

THE UNIVERSITY OF CHINA PRESS
100004 BEIJING, CHINA
AND
DISTRIBUTION OFFICE: THE UNIVERSITY OF CHINA PRESS
300 NORTH ZEEB ROAD, SUDBURY, ONTARIO, CANADA N3B 4Z1

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THE UNIVERSITY OF CHINA PRESS
100004 BEIJING, CHINA

2003

**EFFECT OF LEMONGRASS, TORCH GINGER AND GALANGAL ON
NUTRITIONAL COMPOSITION AND FRESHNESS (LIPID AND PROTEIN
CHANGES) IN LIGHTLY FERMENTED TILAPIA**

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RESEARCH PROJECT submitted in partial fulfillment of the requirements for the
Degree of Bachelor of Food Science
(Food Service and Nutrition)

**FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
MENGABANG TELIPOT
2005/06**

This project report should be cited as:

Heng, S. C. 2006. Effect of lemongrass, torch ginger and galangal on nutritional composition and freshness (lipid and protein changes) in lightly fermented tilapia. Undergraduate thesis, Bachelor of Food Science (Food Science and Nutrition). Faculty of Agrotechnology and Food Science, Kolej Universiti Sains dan Teknologi Malaysia, Terengganu. 96 p.

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DECLARATION

I hereby declare that this research project is based on my original work except the quotation and summaries which have been duly acknowledge.

15th June 2006

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UK 8018

15th June 2006

Approved by,



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ACKNOWLEDGEMENT

First and foremost, I would like to express my utmost appreciation and gratitude to my supervisor, Puan Zamzahaila binti Mohd Zin for her guidance, patience, encouragement, professional knowledge and invaluable opinion towards the accomplishment of this thesis. It would be remembered all the time.

A special thanks to the Head of Food Science Department, Dr. Amiza binti Mat Amin, all the lecturers and staffs of Food Science Department, this included Food Science laboratory and kitchen staffs for their kindness and always given us their fully cooperation and support.

Apart from that, I would also like to thank all my friends and lab mates, who have supported and assisted me during the course of completing this thesis.

Last but not least, thanks are also extended to my family for their fully support, love and concern throughout the entire course of this study. Without them, I would never be able to complete this thesis.

Once again, thank you for your all support and co-operation.

ABSTRACT

Tilapia was used to produce the lightly fermented fish (Pekasam) in order to investigate the effects of lemongrass, torch ginger and galangal on nutritional composition and freshness (protein and fat) changes. Kjeldahl method was used to determine crude protein content, while total volatile bases (TVB-N) was the other parameter used to examine protein changes. Crude fat content was carried out by using Soxtec 2055 extraction unit manual and control unit manual system, while Peroxide value (PV) and free fatty acid (FFA) were the other parameter used to examine the fat changes. In the analysis of the effect of lemongrass, torch ginger and galangal on the nutritional composition and freshness (fat and protein) changes, there was a significant different ($P < 0.05$) of crude protein content compared to control sample but there were no significant differences ($P < 0.05$) of crude fat content, moisture content, ash content, number of TVB-N, PV and FFA compared to the control. Anyway control sample showed the lowest value in crude fat content whereas highest value in number of TVB-N, PV and FFA at the day 45. Besides, the trends showed that samples incorporated with herbs can curtail the process of protein degradation and lipid oxidation. Meanwhile, no any significant trends or changes on the moisture and ash content compared to the control. There was no significant different ($P < 0.05$) for the results during storage period except crude fat content and value of FFA, probably of the shorter time taken in this study cause no any significant to the results. Anyway, observation of trends in the results showed substances from lemongrass, torch ginger and galangal had shown their antioxidant effect by inhibiting lipid oxidation and protein changes as well.

KESAN PENAMBAHAN SERAI, BUNGA KANTAN DAN LENGKUAS TERHADAP PERUBAHAN NILAI PEMAKANAN DAN KESEGRAN (PERUBAHAN PROTEIN DAN LEMAK) DALAM “IKAN PEKASAM” TILAPIA

ABSTRAK

Ikan Tilapia telah digunakan di dalam kajian ini bagi menghasilkan ikan pekasam supaya kajian mengenai kesan penambahan serai, bunga kantan dan lengkuas terhadap nilai pemakanan dan kesegaran (perubahan protein dan lemak) dapat dijalankan. Kaedah Kjeldahl telah digunakan untuk mengukur kandungan protein kasar. Manakala kandungan bes nitrogen meruap total (TVB-N) digunakan sebagai parameter yang lain untuk menguji perubahan protein. Kandungan kasar lemak diukur dengan menggunakan pengekstrakan unit manual Soxhlet 2055 dan sistem manual unit kawalan, manakala nilai peroksida (PV) dan nilai asid lemak bebas (FFA) merupakan parameter yang lain untuk menentukan perubahan lemak. Dalam analisis kesan serai, bunga kantan dan lengkuas pada nilai pemakanan dan kesegaran (perubahan protein dan lemak), terdapat perbezaan yang signifikan antara satu sampel dengan yang lain ($P < 0.05$) dalam kandungan kasar protein berbanding dengan sampel kawalan tetapi tiada perbezaan yang signifikan ($P < 0.05$) antara sampel dalam kandungan kasar lemak, kandungan air, kandungan abu, nilai TVB-N, nilai peroksida dan nilai asid lemak bebas berbanding dengan sampel-sampel yang lain. Walau bagaimanapun, sampel kawalan menunjukkan nilai yang paling kecil dalam kandungan lemak kasar dan nilai yang paling tinggi dalam TVB-N, nilai peroksida dan nilai asid lemak bebas pada hari yang ke-45. Selain itu, terdapat juga arah “trend” dalam graf itu menunjukkan sampel-sampel yang telah dicampur dengan serai, bunga kantan ataupun lengkuas dapat melambatkan proses degradasi protein dan oksidaan lemak. Sementara itu, tidak terdapat apa-apa perbezaan yang signifikan ($P < 0.05$) pada kandungan air dan kandungan abu berbanding dengan sampel kawalan. Tidak terdapat perbezaan yang signifikan ($P < 0.05$) dalam tempoh penyimpanan selain kandungan kasar lemak dan nilai asid lemak bebas, ini mungkin disebabkan tempoh masa yang digunakan dalam kajian ini adalah pendek maka tiada perbezaan yang signifikan ($P < 0.05$) yang didapati di dalam keputusan itu. Walau bagaimanapun, melalui pemerhatian pada arah “trend” dalam keputusan graf itu, didapati serai, bunga kantan dan lengkuas menunjukkan kesan anti-pengoksidaan yang berkesan dengan melambatkan pengoksidaan lemak dan degradasi protein.