Global Scientific JOURNALS

GSJ: Volume 8, Issue 4, April 2020, Online: ISSN 2320-9186
www.globalscientificjournal.com

NASTAR SENSORY ANALYSIS ADDED CONCENTRATES PROTEIN OF NILEM FISH

LailiSalsabila**, Junianto*, EviLiviawaty*, and Eddy Afrianto*

*) Lecturer at Faculty of Fisheries and Marine Science, Padjadjaran, Bandung – Sumendang KM 21 Jatinangor 45363, Indonesia
E-mail: anto_lisc@yahoo.com
**) Student of Faculty of Fisheries and Marine Science, Padjadjaran, Bandung – Sumendang KM 21 Jatinangor 45363, Indonesia
E-mail: laili.salsabila@gmail.com

KeyWords
Nilem, Fish Protein Concentrate, Nastar, Color, Aroma, Texture, And Nastar Taste.

ABSTRACT

A series of processes is needed to get quality food products. This research aims to determine the level of addition of nilem fish protein concentrate to the level of preference in nastar to produce the most preferred product . This research was carried out in August-November 2019 at the Laboratory of Fisheries Product Processing, Faculty of Fisheries and Marine Sciences, Padjadjaran University for the production of nilem fish protein concentrate ,nastar manufacturing, hedonic testing . The research method used was an experimental method with four treatments adding fish protein concentrate nilem is 0%, 7.5%, 10%, and 12.5% based on the weight of wheat flour. The parameters observed in the research were organoleptic characteristics (hedonic test) which included color, aroma, texture, and nastar taste. Based on the results of the research it can be concluded that the addition of nilem fish protein concentrate into nastar in the 0% to 12.5% treatment is still acceptable to panelists. The treatment of the addition of 7.5% nilem fish protein concentrate was the most favorable treatment for the panelists.

INTRODUCTION

Nilem fish is a fish that is widely cultivated in Indonesia because of consumption interests. Nilem has a very tasty meat and egg flavor that is liked by the public. According to Suseno (2004) the protein content in nilem is quite high, 38.83%. However, the utilization of nilem fish is still relatively low, because nilem fish have many thorns so that the community is less interested. Therefore, to increase the utilization of nilem and get nilem with high protein content, nilem must be processed first. One alternative is to process nilem into fish protein concentrate.

Fish protein concentrate is a form of product that is made by separating fat and water from the body of fish which is a "stable protein" from fish for human consumption instead of animal feed where the protein content is more concentrated than the original (Dewita and Syahrul 2010). Fish Protein Concentrate can be used as fortified products to improve the nutritional value of the protein. One product that can be added to fish protein concentrate is nastar products.

Nastar is a cake made from flour, egg yolks, refined sugar, margarine, and pineapple jam as its filling. The dry cake had a small form Air color brown golden crumb texture, and have a taste of sweetness. In addition, the diversification of nastar by increasing protein nutrition can be done by adding fish protein concentrate. Nowadays, nastar cake which contains high protein nutrition is very rare, considering that cookies need low protein flour. According to Febrianti (2017) the nutritional content of protein from nastar cakes is 2.42%. Brownies products added with catfish protein concentrate showed an increase in protein content (Hayati 2014). At present

there are no nastar products with fish protein enrichment. Enriching fish protein with nilem fish protein concentrate in nastar can be used as an effort to increase fish consumption in the community, and also increase the value of protein in nastar products. Therefore, research on adding nilem fish protein concentrate to nastar needs to be done.

MATERIALS AND METHODS

Place and Time

This research has been carried out in August-November 2019 at the Laboratory of Fisheries Product Processing, Faculty of Fisheries and Marine Sciences, Padjadjaran University.

Materials and Tools

The tools used in this research are digital scales , Blender Cutting plastic, glass measuring capacity of 50 ml, jars of glass, fabrics, Mixer, Stopwatch , bowl plastic, Spoon Solet, Brush , Sieve the flour, baking, oven . The materials used in this research are Nilem, Hexan , Sodium Chloride (NaCl) , Water , Wheat Flour, Margarine , Refined Sugar, Milk, Egg Yolk, Vanilla extract.

Research Method

The method used in research is an experimental method consisting of four treatments. In the preliminary research that has been done, the results of nastar with the addition of nilem fish protein concentrate are the most preferred by adding 10% nilem fish protein concentrate . Based on this, this research conducts testing in order to get more precise results. Thus the set of four treatment Extra protein concentrate fish nilem on the cake n astar as follows:

1) Treatment A: 0% nilem fish protein concentrate, 100% wheat flour.
2) Treatment B: 7.5 % nilem fish protein concentrate, 100% wheat flour.
3) Treatment C: 10% nilem fish protein concentrate, 100% wheat flour.
4) Treatment D: 1 2.5 % nilem fish protein concentrate, 100% wheat flour.

Panelists in this research are students of the Faculty of Fisheries and Marine Sciences, Padjadjaran University who have experience in organoleptic assessment and are familiar with the products being tested . Observations were made on the panelists' preference test for the appearance, aroma, taste, and texture of nastar. The formulation used for making nastar by adding modified modifiednilem fish protein flour is shown in Table 1.

The formulations used in this research are refer to Handoyo (2016) research with some modified. The formulation are follows:

Table 1. Formulation of Making Nastar

No.	Materials	Treatment	
		0%	7,5%
1.	Wheat Flour (g)	100	100
2.	Nilem Fish Protein Concentrates (g)	0	7,5
3.	Egg Yolk	1	1
4.	Milk Powder (g)	10	10
5.	Refined Sugar (g)	40	40
6.	Pineapple Jam (g)	0,5	0,5

Source :Handoyo (2016) modified

The procedure for making Nastar refers to the research that has been done (Handoyo 2016) with some modified.

1. Mixing refined sugar, margarine, vanilla, nilem protein concentrate and egg yolk using a mixer.
2. Enter the milk powder and flour, stir using a spatula.
3. Leave the mixture for 10 minutes. After 10 minutes, take a little dough then flat and fill with pineapple jam then the mixture is covered with a round shape.
4. Bake the mixture on a baking sheet then put it in the oven with a temperature of 100^{o} and bake for 15 minutes.
5. If it's been 15 minutes, remove the cake from the oven and spread with the ingredients then put it back into the oven.

ParametersObserved
Organoleptic characteristics were tested using a hedonic test to measure the level of preference for several organoleptic characteristics, such as the color, aroma, taste, and texture of nastarnilem protein concentrate. The panelists used in the hedonic test were semi-trained panelists consisting of Fisheries students, the Faculty of Fisheries and Marine Sciences, Padjadjaran University who had experience in hedonic testing and were given further explanation about the product. There are 20 semi-trained panelists.

Data analysis
Data obtained from organoleptic observations were analyzed using Friedman's two-way analysis of variance (Sudradjat 1999). The Friedman test was carried out to determine the effect of adding nilem fish protein concentrate flour to the astar cake to the degree of preference. The Friedman Test is defined by the following formula:

$$X^2 = (\frac{12}{nk\ (k+1)} \sum_{t=1}^{k} (Rj)^2\ ) - 3n\ (k+1)$$

Information:
X 2 : Friedman Test Statistics
n : Deuteronomy
Rj : Total ranking of each treatment
k : Treatment

If the research data shows the same number, the correction factor (FK) is calculated using the following formula:

$$FK = 1 - \frac{\sum T}{nk\ (k^2 - 1)}$$

$$X^2 c = \frac{X^2}{FK}$$

The significant value of X 2 c observations can be determined by using the Chi-squared critical prices table with db = k-1; α = 0.05. The decision rule to test the hypothesis is:
H 0 = treatment does not have a significant effect on level of liking.
H 1 = treatment gives a real influence on level of liking.

If the value of X 2 c count <X 2 c table, then H 0 is accepted and H 1 is rejected. Whereas if the value of X 2 c count> X 2 c table, then H 0 is rejected and H 1 is accepted. If H 1 is accepted, the treatment provides a real difference and followed by a multiple comparison test (Multiple Comparison) to determine perbedn between treatments. The multiple test formula is as follows:

$$|Ri - Rj|\ \geq z\ \left[1\ \frac{\alpha}{k\ (k-1)}\right] - \sqrt{\frac{nk\ (k+1)}{6}}$$

Information:
Ri - Rj : Difference in average ranking
Ri : Average ranking of the i-th sample
Rj : Average ranking of the jth sample
α: Experiments with error rate at 0.05
n : Number of tests / data
k : The number of treatments
z : Values in table Z for Multiple Comparison (/ k (k-1))

The panelists' decision-making decision on the criteria for the preferred nastar cake product is to make a pairwise comparison then to determine the best treatment used the Bayes method. The results of the hedonic test assessment will usually produce many of the same numbers so that we need an analysis that can provide differences for each treatment. The analysis in question is the Bayes test, an organoleptic test that aims to determine the comparison of determining criteria in a product. The processes produced by the Bayes test are a basis for determining the most preferred product. The Bayes test calculation results will show that the element that has the highest priority value is the most preferred in the panelists (Marimin 2004).

Results and Discussion

Color

Color is an important organoleptic parameter because it is a sensory property that is first seen by consumers. Color assessment is carried out to determine panelist acceptance of colors from nastar. Average results for nastar colors are shown in Figure 1.

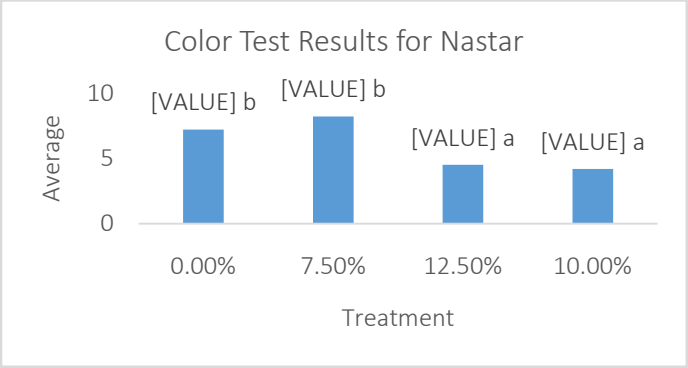
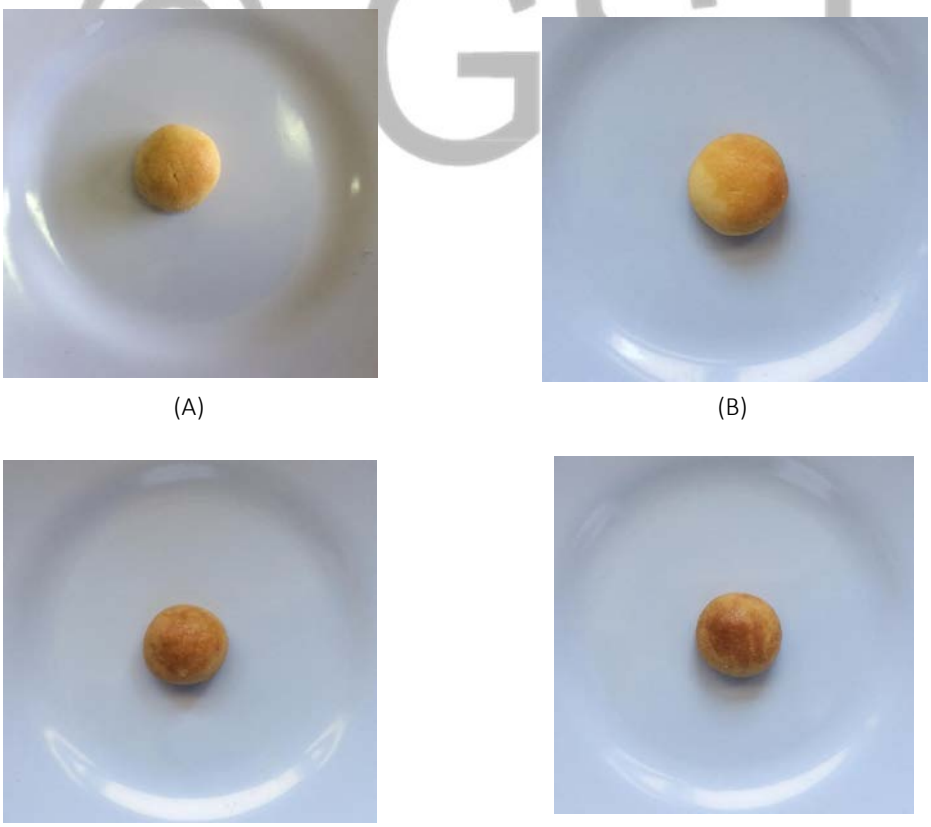


Figure 1. Color Test Results for Nastar

Based on the results of the Friedman test statistics showed that the addition of nilem fish protein concentrate into nastar significantly affected the level of nastar color preference. Furthermore, based on the results of multiple comparison tests, the treatment of the addition of 7.5% nilem fish protein concentrate (treatment B) produced the highest level of color preference (most preferred). The addition of nilem fish protein concentrate in the 0% to 12.5% treatment in nastar is still acceptable to panelists because the average value in each treatment is still above 3, which means it is still below the rejection limit.



(A) (B)

(C) (D)

Figure 2. Colour of Nastar (A) 0%; (B) 7,5%; (C) 10%; (D) 12,5%

Next Figure 2. shows that treatment A produces nastar in pale yellow, treatment B produces nastar in golden yellow, treatment C produces nastar in slightly brownish yellow, treatment D produces nastar in pale yellow. Brownish color due to the presence of non-enzymatic browning , a chemical process that produces brown in food without the enzymatic process in the form of a maillard reaction. The addition of nilem fish protein concentrate causes the nastar to become more brownish because the maillard reaction is increasing (Belitz and Grosch in Afriani 2016).

Aroma

The aroma of many foods determines the delicacy of food. The aroma is a gas molecule that is inhaled by the nose so that it can be determined whether the food is tasty or not. In the food industry, aroma testing is considered important because it can quickly provide an assessment of a product (Hayati 2014).

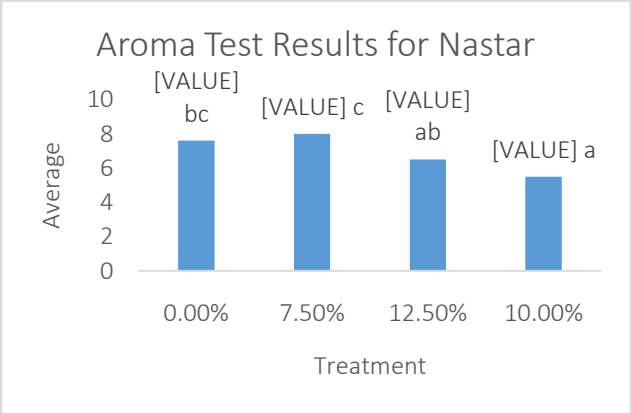


Figure 3. Aroma Test Results for Nastar

Based on the results of the test statistic friedman which showed that the addition of protein concentrate fish nilem into nastar significantly affect the level of preference nastar aroma. Furthermore, based on the results of multiple comparison tests, the treatment of the addition of 7.5% nilem fish protein concentrate (treatment B) resulted in the highest level of aroma preference (most preferred). Treatment of adding nilem fish protein concentrate at 0% to 12.5% in nastar is still acceptable to panelists because the average value for each treatment is still above 3 or above the rejection limit.

Next Figure 3. shows treatment A produces nastar with dominant aroma of milk and butter , treatment B produces nastar with dominant aroma of milk and butter (aroma of protein concentrate of nilem has not been felt), treatment C produces nastar with aroma of milk and butter is slightly lost and there is little the aroma of the protein concentrate of the nilem fish , the treatment of D produced nastar with the aroma of milk and butter slightly lost and there was a scent of the concentrate of the Nile fish more pronounced. This is due to the effect of the addition of nilem fish protein concentrate added to the dough will cause the addition of nilem fish protein concentrate to nastar. Anugrahati (2015) noted that the addition of fish protein concentrate, the higher the aroma concentration of fish protein concentrates will increase. The difference in the amount of addition of fish protein concentrate causes the distinctive aroma of the fish protein concentrate can not be neutralized by other additives (Nando 2015).

Based on research by Nando (2015) that the panelists preferred the aroma of biscuits with the addition of a protein concentrate fish cork as much as 10% for those treatments have aroma concentrate fish protein cork slightly. There is a difference in this research, where the addition of 7.5% treatment of nilem fish protein concentrate to nastar gives the panelist the most preferred aroma . This is because the resulting aroma dominant milk and butter. While the treatment of 10% of Nilem fish protein concentrate in nastar produces a slightly lost aroma of milk and butter and there is a slight aroma of nilem fish protein concentrate. Thus the treatment of 10% of nilem fish protein concentrate has decreased the level of preference.

Texture

The texture of an ingredient will affect the taste caused by the food material. Texture is perceived by a combination of senses i.e. touch, mouth-feel, sight and hearing. (Karimah2019). It is one of the most imperative features of a food. Average results of nastar textures are in Figure 4.

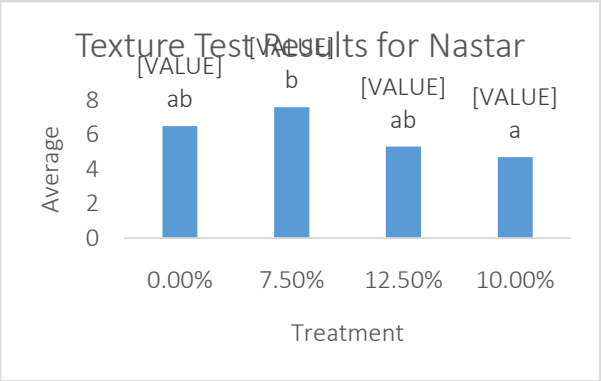


Figure 4. Texture Test Results for Nastar

Based on the results of the Friedman test statistics showed that the addition of nilem fish protein concentrate into nastar significantly affected the preference level of nastar texture. Furthermore, based on the results of multiple comparison tests, the treatment of the addition of 7.5% nilem fish protein concentrate (treatment B) produced the highest level of texture preference (most preferred). Next, Table 6. shows that treatment A produced nastar with very crumb texture, treatment B produced nastar with sufficient crumb texture, treatment C produced nastar with a slightly crumby texture and a little solid, treatment D produced nastar with a slightly crumby texture. This shows that the use of nilem fish protein concentrate affects the texture of nastar which has a less crumb texture with the addition of nilem fish protein concentrate . In cookies , texture is a quite important product attribute because the main assessment of cookies is usually their texture. Fellows in Gracia (2009) explains that the texture of food is determined by the water content, fat content, and the amount and protein that make it up. So the increasing number of nilem fish protein concentrations influences the water content, fat content and protein into the nastar which will make the nastar texture more dense (less dense). According to Anugrahati (2012) the addition of fish protein concentrate in the biscuit formulation will increase solids so that the biscuits become more tough. Then the more solids added in the nastar mixture will also affect the texture of the nastar which will be more tough (hard).

Based on Nando's research (2015) that panelists prefer biscuits with the addition of cork fish protein concentrate as much as 10% because the treatment has a texture that is not too dense . This is different from the addition of fish protein concentrate ni glue to nastar, that the most preferred texture of panelists is 7.5% treatment because the texture is quite crumb . In the treatment of 10% nilem fish protein concentrate innastar produces nastar with a slightly crumby texture rather slightly dense, so that the 10% treatment has a decreased level of preference. However, the addition of nilem fish protein concentrate in the 0% to 12.5% treatment in nastar is still acceptable to the panelists because the average value of each treatment is still above the value of 3 or above the rejection limit.

Taste

Taste is a parameter that is assessed using the sense of taste or tongue. Besides taste is also an important factor to determine whether a product is accepted or not by consumers. Consumer favor of the taste of a product is also supported by an interest in the color and aroma of the product. The taste is a combination of tasting stimuli, odors, and many involve the organ of the tongue (Biological 2015). The average nastar taste results are in Figure 5.

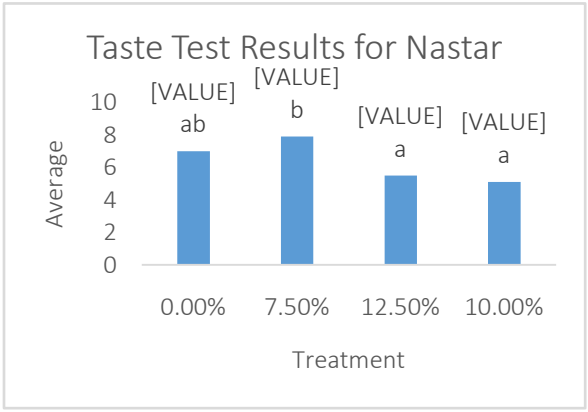


Figure 5. Texture Test Results for Nastar

Based on the results of friedman test statistics showed that the addition of nilem fish protein concentrate into nastar significantly affected the taste level of nastar. Furthermore, based on the results of multiple comparison tests, the treatment of adding 7.5% nilem fish protein concentrate (treatment B) produced the highest level of taste preference (most preferred). The treatment of adding nile m fish protein concentrate at 0% to 12.5% treatment in nastar was still acceptable to the panelists because the average value for each treatment was still above 3 which means it was still above the rejection limit.

Based on Nando's research (2015) that panelists prefer biscuits with the addition of 10% nilem cork protein concentrate because the treatment has a sweet taste and a slight taste of the gray fish protein concentrate . This is not in accordance with the addition of nilem fish protein concentrate to nastar, that the most preferred taste of panelists is the 7.5% treatment because of the taste produced by the specific taste of nastar and sweet taste. In the treatment of 10% nilem fish protein concentrate in nastar produces nastar with a little sweetness and a little taste of nilem fish protein concentrate, so that the 10% treatment has a decreased level of preference.

Treatment A produces nastar with a very sweet taste derived from sugar, treatment B produces nastar with sufficient sweet taste and the taste of the protein of the nilem fish has not been felt, treatment c produces nastar with a slightly sweet taste and a slight taste of the protein of the nilem fish, treatment d produces nastar with very little sweetness and a little taste of nilem fish protein concentrate. This is due to the effect of the addition of nilem fish protein concentrate added to the dough will cause the sweet taste to disappear. Afriani (2016) states that the addition of tilapia protein concentrate which is higher will eliminate the sweet taste and cause a savory taste in the biscuits. The lost sweetness in the product is due to the addition of solids so that it can eliminate sweetness.

Conclusion

Based on the results of the research it can be concluded that the addition of nilem fish protein concentrate into nastar in the 0% to 12.5% treatment is still acceptable to panelists. The treatment of the addition of 7.5% nilem fish protein concentrate was the most favorable treatment for the panelists.

References

[1] Afriani, R.R., N. Kurniawati., I., Rostini. 2016. Addition of Tilapia Protein Concentrate to the Chemical and Organoleptic Characteristics of Biscuits. Journal of Fisheries Product Technology. Faculty of Fisheries and Marine Science. Padjadjaran University.VolVll no. 1(6-13).

[2] Anugrahati, N.A., J. Santoso., I. Pratama. 2012. Utilization of Catfish Protein Concentrates in Making Biscuits. Journal of Fisheries Product Processing. Volume 15 no. 1. IPB. Bogor.

[3] DewitadanSyahrul. 2010. Study on the quality of catfish protein concentrate (Pangasius sp.) Which was processed with different methods during room temperature storage. JurnalNatur Indonesia in press.

[4] Febrianti, L. Karimuna, danAnsharullah. 2017. Effect of Use of Glucose Syrup on Organoleptic Characteristics and Nutritional Value of Cheese Nastar Cakes. Journal of Food Science and Technology. Vol. 2, no. 2, Page. 435-443.

[5] Gracia. C.L, Cynthia, Sugiyono, dan B. Haryanto. Study of Corn Biscuits Formulation in the context of Wheat Flour Substitution. Journal of Food Technology and Industry. Department of Food Science and Technology. Fateta IPB. Vol XX no. 1 2009

[6] Handoyo, Jani. 2016. Pastry Recipes.

[7] Hayati. W, D. Buchari, dan S. Loekman. 2014. Fortification of Patin Protein Concentrate (Pangasiushypohthalamus) in Making Kek Brownies. Journal of Fisheries Product Technology. FPIK Riau University.

[8] Karimah. Q.A, Junianto, E. Liviawaty, Pratama. R.I., 2019. Sensory Evaluation of Bonylip Barb Fish Meat Cream Soup. Journal of Fisheries Product Processing Technology. FPIK Unpad. 26 (146-156) 2019.

[9] Nando, R.P., Suparni., D., Buchari. 2015. Study of Making Biscuits by Adding Cork Protein Concentrates (Channastriata). Journal of Fisheries Product Technology. Faculty of Fisheries and Marine Science. Riau University.

[10] Sudradjat, M. 1999. Non Parametric Statistics. Faculty of Agriculture, Padjadjaran University. Jatinangor.

[11] Susenodan S. Heri. 2004. The Effect of Adding Nilem Mashed Meat (Ostheochilushasselti) on Making Simping as a Snack Food. Journal of Fisheries Product Technology. vol. VII no. 1. Bogor.