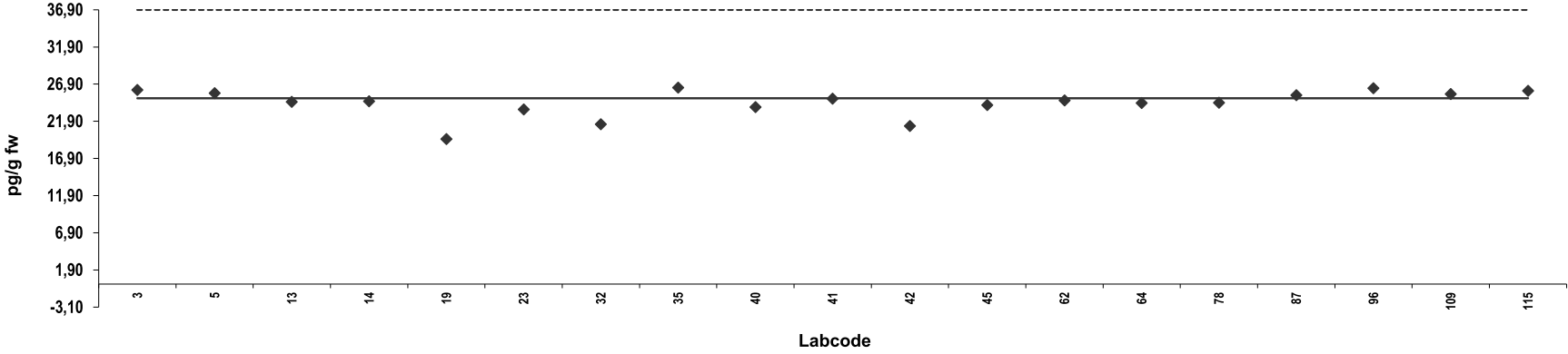
Congener: PBDE-153

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	26	0,30					
5	26	0,22					
13	25	-0,020					
14	25	0,00					
19	20	-1,0					
23	24	-0,22					
32	22	-0,63					
35	26	0,37					
40	24	-0,16					
41	25	0,073					
42	21	-0,68					
45	24	-0,10					
62	25	0,020					
64	24	-0,050					
78	24	-0,041					
87	25	0,16					
96	26	0,36					
109	26	0,20					
115	26	0,28					

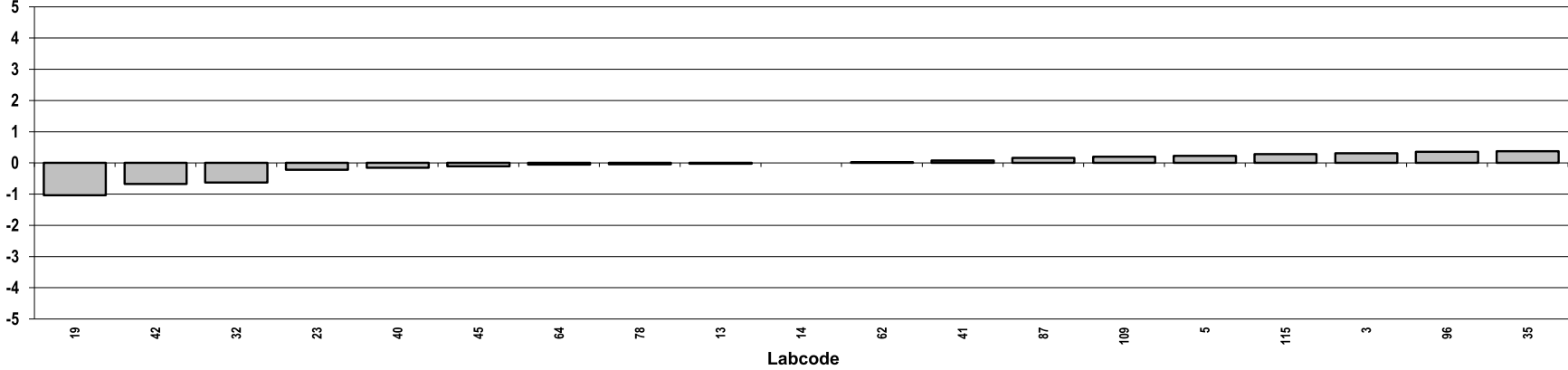
Consensus statistics

Consensus median, pg/g	25
Median all values pg/g	25
Consensus mean, pg/g	24
Standard deviation, pg/g	1,8
Relative standard deviation, %	7,6
No. of values reported	19
No. of values removed	0
No. of reported non-detects	0

PBDE-153



Z-score: PBDE-153



Analyte solution

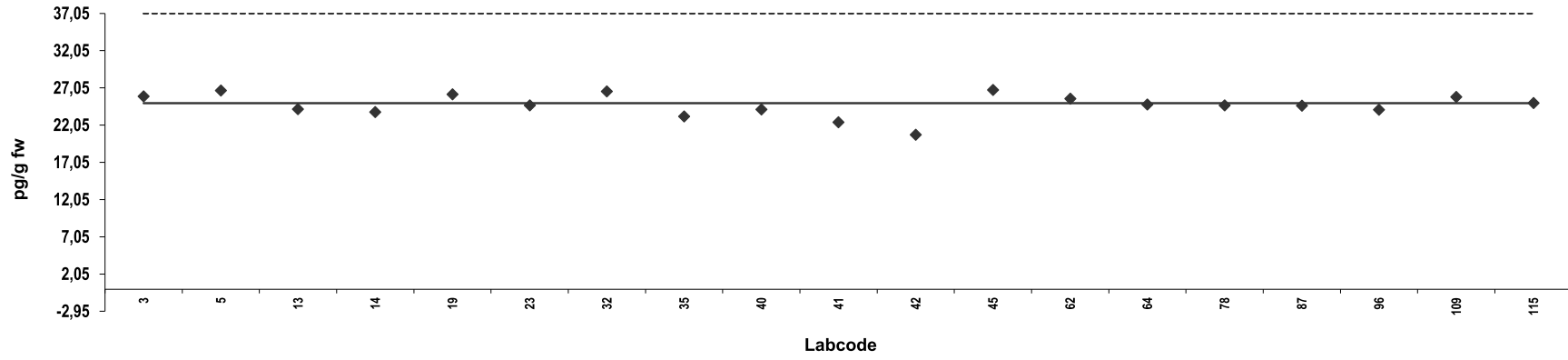
Congener: PBDE-154

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	26	0,24					
5	27	0,40					
13	24	-0,10					
14	24	-0,18					
19	26	0,30					
23	25	0,00					
32	27	0,38					
35	23	-0,30					
40	24	-0,11					
41	22	-0,46					
42	21	-0,80					
45	27	0,42					
62	26	0,18					
64	25	0,024					
78	25	0,00					
87	25	-0,0081					
96	24	-0,12					
109	26	0,23					
115	25	0,061					

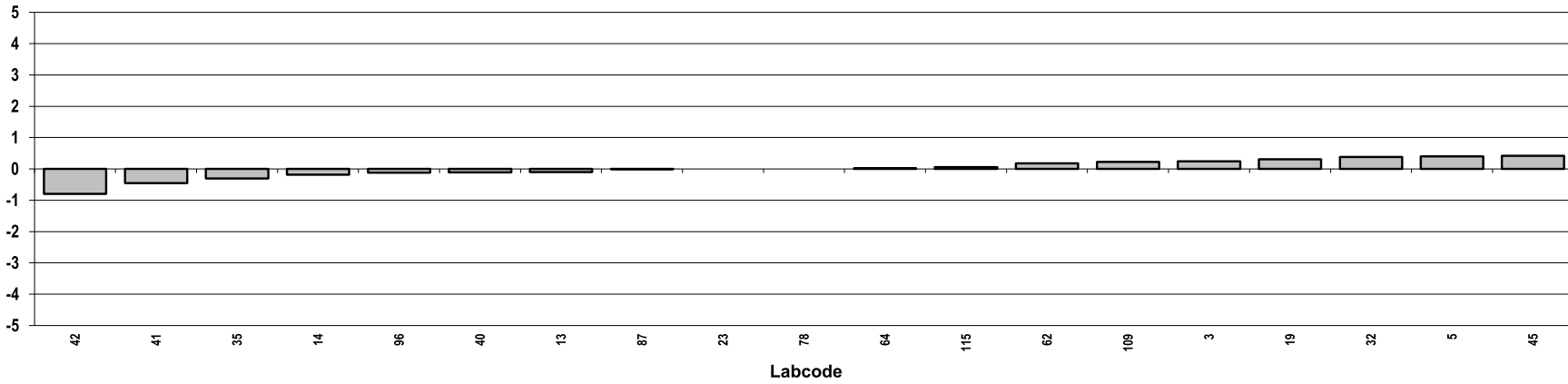
Consensus statistics

Consensus median, pg/g	25
Median all values pg/g	25
Consensus mean, pg/g	25
Standard deviation, pg/g	1,5
Relative standard deviation, %	6,2
No. of values reported	19
No. of values removed	0
No. of reported non-detects	0

PBDE-154



Z-score: PBDE-154



Analyte solution

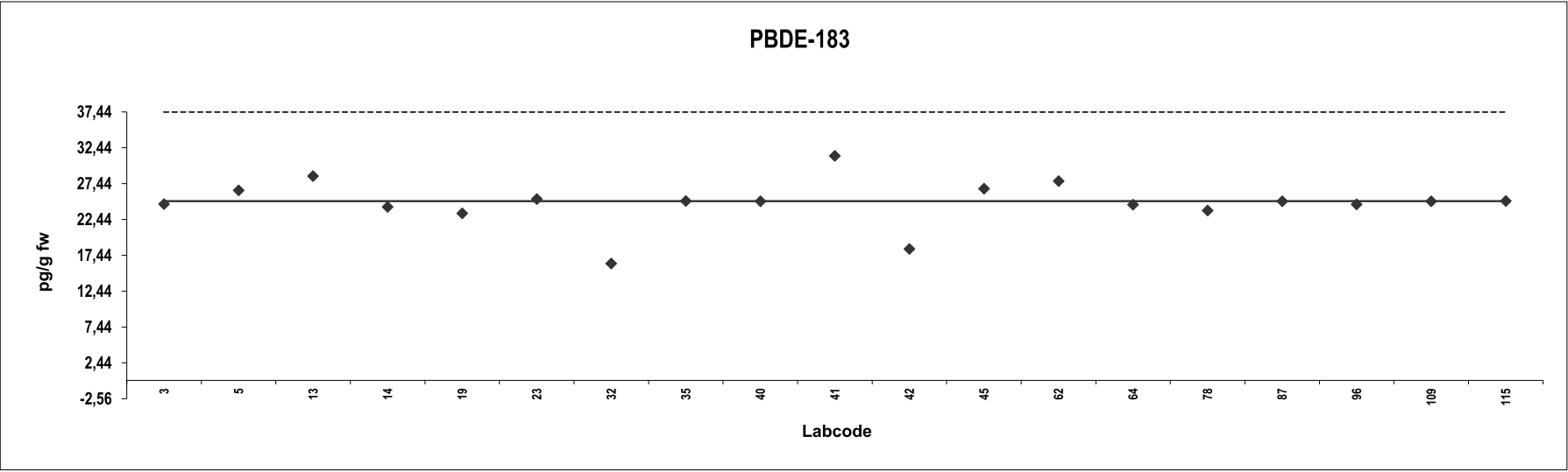
Congener: PBDE-183

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	25	-0,072					
5	27	0,31					
13	29	0,71					
14	24	-0,15					
19	23	-0,33					
23	25	0,068					
32	16	-1,7					
35	25	0,0073					
40	25	0,0032					
41	31	1,3					
42	18	-1,3					
45	27	0,36					
62	28	0,57					
64	24	-0,093					
78	24	-0,25					
87	25	0,00					
96	25	-0,082					
109	25	0,00					
115	25	0,0080					

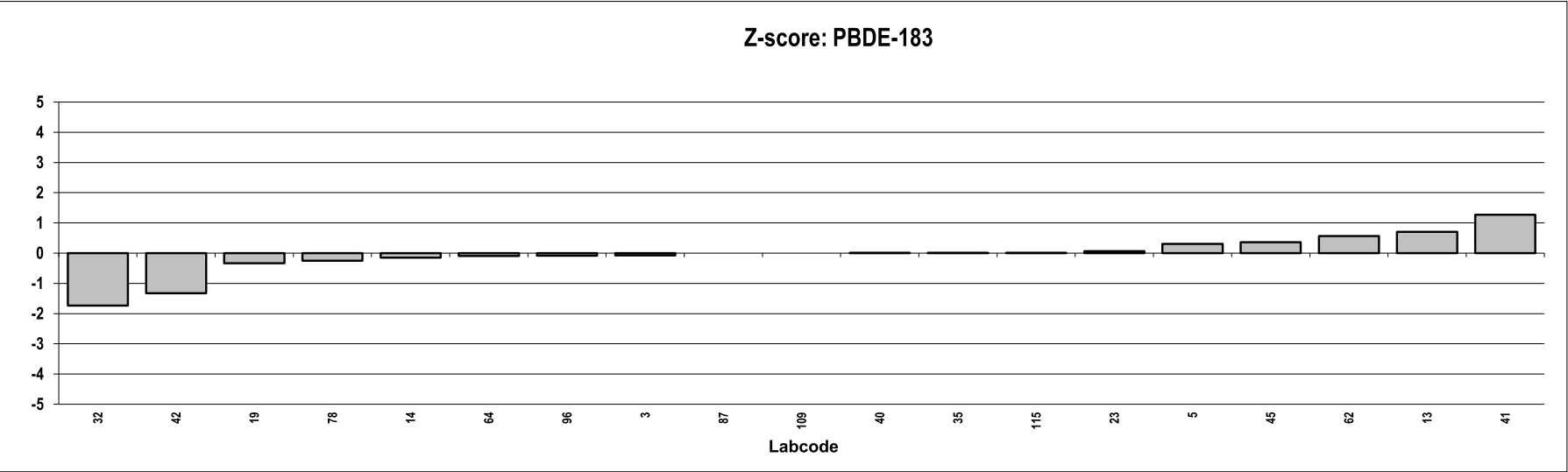
Consensus statistics

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	19
No. of values removed	0
No. of reported non-detects	0

PBDE-183



Z-score: PBDE-183



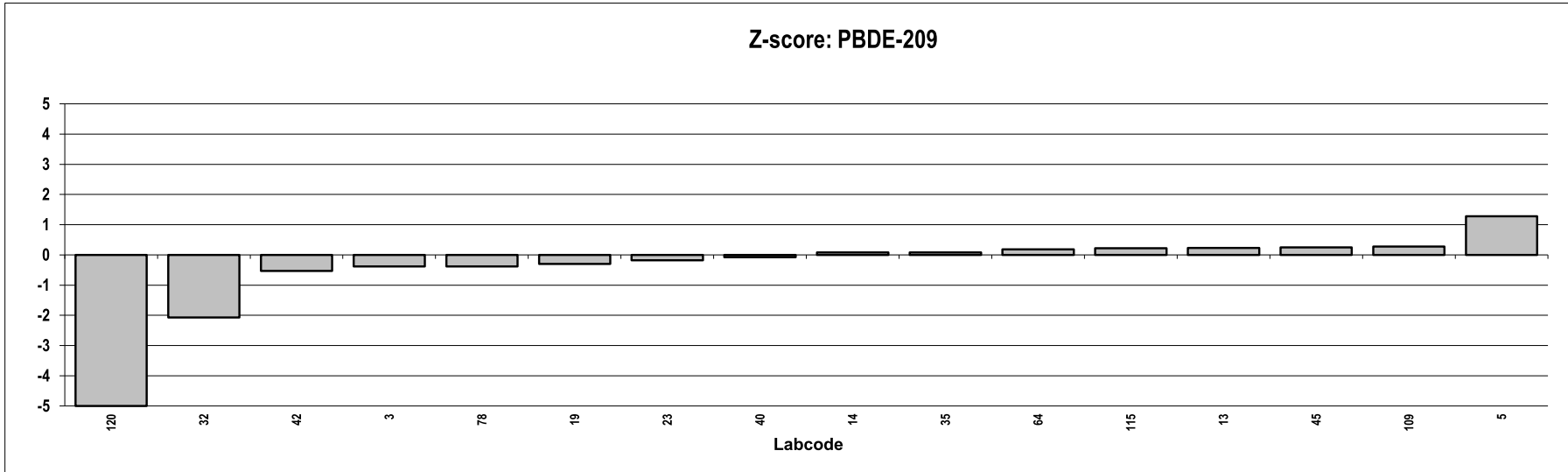
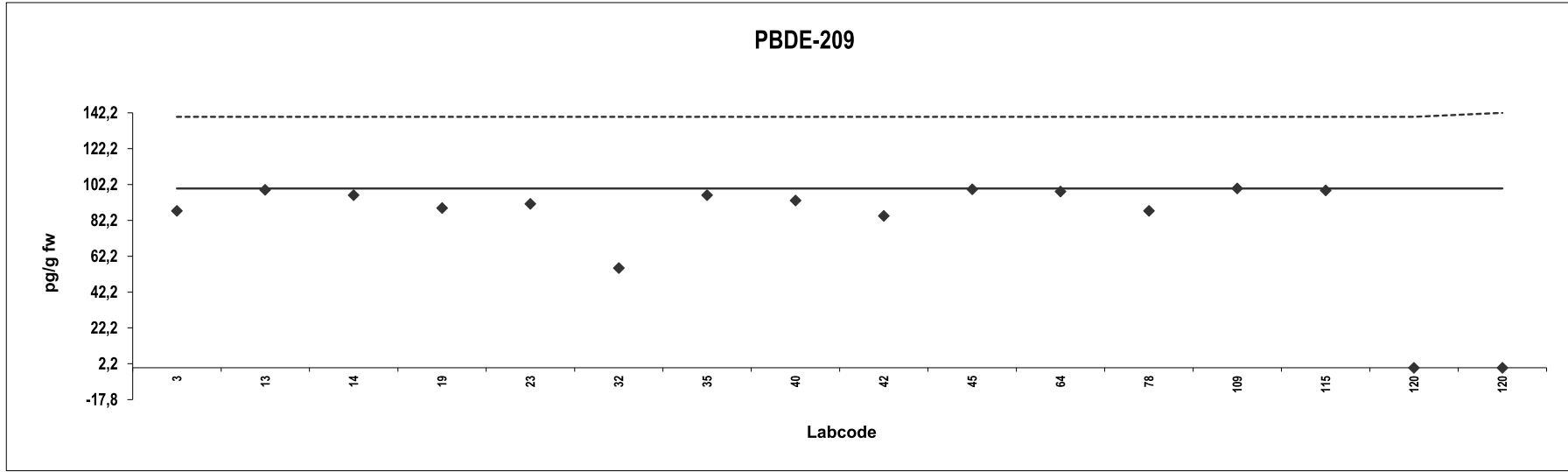
Analyte solution

Congener: PBDE-209

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	88	-0,46					
5	121	1,3					
13	99	0,15					
14	96	0,00					
19	89	-0,37					
23	92	-0,25					
32	56	-2,1					
35	96	0,00					
40	93	-0,15					
42	85	-0,60					
45	100	0,17					
64	98	0,10					
78	88	-0,46					
109	100	0,19					
115	99	0,14					
120	0,00	-5,0	Outlier,ND				

Consensus statistics

Consensus median, pg/g	96
Median all values pg/g	95
Consensus mean, pg/g	93
Standard deviation, pg/g	13
Relative standard deviation, %	14
No. of values reported	16
No. of values removed	1
No. of reported non-detects	1



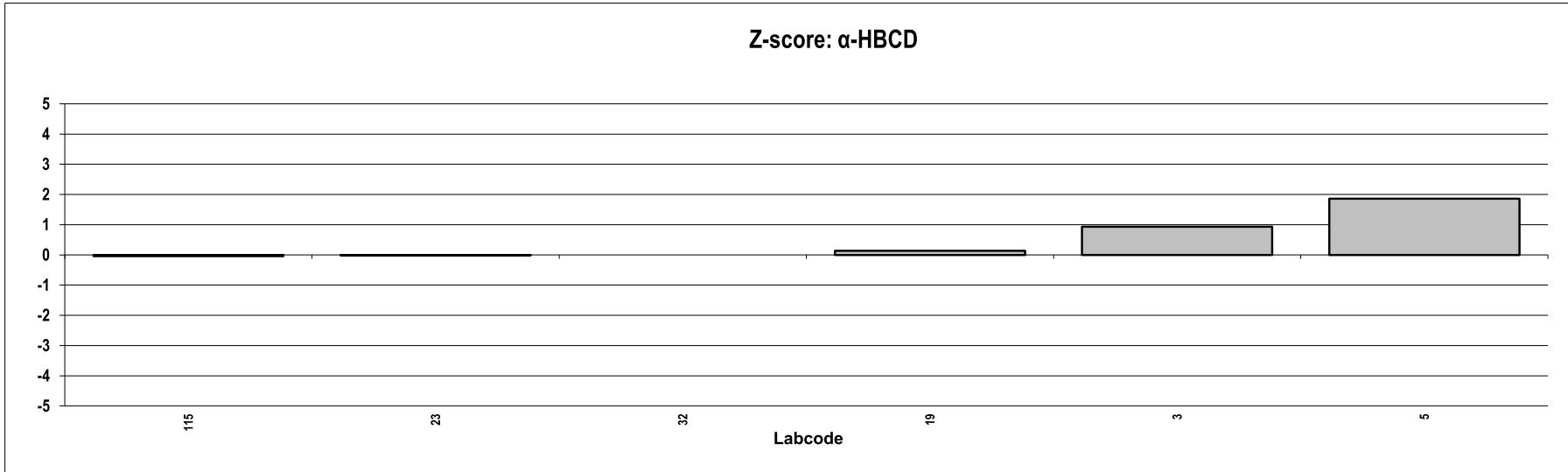
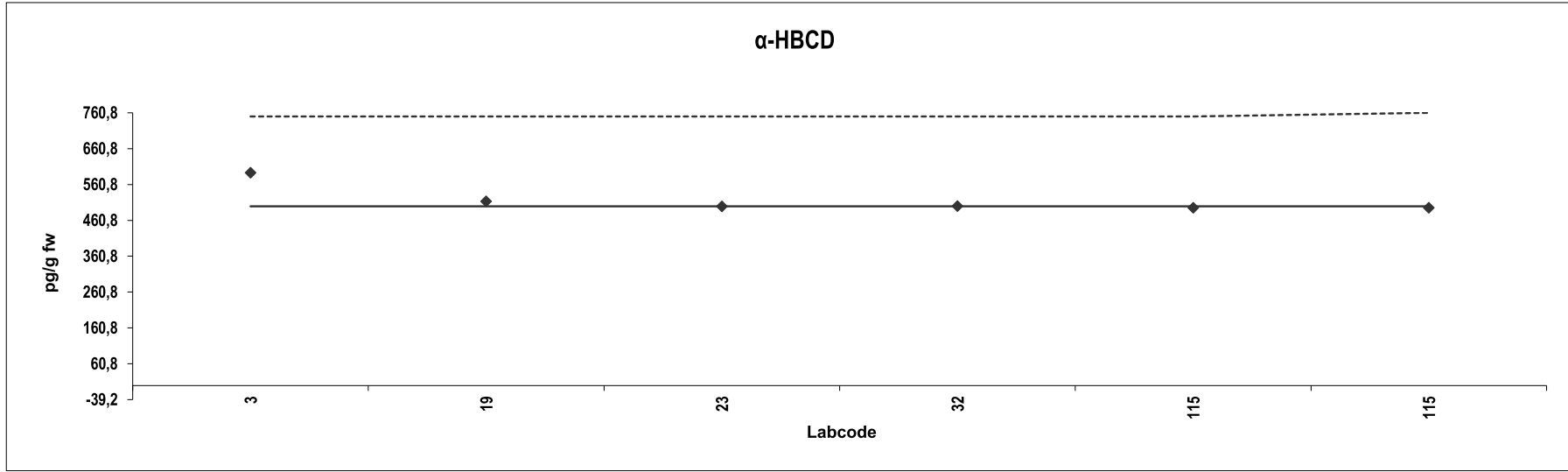
Analyte solution

Congener: α -HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	594	0,86					
5	696	1,86					
19	514	0,067					
23	500	-0,071					
32	500	-0,067					
115	496	-0,11					

Consensus statistics

Consensus median, pg/g	507
Median all values pg/g	507
Consensus mean, pg/g	550
Standard deviation, pg/g	81
Relative standard deviation, %	15
No. of values reported	6
No. of values removed	0
No. of reported non-detects	0





Appendix 2:

Presentation of results for
Veal-2021

Appendix 2: Presentation of results: Veal-2022

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:

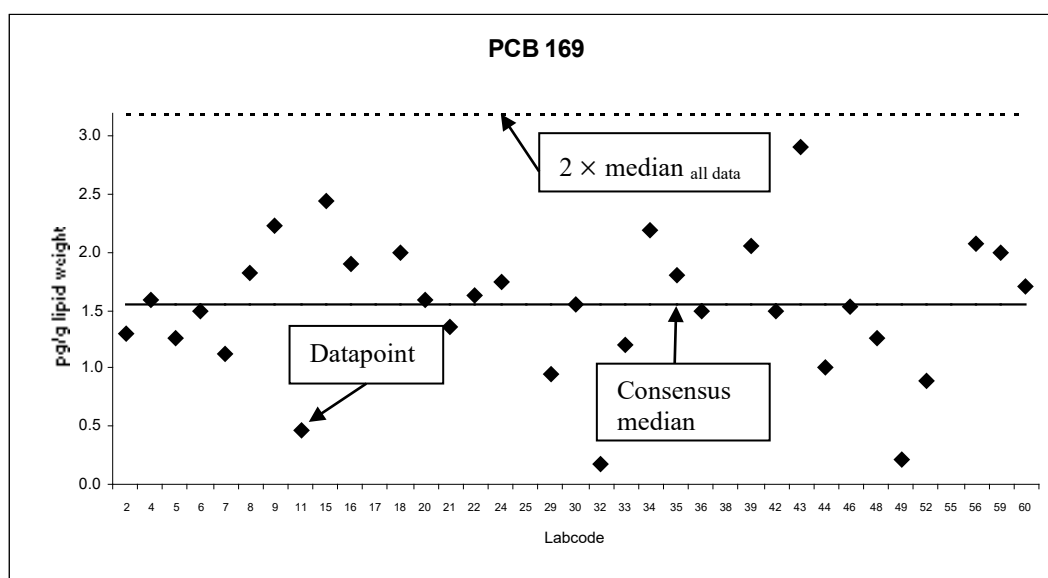
1. The median was calculated from all the reported data, using the detection limit as concentration for non-detected congeners.
2. Values exceeding $2 \times$ this median were defined as outliers and removed from the data set.
3. Median, mean and standard deviation were re-calculated from the remaining 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 $2 \times$ 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 ($2 \times$ 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 $\pm 20\%$ from the consensus value.

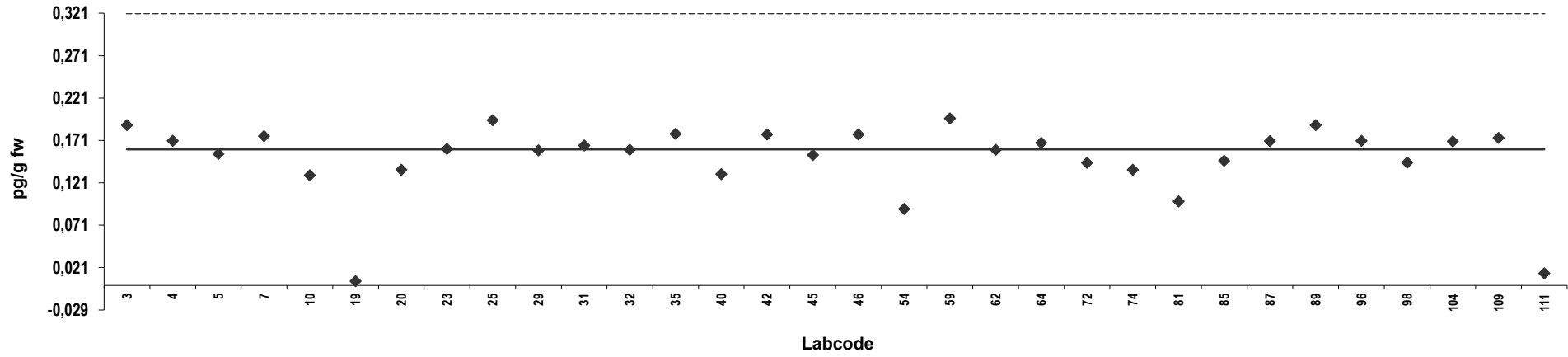
Veal
Congener: 2,3,7,8-TCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,19	0,89					
4	0,17	0,31					
5	0,16	-0,17					
7	0,18	0,48					
10	0,13	-0,95					
19	0,0050	-4,8	ND				
20	0,14	-0,75					
23	0,16	0,016					
25	0,20	1,1					
29	0,16	-0,042					
31	0,17	0,14					
32	0,16	-0,016					
35	0,18	0,57					
40	0,13	-0,91					
42	0,18	0,55					
45	0,15	-0,21					
46	0,18	0,55					
54	0,090	-2,2					
59	0,20	1,1					
62	0,16	-0,016					
64	0,17	0,24					
72	0,14	-0,50					
74	0,14	-0,75					
81	0,099	-1,9					
85	0,15	-0,42					
87	0,17	0,30					
89	0,19	0,89					
96	0,17	0,31					
98	0,15	-0,48					
104	0,17	0,30					
109	0,17	0,42					
111	0,014	-4,6					

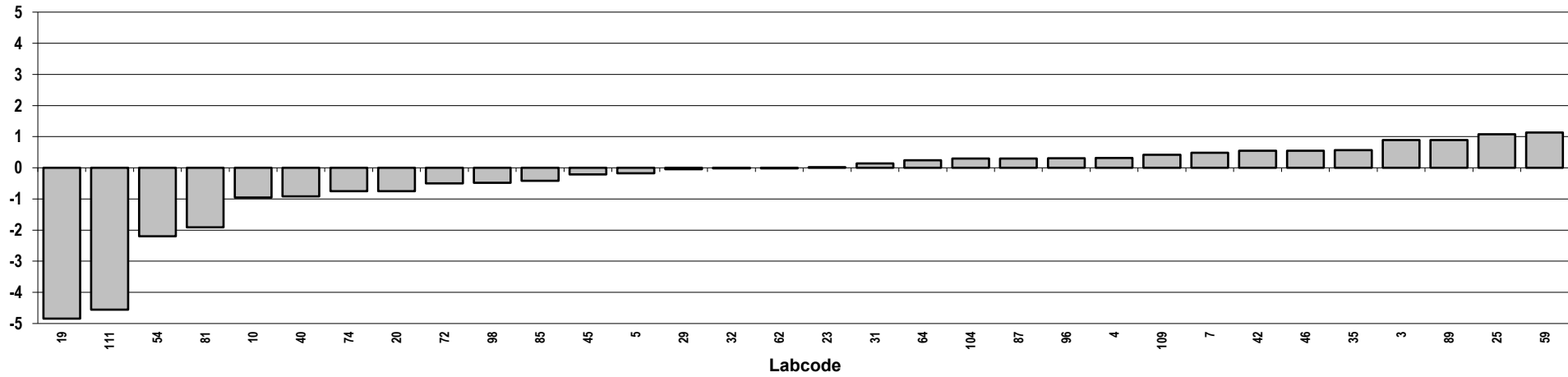
Consensus statistics

Consensus median, pg/g	0,16
Median all values pg/g	0,16
Consensus mean, pg/g	0,15
Standard deviation, pg/g	0,044
Relative standard deviation, %	29
No. of values reported	32
No. of values removed	0
No. of reported non-detects	1

2,3,7,8-TCDD



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



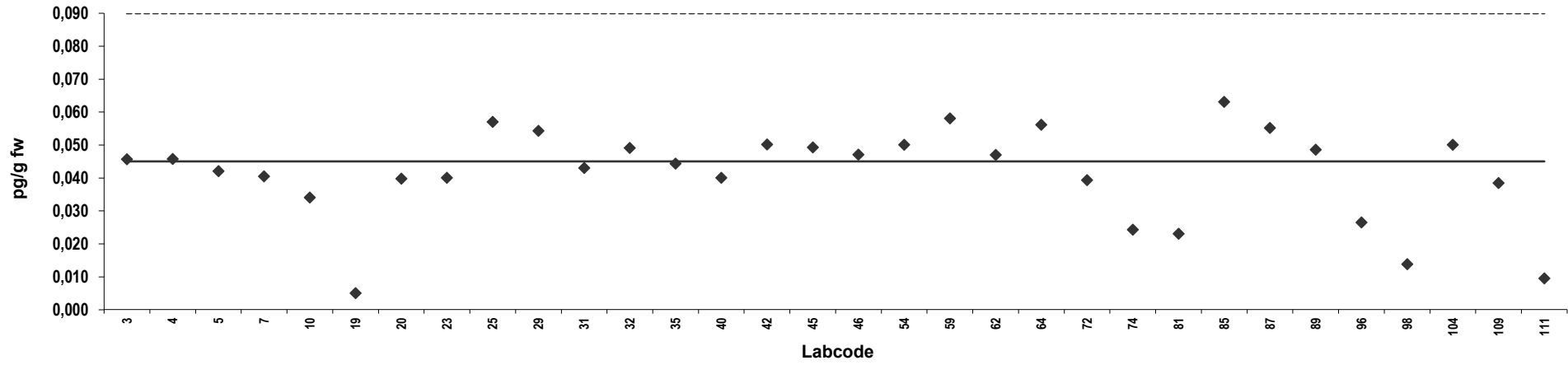
Veal
Congener: 1,2,3,7,8-PeCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,046	0,071					
4	0,046	0,082					
5	0,042	-0,33					
7	0,040	-0,50					
10	0,034	-1,2					
19	0,0050	-4,4	ND				
20	0,040	-0,59					
23	0,040	-0,55					
25	0,057	1,3					
29	0,054	1,0					
31	0,043	-0,22					
32	0,049	0,45					
35	0,044	-0,071					
40	0,040	-0,55					
42	0,050	0,57					
45	0,049	0,47					
46	0,047	0,23					
54	0,050	0,56	ND				
59	0,058	1,4					
62	0,047	0,22					
64	0,056	1,2					
72	0,039	-0,63					
74	0,024	-2,3					
81	0,023	-2,4					
85	0,063	2,0					
87	0,055	1,1					
89	0,049	0,39					
96	0,026	-2,1					
98	0,014	-3,5					
104	0,050	0,56					
109	0,038	-0,73					
111	0,0095	-3,9					

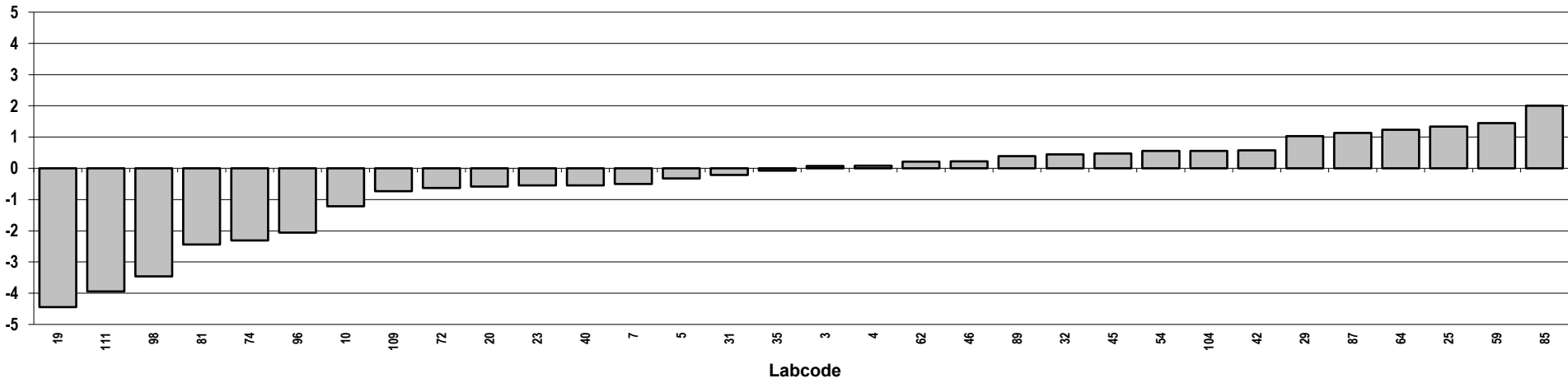
Consensus statistics

Consensus median, pg/g	0,045
Median all values pg/g	0,045
Consensus mean, pg/g	0,042
Standard deviation, pg/g	0,014
Relative standard deviation, %	34
No. of values reported	32
No. of values removed	0
No. of reported non-detects	2

1,2,3,7,8-PeCDD



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



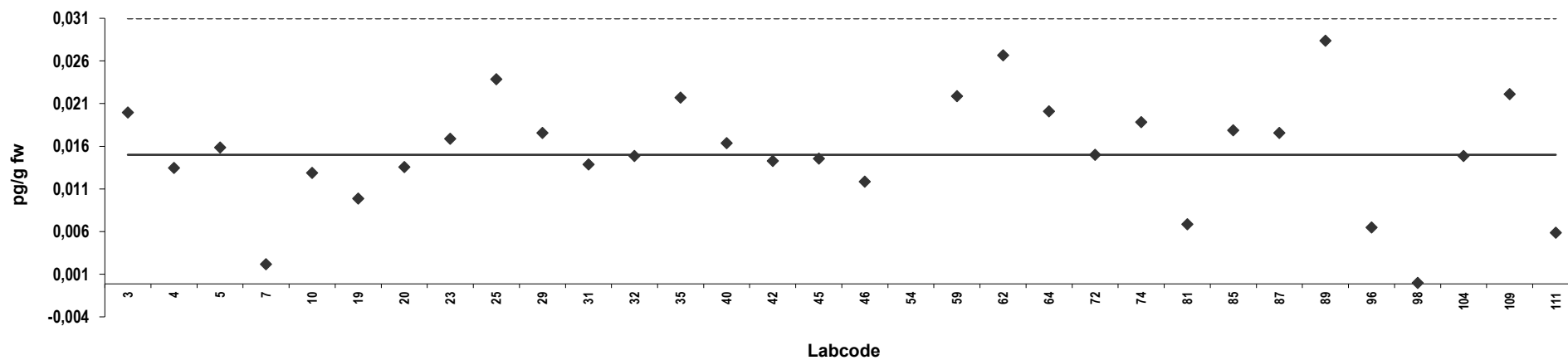
Veal
Congener: 1,2,3,4,7,8-HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,020	1,6					
4	0,014	-0,51					
5	0,016	0,29					
7	0,0023	-4,2					
10	0,013	-0,70					
19	0,010	-1,7	ND				
20	0,014	-0,47					
23	0,017	0,62					
25	0,024	2,9					
29	0,018	0,84					
31	0,014	-0,37					
32	0,015	-0,044					
35	0,022	2,2					
40	0,016	0,45					
42	0,014	-0,24					
45	0,015	-0,14					
46	0,012	-1,0					
54	0,050	12	Outlier,ND				
59	0,022	2,3					
62	0,027	3,9					
64	0,020	1,7					
72	0,015	0,00					
74	0,019	1,3					
81	0,0070	-2,7					
85	0,018	0,95					
87	0,018	0,85					
89	0,029	4,4					
96	0,0066	-2,8					
98	0,00010	-5,0					
104	0,015	-0,044					
109	0,022	2,4					
111	0,0060	-3,0					

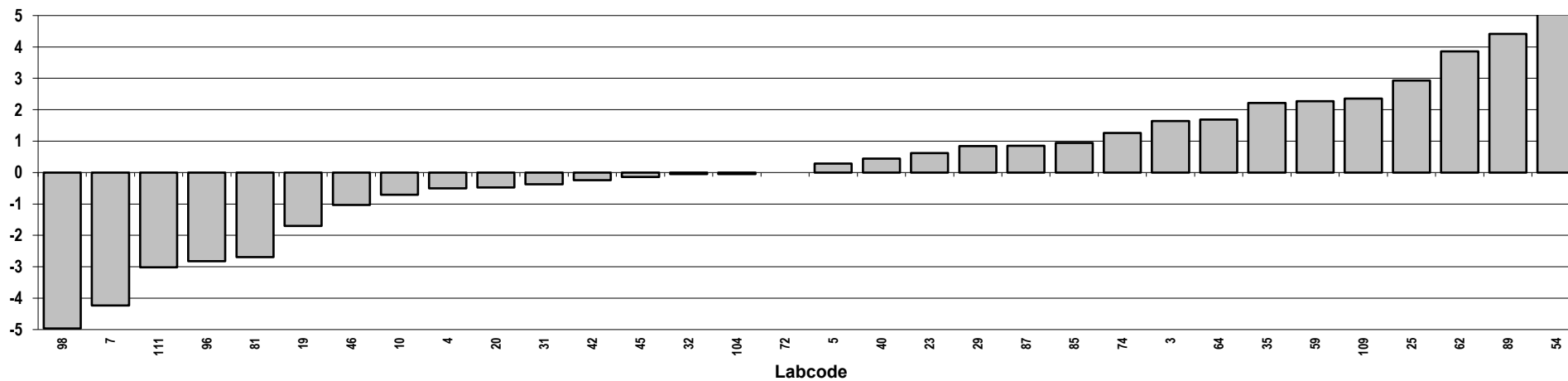
Consensus statistics

Consensus median, pg/g	0,015
Median all values pg/g	0,016
Consensus mean, pg/g	0,015
Standard deviation, pg/g	0,0065
Relative standard deviation, %	42
No. of values reported	32
No. of values removed	1
No. of reported non-detects	2

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



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



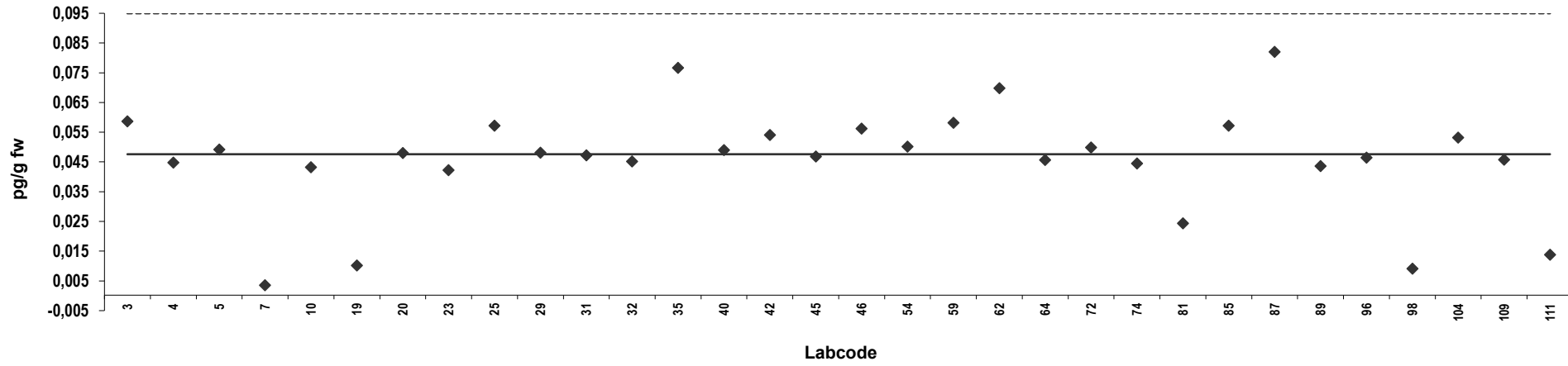
Veal
Congener: 1,2,3,6,7,8-HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,059	1,2					
4	0,045	-0,30					
5	0,049	0,17					
7	0,0033	-4,7					
10	0,043	-0,46					
19	0,010	-3,9	ND				
20	0,048	0,042					
23	0,042	-0,57					
25	0,057	1,0					
29	0,048	0,058					
31	0,047	-0,042					
32	0,045	-0,25					
35	0,076	3,1					
40	0,049	0,15					
42	0,054	0,69					
45	0,047	-0,080					
46	0,056	0,91					
54	0,050	0,27	ND				
59	0,058	1,1					
62	0,070	2,3					
64	0,045	-0,20					
72	0,050	0,24					
74	0,044	-0,33					
81	0,024	-2,4					
85	0,057	1,0					
87	0,082	3,6					
89	0,043	-0,42					
96	0,046	-0,13					
98	0,0089	-4,1					
104	0,053	0,59					
109	0,046	-0,19					
111	0,014	-3,6					

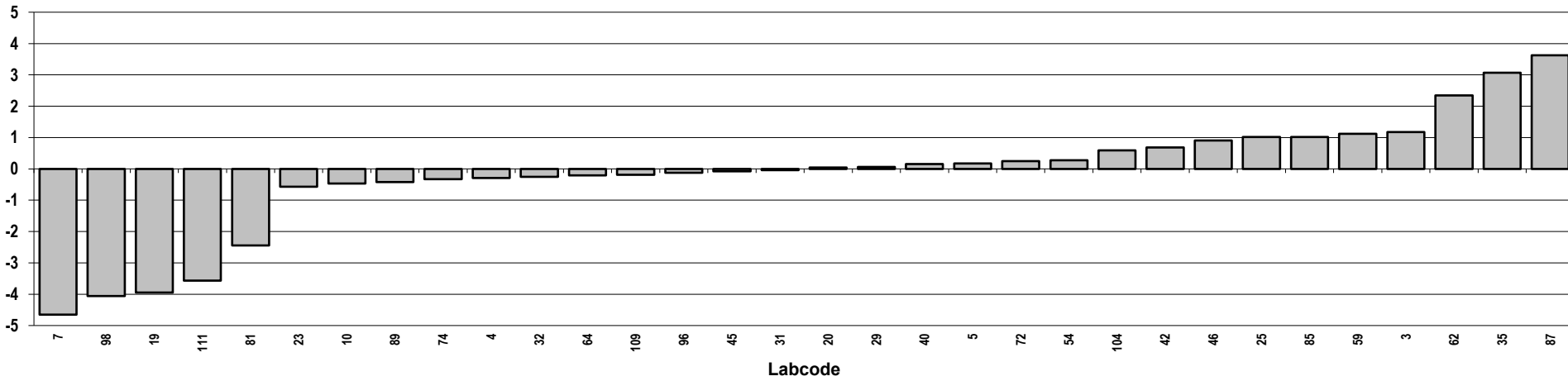
Consensus statistics

Consensus median, pg/g	0,047
Median all values pg/g	0,047
Consensus mean, pg/g	0,046
Standard deviation, pg/g	0,018
Relative standard deviation, %	38
No. of values reported	32
No. of values removed	0
No. of reported non-detects	2

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



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



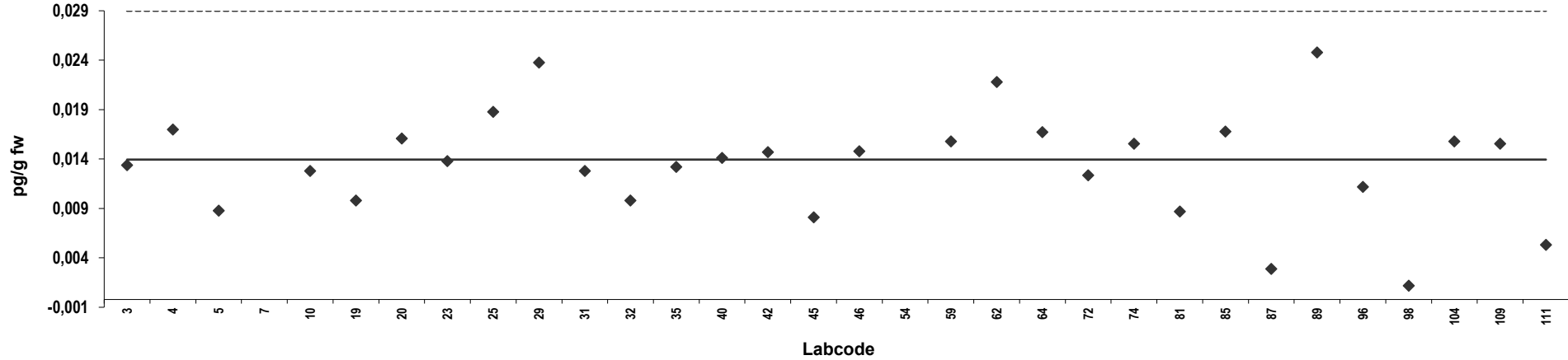
Veal
Congener: 1,2,3,7,8,9-HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,014	-0,20					
4	0,017	1,1					
5	0,0090	-1,8					
7	0,050	13	Outlier,ND				
10	0,013	-0,41					
19	0,010	-1,5	ND				
20	0,016	0,76					
23	0,014	-0,055					
25	0,019	1,7					
29	0,024	3,5					
31	0,013	-0,41					
32	0,010	-1,5					
35	0,013	-0,26					
40	0,014	0,055					
42	0,015	0,26					
45	0,0083	-2,1					
46	0,015	0,30					
54	0,050	13	Outlier,ND				
59	0,016	0,65					
62	0,022	2,8					
64	0,017	0,98					
72	0,013	-0,56					
74	0,016	0,57					
81	0,0089	-1,9					
85	0,017	1,0					
87	0,0031	-3,9	ND				
89	0,025	3,8					
96	0,011	-0,97					
98	0,0014	-4,5					
104	0,016	0,65					
109	0,016	0,57					
111	0,0055	-3,0					

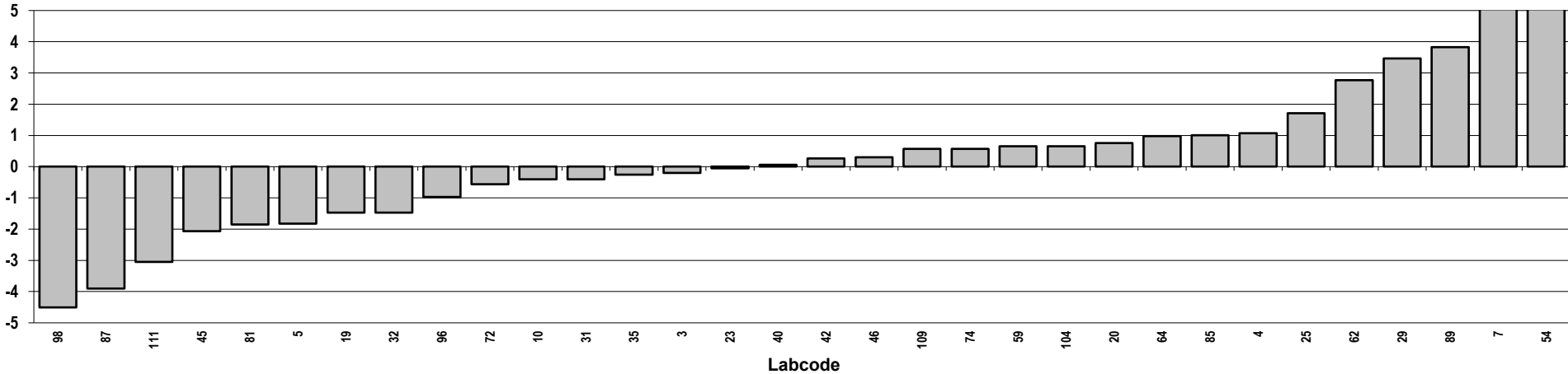
Consensus statistics

Consensus median, pg/g	0,014
Median all values pg/g	0,015
Consensus mean, pg/g	0,014
Standard deviation, pg/g	0,0054
Relative standard deviation, %	39
No. of values reported	32
No. of values removed	2
No. of reported non-detects	4

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



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



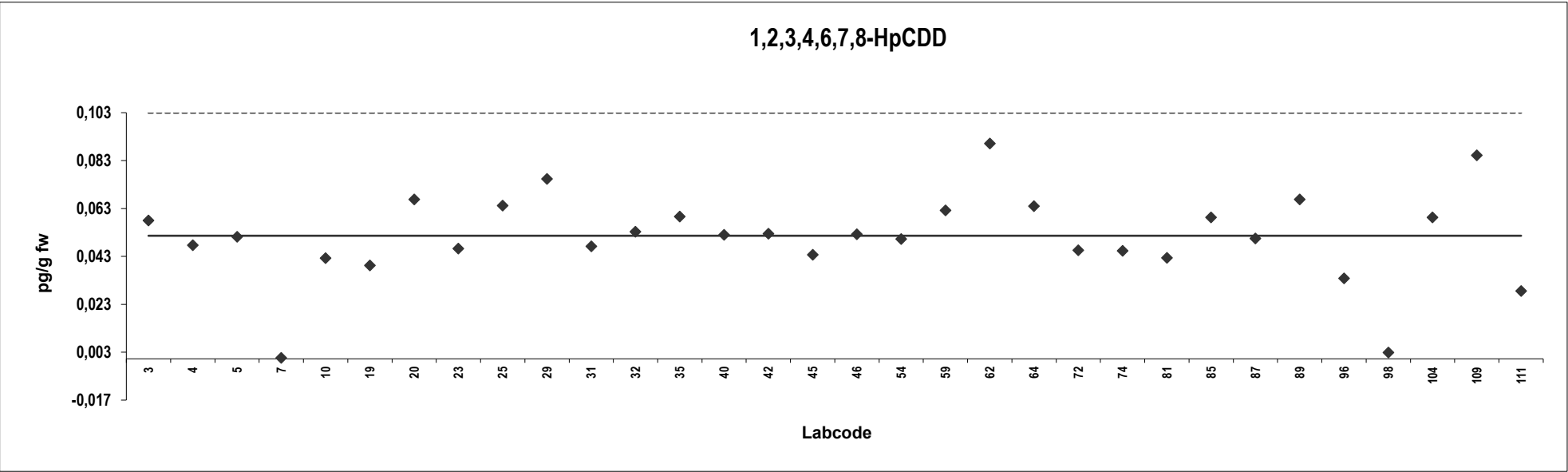
Veal
Congener: 1,2,3,4,6,7,8-HpCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,058	0,62					
4	0,047	-0,39					
5	0,051	-0,037					
7	0,00044	-5,0					
10	0,042	-0,91					
19	0,039	-1,2	ND				
20	0,067	1,5					
23	0,046	-0,52					
25	0,064	1,2					
29	0,075	2,3					
31	0,047	-0,43					
32	0,053	0,16					
35	0,059	0,78					
40	0,052	0,037					
42	0,052	0,080					
45	0,043	-0,77					
46	0,052	0,060					
54	0,050	-0,13	ND				
59	0,062	1,0					
62	0,090	3,7					
64	0,064	1,2					
72	0,045	-0,59					
74	0,045	-0,62					
81	0,042	-0,89					
85	0,059	0,74					
87	0,050	-0,11					
89	0,067	1,5					
96	0,034	-1,7					
98	0,0026	-4,7					
104	0,059	0,74					
109	0,085	3,3					
111	0,028	-2,2					

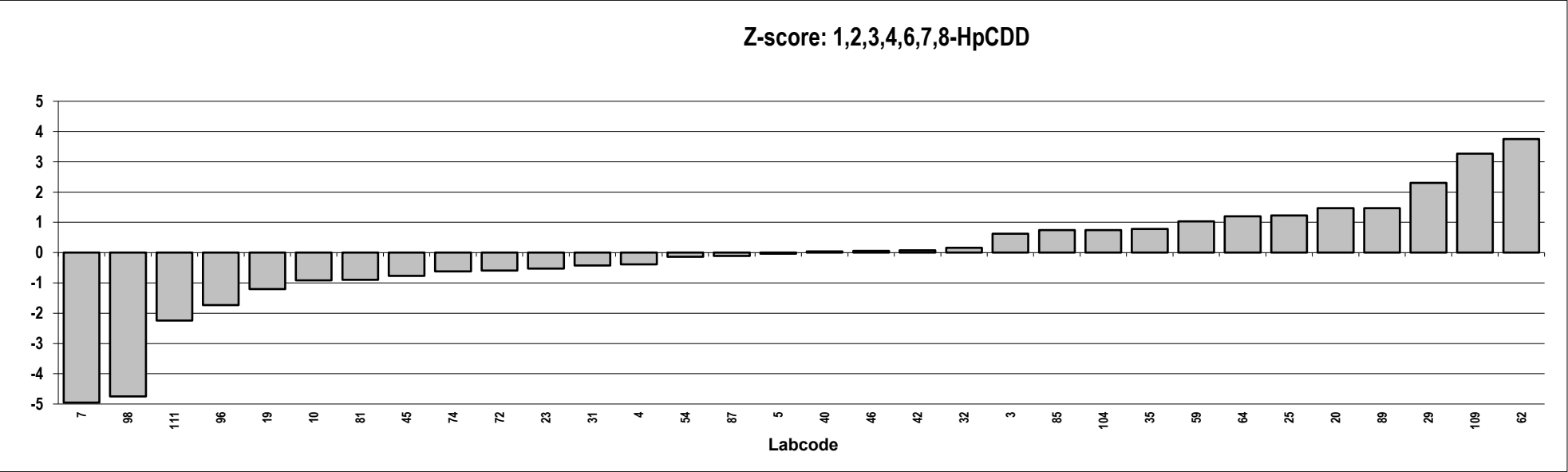
Consensus statistics

Consensus median, pg/g	0,051
Median all values pg/g	0,051
Consensus mean, pg/g	0,051
Standard deviation, pg/g	0,019
Relative standard deviation, %	36
No. of values reported	32
No. of values removed	0
No. of reported non-detects	2

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



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

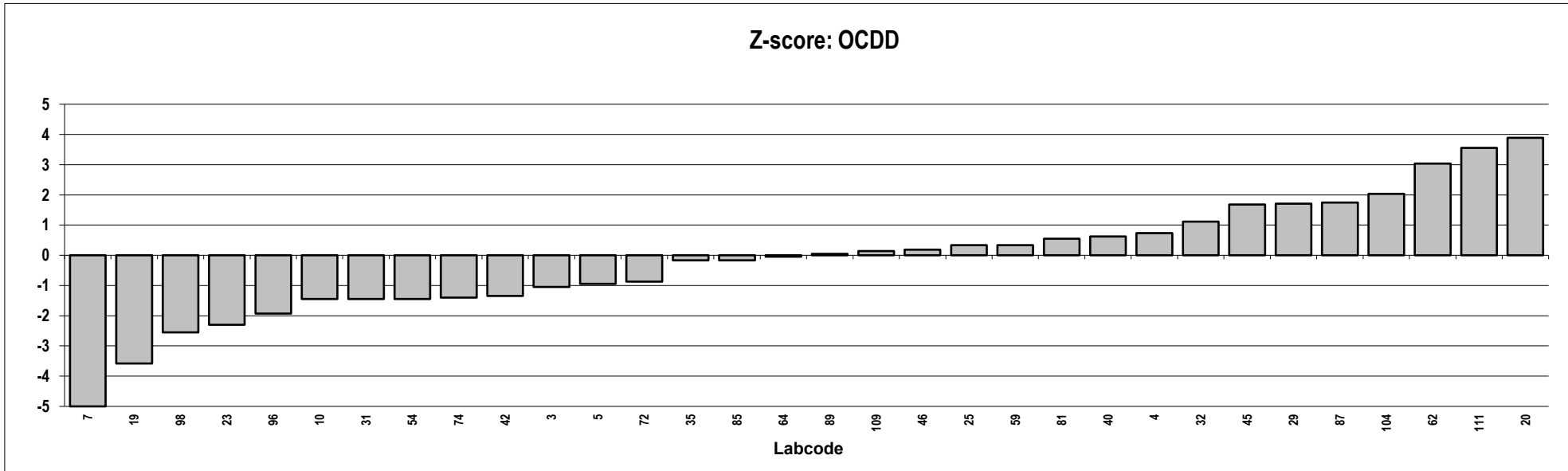
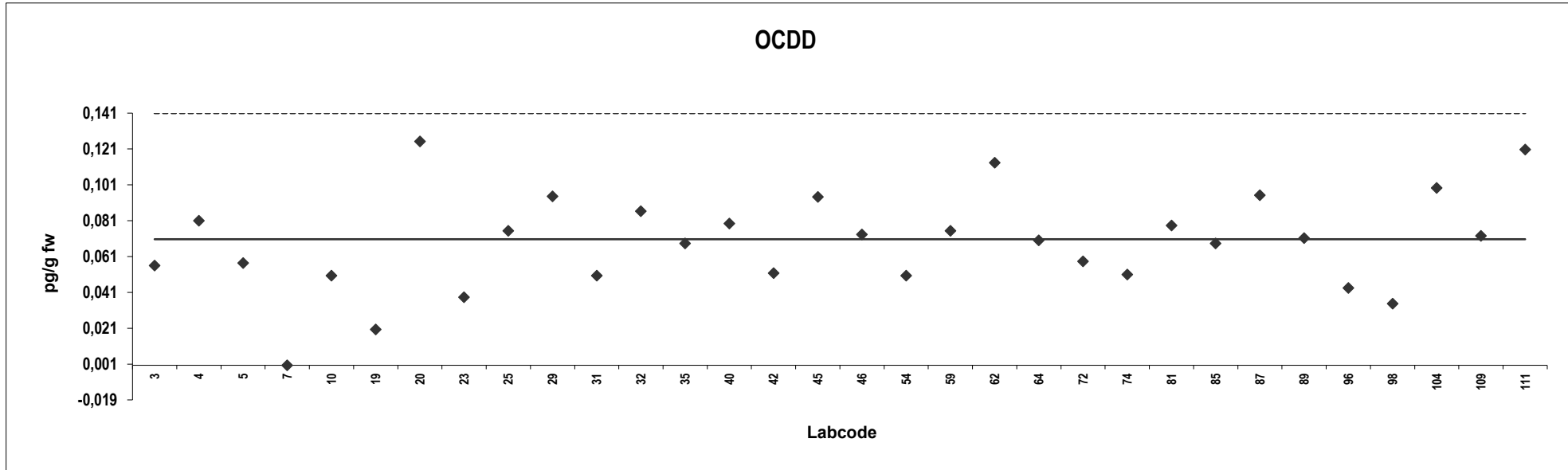


Veal
Congener: OCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,056	-1,0					
4	0,081	0,74					
5	0,057	-0,95					
7	0,000015	-5,0					
10	0,050	-1,4					
19	0,020	-3,6	ND				
20	0,13	3,9	ND				
23	0,038	-2,3					
25	0,075	0,33					
29	0,094	1,7					
31	0,050	-1,4					
32	0,086	1,1					
35	0,068	-0,17					
40	0,079	0,62					
42	0,051	-1,3					
45	0,094	1,7					
46	0,073	0,19					
54	0,050	-1,4	ND				
59	0,075	0,33					
62	0,11	3,0					
64	0,070	-0,047					
72	0,058	-0,87					
74	0,051	-1,4					
81	0,078	0,54					
85	0,068	-0,17					
87	0,095	1,7					
89	0,071	0,047					
96	0,043	-1,9					
98	0,034	-2,6					
104	0,099	2,0					
109	0,072	0,14					
111	0,12	3,6					

Consensus statistics

Consensus median, pg/g	0,070
Median all values pg/g	0,070
Consensus mean, pg/g	0,069
Standard deviation, pg/g	0,027
Relative standard deviation, %	40
No. of values reported	32
No. of values removed	0
No. of reported non-detects	3



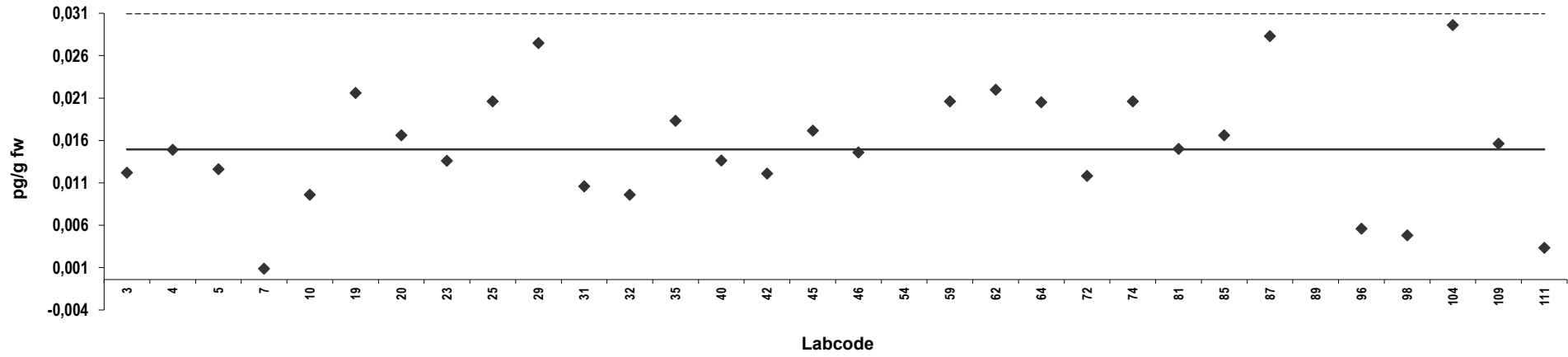
Veal
Congener: 2,3,7,8-TCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,013	-0,90					
4	0,015	-0,016					
5	0,013	-0,77					
7	0,0013	-4,6					
10	0,010	-1,7					
19	0,022	2,2					
20	0,017	0,54	ND				
23	0,014	-0,44					
25	0,021	1,8					
29	0,028	4,1					
31	0,011	-1,4					
32	0,010	-1,7					
35	0,019	1,1					
40	0,014	-0,42					
42	0,013	-0,93					
45	0,018	0,72					
46	0,015	-0,11					
54	0,050	11	Outlier,ND				
59	0,021	1,8					
62	0,022	2,3					
64	0,021	1,8					
72	0,012	-1,0					
74	0,021	1,8					
81	0,015	0,016					
85	0,017	0,54					
87	0,029	4,3					
89	0,052	12	Outlier				
96	0,0060	-3,0	ND				
98	0,0052	-3,3					
104	0,030	4,8					
109	0,016	0,21					
111	0,0037	-3,8					

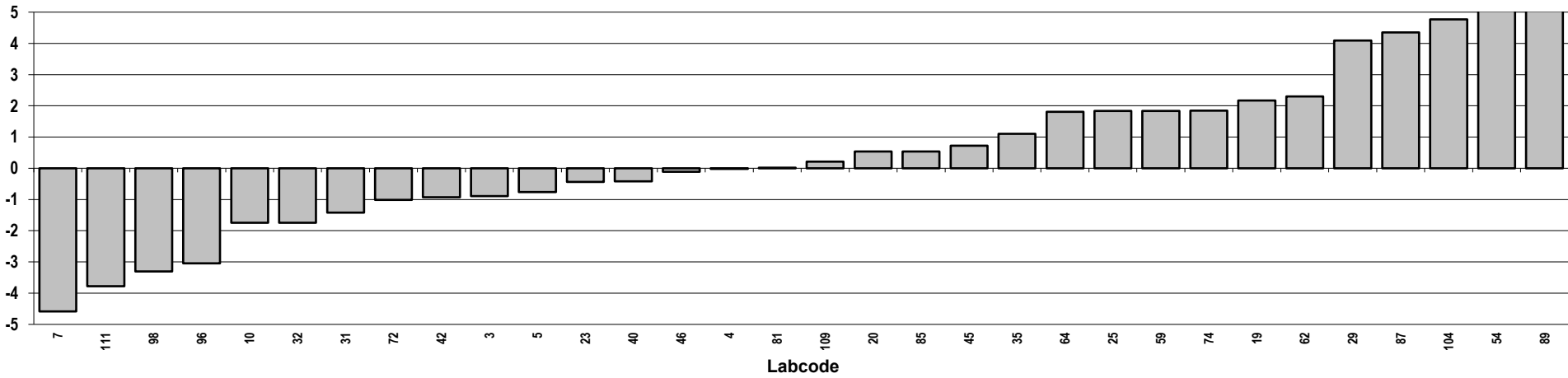
Consensus statistics

Consensus median, pg/g	0,015
Median all values pg/g	0,016
Consensus mean, pg/g	0,016
Standard deviation, pg/g	0,0070
Relative standard deviation, %	44
No. of values reported	32
No. of values removed	2
No. of reported non-detects	3

2,3,7,8-TCDF



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



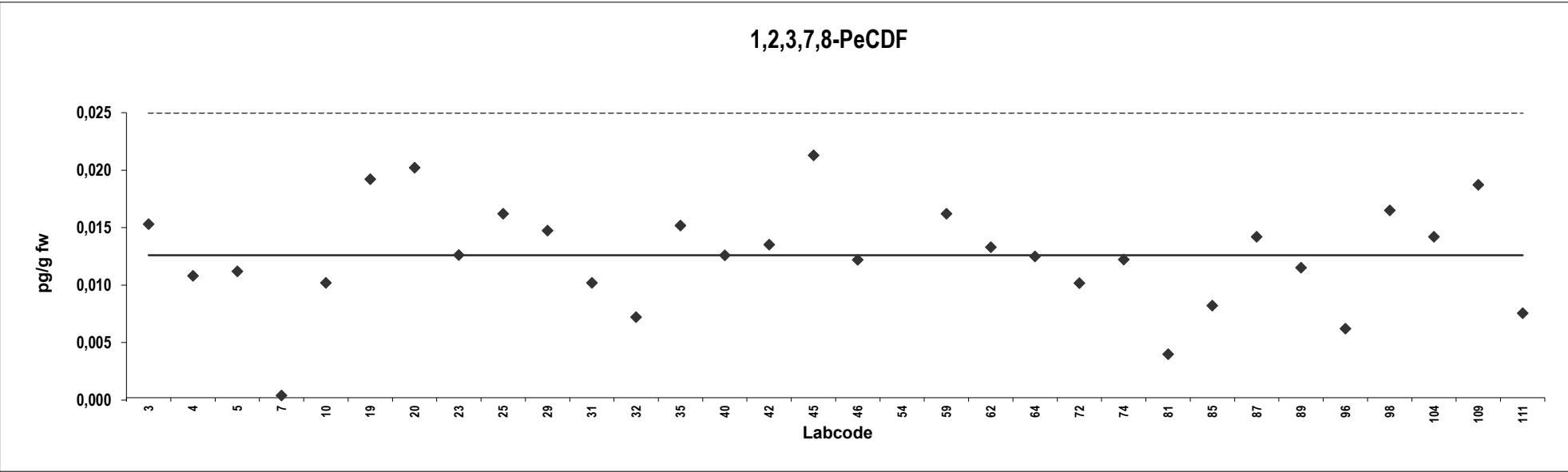
Veal
Congener: 1,2,3,7,8-PeCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,015	1,1					
4	0,011	-0,72					
5	0,011	-0,56					
7	0,00019	-4,9					
10	0,010	-0,96					
19	0,019	2,7	ND				
20	0,020	3,1	ND				
23	0,012	0,0040					
25	0,016	1,5					
29	0,015	0,87					
31	0,010	-0,96					
32	0,0070	-2,2					
35	0,015	1,0					
40	0,012	0,00					
42	0,013	0,37					
45	0,021	3,5					
46	0,012	-0,16					
54	0,050	15	Outlier,ND				
59	0,016	1,5					
62	0,013	0,29					
64	0,012	-0,045					
72	0,010	-0,98					
74	0,012	-0,15					
81	0,0038	-3,5					
85	0,0080	-1,8					
87	0,014	0,65					
89	0,011	-0,44					
96	0,0060	-2,6	ND				
98	0,016	1,6					
104	0,014	0,65					
109	0,019	2,5					
111	0,0073	-2,0					

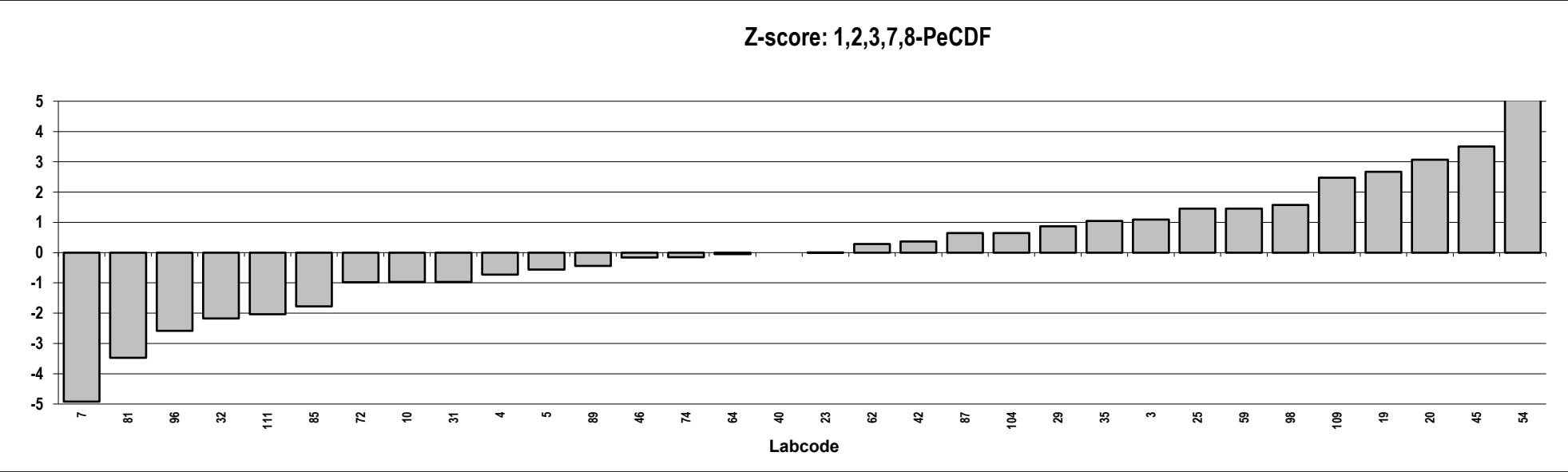
Consensus statistics

Consensus median, pg/g	0,012
Median all values pg/g	0,012
Consensus mean, pg/g	0,012
Standard deviation, pg/g	0,0046
Relative standard deviation, %	38
No. of values reported	32
No. of values removed	1
No. of reported non-detects	4

1,2,3,7,8-PeCDF



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



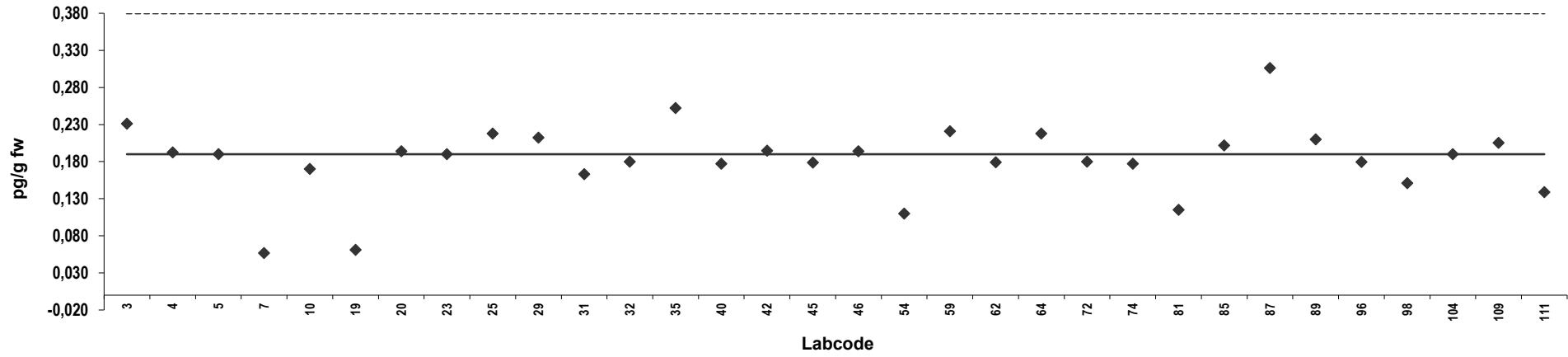
Veal
Congener: 2,3,4,7,8-PeCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,23	1,1					
4	0,19	0,066					
5	0,19	0,00					
7	0,057	-3,5					
10	0,17	-0,53					
19	0,061	-3,4	ND				
20	0,19	0,10					
23	0,19	0,00					
25	0,22	0,74					
29	0,21	0,58					
31	0,16	-0,71					
32	0,18	-0,26					
35	0,25	1,6					
40	0,18	-0,34					
42	0,19	0,13					
45	0,18	-0,29					
46	0,19	0,11					
54	0,11	-2,1					
59	0,22	0,82					
62	0,18	-0,29					
64	0,22	0,73					
72	0,18	-0,26					
74	0,18	-0,34					
81	0,12	-2,0					
85	0,20	0,32					
87	0,31	3,1					
89	0,21	0,53					
96	0,18	-0,28					
98	0,15	-1,0					
104	0,19	0,00					
109	0,21	0,40					
111	0,14	-1,3					

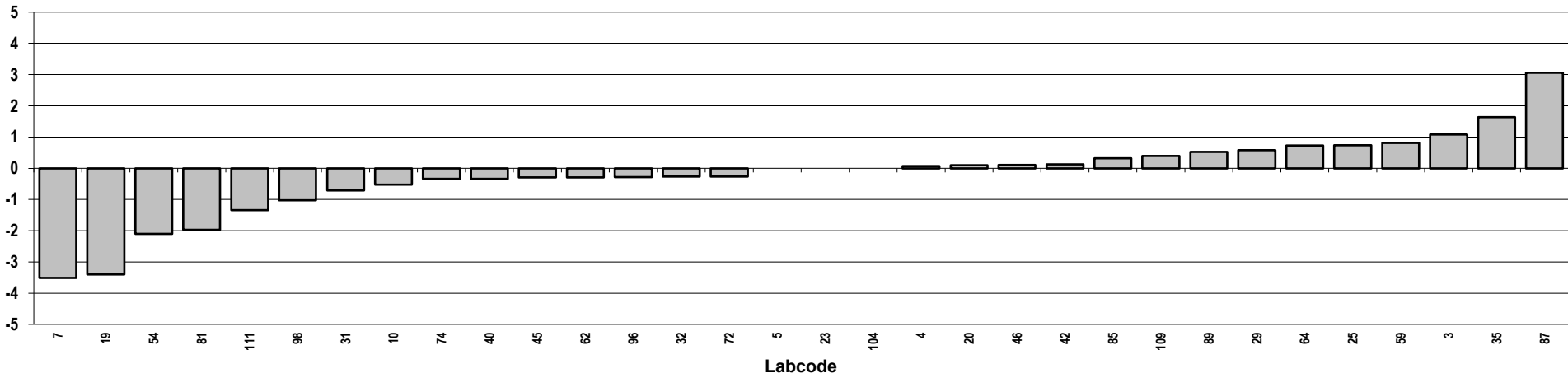
Consensus statistics

Consensus median, pg/g	0,19
Median all values pg/g	0,19
Consensus mean, pg/g	0,18
Standard deviation, pg/g	0,049
Relative standard deviation, %	27
No. of values reported	32
No. of values removed	0
No. of reported non-detects	1

2,3,4,7,8-PeCDF



Z-score: 2,3,4,7,8-PeCDF



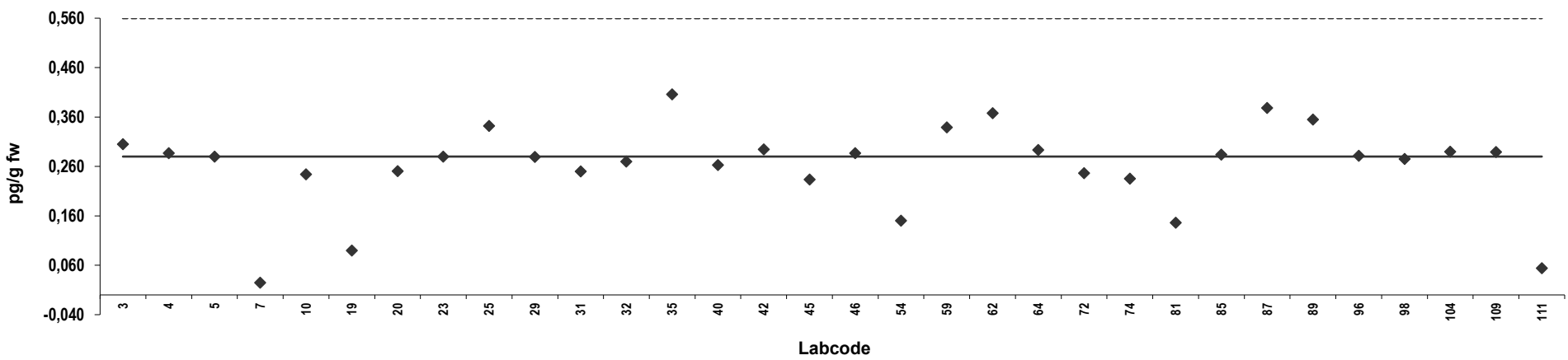
Veal
Congener: 1,2,3,4,7,8-HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,31	0,45					
4	0,29	0,12					
5	0,28	0,00					
7	0,025	-4,6					
10	0,24	-0,64					
19	0,090	-3,4					
20	0,25	-0,53					
23	0,28	0,00					
25	0,34	1,1					
29	0,28	-0,017					
31	0,25	-0,54					
32	0,27	-0,18					
35	0,41	2,3					
40	0,26	-0,31					
42	0,29	0,25					
45	0,23	-0,84					
46	0,29	0,12					
54	0,15	-2,3					
59	0,34	1,1					
62	0,37	1,6					
64	0,29	0,23					
72	0,25	-0,60					
74	0,24	-0,80					
81	0,15	-2,4					
85	0,28	0,071					
87	0,38	1,8					
89	0,36	1,3					
96	0,28	0,025					
98	0,28	-0,089					
104	0,29	0,18					
109	0,29	0,16					
111	0,054	-4,0					

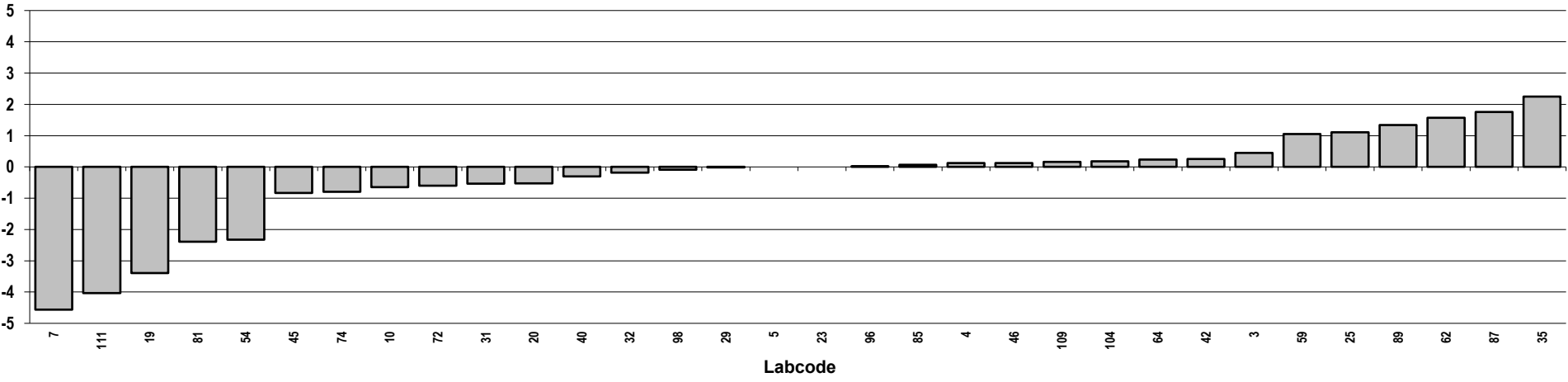
Consensus statistics

Consensus median, pg/g	0,28
Median all values pg/g	0,28
Consensus mean, pg/g	0,26
Standard deviation, pg/g	0,087
Relative standard deviation, %	33
No. of values reported	32
No. of values removed	0
No. of reported non-detects	0

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



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



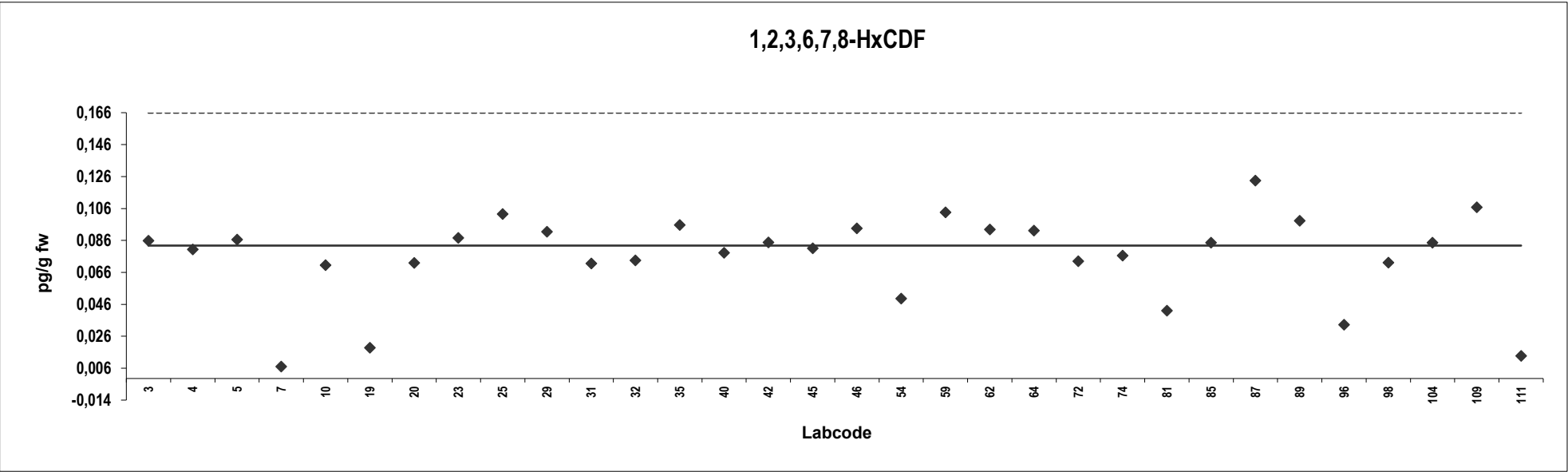
Veal
Congener: 1,2,3,6,7,8-HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,086	0,18					
4	0,081	-0,14					
5	0,087	0,23					
7	0,0074	-4,6					
10	0,071	-0,73					
19	0,019	-3,8	ND				
20	0,072	-0,65					
23	0,088	0,29					
25	0,10	1,2					
29	0,092	0,52					
31	0,072	-0,67					
32	0,074	-0,55					
35	0,096	0,78					
40	0,079	-0,27					
42	0,085	0,12					
45	0,081	-0,11					
46	0,094	0,65					
54	0,050	-2,0	ND				
59	0,10	1,2					
62	0,093	0,60					
64	0,093	0,56					
72	0,073	-0,59					
74	0,077	-0,38					
81	0,043	-2,4					
85	0,085	0,11					
87	0,12	2,4					
89	0,099	0,94					
96	0,034	-3,0					
98	0,073	-0,64					
104	0,085	0,11					
109	0,11	1,4					
111	0,014	-4,1					

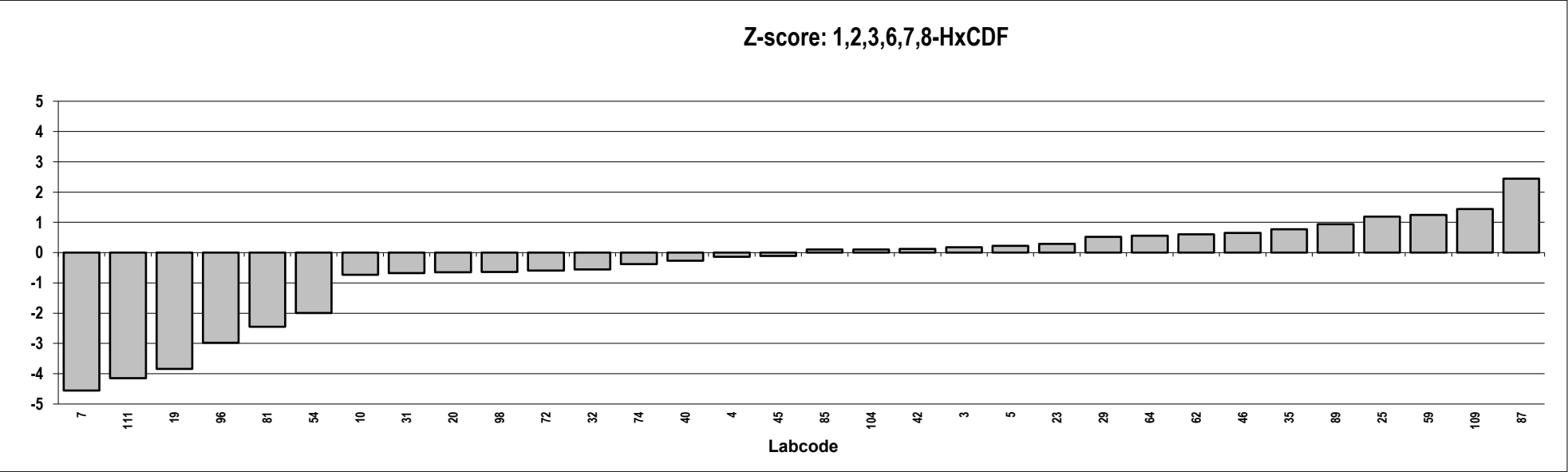
Consensus statistics

Consensus median, pg/g	0,083
Median all values pg/g	0,083
Consensus mean, pg/g	0,076
Standard deviation, pg/g	0,027
Relative standard deviation, %	36
No. of values reported	32
No. of values removed	0
No. of reported non-detects	2

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



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



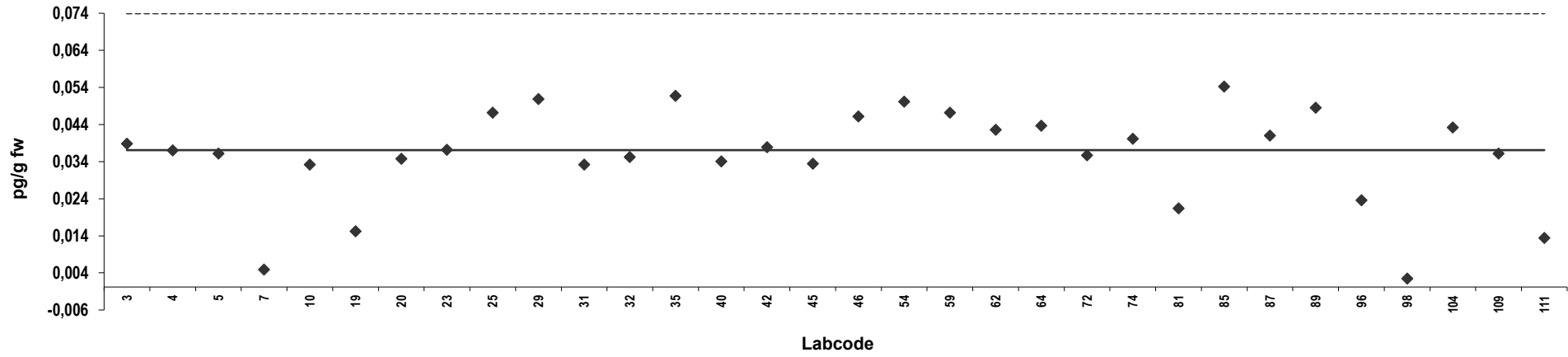
Veal
Congener: 2,3,4,6,7,8-HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,039	0,23					
4	0,037	-0,014					
5	0,036	-0,12					
7	0,0047	-4,4					
10	0,033	-0,53					
19	0,015	-3,0	ND				
20	0,035	-0,31					
23	0,037	0,014					
25	0,047	1,4					
29	0,051	1,9					
31	0,033	-0,53					
32	0,035	-0,26					
35	0,052	2,0					
40	0,034	-0,42					
42	0,038	0,11					
45	0,033	-0,50					
46	0,046	1,2					
54	0,050	1,8	ND				
59	0,047	1,4					
62	0,042	0,75					
64	0,043	0,89					
72	0,036	-0,19					
74	0,040	0,41					
81	0,021	-2,1					
85	0,054	2,3					
87	0,041	0,53					
89	0,048	1,5					
96	0,023	-1,8					
98	0,0023	-4,7					
104	0,043	0,83					
109	0,036	-0,13					
111	0,013	-3,2					

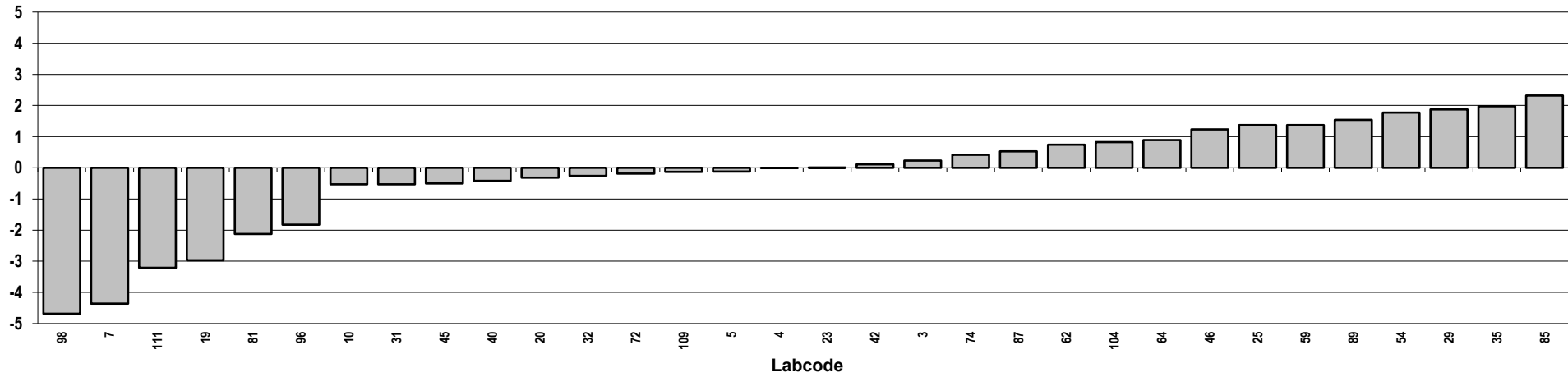
Consensus statistics

Consensus median, pg/g	0,037
Median all values pg/g	0,037
Consensus mean, pg/g	0,036
Standard deviation, pg/g	0,013
Relative standard deviation, %	36
No. of values reported	32
No. of values removed	0
No. of reported non-detects	2

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



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



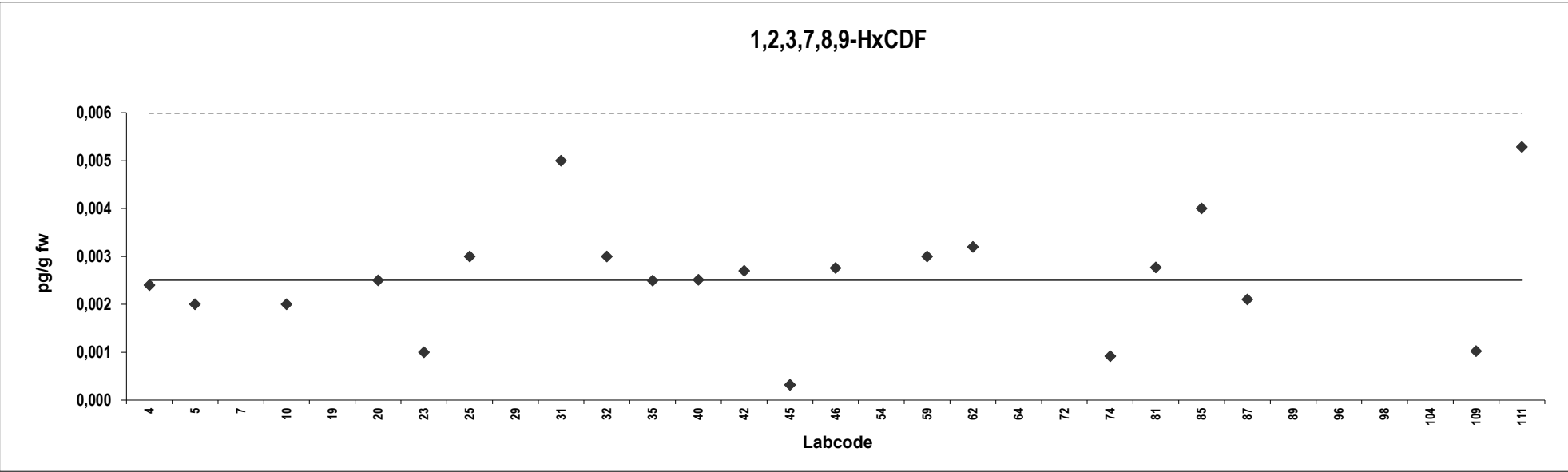
Veal
Congener: 1,2,3,7,8,9 HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
4	0,0024	-0,22	ND				
5	0,0020	-1,0	ND				
7	0,050	95	Outlier,ND				
10	0,0020	-1,0					
19	0,026	47	Outlier,ND				
20	0,0025	-0,021					
23	0,0010	-3,0	ND				
25	0,0030	0,97	ND				
29	0,0063	7,5	Outlier				
31	0,0050	5,0	ND				
32	0,0030	0,97	ND				
35	0,0025	-0,027					
40	0,0025	0,00	ND				
42	0,0027	0,38	ND				
45	0,00032	-4,4					
46	0,0028	0,49	ND				
54	0,050	95	Outlier,ND				
59	0,0030	0,97	ND				
62	0,0032	1,4					
64	0,0073	9,5	Outlier				
72	0,0080	11	Outlier,ND				
74	0,00092	-3,2					
81	0,0028	0,52	ND				
85	0,0040	3,0	ND				
87	0,0021	-0,82	ND				
89	0,019	33	Outlier				
96	0,049	92	Outlier				
98	0,025	45	Outlier				
104	0,0062	7,3	Outlier,ND				
109	0,0010	-3,0					
111	0,0053	5,5					

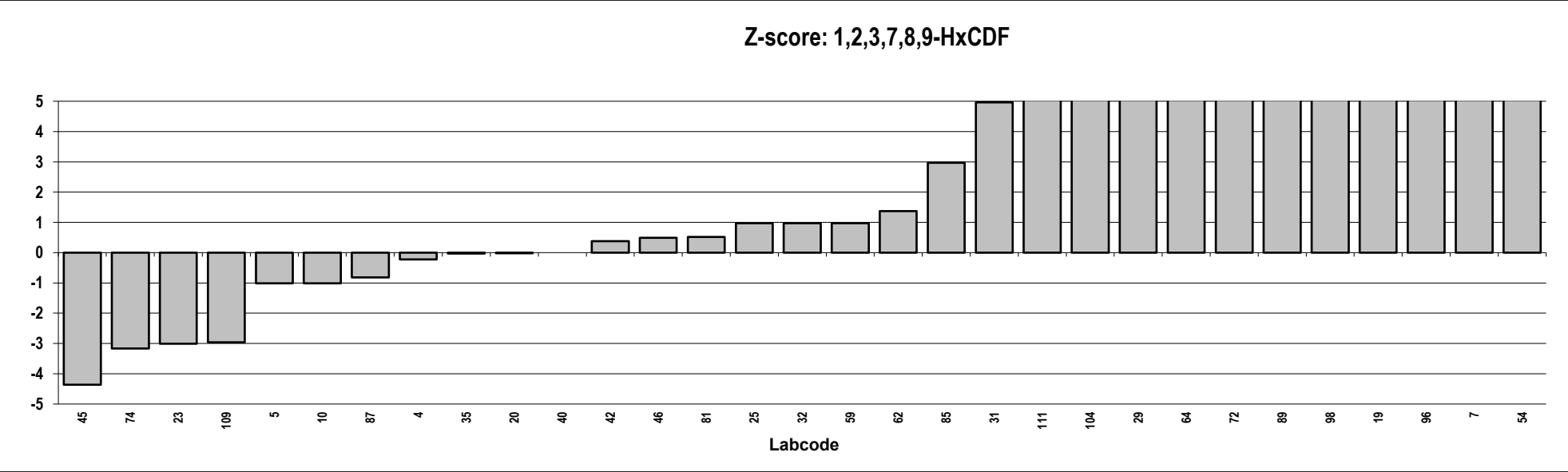
Consensus statistics

Consensus median, pg/g	0,0025
Median all values pg/g	0,0030
Consensus mean, pg/g	0,0026
Standard deviation, pg/g	0,0012
Relative standard deviation, %	48
No. of values reported	31
No. of values removed	10
No. of reported non-detects	18

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



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



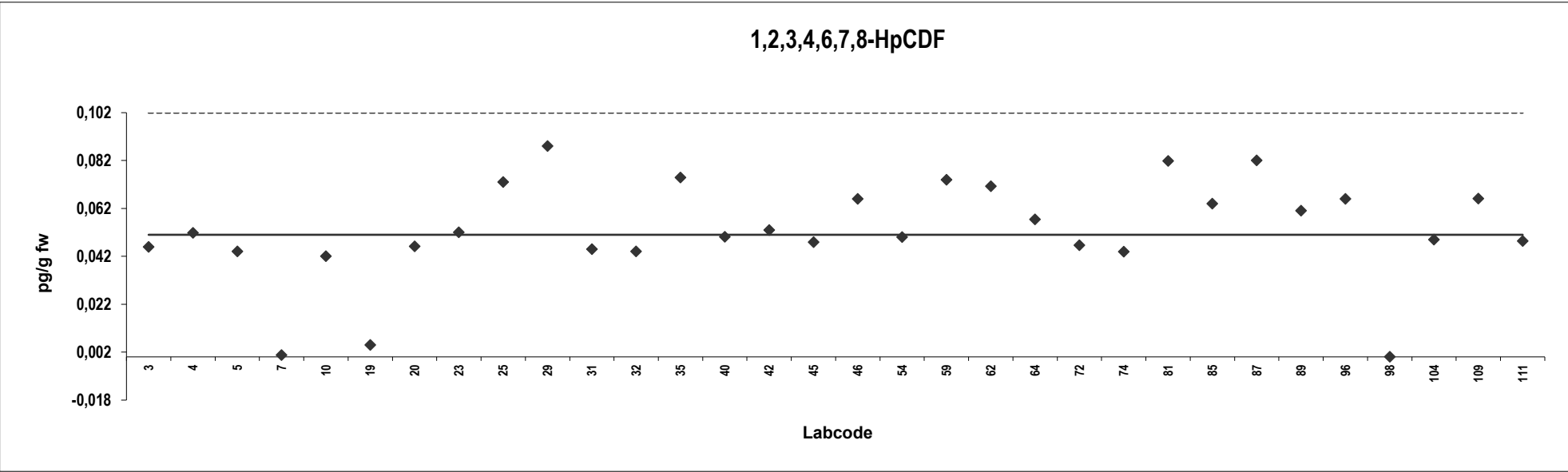
Veal
Congener: 1,2,3,4,6,7,8-HpCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,046	-0,50					
4	0,052	0,081					
5	0,044	-0,68					
7	0,00076	-4,9					
10	0,042	-0,88					
19	0,0050	-4,5	ND				
20	0,046	-0,47					
23	0,052	0,10					
25	0,073	2,2					
29	0,088	3,6					
31	0,045	-0,59					
32	0,044	-0,68					
35	0,075	2,3					
40	0,050	-0,081					
42	0,053	0,19					
45	0,048	-0,30					
46	0,066	1,5					
54	0,050	-0,096	ND				
59	0,074	2,3					
62	0,071	2,0					
64	0,057	0,63					
72	0,047	-0,43					
74	0,044	-0,69					
81	0,082	3,0					
85	0,064	1,3					
87	0,082	3,0					
89	0,061	0,98					
96	0,066	1,5					
98	0,00010	-5,0					
104	0,049	-0,19					
109	0,066	1,5					
111	0,048	-0,25					

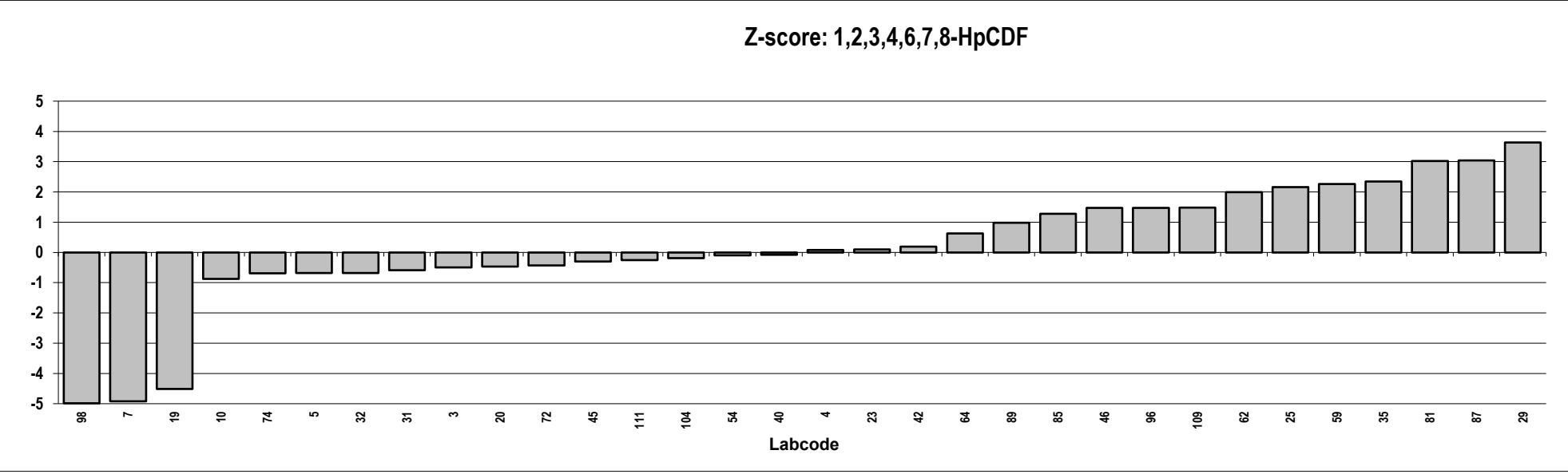
Consensus statistics

Consensus median, pg/g	0,051
Median all values pg/g	0,051
Consensus mean, pg/g	0,053
Standard deviation, pg/g	0,021
Relative standard deviation, %	40
No. of values reported	32
No. of values removed	0
No. of reported non-detects	2

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



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



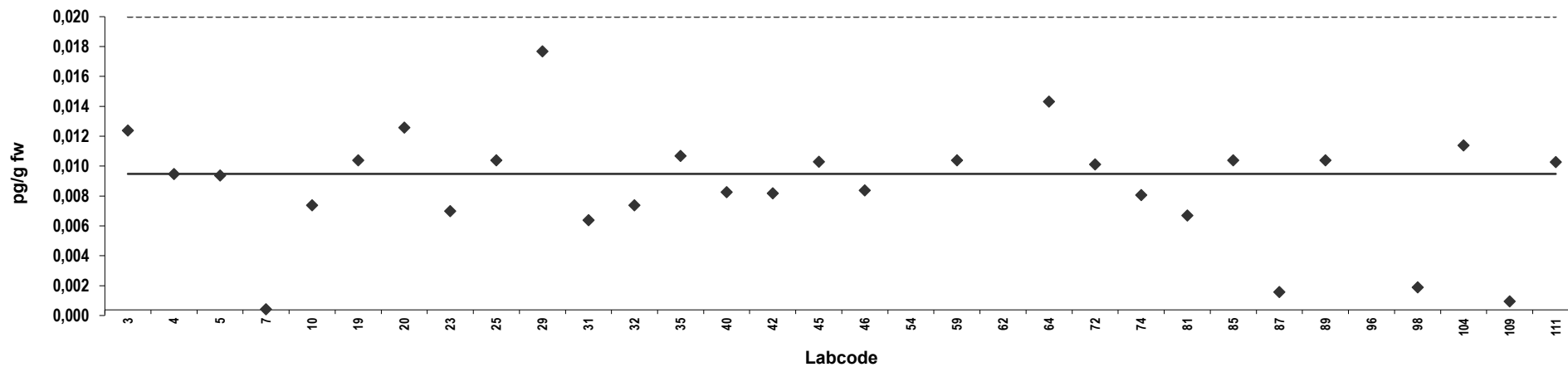
Veal
Congener: 1,2,3,4,7,8,9-HpCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,012	1,6					
4	0,0091	0,00					
5	0,0090	-0,055					
7	0,000039	-5,0					
10	0,0070	-1,2					
19	0,010	0,49	ND				
20	0,012	1,7					
23	0,0066	-1,4					
25	0,010	0,49					
29	0,017	4,5					
31	0,0060	-1,7					
32	0,0070	-1,2					
35	0,010	0,66					
40	0,0079	-0,68					
42	0,0078	-0,71					
45	0,0099	0,44					
46	0,0080	-0,60					
54	0,050	22	Outlier,ND				
59	0,010	0,49					
62	0,084	41	Outlier				
64	0,014	2,7					
72	0,0097	0,35					
74	0,0077	-0,77					
81	0,0063	-1,5					
85	0,010	0,49					
87	0,0012	-4,3	ND				
89	0,010	0,49	ND				
96	0,064	30	Outlier				
98	0,0015	-4,2					
104	0,011	1,0					
109	0,00056	-4,7					
111	0,0099	0,43					

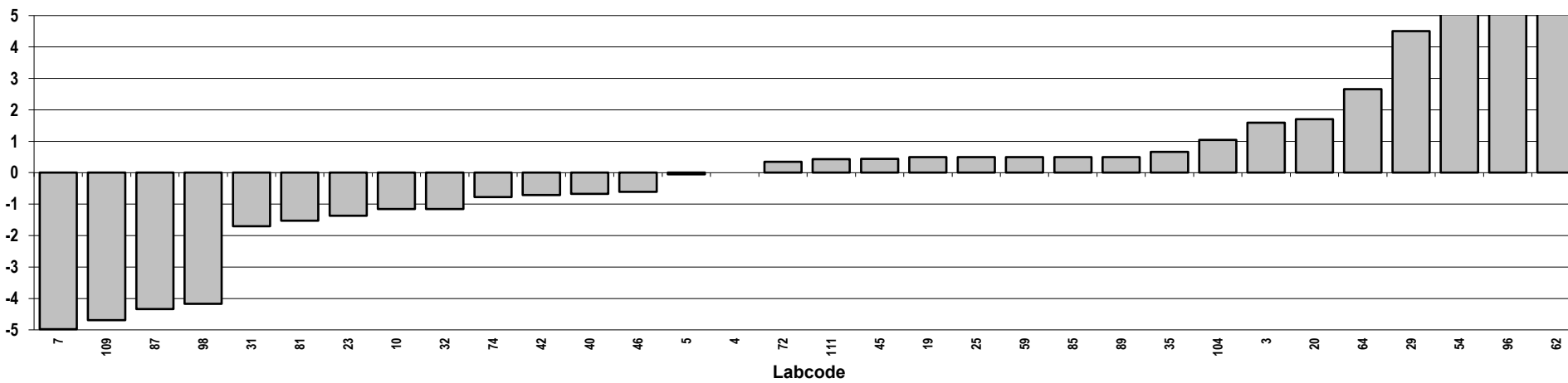
Consensus statistics

Consensus median, pg/g	0,0091
Median all values pg/g	0,0098
Consensus mean, pg/g	0,0083
Standard deviation, pg/g	0,0039
Relative standard deviation, %	46
No. of values reported	32
No. of values removed	3
No. of reported non-detects	4

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



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

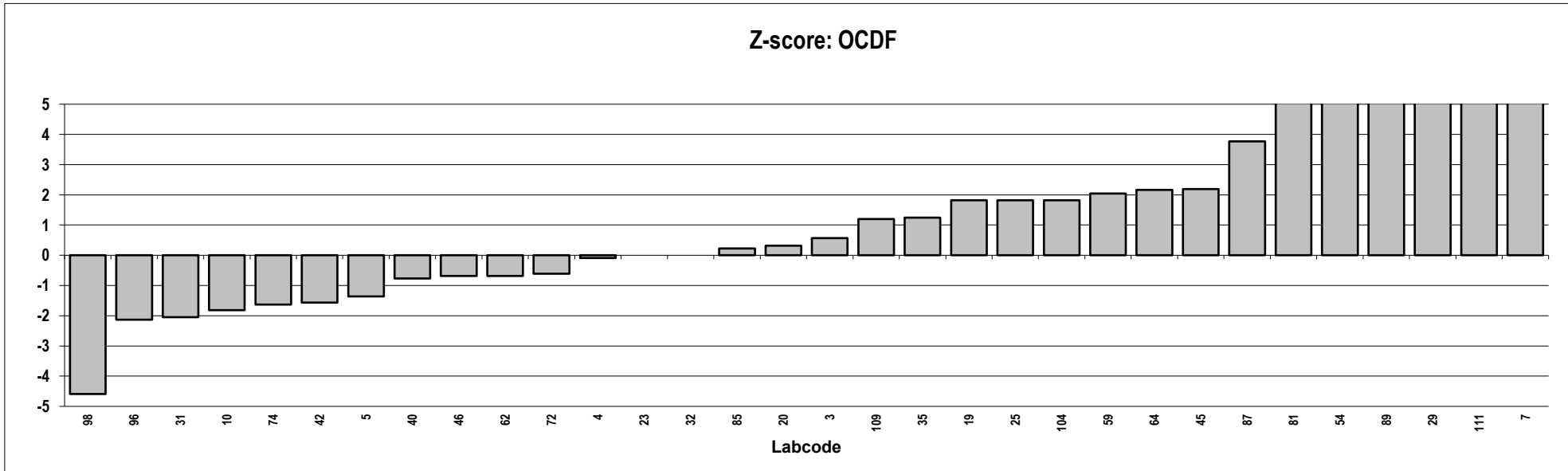
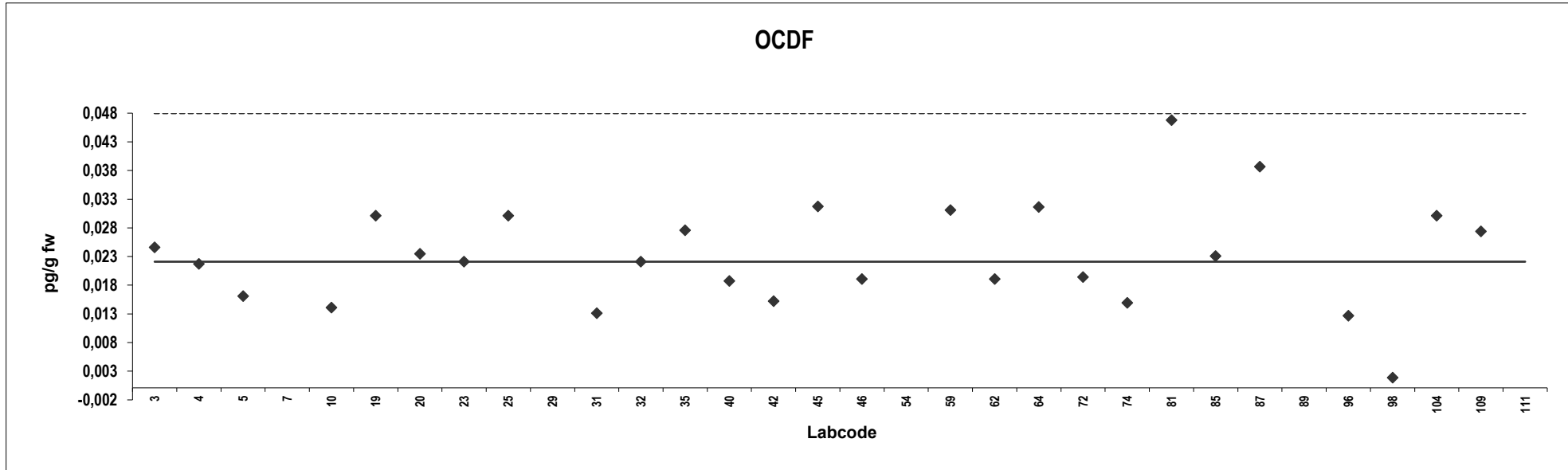


Veal
Congener: OCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,025	0,57					
4	0,022	-0,091					
5	0,016	-1,4	ND				
7	0,10	18	Outlier,ND				
10	0,014	-1,8					
19	0,030	1,8	ND				
20	0,023	0,32					
23	0,022	0,00					
25	0,030	1,8					
29	0,057	7,9	Outlier				
31	0,013	-2,0					
32	0,022	0,00					
35	0,027	1,2					
40	0,019	-0,77					
42	0,015	-1,6					
45	0,032	2,2					
46	0,019	-0,68					
54	0,050	6,4	Outlier,ND				
59	0,031	2,0					
62	0,019	-0,68					
64	0,032	2,2					
72	0,019	-0,61					
74	0,015	-1,6					
81	0,047	5,6					
85	0,023	0,23					
87	0,039	3,8					
89	0,055	7,5	Outlier				
96	0,013	-2,1					
98	0,0018	-4,6					
104	0,030	1,8					
109	0,027	1,2					
111	0,064	9,5	Outlier				

Consensus statistics

Consensus median, pg/g	0,022
Median all values pg/g	0,024
Consensus mean, pg/g	0,023
Standard deviation, pg/g	0,0092
Relative standard deviation, %	40
No. of values reported	32
No. of values removed	5
No. of reported non-detects	4

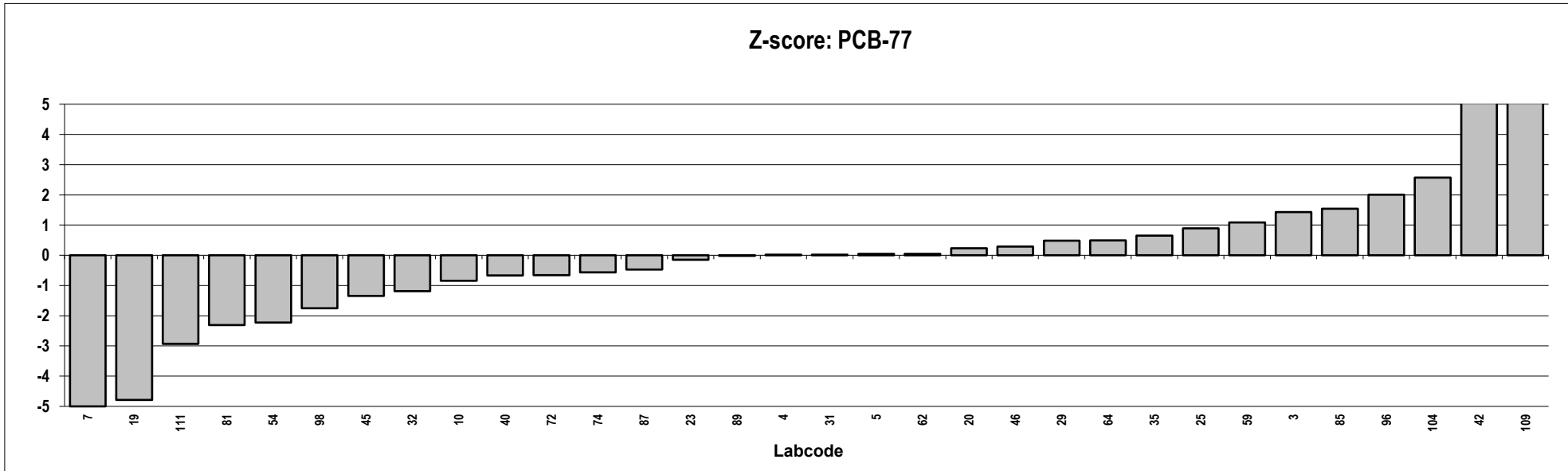
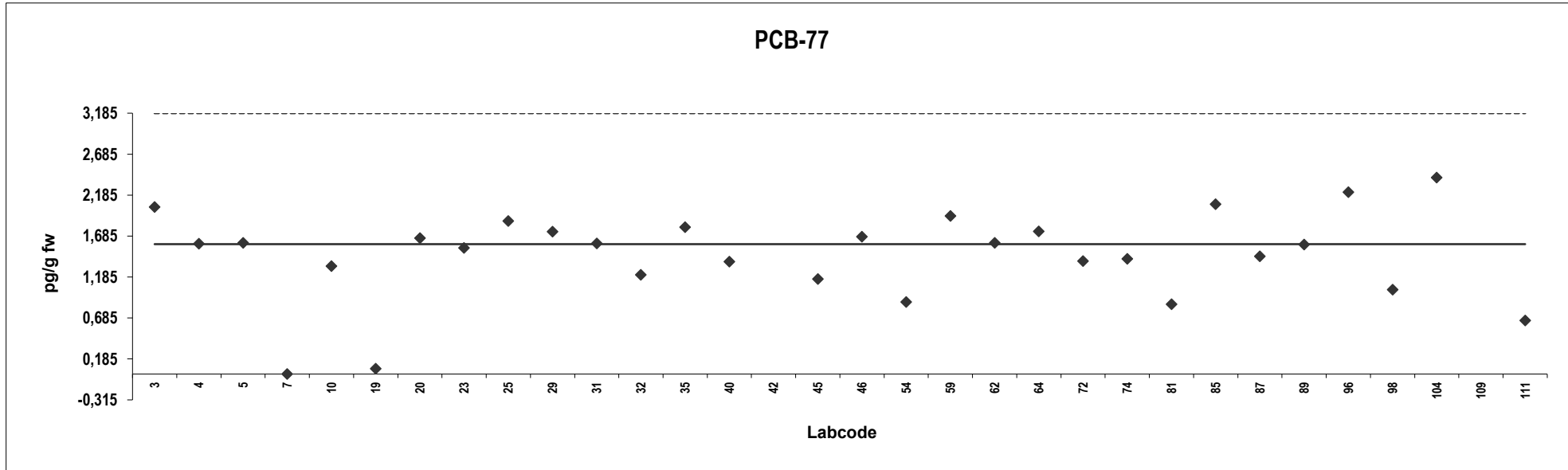


Veal
Congener: PCB-77

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	2,0	1,4					
4	1,6	0,018					
5	1,6	0,045					
7	0,00018	-5,0					
10	1,3	-0,84					
19	0,067	-4,8	ND				
20	1,7	0,24					
23	1,5	-0,14					
25	1,9	0,90					
29	1,7	0,48					
31	1,6	0,023					
32	1,2	-1,2					
35	1,8	0,65					
40	1,4	-0,67					
42	3,9	7,2	Outlier				
45	1,2	-1,3					
46	1,7	0,29					
54	0,88	-2,2					
59	1,9	1,1					
62	1,6	0,045					
64	1,7	0,49					
72	1,4	-0,66					
74	1,4	-0,57					
81	0,85	-2,3					
85	2,1	1,5					
87	1,4	-0,47					
89	1,6	-0,018					
96	2,2	2,0					
98	1,0	-1,8					
104	2,4	2,6					
109	5,2	11	Outlier				
111	0,65	-2,9					

Consensus statistics

Consensus median, pg/g	1,6
Median all values pg/g	1,6
Consensus mean, pg/g	1,4
Standard deviation, pg/g	0,55
Relative standard deviation, %	38
No. of values reported	32
No. of values removed	2
No. of reported non-detects	1

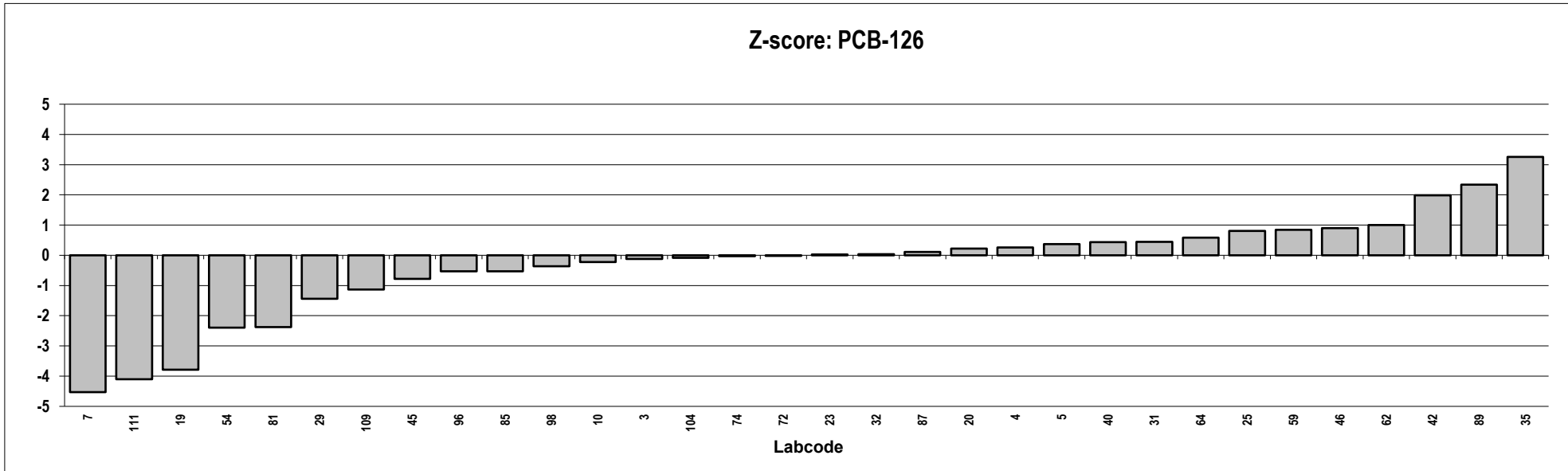
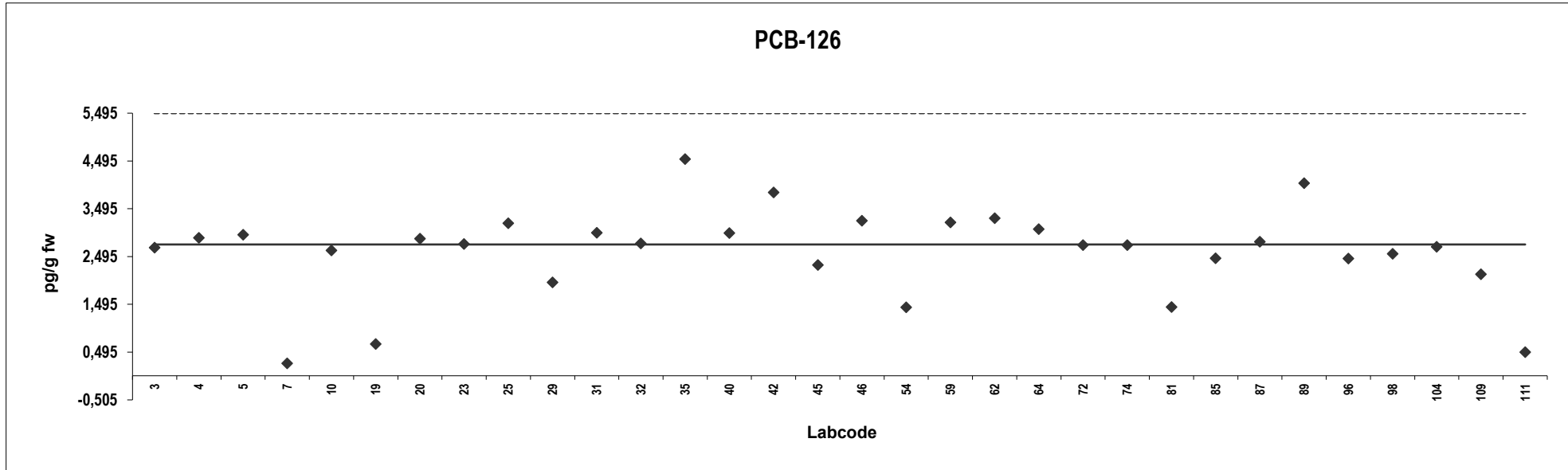


Veal
Congener: PCB-126

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	2,7	-0,12					
4	2,9	0,26					
5	3,0	0,37					
7	0,26	-4,5					
10	2,6	-0,23					
19	0,67	-3,8					
20	2,9	0,22					
23	2,8	0,022					
25	3,2	0,80					
29	2,0	-1,4					
31	3,0	0,45					
32	2,8	0,041					
35	4,5	3,3					
40	3,0	0,43					
42	3,8	2,0					
45	2,3	-0,78					
46	3,2	0,90					
54	1,4	-2,4					
59	3,2	0,84					
62	3,3	1,0					
64	3,1	0,58					
72	2,7	-0,022					
74	2,7	-0,026					
81	1,4	-2,4					
85	2,5	-0,53					
87	2,8	0,11					
89	4,0	2,3					
96	2,5	-0,53					
98	2,6	-0,36					
104	2,7	-0,087					
109	2,1	-1,1					
111	0,50	-4,1					

Consensus statistics

Consensus median, pg/g	2,7
Median all values pg/g	2,7
Consensus mean, pg/g	2,6
Standard deviation, pg/g	0,93
Relative standard deviation, %	36
No. of values reported	32
No. of values removed	0
No. of reported non-detects	0



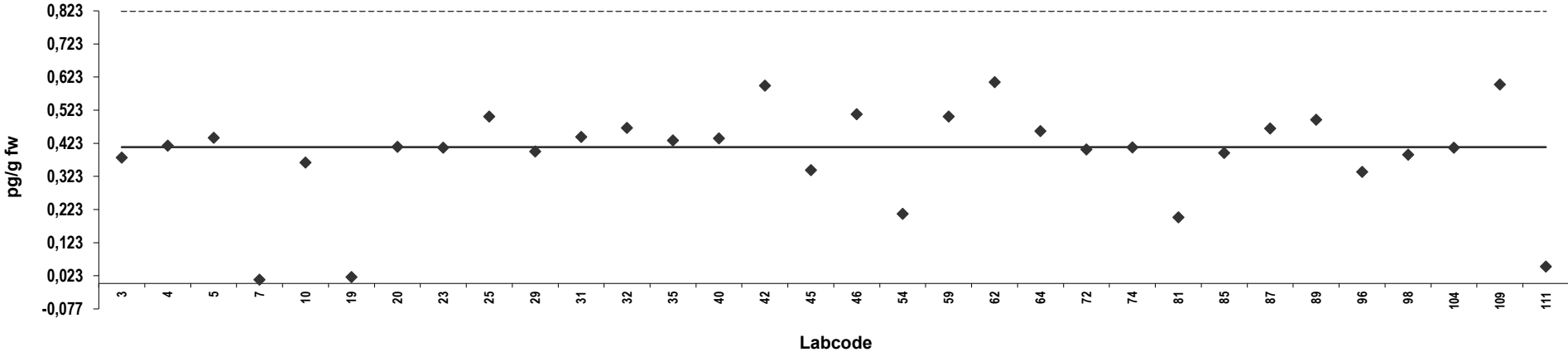
Veal
Congener: PCB-169

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,38	-0,38					
4	0,42	0,055					
5	0,44	0,35					
7	0,012	-4,9					
10	0,37	-0,57					
19	0,019	-4,8	ND				
20	0,41	0,013					
23	0,41	-0,019					
25	0,50	1,1					
29	0,40	-0,16					
31	0,44	0,37					
32	0,47	0,71					
35	0,43	0,25					
40	0,44	0,32					
42	0,60	2,3					
45	0,34	-0,85					
46	0,51	1,2					
54	0,21	-2,4					
59	0,50	1,1					
62	0,61	2,4					
64	0,46	0,59					
72	0,40	-0,081					
74	0,41	-0,013					
81	0,20	-2,6					
85	0,39	-0,21					
87	0,47	0,68					
89	0,49	1,0					
96	0,34	-0,90					
98	0,39	-0,27					
104	0,41	-0,019					
109	0,60	2,3					
111	0,051	-4,4					

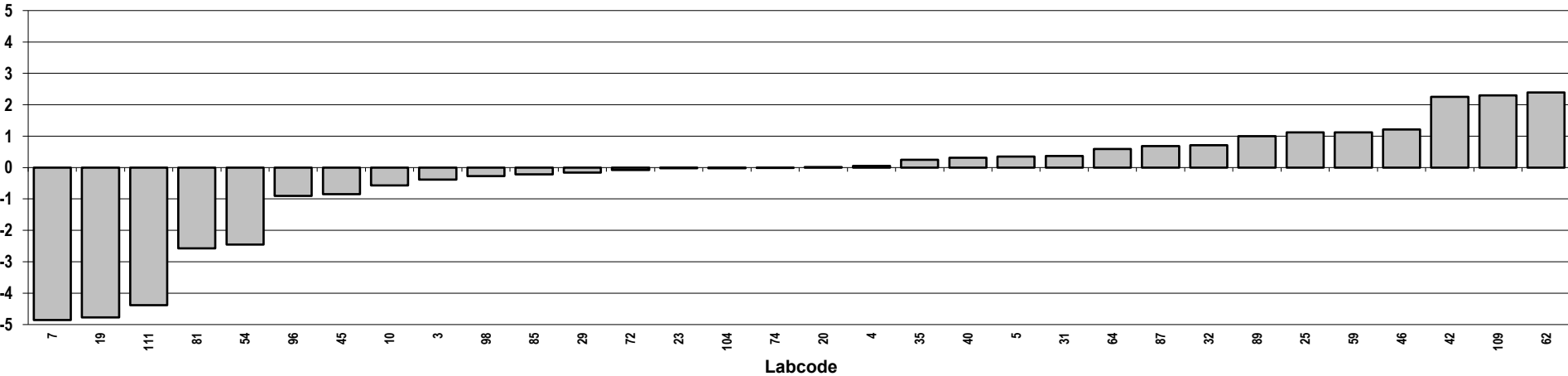
Consensus statistics

Consensus median, pg/g	0,41
Median all values pg/g	0,41
Consensus mean, pg/g	0,39
Standard deviation, pg/g	0,15
Relative standard deviation, %	38
No. of values reported	32
No. of values removed	0
No. of reported non-detects	1

PCB-169



Z-score: PCB-169



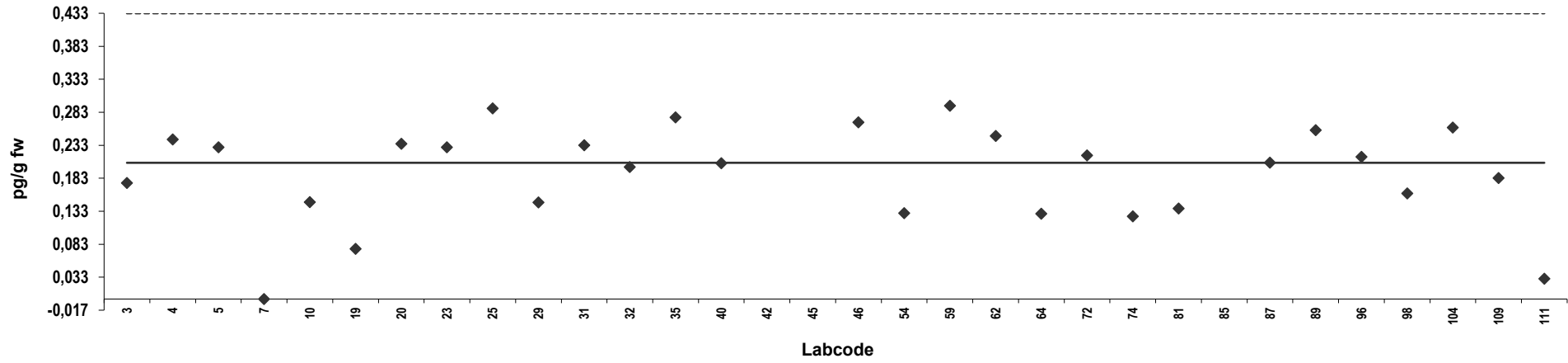
Veal
Congener: PCB-81

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,18	-0,74					
4	0,24	0,86					
5	0,23	0,57					
7	0,000055	-5,0					
10	0,15	-1,4					
19	0,076	-3,2	ND				
20	0,24	0,70					
23	0,23	0,57					
25	0,29	2,0					
29	0,15	-1,5					
31	0,23	0,64					
32	0,20	-0,16					
35	0,28	1,7					
40	0,21	-0,020					
42	1,5	31	Outlier				
45	0,97	18	Outlier				
46	0,27	1,5					
54	0,13	-1,9					
59	0,29	2,1					
62	0,25	0,98					
64	0,13	-1,9					
72	0,22	0,27					
74	0,13	-2,0					
81	0,14	-1,7					
85	0,53	7,9	Outlier				
87	0,21	0,00					
89	0,26	1,2					
96	0,22	0,22					
98	0,16	-1,1					
104	0,26	1,3					
109	0,18	-0,56					
111	0,031	-4,3					

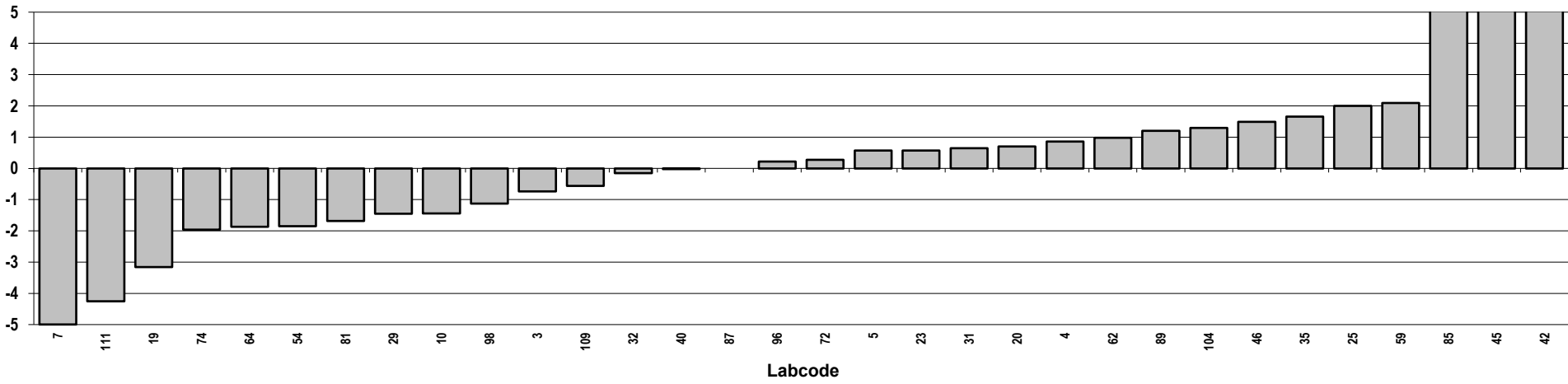
Consensus statistics

Consensus median, pg/g	0,21
Median all values pg/g	0,22
Consensus mean, pg/g	0,19
Standard deviation, pg/g	0,074
Relative standard deviation, %	38
No. of values reported	32
No. of values removed	3
No. of reported non-detects	1

PCB-81



Z-score: PCB-81

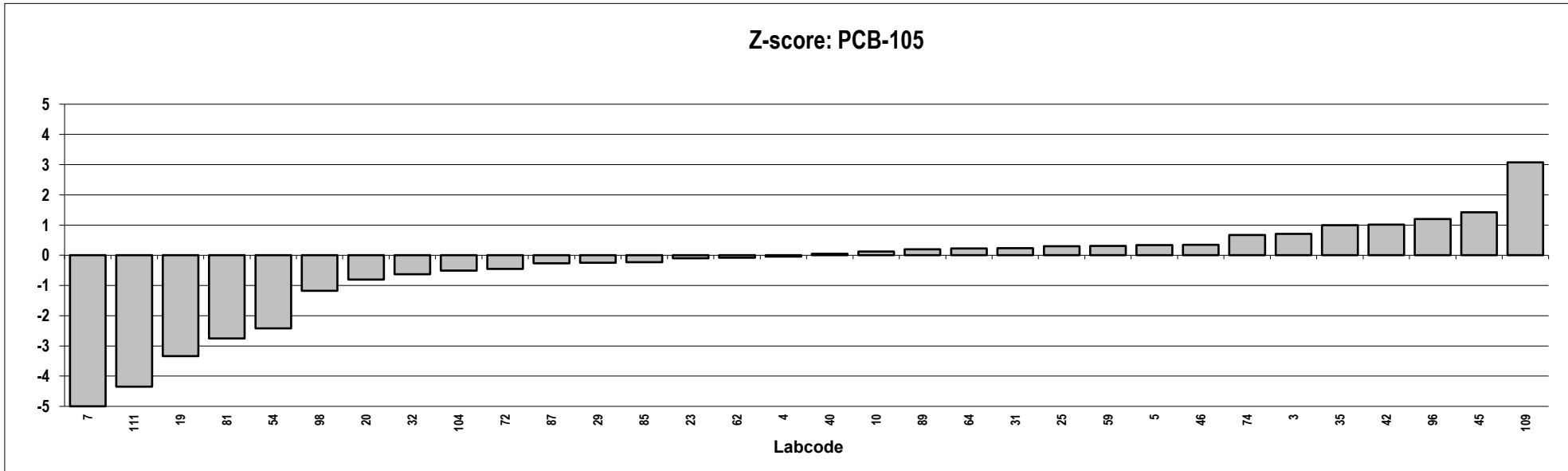
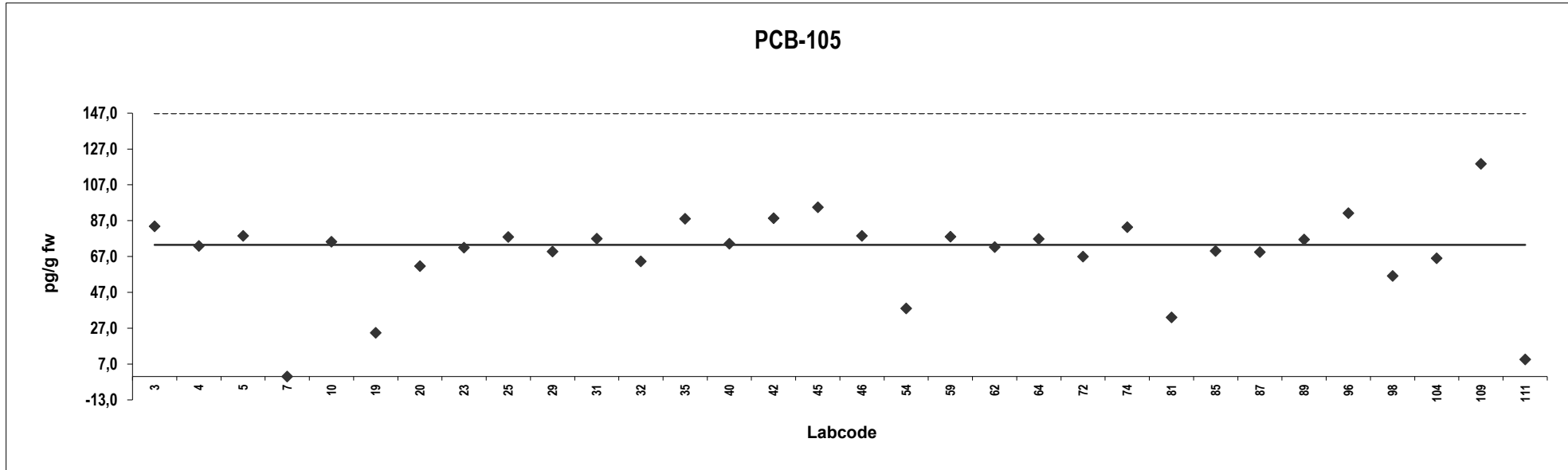


Veal
Congener: PCB-105

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	84	0,71					
4	73	-0,045					
5	79	0,34					
7	0,0018	-5,0					
10	75	0,12					
19	24	-3,3					
20	62	-0,81					
23	72	-0,10					
25	78	0,30					
29	70	-0,25					
31	77	0,24					
32	64	-0,62					
35	88	0,99					
40	74	0,045					
42	88	1,0					
45	94	1,4					
46	79	0,34					
54	38	-2,4					
59	78	0,31					
62	72	-0,081					
64	77	0,22					
72	67	-0,45					
74	83	0,67					
81	33	-2,8					
85	70	-0,23					
87	70	-0,27					
89	76	0,20					
96	91	1,2					
98	56	-1,2					
104	66	-0,51					
109	119	3,1					
111	9,6	-4,3					

Consensus statistics

Consensus median, pg/g	73
Median all values pg/g	73
Consensus mean, pg/g	68
Standard deviation, pg/g	24
Relative standard deviation, %	35
No. of values reported	32
No. of values removed	0
No. of reported non-detects	0

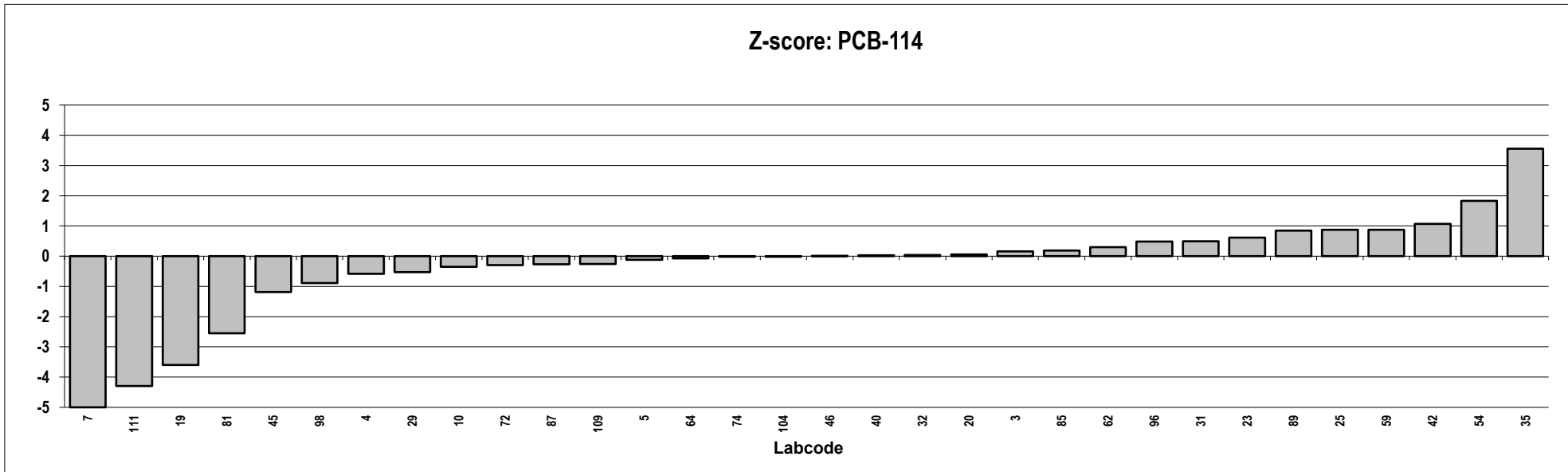
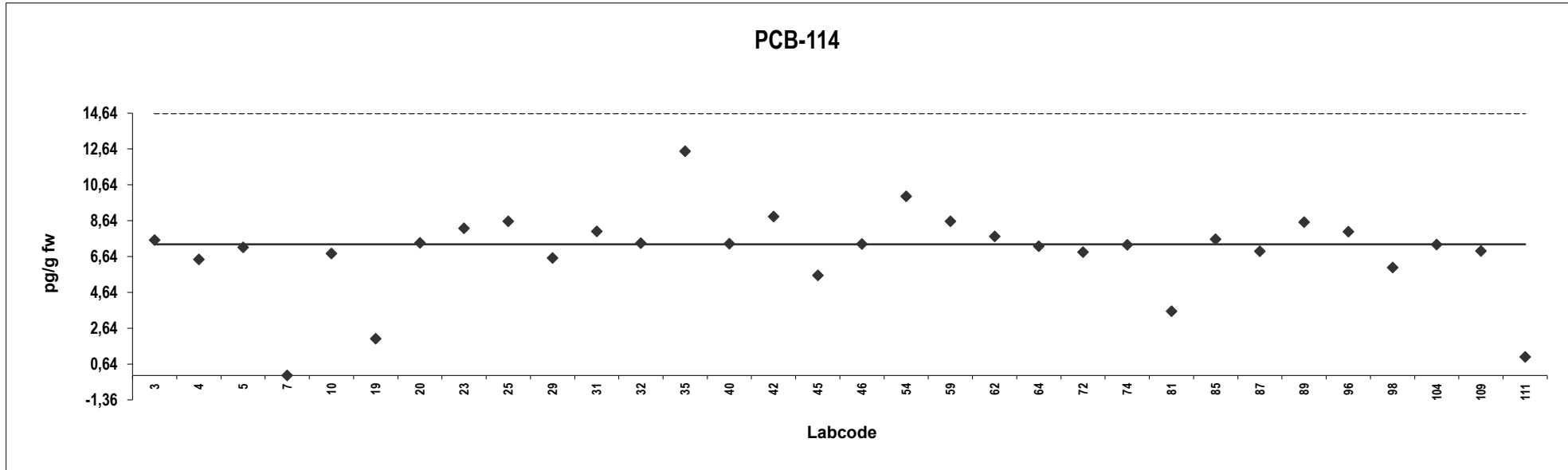


Veal
Congener: PCB-114

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	7,6	0,16					
4	6,5	-0,58					
5	7,2	-0,12					
7	0,00022	-5,0					
10	6,8	-0,35					
19	2,1	-3,6					
20	7,4	0,059					
23	8,2	0,62					
25	8,6	0,88					
29	6,6	-0,52					
31	8,0	0,50					
32	7,4	0,042					
35	13	3,6					
40	7,4	0,026					
42	8,9	1,1					
45	5,6	-1,2					
46	7,3	0,013	ND				
54	10	1,8					
59	8,6	0,88					
62	7,8	0,30					
64	7,2	-0,073					
72	6,9	-0,30					
74	7,3	-0,017					
81	3,6	-2,6					
85	7,6	0,19					
87	6,9	-0,27					
89	8,6	0,85					
96	8,0	0,49					
98	6,0	-0,89					
104	7,3	-0,013					
109	6,9	-0,26					
111	1,0	-4,3					

Consensus statistics

Consensus median, pg/g	7,3
Median all values pg/g	7,3
Consensus mean, pg/g	6,9
Standard deviation, pg/g	2,4
Relative standard deviation, %	35
No. of values reported	32
No. of values removed	0
No. of reported non-detects	1

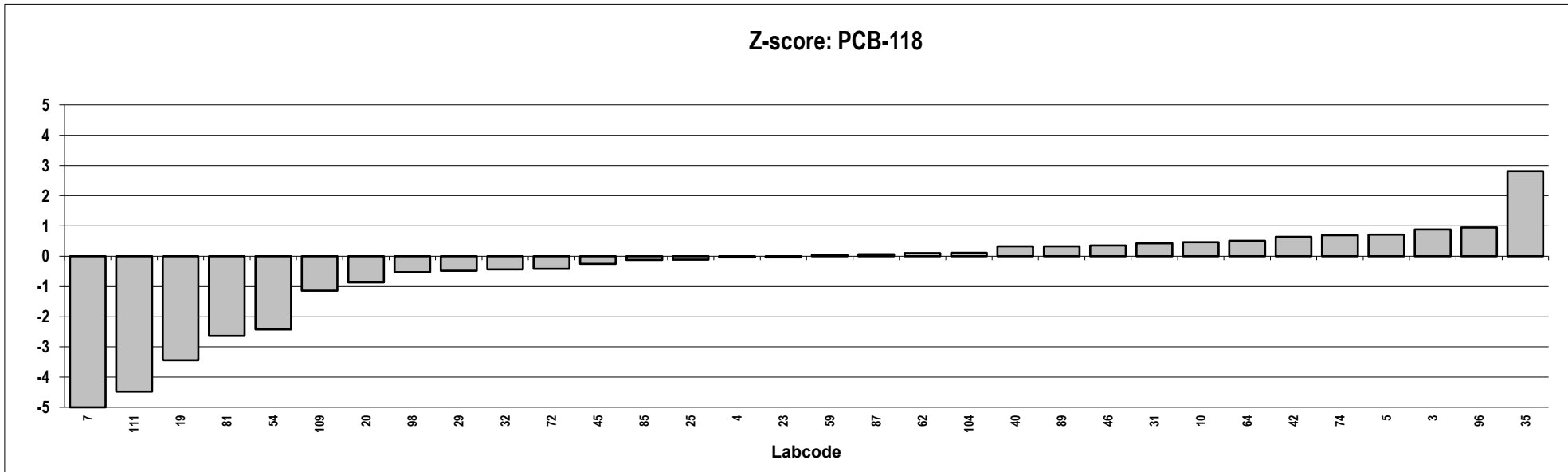
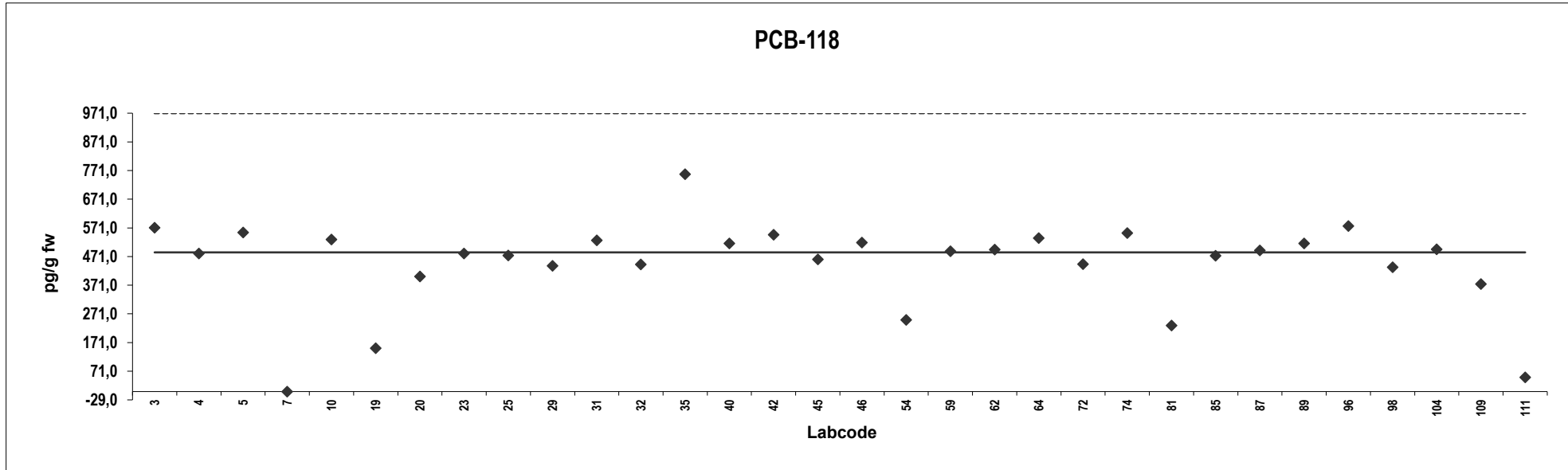


Veal
Congener: PCB-118

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	571	0,88					
4	482	-0,038					
5	555	0,72					
7	0,015	-5,0					
10	530	0,46					
19	151	-3,4					
20	402	-0,86					
23	482	-0,036					
25	475	-0,11					
29	439	-0,48					
31	527	0,43					
32	443	-0,44					
35	758	2,8					
40	517	0,32					
42	548	0,64					
45	461	-0,25					
46	519	0,35					
54	250	-2,4					
59	489	0,036					
62	495	0,098					
64	535	0,51					
72	445	-0,42					
74	553	0,69					
81	230	-2,6					
85	474	-0,12					
87	492	0,066					
89	517	0,32					
96	578	0,95					
98	434	-0,53					
104	496	0,11					
109	375	-1,1					
111	50	-4,5					

Consensus statistics

Consensus median, pg/g	486
Median all values pg/g	486
Consensus mean, pg/g	446
Standard deviation, pg/g	156
Relative standard deviation, %	35
No. of values reported	32
No. of values removed	0
No. of reported non-detects	0

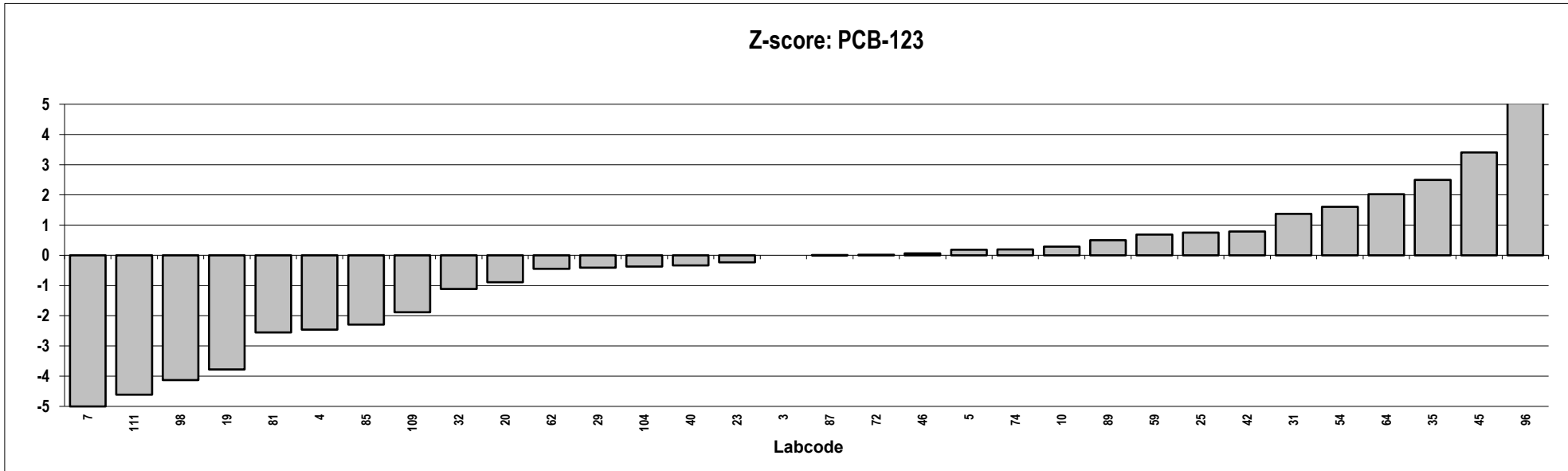
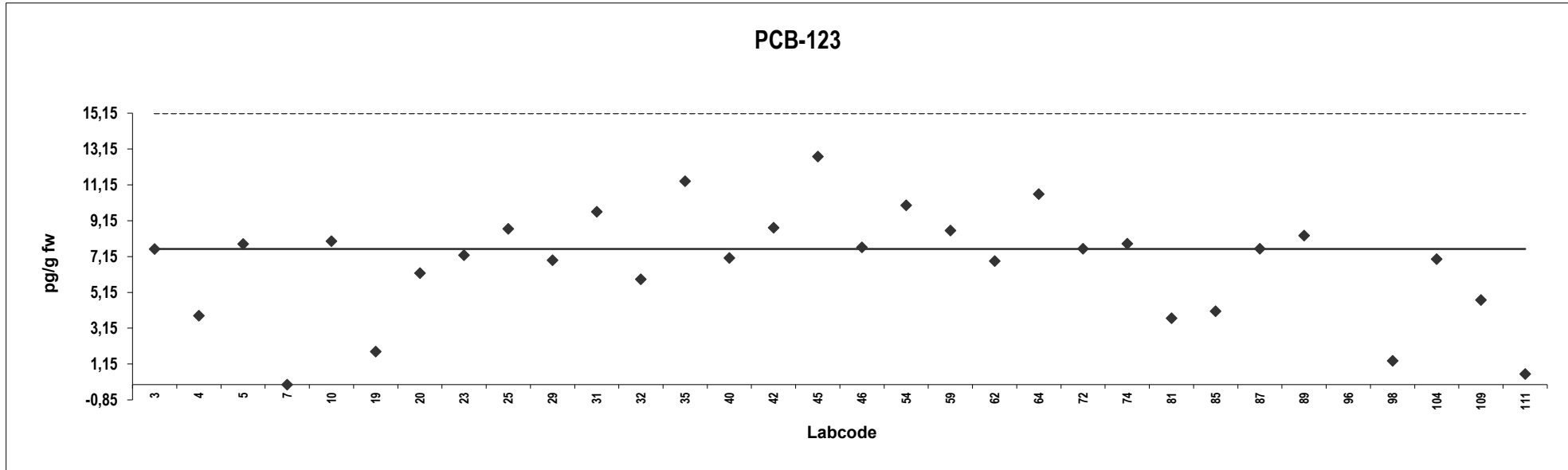


Veal
Congener: PCB-123

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	7,6	0,00					
4	3,8	-2,5					
5	7,9	0,18					
7	0,00022	-5,0					
10	8,0	0,28					
19	1,9	-3,8					
20	6,2	-0,89					
23	7,2	-0,23					
25	8,7	0,75					
29	6,9	-0,41					
31	9,6	1,4					
32	5,9	-1,1					
35	11	2,5					
40	7,1	-0,33					
42	8,8	0,78					
45	13	3,4					
46	7,7	0,060					
54	10	1,6	ND				
59	8,6	0,68					
62	6,9	-0,45					
64	11	2,0					
72	7,6	0,013					
74	7,9	0,19					
81	3,7	-2,5					
85	4,1	-2,3					
87	7,6	0,0053					
89	8,3	0,50					
96	19	7,8	Outlier				
98	1,3	-4,1					
104	7,0	-0,38					
109	4,7	-1,9					
111	0,59	-4,6					

Consensus statistics

Consensus median, pg/g	7,6
Median all values pg/g	7,6
Consensus mean, pg/g	6,8
Standard deviation, pg/g	3,0
Relative standard deviation, %	45
No. of values reported	32
No. of values removed	1
No. of reported non-detects	1

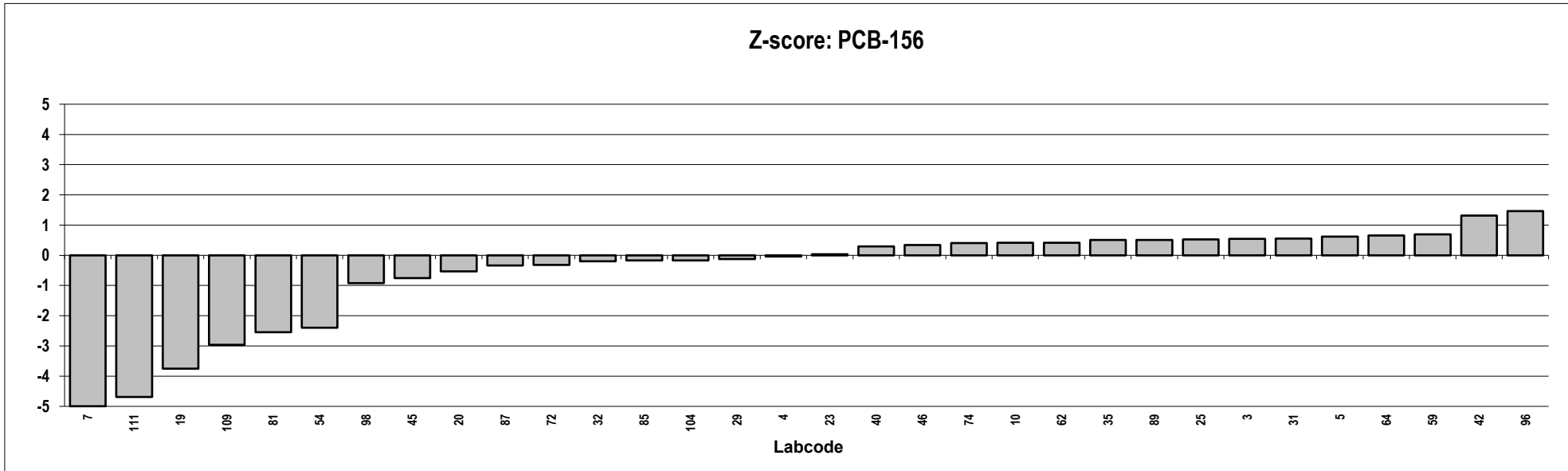
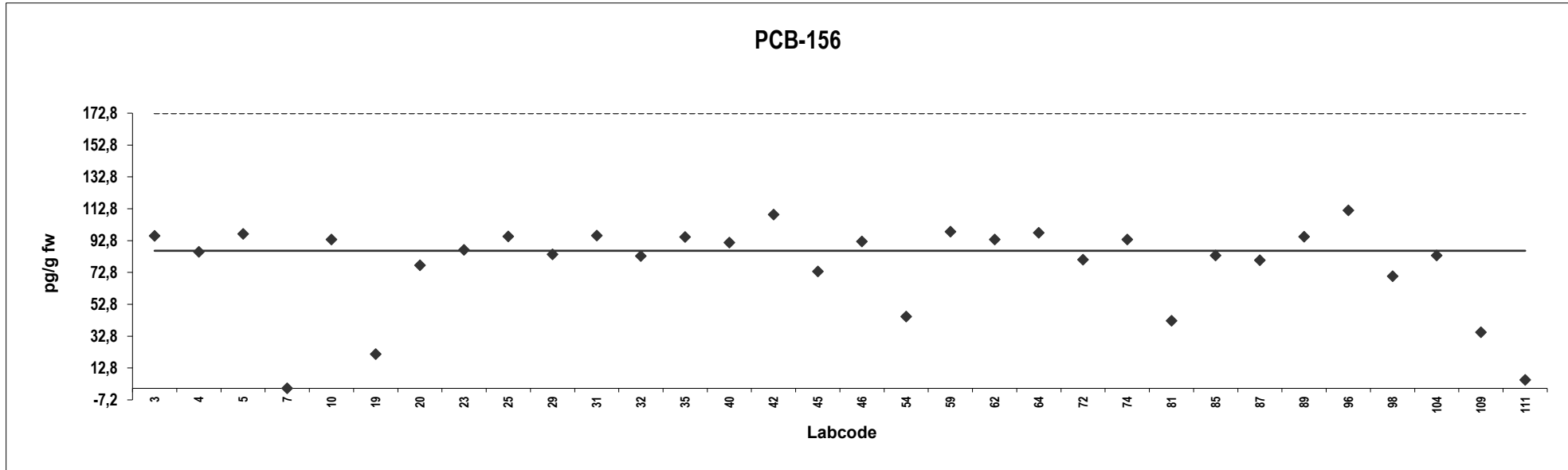


Veal
Congener: PCB-156

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	96	0,54					
4	86	-0,036					
5	97	0,62					
7	0,0026	-5,0					
10	93	0,41					
19	22	-3,8					
20	77	-0,53					
23	87	0,036					
25	95	0,52					
29	84	-0,13					
31	96	0,55					
32	83	-0,20					
35	95	0,50					
40	91	0,29					
42	109	1,3					
45	73	-0,75					
46	92	0,34					
54	45	-2,4					
59	98	0,70					
62	94	0,41					
64	98	0,65					
72	81	-0,32					
74	93	0,41					
81	42	-2,5					
85	83	-0,17					
87	80	-0,34					
89	95	0,51					
96	112	1,5					
98	70	-0,92					
104	83	-0,17					
109	35	-3,0					
111	5,4	-4,7					

Consensus statistics

Consensus median, pg/g	86
Median all values pg/g	86
Consensus mean, pg/g	78
Standard deviation, pg/g	28
Relative standard deviation, %	36
No. of values reported	32
No. of values removed	0
No. of reported non-detects	0



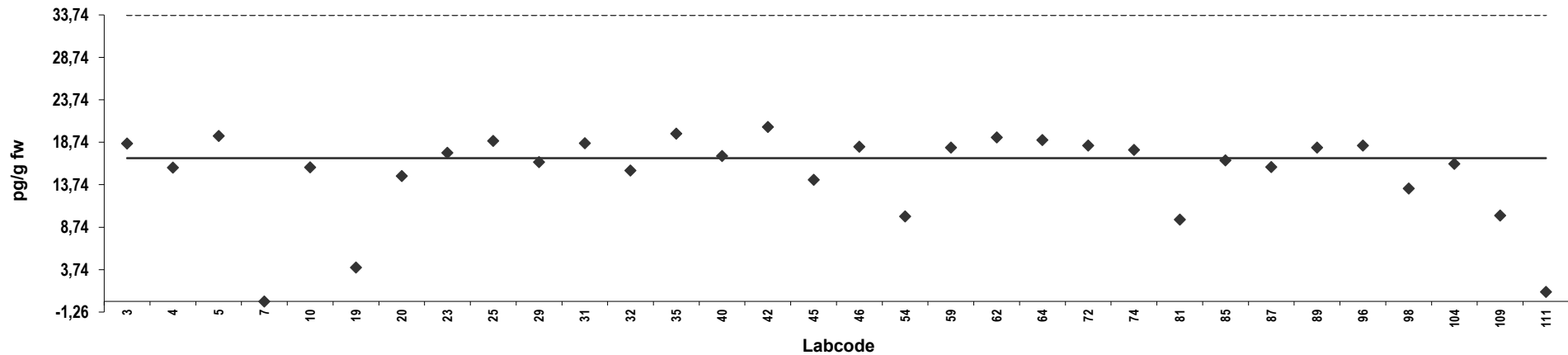
Veal
Congener: PCB-157

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	19	0,51					
4	16	-0,33					
5	20	0,78					
7	0,00051	-5,0					
10	16	-0,32					
19	4,0	-3,8					
20	15	-0,63					
23	18	0,19					
25	19	0,60					
29	16	-0,13					
31	19	0,52					
32	15	-0,44					
35	20	0,85					
40	17	0,079					
42	21	1,1					
45	14	-0,75					
46	18	0,40					
54	10	-2,0	ND				
59	18	0,36					
62	19	0,72					
64	19	0,63					
72	18	0,44					
74	18	0,29					
81	9,6	-2,1					
85	17	-0,079					
87	16	-0,31					
89	18	0,36					
96	18	0,44					
98	13	-1,1					
104	16	-0,20					
109	10	-2,0					
111	1,1	-4,7					

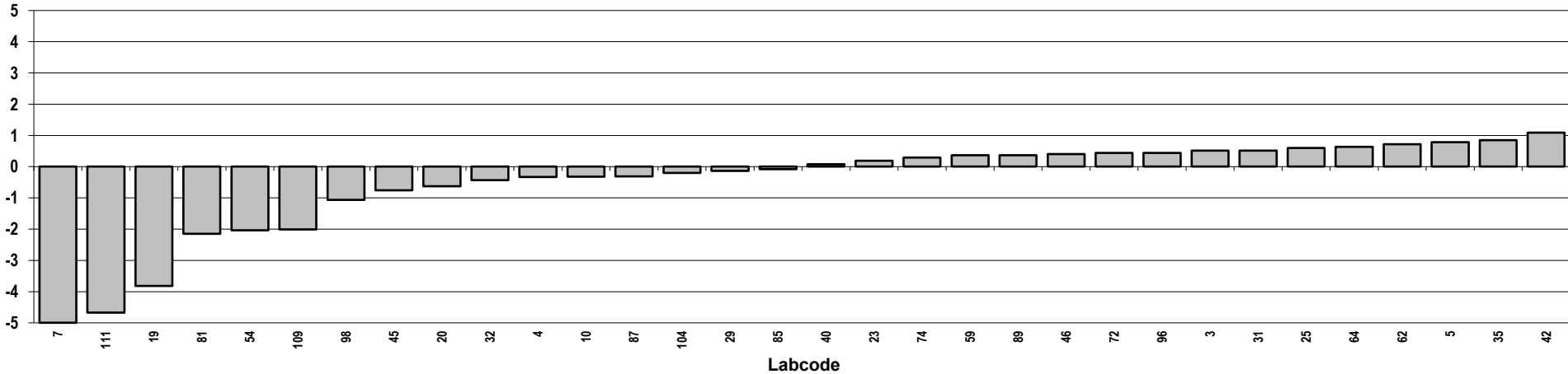
Consensus statistics

Consensus median, pg/g	17
Median all values pg/g	17
Consensus mean, pg/g	15
Standard deviation, pg/g	5,2
Relative standard deviation, %	34
No. of values reported	32
No. of values removed	0
No. of reported non-detects	1

PCB-157



Z-score: PCB-157



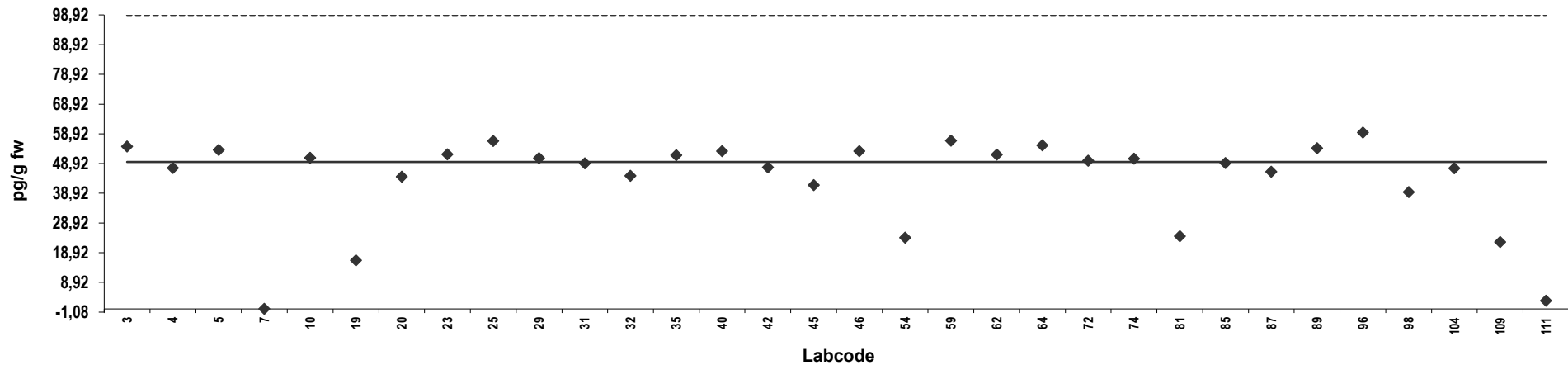
Veal
Congener: PCB-167

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	55	0,53					
4	47	-0,21					
5	54	0,41					
7	0,0016	-5,0					
10	51	0,14					
19	16	-3,3					
20	45	-0,50					
23	52	0,26					
25	57	0,71					
29	51	0,14					
31	49	-0,048					
32	45	-0,47					
35	52	0,23					
40	53	0,37					
42	48	-0,18					
45	42	-0,79					
46	53	0,37					
54	24	-2,6					
59	57	0,72					
62	52	0,25					
64	55	0,56					
72	50	0,037					
74	51	0,12					
81	25	-2,5					
85	49	-0,037					
87	46	-0,34					
89	54	0,47					
96	59	1,0					
98	39	-1,0					
104	47	-0,22					
109	22	-2,7					
111	2,8	-4,7					

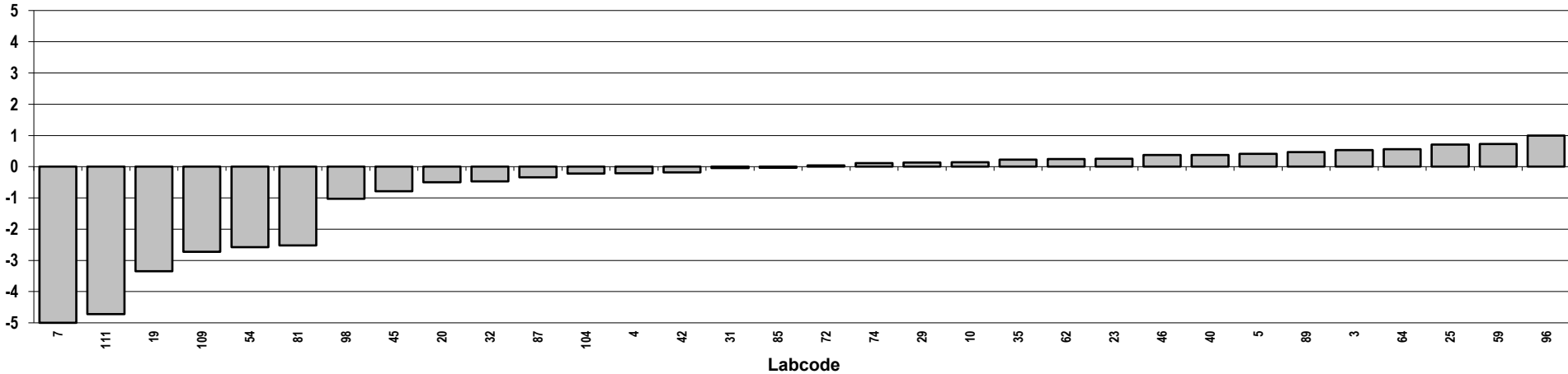
Consensus statistics

Consensus median, pg/g	49
Median all values pg/g	49
Consensus mean, pg/g	44
Standard deviation, pg/g	15
Relative standard deviation, %	35
No. of values reported	32
No. of values removed	0
No. of reported non-detects	0

PCB-167



Z-score: PCB-167

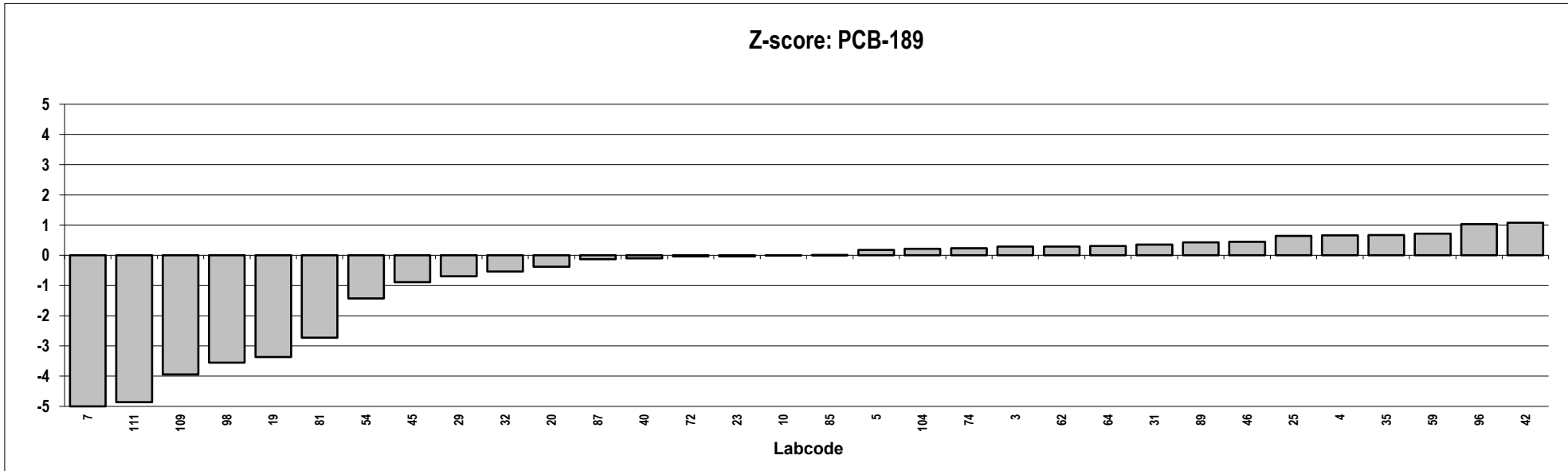
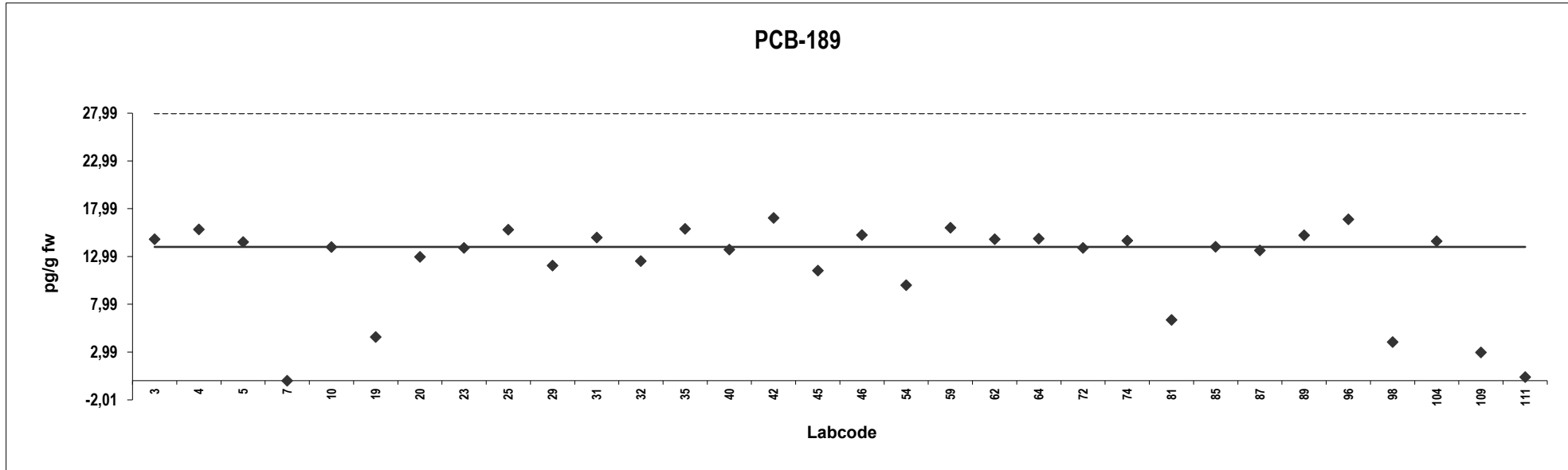


Veal
Congener: PCB-189

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	15	0,29					
4	16	0,66					
5	15	0,18					
7	0,00052	-5,0					
10	14	-0,0032					
19	4,6	-3,4					
20	13	-0,38					
23	14	-0,034					
25	16	0,65					
29	12	-0,70					
31	15	0,35					
32	13	-0,53					
35	16	0,67					
40	14	-0,099					
42	17	1,1					
45	12	-0,89					
46	15	0,44					
54	10	-1,4	ND				
59	16	0,72					
62	15	0,29					
64	15	0,30					
72	14	-0,035					
74	15	0,23					
81	6,4	-2,7					
85	14	0,0032					
87	14	-0,13					
89	15	0,43					
96	17	1,0					
98	4,1	-3,6					
104	15	0,22					
109	3,0	-3,9					
111	0,38	-4,9					

Consensus statistics

Consensus median, pg/g	14
Median all values pg/g	14
Consensus mean, pg/g	12
Standard deviation, pg/g	4,8
Relative standard deviation, %	39
No. of values reported	32
No. of values removed	0
No. of reported non-detects	1

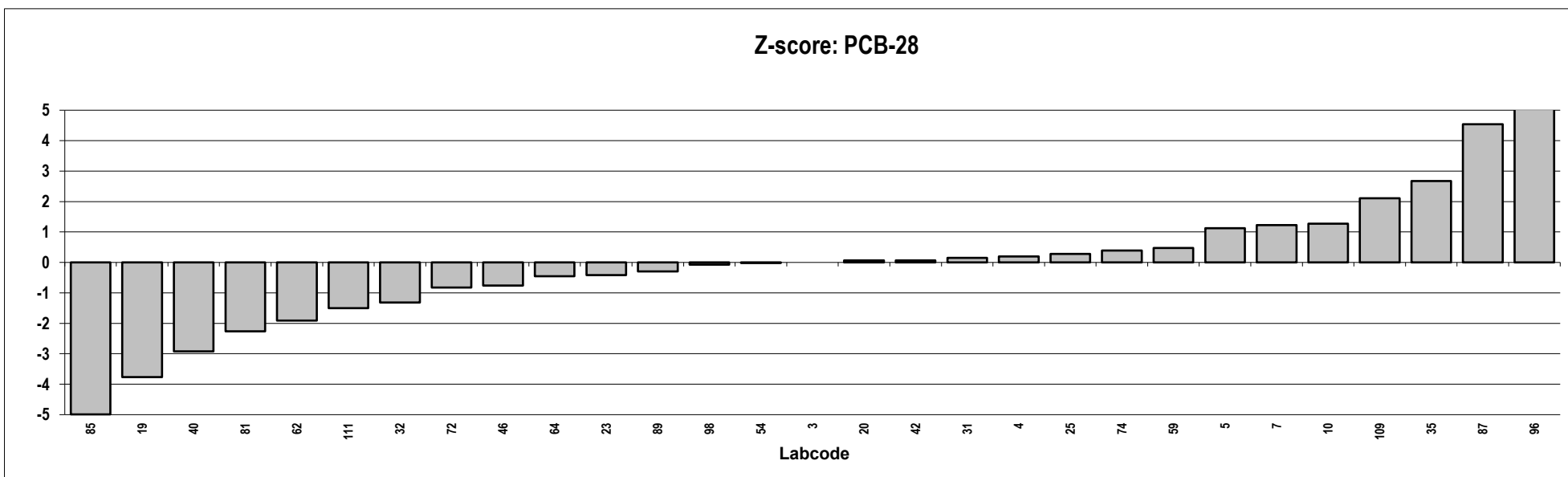
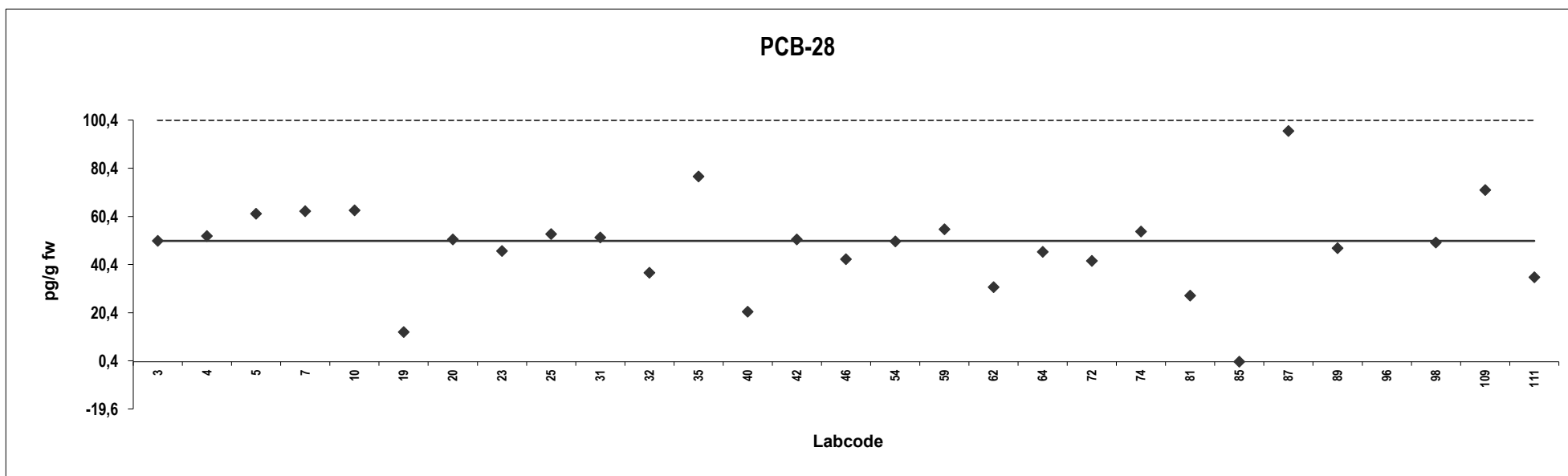


Veal
Congener: PCB-28

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	50	0,00					
4	52	0,20					
5	62	1,1					
7	63	1,2					
10	63	1,3					
19	12	-3,8					
20	51	0,062					
23	46	-0,42					
25	53	0,28					
31	52	0,15					
32	37	-1,3					
35	77	2,7					
40	21	-2,9					
42	51	0,067					
46	43	-0,76					
54	50	-0,020	ND				
59	55	0,48					
62	31	-1,9					
64	46	-0,45					
72	42	-0,82					
74	54	0,39					
81	28	-2,3					
85	0,051	-5,0					
87	96	4,5					
89	47	-0,3					
96	126	7,5	Outlier				
98	50	-0,070					
109	71	2,1					
111	35	-1,5					

Consensus statistics

Consensus median, pg/g	50
Median all values pg/g	50
Consensus mean, pg/g	48
Standard deviation, pg/g	19
Relative standard deviation, %	40
No. of values reported	29
No. of values removed	1
No. of reported non-detects	1

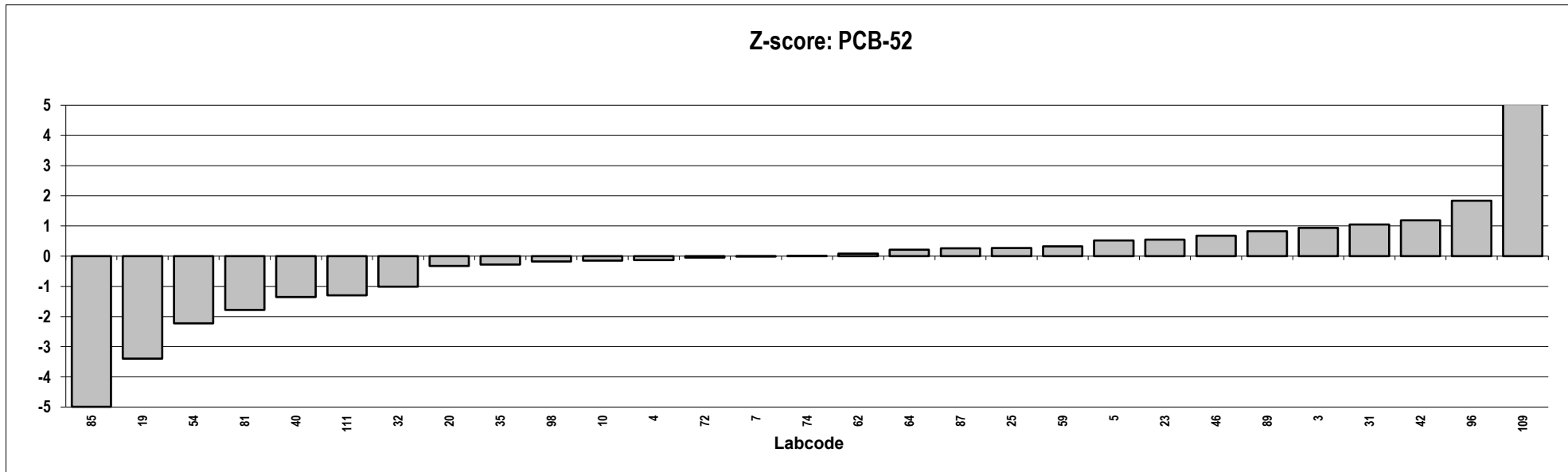
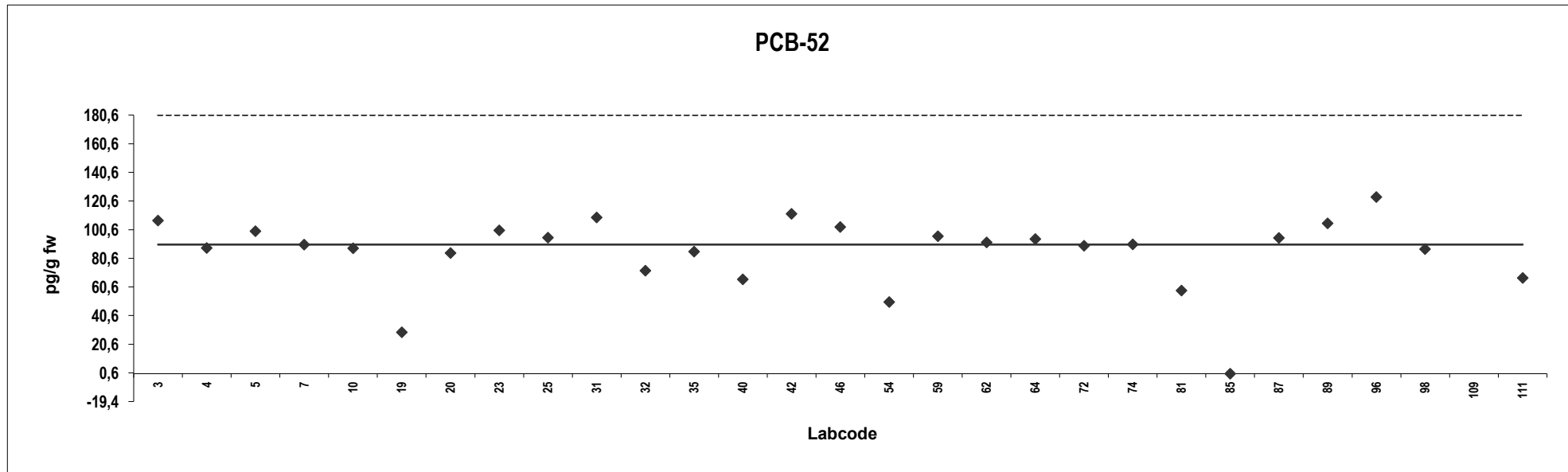


Veal
Congener: PCB-52

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	107	0,93					
4	88	-0,13					
5	100	0,52					
7	90	-0,0069					
10	87	-0,15					
19	29	-3,4					
20	84	-0,33					
23	100	0,55					
25	95	0,27					
31	109	1,0					
32	72	-1,0					
35	85	-0,28					
40	66	-1,4					
42	112	1,2					
46	102	0,68					
54	50	-2,2					
59	96	0,32					
62	92	0,085					
64	94	0,22					
72	89	-0,047					
74	90	0,0069					
81	58	-1,8					
85	0,089	-5,0					
87	95	0,26					
89	105	0,82					
96	123	1,8					
98	87	-0,18					
109	235	8,0	Outlier				
111	67	-1,3					

Consensus statistics

Consensus median, pg/g	90
Median all values pg/g	90
Consensus mean, pg/g	85
Standard deviation, pg/g	26
Relative standard deviation, %	31
No. of values reported	29
No. of values removed	1
No. of reported non-detects	0

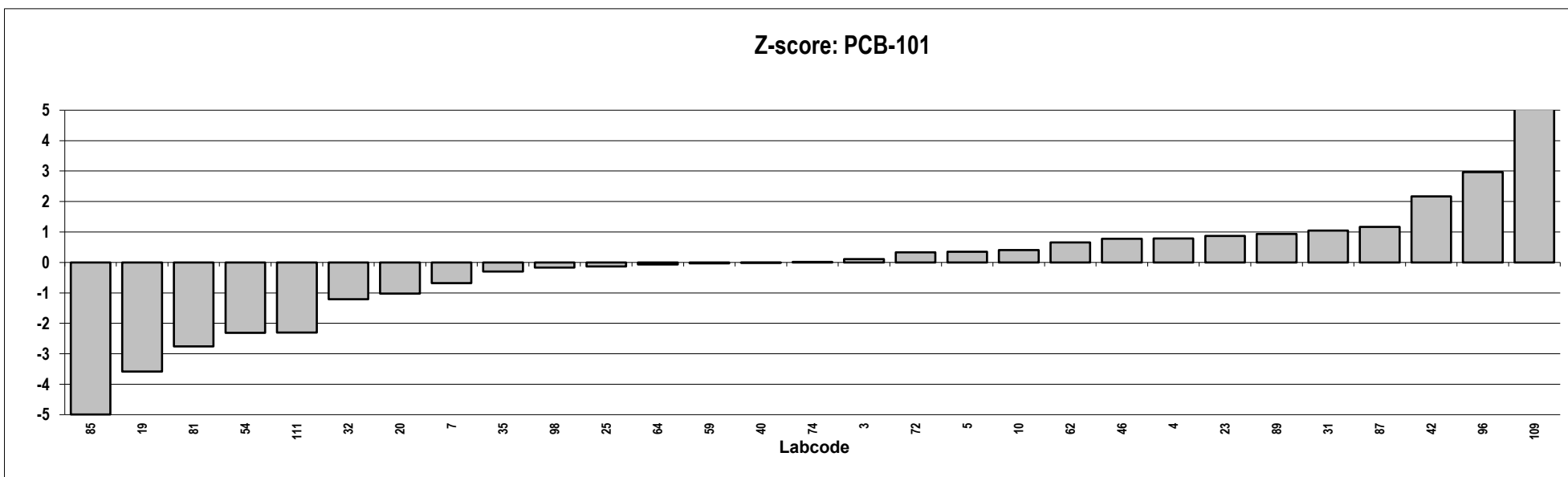
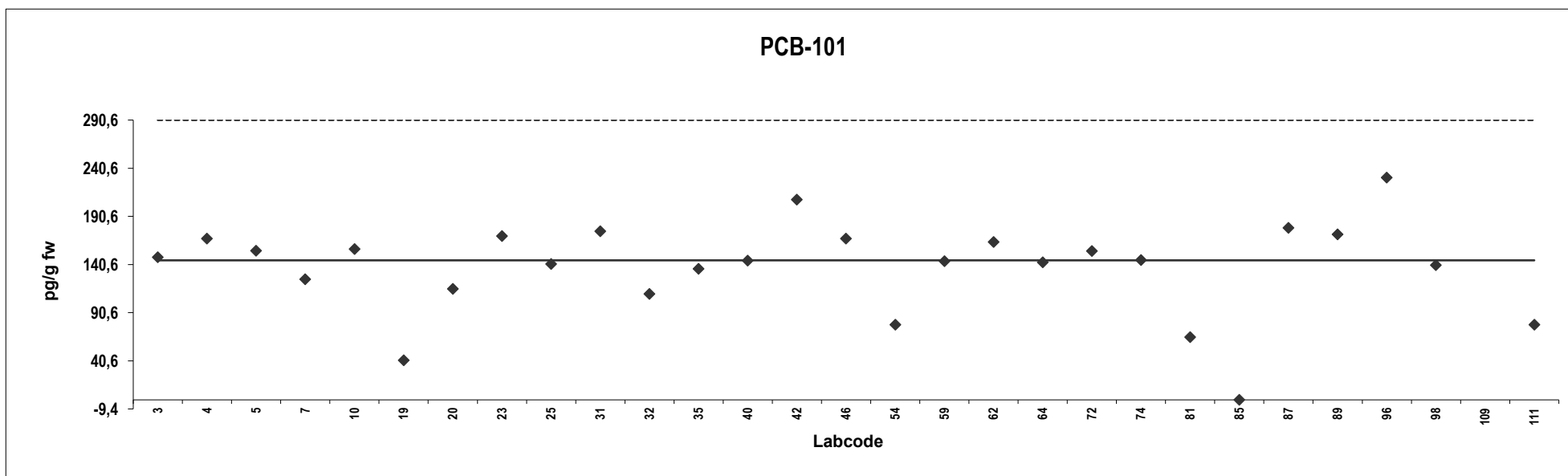


Veal
Congener: PCB-101

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	148	0,11					
4	168	0,78					
5	155	0,35					
7	125	-0,68					
10	157	0,41					
19	41	-3,6					
20	115	-1,0					
23	170	0,87					
25	141	-0,13					
31	175	1,0					
32	110	-1,2					
35	136	-0,30					
40	145	-0,013					
42	208	2,2					
46	167	0,78					
54	78	-2,3					
59	144	-0,031					
62	164	0,66					
64	143	-0,071					
72	155	0,34					
74	145	0,013					
81	65	-2,8					
85	0,15	-5,0					
87	179	1,2					
89	172	0,94					
96	231	3,0					
98	140	-0,17					
109	476	11	Outlier				
111	78	-2,3					

Consensus statistics

Consensus median, pg/g	145
Median all values pg/g	145
Consensus mean, pg/g	138
Standard deviation, pg/g	49
Relative standard deviation, %	36
No. of values reported	29
No. of values removed	1
No. of reported non-detects	0



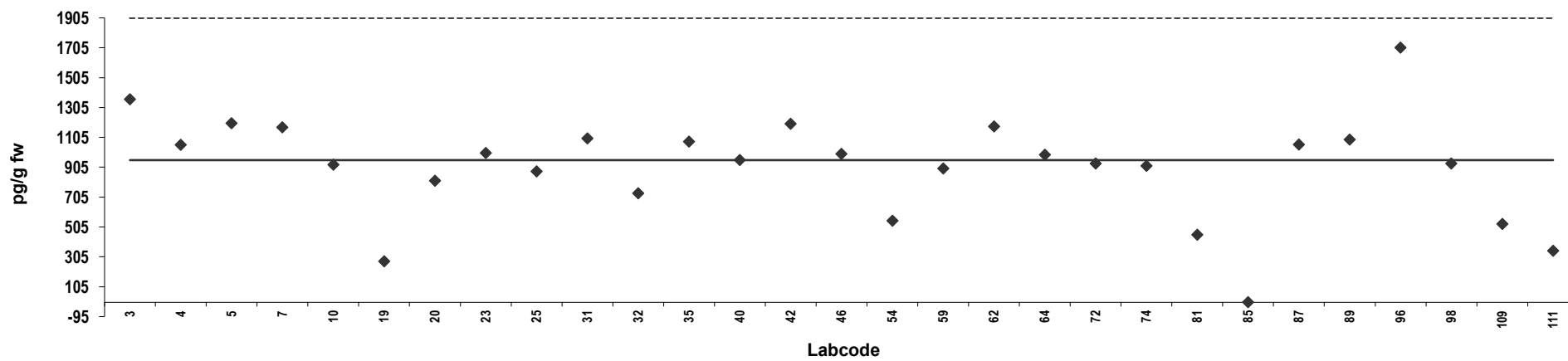
Veal
Congener: PCB-138

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	1360	2,1					
4	1055	0,54					
5	1200	1,3					
7	1173	1,2					
10	921	-0,16					
19	274	-3,6					
20	814	-0,73					
23	1000	0,25					
25	877	-0,40					
31	1097	0,76					
32	730	-1,2					
35	1077	0,66					
40	952	0,00					
42	1195	1,3					
46	994	0,22					
54	546	-2,1					
59	897	-0,29					
62	1178	1,2					
64	989	0,19					
72	929	-0,12					
74	914	-0,20					
81	453	-2,6					
85	0,97	-5,0					
87	1057	0,55					
89	1090	0,72					
96	1707	4,0					
98	930	-0,12					
109	525	-2,2					
111	345	-3,2					

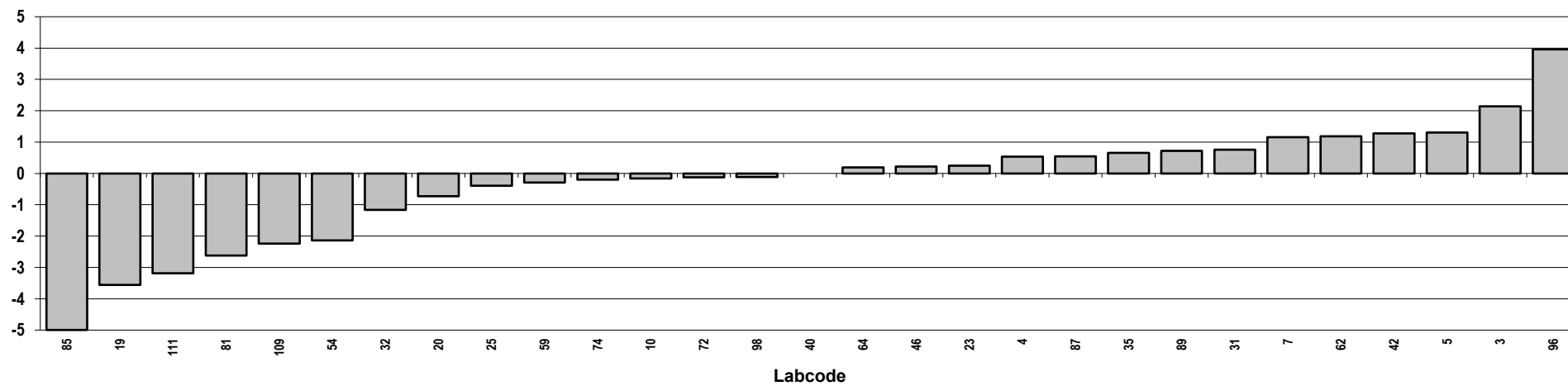
Consensus statistics

Consensus median, pg/g	952
Median all values pg/g	952
Consensus mean, pg/g	906
Standard deviation, pg/g	348
Relative standard deviation, %	38
No. of values reported	29
No. of values removed	0
No. of reported non-detects	0

PCB-138



Z-score: PCB-138

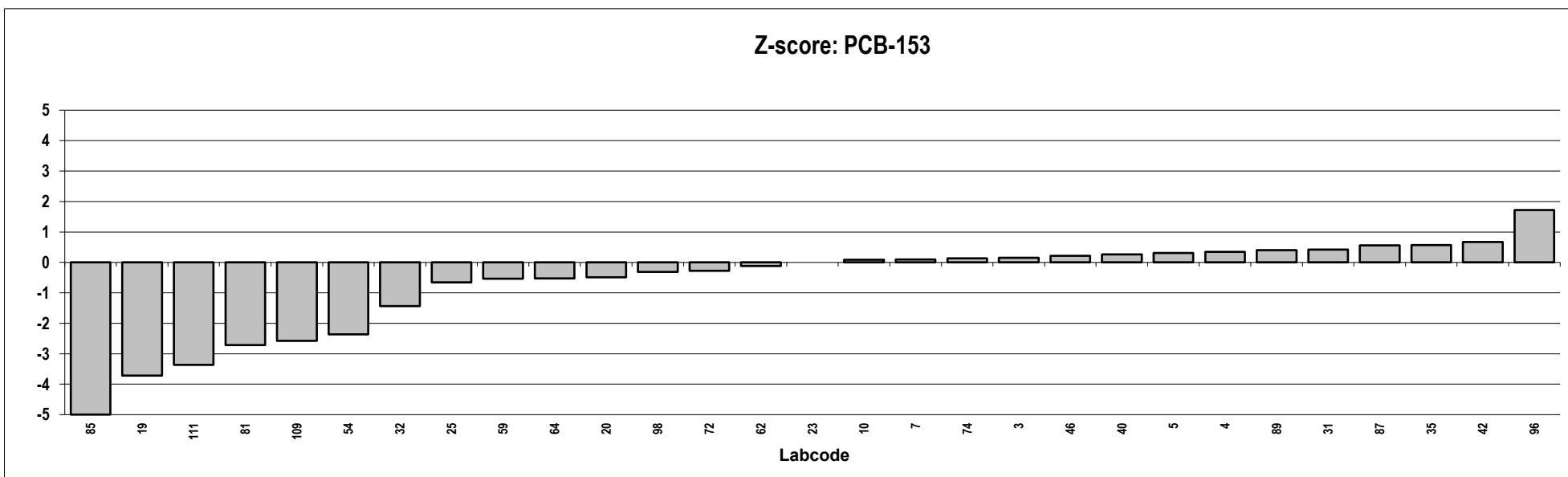
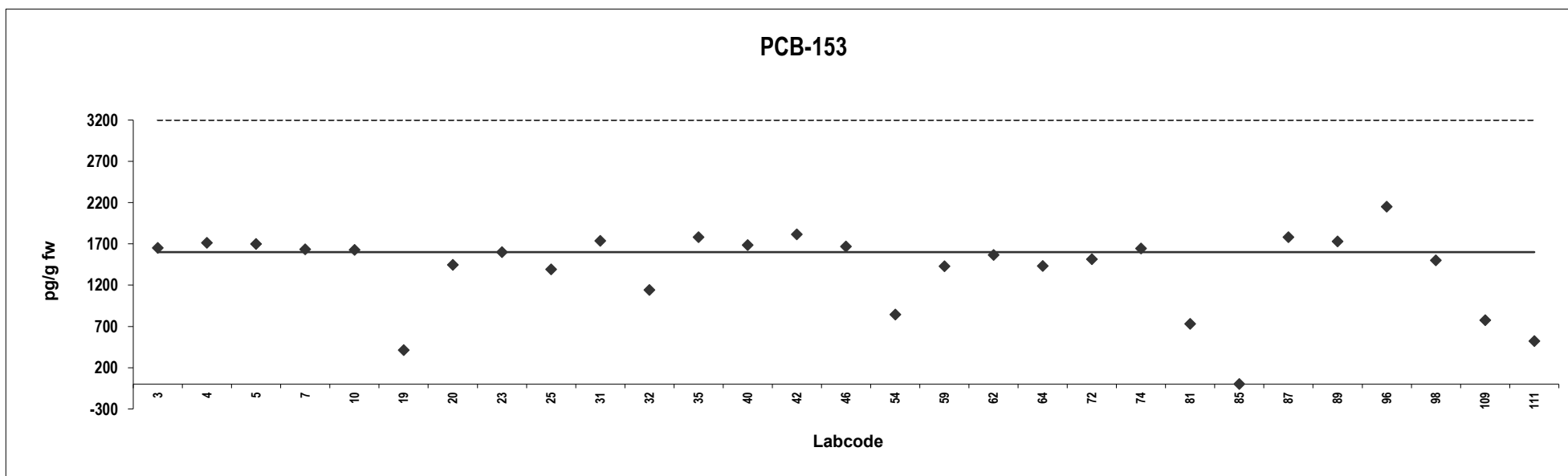


Veal
Congener: PCB-153

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	1650	0,16					
4	1711	0,35					
5	1700	0,31					
7	1632	0,10					
10	1627	0,085					
19	412	-3,7					
20	1445	-0,48					
23	1600	0,00					
25	1390	-0,66					
31	1736	0,43					
32	1140	-1,4					
35	1782	0,57					
40	1686	0,27					
42	1815	0,67					
46	1668	0,21					
54	844	-2,36					
59	1430	-0,53					
62	1564	-0,11					
64	1433	-0,52					
72	1513	-0,27					
74	1643	0,13					
81	731	-2,7					
85	1,5	-5,0					
87	1781	0,56					
89	1730	0,41					
96	2151	1,7					
98	1500	-0,31					
109	776	-2,6					
111	524	-3,4					

Consensus statistics

Consensus median, pg/g	1600
Median all values pg/g	1600
Consensus mean, pg/g	1401
Standard deviation, pg/g	494
Relative standard deviation, %	35
No. of values reported	29
No. of values removed	0
No. of reported non-detects	0

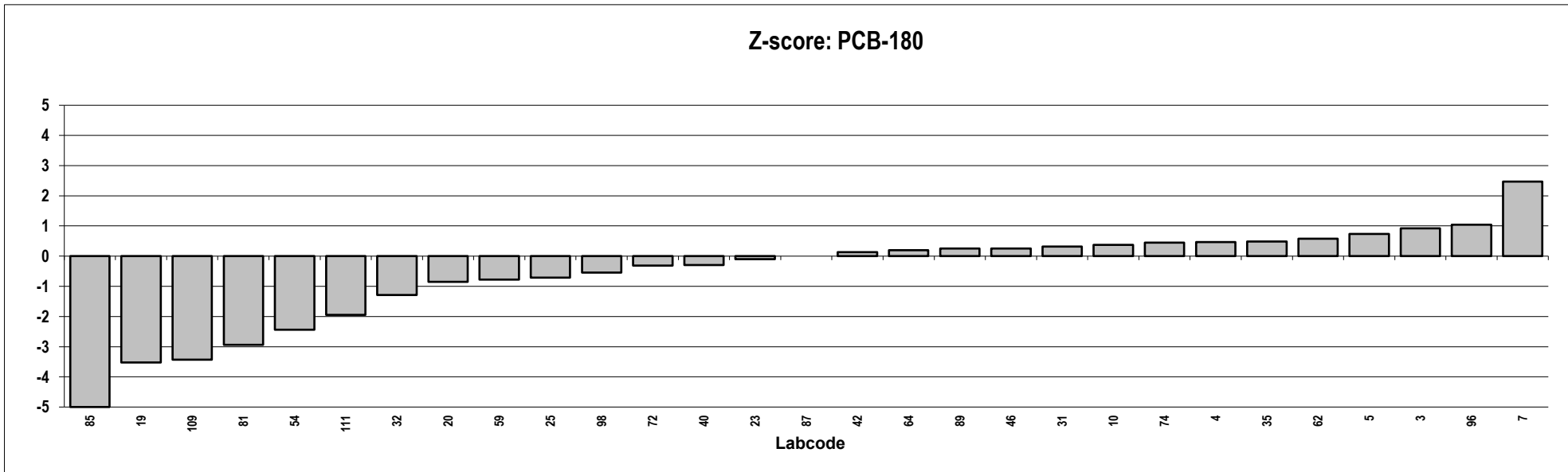
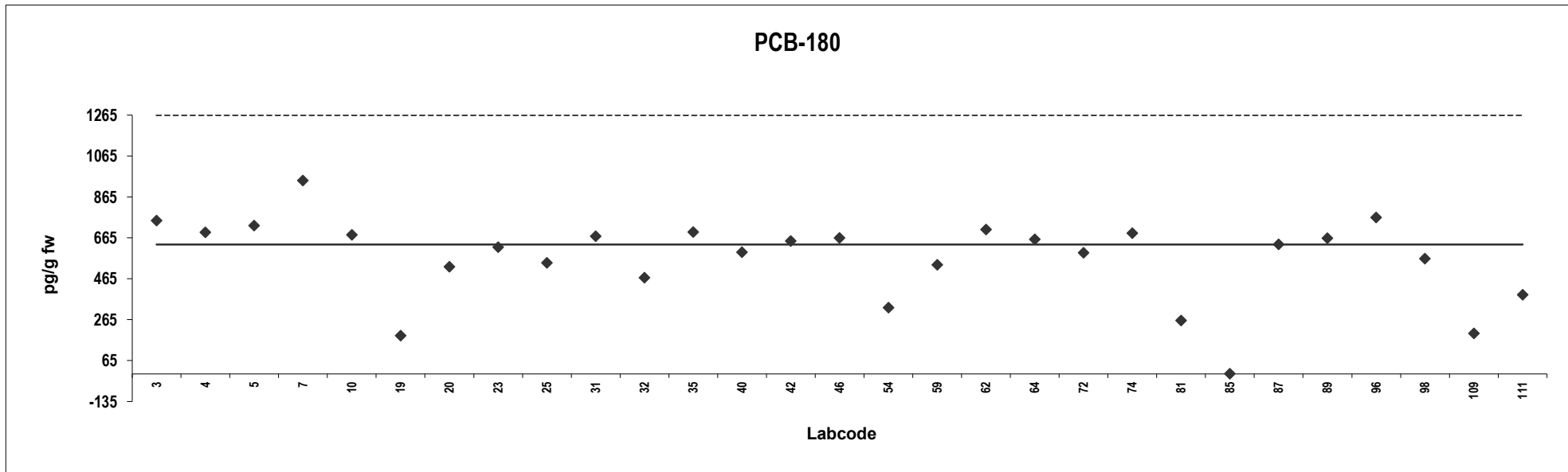


Veal
Congener: PCB-180

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	749	0,92					
4	692	0,47					
5	725	0,73					
7	945	2,5					
10	680	0,37					
19	187	-3,5					
20	524	-0,86					
23	620	-0,099					
25	543	-0,71					
31	673	0,32					
32	470	-1,3					
35	694	0,48					
40	596	-0,29					
42	649	0,13					
46	665	0,25					
54	324	-2,4					
59	534	-0,78					
62	706	0,58					
64	658	0,20					
72	593	-0,32					
74	689	0,44					
81	261	-2,9					
85	0,56	-5,0					
87	633	0,00					
89	664	0,25					
96	765	1,0					
98	564	-0,54					
109	199	-3,4					
111	386						

Consensus statistics

Consensus median, pg/g	633
Median all values pg/g	633
Consensus mean, pg/g	565
Standard deviation, pg/g	205
Relative standard deviation, %	36
No. of values reported	29
No. of values removed	0
No. of reported non-detects	0

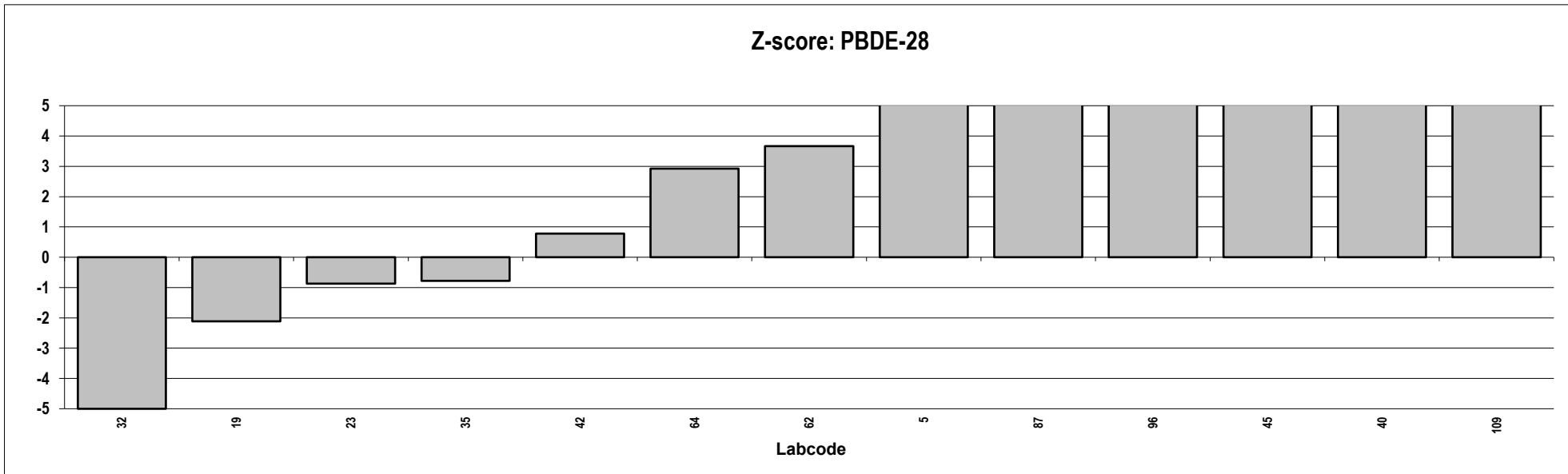
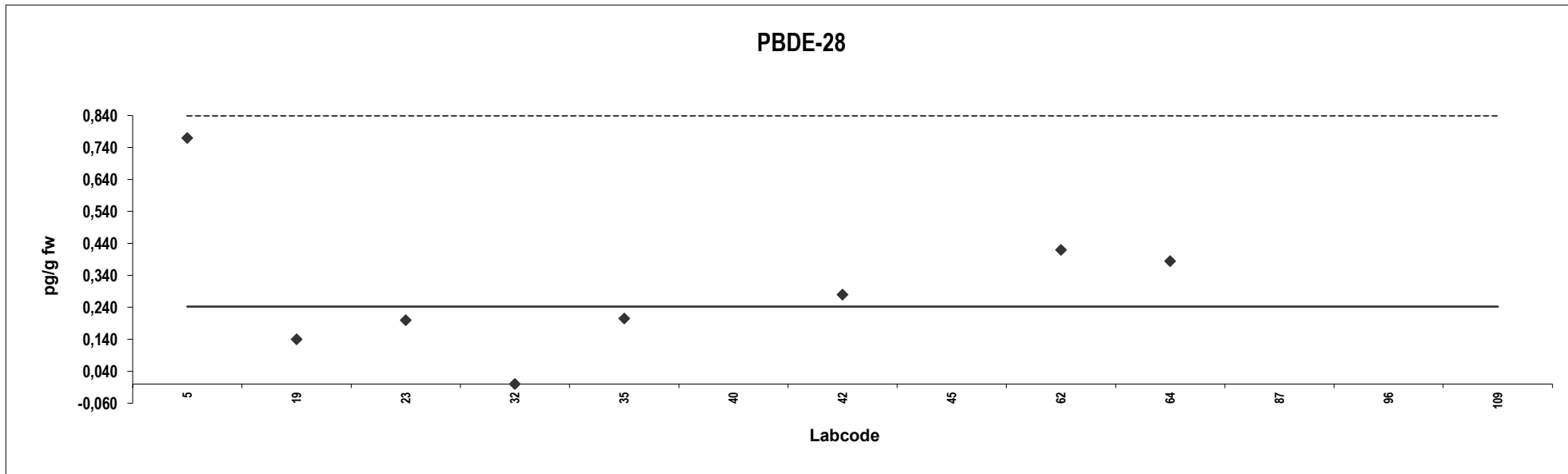


Veal
Congener: PBDE-28

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
5	0,77	11	ND				
19	0,14	-2	ND				
23	0,20	-0,87					
32	0,00012	-5,0					
35	0,20	-0,78					
40	2,0	36	Outlier				
42	0,28	0,78					
45	2,0	36	Outlier				
62	0,42	3,7					
64	0,38	2,9					
87	1,2	20	Outlier				
96	1,6	27	Outlier				
109	81	1663	Outlier				

Consensus statistics

Consensus median, pg/g	0,24
Median all values pg/g	0,42
Consensus mean, pg/g	0,30
Standard deviation, pg/g	0,23
Relative standard deviation, %	77
No. of values reported	13
No. of values removed	5
No. of reported non-detects	2



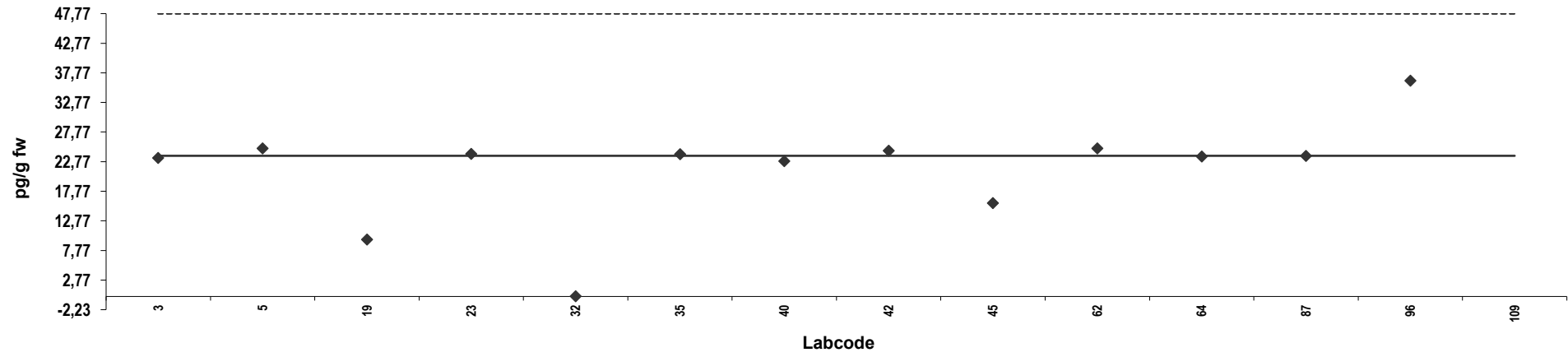
Veal
Congener: PBDE-47

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	23	-0,076					
5	25	0,26					
19	9,6	-3,0					
23	24	0,072					
32	0,018	-5,0					
35	24	0,053					
40	23	-0,19					
42	25	0,19					
45	16	-1,7					
62	25	0,26					
64	24	-0,025					
87	24	0,00					
96	36	2,7					
109	105	17	Outlier				

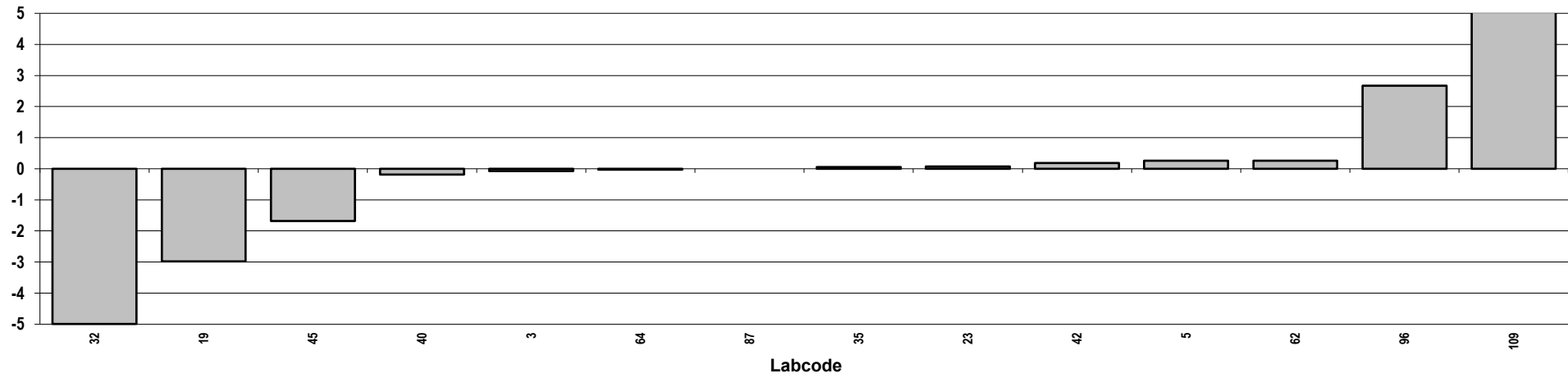
Consensus statistics

Consensus median, pg/g	24
Median all values pg/g	24
Consensus mean, pg/g	21
Standard deviation, pg/g	8,8
Relative standard deviation, %	41
No. of values reported	14
No. of values removed	1
No. of reported non-detects	0

PBDE-47



Z-score: PBDE-47

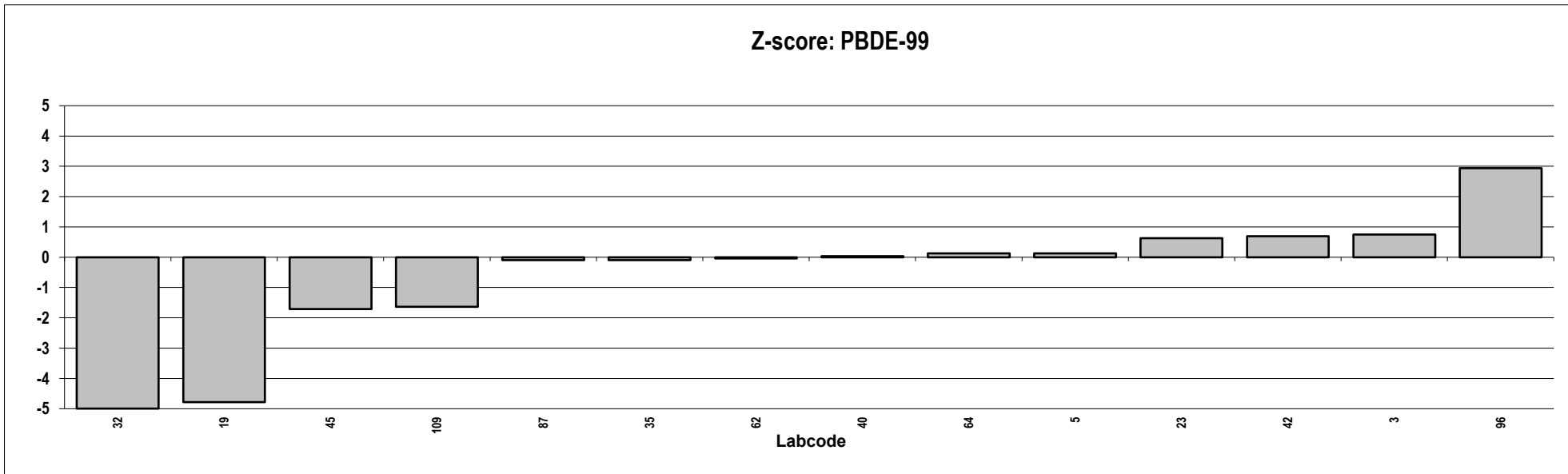
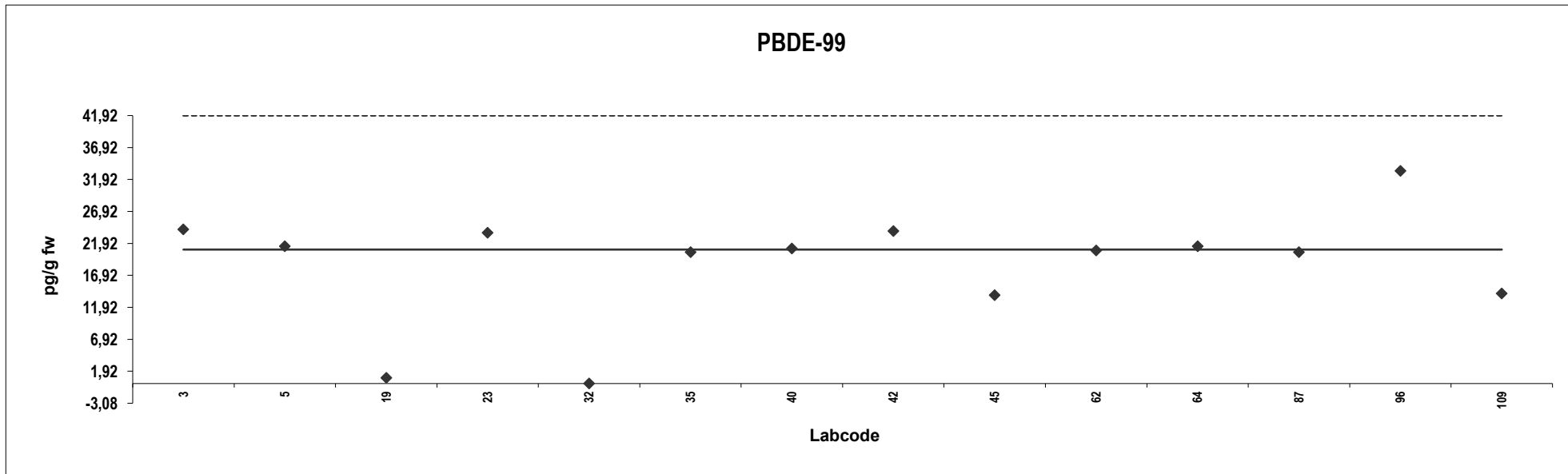


Veal
Congener: PBDE-99

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	24	0,75					
5	22	0,13					
19	0,90	-4,8					
23	24	0,63					
32	0,014	-5,0					
35	21	-0,092					
40	21	0,038					
42	24	0,69					
45	14	-1,706					
62	21	-0,04					
64	21	0,13					
87	21	-0,099					
96	33	2,9					
109	14	-1,6					

Consensus statistics

Consensus median, pg/g	21
Median all values pg/g	21
Consensus mean, pg/g	19
Standard deviation, pg/g	8,9
Relative standard deviation, %	48
No. of values reported	14
No. of values removed	0
No. of reported non-detects	0

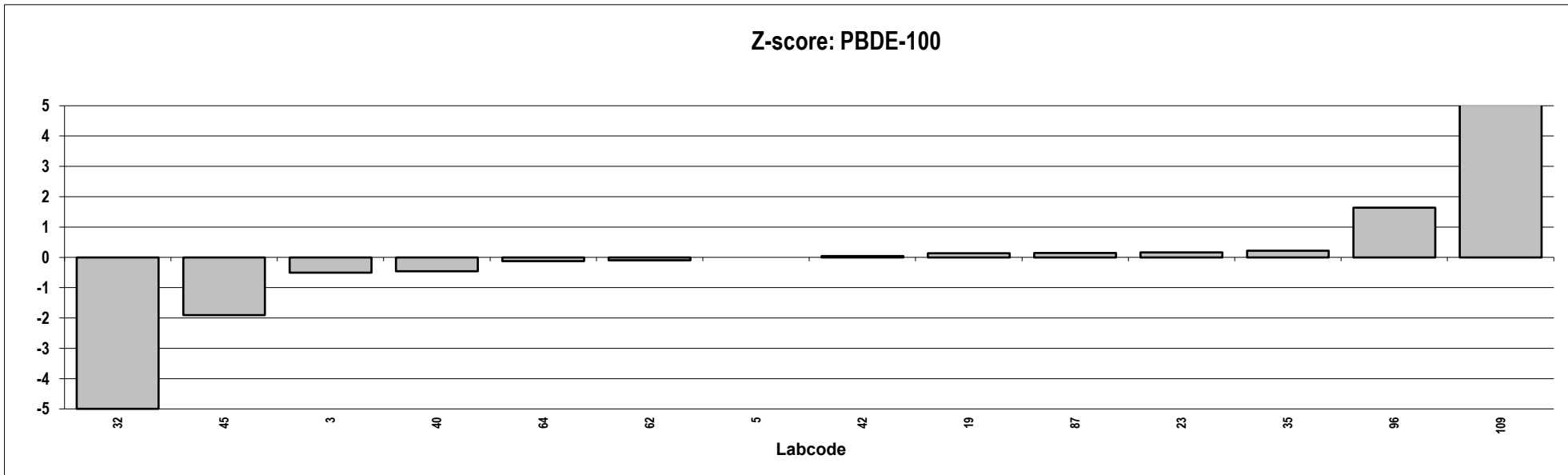
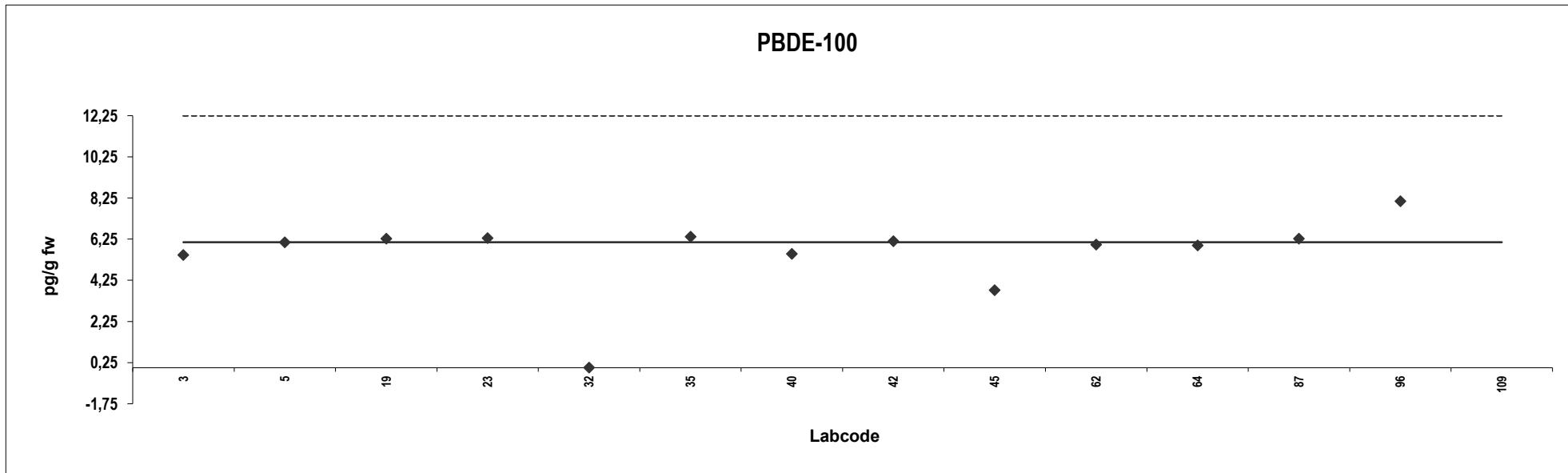


Veal
Congener: PBDE-100

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	5,5	-0,51					
5	6,1	0,00					
19	6,3	0,14					
23	6,3	0,16					
32	0,0042	-5,0					
35	6,4	0,22					
40	5,5	-0,46					
42	6,2	0,041					
45	3,8	-1,9					
62	6,0	-0,098					
64	5,9	-0,13					
87	6,3	0,14					
96	8,1	1,6					
109	29	19	Outlier				

Consensus statistics

Consensus median, pg/g	6,1
Median all values pg/g	6,1
Consensus mean, pg/g	5,6
Standard deviation, pg/g	1,9
Relative standard deviation, %	34
No. of values reported	14
No. of values removed	1
No. of reported non-detects	0



Veal

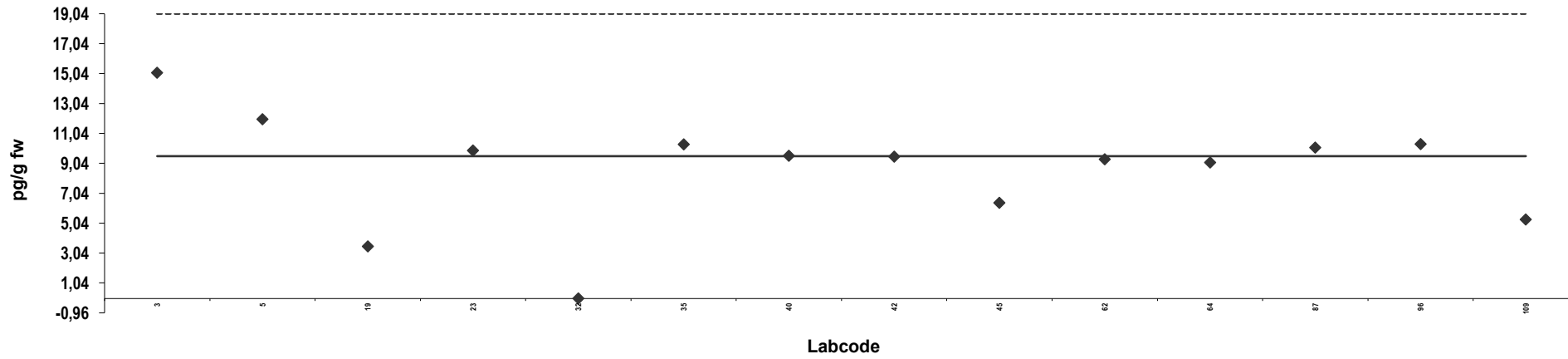
Congener: PBDE-153

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	15	2,9					
5	12	1,3					
19	3,5	-3,2					
23	9,9	0,20					
32	0,0073	-5,0					
35	10	0,42					
40	9,6	0,017					
42	9,5	-0,017					
45	6,4	-1,6					
62	9,3	-0,11					
64	9,1	-0,22					
87	10	0,30					
96	10	0,43					
109	5,3	-2,2					

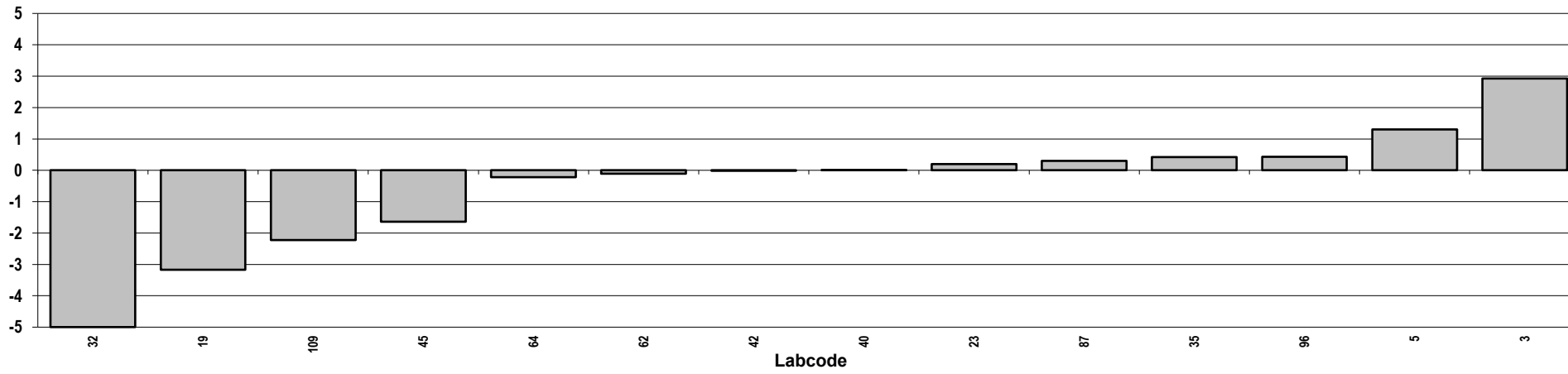
Consensus statistics

Consensus median, pg/g	9,5
Median all values pg/g	9,5
Consensus mean, pg/g	8,6
Standard deviation, pg/g	3,7
Relative standard deviation, %	44
No. of values reported	14
No. of values removed	0
No. of reported non-detects	0

PBDE-153



Z-score: PBDE-153



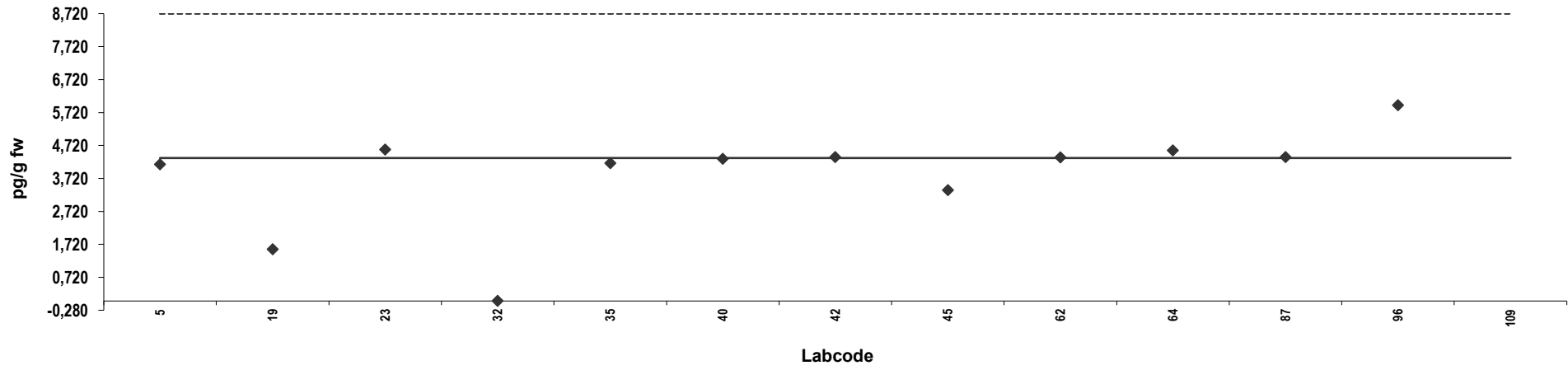
Veal
Congener: PBDE-154

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
5	4,2	-0,22					
19	1,6	-3,2					
23	4,6	0,30					
32	0,0037	-5,0					
35	4,2	-0,18					
40	4,3	-0,025					
42	4,4	0,036					
45	3,4	-1,1					
62	4,4	0,025					
64	4,6	0,27					
87	4,4	0,038					
96	5,9	1,8					
109	30	29	Outlier				

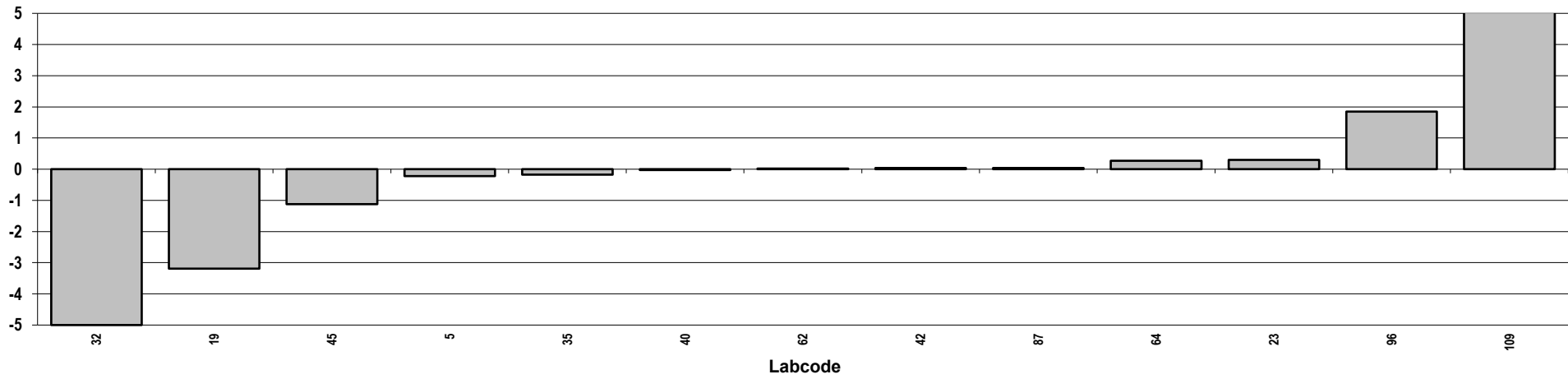
Consensus statistics

Consensus median, pg/g	4,3
Median all values pg/g	4,4
Consensus mean, pg/g	3,8
Standard deviation, pg/g	1,6
Relative standard deviation, %	41
No. of values reported	13
No. of values removed	1
No. of reported non-detects	0

PBDE-154



Z-score: PBDE-154

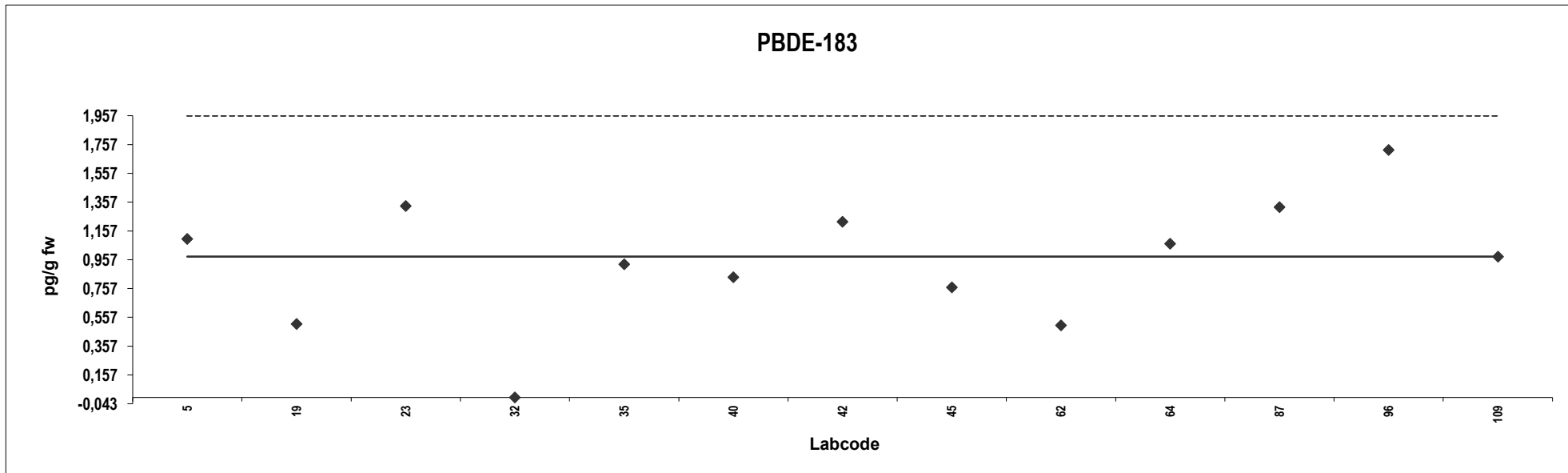


Veal
Congener: PBDE-183

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
5	1,1	0,62					
19	0,51	-2,4					
23	1,3	1,8					
32	0,00075	-5,0					
35	0,93	-0,27					
40	0,84	-0,73					
42	1,2	1,2					
45	0,77	-1,1					
62	0,50	-2,4					
64	1,1	0,46					
87	1,3	1,8					
96	1,7	3,8					
109	0,98	0,00					

Consensus statistics

Consensus median, pg/g	0,98
Median all values pg/g	0,98
Consensus mean, pg/g	0,94
Standard deviation, pg/g	0,44
Relative standard deviation, %	47
No. of values reported	13
No. of values removed	0
No. of reported non-detects	0

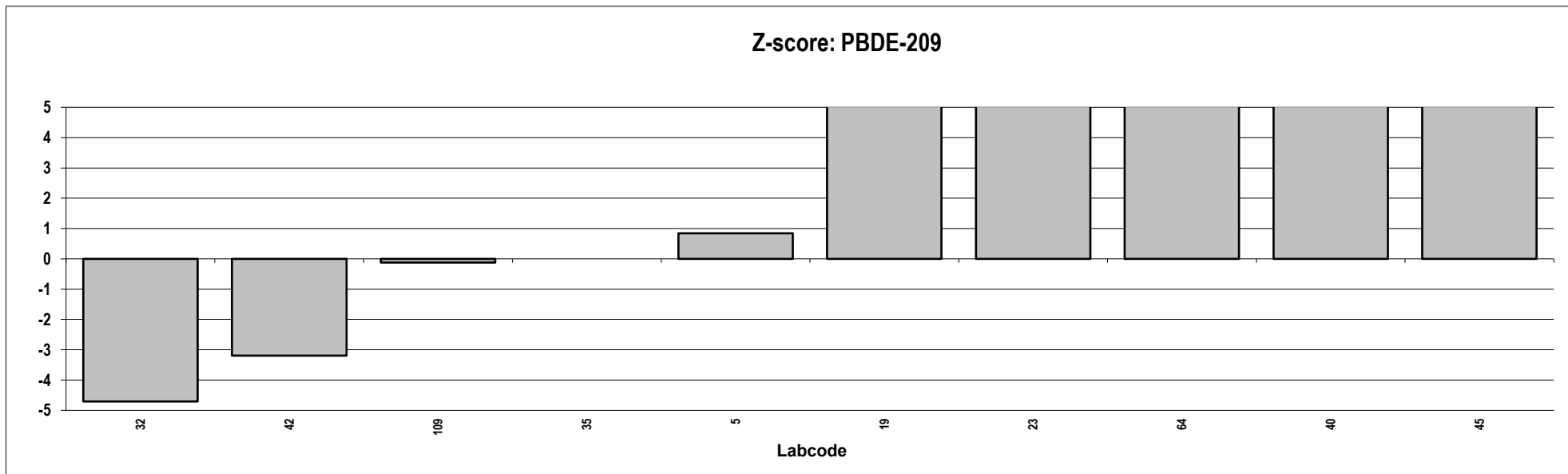
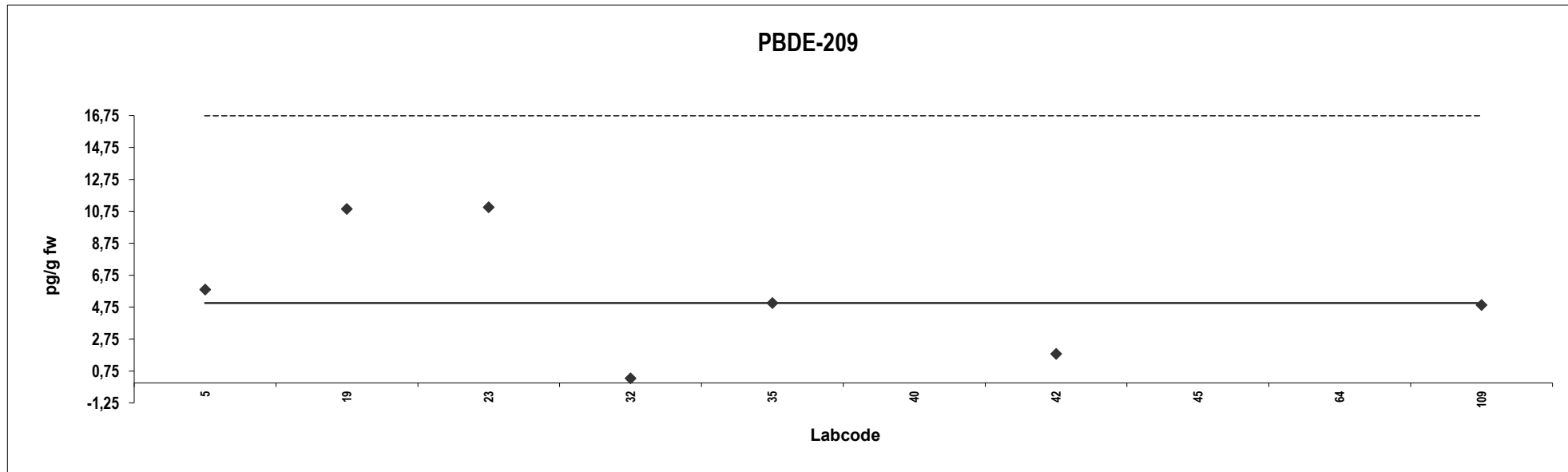


Veal
Congener: PBDE-209

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
5	5,9	0,84					
19	11	5,9					
23	11	6,0					
32	0,29	-4,7					
35	5,0	0,00					
40	40	35	Outlier,ND				
42	1,8	-3,2					
45	79	74	Outlier				
64	24	19	Outlier				
109	4,9	-0,12					

Consensus statistics

Consensus median, pg/g	5,0
Median all values pg/g	8,4
Consensus mean, pg/g	5,7
Standard deviation, pg/g	4,1
Relative standard deviation, %	72
No. of values reported	10
No. of values removed	3
No. of reported non-detects	1



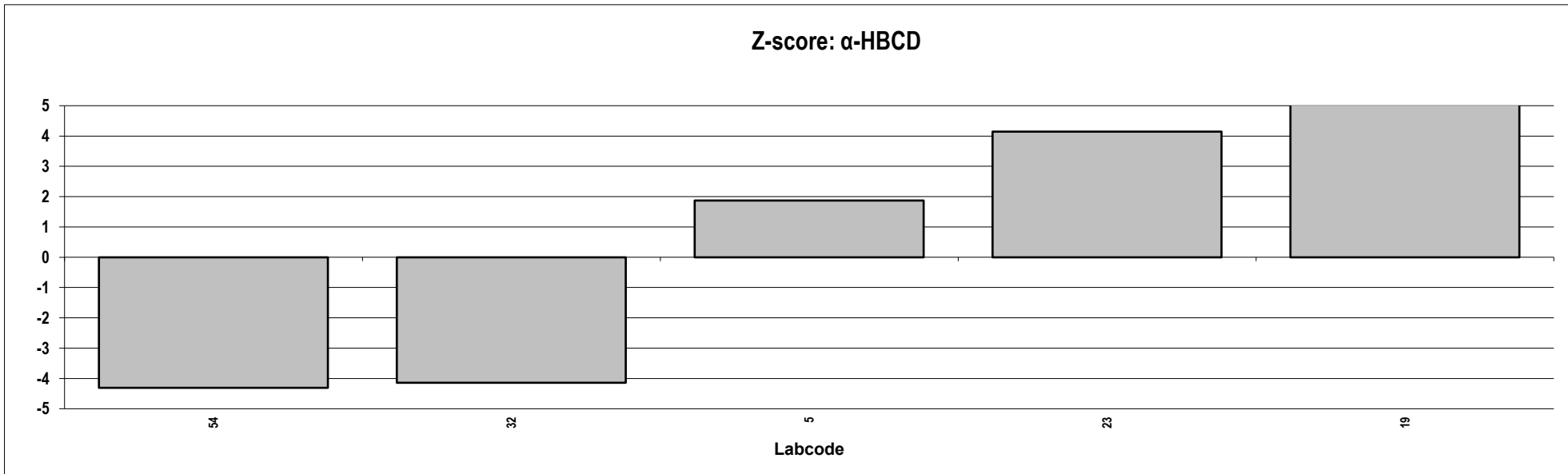
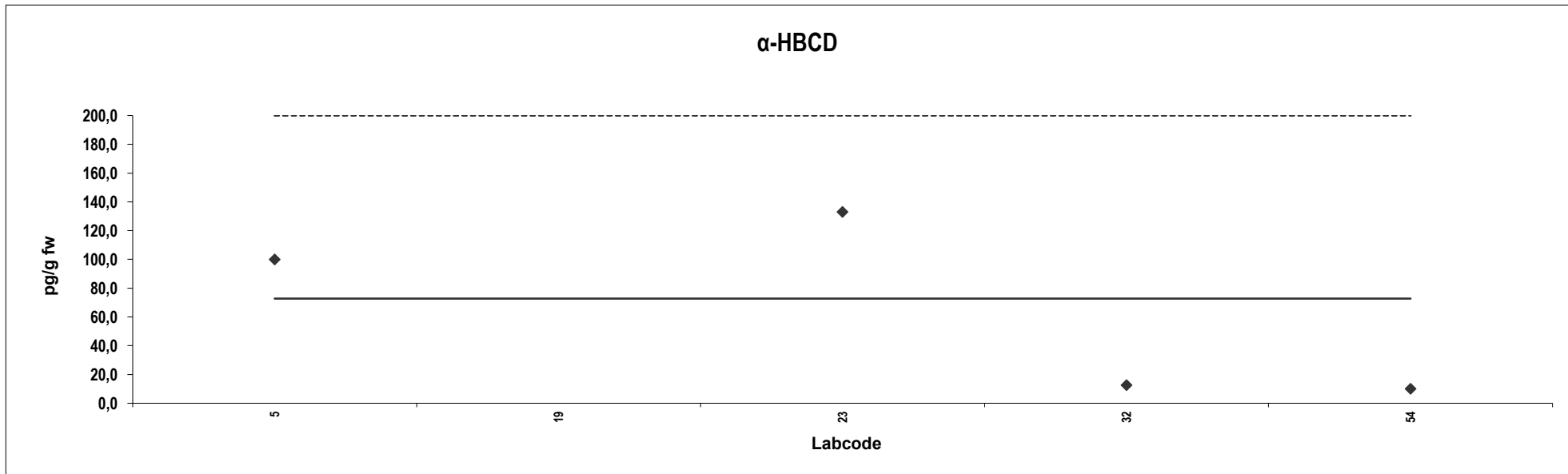
Veal
Congener: α -HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
5	100	1,9	ND				
19	500	29	Outlier,ND				
23	133	4,1					
32	13	-4,1					
54	10	-4,3	ND				

Consensus statistics

Consensus median, pg/g	73
Median all values pg/g	100
Consensus mean, pg/g	64
Standard deviation, pg/g	62
Relative standard deviation, %	97
No. of values reported	5
No. of values removed	1
No. of reported non-detects	3

* : Indicative value due to few reported values



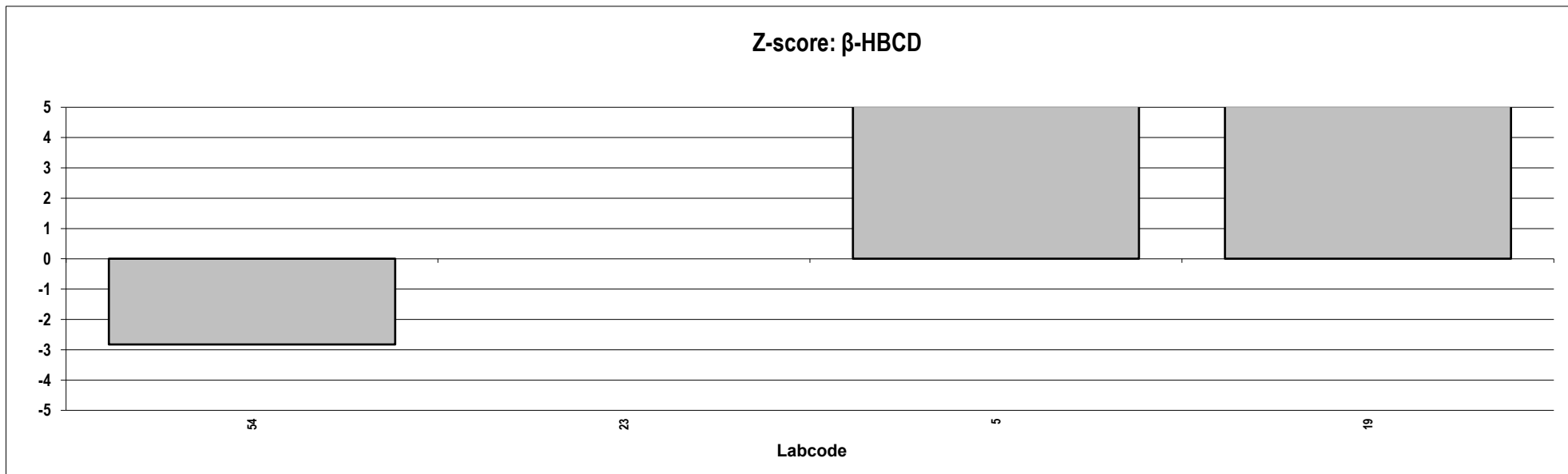
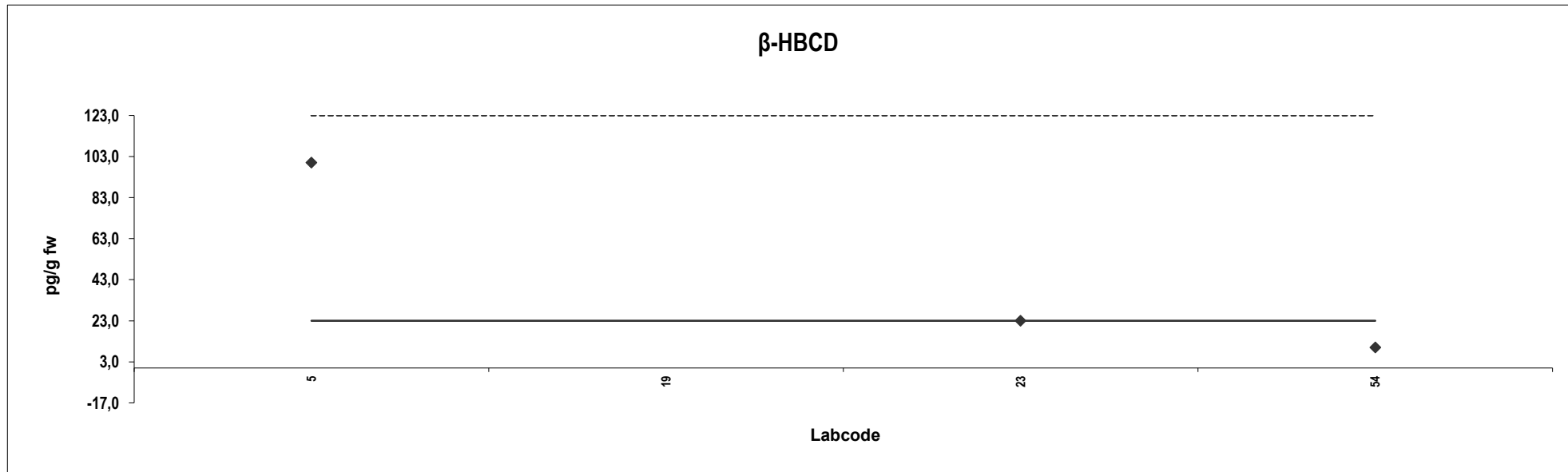
Veal
Congener: β -HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
5	100	17	ND				
19	500	104	Outlier,ND				
23	23	0,00					
54	10	-2,8	ND				

Consensus statistics

Consensus median, pg/g	23
Median all values pg/g	62
Consensus mean, pg/g	44
Standard deviation, pg/g	49
Relative standard deviation, %	110
No. of values reported	4
No. of values removed	1
No. of reported non-detects	3

* : Indicative value due to few reported values



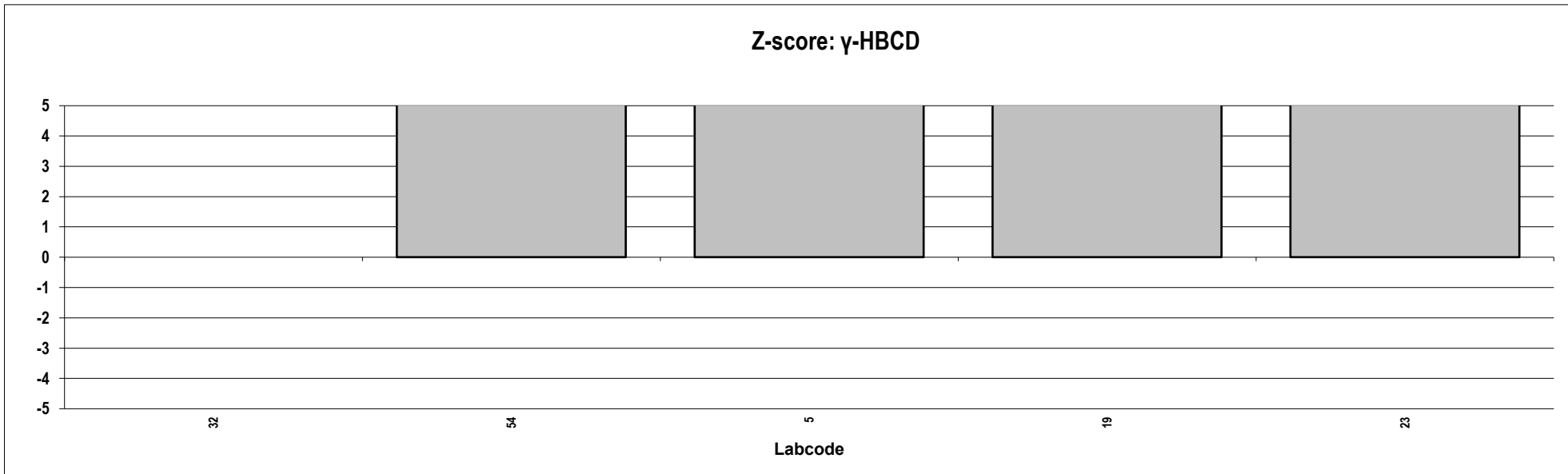
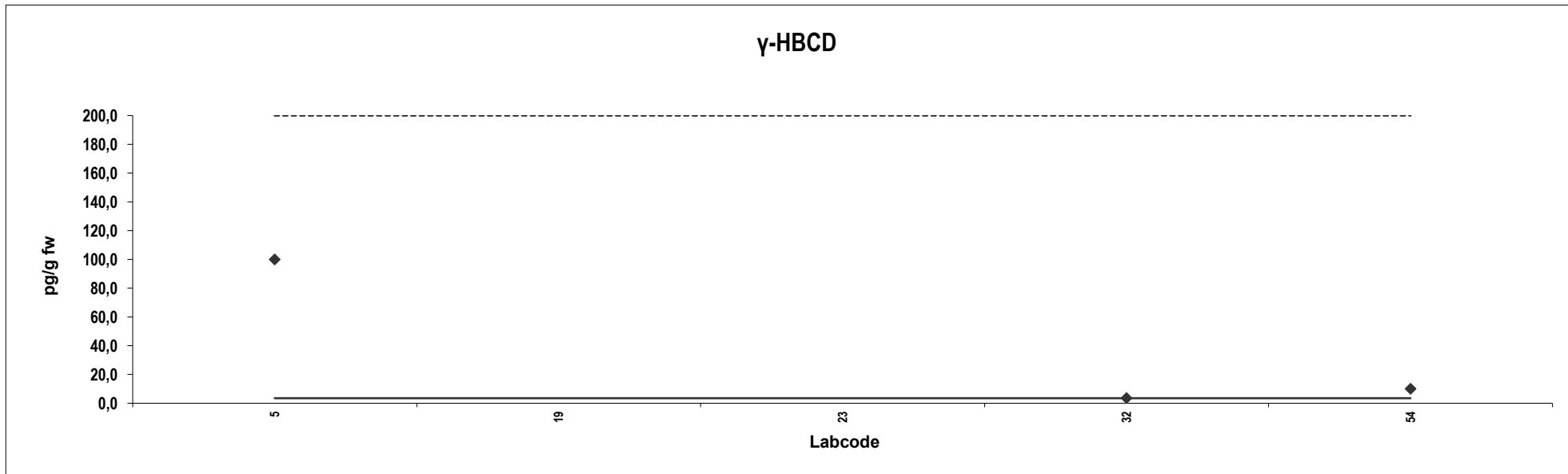
Veal
Congener: γ -HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
5	100	138	ND				
19	500	709	Outlier,ND				
23	770	1095	Outlier				
32	3,5	0,00					
54	10	9,3	ND				

Consensus statistics

Consensus median, pg/g	3,5
Median all values pg/g	100
Consensus mean, pg/g	38
Standard deviation, pg/g	54
Relative standard deviation, %	143
No. of values reported	5
No. of values removed	2
No. of reported non-detects	3

* : Indicative value due to few reported values



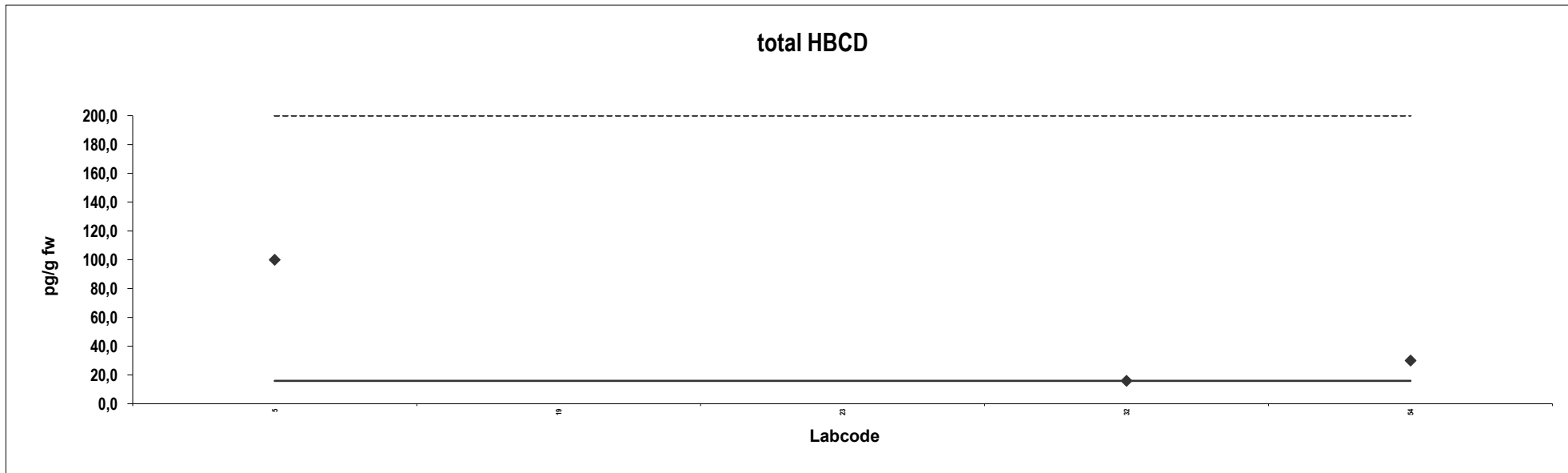
Veal
Congener: total HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
5	100	26	ND				
19	500	152	Outlier,ND				
23	926	286	Outlier				
32	16	0,00					
54	30	4,4	ND				

Consensus statistics

Consensus median, pg/g	16
Median all values pg/g	100
Consensus mean, pg/g	49
Standard deviation, pg/g	45
Relative standard deviation, %	93
No. of values reported	5
No. of values removed	2
No. of reported non-detects	3

* : Indicative value due to few reported values





Appendix 3:

Presentation of results for
Halibut 2022

Appendix 3: Presentation of results: Halibut-2022

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:

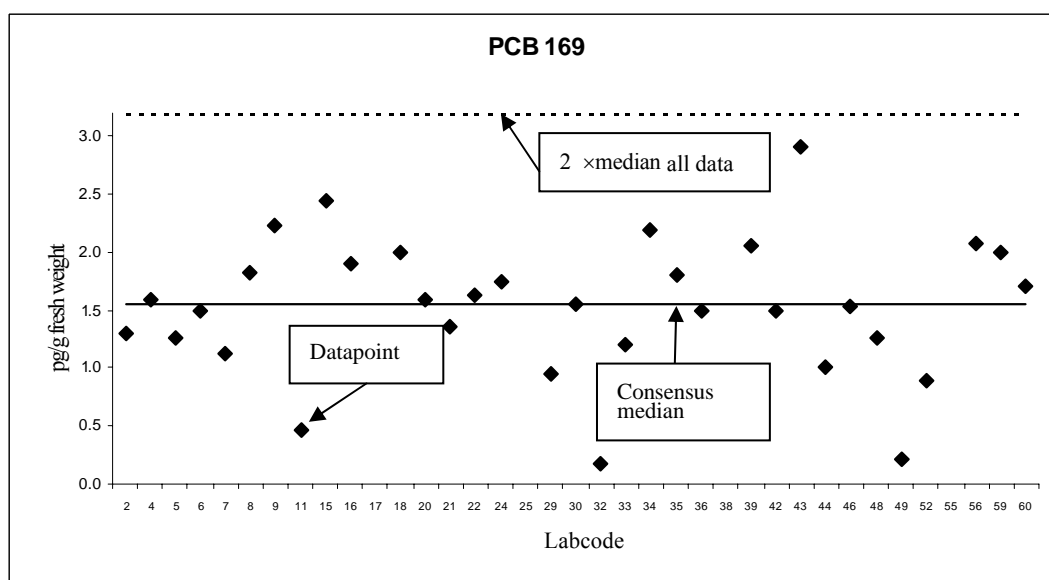
1. The median was calculated from all the reported data, using the detection limit as concentration for non-detected congeners.
2. Values exceeding $2 \times$ this median were defined as outliers and removed from the data set.
3. Median, mean and standard deviation were re-calculated from the remaining 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 $2 \times$ 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 ($2 \times$ 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 $\pm 20\%$ from the consensus value.

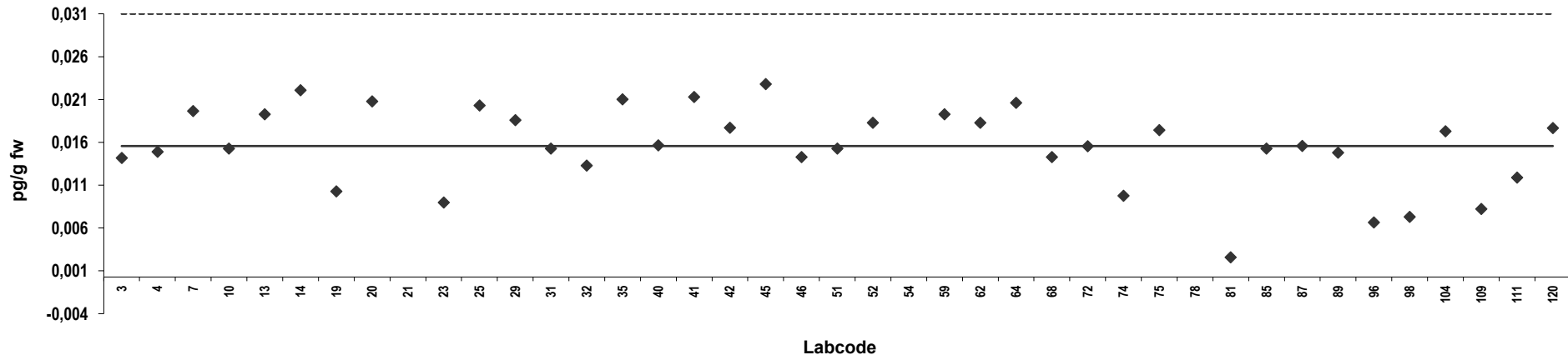
Halibut
Congener: 2,3,7,8-TCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,014	-0,45					
4	0,015	-0,22					
7	0,019	1,3					
10	0,015	-0,093					
13	0,019	1,2					
14	0,022	2,1					
19	0,010	-1,7	ND				
20	0,021	1,7					
21	0,075	20	Outlier,ND				
23	0,0087	-2,2					
25	0,020	1,5					
29	0,018	0,99					
31	0,015	-0,093					
32	0,013	-0,75					
35	0,021	1,8					
40	0,015	0,024					
41	0,021	1,9					
42	0,017	0,69					
45	0,023	2,4					
46	0,014	-0,42					
51	0,015	-0,093					
52	0,018	0,89					
54	0,050	11	Outlier,ND				
59	0,019	1,2					
62	0,018	0,89					
64	0,020	1,7					
68	0,014	-0,42					
72	0,015	-0,0055					
74	0,0095	-1,9					
75	0,017	0,61					
78	0,048	11	Outlier,ND				
81	0,0023	-4,3	ND				
85	0,015	-0,093	ND				
87	0,015	0,0055					
89	0,015	-0,26					
96	0,0064	-2,9	ND				
98	0,0070	-2,7					
104	0,017	0,56					
109	0,0079	-2,4					
111	0,012	-1,2					
120	0,017	0,69					

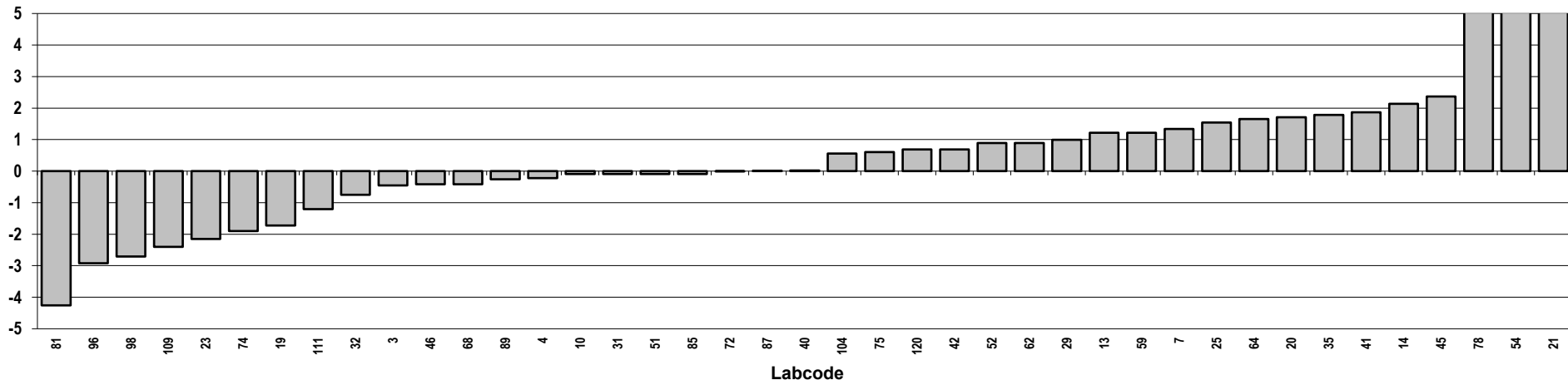
Consensus statistics

Consensus median, pg/g	0,015
Median all values pg/g	0,015
Consensus mean, pg/g	0,015
Standard deviation, pg/g	0,0047
Relative standard deviation, %	31
No. of values reported	41
No. of values removed	3
No. of reported non-detects	7

2,3,7,8-TCDD



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



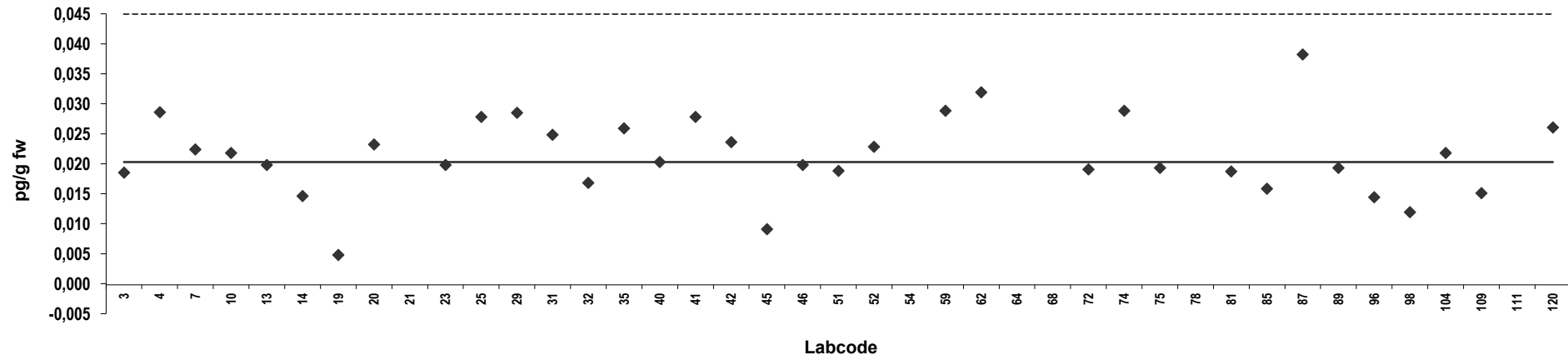
Halibut
Congener: 1,2,3,7,8-PeCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,019	-0,43					
4	0,029	2,0					
7	0,023	0,52					
10	0,022	0,37					
13	0,020	-0,11					
14	0,015	-1,4					
19	0,0050	-3,8	ND				
20	0,023	0,72					
21	0,075	13	Outlier,ND				
23	0,020	-0,11					
25	0,028	1,8					
29	0,029	2,0					
31	0,025	1,1					
32	0,017	-0,85					
35	0,026	1,4					
40	0,020	0,00					
41	0,028	1,8					
42	0,024	0,81					
45	0,0093	-2,7					
46	0,020	-0,11					
51	0,019	-0,36					
52	0,023	0,62					
54	0,050	7,2	Outlier,ND				
59	0,029	2,1					
62	0,032	2,8					
64	0,093	18	Outlier				
68	0,077	14	Outlier				
72	0,019	-0,29					
74	0,029	2,1					
75	0,019	-0,24					
78	0,064	11	Outlier,ND				
81	0,019	-0,38					
85	0,016	-1,1	ND				
87	0,038	4,4					
89	0,020	-0,24					
96	0,015	-1,4					
98	0,012	-2,0					
104	0,022	0,37					
109	0,015	-1,3					
111	0,047	6,5	Outlier				
120	0,026	1,4					

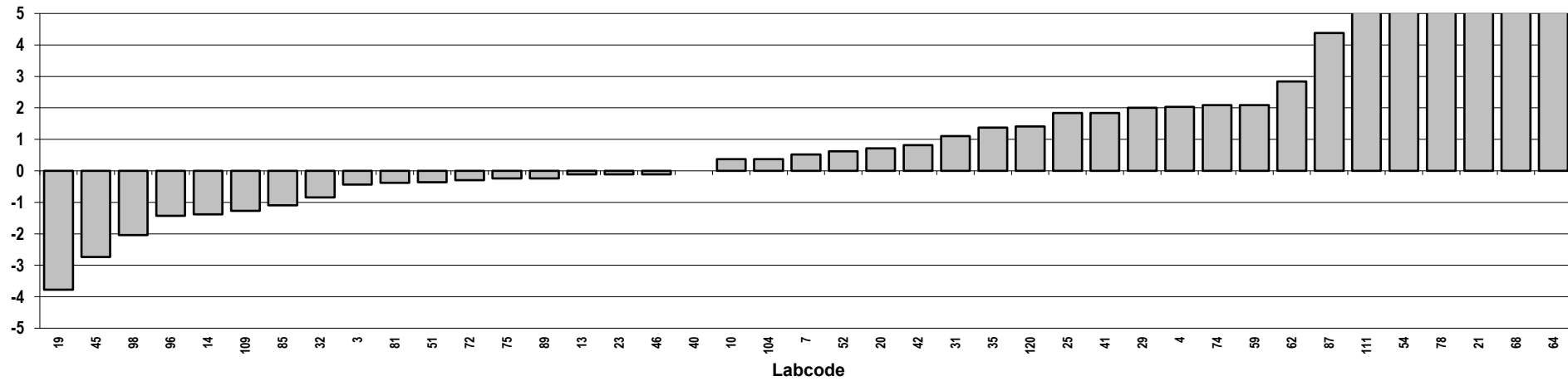
Consensus statistics

Consensus median, pg/g	0,020
Median all values pg/g	0,023
Consensus mean, pg/g	0,022
Standard deviation, pg/g	0,0066
Relative standard deviation, %	31
No. of values reported	41
No. of values removed	6
No. of reported non-detects	5

1,2,3,7,8-PeCDD



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



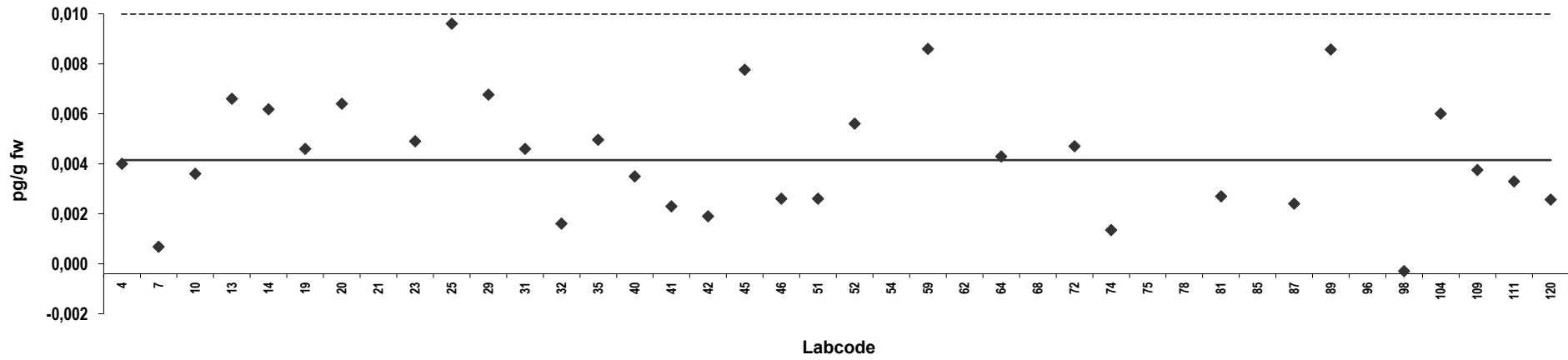
Halibut
Congener: 1,2,3,4,7,8-HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
4	0,0044	-0,16					
7	0,0011	-3,8					
10	0,0040	-0,60					
13	0,0070	2,7	ND				
14	0,0066	2,2					
19	0,0050	0,50	ND				
20	0,0068	2,5					
21	0,099	104	Outlier,ND				
23	0,0053	0,83					
25	0,010	6,0					
29	0,0072	2,9					
31	0,0050	0,50	ND				
32	0,0020	-2,8					
35	0,0054	0,89					
40	0,0039	-0,71	ND				
41	0,0027	-2,0	ND				
42	0,0023	-2,5					
45	0,0082	4,0					
46	0,0030	-1,7					
51	0,0030	-1,7	ND				
52	0,0060	1,6	ND				
54	0,050	50	Outlier,ND				
59	0,0090	4,9					
62	0,015	11	Outlier				
64	0,0047	0,16					
68	0,035	33	Outlier				
72	0,0051	0,61					
74	0,0018	-3,1					
75	0,017	14	Outlier				
78	0,044	43	Outlier,ND				
81	0,0031	-1,6	ND				
85	0,013	9,3	Outlier,ND				
87	0,0028	-1,9					
89	0,0090	4,9					
96	0,017	14	Outlier				
98	0,00010	-4,9					
104	0,0064	2,0	ND				
109	0,0042	-0,43					
111	0,0037	-0,94					
120	0,0030	-1,7					

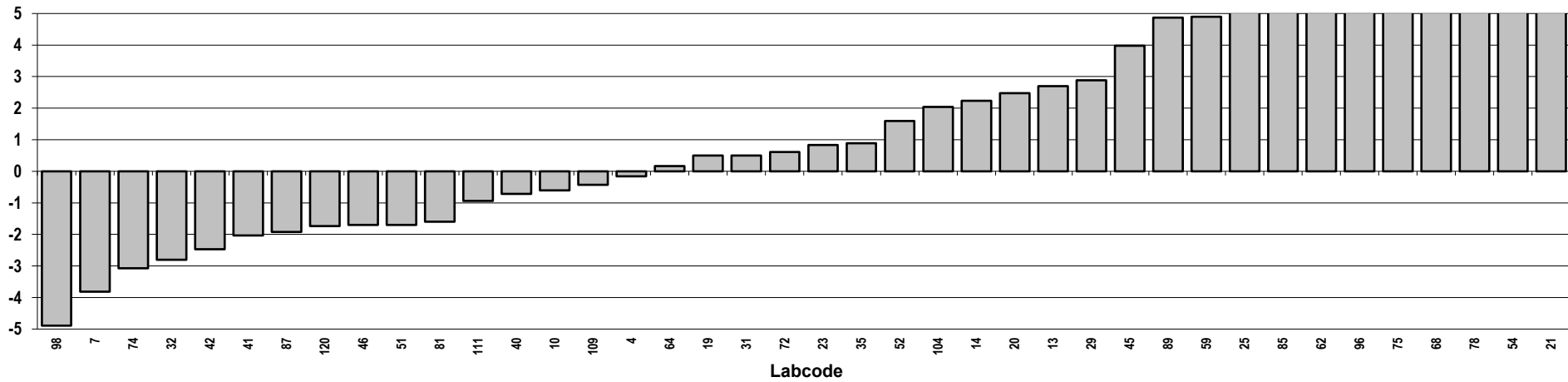
Consensus statistics

Consensus median, pg/g	0,0045
Median all values pg/g	0,0052
Consensus mean, pg/g	0,0047
Standard deviation, pg/g	0,0024
Relative standard deviation, %	51
No. of values reported	40
No. of values removed	8
No. of reported non-detects	13

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



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



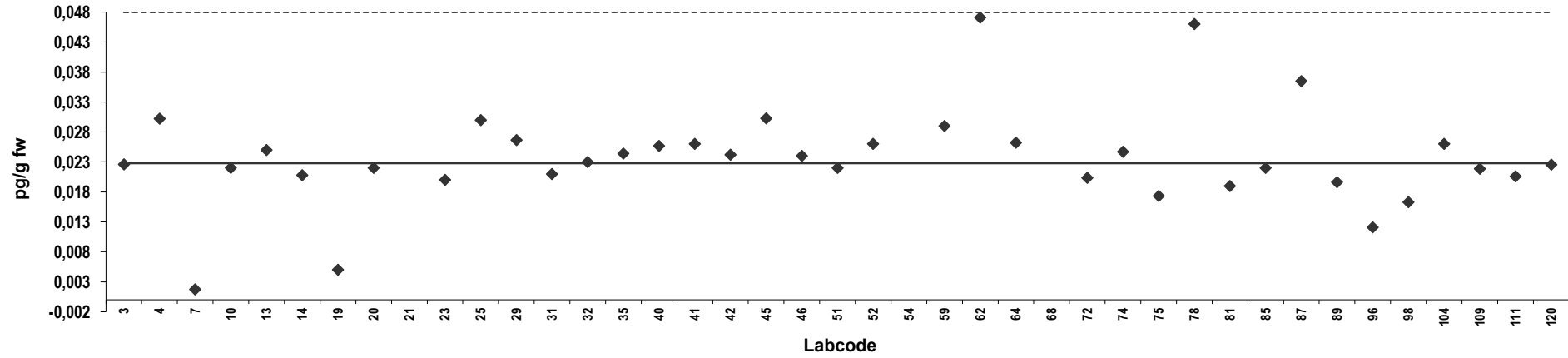
Halibut
Congener: 1,2,3,6,7,8-HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,023	-0,044					
4	0,030	1,6					
7	0,0017	-4,6					
10	0,022	-0,18					
13	0,025	0,48					
14	0,021	-0,44					
19	0,0050	-3,9	ND				
20	0,022	-0,18					
21	0,099	17	Outlier,ND				
23	0,020	-0,61					
25	0,030	1,6					
29	0,027	0,85					
31	0,021	-0,39					
32	0,023	0,044					
35	0,024	0,36					
40	0,026	0,63					
41	0,026	0,70					
42	0,024	0,31					
45	0,030	1,6					
46	0,024	0,26					
51	0,022	-0,18					
52	0,026	0,70					
54	0,050	6,0	Outlier,ND				
59	0,029	1,4					
62	0,047	5,3					
64	0,026	0,75					
68	0,056	7,3	Outlier				
72	0,020	-0,54					
74	0,025	0,41					
75	0,017	-1,2					
78	0,046	5,1	ND				
81	0,019	-0,83					
85	0,022	-0,18					
87	0,037	3,0					
89	0,020	-0,70					
96	0,012	-2,4					
98	0,016	-1,4					
104	0,026	0,70					
109	0,022	-0,20					
111	0,021	-0,49					
120	0,023	-0,058					

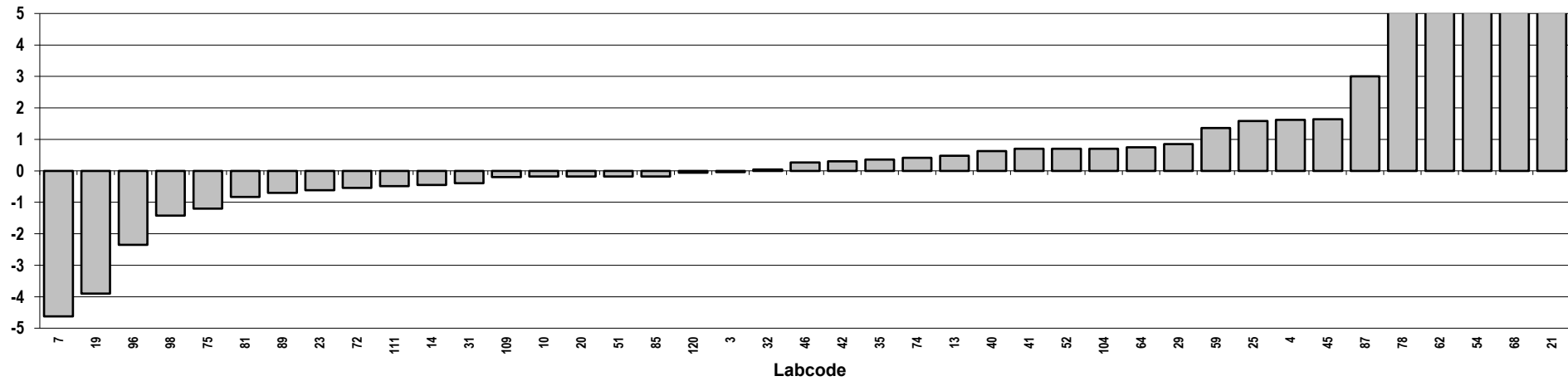
Consensus statistics

Consensus median, pg/g	0,023
Median all values pg/g	0,024
Consensus mean, pg/g	0,024
Standard deviation, pg/g	0,0083
Relative standard deviation, %	35
No. of values reported	41
No. of values removed	3
No. of reported non-detects	4

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



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

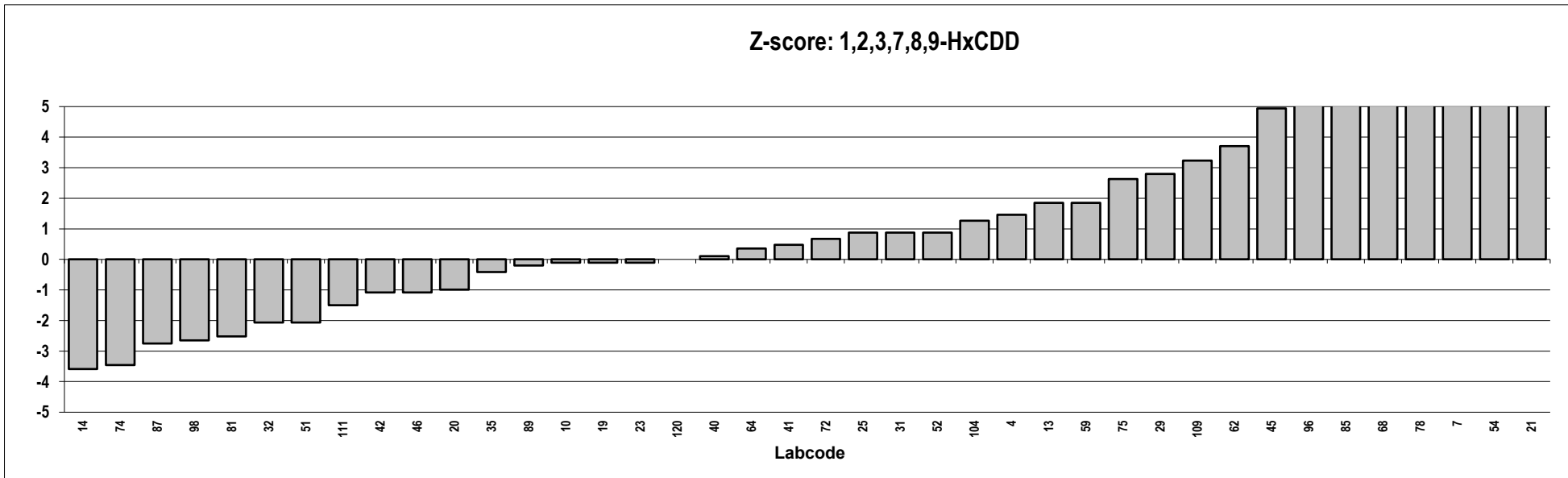
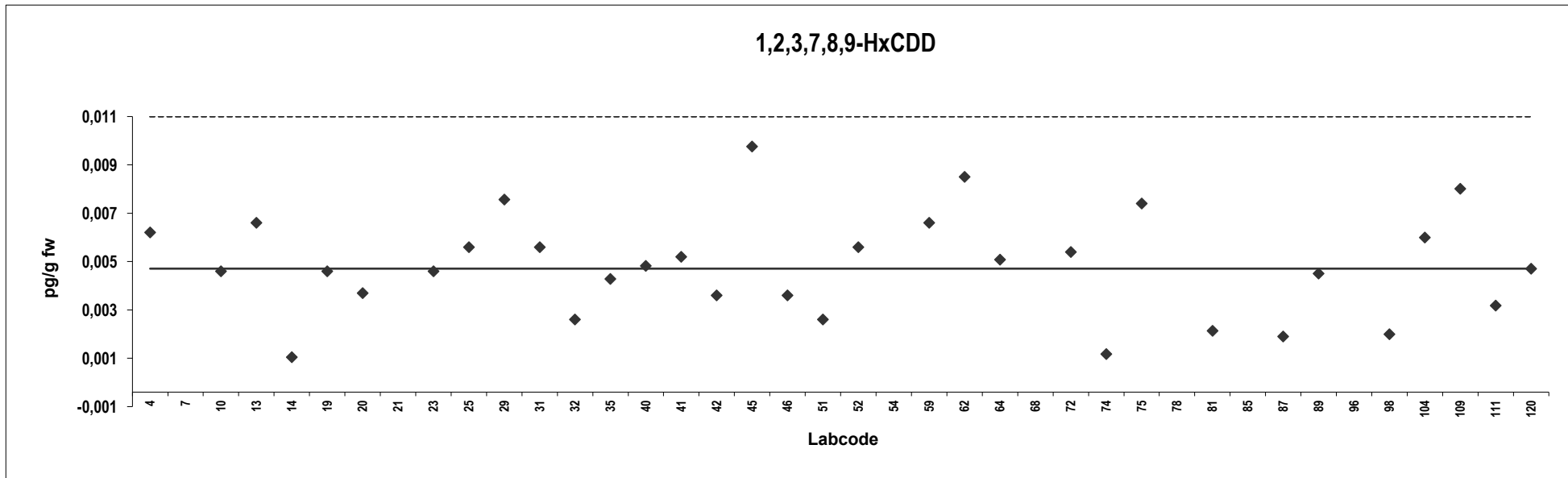


Halibut
Congener: 1,2,3,7,8,9-HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
4	0,0066	1,5					
7	0,050	44	Outlier,ND				
10	0,0050	-0,11					
13	0,0070	1,9	ND				
14	0,0014	-3,6	ND				
19	0,0050	-0,11	ND				
20	0,0041	-0,99					
21	0,099	92	Outlier,ND				
23	0,0050	-0,11	ND				
25	0,0060	0,87					
29	0,0080	2,8					
31	0,0060	0,87					
32	0,0030	-2,1					
35	0,0047	-0,42					
40	0,0052	0,11					
41	0,0056	0,48	ND				
42	0,0040	-1,1					
45	0,010	4,9					
46	0,0040	-1,1					
51	0,0030	-2,1	ND				
52	0,0060	0,87	ND				
54	0,050	44	Outlier,ND				
59	0,0070	1,9					
62	0,0089	3,7					
64	0,0055	0,36					
68	0,027	21	Outlier				
72	0,0058	0,68					
74	0,0016	-3,5					
75	0,0078	2,6	ND				
78	0,046	40	Outlier,ND				
81	0,0025	-2,5	ND				
85	0,014	8,7	Outlier,ND				
87	0,0023	-2,7	ND				
89	0,0049	-0,20					
96	0,014	8,7	Outlier				
98	0,0024	-2,7					
104	0,0064	1,3	ND				
109	0,0084	3,2					
111	0,0036	-1,5					
120	0,0051	0,00					

Consensus statistics

Consensus median, pg/g	0,0051
Median all values pg/g	0,0057
Consensus mean, pg/g	0,0052
Standard deviation, pg/g	0,0021
Relative standard deviation, %	41
No. of values reported	40
No. of values removed	7
No. of reported non-detects	16



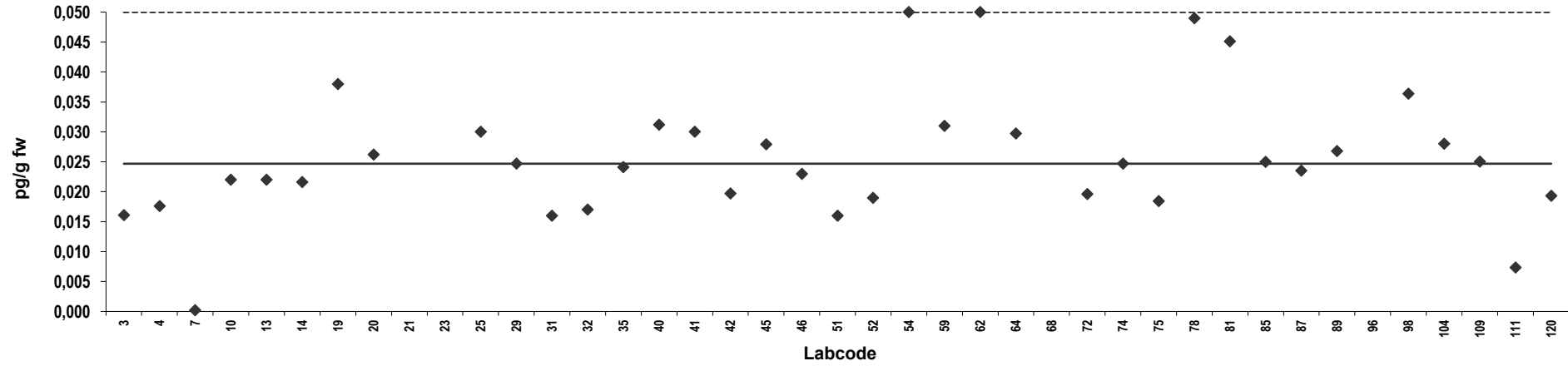
Halibut
Congener: 1,2,3,4,6,7,8-HpCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,016	-1,7					
4	0,018	-1,4					
7	0,00023	-5,0					
10	0,022	-0,54					
13	0,022	-0,54					
14	0,022	-0,63					
19	0,038	2,7	ND				
20	0,026	0,31					
21	0,099	15	Outlier,ND				
23	0,13	21	Outlier				
25	0,030	1,1					
29	0,025	0,00					
31	0,016	-1,8					
32	0,017	-1,6					
35	0,024	-0,12					
40	0,031	1,3	ND				
41	0,030	1,1	ND				
42	0,020	-1,0					
45	0,028	0,66					
46	0,023	-0,34					
51	0,016	-1,8					
52	0,019	-1,2					
54	0,050	5,1	ND				
59	0,031	1,3					
62	0,050	5,1					
64	0,030	1,0					
68	0,056	6,3	Outlier				
72	0,020	-1,0					
74	0,025	0,0019					
75	0,018	-1,3					
78	0,049	4,9	ND				
81	0,045	4,1					
85	0,025	0,064					
87	0,024	-0,24					
89	0,027	0,43					
96	0,066	8,4	Outlier				
98	0,036	2,4					
104	0,028	0,67					
109	0,025	0,070					
111	0,0074	-3,5					
120	0,019	-1,1					

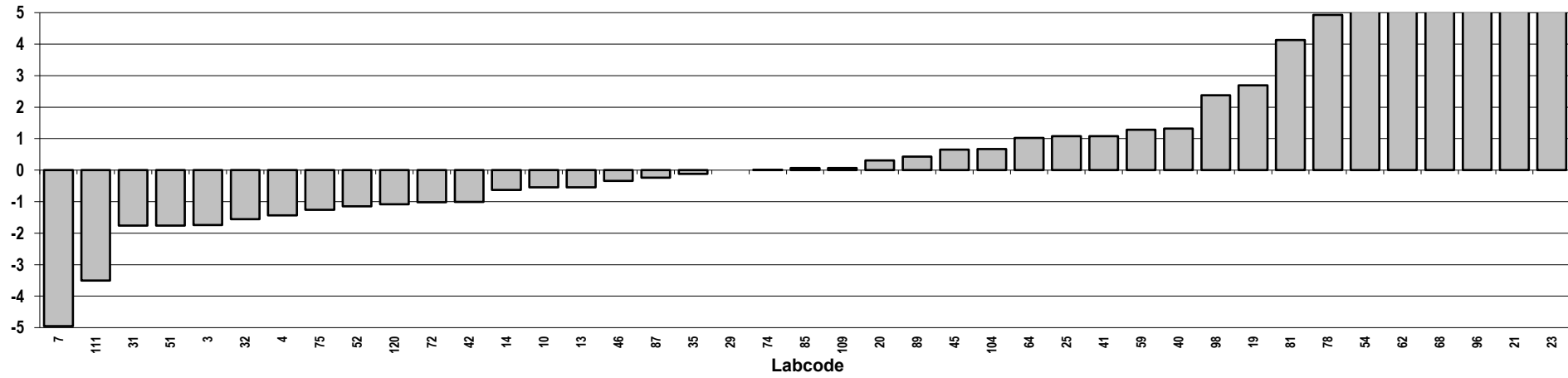
Consensus statistics

Consensus median, pg/g	0,025
Median all values pg/g	0,025
Consensus mean, pg/g	0,026
Standard deviation, pg/g	0,011
Relative standard deviation, %	42
No. of values reported	41
No. of values removed	4
No. of reported non-detects	6

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



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

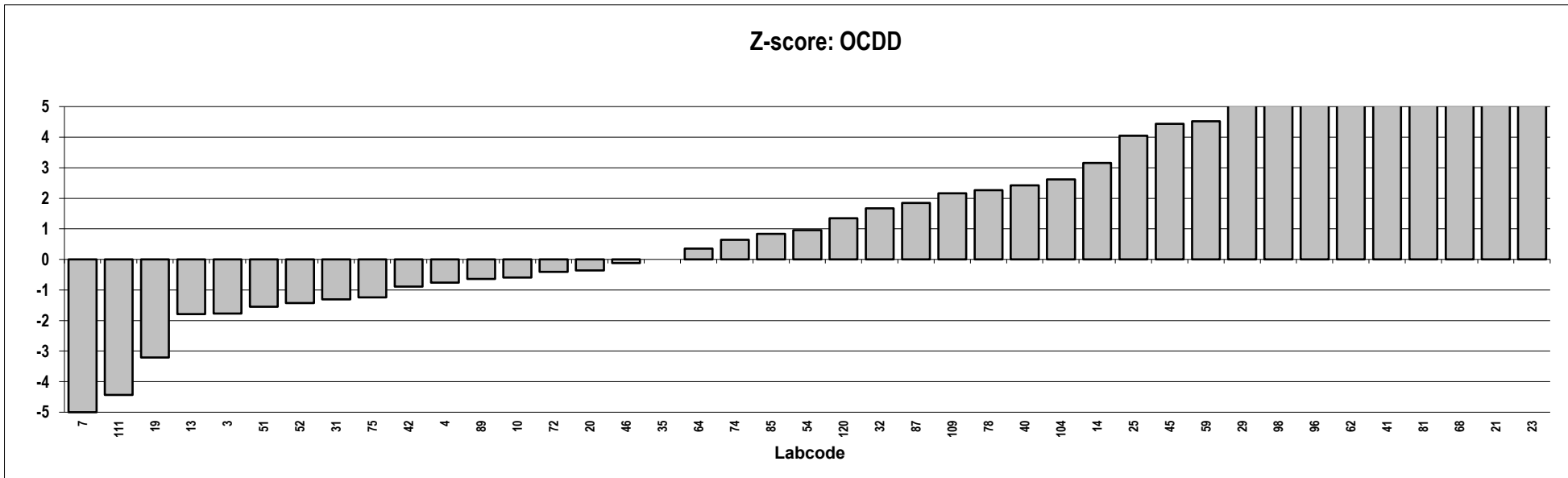
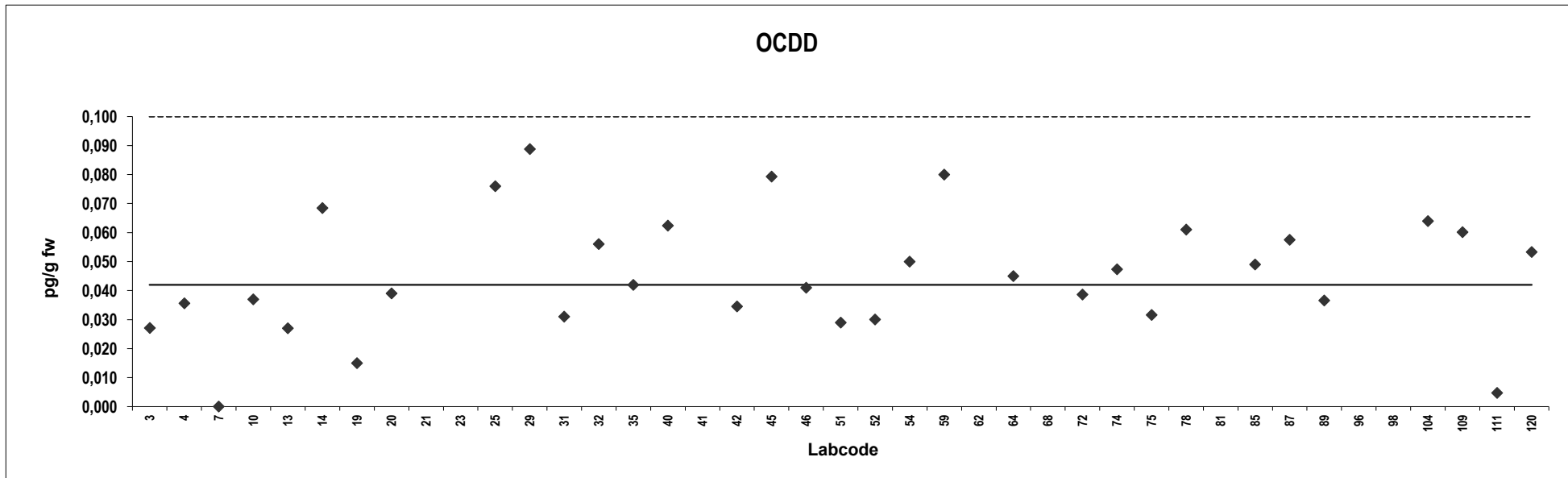


Halibut
Congener: OCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,027	-1,8					
4	0,036	-0,76					
7	0,0000087	-5,0					
10	0,037	-0,60					
13	0,027	-1,8					
14	0,068	3,2	ND				
19	0,015	-3,2	ND				
20	0,039	-0,36					
21	0,20	19	Outlier,ND				
23	0,97	110	Outlier				
25	0,076	4,0					
29	0,089	5,6					
31	0,031	-1,3					
32	0,056	1,7					
35	0,042	0,00					
40	0,062	2,4	ND				
41	0,13	10	Outlier,ND				
42	0,035	-0,89					
45	0,079	4,4					
46	0,041	-0,12					
51	0,029	-1,5					
52	0,030	-1,4					
54	0,050	0,95	ND				
59	0,080	4,5					
62	0,13	10	Outlier				
64	0,045	0,35					
68	0,18	16	Outlier				
72	0,039	-0,40					
74	0,047	0,64					
75	0,032	-1,2					
78	0,061	2,3	ND				
81	0,15	13	Outlier				
85	0,049	0,83					
87	0,058	1,8					
89	0,037	-0,64					
96	0,12	8,9	Outlier				
98	0,10	7,4	Outlier				
104	0,064	2,6					
109	0,060	2,2					
111	0,0047	-4,4					
120	0,053	1,3					

Consensus statistics

Consensus median, pg/g	0,042
Median all values pg/g	0,050
Consensus mean, pg/g	0,045
Standard deviation, pg/g	0,021
Relative standard deviation, %	46
No. of values reported	41
No. of values removed	8
No. of reported non-detects	7



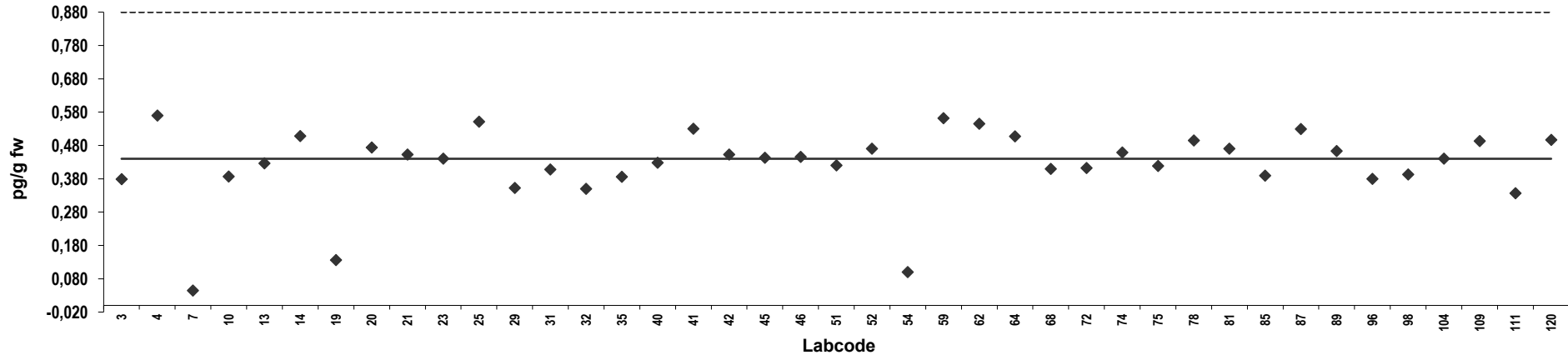
Halibut
Congener: 2,3,7,8-TCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,38	-0,69					
4	0,57	1,5					
7	0,045	-4,5					
10	0,39	-0,60					
13	0,43	-0,16					
14	0,51	0,78					
19	0,14	-3,5					
20	0,47	0,38					
21	0,45	0,14					
23	0,44	0,00					
25	0,55	1,3					
29	0,35	-1,0					
31	0,41	-0,36					
32	0,35	-1,0					
35	0,39	-0,62					
40	0,43	-0,14					
41	0,53	1,0					
42	0,45	0,14					
45	0,44	0,034					
46	0,45	0,068					
51	0,42	-0,23					
52	0,47	0,34					
54	0,10	-3,9					
59	0,56	1,4					
62	0,55	1,2					
64	0,51	0,76					
68	0,41	-0,34					
72	0,41	-0,32					
74	0,46	0,21					
75	0,42	-0,24					
78	0,50	0,63					
81	0,47	0,34					
85	0,39	-0,58					
87	0,53	1,0					
89	0,46	0,26					
96	0,38	-0,69					
98	0,39	-0,53					
104	0,44	0,00					
109	0,49	0,61					
111	0,34	-1,2					
120	0,50	0,64					

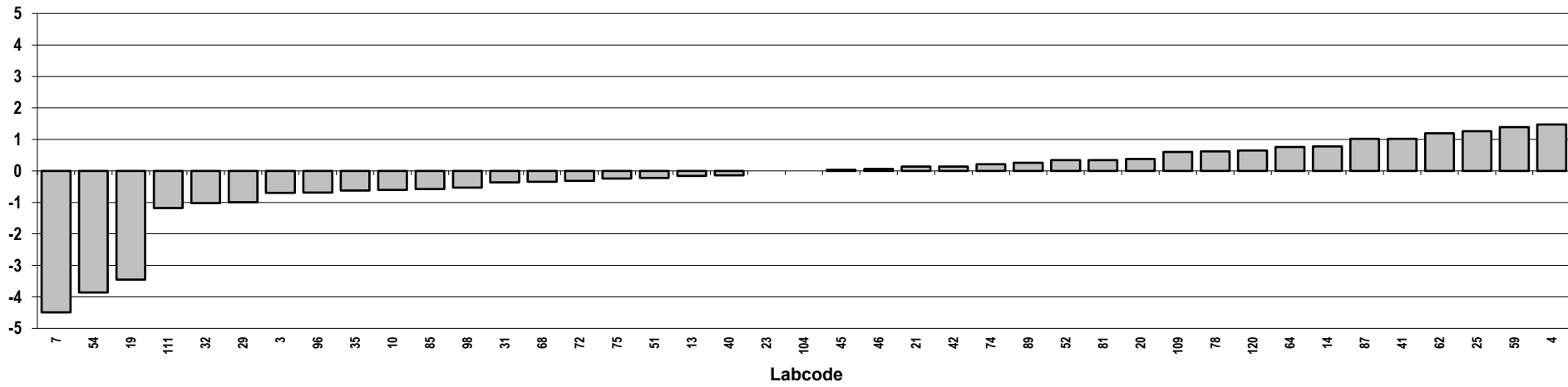
Consensus statistics

Consensus median, pg/g	0,44
Median all values pg/g	0,44
Consensus mean, pg/g	0,42
Standard deviation, pg/g	0,11
Relative standard deviation, %	26
No. of values reported	41
No. of values removed	0
No. of reported non-detects	0

2,3,7,8-TCDF



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



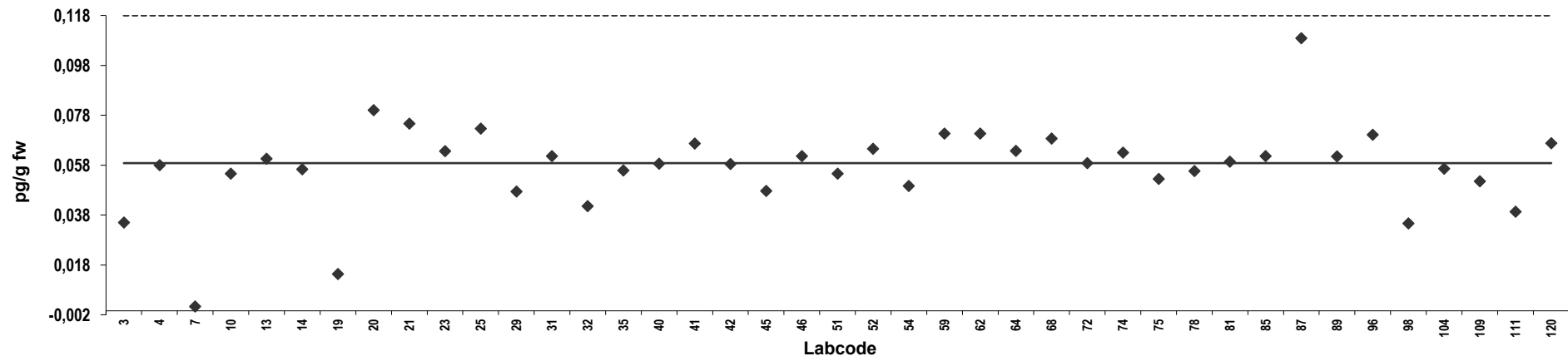
Halibut
Congener: 1,2,3,7,8-PeCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,035	-2,0					
4	0,058	-0,068					
7	0,0017	-4,9					
10	0,055	-0,35					
13	0,061	0,15					
14	0,057	-0,21					
19	0,015	-3,8	ND				
20	0,080	1,8					
21	0,075	1,3	ND				
23	0,064	0,41					
25	0,073	1,2					
29	0,048	-0,97					
31	0,062	0,24					
32	0,042	-1,5					
35	0,056	-0,25					
40	0,059	-0,019					
41	0,067	0,66					
42	0,059	-0,025					
45	0,048	-0,94					
46	0,062	0,24					
51	0,055	-0,35					
52	0,065	0,49					
54	0,050	-0,78	ND				
59	0,071	1,0					
62	0,071	1,0					
64	0,064	0,42					
68	0,069	0,83					
72	0,059	0,00					
74	0,063	0,36					
75	0,053	-0,54					
78	0,056	-0,27	ND				
81	0,060	0,051					
85	0,062	0,24					
87	0,11	4,2					
89	0,062	0,23					
96	0,071	0,96					
98	0,035	-2,0					
104	0,057	-0,19					
109	0,052	-0,62					
111	0,040	-1,6					
120	0,067	0,67					

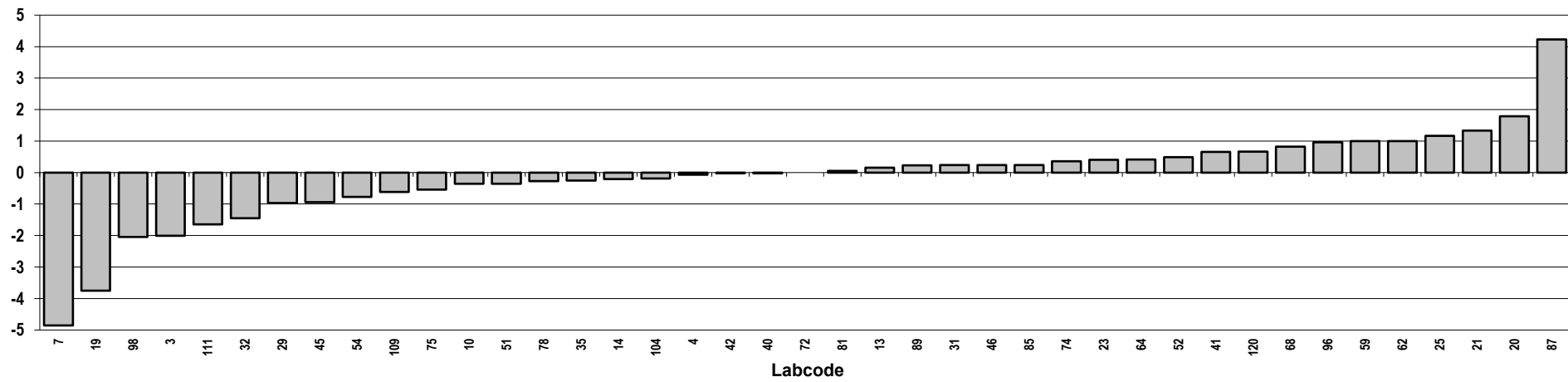
Consensus statistics

Consensus median, pg/g	0,059
Median all values pg/g	0,059
Consensus mean, pg/g	0,058
Standard deviation, pg/g	0,017
Relative standard deviation, %	30
No. of values reported	41
No. of values removed	0
No. of reported non-detects	4

1,2,3,7,8-PeCDF



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



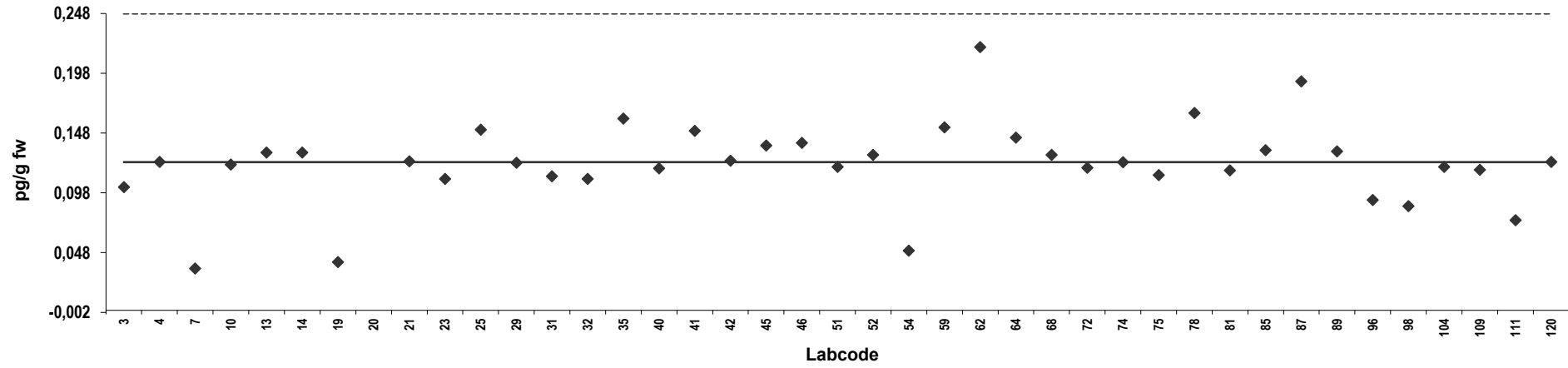
Halibut
Congener: 2,3,4,7,8-PeCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,10	-0,84					
4	0,12	0,011					
7	0,035	-3,6					
10	0,12	-0,078					
13	0,13	0,33					
14	0,13	0,33					
19	0,040	-3,4	ND				
20	0,28	6,3	Outlier				
21	0,12	0,023					
23	0,11	-0,56					
25	0,15	1,1					
29	0,12	-0,021					
31	0,11	-0,48					
32	0,11	-0,56					
35	0,16	1,5					
40	0,12	-0,21					
41	0,15	1,1					
42	0,13	0,043					
45	0,14	0,56					
46	0,14	0,65					
51	0,12	-0,16					
52	0,13	0,25					
54	0,050	-3,0	ND				
59	0,15	1,2	Outlier				
62	0,22	3,9					
64	0,14	0,82					
68	0,13	0,25					
72	0,12	-0,19					
74	0,12	-0,0072					
75	0,11	-0,44					
78	0,17	1,7					
81	0,12	-0,28					
85	0,13	0,41					
87	0,19	2,7					
89	0,13	0,37					
96	0,092	-1,3					
98	0,087	-1,5					
104	0,12	-0,16					
109	0,12	-0,26					
111	0,075	-2,0					
120	0,12	0,0072					

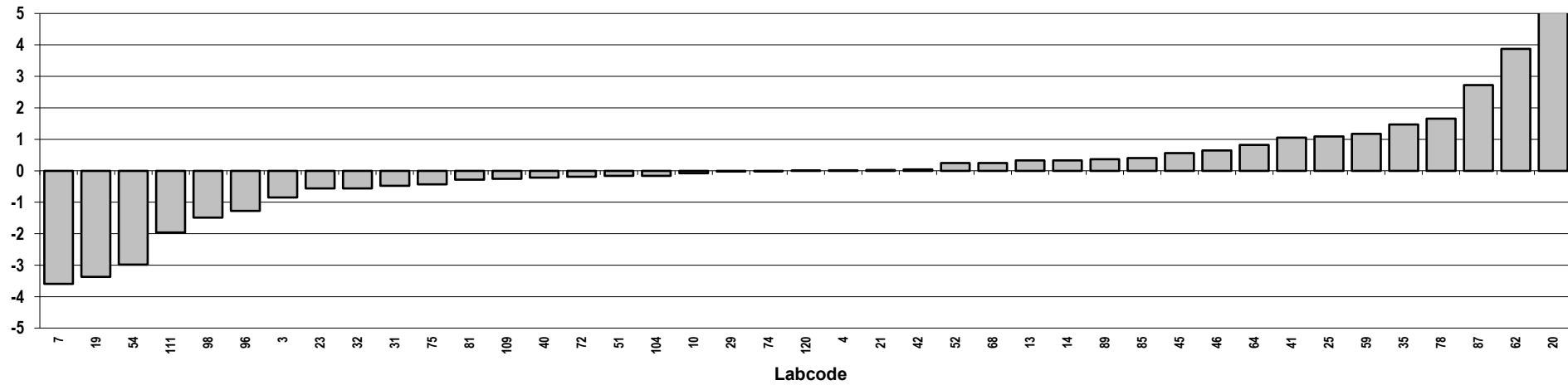
Consensus statistics

Consensus median, pg/g	0,12
Median all values pg/g	0,12
Consensus mean, pg/g	0,12
Standard deviation, pg/g	0,035
Relative standard deviation, %	28
No. of values reported	41
No. of values removed	1
No. of reported non-detects	2

2,3,4,7,8-PeCDF



Z-score: 2,3,4,7,8-PeCDF



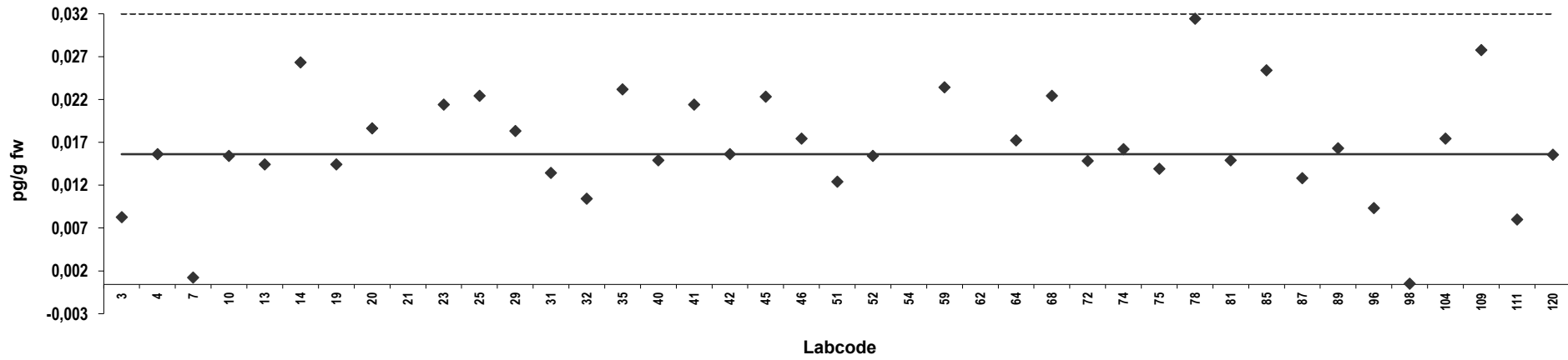
Halibut
Congener: 1,2,3,4,7,8-HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,0078	-2,4					
4	0,015	0,00					
7	0,00081	-4,7					
10	0,015	-0,066					
13	0,014	-0,39					
14	0,026	3,5					
19	0,014	-0,39	ND				
20	0,018	0,99					
21	0,099	28	Outlier,ND				
23	0,021	1,9					
25	0,022	2,2					
29	0,018	0,89					
31	0,013	-0,72					
32	0,010	-1,7					
35	0,023	2,5					
40	0,014	-0,23					
41	0,021	1,9					
42	0,015	0,00					
45	0,022	2,2					
46	0,017	0,59					
51	0,012	-1,1					
52	0,015	-0,066					
54	0,050	11	Outlier,ND				
59	0,023	2,6					
62	0,040	8,2	Outlier				
64	0,017	0,53					
68	0,022	2,2					
72	0,014	-0,26					
74	0,016	0,19					
75	0,013	-0,57					
78	0,031	5,2	ND				
81	0,015	-0,23					
85	0,025	3,2					
87	0,012	-0,92					
89	0,016	0,23					
96	0,0089	-2,1					
98	0,00010	-5,0					
104	0,017	0,59					
109	0,027	4,0					
111	0,0076	-2,5					
120	0,015	-0,027					

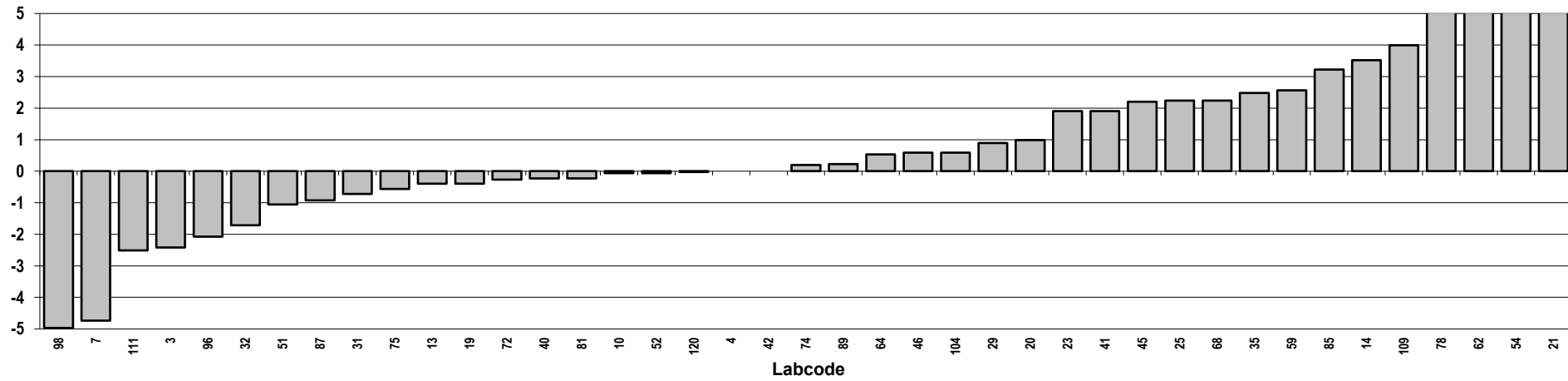
Consensus statistics

Consensus median, pg/g	0,015
Median all values pg/g	0,016
Consensus mean, pg/g	0,016
Standard deviation, pg/g	0,0065
Relative standard deviation, %	40
No. of values reported	41
No. of values removed	3
No. of reported non-detects	4

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



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



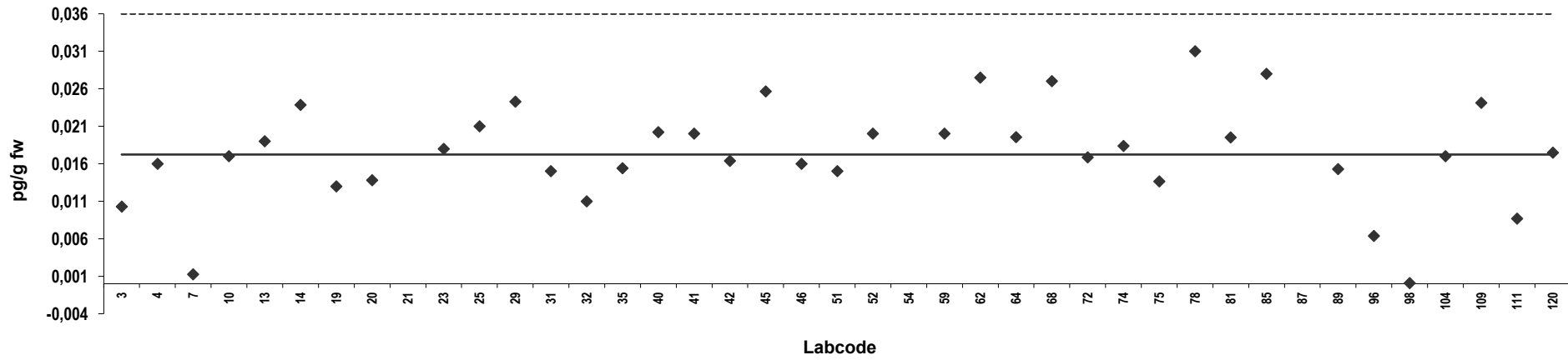
Halibut
Congener: 1,2,3,6,7,8-HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,010	-2,0					
4	0,016	-0,36					
7	0,0012	-4,6					
10	0,017	-0,067					
13	0,019	0,51					
14	0,024	1,9					
19	0,013	-1,2	ND				
20	0,014	-1,0					
21	0,099	24	Outlier,ND				
23	0,018	0,22					
25	0,021	1,1					
29	0,024	2,0					
31	0,015	-0,65					
32	0,011	-1,8					
35	0,015	-0,53					
40	0,020	0,86					
41	0,020	0,80					
42	0,016	-0,24					
45	0,026	2,4					
46	0,016	-0,36					
51	0,015	-0,65					
52	0,020	0,80					
54	0,050	9,5	Outlier,ND				
59	0,020	0,80					
62	0,028	3,0					
64	0,020	0,67					
68	0,027	2,8					
72	0,017	-0,12					
74	0,018	0,33					
75	0,014	-1,0					
78	0,031	4,0	ND				
81	0,020	0,66					
85	0,028	3,1					
87	0,037	5,8	Outlier				
89	0,015	-0,56					
96	0,0064	-3,2	ND				
98	0,00010	-5,0					
104	0,017	-0,067					
109	0,024	2,0					
111	0,0087	-2,5					
120	0,017	0,067					

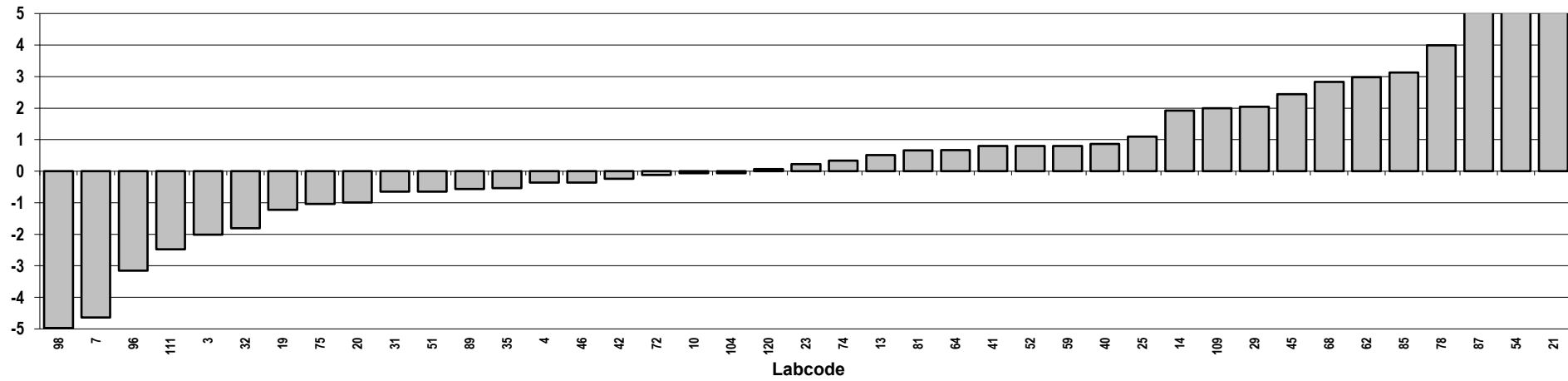
Consensus statistics

Consensus median, pg/g	0,017
Median all values pg/g	0,018
Consensus mean, pg/g	0,017
Standard deviation, pg/g	0,0067
Relative standard deviation, %	39
No. of values reported	41
No. of values removed	3
No. of reported non-detects	5

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



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



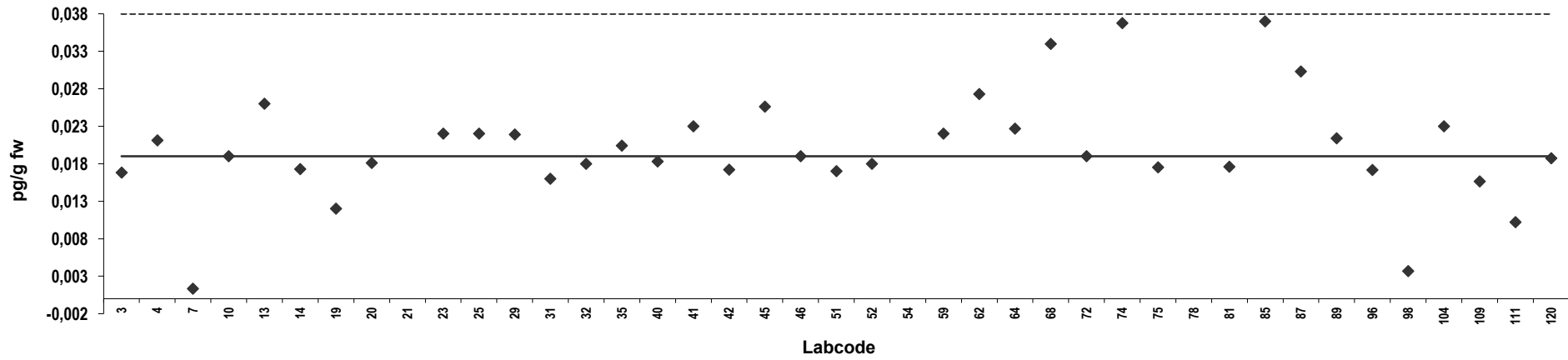
Halibut
Congener: 2,3,4,6,7,8-HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,017	-0,58					
4	0,021	0,55					
7	0,0013	-4,6					
10	0,019	0,00					
13	0,026	1,8					
14	0,017	-0,45					
19	0,012	-1,8	ND				
20	0,018	-0,24					
21	0,099	21	Outlier,ND				
23	0,022	0,79					
25	0,022	0,79					
29	0,022	0,76					
31	0,016	-0,79					
32	0,018	-0,26					
35	0,020	0,37					
40	0,018	-0,19					
41	0,023	1,1					
42	0,017	-0,47					
45	0,026	1,7					
46	0,019	0,00					
51	0,017	-0,53					
52	0,018	-0,26					
54	0,050	8,2	Outlier,ND				
59	0,022	0,79					
62	0,027	2,2					
64	0,023	0,97					
68	0,034	3,9					
72	0,019	0,00					
74	0,037	4,7					
75	0,018	-0,38					
78	0,042	6,1	Outlier,ND				
81	0,018	-0,37					
85	0,037	4,7					
87	0,030	3,0					
89	0,021	0,63					
96	0,017	-0,48					
98	0,0037	-4,0					
104	0,023	1,1					
109	0,016	-0,89					
111	0,010	-2,3					
120	0,019	-0,067					

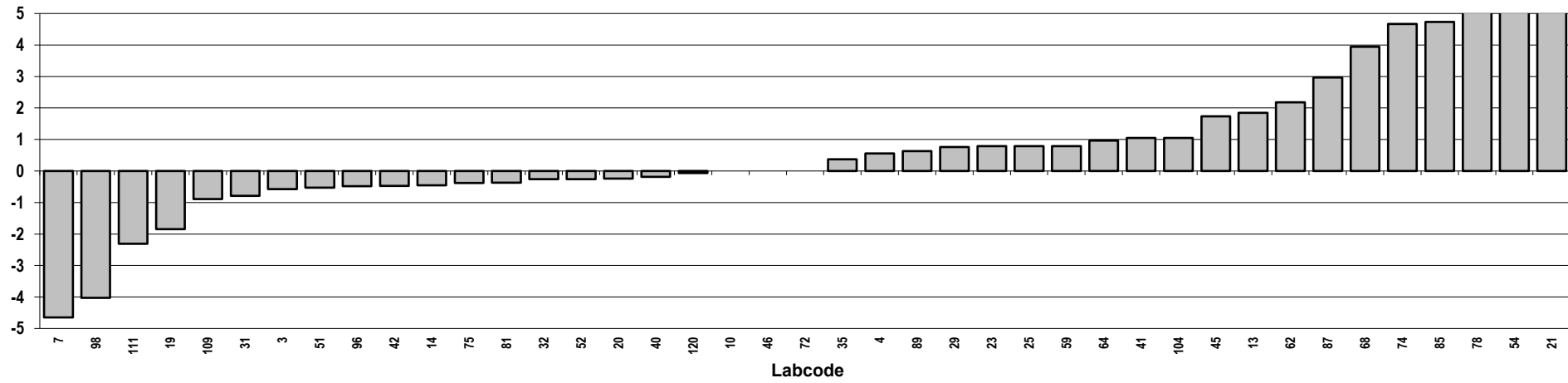
Consensus statistics

Consensus median, pg/g	0,019
Median all values pg/g	0,019
Consensus mean, pg/g	0,020
Standard deviation, pg/g	0,0072
Relative standard deviation, %	36
No. of values reported	41
No. of values removed	3
No. of reported non-detects	4

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



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

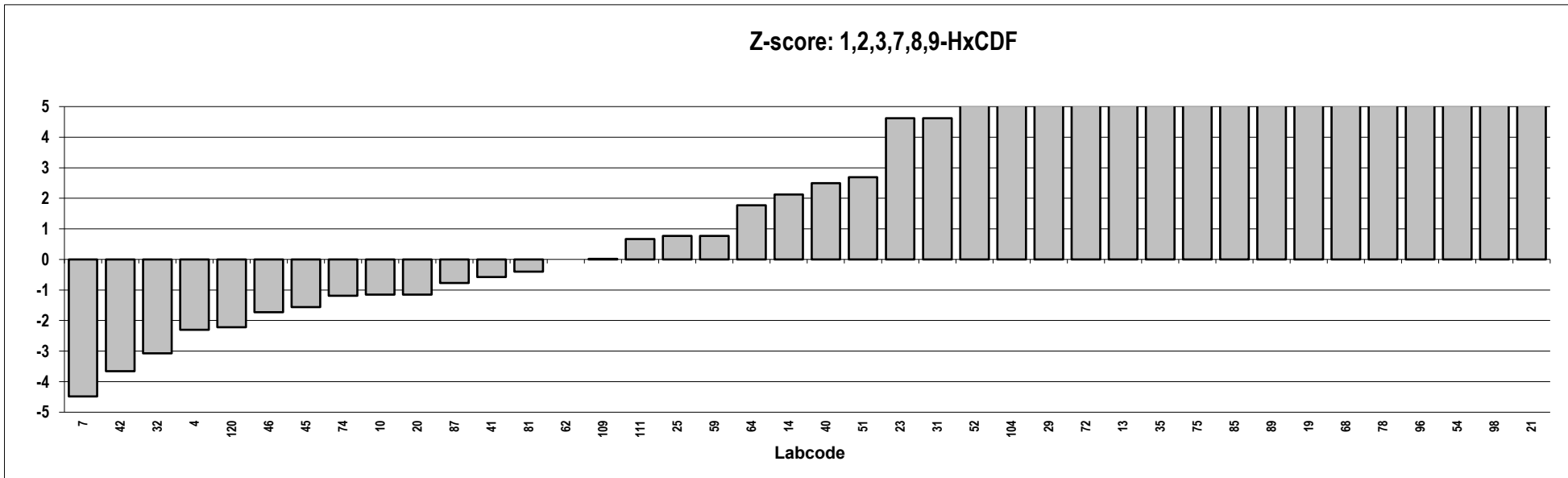
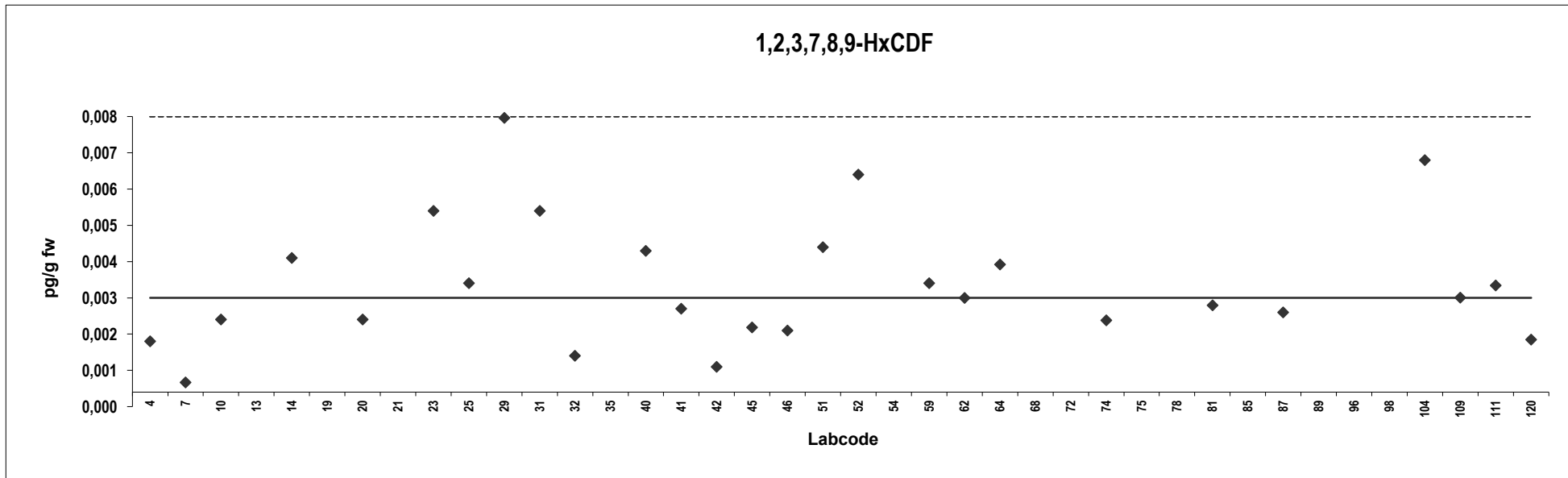


Halibut
Congener: 1,2,3,7,8,9-HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
4	0,0014	-2,3	ND				
7	0,00027	-4,5					
10	0,0020	-1,2					
13	0,0090	12	Outlier,ND				
14	0,0037	2,1	ND				
19	0,023	39	Outlier,ND				
20	0,0020	-1,2					
21	0,099	185	Outlier,ND				
23	0,0050	4,6	ND				
25	0,0030	0,77	ND				
29	0,0076	9,5					
31	0,0050	4,6	ND				
32	0,0010	-3,1	ND				
35	0,0090	12	Outlier				
40	0,0039	2,5	ND				
41	0,0023	-0,58	ND				
42	0,00070	-3,7					
45	0,0018	-1,6					
46	0,0017	-1,7	ND				
51	0,0040	2,7	ND				
52	0,0060	6,5	ND				
54	0,050	91	Outlier,ND				
59	0,0030	0,77	ND				
62	0,0026	0,00					
64	0,0035	1,8					
68	0,028	49	Outlier				
72	0,0080	10	Outlier,ND				
74	0,0020	-1,2					
75	0,0096	13	Outlier,ND				
78	0,035	62	Outlier,ND				
81	0,0024	-0,40	ND				
85	0,012	18	Outlier,ND				
87	0,0022	-0,77	ND				
89	0,015	23	Outlier				
96	0,038	68	Outlier				
98	0,053	97	Outlier				
104	0,0064	7,3	ND				
109	0,0026	0,017					
111	0,0029	0,66					
120	0,0014	-2,2					

Consensus statistics

Consensus median, pg/g	0,0026
Median all values pg/g	0,0038
Consensus mean, pg/g	0,0030
Standard deviation, pg/g	0,0018
Relative standard deviation, %	60
No. of values reported	40
No. of values removed	13
No. of reported non-detects	23



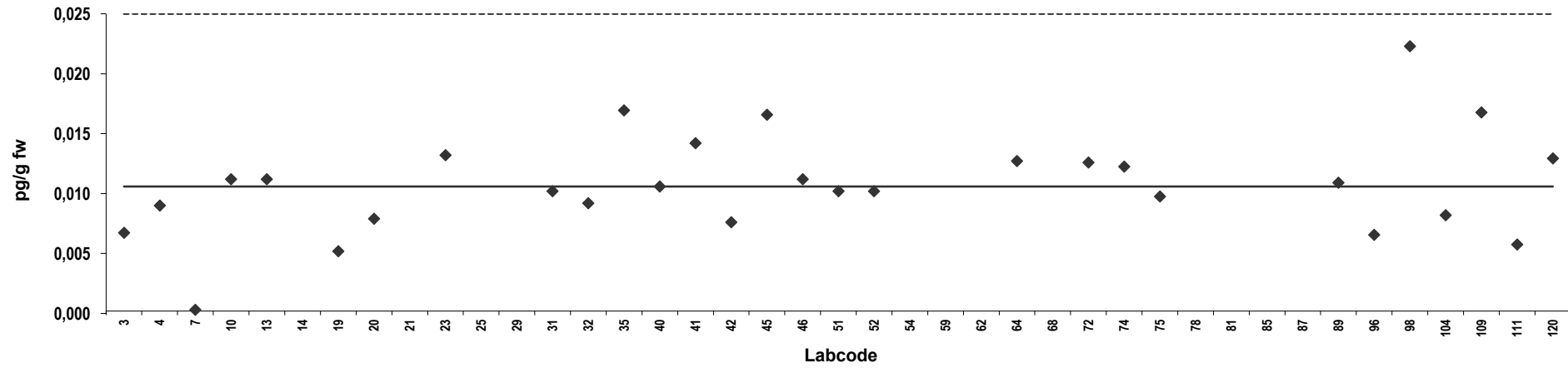
Halibut
Congener: 1,2,3,4,6,7,8-HpCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,0065	-1,9					
4	0,0088	-0,77					
7	0,000091	-5,0					
10	0,011	0,29					
13	0,011	0,29					
14	0,029	9,1	Outlier				
19	0,0050	-2,6	ND				
20	0,0077	-1,3					
21	0,099	43	Outlier,ND				
23	0,013	1,3					
25	0,030	9,4	Outlier				
29	0,035	12	Outlier				
31	0,010	-0,19					
32	0,0090	-0,67					
35	0,017	3,1					
40	0,010	0,00					
41	0,014	1,7	ND				
42	0,0074	-1,4					
45	0,016	2,9					
46	0,011	0,29					
51	0,010	-0,19					
52	0,010	-0,19					
54	0,050	19	Outlier,ND				
59	0,031	9,9	Outlier				
62	0,031	9,9	Outlier				
64	0,013	1,0					
68	0,027	8,0	Outlier				
72	0,012	0,97					
74	0,012	0,80					
75	0,0096	-0,40	ND				
78	0,043	16	Outlier,ND				
81	0,027	8,2	Outlier				
85	0,047	18	Outlier				
87	0,028	8,2	Outlier				
89	0,011	0,15					
96	0,0064	-1,9	ND				
98	0,022	5,6					
104	0,0080	-1,2					
109	0,017	3,0					
111	0,0056	-2,3					
120	0,013	1,1					

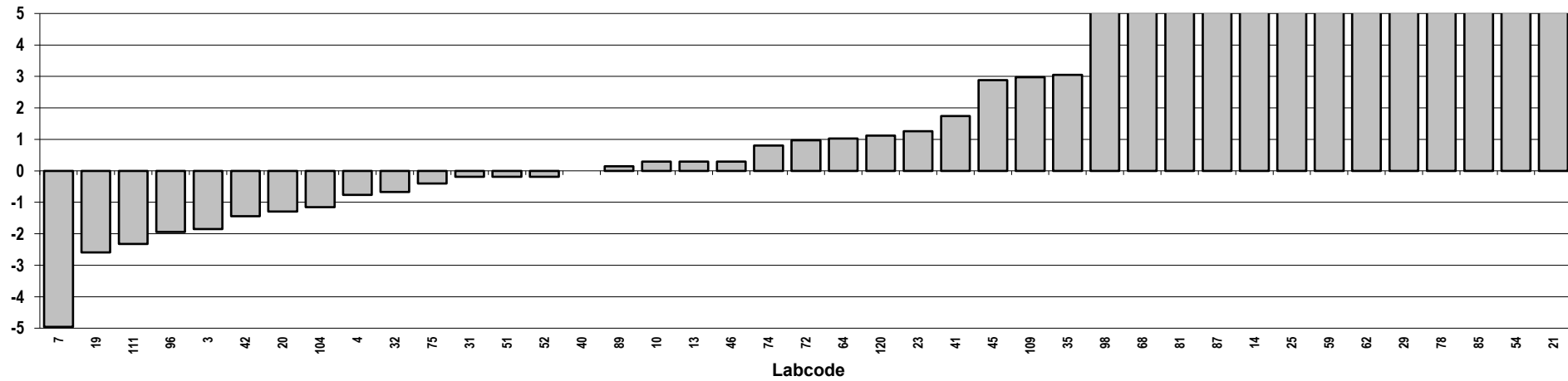
Consensus statistics

Consensus median, pg/g	0,010
Median all values pg/g	0,012
Consensus mean, pg/g	0,011
Standard deviation, pg/g	0,0042
Relative standard deviation, %	40
No. of values reported	41
No. of values removed	12
No. of reported non-detects	7

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



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



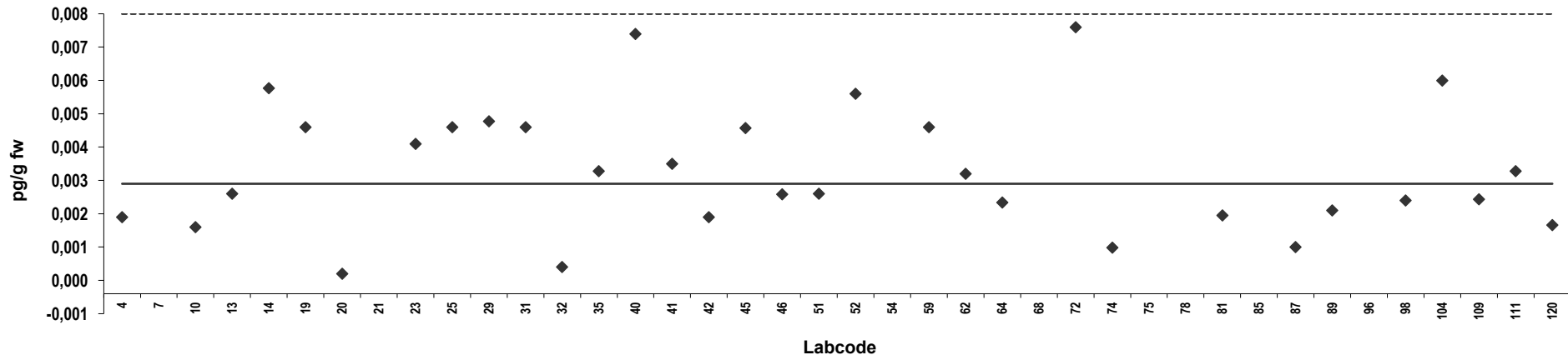
Halibut
Congener: 1,2,3,4,7,8,9-HpCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
4	0,0023	-1,5	ND				
7	0,050	71	Outlier,ND				
10	0,0020	-2,0					
13	0,0030	-0,45	ND				
14	0,0062	4,3	ND				
19	0,0050	2,6	ND				
20	0,00060	-4,1					
21	0,099	145	Outlier,ND				
23	0,0045	1,8					
25	0,0050	2,6	ND				
29	0,0052	2,8					
31	0,0050	2,6	ND				
32	0,00080	-3,8					
35	0,0037	0,58					
40	0,0078	6,8	ND				
41	0,0039	0,91	ND				
42	0,0023	-1,5	ND				
45	0,0050	2,5					
46	0,0030	-0,48	ND				
51	0,0030	-0,45	ND				
52	0,0060	4,1	ND				
54	0,050	71	Outlier,ND				
59	0,0050	2,6	ND				
62	0,0036	0,45					
64	0,0027	-0,85					
68	0,037	51	Outlier				
72	0,0080	7,1	ND				
74	0,0014	-2,9					
75	0,0096	9,5	Outlier,ND				
78	0,057	81	Outlier,ND				
81	0,0024	-1,4	ND				
85	0,0090	8,6	Outlier				
87	0,0014	-2,9	ND				
89	0,0025	-1,2	ND				
96	0,013	15	Outlier				
98	0,0028	-0,76					
104	0,0064	4,7	ND				
109	0,0028	-0,71					
111	0,0037	0,58					
120	0,0021	-1,9					

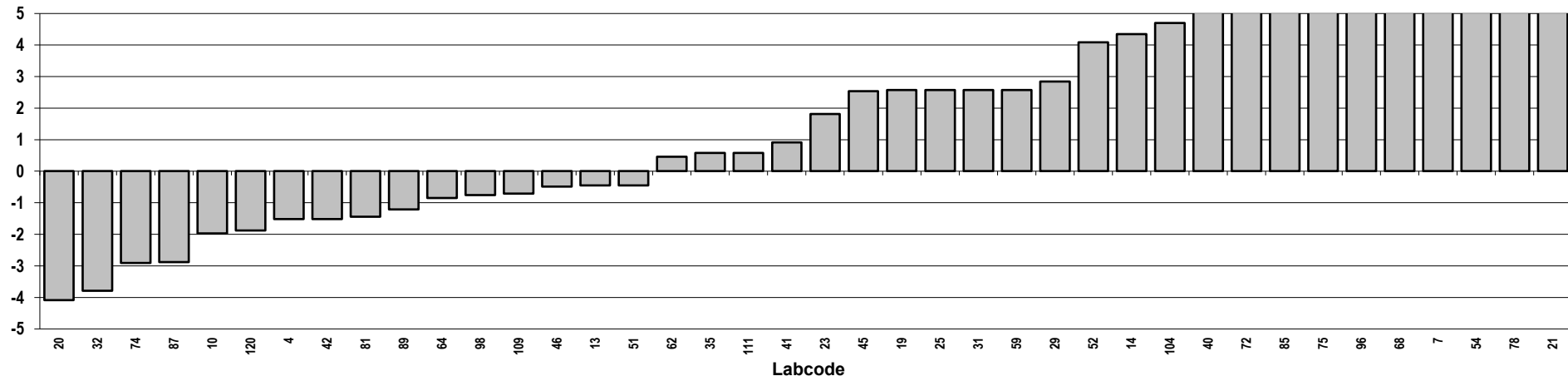
Consensus statistics

Consensus median, pg/g	0,0033
Median all values pg/g	0,0042
Consensus mean, pg/g	0,0037
Standard deviation, pg/g	0,0019
Relative standard deviation, %	51
No. of values reported	40
No. of values removed	8
No. of reported non-detects	23

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



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

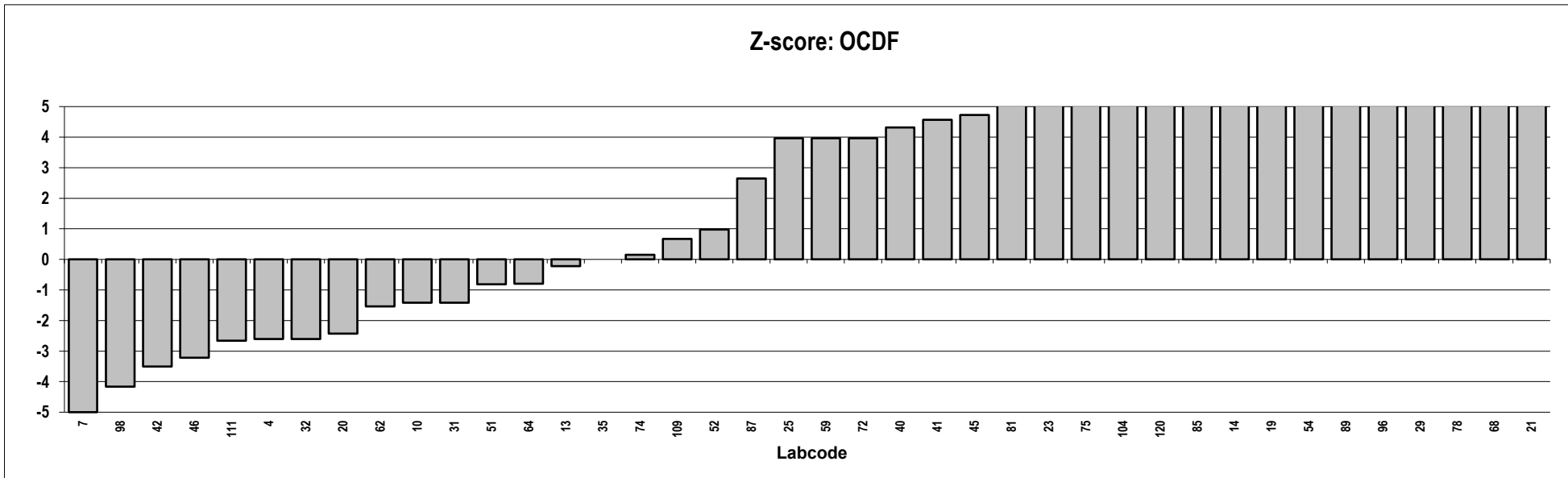
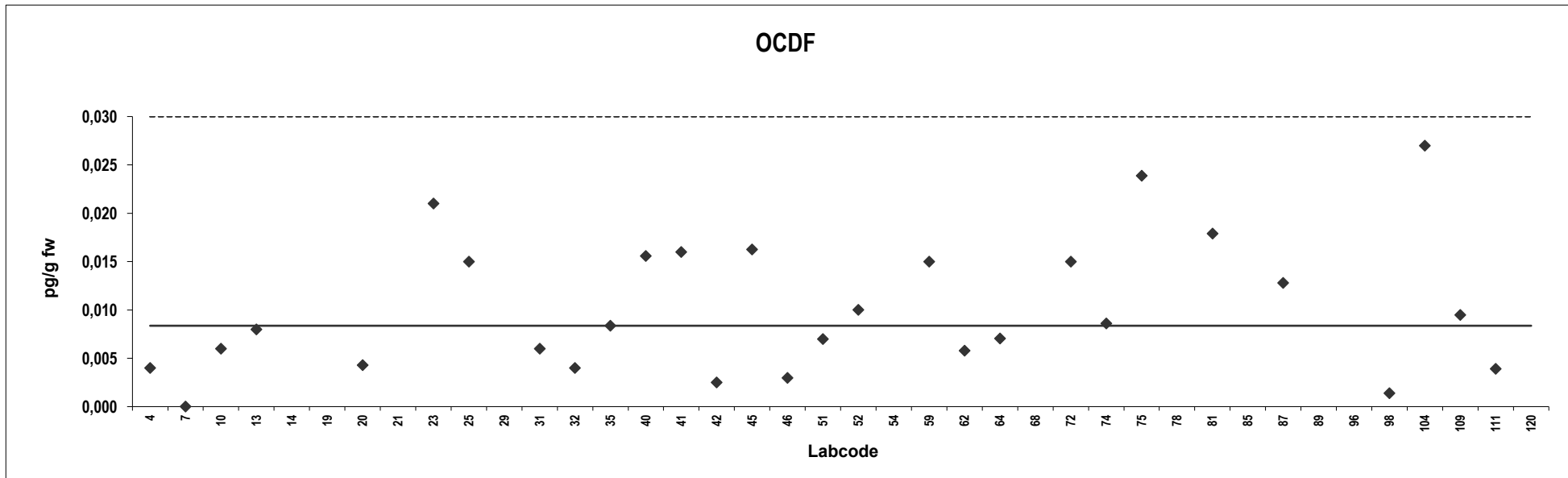


Halibut
Congener: OCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
4	0,0040	-2,6	ND				
7	0,0000016	-5,0					
10	0,0060	-1,4					
13	0,0080	-0,22	ND				
14	0,032	14	Outlier,ND				
19	0,035	16	Outlier,ND				
20	0,0043	-2,4					
21	0,20	114	Outlier,ND				
23	0,021	7,6					
25	0,015	4,0	ND				
29	0,069	36	Outlier				
31	0,0060	-1,4					
32	0,0040	-2,6					
35	0,0084	0,00					
40	0,016	4,3	ND				
41	0,016	4,6	ND				
42	0,0025	-3,5					
45	0,016	4,7					
46	0,0030	-3,2	ND				
51	0,0070	-0,82	ND				
52	0,010	0,98	ND				
54	0,050	25	Outlier,ND				
59	0,015	4,0	ND				
62	0,0058	-1,5					
64	0,0070	-0,79					
68	0,11	61	Outlier				
72	0,015	4,0	ND				
74	0,0086	0,15					
75	0,024	9,3	ND				
78	0,072	38	Outlier,ND				
81	0,018	5,7					
85	0,031	14	Outlier				
87	0,013	2,7					
89	0,053	27	Outlier				
96	0,056	28	Outlier				
98	0,0014	-4,2					
104	0,027	11	ND				
109	0,0095	0,67					
111	0,0039	-2,7					
120	0,030	13	Outlier				

Consensus statistics

Consensus median, pg/g	0,0084
Median all values pg/g	0,015
Consensus mean, pg/g	0,010
Standard deviation, pg/g	0,0069
Relative standard deviation, %	68
No. of values reported	40
No. of values removed	11
No. of reported non-detects	17

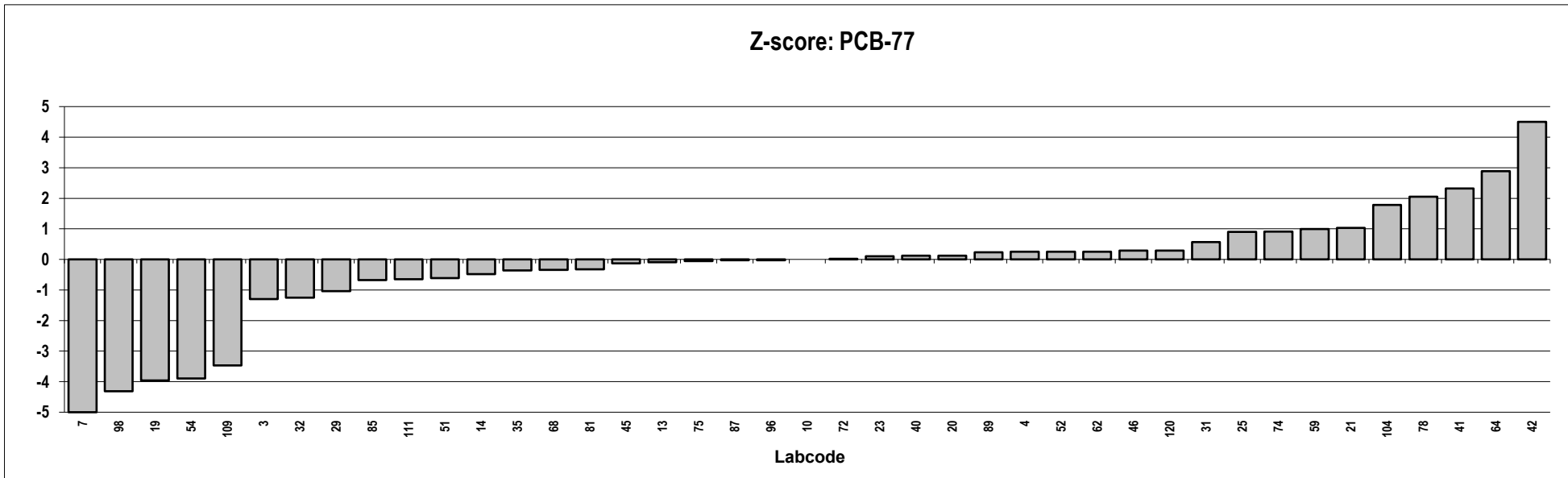
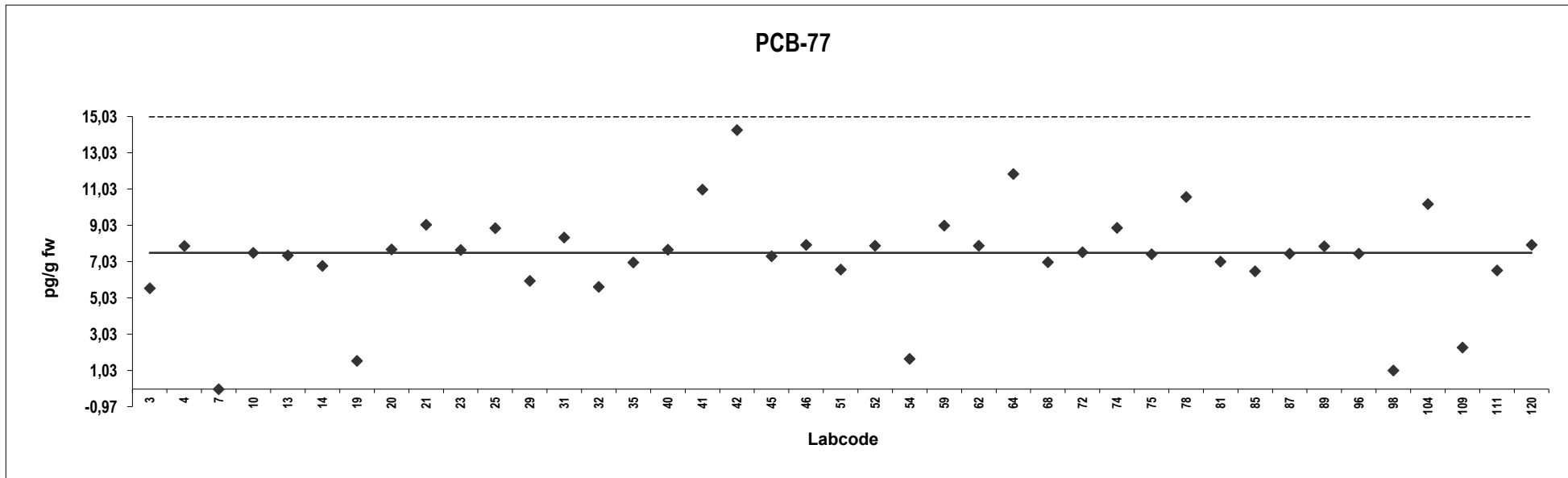


Halibut
Congener: PCB-77

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	5,6	-1,3					
4	7,9	0,25					
7	0,00082	-5,0					
10	7,5	0,00					
13	7,4	-0,091					
14	6,8	-0,48					
19	1,6	-4,0					
20	7,7	0,12					
21	9,1	1,0					
23	7,7	0,10					
25	8,9	0,90					
29	6,0	-1,0					
31	8,4	0,56					
32	5,6	-1,2					
35	7,0	-0,36					
40	7,7	0,12					
41	11	2,3					
42	14	4,5					
45	7,3	-0,13					
46	8,0	0,29					
51	6,6	-0,61					
52	7,9	0,25					
54	1,7	-3,9					
59	9,0	0,99					
62	7,9	0,25					
64	12	2,9					
68	7,0	-0,34					
72	7,5	0,020					
74	8,9	0,91					
75	7,4	-0,052					
78	11	2,1					
81	7,0	-0,32					
85	6,5	-0,67					
87	7,5	-0,031					
89	7,9	0,23					
96	7,5	-0,031					
98	1,0	-4,3					
104	10	1,8					
109	2,3	-3,5					
111	6,5	-0,65					
120	8,0	0,29					

Consensus statistics

Consensus median, pg/g	7,5
Median all values pg/g	7,5
Consensus mean, pg/g	7,2
Standard deviation, pg/g	2,8
Relative standard deviation, %	39
No. of values reported	41
No. of values removed	0
No. of reported non-detects	0

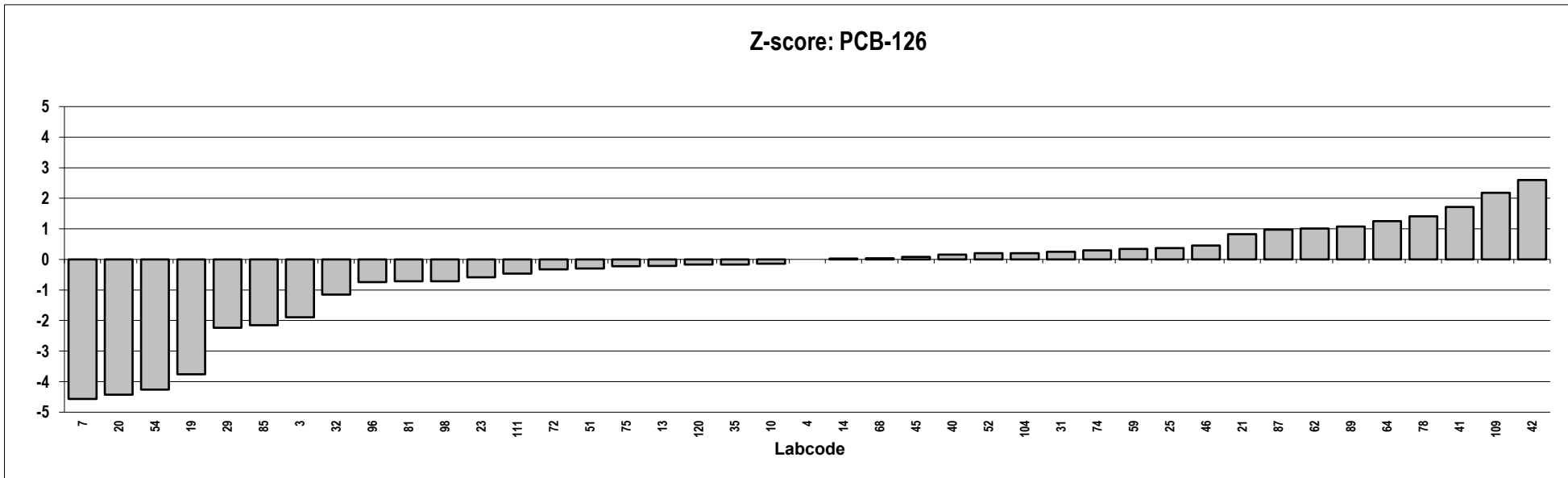
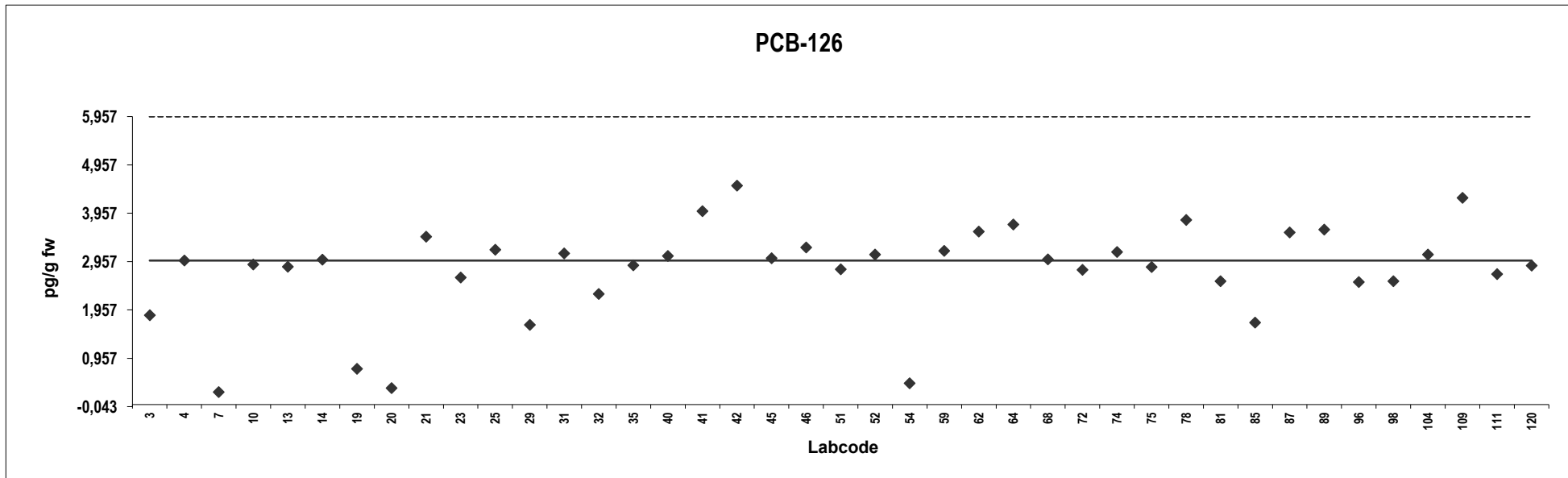


Halibut
Congener: PCB-126

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	1,9	-1,9					
4	3,0	0,00					
7	0,26	-4,6					
10	2,9	-0,14					
13	2,9	-0,22					
14	3,0	0,031					
19	0,74	-3,8					
20	0,34	-4,4					
21	3,5	0,82					
23	2,6	-0,59					
25	3,2	0,37					
29	1,6	-2,2					
31	3,1	0,25					
32	2,3	-1,2					
35	2,9	-0,17					
40	3,1	0,16					
41	4,0	1,7					
42	4,5	2,6					
45	3,0	0,079					
46	3,3	0,46					
51	2,8	-0,30					
52	3,1	0,20					
54	0,44	-4,3					
59	3,2	0,34					
62	3,6	1,0					
64	3,7	1,3					
68	3,0	0,036					
72	2,8	-0,32					
74	3,2	0,29					
75	2,8	-0,22					
78	3,8	1,4					
81	2,6	-0,72					
85	1,7	-2,2					
87	3,6	0,98					
89	3,6	1,1					
96	2,5	-0,75					
98	2,6	-0,72					
104	3,1	0,20					
109	4,3	2,2					
111	2,7	-0,47					
120	2,9	-0,17					

Consensus statistics

Consensus median, pg/g	3,0
Median all values pg/g	3,0
Consensus mean, pg/g	2,8
Standard deviation, pg/g	0,98
Relative standard deviation, %	35
No. of values reported	41
No. of values removed	0
No. of reported non-detects	0

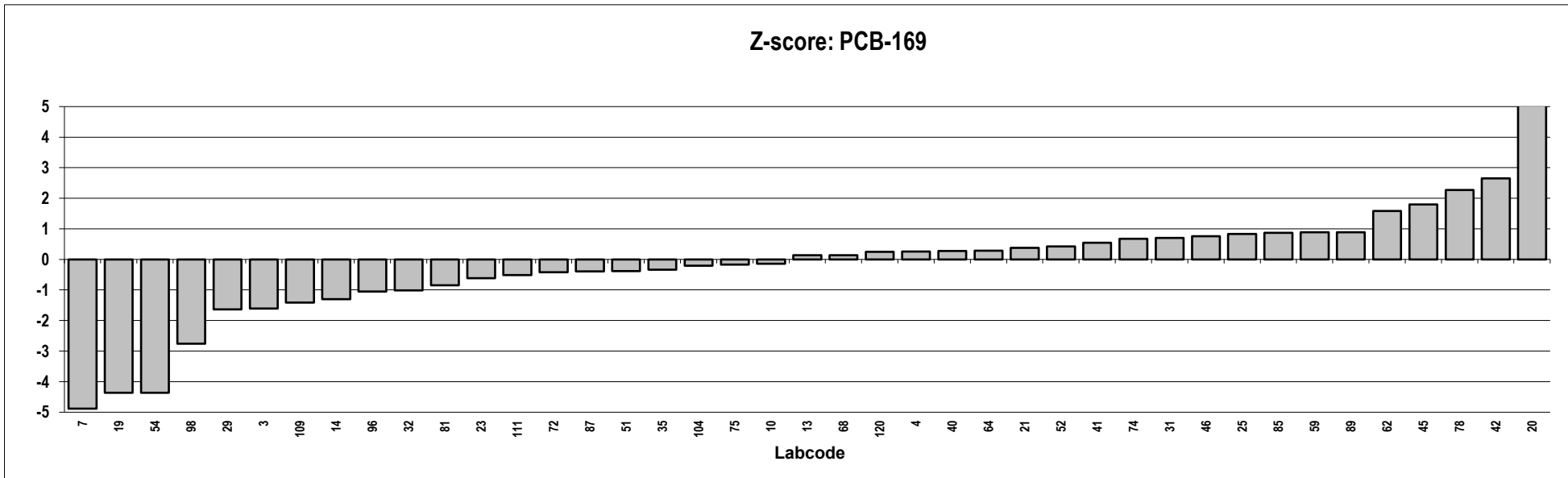
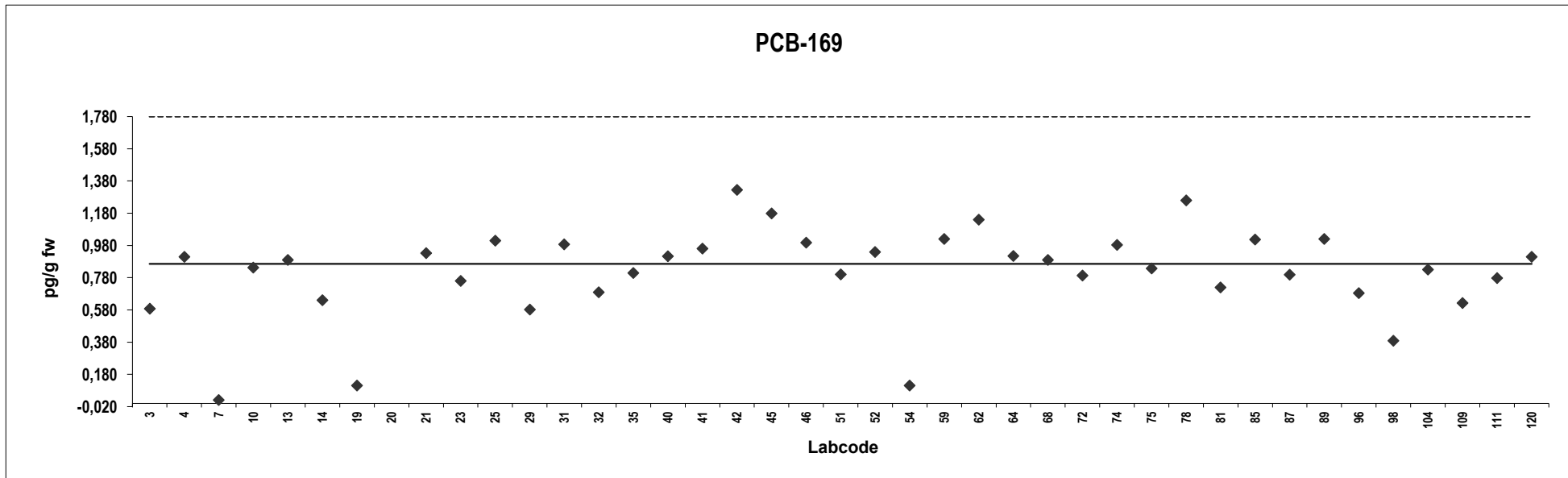


Halibut
Congener: PCB-169

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,59	-1,6					
4	0,91	0,25					
7	0,021	-4,9					
10	0,84	-0,14					
13	0,89	0,14					
14	0,64	-1,3					
19	0,11	-4,4					
20	3,4	14	Outlier				
21	0,93	0,38					
23	0,76	-0,61					
25	1,0	0,83					
29	0,58	-1,6					
31	0,99	0,70					
32	0,69	-1,0					
35	0,81	-0,33					
40	0,91	0,28					
41	0,96	0,54					
42	1,3	2,6					
45	1,2	1,8					
46	1,0	0,76					
51	0,80	-0,38					
52	0,94	0,43					
54	0,11	-4,4					
59	1,0	0,89					
62	1,1	1,6					
64	0,92	0,29					
68	0,89	0,14					
72	0,79	-0,42					
74	0,98	0,68					
75	0,84	-0,17					
78	1,3	2,3					
81	0,72	-0,85					
85	1,0	0,87					
87	0,80	-0,39					
89	1,0	0,89					
96	0,68	-1,0					
98	0,39	-2,8					
104	0,83	-0,21					
109	0,62	-1,4					
111	0,78	-0,51					
120	0,91	0,25					

Consensus statistics

Consensus median, pg/g	0,87
Median all values pg/g	0,89
Consensus mean, pg/g	0,81
Standard deviation, pg/g	0,28
Relative standard deviation, %	34
No. of values reported	41
No. of values removed	1
No. of reported non-detects	0

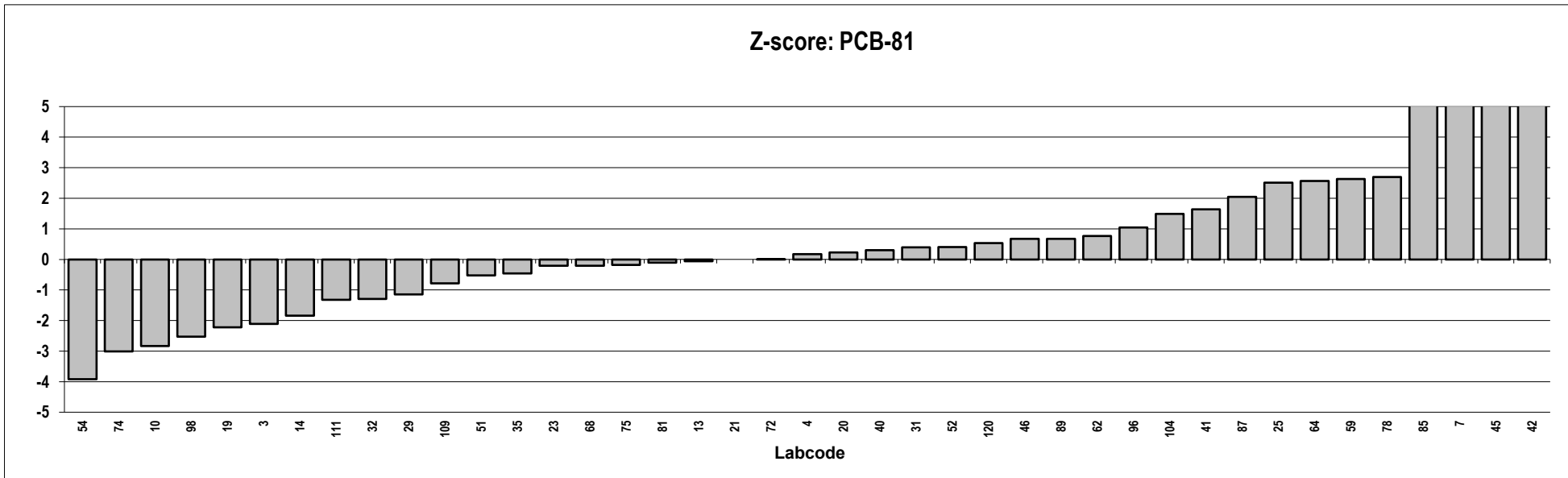
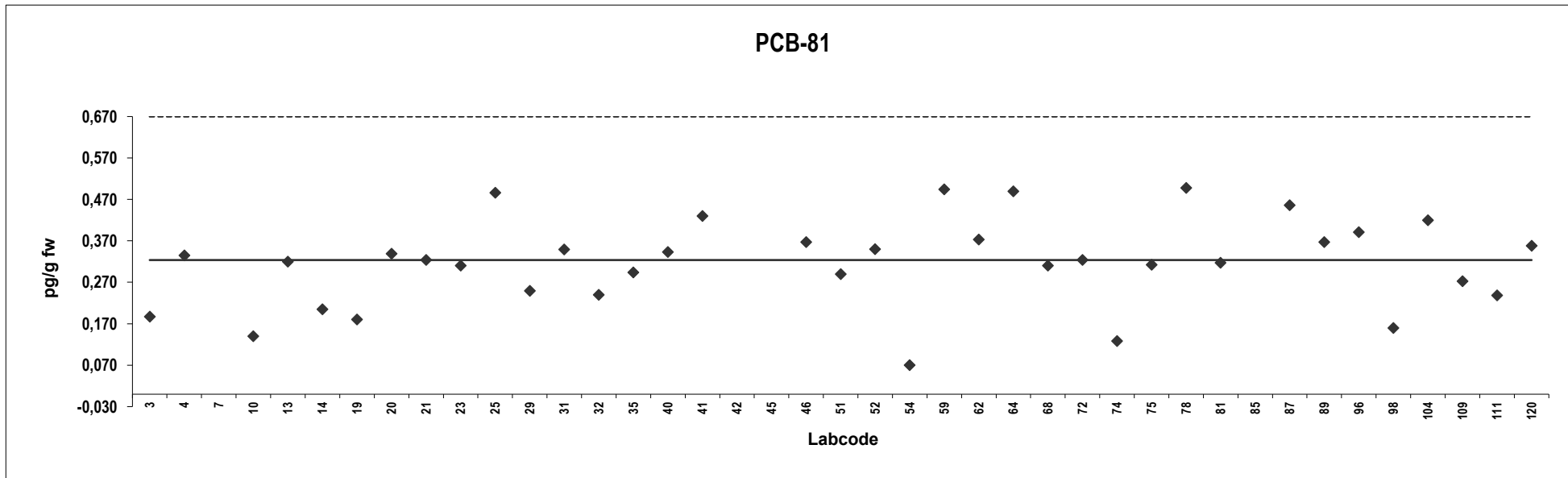


Halibut
Congener: PCB-81

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,19	-2,1					
4	0,34	0,17					
7	5,0	72	Outlier,ND				
10	0,14	-2,8					
13	0,32	-0,057					
14	0,20	-1,8					
19	0,18	-2,2	ND				
20	0,34	0,23					
21	0,32	0,00					
23	0,31	-0,21					
25	0,49	2,5					
29	0,25	-1,1					
31	0,35	0,39					
32	0,24	-1,3					
35	0,29	-0,46					
40	0,34	0,30					
41	0,43	1,6					
42	11	161	Outlier				
45	8,2	122	Outlier				
46	0,37	0,67					
51	0,29	-0,52					
52	0,35	0,41					
54	0,070	-3,9					
59	0,49	2,6					
62	0,37	0,76					
64	0,49	2,6					
68	0,31	-0,21					
72	0,32	0,0046					
74	0,13	-3,0					
75	0,31	-0,18					
78	0,50	2,7					
81	0,32	-0,10					
85	2,2	29	Outlier				
87	0,46	2,0					
89	0,37	0,67					
96	0,39	1,0					
98	0,16	-2,5					
104	0,42	1,5					
109	0,27	-0,78					
111	0,24	-1,3					
120	0,36	0,54					

Consensus statistics

Consensus median, pg/g	0,32
Median all values pg/g	0,34
Consensus mean, pg/g	0,32
Standard deviation, pg/g	0,11
Relative standard deviation, %	33
No. of values reported	41
No. of values removed	4
No. of reported non-detects	2

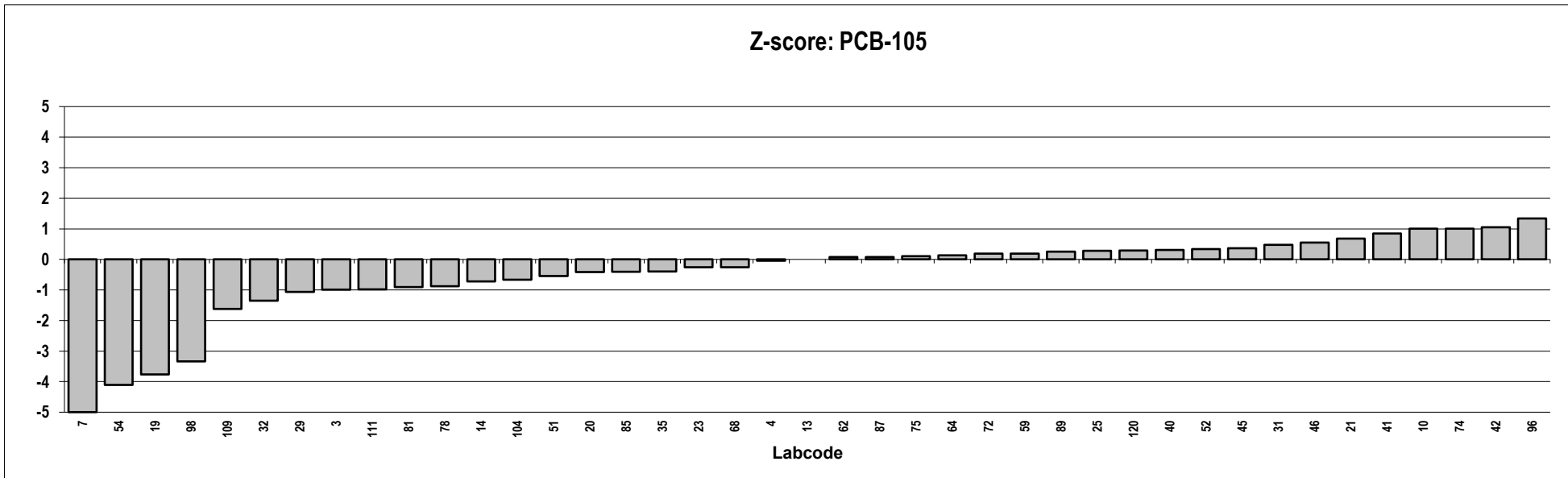
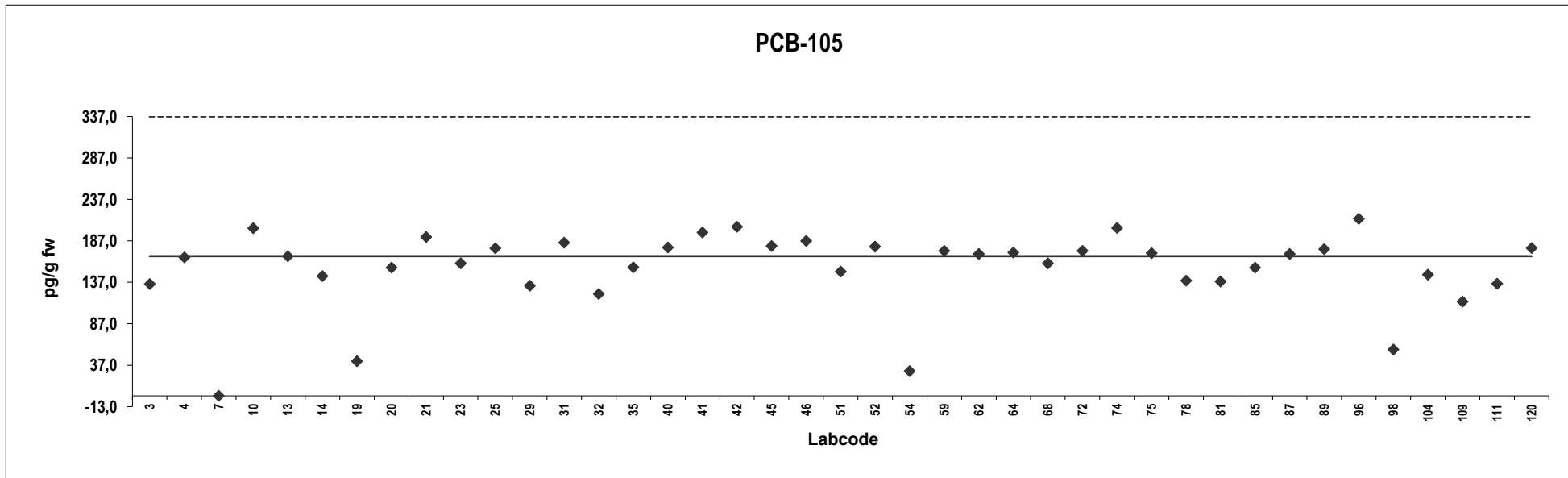


Halibut
Congener: PCB-105

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	135	-0,99					
4	167	-0,047					
7	0,0040	-5,0					
10	202	1,0					
13	168	0,00					
14	144	-0,72					
19	42	-3,8					
20	155	-0,41					
21	192	0,69					
23	160	-0,25					
25	178	0,28					
29	133	-1,1					
31	185	0,48					
32	123	-1,3					
35	155	-0,40					
40	179	0,31					
41	197	0,85					
42	204	1,1					
45	181	0,37					
46	187	0,55					
51	150	-0,55					
52	180	0,34					
54	30	-4,1					
59	175	0,19					
62	171	0,075					
64	173	0,13					
68	160	-0,25					
72	175	0,19					
74	202	1,0					
75	172	0,11					
78	139	-0,88					
81	138	-0,90					
85	155	-0,41					
87	171	0,078					
89	177	0,25					
96	213	1,3					
98	56	-3,3					
104	146	-0,67					
109	114	-1,6					
111	135	-0,98					
120	178	0,29					

Consensus statistics

Consensus median, pg/g	168
Median all values pg/g	168
Consensus mean, pg/g	154
Standard deviation, pg/g	47
Relative standard deviation, %	31
No. of values reported	41
No. of values removed	0
No. of reported non-detects	0

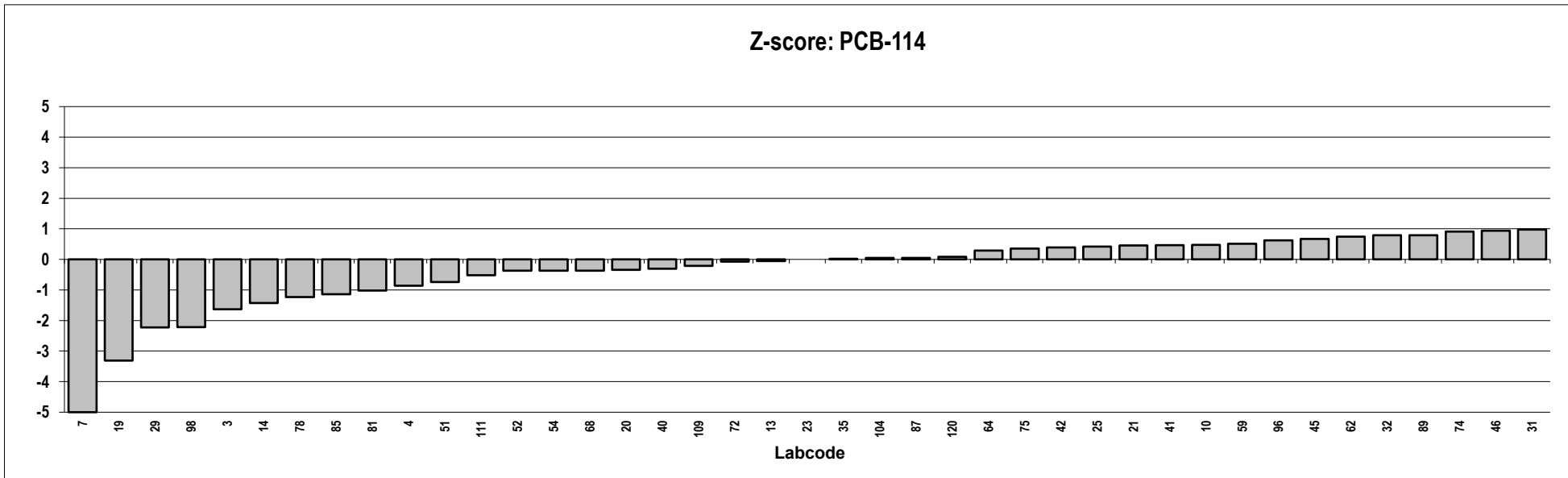
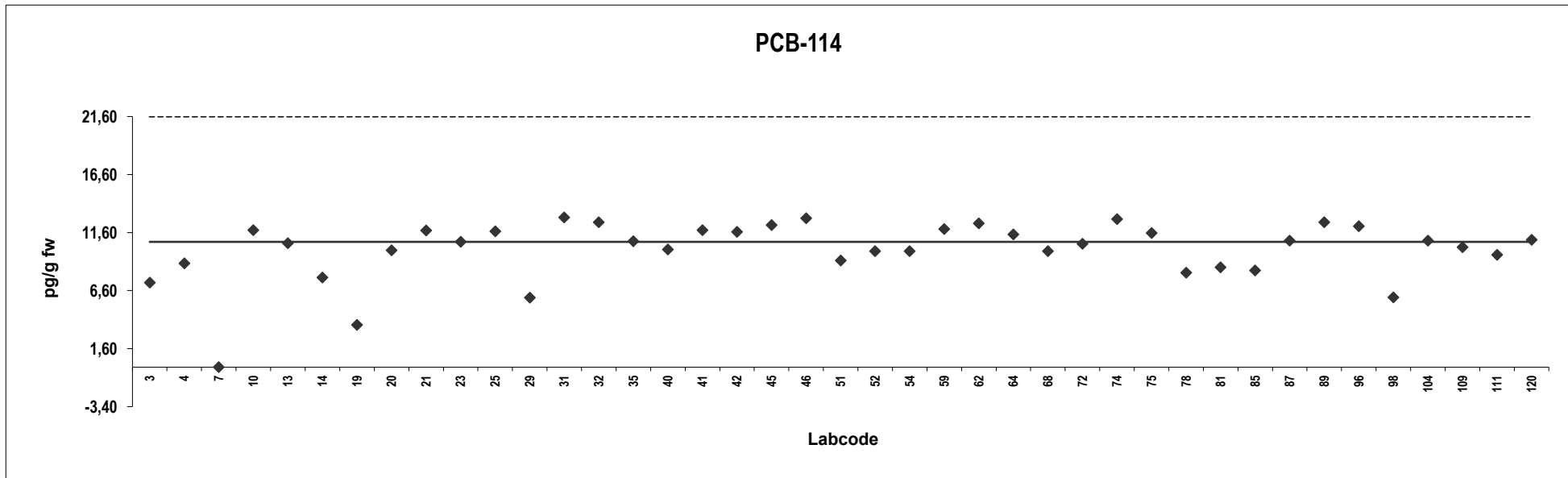


Halibut
Congener: PCB-114

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	7,3	-1,6					
4	8,9	-0,86					
7	0,00026	-5,0					
10	12	0,47					
13	11	-0,054					
14	7,7	-1,4					
19	3,7	-3,3					
20	10	-0,34					
21	12	0,45					
23	11	0,00					
25	12	0,42					
29	6,0	-2,2					
31	13	0,98					
32	13	0,79					
35	11	0,025					
40	10	-0,30					
41	12	0,46					
42	12	0,40					
45	12	0,67					
46	13	0,94					
51	9,2	-0,74					
52	10	-0,37					
54	10	-0,37	ND				
59	12	0,51					
62	12	0,74					
64	11	0,29					
68	10	-0,37					
72	11	-0,073					
74	13	0,91					
75	12	0,35					
78	8,1	-1,2					
81	8,6	-1,0					
85	8,3	-1,1					
87	11	0,048					
89	13	0,79					
96	12	0,63					
98	6,0	-2,2					
104	11	0,046					
109	10	-0,21					
111	9,7	-0,52					
120	11	0,082					

Consensus statistics

Consensus median, pg/g	11
Median all values pg/g	11
Consensus mean, pg/g	10
Standard deviation, pg/g	2,6
Relative standard deviation, %	26
No. of values reported	41
No. of values removed	0
No. of reported non-detects	1

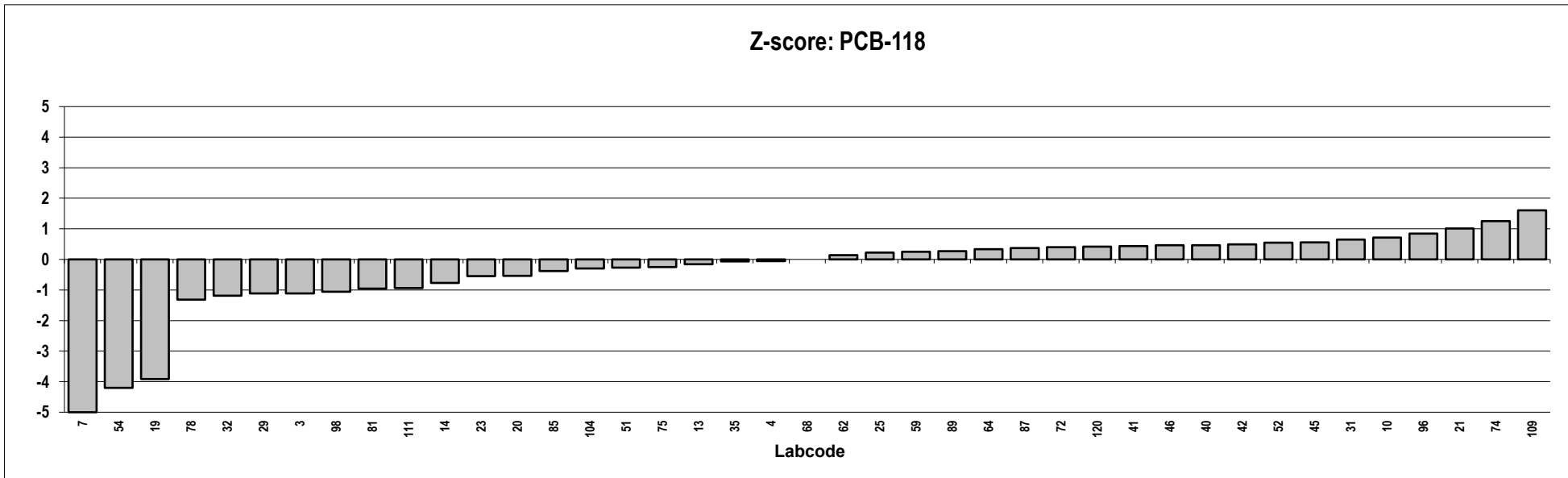
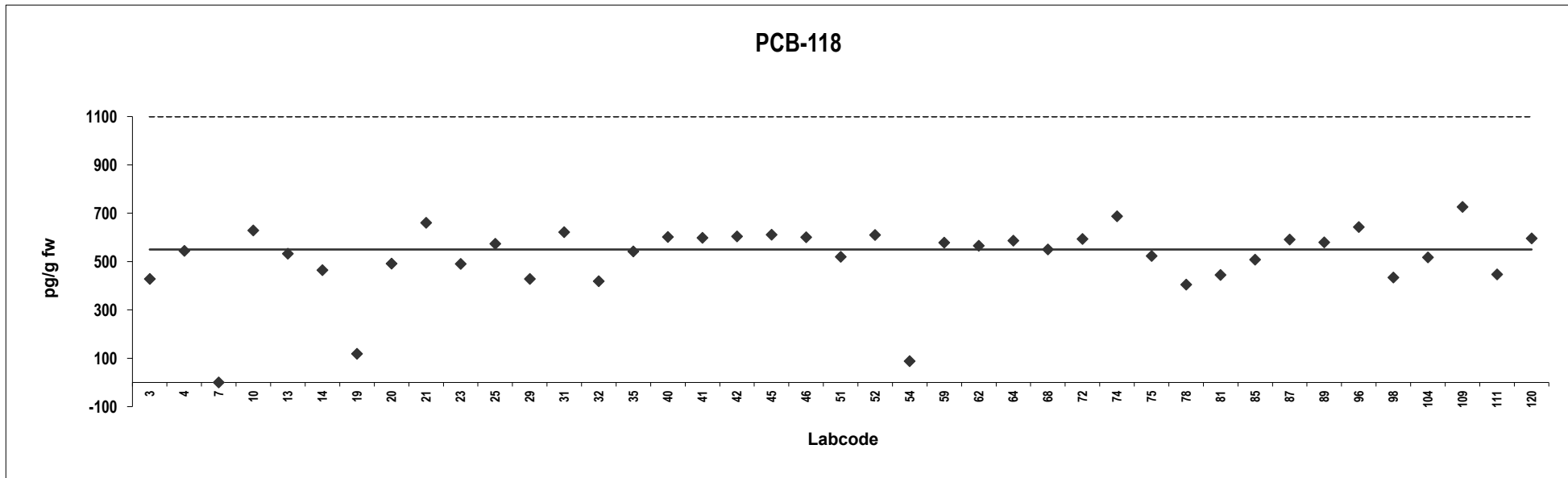


Halibut
Congener: PCB-118

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	428	-1,1					
4	544	-0,054					
7	0,017	-5,0					
10	629	0,72					
13	532	-0,16					
14	465	-0,77					
19	119	-3,9					
20	491	-0,54					
21	661	1,0					
23	490	-0,55					
25	574	0,22					
29	428	-1,1					
31	621	0,65					
32	419	-1,2					
35	542	-0,069					
40	601	0,47					
41	598	0,44					
42	604	0,49					
45	611	0,56					
46	601	0,46					
51	520	-0,27					
52	610	0,55					
54	88	-4,2					
59	578	0,25					
62	565	0,14					
64	587	0,33					
68	550	0,00					
72	593	0,40					
74	688	1,3					
75	523	-0,25					
78	405	-1,3					
81	445	-0,95					
85	508	-0,38					
87	591	0,37					
89	580	0,27					
96	643	0,85					
98	434	-1,1					
104	517	-0,30					
109	726	1,6					
111	447	-0,93					
120	596	0,41					

Consensus statistics

Consensus median, pg/g	550
Median all values pg/g	550
Consensus mean, pg/g	516
Standard deviation, pg/g	149
Relative standard deviation, %	29
No. of values reported	41
No. of values removed	0
No. of reported non-detects	0

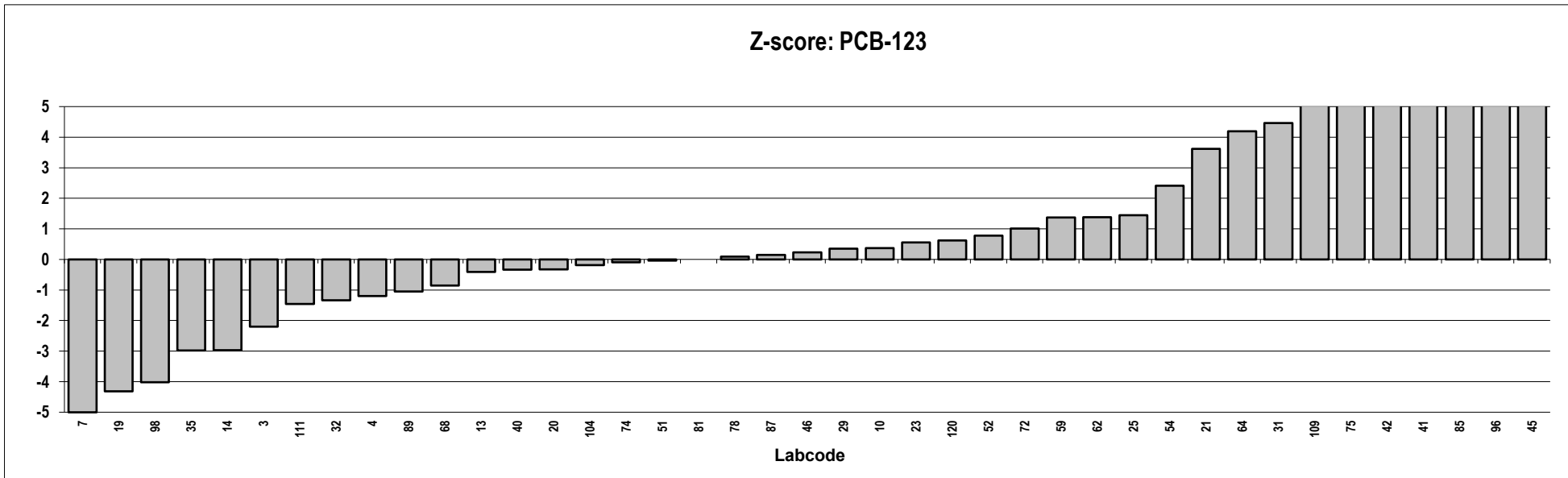
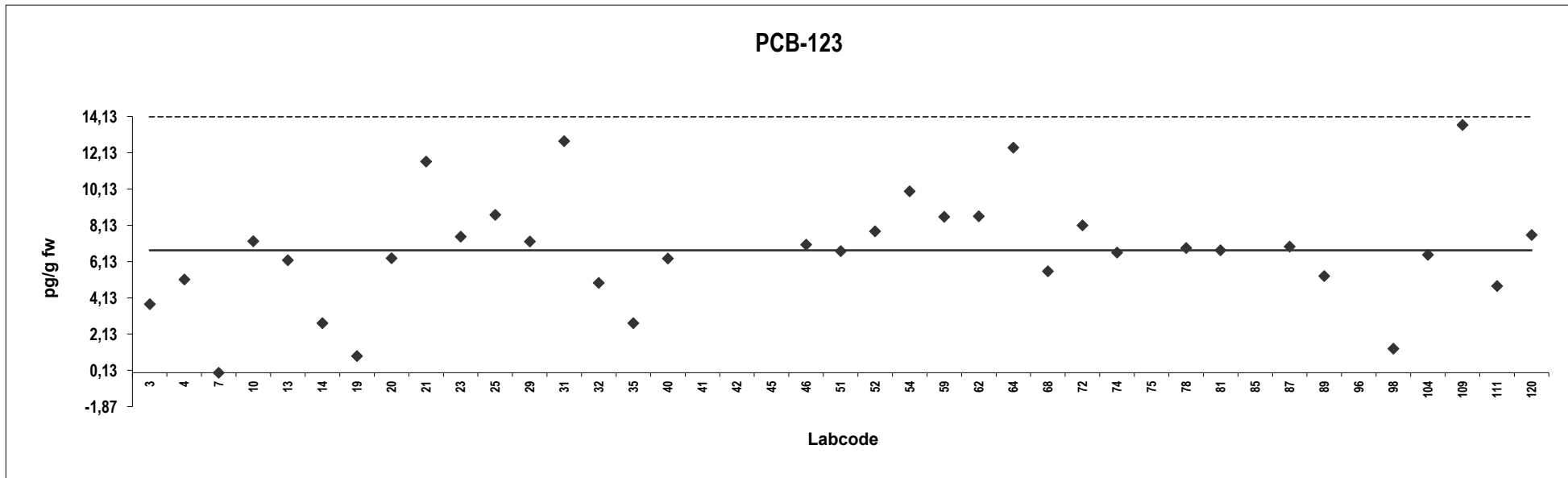


Halibut
Congener: PCB-123

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	3,8	-2,2					
4	5,1	-1,2					
7	0,00033	-5,0					
10	7,3	0,37					
13	6,2	-0,41					
14	2,7	-3,0					
19	0,92	-4,3					
20	6,3	-0,33					
21	12	3,6					
23	7,5	0,56					
25	8,7	1,4					
29	7,2	0,35					
31	13	4,5					
32	5,0	-1,3					
35	2,7	-3,0					
40	6,3	-0,33					
41	17	7,2	Outlier				
42	15	6,2	Outlier				
45	103	72	Outlier				
46	7,1	0,23					
51	6,7	-0,037					
52	7,8	0,78					
54	10	2,4	ND				
59	8,6	1,4					
62	8,6	1,4					
64	12	4,2					
68	5,6	-0,85					
72	8,1	1,0					
74	6,6	-0,097					
75	14	5,7	Outlier				
78	6,9	0,089					
81	6,8	0,00	ND				
85	20	9,7	Outlier				
87	7,0	0,15					
89	5,3	-1,1					
96	100	69	Outlier				
98	1,3	-4,0					
104	6,5	-0,19					
109	14	5,1					
111	4,8	-1,5					
120	7,6	0,62					

Consensus statistics

Consensus median, pg/g	6,8
Median all values pg/g	7,1
Consensus mean, pg/g	6,7
Standard deviation, pg/g	3,1
Relative standard deviation, %	46
No. of values reported	41
No. of values removed	6
No. of reported non-detects	2

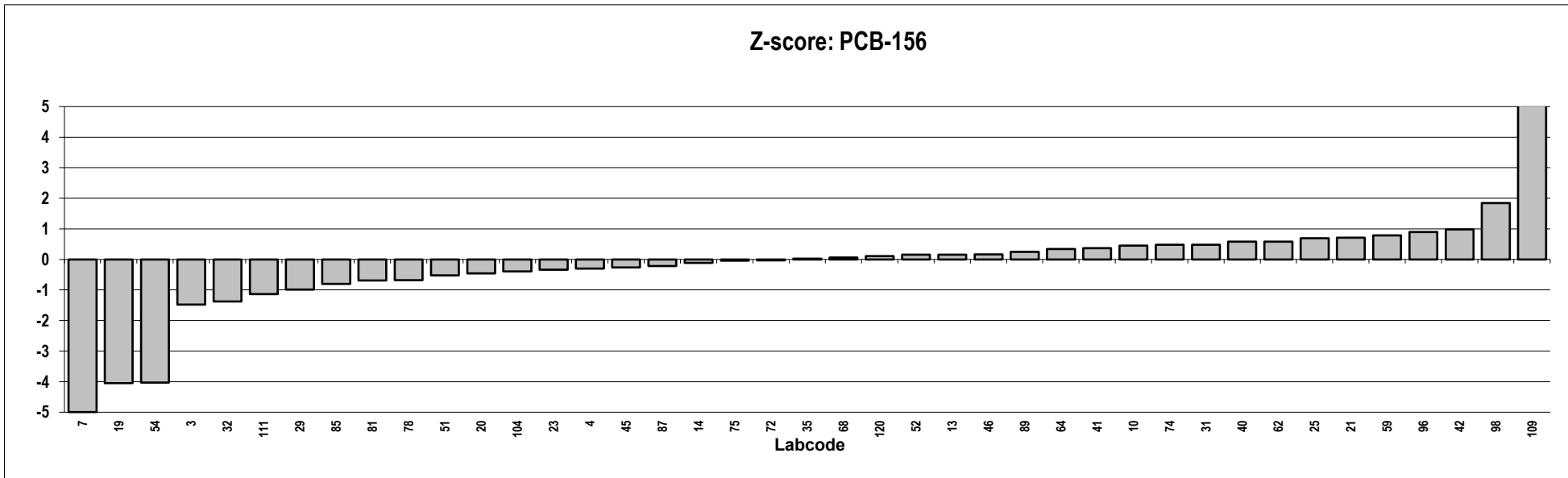
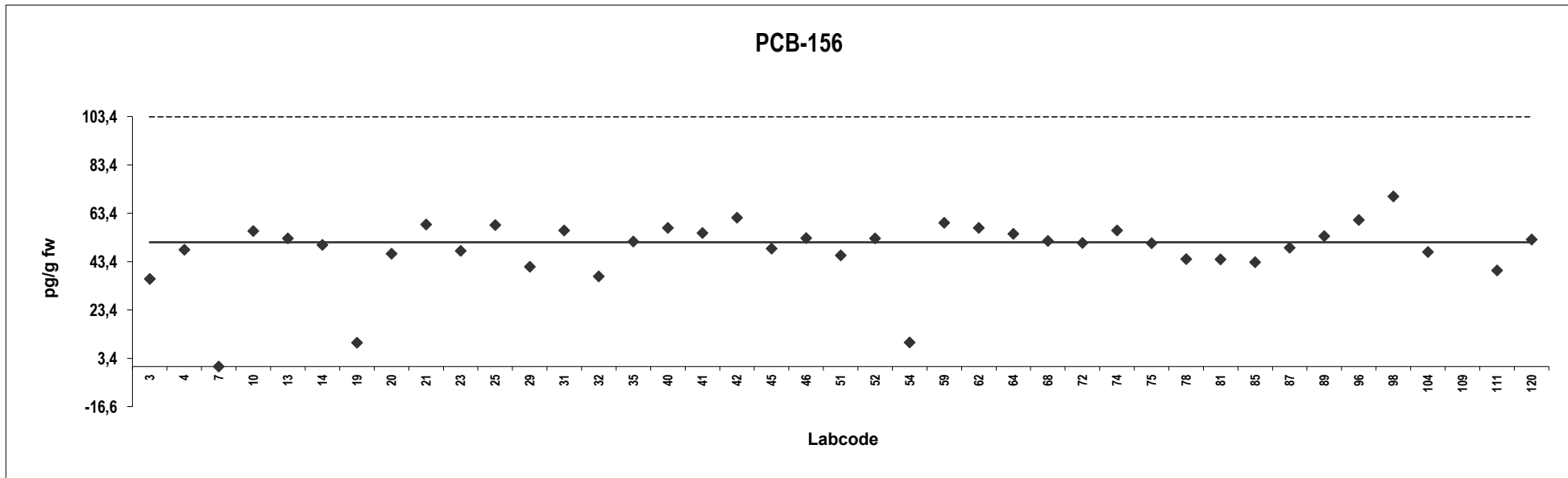


Halibut
Congener: PCB-156

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	36	-1,5					
4	48	-0,30					
7	0,0014	-5,0					
10	56	0,45					
13	53	0,15					
14	50	-0,11					
19	9,8	-4,0					
20	47	-0,46					
21	59	0,71					
23	48	-0,34					
25	59	0,69					
29	41	-0,98					
31	56	0,48					
32	37	-1,4					
35	52	0,029					
40	57	0,58					
41	55	0,37					
42	62	0,98					
45	49	-0,26					
46	53	0,16					
51	46	-0,53					
52	53	0,15					
54	10	-4,0	ND				
59	60	0,79					
62	57	0,58					
64	55	0,34					
68	52	0,057					
72	51	-0,029					
74	56	0,48					
75	51	-0,039					
78	44	-0,68					
81	44	-0,69					
85	43	-0,80					
87	49	-0,22					
89	54	0,25					
96	61	0,90					
98	70	1,8					
104	47	-0,39					
109	134	8,1	Outlier				
111	40	-1,1					
120	53	0,11					

Consensus statistics

Consensus median, pg/g	51
Median all values pg/g	52
Consensus mean, pg/g	48
Standard deviation, pg/g	14
Relative standard deviation, %	29
No. of values reported	41
No. of values removed	1
No. of reported non-detects	1

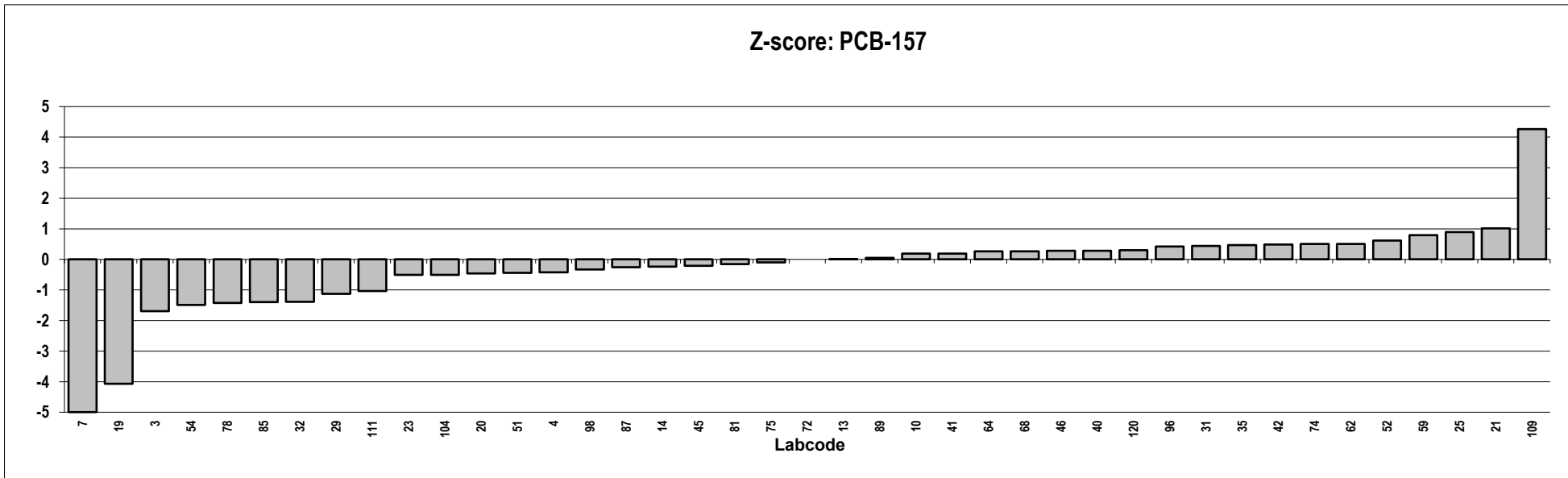
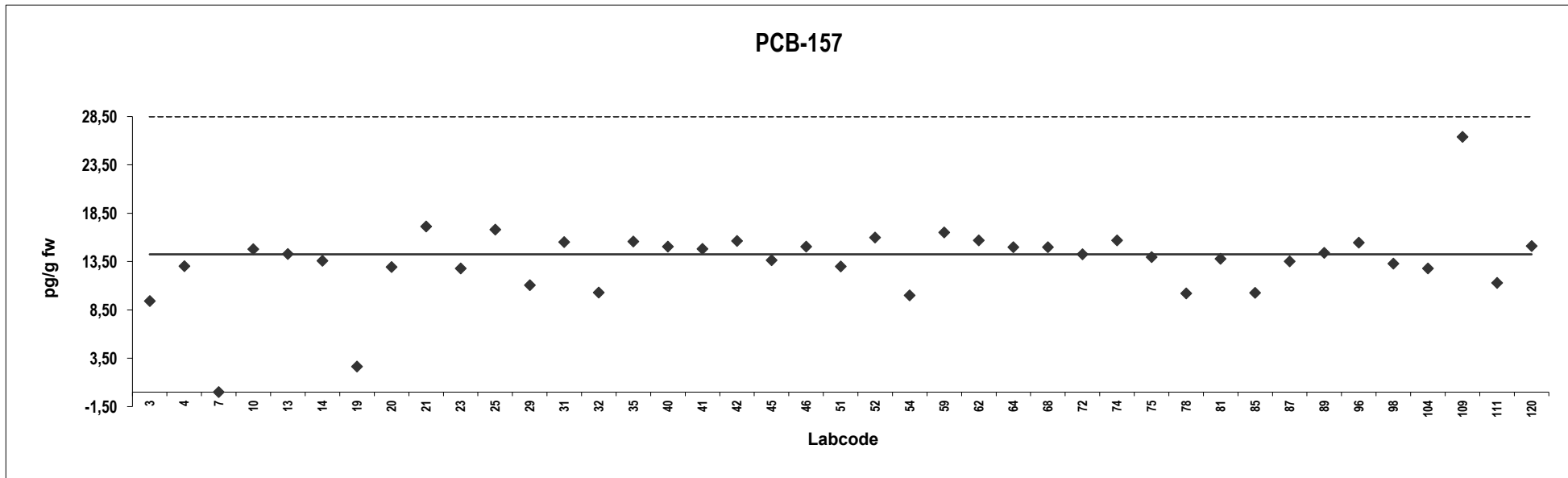


Halibut
Congener: PCB-157

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Notes
3	9,4	-1,7				
4	13	-0,43				
7	0,00038	-5,0				
10	15	0,19				
13	14	0,011				
14	14	-0,24				
19	2,7	-4,1				
20	13	-0,46				
21	17	1,0				
23	13	-0,51				
25	17	0,89				
29	11	-1,1				
31	16	0,44				
32	10	-1,4				
35	16	0,47				
40	15	0,28				
41	15	0,19				
42	16	0,49				
45	14	-0,21				
46	15	0,28				
51	13	-0,44				
52	16	0,61				
54	10	-1,5	ND			
59	17	0,79				
62	16	0,51				
64	15	0,26				
68	15	0,26				
72	14	0,00				
74	16	0,51				
75	14	-0,10				
78	10	-1,4				
81	14	-0,16				
85	10	-1,4				
87	14	-0,26				
89	14	0,053				
96	15	0,42				
98	13	-0,33				
104	13	-0,51				
109	26	4,3				
111	11	-1,0				
120	15	0,30				

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, %	29
No. of values reported	41
No. of values removed	0
No. of reported non-detects	1

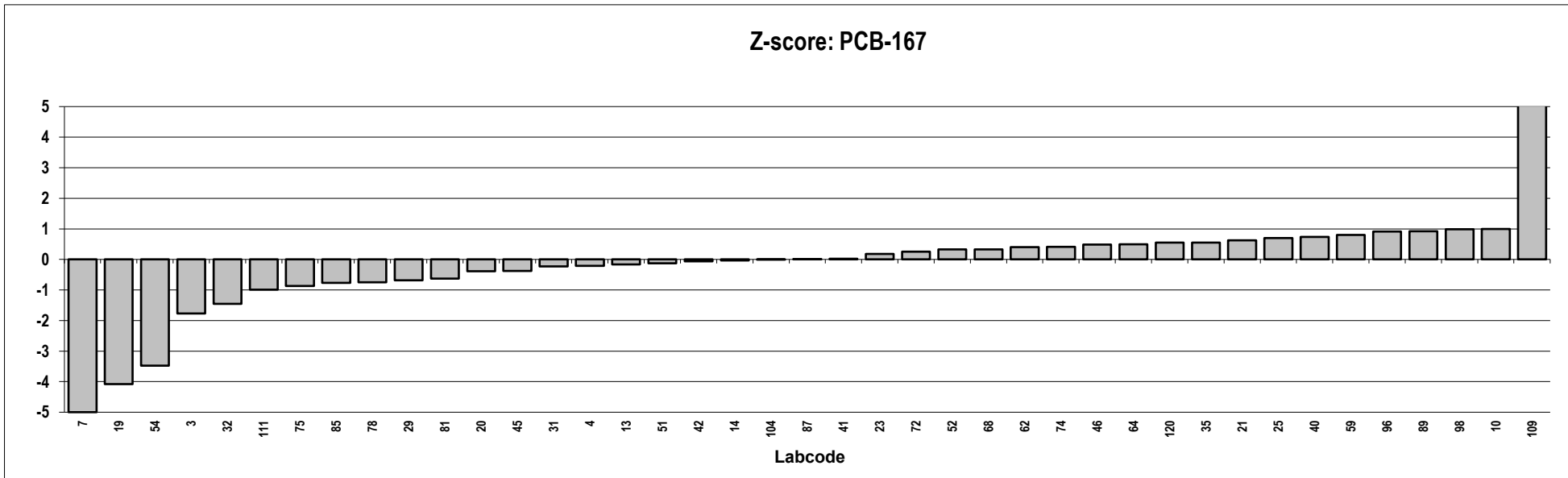
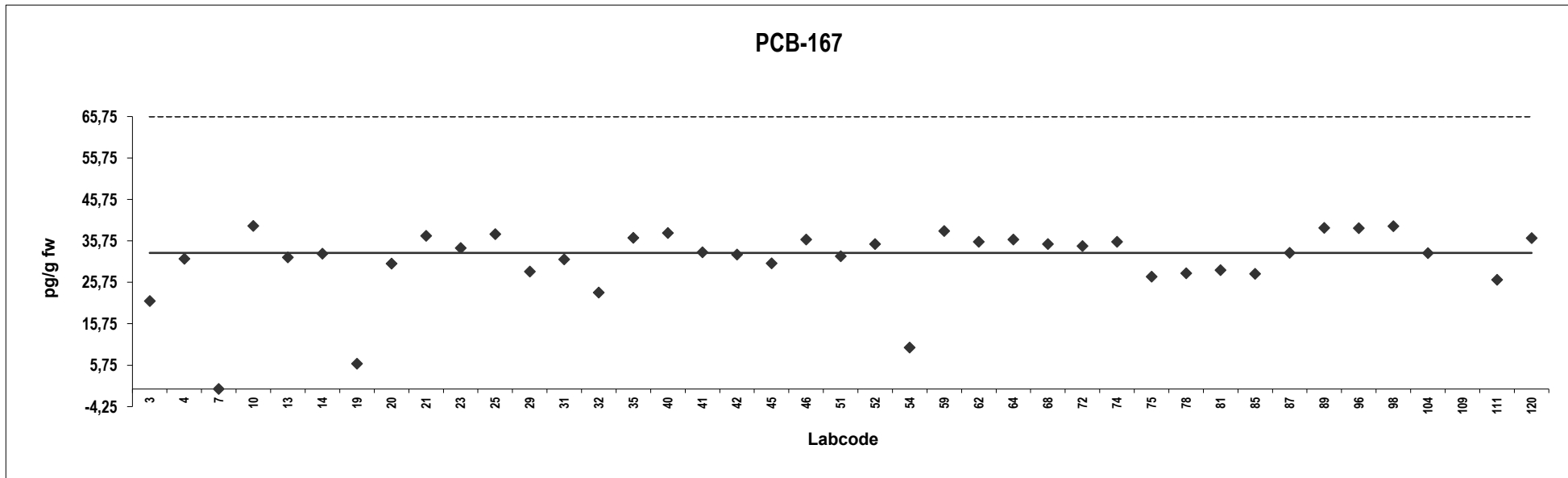


Halibut
Congener: PCB-167

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	21	-1,8					
4	31	-0,22					
7	0,0011	-5,0					
10	39	1,0					
13	32	-0,16					
14	33	-0,032					
19	6,1	-4,1					
20	30	-0,39					
21	37	0,62					
23	34	0,18					
25	37	0,69					
29	28	-0,69					
31	31	-0,23					
32	23	-1,5					
35	36	0,55					
40	38	0,74					
41	33	0,025					
42	32	-0,064					
45	30	-0,38					
46	36	0,49					
51	32	-0,13					
52	35	0,33					
54	10	-3,5	ND				
59	38	0,80					
62	36	0,41					
64	36	0,50					
68	35	0,33					
72	35	0,26					
74	36	0,41					
75	27	-0,87					
78	28	-0,75					
81	29	-0,63					
85	28	-0,77					
87	33	0,0056					
89	39	0,92					
96	39	0,91					
98	39	0,98					
104	33	-0,0056					
109	75	6,4	Outlier				
111	26	-0,99					
120	36	0,55					

Consensus statistics

Consensus median, pg/g	33
Median all values pg/g	33
Consensus mean, pg/g	31
Standard deviation, pg/g	8,6
Relative standard deviation, %	28
No. of values reported	41
No. of values removed	1
No. of reported non-detects	1

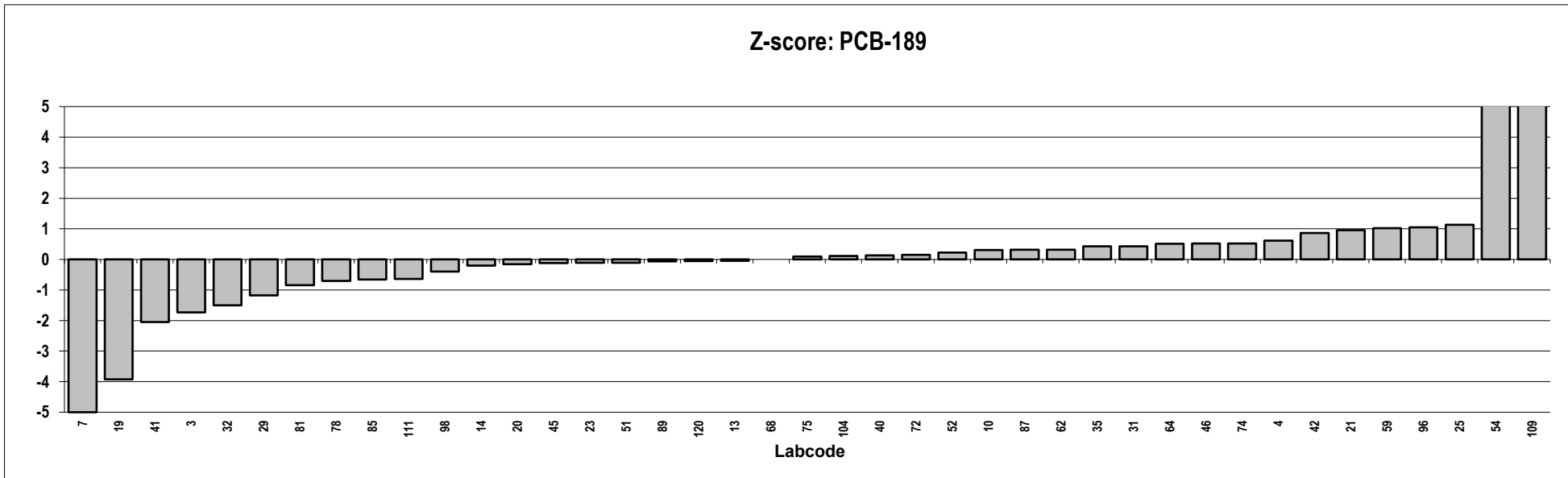
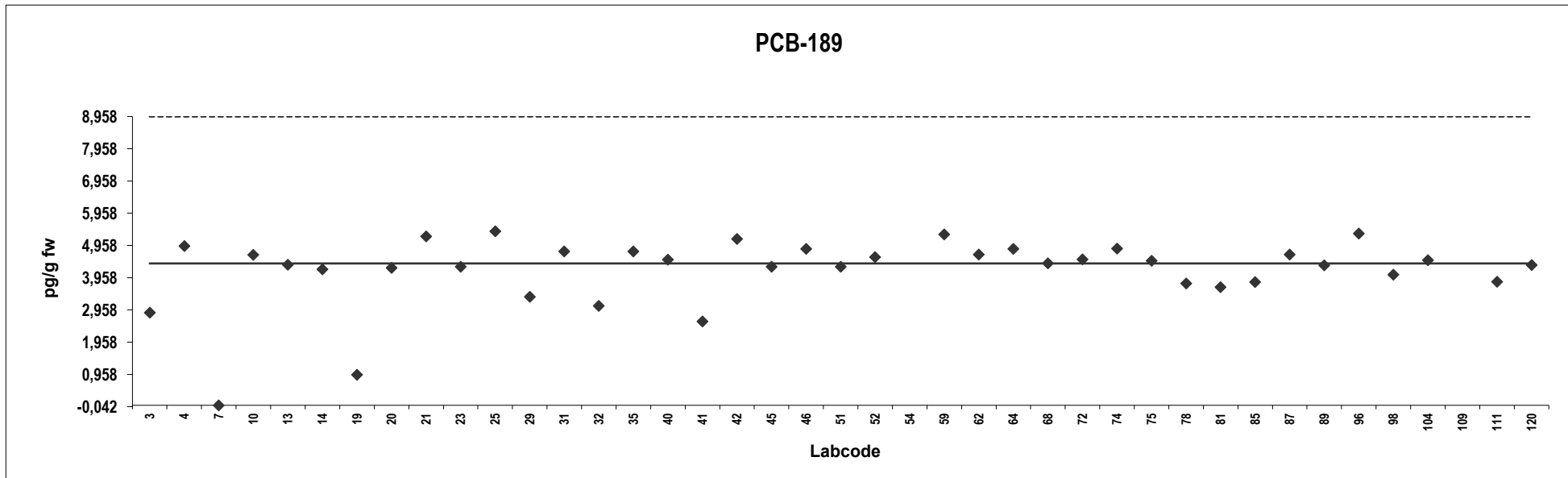


Halibut
Congener: PCB-189

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	2,9	-1,7					
4	4,9	0,61					
7	0,00018	-5,0					
10	4,7	0,31					
13	4,4	-0,045					
14	4,2	-0,21					
19	0,95	-3,9					
20	4,3	-0,15					
21	5,2	0,95					
23	4,3	-0,11					
25	5,4	1,1					
29	3,4	-1,2					
31	4,8	0,43					
32	3,1	-1,5					
35	4,8	0,42					
40	4,5	0,13					
41	2,6	-2,0	ND				
42	5,2	0,86					
45	4,3	-0,12					
46	4,9	0,52					
51	4,3	-0,11					
52	4,6	0,23					
54	10	6,4	Outlier,ND				
59	5,3	1,0					
62	4,7	0,32					
64	4,9	0,52					
68	4,4	0,00					
72	4,5	0,15					
74	4,9	0,52					
75	4,5	0,090					
78	3,8	-0,70					
81	3,7	-0,84					
85	3,8	-0,66					
87	4,7	0,31					
89	4,3	-0,068					
96	5,3	1,0					
98	4,1	-0,40					
104	4,5	0,11					
109	21	19	Outlier				
111	3,8	-0,64					
120	4,4	-0,052					

Consensus statistics

Consensus median, pg/g	4,4
Median all values pg/g	4,5
Consensus mean, pg/g	4,2
Standard deviation, pg/g	1,1
Relative standard deviation, %	26
No. of values reported	41
No. of values removed	2
No. of reported non-detects	2

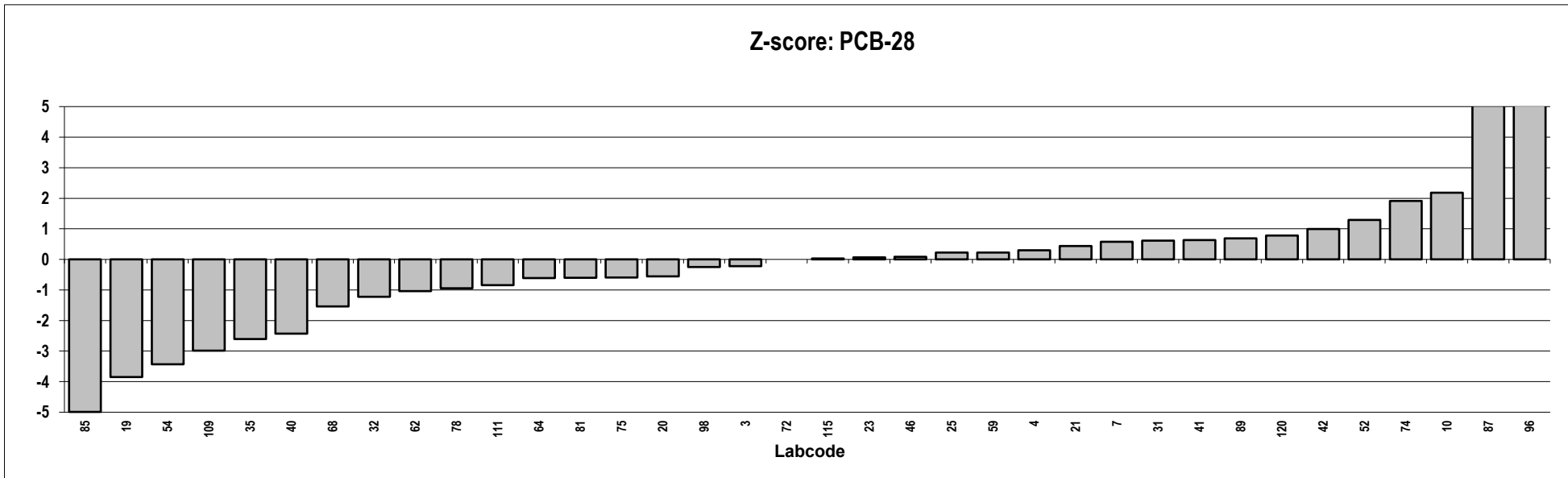
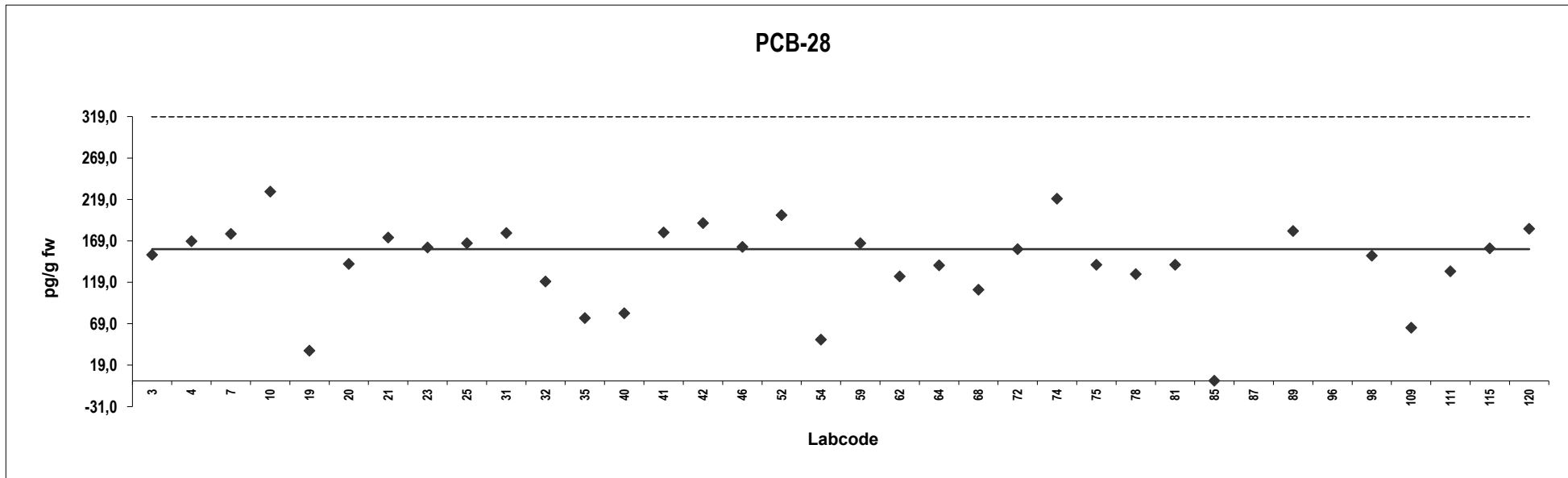


Halibut
Congener: PCB-28

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	152	-0,22					
4	169	0,30					
7	177	0,58					
10	228	2,2					
19	37	-3,8					
20	141	-0,56					
21	173	0,44					
23	161	0,063					
25	166	0,22					
31	179	0,62					
32	120	-1,2					
35	76	-2,6					
40	82	-2,4					
41	179	0,63					
42	190	0,99					
46	162	0,087					
52	200	1,3					
54	50	-3,4	ND				
59	166	0,22					
62	126	-1,0					
64	140	-0,61					
68	110	-1,5					
72	159	0,00					
74	220	1,9					
75	140	-0,59					
78	129	-0,94					
81	140	-0,60					
85	0,15	-5,0					
87	319	5,0	Outlier				
89	181	0,69					
96	414	8,0	Outlier				
98	151	-0,25					
109	64	-3,0					
111	132	-0,84					
115	160	0,031					
120	184	0,78					

Consensus statistics

Consensus median, pg/g	159
Median all values pg/g	160
Consensus mean, pg/g	142
Standard deviation, pg/g	51
Relative standard deviation, %	36
No. of values reported	36
No. of values removed	2
No. of reported non-detects	1

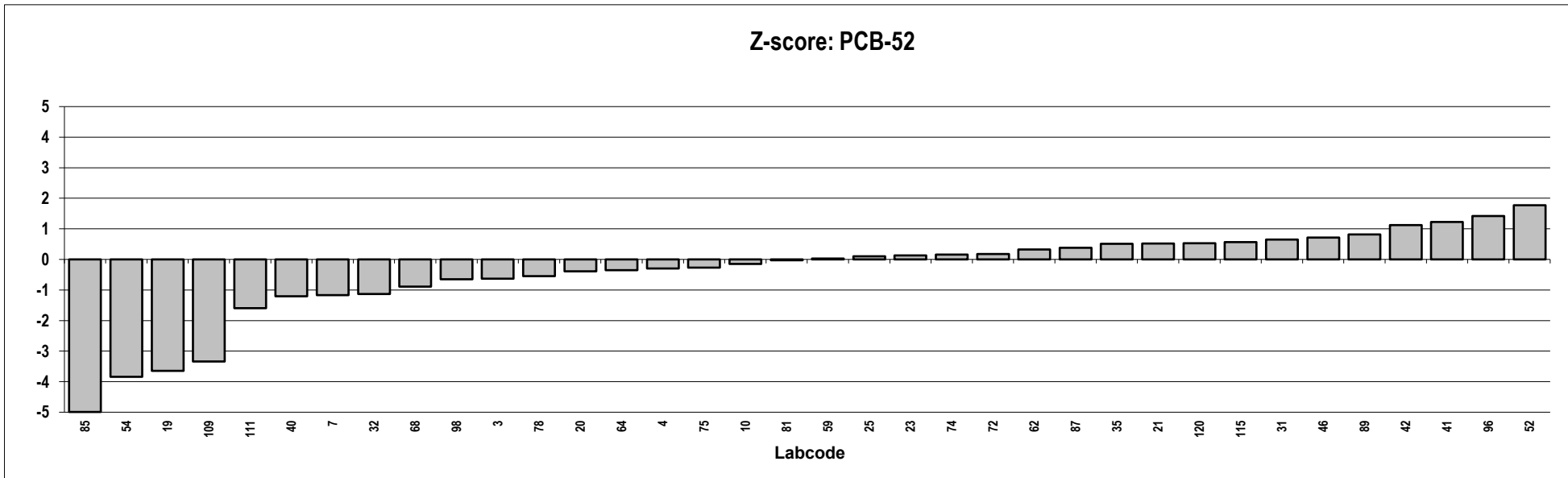
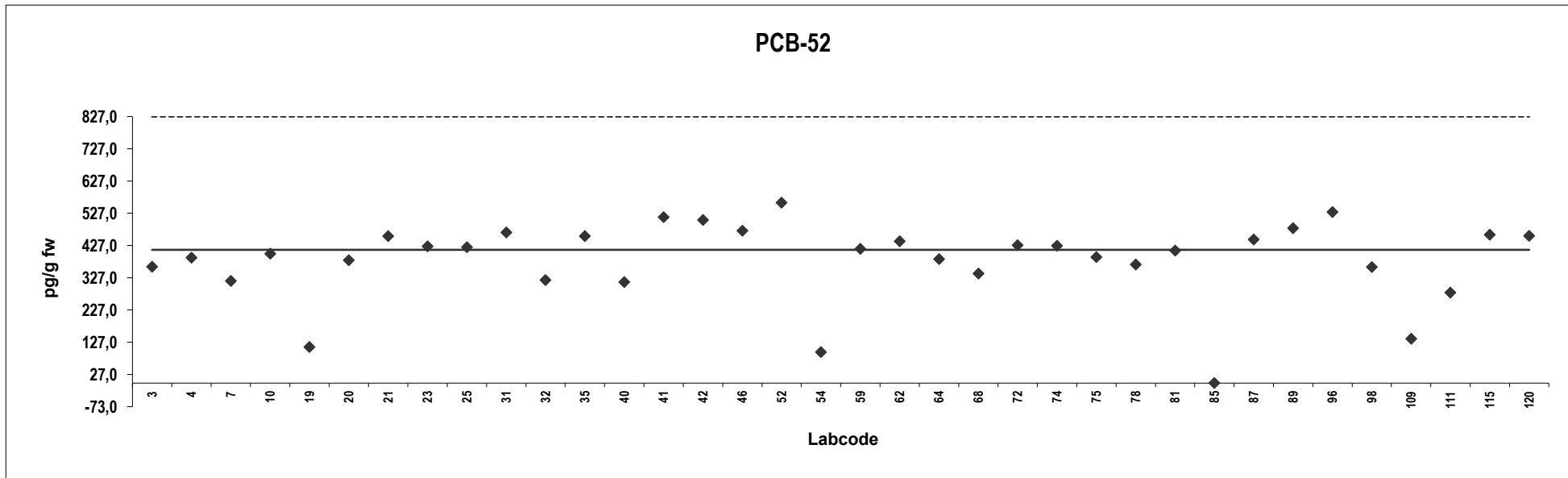


Halibut
Congener: PCB-52

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	361	-0,63					
4	389	-0,30					
7	317	-1,2					
10	401	-0,15					
19	112	-3,6					
20	381	-0,39					
21	456	0,52					
23	424	0,13					
25	422	0,10					
31	467	0,65					
32	320	-1,1					
35	456	0,51					
40	314	-1,2					
41	515	1,2					
42	507	1,1					
46	473	0,72					
52	560	1,8					
54	96	-3,8					
59	416	0,030					
62	440	0,32					
64	384	-0,35					
68	340	-0,89					
72	428	0,18					
74	426	0,16					
75	391	-0,27					
78	368	-0,55					
81	411	-0,030					
85	0,38	-5,0					
87	445	0,38					
89	481	0,82					
96	531	1,4					
98	360	-0,65					
109	137	-3,3					
111	281	-1,6					
115	460	0,56					
120	457	0,53					

Consensus statistics

Consensus median, pg/g	414
Median all values pg/g	414
Consensus mean, pg/g	381
Standard deviation, pg/g	124
Relative standard deviation, %	33
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

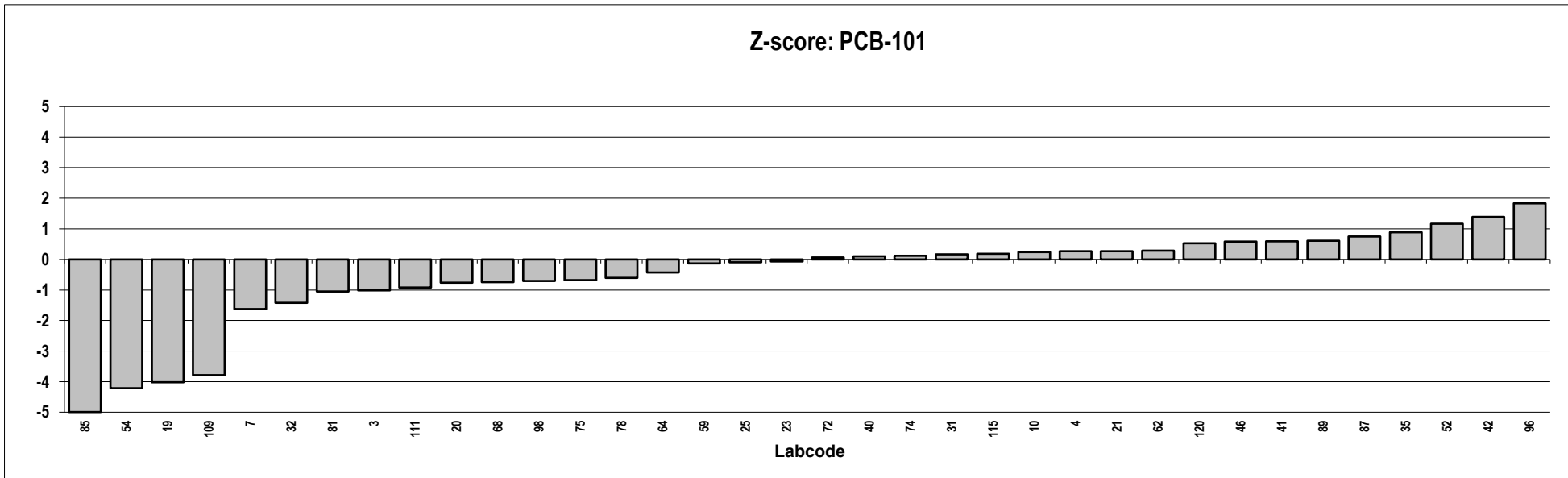
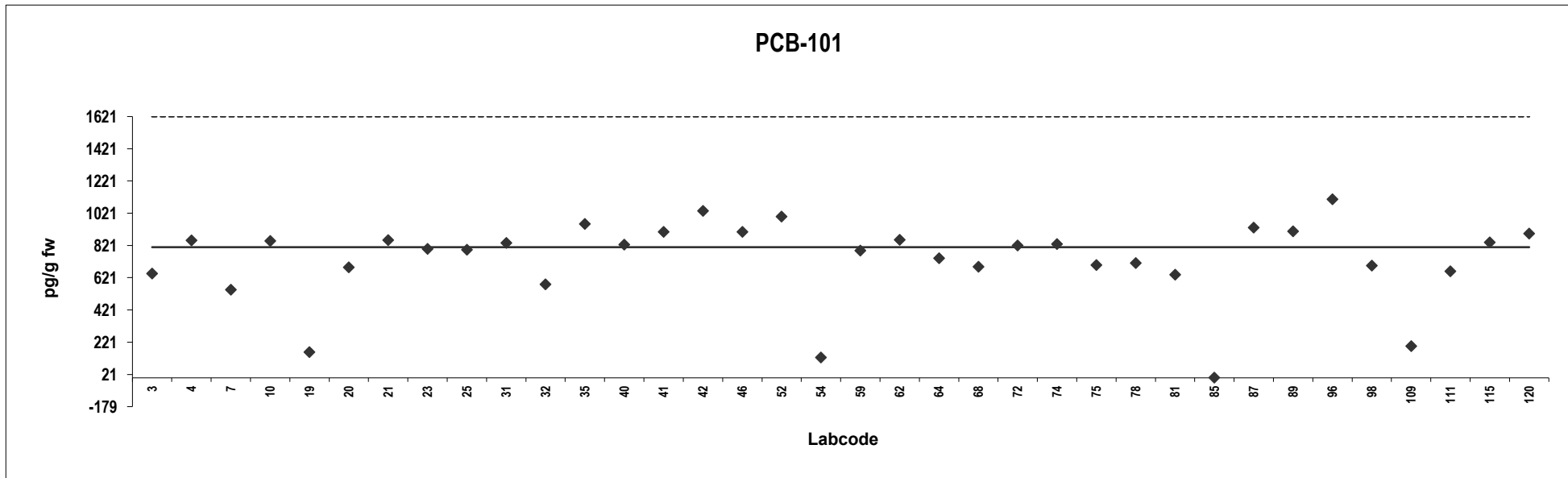


Halibut
Congener: PCB-101

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	647	-1,0					
4	853	0,26					
7	547	-1,6					
10	849	0,24					
19	159	-4,0					
20	686	-0,77					
21	854	0,27					
23	800	-0,066					
25	795	-0,097					
31	838	0,17					
32	580	-1,4					
35	955	0,89					
40	827	0,10					
41	906	0,59					
42	1036	1,4					
46	905	0,58					
52	1000	1,2					
54	127	-4,2					
59	789	-0,13					
62	857	0,29					
64	741	-0,43					
68	690	-0,74					
72	821	0,066					
74	830	0,12					
75	701	-0,68					
78	712	-0,61					
81	640	-1,1					
85	0,75	-5,0					
87	932	0,75					
89	910	0,61					
96	1109	1,8					
98	696	-0,71					
109	196	-3,8					
111	661	-0,92					
115	840	0,18					
120	896	0,52					

Consensus statistics

Consensus median, pg/g	811
Median all values pg/g	811
Consensus mean, pg/g	733
Standard deviation, pg/g	253
Relative standard deviation, %	34
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

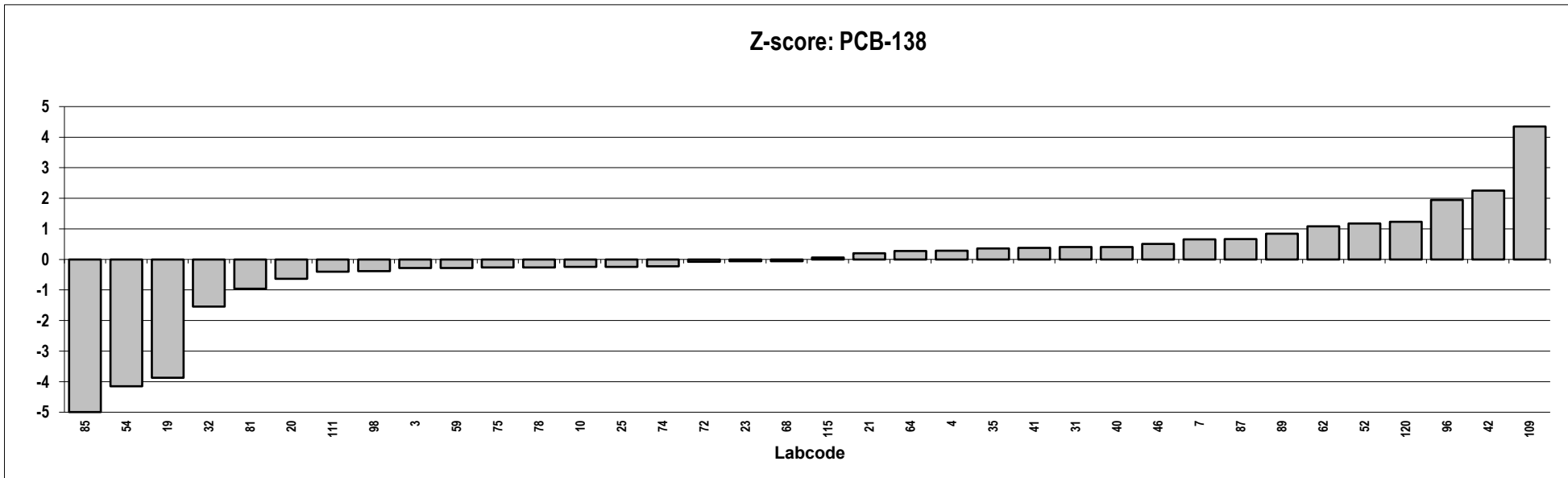
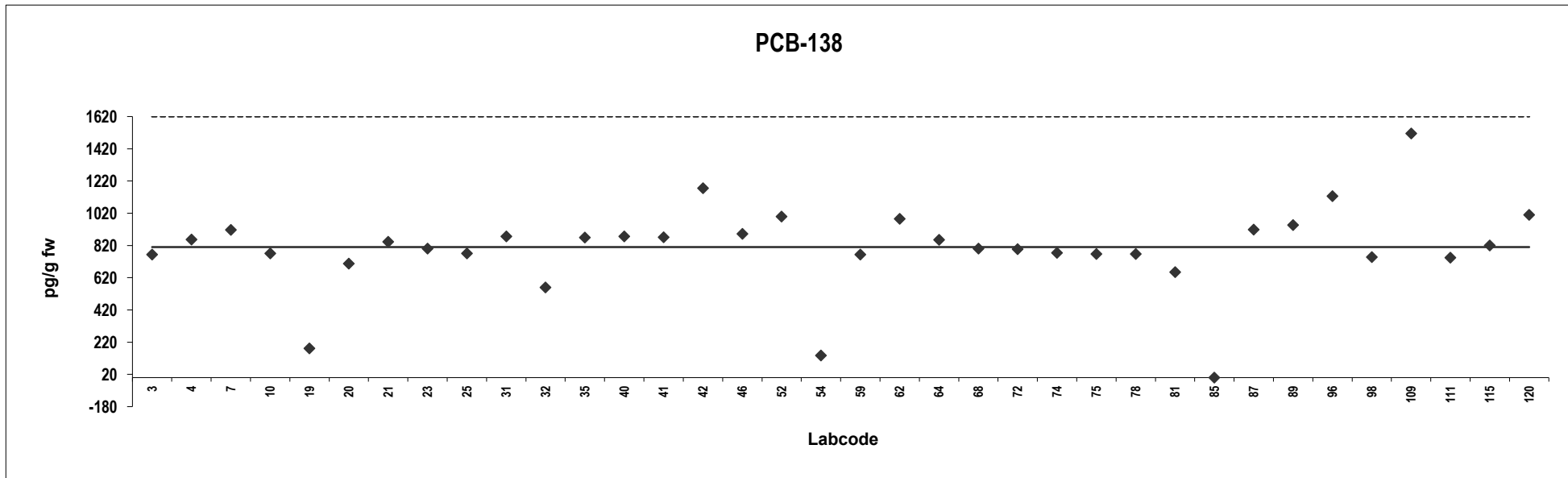


Halibut
Congener: PCB-138

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	764	-0,28					
4	856	0,29					
7	916	0,66					
10	770	-0,24					
19	182	-3,9					
20	707	-0,63					
21	843	0,20					
23	800	-0,062					
25	771	-0,24					
31	876	0,41					
32	560	-1,5					
35	869	0,36					
40	876	0,41					
41	871	0,38					
42	1175	2,3					
46	892	0,51					
52	1000	1,2					
54	138	-4,1					
59	764	-0,28					
62	985	1,1					
64	855	0,28					
68	800	-0,062					
72	798	-0,077					
74	774	-0,22					
75	767	-0,26					
78	768	-0,26					
81	654	-0,96					
85	0,84	-5,0					
87	918	0,67					
89	946	0,84					
96	1126	1,9					
98	748	-0,38					
109	1515	4,3					
111	745	-0,40					
115	820	0,062					
120	1010	1,2					

Consensus statistics

Consensus median, pg/g	810
Median all values pg/g	810
Consensus mean, pg/g	802
Standard deviation, pg/g	268
Relative standard deviation, %	33
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

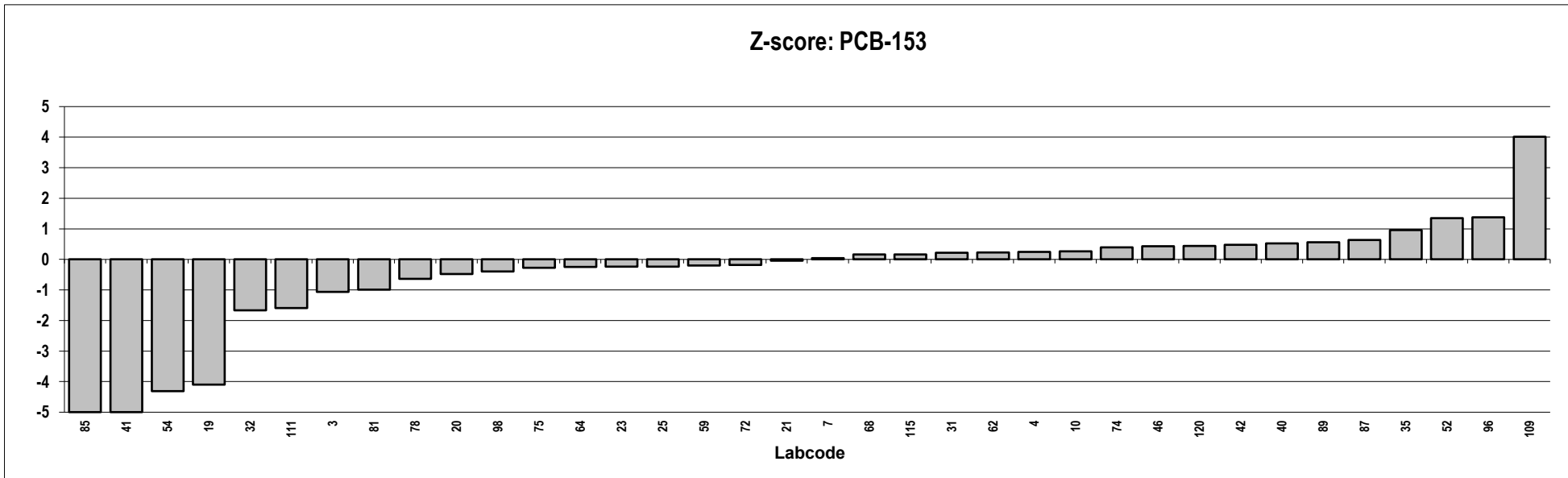
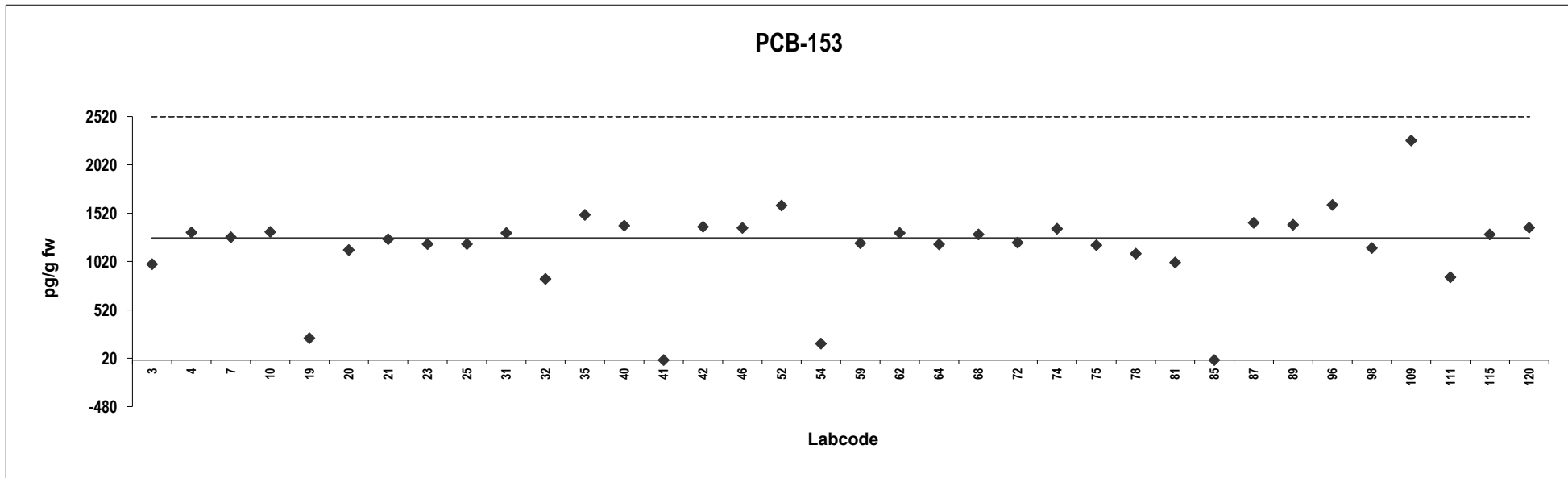


Halibut
Congener: PCB-153

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	992	-1,1					
4	1321	0,24					
7	1270	0,042					
10	1327	0,27					
19	227	-4,1					
20	1138	-0,48					
21	1249	-0,042					
23	1200	-0,24					
25	1200	-0,24					
31	1315	0,22					
32	840	-1,7					
35	1502	0,96					
40	1391	0,52					
41	1,3	-5,0					
42	1380	0,48					
46	1368	0,43					
52	1600	1,4					
54	173	-4,3					
59	1210	-0,20					
62	1316	0,22					
64	1197	-0,25					
68	1300	0,16					
72	1215	-0,18					
74	1359	0,39					
75	1190	-0,28					
78	1100	-0,63					
81	1010	-0,99					
85	1,1	-5,0					
87	1419	0,63					
89	1400	0,56					
96	1606	1,4					
98	1160	-0,40					
109	2272	4,0					
111	858	-1,6					
115	1300	0,16					
120	1371	0,44					

Consensus statistics

Consensus median, pg/g	1260
Median all values pg/g	1260
Consensus mean, pg/g	1161
Standard deviation, pg/g	449
Relative standard deviation, %	39
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

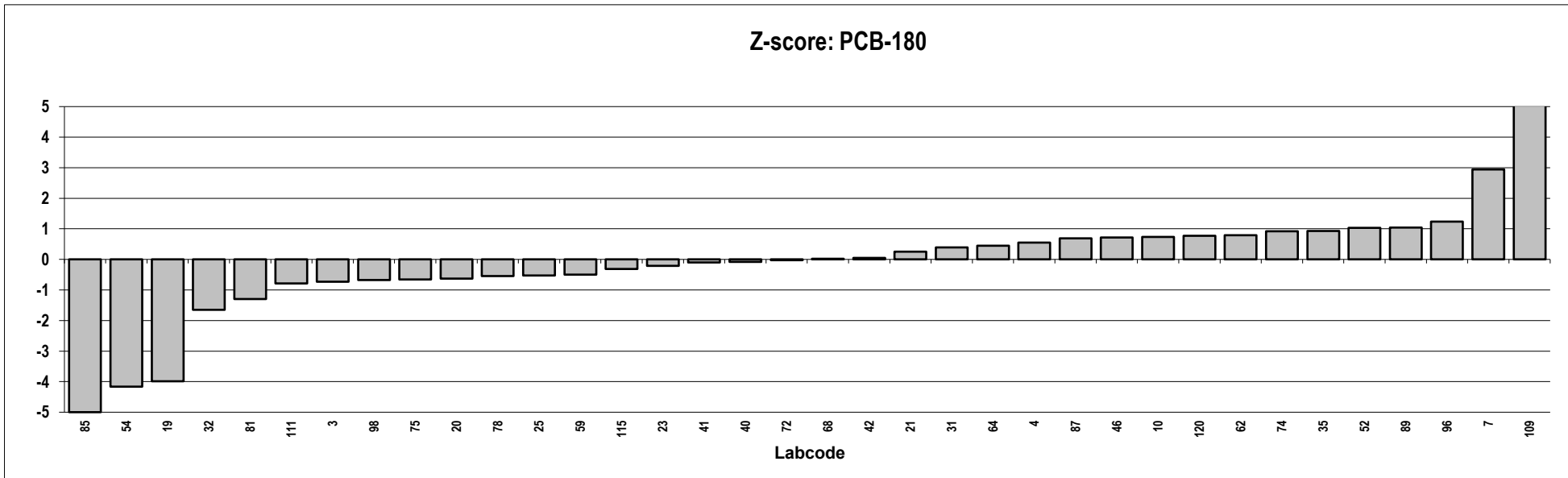
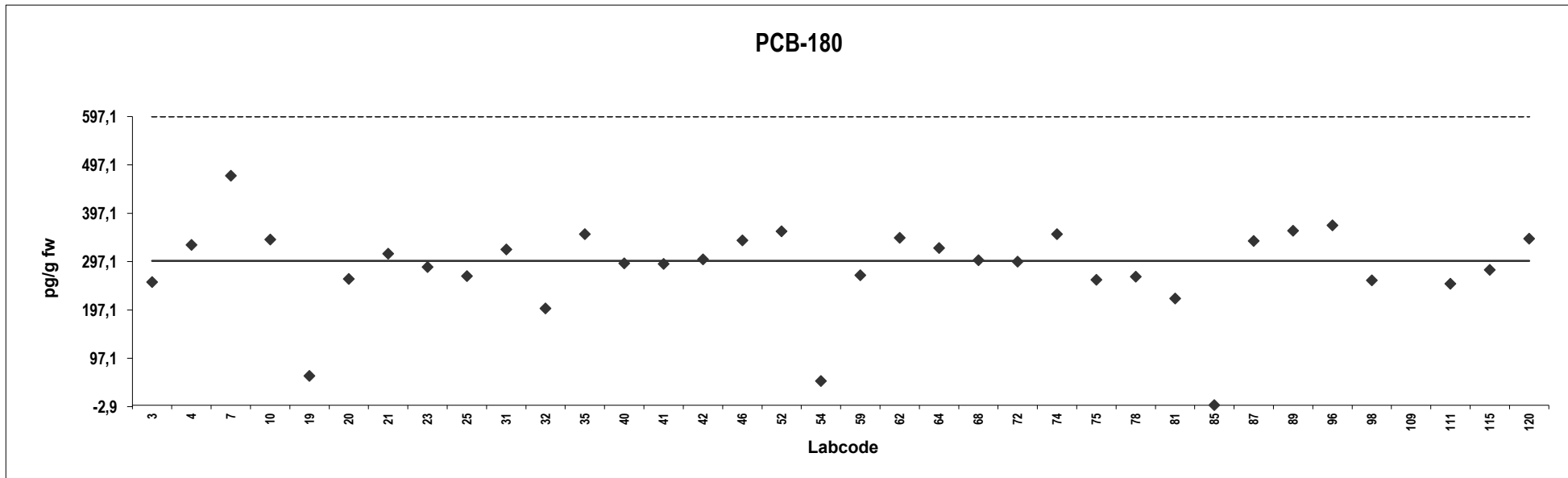


Halibut
Congener: PCB-180

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	255	-0,73					
4	332	0,55					
7	474	2,9					
10	343	0,74					
19	60	-4,0					
20	261	-0,62					
21	314	0,25					
23	286	-0,21					
25	267	-0,53					
31	322	0,39					
32	200	-1,7					
35	354	0,93					
40	293	-0,085					
41	292	-0,10					
42	301	0,047					
46	341	0,72					
52	360	1,0					
54	50	-4,2	ND				
59	269	-0,49					
62	346	0,79					
64	325	0,45					
68	300	0,024					
72	297	-0,024					
74	354	0,93					
75	259	-0,66					
78	266	-0,55					
81	221	-1,3					
85	0,27	-5,0					
87	340	0,69					
89	361	1,0					
96	372	1,2					
98	258	-0,68					
109	921	10	Outlier				
111	252	-0,79					
115	280	-0,31					
120	345	0,77					

Consensus statistics

Consensus median, pg/g	299
Median all values pg/g	299
Consensus mean, pg/g	284
Standard deviation, pg/g	92
Relative standard deviation, %	33
No. of values reported	36
No. of values removed	1
No. of reported non-detects	1

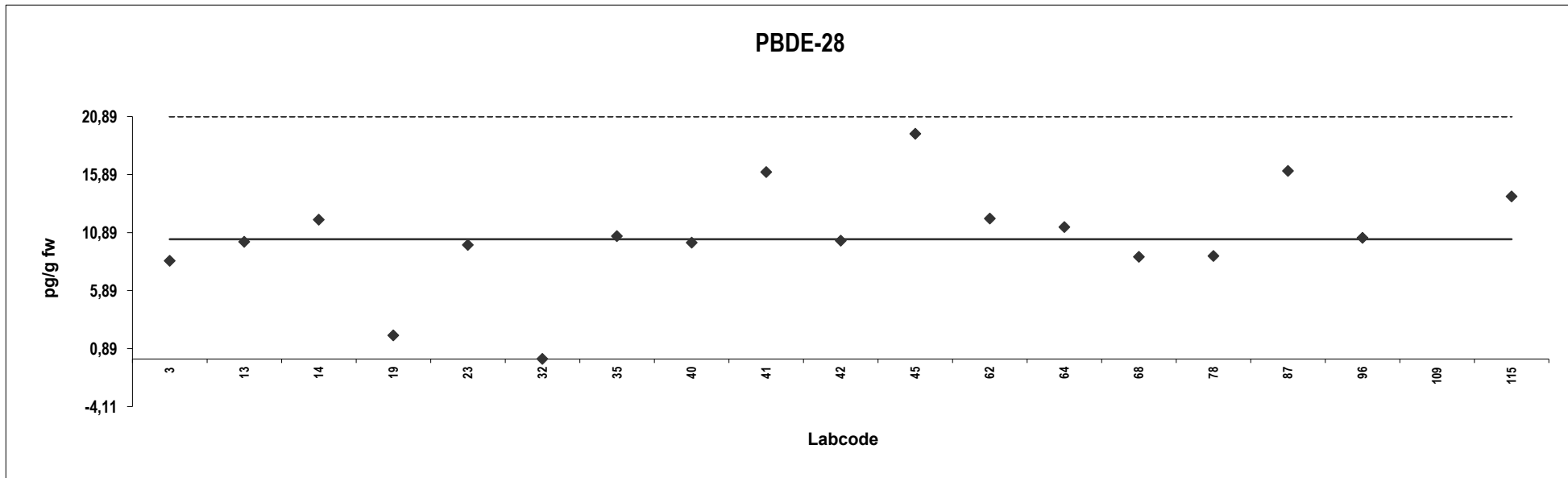


Halibut
Congener: PBDE-28

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	8,5	-0,90					
13	10	-0,11					
14	12	0,81					
19	2,0	-4,0					
23	9,8	-0,23					
32	0,0064	-5,0					
35	11	0,13					
40	10	-0,14					
41	16	2,8					
42	10	-0,062					
45	19	4,4					
62	12	0,86					
64	11	0,51					
68	8,8	-0,74					
78	8,9	-0,70					
87	16	2,9					
96	10	0,062					
109	32	11	Outlier				
115	14	1,8					

Consensus statistics

Consensus median, pg/g	10
Median all values pg/g	10
Consensus mean, pg/g	11
Standard deviation, pg/g	4,6
Relative standard deviation, %	43
No. of values reported	19
No. of values removed	1
No. of reported non-detects	0

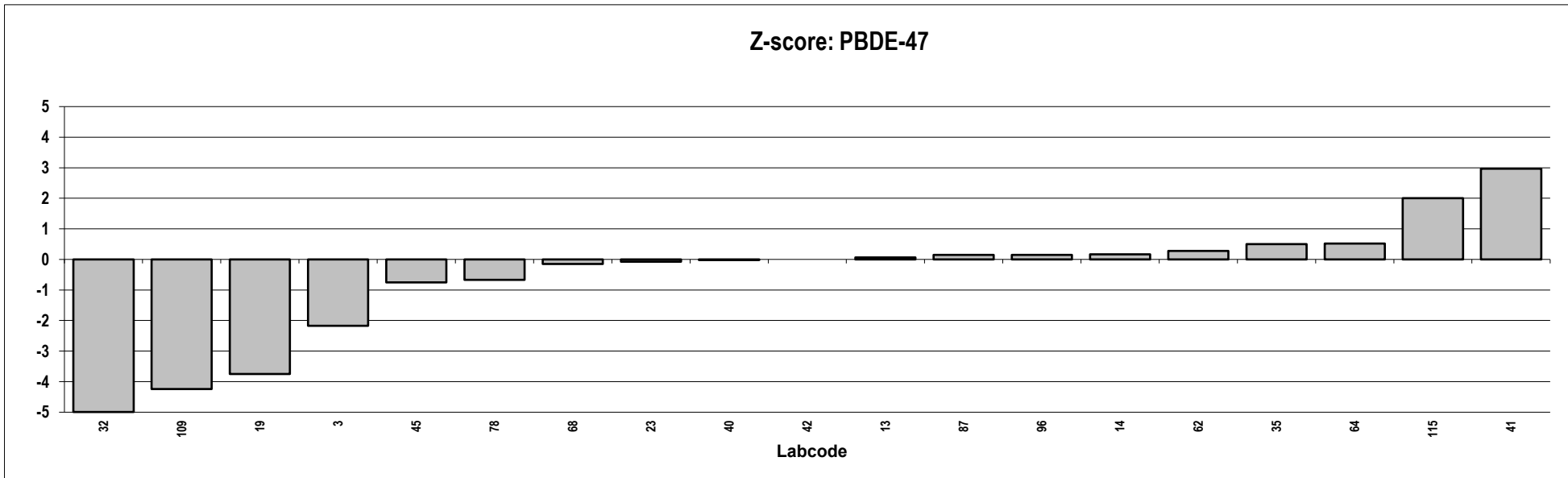
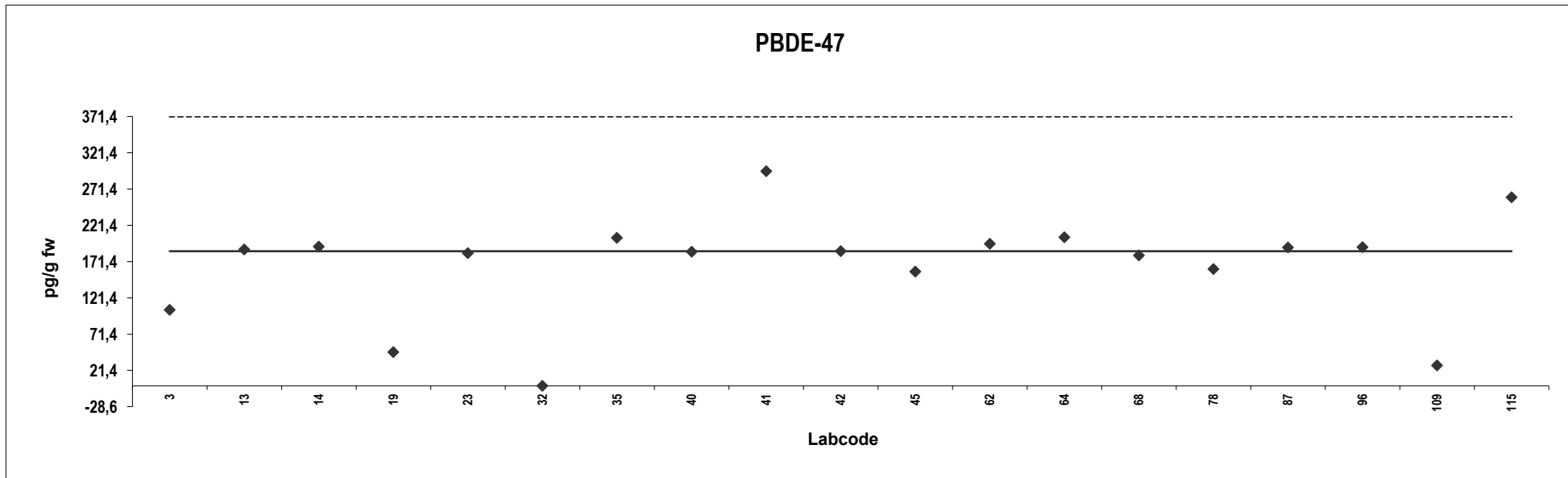


Halibut
Congener: PBDE-47

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	105	-2,2					
13	188	0,062					
14	192	0,17					
19	47	-3,7					
23	183	-0,073					
32	0,13	-5,0					
35	204	0,50					
40	185	-0,018					
41	296	3,0					
42	186	0,00					
45	158	-0,76					
62	196	0,28					
64	205	0,52					
68	180	-0,15					
78	161	-0,67					
87	191	0,14					
96	191	0,15					
109	28	-4,2					
115	260	2,0					

Consensus statistics

Consensus median, pg/g	186
Median all values pg/g	186
Consensus mean, pg/g	166
Standard deviation, pg/g	74
Relative standard deviation, %	44
No. of values reported	19
No. of values removed	0
No. of reported non-detects	0

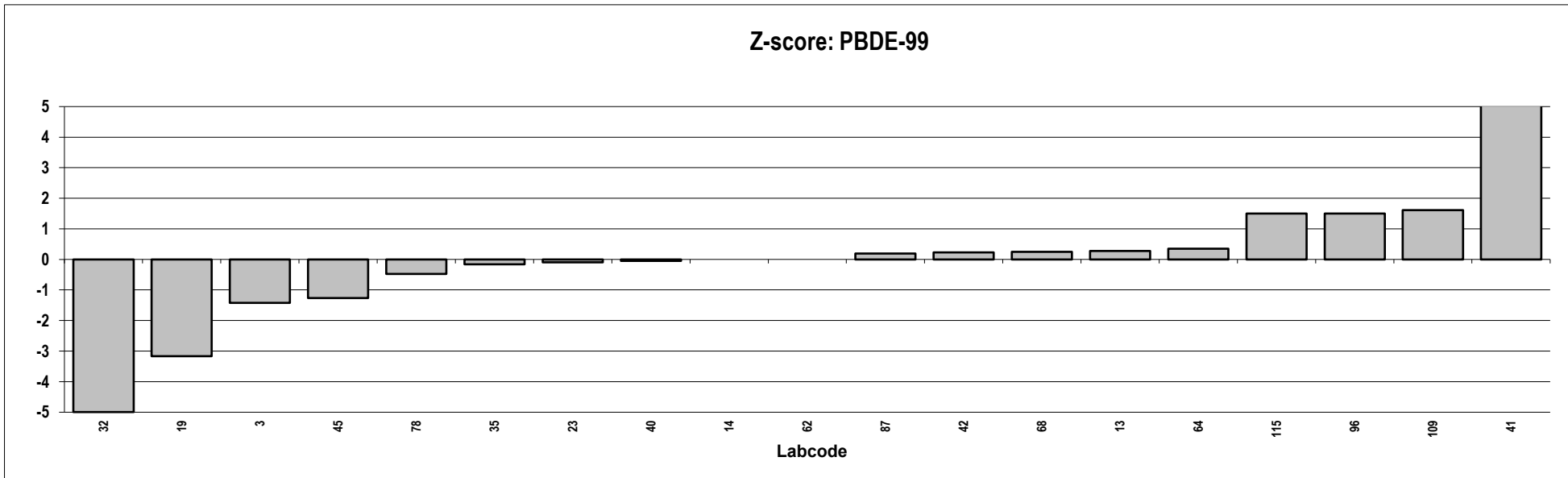
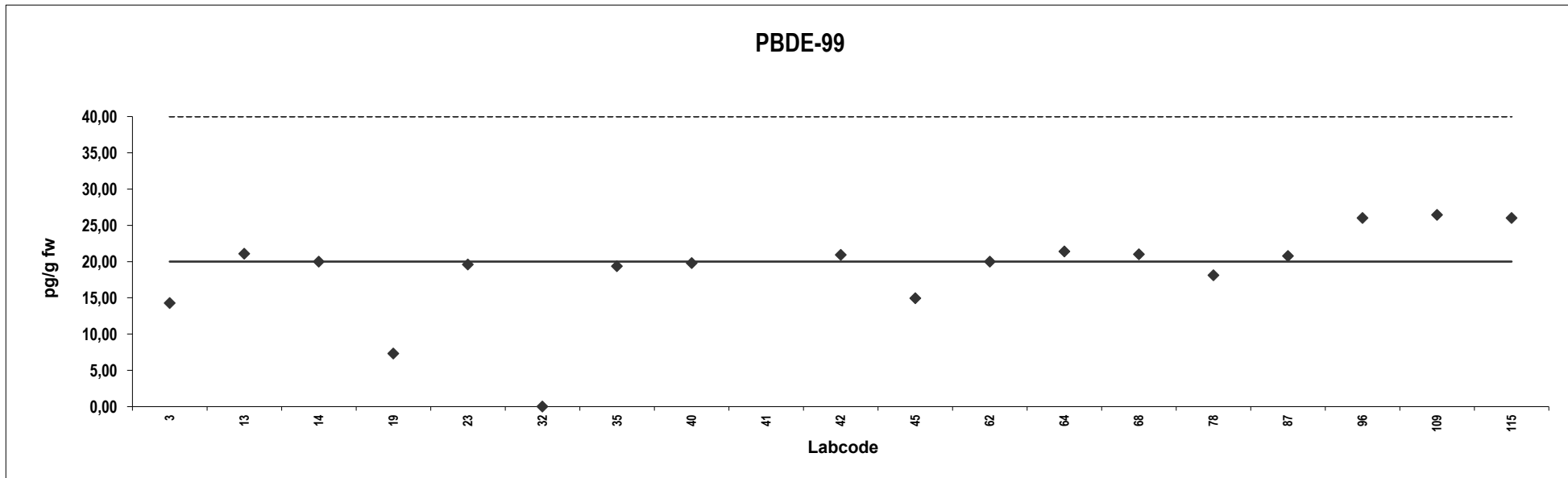


Halibut
Congener: PBDE-99

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	14	-1,4					
13	21	0,28					
14	20	0,00					
19	7,3	-3,2					
23	20	-0,10					
32	0,011	-5,0					
35	19	-0,16					
40	20	-0,048					
41	122	26	Outlier				
42	21	0,23					
45	15	-1,3					
62	20	0,00					
64	21	0,35					
68	21	0,25					
78	18	-0,48					
87	21	0,20					
96	26	1,5					
109	26	1,6					
115	26	1,5					

Consensus statistics

Consensus median, pg/g	20
Median all values pg/g	20
Consensus mean, pg/g	19
Standard deviation, pg/g	6,5
Relative standard deviation, %	35
No. of values reported	19
No. of values removed	1
No. of reported non-detects	0

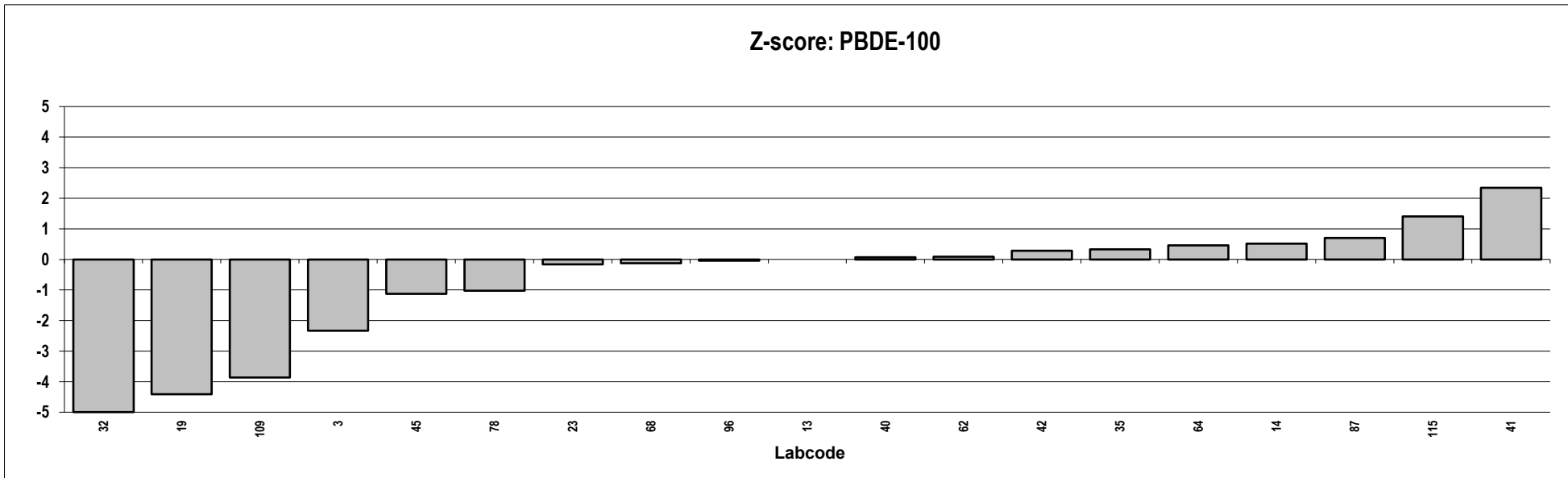
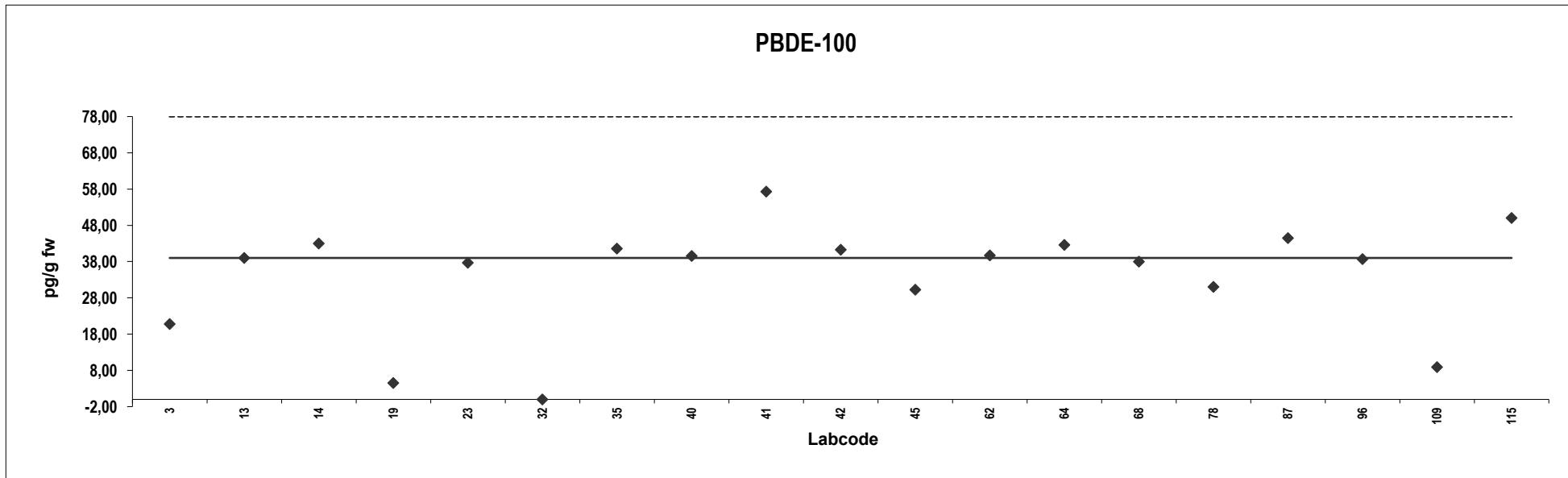


Halibut
Congener: PBDE-100

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	21	-2,3					
13	39	0,00					
14	43	0,51					
19	4,6	-4,4					
23	38	-0,17					
32	0,022	-5,0					
35	42	0,33					
40	40	0,071					
41	57	2,3					
42	41	0,29					
45	30	-1,1					
62	40	0,090					
64	43	0,46					
68	38	-0,13					
78	31	-1,0					
87	44	0,70					
96	39	-0,045					
109	8,9	-3,9					
115	50	1,4					

Consensus statistics

Consensus median, pg/g	39
Median all values pg/g	39
Consensus mean, pg/g	34
Standard deviation, pg/g	15
Relative standard deviation, %	45
No. of values reported	19
No. of values removed	0
No. of reported non-detects	0

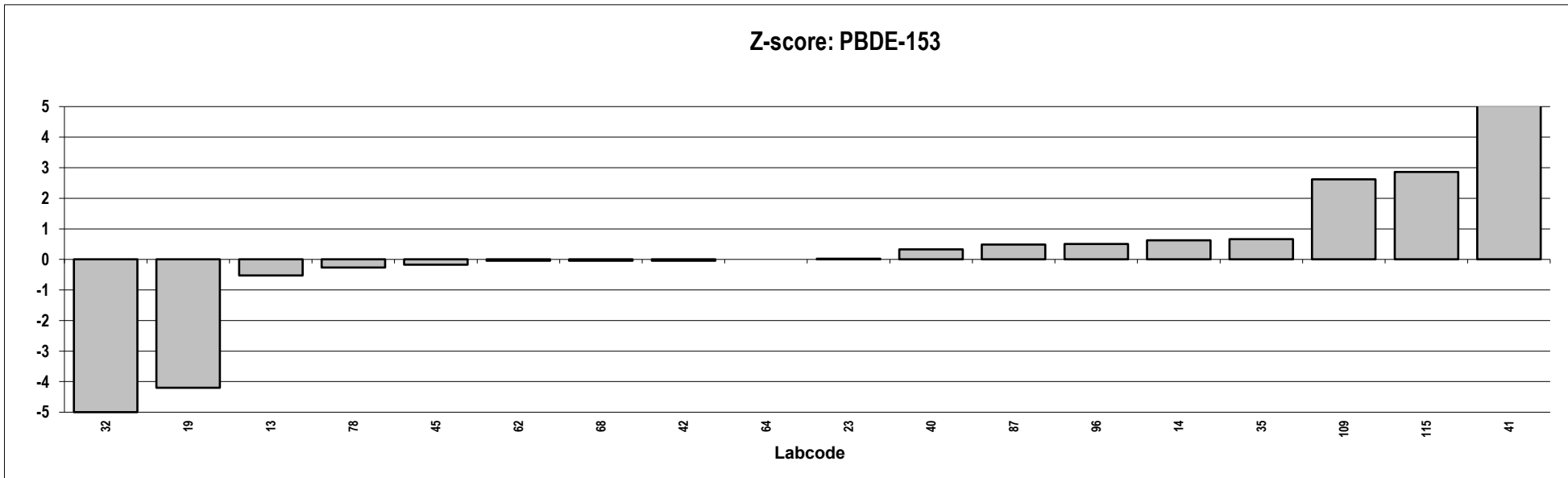
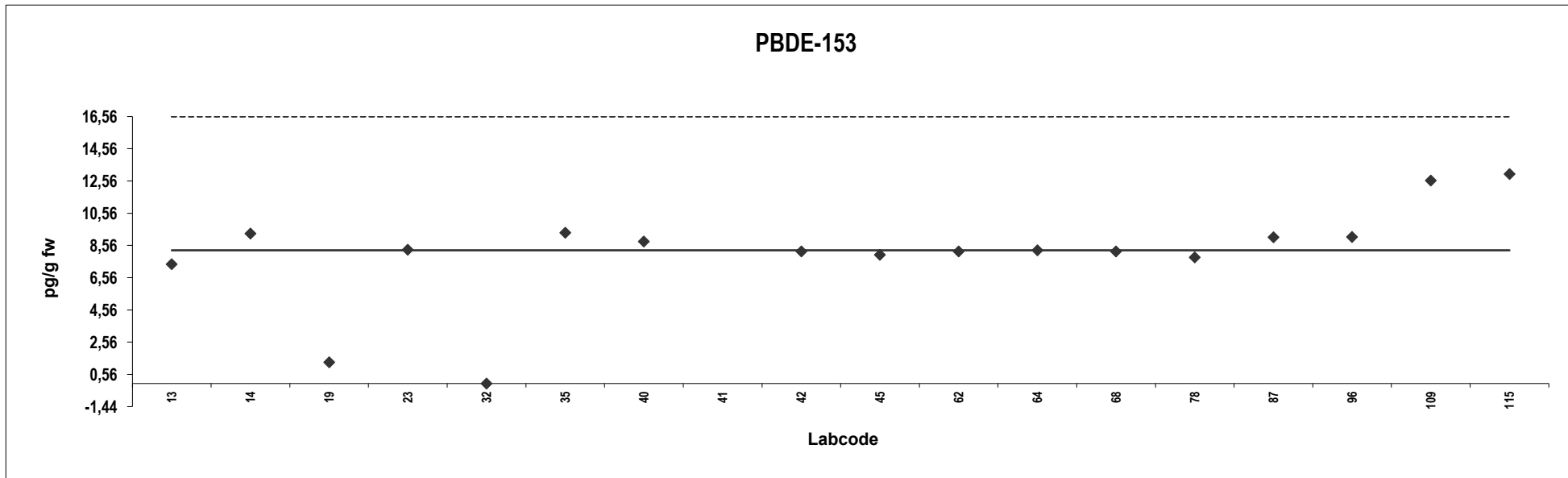


Halibut
Congener: PBDE-153

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
13	7,4	-0,52					
14	9,3	0,63					
19	1,3	-4,2					
23	8,3	0,021					
32	0,0051	-5,0					
35	9,4	0,66					
40	8,8	0,33					
41	18	5,9	Outlier				
42	8,2	-0,039					
45	8,0	-0,17					
62	8,2	-0,039					
64	8,3	0,00					
68	8,2	-0,039					
78	7,8	-0,27					
87	9,1	0,49					
96	9,1	0,50					
109	13	2,6					
115	13	2,9					

Consensus statistics

Consensus median, pg/g	8,3
Median all values pg/g	8,3
Consensus mean, pg/g	8,1
Standard deviation, pg/g	3,2
Relative standard deviation, %	39
No. of values reported	18
No. of values removed	1
No. of reported non-detects	0

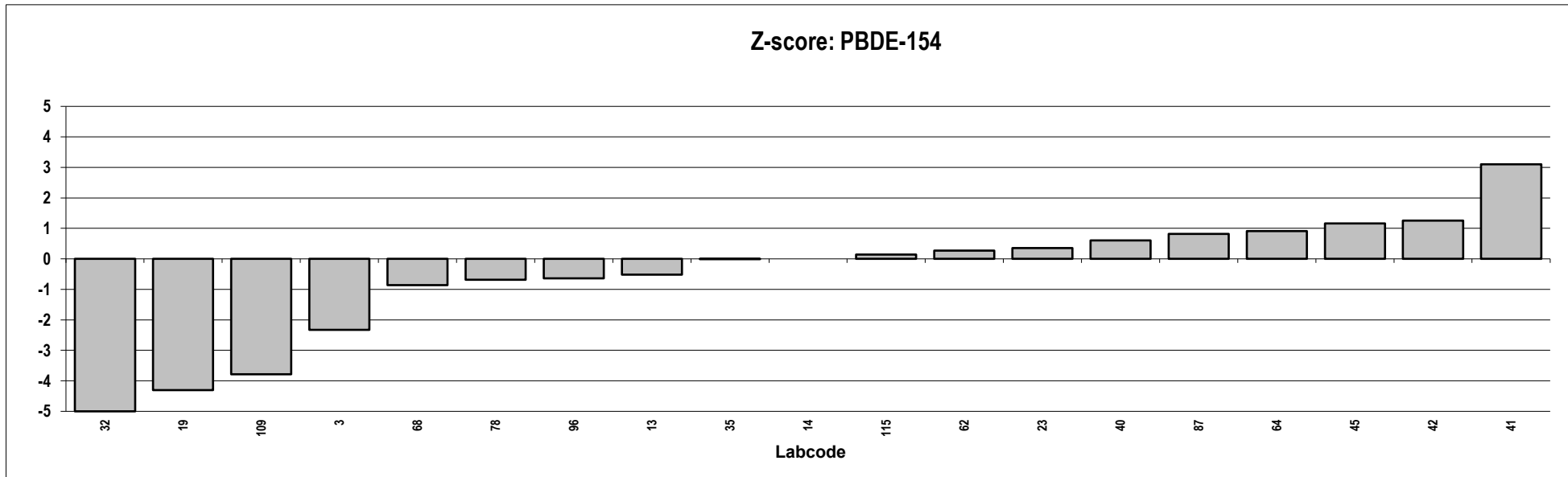
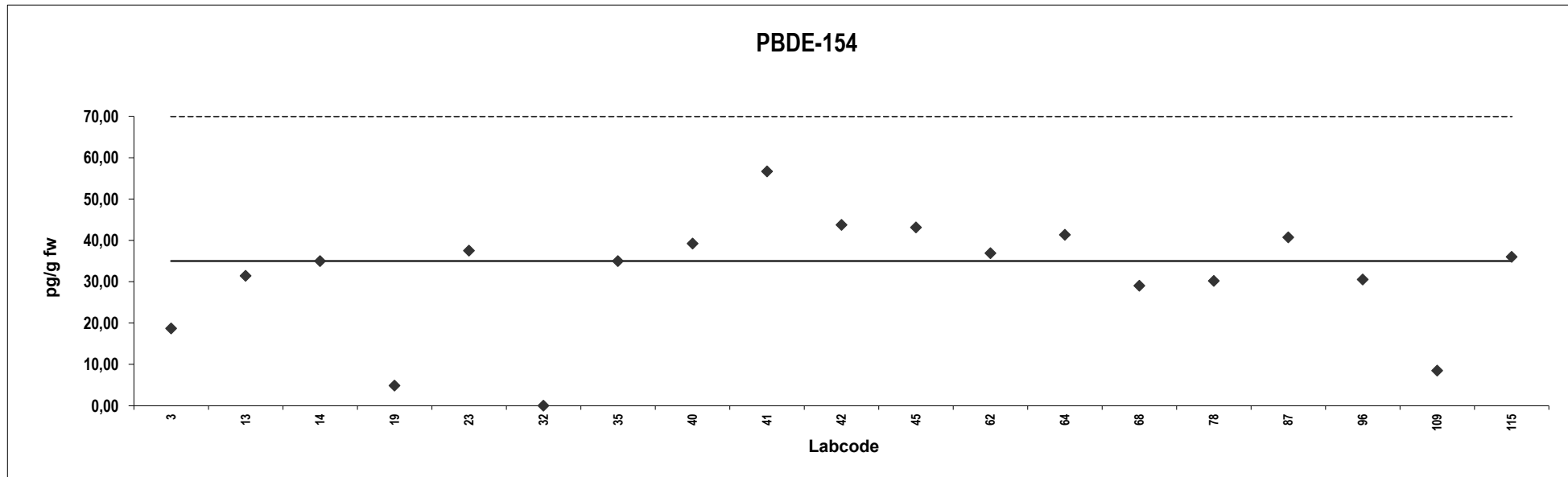


Halibut
Congener: PBDE-154

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	19	-2,3					
13	31	-0,51					
14	35	0,00					
19	4,9	-4,3					
23	38	0,36					
32	0,030	-5,0					
35	35	-0,0048					
40	39	0,60					
41	57	3,1					
42	44	1,3					
45	43	1,2					
62	37	0,27					
64	41	0,91					
68	29	-0,86					
78	30	-0,69					
87	41	0,82					
96	31	-0,64					
109	8,5	-3,8					
115	36	0,14					

Consensus statistics

Consensus median, pg/g	35
Median all values pg/g	35
Consensus mean, pg/g	32
Standard deviation, pg/g	14
Relative standard deviation, %	45
No. of values reported	19
No. of values removed	0
No. of reported non-detects	0

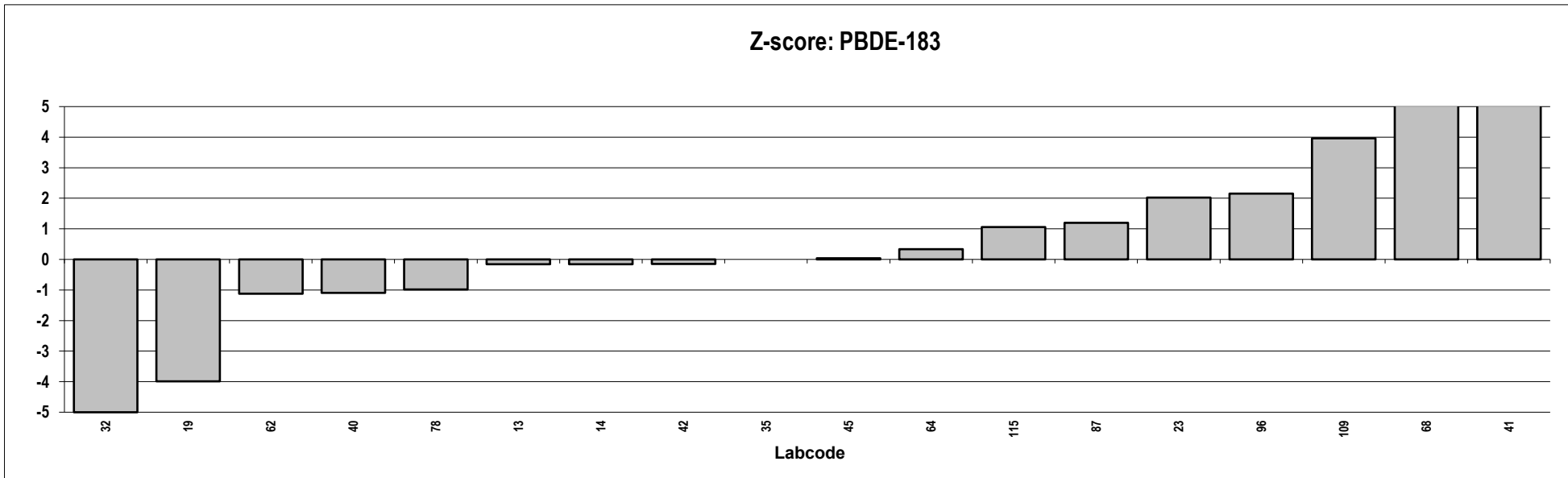
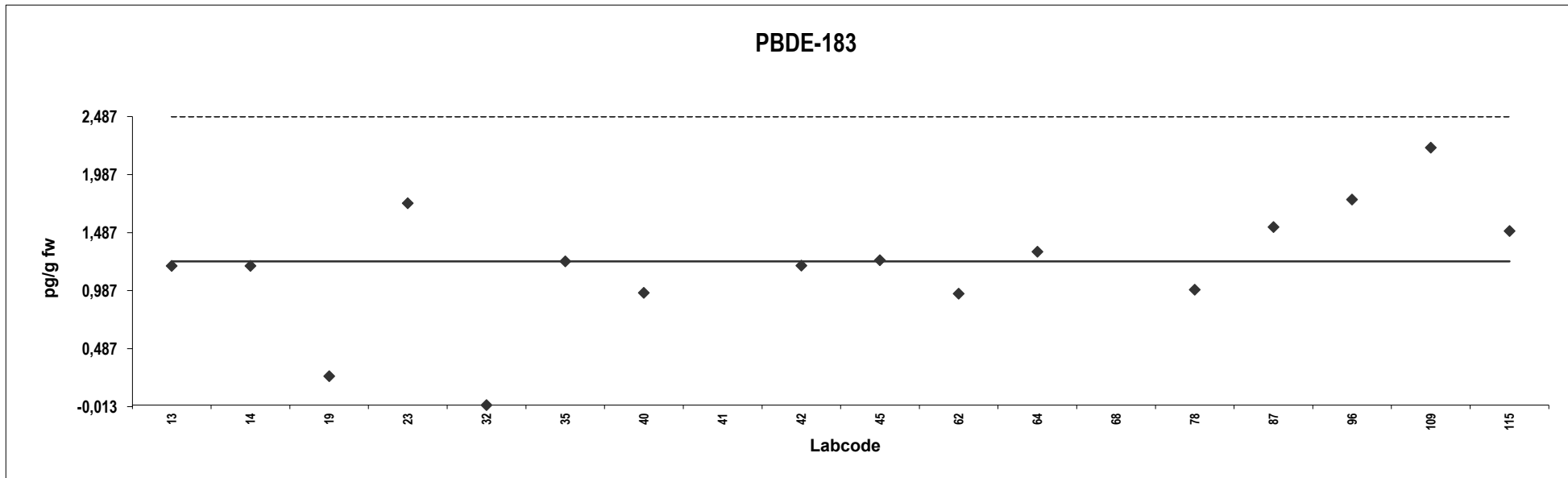


Halibut
Congener: PBDE-183

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
13	1,2	-0,16					
14	1,2	-0,16					
19	0,25	-4,0					
23	1,7	2,0					
32	0,00071	-5,0					
35	1,2	0,00					
40	0,97	-1,1					
41	6,3	21	Outlier,ND				
42	1,2	-0,15					
45	1,2	0,039					
62	0,96	-1,1					
64	1,3	0,33					
68	3,7	9,9	Outlier				
78	0,99	-0,99	ND				
87	1,5	1,2					
96	1,8	2,2					
109	2,2	4,0					
115	1,5	1,1					

Consensus statistics

Consensus median, pg/g	1,2
Median all values pg/g	1,2
Consensus mean, pg/g	1,2
Standard deviation, pg/g	0,54
Relative standard deviation, %	45
No. of values reported	18
No. of values removed	2
No. of reported non-detects	2

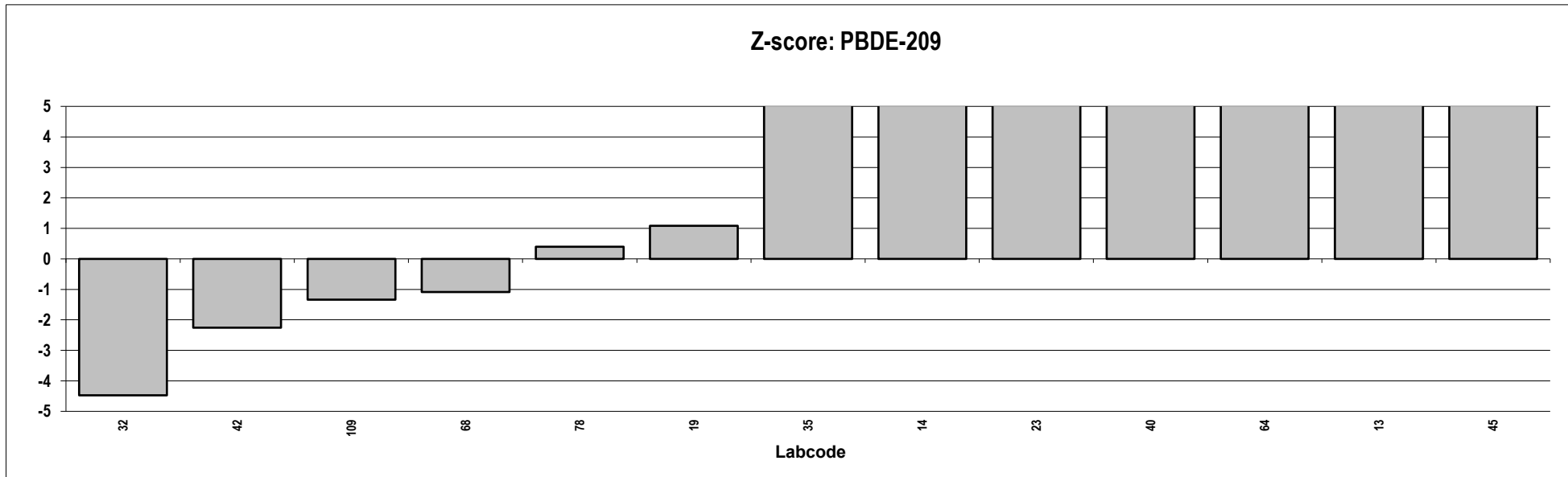
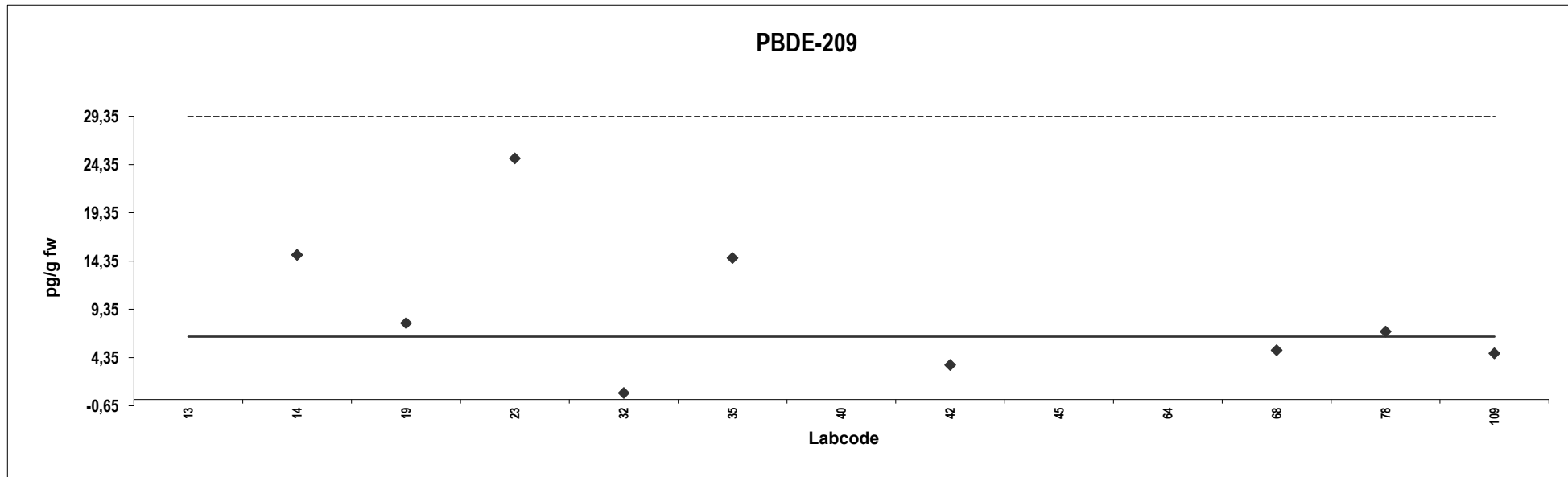


Halibut
Congener: PBDE-209

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
13	170	125	Outlier,ND				
14	15	6,5					
19	7,9	1,1					
23	25	14					
32	0,69	-4,5					
35	15	6,3					
40	62	43	Outlier,ND				
42	3,6	-2,3					
45	199	147	Outlier				
64	95	68	Outlier				
68	5,1	-1,1					
78	7,0	0,40	ND				
109	4,8	-1,3					

Consensus statistics

Consensus median, pg/g	6,5
Median all values pg/g	15
Consensus mean, pg/g	9,3
Standard deviation, pg/g	7,6
Relative standard deviation, %	81
No. of values reported	13
No. of values removed	4
No. of reported non-detects	3



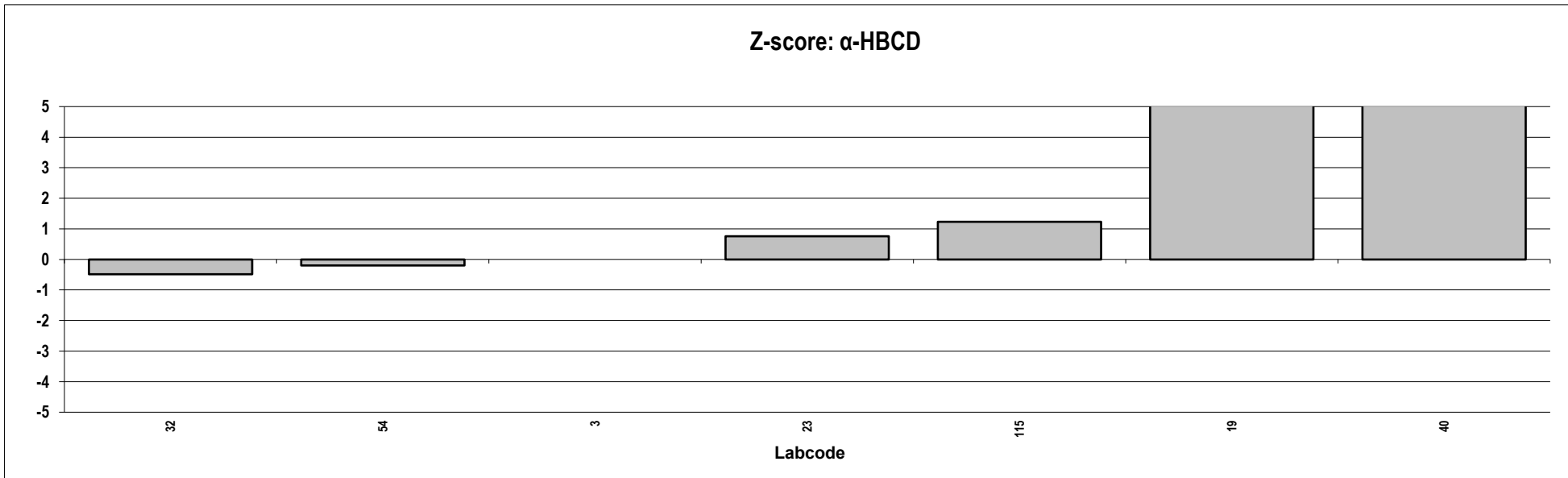
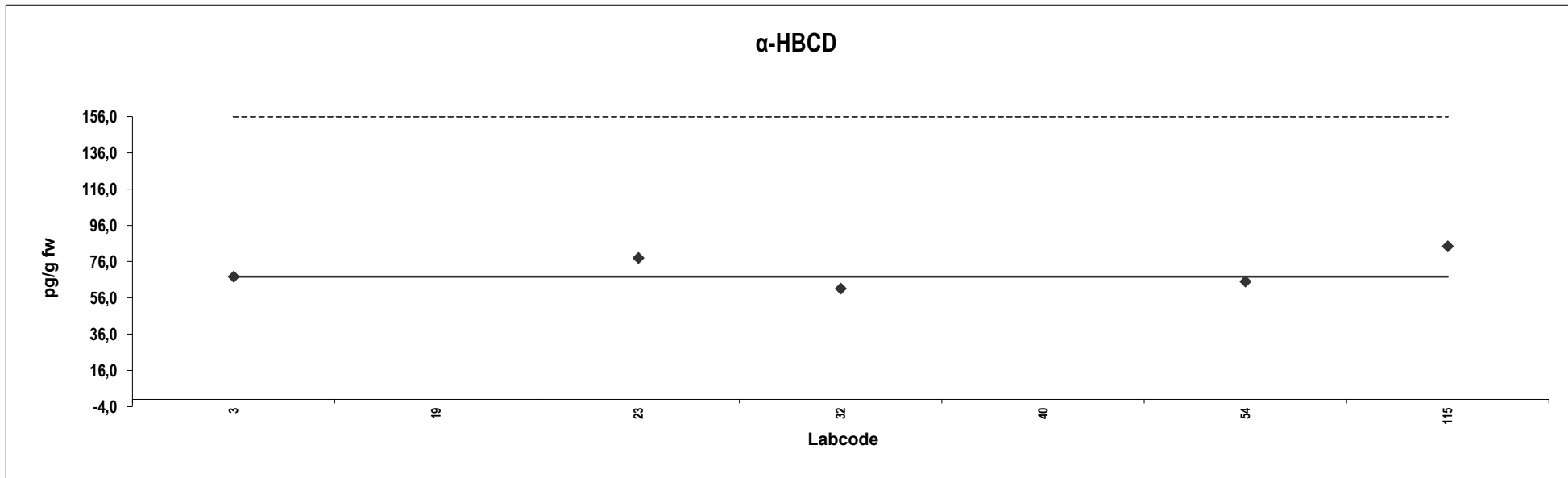
Halibut
Congener: α -HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	68	0,00					
19	3000	217	Outlier,ND				
23	78	0,76					
32	61	-0,49					
40	5000	364	Outlier,ND				
54	65	-0,20					
115	84	1,2					

Consensus statistics

Consensus median, pg/g	68
Median all values pg/g	78
Consensus mean, pg/g	71
Standard deviation, pg/g	9,7
Relative standard deviation, %	14
No. of values reported	7
No. of values removed	2
No. of reported non-detects	2

* : Indicative value due to few reported values



Halibut
Congener: β -HBCD

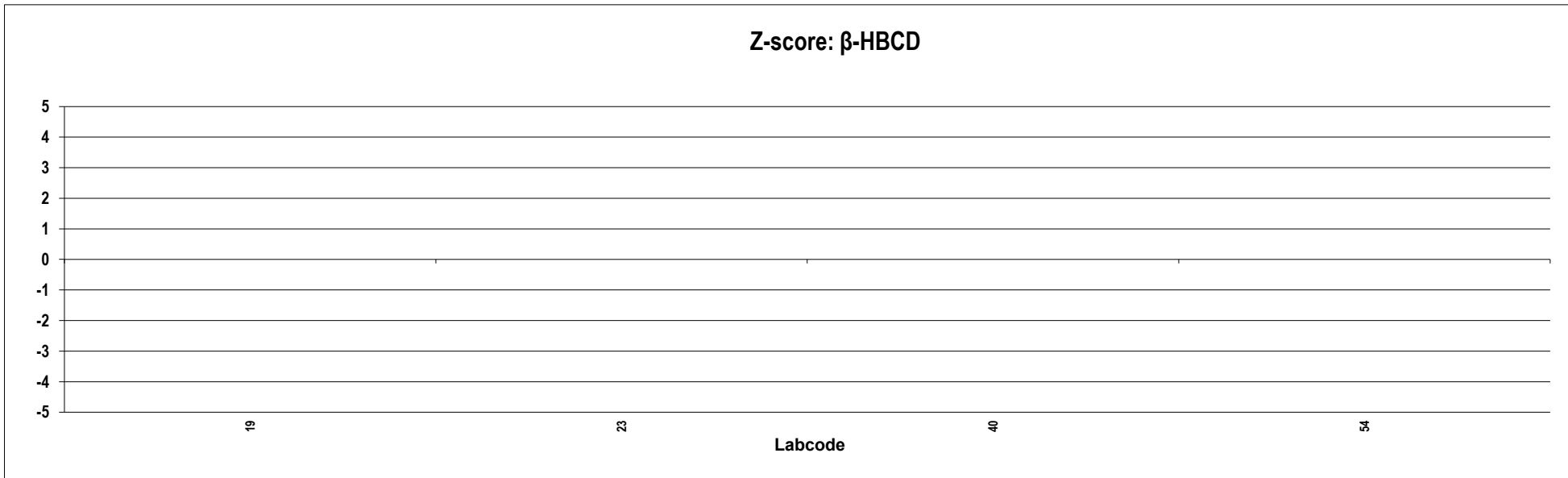
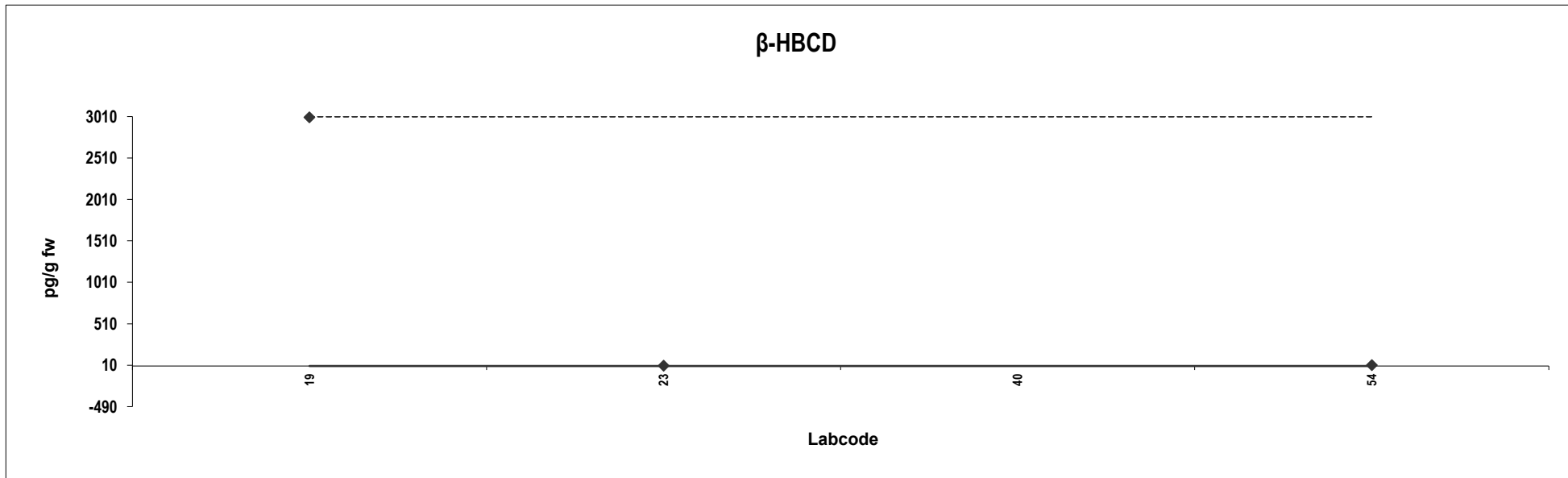
Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
19	3000	**	ND				
23	5,0	**	ND				
40	5000	**	Outlier,ND				
54	10	**	ND				

Consensus statistics

Consensus median, pg/g	*
Median all values pg/g	1505
Consensus mean, pg/g	1005
Standard deviation, pg/g	1728
Relative standard deviation, %	172
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

**Could not calculate results do to few reported results



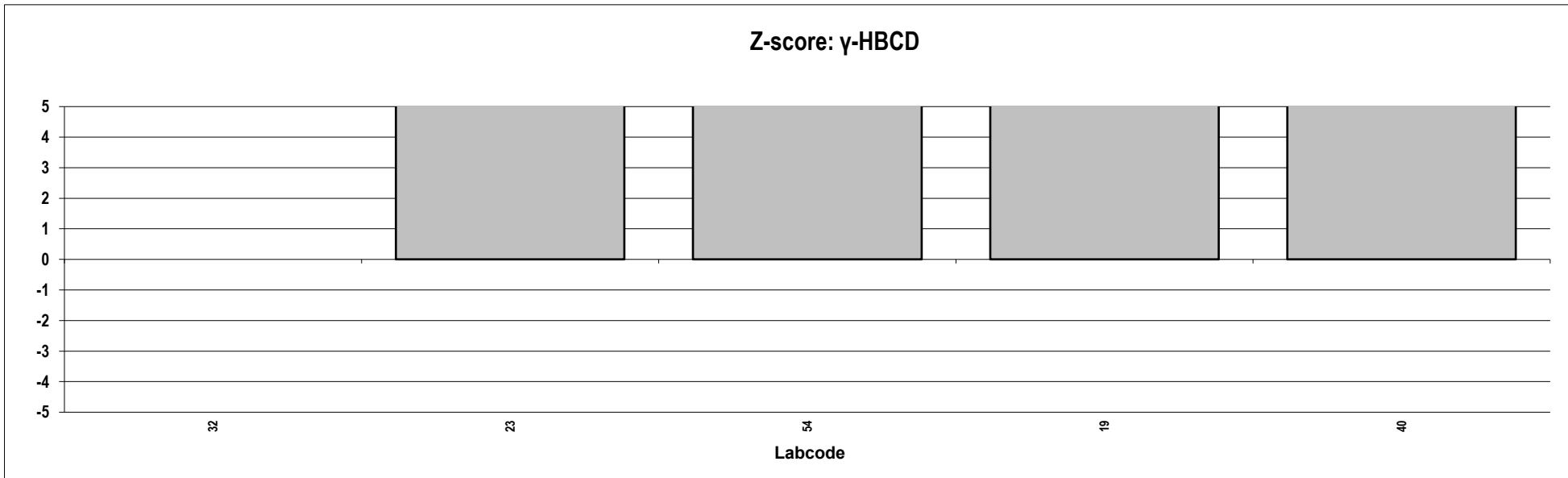
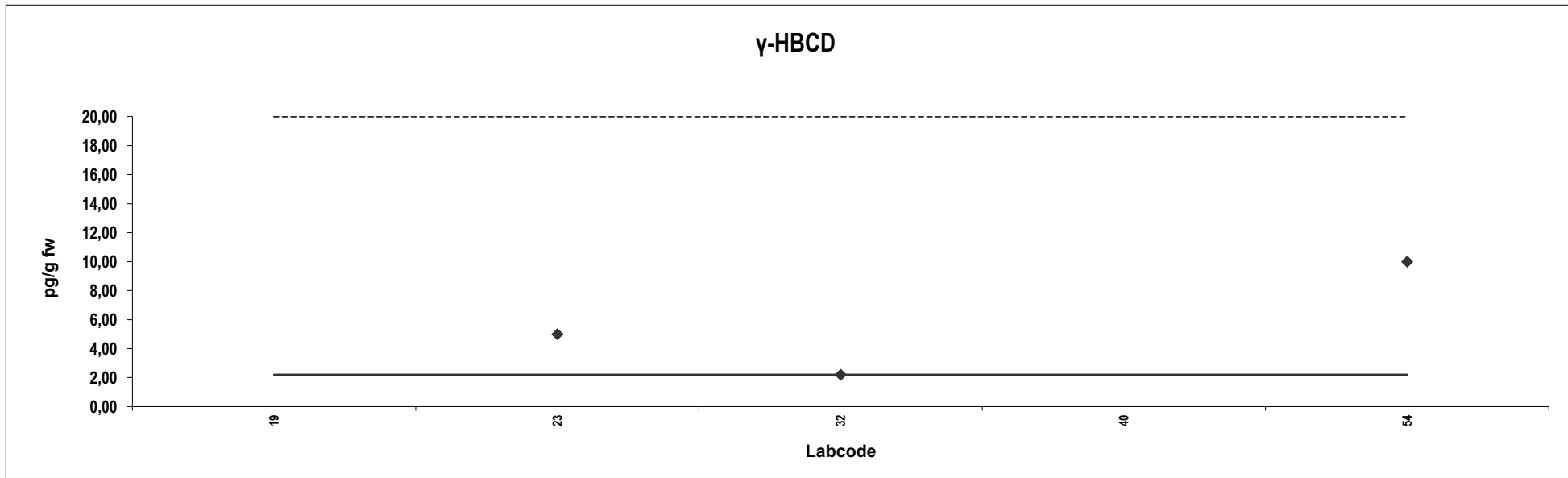
Halibut
Congener: γ -HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
19	3000	6813	Outlier,ND				
23	5,0	6,4	ND				
32	2,2	0,00					
40	5000	11359	Outlier,ND				
54	10	18	ND				

Consensus statistics

Consensus median, pg/g	2,2
Median all values pg/g	10
Consensus mean, pg/g	5,7
Standard deviation, pg/g	4,0
Relative standard deviation, %	69
No. of values reported	5
No. of values removed	2
No. of reported non-detects	4

* : Indicative value due to few reported values



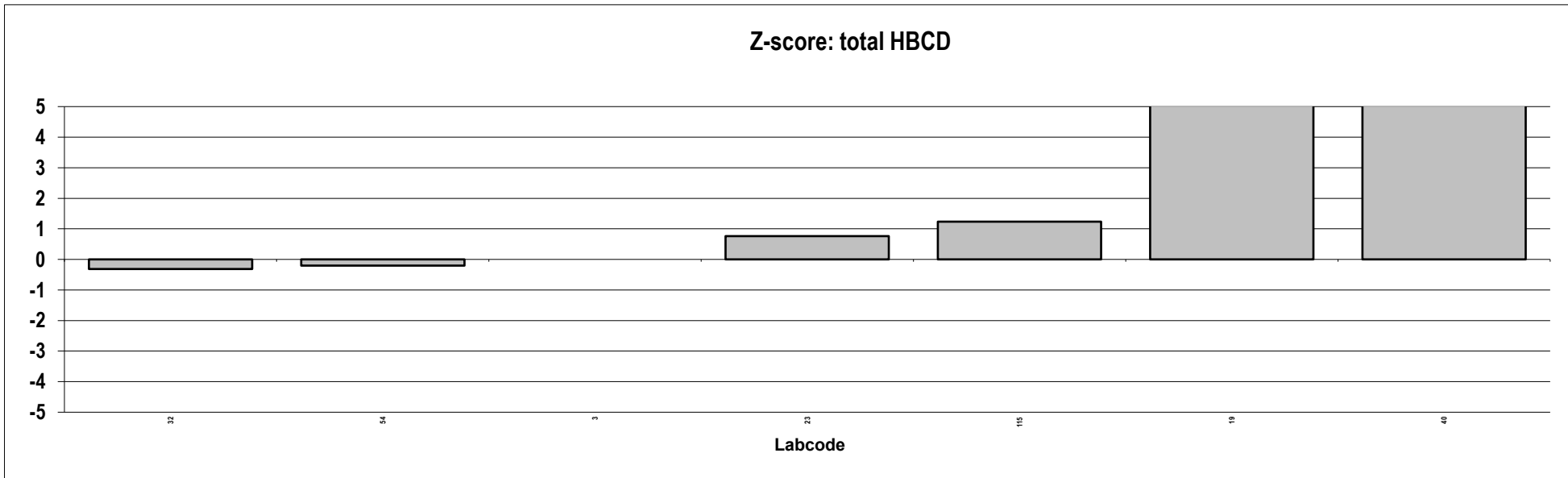
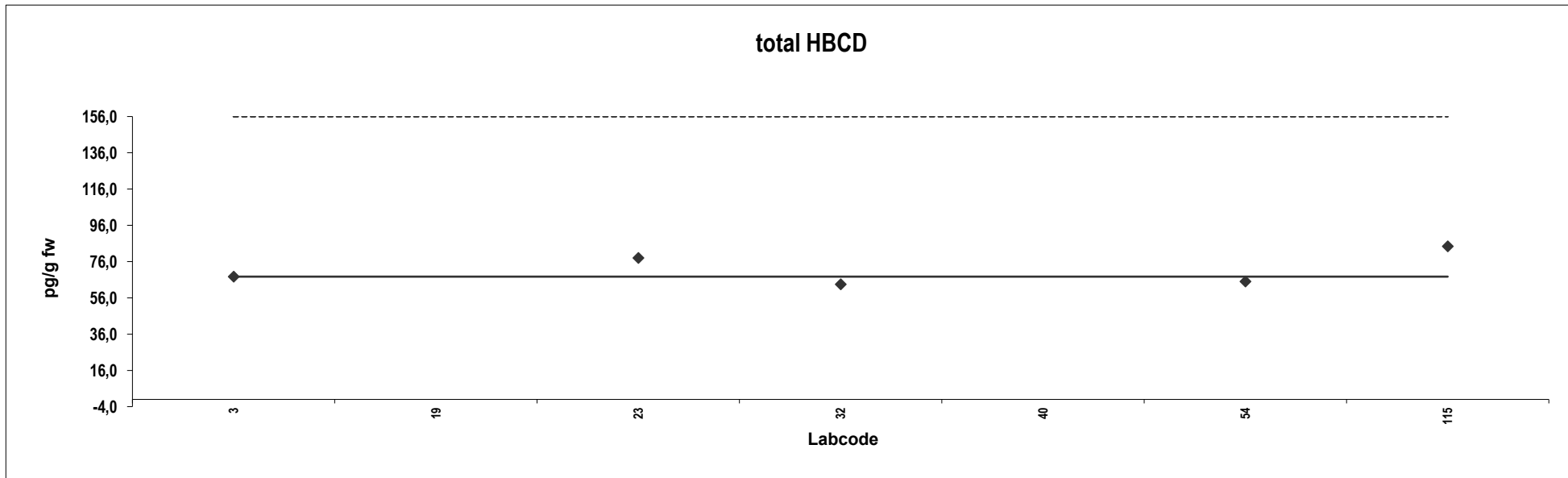
Halibut
Congener: total HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	68	0,00					
19	3000	217	Outlier,ND				
23	78	0,76					
32	63	-0,32					
40	15000	1103	Outlier,ND				
54	65	-0,20					
115	84	1,2					

Consensus statistics

Consensus median, pg/g	68
Median all values pg/g	78
Consensus mean, pg/g	72
Standard deviation, pg/g	9,1
Relative standard deviation, %	13
No. of values reported	7
No. of values removed	2
No. of reported non-detects	2

* : Indicative value due to few reported values



Appendix 4:



Presentation of results for
Fish oil-2022

Appendix 4: Presentation of results: Fish oil-2022

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:

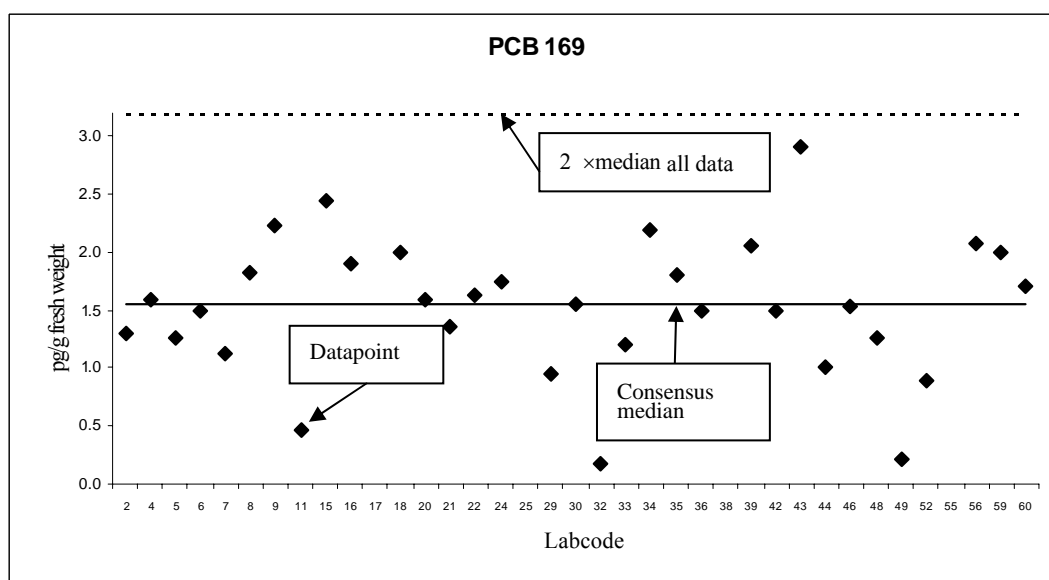
1. The median was calculated from all the reported data, using the detection limit as concentration for non-detected congeners.
2. Values exceeding $2 \times$ this median were defined as outliers and removed from the data set.
3. Median, mean and standard deviation were re-calculated from the remaining 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 $2 \times$ 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 ($2 \times$ 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 $\pm 20\%$ from the consensus value.

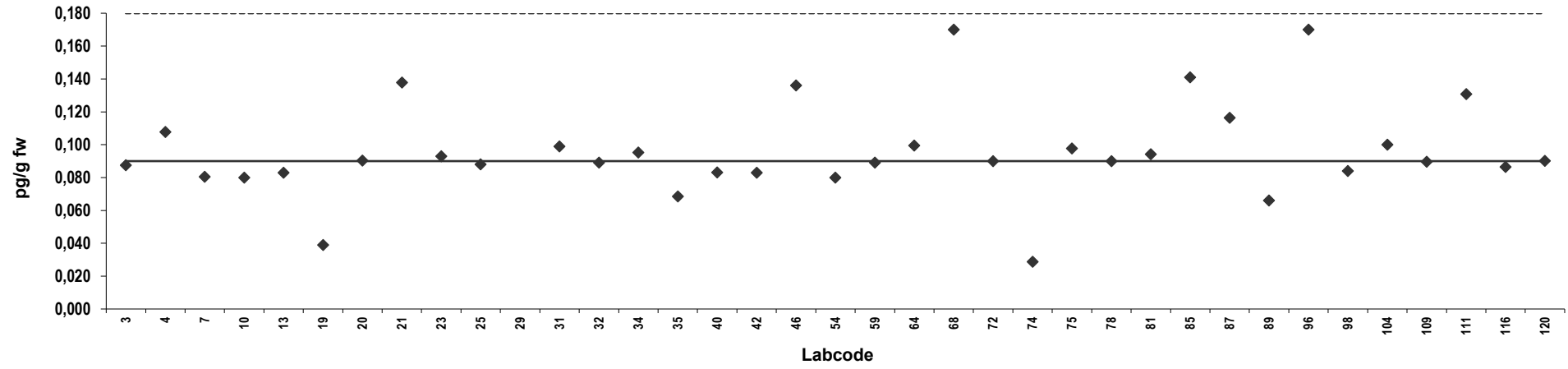
Fish Oil
Congener: 2,3,7,8-TCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,088	-0,14					
4	0,11	0,99					
7	0,081	-0,53					
10	0,080	-0,56					
13	0,083	-0,39					
19	0,039	-2,8					
20	0,090	0,017					
21	0,14	2,7					
23	0,093	0,17					
25	0,088	-0,11					
29	0,26	9,4	Outlier				
31	0,099	0,50					
32	0,089	-0,056					
34	0,095	0,29					
35	0,068	-1,2					
40	0,083	-0,38					
42	0,083	-0,39					
46	0,14	2,6					
54	0,080	-0,56					
59	0,089	-0,056					
64	0,10	0,53					
68	0,17	4,4					
72	0,090	0,00					
74	0,029	-3,4					
75	0,098	0,43					
78	0,090	0,00					
81	0,094	0,23					
85	0,14	2,8	ND				
87	0,12	1,5					
89	0,066	-1,3	ND				
96	0,17	4,4					
98	0,084	-0,33					
104	0,10	0,56					
109	0,090	-0,025					
111	0,13	2,3					
116	0,087	-0,19					
120	0,090	0,0089					

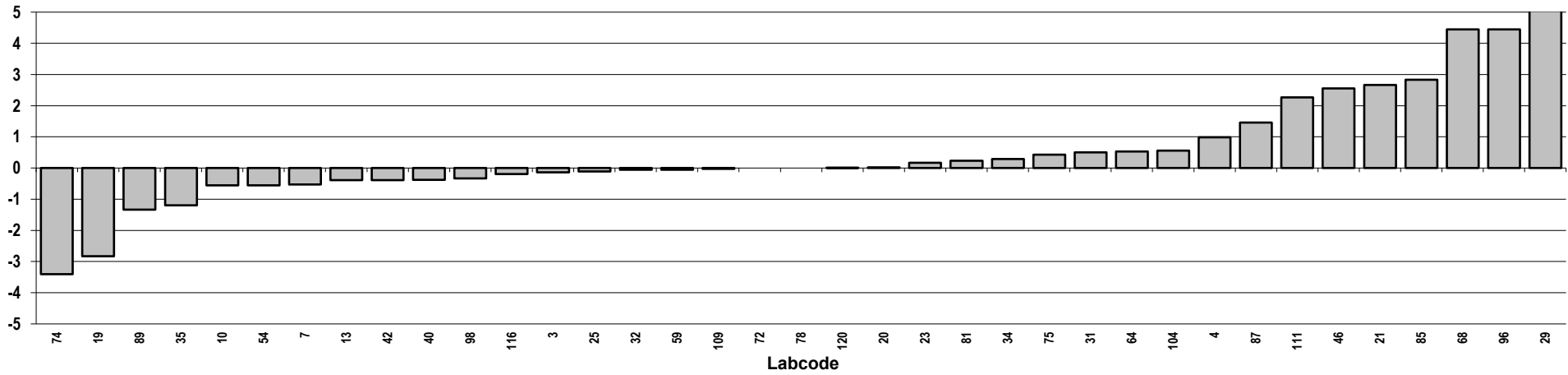
Consensus statistics

Consensus median, pg/g	0,090
Median all values pg/g	0,090
Consensus mean, pg/g	0,096
Standard deviation, pg/g	0,029
Relative standard deviation, %	30
No. of values reported	37
No. of values removed	1
No. of reported non-detects	2

2,3,7,8-TCDD



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



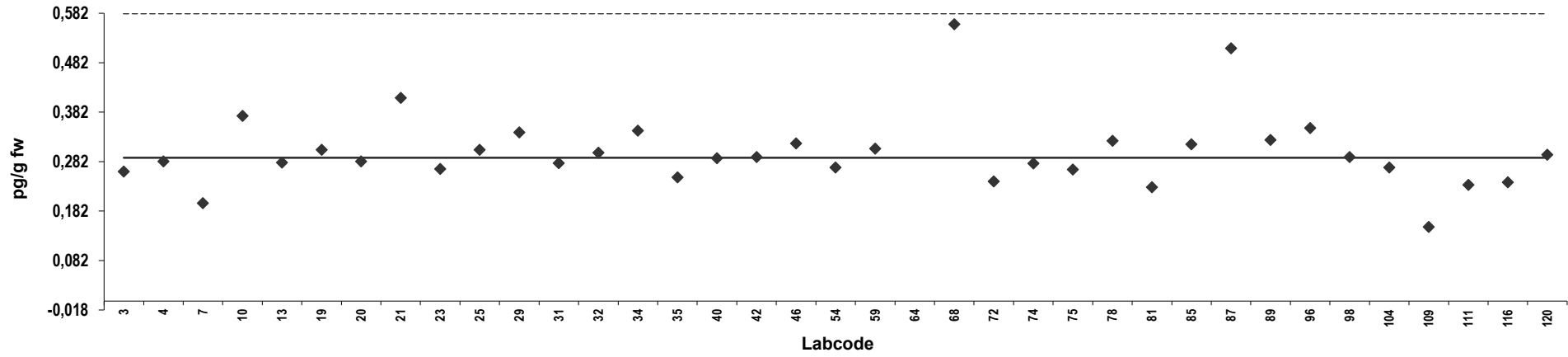
Fish Oil
Congener: 1,2,3,7,8-PeCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,26	-0,48					
4	0,28	-0,13					
7	0,20	-1,6					
10	0,37	1,5					
13	0,28	-0,17					
19	0,31	0,28					
20	0,28	-0,13					
21	0,41	2,1					
23	0,27	-0,39					
25	0,31	0,28					
29	0,34	0,88					
31	0,28	-0,19					
32	0,30	0,17					
34	0,34	0,95					
35	0,25	-0,69					
40	0,29	-0,019					
42	0,29	0,021					
46	0,32	0,50					
54	0,27	-0,34					
59	0,31	0,31					
64	0,68	6,7	Outlier				
68	0,56	4,7					
72	0,24	-0,83					
74	0,28	-0,19					
75	0,27	-0,41					
78	0,32	0,59					
81	0,23	-1,0					
85	0,32	0,47					
87	0,51	3,8					
89	0,33	0,62					
96	0,35	1,0					
98	0,29	0,019					
104	0,27	-0,34					
109	0,15	-2,4					
111	0,24	-0,94					
116	0,24	-0,86	ND				
120	0,30	0,11					

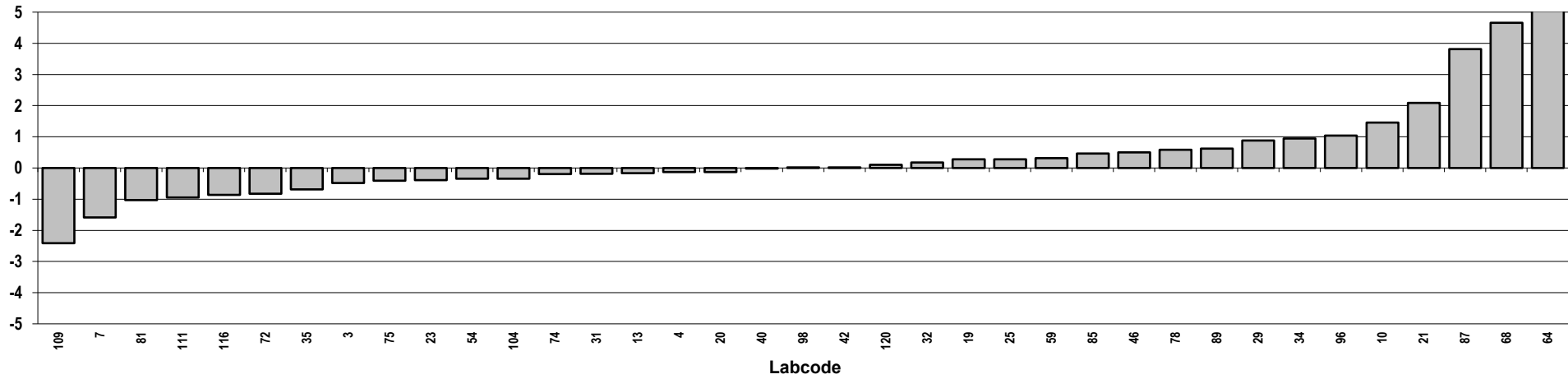
Consensus statistics

Consensus median, pg/g	0,29
Median all values pg/g	0,29
Consensus mean, pg/g	0,30
Standard deviation, pg/g	0,075
Relative standard deviation, %	25
No. of values reported	37
No. of values removed	1
No. of reported non-detects	1

1,2,3,7,8-PeCDD



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



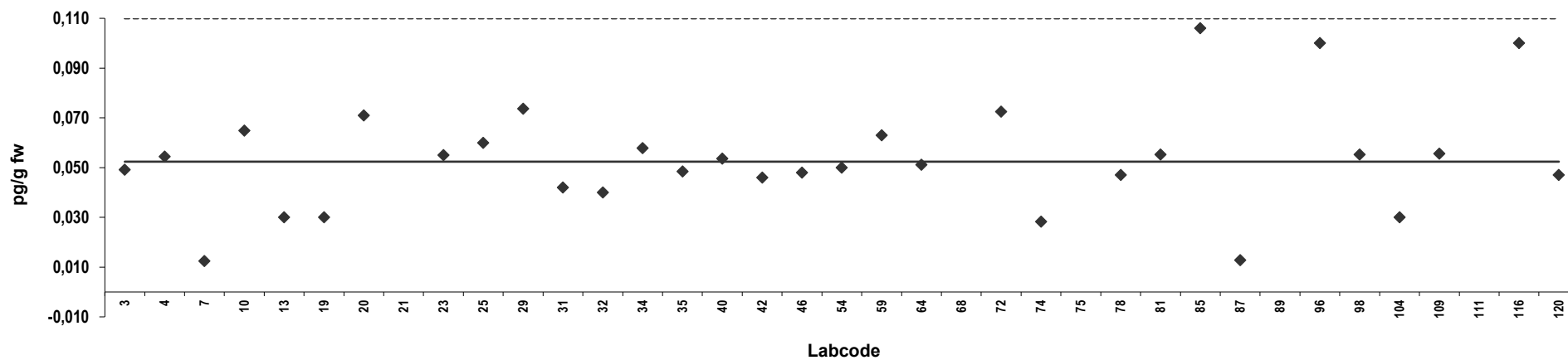
Fish Oil
Congener: 1,2,3,4,7,8-HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,049	-0,31					
4	0,054	0,19					
7	0,012	-3,8					
10	0,065	1,2					
13	0,030	-2,1	ND				
19	0,030	-2,1	ND				
20	0,071	1,8					
21	0,17	11	Outlier,ND				
23	0,055	0,25					
25	0,060	0,73					
29	0,074	2,0					
31	0,042	-0,99					
32	0,040	-1,2					
34	0,058	0,52					
35	0,048	-0,37					
40	0,054	0,11					
42	0,046	-0,61					
46	0,048	-0,42					
54	0,050	-0,23					
59	0,063	1,0					
64	0,051	-0,11					
68	0,31	25	Outlier				
72	0,073	1,9					
74	0,028	-2,3					
75	0,17	12	Outlier,ND				
78	0,047	-0,51	ND				
81	0,055	0,28					
85	0,11	5,1	ND				
87	0,013	-3,8					
89	0,14	8,0	Outlier				
96	0,10	4,5	ND				
98	0,055	0,28					
104	0,030	-2,1					
109	0,056	0,31					
111	0,17	11	Outlier				
116	0,10	4,5	ND				
120	0,047	-0,51					

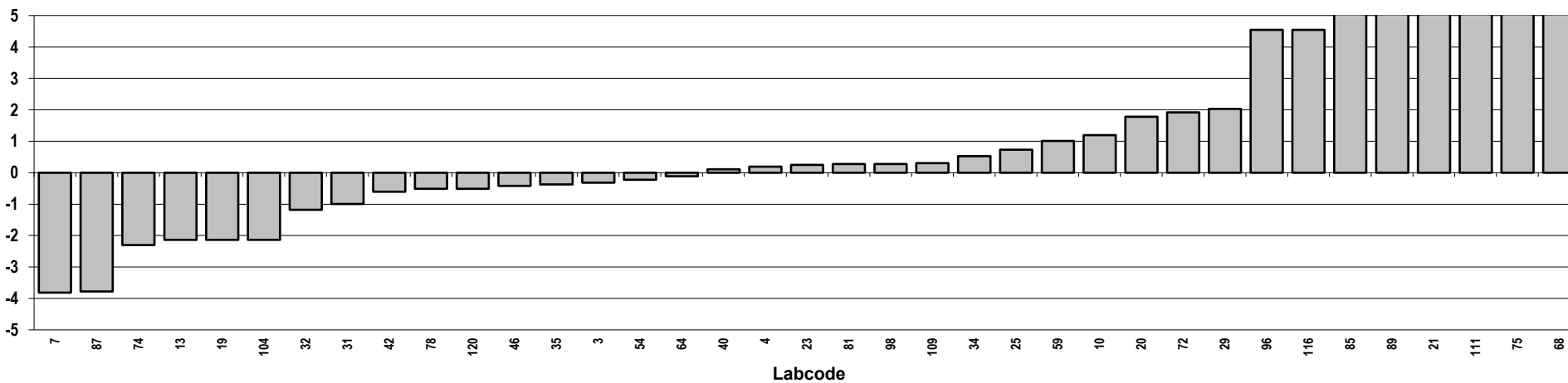
Consensus statistics

Consensus median, pg/g	0,052
Median all values pg/g	0,055
Consensus mean, pg/g	0,053
Standard deviation, pg/g	0,022
Relative standard deviation, %	41
No. of values reported	37
No. of values removed	5
No. of reported non-detects	8

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



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



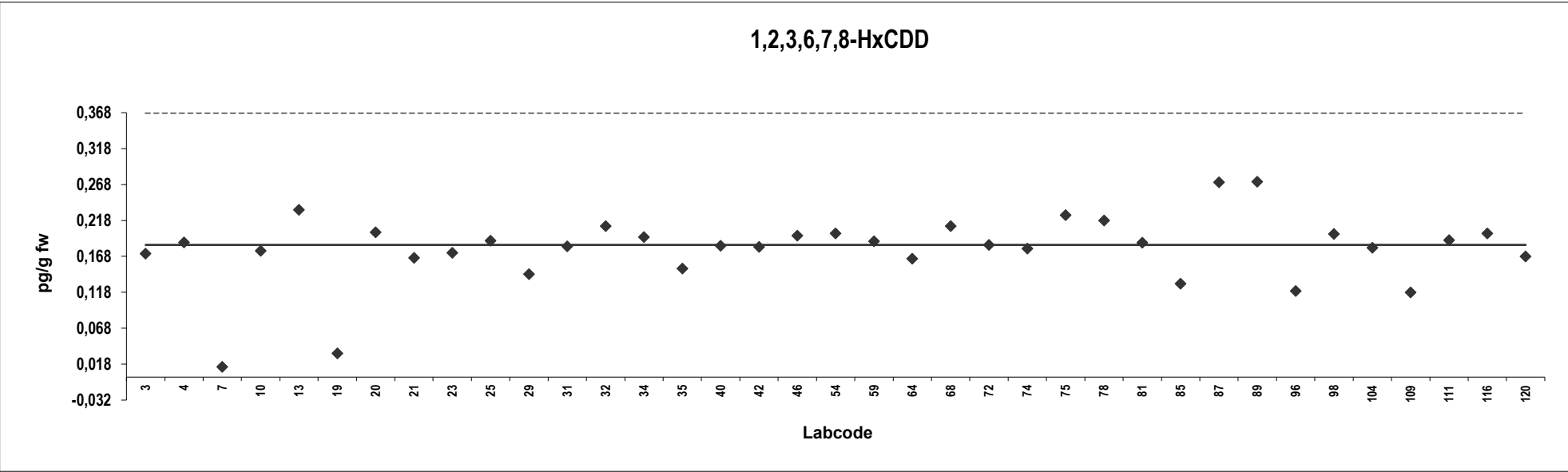
Fish Oil
Congener: 1,2,3,6,7,8-HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,17	-0,33					
4	0,19	0,095					
7	0,014	-4,6					
10	0,18	-0,22					
13	0,23	1,3					
19	0,033	-4,1	ND				
20	0,20	0,47					
21	0,17	-0,49	ND				
23	0,17	-0,30					
25	0,19	0,16					
29	0,14	-1,1					
31	0,18	-0,054					
32	0,21	0,71					
34	0,19	0,30					
35	0,15	-0,89					
40	0,18	-0,037					
42	0,18	-0,079					
46	0,20	0,35					
54	0,20	0,43					
59	0,19	0,14					
64	0,16	-0,52					
68	0,21	0,71					
72	0,18	0,00					
74	0,18	-0,14					
75	0,23	1,1					
78	0,22	0,92					
81	0,19	0,082					
85	0,13	-1,5					
87	0,27	2,4					
89	0,27	2,4					
96	0,12	-1,7					
98	0,20	0,41					
104	0,18	-0,11					
109	0,12	-1,8					
111	0,19	0,18					
116	0,20	0,43	ND				
120	0,17	-0,43					

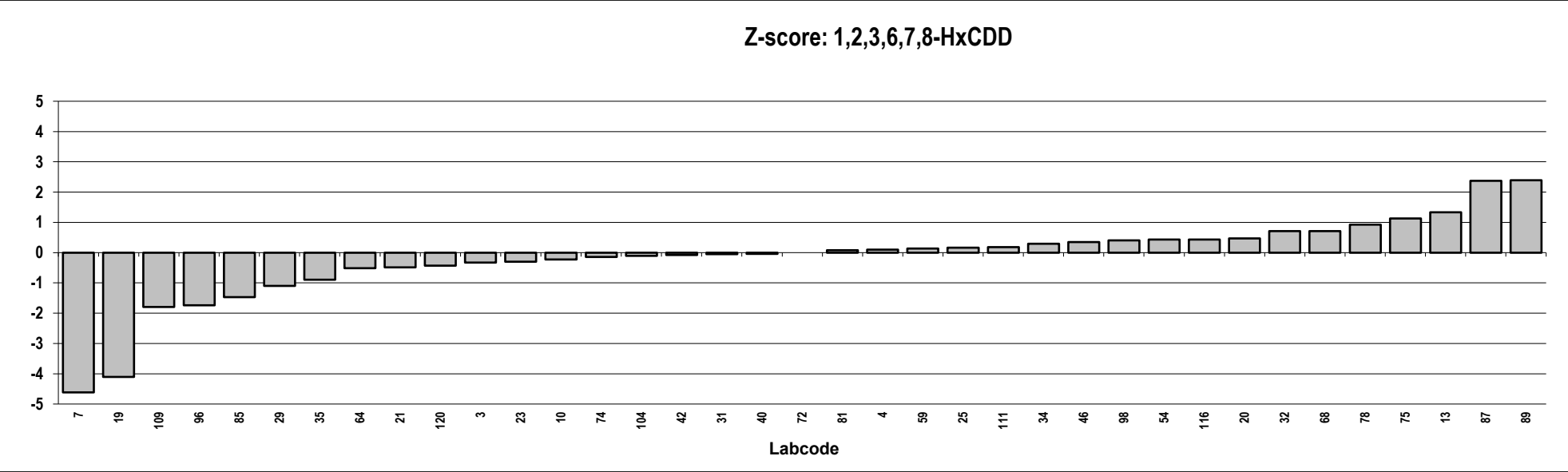
Consensus statistics

Consensus median, pg/g	0,18
Median all values pg/g	0,18
Consensus mean, pg/g	0,18
Standard deviation, pg/g	0,050
Relative standard deviation, %	28
No. of values reported	37
No. of values removed	0
No. of reported non-detects	3

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



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



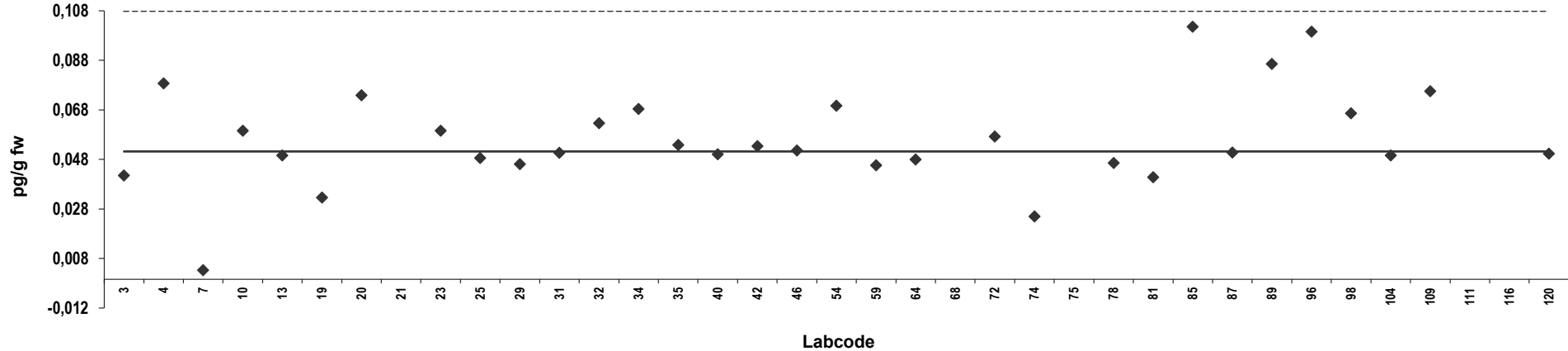
Fish Oil
Congener: 1,2,3,7,8,9-HxCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,042	-0,94					
4	0,079	2,7					
7	0,0037	-4,6					
10	0,060	0,81					
13	0,050	-0,16					
19	0,033	-1,8	ND				
20	0,074	2,2					
21	0,17	11	Outlier,ND				
23	0,060	0,81					
25	0,049	-0,25					
29	0,047	-0,49					
31	0,051	-0,058					
32	0,063	1,1					
34	0,069	1,7					
35	0,054	0,25					
40	0,050	-0,11					
42	0,054	0,20					
46	0,052	0,039					
54	0,070	1,8					
59	0,046	-0,54					
64	0,048	-0,32					
68	0,14	8,6	Outlier				
72	0,058	0,58					
74	0,025	-2,5					
75	0,14	8,8	Outlier,ND				
78	0,047	-0,45	ND				
81	0,041	-1,0					
85	0,10	4,9	ND				
87	0,051	-0,039					
89	0,087	3,4	ND				
96	0,10	4,7	ND				
98	0,067	1,5					
104	0,050	-0,16					
109	0,076	2,4					
111	0,15	9,4	Outlier				
116	0,20	14	Outlier,ND				
120	0,051	-0,084					

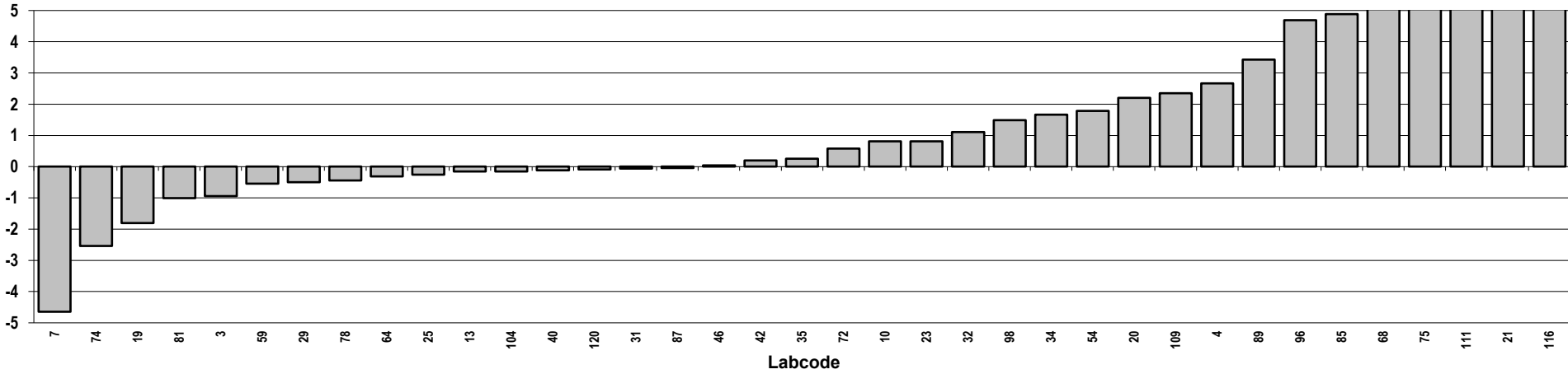
Consensus statistics

Consensus median, pg/g	0,052
Median all values pg/g	0,054
Consensus mean, pg/g	0,057
Standard deviation, pg/g	0,020
Relative standard deviation, %	35
No. of values reported	37
No. of values removed	5
No. of reported non-detects	8

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



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

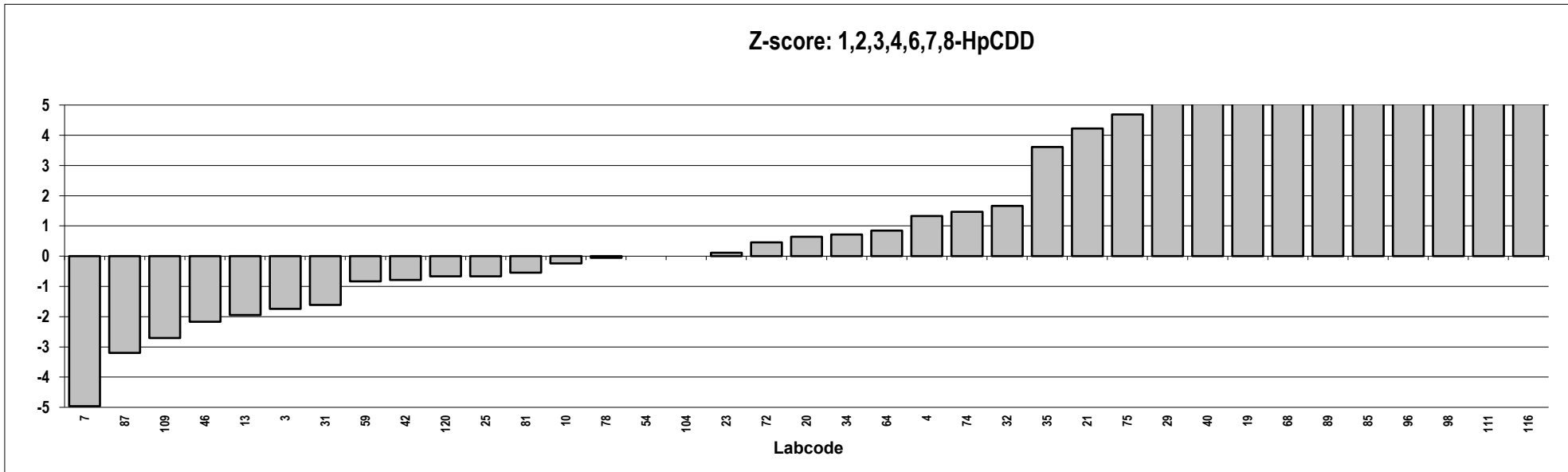
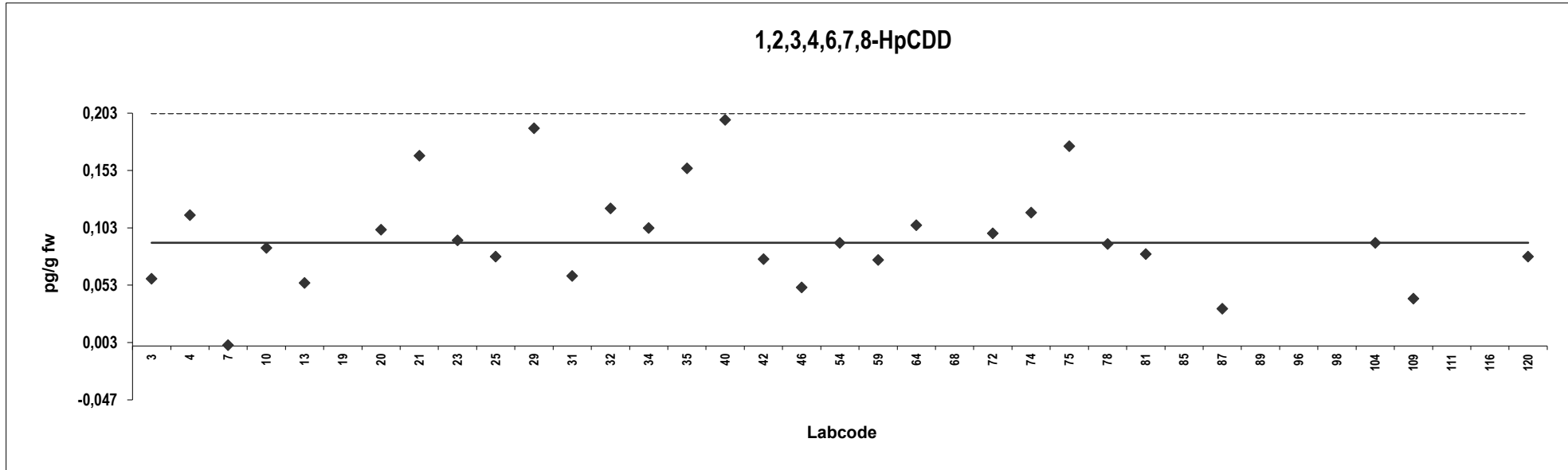


Fish Oil
Congener: 1,2,3,4,6,7,8-HpCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,059	-1,7					
4	0,11	1,3					
7	0,00067	-5,0					
10	0,086	-0,24					
13	0,055	-1,9					
19	0,22	7,1	Outlier,ND				
20	0,10	0,64					
21	0,17	4,2	ND				
23	0,092	0,11					
25	0,078	-0,67					
29	0,19	5,6					
31	0,061	-1,6					
32	0,12	1,7					
34	0,10	0,71					
35	0,15	3,6					
40	0,20	6,0	ND				
42	0,076	-0,79					
46	0,051	-2,2					
54	0,090	0,00					
59	0,075	-0,83					
64	0,11	0,85					
68	0,22	7,2	Outlier				
72	0,098	0,46					
74	0,12	1,5					
75	0,17	4,7	ND				
78	0,089	-0,056					
81	0,080	-0,54					
85	0,26	9,7	Outlier				
87	0,032	-3,2					
89	0,23	7,6	Outlier				
96	0,32	13	Outlier				
98	0,35	15	Outlier				
104	0,090	0,00					
109	0,041	-2,7					
111	0,49	22	Outlier				
116	0,50	23	Outlier,ND				
120	0,078	-0,67					

Consensus statistics

Consensus median, pg/g	0,090
Median all values pg/g	0,10
Consensus mean, pg/g	0,096
Standard deviation, pg/g	0,046
Relative standard deviation, %	48
No. of values reported	37
No. of values removed	8
No. of reported non-detects	5

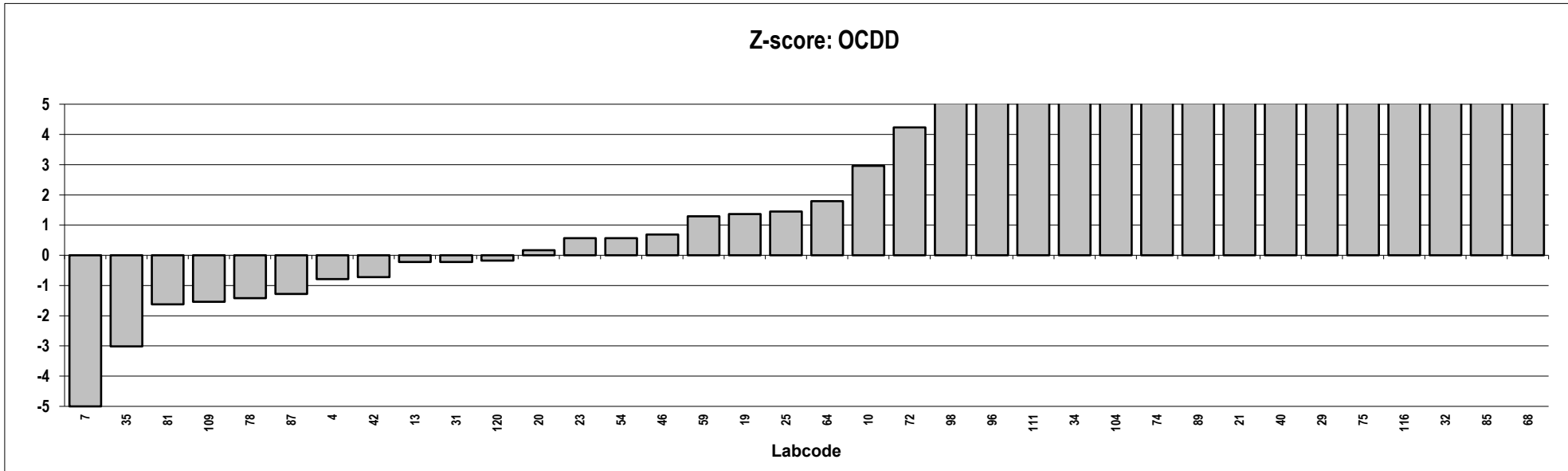
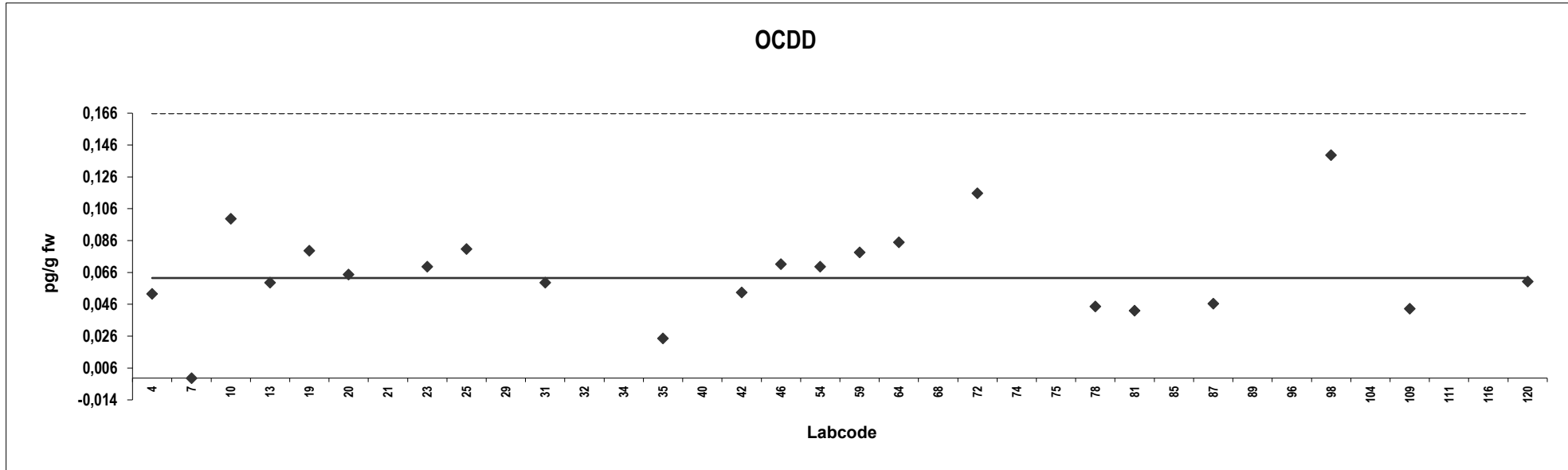


Fish Oil
Congener: OCDD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
4	0,053	-0,79					
7	0,00	-5,0					
10	0,10	3,0					
13	0,060	-0,23	ND				
19	0,080	1,4	ND				
20	0,065	0,17					
21	0,33	21	Outlier,ND				
23	0,070	0,57					
25	0,081	1,4					
29	0,43	29	Outlier				
31	0,060	-0,23	ND				
32	0,53	37	Outlier				
34	0,20	11	Outlier,ND				
35	0,025	-3,0					
40	0,39	26	Outlier,ND				
42	0,054	-0,72					
46	0,072	0,69	ND				
54	0,070	0,57					
59	0,079	1,3					
64	0,085	1,8					
68	0,85	63	Outlier				
72	0,12	4,2					
74	0,22	12	Outlier				
75	0,44	30	Outlier,ND				
78	0,045	-1,4	ND				
81	0,042	-1,6					
85	0,54	38	Outlier				
87	0,047	-1,3					
89	0,30	19	Outlier				
96	0,17	8,5	Outlier				
98	0,14	6,1					
104	0,20	11	Outlier,ND				
109	0,044	-1,5					
111	0,18	9,5	Outlier				
116	0,50	35	Outlier,ND				
120	0,061	-0,17					

Consensus statistics

Consensus median, pg/g	0,063
Median all values pg/g	0,083
Consensus mean, pg/g	0,066
Standard deviation, pg/g	0,030
Relative standard deviation, %	45
No. of values reported	36
No. of values removed	14
No. of reported non-detects	11



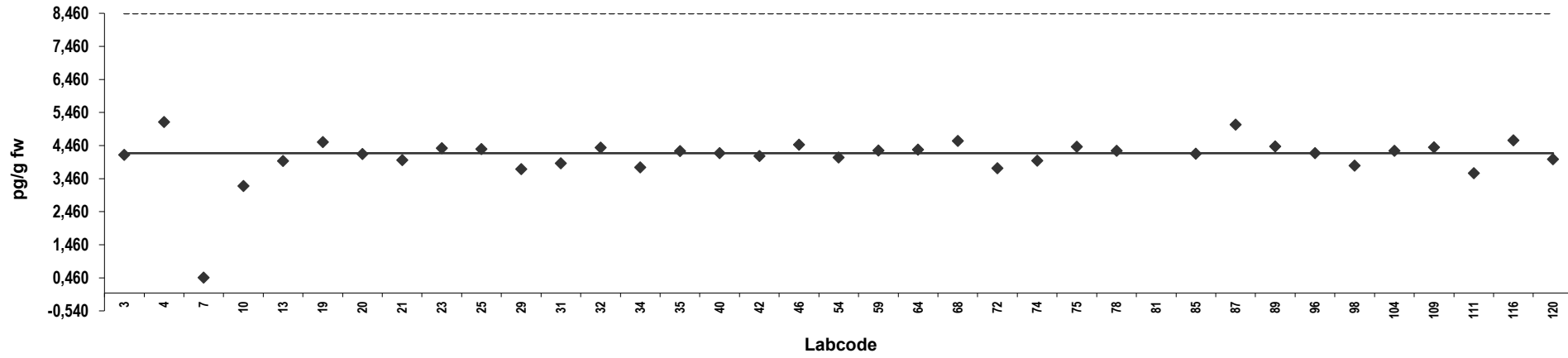
Fish Oil
Congener: 2,3,7,8-TCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	4,2	-0,057					
4	5,2	1,1					
7	0,46	-4,5					
10	3,2	-1,2					
13	4,0	-0,28					
19	4,6	0,40					
20	4,2	-0,028					
21	4,0	-0,25					
23	4,4	0,18					
25	4,4	0,14					
29	3,7	-0,57					
31	3,9	-0,36					
32	4,4	0,20					
34	3,8	-0,50					
35	4,3	0,073					
40	4,2	-0,0021					
42	4,1	-0,10					
46	4,5	0,31					
54	4,1	-0,15					
59	4,3	0,097					
64	4,3	0,13					
68	4,6	0,44					
72	3,8	-0,54					
74	4,0	-0,26					
75	4,4	0,23					
78	4,3	0,085					
81	4,2	44	Outlier				
85	4,2	-0,018					
87	5,1	1,0					
89	4,4	0,24					
96	4,2	0,0021					
98	3,9	-0,45					
104	4,3	0,085					
109	4,4	0,21					
111	3,6	-0,72					
116	4,6	0,46					
120	4,0	-0,22					

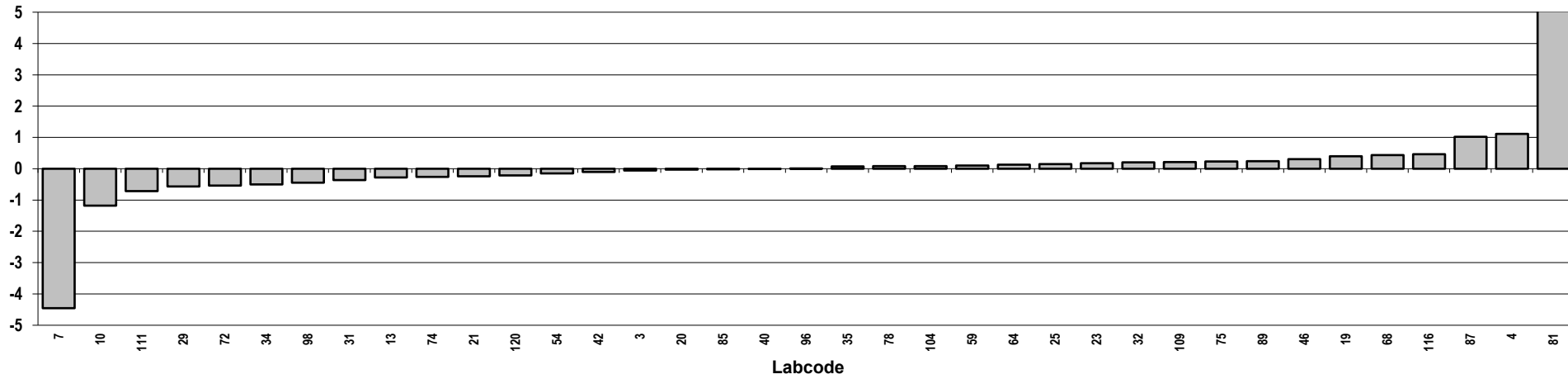
Consensus statistics

Consensus median, pg/g	4,2
Median all values pg/g	4,2
Consensus mean, pg/g	4,1
Standard deviation, pg/g	0,73
Relative standard deviation, %	18
No. of values reported	37
No. of values removed	1
No. of reported non-detects	0

2,3,7,8-TCDF



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



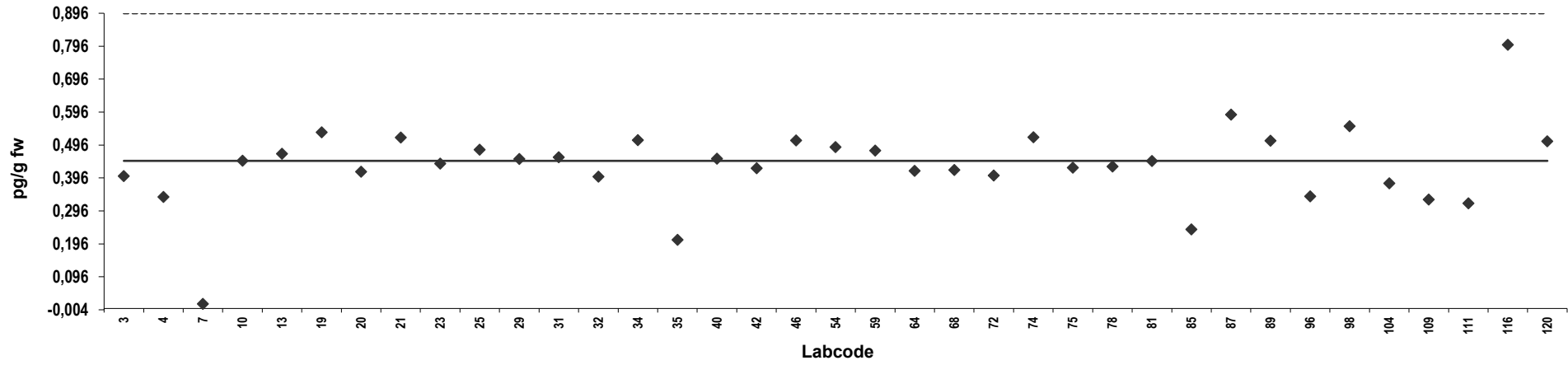
Fish Oil
Congener: 1,2,3,7,8-PeCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,40	-0,51					
4	0,34	-1,2					
7	0,014	-4,8					
10	0,45	0,0030					
13	0,47	0,25					
19	0,54	0,97					
20	0,41	-0,37					
21	0,52	0,79					
23	0,44	-0,089					
25	0,48	0,38					
29	0,45	0,061					
31	0,46	0,12					
32	0,40	-0,54					
34	0,51	0,70					
35	0,21	-2,7					
40	0,46	0,079					
42	0,43	-0,25					
46	0,51	0,69					
54	0,49	0,47					
59	0,48	0,35					
64	0,42	-0,33					
68	0,42	-0,31					
72	0,40	-0,49					
74	0,52	0,80					
75	0,43	-0,23					
78	0,43	-0,19					
81	0,45	0,00					
85	0,24	-2,3					
87	0,59	1,6					
89	0,51	0,68					
96	0,34	-1,2					
98	0,55	1,2					
104	0,38	-0,76					
109	0,33	-1,31					
111	0,32	-1,4					
116	0,80	3,9	ND				
120	0,51	0,67					

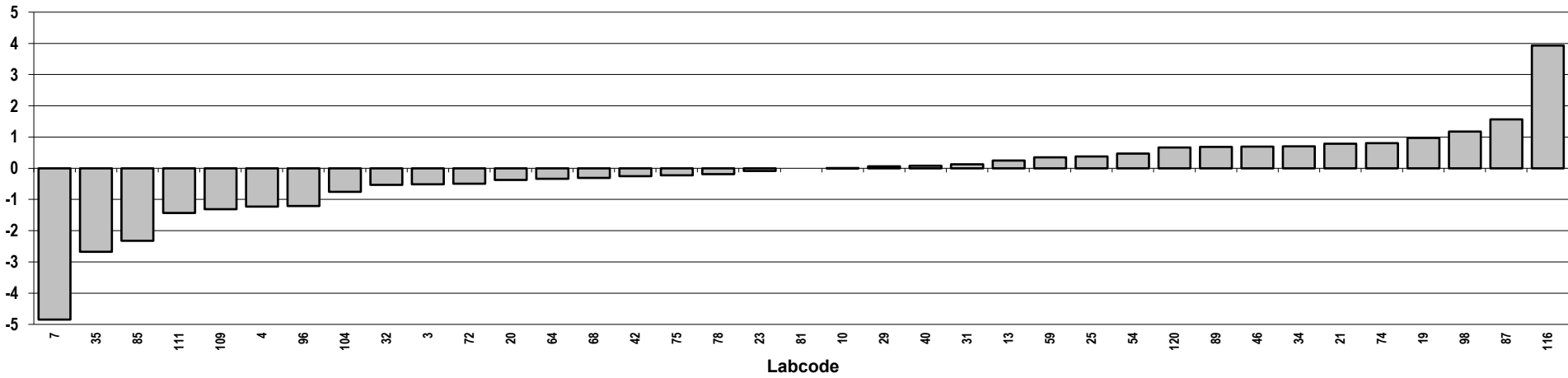
Consensus statistics

Consensus median, pg/g	0,45
Median all values pg/g	0,45
Consensus mean, pg/g	0,43
Standard deviation, pg/g	0,12
Relative standard deviation, %	28
No. of values reported	37
No. of values removed	0
No. of reported non-detects	1

1,2,3,7,8-PeCDF



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



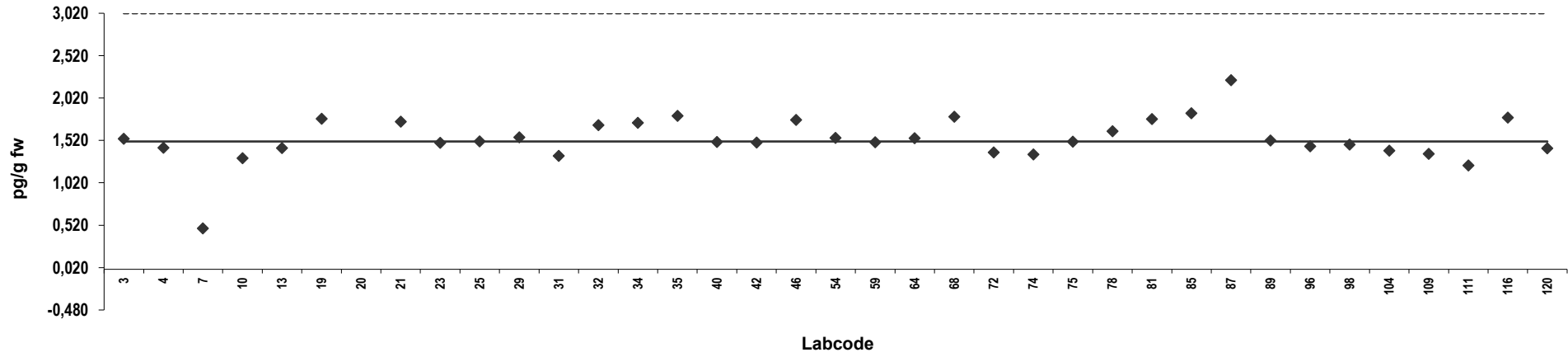
Fish Oil
Congener: 2,3,4,7,8-PeCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	1,5	0,11					
4	1,4	-0,25					
7	0,48	-3,4					
10	1,3	-0,66					
13	1,4	-0,26					
19	1,8	0,89					
20	3,7	7,4	Outlier				
21	1,7	0,77					
23	1,5	-0,059					
25	1,5	0,0075					
29	1,6	0,17					
31	1,3	-0,57					
32	1,7	0,64					
34	1,7	0,73					
35	1,8	1,0					
40	1,5	-0,023					
42	1,5	-0,043					
46	1,8	0,84					
54	1,6	0,14					
59	1,5	-0,026					
64	1,5	0,13					
68	1,8	0,97					
72	1,4	-0,43					
74	1,4	-0,50					
75	1,5	-0,0075					
78	1,6	0,41					
81	1,8	0,88					
85	1,8	1,1					
87	2,2	2,4					
89	1,5	0,041					
96	1,5	-0,19					
98	1,5	-0,13					
104	1,4	-0,36					
109	1,4	-0,49					
111	1,2	-0,94					
116	1,8	0,94					
120	1,4	-0,27					

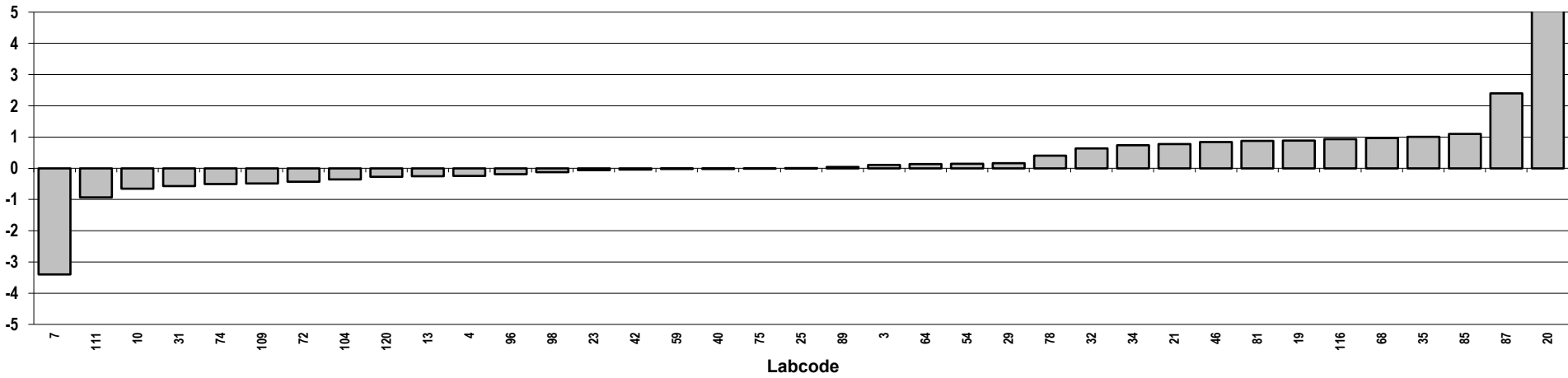
Consensus statistics

Consensus median, pg/g	1,5
Median all values pg/g	1,5
Consensus mean, pg/g	1,5
Standard deviation, pg/g	0,27
Relative standard deviation, %	17
No. of values reported	37
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

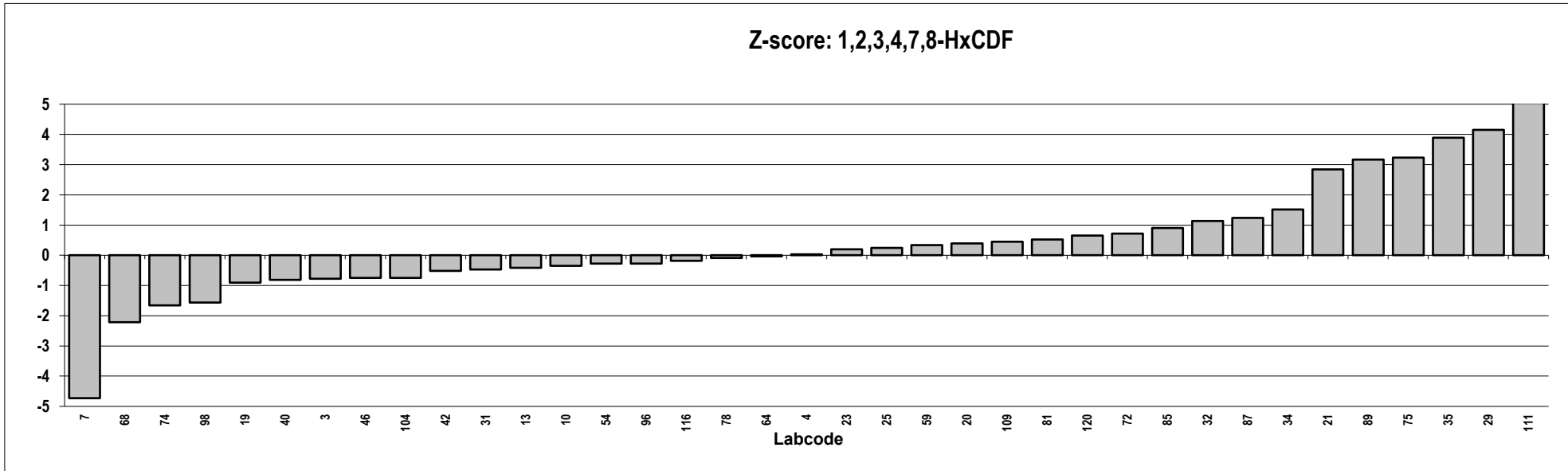
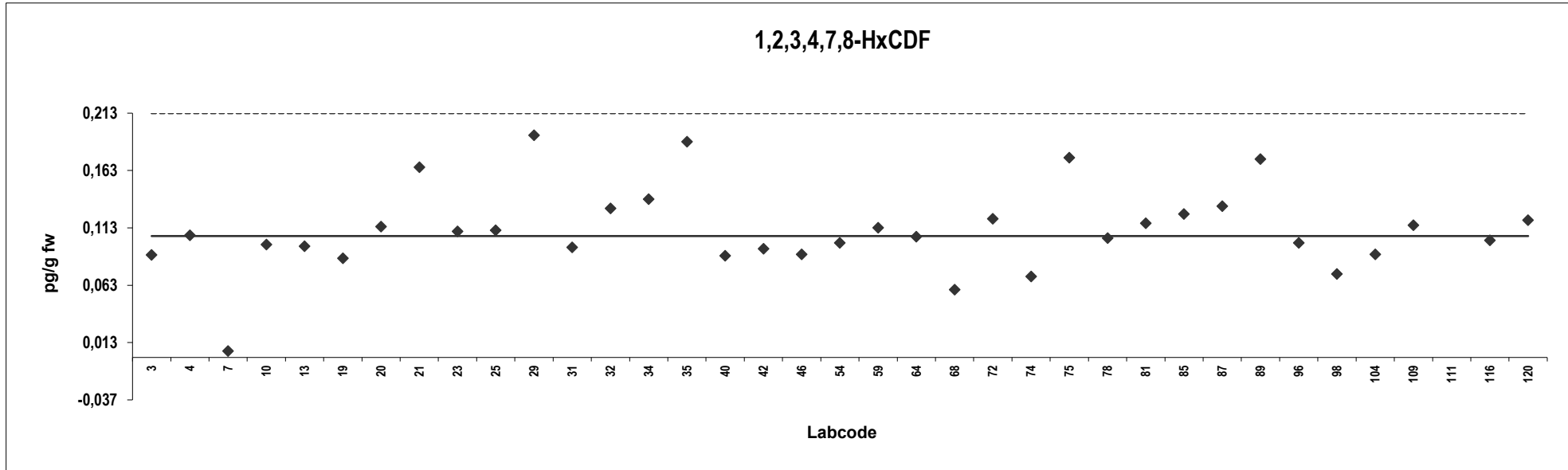


Fish Oil
Congener: 1,2,3,4,7,8-HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,089	-0,78					
4	0,11	0,030					
7	0,0057	-4,7					
10	0,099	-0,35					
13	0,097	-0,42					
19	0,087	-0,91	ND				
20	0,11	0,39					
21	0,17	2,8	ND				
23	0,11	0,20					
25	0,11	0,24					
29	0,19	4,2					
31	0,096	-0,47					
32	0,13	1,1					
34	0,14	1,5					
35	0,19	3,9					
40	0,089	-0,82					
42	0,095	-0,52					
46	0,090	-0,75					
54	0,10	-0,28					
59	0,11	0,34					
64	0,11	-0,030					
68	0,059	-2,2					
72	0,12	0,71					
74	0,071	-1,7					
75	0,17	3,2	ND				
78	0,10	-0,088					
81	0,12	0,53					
85	0,13	0,90					
87	0,13	1,2					
89	0,17	3,2					
96	0,10	-0,28	ND				
98	0,073	-1,6					
104	0,090	-0,75					
109	0,12	0,44					
111	0,23	6,1	Outlier				
116	0,10	-0,18	ND				
120	0,12	0,66					

Consensus statistics

Consensus median, pg/g	0,11
Median all values pg/g	0,11
Consensus mean, pg/g	0,11
Standard deviation, pg/g	0,036
Relative standard deviation, %	33
No. of values reported	37
No. of values removed	1
No. of reported non-detects	5



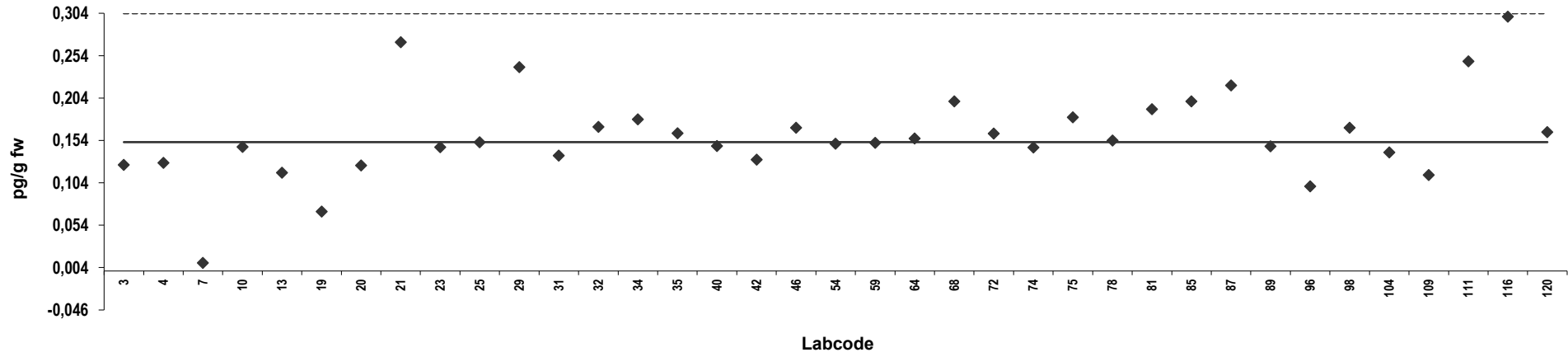
Fish Oil
Congener: 1,2,3,6,7,8-HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,13	-0,89					
4	0,13	-0,81					
7	0,0094	-4,7					
10	0,15	-0,19					
13	0,12	-1,2					
19	0,070	-2,7	ND				
20	0,12	-0,91					
21	0,27	3,9					
23	0,15	-0,20					
25	0,15	0,00					
29	0,24	2,9					
31	0,14	-0,53					
32	0,17	0,59					
34	0,18	0,89					
35	0,16	0,35					
40	0,15	-0,15					
42	0,13	-0,68					
46	0,17	0,56					
54	0,15	-0,066					
59	0,15	-0,033					
64	0,16	0,15					
68	0,20	1,6					
72	0,16	0,33					
74	0,15	-0,21					
75	0,18	0,96					
78	0,15	0,066					
81	0,19	1,3					
85	0,20	1,6					
87	0,22	2,2					
89	0,15	-0,16					
96	0,10	-1,7	ND				
98	0,17	0,56					
104	0,14	-0,39					
109	0,11	-1,3					
111	0,25	3,1					
116	0,30	4,9	ND				
120	0,16	0,39					

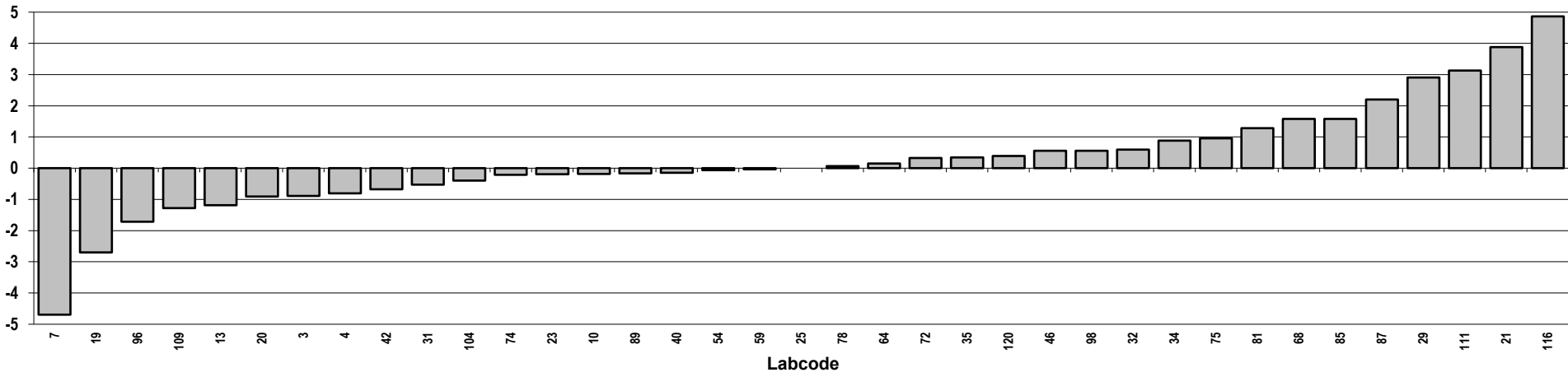
Consensus statistics

Consensus median, pg/g	0,15
Median all values pg/g	0,15
Consensus mean, pg/g	0,16
Standard deviation, pg/g	0,053
Relative standard deviation, %	33
No. of values reported	37
No. of values removed	0
No. of reported non-detects	3

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



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



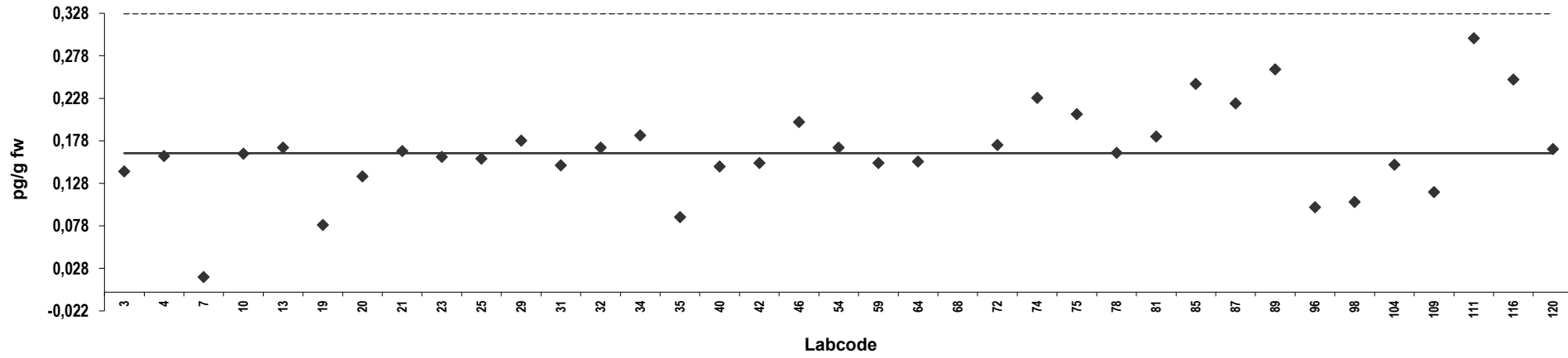
Fish Oil
Congener: 2,3,4,6,7,8-HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,14	-0,66					
4	0,16	-0,11					
7	0,018	-4,5					
10	0,16	-0,017					
13	0,17	0,20					
19	0,079	-2,6	ND				
20	0,14	-0,84					
21	0,17	0,078	ND				
23	0,16	-0,14					
25	0,16	-0,20					
29	0,18	0,45					
31	0,15	-0,44					
32	0,17	0,20					
34	0,18	0,64					
35	0,088	-2,29					
40	0,15	-0,48					
42	0,15	-0,35					
46	0,20	1,1					
54	0,17	0,20					
59	0,15	-0,35					
64	0,15	-0,30					
68	0,33	5,1	Outlier				
72	0,17	0,29					
74	0,23	2,0					
75	0,21	1,4					
78	0,16	0,017					
81	0,18	0,60					
85	0,25	2,5					
87	0,22	1,8					
89	0,26	3,0					
96	0,10	-1,9	ND				
98	0,11	-1,8					
104	0,15	-0,41					
109	0,12	-1,4					
111	0,30	4,1					
116	0,25	2,6	ND				
120	0,17	0,14					

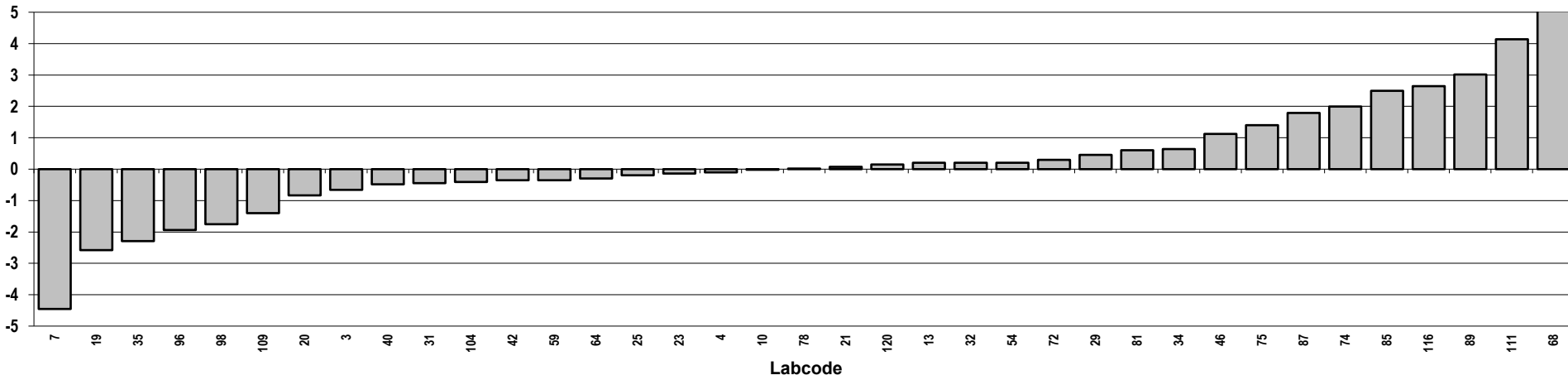
Consensus statistics

Consensus median, pg/g	0,16
Median all values pg/g	0,16
Consensus mean, pg/g	0,17
Standard deviation, pg/g	0,053
Relative standard deviation, %	32
No. of values reported	37
No. of values removed	1
No. of reported non-detects	4

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



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

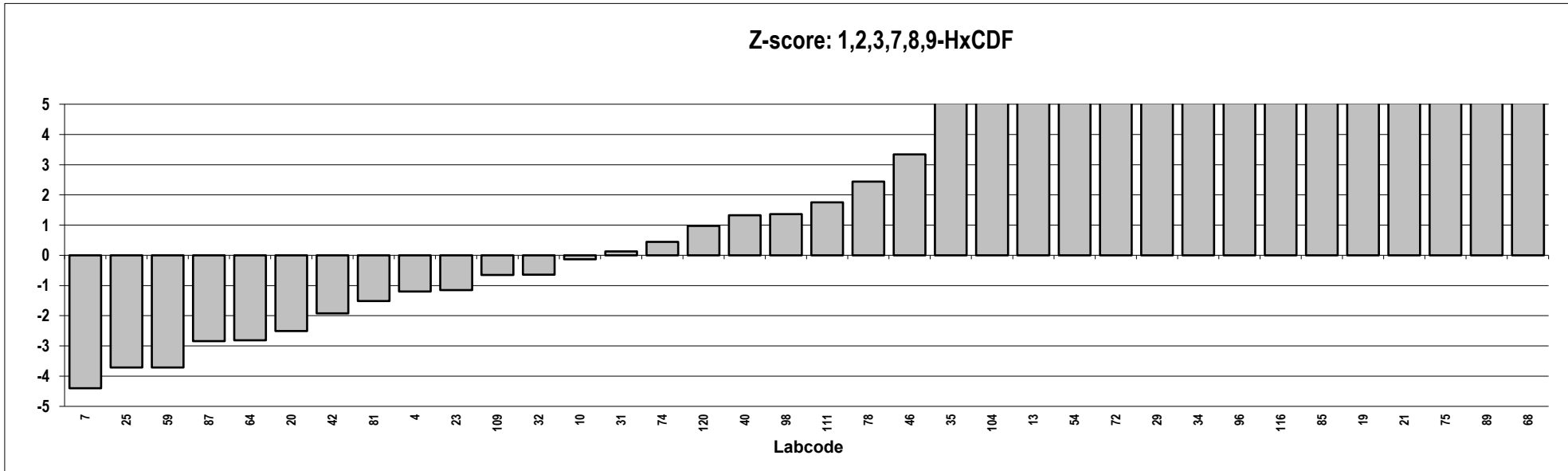
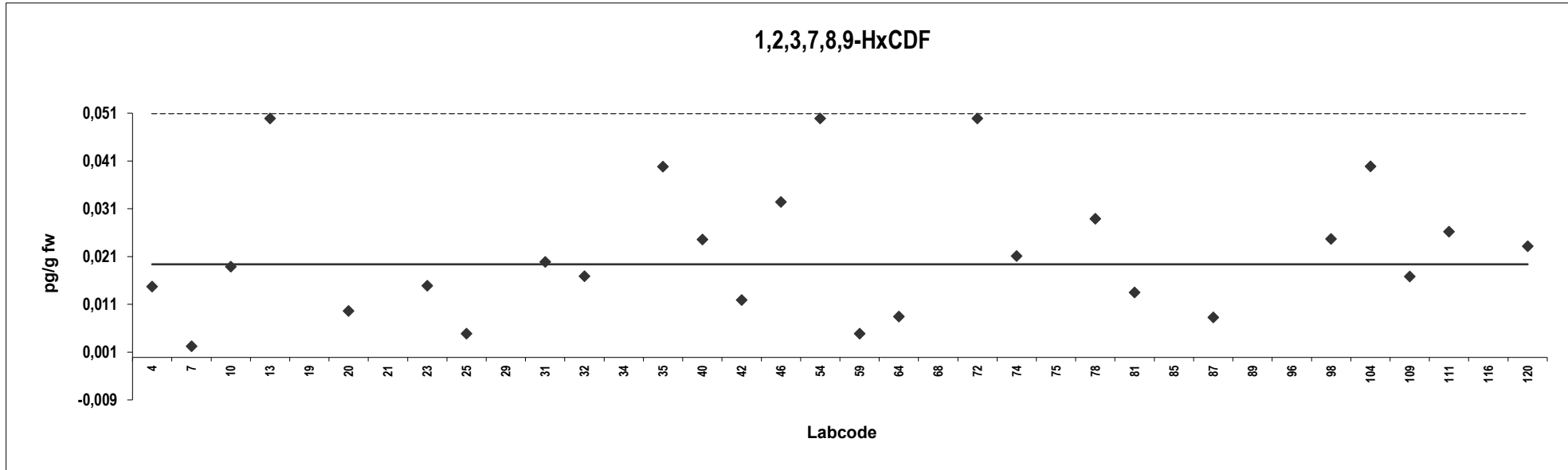


Fish Oil
Congener: 1,2,3,7,8,9-HxCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
4	0,015	-1,2	ND				
7	0,0023	-4,4					
10	0,019	-0,13					
13	0,050	7,8	ND				
19	0,13	29	Outlier,ND				
20	0,0097	-2,5					
21	0,17	38	Outlier,ND				
23	0,015	-1,2	ND				
25	0,0050	-3,7	ND				
29	0,054	8,9	Outlier				
31	0,020	0,13	ND				
32	0,017	-0,64	ND				
34	0,057	9,6	Outlier,ND				
35	0,040	5,2					
40	0,025	1,3					
42	0,012	-1,9					
46	0,033	3,3	ND				
54	0,050	7,8	ND				
59	0,0050	-3,7	ND				
64	0,0085	-2,8					
68	0,20	46	Outlier				
72	0,050	7,8	ND				
74	0,021	0,44					
75	0,17	40	Outlier,ND				
78	0,029	2,4	ND				
81	0,014	-1,5	ND				
85	0,12	27	Outlier,ND				
87	0,0084	-2,8	ND				
89	0,20	45	Outlier				
96	0,10	21	Outlier,ND				
98	0,025	1,4					
104	0,040	5,3	ND				
109	0,017	-0,65					
111	0,026	1,8					
116	0,10	21	Outlier,ND				
120	0,023	0,97					

Consensus statistics

Consensus median, pg/g	0,019
Median all values pg/g	0,026
Consensus mean, pg/g	0,022
Standard deviation, pg/g	0,014
Relative standard deviation, %	64
No. of values reported	36
No. of values removed	10
No. of reported non-detects	21



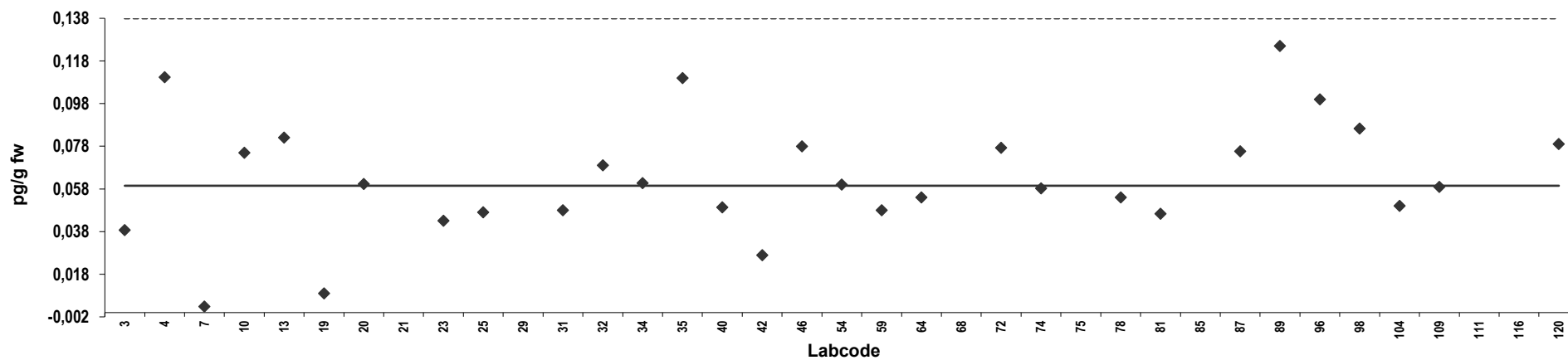
Fish Oil
Congener: 1,2,3,4,6,7,8-HpCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	0,039	-1,7					
4	0,11	4,3					
7	0,0028	-4,8					
10	0,075	1,3					
13	0,082	1,9					
19	0,0090	-4,2	ND				
20	0,060	0,068					
21	0,17	9,0	Outlier,ND				
23	0,043	-1,4					
25	0,047	-1,0					
29	0,18	10	Outlier				
31	0,048	-0,97					
32	0,069	0,80					
34	0,061	0,10					
35	0,11	4,2					
40	0,049	-0,86	ND				
42	0,027	-2,7					
46	0,078	1,6	ND				
54	0,060	0,043					
59	0,048	-0,97					
64	0,054	-0,46					
68	0,27	18	Outlier				
72	0,077	1,5					
74	0,058	-0,11					
75	0,17	9,7	Outlier,ND				
78	0,054	-0,46					
81	0,046	-1,1					
85	0,14	7,0	Outlier				
87	0,076	1,4					
89	0,13	5,5					
96	0,10	3,4	ND				
98	0,086	2,3					
104	0,050	-0,80					
109	0,059	-0,043					
111	0,16	8,5	Outlier				
116	0,50	37	Outlier,ND				
120	0,079	1,6					

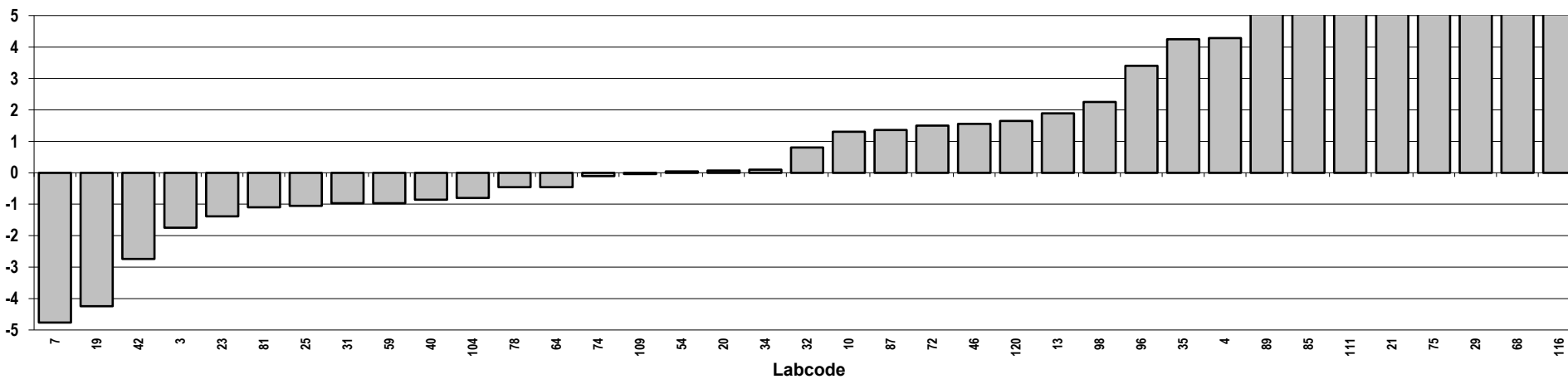
Consensus statistics

Consensus median, pg/g	0,059
Median all values pg/g	0,069
Consensus mean, pg/g	0,063
Standard deviation, pg/g	0,028
Relative standard deviation, %	44
No. of values reported	37
No. of values removed	7
No. of reported non-detects	7

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



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



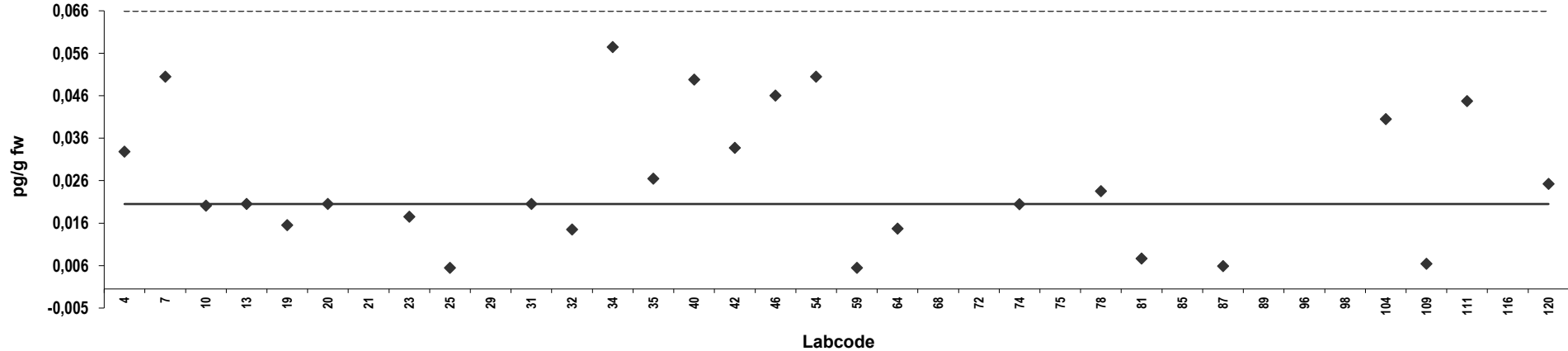
Fish Oil
Congener: 1,2,3,4,7,8,9-HpCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
4	0,032	3,1	ND				
7	0,050	7,5	ND				
10	0,020	-0,091					
13	0,020	0,00	ND				
19	0,015	-1,3	ND				
20	0,020	0,00	ND				
21	0,17	37	Outlier,ND				
23	0,017	-0,75					
25	0,0050	-3,8	ND				
29	0,078	14	Outlier				
31	0,020	0,00	ND				
32	0,014	-1,5					
34	0,057	9,2	ND				
35	0,026	1,5					
40	0,049	7,3	ND				
42	0,033	3,3					
46	0,046	6,4	ND				
54	0,050	7,5	ND				
59	0,0050	-3,8	ND				
64	0,014	-1,4					
68	0,22	50	Outlier				
72	0,080	15	Outlier,ND				
74	0,020	-0,010					
75	0,17	39	Outlier,ND				
78	0,023	0,75	ND				
81	0,0072	-3,2	ND				
85	0,10	20	Outlier,ND				
87	0,0054	-3,7	ND				
89	0,11	22	Outlier,ND				
96	0,10	20	Outlier,ND				
98	0,071	13	Outlier				
104	0,040	5,0	ND				
109	0,0059	-3,5					
111	0,044	6,1					
116	0,25	58	Outlier,ND				
120	0,025	1,2					

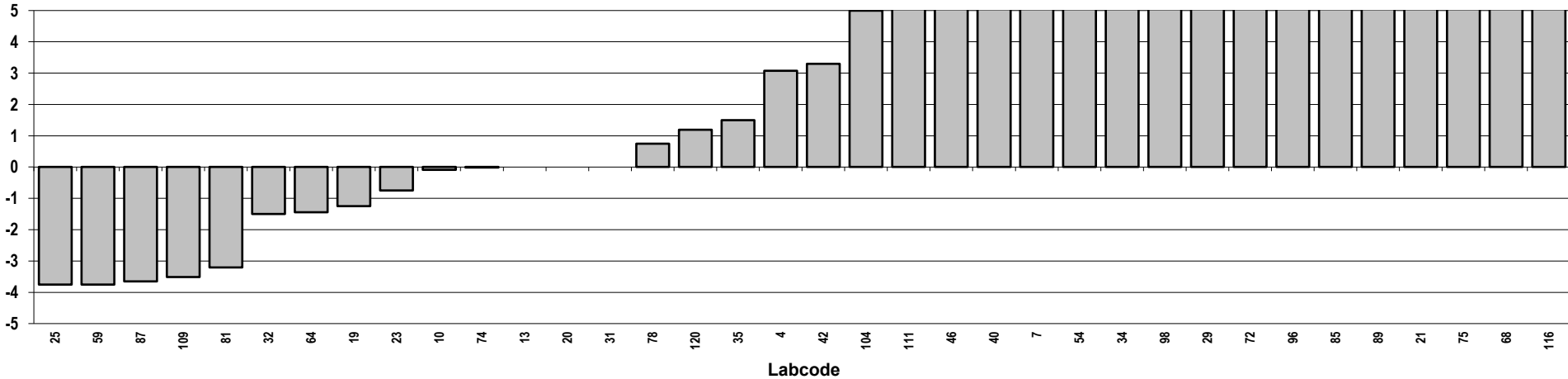
Consensus statistics

Consensus median, pg/g	0,020
Median all values pg/g	0,033
Consensus mean, pg/g	0,026
Standard deviation, pg/g	0,016
Relative standard deviation, %	63
No. of values reported	36
No. of values removed	10
No. of reported non-detects	23

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



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

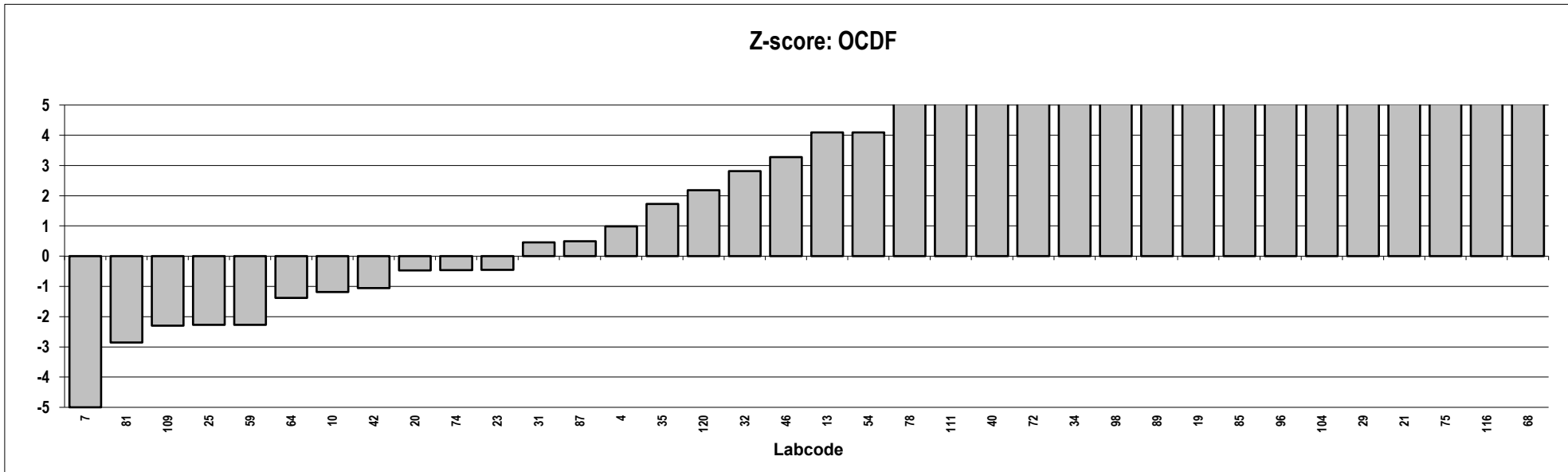
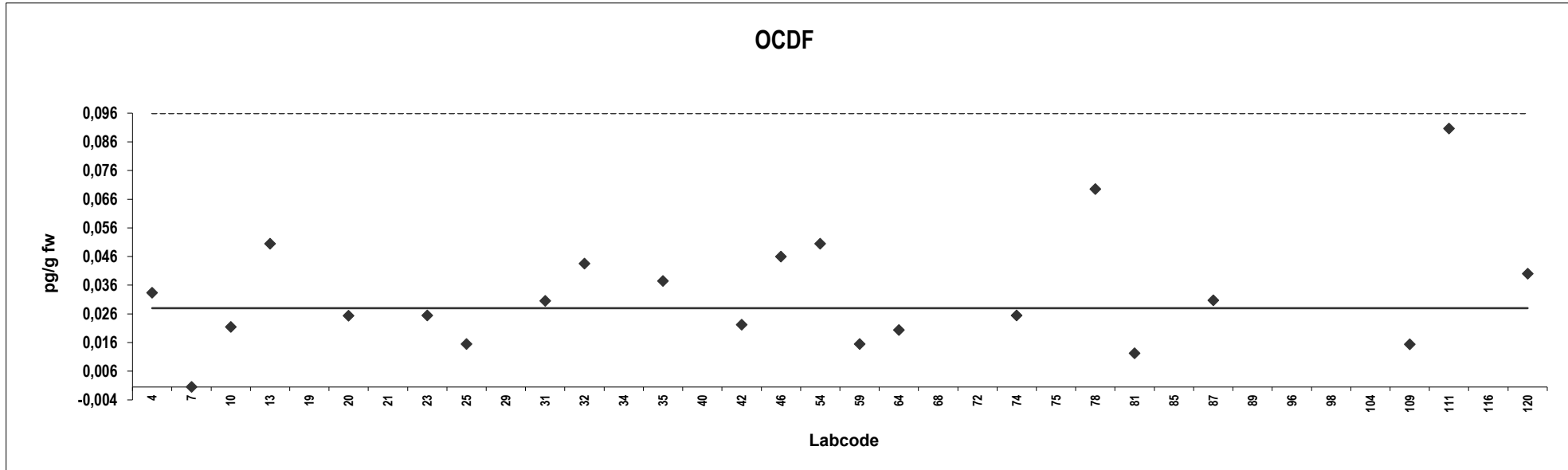


Fish Oil
Congener: OCDF

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
4	0,033	0,98	ND				
7	0,000030	-5,0					
10	0,021	-1,2					
13	0,050	4,1	ND				
19	0,17	25	Outlier,ND				
20	0,025	-0,47					
21	0,33	55	Outlier,ND				
23	0,025	-0,45					
25	0,015	-2,3	ND				
29	0,29	48	Outlier				
31	0,030	0,45	ND				
32	0,043	2,8					
34	0,13	18	Outlier,ND				
35	0,037	1,7					
40	0,099	13	Outlier,ND				
42	0,022	-1,1	ND				
46	0,046	3,3	ND				
54	0,050	4,1	ND				
59	0,015	-2,3	ND				
64	0,020	-1,4					
68	0,83	146	Outlier				
72	0,10	13	Outlier,ND				
74	0,025	-0,46					
75	0,44	74	Outlier,ND				
78	0,069	7,5	ND				
81	0,012	-2,9	ND				
85	0,17	25	Outlier,ND				
87	0,030	0,49					
89	0,16	23	Outlier				
96	0,17	26	Outlier				
98	0,15	22	Outlier				
104	0,20	31	Outlier,ND				
109	0,015	-2,3					
111	0,090	11					
116	0,50	86	Outlier,ND				
120	0,040	2,2					

Consensus statistics

Consensus median, pg/g	0,028
Median all values pg/g	0,048
Consensus mean, pg/g	0,032
Standard deviation, pg/g	0,020
Relative standard deviation, %	63
No. of values reported	36
No. of values removed	14
No. of reported non-detects	19

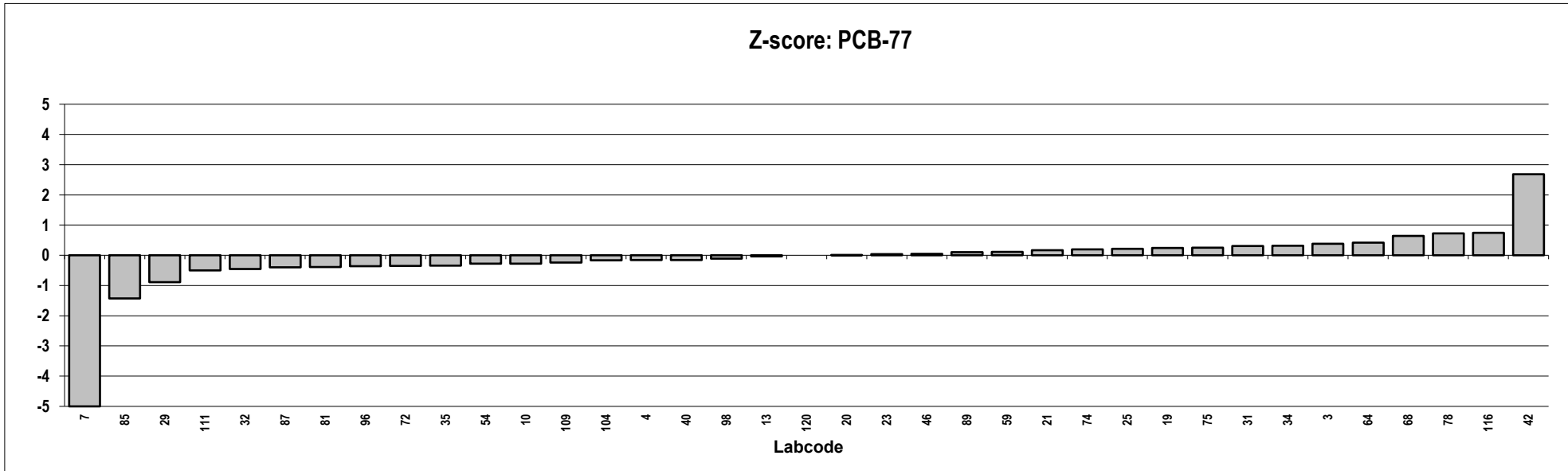
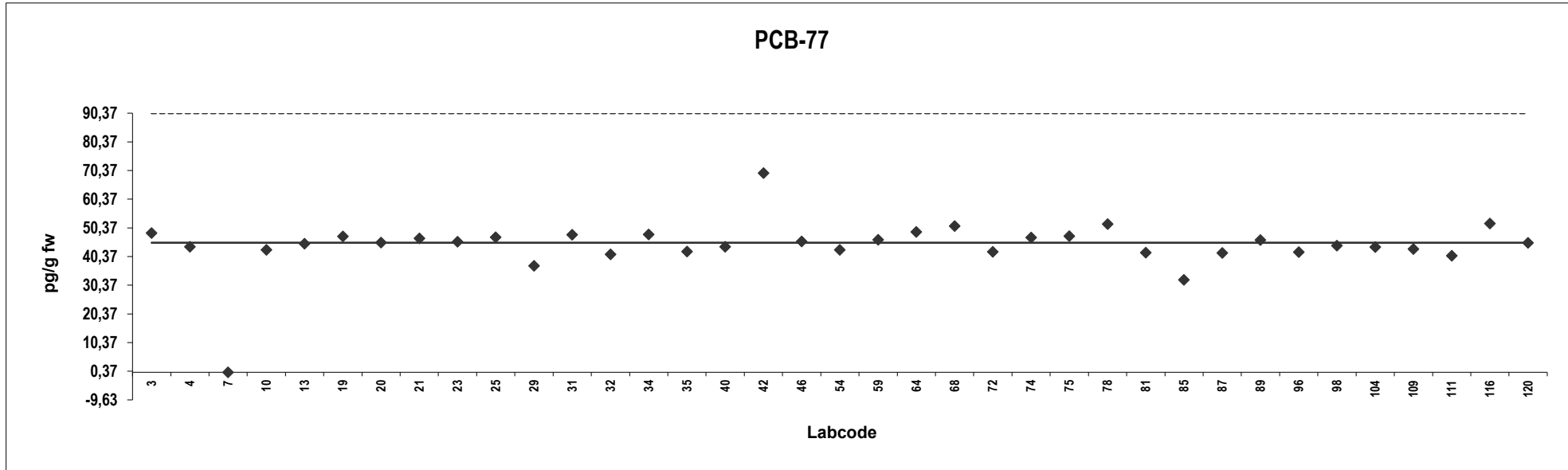


Fish Oil
Congener: PCB-77

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	49	0,38					
4	44	-0,16					
7	0,0050	-5,0					
10	43	-0,28					
13	45	-0,040					
19	47	0,25					
20	45	0,011					
21	47	0,17					
23	46	0,035					
25	47	0,21					
29	37	-0,89					
31	48	0,31					
32	41	-0,45					
34	48	0,32					
35	42	-0,34					
40	44	-0,16					
42	69	2,7					
46	46	0,050					
54	43	-0,28					
59	46	0,11					
64	49	0,42					
68	51	0,64					
72	42	-0,35					
74	47	0,20					
75	47	0,25					
78	52	0,72					
81	42	-0,39					
85	32	-1,4					
87	42	-0,40					
89	46	0,10					
96	42	-0,36					
98	44	-0,11					
104	44	-0,16					
109	43	-0,24					
111	41	-0,50					
116	52	0,74					
120	45	0,00					

Consensus statistics

Consensus median, pg/g	45
Median all values pg/g	45
Consensus mean, pg/g	44
Standard deviation, pg/g	9,3
Relative standard deviation, %	21
No. of values reported	37
No. of values removed	0
No. of reported non-detects	0

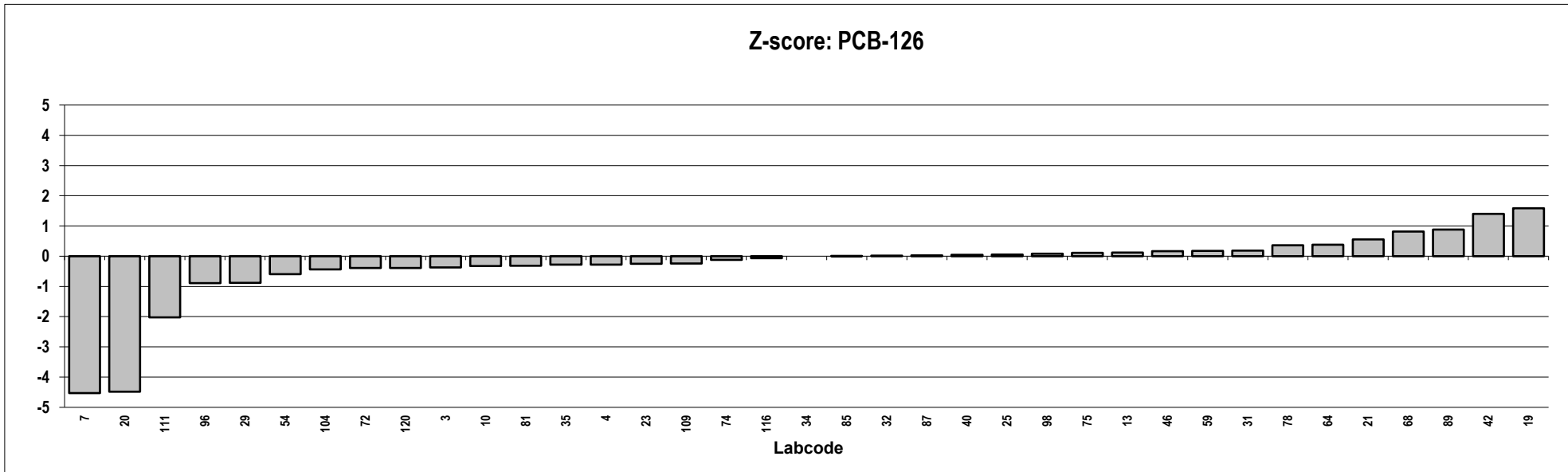
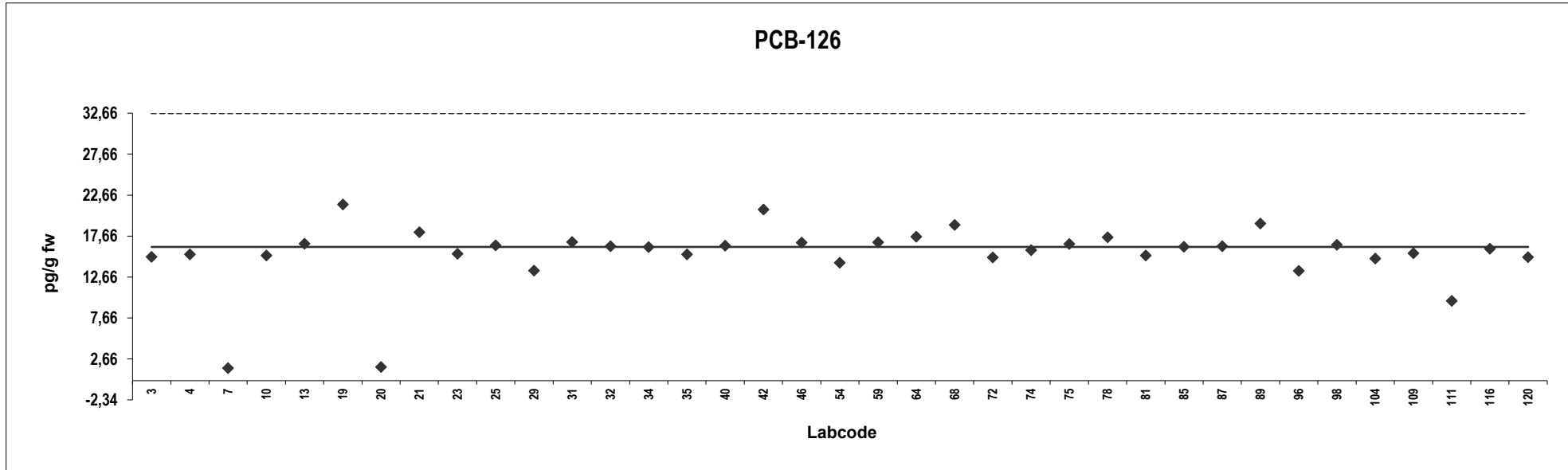


Fish Oil
Congener: PCB-126

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	15	-0,38					
4	15	-0,28					
7	1,5	-4,5					
10	15	-0,32					
13	17	0,12					
19	22	1,6					
20	1,7	-4,5					
21	18	0,55					
23	16	-0,25					
25	17	0,053					
29	13	-0,88					
31	17	0,18					
32	16	0,022					
34	16	0,00					
35	15	-0,28					
40	16	0,045					
42	21	1,4					
46	17	0,17					
54	14	-0,59					
59	17	0,18					
64	18	0,38					
68	19	0,82					
72	15	-0,39					
74	16	-0,12					
75	17	0,11					
78	18	0,36					
81	15	-0,31					
85	16	0,0066					
87	16	0,024					
89	19	0,88					
96	13	-0,89					
98	17	0,083					
104	15	-0,44					
109	16	-0,24					
111	9,7	-2,0					
116	16	-0,070					
120	15	-0,39					

Consensus statistics

Consensus median, pg/g	16
Median all values pg/g	16
Consensus mean, pg/g	15
Standard deviation, pg/g	3,9
Relative standard deviation, %	25
No. of values reported	37
No. of values removed	0
No. of reported non-detects	0

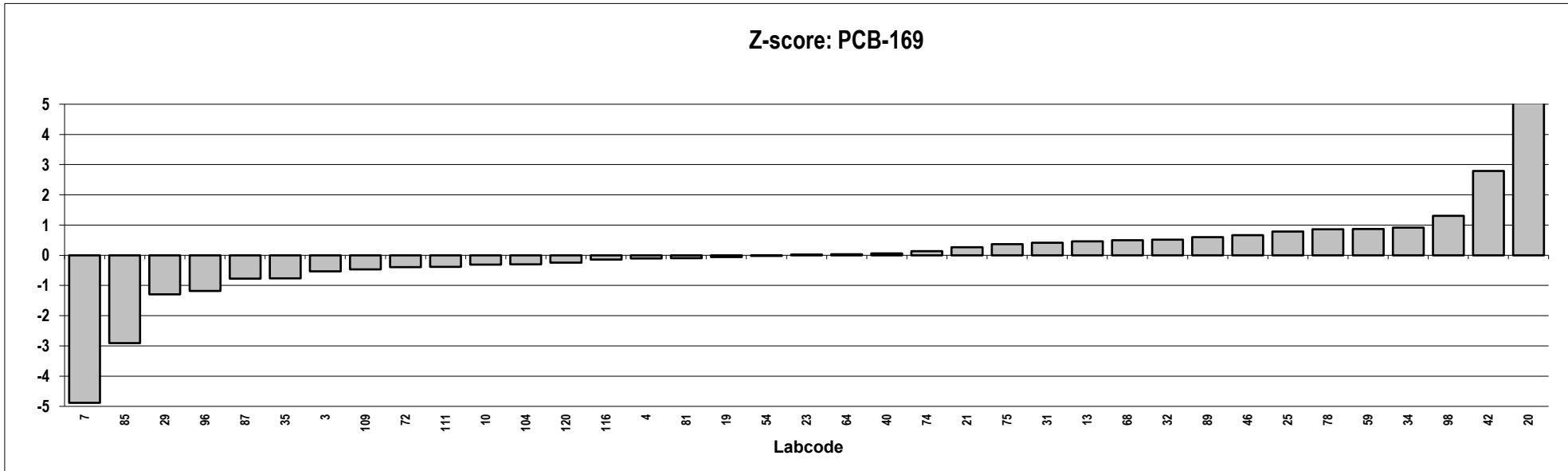
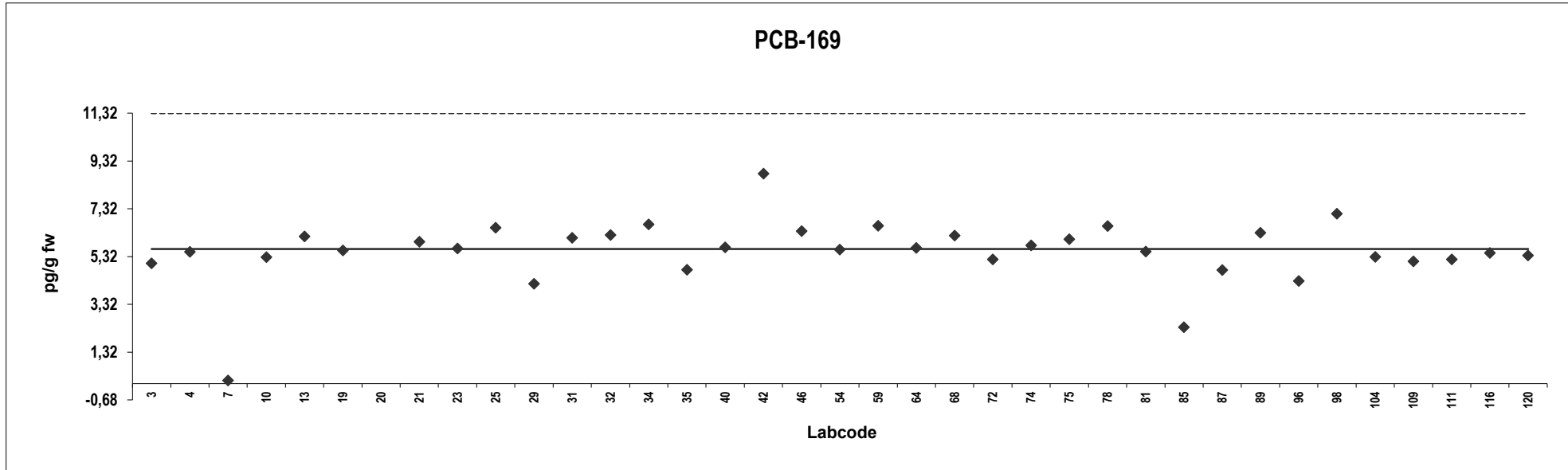


Fish Oil
Congener: PCB-169

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	5,0	-0,53					
4	5,5	-0,10					
7	0,13	-4,9					
10	5,3	-0,31					
13	6,2	0,47					
19	5,6	-0,058					
20	18	11	Outlier				
21	5,9	0,27					
23	5,7	0,022					
25	6,5	0,79					
29	4,2	-1,3					
31	6,1	0,41					
32	6,2	0,52					
34	6,7	0,92					
35	4,8	-0,77					
40	5,7	0,062					
42	8,8	2,8					
46	6,4	0,67					
54	5,6	-0,022					
59	6,6	0,87					
64	5,7	0,037					
68	6,2	0,50					
72	5,2	-0,39					
74	5,8	0,14					
75	6,0	0,37					
78	6,6	0,86					
81	5,5	-0,093					
85	2,4	-2,9	ND				
87	4,8	-0,78					
89	6,3	0,60					
96	4,3	-1,2					
98	7,1	1,3					
104	5,3	-0,30					
109	5,1	-0,46					
111	5,2	-0,38					
116	5,5	-0,15					
120	5,4	-0,24					

Consensus statistics

Consensus median, pg/g	5,6
Median all values pg/g	5,7
Consensus mean, pg/g	5,5
Standard deviation, pg/g	1,4
Relative standard deviation, %	25
No. of values reported	37
No. of values removed	1
No. of reported non-detects	1

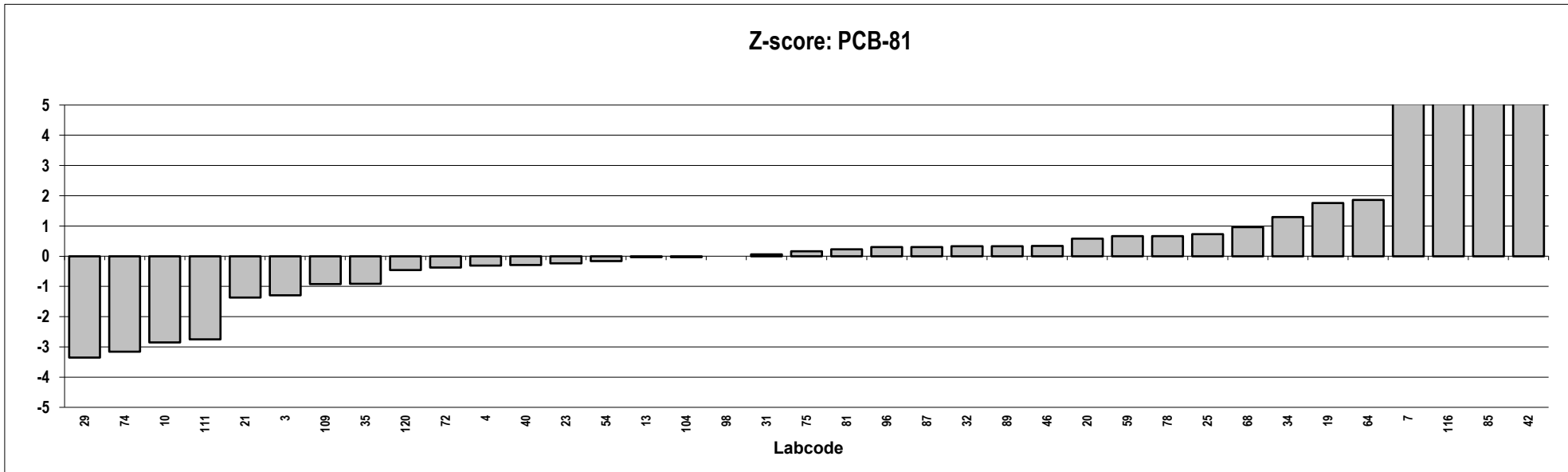
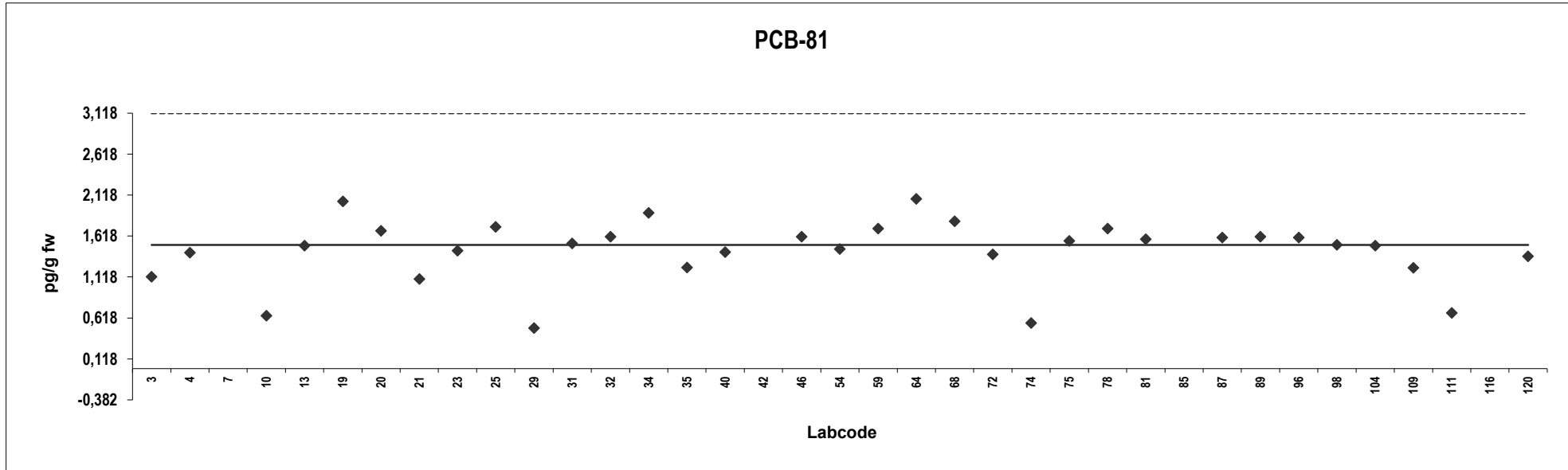


Fish Oil
Congener: PCB-81

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	1,1	-1,3					
4	1,4	-0,31					
7	5,0	12	Outlier,ND				
10	0,65	-2,9					
13	1,5	-0,033					
19	2,0	1,8					
20	1,7	0,58					
21	1,1	-1,4					
23	1,4	-0,23					
25	1,7	0,73					
29	0,50	-3,4					
31	1,5	0,060					
32	1,6	0,33					
34	1,9	1,3					
35	1,2	-0,92					
40	1,4	-0,29					
42	50	160	Outlier				
46	1,6	0,34					
54	1,5	-0,17					
59	1,7	0,66					
64	2,1	1,9					
68	1,8	0,96					
72	1,4	-0,38					
74	0,56	-3,2					
75	1,6	0,16					
78	1,7	0,66					
81	1,6	0,23					
85	22	69	Outlier				
87	1,6	0,30					
89	1,6	0,33					
96	1,6	0,30					
98	1,5	0,00					
104	1,5	-0,033					
109	1,2	-0,92					
111	0,68	-2,8					
116	6,0	15	Outlier,ND				
120	1,4	-0,46					

Consensus statistics

Consensus median, pg/g	1,5
Median all values pg/g	1,6
Consensus mean, pg/g	1,4
Standard deviation, pg/g	0,39
Relative standard deviation, %	27
No. of values reported	37
No. of values removed	4
No. of reported non-detects	2



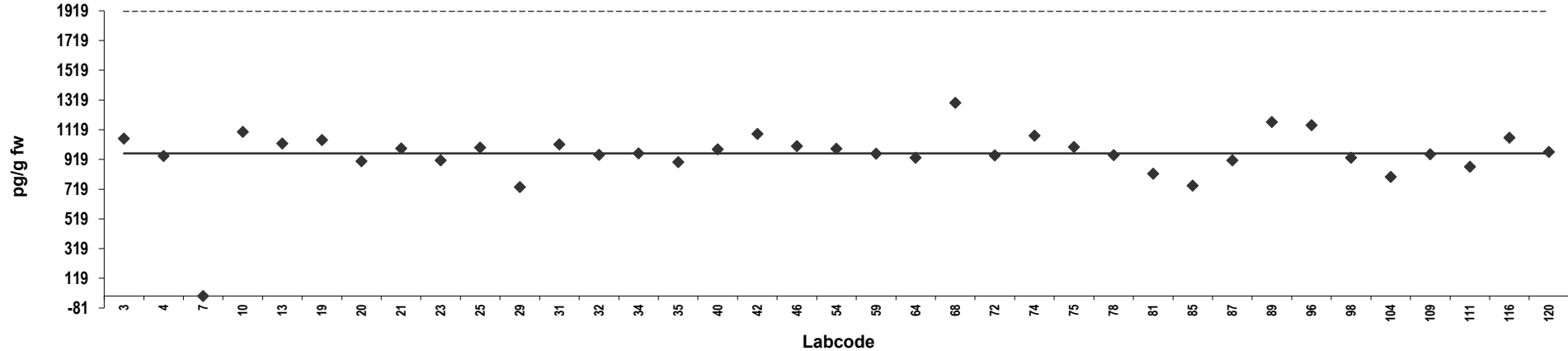
Fish Oil
Congener: PCB-105

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	1060	0,52					
4	943	-0,086					
7	0,024	-5,0					
10	1105	0,76					
13	1027	0,35					
19	1050	0,47					
20	908	-0,27					
21	993	0,18					
23	913	-0,24					
25	998	0,20					
29	733	-1,2					
31	1020	0,32					
32	950	-0,050					
34	960	0,00					
35	902	-0,30					
40	987	0,14					
42	1091	0,69					
46	1008	0,25					
54	990	0,16					
59	958	-0,0079					
64	931	-0,15					
68	1300	1,8					
72	945	-0,075					
74	1080	0,63					
75	1003	0,23					
78	948	-0,060					
81	823	-0,71					
85	743	-1,1					
87	912	-0,25					
89	1170	1,1					
96	1149	0,99					
98	930	-0,15					
104	802	-0,82					
109	954	-0,029					
111	869	-0,47					
116	1065	0,55					
120	970	0,052					

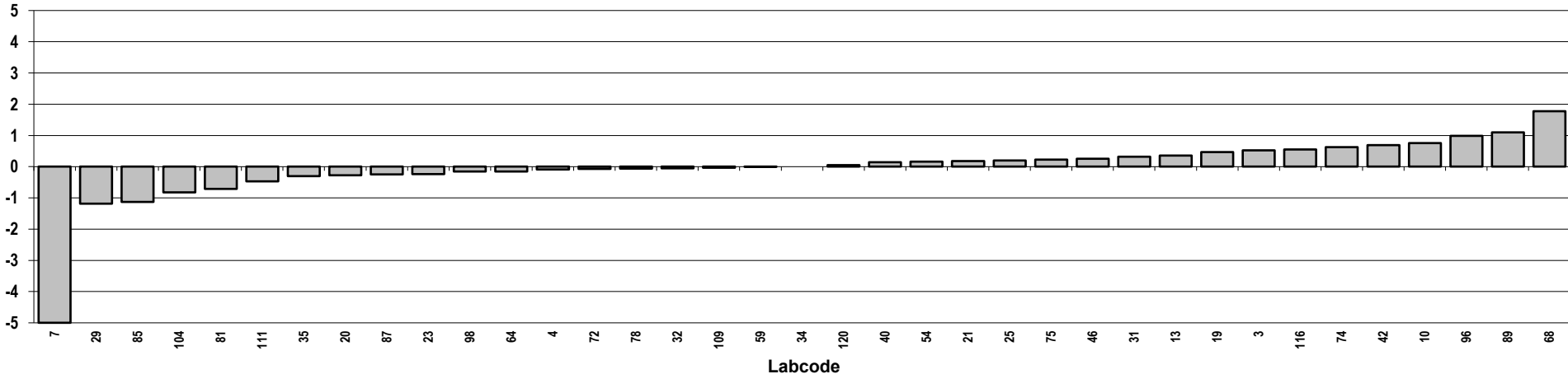
Consensus statistics

Consensus median, pg/g	960
Median all values pg/g	960
Consensus mean, pg/g	951
Standard deviation, pg/g	196
Relative standard deviation, %	21
No. of values reported	37
No. of values removed	0
No. of reported non-detects	0

PCB-105



Z-score: PCB-105

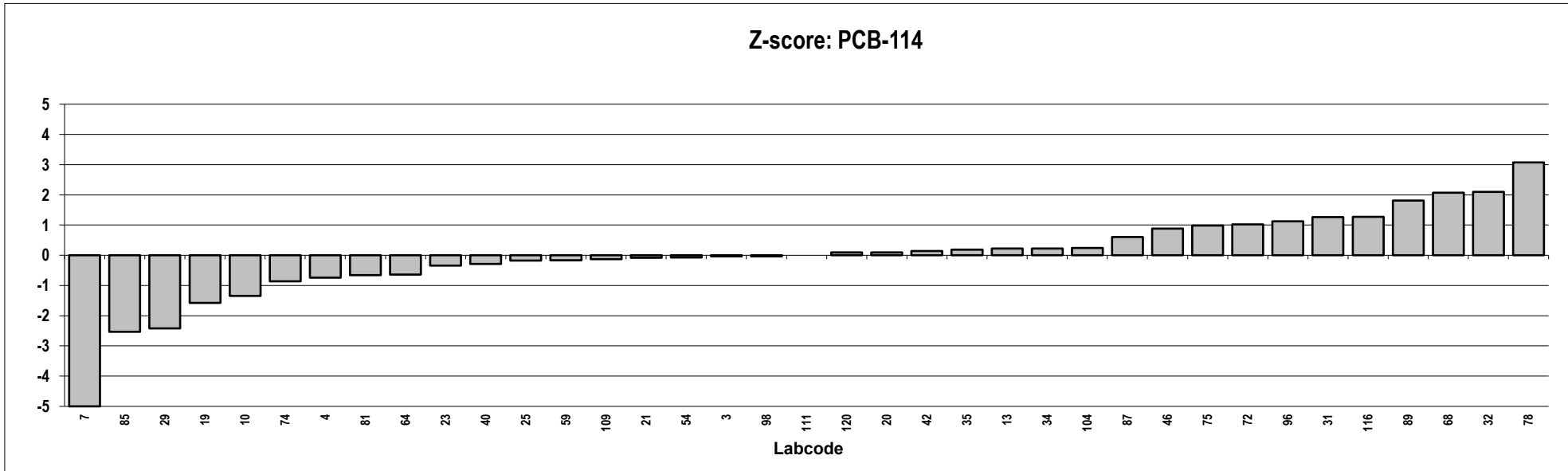
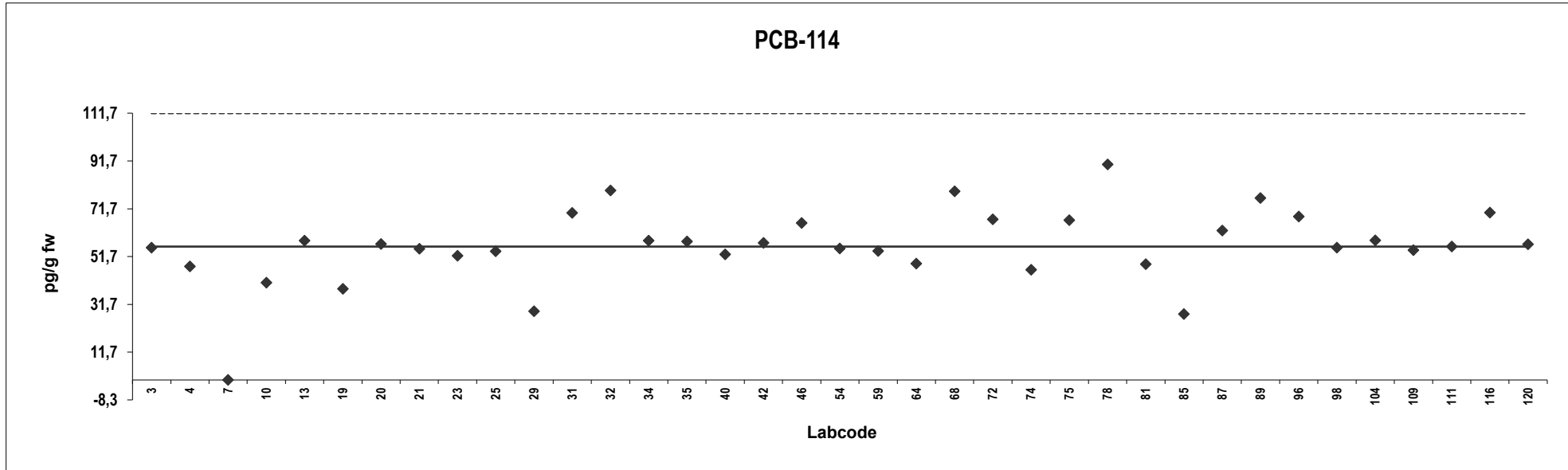


Fish Oil
Congener: PCB-114

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	55	-0,039					
4	48	-0,74					
7	0,0015	-5,0					
10	41	-1,3					
13	58	0,22					
19	38	-1,6					
20	57	0,097					
21	55	-0,084					
23	52	-0,34					
25	54	-0,17					
29	29	-2,4					
31	70	1,3					
32	79	2,1					
34	58	0,22					
35	58	0,19					
40	53	-0,29					
42	57	0,14					
46	66	0,89					
54	55	-0,075					
59	54	-0,16					
64	49	-0,64					
68	79	2,1					
72	67	1,0					
74	46	-0,87					
75	67	0,99					
78	90	3,1					
81	49	-0,66					
85	28	-2,5					
87	63	0,60					
89	76	1,8					
96	68	1,1					
98	55	-0,039					
104	59	0,24					
109	54	-0,13					
111	56	0,00					
116	70	1,3	ND				
120	57	0,090					

Consensus statistics

Consensus median, pg/g	56
Median all values pg/g	56
Consensus mean, pg/g	56
Standard deviation, pg/g	16
Relative standard deviation, %	28
No. of values reported	37
No. of values removed	0
No. of reported non-detects	1



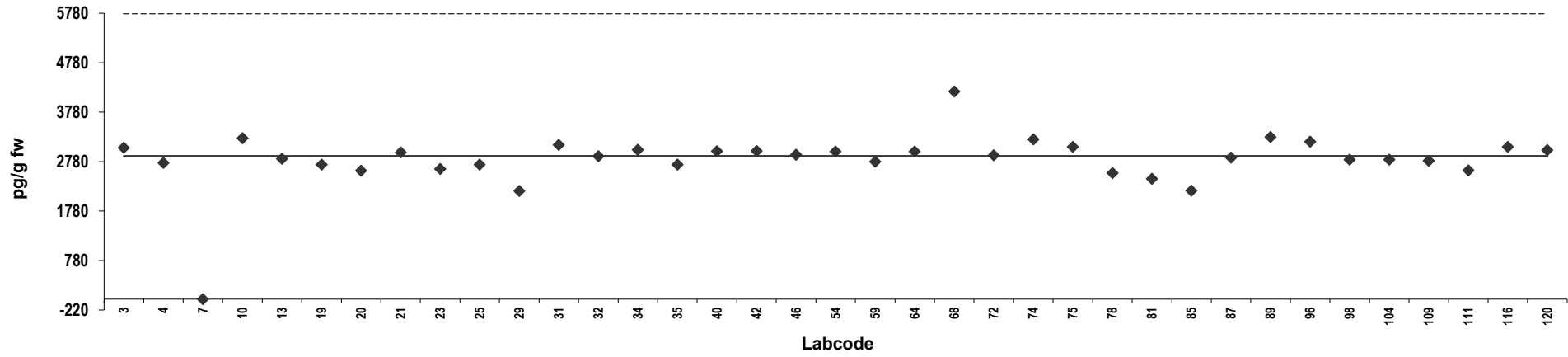
Fish Oil
Congener: PCB-118

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	3060	0,29					
4	2756	-0,23					
7	0,093	-5,0					
10	3255	0,63					
13	2839	-0,089					
19	2720	-0,29					
20	2595	-0,51					
21	2968	0,13					
23	2630	-0,45					
25	2720	-0,29					
29	2188	-1,2					
31	3119	0,40					
32	2890	0,00					
34	3017	0,22					
35	2717	-0,30					
40	2988	0,17					
42	2994	0,18					
46	2920	0,051					
54	2983	0,16					
59	2780	-0,19					
64	2981	0,16					
68	4200	2,3					
72	2905	0,026					
74	3232	0,59					
75	3075	0,32					
78	2550	-0,59					
81	2430	-0,80					
85	2194	-1,2					
87	2860	-0,051					
89	3280	0,67					
96	3185	0,51					
98	2820	-0,12					
104	2820	-0,12					
109	2799	-0,16					
111	2601	-0,50					
116	3080	0,33					
120	3012	0,21					

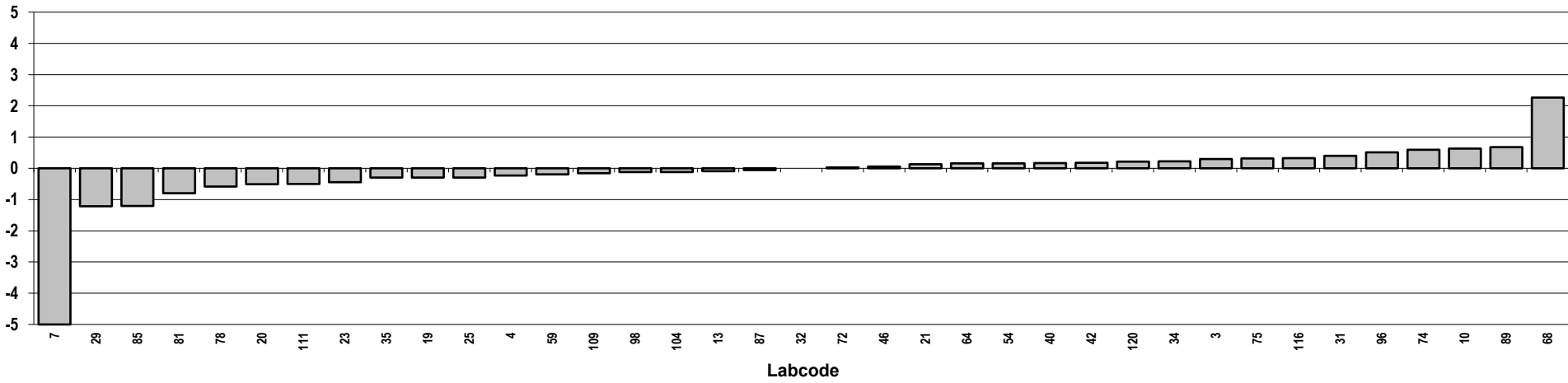
Consensus statistics

Consensus median, pg/g	2890
Median all values pg/g	2890
Consensus mean, pg/g	2815
Standard deviation, pg/g	584
Relative standard deviation, %	21
No. of values reported	37
No. of values removed	0
No. of reported non-detects	0

PCB-118



Z-score: PCB-118

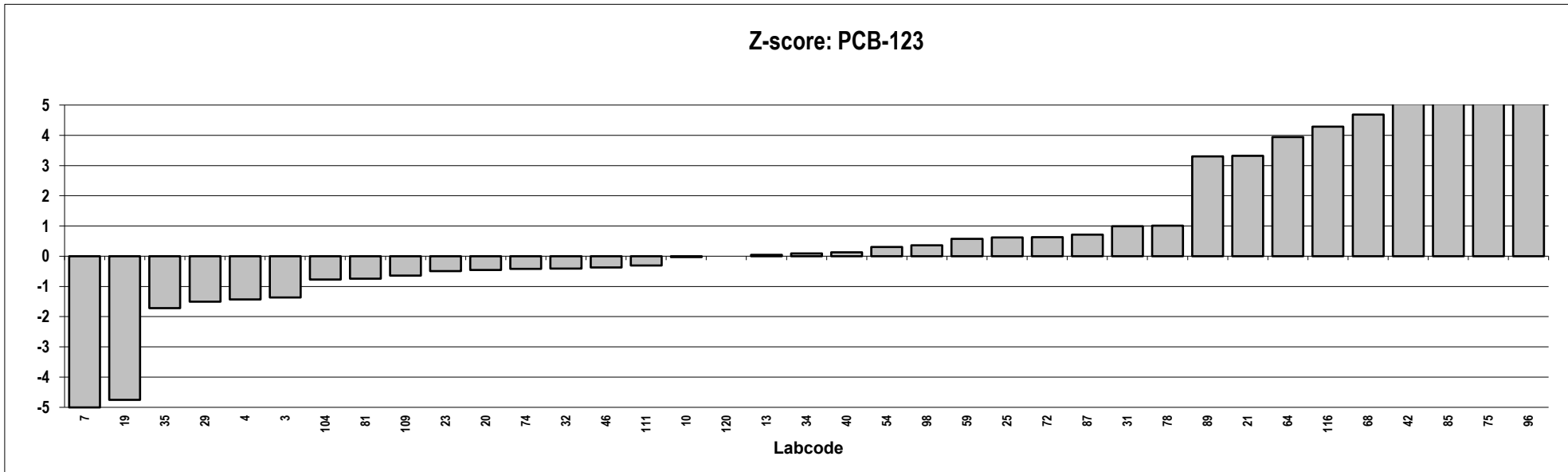
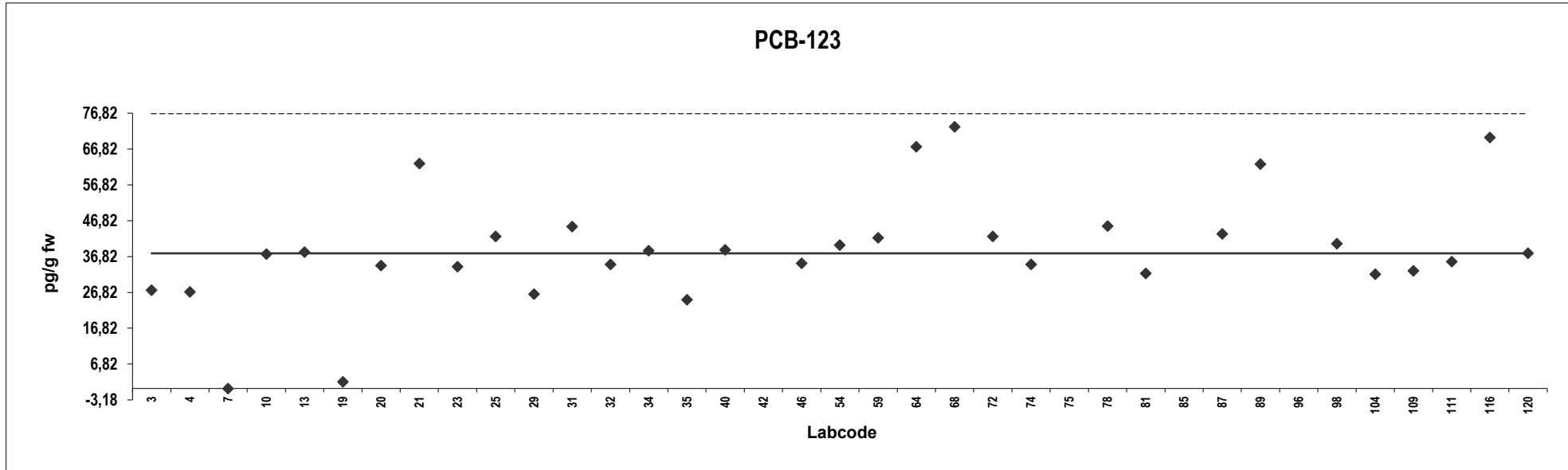


Fish Oil
Congener: PCB-123

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	27	-1,4					
4	27	-1,4					
7	0,0020	-5,0					
10	37	-0,029					
13	38	0,042					
19	1,9	-4,8					
20	34	-0,46					
21	63	3,3					
23	34	-0,49					
25	42	0,62					
29	26	-1,5					
31	45	0,99					
32	35	-0,41					
34	38	0,093					
35	25	-1,7					
40	39	0,12					
42	82	5,9	Outlier				
46	35	-0,37					
54	40	0,30					
59	42	0,57					
64	67	3,9					
68	73	4,7					
72	42	0,63					
74	35	-0,42					
75	120	11	Outlier				
78	45	1,0					
81	32	-0,74	ND				
85	110	9,6	Outlier				
87	43	0,72					
89	63	3,3					
96	518	64	Outlier				
98	40	0,36					
104	32	-0,77					
109	33	-0,65					
111	35	-0,31					
116	70	4,3	ND				
120	38	0,00					

Consensus statistics

Consensus median, pg/g	38
Median all values pg/g	38
Consensus mean, pg/g	39
Standard deviation, pg/g	16
Relative standard deviation, %	41
No. of values reported	37
No. of values removed	4
No. of reported non-detects	2

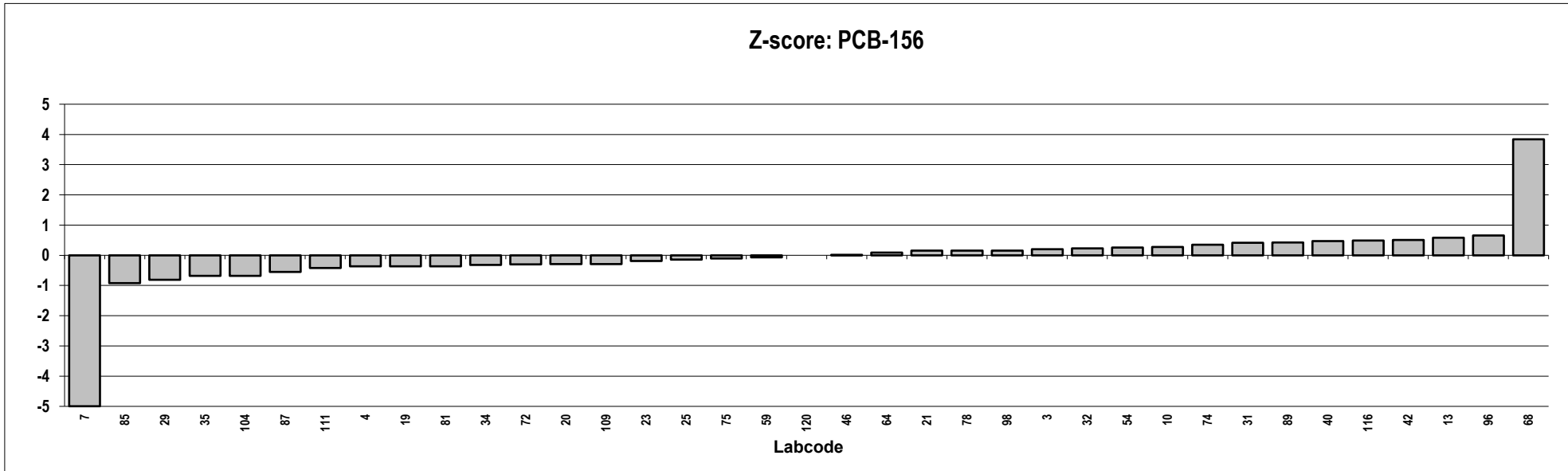
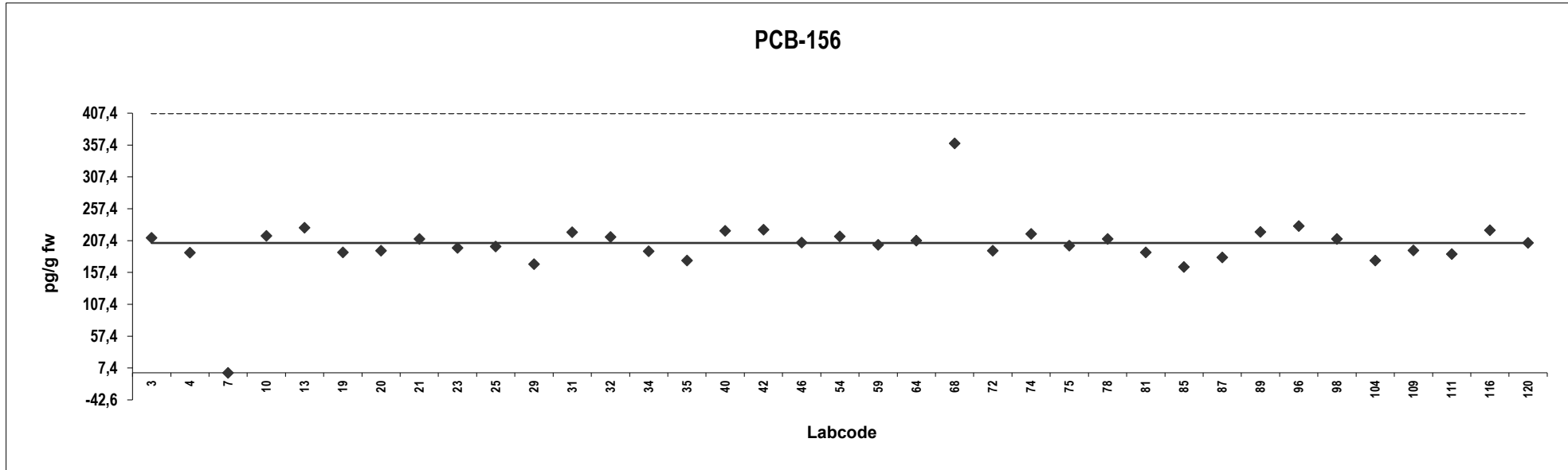


Fish Oil
Congener: PCB-156

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	212	0,20					
4	189	-0,37					
7	0,0059	-5,0					
10	215	0,27					
13	227	0,58					
19	189	-0,36					
20	192	-0,29					
21	210	0,15					
23	196	-0,19					
25	198	-0,14					
29	171	-0,81					
31	221	0,42					
32	213	0,23					
34	191	-0,32					
35	176	-0,68					
40	223	0,47					
42	225	0,51					
46	205	0,020					
54	214	0,25					
59	201	-0,067					
64	207	0,089					
68	360	3,8					
72	191	-0,30					
74	218	0,34					
75	199	-0,11					
78	210	0,15					
81	189	-0,36					
85	166	-0,92					
87	181	-0,55					
89	221	0,42					
96	230	0,65					
98	210	0,15					
104	176	-0,68					
109	192	-0,29					
111	186	-0,42					
116	224	0,49					
120	204	0,00					

Consensus statistics

Consensus median, pg/g	204
Median all values pg/g	204
Consensus mean, pg/g	201
Standard deviation, pg/g	46
Relative standard deviation, %	23
No. of values reported	37
No. of values removed	0
No. of reported non-detects	0

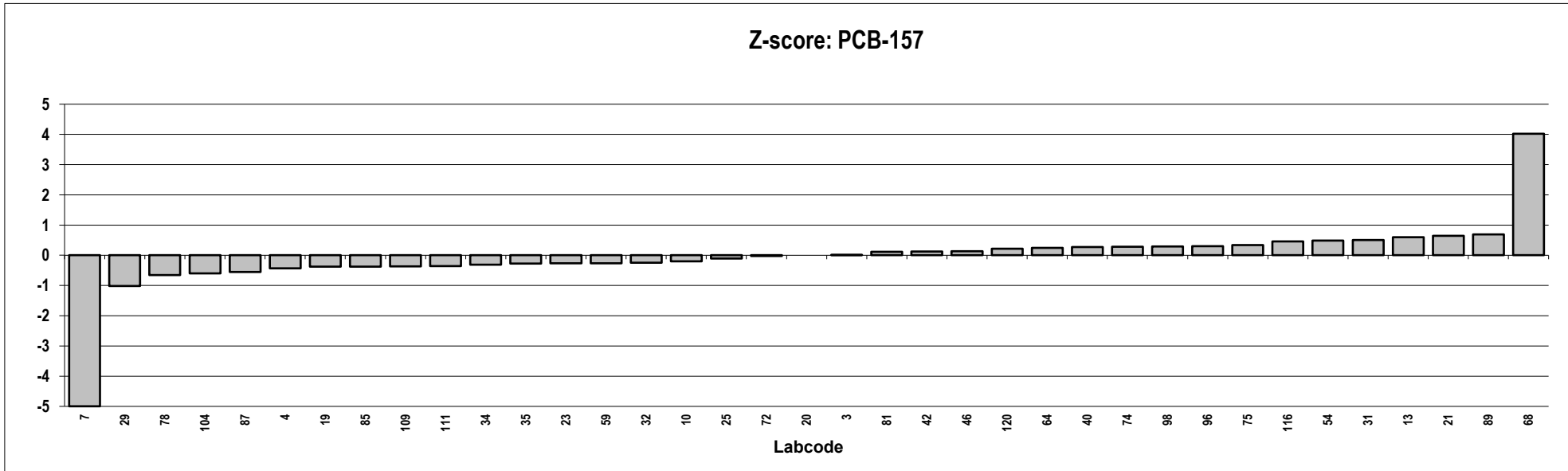
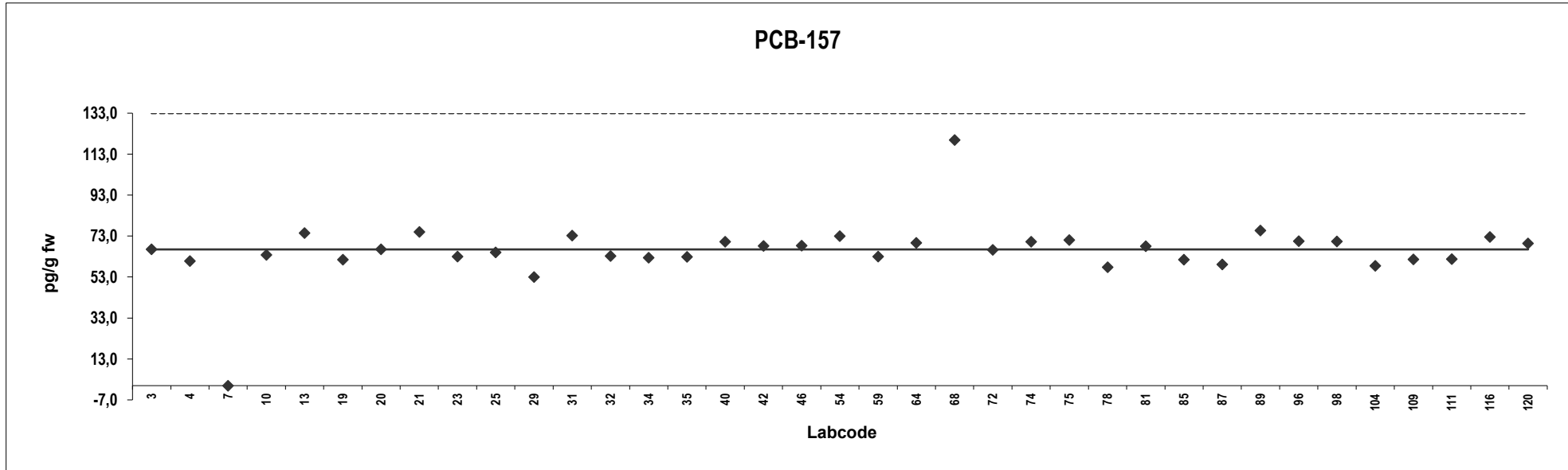


Fish Oil
Congener: PCB-157

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	67	0,0060					
4	61	-0,43					
7	0,0020	-5,0					
10	64	-0,20					
13	75	0,60					
19	62	-0,38					
20	67	0,00					
21	75	0,64					
23	63	-0,26					
25	65	-0,11					
29	53	-1,0					
31	73	0,50					
32	63	-0,24					
34	62	-0,31					
35	63	-0,27					
40	70	0,28					
42	68	0,12					
46	68	0,13					
54	73	0,49					
59	63	-0,26					
64	70	0,24					
68	120	4,0					
72	66	-0,022					
74	70	0,28					
75	71	0,34					
78	58	-0,66					
81	68	0,12					
85	62	-0,37					
87	59	-0,55					
89	76	0,69					
96	70	0,30					
98	70	0,29					
104	59	-0,60					
109	62	-0,37					
111	62	-0,36					
116	73	0,46					
120	69	0,22					

Consensus statistics

Consensus median, pg/g	67
Median all values pg/g	67
Consensus mean, pg/g	66
Standard deviation, pg/g	15
Relative standard deviation, %	23
No. of values reported	37
No. of values removed	0
No. of reported non-detects	0

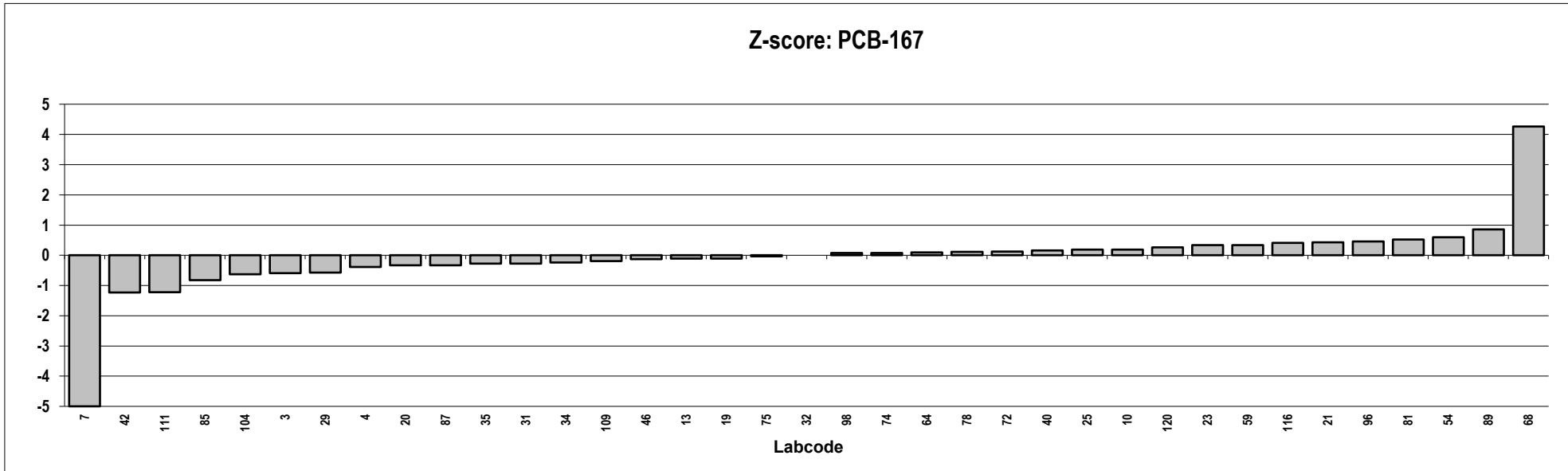
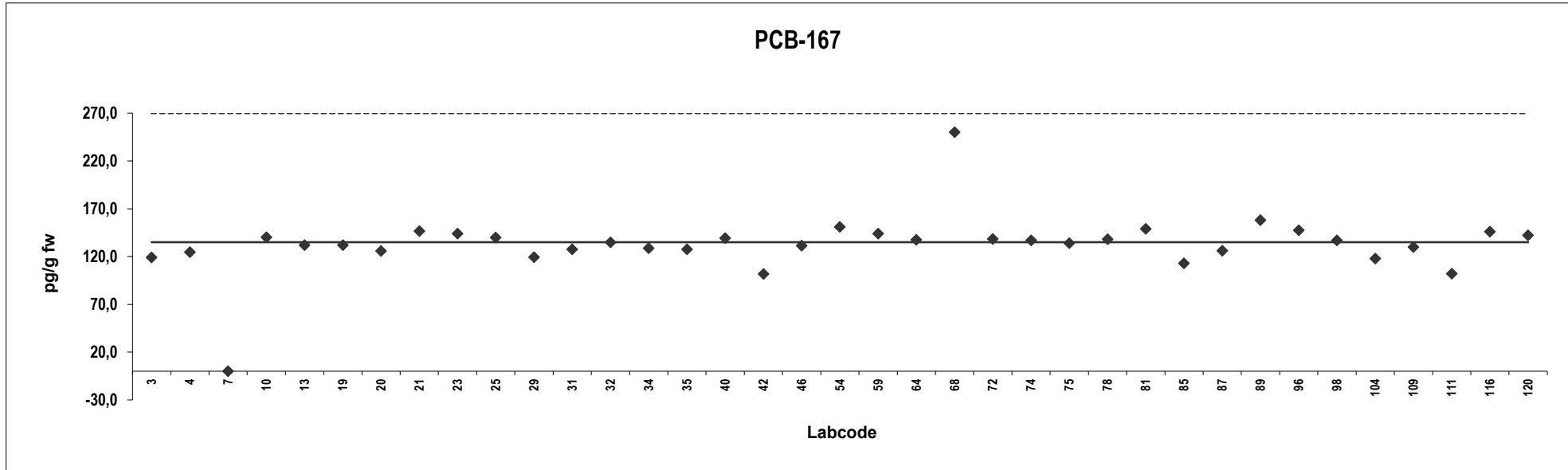


Fish Oil
Congener: PCB-167

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	119	-0,59					
4	125	-0,39					
7	0,0045	-5,0					
10	140	0,19					
13	132	-0,11					
19	132	-0,11					
20	126	-0,34					
21	147	0,43					
23	144	0,33					
25	140	0,19					
29	119	-0,58					
31	128	-0,28					
32	135	0,00					
34	129	-0,24					
35	127	-0,28					
40	139	0,16					
42	102	-1,2					
46	132	-0,13					
54	151	0,59					
59	144	0,33					
64	138	0,099					
68	250	4,3					
72	138	0,12					
74	137	0,076					
75	134	-0,035					
78	138	0,11					
81	149	0,52					
85	113	-0,82					
87	126	-0,33					
89	158	0,85					
96	147	0,46					
98	137	0,074					
104	118	-0,63					
109	130	-0,19					
111	102	-1,2					
116	146	0,41					
120	142	0,27					

Consensus statistics

Consensus median, pg/g	135
Median all values pg/g	135
Consensus mean, pg/g	133
Standard deviation, pg/g	32
Relative standard deviation, %	24
No. of values reported	37
No. of values removed	0
No. of reported non-detects	0

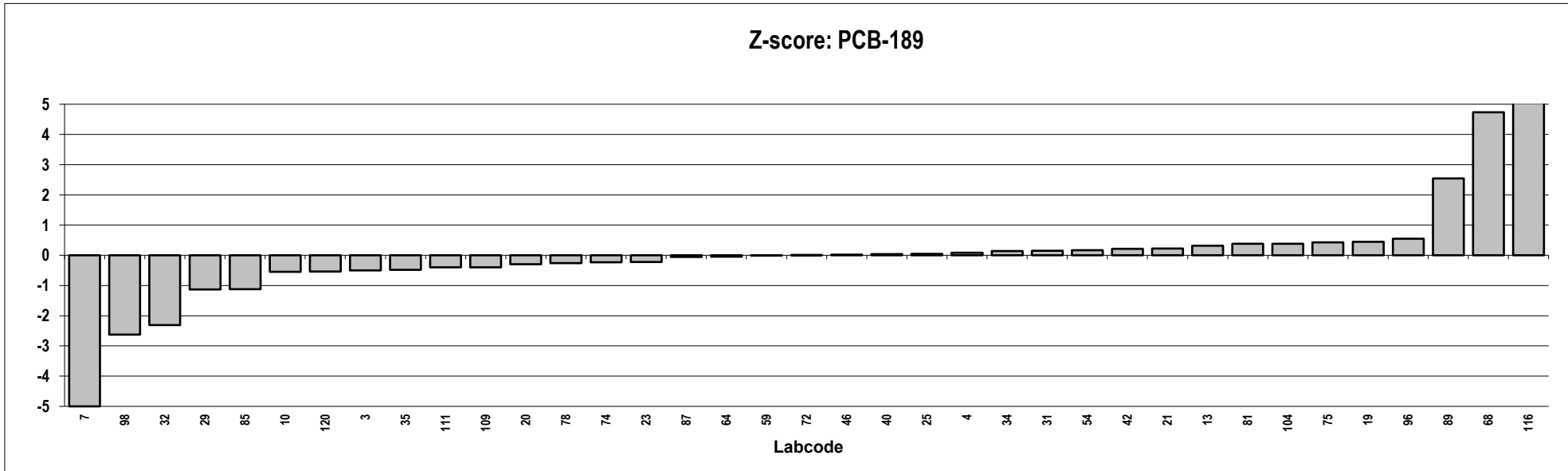
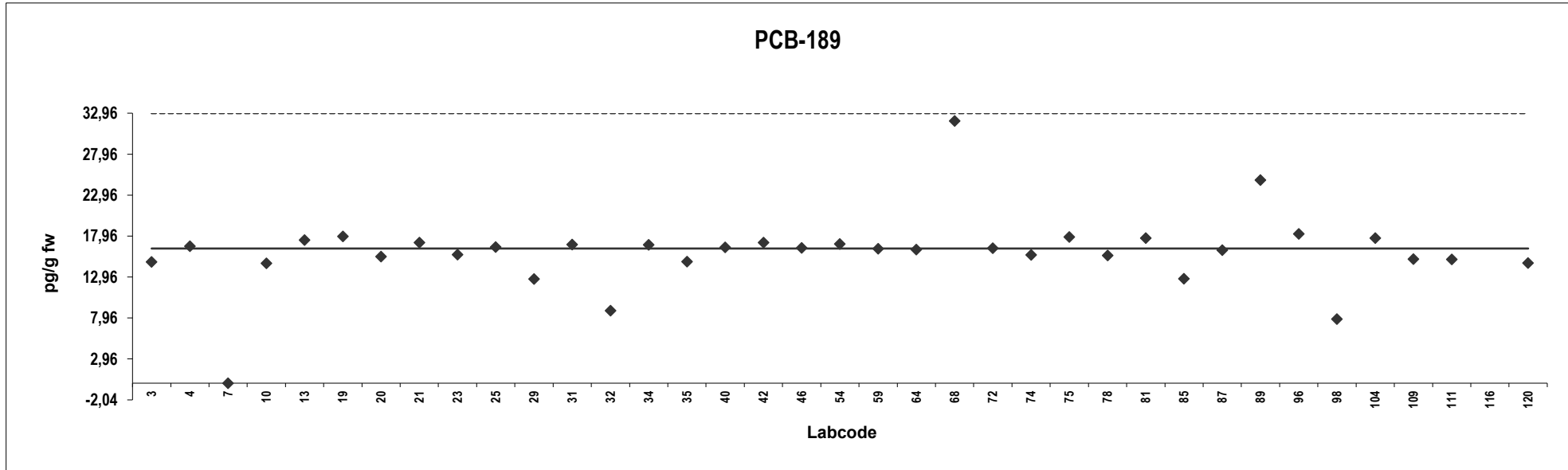


Fish Oil
Congener: PCB-189

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	15	-0,50					
4	17	0,084					
7	0,00065	-5,0					
10	15	-0,55					
13	17	0,31					
19	18	0,44					
20	15	-0,30					
21	17	0,22					
23	16	-0,23					
25	17	0,049					
29	13	-1,1					
31	17	0,15					
32	8,8	-2,3					
34	17	0,14					
35	15	-0,48					
40	17	0,038					
42	17	0,22					
46	17	0,020					
54	17	0,17					
59	16	-0,012					
64	16	-0,043					
68	32	4,7					
72	16	0,012					
74	16	-0,23					
75	18	0,43					
78	16	-0,26					
81	18	0,38					
85	13	-1,1					
87	16	-0,056					
89	25	2,5					
96	18	0,55					
98	7,8	-2,6					
104	18	0,38					
109	15	-0,40					
111	15	-0,40					
116	40	7,2	Outlier,ND				
120	15	-0,54					

Consensus statistics

Consensus median, pg/g	16
Median all values pg/g	16
Consensus mean, pg/g	16
Standard deviation, pg/g	4,7
Relative standard deviation, %	29
No. of values reported	37
No. of values removed	1
No. of reported non-detects	1

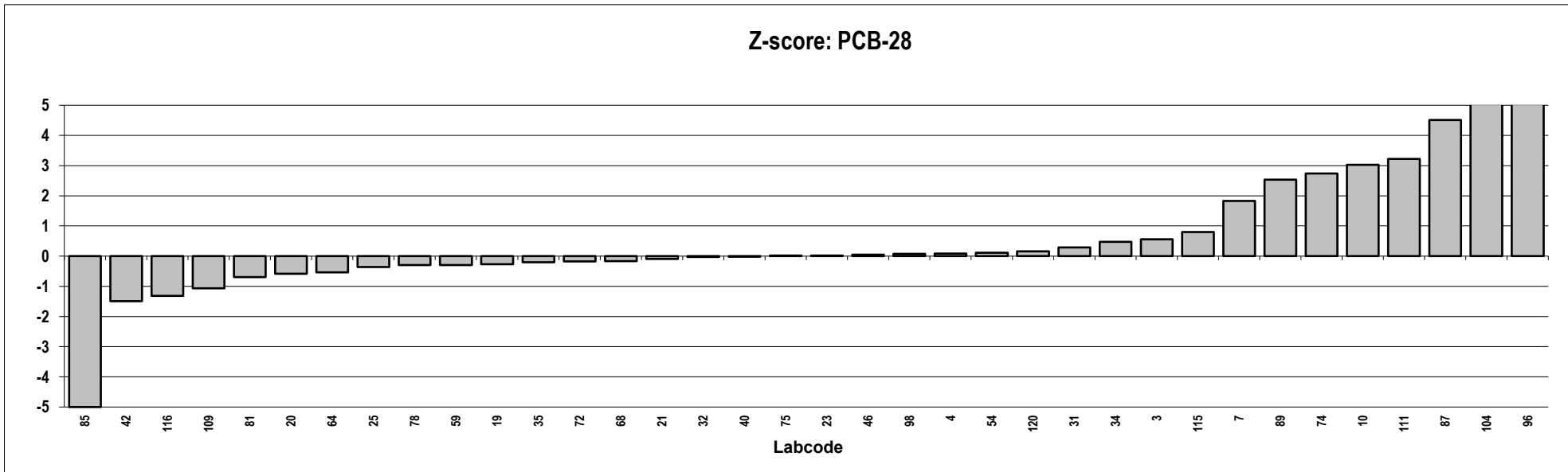
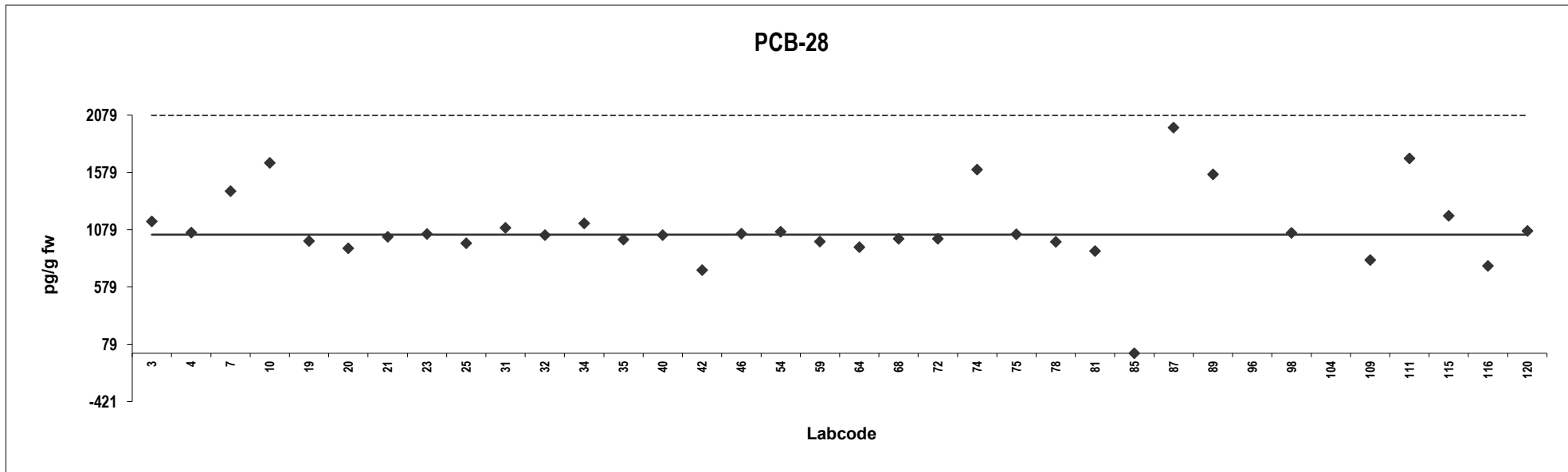


Fish Oil
Congener: PCB-28

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	1150	0,56					
4	1052	0,084					
7	1414	1,8					
10	1661	3,0					
19	980	-0,27					
20	915	-0,58					
21	1016	-0,091					
23	1040	0,024					
25	961	-0,36					
31	1095	0,29					
32	1030	-0,024					
34	1134	0,48					
35	993	-0,20					
40	1031	-0,017					
42	726	-1,49					
46	1044	0,045					
54	1059	0,12					
59	974	-0,29					
64	925	-0,53					
68	1000	-0,17					
72	998	-0,18					
74	1602	2,7					
75	1039	0,017					
78	973	-0,30					
81	891	-0,70					
85	0,81	-5,0					
87	1969	4,5					
89	1560	2,5					
96	2642	7,8	Outlier				
98	1050	0,073					
104	2104	5,2	Outlier				
109	814	-1,1					
111	1701	3,2					
115	1200	0,80					
116	762	-1,3					
120	1067	0,16					

Consensus statistics

Consensus median, pg/g	1035
Median all values pg/g	1039
Consensus mean, pg/g	1083
Standard deviation, pg/g	339
Relative standard deviation, %	31
No. of values reported	36
No. of values removed	2
No. of reported non-detects	0

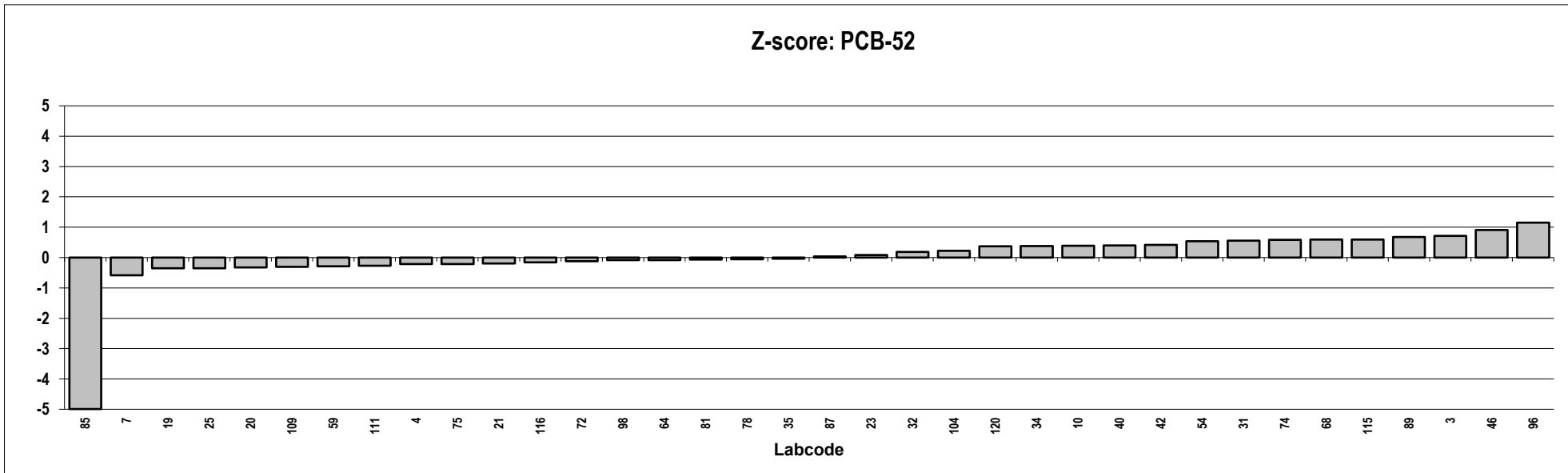
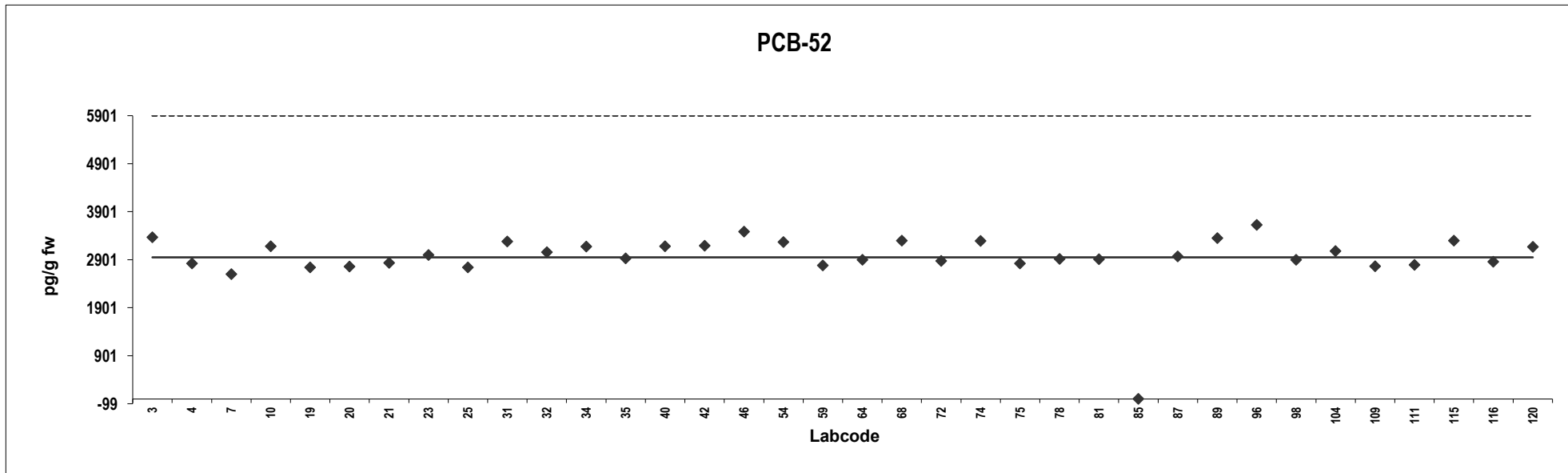


Fish Oil
Congener: PCB-52

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	3370	0,71					
4	2823	-0,22					
7	2603	-0,59					
10	3180	0,39					
19	2740	-0,36					
20	2757	-0,33					
21	2834	-0,20					
23	3000	0,084					
25	2740	-0,36					
31	3279	0,56					
32	3060	0,19					
34	3177	0,38					
35	2929	-0,037					
40	3183	0,39					
42	3196	0,42					
46	3484	0,90					
54	3268	0,54					
59	2780	-0,29					
64	2901	-0,084					
68	3300	0,59					
72	2877	-0,12					
74	3293	0,58					
75	2825	-0,21					
78	2920	-0,052					
81	2910	-0,069					
85	2,4	-5,0					
87	2973	0,037					
89	3350	0,68					
96	3630	1,2					
98	2900	-0,086					
104	3080	0,22					
109	2767	-0,31					
111	2793	-0,27					
115	3300	0,59					
116	2859	-0,16					
120	3170	0,37					

Consensus statistics

Consensus median, pg/g	2951
Median all values pg/g	2951
Consensus mean, pg/g	2951
Standard deviation, pg/g	562
Relative standard deviation, %	19
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

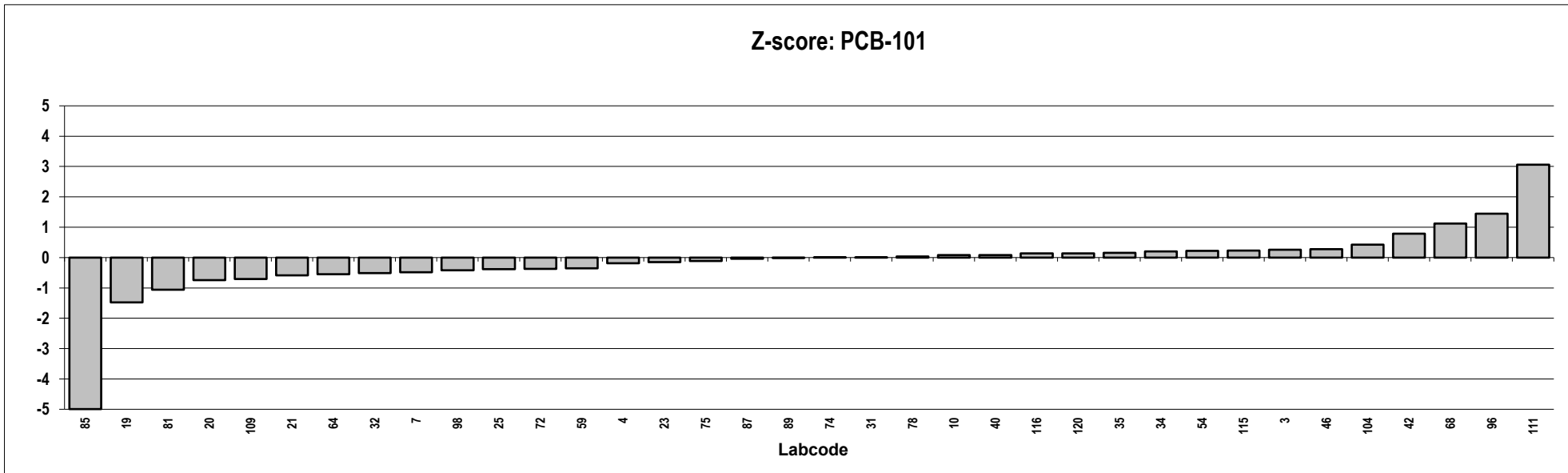
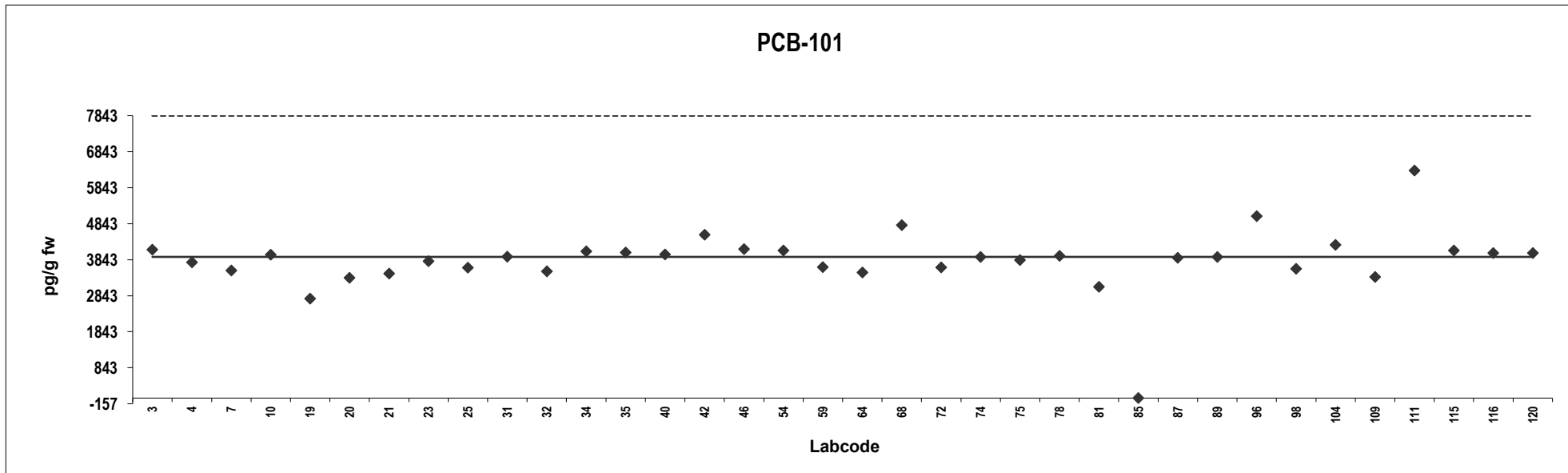


Fish Oil
Congener: PCB-101

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	4120	0,25					
4	3771	-0,19					
7	3543	-0,48					
10	3984	0,079					
19	2760	-1,5					
20	3338	-0,74					
21	3459	-0,59					
23	3800	-0,15					
25	3620	-0,38					
31	3927	0,0072					
32	3520	-0,51					
34	4079	0,20					
35	4044	0,16					
40	3988	0,085					
42	4535	0,78					
46	4140	0,28					
54	4097	0,22					
59	3640	-0,36					
64	3488	-0,55					
68	4800	1,1					
72	3630	-0,37					
74	3923	0,0016					
75	3830	-0,12					
78	3950	0,037					
81	3090	-1,1					
85	3,2	-5,0					
87	3893	-0,036					
89	3920	-0,0016					
96	5055	1,4					
98	3590	-0,42					
104	4258	0,43					
109	3365	-0,71					
111	6323	3,1					
115	4100	0,23					
116	4028	0,14					
120	4028	0,14					

Consensus statistics

Consensus median, pg/g	3921
Median all values pg/g	3921
Consensus mean, pg/g	3823
Standard deviation, pg/g	884
Relative standard deviation, %	23
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

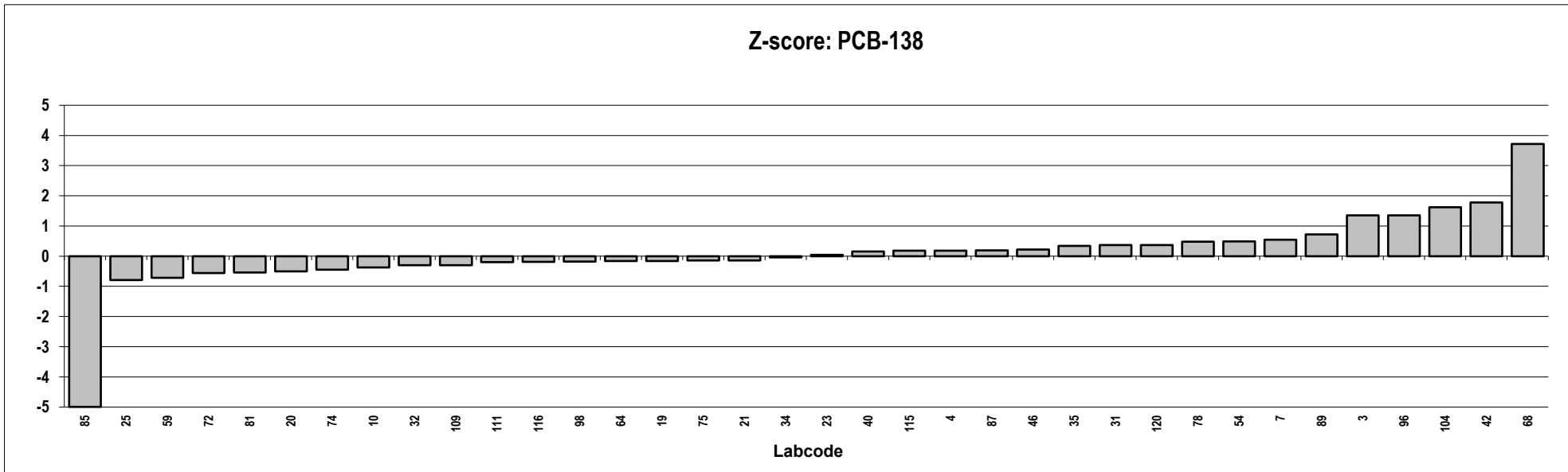
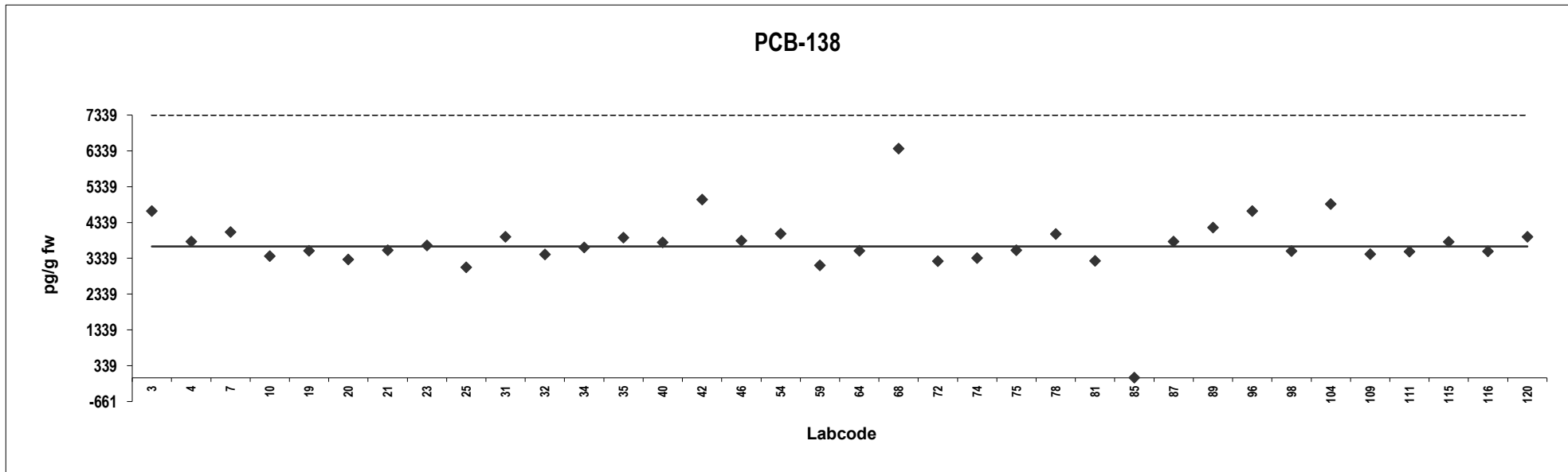


Fish Oil
Congener: PCB-138

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	4660	1,3					
4	3804	0,18					
7	4069	0,54					
10	3397	-0,37					
19	3550	-0,16					
20	3302	-0,50					
21	3564	-0,14					
23	3700	0,042					
25	3090	-0,79					
31	3939	0,37					
32	3450	-0,30					
34	3639	-0,042					
35	3917	0,34					
40	3783	0,15					
42	4977	1,8					
46	3829	0,22					
54	4028	0,49					
59	3140	-0,72					
64	3549	-0,16					
68	6400	3,7					
72	3261	-0,56					
74	3343	-0,44					
75	3562	-0,15					
78	4020	0,48					
81	3270	-0,54					
85	3,9	-5,0					
87	3807	0,19					
89	4200	0,72					
96	4661	1,4					
98	3540	-0,18					
104	4856	1,6					
109	3451	-0,30					
111	3525	-0,20					
115	3800	0,18					
116	3533	-0,19					
120	3942	0,37					

Consensus statistics

Consensus median, pg/g	3669
Median all values pg/g	3669
Consensus mean, pg/g	3738
Standard deviation, pg/g	899
Relative standard deviation, %	24
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

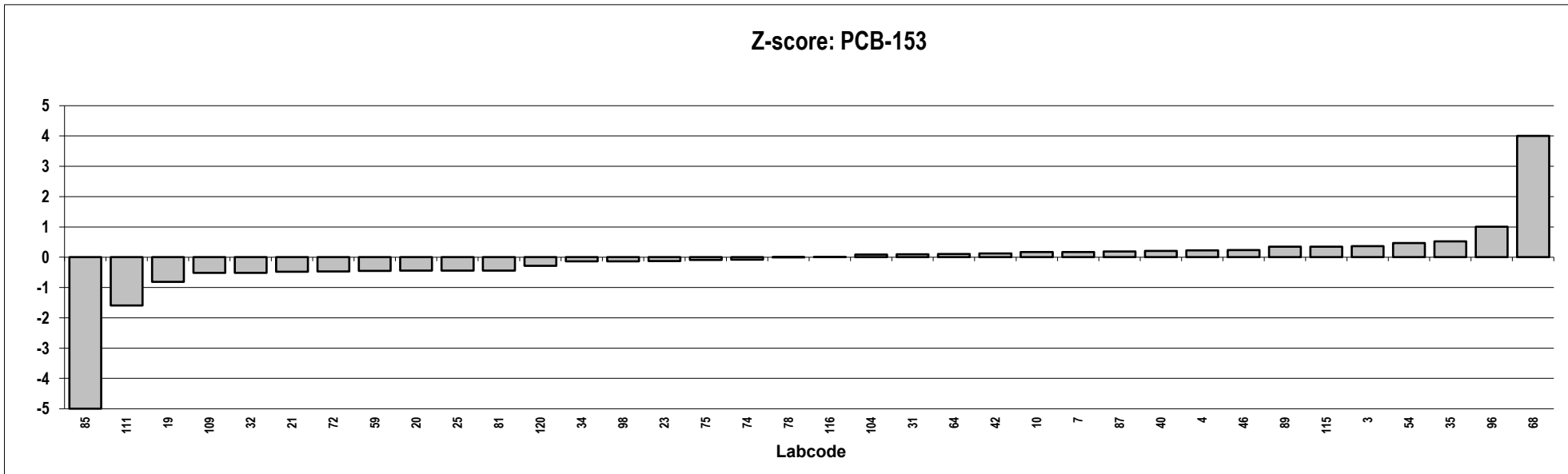
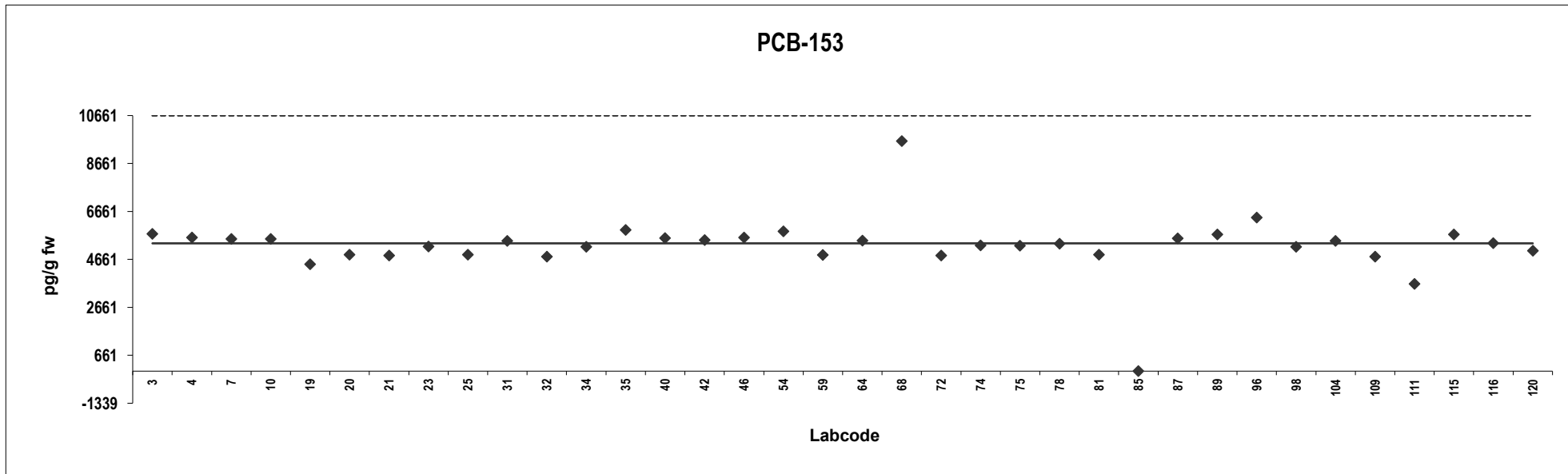


Fish Oil
Congener: PCB-153

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	5720	0,37					
4	5569	0,22					
7	5517	0,18					
10	5513	0,17					
19	4460	-0,82					
20	4858	-0,44					
21	4821	-0,48					
23	5200	-0,12					
25	4860	-0,44					
31	5430	0,093					
32	4780	-0,52					
34	5189	-0,13					
35	5890	0,53					
40	5555	0,21					
42	5468	0,13					
46	5579	0,23					
54	5832	0,47					
59	4850	-0,45					
64	5448	0,11					
68	9600	4,0					
72	4828	-0,47					
74	5246	-0,079					
75	5235	-0,090					
78	5320	-0,0098					
81	4860	-0,44					
85	4,5	-5,0					
87	5538	0,19					
89	5700	0,35					
96	6403	1,0					
98	5190	-0,13					
104	5427	0,091					
109	4778	-0,52					
111	3634	-1,6					
115	5700	0,35					
116	5341	0,0098					
120	5025	-0,29					

Consensus statistics

Consensus median, pg/g	5331
Median all values pg/g	5331
Consensus mean, pg/g	5232
Standard deviation, pg/g	1248
Relative standard deviation, %	24
No. of values reported	36
No. of values removed	0
No. of reported non-detects	0

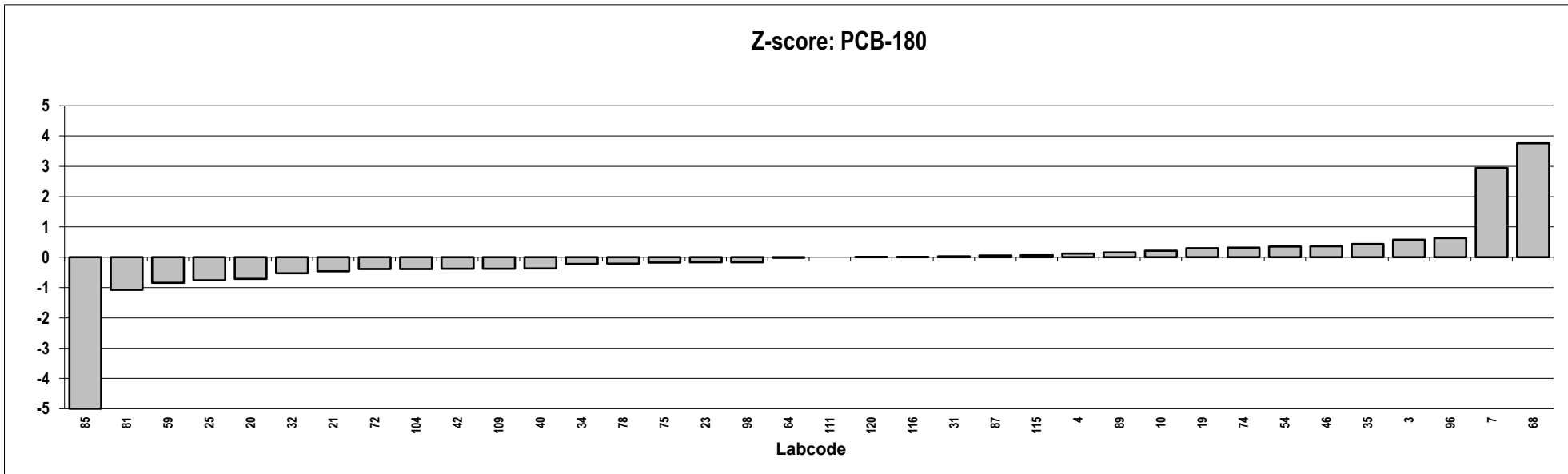
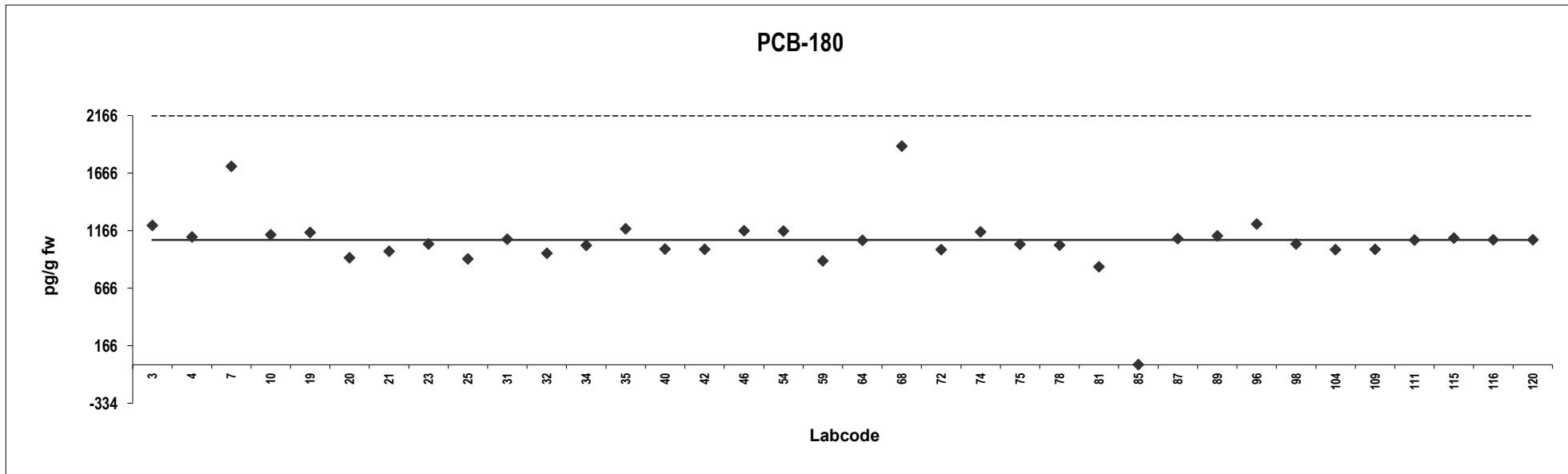


Fish Oil
Congener: PCB-180

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	1210	0,58					
4	1111	0,12					
7	1723	2,9					
10	1131	0,21					
19	1150	0,30					
20	930	-0,71					
21	985	-0,46					
23	1050	-0,16					
25	920	-0,76					
31	1091	0,028					
32	970	-0,53					
34	1038	-0,22					
35	1181	0,44					
40	1005	-0,37					
42	1003	-0,38					
46	1164	0,36					
54	1162	0,36					
59	903	-0,84					
64	1081	-0,018					
68	1900	3,8					
72	1000	-0,39					
74	1155	0,32					
75	1047	-0,17					
78	1040	-0,21					
81	851	-1,1					
85	0,92	-5,0					
87	1097	0,057					
89	1120	0,16					
96	1222	0,63					
98	1050	-0,16					
104	1000	-0,39	ND				
109	1004	-0,37					
111	1085	0,00					
115	1100	0,070					
116	1086	0,0052					
120	1086	0,0051					

Consensus statistics

Consensus median, pg/g	1085
Median all values pg/g	1083
Consensus mean, pg/g	1074
Standard deviation, pg/g	268
Relative standard deviation, %	25
No. of values reported	36
No. of values removed	0
No. of reported non-detects	1

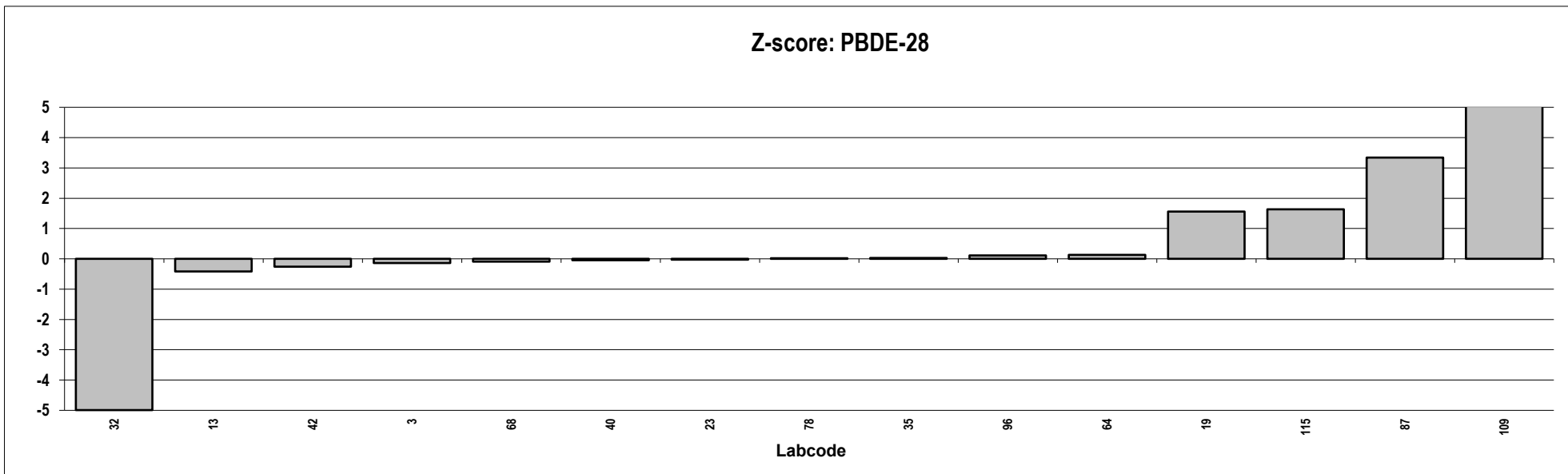
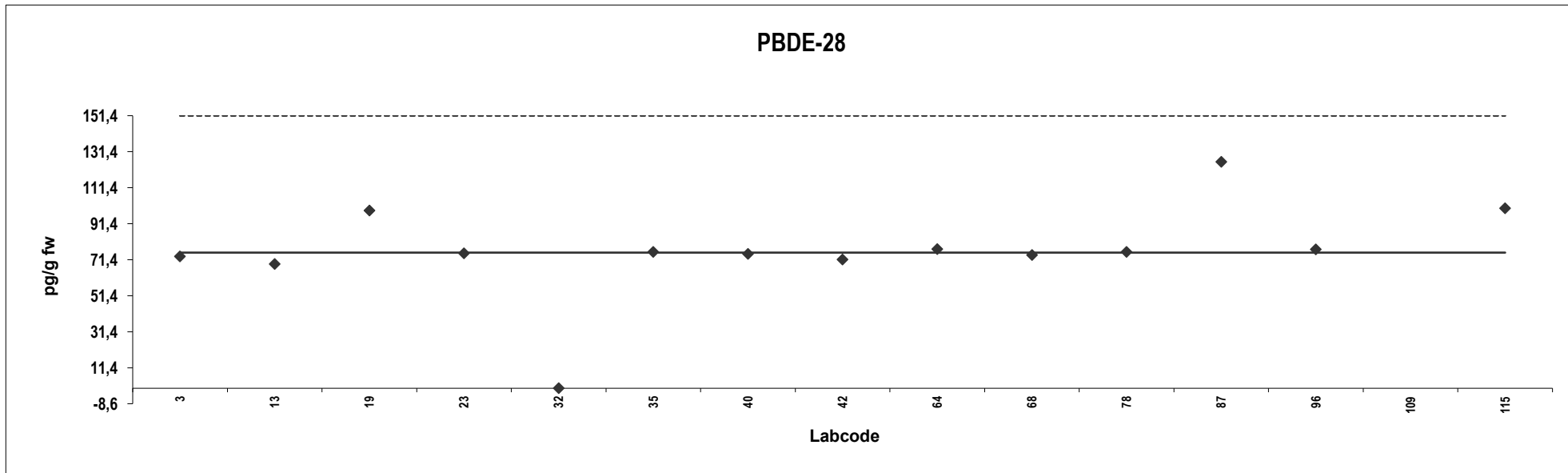


Fish Oil
Congener: PBDE-28

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	73	-0,14					
13	69	-0,42					
19	99	1,6					
23	75	-0,023					
32	0,068	-5,0					
35	76	0,028					
40	75	-0,049					
42	71	-0,26					
64	77	0,13					
68	74	-0,090					
78	76	0,023					
87	126	3,3					
96	77	0,12					
109	424	23	Outlier				
115	100	1,6					

Consensus statistics

Consensus median, pg/g	75
Median all values pg/g	76
Consensus mean, pg/g	76
Standard deviation, pg/g	27
Relative standard deviation, %	35
No. of values reported	15
No. of values removed	1
No. of reported non-detects	0

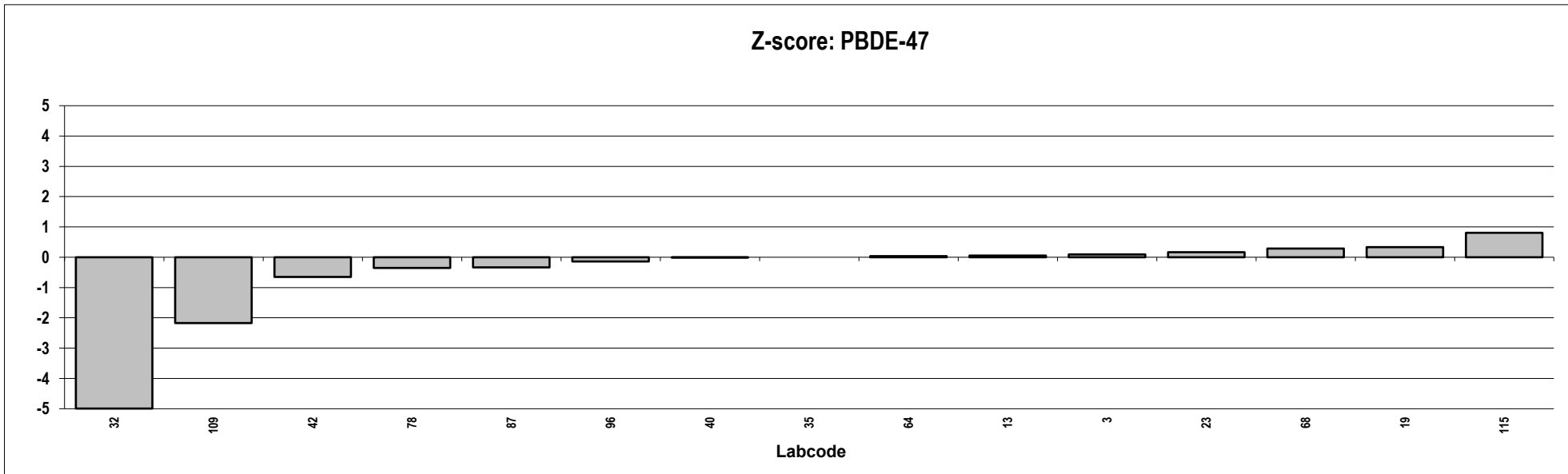
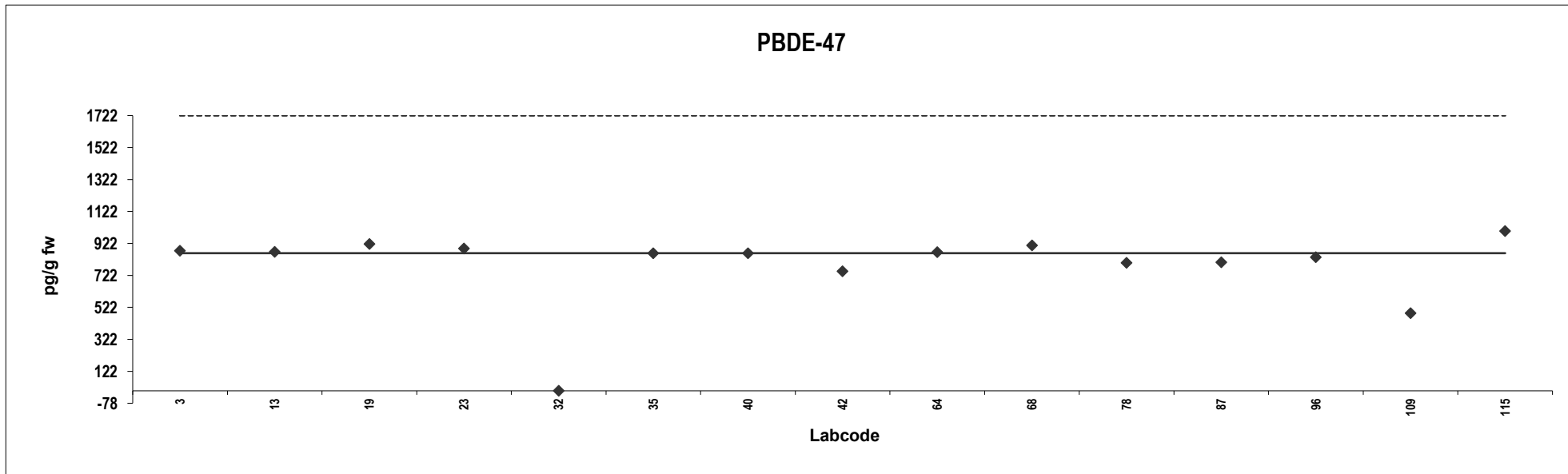


Fish Oil
Congener: PBDE-47

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	877	0,092					
13	870	0,051					
19	919	0,34					
23	890	0,17					
32	0,74	-5,0					
35	861	0,00					
40	861	-0,0029					
42	749	-0,65					
64	868	0,038					
68	910	0,28					
78	801	-0,35					
87	804	-0,33					
96	837	-0,14					
109	486	-2,2					
115	1000	0,81					

Consensus statistics

Consensus median, pg/g	861
Median all values pg/g	861
Consensus mean, pg/g	782
Standard deviation, pg/g	244
Relative standard deviation, %	31
No. of values reported	15
No. of values removed	0
No. of reported non-detects	0

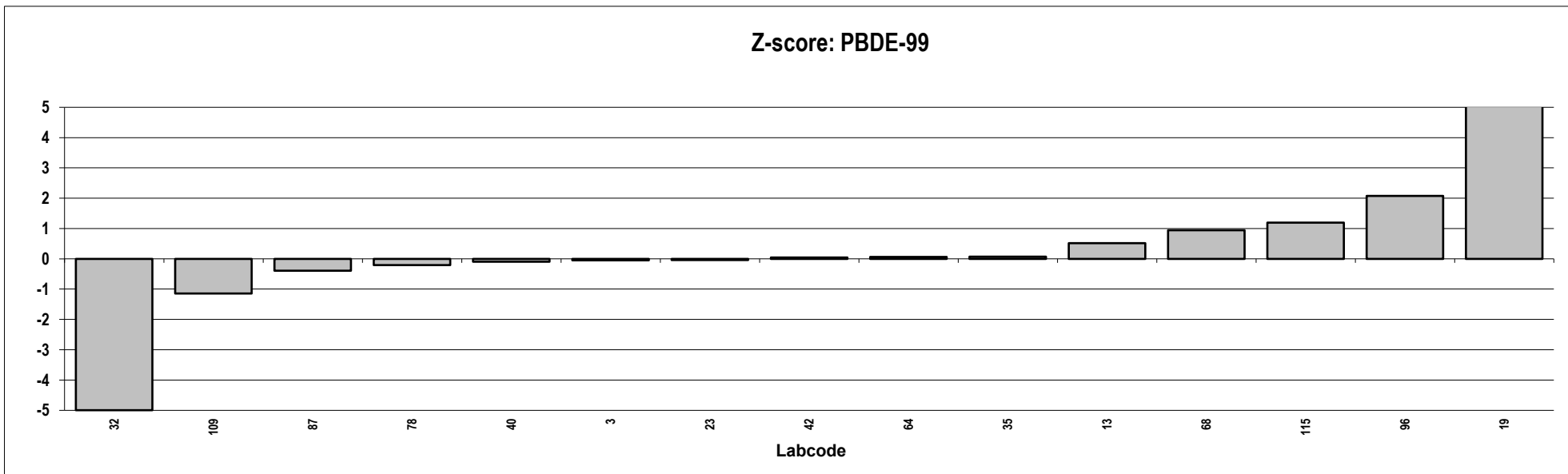
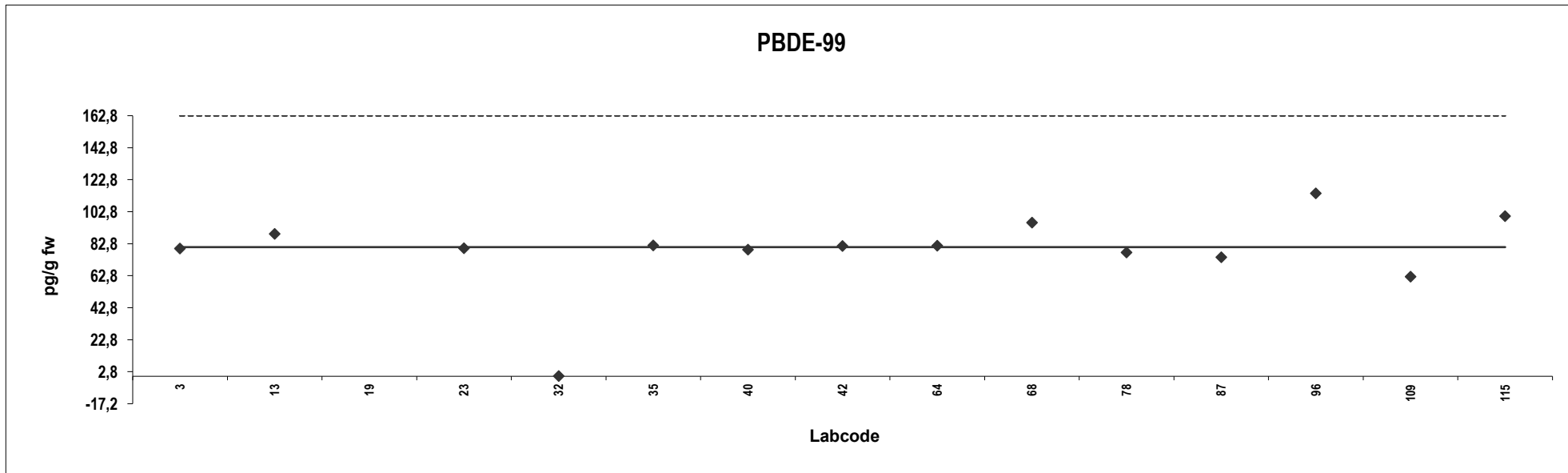


Fish Oil
Congener: PBDE-99

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	80	-0,050					
13	89	0,51					
19	178	6,0	Outlier				
23	80	-0,044					
32	0,061	-5,0					
35	82	0,071					
40	79	-0,095					
42	81	0,044					
64	82	0,059					
68	96	0,95					
78	77	-0,21					
87	74	-0,39					
96	114	2,1					
109	62	-1,1					
115	100	1,2					

Consensus statistics

Consensus median, pg/g	81
Median all values pg/g	81
Consensus mean, pg/g	78
Standard deviation, pg/g	26
Relative standard deviation, %	33
No. of values reported	15
No. of values removed	1
No. of reported non-detects	0

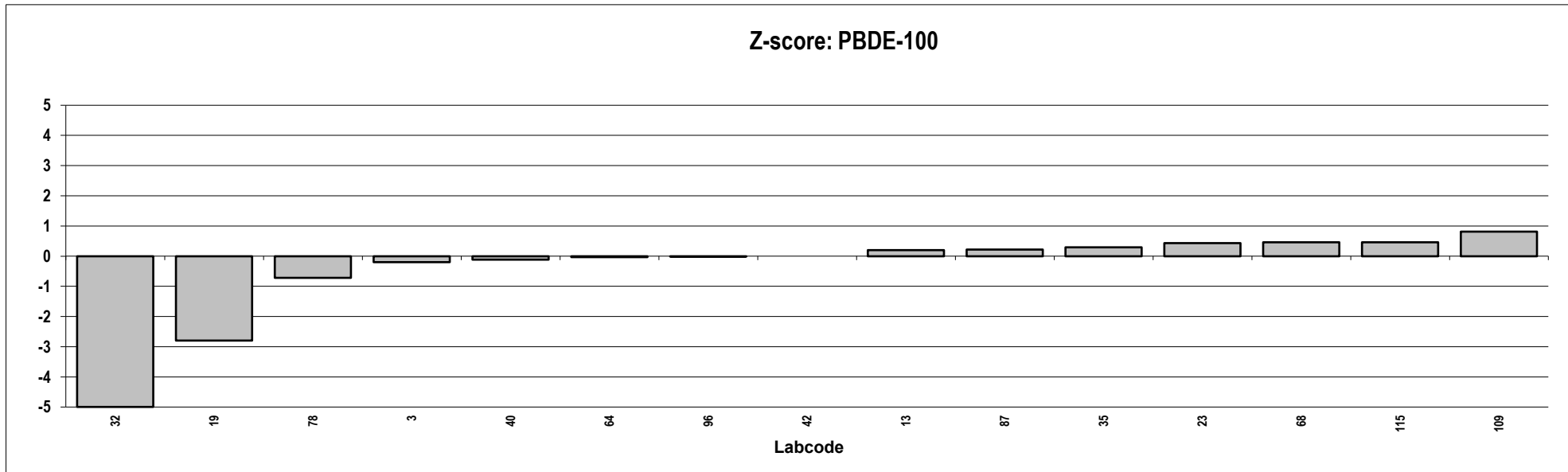
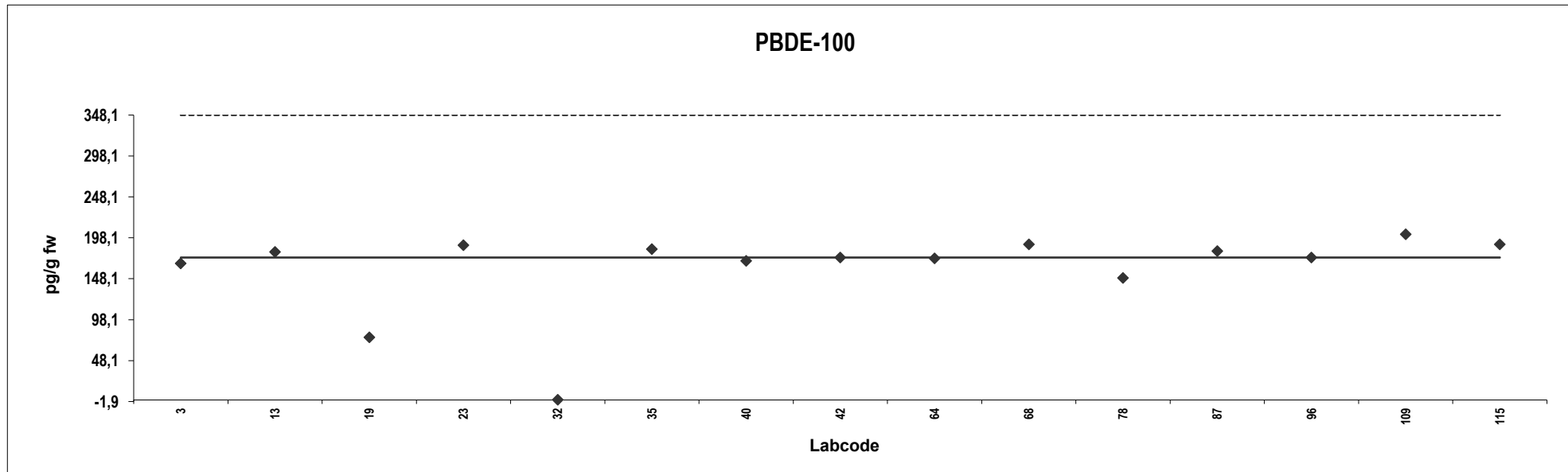


Fish Oil
Congener: PBDE-100

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	167	-0,20					
13	181	0,20					
19	77	-2,8					
23	189	0,43					
32	0,14	-5,0					
35	184	0,30					
40	170	-0,12					
42	174	0,00					
64	173	-0,028					
68	190	0,46					
78	149	-0,72					
87	182	0,22					
96	174	-0,0016					
109	202	0,81					
115	190	0,46					

Consensus statistics

Consensus median, pg/g	174
Median all values pg/g	174
Consensus mean, pg/g	160
Standard deviation, pg/g	53
Relative standard deviation, %	33
No. of values reported	15
No. of values removed	0
No. of reported non-detects	0

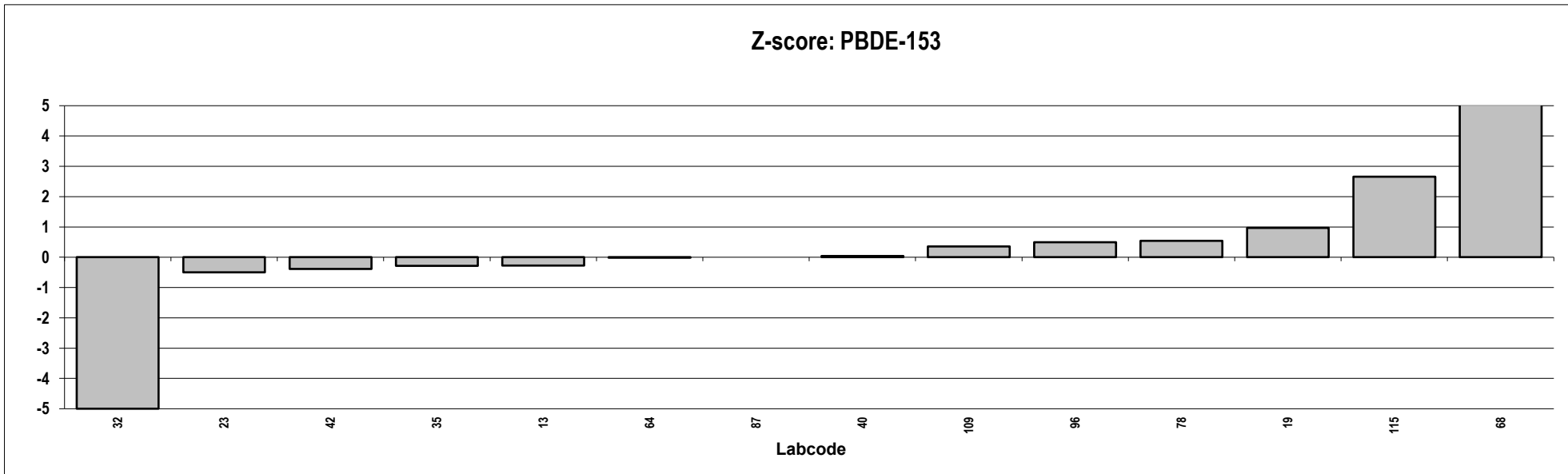
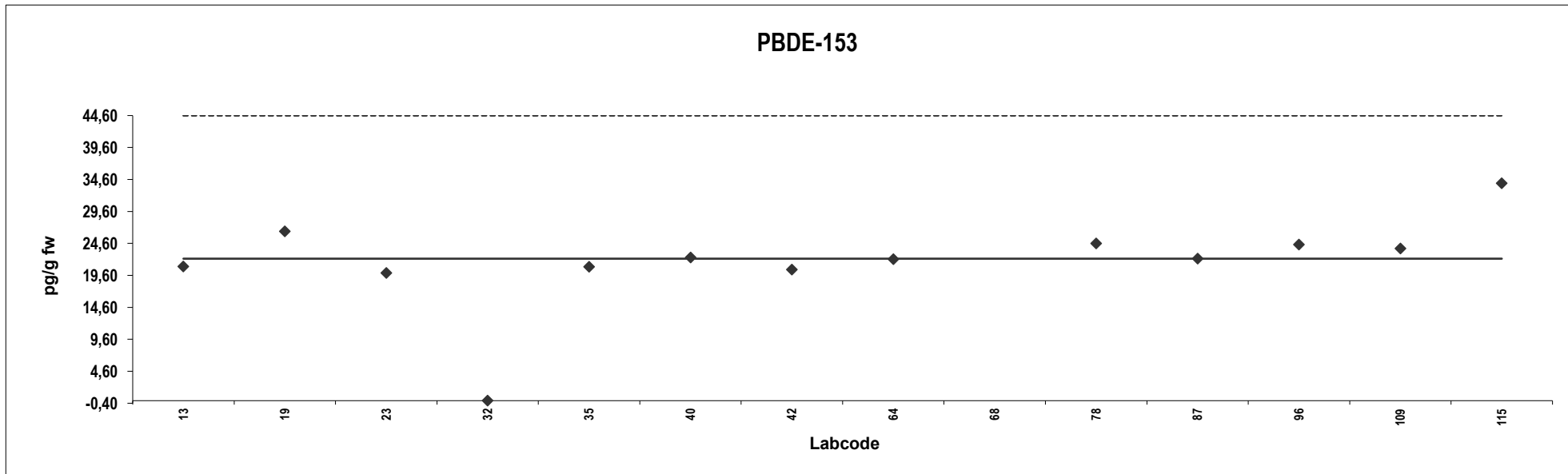


Fish Oil
Congener: PBDE-153

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
13	21	-0,27					
19	27	0,97					
23	20	-0,50					
32	0,015	-5,0					
35	21	-0,28					
40	22	0,040					
42	21	-0,38					
64	22	-0,020					
68	75	12	Outlier				
78	25	0,54					
87	22	0,00					
96	24	0,50					
109	24	0,35					
115	34	2,7					

Consensus statistics

Consensus median, pg/g	22
Median all values pg/g	22
Consensus mean, pg/g	22
Standard deviation, pg/g	7,5
Relative standard deviation, %	34
No. of values reported	14
No. of values removed	1
No. of reported non-detects	0

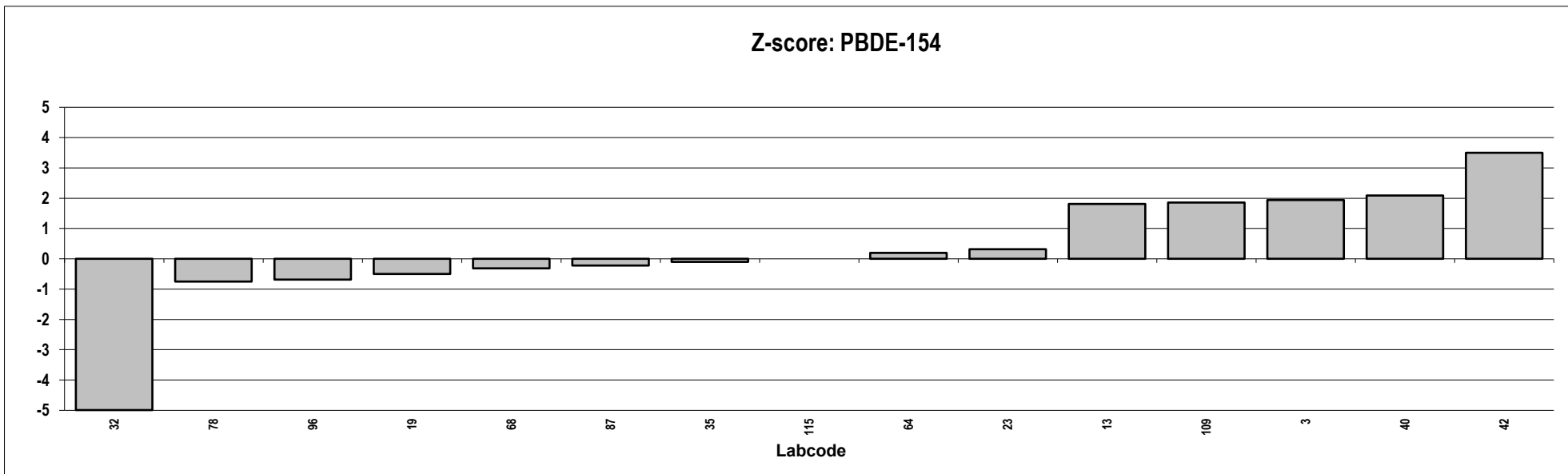
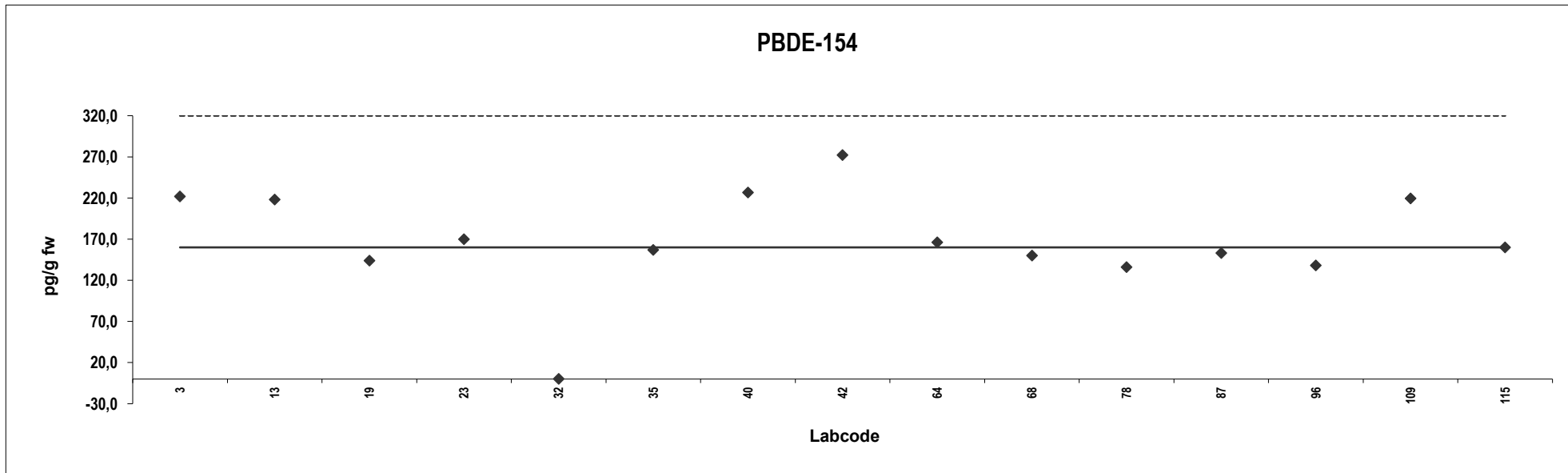


Fish Oil
Congener: PBDE-154

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	222	1,9					
13	218	1,8					
19	144	-0,50					
23	170	0,31					
32	0,22	-5,0					
35	157	-0,10					
40	227	2,1					
42	272	3,5					
64	166	0,19					
68	150	-0,31					
78	136	-0,75					
87	153	-0,22					
96	138	-0,69					
109	220	1,9					
115	160	0,00					

Consensus statistics

Consensus median, pg/g	160
Median all values pg/g	160
Consensus mean, pg/g	169
Standard deviation, pg/g	62
Relative standard deviation, %	37
No. of values reported	15
No. of values removed	0
No. of reported non-detects	0

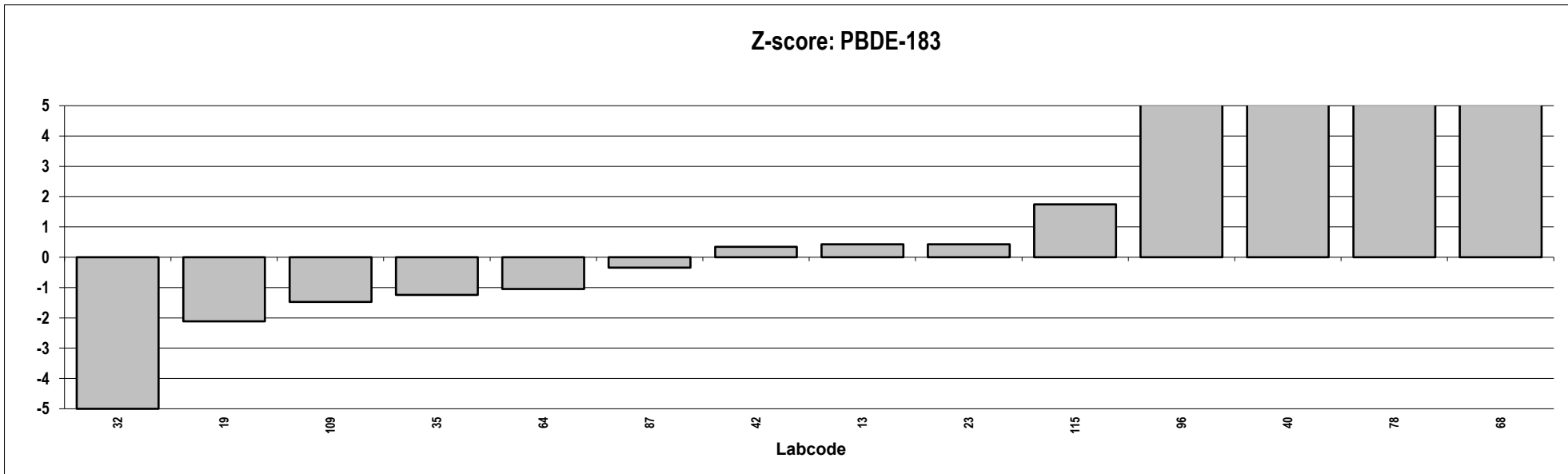
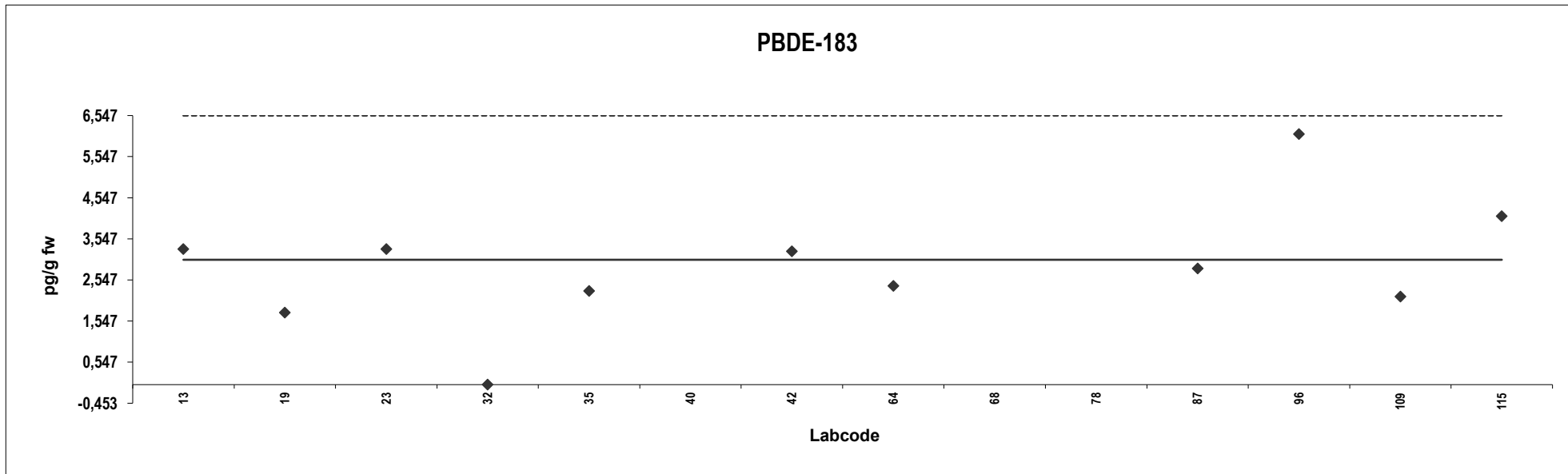


Fish Oil
Congener: PBDE-183

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
13	3,3	0,43					
19	1,8	-2,1					
23	3,3	0,43					
32	0,00039	-5,0	ND				
35	2,3	-1,2					
40	10	11	Outlier,ND				
42	3,2	0,34					
64	2,4	-1,1					
68	75	118	Outlier				
78	11	13	Outlier				
87	2,8	-0,34					
96	6,1	5,0					
109	2,1	-1,5					
115	4,1	1,7					

Consensus statistics

Consensus median, pg/g	3,0
Median all values pg/g	3,3
Consensus mean, pg/g	2,9
Standard deviation, pg/g	1,5
Relative standard deviation, %	53
No. of values reported	14
No. of values removed	3
No. of reported non-detects	2

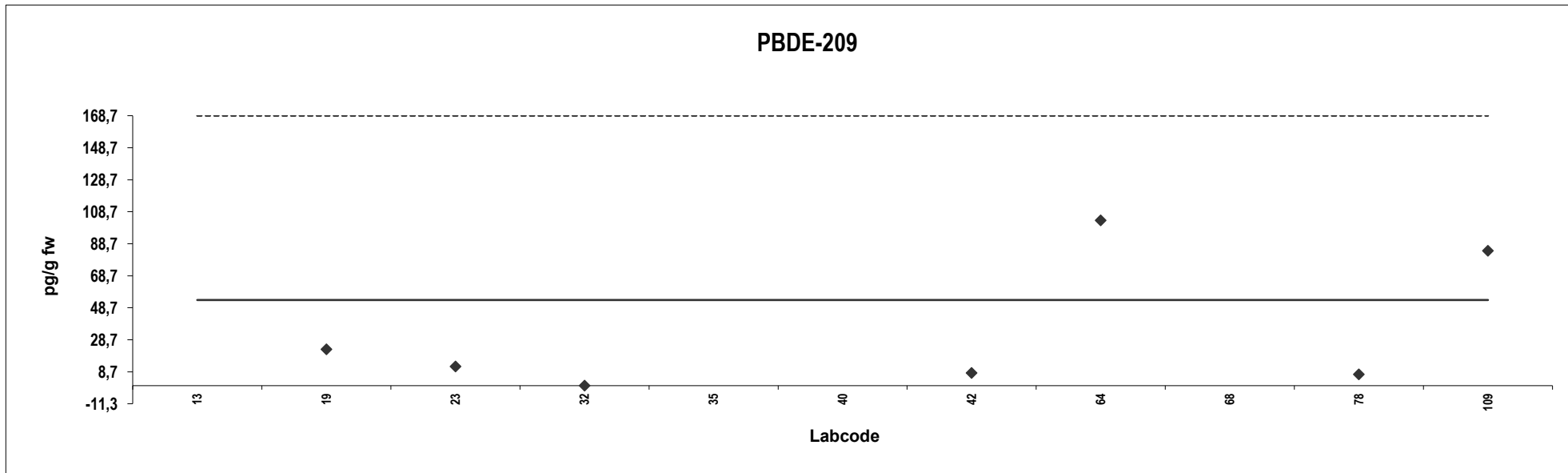


Fish Oil
Congener: PBDE-209

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
13	750	65	Outlier,ND				
19	23	-2,9					
23	12	-3,9					
32	0,050	-5,0	ND				
35	328	26	Outlier				
40	797	69	Outlier,ND				
42	7,9	-4,3	ND				
64	103	4,7					
68	1700	154	Outlier				
78	7,0	-4,3	ND				
109	84	2,9					

Consensus statistics

Consensus median, pg/g	54
Median all values pg/g	84
Consensus mean, pg/g	34
Standard deviation, pg/g	42
Relative standard deviation, %	123
No. of values reported	11
No. of values removed	4
No. of reported non-detects	5

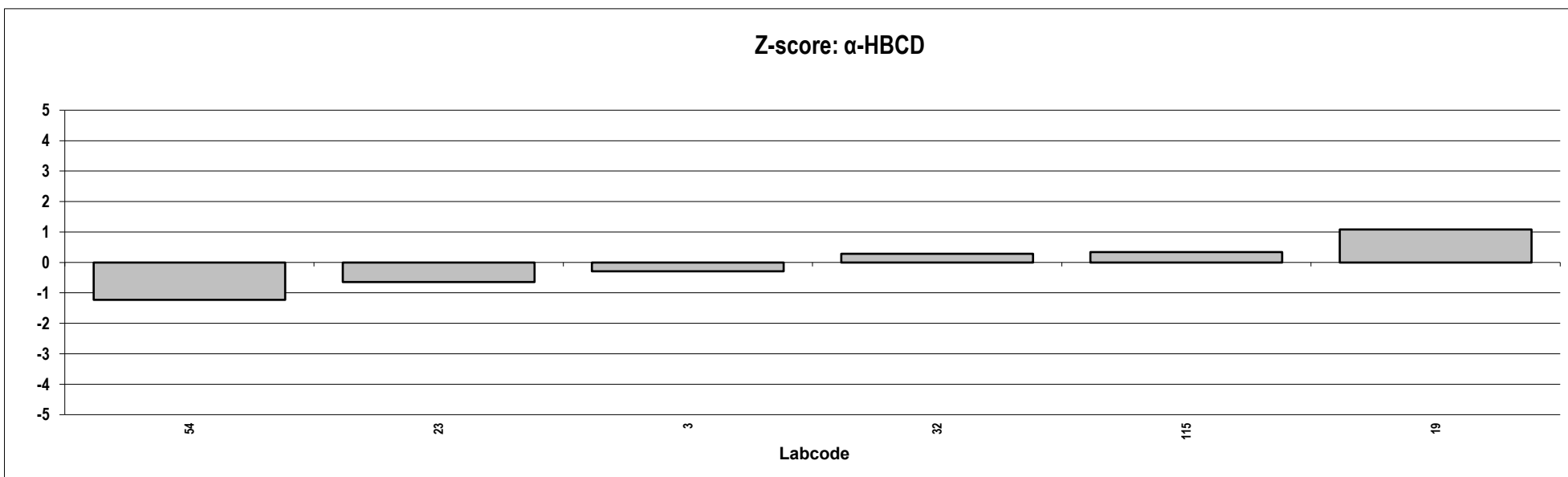
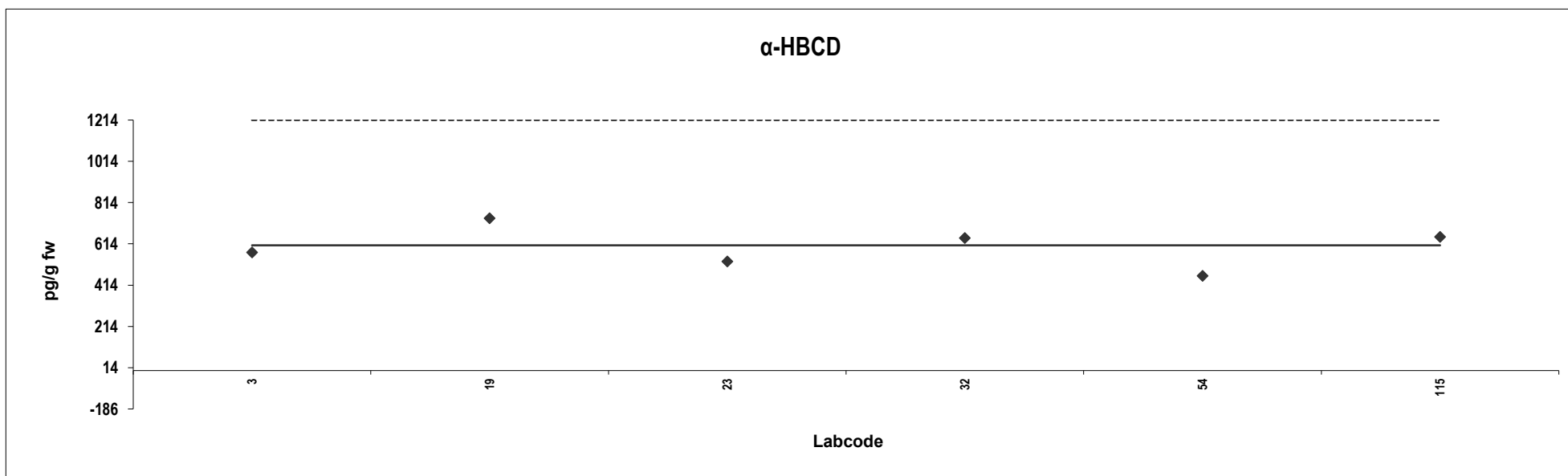


Fish Oil
Congener: α -HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	572	-0,29					
19	738	1,1					
23	529	-0,64					
32	642	0,29					
54	458	-1,2					
115	648	0,34					

Consensus statistics

Consensus median, pg/g	607
Median all values pg/g	607
Consensus mean, pg/g	598
Standard deviation, pg/g	99
Relative standard deviation, %	17
No. of values reported	6
No. of values removed	0
No. of reported non-detects	0



Fish Oil
Congener: β -HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
19	10	**	ND				
23	5,0	**	ND				
54	10	**	ND				

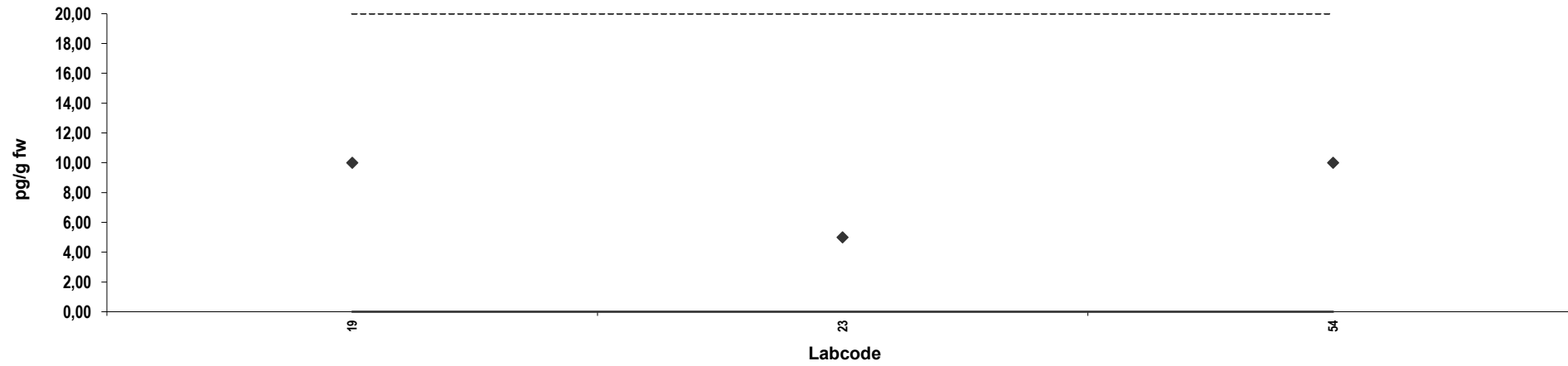
Consensus statistics

Consensus median, pg/g	*
Median all values pg/g	10
Consensus mean, pg/g	8,3
Standard deviation, pg/g	2,9
Relative standard deviation, %	35
No. of values reported	3
No. of values removed	0
No. of reported non-detects	3

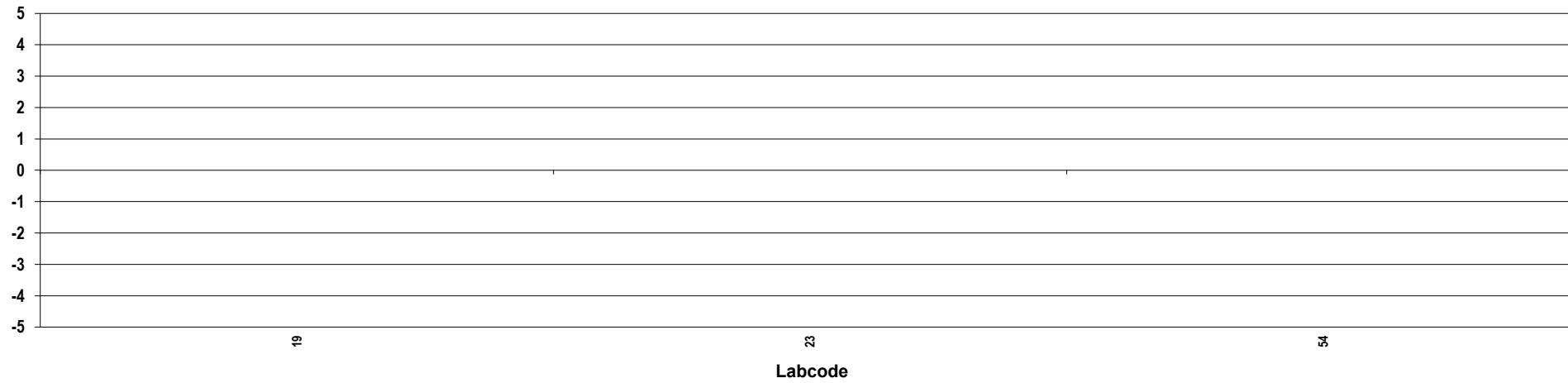
*Could not calculate consensus median do to few reported results

terresults do to few reported results

β -HBCD



Z-score: β -HBCD



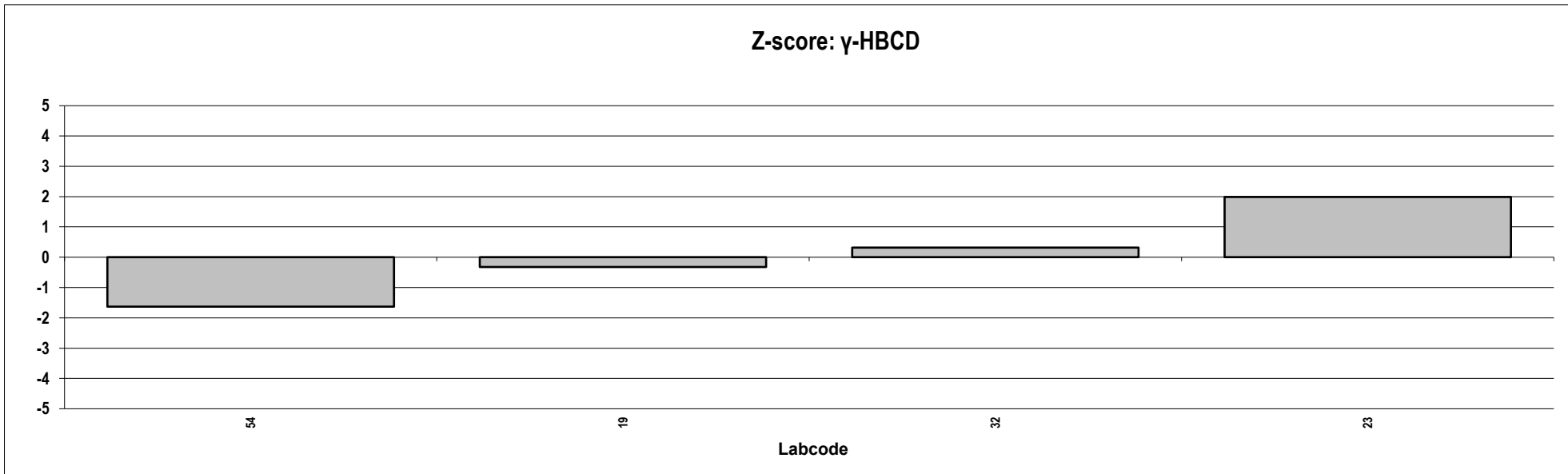
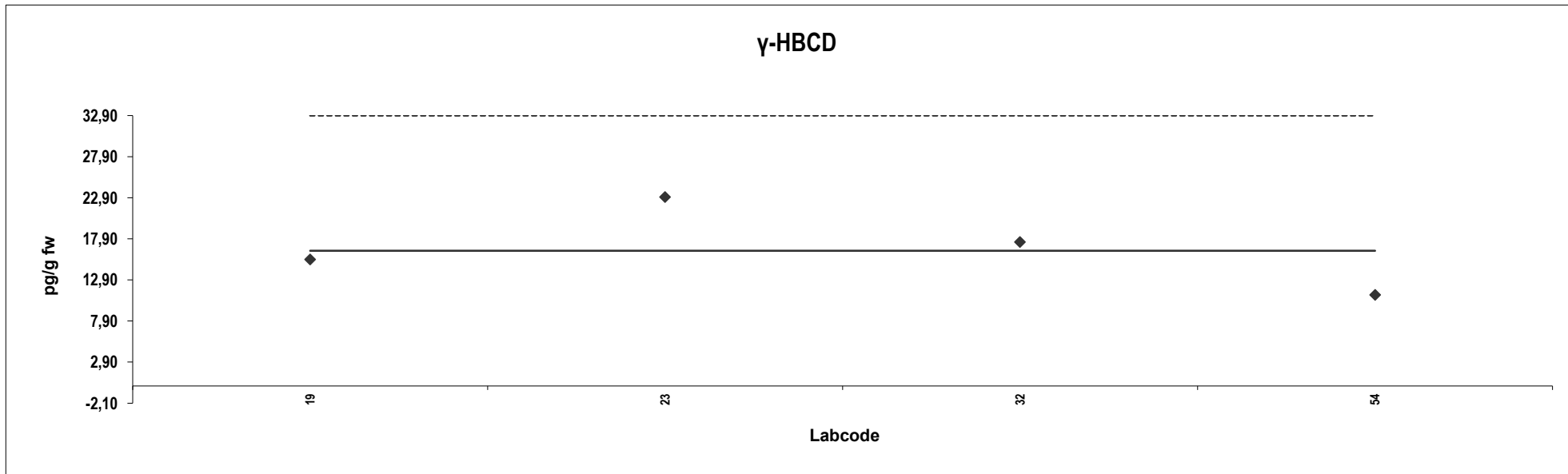
Fish Oil
Congener: γ -HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
19	15	-0,32					
23	23	2,0					
32	18	0,32					
54	11	-1,6					

Consensus statistics

Consensus median, pg/g	16
Median all values pg/g	16
Consensus mean, pg/g	17
Standard deviation, pg/g	5,0
Relative standard deviation, %	30
No. of values reported	4
No. of values removed	0
No. of reported non-detects	0

* : Indicative value due to few reported values

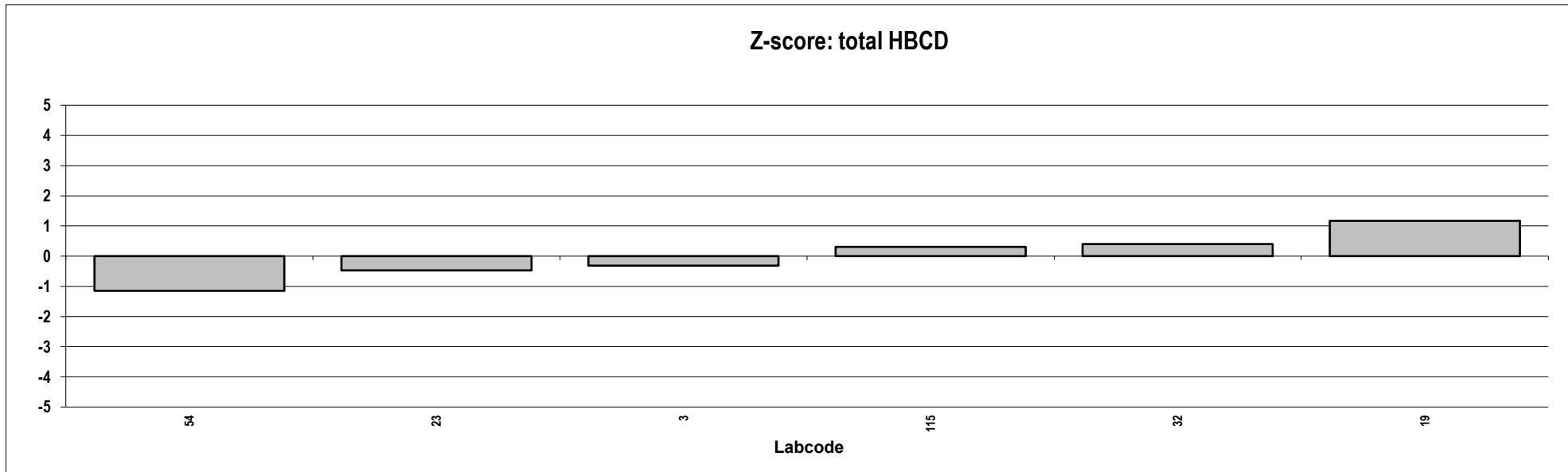
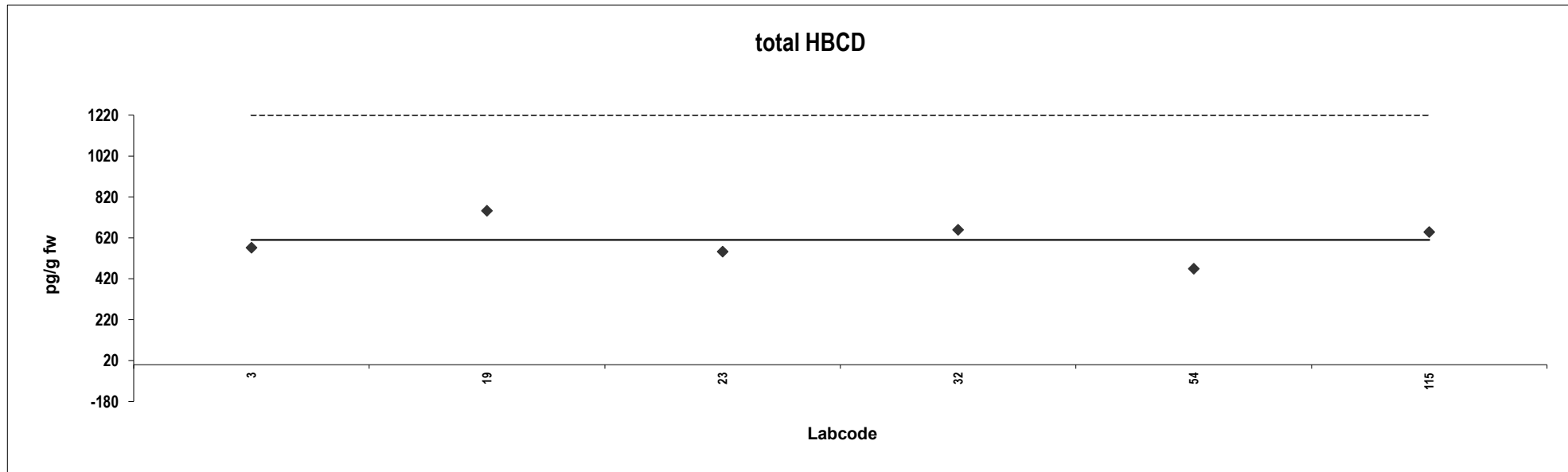


Fish Oil
Congener: total HBCD

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Z-score	Notes
3	572	-0,31					
19	753	1,2					
23	552	-0,48					
32	659	0,40					
54	470	-1,2					
115	648	0,31					

Consensus statistics

Consensus median, pg/g	610
Median all values pg/g	610
Consensus mean, pg/g	609
Standard deviation, pg/g	99
Relative standard deviation, %	16
No. of values reported	6
No. of values removed	0
No. of reported non-detects	0



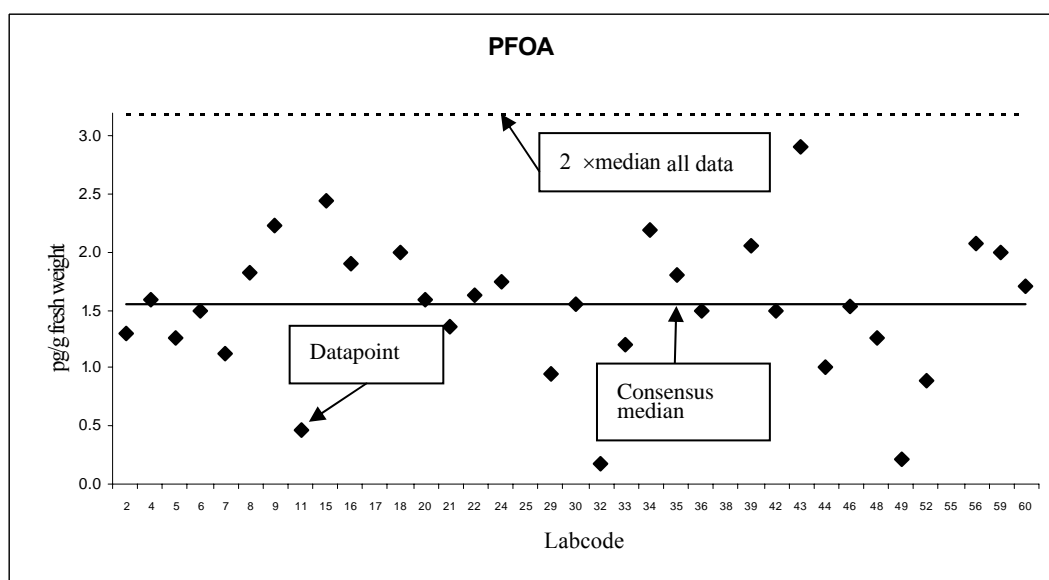
Appendix 5: Presentation of results: Fish-2022

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 $2 \times$ 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 ($2 \times$ 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 $\pm 20\%$ from the consensus value.

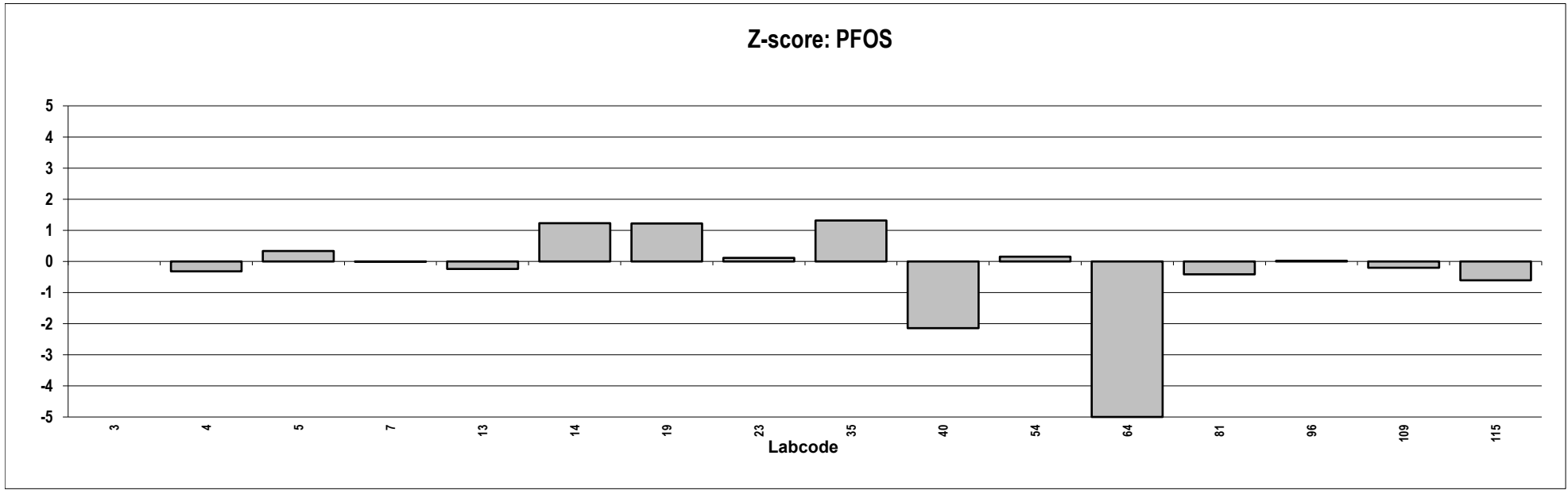
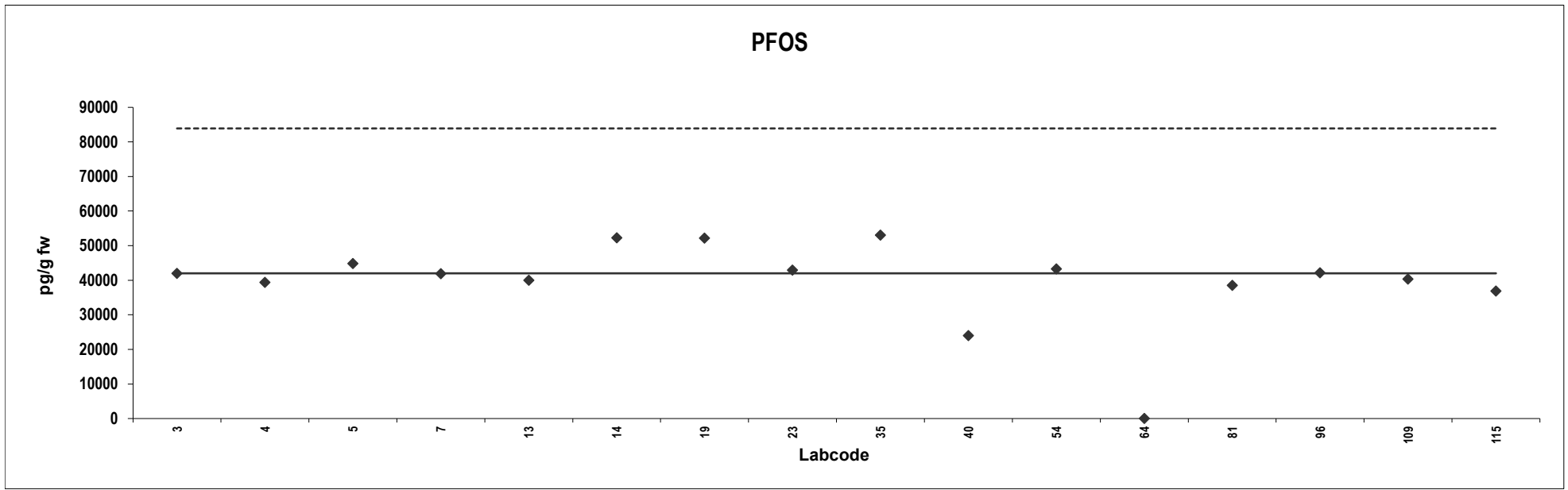
**Fish
PFOS**

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Notes
3	42000	0,00				
4	39350	-0,32				
5	44800	0,33				
7	41902	-0,012				
13	40000	-0,24				
14	52282	1,2				
19	52200	1,2				
23	42942	0,11				
35	53069	1,3				
40	24000	-2,1				
54	43278	0,15				
64	0,049	-5,0	Outlier*			
81	38500	-0,42				
96	42140	0,017				
109	40324	-0,20				
115	36900	-0,61				

Consensus statistics

Consensus median, pg/g	42000
Median all values pg/g	41951
Consensus mean, pg/g	42246
Standard deviation, pg/g	7161
Relative standard deviation, %	17
No. of values reported	16
No. of values removed	1
No. of reported non-detects	0

*outlier due to very low reported value!



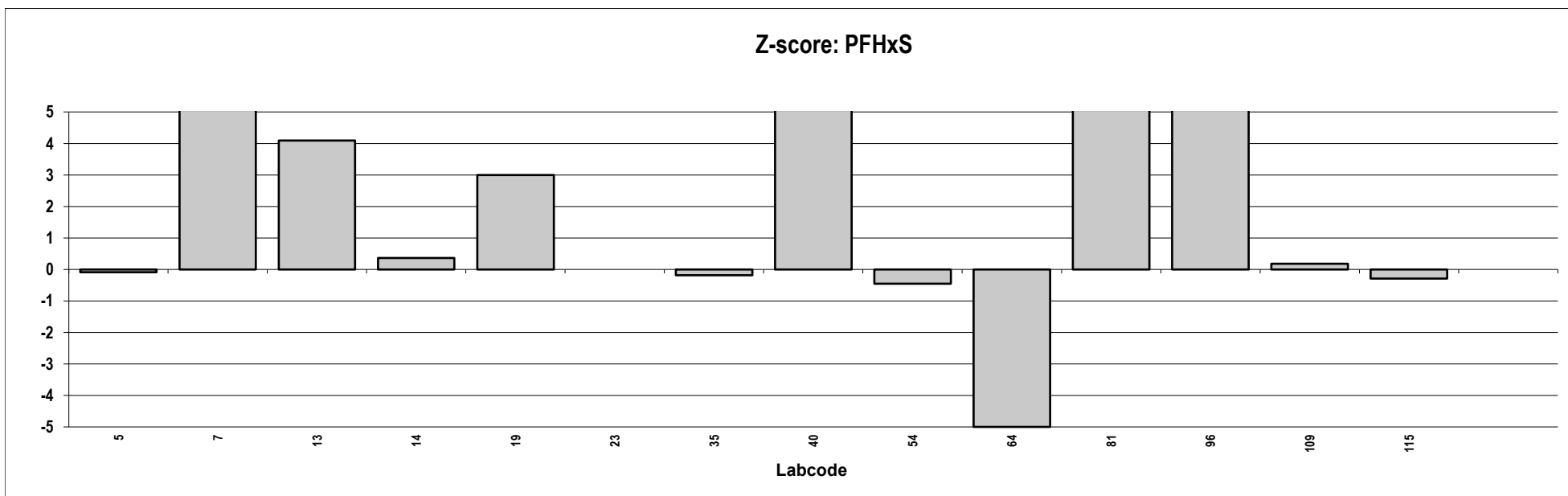
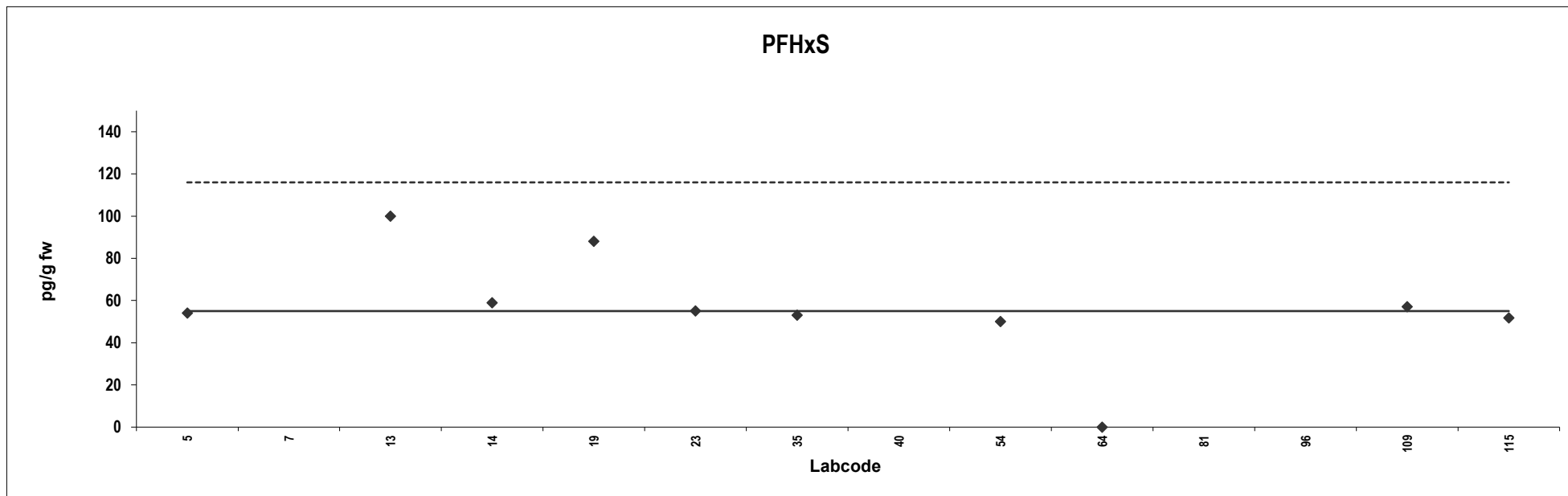
Fish
PFHxS

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Notes
5	54	-0,091				
7	200	13	ND, outlier			
13	100	4,1	ND			
14	59	0,36				
19	88	3,0				
23	55	0,00				
35	53	-0,18				
40	1000	86	ND, Outlier			
54	50	-0,45	ND			
64	0,000069	-5,0	ND, Outlier*			
81	300	22	ND, Outlier			
96	170	10	Outlier			
109	57	0,18				
115	52	-0,29				

Consensus statistics

Consensus median, pg/g	55
Median all values pg/g	58
Consensus mean, pg/g	60
Standard deviation, pg/g	13
Relative standard deviation, %	21
No. of values reported	14
No. of values removed	7
No. of reported non-detects	6

*outlier due to very low reported value!



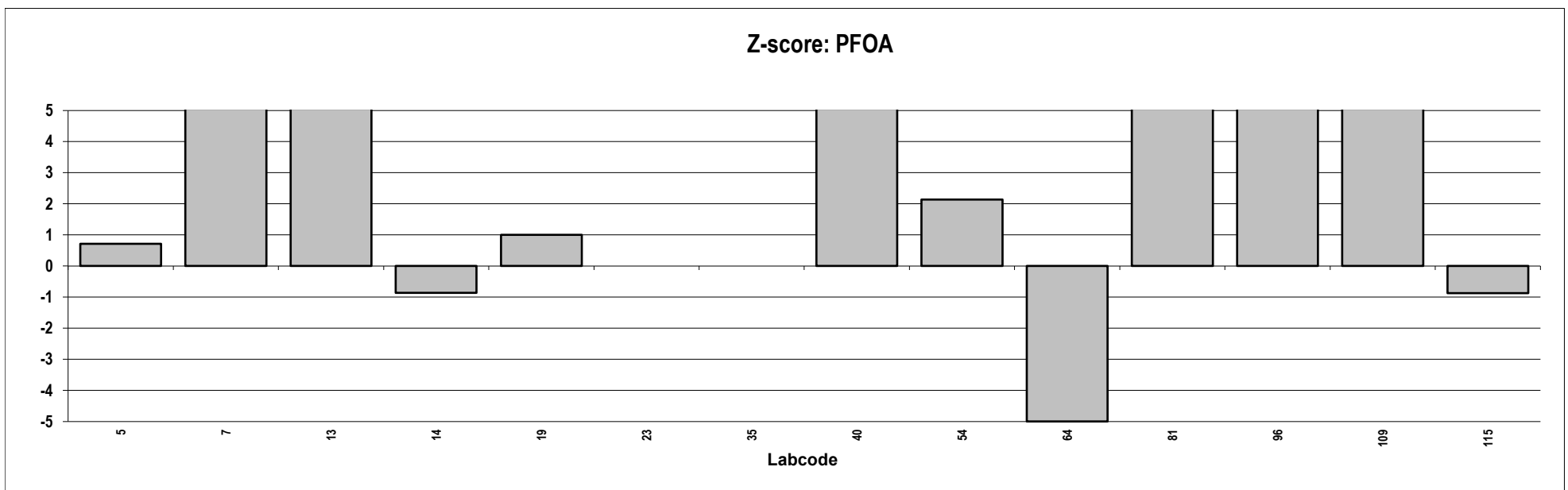
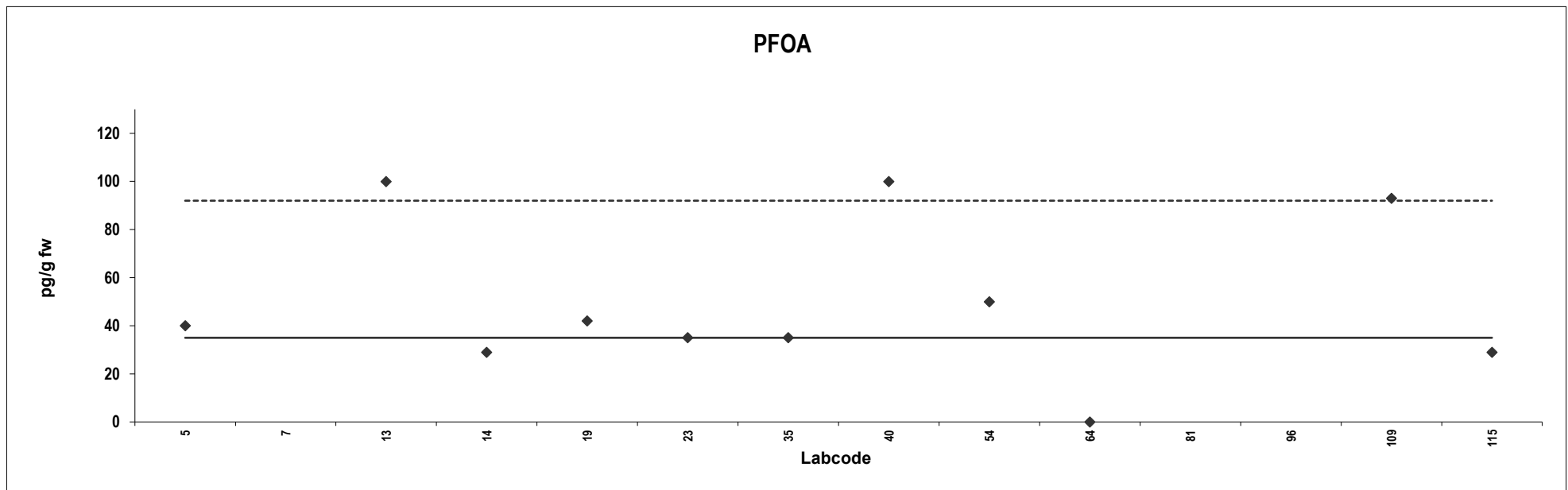
**Fish
PFOA**

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Notes
5	40	0,71				
7	200	24	ND, Outlier			
13	100	9,3	ND, Outlier			
14	29	-0,86				
19	42	1,0				
23	35	0,00				
35	35	0,00				
40	100	9,3	ND, Outlier			
54	50	2,1	ND			
64	0,00014	-5,0	ND, Outlier*			
81	300	38	ND, Outlier			
96	160	18	Outlier			
109	93	8,3	Outlier			
115	29	-0,87				

Consensus statistics

Consensus median, pg/g	35
Median all values pg/g	46
Consensus mean, pg/g	35
Standard deviation, pg/g	5,4
Relative standard deviation, %	16
No. of values reported	14
No. of values removed	8
No. of reported non-detects	6

*outlier due to very low reported value!



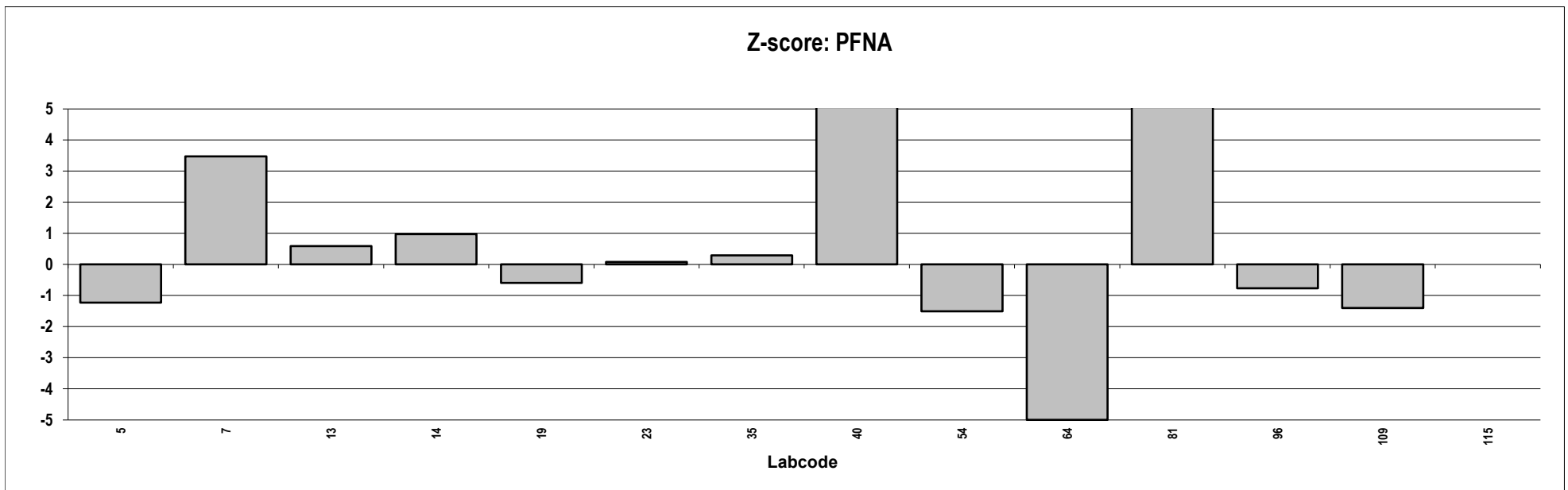
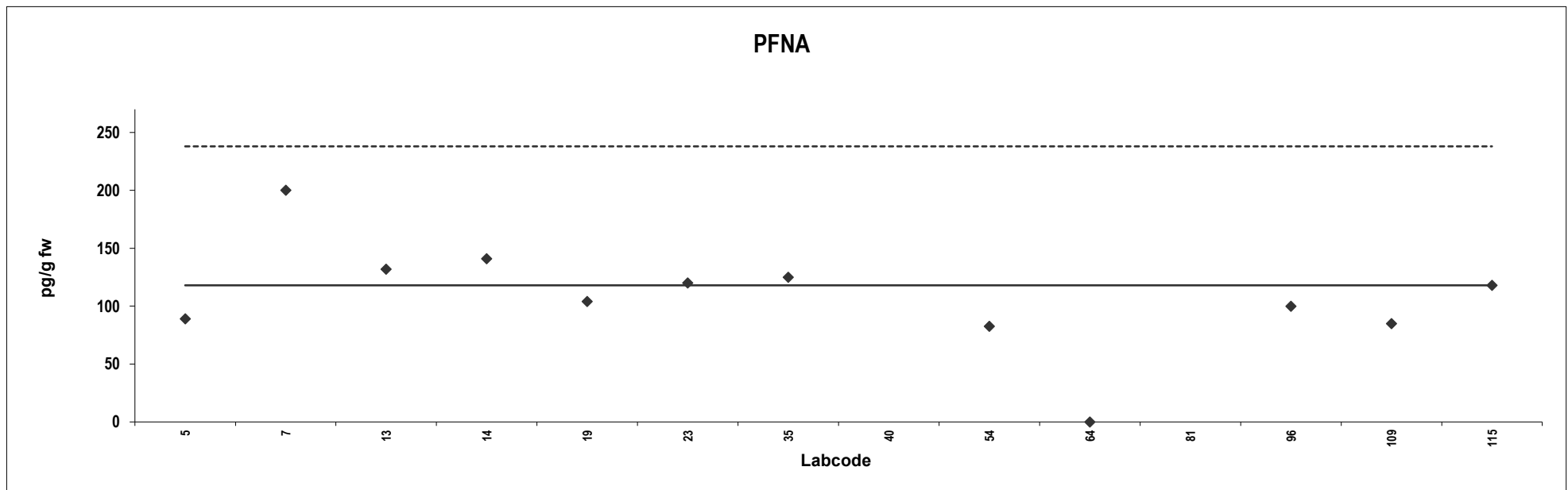
Fish
PFNA

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Notes
5	89	-1,2				
7	200	3,5	ND			
13	132	0,59				
14	141	0,97				
19	104	-0,59				
23	120	0,085				
35	125	0,30				
40	1000	37	ND, outlier			
54	83	-1,5				
64	0,00013	-5,0	ND, outlier*			
81	300	7,7	ND, outlier			
96	100	-0,76	ND			
109	85	-1,4				
115	118	0,00				

Consensus statistics

Consensus median, pg/g	118
Median all values pg/g	119
Consensus mean, pg/g	111
Standard deviation, pg/g	21
Relative standard deviation, %	19
No. of values reported	14
No. of values removed	5
No. of reported non-detects	5

*outlier due to very low reported value!



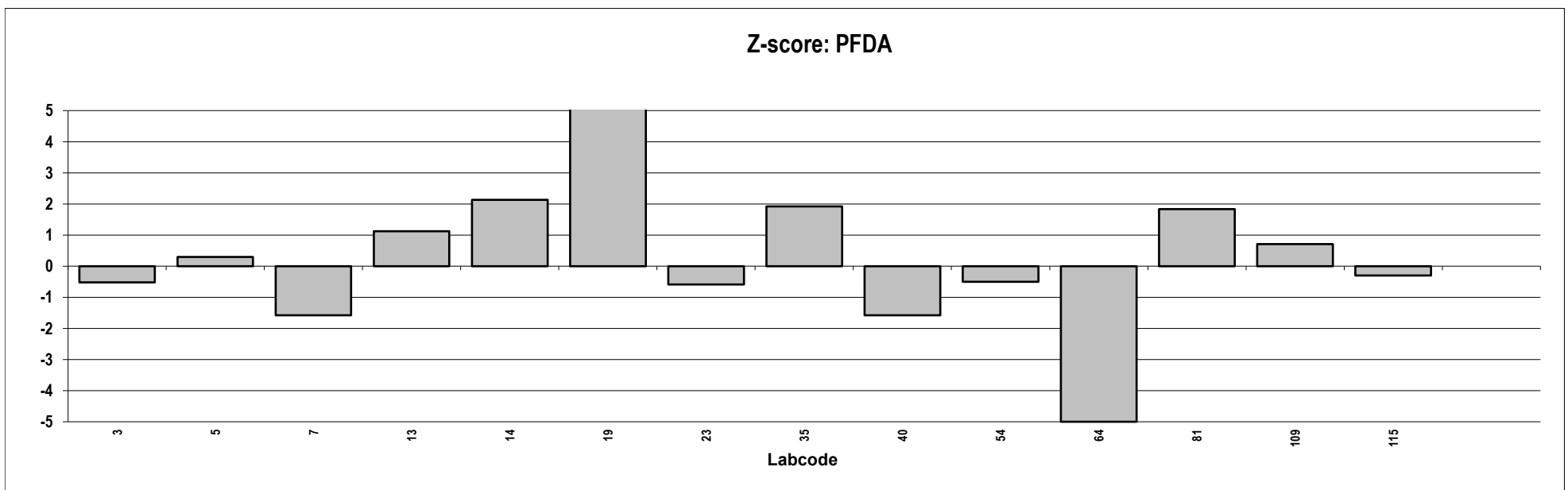
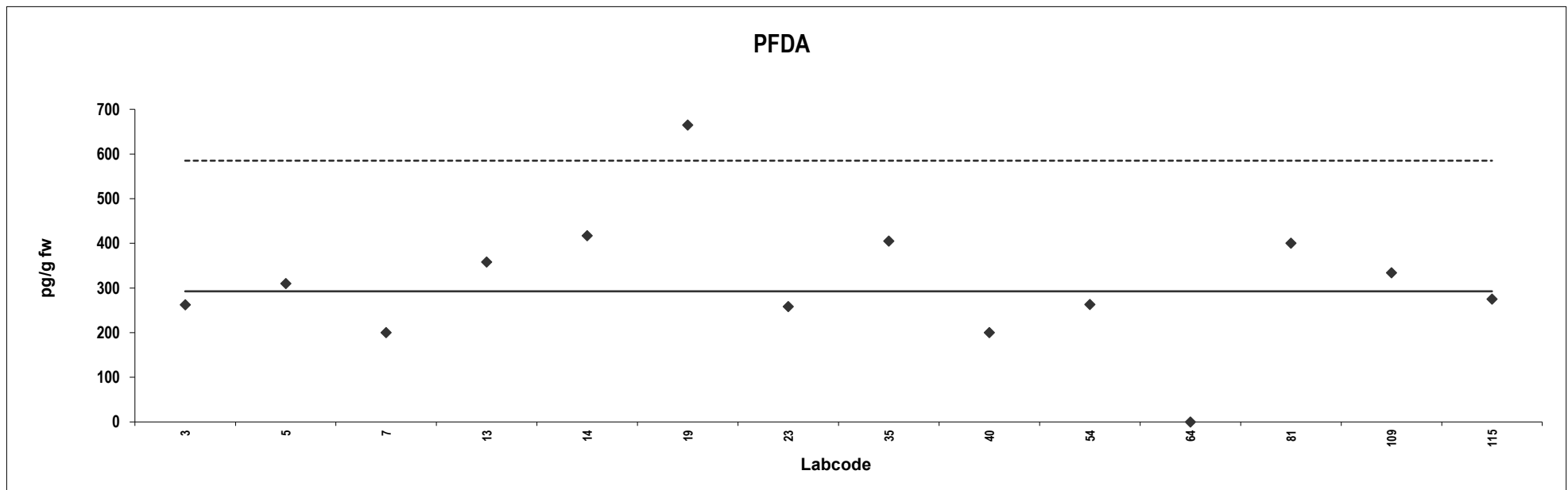
**Fish
PFDA**

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Notes
3	262	-0,52				
5	310	0,30				
7	200	-1,6	ND			
13	358	1,1				
14	417	2,1				
19	665	6,4	Outlier			
23	258	-0,59				
35	405	1,9				
40	200	-1,6				
54	263	-0,50				
64	0,00015	-5,0	Outlier*			
81	400	1,8	ND			
109	334	0,71				
115	275	-0,30				

Consensus statistics

Consensus median, pg/g	293
Median all values pg/g	293
Consensus mean, pg/g	308
Standard deviation, pg/g	70
Relative standard deviation, %	23
No. of values reported	14
No. of values removed	4
No. of reported non-detects	2

*outlier due to very low reported value!



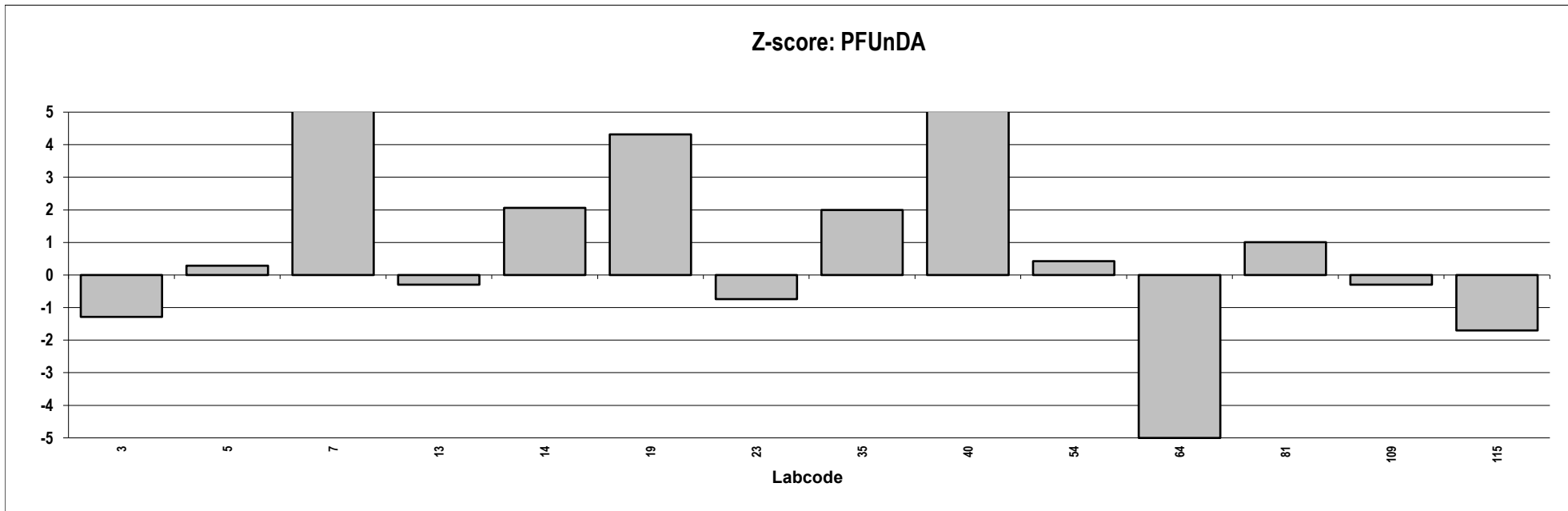
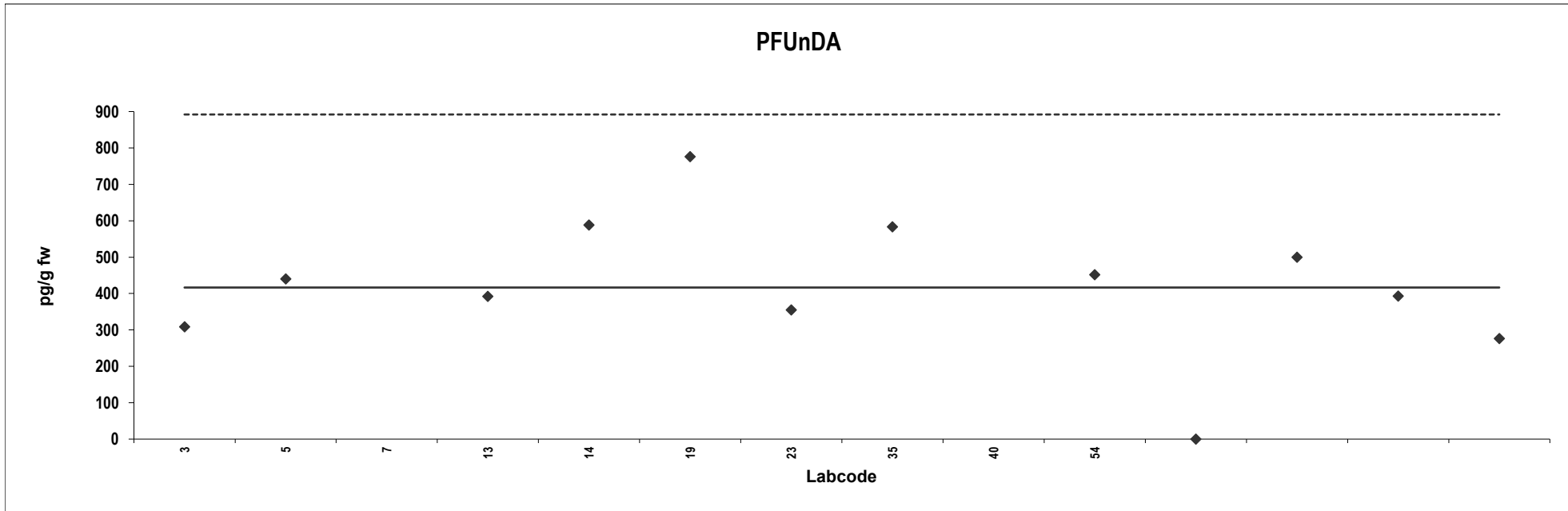
Fish
PFUnDA

Lab code	Conc. pg/g fw.	Z-score	Notes	Lab code	Conc. pg/g fw.	Notes
3	309	-1,3				
5	440	0,28				
7	1656	15	Outlier			
13	392	-0,29				
14	588	2,1				
19	776	4,3				
23	355	-0,74				
35	583	2,0				
40	1000	7,0	ND, outlier			
54	452	0,43				
64	0,00030	-5,0	Outlier*			
81	500	1,0	ND			
109	393	-0,29				
115	276	-1,7				

Consensus statistics

Consensus median, pg/g	417
Median all values pg/g	446
Consensus mean, pg/g	456
Standard deviation, pg/g	152
Relative standard deviation, %	33
No. of values reported	14
No. of values removed	4
No. of reported non-detects	2

*outlier due to very low reported value!



Appendix 6:

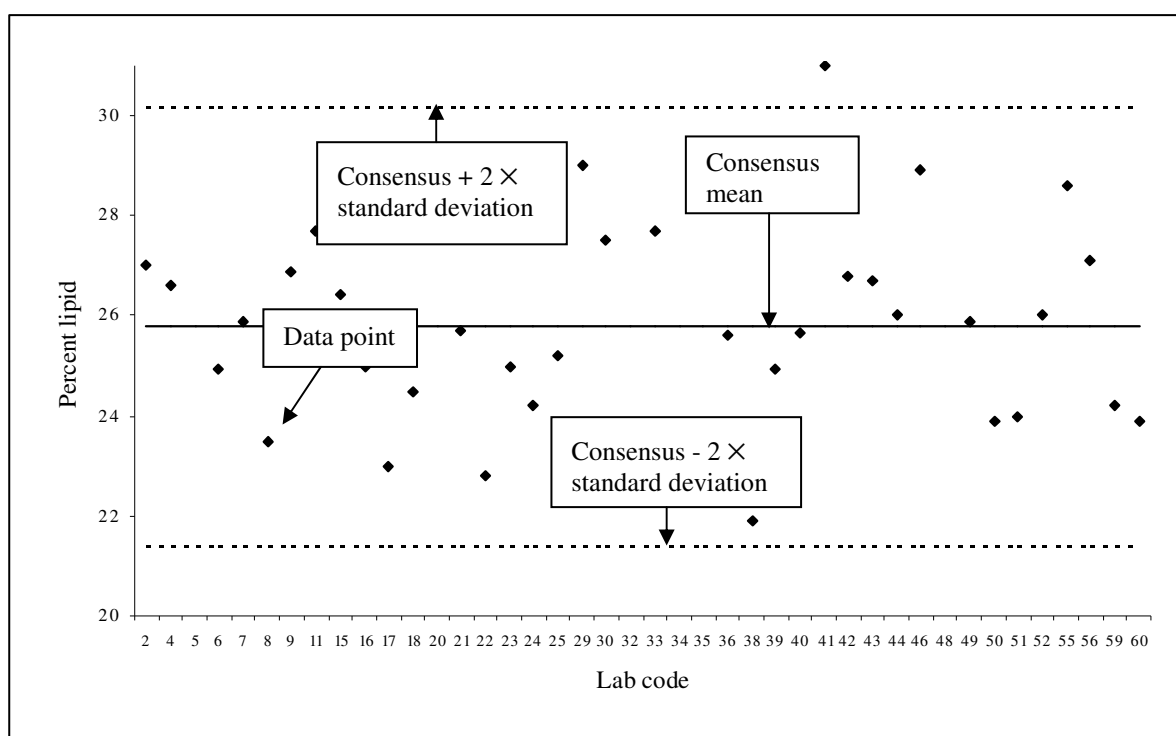
Presentation of results
for lipid determination

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 $\pm 2 \times$ 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 \pm the new standard deviation $\times 2$.



Z-Scores of lipid content

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

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

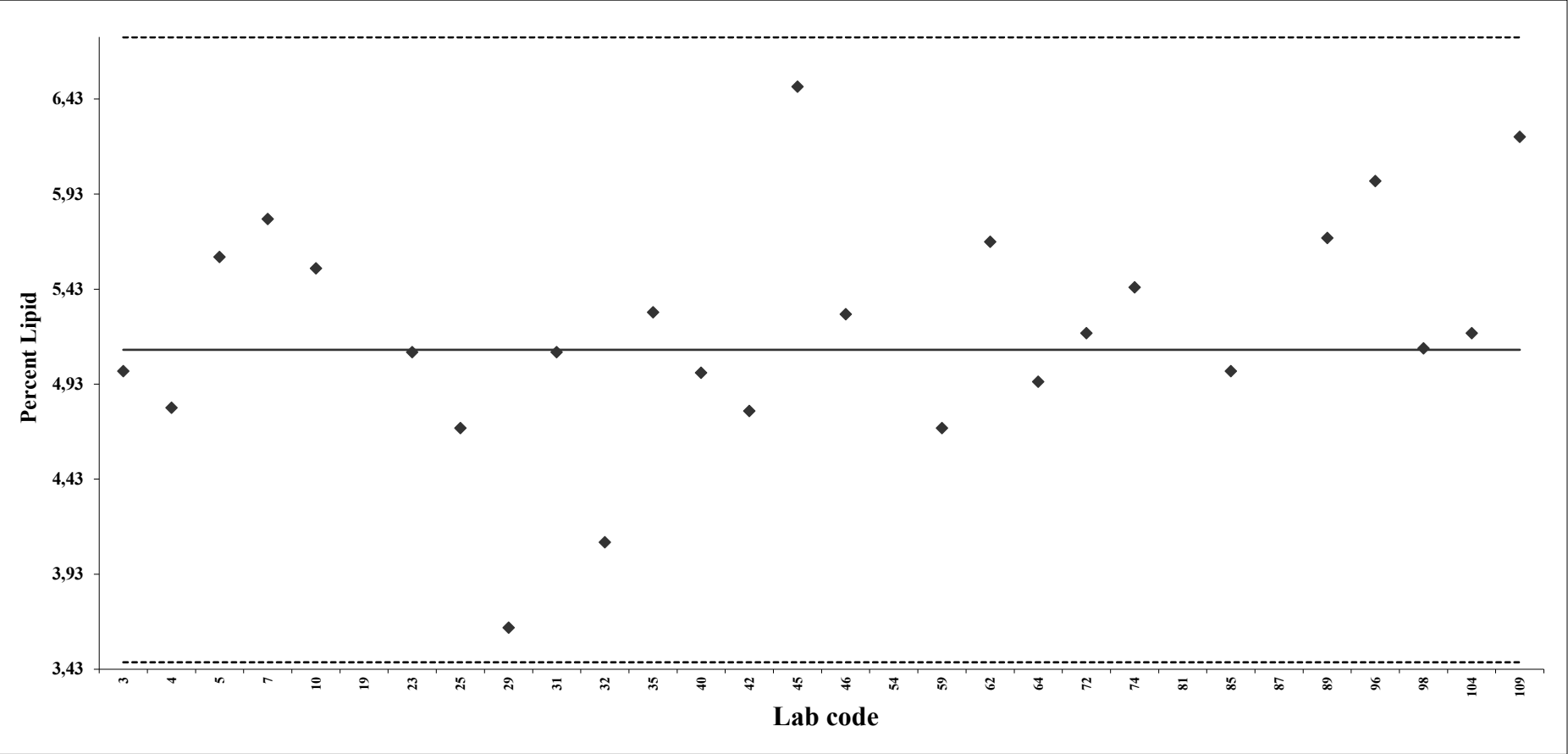
where x = reported value; X = assigned value (consensus); σ = target value for standard deviation. A σ of 20% of the consensus was used, i.e. z-scores between +1 and -1 reflect a deviation of $\pm 20\%$ from the consensus value.

Lipid determination for Fish Oil

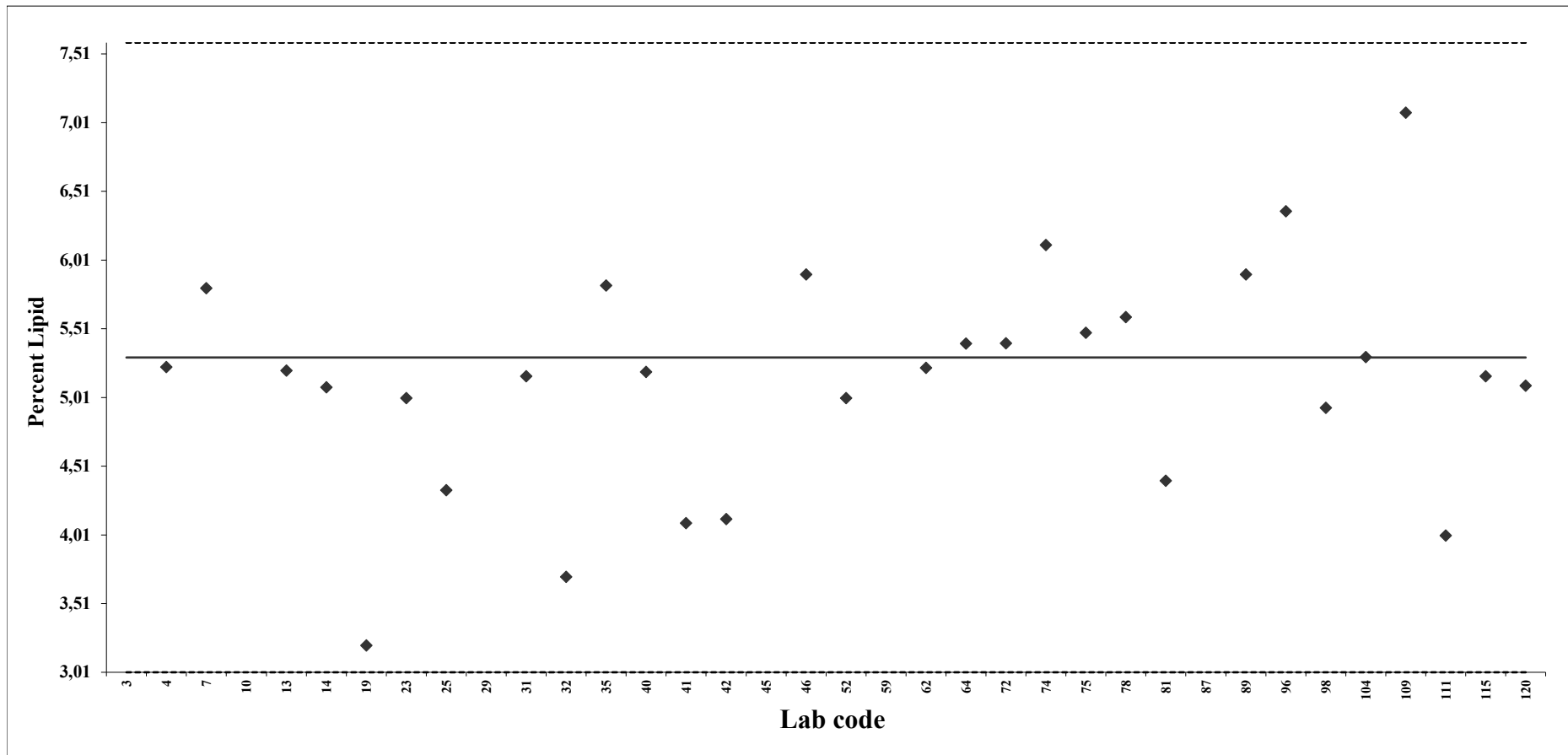
Lab code	% lipid	Notes	Lab code	% lipid	Notes	Lab code	% lipid	Notes
3	100	outlier						
4	100							
7	99							
10	100							
13	100							
19	100							
23	100							
25	100							
29	100							
31	100							
32	100							
34	100							
35	100							
40	100							
42	99							
46	100							
59	100							
64	100							
72	100							
74	100							
75	100							
78	100							
81	100							
85	100	outlier						
87	98							
89	100							
96	100							
98	99							
104	100							
109	100							
111	100							
115	100							
116	100							
120	100							

Mean	Standard deviation	Relative standard deviation	Median
100	0,19	0,19	100

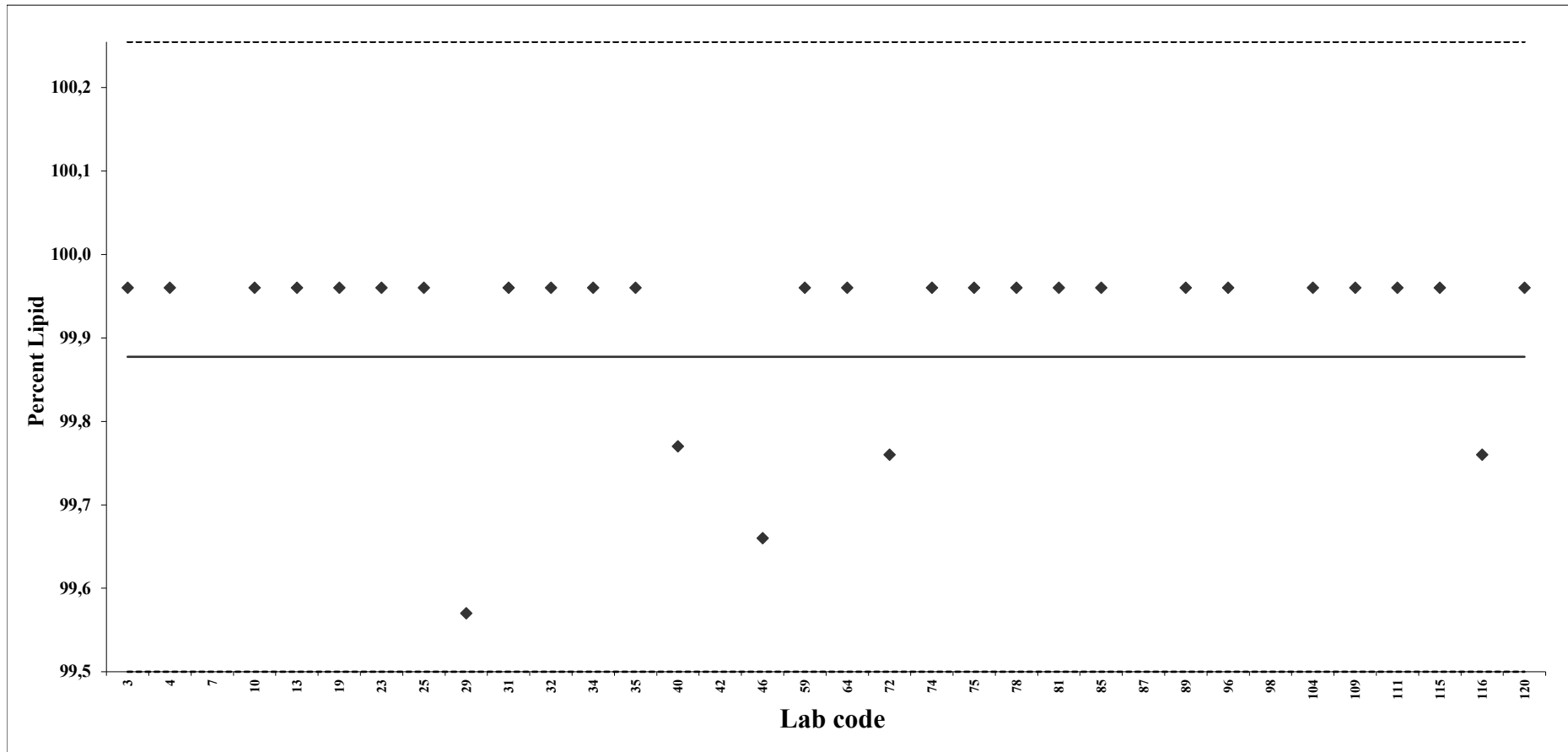
Lipid determination; Veal



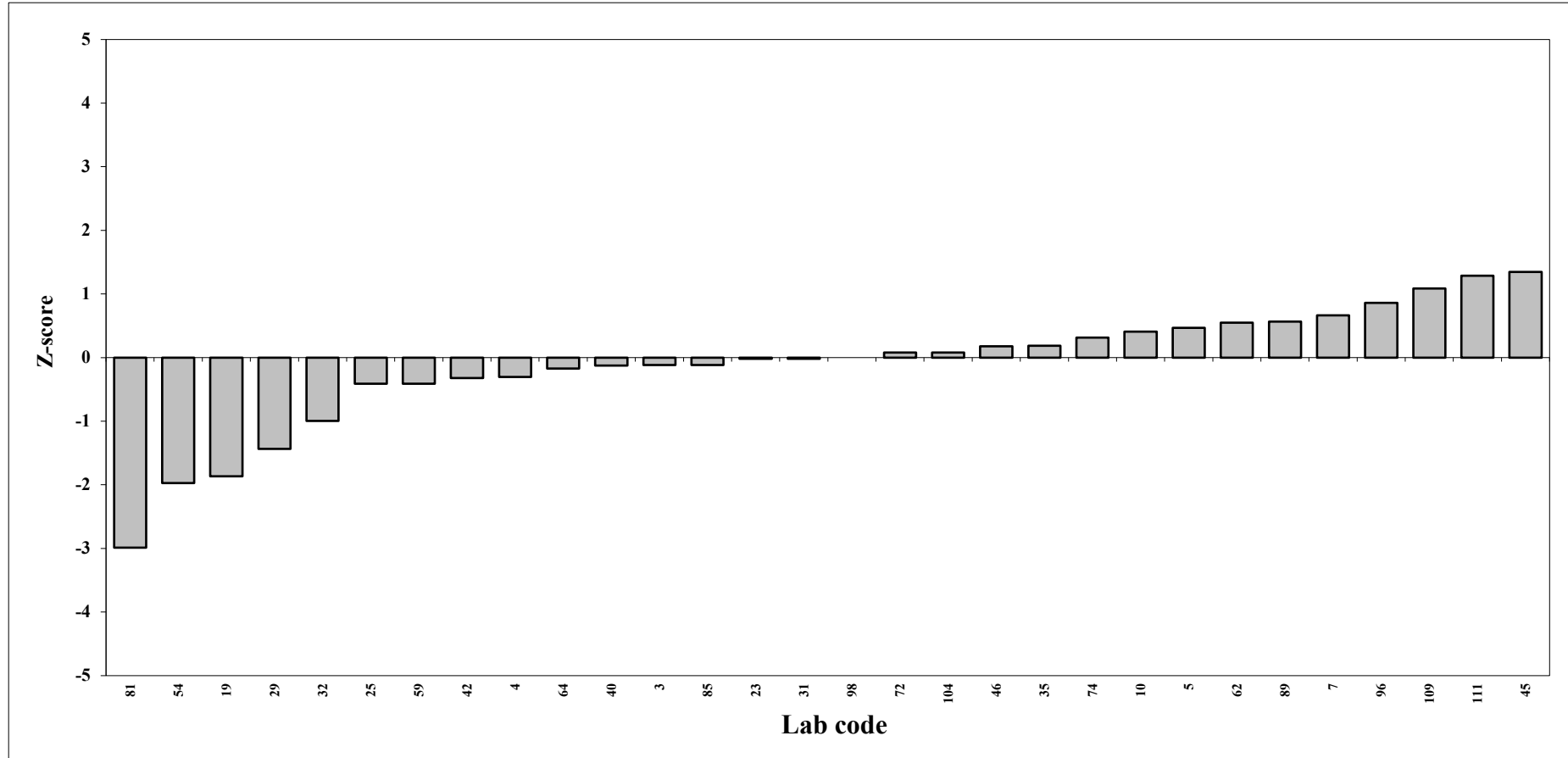
Lipid determination; Halibut



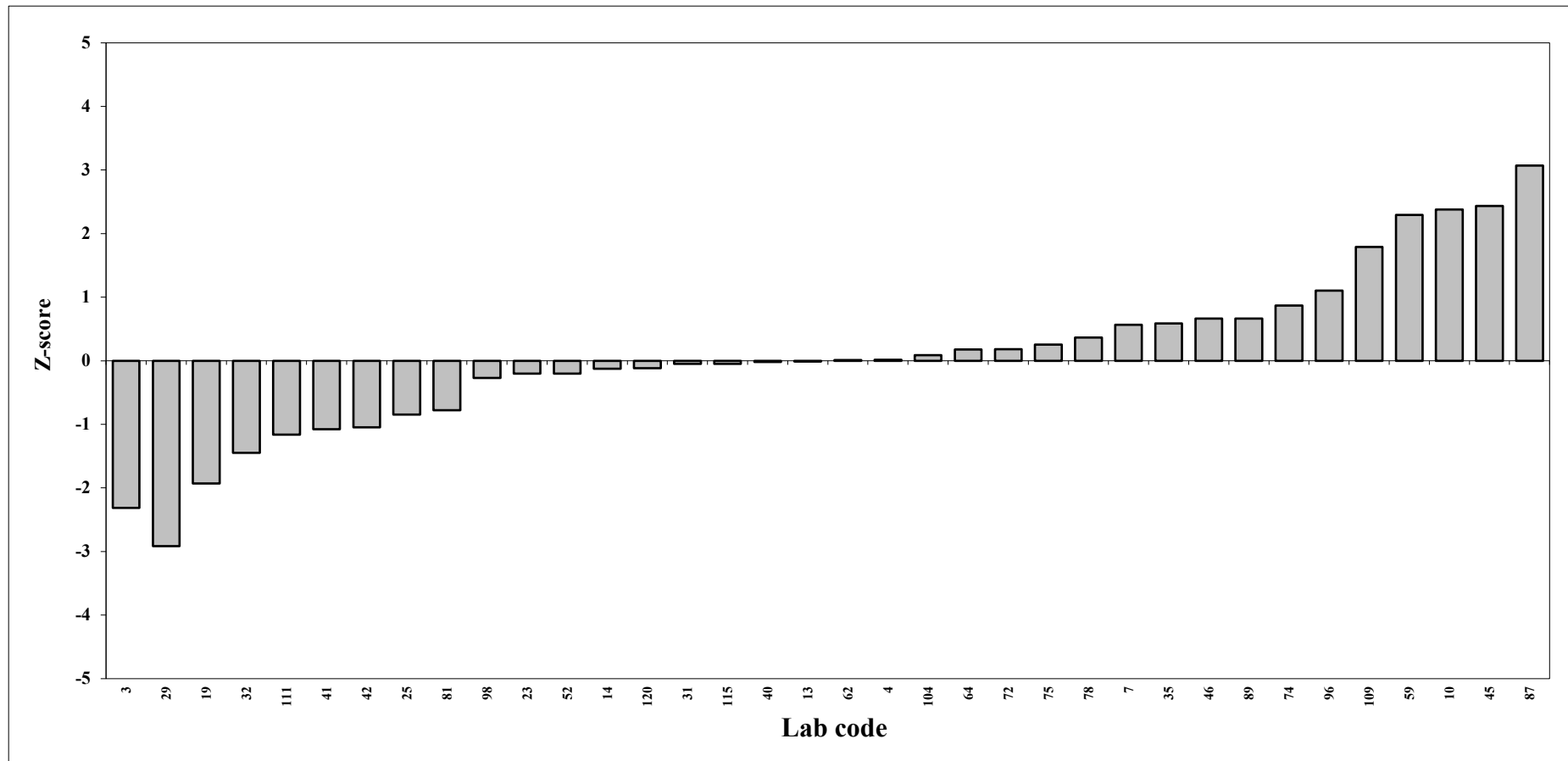
Lipid determination; Fish Oil



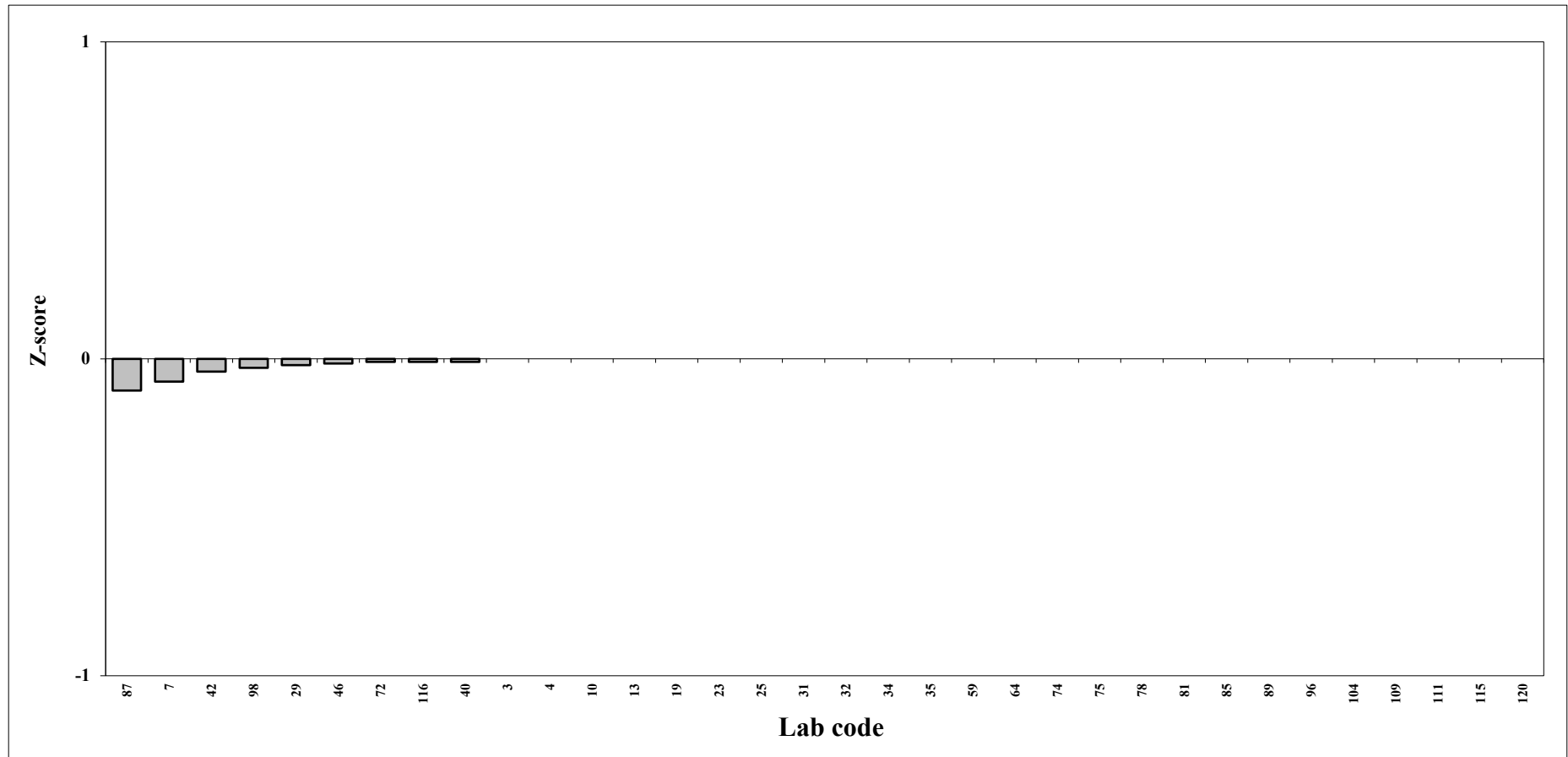
Z-score lipid determination; Veal



Z-score lipid determination; Halibut



Z-score lipid determination; Fish Oil



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