BIOCHEMICAL STUDIES ON RICE BRAN

BY

KHALED MOHAMED AMIN FAUZY

B. Sc. Agric., (Biochem.), Ain Shams Univ. 1994

A thesis submitted in Partial Fulfillment

of

the requirement for the degree of

MASTER OF SCIENCE

In

Agriculture

(Agricultural Biochemistry)

Biochemistry Department

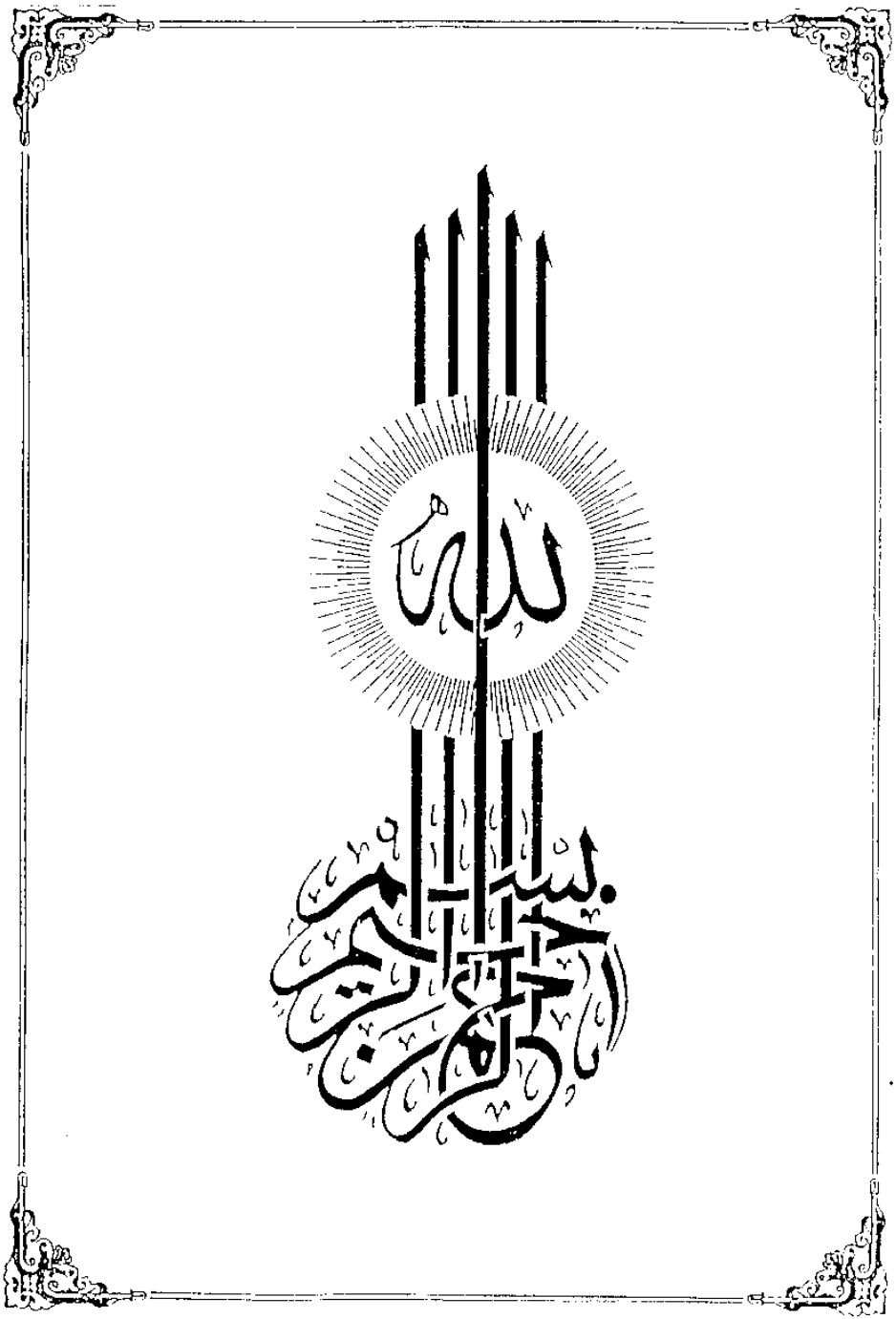
Faculty of Agriculture

Ain Shams University

1999

Central Library - Ain Shams University

Central Library - Ain Shams University



Central Library - Ain Shams University

APPROVAL SHEET

BIOCHEMICAL STUDIES ON RICE BRAN

BY

KHALED MOHAMED AMIN FAUZY

B. Sc. Agric., (Biochem.), Ain Shams Univ. 1994

This thesis for M. Sc. Degree has been approved by:

Prof. Dr. S.M.E. Mansour ..... S. M. Mansour

Prof. of Biochemistry, Institute of Food Technology, Agric. Research Center.

Prof. Dr. Z.A. El-Hadidy El-Hadidy, Z. A.

Prof. of Biochemistry, Faculty of Agric., Ain Shams University.

Prof. Dr. K.R.F. Hussein K. R. F. Hussein

Prof. of Biochemistry, Faculty of Agric., Ain Shams University.

Date of examination 17/7/1999 .

Central Library - Ain Shams University

Central Library - Ain Shams University

BIOCHEMICAL STUDIES ON RICE BRAN

BY

KHALED MOHAMED AMIN FAUZY

B. Sc. Agric., (Biochem.), Ain Shams Univ. 1994

Under the supervision of:

Prof. Dr. KAMAL, R.F. HUSSEIN

Prof. of Biochemistry Fac. of Agric., Ain Shams University.

Prof. Dr. REFAT, E. EL-GHOBASHY

Prof. of Biochemistry Fac. of Agric., Ain Shams University.

Prof. Dr. NAGAH, E. ALI

Prof. of Biochemistry Fac. of Agric., Ain Shams University.

Central Library - Ain Shams University

Central Library - Ain Shams University

ABSTRACT

Khaled Mohamed Amin Fauzy. Biochemical studies on Rice Bran. Unpublished Master of Science, University of Ain Shams, Faculty of Agriculture, Department of Biochemistry (1999).

Dry heat stabilization, autoclaving, cold storage and parboiling were investigated as a method of stabilization of rice bran, extraction of oil immediately after milling showed to be preventing its deterioration, parboiled bran, cold stabilized, heat stabilized at 110°C for 30 min, autoclaving and heating for 20 min also found to be retarded oil deterioration during storage. Heating rice bran for 10 min at 110°C seems to be not effective for destroying lipase enzyme. Effect of stabilization and storage on fatty acid composition of oil were investigated by GLC technique. Palmitic, oleic and lenoleic are the predominant fatty acids in rice bran oil. Crude proteins, crude fat, carbohydrates, fibers, ash and free amino acids were determined. These components were only affected by parboiling. Hypocholesterolemic activity was subjected on full fat rice bran and rice bran oil in two biological experiments on rats, rice bran and rice bran oil lowered serum total cholesterol and total lipids, LDL, triglycesides in normal and hyperlipemic rats. HDL were significantly increased, and GOT and GPT were lowered. Full fat rice bran were mixed with wheat flour at 20% level, rheological properties were determined, water absorption, arrival time and dough development were increased while dough stability and mixing tolerance index were reduced (Farinograph test), from data of extensograph test, elasticity and proportional number were increased, while extensability and energy were decreased. Maximum viscosity was increased when visco-

Central Library - Ain Shams University

amylgraph test carried out. Baking test were also made to determine the quality of panned bread which containing full fat stabilized rice bran. The volume was reduced and the crust and cramp colour were increased.

Key Words:

Rice bran, Rice bran oil, stabilization, parboiling, storage fatty acid, chemical analysis, hypocholesterolemic activity cholesterol, HDL, LDL, transaminase, Rheological, Baking.

Central Library - Ain Shams University

ACKNOWLEDGMENT

The student wishes to express his deepest gratitude and sincere thanks to **Prof. Dr. K.R.F. Hussein,** professor of Biochemistry Faculty of Agriculture, Ain Shams University for his supervision sincere guidance, continuous encouragement and valuable helps in accomplishing this study.

My deepest gratitude is extended to **Prof. Dr. R.E.El-Gobashy,** professor of Biochemistry Faculty of Agriculture, Ain Shams University and **Prof. Dr. N.E.Ali,** professor of Biochemistry Faculty of Agriculture, Ain Shams University for their guidance and advice, for their valuable discussions, useful helps and cooperation during this study.

Due thanks are also presented to all members of Biochemistry Department, faculty of Agriculture, Ain Shams University for their help and encouragement.

Central Library - Ain Shams University

Central Library - Ain Shams University

CONTENT

Central Library - Ain Shams University

Central Library - Ain Shams University

Central Library - Ain Shams University

Central Library - Ain Shams University