

UNIVERSITI TEKNOLOGI MARA

**HEAVY METALS CONTAMINATION
IN CANNED TUNA FISH WITH
TOMATO SAUCE AND OIL AND ITS
POTENTIAL HEALTH RISK**

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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 “Heavy Metals Contamination in Canned Tuna Fish with Tomato Sauce and Oil and Its Potential Health Risk” 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, Prof. Madya Rodziah Binti Ismail. 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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In the name of Allah, The Most Gracious, The Most Merciful.

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ABSTRACT

This study was carried out to determine the heavy metals level (iron, lead, cadmium, copper and zinc) in canned tuna fish product. The other reason of this study was to estimate the potential health effects associated with the consumption of heavy metals contamination in canned tuna fish with tomato sauce and oil. The results from this study were compared with the standard of permissible limit as stated in the fourteenth schedule of Malaysia Food Regulation 1985 and another international standard. All thirty samples were chosen regarding the basic characteristics that being form which were fifteen from the canned tuna fish with tomato sauce and another fifteen was canned tuna in oil. All samples were purchased from supermarket around the area of Klang district. The study design was a cross-sectional study as it was conducted to identify concentration of the heavy metal in both canned tuna fish in tomato sauce and oil. All samples were duplicated and undergone sample preparation using acid digestion method. In detecting the type of heavy metals, all samples were analyzed by using Atomic Absorption Spectrophotometer (AAS). 108 questionnaires were distributed to the participants regarding the intake of canned tuna in tomato sauce and in oil. The questionnaires including body weight, age, daily intake of canned fish product and frequency of food consumption. The results of iron, lead, cadmium, copper and zinc were analyzed with Independent t-test to determine the mean of heavy metals. The heavy metal concentration in tomato sauce ranged from 0.066-0.159 mg/kg for iron while in oil ranged from 0.054-0.146 mg/kg. No lead was detected in both samples. For cadmium, values ranged from 0.002–0.004 mg/kg found in S1-S4 while no cadmium detected in oil product. The copper concentration in tomato sauce had been reported in the ranged 0.081–0.122 mg/kg while in oil, the concentration ranged from 0.081–0.108 mg/kg. For zinc concentration in tomato sauce has been found to be in ranged of 0.121-0.299 mg/kg while the range in oil were from 0.191-0.265 mg/kg. All samples did not exceed the standard limit of Malaysian Food Regulation 1985 and FAO/WHO Food Standard (Codex Alimentarius). The health risk assessment was conducted for 108 respondents who consumed canned tuna product. In conclusion, this study indicated there were low concentration of heavy metals in canned tuna fish from the two brands and were below the permissible limit as stated in the fourteenth scheduled in Food Regulation 1985 and FAO/WHO Food Standard (Codex Alimentarius). The heavy metals concentration in two brands of canned tuna fish were in the following order: Zn > Fe > Cu > Cd > Pb. The hazard index was less than 1 indicating no potential adverse health effect expected on consumption.

Keywords: Iron, Zinc, Copper, Cadmium, Lead, Canned tuna fish product.