

Metal Contamination in Milk: A Potential Human Health Toxicity

Mahmood Ahmed

Institute of Chemistry, University of the Punjab, Renacon Pharma Limited, Lahore, Pakistan

***Correspondence to:** Dr. Mahmood Ahmed, Institute of Chemistry, University of the Punjab, Renacon Pharma Limited, Lahore, Pakistan.

Copyright

© 2018 Dr. Mahmood Ahmed. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Received: 25 September 2018

Published: 06 November 2018

Keywords: *Toxicity; Lacteal Secretion*

Milk is one of the most important food in daily life providing rich nutrients is produced by lacteal secretion from mammal's mammary glands. Varieties of milk contains all essential ingredients although differ in odor, taste and chemical composition. It is an exclusive healthy food which cannot replace by any other food required for maintenance of life of both adults as well as for the infants.

Milk contains more than twenty trace elements which are essential and important for life cycle completion of an organism, deficiency of these elements can induce metabolic changes. Ca, Mn, Fe, Cu, Zn and Se are the prominent elements play role in physiological functions and co-factors in many enzymes in humans.

Metals form stable covalent complexes and possess the damaging effect at molecular level after interacting with macromolecules. Contaminated cattle's feed, environmental conditions and adulteration of milk with polluted water is contributor in contamination of milk with metals such as Cr, Cu, Cd and Pb. Aluminium (Al) is not important for life cycle because it is not absorbed metabolically by humans but its higher concentration can be deposited in the tissue, liver, colon, brain, bone and may be immunosuppressive.

Cr is important element among the microelements required to maintain the body's metabolic system and has prime role whether it is trivalent or hexavalent. Cr (III) has low toxicity prevails in most of foods while Cr (VI) is toxic, mutagenic even carcinogenic in nature and permissible level of Cr in milk is 0.30 µg/mL. Wilson's disease is associated with higher concentration of Cu which is characterized by deficiency of ceruloplasmin and 0.1-0.9 µg/mL is considering the normal range of Cu in milk.

Permissible level of Al in fresh milk is 0.4-0.8 µg/mL. Cd is non-biodegradable and its toxicity cause high blood pressure, mutation, fetal death and prostate malignancy. Permissible level of Pb in fresh milk is 0.02 µg/mL as of CE regulations, Pb is chemically identical to Ca, Fe and Zn, replaced their metabolic sites and disables their function. Oxygen carrier Fe in heme is hindered by Pb also compete the Ca in neurons.