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FURAN AND ALKYLFURANS IN CEREAL BABY FOODS: OPTMIZATION AND VALIDATION OF A HS-SPME GC/MS METHOD

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Furan and its methyl derivatives are process contaminants involved in the food flavouring. They have been first reported in food in 1979 by Maga et al. [1] and furan itself has been classified as possibly carcinogenic to humans two decades later [2]. Since, the food safety authorities have paid more attention to this food borne contaminant and highlight its occurrence in coffee, baby food and snacks [3]. Those data have been used in risk assessments [4,5] and have demonstrated a risk related to its ingestion by babies. Recent studies [6,7] put forward that furan methyl derivatives such as 2-methylfuran, 3-methylfuran, and 2,5-dimethylfuran can have toxic effect as well. In that framework, food safety authorities within EU Member States were asked to provide additional data regarding the occurrence of alkylfurans in foodstuffs.
A HeadSpace Solid Phase MicroExtraction method coupled to Gas Chromatography/Mass Spectrometry (HS-SPME GC/MS) using the isotope dilution for the quantitation has been optimized in naturally contaminated cereal baby foods through a Central Composite Design approach. It highlights that optimal conditions are different but close for every analyte. Therefore, compromised optimal conditions were found to be an extraction temperature of 30 ℃ for 35 minutes.
This method has been validated in spiked cereal baby food at three levels (10, 30 and 60 µg/kg) for three days in triplicate. The validation shows that the method fills the European Commission requirements with a high sensitivity (LOQs < 2 µg/kg) and an intermediate precision between 2 and 13%.

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