FACT SHEET

Analysis of dioxin-like compound in fish tissue from San Francisco Bay

In the summer of 2000, the USEPA Region 9 coordinated with the San Francisco Estuary Institute (SFEI) to fund the analysis of dioxins and dioxin-like compounds (furans and co-planar PCBs) in fish collected as part of the Regional Monitoring Program. Samples were collected from six areas from within the Bay: the South Bay, Oakland, San Leandro Bay, San Francisco Waterfront, Berkeley, and San Pablo Bay.

Thirty-two fish composites were analyzed for dioxins, furans and co-planar PCBs (PCB-77, PCB-126, PCB-169) with High Resolution Mass Spectrometry by the Department of Toxics Substances Control Lab in Berkeley CA. The other dioxin-like PCBs (105, 114, 118, 156, 157 and 189) were measured by a California Department of Fish and Game Laboratory in Rancho Cordova, CA.

The potency of PCBs, dioxins and furans has been assessed by the World Health Organization (1998) and the combined potency of a sample is expressed as a Toxic Equivalency Quotient (TEQ in pg/g). The dioxin toxic equivalents resulting from dioxins and furans alone are expressed as ITEQs. The TEQ and ITEQ were compared to screening level concentration of 0.3 pg/g. A screening value is a concentration of a target analyte in fish tissue that is of potential public health concern. Exceedance of screening value is an indication that more intensive site-specific monitoring and/or evaluation of human health risk should be conducted.

Median TEQ and ITEQ for fish composite samples collected in SF Bay 2000 Species

Species	Number of composites	Number of fish per composite	TEQ_{DF} (dioxins and furans)	TEQ_{DFP} (dioxins, furans, and PCBs)
White croaker	**14**	**5**	**1.6**	**6.7**
Shiner surfperch	**8**	**20**	**1.4**	**6.4**
Striped bass	**9**	**3**	**0.2**	**1.2**
Jacksmelt	**1**	**5**	**0.2**	**NA**

Approximately 80% of total TEQ in fish tissues is due to PCBs. PCB-126, the most potent dioxin-like congener, contributed an average of 49% to the total TEQ. The dioxins and furans contributed about 20% of the TEQ. These were primarily associated with four compounds: 2,3,4,7,8-PCDF, 2,3,7,8-TCDF, 2,3,7,8-TCDD, 1,2,3,7,8-PCDD. Based on the TEQ data three fish species had median concentrations above the screening level of 0.3 pg/g. The ITEQ is more equivocal. All white croaker (n = 14) and shiner surfperch (n = 8) samples were above the screening level of 0.3 pg/g. On the other hand, all striped bass (n =9) and the jacksmelt (n = 1) were below the screening level of 0.3 pg/g.

The results are similar to those found in the previous RMP survey conducted in 1997. Most of the TEQ is due to the co-planar PCBs. However, dioxins alone are higher than screening levels in some fish. This study provided data on two Bay species (shiner surfperch and jacksmelt) that had not been previously analyzed for dioxins.