MoniQA Fact Sheet No 2 on:

Melamine

MoniQA

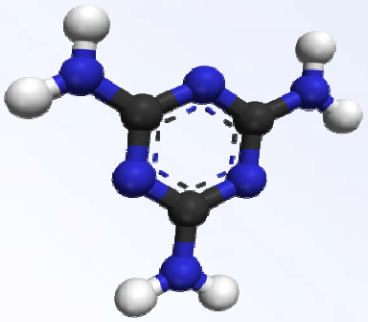
Network of Excellence supported by the European Commission under FP6
Coordinator: Roland Poms (ICC) www.moniqa.org

Globalized trade in food means more choice for consumers. However, as the current melamine crisis in Chinese milk shows, globalization can also threaten human health. By bringing together over 100 organisations from 35 countries and five continents MoniQA (**Moni**toring and **Q**uality **A**ssurance in the Food Supply Chain) is able to react quickly and comprehensively to emerging food safety issues.

This factsheets provides an overview of the recent melamine crisis (page 1) and MoniQA activities in this area as well as planned actions in other emerging food safety issues (page 2).

The Melamine Molecule

$C_3N_6H_6$



MoniQA, an EU-funded project connecting global players in the field of food safety and quality, addresses the melamine crisis and other emerging issues in food safety.

What is Melamine?

Melamine is an organic compound. Synthesised in 1834 by German chemist Justus von Liebig, it forms a very durable thermosetting plastic (melamine resin) when combined with formaldehyde, and has been used in products such as housewares (cookware, appliances, lighting etc.), fertilizers, countertops, flame retardants, glues, fabrics and dry-erase boards (white boards). Since it consists of 66% nitrogen, melamine was also used as a so-called non-protein nitrogen (or NPN) in cattle food from 1958 onwards, until this was judged as unacceptable in 1978.

Melamine is non-toxic in low doses. However in combination with cyanuric acid, it can form insoluble crystals, leading to the formation of kidney stones, which can cause kidney failure and ultimately death, particularly in vulnerable individuals such babies and young children. For adults melamine is only dangerous in very high concentrations – the US Food and Drug Administration (FDA) has set a concern level of 0.5 mg/ kg body weight.

The Case in China

Chinese melamine production started in 1958. Today, China is the largest melamine exporter, globally.

In 2007, melamine was discovered in pet food imported from China by the United States. It caused the death of 16 pets, and the recall of 60 million pet food packages. The first baby affected by melamine was diagnosed in Nanjing in March 2008. In September 2008, the Sanlu Group admitted deliberate contamination of milk powder with melamine, in order to artificially boost its protein content. In total, 54, 000 Chinese babies have been affected; 6000 were seriously ill and four died.

As a result of the crisis, consumption of milk in China dropped significantly, and farmers were forced to dispose of milk they could not sell and reduce numbers of cattle through culling. Chinese authorities dispatched medical teams across the country and encouraged free screening of babies in local hospitals. New regulations and quality standards have also been implemented (see page 2).

The Case Worldwide

On 23rd September 2008, the Canadian Food Inspection Agency found, for the first time, melamine in some instant coffee products. The products were recalled in Taiwan and Canada. Melamine was also detected in a Canadian chocolate brand, on 8th October, leading to its recall.

On 24th September 2008, melamine-contaminated confectionary was discovered in Australia and New Zealand. Cadbury Schweppes plc. recalled all of its chocolate products made at the Beijing plant on 29th September 2008. In total, 11 chocolate products, exported to Hong Kong, Taiwan and Australia, were withdrawn from the market.

In Europe, contaminated biscuits were detected on 3rd October in the Netherlands. The biscuits in question were also recalled in the UK by the Food Standards Agency.

At the end of October, and just as the crisis seemed to be contained, health authorities in Hong Kong found eggs containing melamine after chicken were fed with melamine-contaminated feed

MoniQA Fact Sheet No 2 on:

Melamine

Network of Excellence supported by the European Commission under FP6
Coordinator: Roland Poms (ICC)

MoniQA and Melamine

MoniQA devotes a share of its resources to emerging (and previously unforeseen) food safety issues such as melamine. The melamine issue was discussed extensively during the recent MoniQA consortium meeting and the First International MoniQA Conference in Rome (Italy) with presentations on the current state-of-play by Xioafang Pei and Lishi Zhang from Sichuan University. Samuel Godefroy from Health Canada also spoke, outlining a regulator's perspective and summarising the global response.

Melamine was one of the topics of a recent MoniQA Food Scientists' Training workshop on 'Food Safety and Risk Assessment', which took place in Nanjiing (China). This event brought together experts from European organisations (Institute of Food Research-UK, International Association for Cereal Science and Technology-Austria) as well as Asian institutions (Jiangsu Entry-Exit Inspection and the Quarantine Bureau of China, NUFE). ESR has been able to provided valuable input on the situation in New Zealand. As a result of these events, interviews with MoniQA experts were broadcast on Italian (Rai 3) and Chinese television.

Decision-support and information resources for melamine are available on the MoniQA website: www.moniqa.org/melamine. In addition, information about melamine regulations as well as current validated methods can be accessed through the MoniQA database with links to the EU's Rapid Alert System for Food and Feed. MoniQA also provides links to scientific papers about melamine from EFSA, FDA and other organisations, and we are currently preparing our own publications as well as integrating such emerging issues into the MoniQA workplan.

MoniQA experts are collecting analytical methods for melamine, and analysing validation levels and requirements in addition to providing background information (see box on the right - Emerging issues working group: melamine actions).

Socio-Economic Ramifications

The death of infants, loss of consumer trust, a drop in revenue for export companies, and lower income for farmers – these are only some of the social and economic ramifications of the melamine crisis.

MoniQA will address the socio-economic implications of the crisis through a Compliance Case Study, focusing on changes in the Chinese food safety regulatory framework towards alignment with standards existing in the European Union.

The research will compare the costs and benefits of different policy options and, more specifically, the slow or fragmented implementation of new legislation as opposed to a phased but careful implementation of safety legislation. The study will focus on the impact on consumers, the food industry in terms of re-structuring, and international trade.

Emerging Issues Working Group: melamine actions

- Analytical method collection
- Validation level and needs
- Background information
- Hazard characterisation
- Links to RASFF and MoniQA db
- Relevant publications
- EFSA, FDA, etc...positions
- MoniQA workplan

Challenges and Actions

The melamine crisis is not over – current challenges include analytical methods and validation, analytical results for "low background" levels, hazard characterization (effects of other structural related chemicals), and the detection of other foods where melamine is may have been used to artificially boost the protein content.

In order to address these issues, a new working group on emerging issues has been set up by MoniQA. It has enabled a swift response to the melamine crisis (see box on the left), but this group is also a tool for horizon-scanning; anticipating other potential food safety issues and hazards.

MoniQA also provides training on melamine and other relevant food safety aspects through its Food Scientists' Training workshops.

For further information please visit our website:
www.moniqa.org or contact moniqa@moniqa.org

A European Commission funded initiative within the Sixth Framework Programme
Topic T5.4.5.1: Quality and safety control strategies for food (NOE)
Contract N0. FOOD-CT-2006-036337