Original Research Article

Characterization of Peda Patin Jambal Based on Soaking Time in Salt Solution.

ABSTRACT

Peda is one of the fermented fish products with the help of microorganisms in controlled conditions by soaking the salt solution for a certain time. The types of fish made peda are mackerel (*Rastrelliger* sp.) And Scad (*Decapterus* sp.). So the selection of Patin Jambal (*Pangasius djambal*) as the ingredient for making peda is to add to the product variant, besides that the djambal pangasius has thick flesh, the texture is thick, dense and compact, and has a savory and juicy flavor compared to other types of catfish. The purpose of this study is to get a long time to soak the right salt to produce jambal pause products with the best characteristics. The method used is an experimental method consisting of three treatments, namely the soaking time of salt solution 12 hours, 24 hours, and 36 hours tested organoleptically by 20 semi-trained panelists. The fermentation results were observed for appearance, aroma, taste, and texture parameters and then added with water content test, and salt content. Data from the test results were analyzed using the Friedman statistical test, and decision making using the Bayes test. The results showed that the saline immersion time had a significant effect on the taste of catfish. Based on Bayes' decision-making method, the 24-hour immersion treatment resulted in the product of patchy pangasius with the best characteristics of the panelists.

Keywords: Fermentation, Soaking Length of Salt Solution, Patin Jambal, Peda

1. INTRODUCTION

Fish is a commodity that has great potential in its use. The existence of fish as food can be accepted by various layers of society. Besides having a distinctive taste, fish meat also has good nutrition. The content of protein, fat, vitamins and minerals in fish meat is very good to meet the daily needs of the body so it is highly recommended to make fish as one of the main food menus every day (Khasanah 2009). Catfish are known as fish that have important economic value and their production potential increases every year. According to the Ministry of Maritime Affairs and Fisheries (2015).

Peda is one of the spontaneous fermentation results, namely fermentation without the addition of a starter with the help of microorganisms in controlled environmental conditions in the presence of a high concentration of a salt solution (Center for Marine and Fisheries Education 2015). According to the fermentation process can produce food products that have higher nutritional value, as well as distinctive flavors. Besides, fermentation can extend storage power and increase the selling value of the products produced (Heruwati 2002).

The purpose of this study was to determine the soaking time of the right salt solution so that the peda catfish produced with the best characteristics. Becoming a reference in building a business of fermented products that use patched catfish (Pangasius djambal) as its raw material. Become a reference in the future for research on fish fermentation or other studies related to fermented products.

2 METODE PENELITIAN

2.1 Time and Place of Research

The research was conducted at the Fisheries Product Processing Laboratory, Faculty of Fisheries and Marine Sciences, Padjadjaran University. This research was conducted in January 2019.

2.2 Tools and Materials

The tools used in this study consisted of tools used for handling fish and the tools used during the fermentation process were knives, cutting boards, scales, fermentation containers, fine brushes, and organoleptic test kits. The ingredients used are Jambal Patin (Pangasius djambal) and Salt.

2.3 Observation Parameters

The parameters observed in this study consisted of organoleptic characteristics and chemical content. Organoleptic characteristics observed consisted of appearance, aroma, texture, and taste. Organoleptic characteristics are tested through organoleptic testing of preference level (hedonic test), and Bayes test. The chemical content measured consists of water content and salinity measured through proximate tests.

2.4 Data Analysis

The hedonic test data (level A) which is a non-parametric analysis, were analyzed using a two-way analysis of variance Friedman test with a Chi-square test.

Decision-making assessment of the panelist's preferred product criteria nori is performed pairwise comparisons (Pairwise Comparison) then to determine the best treatment to use

Bayesian methods. Bayes methods used to compare different criteria and choose one of the criteria that are prioritized or preferably by using numbers to describe the relative importance of an element.

Comparative descriptive analysis will be used to analyze the results of the calculation of the yield and chemical test data.

3 RESULTS AND DISCUSSION

3.1 Organoleptic Test

This study uses organoleptic test in the analysis of observations. By observing several parameters namely appearance, aroma, taste, and texture.

3.1.1 Appearance

Based on the results of the study, the length of soaking of the salt solution did not affect the appearance of the patched catfish. The results of the evaluation of the appearance of peda patin jambal are presented in Table 1.

Table 1. Average Appearance Peda Patin Jambal

Length of Salt Soaking (hour)	Median	Average Appearance
12	5	5,90 a
24	7	6,40 a
36	7	5,70 a

Note: The average number followed by the same letter shows no significant difference according to the multiple comparison test at the error level of 5%.

Based on the evaluation of the appearance of patched catfish, the treatment of soaking time of salt solution did not have a significantly different effect on the appearance of patched catfish on Friedman's statistical test with an error level of 5%. The median values for all treatments ranged from 5 (neutral) to 7 (preferably) panelists with an average value of 5.70 to 6.40.

The salt soaking time which gives a change in appearance is the color of jambal catfish meat which is white to brown. Color changes that occur due to the high content of hemoprotein and fat in fish meat (Hadiwiyoto 1993). The process of hydrolysis and oxidation of fat in the body of the fish will result in discoloration (Adawyah 2011). The appearance of patched catfish after the frying process can be seen in Picture 1.

(a) (b) (c)

Picture 1. The appearance of jambal catfish after cooking is done by frying (a) 12-hour immersion treatment; (b) 24 hours; and (c) 36 hours

The appearance of patched catfish looks the same for all treatments and has no physical damage and has no significant color difference. According to Hadiwiyanto (2012) fat oxidation can cause damage to meat cells so that the physical appearance of fish will change.

3.1.2 Aroma

Based on the results of the study, the length of soaking the salt solution does not affect the aroma of the catfish patch. The results of the assessment of the pang patin jambal aroma are presented in Table 2.

Table 2. Average Aroma Peda Patin Jambal

Length of Salt Soaking (hour)	Median	Average Aroma
12	5	4,7a
24	7	6,4a
36	7	6,0a

Note: The average number followed by the same letter shows no significant difference according to the multiple comparison test at the error level of 5%.

Based on the evaluation of the scent of the patin jambal, the treatment of the soaking time of salt solution did not have a significant effect on the aroma of the patch of the patin jambal in the Friedman statistical test with an error level of 5%. Based on the results of the test of preference for the scent of jambal patin, the median values for all treatments ranged from 5 (neutral) to 7 (preferred) panelists (Soekarto 1985).

According to Maisyaroh et al (2011), aroma compounds are chemical compounds that have an aroma or odor because these compounds are volatile. Volatile compounds are volatile compounds, especially when there is an increase in temperature. Aroma of peda odor in all treatments produces a distinctive aroma of fermentation. The distinctive aroma of fermented products is mainly caused by the degradation of protein and fat in fish meat during fermentation (Tariq et al 2014). There is also according to Rochima (2005) the distinctive aroma of fish fermentation derived from compounds methyl ketone, butyl aldehyde, amona, amino, and other compounds arising from fat degradation.

3.1.3 Taste

Based on the results of the study, the soaking time of salt solution affects the peda pang peda taste. The results of the assessment of peda patin jambal are presented in Table 3.

Table 3. Average Taste Peda Patin Jambal

Length of Salt Soaking (hour)	Median	Average Taste
12	5	5,3a
24	7	6,8b
36	5	5,2a

Note: The average number followed by the same letter shows no significant difference according to the multiple comparison test at the error level of 5%.

Based on the results of the test of preference for the peda taste, the highest median value was found in the 24-hour-long immersion treatment with a median value of 7 and a higher average value of 6.8, this shows that the 24-hour immersion treatment was preferred by the while the panelists treated for soaking time for 12 hours with an average yield of 5.3 and 36 hours with an average result of 5.2 having the same median value with a value of 5 this shows both treatments have a value (neutral/ordinary). The most preferred flavor of panelists in this research is the treatment with a 24-hour salt immersion solution resulting in a patch of pangasius with a tasty, savory, and slightly salty taste. The taste of jambal catfish in this research is close to the common flatulent of mackerel on the market.

According to Sahlan et al (2018), the amino acids found in fish protein can affect sweetness, taste, even bitter. Free amino acids play a role like nonvolatile flavors and have a beneficial effect because they participate in thermal reactions. Peda Patin Jambal has a good taste, is tasty and does not give an after-taste like bitter. The taste produced in the peda patin jambal is affected by the immersion time of different salt solutions in the fermentation product. The longer soaking the salt solution that is given in a fish product will produce a taste that is too salty so that the panelists are less favored.

The difference in the time of soaking the salt solution has an effect on the content of glutamic acid which plays a role in the formation of savory flavors (umami) in the peda product. Glutamic acid is a simple molecule produced by the breakdown of proteolytic enzymes during the fermentation process. According to Tariq et al (2014) the higher the salt content, the activity of fermentation microorganisms to break down proteins into amino acids, especially glutamic acid, decreases because it can slow down the activity of fermentation bacteria and will affect the taste of savory (umami) produced by peda products.

3.1.4 Texture

Based on the results of the study, the duration of soaking of the salt solution had no effect on the texture of the patches of catfish. The results of the evaluation of the texture of the peds patin jambal are presented in Table 4.

Table 4. Average Texture Peda Patin Jambal

Length of Salt Soaking (hour)	Median	Average Texture
12	7	5,8a
24	7	5,9a
36	7	5,8a

Note: The average number followed by the same letter shows no significant difference according to the multiple comparison test at the error level of 5%.

Based on the assessment of the texture of the patin patch, the treatment of soaking salt did not have a significant effect on the texture of the patin patch in Friedman's statistical test with an error level of 5%. Based on the results of a preference test for the texture of the peda patin jambal, the median values were obtained for all 7 (preferable) panelists (Soekarto 1985).

According to Fellows (2000), the texture of the sand is a sandy texture caused by a reaction between lipoprotein in fish meat and salt that enters the fish meat. Salt that goes into fish meat will. Soaking fish in a saline solution will cause diffusion of NaCl salt into fish meat, the diffusion of Na + and Cl ions causes damage to lipoprotein bonds. The release of lipoprotein bonds causes fat to separate from protein. This results in the merging of proteins which then form solids and give rise to a grainy texture (Chi and Tseng 1998 in Rukmiasih et al. 2015).

3.2 Water Content

Based on the test results of the water content using the gravimetric method, the length of soaking of the salt solution affects the water content of the patch pang catfish. The results of the water content test from the jambal pangasius with the gravimetric method are presented in Table 5.

Table 5. Water Content of Peda Patin Jambal Metode Gravimetri

No.	Length of Salt Soaking (hour)	Results (%, b/b)
1.	12	38,1751
2.	24	32,5301
3.	36	29,7326

The value of water content in patched catfish tends to decrease with the length of time soaking the salt solution. Based on the results of the test levels of pang catfish patches produced in this study still meet the requirements of SNI 01-2721-2009 which is a maximum of 40%.

3.3 Salinity

The resulting salt levels of the catfish patches ranged from 12.37% -15.50% (Table 6). According to Rahmani et al. (2007), the salt content tends to increase with the length of time the salt solution is given. The following are the results of the test of the pang catfish patch using Argentometri method

Table 6. Salinity of Peda Patin Jambal Metode Argentometri

No.	Length of Salt Soaking (hour)	Results (%, b/b)
1.	12	12,3756
2.	24	13,1276
3.	36	15,5054

Based on the results of the test levels of pang catfish patch produced in this study still meets the requirements of SNI 01-2721-2009 which is a maximum of 20%.

3.4 Bayes Decision Methods

Decision making by looking at the relative weight value of the criteria for appearance, aroma, texture, and Taste peda patin jambal is done by pairwise comparison (Pairwise Comparison) by changing the pairwise comparison with a set of numbers that represent the relative priority of criteria and alternatives (treatment).

The paired comparison test data results on the appearance, aroma, texture, and Taste of peda ptin jambal from 20 panelists. The completion of the pairwise comparison results is done by manipulating the matrix to determine the criteria weights. The results of the calculations on the weight criteria for appearance, aroma, texture, and Taste peda patin jambal are presented in Table 7.

Table 7. Weight Value Criteria Peda Patin Jambal

Criteria	Weight Criteria
Appearance	0,14
Aroma	0,26
Taste	**0,5**
Texsture	0,1

Based on table 7, it shows that taste is the most important criterion that determines the panelists' final decision in choosing a peda with a weighting criteria value of 0.5. Furthermore, panelists also considered that aroma was an important criterion with a weight of 0.26 followed by appearance and taste, namely 0.14 and 0.1. This shows that although other assessments are good if the taste of the Peda patin jambal is not liked, the product will be rejected by the panelists. Bayes Method is one of the methods used to analyze in making the best decision of many alternatives or treatments by considering criteria. The results of calculations in determining the best treatment by considering the criteria for appearance, aroma, taste, and texture of peda are presented in table 8.

Table 8. Peda Patin Jambal Rate Decision matrices with Bayes Method

Length of Salt Soaking (hour)	Kriteria				Alternative values	Priority Values
	Appearance	Aroma	Texture	Taste		
12	5,90	4,70	5,30	5,80	5,48	0,31
24	6,40	6,40	6,80	5,90	**6,19**	**0,35**
36	5,70	6,00	5,20	5,80	5,78	0,33
Weights Criteria	0,14	0,26	0,10	**0,50**	17,45	1,00

Table 8 shows that the 24-hour immersion salt immersion treatment process in making jambal patin has the highest alternative value of 6.19 followed by 36 hours soaking treatment with an alternative value of 5.78 while the 12-hour immersion treatment has the lowest alternative value of 5.48. Based on the observed organoleptic test parameters, the 24-hour salt immersion treatment resulted in the best patch of catfish with the best characteristics that panelists liked.

4 CONCLUSIONS

Based on the results of the study, the 24-hour salt immersion treatment produced the best quality of catfish with the best characteristics, which were a rather clean appearance, dull-white flesh, brownish skin surface, wrinkled compact texture, and had a savory and slightly salty taste.

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