

**UNIVERSITI TEKNOLOGI MARA**

**HEAVY METALS CONCENTRATION IN FISH IN  
SELAT PRAI NEAR JELUTONG LANDFILL AND  
RISK TO HUMAN HEALTH**

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## Declaration by Student

Project entitled "Heavy Metals Concentration in Fish in Selat Prai near Jelutong Landfill and Risk to Human Health" is a presentation of my original research work. Wherever contributions of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of En. Razi Ikhwan Bin Md. Rashid as Project Supervisor and En. Nasaruddin Bin Abdul Rahman as Co-supervisor. 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 CONCENTRATION IN FISH IN SELAT PRAI NEAR JELUTONG LANDFILL AND RISK TO HUMAN HEALTH

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Solid waste landfill site can potentially deteriorate the ecology of the surrounding area and pose a serious threat to water bodies located in its vicinity by the outflow and percolation of leachate. The risks from waste leachate are due to its high concentrations of heavy metal. Heavy metals are able to be bio accumulated in aquatic ecosystem and cause detrimental effects to the marine organism especially fish and being transferred into human metabolism through consumption of contaminated fish that leads to serious deterioration of human health. Therefore this study was carried out with the objective to determine the concentration of heavy metals in fish in Selat Prai near the Jelutong Landfill site, and to assess the health risk to human by consumption of the fish.

15 samples of Red Snapper (*Lutianus argentimaculatus*) were collected from Selat Prai near Jelutong landfill site and 15 samples of the same species were also collected at about 28 kilometres away at Teluk Bahang fishermen jetty, as a comparison purpose. All samples were going through the analysis using a Graphite Furnace Atomic Absorption Spectrometry (GFAAS) to determine the concentration of cadmium (Cd), lead (Pb), copper (Cu) and iron (Fe) in both fish samples. Data result obtained was statistically analysed using IBM SPSS Statistic. Data result from the analysis also was used to assess risk to human health by consuming the fish using a formula called Target Hazard Quotients (THQ).

From the result, it was clearly identified that the mean concentration of Cd, Pb, Cu and Fe in studied fish varies from each other, but yet still considered as in low concentration. The highest concentration was Fe with 652.11µg/L and the lowest concentration was Cd with 14.44µg/L. The concentration of Cd, Pb, Cu and Fe in exposed fish decreased in the following sequence: Fe > Cu > Pb > Cd. As a comparison to the non-exposed fish, statistically there was no significant difference in the concentration of Cd, Pb, Cu and Fe between both studied fish group. All samples were also did not violate both Malaysian and International food standards. From the result, the highest THQ value was Cd (0.144) and the lowest THQ value was Fe (0.009). The total THQ value for all heavy metal element studied was 0.266.

Findings from the result of this study, a conclusion can be made that the concentration of Cd, Pb, Cu and Fe in fish studied in this research is generally low and do not violate both Malaysian and International food standards. Statistically, there were no significant differences in Cd, Pb, Cu and Fe concentration in fish in both study location. Therefore, it is unsafe to come to a conclusion that there is a possibility of heavy metal contamination from the Jelutong Landfill site to the marine environment nearby. The THQ of each metal studied from this research is generally less than 1, shows that people would experience low significant health risk from the consumption of individual metals through contaminated fish from the study location.

*Keywords : Landfill, Heavy Metals, Fish, Health Risk*