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Production of Fish-Based Floss as Food Product Innovation

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Abstract: Fish is one of the many fishery products produced in Indonesia and is a source of animal protein which is consumed by many people. This study aims to (1) find out the innovation of fish-based floss products, (2) find out which fish is suitable as a basic ingredient for making fish floss, (3) find out the added value of making fish into fish floss. The method used in this study is descriptive quantitative using organoleptic tests consisting of hedonic quality tests and hedonic tests on panelists. From the results of the organoleptic test, it was found that catfish fish showed the mean value for each color indicator (3.30), aroma (3.47), taste (3.20), and texture (3.33). Furthermore, the results of testing the dory floss showed values for color indicators (2.97), aroma (3.20), taste (3.63), and texture (3.20). Lastly, the Jambal Roti test showed mean values for color (2.90), aroma (3.17), taste (2.90), and texture (3.27). The results of the hedonic test showed that the mean values for catfish floss for each indicator were color (3.67), aroma (3.67), taste (3.33), and texture (3.33). Furthermore, the results of testing the dory floss showed values for color indicators (3.33), aroma (4.00), taste (3.67), and texture (3.33). Lastly, jambal roti testing showed mean values for color (3.00), aroma (3.67), taste (2.67), and texture (3.00). As a result, all floss products in this study were acceptable, but balanced floss catfish and dory products were the most preferred.

Keywords: fish-based, floss, innovation

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INTRODUCTION

Indonesia is an archipelagic country where most of its territory is water. The sea and fishermen cannot be separated from Indonesia, with about 75% of Indonesia's area being sea, many Indonesian people, especially coastal people, make fish a source of income for their lives (Rangkuti et al., 2022). Fish is a source of animal protein that is widely consumed by the public, so that fish contributes greatly to improving the health status of the community (Hasnidar, 2021). Most people consume fish because it has a high nutritional value. Catfish and dory are a type of freshwater fish which are known as commodities with bright prospects and the delicious and tasty taste of the meat results in high selling prices (Hasan, 2021).

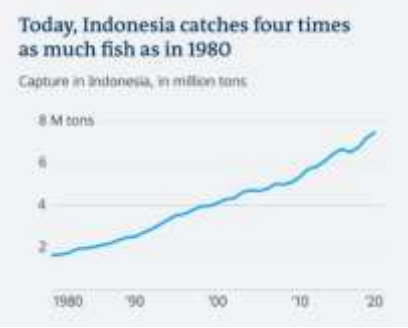

Figure 1. Indonesia's Fish Statistic (Source:) FAQ Fishery and Aquaculture Statistic (2022)

In Indonesia, overfishing happens, in which could affect in loss of biodiversity and destruction of marine areas. This happens, for example, when fishing is undertaken beyond sustainable levels or when subsidies encourage harmful fishing practices. (Merk, 2022). Floss is a processed product that is well known to many people. According to Jusniati et al. (2018), floss is a type of dry food with a distinctive shape made from boiled and sliced meat, seasoned, fried, then pressed. In principle, floss is a product of preservation, which is a combination of boiling and frying by adding spices. The resulting product has a distinctive texture, aroma and taste. In addition, the process of making floss food is a process of reducing the water content in foodstuffs which aims to extend the storage process. (Jusniati et al, 2018). Floss production is a method of drying in food processing which aims to extend the shelf life, reduce the volume and weight of the ingredients. The stages of making floss include reducing the size, sauteing with coconut milk, frying, pressing, and packaging (Fitriya & Ekantari, 2019). There are several types of floss fish that are popular in Indonesia, including catfish, tuna, salmon, and dory fish floss (Hatta et al., 2023). Catfish floss aims to process fish without 5 reducing the value of the protein contained in the catfish itself. Catfish Floss is beneficial for the body because it is low in calories and low in fat, a source of complete protein, a source of vitamin B12, low in mercury, and contains healthy fatty acids. Dory fish has coarse fiber and does not contain many bones. This dory fish is widely known as a meat-producing fish because the composition and growth of its meat is relatively better than other fish. Floss dory fish is also produced into processed food,which is very durable and long lasting and does not escape the value of high protein content. Jambal Roti Fish, one of the well-known salted fish products is Jambal Roti. This fish is a salt fermented product made from sea catfish (Arius thalassinus). According to oral statements from several fish traders, the term jambal roti, especially in Pekalongan, Cirebon and Cilacap, is used because the jambal roti meat that has been

fried can easily crumble like toasted bread (Maulid & Abrian, 2020). From the catch of sea catfish in West Java in 1998, amounting to 2,764.70 tonnes, nearly 85 percent were processed into dried jambal roti (West Java Fishery Service 2020). The quality of fish for consumption is very important, so the handling and management of fish that is fast, precise, correct, easy and low cost is an urgent need for fishing communities to be able to provide fish and processed products according to the needs of the community (Trihasa& Ikhwana, 2018). Creativity and innovation are needed by applying simple and effective technology that is suitable for solving fish processing and storage. Innovation for managing catfish, dory, and jambal roti into floss as a culinary product that can be taken anywhere and at any time, practically in the form of ready-to-eat 12 instant foods without preservatives and harmful ingredients that is efficient (Fajriani & Fidyansari, 2019). Various problems and obstacles faced by fishermen, it is necessary to make efforts in further processing as processed products in the form of fish floss which have high quality, good quality and have a long shelf life (Alimusa & Murini, 2018; Fauzy, Pattiasina, & Kembauw, 2020).

LITERATURE REVIEW

According to Anwar & Irhami (2018), floss meat is a typical Indonesian food made from meat. Its distinctive taste makes floss meat no longer only enjoyable from meat, but fish. Utilization of fish meat can also come from various types of fish on the market. To take advantage of the abundant marine products andminimize production so that it is not wasted, it is necessary to diversify processed fish meat into various food productions, one of which is fish floss. Usually, floss is made from beef or buffalo meat, but now a new trend has emerged for making flossfish. Fish is a food ingredient that is consumed by many people apart from being an export commodity (Anwar & Irhami, 2018).

Floss is a processed product that is well known to many people. According to Jusniati et al. (2018), floss is a type of dry food with a distinctive shape made fromboiled and sliced meat, seasoned, fried, then pressed. In principle, floss is a product of preservation, which is a combination of boiling and frying by adding spices. Theresulting product has a distinctive texture, aroma, and taste. In addition, the processof making floss food is a process of reducing the water content in foodstuffs which aims to extend the storage process. (Jusniati et al, 2018).

According to Suhendra (2021), the type of fish consists of freshwater fish and marine fish. Both are food sources of protein which are very important for body growth. Fish contains 18 percent protein consisting of essential amino acids that are not damaged by cooking. The fat content of fish is 1-20 percent. Fish fat is easily digested and can be used directly by the body. The fat contentof fish is mostly unsaturated fatty acids which are needed for growth and can lower blood cholesterol. Various kinds of fish contain varying amounts of fat (Suhendra, 2021).

It was further explained that there are also various vitamins in fish, namelyvitamins A, D, Thiamin, Riboflavin, and Niacin. Fish also contains more or lessas many minerals as the minerals contained in milk. As for minerals such as calcium and phosphorus, they are higher than milk (Suhendra, 2021).

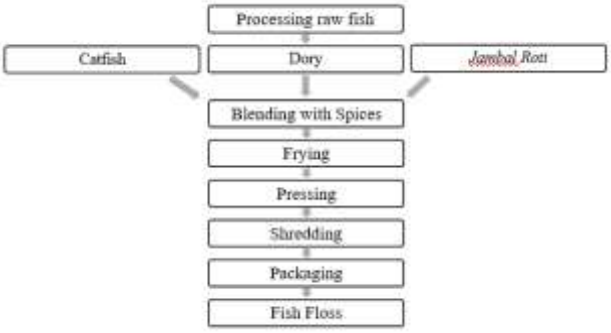

Figure 2. Process of Making Fish Floss
Source: Processed Data (2022)

In the process of making fish floss, there are important steps that must be taken to produce good quality floss, including blending with spices, frying, pressing, shredding, and packaging (Novita, 2022).

The blending with spices process in making floss meat is the process of blending the meat with the spices used in making floss meat. The blending process can be done manually or using a blender with a stirrer. The fish is thenleft for a while so that the spices seep into the ingredients (Novita, 2022).

Frying is a drying method to remove water using heat energy from oil. Oil penetration into the material is evaporated so that the floss becomes dry and crunchy. The frying process also enhances the aroma of floss (Novita, 2022). In the process of making floss meat, pressing is carried out with the aim of removing the cooking oil that is in the floss meat. Because too much oil remainsin floss will reduce the quality of floss. The oil content that is too high will accelerate the rancidity of the floss (Novita, 2022).

This shredding process is carried out after the pressing process. Because after being pressed, the floss becomes dense and lumpy. The goal is for the flossto expand. So that the dense floss could be broken down into a smooth and even,the process must be done slowly and starting from the edge or the outermost part. The tools used can be in the form of a fork or manually by hand (Novita, 2022).

Floss packaging can be done with a plastic bag and covered or glued with asealer. Floss packaging aims to maintain quality, avoid damage during storage, facilitate transportation, protect food from dust and other impurities, and prevent contamination by insects and microbes (Novita, 2022).

RESEARCH METHODS

Research on making fish floss made from smoked catfish, dory fish, and jambal roti fish. Catfish is one of the food sources of protein because the proteincontent ranges from 22.0–46.6%. Therefore, preparations made from catfish can be an alternative source of protein (Mahyudin, 2013). One alternative processed catfish product that has many enthusiasts and is easy to market is floss. According to Harianti & Tanberika (2018), floss fish is a processed fish-based product that has gone through several processes such as grinding, seasoning, andfrying.

The type of research in this research is experimental research. Experimental research is a study that conducts experimental activities (experiments) which aim to find out a symptom that arises because of a particular treatment or experiment (Arifin, 2020).

In this research, experimental research is suitable for this research, experimental research was carried out to get results for the manufacture of fish-based fish floss. This research was conducted to obtain valid, objective, efficient and effective results, as well as the product development stage from the start to the product that has been produced. Primary data collection for this study was carried out by distributing organoleptic test questionnaires and hedonic quality tests to expert panelists (lecturers) and trained panelists (students) to determine the level of preference for fish-based floss products. According to (Sugiyono, 2008), a questionnaire is a data collection strategy in which respondents answer a series of questions or written statements.

The questionnaire provided will display an evaluation of four characteristics, including aspects of taste, color aspects, texture aspects, aroma aspects. These four factors were used by the team to validate the findings of theorganoleptic and hedonic tests. By using a Likert scale, panelists who fill out the questionnaire will assess their level of preference. This allows us to categorize our objects (consumers) based on their positive or negative attitude towards a particular item. Likert scale is simple to construct and likely to produce a highly reliable scale. Besides, from the perspective of participants, itis easy to read and complete (Taherdoost, 2019).

In the hedonic test, the researchers tested floss fish products to expert panelists to get direct preferences for floss fish products so they could get approval to continue the research and continue testing with consumers to get consumers' opinions on floss fish products. Comparable to the hedonic test, the hedonic quality test is a preference test to determine the response of panelists to quality attributes in general. The hedonic test provides a perceptual statement about the good or bad quality of a product, but the hedonic test tests various special features, including taste, texture, aroma, and color, while the hedonic test is only a preference test. In the hedonic quality test, researchers who have tested thehedonic test and get opinions and preferences from experts test the quality of the product where experts assess the product in terms of good or bad so they can get the desired value to continue research on floss fish products.

RESULTS AND DISCUSSION

The results of the research regarding the product innovation of making fish-based floss fish were obtained by processing organoleptic test data that had beencarried out on expert panelists (lecturers). The hedonic test will provide preference data for a product, whether they like or dislike the product. On the other hand, a hedonic quality test will provide more specific data by assessing the quality data of a product, not just based on choice. Both tests will assess the overall aspects including appearance, aroma, taste, and texture;however, the hedonic quality test will focus more on the aspect of the quality.

Results

Table 1. Organoleptic Test Result Catfish

Skor	Warna		Aroma		Rasa		Tekstur	
	F	%	F	%	F	%	F	%
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	1	33.3	1	33.3	2	66.7	2	66.7
4	2	66.7	2	66.7	1	33.3	1	33.3
Mean	3.67		3.67		3.33		3.33	

Source: Processed Data (2022)

Table 2. Hedonic Test Result Catfish

Skor	Warna		Aroma		Rasa		Tekstur	
	F	%	F	%	F	%	F	%
1	0	0	0	0	0	0	0	0
2	3	10	2	6.7	2	6.7	2	6.7
3	15	50	12	40	20	66.7	16	53.3
4	12	40	16	53.3	8	26.7	12	40
Mean	3.30		3.47		3.20		3.33	

Source: Processed Data (2022)

Table 3. Organoleptic Test Result Dory

Skor	Warna		Aroma		Rasa		Tekstur	
	F	%	F	%	F	%	F	%
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	2	66.7	0	0	1	33.3	2	66.7
4	1	33.3	3	100	2	66.7	1	33.3
Mean	3.33		4.00		3.67		3.33	

Source: Processed Data (2022)

Table 4. Hedonic Test Result Dory

Skor	Warna		Aroma		Rasa		Tekstur	
	F	%	F	%	F	%	F	%
1	0	0	0	0	0	0	0	0
2	8	26.7	4	13.3	1	3.3	2	6.7
3	15	50	16	53.3	9	30	16	53.3
4	7	23.3	10	33.3	20	66.7	12	40
Mean	2.97		3.20		3.63		3.20	

Source: Processed Data (2022)

Table 5. Organoleptic Test Result Jambal Roti

Skor	Warna		Aroma		Rasa		Tekstur	
	F	%	F	%	F	%	F	%
1	0	0	0	0	0	0	0	0
2	1	33.3	0	0	1	33.3	0	0
3	1	33.3	1	33.3	2	66.7	3	100
4	1	33.3	2	66.7	0	0	0	0
Mean	3.00		3.67		2.67		3.00	

Source: Processed Data (2022)

Table 6. Hedonic Test Result Jambal Roti

Skor	Warna		Aroma		Rasa		Tekstur	
	F	%	F	%	F	%	F	%
1	0	0	0	0	2	6.7	0	0
2	10	33.3	5	16.7	8	26.7	7	23.3
3	13	43.3	15	50	11	36.7	8	26.7
4	7	23.3	10	33.3	30	30	15	50
Mean	2.90		3.17		2.90		3.27	

Source: Processed Data (2022)

Discussion

Based on the results of research and discussion regarding the innovation ofmaking fish floss made from catfish, dory fish, and *jambal roti*, the authors can provide the following conclusions .

Based on organoleptic tests, it was found that catfish floss showed mean values for each color indicator (3.30), aroma (3.47), taste (3.20), and texture (3.33). Furthermore, the results of testing the floss dory fish showed values for color indicators (2.97), aroma (3.20), taste (3.63), and texture (3.20). Lastly, the *Jambal Roti* test showed mean values for color (2.90), aroma (3.17), taste (2.90), and texture (3.27). These results indicated that floss catfish was the most acceptable in terms of aroma and taste, floss dory fish was the most accepted in terms of taste while jambal roti floss in terms of texture.

Based on the hedonic test, it is known that the mean values for floss catfishfor each indicator are color (3.67), aroma (3.67), taste (3.33), and texture (3.33). Furthermore, the results of testing the floss dory fish showed values for color indicators (3.33), aroma (4.00), taste (3.67), and texture (3.33). Lastly, *jambal roti* testing showed mean values for color (3.00), aroma (3.67), taste (2.67), and

texture (3.00). These results indicated that floss catfish was the most preferred in terms of color, and floss dory fish was the most preferred in terms of taste.

CONCLUSION & SUGGESTION

Conclusion

The needs to meet the high demand for floss fish as public consumption, this research aims to apply simple and effective technology that is suitable for solving fish processing, storage, processing, and marketing problems. Innovation for managing catfish, dory, and jambal roti into floss salted fish as a culinary product that can be taken anywhere and at any time, practically in the form of ready-to-eat instant food without preservatives and harmful ingredients that is efficient and liked by all people. Based on the results of research and discussion regarding the innovation of making fish floss made from catfish, dory fish, and jambal roti, the authors can conclude the innovation about fish floss, this research conducted experimental research. In which was suitable for this research, experimental research was carried out to get results for the manufacture of fish-based fish floss. This research was conducted to obtain valid, objective, efficient and effective results, as well as the product development stage from the start to the product that has been produced. Further research, the researcher hopes that this research can help future readers and researchers to gain insight into the production of fish floss. In addition, this research is planned to provide some business ideas for those who want to open a business in the manufacture and sale of fish floss. Like the innovation of making catfish floss, dory fish, and jambal roti which was quite successful in this study. In the next opportunity, the author will develop innovations with other raw materials that are better and increase competitiveness in society.

Suggestion

Based on the conclusions from this study, for further research, researchers can choose the right ingredients and adjust production techniques to help maintain the quality of the final product, especially in the texture and taste of fish floss products. In this study, the production of floss jambal roti was carried out, but the test results were still not good compared to floss catfish and dory fish. Further 55 research is suggested to try the production of floss jambal roti with different recipes and techniques so that it is more accepted by the community.

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