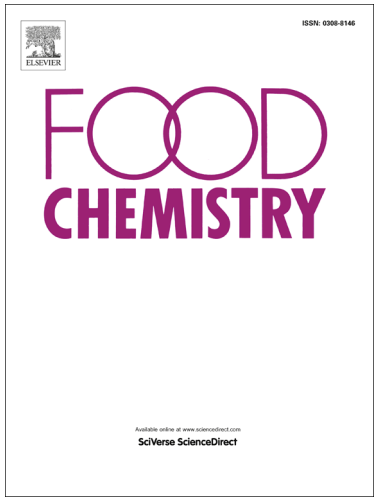

Levels, Dietary Intake and Risk of Polybrominated Diphenyl Ethers (PBDEs) in Foods commonly consumed in Nigeria

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Levels, Dietary Intake and Risk of Polybrominated Diphenyl Ethers (PBDEs) in Foods commonly consumed in Nigeria

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Abstract

Polybrominated diphenyl ethers are non-reactive flame retardants listed among the persistent organic pollutants. This study assesses the levels and health risk of PBDEs in foods commonly consumed by the adult population in Southwest Nigeria. Seven different food categories were collected and extracted using standard QuEChERS protocol prior to analysis by gas chromatography with micro electron capture detector. Aquatic foods had the highest maximum concentration of the eight PBDEs congeners, 748 pg/g; followed by 80.3 pg/g and 54.9 pg/g in edible oil and meat products, respectively. Dairy products had the lowest concentration (0.46 pg/g). The estimated average dietary intake of PBDEs by an adult was 131 pg/kg bw/day. Based on the levels of PBDEs found in common foods consumed by the adult population in Southwest Nigeria, there is unlikely to be a health risk. However, there is a need to investigate the dietary intake of PBDEs in other food categories, especially by vulnerable groups, such as children and the elderly.

Keywords: Persistent organic pollutants, endocrine disruptor, exposure, QuEChERS, gas chromatography, health risk

1. Introduction

Polybrominated diphenyl ethers (PBDEs) are a group of persistent organic pollutants (POPs) applied as brominated flame retardants (BFRs) since 1960. Brominated flame retardants (BFRs) are high volume industrial chemicals usually incorporated into a wide range of polymers used in several consumer products, such as textiles, electric cable insulation, plastic, furniture (carpeting and drapery), office equipment, water and sewage pipes and electronic devices, such as televisions, computers and photocopiers (Kemmlein *et al.*, 2009).They are frequently applied to combustible materials to reduce their flammability, delay ignition and to meet fire safety requirement (Daso *et*