

DETECTION AND QUANTIFICATION OF MELAMINE IN MILK POWDER BY LC-MS/MS METHOD

M. ANWAR HOSSAIN*, M. RAHIM, RASHAD CHUDHURY, M. TARIQUL HASSAN and M. NURUL HUDA BHUIYAN

Institute of Food Science Technology (IFST), Bangladesh Council for Scientific and Industrial Research (BCSIR), Dhaka, Bangladesh. *Corresponding author's E-mail: prince9802046@yahoo.com

ABSTRACT

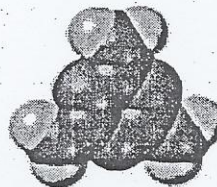
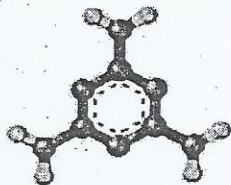
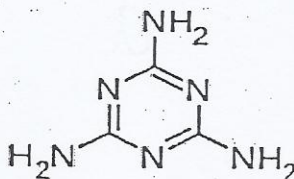
The study was conducted at the Laboratory of Food Toxicology Research Section, Institute of Food Science and Technology, Bangladesh Council of Scientific and Industrial Research, Dhaka, Bangladesh during 2010-2011. Melamine is an organic base chemical most commonly found in the form of white crystals rich in nitrogen. It is widely used in plastics, adhesives, Countertops, etc. When water has been added then raw milk is increasing its volume. As a result of this dilution the milk has a lower protein. Normally check the protein level through test measuring nitrogen content. The addition of melamine increases the nitrogen content of the milk and therefore its apparent protein content. Addition of melamine into food is not approved by the FAO/WHO Codex because it can induce the formation of kidney stones, especially in infant/children, which can cause renal failure and in some cases death. For these circumstances the simple methods for melamine determination are current goal for food analysts around the world.

Keywords: Melamine, Milk, Infant milk, Solvent Clean-up and LCMSMS method.

INTRODUCTION

Melamine is a white crystal compounds $C_3H_6N_6$, milky white, pH 6.6-7.2 and high temperature stability about $120^{\circ}C$. It is an organic base and a trimmer of cyanamide, with a 1,3,5-triazine skeleton. Like cyanamide, it contains 67% nitrogen and mixed with resins, has fire retardant properties due to its release of nitrogen gas when burned or charred, and has several other industrial uses. Melamine is also a metabolite of cyromazine, a pesticide. It is formed in the body of mammals that have ingested cyromazine (Anonymous, 2012). It has been reported that cyromazine can also be converted to melamine in plants (Lim *et al.*, 1990 and David Barboza and Alexei Barrionuevo, 2007). Melamine combines with cyanuric acid and related compounds to form melamine cyanurate and related crystal structures, which have been implicated as contaminants or biomarkers in Chinese protein adulterations (Anonymous, 2005).

Melamine



Names

IUPAC name: 1,3,5-Triazine-2,4,6-triamine

Other names: 2,4,6-Triamino-s-triazine, Cyanurotriamide, Cyanurotriamine and Cyanuramide