



Determination of Trace Metal Levels in Drinking Water and Fruit Juice in Benin City, Nigeria

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ABSTRACT

Objective: Trace elements are important for the normal functions of the body when their concentrations are within allowable limits but can cause health hazards when they exceed such limits. This study investigated levels of the trace metals Chromium (Cr), Copper (Cu), Iron (Fe), Lead (Pb), Manganese (Mn) and Zinc (Zn) in water and juice consumed in Benin City.

Methodology and results: Trace metal levels were determined in fifteen drinking water and ten fruit juice samples using Atomic Absorption Spectrophotometry (AAS). The drinking water is packaged water samples and the fruit juice were obtained from commercial (small-scale) sources. The metallic elements measured are Cr, Cu, Fe, Pb, Mn and Zn. The results show that Fe was present in all the samples, Cu was present only in the drinking water samples, Mn and Zn were found in all drinking

water samples and only three fruit juice samples. Pb and Cr were below the detection limits in all the samples. Except in one of the fruit juice sample, the trace metal levels in all the samples were below the allowable limits set by the National Research Council (NRC) and WHO (1996). The exception sample had 5.696 mg/L Zn which is above the beneficial limit and therefore unsafe for human consumption.

Conclusion and application of findings: Erah et al had reported that the water source (ground water and rivers) as raw material for the manufacture of fruit juices and preparation of drinking water in Benin-City are contaminated with abnormal levels of lead (Pb) and Zinc (Zn), and other studies in different parts of Nigeria has shown the need to properly process water meant for drinking and use for manufacture of consumables. Although, the water obtained from bore-holes and rivers are subjected to various treatment by different manufacturing companies before they are packaged for consumption or use for other manufacturing processes, it is recommended that regular surveillance should be carried out to ensure that drinking water and other products are safe for human consumption in terms of their metallic content.

Key words: Trace metals, fruit juice, drinking water, Atomic Absorption Spectrophotometry (AAS).