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VALIDATION OF A SUB-ROOM TEMPERATURE ID-SPME-GC-MS METHOD FOR THE ANALYSIS OF FURAN IN FOOD

Georges Scholl[1*], Marie-Louise Scippo[2], Jean-François Focant[3], Edwin De Pauw[4], Gauthier Eppe[5]

[1 3 4 5] CART, Mass Spectrometry Laboratory, Faculty of Sciences, University of Liège
[2] CART, Laboratory of food analysis, Faculty of Veterinary Medicine, University of Liège
[*] Corresponding author–E-mail: g.scholl@ulg.ac.be; Phone: +32(0)43663433

Furan is a toxicant found in many food items that undergo heat treatment like canned and jarred food [1]. It is a little heterocyclic molecule classified by the IARC in 1995 as a possible carcinogenic to humans (group 2B) [2]. In 2004, the US Food and Drug Administration (FDA) published a report about its occurrence in food [1]. More recently, the European Food Safety Authority (EFSA) called for more information about its presence in food. Development of fast, sensitive and reliable analytical methods are needed to provide actual levels of furan in food in order to allow a more sound dietary exposure assessment of the European population.

We already reported the development of a headspace–solid phase microextraction (HS-SPME) coupled to gas chromatography–mass spectrometry (GC/MS) method [3]. The HS-SPME parameters were optimised by experimental design and the major finding resulted in a sub-room optimal extraction temperature [3]. The current study focuses on the validation of the HS-SPME for hot drink, juices, sauces and baby food according to the Commission Decision 2002/657/EC. To estimate the Limit of Detection (LOD) and the Limit of Quantification (LOQ), the standard-deviation/slope ratio approach was used instead of the signal to noise (S/N) approach. Indeed, the HS-SPME-GC-MS method has a limited linearity response range (3 orders of magnitude), The assessment of the LOQ by the S/N approach (S/N = 10) did not provide an acceptable accuracy at the LOQ. The CC_α and CC_β approach gave more reliable limits. Since no maximum limits for furan in food have already been enforced, the *Minimal Required Performance Level* (MRPL) methodology was applied. The CC_β were close to, or lower than, 1 ppb (e.g. 0.18 ppb, 1.02 ppb, 1.57 ppb and 0.32 ppb for the juices, the hot drinks, the sauces and the baby foods, respectively).

The intermediate precisions and the trueness were evaluated using juices, sauces and hot drinks homemade matrices,. The intermediate precisions RSDs (3 days, n=20) were 3.4% (at 0.65 ppb), 7.8% (at 1.37 ppb), and 12.6% (at 1.4 ppb), respectively. The mean relative biases (same conditions) were 9.8, 5.8, and 12.3%. In addition, the baby food matrix was evaluated through the participation at an interlaboratory exercise. The z-score (22 participants) was 0.7 (assigned value: 44.2 ppb; SD: 9.7 ppb) [4] and the intermediate precision RSD (2 days, n=4) 9.0%.

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