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DIVERSIFICATION AND ORGANOLEPTIC QUALITY OF PROCESSED PRODUCTS BASED ON CATFISH IN THE UPTD OF FISHERIES PRODUCT DEVELOPMENT, PURWAKARTA REGENCY

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ABSTRACT

Catfish has a high economic value, in addition to that, local and export demand for catfish is increasing from year to year. The Central Bureau of Statistics (2015) recorded that during the 2010-2014 period, the average increase in catfish production per tonne increased. Transfer of processing technology in the context of diversity (diversification) of catfish processed products in Puwakarta Regency is still very much needed to introduce processors to the types of catfish processed products. What will be done is to process new processed products such as meatballs, nuggets and otak-otak based on catfish. Then it will be compared between the processed products of UPTD Fishery Product Development in Purwakarta Regency with commercial products according to their favorite level. The method used in this field work practice is direct practice, then an analysis of the organoleptic quality (hedonic test) is carried out using 3 treatments with 20 semi-trained panelists. The panelists were asked to determine their level of preference for each of the 3 samples of meatball products, 3 samples of nuggets and 3 samples of otak-otak. In the organoleptic test using the two-way non-parametric statistical method Friedman analysis with the Chi-Square test followed by the Bayes test. Based on the results of the organoleptic quality, it was concluded that all samples of meatballs, nuggets and otak-otak were still favored by the panelists because nuggets 3 samples and otak-otak 3 samples. In the organoleptic test using the two-way non-parametric statistical method Friedman analysis with the Chi-Square test followed by the Bayes test. Based on the results of the organoleptic quality, it was concluded that all samples of meatballs, nuggets and otak-otak were still favored by the panelists because they were still above the product rejection value, which was above the value of 3. Based on the calculation of the appearance, aroma, texture and taste, the highest total criterion weight is the taste parameter. Samples of BP (catfish meatballs), NA (chicken nuggets) and OT (otak-otak of mackerel fish) are the preferred samples compared to other samples with alternative values respectively are 7,85 ; 7,36 ; and 7,00.

Keywords: Diversification, Organoleptic Quality, Meatballs, Nugget, Otak-otak, Catfish

INTRODUCTION

Purwakarta Regency is part of the West Java Province which located in between 107°30'- 107°40' East Longitude and 6°25'–6°45' South Latitude. The area of Purwakarta Regency is 97,172 hectares or 971.72 km^2 (Perda Puwakarta Regency 2018).

Catfish has a high economic value, in addition to that local and export demand for catfish is increasing from year to year (Bank Indonesia 2010). The Central Bureau of Statistics (2015) recorded that national catfish production in 2010 reached 147,888 tons/year, in 2011 it reached 229,267 tons/year, in 2012 it reached 374,000 tons/year, in 2013 it reached 410,883 tons/year and in 2014 it reached 418,002

tons/year. During the 2010-2014 period, the average increase in catfish production per ton has increased.

Diversification of fishery products is one way to increase fish consumption for the community. Transfer of processing technology in the context of diversity (diversification) of catfish processed products in Puwakarta Regency is still very much needed to introduce processors to the types of catfish processed products. What will be done is processing new processed products such as meatballs, nuggets and otak-otak based on catfish. This effort is able to provide an understanding of the optimal treatment of catfish-based processed diversification systems. Besides that, a comparison will be made between the processed products of the UPTD Fishery Product Development in Purwakarta Regency including meatballs, nuggets and catfish otak-otak which are the most preferred by comparing commercial products. in his favorite level.

MATERIAL AND METHOD
Time and Place

Field Work Practices are carried out at UPTD Fishery Product Development - Department of Fisheries and Livestock located at Jalan Kapten Halim (Simpang), Puwakarta District, Purwakarta Regency, West Java. The implementation time is from 21 September 2020 - 21 October 2020.

Method

The method used in this field work practice is direct practice, namely the method by practicing directly in accordance with the material that has been presented. Then the organoleptic quality analysis was carried out, which used the hedonic test (preference level) using 3 treatments with 20 semi-trained panelists who were students of the Faculty of Fisheries and Marine Sciences, Padjadjaran University.

The hedonic test parameters were presented to the panelists to observe appearance, aroma, texture and taste. This method uses a number scale ranging from 1-9, namely: 1 (very dislike), 3 (dislike), 5 (neutral / ordinary), 7 (like), 9 (very like).

In this test the panelists were asked to determine their level of preference for each of the 3 samples of meatball products, 3 samples of nuggets and 3 samples of otak-otak. The 3 meatball samples are as follows:

A. Catfish meatball (BP)
B. Mackerel fish meatball (BT)
C. Chicken meatball (BA)

The 3 sample nuggets are as follows:

A. Catfish nugget (NP)
B. Mackerel fish nugget (NT)
C. Chicken nuggets (NA)

The 3 samples of these otak-otak are as follows:

A. Otak-otak of catfish (OP)
B. Otak-otak of mackerel fish (OT)
C. Otak-otak of tuna fish (OL)

The organoleptic quality used the two-way non-parametric statistical method Friedman analysis with the Chi-Square test. The results of the organoleptic quality are described in a scientific paper in the form of a narrative, then a conclusion is drawn from the analysis that has been carried out.

Data Analysis

The data from the measurement results of chemical testing and physical testing were analyzed descriptively and comparatively. The test data obtained in the form of hedonic test data on the appearance, aroma, texture and taste of meatballs, nuggets and otak-otak were analyzed statistically non-parametric using Friedman test with Chi-squared test.

The statistics used in the Friedman test are defined by the following formula (Sudrajat 1999):

$$X2 = 2) - 3N \, (K + 1)[\frac{12}{NK \, (K+1)} \sum_{t=1}^{k} (Rj)$$

Information:
X = Friedman test statistics
n = test
k = treatment
Rj2 = total ranking of each treatment

If the research data shows the same number, the correction factor (FK) is calculated with the following formula:

$$FK = 1 - \frac{\sum T}{NK(K^2 - 1)}$$

$$H_0 = \frac{X^2}{FK}$$

Information:
T = N (t^3-t)
ti = the number of the same observed values for a rank.
N = the number of the same observed values for a rank with the same t value.

The significant value of the observation price of H can be done using the critical price table *Chi-Square* where db = k - 1: α = 0.05. The decision rules for testing the hypothesis are:

H_0 = treatment does't give a real difference at the level α = 0.05.

H_1 = treatment provides a significant difference at the level of α = 0.05.

If the price H $<X^2$ α (k - 1), then H_0 is accepted and H_1 is rejected, and if the price H$> X^2$ α (k - 1), then H_0 is rejected and H_1 is accepted. If H_1 is accepted, then the treatment gives a real difference and continues to find out the median value that is not the same or to find out the difference between treatments using the Multiple Comparison test with the following formula:

$$|R_i - R_j| \le z\left[\frac{\alpha}{K(K+1)}\right]\sqrt{\frac{NK(K+1)}{6}}$$

Information:
Ri - Rj = difference in average *ranking*
Ri = average ranking of the i-th sample
Rj = average ranking of the jth sample
A = *experimentwise error rate* at 0.05
N = amount of combined observational data
K = number of treatments

The results of the hedonic test assessment will usually produce many of the same numbers so that an analysis is needed that can provide a difference in each treatment. The analysis in question is the Bayes test.

The results of the Bayes test calculation will show that the element that has the highest priority value is the most preferred by the panelists (Marimin 2004). The Bayes equation is as follows:

$$Total\ nilai_i = \sum_{i-1}^{m} Nilai_{ij}\,(Krit_j)$$

Information:
Total score i = Total final value of alternative i
Valueij = Value of alternative I on criterion - j
Kritj = Level of importance (weight) criterion - j
i = 1, 2, 3,… … n; n = number of alternatives
j = 1, 2, 3,… … n; n = number of criteria

Tools and Materials
1. Catfish Meatball

The tools used in the manufacture of catfish meatballs consist of a scale, knife, mortar, food processor, tablespoon, boiling pot, bowl, scoop, basin, stove, mica plastic and plastic.

The ingredients used in the manufacture of catfish meatballs consist of catfish fillets, salt, pepper, sugar, shallots, garlic, celery, chicken eggs, tapioca flour, ice water and coconut milk.

2. Catfish Nugget

The tools used in making catfish nuggets consist of a scale, knife, mortar, food processor, steamer, plastic plate, brush, banana leaf, plastic mica, plastic, stove, tray, spatula, and grater.

The ingredients used in the manufacture of catfish nuggets consist of catfish fillets, salt, pepper, sugar, shallots, garlic, onions, chicken eggs, tapioca flour,

carrots, coconut milk, panir flour, and vegetable oil.

   3. Otak-otak of Catfish

The tools used in the manufacture of otak-otak of catfish consist of a scale, knife, mortar, food processor, steamer, banana leaves, plastic mica, plastic, stove, tray, spatula and roasting pan. The ingredients used in the manufacture otak-otak of catfish consist of catfish fillets, salt, pepper, sugar, shallots, garlic, leeks, chicken eggs, tapioca flour and coconut milk.

Procedures

   1. Catfish Meatball

     The following is the work procedure used for the manufacture of catfish meatballs as follows:

a) Puree ingredients consisting of garlic and shallots.
b) The catfish meat mixture is mashed into a food processor to obtain a smooth meat.
c) Add spices that have been mashed, add salt, sugar, pepper, celery, eggs, tapioca flour, vegetable oil, ice water, and coconut milk regularly.
d) The meatball dough that is already smooth is then transferred to the tray.
e) Bring water that has been heated to a boil.
f) The meatball dough is printed in a round shape while boiling it in a pot filled with boiling water.
g) Boil until the meatballs float then removed from the pan and drain.

   2. Catfish Nugget

     The following is the work procedure used for the manufacture of catfish nuggets as follows:

a) Grind the ingredients consisting of onions, garlic and shallots then grated the carrots.
b) The catfish meat mixture is mashed into a food processor to obtain a smooth meat.

c) Add spices that have been mashed, add salt, sugar, pepper, carrots, eggs, tapioca flour, vegetable oil and coconut milk regularly.
d) The doughy nuggets are then transferred to the tray.
e) The nugget dough is printed in a round shape and then covered with flour.
f) The dough is stored in a steamer pan which has been covered with banana leaves.
g) Steamed for 30 minutes.
h) The nugget dough that has been cooked is removed and aerated.

   3. Otak-otak of Catfish

     The following is the work procedure used to manufacture otak-otak of catfish as follows:

a) Steam the banana leaves until flexible for about 15 minutes.
b) Puree ingredients consisting of garlic and shallots.
c) The catfish meat mixture is mashed into a food processor to obtain a smooth meat.
d) Add spices that have been mashed, add salt, sugar, pepper, vegetable oil, leeks, eggs, tapioca flour, and coconut milk regularly.
e) The dough for otak-otak that is already dull is then transferred to a tray.
f) The otak-otak mixture is formed into banana leaves and folded.
g) The dough is stored in the steamer pan.
h) Steamed for 30 minutes.
i) The dough of the otak-otak that has been cooked is removed and aerated.
j) The cold otak-otak was then burned.

RESULTS AND DISCUSSION
Hedonic Test

     The goal is to find out the response or responses from the panelists to the products produced by comparing commercial products in terms of their preference.

Meatballs

1. Appearance

Appearance is the first assessment seen by panelists who determine panelist acceptance before finally spreading to other factors (aroma, texture, and taste). The average appearance of meatballs can be seen in Table 1.

Table 1. Average Appearance of Meatballs with Different Compositions

Sample	Median Value	Average Appearance
BP	7	7.6 a
BT	7	6.9 a
BA	7	7.2 a

Note: The average value followed by the same letter shows no significant difference in the Multiple Comparison test at the 5% level.

Based on the Friedman test, it can be concluded that between the meatballs of each sample of meatball does't have an effect on appearance, so that there is no multiple comparison test. From the results of the notation contained in table 1, it can be concluded that between meatballs have a relatively similar appearance preference. Based on appearance parameters, the median value produced at the level of preference for the appearance of the meatballs was obtained by a median value of 7. This value indicates that the product is entirely accepted and liked by the panelists. The BP sample (catfish meatballs) showed an uneven surface, but the addition of celery made the surface appearance different from other meatballs and made the panelists interested. The BT sample (mackerel fish meatball) shows that the surface color looks cloudy and not bright white so it looks less attractive. The average value has decreased to the level of preference for the panelists. The BA sample (chicken meatball) shows a bright white appearance like other meatballs.

According to Sofyan (2005), the color of the product will affect the appearance and acceptance of consumers from food. Visually color counts first and sometimes decisively.

2. Aroma

Aroma assessment aims to determine the delicacy of food ingredients based on the five senses of smell. The aroma contained in food products mostly comes from ingredients added to the dough (Widjaya *et al*. 2015).The average aroma of meatballs can be seen in Table 2.

Table 2. Average Aroma of Meatballs with Different Compositions

Sample	Median Value	Average Aroma
BP	7	6.7 a
BT	7	6.1 a
BA	7	6.4 a

Note: The average value followed by the same letter shows no significant difference in the Multiple Comparison test at the 5% level.

Based on the results of the Friedman test, it shows that each meatball sample has no effect on aroma, so that there is no multiple comparison test. From the results of the notation contained in table 2, it can be concluded that the meatballs have the same relative preference for aroma. The BP sample (catfish meatball) had the highest average aroma value. The average value of the aroma of the BT sample (mackerel fish meatballs) has decreased due to the aroma of the mackerel fish which has a distinctive and strong aroma. Where the aroma is very influential on the aroma of the mackerel fish ball products so that it is less liked by the panelists.

Aroma is one of the factors that will determine consumers to choose products because aroma can attract consumers' attention to these food products (Bakhtiar *et al*. 2019). The aroma received by the nose and otak-otak is more a mixture of four main scents, namely fragrant, rancid, sour and charred (Winarno 1991).

3. Texture

Texture factors include hand feel, tenderness and easy chewing (Meilgaard *et al*. 1999) as well as wetness, dry, hard, smooth, coarse, crunchy and oily (Soekarto and Hubeis 2000). The average texture of the meatballs can be seen in Table 3.

Table 3. Average Texture of Meatballs with Different Composition

Sample	Median Value	Average Texture
BP	8	8 a
BT	7	6.4 a
BA	7	7 a

Note: The average value followed by the same letter shows no significant difference in the Multiple Comparison test at the 5% level.

Based on the results of the Friedman test, it shows that each meatball sample has no effect on the texture, so a Multiple Comparison test is not carried out. From the results of the notation contained in table 3, it can be concluded that the meatballs have a similar level of texture preference. The BP sample (catfish meatballs) had the highest average texture value with a value of 8 and a median value of 8. The average texture value of the BT sample (mackerel fish meatball) decreased due to the texture of the BT sample (mackerel fish meatball) having a different texture. a little louder than the other samples. Where the texture has an effect on the texture of the mackerel fish ball product so that it is less liked by the panelists. Based on texture parameters, the median value produced at the level of preference for the meatball texture obtained a median value of between 7 and 8 which means it is included in the category of preferred to very favorable. This value indicates that the product is entirely accepted and liked by the panelists.

4. Taste

Taste is a very decisive factor in the panelist's final decision to accept or reject a food, because although other parameters are good, if it has a taste that is not liked, the product will be rejected (Soekarto and Suwarno 1985). The average taste of meatballs can be seen in Table 4.

Table 4. Average Taste of Meatballs with Different Composition

Sample	Median Value	Average Taste
BP	9	8.4 b
BT	7	6.8 a
BA	7	6.5 a

Note: The average value followed by the same letter shows no significant difference in the Multiple Comparison test at the 5% level.

Based on the results of the notation contained in table 4, it can be concluded that the BP sample (catfish meatballs) gives a different appearance that is significantly different fromsamples of BT (mackerel fish meatballs) and BA (chicken meatballs). The BP sample (catfish meatballs) had the highest average taste value with a value of 8.4 and a median value of 9. BP (catfish meatballs) was the most preferred by the panelists because it gave a different taste among other samples, the addition of celery to the catfish meatballs is the most important assessment or as the main consideration according to the panelists in choosing meatball products. Based on taste parameters, The median value generated at the level of preference for the taste of meatballs was obtained a median value of between 7 and 9 which means it is included in the category of preferred to very favorable.

5. Decision Making Using the Bayes Method

The weight of the criteria and the best treatment obtained in the study are presented in Table 5.

Table 5. The Weight Value of Meatball Criteria

Criteria	Criteria Weights
Appearance	0.18
Aroma	0.16
Texture	0.20
Taste	**0.46**

Based on the results of the calculation of the appearance, aroma, texture and taste parameters of meatballs, the highest criterion weight was the taste parameter of 0.46 meaning that the taste parameter was the most important assessment or as the main consideration according to the panelists in choosing meatball products. The second most important parameter is texture followed by appearance and aroma respectively with a criterion weight value of 0.20; 0.18; 0.16. This shows that the taste criteria are the main consideration for the panelists in choosing meatball products. According to Winarno (2004), taste is the tongue's response to a food. In oral stimulation, food ingredients have the property of stimulating the taste buds on the tongue which will cause certain feelings.

Table 6. Meatball Assessment Decision Matrix with Method *Bayes*

Sample	Criteria				Alternative value	Priority Value
	Appearance	**Aroma**	**Texture**	**Taste**		
BP	7	7	9	8	**7.85**	**0.36**
BT	7	7	7	7	7.00	0.32
BA	7	7	7	7	7.00	0.32
Value Criteria	0.18	0.16	0.20	**0.46**	21.85	1.00

Based on the results of calculations using the Bayes method, it was found that BP (catfish meatballs) had the highest alternative value, namely 7.85. The BP sample (catfish meatballs) was the most preferred by the panelists.

Nugget

1. Appearance

The average nugget appearance can be seen in Table 7.

Table 7. Average Appearance of Nugget with Different Composition

Sample	Median Value	Average Appearance
NP	7	7,1 a
NT	7	7,1 a
NA	9	8.1 a

Note: The average value followed by the same letter shows no significant difference in the Multiple Comparison test at the 5% level.

Based on the Friedman test, it can be concluded that between the nuggets of each sample of the nuggets does't have an effect on appearance, so that a Multiple Comparison test is not carried out. From the results of the notation in Table 15, it can be concluded that the nuggets have a relatively similar appearance preference. The NA sample (chicken nuggets) has the highest average appearance value with an average appearance value of 8.1 and a median value of 9. Based on the appearance parameters, The median value generated at the nugget taste preference level obtained a median value of between 7 and 9 which means it is included in the category of preferred to very liked. This value indicates that the product is entirely accepted and liked by the panelists.

The appearance of the final product is influenced by cooking oil, which functions as a medium for conducting heat, adds a savory taste because it absorbs oil during the drying process, adds nutritional value and flavor to the nuggets with a brownish yellow color during frying, and adds calories in the nuggets, so that from the three treatment produced almost the same color, namely brownish yellow (Winarno 2008).

2. Aroma

The average nugget aroma can be seen in Table 8.

Table 8. Average Nugget Aroma with Different Composition

Sample	Median Value	Average Aroma
NP	7	7.2 a
NT	7	7.3 a
NA	7	7.6 a

Note: The average value followed by the same letter shows no significant difference in the Multiple Comparison test at the 5% level.

Based on the results of the Friedman test, it shows that each sample of nuggets has no effect on aroma, so a Multiple Comparison test is not carried out. From the results of the notation contained in table 16, it can be concluded that the nuggets have the same relative preference for aroma. The NA sample (chicken nugget) had the highest average aroma value with a value of 7.6 and a median value of 7. The average value of the aroma of the NP samples (catfish nuggets) decreased where the aroma had an effect on the aroma of the catfish nugget products. less liked by the panelists. Based on aroma parameters, The median value produced at the level of preference for the appearance of the nugget was obtained by a median value of 7. This value indicates that the product is entirely accepted and liked by the panelists.

3. Texture

The average texture of the nuggets can be seen in Table 9.

Table 9. Nugget Texture Average with Different Composition

Sample	Median Value	Average Texture
NP	5	5.6 a
NT	7	7 b
NA	7	7.1 b

Note: The average value followed by the same letter shows no significant difference in the Multiple Comparison test at the 5% level.

Based on the Friedman test, samples of NA (chicken nuggets) and NT (mackerel fish nuggets) were significantly different from those of NP samples (catfish nuggets). The samples of NT (mackerel fish nuggets) and NA (chicken nuggets) had the same texture preference. The NA sample (chicken nugget) had the highest average texture value with a value of 7.1 and a median value of 7. The mean texture value of the NP sample (catfish nuggets) decreased due to the lack of texture of the NP (catfish nugget) sample. favored by the panelists. Based on texture parameters, The median value produced at the level of preference for the meatball texture obtained a median value of between 5 and 7 which means it is included in the neutral to preferred category.

4. Taste

The average flavor of the nuggets can be seen in Table 10.

Table 10. Average Nugget Taste with Different Composition

Sample	Median Value	Average Taste
NP	7	7.3 a
NT	7	7.2 a
NA	7	7.5 a

Note: The average value followed by the same letter shows no significant difference in the Multiple Comparison test at the 5% level.

Based on the results of the Friedman test, it shows that each sample of nuggets has no effect on aroma, so a Multiple Comparison test is not carried out. From the results of the notation contained in table 18, it can be concluded that the nuggets have a relatively similar level of taste preference. The NA sample (chicken nuggets) had the highest average taste value with a value of 7.5 and a median value of 7. Based on the taste parameters, The median value generated at the nugget taste preference level obtained the overall median value of 7 which means it is included in the preferred category. This value

indicates that the product is entirely accepted and liked and accepted by the panelists.

5. Decision Making Using the Bayes Method

The weight of the criteria and the best treatment obtained in the study are presented in Table 11.

Table 11. The Weight Value of Nugget Criteria

Criteria	Criteria Weights
Appearance	0.11
Aroma	0.28
Texture	0.14
Taste	**0.47**

Based on the results of the calculation of the appearance, aroma, texture and taste of the nuggets, the highest criterion weight is the taste parameter of 0.47, meaning that the taste parameter is the most important assessment or as the main consideration according to the panelists in choosing nugget products. The second most important parameter is aroma followed by texture and appearance respectively with a criterion weight value of 0.28; 0.14; 0.11. This shows that taste criteria are the main consideration for panelists in choosing nuggets. The calculation results in determining the best treatment using the Bayes method by considering the appearance, aroma, texture and taste criteria of the nuggets are shown in Table 12.

Table 12. Nugget Assessment Decision Matrix with Method *Bayes*

Sample	Criteria				Alternative value	Priority Value
	Appearance	Aroma	Texture	Taste		
NP	7	7	7	7	7.00	0.32
NT	9	7	7	7	7.21	0.33
NA	9	7	8	7	**7.36**	0.35
Value Criteria	0.11	0.28	0.14	**0.47**	21.51	1.00

Based on the results of calculations using the Bayes method, it was found that NA (chicken nuggets) had the highest alternative value, namely 7.36. The NA (chicken nuggets) sample was the most favored by the panelists.

Otak-Otak

1. Appearance

The average appearance of the otak-otak can be seen in Table 13.

Table 13. Average Appearance of Otak-otak with Different Compositions

Sample	Median Value	Average Appearance
OP	7	6.4 a
OT	7	7.6 a
OL	5	5.1 a

Note: The average value followed by the same letter shows no significant difference in the Multiple Comparison test at the 5% level.

Based on the Friedman test, it can be concluded that between the otak-otak of each sample of the otak-otak doesn't have an effect on appearance, so that a Multiple Comparison test is not carried out. The otak-otak have a relatively similar degree of liking for appearance. The OT sample (otak-otak of mackerel fish) had the highest average appearance value with an average appearance value of 7.6 and a median value of 7. The OL (otak-otak of tuna fish) sample experienced a decrease with an average appearance value of 5.1 and the median value is 5. This is because the color of the product looks opaque with an orange color, so it looks less attractive.

According to Sofyan (2005), the color of the product will affect the appearance and acceptance of consumers from food. Visually color counts first and sometimes decisively. Based on the appearance parameters, The resulting median value at the otak-otak appearance preference level was obtained by a median value of between 5 and 7, which means it is included in the neutral and preferred categories.

2. Aroma

The average aroma of the otak-otak can be seen in Table 14.

Table 14. Average Scent Otak-otak with Different Compositions

Sample	Median Value	Average Aroma
OP	7	6.9 b
OT	9	8.1 b
OL	5	5 a

Note: The average value followed by the same letter shows no significant difference in the Multiple Comparison test at the 5% level.

Based on the Friedman test, it shows that the aroma of the otak-otak has an influence on the level of preference, so a Multiple Comparison test is carried out. Based on the results of the multiple comparison test, the OP samples (otak-otak of catfish) and OT (otak-otak of mackerel fish) were significantly different from the OL samples (otak-otak of tuna fish). OP (otak-otak of catfish) and OT (otak-otak of mackerel fish) have a relatively similar preference for aroma. Sample OT (otak-otak of mackerel fish) has the highest average aroma value with a value of 8.1 and a median value of 9. The average value of aroma samples OL (otak-otak of tuna fish) has decreased, where the aroma affects the aroma of the otak-otak of tuna fish product so that it is less liked by panelists. Based on aroma parameters, the resulting median value at the appearance preference level of the otak-otak obtained a median value between 5-9. This

value indicates that the product is entirely accepted and liked by the panelists.

The smell of food determines the delicacy of these food ingredients. The aroma of otak-otak is influenced by the addition of spices in the formulation and the use of banana leaves as packaging for the otak-otak during steaming. According to Pratama *et al.* (2018), aroma components can affect the organoleptic characteristics of a food material so that in the end it plays a role in the level of acceptance and consumption of the final product.

3. Texture

The average texture of the otak-otak can be seen in Table 15.

Table 15. Average Otak-otak Texture with Different Composition

Sample	Median Value	Average Texture
OP	7	7.3 b
OT	7	7.5 b
OL	5	5.1 a

Note: The average value followed by the same letter shows no significant difference in the Multiple Comparison test at the 5% level.

Based on the Friedman test, it shows that the texture of the otak-otak has an influence on the level of preference, so a Multiple Comparison test is carried out. Based on the results of the multiple comparison test, the OP samples (otak-otak of catfish) and OT (otak-otak of mackerel fish) were significantly different from the OL samples (otak-otak of tuna fish). The OP (otak-otak of catfish) and OT (otak-otak of mackerel fish) samples had relatively the same texture preference. OT Samples (otak-otak of mackerel fish) has the highest average texture value with a value of 7.5 and a median value of 7. The average value of the texture of the sample OL (otak-otak of tuna fish) decreased due to the texture of the sample otak-otak of tuna fish less liked by the panelists. Based on texture parameters, The median value generated at the level of

preference for the otak-otak texture obtained a median value of between 5 and 7, which means it is included in the neutral to preferred category. This value indicates that the product is entirely accepted by the panelists.

According to Purnomo (1995), texture is one of the factors that influence consumer choice of a food product. Texture is an important aspect of food quality, sometimes more than aroma, taste and color where the state of texture greatly affects the image of the food.

4. Taste

The average taste of the otak-otak can be seen in Table 16.

Table 16. Average Otak-otak Sense with Different Composition

Sample	Median Value	Average Taste
OP	7	6.7 b
OT	7	7.6 b
OL	5	5.2 a

Note: The average value followed by the same letter shows no significant difference in the Multiple Comparison test at the 5% level.

Based on the Friedman test, it shows that the taste of the otak-otak influences the level of preference, so a Multiple Comparison test is carried out. Based on the results of the multiple comparison test, the OP samples (otak-otak of catfish) and OT (otak-otak of mackerel fish) were significantly different from the OL samples (otak-otak of tuna). The OP samples (otak-otak of catfish) and OT (otak-otak of mackerel) had relatively the same taste preferences. Sample OT (otak-otak of mackerel fish) has the highest average taste value with a value of 7.6 and a median value of 7. Based on taste parameters, the median value generated at the otak-otak taste preference level obtained the overall median value of 5 and 7, which means it is included in the neutral and preferred categories. This

value indicates that the product is entirely accepted by the panelists.

The taste caused can be caused by several factors, including the addition of spices (salt, garlic, onion, pepper, sugar and coconut milk). According to Suryaningrum (2002), the taste of food is influenced by the components found in food such as protein, fat and carbohydrates that make it up. The taste test mostly involves the tongue senses which can be identified through the solubility of food ingredients in contact with the taste nerves.

5. Decision Making Using the Bayes Method

The weights of the criteria and the best treatment obtained in the study are presented in Table 17.

Table 17. The Weight Value of Otak-otak Criteria

Criteria	Criteria Weights
Appearance	0.16
Aroma	0.16
Texture	0.24
Taste	**0.42**

Based on the results of the calculation of the appearance, aroma, texture and taste of otak-otak, the highest criterion weight was the taste parameter of 0.42, meaning that the taste parameter was the most important assessment or as the main consideration according to the panelists in choosing otak-otak products. The second most important parameter is texture followed by aroma and appearance respectively with a criterion weight value of 0.24; 0.16; 0.16. This suggests that taste criteria are the panelists' main consideration in choosing otak-otak products. The results of calculations in determining the best treatment using the Bayes method by considering the appearance, aroma, texture and taste criteria of the otak-otak are shown in Table 18.

Table 18. Otak-otak Assessment Decision Matrix with Method *Bayes*

Sample	Criteria				Alternative Value	Priority Value
	Appearance	Aroma	Texture	Taste		
OP	7.00	7.00	7.00	6.00	6.57	0.32
OT	7.00	7.00	7.00	7.00	**7.00**	0.35
OL	5.00	7.00	7.00	7.00	6.67	0.33
Value Criteria	0.164	0.161	0.246	**0.428**	20,243	1.00

Based on the results of calculations using the Bayes method, it is found that OT (otak-otak of mackerel fish) has the highest alternative value, which is 7.00. The sample of OT (otak-otak of mackerel fish) was the most preferred by the panelists

CONCLUSIONS AND SUGGESTIONS
Conclusion
1. Diversification of catfish-based processing carried out at the UPTD of Fishery Product Development in Purwakarta Regency includes catfish meatball products, catfish nuggets and otak-otak of catfish.
2. Based on the results of the organoleptic quality, it was concluded that all samples of meatballs, nuggets and otak-otak were still favored by the panelists because is still above the product rejection value limit, which is above the value of 3. Based on the calculation of the appearance, aroma, texture and taste, the highest total criterion weight is the taste parameter. Samples of BP (catfish meatballs), NA (chicken nuggets) and OT (otak-otak of mackerel fish) are the preferred samples compared to other samples with alternative values respectively are 7,85 ; 7,36 ; and 7,00.

Suggestion
There is a need for proximate analysis testing of the products produced, this is to determine the nutritional content of the products produced. Then, it is necessary to obtain a permit from the BPOM and expand the area of the disguise.

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