Scholars LITERATURE

La Prensa Medica Argentina

Research Article

DOI: https://doi.org/10.47275/0032-745X-149
Volume 105 Issue 5

Evaluation the Health Impact of Some Heavy Metals in Milk from Markets

Almayahi B[1]*, Algburi J[1], Jarrah N[2], Mohammed K[3], Jaafar A[3] and Alshabani M[4]

[1]Department of Environment, Faculty of Science, University of Kufa, Iraq
[2]Department of Physics, Babylon University, Iraq
[3]College of Science, University of Kufa, Iraq
[4]Department of Chemistry, Faculty of Science, University of Kufa, Iraq

Abstract

This study focuses on the heavy metals concentrations (Fe, Cu, Zn, Pb, and Cd) in certain common milk species are collected from Iraqi markets using Flame Atomic Absorption Spectrophotometer-6300 AA, Shimadzu, Japan, respectively. This study shows the pollution in the environment obtained by heavy metals. The results showed that Cr, Cd, Cu, Zn, and Fe were varying according to the order: Zn>Fe>Cr>Cd>Cu. levels of heavy metals were 0.610(Cr), 0.125(Cd), 0.052(Cu), and 6.902(Zn), and 0.759(Fe). All the heavy metals were observed within maximum limit in milk. Overall, the number of analyzed heavy metals and sample size were limited in present study.

Keywords: Heavy metals; Milk; Najaf; Flame atomic absorption; Spectrophotometer

Correspondence to: Basim Almayahi, Infertility fellowship, Department of Environment, Faculty of Science, University of Kufa, Najaf, Iraq, Tel: 009647823004353; E-mail: basimnajaf@yahoo.com

Citation: Almayahi B, Algburi J, Jarrah N, et al. (2019) Evaluation the Health Impact of Some Heavy Metals in Milk from Markets. Prensa Med Argent, Volume 105:5. 149. DOI: https://doi.org/10.47275/0032-745X-149.

Received: August 25, 2019; **Accepted:** September 03, 2019; **Published:** September 09, 2019

Introduction

Environmental pollution is a source of daily concern to the different segments of society because of its multiple forms and the expansion of its forms that negatively affect the environment and human health. According to WHO standards, pollution is defined as any quantitative or qualitative change in the components of the Earth from the normal limit, whether it is an increase or decrease, which leads to any imbalance in the natural components of the ecosystem [1]. Heavy elements are the most important problems of environmental pollution in the present time for their spread in nature due to the accumulation of industrial wastes and pesticides, and others, including lead, copper, zinc, chromium and cobalt, and its importance in the presence of very low concentrations of parts in million [2-7]. Increasing these elements from the natural limit makes them toxic and harmful and affects the health of animals and humans. Where it is transmitted to the animal through the skin, digestive tract or respiratory tract causing toxic and functional effects. These elements are hazardous because they are not chemically or thermally disintegrated, and lead to their build-up in the environment, food contamination and disease, such as cancer [8]. Where these elements are transferred to the milk causing damage to the consumer. Heavy metal in milk and is a matter of great concern for food safety and human health. Milk contaminated with metals (zinc, lead, cadmium, selenium, sulphur, iodine and possibly even more dangerous arsenic and cyanide) [9]. It is toxic in nature and even at relatively low concentrations can cause adverse effects for human health. Heavy metal contamination in milk has been reported from different region in various studies.

Material and Methods

Samples collected from local market in Najaf city of Iraq. In order to measure the concentration of Cr, Cd, Cu, Zn, and Fe in milk, we had to mineralize the samples via wet-processing treatment with the supplement of hydrogen peroxide (H_2O_2) and nitric acid (HNO_3) (2 ml of milk+1 ml H_2O_2+2 ml HNO_3) [10]. We applied the microwave digestion technique (2 h+200]+ diluted to50 ml with distilled water) using digester heater system.Then filtration method on the mixed using paper filter of 0.45 µm.Heavy metals levelwas measured via electro thermic atomic absorption spectrophotometry (6300 AA, Shimadzu, Japan). Milk samples were collected from places in and around Najaf markets. The present work was carried out at the College of Science, University of Kufa to estimate the level of heavy metal. The samples were maintained at 5°C until processing.

Results and Discussion

The study showed that the concentration of trace elements like Cr, Cd, Cu, Zn, and Fe in milk using atomic absorption spectrophotometry were ranged 0.166-1.505, 0.038 -0.413, 0.027-0.123, 3.978-12.803, respectively (Table 1). Cr is found in high level in M_2 (NADA), while the low level was found in M_1 (KDD). Cd and Cu are found in high level in M_1 (KDD) and the low level was found in M_9 (ALIS FRESH

Table 1: Heavy elements concentration (ppm).

Sample Code	MilkName	Cr	Cd	Cu	Zn	Fe
M 1	KDD	0.166	0.413	0.123	8.744	0.804
M 2	NADA	1.505	0.227	0.047	12.803	1.764
M 3	PEGAH	0.864	0.107	0.052	5.446	0.865
M 4	SAMBO BANNANA	0.673	0.138	0.052	5.446	0.652
M 5	KALEH STRAWBERN	0.609	0.048	0.052	3.978	0.652
M 6	ALMARAI NIJOOM	0.546	0.038	0.052	11.019	0.094
M 7	NADEC	0.482	0.087	0.037	5.568	0.163
M 8	YAG GO	0.482	0.107	0.037	3.978	2.009
M 9	ALIS FRESH MILK	0.419	0.038	0.027	5.446	0.548
M 10	STRAWBERY BONNY MILK	0.356	0.048	0.042	6.593	0.039
	Average	**0.610**	**0.125**	**0.052**	**6.902**	**0.759**

The heavy metal contents were arranged in the order: Zn > Fe> Cr> Cd> Cu for the milk.

MILK). Zn is found in high level in M_1 (NADA), while the low level was found in M_5 (KALEH STRAWBERN) and M_8(YAG GO). Fe is found in high level in M_2 (NADA), while the low level was found in M_{10} (STRAWBERY BONNY MILK).

Conclusion

The purpose of the present study is to focus concentration of some metals in milk. The results showed higher concentrations of Zn, Fe, and Cr in NADA milk (M_2) and (Cd, Cu) in KDD milk (M_1). Cr, Cd, Cu, Zn, and Fe were varying according to the order: Zn>Fe>Cr>Cd>Cu. levels of heavy metals were 0.610(Cr), 0.125(Cd), 0.052(Cu), and 6.902(Zn), and 0.759(Fe). All the heavy metals were observed within maximum limit in milk. Milk does not pose any heavy metal pollution hazard. Comparing results with other studies revealed similar concentrations of metals in milk. Overall, the number of analyzed heavy metals and sample size were limited in present study and further studies are necessary to evaluate the contents of metals on a greater number of milk from various market of Najaf and to confirm the absence of possible toxicological risks.

References

1. World Health Organization (1993) Guidelines for drinking-water quality. (2nd edition), Geneva, Switzerland.
2. Alduhaidahawi FJ, Abed HN, Alfarhad AF, Almayahi BA (2018) Environmental estimation of the air pollutants in some areas in Iraq. Indian Journal of Environmental Protection 38: 871-875.
3. Alduhaidahawi FJ, Almayahi BA, Alasadi KS, Alasadi K (2015) Gases pollutants and trace element concentrations in the air of Najaf City, Iraq. International Journal of Environmental Monitoring and Protection 2: 47-51.
4. Almayahi BA, Alfarhad AF, Resen A (2019) Radionuclides and heavy elements in a water deposits of reverse osmosis system filters in Iraqi houses. Iranian Journal of Medical Physics 16: 15-18.
5. Almayahi BA, Hakeem E, Alduhaidahawi FJ, Aqeela H (2014) Heavy metals concentration in different soil samples in Najaf city, Iraq. International Journal of Engineering Trends and Technology 16: 69-71.
6. Almayahi BA, Saheb L, Abbood AH (2018) Determination of Alpha particles and heavy metal contamination in meat consumption from Najaf, Iraq. Iranian Journal of Medical Physics 16: 133-138.
7. Almayahi BA, Alduhaidahawi FJ, Alasedi KK (2016) Hydrocarbon and trace elements concentrations in Najaf city, Iraq. Research Journal of Pharmaceutical Biological and Chemical Sciences 7: 2127-2135.
8. Giri S, Singh G, Jha VN, Tripathi RM (2011) Risk assessment due to ingestion of natural radionuclides and heavy metals in the milk samples: a case study from a proposed uranium mining area, Jharkhand. Environmental Monitoring and Assessment 175: 157-166.
9. Belete T, Hussen A, Rao VM (2014) Determination of concentrations of selected heavy metals in cow's milk: Borena Zone, Ethiopia. Journal of Health Science 4: 105-112.
10. Pechova A, Pavlata L, Dvorak R, Lokajova E (2008) Contents of Zn, Cu, Mn and Se in milk in relation to their concentrations in blood, milk yield and stage of lactation in dairy cattle. Acta Veterinaria Brno 77: 523-531.