

Determination of A α C and other pyrolytic heterocyclic amines in cooked meat by HPLC/FLD using extraction by SPME

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Heterocyclic amines (HAs) are considered the main food mutagens in cooked meat products. Temperatures between 150 and 250 °C lead mainly to the formation of aminoimidazoazaarenes that are thermic amines. At higher temperatures (>250°C) aminocarbols are formed through pyrolysis of amino acids. Few food surveys describe the analysis of pyrolytic HAs, however, they are present in meat and fish.

Due to high complexity of most food matrices and the low concentration (ppb levels) of HAs, sensitive and selective analytical methodology is needed. Solid-phase extraction (SPE) is generally used. However it involves tedious and time-consuming and has intrinsic disadvantages like the use of toxic solvents and plugging of the cartridges. These drawbacks can be avoided by using solid-phase microextraction (SPME) [1].

This abstract deals with comparison of efficiency of extraction techniques (SPE and SPME) used for extraction of pyrolytic HAs (Trp-P1, A α C, MeA α C), in grilled meat, using extraction coupled to HPLC with fluorescence detection [1, 2].

The main analytical characteristics of the SPME method have been evaluated. Good linearity, with correlation coefficients better than 0.995 in all cases, was obtained in the range of concentration of 1 to 25ng/ml. All the analytes were quantified by a standard addition method, using one unspiked and two spiked meat extracts. The limits of detection (LD) ranged between 0,106 and 0,005ng/mL, similar to obtained from SPE. The SPME chromatograms showed low sample matrix interferences in the analytical peaks of interest and that enabled detection of Trp-P1 and MeA α C. Concerning A α C contents the SPME method gave results comparable to those obtained with SPE method. Additionally, we observed in our experiments, that presence of A α C, in grilled meat and fish dishes prepared in a way that reflects normal household cooking, can be a marker of the high temperatures used during cooking.

SPME method is much more economical and combines rapidity and sensibility when compared with conventional SPE method, and give similar results for pyrolytic amines, such as A α C.

[1] Martín-Calero, A.; Ayala, J.H.; González, V.; Afonso, A.M. *Determination of less polar heterocyclic amines in meat extracts: Fast sample preparation method using solid-phase microextraction prior to high-performance liquid chromatography-fluorescence quantification*. 2007, *Analytica Chimica Acta*, 582, 259 – 266.

[2] Santos, F.J.; Barceló-Barrachina, E.; Toribio, F.; Puignon, L.; Galceran, M.T.; Person, E.; Skog, K.; Messner, C.; Murkovic, M.; Nabinger, U.; Ristic, A. *Analysis of Heterocyclic amines in food products: interlaboratory studies*. 2004, *Journal of Chromatography B*, 802, 69-78.