UNIVERSITI TEKNOLOGI MARA

DETERMINATION OF HEAVY METALS IN ORGANIC AND CONVENTIONAL VEGETABLES AND THEIR POTENTIAL HEALTH RISKS

ADRINA BINTI A.GHANI

Project submitted in fulfillment of the requirements for the degree of
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DECLARATION BY STUDENT

Project entitled "Determination of Heavy Metals in Organic and Conventional Vegetables and Their Potential 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, Dr. Farah Ayuni Bt Shafie. 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).

Student's signature:

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(Adrina Binti A.Ghani)

2013435764

941130-11-5434

Date: ……..

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

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ABSTRACT

Organic foods become more popular among the consumer because the organic producer claimed that the production of organic food is safer, healthier and environmental friendly. However there is no strong evident that shows the organic food is better than other types of food. The aim of this study is to determine the concentration of heavy metals in organic and conventional vegetables and comparison of heavy metals concentration in leafy and fruit vegetables. A number of 64 samples of organic and conventional vegetables had been collected and analysed by using atomic absorption spectrophotometric (AAS) to determine the concentration of heavy metals (Cd, Zn and Pb) in organic and conventional vegetables. To study the potential health risk from the consumption of organic and conventional vegetables, the target hazard quotient (THQ) and hazard index (HI) were used. The analysis of Pb shows no detection of Pb in both types of vegetables. The concentration of Zn in conventional vegetables is significantly higher than organic. While, there is no significant difference of Cd in organic and conventional vegetables. The concentration Cd and Zn in leafy vegetables is significantly higher than fruit vegetables. Based on Malaysia Food Regulations and WHO/FAO Food Standard the concentration of Cd in organic and conventional vegetables exceeds the safe limit stated in both standards. The study of HI shows that the HI values for organic and conventional vegetables are 2.93 and 3.03 respectively. This shows that the consumer may have potential health risk due to consumption of organic and conventional vegetables.

Keywords**:** *organic; vegetables; health risk; heavy metal; target hazard quotient (THQ)*