

DEDICATION

To my parents

To my soul mate husband and daughter

Brothers and sisters

To my close friends

(Marowa & Eman)

To all researchers in this country

WITH LOVE

Safaa Ahmed

Firstly and lastly my thanks and gratefulness to “*Allah*” who gave
.me health and patience to carry out this study successfully

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Abbreviations

AFB₁: Aflatoxin B₁

AFB₂: Aflatoxin B₂

AFG₁: Aflatoxin G₁

AFG₂: Aflatoxin G₂

W: Walad sesame oil

N: Normal sesame oil

RI: Refractive Index

PV: Peroxide Value

AV: Acid Value

ABSTRACT

This investigation was carried out to determine the aflatoxin content and the physical and chemical characteristics of two types of sesame oil (Walad) (W) and (Normal sesame oil) (N), 104 samples were collected during two seasons (50 samples in June/2009, 54 samples in January/2010) from traditional mills in five states of Sudan (Khartoum, Kordofan, Gadarif, Blue Nile and Sennar state).

Two types of sesame oil in two seasons are assessed for aflatoxin B₁ (AFB₁), aflatoxin B₂ (AFB₂), aflatoxin G₁ (AFG₁) and aflatoxin G₂ (AFG₂), using high performance liquid chromatography (HPLC).

The physical testes were refractive index, viscosity, specific gravity and color, the chemical testes were acid value and peroxide value, and all

samples were subject to disclosure of sesame oil which has positive
.result

There are significant differences ($P \leq 0.05$) in physical and chemical characteristics of sesame oil in two seasons due to variation in variety of
.sesame seeds, soil types and production season

Aflatoxin B₁ levels in sesame oil samples ranged from 0.5–9.8
 $\mu\text{g}/\text{kg}$ and were 0.5-1.3 $\mu\text{g}/\text{kg}$ of aflatoxin B₂, which were within the
(permitted range (10 $\mu\text{g}/\text{kg}$ for total aflatoxins

Aflatoxin B₁ (AFB₁) was detected in seventy samples representing
67.31%. While aflatoxin B₂ (AFB₂) was detected in eight samples
representing 7.69%. The highest incidence of aflatoxin B₁ contamination
occurred in season II for N samples, Khartoum state had recorded the
(highest incidence (91.67%

Aflatoxin B₂ contamination recorded the highest incidence in
season II for N sample, Khartoum state had recorded the highest
incidence (12.50%). While no aflatoxin contamination with AFG₁ and
.AFG₂ was detected in any samples of sesame oil

High aflatoxin contamination levels was observed in season II
(long storage period) on normal sesame oil samples more than walad
sesame oil samples. This results show that the aflatoxin levels in sesame
oil seeds is dependent on type of seeds, storage condition and storage
.period

ملخص الأطروحه

اجريت هذه الدراسه لمعرفة محتوى الافلاتوكسين و دراسة الخصائص الفيزيائيه و الكيميائيه في 104 عينه من نوعين من زيت السمسم (ولد) (W) و(سمسم عادي) (N) التي تم جمعها خلال موسمين (50 عينه في يونيو 2009, 54 عينه في يناير 2010) من عصارات تقليديه في خمس ولايات في السودان (الخرطوم, كردفان, القضارف, النيل الازرق و سنار) .

اخضع نوعي زيت السمسم في الموسمين لدراسة انواع الأفلاتوكسين B_1 (AFB_1), G_1 (AFG_1) B_2 , (AFB_2) و (G_2) (AFG_2) وذلك بإستخدام الكروماتوغرافيا السائله ذات الاداء العالي (HPLC).

اجريت الأختبارات الفيزيائيه والكيميائيه التاليه:معامل الانكسار, اللزوجه, الكثافه النوعيه, اللون , القيمه الحمضيه و قيمة البيروكسيد (الأحماض الدهنيه الحره), كما اخضعت العينات لإختبار الكشف عن زيت السمسم و قد كانت النتيجة ايجابيه.

اظهرت نتائج التحليل الاحصائي فروقات معنوية ($P \leq 0.05$) في كل من الخصائص الفيزيائية والكيميائية لنوعي زيت السمسم خلال الموسمين, وذلك نتيجة لإختلاف نوعية السمسم المستعمل , نوعية التربة, وموسم الإنتاج.

وقد تم الكشف عن وجود تلوث بالافلاتوكسين B_1 في سبعين عينة من اصل 104 عينة اعدت للبحث ومثلت نسبة 67.31%, كما تم الكشف عن وجود تلوث بالافلاتوكسين B_2 في ثمانية عينات من عينات الدراسة مثلت نسبة 7.69% , اعلى معدل للتلوث بالافلاتوكسين B_1 سجل في الموسم الثاني لعينات زيت السمسم العادي (N), سجلت عينات زيت السمسم من ولاية الخرطوم اعلى نسبة اصابة بالافلاتوكسين (91.67% AFB_1).

اعلى تلوث بافلاتوكسين B_2 سجل في الموسم الثاني لعينات زيت السمسم العادي , سجلت عينات زيت السمسم من ولاية الخرطوم اعلى نسبة اصابة بالافلاتوكسين (12.50% AFB_2).

كما اوضحت النتائج انه ليس هناك تلوث بال AFG_1, AFG_2 في اي عينة من عينات زيت السمسم.

وتراوحت مستويات الأصابة بالافلاتوكسين B_1 في عينات زيت السمسم بين (0.5-9.8 $\mu\text{g}/\text{kg}$) وبالافلاتوكسين B_2 بين (0.5-1.3 $\mu\text{g}/\text{kg}$), بالرغم من وجود نسبه عالية من التلوث في عينات البحث إلا انها في المستوي المسموح به (10 $\mu\text{g}/\text{kg}$ للنسبة الافلاتوكسين الكليه).

اوضحت هذه الدراسة على ان النسب العالية من التلوث قدظهرت في الموسم الثاني(فترة تخزين اطول) لزيت السمسم العادي اكثر من عينات زيت الولد وهذا يدل على ان مستوى الأفلاتوكسين في زيت السمسم يعتمد على نوعية البذور, ظروف التخزين و فترة التخزين.

