Editorial

Dicyandiamide contamination of milk powders

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(Key words: Dicyandiamide; DCD; contamination of milk powder)

Rather than payment on weight, the food industry pays ingredient suppliers based on nutritional parameters, including content of protein or fat. Protein content is invariably quantified using either the Kjeldahl wet chemistry method or the Dumas combustion method[1]. Both methods, however, rely on measurement of nitrogen content and directly relate the value to protein by an arbitrary number. This means that adding high nitrogen content compounds to protein containing foods generates a higher protein content reading and a higher price. This process was seen in the case of the 2008 milk adulteration scandal where additional melamine allowed further dilution of milk to give a consistent protein reading and increase profits dishonestly[1]. In 2008, increasing numbers of infants and young children in China started to develop unexplained urinary tract stones due to the addition of melamine to raw milk to falsely increase the protein content after dilution[2].

Dicyandiamide (DCD), is a chemical compound used by farmers to reduce the negative effects of greenhouse gas emission and nitrate leaching into waterways. It has also been reportedly used by some to promote the growth of pastures where cows graze. Furthermore, dicyandiamide is a nitrogen-rich compound that is classified with compounds such as melamine as a potential economic food adulterant to enhance the apparent protein content of the food product[3].

Cows eating contaminated grass may produce milk with traces of DCD residues. Laboratory testing of 100 samples of Fonterra dairy milk products in September 2012 revealed low levels of DCD residues in 10 samples of whole milk powder, skim milk powder and buttermilk powder made with milk from the North and South Islands[4].

In the wake of the revelation on DCD, New Zealand's two biggest fertilizer companies, Ravensdown and Ballance Agri-Nutrients, withdrew the agrochemical from the market in late November 2012 until acceptable residue levels have been internationally agreed upon[3]. Although there is no internationally agreed 'safe limit' for DCD in food, the discovery of this toxic chemical residue has become a concern in consuming milk or dairy products, especially infant formula[4].

The New Zealand Ministry of Primary Industries Director General Wayne McNee said that the Ministry had tested nearly 2,000 samples from all major dairy companies, including Fonterra, and had found "minute" traces of DCD in 371 samples but that the levels of DCD detected presented no food safety risk. He further stated that no DCD has been found in any sample tested after the 13th of November, 2012 [5].

New Zealand milk powder products are available in the Sri Lankan market. The Consumer Affairs Authority of Sri Lanka says that it plans to conduct tests on milk powder imported from New Zealand to ascertain whether they have been contaminated with DCD[6]. The samples have to be sent abroad as Sri Lanka does not possess the technical capabilities to conduct such tests.

Whilst the levels of DCD detected may not present any food safety risk, the presence of even minute quantities of a potentially toxic chemical residue in milk consumed by infants and young children is truly alarming. Until the situation crystallizes, one has to question whether it is advisable to use these milk products and perhaps even conclude that it is safer to avoid using New Zealand milk powder products in young children at least for the time being.

References

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