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## Use of Volatile Compound Metabolic Signatures in Poultry Tissues to Back-Trace Dietary Exposure to Xenobiotics

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**ABSTRACT** We investigated the feasibility of using volatile compound signatures of liver in poultry to detect previous dietary exposure to different types of xenobiotic. Six groups of broiler chickens were fed a similar diet either non-contaminated or contaminated with polychlorinated dibenzo-*p*-dioxins/-furans (PCDD/Fs), polychlorinated biphenyls (PCBs), polybrominated diphenyl ethers (PBDEs), polycyclic aromatic hydrocarbons (PAHs) or coccidiostats. The liver of each chicken was analysed by solid-phase microextraction - mass spectrometry (SPME-MS) for volatile compound metabolic signature and by gas chromatography - high resolution mass spectrometry (GC-HRMS), gas chromatography - tandem mass spectrometry (GC-MS/MS) and liquid chromatography - tandem mass spectrometry (LC-MS/MS) to quantify xenobiotic residues. The results show that the volatile compound metabolic signature could clearly differentiate the non-contaminated chickens from those contaminated with PBDEs, PAHs or coccidiostats. The results for PAHs showed a clear metabolic response in the liver although these rapidly metabolized xenobiotics are undetectable in this organ by the targeted reference analytical method. However, the rough metabolic signature obtained by SPME-MS did not enable us to evidence previous exposure to slowly metabolized compounds such as PCDD/Fs and PCBs, the residues of which are clearly detected by targeted reference methods.

**KEYWORDS** : Non targeted approach, environmental micropollutant, drug, liver, poultry