

UNIVERSITI TEKNOLOGI MARA

**DETERMINATION OF ACRYLAMIDE IN BANANA
FRITTERS (*PISANG GORENG*) AND IT'S RISK
TO HUMAN HEALTH**

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**Project paper submitted in partial fulfilment of the
requirements for the degree of Bachelor in Environmental
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Declaration by Student

Project entitled "Determination of Acrylamide in Banana Fritters (*Pisang Goreng*) and It's 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 Mr. Nasaruddin bin Abd. Rahman as Project Supervisor and Mr. Ahmad Razali bin Ishak 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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In the name of Allah S.W.T., The Most Gracious, The Most Merciful.

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Abstract

Determination of Acrylamide in Banana Fritters (*Pisang Goreng*) and Its Risk to Human Health

Yasirah binti Mohd Razif

Introduction: Acrylamide is a genotoxic and carcinogenic in studies in animal and classified as Group 2A which is probably carcinogenic to humans. Acrylamide are form naturally in certain carbohydrate-rich food. The research indicated that high frying temperature and repeated usage of frying oil will increase the formation of acrylamide in banana fritters. The high consumption of banana fritters in Malaysia makes it a potentially significant source of daily exposure to acrylamide.

Methodology: The study design of this study is cross-sectional and experimental study. Sixty samples of banana fritters with repeated usage of frying oil and non-repeated usage of frying oil were obtained. Frying temperature of each sample was measured during the cooking hours. The sample collected was analyzed by using Gas Chromatographic–Mass Spectrometric (GC-MS). For sample population, sampling data collection was using modified Food Frequency Questionnaire (FFQ) and oral interview. A statistical analysis that is statistical package for the social science (SPSS) version 17.0 was used in this study.

Results: The study was found that there was significant association between frequency of oil being use and acrylamide exposure with p -value < 0.05 ($p = 0.004$). Statistical analysis shows there was significant association between high temperature of frying oil and acrylamide exposure with p -value < 0.05 ($p = 0.003$). The risk value for acrylamide in banana fritters in this study is high (risk value = 0.02) and probability of cancer develop in respondents is high. Statistical analysis shows there was significant association between high acrylamide exposure and cancer risk with p -value < 0.01 ($p < 0.001$).

Conclusion: In conclusion, repeated usage of frying oil and high frying temperature during cooking hours will increase the formation of acrylamide in banana fritters. Respondents who consumed more than 0.02 mg/kg-day of acrylamide will exposed to high developing of cancer risk, thus there was association between acrylamide concentration in banana fritters and cancer risk with p -value < 0.01 ($p < 0.001$). Food should not be cooked excessively for example cooked for too long or at too high temperature and also should not be cooked with repeated usage of oil to reduced development of acrylamide.

Keywords: *Acrylamide, repeated usage of frying oil, high frying temperature, banana fritters, GC-MS.*