STUDIES ON STERIGMATOCYSTIN IN SOME WHEAT BASED FOODS

BY

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B. Sc. Agric. Sc. (Food Science), Tanta University, 2001

A thesis submitted in partial fulfillment
of
the requirements for the degree of
MASTER OF SCIENCE

In
Agricultural Science
(Food Science and Technology)

Dep. of Food Science-Faculty of Agriculture
Ain Shams University

2008

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ABSTRACT

Tarek Ahmed El dosoky. "Studies On Sterigmatocystin In Some Wheat Based Foods ", Unpublished M.Sc Thesis, Dept. of Food Science, Faculty of Agriculture, Ain Shams University, 2008

Sterigmatocystin (Stg) is a mycotoxin produced by *Aspergillus versicolor* and *Aspergillus nidulans*. Stg has been shown to be carcinogenic, causes cancer in number of animal species and classified as class 2B carcinogen (as possibly carcinogenic to humans) by IARC.

The results indicated that the developing system Benzene: acetic acid (9: 1 v/v) showed the best separation for small concentrations of Stg when used TLC technique. Moreover the data showed also that the mobile phase methanol: water (8: 2 v/v) succeeded to separate Stg at 5.4 min retention time when the flow rate was 1ml/ min. When comparison between different methods for Stg determination by HPLC in spiked wheat samples. The results cleary indicated that the percentages of loss in AOAC (2000) method were 10.44, 24.55, 17.07 and 28.95% for the tested concentration levels (5, 10, 50 and 100µg) respectively. Moreover the percentage of toxin loss ranged from 93.47 and 96.64% with average of 94.895 in TLC determination and however, it ranged from 10.52 and 27.95% with average of 19.68% in HPLC method.

Determination of naturally occurrence of Stg in Wheat, Bread (balady and Fino) and Cerelac. The results indicated that 16, 8, 12 and 6% for wheat, Balady bread, Fino bread and Cerelac respectively.

Studies on naturally sterigmatocystin-contaminated wheat have shown that highest concentrations of Stg were found in wheat flour with a reduction percentage ranged from 87.109 to 59.943% while the lowest concentrations were detected in bran with a reduction percentage ranged from 40.057 to 12.839%. The reduction percentage of Stg after baking was only 16.949% while it was 43.412% after fermentation.

The current results indicated that the fermentation process significantly reduced Stg to 3.380, 6.417 and 20.755 µg/g in dough made from flour artificially contaminated with 5, 10 and 50 µg/g, respectively. The residual amount of Stg was 2.329, 4.240 and 12.625µg/g after baking dough artificially contaminated with different concentration of Stg i. e, 5, 10 and 50 µg/g, respectively.

A higher percent of reduction of Stg could be occurred during fermentation of lokmet el-khady made with 5µg/g Stg, being 42.766% while it reached 63.324% when 50µg/g Stg was used. The average percentage of Stg reduction during frying of lokmet el-khady was 63.26%, 61.23% and 72.28% for the level of 5, 10 and 50µg/g, respectively.

Key Words: sterigmatocystin, HPLC, TLC, Wheat, processing

Acknowledgement

Praiseworthy and gratitude to **ALLAH** who gave me the ability to finish my thesis.

I would like to pray for **Prof. Dr. Mohamed A. Abdulla**, who was the supervisor of this thesis, suggesting the points of research, putting the plan of this work and for his valuably directions before his departure.

Deep appreciation and gratitude are extended to **Prof Dr. Neverty F. M. Gamal** Prof. of Food Science and Technology, Faculty of Agriculture, Ain-shams University for her kind supervision, editing and revision of the thesis.

I wish to express my deepest appreciation to **Prof. Dr. Khayria M. Naguib** Prof. of Food Toxicology and Contaminants Department, National Research Center, for her keen supervision, continuous guidance and encouragement as well as scientific revision of this work

Grateful appreciation to **Dr. Hanan, M. A. Al-Sayed**, Lecturer of Food Science and Technology, Faculty of Agriculture, Ain-shams University for co-supervising of this thesis.

Grateful appreciation and sincere gratitude to **Dr. Mona M. Abdel Galil** prof. of Food Contaminants, National Research Center for her keen supervision of this work

Grateful appreciation and sincere gratitude to Dr. **Mosaad Attia Abdel-Wahhab** Prof. of Toxicology, National Research Center for his keen supervision, able guidance as well as editing and valuable criticism during all stages of this work.

Grateful appreciation is also due to Prof , Dr. **Abdel-Ghany El-Gendy** former Dean of the Faculty of Agriculture, Ain-shams University for his great support during the course of this study. Deep thanks are also due to the staff members at the Arid Land Agricultural Research Services Center Faculty of Agriculture, Ain-shams University for their valuable help in the third part of this study

I wish to express my great thanks for all the stuff members at the Food Science and Technology Dept., Faculty of Agriculture, Ain-Shams Univ. and Department of Food Toxicology & Contaminants, National Research Center for their help and encouragement during the course of this study.

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