

Occurrence of brominated contaminants in selected foods

Area of research interest: [Chemical hazards in food and feed](#)

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Conducted by: Fera

Background

A number of brominated compounds or classes of compounds previously used as flame retardants have been identified as PBT- type POPs and banned (PBBs, penta and octa-PBDEs) and others are under review. Replacement compounds, notably HBCD, are now also being reported increasingly in foods. It is also becoming easier to measure brominated dioxins and furans, which are by-products of the combustion of BFR-containing materials and some of which are as potent as or even more potent than their chloro-analogues. At present we have data only for TDS food groups and composite fish samples. Further data on occurrence in individual foods, particularly fish, meat and offal, is needed to assess consumer exposure.

Research Approach

A subset of samples, predominantly animal derived products with higher fat content (as the compounds of interest are bioaccumulative and lipophilic), will be taken from the larger sample set collected for the perfluorinated compound survey (C02083). They will be analysed for polybrominated biphenyls (BPPs), polybrominated diphenyl ethers (PBDEs), hexabromocyclododecanes (HBCDDs), brominated dioxins and furans (PBDD/Fs) and tetrabromo-bisphenol A (TBBPA).

Results

This work was carried out to investigate more fully the occurrence of brominated chemicals in food. Polybrominated diphenyl ethers (PBDEs), brominated dioxins and furans (collectively referred to simply as brominated dioxins), polybrominated biphenyls (PBBs), hexabromocyclododecanes (HBCDs) and tetrabromobisphenol A (TBBP-A) were measured in a variety of food samples. In addition, hexabromobenzene (HBB), decabromodiphenylethane (DBDPE) and bis(2,4,6-tribromophenoxy)ethane (BTBPE) were analysed by us for the first time.

- BDE 47 was the most abundant PBDE congener in most fish and shellfish. BDE 99 and BDE 153 were also frequent but at lower levels. The higher brominated congeners such as BDE 153 and BDE 154 were more abundant in meat.
- BDE 209 (decabromodiphenyl ether) was found in 5 out of 7 egg samples and was sometimes the most abundant congener when it was detected.

- Other PBDEs, brominated dioxins, PBBs and HBCDs were detected less frequently, and mostly in fish. Most occurrences of PBBs were in fish except for BB 126, which was found most commonly in offal.
- TBBP-A, HBB and DBDPE were not found above the limit of determination (LOD) in any sample. BTBPE was detected at low concentrations in some fish, meat and offal samples.
- The Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment evaluated brominated chemicals for a previous survey and concluded that the concentrations of PBDEs and HBCDs in the diet do not raise toxicological concerns. The results of the current survey do not raise any new concerns.

Additional Info

A short paper was presented at the BFR2010 symposium in Kyoto.