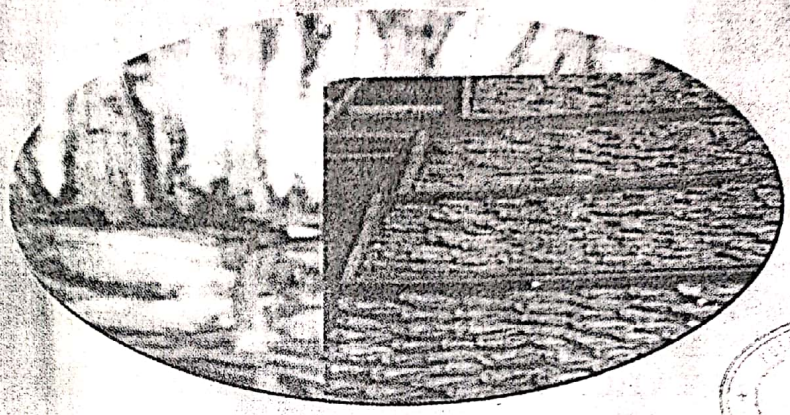
ISBN : 4-925135-18-9

Proceeding of
The JSPS - DGHE International Workshop on
Processing Technology of Fisheries Products



Quality Improvement of Traditional Fisheries Products in Asian Region

Widya Puraya Building, Diponegoro University
Semarang, Central Java-Indonesia; 25 - 26 August 2003

Edited and Compiled by :
Ratna Ibrahim, Tri Winarni A., Fronthea S., Eko Nurcahyo D., Sudibjono
Takeshi Suzuki, Munehiko Tanaka, Tateo Fujii

JAPAN SOCIETY FOR THE PROMOTION OF SCIENCE

TOKYO UNIVERSITY OF FISHERIES

DIPONEGORO UNIVERSITY

DIRECTORATE GENERAL OF HIGHER EDUCATION

Proceeding of the JSPS-DGHE International Workshop
on Processing Technology of Fisheries Products

Quality Improvement of Traditional Fisheries Products in Asian Region

25-26 August, 2003 at Widya Puraya Building
Diponegoro University, Semarang, Central Java. INDONESIA

Published by **TUF International JSPS Project**
Volume 18 (March 2004)
Tokyo University of Fisheries
4-5-7 Konan, Minato-ku, Tokyo 108-8477 JAPAN
Edited and compiled by
Ratna Ibrahim, Tri Winarni A., Fronthea S., Eko Nurcahya D., Sudibjono.,
Takeshi Suzuki., Munehiko Tanaka., Tateo Fujii.

Bibliography : ISBN 4 – 925135 – 18 – 9

PUBLICATION LIST OF TUF International JSPS Project

Volume 1 Fisheries Science in Tropical Area with Special Reference to Post-Harvest Subjects in 21st Century (*Ed. Subiyanto and E. Watanabe*), March.1996, Proceedings of the International Seminar in Nov-Dec 1995 at Semarang-Indonesia

Volume 2 Education and Research in Fisheries Science (*Ed. F. Takashima and Subiyanto*), March 1997, Proceedings of the International Workshop in Oct. 1996 at Tokyo/Hakata-Japan

Volume 3 Aquaculture in Asia (*Ed. F. Takashima, T. Arimoto and C. Itosu*), Dec. 1997, Proceedings of the International Seminar in August. 1977 at Tokyo-Japan (ISBN 4-925135-01-5)

Volume 4 Education and Training Program in Fishing Technology-Past, Present and Future (*Ed. J. Haluan and K. Satoh*), March.1998, International Workshop in Dec. 1997 at Jakarta-Indonesia (ISBN 4-925135-00-7)

Volume 5 A list of Participants in Exchanging Program under JSPS - DGHE Core University (*Ed. F. Takashima*), Sept.1998

Volume 6 Research Report in Fisheries Science under JSPS-DGHE Core University System (*Ed. C. Koizumi et al.*), Sept. 1998 (ISBN 4-924135-02-3)

Volume 7 Tentative Agenda and Abstract for the 3rd JSPS International Seminar on Fisheries Science in Tropical Area (*Ed. K. Satoh*), August. 1999

Volume 8 Sustainable Fishing Technology in Asia Towards the 21st Century (*Ed. T. Arimoto and J. Haluan*), March. 2000, Proceeding of the International Seminar in August. 1999 at Bali – Indonesia (ISBN 4-925135-08-2)

Volume 9 Symposium Abstract Book for the 4th JSPS International Seminar on Fisheries Science in Tropical Area-Sustainable Fisheries in Asia in the New Millennium, (*Ed. O. Carman et al*) August. 2000 at Bogor-Indonesia (ISBN 4-925135-9-0)

JSPS-DGHE International Workshop
Quality Improvement of Traditional Fisheries Products in Asian Region

Contents

Scientific Papers (Oral Presentation)

Scientific Papers (Poster Presentation)

JSPS-DGHE International Workshop
Quality Improvement of Traditional Fisheries Products in Asian Region

Poster Paper-04

DEVELOPMENT OF SPICED FISH SNACK FROM YELLOWSTRIPES TREVALLY (*Selaroides leptolepis*)

Hari Eko Irianto, Ninoek Indriati and Sugiyono

Research Center for Marine and Fishery Product Processing and Socio-Economic
JL. Petamburan VI, Jakarta, 10260, INDONESIA
e-mail: hari_irianto@hotmail.com

ABSTRACT

Development of new product based on the existing products is easier compared to the one from the beginning, especially in penetrating the market, since the consumer has been familiar with the product. This study developed spiced fish snack inspired with existing product in the market, i.e. dried spiced fish. The objective of this research was to develop a fish snack by modification of spiced fish product. Study on the development of spiced fish snack has been carried out by using yellow stripes trevally (*Selaroides leptolepis*) as raw material. Processing factors studied were spice mixture addition steps (before baking and half baking period) and taste types (hot, sour and sweet). Result indicated that the spice dipping should be carried out prior to baking. The most preferred taste was sweet. Predominant amino acids in spiced fish snack were glutamic, histidine and lysine.

Keywords : Spiced fish snack, yellow stripes trevally, taste types.

Introduction

About 50% of marine fish catch is processed into various processed products that are dominated by traditional products, e.g. 27.22% salted fish, 4.53% boiled salted fish, 1.77% fermented products, 1.73% smoked fish, 8.39% frozen fish and 1.49% canned fish (Directorate General of Fisheries, 1998).

The traditional fish products are mainly marketed locally, and actually prospective to use for improving nutritional status of Indonesian. Recently, trend of food consumption has moved from traditional products to either 'ready to serve' or 'ready to eat' products. Therefore, the availability of modern processed products, which are normally enjoyed to eat by consumers, is demanded. Product diversification is required to improve added value of non-economic fish, to encourage home industry, to generate income and to provide job opportunity.

Processing of spiced fish snack to meet consumer's desire will increase added value and has a good prospect to be accepted in the market. Resources of yellowstripes trevally (*Selaroides leptolepis*) in Indonesia are abundant, especially at the peak season, thus the products processed from that fish have a good prospect. Production of spiced fish snack can be run by home industry, thus increasing family income. The key to produce spiced fish snack is how to develop acceptable formula of spices mixture.

This study will develop processing technique of fish snack with various tastes from yellow stripes trevally. The fish snack is expected to be ready to eat product which can be consumed without any cooking preparation.

Materials and Methods

a. Materials

This study used yellow stripes trevally as raw material. The fish was purchased from Eretan's landing place, West-Java and transported to Research Center for Marine and Fisheries Product Processing and Socio-

Economic by icing with fish and ice ratio of 1:1. Proximate composition of yellowstripes trevally was 75.95% moisture, 17.35% protein, 2.29% fat and 4.67% ash.

b. Methods

Fish snack was prepared through a procedure outlined on Figure 1. The fish was firstly washed, gutted, and split into butterfly form fillets. The fillets were then washed in 3 % salt solution and dried in a mechanical dryer. Dried fillets were drum rolled using a noodle-forming machine. Dried rolled fillets were dipped in a spice mixture to give desired tastes and then baked in an oven at 145 – 150°C for ±30 minutes. In another way, dried rolled fillets were directly baked for 15 minutes and then dipped in a spice mixture. After that, the products were baked again until crispy.

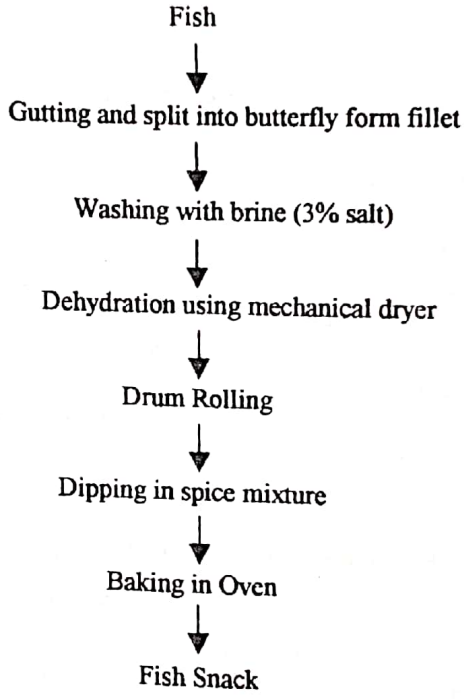


Figure 1. Processing of Fish Snack

c. Experimental Design

The study concentrated to investigate the effect of spice mixture addition steps (before baking and half-baking period) and taste types (hot, sour and sweet). Formula of spice mixtures is shown in Table 1. Experiment was conducted with two replications. The product was evaluated organoleptically, chemically and microbiologically. Organoleptic evaluation was included product acceptability in terms of appearance, colour, brightness, odour, taste, crispiness and overall acceptability. Chemical analyses covered proximate composition (AOAC, 1984) and amino acid analyses. Microbiological analyses were emphasized on the determination of total plate count (TPC) (Fardiaz, 1993). Amino acid profiles were determined using HPLC – Waters model 510 completed with Fluoresence Detector and Pico Tag 420 column as well as Hitachi 15-20 spectrophotometer. Method used for amino acid profile analyses followed as described by Anonymous (1987).

Table 1. Formula of Spice Mixture

Hot Taste		Sweet Taste		Sour Taste	
Cane sugar	: 330 g	Cane sugar	: 330 g	Cane sugar	: 330 g
Water	: 250 ml	Water	: 250	Water	: 250 ml
Salt	: 6 g	Salt	: 6 g	Salt	: 6 g
Red Chilly	: 15 g	Vanilla	: 2 g	Tamarind extract	: 60 ml
Ginger	: 9 g			Vanilla	: 2 g
Vanilla	: 2 g				

Results and Discussion

1. Organoleptic acceptability

a. Appearance

Spice mixture type affected appearance acceptability of the product. Spice addition step gave different appearance acceptability. Spice introduced to a half baking product showed a better appearance acceptability compared to the one given spice mixture before baking. Fish snack with sour taste exhibited the lowest appearance acceptability score.

b. Colour

Colour acceptability score of fish snack was affected by spice mixture addition steps. Colour of the product introduced with spice at half baking had higher colour acceptability score compared to the product immersed in spice mixture before baking. Fish snack with hot taste showed better colour acceptability than products with other tastes. Red chilly in a hot taste spice mixture gave positive effect on the colour of the product.

c. Brightness

Spice mixture addition steps influenced the brightness acceptability of the product. Fish snack introduced with spice mixture after half baking showed better brightness acceptability compared to the product given spice mixture before baking. The same as the results of colour observation, fish snack having hot taste showed higher brightness acceptability score than those with other tastes.

d. Odour

In the products introduced with spice mixture after half baking, the odour scores of the products with hot and sweet tastes were higher than the one with sour taste. Meanwhile in the product immersed in spice mixture prior to baking, the fish snack having sour and sweet tastes showed better odour acceptability compared to those having hot taste. The highest odour acceptability score was found in the product with sweet taste and processed by the addition of spice mixture before baking.

e. Taste

In general, fish snack having various tastes introduced with spice mixtures after half baking showed similar taste acceptability scores. For fish snack processed by immersing in the spice mixture before baking, the product with sweet taste has higher taste acceptability score than the ones having sour and hot tastes. Fish snack processed by introducing with a sweet taste spice prior to baking showed the highest taste acceptability score.

f. Crispiness

Crispiness acceptability of fish snack was affected by the addition step of spice mixture. Fish snack processed by introducing spice mixture prior to baking had better crispiness acceptability than the ones immersed in spice mixture after half baking. Fish snack with sweet taste had a higher crispiness acceptability score compared to those with hot and sour taste.

Table 2. Organoleptic acceptability scores of spiced fish snack

Spice Mixture Addition	Taste Type	Appearance	Colour	Brightness	Odour	Taste	Crispiness	Overall Acceptability
After Half Baking	Hot	6.9	7.0	6.8	6.3	5.5	5.0	5.5
	Sour	6.2	6.1	6.3	5.7	5.5	5.0	5.5
	Sweet	6.5	6.4	6.3	6.1	5.6	5.5	5.8
Before Baking	Hot	4.4	4.5	4.9	6.0	5.2	6.3	5.0
	Sour	3.9	4.0	4.2	6.1	5.3	6.2	4.5
	Sweet	5.4	5.9	5.7	6.4	6.4	6.5	6.0

g. Overall acceptability

Panellists noted that taste types of fish snack processed by introducing spice mixture after half baking showed insignificant effect on acceptability scores. However, the taste types for the fish snack immersed in spice mixture before baking significantly affected their overall acceptability scores, in which a sweet taste fish snack was the most acceptable product.

2. Proximate Composition and Total Plate Count (TPC)

Results of proximate composition and TPC can be seen in Table 3. In general, introduction of spice mixture with various taste types induced differences in proximate composition of fish snack. Fish snack processed by immersing in spice mixture with sour taste had the highest moisture, ash and protein contents. The highest fat content was found in the sweet taste products introduced with spice mixture after half baking. High fat content indicated that the product to be more susceptible to oxidation attack. All products had low moisture content indicating that those were to be stable from surrounding influences by applying proper protection, such as good packaging practices.

In respect to the product having sweet taste, fish snack immersed in a spice mixture after half baking showed a lower TPC compared to the one introduced with a spice mixture prior to baking.

Table 3. **Proximate composition and TPC of spiced fish snack**

Spice Mixture Addition	Taste Type	Moisture Content (%)	Ash Content (%)	Protein Content (%)	Fat Content (%)	TPC (cfu/g)
After Half Baking	Hot	7.63	6.65	53.29	4.54	
	Sour	9.59	9.38	60.64	4.60	
	Sweet	7.62	7.56	55.80	8.26	19×10^5
Before Baking	Hot	6.89	7.22	57.70	4.24	
	Sour	7.39	6.31	59.29	6.58	
	Sweet	6.93	8.08	56.69	3.49	4×10^6

3. Amino Acid Composition

Amino acid profile analyses were carried out only to the product showed the highest organoleptic acceptability, i.e. fish snack processed by introducing to a sweet taste spice mixture prior to baking. Dominant amino acids in that product were glutamic acid, histidin and lysine (Table 4). According to Shimizu (1997) glutamic acid is amino acid giving delicious taste, inspite of IMP (inosine mono phosphate)

Table 4. **Amino acid composition of spiced fish snack (sweet taste)**

Amino Acids	µ/n
Aspartic acid	52.0
Glutamic acid	260.9
Serine	31.1
Glycine	65.0
Histidine	184.4
Arginine	25.6
Threonine	not detected
Alanine	not detected
Proline	not detected
Tyrosine	47.5
Valine	93.9
Methyonine	39.9
Cysteine	57.6
Isoleucine	not detected
Leucine	not detected
Phenylalanine	not detected
Lysine	140.0

Conclusion

The above results recommend that processing of spiced fish snack using yellowstripes trevally as raw material should be introduced with spice mixture prior to baking. Sweet is the most suitable taste for the fish snack. Predominant amino acids contributing mostly to spiced fish snack are glutamic acid, histidine and lysine.

References

Anonymous. 1987. *Liquid chromatographic analysis of amino acids in feeds and foods using a modification of pico-tag method (revision).* Milipore Corporation.

AOAC, 1984. Official Methods of the Association of Official analytical chemists 14th, Association Of Analytical Chemists. Virginia.

Directorate General of Fisheries. 1998. *Fisheries Statistics.* Ministry of Agriculture. Jakarta.

Fardiaz, S. 1989. Penuntun praktek mikrobiologi pangan. PT Penerbit IPB. Bogor.

Shimizu, Y. 1997. Traditional Japanese products made from miscellaneous small fish. Paper presented in Final Seminar STD-3 Project: Improved utilization of low value fish species. Iloilo City. Phillipines, 23-27 September 1997.