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Health risk assessment of heavy metals in some vegetables-Erbil City-Kurdistan Region of Iraq

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Abstract

Heavy metals can have significant impacts on human health due to their toxicity and potential to accumulate in the body over time. Some heavy metals, such as lead, cadmium, mercury, and arsenic, are particularly harmful even at low concentrations. The estimation of hazards of vegetable intake to human health as well as explore the of heavy metals accumulation in different vegetables (cucumbers, tomato, eggplant, and bell peppers) collected in Erbil city from different source locally and imported from nearby country are conducted. The heavy metals concentration (cooper, zinc, lead and cadmium) was measured and analyzed by inductively coupled plasma-optical emission spectrophotometry. The maximum concentration of Pb was 27.95 mg/kg and the minimum was 6.49 mg/kg; for Cd, the concentration was 1.43 and 0.99 mg/kg, 74.94 and 5.14 mg/kg for Zn; and for Cu, the result was 56.25 and 8.2 mg/kg for the maximum and minimum, which they are within limits described by Food Agricultural Organization, but more than health limits and health risks calculated by mean of hazard quotient (HQ) techniques for Cu and Pb which they are more than 1. The local sample that collected in Erbil city show less concentration of heavy metals and low HQ in comparison with imported samples. The carcinogenic risk study shows elevated risk of accumulative consuming of edible part of those plant which they exceed the permissible limit that is 10^{-6}.

Keywords: Erbil; Heavy metals; Iraq; Risk assessment; Vegetables.

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