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Addition of Tila Fish Meal on the Development of Kembang Goyang Cake

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***Abstract*—** *Tilapia fish is a type of fish with high protein content and low fat. Tilapia fish powder can be used as an additional ingredient to increase the nutritional value, especially protein in goyang flower cakes. The purpose of this study was to analyze the level of people's preference for Kembang Goyang cake with the addition of tilapia fish powder at different concentrations, and determine the best formulation. The research method used was the experimental method and the data collection technique used a subjective assessment of the organoleptic test (level of preference) taken from the results of the panelist's assessment which included an assessment of the color, texture, scent, and taste of the Kembang Goyang cake with four different treatments (Treatment A (0%), Treatment B (5%), Treatment C (7.5%), and Treatment D (10%)). The scale for measuring the level of liking is very like, like, normal/neutral, dislike and really dislike with a rating of 1-9. The Kembang Goyang cake hedonic test uses 15 semi-trained panelists. The results showed that the average value of the preference level (organoleptic test) of the panelists for the Kembang Goyang cake with four different treatments, including the color aspect was 6.1 (almost liked), the texture was 5.9 (almost liked), the scent is 5.8 (almost like), and taste is 6.3 (almost like) with a preference scale of 1-9. Of the four treatments, the panelist preferred the best treatment based on the average value of the level of preference (organoleptic), namely the Kembang Goyang cake with the addition of 5% tilapia fish powder (Treatment B). This treatment produced a Kembang Goyang cake with good and effective color, texture, scent and taste compared to treatment A (0%), treatment C (7.5%), or treatment D (10%).*

***Keywords*—** *Kembang Goyang cake, tilapia fish powder, fortification, hedonic test.*

I. INTRODUCTION

Kembang Goyang Cake is one of the traditional foods in the form of a kind of dry cake made from rice flour. Kembang Goyang Cake is in great demand by everyone, because it has a distinctive scent, taste and texture. The shape of the Goyang Flower itself is in the form of flower petals that are adjusted to the mold it uses. Printing is done when frying by deep frying. There is a weakness or shortcoming of this Kembang Goyang cake, which is the low protein content. Meanwhile, the fulfillment of protein needs for the community, especially in Indonesia, still relies on vegetable protein (Ariani 2010).

Kembang Goyang Cake is usually served at big events such as Eid al-Fitr, wedding ceremonies, or as a special food that can be made as a souvenir because it has an attractive shape. The basic ingredients for making the Kembang Goyang cake are rice flour, tapioca flour, eggs, sugar, salt, water, and thick coconut milk. From these ingredients, it is known that the nutritional content of Kembang Goyang cake per 100 grams is 51.88% carbohydrates, 5.18% protein, 2.36% fiber, 0.11 mg of vitamin B15, 1.12 mg of vitamin E, and 342 mg of energy. .8 cal (Industry Research and Consulting Center 2016). The nutritional content is still relatively low. The addition of ingredients is expected to increase and complement the nutritional content of the Kembang Goyang cake, especially protein, considering the consumption pattern of modern society which consumes more foods that contain lots of carbohydrates (Fuadah and Anna 2016).

Tilapia (*Oreochromis niloticus*) is one of the leading commodities of aquaculture. Tilapia (Oreochromis niloticus) is a freshwater fish that easily adapts to the environment and is easily spawned so that its distribution in nature is very wide, both in tropical and temperate regions (KKP 2013). Data were obtained regarding the protein content of tilapia of 43.76%, water content of 79.44%, fat content of 7.01%, and ash content of 6.80% per 100 gram weight of tilapia (Kusmini *et al*. 2015). One of the efforts to increase the nutritional value and optimize the utilization of fishery products is fortification which can be utilized in the manufacture of fish meal. Fish meal is a dry solid product that is produced by removing most of the liquid and some or all of the fat contained in the body of the fish (Syadeto *et al*. 2017)

Food diversification or diversification is one of the efforts to increase people's fish consumption. This diversification aims to meet diverse and growing consumer tastes so that there are always alternatives and menu refreshments. Thus, market saturation can be overcome (Indriyani *et al*. 2020). This study aims to determine the best formulation for Kembang Goyang cake products that are preferred by consumers (panelists).

II. RESEARCH METHOD

The research was conducted at the Fishery Processing Technology Laboratory, Fisheries Study Program, Padjadjaran University, Indonesia. The tools used in this study were scales, measuring cups, bowls (plastic containers), spatulas, spoons, balloon whisks, Kembang Goyang molds, pans, and stoves. The materials used in this study were rice flour, wheat flour, tapioca, tilapia fish flour, coconut milk, eggs, granulated sugar, vanilla powder and cooking oil. The research method used was experimental with 4 treatments, namely the level of

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addition of tilapia meat flour 0% (without addition, as a control), 5%, 7.5% and 10% of the total cake mix.

The process of making the Kembang Goyang cake is as follows: First, mix all the ingredients into a plastic container that is used as a container for making the Kembang Goyang cake mix. The next stage, all the ingredients are stirred until evenly mixed and until there are no lumps in the dough. After that, the mixture was weighed and then tilapia meat flour was added according to the treatment (Treatment A (0%), Treatment B (5%), Treatment C (7.5%), and Treatment D (10%)). The next step is to heat a pan with a large amount of oil using the stove. Then, briefly heat the Kembang Goyang cake mold by dipping it in hot oil. Then, dip the mold into the batter and don't let it sink. Then, put the mold containing the dough into the frying pan while shaking it until the cake comes off. Next, fry the Kembang Goyang until it is completely cooked and the color becomes golden brown. After that is lifting, draining, and putting the cooked Kembang Goyang in the serving container according to the treatment of the dough.

Observation variables were carried out on the level of preference for color, texture, scent, and taste of the Kembang Goyang cake. Testing the level of liking is done by hedonic test with the following scale: really dislike (1), dislike (3), neutral (5), like (7), and really like (9). The panelists used were semi-trained panelists of 15 people. The data obtained from the organoleptic test results on the Kembang Goyang Cake from various treatments on the level of addition of tilapia meat flour were analyzed descriptively comparatively.

III. RESULTS

The level of preference is a person's ability to judge a product based on preference for the color, texture, scent, and taste of the Kembang Goyang cake which is known by means of the senses. The level of preference for Kembang Goyang cake is carried out by the hedonic scoring test method using a test scale of 1-9. The average value of the preference level (organoleptic) of Kembang Goyang cakes with the addition of different tilapia meat is shown in table 1.

TABLE 1. The Average Value of Likeliness (Organoleptic) Kembang Goyang Cake with the Addition of Different Tilapia Meat.

No.	Specifications	Organoleptic Average Values of Kembang Goyang Cake			
		0%	**5%**	**7,5%**	**10%**
1	Color	5,4	6,6	6,6	5,8
2	Texture	4,8	6,6	7,1	5,3
3	Scent	6,4	6,1	5,4	5,3
4	Flavor	6,6	7,5	6,1	5,1
	Averages	5,8	6,7	6,3	5,4

The pictures below are Kembang Goyang cakes with four different treatments.

Picture 1. Kembang Goyang Cake Treatment A (0%)

Picture 2. Kembang Goyang Cake Treatment B (5%)

Picture 3. Kembang Goyang Cake Treatment C (7,5%)

Picture 4. Kembang Goyang Cake Treatment D (10%)

Color

Determining the quality of a food in general is very dependent on several factors, one of which is color. Visually,

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color greatly determines consumer acceptance of a product. Color is the first appearance that greatly influences consumers to choose a product (Maryati *et al*. 2021).

Based on the results of the preference level in Table 1, it can be seen that the overall average value for the color of the Kembang Goyang cake is 6.1 which indicates that the panelists almost like the color of the Kembang Goyang cake. The average results of the color organoleptic test for each different treatment in Table 1 show that Treatment A (0%) has a value of 5.4 (ordinary/neutral), Treatment B (5%) has a value of 6.6 (like), Treatment C (7.5%) has a value of 6.6 (likes), and Treatment D (10%) has a value of 5.8 (almost likes). From these results, the panelists preferred the texture of the Kembang Goyang cake with the addition of tilapia fish meal of 5% (Treatment B) and 7.5% (Treatment C) because according to the panelist's assessment, the color of the Kembang Goyang cake was quite bright and not too brown.

The color of the Kembang Goyang cake has an organoleptic test, which is almost preferred, which is suspected because the color of the Kembang Goyang cake is slightly brownish as seen in pictures 1-4. According to Rosell (2021), a frying pan that has a fairly high temperature, which is around 160-190°C, will have an impact on the color of the product in the form of a browning reaction.

The change in the color of the Kembang Goyang cake is related to the browning reaction that occurs during frying. The non-enzymatic reaction that occurs has a direct impact on the color of the Kembang Goyang cake produced, the color is caused by a reaction between sugar and amino acids known as the Maillard reaction. The results of this reaction will produce the desired brown colored material, or it could be a decrease in quality (Rahmiah *et al*. 2018).

Texture

Texture is a pressure sensation that can be observed with the mouth (when biting, chewing and swallowing) or palpated with the fingers. The various types of texture sensing include dryness, wetness (juiciness), hard, smooth, rough and oily (Mukminah *et al*. 2019).

Based on the results of the preference level in Table 1, it can be seen that the overall average value of the treatment of the texture of the Kembang Goyang cake is 5.9 which indicates that the panelists almost like the texture of the Kembang Goyang cake which is quite crunchy. The average results of the organoleptic texture test for each different treatment in Table 1 show that Treatment A (0%) has a value of 4.8 (ordinary/neutral), Treatment B (5%) has a value of 6.6 (likes), Treatment C (7.5%) has a value of 7.1 (likes), Treatment D (10%) has a value of 5.3 (ordinary/neutral). From these results the panelists preferred the texture of the Kembang Goyang cake with the addition of 7.5% tilapia fish flour (Treatment C) because according to the panelist's assessment the texture of the Kembang Goyang cake was crunchier and not hard.

Tapioca flour has the ability to absorb water. Making the Kembang Goyang cake requires ingredients that contain carbohydrates as a binder so that the ingredients bond with each other in a dough which is useful for improving texture. The starch contained in the Kembang Goyang cake when fried experiences perfect drying and causes the resulting texture to be hard and crunchy. The texture of the Kembang Goyang cake is influenced by the protein content and fiber content of the basic ingredients used. Protein plays a role in increasing hardness because the proteins found in fish are myosin and actomyosin (Eni *et al*., 2017).

Scent

Scent is one of the supporting factors for taste that determines the quality of a product. Scent is also an indicator to determine the level of acceptance of a product by consumers. Testing the scent in a new product is considered important because it quickly gives the results of an assessment of the product. The emergence of this scent or smell is because the odor substance is volatile or easily evaporates (Asikin and Kusumaningrum, 2016).

Based on the results of the preference level in Table 1, it can be seen that the overall average value of the treatment for the scent of Kembang Goyang cake is 5.8 which indicates that the panelists almost like the scent of the fragrant Kembang Goyang cake and not too fishy fish smell. The average results of the scent organoleptic test from each different treatment in Table 1 show that Treatment A (0%) has a value of 6.4 (almost likes), Treatment B (5%) has a value of 6.1 (almost like), Treatment C (7.5%) has a value of 5.4 (average/neutral), Treatment D (10%) has a value of 5.3 (average/neutral). From these results, the panelists preferred the scent of Kembang Goyang cake without the addition of tilapia fish meal (control) of 0% (Treatment A) because according to the panelist's assessment, the panelists were not used to the slight smell of fish found in Kembang Goyang cake.

Panelists who like the scent of Kembang Goyang cake suspect that panelists can smell vanilla and also a slightly savory scent from tilapia which is not too overpowering (just right) after frying. The scent of Kembang Goyang cake produced during frying (cooking) and the addition of ingredients such as flour, sugar, vanilla powder can eliminate the fishy smell of tilapia fish flour as an additional raw material and give a distinctive taste to the scent of Kembang Goyang cake. Another factor that affects the scent is the frying process. The frying process will cause changes in scent as a result of changes in certain compounds in the oil and foodstuffs that are fried (Maryati *et al*., 2021).

Flavor

Selection of taste involves the role of the sense of taste. Taste is one of the organoleptic properties originating from the sense of taste where the end of the interaction unity between the properties of scent, taste and texture is the whole food being assessed (Fuadah and Anna, 2016).

Based on the results of the preference level in Table 1 it can be seen that the overall average value of the treatment of the taste of the Kembang Goyang cake is 6.3 which indicates that the panelists almost like the taste of the delicious and tasty Kembang Goyang cake from the addition of tilapia fish flour. The average results of the organoleptic taste test for each different treatment in Table 1 show that Treatment A (0%) has

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a value of 6.6 (likes), Treatment B (5%) has a value of 7.5 (likes) , Treatment C (7.5%) has a value of 6.1 (almost likes), Treatment D (10%) has a value of 5.1 (ordinary/neutral). From these results, the panelists preferred the taste of the Kembang Goyang cake with the addition of 5% tilapia flour (Treatment B) because according to the panelists' assessment it tasted better, fit, and there was a savory taste from the addition of tilapia flour.

Panelists who like the taste of flower cakes are suspected of having a delicious, sweet, and savory taste of the Kembang Goyang cake from the addition of tilapia fish flour. The taste of the Kembang Goyang cake is not only influenced by the amount of flour, sugar, vanilla powder or eggs used, but is also thought to be influenced by the addition of tilapia flour. Sugar, tilapia fish flour, and also a little salt are added to the process of making the Kembang Goyang cake with the aim of adding flavor. In addition, vanilla powder is a vegetable scenttic component which is mostly used as an ingredient to enhance the taste of the resulting product and remove the slightly fishy smell of added tilapia fish flour. The savory taste of fat (oil) also causes the fishy smell to disappear when the frying process is at high temperatures (Fitriani, 2018).

Based on the average value of the level of preference (organoleptic) for color, texture, scent, and taste in Table 1, the best treatment and preferred by the panelists was the Kembang Goyang cake which was added 5% tilapia fish flour, namely in Treatment B with an average score overall of 6.7 (likes). This is because the Kembang Goyang cake with the addition of 5% tilapia flour has the color, texture, scent and taste which are considered good and the most effective of other treatments.

IV. CONCLUSION

Based on the results of the study it can be concluded that the best formulation for the Kembang Goyang cake product which is favored by consumers is obtained from the addition of 5% tilapia meat flour to the total dough. The average value of the preference level for color, texture, scent and taste of the Kembang Goyang cake produced was 6.6; 6.6; 6.1 and 7.5.

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