

UNIVERSITI TEKNOLOGI MARA

**HEAVY METALS IN FREE-RANGED AND
FARMED CHICKENS**

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DECLARATION BY STUDENT

Project entitled “Heavy Metals in Free-Ranged and Farmed Chickens” 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 Miss Farah Ayuni Binti Sahafea @ Shafie and former Project Supervisor Hj Hahsim Bin Ahmad. 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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ABSTRACT

HEAVY METALS IN FREE-RANGED AND FARMED CHICKENS

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Background: In polluted regions, such as an ex-mining area or an industrial area, free-range chickens can accumulate high concentrations of potentially toxic heavy metals, such as lead, copper, cadmium, and zinc, particularly in liver and kidney. Heavy metals are able to bioaccumulate higher in liver compared to meat. Contaminated meat is a source of illness in human beings; in this case, heavy metals are directly related to health diseases in humans. Among other routes, food is one of the main sources of consumer exposure to heavy metals. **Methodology:** This study is an observational study, where samples purchased are all from broilers grown in Kuala Langat district only. For sample preparation, wet digestion method was used. PerkinElmer's Flame Atomic Absorption Spectroscopy (FAAS) model PinAAcle 900T is used to analyze heavy metals concentration in the samples. For the purpose of approximating the potential health risks associated with long run exposure to heavy metals pollutants, target hazard quotients (THQ) and Hazard Index (HI) are used in this study. **Results:** Mean concentration of cadmium, lead and zinc in free-ranged chicken liver are 0.38 ± 0.03 , 0.076 ± 0.006 , and 19.43 ± 0.10 mg/kg respectively. Meanwhile, mean concentration of cadmium, lead and zinc in farmed chicken liver are 0.43 ± 0.03 , 0.227 ± 0.014 , and 22.97 ± 1.39 mg/kg respectively. **Conclusion:** Farmed chicken livers showed significantly higher heavy metals concentrations compare to of free-ranged chickens. However, health risk assessment conducted showed that both Target Hazard Quotient (THQ) and Health Index (HI) are lower than the value of 1, which means that there is no possible health risk and it is safe to consume chickens' livers from both groups.