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Detection of aflatoxin M1 and some heavy metals as contaminant of raw milk

A thesis submitted by

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Abstract

This study analyzed 50 raw milk samples collected randomly from different supermarkets in Kafr El-Sheikh Governorate for detection of aflatoxin M1 and some heavy metals (Cu, Zn, Pb and Cd); and apply some trials for AFM1 detoxification in artificially contaminated raw milk by using natural clay and yoghurt manufacturing. Results showed high level of AFM1 contamination (ranged from 1.4 to16.2 ppb) in these samples. And by adding Kaolin and Ca-bentonite at different amounts (2.5; 5 and 10g/100ml milk) separately to artificially contaminated milk; results revealed a significant effect in the reduction of AFM1 level compared with the control sample (AFM1=116.2 ng/L) as AFM1 level decrease to (12.73, 7.8 and 16.13 ng/L) and (7.33, 4.33 and 2.66 ng/L) with three different amounts of both clays, respectively. Also yoghurt manufacturing revealed significant effect in AFM1 detoxification as AFM1 level (116.2 ng/L) decreased to 7.66 ng/L at 5^{th} day of storage period**.** When analyzed the second part of 50 samples for heavy metals residues the results showed that Cu and Zn was detected in 20% and 100%,respectively. But, Pb and Cd failed to be detected the examined samples.

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LIST OF ABBREVIATION

µg	Micro gram
AAS	Atomic Absorption Spectrophotometer
AFB1	Aflatoxin B1
AFM1	Aflatoxin M1
Afs	Aflatoxins
APHA	American Public Health Association
Cd	Cadmium
CEC	Cation Exchange Capacity
Cu	Cupper
DVS	Direct Vat Set
EC	European Commission Regulation
EFSA	European Food Safety Authority
ELISA	Enzyme Linked Immunosorbant Assay
EPA	Environmental Protection Agency
ES	Egyptian Organization for Standardization and Quality Control.
EU	European Union
FAO/WHO	Food and Agriculture Organization/World Health Organization
FDA	Food and Drug Administration
Fe	Iron
GRAS	Generally Recognized As Safe
HCC	Hepatic Cellular Carcinoma
HPLC	High Performance Liquid Chromatography
hr.	Hour
HSCAS	Hydrated Sodium Calcium Alumino Silicate
IARC	International Agency for Research on Cancer

IDF	International Dairy Federation
IU	International Unit
JECFA	Joint FAO/WHO Expert Committee on Food Additives
LAB	Lactic Acid Bacteria
L.bulgaricus	*Lactobacillus bulgaricus*
Mg	Milligram
MPL	Maximum Permissible Limit
MRLs	Minimum Risk Levels
ND	Not detected
ng/L	Nano gram per litre
Pb	Lead
PDI	Probable Daily Intake
Ppm	part per million
Ppb	part per billion
Ppt	part per trillion
PTDI	Provisional Tolerable Daily Intake
PTMI	Provisional Tolerable Monthly Intake
PTWI	Provisional Tolerable Weekly Intake
S.thermophilus	*Streptococcus thermophiles*
WHO	World Health Organization
Zn	Zinc