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Detecting melamine in food: world's labs are ready and able

A majority of laboratories around the world are capable of effectively testing for the presence of melamine in food, according to a new study by the European Commission's Joint Research Centre (JRC). Results of the international study published this week show that levels of the harmful substance in food samples can be accurately measured by the majority of laboratories tested, suggesting that the global response to the Chinese contaminated milk scare of 2008 has been effective.

Dr Alejandro Herrero, Director of the JRC's Institute for Reference Materials and Measurements (IRMM), commented: "*This study is one of the first and largest snapshots of labs' abilities to accurately measure melamine in food, and it confirms that the majority of labs are up to the job. It shows that food laboratories in the EU and their counterparts around the globe are able to accurately detect melamine in food. This is a pre-requisite for enforcing the limits set in EU legislation to protect consumers.*"

Testing the testers

114 analytical laboratories from around the world volunteered to put their measurement competence to the test for the study, which was organised and carried out by the JRC at the request of the European Commission's Directorate-General for Health and Consumer Protection. Carefully prepared samples of contaminated milk powder and baking mix were sent to the laboratories for testing without revealing the known levels of melamine present. Participating laboratories measured the melamine content of these 'blind' samples to the best of their abilities and reported their results back to the JRC.

Laboratories from 31 countries participated in the test, including Australia, China, India, Japan, New Zealand, the United States of America, as well as 21 of the 27 EU Member States. The response to the call for participation was so overwhelming that the test was fully subscribed within days and the registration had to be closed prematurely.

How do the labs shape up?

The results of the study were that 74% of the 114 results for milk powder and 73% of the 112 results for the baking mix were within the acceptable range (defined by common international measurement guidelines). These figures are in line with other similar tests that benchmark measurement competence amongst analytical laboratories.

The values reported by the labs were also accompanied by values of measurement uncertainty, which is extremely important when measuring close to a legal limit. Here there was some scope for improvement, as around a quarter of the uncertainty values (23% milk powder, 22% baking mix) were underestimated.

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The JRC researchers also compared the laboratories' results with the methods they used to reveal which measurement technique works best. In this case, isotope dilution mass spectrometry with a stable isotope labelled melamine was generally more accurate. A more detailed analysis of the influence of methods and instrumentation on the results is available in the report.

Accurate measurements for protecting consumers

Although the EU does not import milk or other dairy products from China, processed food such as chocolates or biscuits might contain contaminated milk powder. The European Commission therefore decided that food or feed containing milk products originating in - or transported from – China should be checked. Any product containing more than 2.5 mg/kg melamine must be destroyed[1].

In order to enforce the 2.5 mg/kg limit, official control laboratories must be able to measure the melamine content in food and feed within reasonable limits. Failure to hit the mark could result in products being destroyed needlessly or worse still, contaminated products making it through onto the European market.

To minimise the risk of similar incidents in future, the European Commission and its Member States vigilantly monitor the presence of contaminants in food. The JRC develops and validates analytical methodology to facilitate the enforcement of EU legislation.

Download the JRC's melamine report: http://irmm.jrc.ec.europa.eu/melamine

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About JRC-IRMM

The Joint Research Centre is a Directorate-General of the European Commission providing independent scientific and technical support to European policy-making. Its Institute for Reference Materials and Measurements (IRMM) promotes a common and reliable European measurement system in support of EU policies. The prime objective of the JRC-IRMM is to build confidence in the comparability of measurements by the production and dissemination of internationally accepted quality assurance tools, including reference materials, validated methods, reference measurements, inter-laboratory comparisons and training.

[1] Commission Decision of 14 October 2008 imposing special conditions governing the import of products containing milk or milk products originating in or consigned from China, and repealing Commission Decision 2008/757/EC.