

Environ Sci Technol, 42(17):6755-6761
September, 2008

Assessment of polybrominated diphenyl ether exposures and health risks associated with consumption of southern Mississippi catfish

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Despite the growing public interest in polybrominated diphenyl ethers (PBDEs), there are relatively few studies in the published literature which characterize and quantify human intake of these compounds. In this study, PBDE concentrations were measured in southern Mississippi catfish to determine background levels, daily intake, and risk associated with the consumption of these chemicals from a primary food source for residents in this region of the United States. A total of 33 wild catfish samples were collected from five sites, and 28 farm raised catfish samples were purchased, all of which were from locations in southern Mississippi. All samples were analyzed for 43 PBDEs (mono- through deca-congeners) using high resolution gas chromatography-mass spectrometry. Both PBDE concentrations (Σ PBDE ranged from 0.3 to 23.3 ng/g wet weight) and congener profiles varied by fish type and location; however, BDE congeners 47, 99, 100, 153, and 154 were the dominant contributors in all samples. The estimated daily intake of PBDEs associated with consumption of the catfish ranged from 0.03 to 1.80 ng/kg-day. Evaluation of the cancer risk for BDE 209 and the noncancer hazard for BDE congeners 47, 99, 153, and 209 indicated that health risks/hazards due to fish consumption in adults are substantially lower than risk levels generally considered to be at the U.S. EPA minimum concern level.