ISBN 978-602-6204-25-7

ISPHE
INTERNATIONAL SEMINAR
PUBLIC HEALTH EDUCATION

PROCEEDINGS

"EDUCATIONAL CHALLENGES AND STRATEGIES OF HIGHER EDUCATION IN HEALTH ACHIEVEMENT OF SDGS 2030"

Hotel Damhil UNG, Gorontalo City, Sept 27th 2017

BOOK 3

SUSTAINABLE DEVELOPMENT GOALS

PUBLIC HEALTH DEPARTMENT
SPORT AND HEALTH FACULTY
GORONTALO STATE UNIVERSITY

THIRD INTERNATIONAL SEMINAR ON PUBLIC HEALTH AND EDUCATION (ISPHE) PROCEEDINGS
Public Health Department, Sport and Health Faculty, Gorontalo State University

Published by

Public Health Department Sport and Health Faculty Gorontalo State University
Gorontalo City, Gorontalo Province, 96128 Email: Kesmasung2017@gmail.com
Telp. – Fax. +628435821698

First published in September 2017

Editor	: Sri Manovita Pateda, Rani Hiola, Oktia Woro K.H., Kukiat Tudpor, Febi Dwirahmadi, Kraicat
Manuscript Team	: Lilyandra Pobela, Dessy Nur Anggriani Deu, Rahayu Putri Veybe M. Yantu, Selvi Ahmad, Christian J. Ottay, Novalin Bau, Mei Bobihu.
Layout	: Lilyandra Pobela
Cover Design	: Fery Fadly M. Umar

Library cataloguing in Publication Data:
Third International Seminar on Public Health and Education (ISPHE) Proceedings published the Public Health Department, Sport and Health Faculty, Gorontalo State University – includes bibliographical references.
Series ISBN 978-602-6204-25-7

Distributed by :

Public Health Department Sports and Health Faculty Gorontalo State University
Gorontalo City, Gorontalo Province, 96128 Email: kesmasung2017@gmail.com
Telp. – Fax.+628435821698

PREFACE

Assalamu'alaikum warrahmatullahi wabarakatuh

Firstly, may we made our highest praise and thank to Allah The Almighty, for His bless so what we are able to conduct such an precious moment; Third International Seminar on Public Health and Education 2017 in Gorontalo Indonesia, to share our knowledge and ideas with so much warm and friendship from worldwide public health and education community.

International Seminar on Public Health and Education 2017 is aimed to gather all of experts, researchers, academiciansand practitioners in health education field in general as well as national and international level in one prestigious academic forum which to discuss all health-education-related issues, ranging from human resources, curriculum, institusionalization ect. The seminar also proposed to contribute to the focus of health development direction; by considering also situation and the status of local health condition from each region, both national and regional levels as well as its relation to global health trends.

I would like to deliver our highest respect and appreciation to our honorable speakers, Dr. Jihane Tawilah (WHO Indonesia Representative), Prof. Dr. dr. Oktia Woro K.H.,M.Kes (Keynote Speaker from Semarang State University), Febi Dwirahmadi, SKM, MSc.PH, PhD (Centre of Environment and Population Health School of Medicine, Griffith University, Australia), Prof. Kraichat Tantrakarnapa (Mahidol University), and Dr. Kukiat Tudpor, PhD (Mahasarakham University). I really expect that this seminar will be beneficial for all of us and to the development of the Public Health and Education field.

Allow me to express my gratitude to the participants and audiences from Indonesia and other foreign countries who are enthusiastic in attending this seminar. I do hope that all audiences will gain important values and collaborate it into our fields and make significant changes in the future. Besides that, I also

convey my appreciation to all of organizing committee who has given their outstanding commitment for presenting this occasion.

Wassalamu’alaikum warrahmatullahi wabarakatuh

Content

ORAL PRESENTATIONS

ORAL PRESENTATIONS

CHANGES OF AMINO ACID CONTENT IN MANGGABAI FISH OF FERMENTATION RESULTS

Faiza A. Dali*, Rita Marsuci Harmain

Teknologi Hasil Perikanan, Fakultas Perikanan dan Ilmu Kelautan, Universitas Negeri Gorontalo, Jalan Jenderal Sudirman No. 6 Kota Gorontalo, 96128 Gorontalo
Telp (0435) 821125, Faks (0435) 821752

*Korenspondensi: dali.faiza@yahoo.co.id

Abstract

This study aims to determine the content of amino acids in fresh manggabai fish and fermented products. Manggabai fresh fish obtained from fishermen in the waters of Limboto lake, Gorontalo. Manggabai fish washed, cut into small pieces then fermented with 15% salt mixture, 20% and 40% carbohydrates for 15 days anaerobically at ± 45 ºC. Amino acid testing was performed on fresh manggabai fish and dried fermented products. Test results obtained that fresh manggabai fish and fermented products contain the highest amino acids in glutamic acid and the lowest in histidine. Levels of amino acids contained in manggabai fish increased after the fermentation process with carbohydrate 20%. The existence of fermentation technology can increase the nutritional value of manggabai fish. The amino acid content decreases in value after fermented 40% carbohydrate.

Keywords: manggabai fish, Limboto lake, salt, carbohydrate

PRELIMINARY

Foods that have many benefits for human health include fish. Currently the Indonesian people have a consumptive nature of fish, due to the nutritional content of fish, especially proteins that are needed to stabilize the performance of the human body. Fish meat has shorter protein fibers than protein fibers of chicken and beef.

Fish protein content of 15-25% w / w composed of amino acids. The content of amino acids in fish meat varies depending on the type of fish. One of the freshwater fish that people love Gorontalo is manggabai fish, living in the waters of Lake Limboto. Suryandari and Krismono (2011) stated that biologically manggabai fish are carnivorous fish and spawn more than once a year. Gorontalo people consume manggabai fish in the form of fried foods, broth or baked. Utilization of mangabai fish to be a variety of food has not been optimally done, especially to avoid fish from decay.

Fermentation includes processing technology in preserving fish by utilizing enzymes in fish tissues and microorganisms. During the fermentation process the food will undergo changes in physical and chemical properties. Fermented food products made from fish, for example in Indonesia, namely bakasang (Yanti and Dali 2013), former (Nuraini et al 2014), peda (Thariq et al 2014), terasi (Suwandi et al 2017). Fish fermented products are also found outside of Indonesia, for example in India called Lona ilish (Majumbar and Basu 2010).

Carbohydrate sources for the fermentation process are limited in the fish body, so additional carbohydrates are needed from the outside. Carbohydrates in the fish body mostly in the form of polysaccharides is glycogen. Kalista et al. (2012) states that the amylopectin content in rice flour is lower than other carbohydrate sources, so the bacteria more easily use it as a medium for growth of BAL and better fermentation results. Carbohydrates, protein and fat in fish is a medium used as a source of nutrients for microorganisms that play a role in the process of fermentation. The fermentation process is influenced by several factors such as acid, temperature and oxygen (aerob or anaerob). This study was conducted with the aim of knowing the amino acid content in fresh mangabai fish and fermented products.

METHOD

Tools and materials

The equipment used in this study includes incubators, ovens, scales, large basins, knives, cutting boards, gloves and masks. The materials used, namely fresh manggabai fish purchased directly to fishermen on the coast of Limboto lake, salt and carbohydrates.

Research procedure

The fresh manggabai fish are washed with ice water, then the fish is drained, cut into small pieces to facilitate the process of mixing the ingredients. The fish was then weighed, then mixed with 15% salt and 20% floured carbohydrate (C) and 40% (D) of the starchy carbohydrate. After mixing the ingredients, the sample was put into a sealed container and incubated at ± 45 º C for 7 days, then dried at 60 ºC for 8-12 hours, then fermented again for 8 days.

Fresh mangabai fish and fermented products were then tested for amino acid content. Test method for amino acid content in mangabai fish using HPLC (High Performance Liquid Chromatogrphy).

RESULTS AND DISCUSSION

Amino Acid Fish Manggabai Fresh

The non essential content of amino acids in raw mangabai fish feedstock showed that the highest level was glutamic acid of 1.6%, followed by aspartic acid 0.97%, while the lowest value in tyrosine was 0.32%. The highest essential amino acid content in lysine and the lowest in histidine.

Maggabai fish have glutamic acid that can be used as a flavoring agent, as well as aspartic acid. Mouritsen (2012), reported amino acids aspartate can provide a savory taste (umami) after the amino acid glutamate.

Fermented Amino Acid

Fermentation of mangabai fish with 15% salt and 20% carbohydrate (C treatment) shows differences in amino acid levels. The highest non essential essential amino acid content in glutamic acid was 3.41% and the lowest in serine was 0.76%, while the highest essential amino acid in leucine was 1.62% and the lowest in histidine was 0.29%.

Treatment with 40% carbohydrate (D) showed changes in amino acid levels after fermentation. Non essential essential amino acids have the highest value on glutamic acid of 3.17% and the lowest in serine is 0.64%, while the highest essential amino acid in leucine is 1.57% and the lowest in histidine is 0.31%.

Fresh mangabai fish and fermented products obtain varying amino acid values. The nutritional value of amino acids is increased through the fermentation process can provide added value to mangabai fish for consumption. Pawiroharsono (2007), explains the benefits of fermented food products such as the value of nutritional food increased due to the formation of new nutrient compounds metabolism results. The results of the analysis can be seen in Table 1.

Table 1. Amino Acid Content In Maggabai Fish

Asam Amino	Manggabai (%)		
Non esensial :	Manggabai Segar	C (20%)	D (40%)
Asam Aspartat	0,97	1,84	1,73
Asam Glutamat	1,6	3,41	3,17
Alanin	0,64	1,45	1,15
Glisin	0,5	1,17	0,77
Serin	0,39	0,76	0,64
Tirosin	0,32	0,99	1,02
Esensial :			
Arginin	0,57	0,84	0,74

Histidin	0,19	0,29	0,31
Isoleusin	0,45	1,12	1,09
Leusin	0,77	1,62	1,57
Lisin	0,88	1,15	1,11
Metionin	0,29	0,54	0,6
Penilalanin	0,42	1,04	0,97
Treonin	0,37	0,64	0,61
Valin	0,47	1,25	1,23

Graphically the Amino Acid Content in Manggabai Fish is fresh, the fermentation of C (20%) and D (40%) both non essential and essential can be shown in Figure 1.

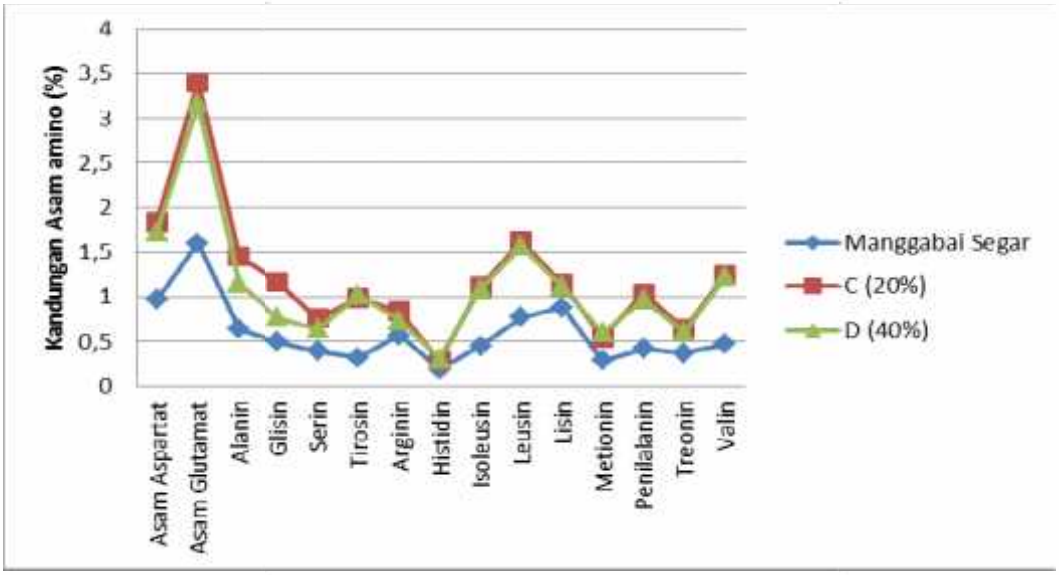

Figure 1. Amino Acids content in fresh Manggabai fish, fermented C (20%) and D (40%)

CONCLUSION

Changes in amino acid levels contained in mangabai fish occur in the presence of fermentation technology. The fresh mangabai fish and fermented yields of amino acids vary with the highest levels of glutamic acid and the lowest in histidine. Fish manggabai after fermented with 20% carbohydrate, the value of amino acid nutrition has increased.

THANK-YOU NOTE

Thanks to the UNG Research Institute and the RISTEK DIKTI Ministry for the support of the Competitive Grants scheme.

BIBLIOGRAPHY

Kalista A, Supriadi A, Rachmawati SH. 2012. Bekasem ikan lele dumbo (Clarias gariepinus) dengan penggunaan sumber karbohidrat yang berbeda. *FishtecH* 1(1):102-110.

Majumbar RK, Basu S. 2010. Characterization of the traditional fermented fish product of *Lona ilish* of Northeast India. *Indian Journal of Traditional Knowledge* 9 (3): 453-458.

Mouritsen AG. 2012. Umami flavour as a means of regulating food intake and improving nutrition and health. *Nutrition and Health* 21 (1):56-75.

Nuraini A, Ibrahim R dan Rianingsih L. 2014. Pengaruh penambahan konsentrasi sumber karbohidrat dari nasi dan gula merah yang berbeda terhadap mutu bekasam ikan nila merah (Oreochromis niloticus). *Jurnal Saintek Perikanan* 10 (1): 19-25.

Pawiroharsono S. 2007. Potensi pengembangan industri dan bioekonomi berbasis makanan fermentasi tradisional. *Jurnal Ilmu Kefarmasian Indonesia* 5 (2): 85-91.

Thariq AS, Swastawati S, Surti T. 2014. Pengaruh perbedaan konsentrasi garam pada peda ikan kembung (*Rastrelliger neglectus*) terhadap kandungan asam glutamat pemberi rasa gurih (*umami*). *Jurnal Pengolahan dan Bioteknologi Hasil Perikanan* 3 (3): 104-111.

Suryandari A dan Krismono. 2011. Beberapa aspek biologi ikan manggabai (Glossogobius giuris) di danau Limboto, Gorontalo. *Bawal* 3 (5): 329-336.

Suwandi, Rohanah A, Rindang A. 2017. Uji komposisi bahan baku terasi dengan menggunakan alat pencetak terasi. *Jurnal Rekayasa Pangan dan Pertanian* 5 (1): 196-201.

Yanti DIW dan Dali FA. 2013. Karakterisasi bakterim asam laktat yang diisolasi selama fermentasi bakasang. *Jurnal Pengolahan Hasil Perikanan Indonesia* 16 (2):132-140.

ISPHE

INTERNATIONAL SEMINAR
PUBLIC HEALTH EDUCATION

ISBN 978-602-6204-25-7