



# World News of Natural Sciences

An International Scientific Journal

WNOFNS 49 (2023) 147-155

EISSN 2543-5426

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## Level of Favorability of Dumplings With The Addition of Tuna Fish (*Thunnus* sp.) Flour

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### ABSTRACT

This research aims to determine the appropriate level of addition of fish meat meal in the formulation of making dumplings so that the most preferred product is obtained. The research method used was experimental with 4 treatments, namely the level of tuna meat meal addition of 0% (no addition, as control), 5%, 7.5% and 10% of the total wheat flour + tapioca used in making dumplings. The process of making dumplings consists of four stages, namely mixing ingredients, kneading, molding, and frying. Variable observations were made on the level of color, aroma, texture, and taste of the biscuits. The test of the level of favorability was carried out by hedonic test with the following scale: very dislike (1), dislike (3), neutral (5), like (7), and very like (9). The panelists used were 15 semi-trained panelists. Data obtained from the results of organoleptic testing of dumplings from various treatments of the level of tuna meat flour addition were analyzed descriptively comparative. Based on the research that has been done, it can be concluded that the level of organoleptic liking both appearance, aroma, texture, and taste of the most preferred dumplings is obtained from the level of addition of 0% tuna meat flour, namely without addition, but the value of the level of liking is almost the same as the level of addition of 5% tuna meat flour. The average values of color, aroma, texture, and taste of dumplings from the 0% addition level are 7.67; 6.33; 7.00 and 7.80, respectively; while from the 5% tuna meat flour addition level are 7.40; 5.93; 5.80 and 7.40, respectively.

**Keywords:** Panelist, Organoleptics, Taste, Molding, Frying

## **1. INTRODUCTION**

Dumplings are snacks made from wheat flour as the main ingredient with additional ingredients such as flavoring, salt, and others (Saputra et al., 2016). This dumpling can be used as a snack, topping on meatballs or chicken noodles (Anugrahati et al., 2017) Indonesian people are generally very fond of this dumpling both among children and adults.

According to Kuswanto et al., (2019), the nutritional content of dumplings consists of water 2.83%, ash 2.83%, protein 6.10%, fat 26.23%, carbohydrates 64.85% calcium 0.81% and phosphorus 0.16%. The protein content is relatively small compared to fat and carbohydrates. Increasing the protein content of these dumplings can be done by adding fish meat flour to the formulation. Dumplings with high protein content can be used as supplementary food in children to prevent and reduce stunting.

According to Waroh (2019), stunting is a state of growth failure experienced by children under five years old, the condition is stunted, namely less height when compared to age. This condition is measured by length or height that is more than minus two standard deviations of the WHO median child growth standards. Prevention of stunting can be done by intervening in nutritional intake since toddlers and even since the fetus with two or more macro and micronutrients (Rosmalina et al., 2018). Macronutrients such as protein and fat are rich in omega 3 and 6. Micronutrients such as vitamins and minerals.

Fish meat flour as a supplementary ingredient in these dumplings has a high protein content and is rich in omega-3 fatty acids. One of the fish commodities whose meat can be processed into flour is tuna. Tuna fishing production in Indonesia is relatively large. Tuna meat flour in the formulation of dumpling making will have an impact on the level of consumer preference for the dumplings. Therefore, this research aims to determine the appropriate level of addition of fish meat flour in the formulation of making dumplings so that the most preferred product is obtained.

## **2. MATERIALS AND METHODS**

The research was conducted at the Laboratory of Fishery Processing Technology, Fisheries Study Program, Padjadjaran University, Indonesia. The materials used were tuna meat flour, wheat flour, tapioca flour, chicken broth, salt, cooking oil, and hot water. The tools used were knife, stove, tray, cutting board, measuring cup, wok, spatula, basin, pan, plate, dumpling grinder, digital scale, work table, and camera.

The research method used was experimental with 4 treatments, namely the level of tuna meat flour addition of 0% (no addition, as control), 5%, 7.5% and 10% of the total wheat flour + tapioca used in making dumplings.

The process of making dumplings refers to research conducted by Saputra et al., (2016) with several modifications. Making dumplings starts with preparing and weighing all the ingredients, namely wheat flour, tuna flour, tapioca flour, water, cooking oil, salt, and chicken broth. The manufacturing process begins by mixing all the ingredients into a stainless bowl or basin. Kneading the dough by hand until the dough is smooth. Next, thin the dough with a dough grinding machine several times of grinding, the first grinding at a thickness of one for three repetitions and the second grinding at a thickness of 7 mm.

Finally, cut the dough according to the predetermined size. The dumpling skin is ready to be fried and served. As to be shown in Figure 1.



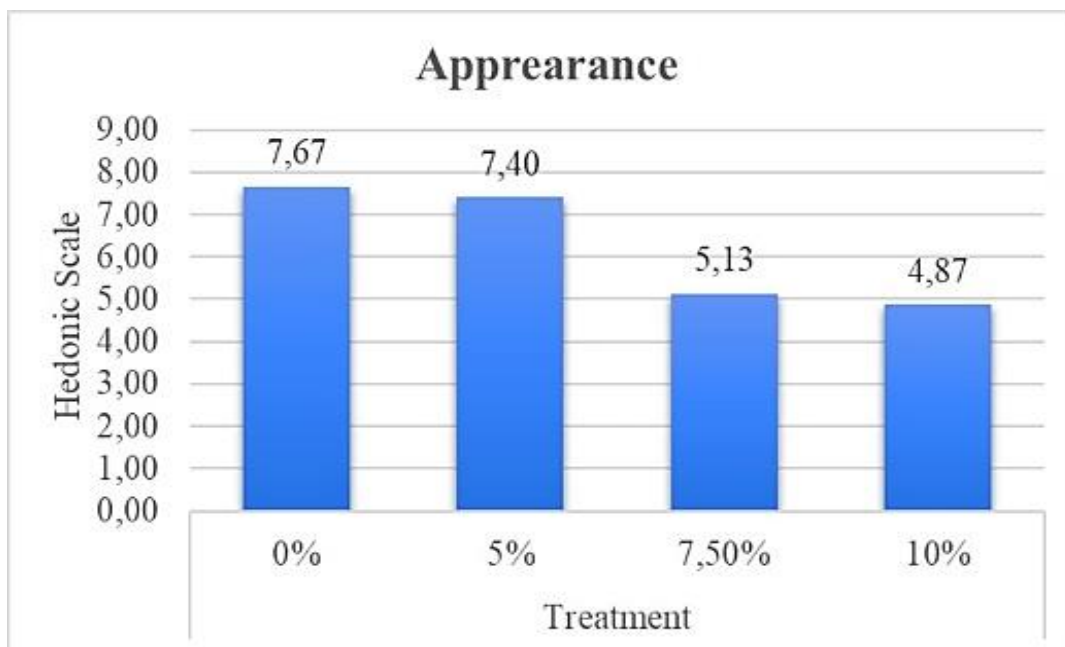
**Figure 1.** The process of making dumpling; 1. Weighing of rawmaterials such as flour 2. Weighing of Tuna Fish Flour 3. Mix all ingredients 4. Finished and smooth dough 5. Thin the dough with a grinding machine 6. Cut the dough to the desired size 7. The cut dough is lightly floured 8. Do the frying 9. Panelist process

Variable observations were made on the level of liking for color, aroma, texture, and taste of the biscuits. The test of the level of favorability was carried out by hedonic test with the following scale: very dislike (1), dislike (3), neutral (5), like (7), and very like (9). The panelists used were 15 semi-trained panelists. Data obtained from the results of organoleptic testing of dumplings from various treatments of the level of tuna meat flour addition were analyzed descriptively comparative.

## **2. 1. Appearance**

Appearance is one of the organoleptic parameters that is quite important to be assessed by panelists. This is because the appearance is the first thing panelists will see and notice. A good and favorable impression of appearance will cause panelists to see other organoleptic

parameters such as aroma, texture, and taste. Appearance will also affect how consumers respond to the product, although appearance does not determine the level of consumer preference. The uniformity and wholeness of a product will certainly attract panelists and be preferred when compared to products that are diverse and not intact (Rinaldo, 2018). The results of the observation of the level of favorability of the appearance of dumplings from various levels of tuna meat flour addition are shown in Figure 2.



**Figure 2.** The Average value of the appearance level of flour dumplings from various levels of tuna meat flour addition

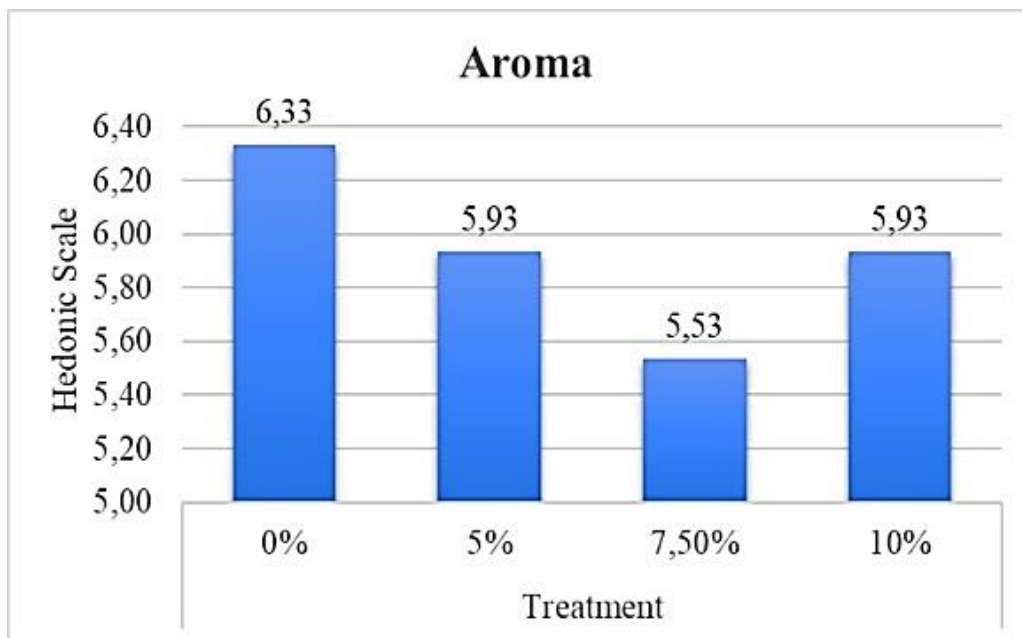
Based on Figure 2 above, it can be seen that the average value obtained for each treatment level of tuna meat flour addition to the level of liking of its appearance based on the assessment of 15 panelists shows different results. The 0% and 5% treatments tend to be favored with an average value of 7.64 and 7.40. Based on these average values, when viewed on a hedonic scale for the 0% and 5% treatments, they have a very appetizing appearance with a light golden brown color like the color of dumplings in general, and a bubbling outer skin that looks crispy. Meanwhile, the 7.5% and 10% treatments tend to be somewhat preferred with an average value of 5.13 and 4.87 which when viewed on a hedonic scale have a somewhat preferred appearance with a darker color appearance compared to the 0% and 5% treatments. The darker color appearance is due to the addition of tuna meat flour which tends to be dark in color during the manufacturing process. According to Yuliani et al., (2018), the addition of calcium-source flour such as tuna bone meal tends to affect the appearance color of the product to be darker due to the increase in protein and ash content in the product.

Based on the value of the level of liking that the addition of tuna fish flour up to 5% tends to be preferred by panelists and consumers. This is in line with research conducted by Nusaibah et al., (2021) in their research on the addition of tuna fish bone meal in making crackers found

that the addition of 5% tuna fish bone meal is the most superior and good in color and appearance.

## 2. 2. Aroma

Aroma is a visual property that can be used to assess product quality and can be tested quickly to provide an assessment of whether a product is accepted or not by consumers (Sachlan, et al., 2019). The aroma in food products mostly comes from seasonings that are included in the manufacturing process, especially in the kneading process (Walll et al., 2022). The results of observations on the level of favorability of the aroma of dumplings from various levels of tuna meat flour addition are shown in Figure 3.



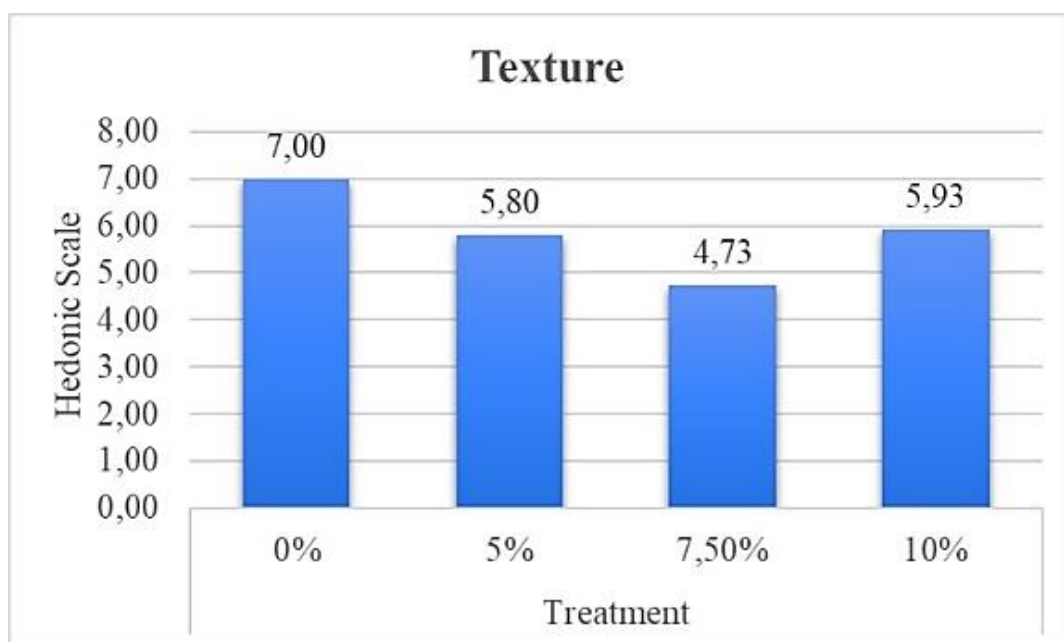
**Figure 3.** The Mean score of flavor level of flour dumplings from various levels of tuna meat aroma addition

Based on Figure 3, the analysis of organoleptic characteristics of the aroma of dumplings with the addition of tuna fishmeal produced with different treatments based on the assessment of 15 panelists, namely the aroma of dumplings without the addition of tuna fishmeal has the highest average value of 6.33 which means the aroma is very pleasant, while the treatment of adding 7.50% tuna fishmeal has the lowest average value, which is 5.53 which means the aroma is pleasant. So it can be seen that dumplings that are not added to tuna fish flour tend to be favored by panelists and consumers. This is because the dumplings with the 7.5% and 10% treatments have a stronger fishy aroma than the 0% treatment, thus masking the aroma of the dumplings. In general, the aroma of dumplings is not fishy and not rancid. According to Cordova (2015), a good indicator of dumplings is that they have a distinctive dumpling aroma, not sour, not rancid, and not musty. So that when the more concentration of tuna fishmeal is added, it will give a stronger fish aroma, so that because of this, it is thought to reduce the

panelists' liking. However, the addition of tuna fishmeal in accordance with the dosage can provide a savory taste to the depth of the dough (Sumbodo et al, 2019).

### 2. 3. Texture

The texture is a very essential characteristic, changes in the texture of an ingredient can change its aroma and taste (Anwar et al., 2022). This is because the texture will affect the speed of stimulation of olfactory cells and salivary glands. The results of observations on the level of texture preference of dumplings from various levels of tuna meat flour addition are shown in Figure 4.



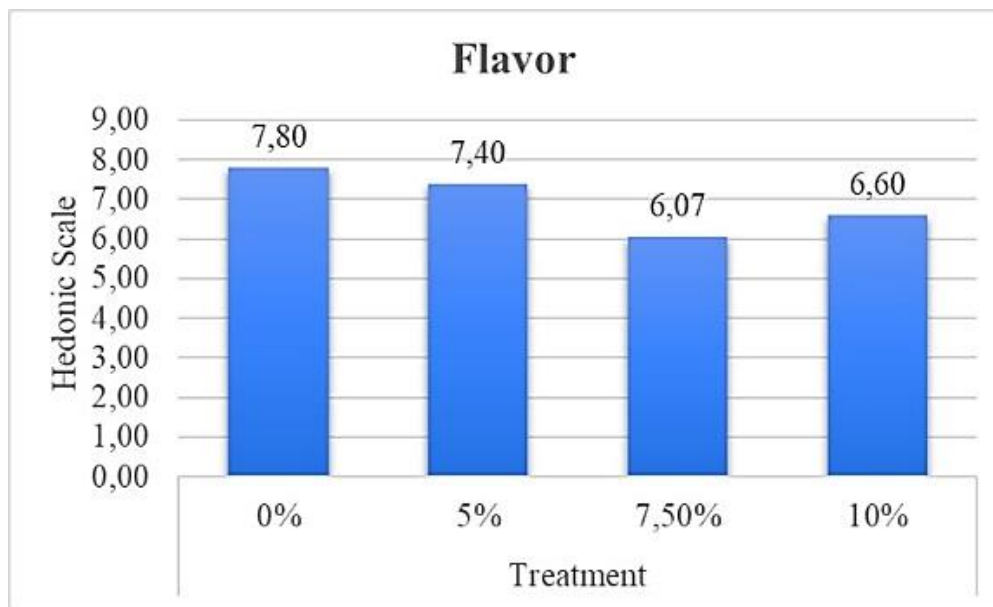
**Figure 4.** The Mean score of texture level of flour dumplings from various levels of tuna meat flour addition

Based on Figure 4, the level of liking for the texture of dumplings with various levels of tuna meat flour addition produced with different treatments. Based on the assessment by 15 panelists, the dumplings without treatment produced a very crispy texture, in dumplings with the addition of 5% and 10% tuna fishmeal obtained crispy results, and in dumplings with the addition of 7.50% tuna fishmeal the results were partially crispy. Therefore, the average value of the level of texture preference in the 7.5% treatment is the smallest because there is no process of adding water so the dough will be denser, and the texture becomes harder and less crispy. This is in line with the statement of Syadeto et al. (2017) that the higher the concentration of fishmeal added, the higher the hardness of these dumplings which is related to the volume of development.

The high hardness of the texture of the dumplings can be caused by the reduction in amylopectin content and the increase in fishmeal in the dumplings. In addition to the addition of water and the volume of fishmeal added in the kneading process, unevenly heated oil during frying is one of the causes of partially crispy dumplings

## 2. 4. Flavor

The flavor of a product affects the level of consumer acceptance. Although other organoleptic parameters are good, when the taste is not liked by the taste buds, it will be rejected (Basrin and Babe, 2019). Analysis of the flavor characteristics of dumplings with the addition of tuna flour is done using the sense of taste. The results of observations on the level of texture preference of dumplings from various levels of tuna meat flour addition are shown in Figure 5.



**Figure 5.** The Average score of flavor level of flour dumplings from various levels of tuna meat flour addition

Based on Figure 5, the results of the organoleptic characteristic analysis of the flavor of dumplings with the addition of tuna fishmeal produced with different treatments. Based on the assessment of 15 panelists, the taste of dumplings without the addition of tuna fishmeal and dumplings with the addition of 5% tuna fishmeal has the same taste, which is very savory. Meanwhile, dumplings with the addition of 7.50% and 10% tuna fishmeal have a savory taste. Higher addition of fishmeal will reduce the level of flavor preference of dumplings. This is due to the calcium and phosphorus content in fishmeal which produces aftertaste (Arbie et al, 2020). Based on the data obtained, it can be seen that panelists and consumers tend to like the 0% and 5% treatments because the distinctive taste of fish is not too strong and the siomay flavor will not be lost. Because the amount of fishmeal given to the product will give the dominant distinctive flavor of the garden (Nusaibah et al., 2021).

## 3. CONCLUSIONS

Based on the research that has been done, it can be concluded that the level of organoleptic liking both appearance, aroma, texture, and taste of the most preferred dumplings is obtained

from the level addition of 0% tuna fish meat flour, namely without addition, but the value of the level of liking is almost the same as the level of addition of 5% tuna fish meat flour. The average values of color, aroma, texture, and taste of the dumplings from the 0% addition level were 7.67; 6.33; 7.00, and 7.80, respectively; while from the 5% tuna meat flour addition level were 7.40; 5.93; 5.80 and 7.40, respectively.

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