

UNIVERSITI TEKNOLOGI MARA

**CONCENTRATION OF CAFFEINE IN
SELECTED TYPES OF ENERGY DRINKS
AND POTENTIAL HEALTH RISKS**

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**Project submitted in fulfilment of the requirements
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(Hons.)
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Declaration by Student

Project entitled Caffeine Concentration in Selected Types of Energy Drink and the Perception on the Potential Health Risks to Human 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 Tn. Haji Hashim bin Ahmad and Miss Farah Ayuni binti Sahafea @ Shafie as Project Supervisor. It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Degree in Bachelor of Environmental Health and Safety (Hons.).

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ABSTRACT

Concentration of Caffeine in Selected Types of Energy Drink and the Perception on the Potential Health Risks to Human

by

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Energy drinks are non-alcoholic beverages containing caffeine that is combined with other ingredients like taurine, guarana, ginseng, inositol, carnitine, B vitamins and sugars which can act as stimulants. Consuming too much of energy drink can create some problematic issues to the consumer since it contains modest to relatively high levels and concentrations of caffeine compared to other beverages. Heavy caffeine consumption can cause caffeine intoxication with specific symptoms such as nervousness, anxiety, restlessness, insomnia, gastrointestinal upset, tremors, tachycardia, and psychomotor agitation, and for rare cases, death may also occur because of over-consuming caffeine. The objective of this study is to compare the concentration of caffeine in different types of energy drinks in markets and the perception on the potential health risks to human. Fifty samples of energy drinks with ten different types were purchased in the market based on five different batches of manufacturing for each type. An online questionnaire had been distributed to 187 participants to get information regarding on energy drink consumption. Fifty samples of energy drinks were analysed using High Performance Liquid Chromatography (HPLC). A risk assessment had been carried out by determining the Estimated Daily Intake (EDI) of caffeine and the Hazard Index (HI). There is a violation of caffeine concentration in energy drink type A2, D1 and D2 from the first batch and type D1 and D2 from the second batch in which all of these types had contravene the safe standard limit set in Regulation 354(3), Food Regulation 1985 which is 200 mg/L. 123 out of 187 respondents had consumed energy drinks with seven of them had associated with health risks. Energy drink type D1 and D2 both had the highest concentration of caffeine which contravene with the safe standard limit of caffeine according to Food Regulation 1985. It is suggested for the Malaysian Regulation to provide a safe standard limit for other ingredients in energy drinks and provide a standard limit of caffeine consumption according to Malaysian average body mass weight. For the time being, people with low body immunity such as children, pregnant women and elderly should be warned on the energy drink consumption and its health effects.

Keywords: caffeine, energy drink, health risks, concentration, caffeine intoxication