UNIVERSITI TEKNOLOGI MARA

MONITORING OF AFLATOXIN M1 RESIDUES IN MILK MARKETED IN MALAYSIA

SITI NABILAH BINTI BASAR

Project paper submitted in partial fulfillment of the requirements for the degree of
Bachelor in Environmental Health and Safety (Hons.)

Faculty of Health Sciences

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Declaration by student

Project entitled "Monitoring of Aflatoxin M1 Residues in Milk Marketed in Malaysia" 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 Dr Mehdi Sameni as Project 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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In the name of Allah, the Most Gracious and the Most Merciful

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Abstract

Title: Monitoring of Aflatoxin M1 Residues in Milk Marketed in Malaysia

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Background: The purpose of this study is to investigate the occurrence of AFM1 in milk obtained from the market in Malaysia. A reliable, rapid and sensitive analytical method using liquid chromatography-tandem mass spectrometry (LC-MS/MS) method to determine the aflatoxin M1 in milk has been developed. Methods: Milk samples (69) were collected from supermarket around Puncak Alam city, Selangor state. Methodology includes simple extraction of sample by adding acetonitrile, mobile phase 4mM of ammonium acetate aqueous solution/ methanol (60:40, v/v), separation using Reverse Phase Symmetry C18 column and MS/MS analysis by using Multiple Reaction Monitoring (MRM) mode for quantitative analysis. The aflatoxin M1 LC-MS/MS method was developed and validated according Commission Decision 2002/657/EC. Results: Among 69 samples, 3% of sample were found positive aflatoxin M1, with concentration level range of 0.036-0.045 ng/mL however, they were below maximum residue level (MRL) established by the European Community (EC). The limits of detection (LOD) and limits of quantifications (LOQ) were 0.01 ng/mL and 0.03 ng/mL respectively. The recovery values ranged from 86% to 93% when samples were fortified at three different concentrations. Conclusion: The method applied was successfully determined AFM1 in milk. The LOQs (0.03 ng/mL) of AFM1 detected was lower than the MRL for AFM1 in milk (0.05 ng/mL) set by the European Union. The method was sensitive, reliable, and suitable for residue confirmation analyses.

Keywords: *Aflatoxin M1 Milk, Food safety, LC-ESI-MS-MS*