Available online at www.worldscientificnews.com

World Scientific News

An International Scientific Journal

WSN 202 (2025) 174-185 EISSN 2392-2192

Level of Preference of Simping Cake Supplemented with Patin Fish Meat Flour (*Pangasius hypopthalmus*)

Salmaa Ishma Hidayati[1], Junianto[1], Iis Rostini[1], Rusky Intan Pratama[1]

[1]Department of Fisheries, Faculty of Fisheries and Marine Science, Universitas Padjadjaran

E-mail address: salmaaishma03@gmail.com

ABSTRACT

This research aims to determine the maximum level of adding catfish meat flour in the production of simping cakes, resulting in a product still favored by panelists, and to analyze the proximate composition of simping cakes that are still favored with the maximum addition of catfish meat flour. This research was conducted at the Regional Technical Implementation Unit for Processing of the Purwakarta Regency Office, the Fisheries Product Processing Laboratory of the Faculty of Fisheries and Marine Sciences at Padjadjaran University, and the Nutrition Laboratory of the Faculty of Animal Science at Padjadjaran University from November to December 2024. The research method used is an experimental method with 4 treatments of adding catfish meat flour at 0%, 5%, 10%, and 15%. The parameters observed were the organoleptic characteristics assessed by 20 semi-trained panelists, including appearance, aroma, texture, and taste, as well as the proximate composition of the control treatment and the treatment with the maximum addition of patin fish meat flour. The research results based on statistical tests show that treatment A is significantly different from treatment D in terms of aroma, taste, and texture characteristics. Therefore, the maximum addition limit in simping cake that can still be liked is at a percentage of 10% with average values of aroma 7.0, texture 7.8, and taste 7.0. The results of the proximate analysis with the treatment of 10% addition of catfish meat flour showed moisture content of 2.06%, ash content of 2.19%, fat content of 9.33%, protein content of 6.69%, and carbohydrate content of 79.73%.

Keywords: fish meat flour, level of preference, patin fish, proximate, simping cake.

(Received 15 January 2025; Accepted 20 March 2025; Date of Publication 12 April 2025)

1. INTRODUCTION

The production of catfish aquaculture in West Java has increased. According to statistical data from the Ministry of Maritime Affairs and Fisheries (KKP) in 2022, the aquaculture production of catfish in West Java reached 34,156 tons, up from 31,176 tons in 2021. Patin fish has several advantages, including high resilience and adaptability, high protein content, and an affordable price compared to tilapia, which is also a cultured fish. However, the difference in protein content is not significant, with only a 1.52% difference, as tilapia has superior protein content (Matondang, 2022). Patin fish contains nutrients consisting of 17 grams of protein, 6.6 grams of fat, 135 kcal of energy, 1.1 grams of carbohydrates, and 1.6 grams of Fe per 100 grams of patin fish flesh (Kodriah and Hastuti 2021).

Patin fish is a cultivated fish that is readily available, and with the high production yield of patin fish farming, it can be utilized as a semi-finished product. Semi-finished products in the fisheries sector include surimi, fish fillets, minced fish, and fish meal. One part of the fish that can be utilized to make flour is the flesh (Fatmawati and Mardiana 2014). Fish meat processed into flour is more advantageous than in its fresh form; the benefits include having a longer shelf life, ease of application, diversification and food consumption, as well as enhancing fish processing efforts (Adawyah et al., 2020).

Fish meat flour can be applied to products that have low protein content, such as cookies. Processing patin fish meat into flour and applying it to a product can help increase fish protein consumption in the community. According to Wicaksana (2019), 100 grams of patin fish flour contains 67.54 grams of protein. The high protein content of patin fish flour makes it a suitable additive in the production of food products.

One of the food products that is well-known and widely liked by the people of Purwakarta is simping. Simping is a traditional processed food that originates from Purwakarta, West Java. Simping is a type of snack food. Generally, simping can be consumed and enjoyed by all age groups, from children to adults, and is sold in tourist areas. The main raw materials in the production of simping cakes are tapioca flour and wheat flour, so simping cakes contain more carbohydrates and have a low protein content. The low protein content allows for the addition of catfish meat flour when making simping cake to increase its protein content. According to Suseno (2005), the nutritional content of the original simping cake is 5.04% protein, 1.25% fat, 88.14% carbohydrates, 3.77% moisture, and 1.81% ash.The addition of patin fish meat flour to simping products not only increases protein but also affects consumer acceptance. According to Okfrianti et al., (2013), the more fish flour is added, the lower the panelists' preference for the organoleptic quality of a product. Therefore, it is very important to conduct research on the addition of patin fish meat flour to the level of preference to determine the percentage limit of adding patin fish meat flour to simping cake. The preference test was conducted because the addition of patin fish meat flour to simping cake has never been done and is not available in the market, so to determine whether the product is still liked or not, a preference test was conducted.

2. MATERIALS AND METHODS

This research uses an experimental method with 4 treatments of adding catfish meat flour. The percentage of added patin fish meat flour used is 0%, 5%, 10%, and 15%. The observation parameters conducted in this study are the level of preference regarding the appearance, texture, taste, and aroma of simping cake. Proximate analysis (moisture, fat, protein, ash, and carbohydrates) of simping cakes without the addition of patin fish meat flour and simping cakes with the maximum addition of patin fish meat flour that are still preferred.

The panelists used in this study were 20 semi-trained panelists from the Faculty of Fisheries and Marine Sciences students. This research was conducted from November to December 2024. The processing of catfish meat flour and simping cake was carried out at the Technical Implementation Unit for Regional Processing of the Purwakarta Regency Office. Organoleptic testing was conducted at the Fishery Product Processing Laboratory of the Faculty of Fisheries and Marine Sciences, Padjadjaran University, while proximate analysis was carried out at the Nutrition Laboratory of the Faculty of Animal Husbandry, Padjadjaran University.

The data obtained from the level of preference were analyzed statistically using non-parametric Friedman Test with Microsoft Excel application. The aim was to determine the effect of treatment on the observed parameters. The data from the proximate analysis were analyzed descriptively comparatively. The analysis was reviewed by linking it to the theoretical basis, related literature and SNI.

2.1. Research Tools and Materials

The tools used to make fish meat flour are a basin, knife, cutting board, scale, steamer, gas stove, mortar, sieve, oven, chopper, and 100 mesh Tyler sieve. The tools used to make simping cake are containers, mixers, scales, simping molds, small spatulas, jars, blenders, and sieves. The materials used for this research are catfish weighing 1-2 kg each, tapioca flour, wheat flour, coconut milk, kencur, garlic, salt, and sugar. The formulation of simping cake can be seen in Table 1.

Table 1. Formulation of simping cake with patin fish meat flour

Nama Bahan	Formulasi Kue Simping Tepung Daging Ikan Patin			
	A (0 %)	B (5%)	C (10%)	D (15%)
Tapioca flour (g)	350	350	350	350
Wheat flour (g)	100	100	100	100
Patin fish meat flour (g)	0	22,5	45	67,5
Coconut milk water (ml)	1000	1000	1000	1000
Aromatic ginger (g)	6	6	6	6
Salt (g)	14	14	14	14
Sugar (g)	6	6	6	6
Garlic (g)	6	6	6	6
Water (ml)	20	20	20	20

2.2. Manufacturing Process

The production of fish meat flour refers to the modified research by Wicaksana (2019), namely: 1) preparation of tools and materials, 2) filleting of patin fish, 3) the fish meat is steamed in a steamer, 4) squeezed with a cloth, 5) the meat is cut into small pieces, 6) the meat is dried in an oven at 70°C for 12 hours, 7) after drying, ground using a chopper, 8) sift the fish flour using a Tyler 100 mesh sieve. The preparation of simping cake refers to the research by Tarigan (2002), namely: 1) Preparation of tools and ingredients, 2) grated coconut is squeezed until it produces coconut milk, 3) tapioca flour, wheat flour, fish meat flour, sugar, salt, and coconut milk are put into a container, 4) garlic and kencur are blended using a blender and added to the container with the previous ingredients, 5) Stir until well mixed, 6) The simping cake mold is heated on the stove, 7) Print the simping cake batter for 1.5±1 minutes, 8) The simping cake is removed from the mold and placed into a jar.

3. RESULTS AND DISCUSSION

The results of the study on the addition of patin fish meat flour to simping cookies with observation parameters of preference levels regarding appearance, texture, taste, and aroma of simping cookies, as well as proximate analysis of simping cookies, can be seen in the following explanation:

3.1. Appearance

Appearance is assessed based on visual or what can be seen by the eye. Appearance is an important parameter of a product because it is the first thing seen by consumers. A good appearance tends to be perceived as having a delicious taste and high quality (Tarwendah 2017).

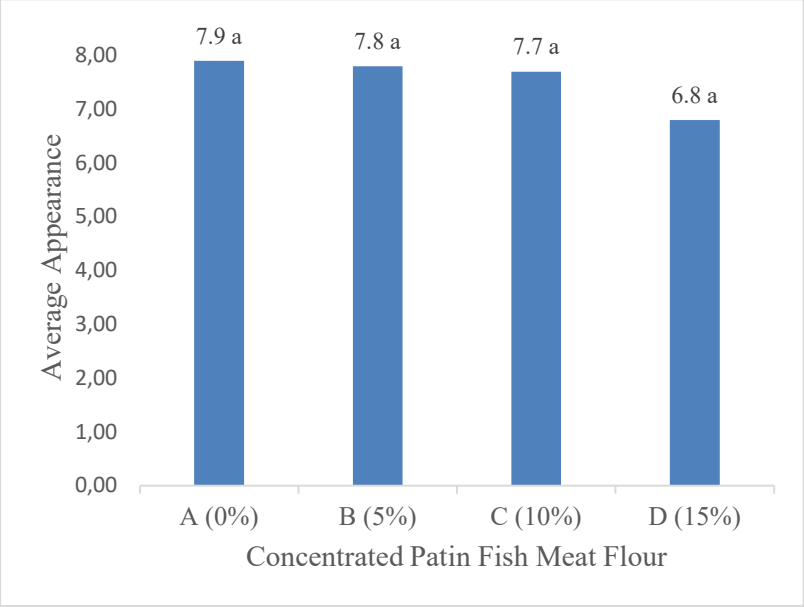

Figure 1. Average Value of Appearance of Patin Meat Flour Simping Cake.

The average appearance score of the simping cake is presented in Figure 1. The average value of treatment A with a percentage of 0% is 7.9. The average score of B with a percentage of 5% is 7.8. The average score of treatment C with a percentage of 10% is 7.7. The average value of treatment D with a percentage of 15% is 6.8. Based on Figure1, which is the result of statistical testing, the level of addition of patin fish meat flour does not significantly affect the appearance of simping cake with several treatments of patin fish meat flour addition.

In the 0% treatment without the addition of patin fish meat flour, the simping cake produced a cream color. In the 5% treatment with the addition of patin fish meat flour, the simping cake produced a light brown color. In the 10% treatment, the simping cake had a cream color with light brown on some edges. In the 15% treatment, the simping cake had a cream color with a brownish hue.

The level of addition of fish meat flour did not significantly differ in the appearance of simping cookies due to the cream color of the patin fish meat flour used, resulting in a minimal impact on the color of the produced simping cookies. According to the research by Irpan et al., (2024), the addition of patin fish meat flour at different concentrations does not have a significant effect on the color of ladyfinger cookies because the color of the fish meat flour is yellowish-white and not dark. The simping cake without the addition of patin fish meat flour was preferred, in line with the research by Nazzila et al., (2019), which found that panelists preferred simping cakes that were generally cream-colored. The simping cake, which is added with patin fish meat flour, has a brownish color on some parts of its sides, presumably due to the high percentage of patin fish meat flour used, and the color change occurs after molding and cooking. The protein content in patin fish meat flour can influence the browning reaction in a product, so the higher the percentage of patin fish meat flour added to the simping cake, the browner the color of the simping cake will become.

3.2. Smell

Smell is a subjective taste and smell that is difficult to measure because people's sensitivity and preferences vary (Putri et al., 2022). The organoleptic aroma test is conducted using the sense of smell or subjective assessment from the results of smelling. Aroma is an important factor that can determine the palatability of a food by consumers, thus making it appealing (Fitri et al., 2016).

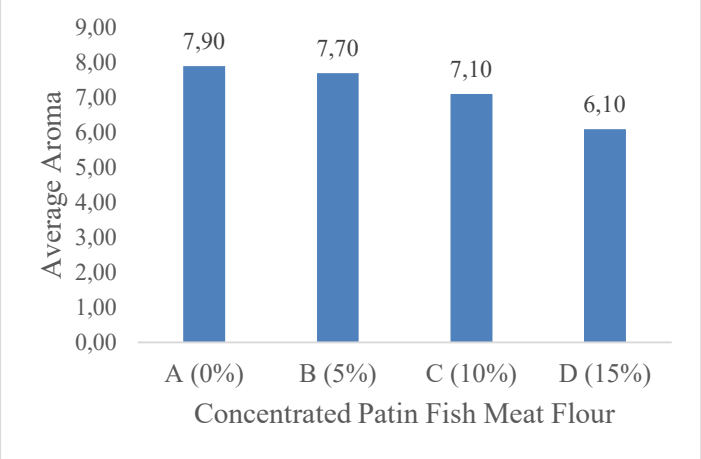

Figure 2. Average Value of Aroma of Patin Meat Flour Simping Cake.

The average aroma value can be seen in Figure2. The average value of treatment A with a percentage of 0% is 7.9. The average score of B with a 5% percentage is 7.7. The average score of treatment C with a 10% percentage is 7.1. The average value of treatment D with a percentage of 15% is 6.1.

Figure 2 shows the results of the statistical test indicating that the level of flour addition has a significant effect on the aroma of simping cookies. Treatment C, denoted as ab, is not significantly different from treatments A and B, denoted as b, but treatments A and B are significantly different from treatment D, denoted as a. In treatment A with a percentage of 0%, the simping cake produced had a specific aroma of coconut milk and kencur, whereas in treatment D with a percentage of 15%, the simping cake produced had an aroma typical of fish. Based on the results of the Friedman statistical test, it shows that the aroma in treatments A and D is significantly different, therefore 10% is the maximum percentage of patin fish meat flour that can be added to the simping cake.

Treatment A (0%) only contains a composition of tapioca flour and wheat flour, and no catfish meat flour is added. Simping cake has a specific aroma of coconut milk and the scent of kencur. Simping cake with an increasing addition of fish meat flour results in a decreasing preference for the aroma, caused by the panelists not being accustomed to the dominant fishy aroma of patin fish in the simping cake. In catfish, there are proteins that degrade after the catfish is made into flour. According to Nurfajrina and Hastuti, (2021), degradation will produce volatile compounds that cause a fishy aroma, and this aroma will be inhaled and recognized by the sense of smell. The fishy aroma that arises in fish comes from the compound trimethylamine (TMA) (Safitri et al., 2022). This is in line with the research by Ernisti et al., (2018) that the more fish meat flour is added to the crackers, the lower the preference for the aroma of the product.

3.3. Texture

Texture is a parameter that indicates the result of the tactile sense response to physical stimuli when the inside of the oral cavity comes into contact with food (Putri et al., 2022). According to Nazzila et al. (2019), simping cake has a light and crispy texture.

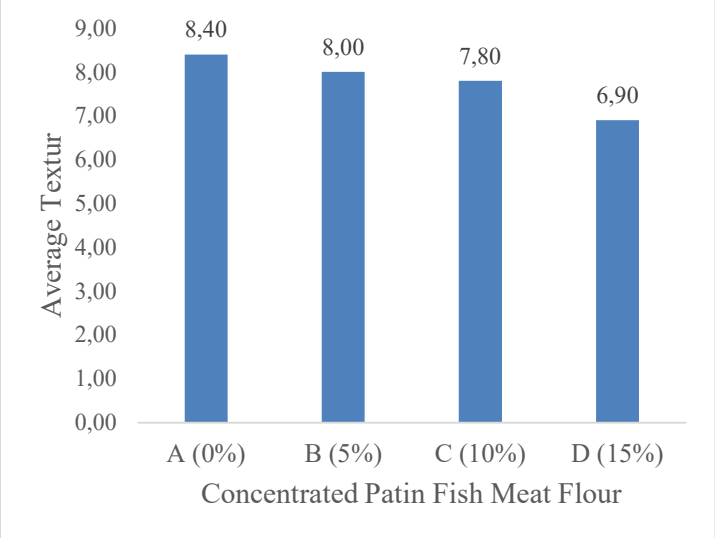

Figure 3. Average Value of Texture of Patin Meat Flour Simping Cake.

The average texture value of the simping cake can be seen in Figure3. The average value of treatment A with a percentage of 0% is 8.4. The average score of treatment B with a 5% percentage is 8.0. The average score of treatment C with a 10% percentage is 7.8. The average value of treatment D with a percentage of 15% is 6.9.

Figure 3 shows the statistical test results that the level of addition of patin fish meat flour has a significant effect on the texture of simping cake. Treatments B and C, denoted as ab, did not differ significantly from treatment A, denoted as b, and treatment D, denoted as a. However, treatment A, denoted as b, differed significantly from treatment D, denoted as a. In treatment A, the simping cake has a light and crispy texture, whereas in treatment D, the texture of the simping cake is not very crispy and has thickened. The results of the Friedman statistical test show that the texture in treatments A and D is significantly different; therefore, 10% is the maximum percentage of catfish meat flour that can be added to the simping cake.

Treatment A with a 0% percentage resulted in a simping cake texture and crispiness due to the absence of added patin fish meat flour. Patin fish meat flour does not contain amylopectin, which is the reason why the simping cake becomes less crispy as more patin fish meat flour is added. Amylopectin functions as a producer of a crispy texture and good durability, resulting in a food product that is brittle with low density (Jayanti et al., 2017). In the flour of patin fish meat, the proteins contained within consist of carboxyl groups that absorb more water, causing the cake to lose its crispiness because in dry products, the higher the water-binding capacity, the more it affects the hardness level of the product. According to the research by Wildah et al., (2024), semprong cookies with increasing amounts of patin fish meat flour have a harder texture and are less crispy.

3.4. Taste

Taste is formed from the combination of ingredients and composition in a food that is perceived by the taste buds and supports the quality of a product (Pramitasari 2010). Taste in food ingredients is very important in determining consumer acceptance, as well as being a crucial determinant of food quality. According to Prabowo et al., (2014), taste is a very important factor in determining the level of consumer acceptance of a product, as taste will determine consumer preferences before consuming the product in large quantities.

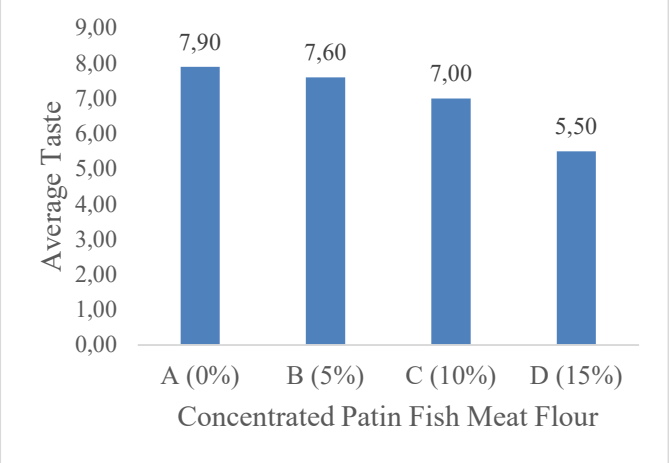

Figure 4. Average Value of Taste of Patin Meat Flour Simping Cake.

The average taste score of the simping cake can be seen in Figure 4. The average value of treatment A with a 0% percentage is 7.9. The average score of treatment B with a 5% percentage is 7.6. The average value of treatment C with a 10% percentage is 7.0. The average value of treatment D with a 15% percentage is 5.5.

Figure 4, which is the result of the statistical test, shows that the level of addition of patin fish meat flour has a significant effect on the taste of simping cake. Treatment C is not significantly different from treatments A and B, but treatments A and B are significantly different from treatment D. At 0% percentage, the taste of simping cake is savory due to the presence of coconut milk, which has a fat content that can impart a savory flavor to the simping cake product without any additional ingredients, resulting in a taste that is specific to coconut milk and kencur. At a 5% percentage, the taste of simping cake is still savory and starts to have the distinctive flavor of patin fish meat flour. At the 10% percentage, the simping cake has a savory taste derived from coconut milk and patin fish meat flour, which is stronger than at the 5% percentage. However, the strong fishy aroma present in the simping cake with the addition of patin fish meat flour makes the panelists less fond of the resulting taste. At a 15% concentration, the taste of the simping cake is dominated by the patin fish meat flour, resulting in a bitter aftertaste that makes the panelists uncomfortable with its flavor. The results of the Friedman statistical test show that the taste in treatments A and D is significantly different, therefore 10% is the maximum percentage of catfish meat flour that can be added to simping cake.

The higher the addition of patin fish meat flour in the simping cake, the more dominant the fish flavor will be, causing the panelists' preference for the taste of the simping cake to decrease. This is because the panelists are not yet accustomed to the simping cake with the addition of patin fish meat flour, and the simping cake with the variant addition of patin fish meat flour has never been marketed. Patin fish meat flour does contain 2.16 grams of glutamic acid per 100 grams, which gives a savory impression to the simping cake. However, the taste produced in the product is influenced by several factors, including chemical compounds, temperature, concentration, and interaction with other flavor components Sriwidianingsih (2013). The raw materials in the making of simple simping cake are wheat flour, tapioca flour, and coconut milk, as well as other additional ingredients like sugar and salt, which are present in smaller quantities than the main raw materials, thus unable to minimize the aroma and taste produced by the patin fish meat flour. Poli (2024) research on puff pastry with the addition of mackerel fish flour at 5% and 10% did not show a significant difference in taste because the ingredients for making the product included margarine, which can cover the fishy smell and odor, improve the fishy taste in the dough due to its high fat content that can help absorb or dissolve volatile compounds causing the fishy aroma, making it less dominant. Additionally, margarine contains emulsifiers that help blend ingredients with different tastes and aromas, creating balance. Although coconut milk is used in the making of simping cookies, according to Isuarti (2015), the fat content in coconut milk is low compared to margarine, and the emulsifier in coconut milk is not significant in uniting different ingredients and aromas. This study is in line with the research by Wahyuningsih et al., (2024), which found that semprit cookies with a 10% fish content were still favored by the panelists because, although the distinctive fish flavor was present, it was not too dominant. According to the research by Dewi et al., (2023), the addition of more catfish meat flour will replace the flour taste in the flakes with a percentage above 10%, and the flakes will increasingly have a fishy taste, which is not favored by the panelists.

3.5. Proximate composition Simping cake made from patin fish meat flour

Proximate analysis of a product is a chemical analysis used to determine the nutritional content, raw materials, and properties of a product. Proximate analysis is important to determine the quality and nutritional value of a food ingredient or product. The components of proximate analysis include moisture content, fat content, protein content, ash content, and carbohydrates. In the simping cake product with the supplementation of patin fish meat flour, the treatments analyzed are treatment A (0%) and treatment C (10%). The results of the analysis on the simping cake can be seen in Table 2.

Table 2. Proximate composition Simping cake made from patin fish meat flour.

Parameter	Simping Cake	
	A (0%)	C (10%)
Water (%)	1,60	2,06
Ash gray (%)	1,78	2,19
Fat (%)	5,97	6,69
Protein (%)	3,06	9,93
Carbohydrate (%)	87,59	79,73

Water content is the amount of water contained in food ingredients. The moisture content is important to determine and analyze to know the shelf life of a product because high moisture content can allow biological activities such as spoilage bacteria to enter, thereby reducing the quality of food products. Based on Table 2, the results of the moisture content analysis on simping cakes without the addition of patin fish meat flour and with the addition of patin fish meat flour are different. The water content increased by 0.46%. The moisture content with the addition of patin fish meat flour increased not only because of the addition of patin fish meat flour into the dough. The moisture content in a product will tend to increase with the addition of patin fish meat flour because it has a high protein content that can bind water in the product (Wahyuningtyas et al., 2020). This is in line with the research by Ernisti et al. (2018) that the more fish meat flour added to the biscuits, the higher the moisture content will be. The increase in moisture content in simping cookies is also influenced by the molding process because the simping cookie dough is placed into molds and pressed, resulting in shrinkage due to evaporation. The main raw material, namely wheat flour, has a high gluten content which makes it easier to bind water during the baking process (Damayanti et al., 2020), and the addition of catfish meat flour, which is high in protein, can also bind water.

Ash content refers to the residue resulting from the combustion of organic materials at high temperatures. Based on the proximate analysis results, the ash content in simping cake increased by 0.41%. The simping cake without the addition of patin fish meat flour has an ash content of 1.78%, while the simping cake with the addition of patin fish meat flour has an ash content of 2.19%. The high ash content in the simping product without the addition of patin fish meat flour is due to the relatively high mineral content in tapioca flour. It is known that tapioca flour contains 84 mg of calcium and 125 mg of phosphorus per 100 grams of material, so products with high mineral content will increase the ash content (Soemarno 2017, Mumtazah et al., 2021).

Wheat flour, as the main ingredient used in the making of simping cake, also affects the increase in ash content. According to Fakhrudin (2009), wheat flour has the ability to increase inorganic substances in the product, resulting in a higher ash content in the product.

The fat content is the amount of fat present in a food that serves as a source of energy. The increase in fat content from treatment A to treatment C is due to the addition of patin fish meat flour. It is known according to the research by Dewi et al., (2023), that the flour from patin fish meat has a fat content of 5.03%. The low fat content is due to the ingredients used in the making of simping cookies, which have a low fat content, namely tapioca flour at 3.39% and wheat flour at 0.5%. If compared to the research by Wildah et al., (2024), the semprong cake without the addition of patin fish meat flour has a fat content above 9.5% due to the ingredients used in making the semprong cake, which include eggs and margarine that can increase the fat content. Therefore, the food ingredients used in the production of the product also affect the resulting fat content.

Protein is a nutrient that contains nitrogen and is important for bodily functions. Protein is a macromolecule consisting of many L-amino acids bound by peptide bonds (Probosari 2019). The results of the proximate analysis of protein content that have been conducted show that the protein content of simping cakes without the addition of patin fish meat flour is 3.06%, whereas the protein content of simping cakes with the addition of patin fish meat flour is 9.33%, which means there is an increase in protein content in simping cakes by 6.27%. The increase in protein content in simping cake is influenced by the addition of patin fish meat flour, which contains 67.76 grams of protein. The increase in protein content in simping cakes added with patin fish meat flour is in line with the research by Dewi et al. (2023), which found that flakes added with patin fish meat flour have an increasing protein content. It can be concluded that the addition of patin fish meat flour into a product can increase the protein content in the product.

Carbohydrates are one of the macronutrients that serve as an energy source for the human body by producing energy. The results of the carbohydrate by difference calculation in treatment A, with no addition of catfish meat flour, showed a carbohydrate content of 87.59%, while in the treatment with the addition of catfish meat flour, the carbohydrate content was 79.73%. The carbohydrate content in the treatment with the addition of patin fish meat flour tends to decrease because other nutritional components increase, and fishery products do not contain fiber; generally, carbohydrates are stored as glycogen (Nurjannah et al., 2009).

4. CONCLUSIONS

Based on the research results, the supplementation of patin fish meat flour can affect the organoleptic and proximate characteristics of simping cake. Based on the results of the statistical test, treatment A is significantly different from treatment D in terms of aroma, taste, and texture characteristics. Therefore, the maximum addition to the simping cake that can still be liked is at a percentage of 10% with average values of aroma (7.1), texture (7.8), and taste (7.0). Simping cake with a 10% addition of catfish meat flour has a moisture content of 2.06%, ash content of 2.19%, fat content of 6.69%, protein content of 9.33%, and carbohydrate content of 79.73%.

References

[1] Adawyah, R., Khusnul Khotiffah, S., Wahyudinur, & Puspitasari, F. (2020). Effect of CookingTime on Protein, Fat, Amino Acid Profile, and Fatty Acid Content of Swamp Goat Fish (Trichogaster trichopterus) Flour. Indonesian Journal of Fisheries Product Processing, 23(2), 286–294.

[2] Damayanti, S., Bintoro, V. P., & Setiani, B. E. (2020). The Effect of Adding Composite Flour, Bran and Red Beans on the Physical Properties of Cookies. College Journal of Nutrition, 9(3), 180–186.

[3] Dewi, T. A., Tjahjaningsih, W., Pujiastuti, D. Y., Subekti, S., Nirmala, D., & Saputra, E. (2023). Chemical and Organoleptic Characteristics of Flakes with Substitution of Patin Fish Meat Flour (Pangasius sp.). Journal of Food Technology, 17(2), 84–97.

[4] Ernisti, W., Riyadi, S., Fitra, D., & Jaya, M. (2018). Characteristics Of Crackers Fortified With Different Concentrations Of Siam Patin Fish Flour (*Pangasius hypophthalmus*). *Journal of Fisheries Sciences and Aquaculture*, 13(2), 88–100.

[5] Fatmawati, & Mardiana. (2014). Analysis of Snakehead Fish Flour as a Protein Source. OCTOPUS: Journal of Fisheries Science, 3(1), 235–243.

[6] Fitri, A., Anandito, R. B. K., & Siswanti. (2016). "Use of Milkfish (Chanos Chanos) Meat and Bones in Fish Sticks as a High Calcium and Protein Snack." Journal of Agricultural Product Technology, 9(2), 65–77.

[7] Irpan, Junianto, Herman, R. G., & Rostini, I. (2024). LEVEL OF PREFERENCE KATTE TONG COOKIES WITH ADDITION PANGASIUS CATFISH MEAT FLOUR. Journal of Fisheries, 14(3), 1409–1415. https://doi.org/http://doi.org/10.29303/jp.v14i3.961

[8] Jayanti, U., Dasir, & Idealistuti. (2017). Study of the Use of Tapioca Flour from Various Cassava Varieties (Manihot esculenta Crantz.) and Fish Types on the Sensory Properties of Pempek. Edible Journal, 6(1), 59–62.

[9] Kodriah, N. R., & Hastuti, W. (2021). The Quality and Shelf Life of Brownies Satin Based on Mocaf Flour and Patin Fish Flour. Journal of Nutrition and Health (JGK), 1(1), 42–51.

[10] Matondang, S. E. (2022). Comparison of Protein Levels in Freshwater Fish and Saltwater Fish. 1(1).

[11] Mumtazah, S., Romadhon, R., & Suharto, S. (2021). The Effect of Concentration and Combination of Flour Types as Fillers on the Quality of Petis from Crab Boiled Water. Journal of Fisheries Science and Technology, 3(2), 105–112. https://doi.org/10.14710/jitpi.2021.13147

[12] Nazzila, Q., Mahdiyah, & Sachriani. (2019). The Effect of Adding Rebon Shrimp Flour (Mysis relicta) in Making Simping Cakes on Consumer Acceptance. Journal of Culinary Science, 2(2), 21–28. https://doi.org/10.21009/jsb.002.2.03

[13] Nurfajrina, A. A., & Hastuti, W. (2021). Formulation of Mocaf Flour and Patin Fish Flour on the Quality and Nutritional Value of Patin Mocaf Cookies. JGK: Journal of Nutrition and Health, 1(2), 95–103. https://doi.org/10.36086/jgk.v1i2.1087

[14] Okfrianti, Y., Kamsiah, K., & Veli, D. G. (2013). Effect of Addition of Eel Flour (Anguilla Spp) in Making Tortilla Chips on Nutritional Value, Water Content and Organoleptic Acceptability. Indonesian Journal of Animal Science, 8(2), 139–152. https://doi.org/10.31186/jspi.id.8.2.139-152

[15] Prabowo, I., Nadya, A., & Mutamimah, D. (2014). Making Shrimp Lumpia as an Innovation of Fishery Products. Journal of Fisheries and Marine Sciences, Vol. 2(1): 15-21, March 2020 Making, 2(1), 15–21.

[16] Pramitasari, G. F. (2010). ADDITION OF GINGER EXTRACT (Zingiber officinale rosc.) IN THE PRODUCTION OF INSTANT SOY MILK POWDER WITH THE SPRAY DRYING METHOD: CHEMICAL COMPOSITION, SENSORY PROPERTIES AND ANTIOXIDANT ACTIVITY. In Thesis. Sebelas Maret University.

[17] Probosari, E. (2019). The Effect of Dietary Protein on Glycemic Index. Journal of Nutrition and Health, 7(1), 33–39.

[18] Putri, M. R. A., Arsil, Y., Marlina, Y., & Rosiana. (2022). Level of Preference and Analysis of Protein Content in Patin Fish Sticks. Journal of Health Protection, 11(1), 24–34.

[19] Safitri, N. K. E., Masdarini, L., & Ariani, R. P. (2022). Utilization of Base Genep in Making Cookies. Culinary Journal, 2(2), 59–64. http://10.0.93.79/jk.v2i2.40832

[20] Tarwendah, I. P. (2017). COMPARATIVE STUDY OF SENSORY ATTRIBUTES AND BRAND AWARENESS OF FOOD PRODUCTS. Journal of Food and Agroindustry, 5(2), 66–73. https://doi.org/10.5958/0974-360X.2019.00231.2

[21] Wahyuningsih, Sukma, S. O., & Wibowotomo, B. (2024). Impact of Patin Fish Flour on Mocaf Semprit Cookies. Journal of Fashion and Culinary Technology, 12(1), 59–66.

[22] Wahyuningtyas, M. P., Setiati, Y., & Riska, N. (2020). Physical Characteristics of Siamese Catfish (Pangasius sutchii) Addition to Dry Milk. TEKNOBUGA: Journal of Fashion and Culinary Technology, 8(2), 114–120. https://doi.org/10.15294/teknobuga.v8i2.23487

[23] Wildah, H. A., Junianto, Maulina, I., & Rostini, I. (2024). HEDONIC QUALITY OF SEMPRONG CAKE FROM VARIOUS LEVELS OF CATFISH FLOUR ADDITION. Fisheries Journal, 14(3), 1393–1401.