شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومـــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

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 %

بالرسالة صفحات

لم ترد بالأصـــل

بعض الوثائق الأصلية تالفة

IMPROVING BIOLOGICAL PROPERTIES OF RAPESEED PROTEIN PRODUCTS

By
ALAA AZOUZ SALAMA ABD- ELMAKSOUD
B.Sc.Agric.Sci. (Food Technology), Ain Shams Univ., 1989
M.Sc. Agric.Sci. (Food Science and T`echnology), Ain Shams Univ., 1996

A thesis Submitted in partial fulfillment
of
the requirements for the degree of

Doctor of Philosophy
in

Agricultural Science
(Food Science and Technology)

Department of Food science
Faculty of agriculture
Ain Shams University

2002

A PPROVAL SHEET

IMPROVING BIOLOGICAL PROPERTIES OF RAPESEED PROTEIN PRODUCTS

By

ALAA AZOUZ SALAMA ABD- ELMAKSOUD

B.Sc.Agric.Sci. (Food Technology), Ain Shams Univ., 1989

M.Sc. Agric.Sci. (Food Science and T`echnology), Ain Shams Univ., 1996

This thesis for Ph.D. degree has been approved by.

Prof.Dr.Ahmed Abd Elaziz Al-Refai .....

Prof of Food Science and Technolgy, Dean of Faculty of Specific Education,Mansura University.

Prof.Dr.Ramadan Mohamed Mahmoud .....

Prof. Food Science and Technology, Faculty of Agriculture, Ain Shams University.

Prof.Dr. Magda H. Allam .....

Prof. Food Science and Technology, Faculty of Agriculture, Ain Shams University. (Supervisor)

Date of Examination 13 / 8/ 2002.

IMPROVING BIOLOGICAL PROPERTIES OF RAPESEED PROTEIN PRODUCTS

By

ALAA AZOUZ SALAMA ABD- ELMAKSOUD

B.Sc.Agric.Sci. (Food Technology), Ain Shams Univ., 1989

M.Sc. Agric.Sci. (Food Science and T`echnology), Ain Shams Univ., 1996

Under the Supervision of

Prof. Dr. Magda H. Allam

Prof. of Food Science and Technology, Faculty of Agriculture, Ain Shams University.

Prof. Dr. Mohamed S. El- Habbal

Prof.of Agriculture, Chem. and Technology, Faculty of Agriculture; Ain Shams University.

Associate Prof. Dr. Salem H. El-Deep

Associate Prof. of Food Science and Technology. Faculty of Agriculture, Ain Shams University.

ABSTRACT

Alaa Azouz Salama Abd- El Maksoud. Improving biological Properties of rapeseed protein products. Unpublished Doctor of Philosophy dissertation, Department of Food Science,Faculty of Agriculture, Ain Shams University, 2002.

Several methods were used to minimize the antinutritional substances in some rapeseed protein products i.e., heat treatments of meal by toasting for 15, 30, 60 and 120 min at 100°C, autoclaving for 30 min at 127°C, and formaldhyde treatments (3, 5 and 10 g formaldhyde / kg meal). Rapeseed flower was extruded and was also used for preparation protein concentrate using 10% solution (w/w) amonia in 95% methanol, and protein isolate using 0.25% sodium hexametaphophate solution. The prepared samples were subjected to chemical analysis and function properties, and biological evaluation.

The data indicated that protein, dietary fibers and soluble carbohydrates content decreased versus increasing toasting period and using formaldhyde. Extrusion of flour decreased soluble carbohydrates. The crude protein content increased in PC and PI, while ash, crude fibers and carbohydrates decreased. Essential amino acids content and GDR varied in proportion to the method of processing and exceeded those of FAO/WHO/UNU. PC and PI had the lowest levels of antinutrients.

The studied samples had higher emulsifying and foaming properties at pH 7.0, and higher water than lipid absorption.

LBW and BWG were significantly the highest for rats fed toasted meal compared to other treatments. Rats fed casein or toasted meal diets had statistically the highest values of final protein and protein retention by rat bodies. The control casein diet had the greatest means of PER, BV and NPU. Intrinsic reduction was noticed in descending relationship with toasted meal, PC, autoclaved meal and untreated meal. Meanwhile, protein digestibility of casein and toasted meal diets were insignificantly differed giving the highest results.

It was cleared that rats fed untreated meal caused liver enlargment. The relative weight of rat livers fed toasted or autoclaved meal compared to control. The lowest effect on liver weight and its relative weight was found for rats fed PI or PC diet without any abnormality or haemorrhage. The weight and relative weight of hearts had insignificant differences in rats fed casein, autoclaved meal or PI.

The data indicated that blood glucose was statistically stable for rats fed experimental diets. The albumin level was slightly differed in blood of rats fed casein, autoclaved meal, PC or PI diets. The triglycerides content was stable versus casein, autoclaved or PC diets.

The untreated meal rat diet increased significantly the total cholesterol content in the blood. Meanwhile, toasted meal, autoclaved meal or PC gave the same results of casein diet. The, PI diet depressed the total cholesterol to its minimal value. Diet contaning untreated meal increased significantly SGOT and SGPT in rat blood. On the contrary, PC diet decreased significantly the above two enzymes to the minimum. Concerning thyroid hormones, TSH significantly increased in blood of rats fed untreated or autoclaved meal. The total and free T_3 indicated significant depression for rats fed untreated meal. Opposite results were found for total and free T_4.

The histological studies indicated normal liver and heart tissues for rats fed casein, toasted meal or PC. The use of other treatments caused liver and heart infection.

Key words: Rapeseed, rapeseed protein products, chemical composition, functional properties, antinutritional factors, blood analysis, liver histology, heart histology, protein quality, biological studies.

ACKNOWLEDGEMENT

First of all, I'm express my deepest thanks to **"Allah"**, who blessed me, given me the power, knowledge and the ability to carry out and finished this thesis.

My great appreciation and gratitude sincere to **Prof. Dr. Magda H. Allam,** Prof. of Food Science and Technology, Faculty of Agriculture, Ain Shams University, for her supervision, guidance, constructive criticism and every possible help she kindly offered during the course of this investigation.

Gratefulness and thanks are not enough to express my deep gratitude, and sincere appreciation to **Prof. Dr. M.S. El-Habbal,** Prof. of Agriculture Chemistry and Technology, Faculty of Agriculture, Ain Shams University, for setting up all experiments and providing the chemical analysis facilities and unlimited help during this study.

I am expressing my deepest gratitude to **Dr. S.H. El-Deep,** Associate Prof. of Food Science and Technology, Faculty of Agriculture, Ain Shams University, for his supervision and advising during this investigation.

I would like to express my deep thanks for all staff members of **Food Technology Research Institute** for their help and unlimited facilities during this work .