

UNIVERSITI TEKNOLOGI MARA

**DETERMINATION OF HEAVY METALS
CONCENTRATIONS IN MAIZE COBS
(ZEA MAYS L) AND SOILS AND THEIR
POTENTIAL HEALTH RISK TO HUMAN**

NURUL AQILAH BINTI AHMAD TERMIZI

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

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DECLARATION BY STUDENT

Project entitled “Determination of Heavy Metals Concentrations in Maize Cobs (*Zea Mays L*) and Soils and Their Potential Health Risk to Human” 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, Mr. Nasaruddin Bin Abd Rahman. 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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(Nurul Aqilah Binti Ahmad Termizi)

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Date:

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

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ABSTRACT

Increasing usage of hazardous chemicals in the agricultural activities was because of high demand to improve the quality and increase the quantity of crop yields. If the preventive measures are not taken, these hazardous substances have potential to be released into environment and will enter the plants's life cycle. The aim of this study being conducted was to determine the heavy metal (Pb, Cu, Zn, Fe, Cr and Cd) concentrations in maize cobs (*Zea Mays L*) and soils. The maize farm is located at Kompleks Pertanian Titi Gantung, Perak. A number of 30 samples maize cobs and five soil samples had been collected from five selected locations at the farm. Extraction of the heavy metals from the sample were done using dry-ashing and acid digestion method. Atomic Absorption Spectrophotometer (AAS) was used to analyze all the elemental analyses. To study the potential health risk from the consumption maize cobs, the target hazard quotient (THQ) and hazard index (HI) was used. The result showed that among the metal studied, the mean concentrations of Pb in maize cobs were exceed the maximum permissible limits based on Malaysia Food Regulations and WHO standard regulation. The analysis of Cr and Cd shows no detection of Cr and Cd in maize cobs. Fe, Zn, Cu showed mean concentration of 18.884 mg/kg, 7.452mg/kg and 6.893 mg/kg respectively which were within the permissible limit set by both standard. For the soil samples, the mean concentration of heavy metals were comply to the standard. The study of (Health Index) HI shows that the HI values for maize cobs at Location 1 Location 2, Location 3, Location 4 and Location 5 are 0.87, 1.29, 0.93, 1.29 and 1.05 respectively. This shows that the consumer may pose potential health risk through consumption of maize cobs.

Keywords: *Heavy Metals, Maize (Zea Mays L), Soils, Maximum permissible limits*