

REPORT AND CONCLUSIONS OF THE INVESTIGATION
CONDUCTED BY THE BUREAU OF THE INSPECTOR GENERAL
IN CONNECTION WITH THE INVESTIGATION OF THE
OPERATIONS OF THE
BUREAU OF THE INSPECTOR GENERAL

THE BUREAU OF THE INSPECTOR GENERAL

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF THE INSPECTOR GENERAL
WASHINGTON, D. C. 20501

1967

1100030762

PERPUSTAKAAN KOLEJ UNIVERSITI SAINS & TEKNOLOGI MALAYSIA (KUSTEM)			
Pengarang Lim chin keong.		No. Panggilan HP9 PST 16 2004	
Judul Fatty acid composition			
Tarikh	Waktu Pemulangan	Nombor Ahli	Tanda tangan

**FATTY ACID COMPOSITION OF TRANSESTERIFIED COD LIVER OIL
AND PALM OLEIN USING IMMOBILIZED *Rhizomucor miehei* LIPASE IN
ORGANIC SOLVENTS**

By

Lim Chin Keong

**Research Report submitted in partial fulfilment of
the requirements for the degree of
Bachelor of Science (Biological Sciences)**

**Department of Biological Sciences
Faculty of Science and Technology
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
2004**

PENGAKUAN DAN PENGESAHAN LAPORAN PROJEK PENYELIDIKAN I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:

FATTY ACID COMPOSITION OF TRANSESTERIFIED COD LIVER OIL AND PALM OLEIN USING IMMOBILIZED *RHIZOMUCOR MIEHEI* LIPASE IN ORGANIC SOLVENTS oleh Lim Chin Keong, No.Matrik UK 5839 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperoleh Ijazah Sains Biologi, Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

Disahkan oleh:



Penyelia Utama

Nama: **HAZLINA AHAMAD ZAKERI**
Pensyarah
Jabatan Sains Biologi
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia (KUSTEM)
Mengabang Telipet
21030 Kuala Terengganu, Terengganu Darul Iman.

Tarikh: 23/3/04



Ketua Jabatan Sains Biologi

Nama: **PROF. DR. CHAN ENG HENG**
Ketua
Jabatan Sains Biologi
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
(KUSTEM)
21030 Kuala Terengganu.

Tarikh: 23/3/04

ACKNOWLEDGEMENTS

First and foremost, my appreciation would be dedicated to my supervisor, Cik Hazlina Binti Ahamad Zakeri from the Department of Biological Sciences, Faculty of Science and Technology. Her patient guidance and advice on this thesis have eventually accomplished my final project within a proposed time.

Secondly, I would like to dedicate my thankness to both the biochemical lab officers namely Cik Norazlina and Cik Ku Naiza for their assistance in coping with the technically problems of using gas chromatography (GC). Their kind cooperation and patient are highly appreciated.

Thirdly, my appreciation goes to my fellow labmates namely Tham Wei Shin, Chew Meng Li, Mah Hoong Yann and Ooi Keng Wooi for their constant help in using GC and informations regarding the thesis.

Lastly, my gratitude goes to my grandmother, parents and brothers as well for their encouragement and supportive advice to finish my thesis successfully.

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ABSTRACT

The investigation of the effect of different oil blend ratios and organic solvents on transesterification were studied. Palm olein originally was lacking in linolenic acid, EPA and DHA, was found to contain these fatty acids after transesterification with cod liver oil. Diethyl ether ($\log P$ 0.85), hexane ($\log P$ 3.5) and isooctane ($\log P$ 4.52) were used as different media for transesterification of palm olein: cod liver oil (1:1) blend. The results indicated that diethyl ether and hexane were found as the better organic solvents since they produced a significant increment of DHA composition after transesterification. In the palm olein: cod liver oil (2:3) blend and (3:2) blend, the concentration of polyunsaturated fatty acid (PUFA) (e.g. linoleic, linolenic, EPA and DHA) was found to be the highest in 2:3 blend. Subsequently, 2:3 blend was considered the best blend in yielding higher amounts of PUFA after transesterification. This is due to an efficient transesterification based on the increment of PUFA composition retained in oil blends after transesterification.

ABSTRAK

Kesan penggunaan nisbah pencampuran minyak yang berbeza dan pelbagai jenis pelarut organik telah dipelajari. Minyak olein asal adalah dalam ketiadaan linolenik asid, EPA dan DHA, telah dikesan kewujudan mereka setelah ditransesterifikasi dengan minyak ikan kod Dietil eter ($\log P$ 0.85), heksana ($\log P$ 3.5) dan isooktana ($\log P$ 4.52) telah digunakan sebagai medium bagi transesterifikasi antara nisbah pencampuran minyak olein: minyak ikan kod (1:1). Keputusan menunjukkan bahawa dietil eter dan heksana merupakan pelarut organik yang baik disebabkan ia memberi komposisi DHA yang tinggi setelah transesterifikasi. Dalam nisbah pencampuran minyak olein: minyak ikan kod (2:3) dan (3:2), kandungan dalam nisbah 2:3 telah memberikan peratus komposisi asid lemak poli-taktepu (e.g. linoleik, linolenik, EPA dan DHA) yang tinggi. Dengan itu, nisbah 2:3 boleh dikatakan sebagai nisbah pencampuran yang baik dalam penghasilan asid lemak poli-taktepu yang lebih tinggi setelah transesterifikasi. Hal ini disebabkan oleh transesterifikasi yang baik adalah berasaskan penambahan dalam komposisi asid lemak poli-taktepu setelah transesterifikasi dijalankan.