Simultaneous determination of ochratoxin A, mycophenolic acid and fumonisin B-2 in meat products

Here we present a method for simultaneous determination of the fungal metabolites mycophenolic acid, ochratoxin A (OTA) and fumonisin B-2 (FB2) in meat products. Extraction was performed with water-acetonitrile, followed by acetonitrile-induced precipitation of salts and proteins. Purification and identification of analytes was performed by mixed-mode reversed-phase anion-exchange chromatography in direct ion-exchange mode, followed by liquid chromatography-tandem mass spectrometry (LC-MS/MS) detection. Quantification was based on isotope dilution with fully C-13-labelled FB2 and OTA, and matrix-spiked calibration curves. Fermented sausages inoculated with an OTA- and FB2-producing strain of Aspergillus niger were analysed, but no analytes were detected. Analysis of 22 retail products showed one Parma meat with a very high level of OTA contamination (56-158 μg/kg) that clearly exceeded the Italian regulatory limit of 1 μg/kg. This sample and uninfected control samples were subsequently reanalysed, and the high OTA content was verified by two other techniques: (i) LC-time-of-flight MS confirmed the accurate mass as well as chlorine isotope pattern; and (ii) sample methylation in methanol-BF3 and subsequent LC-MS/MS provided indirect confirmation by detection of the OTA methyl ester. In the contaminated Parma ham, the high OTA level most likely originated from growth of Penicillium nordicum on the meat.