MILK: carrier of heavy metals from crops through ruminant body to human beings

ABSTRACT

Exposure of heavy metals to humans is higher today than ever before in modern history due to continuously increasing industrialization around the globe. Industrial wastes are rich in heavy metals and these wastes are discharged near agricultural fields or mixed with soil, from where these metals are taken up by the crops and are finally transported to humans. Due to this increasing threat of heavy metals contamination in food, it is necessary to analyze the food before consumption. Content of selected metals (Cd, Cr, Cu, Pb and Zn) in cow milk is determined in this study. To investigate the possible pathways of these metals to reach in milk; fodder supplied to these cows was analyzed besides analysis of soil samples on which this fodder was grown. Pearson correlation among metal contents in soil-forage and forage-milk was also determined to check the route of transfer of these metals from soil to forage and from forage to milk. It was found that a strong correlation ($p < 0.5$) exists for Cr, Cd, Cu and Zn. This shows that these metals are mainly transferred through soil. However, a weak correlation was found for Pb, which shows that Pb is introduced into forage through some other source (automobile exhaust etc.). A comparison of present study is also done with previously reported work from other countries on metal contents in milk and findings of both the studies were in good agreement mutually.

Keyword: Atomic absorption spectrometer; Forage; Heavy metals; Milk; Pearson correlation; Soil