بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــسـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

THE ROLE OF AFLATOXINS IN FOODS

BY

Eman Abd El-Baky Abd El-Gaffar

B. Sc. (Food Science and Technology) 1991

Faculty of Agriculture, Ain Shams University

A thesis submitted in partial fulfillment

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Approval Sheet

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ABSTRACT

Eman Abd El-Baky Abd El-Ghaffar, The role of aflatoxins in foods.Unpublished Master of Science, Ain Shams University, Faculty of Agriculture, Department of Food Science, 1998.

Aflatoxins became an economical problem in our country due to its contamination in agricultural commodities. Aflatoxins are highly toxic metabolites produced by certain fungal strains.

Therefore, the objectives of the present work were to study: (1) The presence of fungal flora and their ability to produce aflatoxins in some foodstuff samples, (2) The influence of fungal strain, incubation period and temperature on aflatoxins production, (3) The effect of some factors on fungal growth and aflatoxin production and (4) Chemical composition of some foodstuffs after growth of toxigenic fungi and aflatoxin control in some processed foodstuffs.

From such point of view, meat, sesame, wheat grains, fig fruits and tomato fruits samples were collected from different sources and tested for their content of aflatoxins.

Aspergillus and *Penicillium* were the predominant genera in all foodstuffs examined samples. It appeared that, *Asp. niger* was the dominant fungal species. *Asp. flavus* (Br) isolated from sesame seeds was the most active isolated species for producing aflatoxins.

Generally, aflatoxins production increased and reached the maximum levels after two weeks of incubation at 25°C of *Asp. flavus* EMCC 274 which was inoculated singly or in combination with *Asp.parasiticus* NRRL 2999. *Asp. niger* was capable of producing metabolites inhibiting the growth of the other tested toxic fungal strains as well as aflatoxins formation by these fungal.

The inhibition of the growth and aflatoxins production by the mixed culture increased indirect proportion to the increase in garlic or onion extract concentration. Also, *Lactobacillus casei* 375, has the

strongest antagonistic effect followed by *Lactobacillus acidophilus* 330, then *Pediococcus acidilactici* 424.

The inhibition of the growth and aflatoxins production by the mixed culture increased indirect proportion to the increase in the concentration each of propionic acid, sorbic acid, citric acid, sodium bisulfite and / or sodium bicarbonate added to the growth medium. Among the five food additives, sodium bisulfite was the most inhibitory one followed by propionic acid.

The mixed fungal culture could not produce aflatoxins in all fermented sausage sample treatments. Aflatoxin B_1 concentration did not change in fermented sausage treatments 2,3 and 4 when fresh and after storage for 24 hr and 15 days at 37°C.

Using unirradiated wheat grains with the addition of 0.8% sodium bicarbonate in processing cake decreased the concentration of aflatoxins B_1, B_2, G_1 and G_2 in the resultant cake. Utilization of unirradiated sesame seeds with addition 1.5% propionic acid in the manufacture of sesame halva decreased the levels of aflatoxins.

Addition of 0.4% citric acid in the production of fig jam from unirradiated fig fruits decreased the levels of aflatoxin B_2 by 40.7%. Using unirradiated tomato fruits with the addition of 5% sodium bisulfite in the production of tomato concentrate (TC_3) decreased the levels of aflatoxins B_2 and G_2.

Key words : *Asp. flavus* EMCC 274, *Asp. parasiticus* NRRL 2999, meat, sesame seeds, wheat grains, fig fruits, garlic extract, onion extract, propionic acid, sorbic acid, citric acid, sodium bisulfite, sodium bicarbonate, processing.

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