



Rapid GC-MS/MS Analysis of Multiple Pesticide Residues in Cereal-Based Products

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For the simultaneous detection of 95 pesticides in cereal-based products, a quick GC-MS/MS method was validated in order to determine the safety and compliance with the legal maximum residue levels.^{1,2} The samples, fortified with triphenyl phosphate as an internal standard, were first extracted with acetonitrile, followed by a salting out process using the QuEChERS extraction kit, and a dispersive SPE cleanup. Analysis of spiked samples, prepared by adding standard pesticide solution mixture to one representative sample consisting of five pesticide-free grains was conducted at three different levels (2.5, 5 and 10 $\mu\text{g kg}^{-1}$). Mean recoveries from six replicates ranged from 70.78 to 115.05%, with RSD lower than 20. The limit of quantification for all pesticides was 5 $\mu\text{g kg}^{-1}$. The correlation coefficient was ≥ 0.990 for all pesticides. Evaluation was performed using a matrix-matched calibration curve for each pesticide in a concentration range of 2.5 to 50 ng mL^{-1} . This method with a 21-min run time demonstrated the ability to quantify pesticides at concentrations below the LOQ, suggesting that it may have a useful application for the safety control of residues in cereal-based food, even when other components are present in the samples. Such method that could determine residues at lower levels than legal limits is needed to ensure a high degree of consumer protection, since a specific pesticide/product combination may exceed health-based recommendation levels and pose a risk to health.

Keywords: cereal-based products, pesticide residues, GC-MS/MS.

References

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