

# **PROTOZOA AND HEAVY METALS IN LETTUCE GROWN WITH UNTREATED WASTEWATER IN ACCRA**

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## **ABSTRACT**

The study was conducted on Alajo, Ghana Broadcasting Corporation (G.B.C.), Korle-Bu, Osu, and Dzorwulu (Suburbs of Accra) to:

- (a) Ascertain the presence or absence of protozoa and heavy metals (Cd, Pb, and Zn) in soil and water used for irrigation.
- (b) Ascertain the presence or absence of protozoa, Cd, Pb, and Zn in lettuce grown with untreated wastewater.
- (c) Ascertain whether the presence or absence of protozoa, Cd, Pb, and Zn in lettuce is linked to soil and water quality used for irrigation.
- (d) Determine whether protozoa that may be present on lettuce could be eliminated by washing the vegetable in salt solution or vinegar and
- (e) Have an over view of the socio-economic profile of farmers involved in urban farming in Accra.

The untreated wastewater used to grow lettuce accounted for 88% of protozoa on the vegetable at G.B.C. and Korle-Bu. Counts of 250 protozoa/100g lettuce and 100/100g lettuce were estimated at G.B.C. and Korle-Bu respectively. However washing vegetables with salt water or vinegar eliminated the contaminating protozoa.

The levels of Pb in the water used for irrigation at Alajo, Korle-Bu, Osu and Dzorwulu were 0.0060mg/L, 0.0129mg/L and 0.0047 mg/L, respectively. These levels were below the maximum allowable limit of 0.02mg/L. However, Pb was absent in the water used for irrigation at G.B.C. In soil, the levels of Pb at Alajo, G.B.C., Korle-Bu, Osu and Dzorwulu were 25.52mg/kg, 24.03mg/kg, 9.34mg/kg, 17.69mg/kg and 72.07mg/kg, respectively. Excerpt for Dzorwulu, these levels were below the maximum allowable limit of 50.0mg/kg, 1.73mg/kg, 1.69mg/kg, 0.88mg/kg and 1.31mg/kg, respectively. These levels were above the maximum allowable limit of 0.3mg/kg. The level of Zn in the water used for irrigation at Alajo was 0.2586mg/kg and was below the maximum allowable limit of 2.0mg/L. Zinc was however, absent in the water used for irrigation at the other sites. The levels of Zn in the soils at Alajo, G.B.C., Korle-Bu, Osu and Dzorwulu were 100.67mg/kg, 27.92mg/kg, 27.67mg/kg, 42.24mg/kg and 109.14mg/kg, respectively. These levels were below the maximum allowable limit of 300.0mg/kg. The levels of Zn in lettuce at Alajo, G.B.C., Korle-Bu, Osu and Dzorwulu were 34.75mg/kg, 47.92mg/kg, 33.42mg/kg, 33.50mg/kg and 58.59mg/kg, respectively. These levels were below the maximum allowable limit of 99.40mg/kg. However, Cd was absent in water soil and lettuce at all the sites.

From the social survey, all the fifty farmers interviewed were men. Eighty-four percent of the farmers use untreated wastewater for irrigation whilst 16% use treated portable water for irrigation. Fifty-eight percent of the farmers were northerners. The dominant age groups were 21-30 and 31-40 years.

The result from the study indicated that:

- (a) The main source of protozoa in lettuce cultivated at G.B.C. and Korle-Bu was the untreated wastewater used to grow the vegetables.
- (b) Health risk exists in consuming lettuce from all the sites due to Pb contamination. However, Zn and Cd were not present at harmful levels in the lettuce grown at all the sites and thus pose no health risk.
- (c) The dominant water used for irrigation by farmers was untreated wastewater.
- (d) Men dominated urban farming in Accra
- (e) Northerners were the dominant ethnic group engaged in urban ethnic group engaged in urban farming in Accra and
- (f) Young men of ages 21 to 40 were mostly involved in urban farming in Accra

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