UNIVERSITI TEKNOLOGI MARA

LEAD AND CADMIUM CONTAMINATION IN FRESHWATER FISH AND POTENTIAL HEALTH RISK IN A FISH FARMING CENTRE

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Project paper submitted in partial fulfillment of the requirements
for the degree of
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Declaration by Student

Project Entitled "Lead and Cadmium Contamination in Freshwater Fish and Potential Health Risk in a Fish Farming Centre" 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 Associate Professor Dr Hazilia Hussain as project Supervisor and Mr Ahmad Razali bin Ishak as Co-supervisor. It has been submitted to the Faculty of Health Sciences in partial fulfillment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

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Abstract

Lead and Cadmium Contamination in Freshwater Fish and Potential Health Risk in a Fish Farming Centre

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Introduction: Fish are important for human diet in many parts of the world because they contribute to solve the global food problem and provide the well known proteins, omega-3, minerals, vitamins and also a vital source of heavy metal. The common heavy metals that are found in fish are copper, zinc, mercury, arsenic, chromium, cadmium and lead. Fish as among the highest consumers in aquatic food web have high risk to be exposed to the metal pollutions. Metals can be taken into fish through respiration, direct absorption and feeding. The objective of this study is to determine the concentration of heavy metals (Pb and Cd) in the tissue of fish in a fish farming centre, to compare the levels of heavy metals contamination in different species of fish *Clarias Batrachus (Linn)* and *Oreochromis Niloticus* and to determine the heavy metal concentration in pond water and fish pellet

Methodology: Fish, pond water and pellet samples were collected from fish farming centre in Kampung Ulu Sungai Buloh, Alor Gajah, Melaka. These samples were analyzed using atomic absorption spectrophotometer (AAS) AA 800 model Perkin Elmer. Other method used for data collection is questionnaire. All data were tested will be analyze by SPSS v18 (Statistical Package for the Social Sciences)

Results: Concentration of Pb and Cd were found in *Clarias Batrachus (Linn)* and *Oreochromis Niloticus*. The mean concentration of Pb in *Clarias Batrachus (Linn)* (0.5216 mg/kg) is higher than *Oreochromis Niloticus* (0.4295 mg/kg). While for Cd, the mean of *Clarias Batrachus (Linn)* (0.1056 mg/kg) were also higher than the *Oreochromis Niloticus* 0.0844 mg/kg. There was a significant difference ($p<0.05$) in Pb and Cd contamination between these two species of fish. Health Risk Assessment show that the Hazard index (HI) is less than 1 for both Cd and Pb.

Conclusion: In conclusion, the heavy metals concentration of Cd and Pb in these two types of fish were found to be lower than the recommended maximum level allowed in food by Malaysian Food Regulation 1985. Health Risk Assessment of the heavy metal indicated that the fish from the fish farming centre is safe to be consumed.

Keywords: Heavy Metals, Clarias Batrachus (Linn), Oreochromis Niloticus, Health Risk Assessment