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Back-tracing an emerging environmental toxicant (hexabromocyclododecane, HBCD) in animal-derived food chain based on foodomics

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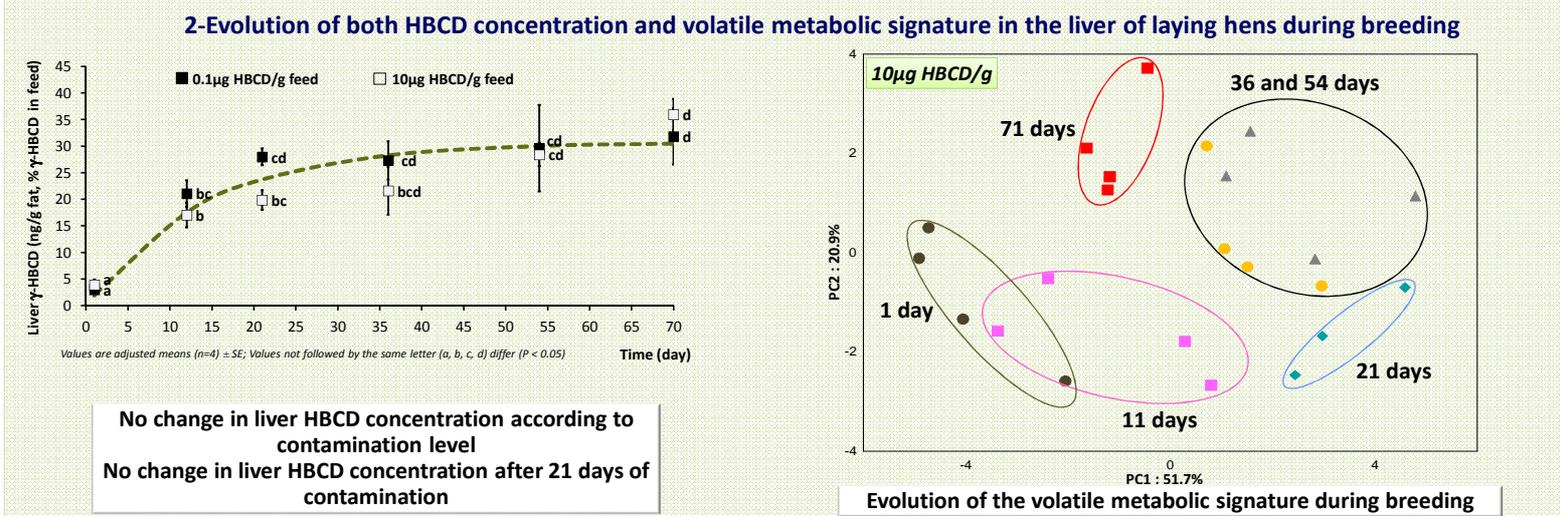
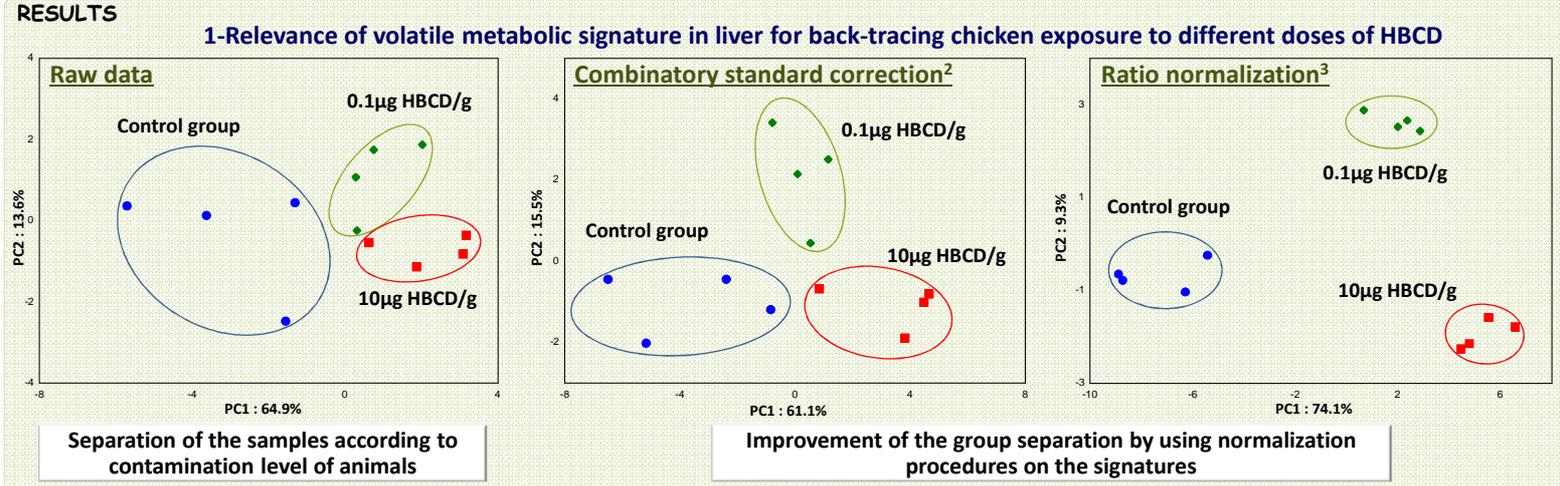
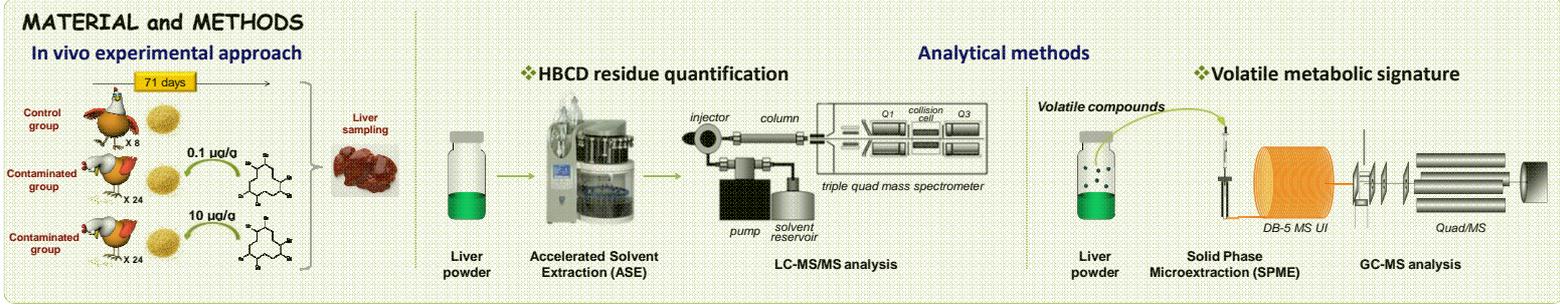
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CONTEXT and OBJECTIVES Human activity is the main cause of the emission of pollutants which may accumulate in environmental compartments, then in livestock tissues and subsequently in the food chain. These chemicals are particularly monitored in food products and include brominated flame retardants. Among brominated flame retardants, hexabromocyclododecane (HBCD) is a chemical of potential concern. 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 xenobiotics¹, the present study investigates the relevance of this approach to evidence a previous HBCD contamination in laying hens.



CONCLUSIONS After data normalization, volatile compound signature enabled the differentiation of samples according to HBCD contamination level of animals. For a same contamination level, a discrimination of the samples according to exposure duration was achieved. To validate the metabolomic approach and to enable its further use, new investigations are in progress in order to determine the biochemical origin of these volatile biomarkers.

REFERENCES ¹ Berge et al., 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. ² Engel and Rattel, Correction of the data generated by mass spectrometry analyses of biological tissues: Application to food authentication. *J. Chromatogr. A*, 2007, 1154, 331-341. ³ Lehallier et al., Systematic ratio normalization of gas chromatography signals for biological sample discrimination and biomarker discovery. *Anal. Chim. Acta*, 2012, 733, 16-22.

