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## **Diet Contributes Significantly to the Body Burden of PBDEs in the General U.S. Population**

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**Abbreviations and acronyms:**

AMPM	Automated Multiple Pass Method
BMI	Body mass index
CDC	Centers for Disease Control and Prevention
CI	Confidence interval
FFQ	Food frequency questionnaire
LOD	Level of detection
LSGM	Least square geometric mean
NHANES	National Health and Nutrition Examination Survey
PBDE	Polybrominated diphenyl ether
PIR	Poverty index ratio
US	United States
USDA	United States Department of Agriculture
24FR	24-hour food recall
$\Sigma$ PBDE	Sum of BDE 28, 47, 99, 100 and 153

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## Abstract

**Background:** Exposure of the US population to polybrominated diphenyl ethers (PBDEs) is thought to be via exposure to dust and diet. However, little work has been done to empirically link body burdens of these compounds to either route of exposure.

**Objectives:** The primary goal of this research was to evaluate the dietary contribution to PBDE body burdens in the US by linking serum levels to food intake.

**Methods:** We used two dietary instruments--a 24-hour food recall and a 1-year food frequency questionnaire--to examine food intake in participants of the 2003-2004 National Health and Nutrition Examination Survey (NHANES). We regressed serum concentrations of five PBDEs (BDE-28, 47, 99, 100 and 153), and their sum ( $\Sigma$ PBDE), against diet variables while adjusting for age, sex, race/ethnicity, income and BMI.

**Results:**  $\Sigma$ PBDE serum concentrations among vegetarians were 23% ( $p=0.006$ ) to 27% ( $p=0.009$ ) lower than among omnivores for 24-hour recall and 1-year food frequency questionnaire, respectively. Serum levels of five PBDE congeners were associated with consumption of poultry fat: low, medium and high intake corresponded to geometric mean  $\Sigma$ PBDE concentrations of 40.6, 41.9 and 48.3 ng/g lipid, respectively ( $p=0.0005$ ). Similar trends were observed for red meat fat, which were statistically significant for BDE-100 and BDE-153. No association was observed between serum PBDEs and consumption of dairy or fish. Results were similar for both dietary instruments, but were more robust using the 24-hour food recall.

**Conclusions:** Intake of contaminated poultry and red meat contribute significantly to PBDE body burdens in the United States.