ICTAFF 2018

International Conference on Tropical Agrifood, Feed, and Fuel

Sustainability of Food, Feed, and Fuel Tropical Resources for Quality Future

PROCEEDING

Samarinda, 13-14 November 2018
MESRA Bussines Hotel

PROCEEDING

INTERNATIONAL CONFERENCE ON TROPICAL AGRIFOOD, FEED, AND FUEL (ICTAFF) : SUSTAINABILITY OF FOOD, FEED, AND FUEL TROPICAL RESOURCES FOR QUALITY FUTURE

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Department of Agricultural Products Technology
Agriculture Faculty, Mulawarman University
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PREFACE

The greatest regards should be expressed only to God the Almighty, Allah SWT. We have finished the Proceeding book of International Conference on Tropical Agrifood, Feed, and Fuel (ICTAFF) after the conference which was held on 13-14 November 2018 in Mesra bussines Hotel Samarinda.

The conference takes "Sustainability of Tropical Food, Feed, and Fuel Tropical Resources for Quality Future" as the main theme.This international conference is aimed at resolving problems and bringing together scientists, researchers, professionals, and students from multidisciplinary agriculture-related fields to share the latest findings or ongoing research activities.

There are 6 sub themes emphasized in the ICTAFF 2018, including halal, safe, and healthy food, improving quality food and nutrition, security and sustainability food and agriculture, innovation in feed technology to increase animal production, sustainable and renewable fuels based on tropical resources, and empowering of agribusiness based on community.

We would like to thank all keynote speakers for their contributions to the Conference, they are Asst. Prof. Dr. Somsak Maneepong from Walailak University Thailand, Prof. Xuming Huang from South China Agricultural University, Prof. Irwandi Jaswir from International Islamic University Malaysia (IIUM), Prof. Ali Agus from Gadjah Mada University, Dr. Dadan Rohdiana from Research Institute of Tea and Cinchona Indonesia, and Widi Sunaryo, Ph.D from Mulawarman University Indonesia.

Finally, we would like to thanks all of the proceeding team who have dedicated their constant supports and countless time to bring these scratches into a book. The ICTAFF 2018 proceeding is a credit to a large group of people, and everyone should be proud of the outcome.

Editors

Welcome Speech

Welcome Note From ICTAFF 2018 Committee

Assalamu'alaikum Warahmatullah Wabarakatuh

I would like to express the greatest regard to the Almighty God, Allah Subhanallahi Wa Ta'ala, for the Successful of International Conference of Food, Feed and Fuel 2018. I also would like to welcome all the audiences to Samarinda Kota Tepian.

Food security is very important to strengthen and support sustainable development in agriculture. Food, not only from plant but also from animal, should be available for all resident of Indonesia. It is urgent to provide quality feed to support food animal development to fulfill people needs of nutrition.

We would like to report that about sixty participants are attending the conference. Researcher and lecturer from some universities and research institutions will disseminate their research in this conference.This number is beyond our expectation when we were arranging the conference.

This conference will present international speakers from Wailailak University, Associate Professor Somsak Maneepong, Prof. Irwandi Jaswir from International Islamic University of Malaysia, Prof Xuming Huang from South China Agricultural University, Prof Ali Agus from Gadjah Mada University, Dr. Dadan Rohdiana from Research Institute of Tea and Cinchona Indonesia, and last but not least, Widi Sunaryo, Ph.D from Mulawarman University.

The morning session is designed to keynote speeches and the afternoon session is for parallel sessions. The parallel sessions will be focused into six topics: Halal, safe and healthy food; Security and sustainability of food and agriculture; Innovation in feed technology to increase animal production; Sustainable and Renewable fuel based on tropical resources; and Empowering of agribusiness based on community.

Faculty of Agriculture as conference organizer would like to thank Agrivita, the Journal of Agricultural Science on an agreement for publication of the selected papers from ICTAFF participants, and special thank Dr. Haviludin for helping our communication to the agreement. I also would like to thank to STIPER Kutai Timur, especially Prof. Juraemi, for cooperation in organizing and special thanks to PT. Kaltim Prima Coal and PT. Pupuk Kaltim for strong support to this conference.

We hope you will enjoy the tropical climate as long as staying in Samarinda. Thank you

Wassalamu'alaikum Warahmatullah Wabarakatuh

Committee,

Aswita Emmawati
Chairman

CONTENTS

THE EFFECT OF FORMULATION OF BAUNG FISH MEAT (*Mystus nemurus*) AND WHITE OYSTER MUSHROOM (*Pleurotus ostreatus*) ON CHEMICAL AND SENSORY CHARACTERISTICS OF AMPLANG

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ABSTRACT

Amplang is one of the traditional snacks made from fish and is widely produced in East Kalimantan. Amplang processing using Baung fish and white oyster mushrooms is one form of modification in amplang processing. The aim of this study was to determine the effect of baung fish and white oyster mushroom formulations on chemical and sensory properties of amplang and to obtain the right formulation. The study used a Completely Randomized Design using a formulation of meat formulations of baung fish and white oyster mushrooms consisting of (100: 0), (90:10), (80:20), (70:30), (60:40) and (50:50) and repeated three times with proximate test and organoleptic test parameters. The results showed that the formulation of baung fish and white oyster mushroom significantly affected the moisture content, ash content, fat content, protein content, and carbohydrate content. Treatment with meat formulations of baung fish and white oyster mushrooms on 90:10 concentration gave the best results on moisture, ash, protein, fat, and carbohydrate contents are 1.38%, 20.86%, 33.05%, 43.37% in mg/100 g of ingredients, respectively. Meanwhile, a sensory test of color, flavor, texture, and taste are white cream (very like), slightly aromatic of baung fish (like), crunchy texture (like) and a slight taste of baung fish (like).

Keywords: baung fish, white oyster mushroom, amplang

INTRODUCTION

Amplang is one of the traditional snacks made from fish by adding tapioca flour and herbs that are widely produced in East Kalimantan. Generally processed from belida fish and mackerel fish. The use of other types of fish can also be used like baung fish. Baung fish is a fish native to Indonesian waters that are found on the Mahakam river. The characteristics of baung fish have a taste that is tastier and more savory with fairly high nutrient content, especially in proteins of 18.43% and low-fat content of 4.93% (Mesomya, et al., 2002). In addition, it is necessary to process envelopes by adding vegetable ingredients as a form of food diversification. Vegetable material that can be used is white oyster mushroom as a form of modification in the processing of envelopes. White oyster mushroom is one source of vegetable protein that has organoleptic characteristics with a savory flavor that has been applied in cracker processing (Nuraini, et al 2015). The aim of this study was to determine the effect of the formulation of baung fish and white oyster mushroom on the chemical and sensory properties of the envelope and to obtain the right formulation.

MATERIAL AND METHODS

Materials and tools

Materials for making amplang consisted of baung obtained from Tenggarong sub-district, Kutai Kartenegara district, white oyster mushrooms obtained from farmers in Samarinda City, tapioca flour, chicken eggs, garlic, salt, sugar, powdered pepper, baking soda, and cooking oil. Chemicals for H_2SO_4, NaOH, $Na_2S_2O_3$, zinc granules, H_3BO_3, indicators of methyl red and blue, HCl, petroleum ether, NaOH, and ethanol 96%. Chemicals for analysis such as H_2SO_4, NaOH, $Na_2S_2O_3$, zinc granules, H_3BO_3, indicators of methyl red and blue, HCl, petroleum ether, NaOH, and 96% ethanol were obtained from Riedel Haen.

The equipment for making amplang used consists of knives, basins, pans, blenders, stirrers, pans, stoves and analytical scales. Protein measurements using Kjeldahl, water content using an oven (Sanyo model MOV-212F, Japan), ash content using furnaces and soxhlet apparatus for fat analysis.

Research design

The study used a single factor study which was compiled in a Completely Randomized

Design (CRD) with six levels of treatment and repeated three times. These factors are the formulation of baung fish with white oyster mushrooms in making envelopes with levels (100:0), (90:10), (80:20), (70: 30), (60:40) and (50:50)) The observational parameters consisted of chemical properties including water content, ash content, protein content, fat content (Sudarmadji et al., 2010), carbohydrate levels (Winarno, 1997) and hedonic sensory properties and hedonic quality for color, aroma, texture, and taste (Susiwi, 2009). Data for chemical properties were analyzed using variance followed by the Smallest Significant Difference test at α 5%, for treatment of each parameter that showed significant differences while for data sensory properties through the measure of data concentration using mode.

Research procedure

Preparation of Baung Fish Meat

Baung fish meat is prepared by washing with running water and continued by separating the contents of the stomach, head, and bones. Baung fish meat is given orange juice to remove fishy odor then wash again until clean. Followed by smoothing using a blender.

Preparation of White Oyster Mushrooms

Fresh white oyster mushrooms are cleaned by washing running water then boiling for 5 minutes at 90oC. Oyster mushrooms are cut and then mashed with a blender.

Processing of Amplang

Amplang processing is done by mixing baung fish and white oyster herbs and adding 1 g of salt, 20 g of sugar, 0.5 g of pepper powder, 5 g of garlic, 36 ml of water, 25 g of egg, and 0.25 g of baking soda stirred and add 200 g tapioca flour until it mixes into a smooth mixture. The dough is printed elongated and cut to ± 5 cm in size. Frying was done at 120ºC for 30 minutes with a volume of 1 L cooking oil.

RESULT AND DISCUSSION

Chemical Characteristics of Amplang

The formulation of baung fish and white oyster mushroom in envelope processing has a significant effect on all chemical parameters. The chemical characteristics of amplang are presented in Table 1.

Table 1. Effect of baung and white oyster mushroom meat formulations on chemical characteristics of amplang.

Baung fish meat formulation: white oyster mushroom (g)	Parameter (%)				
	Moisture	Ash	Protein	Fat	Carbohydrate
(100:0)	1,27±0,01 d	1,22±0,01 d	19.81± 0,68 a	34,85±0,26 a	42.83±0,88 d
(90:10)	1,33±0,02 d	1,38±0,03cd	20.86±0,31 a	33,05±0,93 b	43.37±0,68 d
(80:20)	1,64±0,04 c	1,53±0,04 c	16.63±0,88 b	31,92±1,37 b	47.89±1,67 c
(70:30)	1,83±0,05 b	1,77±0,07 b	13.13±0,88cd	32,14±0,26 b	51.11±0,96 b
(60:40)	2,30±0,07 a	2,08±0,08a	14.00±0,88 c	30,31±0,24 c	51.29±0,98 b
(50:50)	2,33±0,11 a	2,16±0,24 a	12.25± 0,88d	28,85±0,10 d	54.38±0,77 a

Description: data on the same lane, followed by the same letter shows no significant difference based on the smallest real difference test (LSD) at the level of α 5%

Moisture content

The highest water content in the envelope was in the formulation treatment of baung and oyster mushroom (50:50) fish which was 2.33 ± 0.11. Increased water content tends to rise along with the number of white oyster mushrooms used in the formulation. The increase in water content was caused by white oyster mushrooms having a high fiber content of 39.8% (Sumarsih, 2015) which can absorb water because it is hydrophobic (Surono et al, 2016). This is in line with Iqbal (2017), that the amplang made from African catfish with the addition of seaweed will produce high fiber content which affects the increase in water content in amplang products. Based on the quality and safety requirements of the fish envelope (SNI 7762-2013) the maximum fish water content of the fish envelope is 4%. This shows that the amplang water content of the formulation of baung and white oyster mushrooms all treatments have met the SNI standard for fish species (1.27 ± 0.01-2.33 ± 0.11%).

Ash content

The results of the analysis show that the ash content is higher along with the number of white oyster mushrooms formulated in making amplang. The lowest ash content was obtained

from the formulation of baung and oyster mushroom (0: 100), which was 1.22 ± 0.01 and the highest in the formulation (50:50) of 2.16 ± 0.24%. This is consistent with the statement of Astuti et al. (2016) that ash content tends to increase with the increasing number of oyster mushrooms added to the processing of crackers with the formulation of white oyster mushrooms and tapioca. This is supported by Suriawiria (2002) which states that the oyster mushroom ash content is 9.3%, greater than the ash content of baung which is only 0.59% (Mesomya et al, 2002). Based on the quality and safety requirements of fish amplang (SNI 7762-2013) the maximum fish ash content is 5%. This shows that the amplang ash content of the formulation of baung and white oyster mushrooms in the treatment of all treatments met the SNI standard for fish species (1.22 ± 0.01-2.16 ± 0.24%).

Protein Levels

The highest protein content in the amplang is in the formulation of white baung and oyster mushroom meat (90:10) which is 20.86 ± 0.31% which is not significantly different from the treatment (100: 0) which is 19.81 ± 0.68%. These protein levels tend to fall along with the number of white oyster mushrooms used in the formulation. This is caused by the level of baung fish protein 18.43% (Mesomya et al, 2002) greater than the level of white oyster mushroom protein (10.5%), Suwito (2006). Based on the requirements of the quality and safety of the fish envelope (SNI 7762-2013) the minimum level of fish envelope protein is 7%. This shows that the levels of envelope protein formulations of baung and white oyster mushrooms in the treatment of all treatments met the SNI standard for fish species (12.25 ± 0.88 -19.81 ± 0.68%).

Fat level

The fat content produced on the envelope with the formulation of white baung and oyster mushroom meat ranged from 28.85 ± 0.10 to 34.85 ± 0.26%. Based on the results of the analysis, fat levels tend to decrease along with the increasing number of white oyster mushrooms used in the formulation. This is caused by the content of the raw material of white oyster mushrooms having a lower fat content of 1.70% (Sumarmi, 2006) compared to baung which has a higher fat content of 4.93% (Mesomya, et al., 2002). . Based on the requirements of quality and safety of fish envelope (SNI 7762-2013) the maximum fish fat content is 35%. This shows that the level of envelope fat in the formulation of baung and white oyster mushrooms in all treatments met the SNI standards for fish (28.85 ± 0.10 - 34.85 ± 0.26%).

Table 2. Effect of baung and white oyster mushroom meat formulations on the sensory characteristics of amplang.

Sensory characteristics		Baung fish formulation: white oyster mushroom (g)					
		100:0	90:10	80:20	70:30	60:40	50:50
		Modus/ Persentase (%)	Modus/ Persentase (%)	Modus/ Persentase (%)	Modus/ Persentase (%)	Modus/ Persentase (%)	Modus/ Persentase (%)
Hedonic	Aroma	4(46.67)	4(50.67)	4(56.00)	4(45.33)	4(45.33)	4(52.00)
	Color	4(46.67)	5(50.67)	4(41.33)	3(41.33)	3(44.00)	3(37.33)
	Texture	4(40.00)	4(48.00)	3(42.67)	4(36.67)	3(41.33)	3(36.00)
	Taste	4(38.67)	4(53.3)	4(45.33)	4(48.00)	4(46.67)	4(49.33)
Hedonic quality	Aroma	4(48.00)	4(49.33)	3(48.00)	3(40.00)	2(41.33)	1(36.00)
	Color	5(74.67)	5(92.00)	4(70.67)	3(37.33)	3(38.67)	2(33.33)
	Texture	4(40.00)	4(45.33)	4(42.67)	3(38.67)	3(37.33)	3(36.00)
	Taste	2(58.67)	4(57.33)	4(52.00)	4(42.67)	4(38.67)	4(36.00)

Description: *Hedonic scale score, 5:Very like, 4:like, 3:Rather like, 2:Don't like, 1:Very not like it;Hedonic quality scale scent score, 5:Bearoma Fish baung, 4:A little scented fish baung, 3:Neutral, 2:Scented with mushrooms oysters, 1:A little flavorful oyster mushroom;Hedonic quality scale score, 5:White Cream, 4:A little brown young, 3:Rather brown, 2:Chocolate, 1:Very brown;Hedonic quality scale texture score, 5:Very crispy, 4:crispy, 3:somewhat crispy, 2:No crispy, 5:Very not crunchy;Hedonic quality scale taste score, 5:Fish taste baung, 4:Somewhat taste baung fish, 3:Neutral, 2:Mushroom, taste oysters, 5:A little taste baung fish*.

Carbohydrate Levels

Carbohydrate levels based on the calculation by the difference obtained the highest results in the treatment of formulations of fish baung and oyster mushroom (50:50) of 54.38 ± 0.77% while the lowest was obtained in the formulation (0: 100) which was 42.83 ± 0.88. The high carbohydrate content in the formulation of baung and white oyster mushroom (50:50) is caused by the number of white oyster mushrooms added more compared to other treatments. In accordance with Sumarmi (2006) which states that white oyster mushrooms contain carbohydrates which are quite high at 56.6%.

Sensory characteristics of Amplang

The sensory characteristics of amplang are one of the parameters to find out that the received power is subjectively tested by panelists through hedonic testing and hedonic quality. The results of statistical tests through the measure of data concentration using the mode are presented in Table 2.

Aroma

Based on the hedonic test results and the hedonic quality of the amplang aroma with the formulation of baung and white oyster mushroom meat from all the treatments the panelists favored. Panelists gave the highest response to the treatment of formulations of baung and oyster mushrooms (80:20) with a percentage of 56%. The aroma produced through the hedonic quality test is neutral with a percentage of 48% mode.

Color

The color of the envelope is one of the main sensory characteristics and is the first consideration in choosing a product. Based on the results of the hedonic test, the highest response of the panelists to the envelope was in the formulation of white baung and oyster mushroom fish (90:20), which were very fond of the percentage of 50.67% with a creamy white hedonic quality value of 92.00%. This is due to the least addition of white oyster mushrooms. The higher the number of oyster mushrooms added to each formulation, the more the color will turn brown. The brown color is formed because there is a Maillard reaction due to a reaction between reducing sugars and amino acids during the heating process.

Texture

The hedonic value of the texture that gives the highest level of acceptance of the envelope is in the formulation of white baung and oyster mushroom (90:10) i.e. liking (4) of 48% with hedonic quality on the crispy scale (4) with a percentage of 45%.

This is influenced by the moisture content of the resulting amplang. Amplang tends to be high in water content with higher fungi added to each formulation. According to Muchtadi et al (1988), the high water content in the material will hinder the product development process, so the resulting texture becomes less dry and less crispy.

Taste

The highest response of the panelists to the taste of the envelope was in the formulation of baung and oyster mushroom fish (90:10) on the liking scale (4) with a percentage of 53.33% with a hedonic quality value of oyster mushroom flavor (4). The addition of oyster mushrooms will produce a more preferred taste because white oyster mushrooms contain glutamate amino acid which is 0.94% bb (Tjokrokusumo, 2008). Natural glutamic acid in mushrooms gives the same delicious taste like meat.

CONCLUSIONS

The results showed that the formulation of baung and oyster mushroom fish had a significant effect on water content, ash content, protein content, fat content, and amplang carbohydrate content. Formulations of baung and oyster mushroom (90:10) provide the best results based on organoleptic testing and meet SNI standards with water content 1.33 ± 0.02%, ash content 1.38 ± 0.03%, protein content 20.86 ± 0.31%, fat content 33.05 ± 0.93 %, carbohydrate content 43.37 ± 0.68%. The hedonic assessment of aroma, texture, and taste is like and color is very like with the quality of hedonic rather scented with baung, creamy white, crunchy texture and the taste of oyster mushrooms.

REFERENCES

Astuti S., A.S. Suharyono, dan Fitra, N. 2016. Pengaruh Formulasi Jamur Tiram Putih (*Pleurotus oestreatus*) dan Tapioka Terhadap Sifat Fisik, Organoleptik, dan Kimia Kerupuk. *Jurnal Penelitian Pertanian Terapan Vol. 16 (3): 163-173. ISSN 1410-5020*

Iqbal, M. 2017. Pengaruh Penambahan Rumput Laut (*Eucheuma cottoni*) Terhadap Karakteristik Kimia Dan Sensoris Amplang Ikan Lele Dumbo (*Clarias gariepinus*). *Skripsi*. Jurusan Teknologi Hasil Pertanian Fakultas Pertanian Universitas Mulawarman. Samarinda.

Mesomya, W., Cuptapun, Y., Jittanoona, P., Hangsawadi, D., Boonvisut, B., Huttayanon, P., Sriwatana, W. 2002.

Nutritional Evaluations of Green Catfish (*Mystus nemurus*). *J. (Nat,Sci.) 36-74*.

Muchtadi, T.R., P. Hariadi dan A.B. Aliya. 1988. Teknologi Pemasakan Ekstruksi. Institut Pertanian Bogor. Bogor.

Nurainy, F., Sugiharto,R., Sari, D.W. 2015. Pengaruh Perbandingan Tepung Tapioka dan Tepung Jamur Tiram Putih *(Pleurotus ostreatus)* Terhadap Volume Pengembangan, Kadar Protein Dan Organoleptik Kerupuk. *Jurnal Teknologi Industri & Hasil Pertanian*. *Vol. 20 No.1*.

Badan Standardisasi Nasional. (1996). Standar Nasional Indonesia: Syarat Mutu Amplang Ikan (SNI -7762-2013). Jakarta. Badan Standardisasi Nasional.

Sudarmadji, S., B, Haryono., dan Suhardi. 2010. *Analisi Bahan Makanan Dan Pertanian*. Liberty. Yogjakarta.

Sumarmi, 2006. Botani dan Tinjauan Gizi Jamur Tiram Putih. *Jurnal Inovasi Pertanian*. 4(2) : 124-130.

Surono, Suyatno, Muchsiri, M.2016. Pengaruh Perbandingan Jamur Tiram Putih (*Pleurotus ostreatus* Jacq) dan Tepung Tapioka Terhadap Karateristik Fisika, Kimia Pada Organoleptik Pempek Jamur Tiram. Edible : Jurnal Penelitian Ilmu-ilmu dan Teknologi Pangan *1 : 8 – 13*

Susiwi, S. 2009. Penilaian Organoleptik. Jurusan Pendidikan Kimia. Universitas Pendidikan Indonesia. Bandung

Tjokrokusumo, D. 2008. Jamur Tiram (*Pleorotus ostreatus*) untuk Meningkatkan Ketahanan Pangan dan Rehabilitasi Lingkungan. Jurnal Rekayasa lingkungan 4(1): 53-62.

Winarno, F. G. 1997. *Kimia Pangan dan Gizi*. Gramedia Pustaka Utama. Jakarta.

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