شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

بالرسالة صفحات لم ترد بالأصل

شبكة المعلومات الجامعية

بعض الوثائق الأصلية تالفة

CHEMICAL AND TECHNOLOGICAL STUDIES ON SOME FOODS

UTILIZATION OF SOME PHENOLIC COMPOUNDS EXTRACTED FROM PLANT SOURCES AS NATURAL OIL ANTIOXIDANTS

By

Mohamed Fawzy Osman Mohamed Abdou

B. Sc. (Agric.), Tanta University, (1995)

Thesis

Submitted in Partial Fulfillment of

the Requirements for the Degree

of

MASTER OF SCIENCE

In

(Food Technology)

Food Science and Technology Dep.
Faculty of Agriculture
Kafr El-Sheikh, Tanta University

(1999)

Approval Sheet

CHEMICAL AND TECHNOLOGICAL STUDIES ON SOME FOODS

UTILIZATION OF SOME PHENOLIC COMPOUND EXTRACTED FROM PLANT SOURCES AS NATURAL OIL ANTIOXIDANS

By

Mohamed Fawzy Osman Mohamed Abdou

B. Sc. (Agric.), Tanta University, (1995)

DEGREE OF
MASTER OF SCIENCE

IN

(FOOD SCIENCE AND TECHNOLOGY)

Faculty of Agriculture,
Kafr El-Sheikh, Tanta University,
(1999)

Approved by :

Prof. Dr. .....

Prof. Dr. .....

Prof. Dr. .....

Prof. Dr. .....

(Committee in Change)

Submitted to the Faculty Library:

Date ...../ 7 / 1999.

Supervision committee

Prof. Dr. M.A. Noaman

Professor of Food Sciences and Technology ,

Faculty of Agriculture, Kafr El-Sheikh, Tanta University

Prof. Dr. M. R. Nour El-Dein

Professor and Head of Food Sciences and Technology Department ,

Faculty of Agriculture, Kafr El-Sheikh, Tanta University

Dr. M. A. Owon

Associate Professor of Food Sciences and Technology

Faculty of Agriculture, Kafr El-Sheikh, Tanta University

ACKNOWLEDGMENT

Having completed this Master Thesis, my first thanks goes to **ALLAH.**

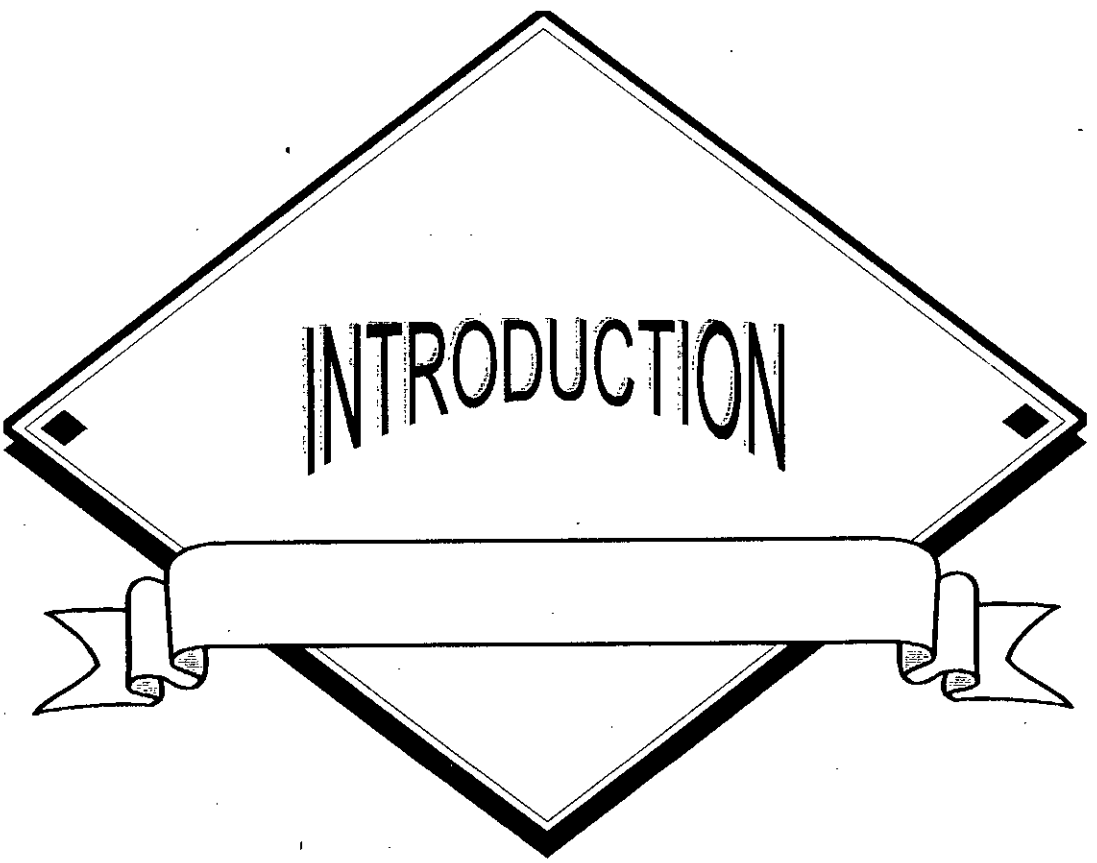
I would like to express my sincere thanks, deep appreciation and heartfelt gratitude to **Professor Dr. M. A. Noaman**, Professor of Food Sciences and Technology, Faculty of Agriculture at Kafr El-Sheikh, Tanta University for his supervision, helpful suggestions, and valuable guidance as well as during the writing of the manuscript.

I wish to express my deepest gratitude to **Professor Dr. M. R. Nour EL-Dein**, Professor and Chairman of Food Sciences and Technology Department, Faculty of Agriculture at Kafr El-Sheikh, Tanta University, for suggesting the problem, supervision, continuous assistance throughout the course of this study and his valuable help through the investigation and the writing of this manuscript.

Sincere thanks and heartfelt gratitude are extended to **Dr. M. A. Owon**, Associate Professor of Food Sciences and Technology, Faculty of Agriculture at Kafr El-Sheikh, Tanta University for suggesting the problem, his useful advice, valuable guidance and assistance during this work as well as throughout the investigation and writing of the manuscript.

Many thanks are extended to all the staff members of Food Sciences and Technology Department, Faculty of Agriculture at Kafr El-Sheikh, Tanta University.

CONTENTS


INTRODUCTION

1- INTRODUCTION

Consumers all over the world are becoming increasing conscious of the nutritional value and the safety of their food and its ingredients. At the same time, there is an increase preference for natural foods and food ingredients which are generally believed to be safer, more healthy and less subject to hazards than foods containing artificial food additives **(Allen and Hamilton, 1983 and Farag *et al.* 1989)**.

Since some synthetic antioxidants, such as butylated hydroxy anisole, have been found to be toxic to experimental animals **(Ford *et al.* 1980)**; Natural plant products began to receive much more attention as sources of safe antioxidants **(Frankel *et al.* 1996)**.

The main sources of natural antioxidants are various kinds of plant products such as oil, seeds, cereals, beans, and nuts **(Namiki, 1990)**.

Plant seeds and leaves contain effective antioxidants, such as tea and barley leaves contain strong antioxidants **(Osawa *et al.* 1992)**. An isoflavonoid isolated from young barley leaves inhibited malonaldehyde formation from squalene by almost 100 % upon ultra violet (U. V) irradiation at the level of 10 μ mol/m mol **(Nishiyama *et al.* 1993)**.

Lipid oxidation not only lowered quality and nutritional value of foods, but also was associated with aging, membrane damage, heart diseases and cancer **(Cosgrove *et al.* 1987)**.

Lipid peroxidation initiated by reactive radicals, such as the hydroxy radical, causes many biological damages including atherosclerosis **(Iwakami, 1965)**, liver diseases **(Suematsu and Abe, 1982)**, diabetes **(Saito *et al.* 1979)**, and aging **(Sagia and Ichinose, 1980)**. Moreover, the

formation of lipid peroxides and their secondary products such as reactive carbonyl compounds also causes various kinds of biological damage. In particular, the aldehydic products malonaldehyde (MA), formaldehyde, acetaldehyde, and 4- hydroxy nonenal are known to be mutagenic and carcinogenic **(Marnett *et al.* 1985; Feinman, 1988; Esterbauer *et al.* 1991; Chaudhary *et al.* 1994)**.

There is a great need for safe, natural antioxidants, not only to prevent oxidative deterioration in foods but also to inhibit oxidative damages caused by lipid peroxidation. Therefore, antioxidants in foods have recently attracted special interest because they can protect the human body from free radicals which may cause various diseases including carcinogenesis and aging **(Osawa *et al.* 1987; Cutlar, 1992)**. These antioxidants can also retard oxidative rancidity caused by atmospheric oxidation and thus protect oils, fats, and fat-soluble components such as vitamins, carotenoids, and other nutritive ingredients in foods.

Addition of synthetic antioxidants can control lipid oxidation in foods. However, use of such compounds has been related to health risks resulting in strict regulations over their use in food products **(Hettiarachchy *et al.* 1996)**.

There has been some discussion recently of the undesirable use of synthetic antioxidants, for example, dietary administration of butylated hydroxytoluene (BHT) to rats caused fatal hemorrhages in the pleural and peritoneal cavities and in organs such as epididymis tests and pancreas. BHT caused also changes in rat thyroids,