



Pollution of Chicken Meat and Its Products by Heavy Metals

Fahim Shaltout*

Department of Food Hygiene, Faculty of Veterinary Medicine, Benha University, Egypt

*Corresponding author: Fahim Shaltout, Department of Food Hygiene, Faculty of Veterinary Medicine, Benha University, Egypt

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Pollution of chicken meat and its products by heavy metals is important for human diet in all over the world because they contribute to solve the global food problems and provide the well-known protein, fat, essential amino acids, minerals, vitamins and other nutrients and they also have a milder flavor which is more readily complemented with flavoring and sauces. Environmental pollution by heavy metals is considered as one of the most serious problems in the world over the last few decades. Emissions of heavy metals to the environment occur via a wide range of pathways, including air, water and soil, threatening the animal and human health and quality of the environment. Heavy metal toxicity could be present in different ways depending on its route of ingestion, its chemical form, dose, tissue affinity, age and sex, as well as whether exposure is acute or chronic. Nowadays, poultry feed is produced from various raw materials such as fish by-products that can transfer heavy metals to poultry feed in undesirable levels following collecting them from contaminated waters, that may lead to increase of trace metals in chicken and chicken products with a serious threat because of their toxicity, bioaccumulation and biomagnifications in the food chain. The main heavy metals of concern are lead, cadmium, copper, mercury and arsenic which at even low concentrations pose serious health hazard to primary and secondary consumers due to bio magnifications (Munoz-Olives and Camera and Demirezen et al. The effects of metals and metalloids are partly due to the direct inhibition of enzymatic systems and also to the indirect alteration of the essential metal ion equilibrium. Majority of the known metals and metalloids are very toxic to living organisms and even those considered as essential can be toxic if present in excess. Moreover, owing to their toxicity persistence and tendency to accumulate, heavy metals when occurring in higher concentrations, become severe toxic for human being and all living organisms through alteration of physiological activities and biochemical parameters in blood and tissues, and through defects in cellular uptake mechanisms in the mammalian liver and kidney, inhibiting hepatic and renal sulfate / bicarbonate transporter causing sulfaturia.

Lead is an accumulative poison; it has hematological effect due to the inhibition of hemoglobin synthesis and shortening life span of circulating erythrocytes resulting in anemia. It has a toxic and damage effects leading to reduction of the cognitive development and intellectual performance in children; increase blood pressure; damage of the brain and kidneys; cardiovascular and reproductive diseases in adults. Cadmium is used extensively in the mining and electroplating industries and found in fertilizers and fungicides. It is a very toxic heavy metal, which accumulates inside the body particularly kidneys and chronic exposure may induce heart diseases, anemia, skeletal weakness, depressed immune system response, kidney and liver diseases; cancer and death. Copper is an essential element for man and animals. It is required for normal biological activity of several enzymes and it added to poultry diets with manganese and zinc (premix) to enhance their weight gain and disease prevention. Meanwhile, ingestion of excessive doses of copper may lead to adverse health problems, such as severe nausea, bloody diarrhea, hypotension, liver and kidney damage. Arsenic is a metalloid that occurs in inorganic and organic forms and is found in the environment, both naturally occurring and as a result of human activity. The inorganic forms of arsenic are more toxic than organic ones. However, so far, most of the data regarding arsenic occurrence in food, gathered under the official control of foodstuff, is still reported as total arsenic, without differentiating the various types of arsenic in the diet. It has a toxic effect includes decrease in hemoglobin, packed cell volume, erythrocytic count and total leukocytic counts, heterophils and lymphocytes. The presence of the residual agro-chemicals in foods is detrimental to human health and the accumulation of foreign chemicals such as lead, arsenic, cadmium, copper and mercury in human system has been linked to immune-suppression, hypersensitivity to chemical agents, liver and kidney damage, breast cancer, reduce sperm count and infertility, respiratory distress DNA alteration and death in extreme cases. Considering the fact that chicken meat and its products can contain some toxic heavy metals and therefore exposure to the toxic trace metals will be gained through consumption of these products, the accurate determination of them has been focused by researchers in last decades, worldwide.



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