

Title Fish and food safety: Determination of formaldehyde in 12 fish species by SPME extraction and GC–MS analysis

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Abstract

The formaldehyde (FA) content in different fish products was evaluated using a solid phase microextraction (SPME)-GC–MS method based on fiber derivatisation with pentafluorobenzyl-hydroxyl-amine hydrochloride. LOD and LOQ values of 17 and 28 $\mu\text{g kg}^{-1}$, respectively were calculated. Fish quality was assessed by the analysis of 12 species (sea-fish, freshwater-fish and crustaceans), revealing variable FA levels. Fresh, deep frozen, canned, boiled and roasted fish were analysed; cooking always produced a decrease in the analyte content. Fish belonging to the *Gadidae* family were the samples with the highest FA concentration (from $6.4 \pm 1.2 \text{ mg kg}^{-1}$ to $293 \pm 26 \text{ mg kg}^{-1}$), in four cases out of 14 exceeding the value of 60 mg kg^{-1} proposed by the Italian Ministry of Health. Storage on ice was also investigated, showing moderate FA production also at temperature around 0 °C. FA contents lower than 22 mg kg^{-1} were finally found in all the other samples.