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Impact of food cooking on chlordecone contents in animal matrices – identification of elimination mechanisms

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Chlordecone (CLD) was an organochlorine pesticide frequently used in the French West Indies between 1972 and 1993 to control the banana weevil (*Cosmopolites sordidus*). The CLD has impregnated the whole ecosystem at all trophic levels, and contaminated the local population through the consumption of locally produced food, raising a major issue of sanitary safety and public health. Self-production is a major route of CLD exposure. These foodstuffs, of vegetal or animal origin, may be consumed by the producer or offered for sale at the roadside and can far exceed the current CLD maximum residue limit of 20 $\mu g.kg^{-1}$. Consumption recommendations of these matrices have been proposed to local populations to limit the ingestion of CLD.

A method of analysis of CLD and chlordecol (CLDOH), using QuEChERS extraction salts and tandem mass spectrometry (LC-MS/MS) in MRM mode with isotopic dilution, was developed and used to assess the effects of cooking (Saint-Hilaire et al., 2018; Martin et al., 2020). The aim of this study is to analyze a wide variety of animal matrices (i.e. fish, lobster, crayfish, chicken, egg and pork) and identify the CLD elimination mechanisms occurring during a cooking process. These new matrices were pan-fried, oven-fried and microwaved, with adapted cooking conditions. CLD levels were measured before and after cooking for each matrix, and processing factors (PF) representing the proportion of CLD remaining in a matrix were calculated for each pair of matrix/cooking conditions (Devriendt-Renault et al., 2023). CLD Transformation hypothesis was investigated using high-resolution mass spectrometry coupled with liquid chromatography (LC-HRMS) for the search of chlorinated by-products, possibly generated during the cooking process.

Keywords: Chlordecone, food processing, animal matrices, mass spectrometry, elimination

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