

Free Access*: [High-performance liquid chromatographic method for the simultaneous detection of the adulteration of cereal flours with melamine and related triazine by-products ammeline, ammelide, and cyanuric acid](#)

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Melamine has been used for the adulteration of cereal flours in order to increase their apparent protein content. Crude melamine may contain several by-products, i.e. ammeline, ammelide, and cyanuric acid. The simultaneous analysis of all four chemicals is difficult because of the formation of an insoluble salt between melamine and cyanuric acid. A simple and convenient high-performance liquid chromatography (HPLC) method for the detection of the adulteration of cereal flours with all four chemicals is proposed herein. The precipitate formation between melamine and cyanuric acid was prevented by using alkaline conditions (pH 11-12) for both standards preparation and sample extraction. The method uses matrix-matching, which involves the construction of a calibration curve on a blank (negative control) matrix, which is then used for the quantitation of melamine and by-products in adulterated (positive) samples. Matrix-matching compensates for analyte losses during sample preparation, and for matrix effects. The method was successfully applied to wheat, corn, and rice flours, and is expected to be applicable (with some modifications) to soy flour as well. The method allows for the detection of melamine, ammeline, and ammelide at approximately $5 \mu\text{g g}^{-1}$, and cyanuric acid at approximately $90 \mu\text{g g}^{-1}$ in wheat flour.

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