

EFFECTS OF SUPPLEMENTATION OF  
ADDITIONAL FEED WITH BANANA POWDER  
IN AN INTEGRATED CULTURE SYSTEM

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2007



**ENRICHMENT OF TILAPIA (*Oreochromis sp.*) ARTIFICIAL FEED WITH BANANA  
POWDER IN AN INTEGRATED CULTURED SYSTEM**

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**This project report is submitted in partial fulfillment of the requirement  
of the degree of Bachelor of Science in Agrotechnology (Aquaculture)**

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**2007**

**1100057952**

This project should be cited as:

Najmunddin-Alwi, M. M. 2007. Enrichment of tilapia (*Oreochromis sp.*) artificial feed with banana powder in an integrated cultured system. Undergraduate thesis, Bachelor of Science in Agrotechnology (Aquaculture), Faculty of Agrotechnology and Food Science, Universiti Malaysia Terengganu. 52p

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## ACKNOWLEDGEMENTS

First of all, thanks to Allah for all His blessing for me to finish this final year project. Without His guidance, I won't be able to complete this task successfully. I want to acknowledge many people that contribute to the success of this final year project.

My sincerely appreciate for ideas, supervisions, comments and guidance that Dr. Hamid Khoda Bakhsh as the supervisor gave. I particularly thank to my project partner, Mr. Fong with cooperation and kindness in completing this project together. I am also indebted Mr. Raja, Mr. Aziz, Tuan Haji Umar Salleh, Mr. Sharol, Mrs. Faridah and Mr. Johari who provided space and equipment for my project at freshwater hatchery and laboratory, also for giving some suggestions and comment to improve my project. Only God can pay back all your kindness and sincerity. I also want to express tones of thanks to Mr Shahreza and Mrs. Nur Asma for their guidance and suggestions.

I express my gratitude to my parents, Tuan Haji Mohamad Alwi Awang and Puan Hajjah Rafiaah Abdul Rahman for being so supportive and always praying for my success. My beloved siblings, Mrs. Illyana and Mr. Hafidz who always blew up the spirit throughout my study in UMT.

Special thanks to Zul Asyraf, Lokman Nor Hakim, Azhani, Suriani, Emy and all my colleagues for their support and encouragement. I really hope this study can present something useful in this field. May God bless all of us. Amen

## ABSTRACT

The experiment were conducted for 50 days using integrated culture between Tilapia, *Oreochromis sp.* and lettuce, *Lactuca sativa L.* in closed water recirculation system. This study was held to access the enrichment of Tilapia artificial feed with banana powder in an integrated tilapia-lettuce production system. Banana powder was selected as feed additive which was widely found and available around Malaysia and famous product from food processing industries. Treatment feed 1 was control feed, treatment feed 2 consist 10% banana powder, treatment feed 3 consist of 20% banana powder and treatment feed 4 consist 20% banana powder. For treatment 4 which powder of banana skin was replaced with banana powder (T4). The proximate analyses were done to access the nutrition content of banana powder, banana powder skin, treatment diet and fish tissue at the end of the experiment (feeding protocol). The total yields of the fish and lettuce were measured. From the results, addition of 10% of banana powder (T2) significantly increased the SGR of tilapia. The crude protein of the fish tissue was not significantly different among the treatments. A lettuce yield was also not significantly different between all treatments. Based on results, addition of 10% of banana powder can increase the growth rate of tilapia in an integrated culture system. Integrating culture between lettuce and tilapia is much profitable for commercial sectors and environmental conservation by using waste water and nutrients.

## ABSTRAK

Kajian ini dijalankan selama 50 hari menggunakan integrasi antara ikan Tilapia, *Oreochromis sp.* dan Salad, *Lactuca sativa L.* dalam sistem kitaran tertutup. Kajian ini dijalankan untuk menilai pengkayaan makanan buatan ikan Tilapia, *Oreochromis sp.* dengan tepung pisang di dalam sistem ternakan bersepadu antara kultur ikan tilapia-salad. Tepung pisang dipilih kerana ia mudah didapati di seluruh Malaysia dan produk popular dari industri pemprosesan makanan. Makanan rawatan 1 ialah kawalan, makanan rawatan 2 mengandungi 10% tepung pisang, makanan rawatan 3 mengandungi 20% tepung pisang dan makanan rawatan 4 mengandungi 20% tepung kulit pisang. Untuk makanan rawatan 4, tepung daripada kulit pisang menggantikan tepung pisang. Analisa proksimat dijalankan untuk menilai kandungan nutrisi tepung pisang, tepung kulit pisang, makanan rawatan dan fillet ikan selepas proktokol pemakanan. Daripada keputusan yang diperolehi, pertambahan 10% tepung pisang akan meningkatkan SGR ikan tilapia secara signifikan. Nilai protein mentah dalam tisu ikan tidak berbeza secara signifikan antara rawatan dengan rawatan yang lain. Hasil tuaian salad juga tidak berbeza secara signifikan antara rawatan. Berdasarkan kajian, pertambahan 10% tepung pisang boleh meningkatkan kadar tumbesaran ikan tilapia dalam sistem akuakultur bersepadu. Sistem bersepadu antara ikan tilapia dan salad juga menguntungkan untuk sektor komersil dan penjagaan alam sekitar melalui penggunaan air dan nutrien buangan.