

OW6 Analysis and confirmation of melamine in food.

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A confirmation protocol for the analysis of melamine in food has been developed.

In 2007, melamine was found in pet food at high levels, which caused renal failure in cats and dogs [1]. Recently, several Chinese companies were suspected of adulteration of dairy products with melamine. Some infant milk formulas were found to contain melamine to greater than 2,500 ppm [2], well above Health Canada's interim safe level of 1 ppm [3].

Although pure melamine has low toxicity, when present with cyanuric acid or other melamine related compound Fig.1, melamine cyanurate kidney stones can form [4].

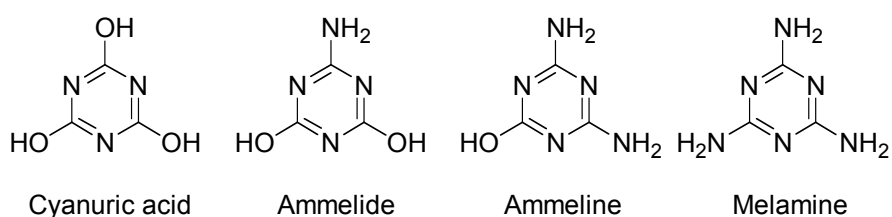


Figure 1. Structure of melamine and melamine related compounds.

We developed a quality assurance protocol for the confirmation of the melamine in different food matrices, which includes repeat analysis of the positive sample and confirmation of the results by high resolution mass spectrometry. Method for the analysis of melamine includes fortification of sample with isotopically labelled analogues, followed by a series of dilutions and analysis by LC/ESI-MS/MS using 3 μ m S NH₂ column (Limit of Reporting is 1 ppm). Confirmation was achieved by GC/HR-MS analysis of silyl derivatives or exact mass determination by LC-Orbitrap.

[1] C.A. Brown et al., J. Vet. Diagn. Invest. 2007, 19: 525-531.

[2] Interim Safety and Risk Assessment of Melamine and its Analogues in Food for Humans. US FDA/CFSAN. October 3, 2008. <http://www.cfsan.fda.gov/~dms/melamra3.html#ftn1>

[3] The Government of Canada responds to reports of melamine in food products. <http://www.hc-sc.gc.ca/fn-an/securit/chem-chim/melamine-eng.php>

[4] R.L.M. Dobson et al., Toxicol. Sci. 2008, 106: 251-262.