A STUDY ON EFFICIENCY OF DIFFERENT TYPES OF BINDING AGENTS IN PRACTICAL DIET: EMPHASIZING ON WATER STABILITY AND NUTRIENT LEACHING

CHU CHEUN SIA

FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE
UNIVERSITY MALAYSIA TERENGGANU
2007

A study on efficiency of several types of binding agents in practical diet : emphasizing on water stability and nutrient leaching / Chu Cheuw Sia.

A STUDY ON EFFICIENCY OF SEVERAL TYPES OF BINDING AGENTS IN PRACTICAL DIET: EMPHASIZING ON WATER STABILITY AND NUTRIENT LEACHING

CHU CHEUW SIA

This project is submitted in partial fulfillment of the requirement of the degree of Bachelor of Applied Science (Fisheries)

FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE
UNIVERSITY MALAYSIA TERENGGANU
2007

This project report should be cited as:

Chu, C. S. 2007. A Study On Efficiency Of Several Types of Binding Agents In Practical Diet: Emphasizing on Water Stability and Nutrient Leaching. Undergraduate thesis, Bachelor of Applied Science (Fisheries Science), Faculty of Agrotechnology and Food Science, Universiti Malaysia Terengganu. 61 p.

ACKNOWLEDGEMENTS

I would like to take this opportunity to thank the following people who have made my thesis can be complete and able to pass up on time:

Mr. Masduki Mohd Morni, my final year project's supervisor, who has been very patient with me ever since I started with this project. I am very grateful for your guidance, advice and concern in this project. I would also like to thank you for resolving the problems encountered throughout the writing of this thesis. I hope the end result is similar to what you had envisioned.

Mr. Shahreza Md. Sheriff, our coordinator, who guides us in writing report and presentation. I am also very thankful for you to organize a lot of useful talk for us and give us enough time to complete it.

Freshwater's hatchery staff and lab assistant of lab MAF, I would like to express my thankful to Mr. Raja and Mr. Aziz who provides me the facilities needed during formulation pellets and also give me advice and guidance throughout the period of running this project at freshwater's hatchery. Furthermore, my sincere thanks also go to the lab assistants of the Anatomy and Physiology Lab (MAF), Mr. Sharul, Mr. Johari and Madame Faridah for taking some time off to guide me during the proximate analysis and handling my repeated requests for fine forceps and other instruments. Thank you for all the technical advice that you have given me.

My parents and friends, I would like to express my sincere thankful to my family for support me throughout the period of running this project. In addition, I would like to thank all the friends who have been encouraged me and cheering me on.

ACKNOWLEDGEMENTS

I would like to take this opportunity to thank the following people who have made my thesis can be complete and able to pass up on time:

Mr. Masduki Mohd Morni, my final year project's supervisor, who has been very patient with me ever since I started with this project. I am very grateful for your guidance, advice and concern in this project. I would also like to thank you for resolving the problems encountered throughout the writing of this thesis. I hope the end result is similar to what you had envisioned.

Mr. Shahreza Md. Sheriff, our coordinator, who guides us in writing report and presentation. I am also very thankful for you to organize a lot of useful talk for us and give us enough time to complete it.

Freshwater's hatchery staff and lab assistant of lab MAF, I would like to express my thankful to Mr. Raja and Mr. Aziz who provides me the facilities needed during formulation pellets and also give me advice and guidance throughout the period of running this project at freshwater's hatchery. Furthermore, my sincere thanks also go to the lab assistants of the Anatomy and Physiology Lab (MAF), Mr. Sharul, Mr. Johari and Madame Faridah for taking some time off to guide me during the proximate analysis and handling my repeated requests for fine forceps and other instruments. Thank you for all the technical advice that you have given me.

My parents and friends, I would like to express my sincere thankful to my family for support me throughout the period of running this project. In addition, I would like to thank all the friends who have been encouraged me and cheering me on.

ABSTRACT

This experiment was conducted to assess the water stability and nutrient leaching of a practical diet manufactured with various flour binding source (durian seed flour, wheat flour, corn flour and tapioca flour). They were included at 20% of total ingredient weight and tested with equal ingredient weight to water volume. The water stability (% lost of dry matter) and nutrient leaching (% protein remaining) after being immersed in distilled water for 10 minutes was calculated. All the data of binding sources, treatment diets, water stability and nutrient leaching were analyzed with one-way ANOVA and the differences between treatment means were determined by the Tukey HSD test and significant at level $P< 0.05$. The analysis revealed that the pellets formulated by using durian seed flour as binding sources shows the lowest rate of dry matter loss (best water stability) which is only 3.38% and the diet with tapioca flour shows the lowest water stability (8.38% lost of dry matter). Diet durian seed flour is significantly different with three other treatment diet ($P<0.05$), while three of the diet is no significant different. Results indicated that pellets formulated by using corn flour retained significantly ($P < 0.05$) more protein than other binding sources where this diet still contain 90.31% of initial protein content which is higher than diet tapioca flour (83.92%), diet durian seed flour (66.78%) and diet wheat flour (54.94%). Results also reported that fiber content and carbohydrate (in starch form) can increase the binding water capacity of pellets, while protein content might give an adverse effect to the stability of pellets. As a conclusion, it is suggested that corn flour is the suitable binding sources that should use commercially for fish or shrimp feed due to the lowest nutrient leaching and good binding water capacity. However, price of the flour should take into consideration.