OCCURRENCE OF HALOGENATED FLAME RETARDANTS IN BELGIAN FOOD SAMPLES

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INTRODUCTION and OBJECTIVES

- Lack of data on the presence of brominated flame retardants (BFRs) in food → incorrect estimation of the health risks.
- EFSA indicated that it is not possible to perform an accurate risk assessment due to the lack of data on the occurrence in food and consequently on the exposure to BFRs via the diet.
- This project follows up the European Commission Recommendation 2014/118/EU on the monitoring of BFRs in food.
- A simple two-step clean-up method, based on GC/ECN/MS, for the determination of PBDEs and emerging halogenated flame retardants (EHFRs) in food was developed and validated.
- 183 composite food samples, belonging to 15 different food categories were analyzed in the frame of the project.

RESULTS and DISCUSSION

- Sample weight: 0.2 – 2 g (depending on the lipid content).
- Solid-liquid extraction with 5 mL acetonitrile/toluene (9:1, v/v).
- Clean-up performed on Florisil® and acidified silica (1 g, 5% H2SO4, w/w).
- Target analysis performed with a GC-ECN/MS, operated in SIM.
- LOQs: 50 pg/g ww for TBA, 5 pg/g ww for PBDEs, 100 pg/g ww for BDE-209, 20 pg/g ww for HBB and DPs, 10 pg/g ww for BTBPE, 200 pg/g ww for TBB and TBP.

- LB mean levels for 3PBDEs from 17 ± 61 pg/g ww in BC to 1,029 ± 3,564 pg/g ww in CHC; 3PBDEs up to 16,888 pg/g ww (enormenal).

- Mean distribution of PBDEs in the analyzed food categories: CHC (28%) > MEC (19%) > POC (16%) > FC (12%).

CONCLUSIONS

- PBDEs were the prevalent contaminants among the food categories (BDE-47 was the most frequently detected congener).
- TBA was mainly present in FC and MC categories, as expected due to its primary natural origin from the marine environment.
- General low contamination of food with brominated flame retardants.
- The measured concentrations will be used to estimate the dietary exposure to BFRs in the Belgian population.