UNIVERSITI TEKNOLOGI MARA

HEAVY METALS IN SWEET POTATO AND ITS POTENTIAL HEALTH RISK TO HUMANS

AZWAN AZREEN BIN ALIAS

Project paper submitted in partial fulfillment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons.)

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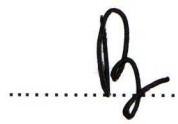
Declaration by Student

Project entitled "Heavy Metals in Sweet Potato and Its Potential Health Risk to Humans" is a presentation of my original research work. Wherever contribution of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussion. The project was done under the guidance of Mr. Mohd Izwan Bin Masngut as Project Supervisor. It has been submitted to the Faculty of Health Sciences in partial fulfillment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

Student's Signature



(Azwan Azreen Bin Alias)

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In the name of Allah, The Most Gracious, The Most Merciful.

Alhamdulillah, all praise is to Allah, The Supreme Lord if the Universe. Peace and blessing to Prophet Nabi Muhammad S.A.W., all the prophets, their family and all the Muslims.

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Abstract

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Introduction: Locally grown sweet potatoes (*Ipomoea batatas* L.) maybe contaminated by heavy metals from various sources. Heavy metals in vegetables such as tuber when ingested may lead to adverse health effects. This study will determine the heavy metals concentration in sweet potato grown at highland and lowland areas and its potential health risk to humans.

Methodology: In this study, sweet potatoes from lowland namely Kuala Selangor and highland namely Cameron Highland were taken and analyzed for Lead (Pb), Cadmium (Cd), Arsenic (As) by Flame and Graphite Atomic Absorption Spectrometer. The heavy metals concentration was compared with maximum permitted proportion of metal contaminant in specified food as stated in Food Regulations 1985. Questionnaires were distributed among public at both study location and Health Risk Assessment was done to predict potential health risk from consumption of the sweet potatoes. Statistical analysis was done to compare the mean concentration of heavy metals of sweet potatoes from both lowland and highland.

Result: Based on this study, concentration of Cd and Pb in lowland sweet potatoes were found to exceed the maximum permitted proportion of metal contaminant in specified food as stated in Food Regulations 1985 with mean of 1.46mg/kg and 2.09mg/kg respectively. Concentration of As for both highland and lowland sweet potatoes were found to be below the maximum permitted proportion. There is significant difference of mean concentration of Pb (p-value < 0.05, p= 0.006) in sweet potato grown at lowland and highland. Concentration of Cd in both sweet potatoes grown at lowland and highland shows significant difference (p-value<0.05, p=0.04). For As, there is also significant difference of mean concentration was found (p-value <0.05, p=0.00). Hazard Index was found to be less than 1 which indicates consumption of sweet potatoes tested in this study will not pose health risk.

Conclusion: This study shows a significant difference of mean concentration for all three heavy metals tested in lowland and highland sweet potatoes. Consumption of the sweet potatoes under current consumption rate will not pose health risk. However, further study should be done to support these findings.

Keywords: Sweet potatoes, Health Risk Assessment, Lead, Cadmium, Arsenic, Highland, Lowland