

## ABSTRACT (AJ)

Food contact materials pose a risk to human health due to a variety of contaminants which they can release into food. These compounds, migrants, include aromatic hydrocarbons, dialkyl phthalates, bisphenols, printing ink photoinitiators, and perfluoroalkyl compounds. The determination of all these substances can be expensive and time-consuming since universally applicable analytical approaches are not available nowadays. This work attempted to develop methods for the simultaneous determination of migrants from all of the mentioned groups in paper-based food contact materials and fatty food.

A total of 68 contaminants were studied in paper products using liquid chromatography and gas chromatography coupled with tandem mass spectrometry detection. All analytes were isolated simultaneously using the modified "QuEChERS" method. This method demonstrated acceptable recovery and repeatability for most analytes in the validation study; LOQs ranged from 1.3 to 220 µg/kg. Analysis of 132 real paper products confirmed the occurrence of almost all studied analytes, which were often present in complex mixtures and at concentrations up to 628 mg/kg.

A total of 41 potential contaminants were monitored in fatty foods by liquid chromatography with tandem mass detection. Contamination of the mobile phase by some analytes represents the main drawback of liquid chromatography. However, several preventive measures to eliminate this problem were developed, of which the use of the precolumn (mobile phase filter) was the most important. The analytes were extracted from fatty foods using the immiscible solvent. Solid phase extraction (SPE) technique was successfully optimized for defatting the extract during the first experiments. In later experiments, these results were confronted with other purification methods, some of which represented a simple, inexpensive and comparatively effective alternative to SPE. The validation study showed that most analytes were determined with satisfactory recovery, repeatability, and LOQs in the range of 1.0–42 µg/kg. During the analysis of 60 real fatty foods, 17 analytes were identified at concentrations up to 33 mg/kg.

**Keywords:** food contact materials, fatty food, paper and cardboard, migrants, liquid chromatography, gas chromatography, mass spectrometry, solid phase extraction, QuEChERS, lipids, methanol-associated sensitivity loss