TRACE QUANTITATIVE ANALYSIS OF PESTICIDES BY MASS SPECTROMETRY

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Pesticides from a broad range of classes have been widely used in various combinations at different stages of cultivation and during post-harvest storage to protect crops against a range of pests and fungi and/or to provide quality preservation. Pesticides residues, which might pose a potential risk for human health due to their subacute and chronic toxicity, could possibly end up in the final products of crops such as processed infant foods. The European Union Commission Directive 96/5/EC [1] and its subsequent revisions, for example, 1999/39/EC [2], and 2003/14/EC [3], have placed emphasis on the control of pesticides by requiring that processed cereal-based foods and infant foods shall not contain residues of individual pesticides at levels exceeding regulatory maximum residue limits, for example, 10 µg/kg.

Gas chromatography and/or liquid chromatography-mass spectrometry are essential for the determination of pesticides in foods.

In this work, we present a simple and sensitive multiresidue method for the quantitative determination of over 100 pesticides in fruit and vegetables. The sample extraction and clean-up procedures were based on the buffered procedure known as the quick, easy, cheap, effective, rugged, and safe (QuEChERS) method. The method was validated, to evaluate its performance characteristics including overall recovery, precision, accuracy and reproducibility. The calculated limits of detection and quantitation were lower than the maximum residue levels established by European legislations.

References