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Human activity is the main cause of the emission of pollutants which may accumulate in environmental compartments, then in livestock tissues and subsequently in the food chain. The toxic environmental micropollutants possibly transferred to animal products are listed in the frame of the Stockholm Convention. These chemicals are particularly monitored in food products and include brominated flame retardants. Among brominated flame retardants, hexabromocyclododecane (HBCD) is a chemical of potential concern currently proposed for listing. HBCD is an emerging toxic micropollutant found in the environment and in animal tissues. Direct HBCD quantification is extremely difficult because it undergoes a rapid metabolism in biota. Based on a previous report showing the relevance of volatile compound metabolic signature in chicken liver for back-tracing a dietary exposure to rapidly metabolized xenobiotics[1], the present study investigates the relevance of this approach to evidence a previous HBCD contamination in laying hens.

Three groups of laying hens (n=56) were fed a similar feed either non contaminated (control group) or contaminated during 71 days with either 0.1 $\mu g.g^{-1}$ or 10 $\mu g.g^{-1}$ HBCD. Animals were periodically slaughtered throughout the experiment and their liver was excised. Solid phase microextraction – gas chromatography-mass spectrometry (SPME–GC-MS) was used to determine the liver content in volatile compounds. After correcting the data from instrumental drifts by normalization methods, the use of volatile compounds enabled the differentiation of samples according to contamination level of animals. For a same contamination level, a discrimination of the samples according to exposure duration was also observed. This discrimination is improved when animals are exposed to the highest HBCD dose. The volatile compound metabolic signatures in poultry liver seem to be relevant in order to back-trace an exposure to HBCD in laying hens. In order to validate the metabolomic approach and to enable its use in the field conditions, further investigations are undertaken to determine the biochemical pathways responsible for the changes in the levels of these volatile biomarkers.

(1) Berge P., Ratel J., Fournier A., Jondreville C., Feidt C., Roudaut B., Le Bizec B., Engel E. Use of Volatile Compound Metabolic Signatures in Poultry Liver to Back-Trace Dietary Exposure to Rapidly Metabolized Xenobiotics. *Environ. Sci. Technol.* **2011**, *45*, 6584–6591.

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