





ثبكة المعلومات الجامعية





جامعة عين شمس

التوثيق الالكتروني والميكروفيلم



نقسم بللله 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 %



ثبكة المعلومات الجامعية







Menoufia University
Faculty of Home Economics
Dept. of Nutrition and Food Science

BIOCHEMICAL AND TECHNOLOGICAL STUDIES ON FISH DISTRIBUTED IN MIDDLE -DELTA GOVERNORATES

BY

Mabrouk Abd El-Zaher El-Sayed Sileem

B.Sc. (Agricultural science) Fac. of Agriculture, Menoufia University (1979)

THESIS

Submitted in Partial Fulfillment of the Requirements for the Degree of Master

IN

Nutrition and Food Science

SUPERVISORS

Prof. Dr.

Moustafa Abd Allah Hammam

Prof. of Agric. Biochemistry
Faculty of Agriculture
Menoufia University

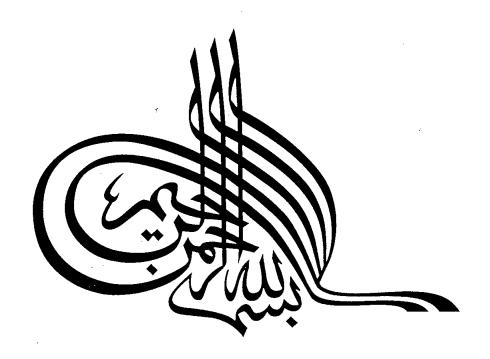
Dr.

Yousif Abd El-Aziz El-Hassaneen

Lecturer of Nutrition and Food Sci.
Faculty of Home Economics
Menoufia University

1998

B



DEDICATION

TO ALLAH FOR ALL THE GOODS THAT HAS BESTOWED UPON ME. I PRAISE HIM, THE EXALTED ONE AND THE HIGH, AND I THANK HIM. IT IS HE WHO DESERVES THE PRAISE AND GRATITUDE.

TO MY FATHER, WIFE, BROTHERS, SISTERS, AND KIDS FOR ALWAYS BEING THERE AND SUPPORTING ME THROUGHOUT MY ENDEAVORS IN LIFE. THEY ARE THE REASON I DID NOT GIVE UP ON MY DREAMS.

Al.Menoufia University
Faculty of Home Economics
Nutrition and Food Science Dept.

APPROVAL SHEET

The Researcher: Mabrouk Abd El-Zaher El-Sayed Sileem

Title of Thesis : Biochemical and Technological Studies on Fish

Distributed in Middle Delta Governorates.

Degree : Master in Nutrition and Food Science

This thesis has been approved by:

Name	Profession	Signature
Dr. Mohamed Moustafa El-Sayed Ali	Prof. of Nutrition and Food Science, and Dean Faculty of Home Economics, Al-Menoufia University	M.M. EI Sa
Dr. Nabil El - Sayed Hafiz	Prof. of Food science Faculty of Agriculture El-Fayoum, Cairo University	N. Hafiz
Dr. Moustafa Abd Allah Hammam	Prof. of Agric. Biochemistry Faculty of Agriculture Menoufia University	M. Hamman

Date 30 / 8 / 1998

Committee in Charge



Al.Menoufia University
Faculty of Home Economics
Nutrition and Food Science Dept.

supervision

The Researcher: Mabrouk Abd El-Zaher El-Sayed Sileem
Title of Thesis: Biochemical and Technological Studies on

Fish Distributed in Middle - Delta Governorates.

This thesis Supervised By:

Name	Profession	Signature
Dr. Moustafa Abd Allah Hammam	Prof. of Agric. Biochemistry Faculty of Agriculture Menoufia University	M Hammam
Dr. Yousif Abd El-Aziz El-Hassaneen	Lecturer of Nutrition and Food Science, Faculty of Home Economics, Al-Menoufia University	Jou of other

ACKNOWLEDGEMENT

The researcher wishes to express his profound gratitude and deep thanks to <u>Dr. Moustafa Abd-Allah Hammam</u>, Professor of Agicultural Biochemistry, Agricultural Biochemistry Dept. Faculty of Agriculture, Menoufia University, Shebin El-Kom, Egypt, for his supervision, general logistical support, great helpful throughout the course of this investigation.

Grateful acknowledgement, sincere thanks and infinite appreciation are also due to <u>Dr. Yousif Abd El-Aziz Elhassaneen</u>, Lecturer of Nutrition and Food Science, Faculty of Home Economics, Al-Menoufia University, Shebin El-Kom, Egypt, for his supervision, great helpful, valuable suggestions and criticism, and guidance in presenting this study. Also, Dr. Yousif offered me every possible assistance during the course of this study involving the experimental design, the preparation of samples, the operation of chemical analysis apparatus ...etc (no easy task). Really, his patience in working with students and his enthusiasm for science has greatly influenced me.

Finally, my deepest thanks are expressed to all post gratuated students working with Dr. Yousif El-Hassaneen and all employers working in research lab, Fac. of Home Economics, Menoufia University, Egypt, for their kind assistance.

And last but not least, sincere thanks are extended to my family: my father, my wife, my brothers and sisters, and my kids. Their love, confidence and their encouragements of my work were endless.

TABLE OF CONTENTS

	Page
LIST OF ABBREVIATION	
LIST OF TABLES	
LIST OF FIGURE	
INTRODUCTION	1
AIM OF INVESTIGATION	4
REVIEW OF LITERATURE	5
MATERIAL AND METHODS	33
RESULTS AND DISCUSSION	4.2
SECTION (1) Chemical composition of raw, frozen and cooked fish distributed in Middle - Delta	
Governorates markets	42
SECTION (2) Nutritional evaluation of raw, frozen, and cooked fish distributed in Middle - Delta Governorates markets	51
SECTION (3) Physical properties of raw, frozen and cooke fish distributed in Middle - Delta	d
Governorates markets	56
SECTION (4) Nitrogenic fractions content of raw, frozen and cooked fish distributed in	
Middle-Delta Governorates markets	63
SECTION (5) Volatile nitrogenous constituents (T.V.N, T.M.A. and N.H ₃ .N. of raw, frozen and	
cooked fish distributed in Middle - Delta	
Governorates markets	67

SECTION (6) pH values and malonaldehyde contents of	
raw, frozen and cooked fish distributed in	
Middle-Delta Governorates markets	7
SECTION (7) Level of heavy metals in raw, frozen and	
cooked fish distributed in Middle - Delta	
Governorates markets	8
SECTION (8) Total count bacteria in raw, frozen and cooked fish distributed in Middle - Delta	
Governorates markets	0.0
Oovernorates markets	9(
ENGLISH SUMMARY	93
REFERENCES	10
ARABIC SUMMARY	12

.

ABBREVIATIONS

A.O.A.C. Official methods of analysis of the Association

of Official Analytical Chemists.

A.B.S. Absorbation

A.T.P. Adinosine Triphosphate

B.P.W. Buffered Pepton Water

Cm Centimeter

Cd Cadmium

E.C. Emulsifying Capacity

E.S. Egyptian Standerd of specification

F.A.O. Food and Agricultural Organization of the

United Nations

F.D.A. Food and Drug Administration.

Fig Figure

gm Gram

G.D.R. Gram consumed to cover the dairy

Requirement

hrs Hours

Hg Mercury

I.C.M.S.F. International commission on microbiological

specifications for Foods

Kg Kilogram

Kcal Kilocalory

Min Minute

M.P.L. Maximum permissible limit

ml Milliliter

mg Milligram

NH₃.N Ammonia nitrogen

nm Nano mole

O.D. Optical density.

Org Organisms

Phth Phenolphthalein

P.S. Percent of satisfaction

P.P.m. Part per million

Pb lead

R.D.A. Recommended dietary allowances

R.P.m. Rotation per minute

Sec Second

Sp Species

T.N. Total nitrogen

T.S.N. Total soluble nitrogen

T.V.B.N. Total volatile basic nitrogen

T.V.N. Total volatile nitrogen

T.P.C. Total plate count

T.B.A. Thiobarbituric acid

T.M.A.O. Trimethylamine oxide

W.H.C. Water holding capacity