ADDITION OF PATIN FISH (Pangasius hypophthalmus) FLOUR TO THE PREFERENCE LEVEL OF ONION STICKS

Penambahan Tepung Daging Ikan Patin (Pangasius hypopthalmus) Terhadap Tingkat Kesukaan Stick Bawang

Rani Pratiwi[*], Junianto, Atikah Nurhayati, Iis Rostini

Fisheries Study Program, Faculty of Fisheries and Marine Sciences, Padjadjaran University

Jl. Raya Bandung Sumedang KM 21, Jatinangor 45365

[*]Coresponding author: ranipratiwi5@gmail.com

ABSTRACT

Stick is a type of snack that is long and flat with a savory and crunchy taste, made from wheat flour, eggs, salt, margarine, and water. Stick is generally made from main ingredients such as wheat flour, tapioca, and other starch sources with high carbohydrate content but low in other nutrients, thus necessitating the addition or fortification of other energy source nutrients like fat, protein, vitamins, and minerals. The addition of patin fish meat flour to onion stick products will affect the protein content; furthermore, the addition of flour to the product will impact the preference level of the onion stick. The aim of this research is to determine the optimal level of patin fish meat flour addition in the production of onion sticks to create the most preferred product. The method used is experimental, consisting of four treatments of patin fish meat flour addition: 0%, 12.5%, 15%, and 17.5%. The parameters observed in this study include a preference test (hedonic), analyzed using non-parametric statistics with the Friedman test, followed by a multiple comparison test and a Bayes test for decision making, and a proximate test to determine moisture content, ash content, fat content, protein content, and carbohydrate content. The results of the hedonic test indicated that onion sticks with 15% patin fish meat flour addition were the most preferred by the panelists, with preference scores for color at 8.3; aroma at 8; taste at 8; and texture at 7.9.

Keywords: Onion Stick, Patin Fish Meat Flour, Preference Level, Proximate

ABSTRAK

Stick merupakan salah satu camilan berbentuk pipih memanjang dengan rasa gurih dan renyah, dimana terbuat dari tepung terigu, telur, garam, margarin dan air. *Stick* umumnya berbahan utama tepung terigu, tapioka dan bahan sumber pati lainnya dengan kandungan karbohidrat yang tinggi, tetapi rendah zat gizi lainnya sehingga perlu ditambahkan atau difortifikasikan zat gizi sumber energi lainnya seperti makanan sumber lemak, protein, vitamin dan mineral. Penambahan tepung daging ikan patin pada produk *stick* bawang akan mempengaruhi kandungan protein, selain itu juga penambahan tepung pada produk akan berdampak pada tingkat kesukaan pada *stick* bawang. Tujuan penelitian ini adalah untuk menentukan tingkat penambahan tepung daging ikan patin yang tepat pada pembuatan *stick* bawang agar menghasilkan produk yang paling disukai. Metode yang digunakan adalah eksperimental yang

terdiri dari 4 perlakuan penambahan tepung daging ikan patin yaitu 0%, 12,5%, 15% dan 17,5%. Parameter yang diamati pada penelitian ini yaitu uji tingkat kesukaan (hedonik) dianalisis menggunakan statistik non-parametrik dengan uji *Friedman*, yang selanjutnya dilakukan uji lanjutan perbandingan berganda (*multiple comparison*) dan uji *Bayes* untuk pengambilan keputusan, lalu dilakukan uji proksimat untuk mengetahui kadar air, kadar abu, kadar lemak, kadar protein dan kadar karbohidrat. Hasil penelitian uji hedonik menunjukan *stick* bawang dengan penambahan tepung daging ikan patin didapatkan bahwa perlakuan 15% merupakan perlakuan yang paling disukai oleh panelis dengan nilai kesukaan warna 8,3; aroma 8; rasa 8 dan tekstur 7,9.

Kata Kunci: Proksimat, Stick Bawang, Tepung Daging Ikan Patin, Tingkat Kesukaan

INTRODUCTION

Based on the Statistical Data of the Ministry of Maritime Affairs and Fisheries in 2022, it was stated that the production of aquaculture, especially catfish, had a greater volume growth than other types of fish, which was 14.12% with a total catch of 161,114 tons. Catfish (Pangasius hypophthalmus) is one of the freshwater commodities that has good prospects because it has a fairly high selling value and a cultivation method that is not difficult (Ananda et al., 2015). Catfish processing in Indonesia is generally processed into semi-finished products / fillets, shredded fish and wadi which are traditional foods typical of the island of Kalimantan made from fermented catfish (Bakrie, 2020). However, some traditional products made from catfish have the disadvantage of having a relatively short shelf life. Fishmeal is a diversification of semi-finished fishery products which in the manufacturing process goes through many stages, namely by removing the water and fat content in the fish's body. (Asih, 2020).

Stick is a flat, long snack with a savory and crunchy taste, made from wheat flour, eggs, salt, margarine and water. Sticks are usually made from wheat flour, tapioca, and other starch sources that are high in carbohydrates, but low in nutrients, so they need to be added with fat, protein, vitamins, and minerals (Lekahena, 2019). The addition of fish flour is expected to provide additional high protein to the human body as in onion stick products. The addition of patin fish flour to onion stick products will affect the protein content, in addition, the addition of flour to the product will have an impact on the level of preference for onion sticks.

There are several previous studies on the addition of patin fish flour to a product, one of which was conducted by Ningum et.al, 2017 making biscuits with a patin fish flour substitution of 10%, 15%, 20%. The results of the study showed that the addition of patin fish flour by 15% was more acceptable to the panelists compared to other treatments. Ernisti et.al, 2018 made Creakers with fortification of Siamese catfish flour of 0%, 10%, 20%, 30% and 40%. The results showed that the addition of Siamese catfish flour of 10% was the best treatment.

Based on the description above, this study aims to determine the right level of addition of catfish meat flour in making onion sticks to produce the most preferred product.

METHODS

Place and Time

The research was conducted from February to March 2024. This research was conducted at the Fisheries Product Processing Technology Laboratory of the Joint Fisheries and Agriculture Building, Faculty of Agriculture, Padjadjaran University and proximate testing was conducted at the UPTD for Testing and Implementation of Fisheries Product Quality (PPMPP) Cirebon, Fisheries and Marine Service of West Java Province.

Tools and Materials

The tools and materials used were catfish (Pangasius hypopthalmus), wheat flour, tapioca flour, garlic, spring onions, salt, eggs, margarine, water and cooking oil. The equipment used

to make onion sticks is a gas stove, digital scales, steamer pan, 60 mesh and 100 mesh sieves, blender, oven, knife, frying pan, spatula, pasta maker, measuring cup, gloves, label paper, tray, plate, spoon and label paper.

Research Design

This research was conducted using an experimental method using 4 treatments of adding catfish meat flour to the making of onion sticks. The four treatments were tested on 20 semi-trained panelists consisting of students of the Faculty of Fisheries and Marine Sciences, Padjadjaran University. The treatments can be seen as follows:

Treatment A = 0% catfish meat flour
Treatment B = 12.5% catfish meat flour
Treatment C = 15% catfish meat flour
Treatment D = 17.5% catfish meat flour

Research Procedure
Making catfish meat flour

The catfish is cleaned from the head, guts and fins, then given lime juice for 30 minutes and then steamed for 30 minutes at a temperature of 85˚- 90˚C. The catfish meat is separated from the skin and bones and then squeezed until the water comes out of the fish. The fish meat is oven-baked for 4 hours at a temperature of 125˚C. After the catfish meat is dry, puree it with a blender and sift it using a 60 mesh sieve first, then sift it again with a 100 mesh sieve to produce finer catfish meat flour.

Making catfish meat flour onion sticks

All raw materials are weighed according to the specified measurements to be kneaded until smooth. After smooth, the dough is left for 20 minutes to rest so that the dough texture is perfect. The dough is molded using a pasta maker then molded into 10 cm long sticks. Fry the onion sticks at a temperature of 100˚C for 7 minutes over low heat until they are yellowish brown. The formulation used in making onion sticks with the addition of catfish meat flour can be seen in Table 1.

Table 1. Formulation of onion sticks with the addition of catfish meat flour.

Ingredients	Treatment			
	A (0%)	B (12,5%)	C (15%)	D (17,5%)
Flour (g)	150	150	150	150
Catfish meat flour (g)	-	18,75	22,5	26,25
Tapioca flour (g)	60	60	60	60
Garlic (g)	18	18	18	18
Chicken eggs (g)	45	45	45	45
Margarine (g)	40	40	40	40
Leek (g)	12	12	12	12
Salt (g)	15	15	15	15
Water (ml)	45	45	45	45

Observation Parameters

Onion sticks obtained from various treatments above, were observed for organoleptic preference levels including taste, aroma, texture and color. The preference level was tested using a hedonic test followed by a Bayes test to determine the best product decision. Observations were also made on the proximate of onion sticks against the control treatment

and the treatment most preferred by the panelists including water content, ash content, fat content, protein content and carbohydrate content.

RESULT

Color

The results of the test of the level of preference for the color of onion sticks with the addition of patin fish meat flour showed that onion sticks with the addition of 15% patin fish meat flour had the highest average value, which was 8.3, compared to other treatments. Meanwhile, the lowest average value was found in the control treatment, which was 6.6. The graph of the average value for the color of onion sticks with the addition of patin fish meat flour is shown in Figure 1.
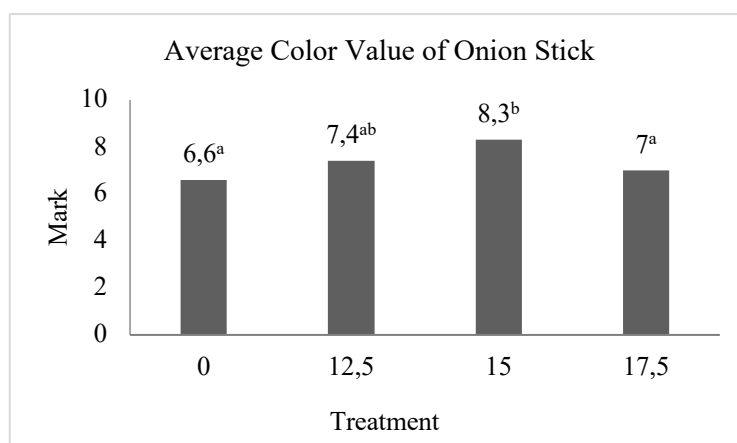

Figure 1. Average Color Value for Onion Sticks
Description: 1=very dislike; 3=dislike; 5=Neutral; 7=Like; 9=Very Like

Aroma

The results of the test of the level of preference for the aroma of onion sticks with the addition of patin fish meat flour showed that onion sticks with the addition of 15% patin fish meat flour had the highest average value, which was 8. Meanwhile, onion sticks with the addition of 12.5% and 17.5% patin fish meat flour had the same average value, which was 6.5. The graph of the average value of the aroma of onion sticks with the addition of patin fish meat flour is shown in Figure 2.
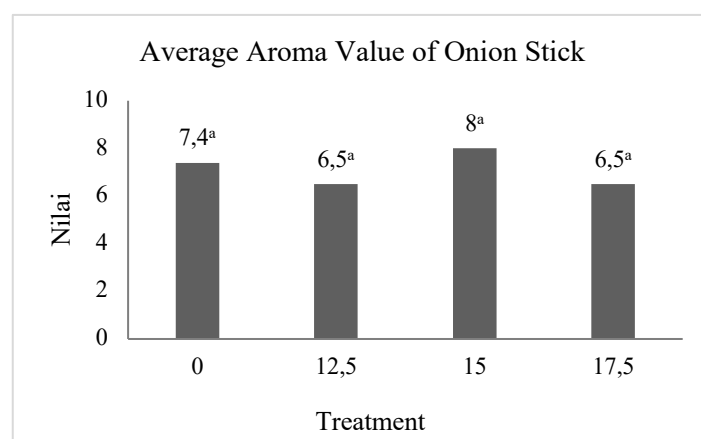

Figure 2. Average value of aroma towards onion stick
Description: 1=very dislike; 3=dislike; 5=Neutral; 7=Like; 9=Very Like

Taste

The results of the preference level test for the taste of onion sticks with the addition of patin fish meat flour showed that onion sticks with the addition of 15% patin fish meat flour had the highest average value, which was 8. Meanwhile, onion sticks with the addition of 17.5% patin fish meat flour had the lowest average value, which was 6.2. The graph of the average value for the taste of onion sticks with the addition of patin fish meat flour is shown in Figure 3.
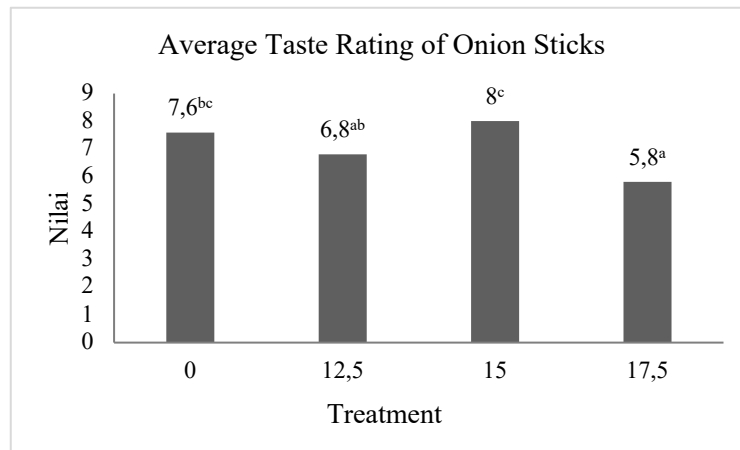

Figure 3. Average taste rating for onion sticks
Description: 1=really dislike; 3=dislike; 5=Neutral; 7=Like; 9=Very Like

Texture

The results of the test of the level of preference for the texture of onion sticks with the addition of patin fish meat flour showed that onion sticks with the addition of 15% patin fish meat flour had the highest average value, which was 7.9. Meanwhile, onion sticks with the addition of 17.5% patin fish meat flour had the lowest average value, which was 6.1. The graph of the average value of the texture of onion sticks with the addition of patin fish meat flour is shown in Figure 4.
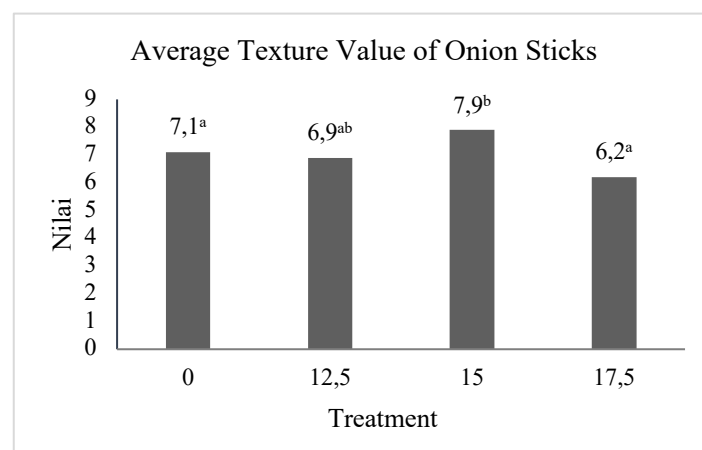
Gambar 1. Nilai rata-rata tekstur terhadap stick bawang
Keterangan : 1=sangat tidak suka; 3=tidak suka; 5=Netral; 7= Suka; 9=Sangat Suka

Decision Making with Bayes Method

Based on the calculation of the weight of the criteria for color, aroma, taste and texture of onion sticks with the addition of patin fish meat flour, the results showed that the assessment of appearance was the most important criterion that determined the final decision of the

panelists in choosing onion sticks with a criterion weight of 0.46. The weight value of the onion stick criteria can be seen in Figure 5.
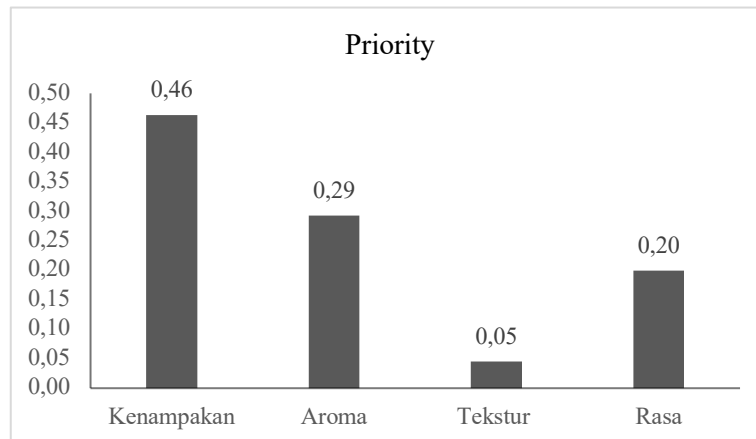

Figure 5. Weight value of onion stick criteria

DISCUSSION

Color is an organoleptic parameter that is quite important for panelists, because if the color is liked, they will tend to pay attention to other organoleptic parameters. Products with uniform and bright colors will be more attractive and preferred by panelists compared to products with less uniform and dull colors. (Rochima et al., 2015). Based on the results of the test of the level of color preference for onion sticks with the addition of 15% patin fish meat flour, the treatment showed the highest value with a brownish yellow appearance. Based on the Friedman statistical test, the level of color preference for onion sticks was significantly influenced by the level of patin fish meat flour addition. This shows that the color of onion sticks with the addition of 15% patin fish meat flour is significantly different from onion sticks with the addition of 0%, 12.5% and 17.5% patin fish meat flour. The higher the addition of patin fish meat flour to onion sticks, the appearance of the color of the onion sticks became less preferred by panelists so that the resulting level of preference decreased because the resulting onion sticks were darker brown. The results of observations of the color of onion sticks with several treatments can be seen in Figure 6.

Figure 6. Appearance of Onion Stick color

The dark color of the catfish flour onion stick is thought to be caused by the influence during frying because wheat flour contains protein and reducing sugars that will undergo a Maillard reaction when heated. The Maillard reaction is the interaction between carbohydrates, especially reducing sugars, with primary amino acids in a material that produces a brown color, known as melanoidin (Bunta et al., 2013). This reaction occurs quickly at a temperature of 100˚C, but does not occur at a temperature of 150˚C, and affects the taste, color, and aroma of the material (Arsa, 2016).

Aroma is one of the parameters in determining the delicious taste of a food product using the sense of smell because it can quickly provide an assessment of whether the product is liked or not (Winarno, 2002). Based on the results of testing the level of preference for the aroma of onion sticks with the addition of catfish flour, it shows that onion sticks with the addition of catfish flour in the 15% treatment showed the highest value with the aroma of onion sticks smelling of fish and garlic. Based on the Friedman analysis test, the level of preference for the aroma of onion sticks did not have a significant effect on the level of addition of catfish meat flour to the aroma of the resulting onion sticks. The difference in aroma found in each treatment was not too significant, because the percentage of addition to fish meat flour was still within reasonable limits, so that the fishy aroma of fish meat flour was not too noticeable to the panelists.

The aroma is influenced by other ingredients used and their comparisons such as eggs, margarine and the type of flour used. The aroma of onion sticks that can be accepted by the panelists is the typical aroma of sticks and does not smell rancid (Iqbal et al., 2016). Aroma is also produced from the Maillard reaction, where the browning process during frying creates a distinctive aroma that is preferred. (Martunis, 2012).

Taste is one aspect of assessing a product that is used to measure the level of preference for the product. (Iqbal et al., 2016). Based on the Friedman statistical test, the level of preference for the aroma of onion sticks was significantly influenced by the level of addition of catfish meat flour. Based on the results of the test of the level of preference for the taste of onion sticks with the addition of patin fish meat flour, it shows that onion sticks with the addition of patin fish meat flour treatment of 15% have the highest value because the taste of the onion sticks is savory and smells of patin fish, besides that, the results of the average value of the 15% treatment have the best value. According to Aryani & Norhayani (2011) stated that protein is related to the components that form the taste of food ingredients, the more protein, the more savory the product will taste.

Texture is one of the sensory parameters that can be felt through skin touch or by tasting (Martiyanti & Vita, 2019). Based on the Friedman statistical test, the level of preference for the texture of onion sticks has a significant effect on the level of addition of patin fish meat flour. Based on the results of the test of the level of preference for the texture of onion sticks with patin fish meat flour, it shows that onion sticks with the addition of patin fish meat flour treatment of 15% have the highest average value, namely 7.9 The effect of adding patin fish meat flour on the texture of onion sticks affects the characteristics of the texture of the sticks formed. The characteristics of the onion stick texture known to the public are crispy and not easily broken or crushed (Rahmadani 2020). According to Rakhmawati (2013), increasing the protein value in flour will increase the level of product hardness, which can make the product texture relatively hard and less crispy. Based on these data, the higher the concentration of catfish flour added, the less preferred the onion stick by the panelists because its texture is not crispy.

Based on the weight value of the onion stick criteria, it was found that appearance was the most important criterion that determined the panelists' final decision in choosing onion sticks with a value of 0.46. This means that 46% of panelists considered the appearance criteria of onion sticks. While the remaining 54%, the panelists divided into three other criteria

including aroma, texture and taste. Appearance is the first thing that consumers assess, if the impression of the product's appearance is good, consumers will look at other characteristics (Prakoso et al., 2013). Based on calculations using the Bayes method, the results showed that onion sticks with the addition of catfish meat flour with an addition of 15% were the onion sticks most preferred by the panelists because they had the highest value.

CONCLUSION

The treatment of adding patin fish meat flour has a significant effect on the parameters of color, aroma, taste and texture of onion sticks. The results of observations on the parameters of the level of preference test for onion sticks with the addition of patin fish meat flour can be concluded that the 15% treatment is the most preferred treatment by the panelists with the highest average value of color 8.3; aroma 8; taste 8 and texture 7.9. This can be seen from the golden yellow color with a slight aroma of patin fish, a savory taste and a texture that expands well. Based on the calculation of the criteria value, it was found that appearance was the most important criterion seen by the panelists in considering onion sticks with the addition of patin fish meat flour.

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