

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

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**An Analysis of Heavy Metal Concentration in Vegetables on
5th Avenue Market of Bulawayo**

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ABSTRACT

Heavy metals have been ranked as one of the chief contaminants of vegetables in recent years and this has subsequently led to health challenges in consumers or the risk thereof. This research is one of the few studies done in Zimbabwe for the assessment of heavy metals in vegetables on market, the market being the 5th Avenue market in Bulawayo. It is situated at the margins of the Central Business District and is about 300 metres long with 40 to 45 vendor slots with the vegetables under investigation, which are amongst the 120 to 130 slots on the market. The concentrations of Copper, Iron, Chromium, Nickel, Lead and Cadmium in vegetables were determined by using the Wet-digestion method and Atomic Absorption Spectrophotometry. 12 samples were tested which consisted of 4 tomatoes, 4 cabbages and 4 chaumollier bundles. Heavy metal concentrations were all found to be below 5mg/kg and all were within FAO/WHO limits except for Cadmium. Vegetables showed highest concentration of Iron (Fe) than any other metal tested. However, Iron's concentration was very low compared to the FAO/WHO limits. Lead (Pb) was the least in 58% of all the vegetable samples and was second least in the remaining 42%. About 83.3% of the samples were exceeding the Cadmium limit and the vegetables were from Nyamandlovu, Umguza, Mutorashanga, Killarney, Woodville, Kesington, Sauers town and South Africa. Sauers town vegetable concentrations were more than twice the Cadmium FAO/WHO limit. Pb concentrations were all below the limit but 17% of the samples were over half the limit and these samples were from Nyamandlovu and Umguza. It was concluded in this study that the vegetables on this market are safe in terms of Cu, Cr, Fe, Ni and Pb but Pb levels need close monitoring. A potential health hazard is however present due to the high Cd levels found.