UNIVERSITI TEKNOLOGI MARA

DETERMINATION OF HEAVY METALS CONCENTRATION IN SOILS AND SELECTED VEGETABLES AND THEIR POTENTIAL HUMAN HEALTH RISKS

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

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DECLARATION BY STUDENT

Project entitled "Determination of Heavy Metals Concentration in Soils and Selected Vegetables and Their Potential Human Health Risks" is a presentation of my original research work. Whenever contributions of others are involved, every effort is made to indicate this clearly, with due reference to literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Project Supervisor, Profesor Madya Rodziah Ismail. It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

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

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TABLE OF CONTENTS

ABSTRACT

Vegetables are essential for human diet due to their nutritional contents and often associated with toxic metals that derived from contaminated land where the vegetables are grown. This study was conducted to assess the concentration of heavy metals namely Cd, Cu, Pb and Zn in soils and selected vegetables and their potential human health risks. The preparation of samples were conducted by using wet digestion method before analysis using Atomic Absorption Spectrometer (AAS) to determine the concentration of selected heavy metals. The heavy metals concentration in the soils were ranged from 4.15 to 18.25 mg/kg, 11.10 to 13.00 mg/kg , 60.50 to 137.90 mg/kg for Cu, Pb and Zn respectively. The heavy metals contained in edible parts of the cucumber, mustard green and sweet potato were approximately in the range of 2.20 to 4.78 mg/kg, 3.25 to 7.70 mg/kg and 58.85 to 95.85 mg/kg for Cu, Pb and Zn respectively. Cd was not detectable in all soils and vegetables samples. Analysis of Variance (ANOVA) was conducted to compare heavy metals concentration in selected vegetables and p- value < 0.05 obtained indicating statistically significant different.The health risk assessment was conducted by using Target Hazard Quotient (THQ) formula and Hazard Index (HI). The results obtained were higher than 1 indicating adverse health effect on the population. The concentration of Pb in soils and vegetables samples were higher than permissible-maximum limit regulated by FAO/WHO. Thus, same lead contamination found in soils and all edible part of the vegetables from Selangor Fruits Valley.

Keywords: Heavy metals, vegetables, ANOVA, health risks assessment