Analysis of Consumer Preferences in Selecting Processed Fish Products (Case Study in Bendungan Hilir Market, Central Jakarta, Indonesia)

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

At the moment, there has been minimal research on consumer preferences for purchasing processed fish products, with this study aiming to discover how consumer behavior affects the purchasing decision towards processed fish products. The purpose of this study is to examine processed fish products that are popular among Jakarta Indonesia consumers, as well as the factors that influence their purchasing decisions at Bendungan Hilir Market in Central Jakarta. The study used the method of descriptive analysis by observing Packaging color, type of packaging, product color, taste, and price. Validity and reliability tests were performed on the questionnaire. The characteristics of respondents and consumer behavior were analyzed descriptively, while the preferences of processed fish products, such as fish balls, jambal salted fish, shredded fish, fish nuggets, fish cake, and attributes in processed fish products that consumers will consider when purchasing processed fish products, were analyzed using Chi-Square. According to the findings, the processed fish product that became the consumer's favorite at the Bendungan Hilir Market was fish cake. Many of the factors that influenced the purchasing decision included the color of the white packaging, the color of the natural product, and the type of plastic packaging, but the most important factor in selecting products for fish balls, jambal salted fish, shredded fish, fish nuggets, and fish cake was the original taste. Fish balls and fish cake are priced between Rp. 15,000 and Rp. 20,000, while jambal salted fish, shredded fish, and fish nuggets are priced above Rp. 20,000.

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1. INTRODUCTION

Consumers often choose a product because it has a reasonable price, or an attractive, efficient pack of packaging, or the fresh color of the product. Processed products such as fish balls, jambal salted fish, shredded Fish, fish nuggets, and fish cake have the considerations are used in buying and selecting fisheries products. Whether visual factors (the type of packaging, the color packaging, and the color of the product) or other factors such as price and taste. Based on these factors, there are some of the most important factors in the purchase of fisheries processed products [1].

In 2018 it is known that Jakarta population consumes roughly 42.98 kg of fish / year. The rate of consumption increased from 2017-2018, with an average of 8.71 kg per capita / year, but it has not yet reached the expected target of 54 kg per capita / year [2]. The Jakarta government is holding a campaign like to eat fish that aims to increase its consumption preference.

In this study, random sampling was used as a sampling technique. This study included 30 respondents who were consumers of processed fish products in Bendungan Hilir Market in Central Jakarta, Indonesia. Product samples to be used are fish meatballs, jambal salted fish, shredded fish, fish nugget and fish cake

2. RESEARCH METHODOLOGY

The research carried out at the Bendungan Hilir Market, Central Jakarta City, Indonesia between July and August 2021. The case study method was applied (case study). Primary data and secondary data are the main sources of data. Interviews with respondents who buy processed fish products at Bendungan Hilir Market in Central Jakarta City, Indonesia, yielded primary data. Secondary data for this research comes from research reports from an agency, library materials, and the Central Bureau of Statistics.

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2.1 Data Analysis

Descriptive statistics and Chi-square test were used to analyze the data.

2.1.1 Validity analysis

The validity test determines whether or not the instrument used to collect data in the study can be used. In this research, the instrument's validity was determined to see if the measuring instrument, which was designed in the form of a questionnaire, could perform its function. The validity test uses a statistical approach, specifically comparing the correlation coefficient value of the statement item score to the total score of the stated item, if the correlation coefficient is greater than or equal to 0.30, the statement is declared valid.

2.1.2 Reliability analysis

The reliability test was carried out according to Sugiyono [6] to see how consistent the results were if measurements were taken twice or more for the same cases using the same measuring device. The author assesses the reliability of each instrument using the Cronbach alpha coefficient and the Statistical Product and Service Solution (SPSS) for interval measurement. If the Cronbach alpha value exceeds the specified limit of 0.6 or the calculated correlation value exceeds the value in the table, the instrument is said to be reliable.

2.1.3 Consumer preferences analysis

A Likert Scale is a method for analyzing consumer preferences. The scale would be used...
to collect research data. A Likert scale is used to assess a person's behavior, opinions, and perceptions of social phenomena. Behaviour scale is a type of scale used to assess a person's behaviour towards a specific object. The responses to every instrument item in the form of words, with gradations ranging from very positive to very negative. Likert scales used to measure consumer behaviour include five assessment points, with Strongly Agree Answer receiving a score of 5, Agree to Answer receiving a score of 4, Doubtful Answer receiving a score of 3, Answer Disagree receiving a score of 2, and Very Disagree Receiving a score of 1.

The research presented was acquired using a questionnaire data collecting approach, for example, the instrument was supplied to respondents with a certain quantity, and an analysis was done by categorizing respondents based on their behavior assessment score. These statistics are used to compute the number of persons who agree and strongly agree. The responses that were given the most often by respondents will be displayed in the results. The interval data may also be evaluated by computing the average answer for each response depending on the respondent's score.

### 2.1.4 Analysis of fish product attributes

The Chi Square test was used to analyze the characteristics of processed fish products. According to Sugiyono [7] Chi Square is a statistical technique for testing hypotheses when a population consists of two or more attributes of Bendungan Hilir and the data is nominal and the sample size is large.

\[
\chi^2 = \sum_{i=1}^{k} \left( \frac{f_o - f_h}{f_h} \right)^2
\]

Notes:

\( \chi^2 \) : Chi Square  
\( f_o \) : Frequency observed in research  
\( f_h \) : Frequency expected in research

Where:

\[
f_h = \frac{n}{k}
\]

Notes:

\( n \) : Number of people that responded  
\( k \) : The attribute category in the processed fish product variable in Market

**Ho** : There is no difference in consumer preferences for the attributes of processed fish products  
**Ha** : There are differences in consumer preferences for the attributes that exist in processed fish products

95 percent confidence level testing with the following testing criteria:  
Ho is rejected if \( \chi^2 \) count > \( \chi^2 \) table  
Ho is accepted if \( \chi^2 \) count ≤ \( \chi^2 \) table

### 3. RESULTS AND DISCUSSION

In this research, consumers are individuals who buy processed fish items at Bendungan Hilir Market in Central Jakarta, Indonesia. General consumer variables such as gender, age, education level, occupation, income, and family size were included in the questionnaire forms to 30 respondents.

#### 3.1 Gender

Consumer characteristics are divided into two groups based on gender: male and female. Table 1 shows the characteristics of consumers by gender.

According to the results, women are interested in 90 percent of processed fish product consumers, while male consumers are interested in 10 percent. This could be because women are in charge of determining the household's meal needs.

| No | Gender | People | Percentage (%) |
|----|--------|--------|----------------|
| 1  | Male   | 3      | 10             |
| 2  | Female | 27     | 90             |
|    | Total  | 30     | 100            |

Table. 1. Consumer characteristics by gender
3.2 Ages

In this survey, the age group was divided into four classes with a 10 year age difference. Consumers buying fish processed products in Jakarta City's Bendungan Hilir Traditional Market range in age from 17 - 26, 27 - 36, 37 - 46, and >47 (Table 2).

is 3.3% of the overall. The age group 27-36 years accounts for 13.3%, while the age group 37-46 years is 36.7%. The age group of respondents over 47 years old is the most dominant as consumers when it comes to choosing processed fish products. Respondents over the age of 60 consume less food because they are more careful in choosing and consuming food at this age, choosing foods made from vegetables.

3.3 Education Level

The level of education a person must have affects their choice and consumption patterns. A person's level of education will also influence their way of thinking and even how they recognize a problem [8]. In this study, the level of education was divided into four categories: high school, diploma, undergraduate degree, and master's degree. (Table 3).

According to the research results, the youngest consumers range in age from 17 - 26 years.

Table 3 shows that most respondents (63.7%) came from undergraduate backgrounds, while the least respondents came from an senior high school background (6.7%).

3.4 Income Level

Sumardi asserts that income is the sum of all family members' contributions to meet the needs of the family and individuals [9]. Table 4 shows how consumer income for processed fish products is divided into three groups.

According to Table 4, 90 percent of Central Jakarta Citizens have the greatest possible income level (> Rp. 4,000,000), and the lowest (3.3 percent) income level (Rp. 1,000,000).

3.5 Occupations

According to consumer research, employment is the strongest single factor of social class. Consumers' work impacts their way of life (Table 5).

Table 2. Consumer characteristics by ages

| No | Ages  | People | Percentage (%) |
|----|-------|--------|----------------|
| 1  | 17-26 | 1      | 3.3            |
| 2  | 27-36 | 4      | 13.3           |
| 3  | 37-46 | 11     | 36.7           |
| 4  | >47   | 14     | 46.7           |
|    | Total | 30     | 100            |

Table 3. Consumer characteristics by education level

| No | Education Level       | People | Percentage (%) |
|----|-----------------------|--------|----------------|
| 1  | Senior High School    | 2      | 6.7            |
| 2  | Diploma               | 5      | 16.7           |
| 3  | Undergraduate Degree  | 19     | 63.3           |
| 4  | Master Degree         | 4      | 13.3           |
|    | Total                 | 30     | 100            |

Table 4. Consumer characteristic by income level

| No | Income       | People | Percentage (%) |
|----|--------------|--------|----------------|
| 1  | 1,000,000-2,000,000 | 1      | 3.3            |
| 2  | 2,000,000-3,000,000 | 2      | 6.7            |
| 3  | >4,000,000    | 27     | 90             |
|    | Total        | 30     | 100            |
Table 5. Consumer characteristics based on occupation

| No | Occupations      | People | Percentage (%) |
|----|------------------|--------|----------------|
| 1  | Government Employees | 1      | 3.3            |
| 2  | Doctor            | 1      | 3.3            |
| 3  | Entrepreneur      | 6      | 20             |
| 4  | Housewives        | 7      | 23.3           |
| 5  | Private Employees | 15     | 50             |
|    | Total             | 30     | 100            |

The percentage population of the city of Central Jakarta according to the type of work shows that Private Employees have the highest percentage, (50%) and the lowest percentage of the population is the Government Employees and Doctor is 3.3% (Table 5).

3.6 The Number of Family Members

The number of family members has a significant effect on customers' decisions to purchase processed fish products. (Table 6).

Consumers of processed fish products in Central Jakarta City come from a wide range of family backgrounds (Table 6). It can be observed that households with four people have the largest proportion (53.3 %), while families with two members have the lowest rate (3.3 %).

3.7 Consumer Behaviour

Consumer buying behaviour with reference to purchasing processed fishery products is described as the act of directly involved, seeking, obtaining, eating, and spending processed fishery products. Respondents are used as research material in studies of processed fish product marketers because marketing have a duty to understand the respondent, how the respondent's tastes differ, and how the respondent decides to buy processed fish goods. Understanding respondents will bring marketers to the proper and effective marketing policies, therefore studying customer behavior is critical.

3.8 Consumer Preference

Consumer preference for processed fisheries goods refers to whether or not a person prefers to eat processed fishery products (Table 7).

Table 7 shows that the most consumers like processed fish products in the form of fish cake. According to the results of the calculation of the value of the behavior calculation scale, how many tuna fish were obtained in the range of 140, while fish meatballs were obtained in the range of 109, jambal salted fish in the range of 98, shredded fish in the range of 107, and fish nuggets were obtained in the range of 100. Because this product is available, consumers prefer processed fish products in the form of fish cake.

3.9 Test Validity and Reliability

Tables 8 and 9 show the results of the validity and reliability testing of customer preferences for all items.

Table 6. Consumer characteristics by the number of family members

| No | Number of family members | People | Percentage (%) |
|----|----------------------------|--------|----------------|
| 1  | 2 members                  | 1      | 3.3            |
| 2  | 3 members                  | 3      | 10             |
| 3  | 4 members                  | 16     | 53.3           |
| 4  | 5 members                  | 8      | 26.7           |
| 5  | 6 members                  | 2      | 6.7            |
|    | Total                      | 30     | 100            |
Table 7. Behaviour measurement scale towards processed fish products

| Product     | Very dislike (1-30) | Dislike (31-60) | Normal (61-90) | Like (91-120) | Really like (121-150) |
|-------------|---------------------|-----------------|----------------|---------------|-----------------------|
| Fish Ball   |                     |                 |                |               |                       |
| Jambal Salted Fish |                 |                 |                |               |                       |
| Shredded Fish |                     |                 |                |               |                       |
| Fish Nuggets |                     |                 |                |               |                       |
| Fish Cake   |                     |                 |                |               |                       |

Table 8. Validity test result of all products

| Product            | Preference                  | Validity |
|--------------------|-----------------------------|----------|
| Fish Balls         | The package colour          | 0.721    |
|                    | The product colour          | 0.801    |
|                    | The kind of package         | 0.886    |
|                    | Flavour                     | 0.862    |
|                    | Price                       | 0.623    |
| Jambal Salted Fish | The package colour          | 0.878    |
|                    | The product colour          | 0.905    |
|                    | The kind of package         | 0.794    |
|                    | Flavour                     | 0.886    |
|                    | Price                       | 0.91     |
| Shredded Fish      | The package colour          | 0.81     |
|                    | The product colour          | 0.866    |
|                    | The kind of package         | 0.836    |
|                    | Flavour                     | 0.906    |
|                    | Price                       | 0.875    |
| Fish Nuggets       | The package colour          | 0.919    |
|                    | The product colour          | 0.959    |
|                    | The kind of package         | 0.977    |
|                    | Flavour                     | 0.926    |
|                    | Price                       | 0.838    |
| Fish Cake          | The package colour          | 0.888    |
|                    | The product colour          | 0.93     |
|                    | The kind of package         | 0.927    |
|                    | Flavour                     | 0.881    |
|                    | Price                       | 0.847    |

Table 9. Validity test results of all products

| Product            | Cronbach’s Alpha | Items Total |
|--------------------|------------------|-------------|
| Fish Balls         | 0.839            | 5           |
| Jambal Salted Fish | 0.922            | 5           |
| Shredded Fish      | 0.910            | 5           |
| Fish Nuggets       | 0.956            | 5           |
| Fish Cake          | 0.937            | 5           |

Because the validity value of each product attribute is more than 0.3, the validity value of each attribute is declared valid (Table 8). The validity test results are consistent with According to Sugiyono [6] if the correlation coefficient is larger than or equal to 0.30, the statement is valid. Table 9 shows the results of the Reliability all products test.
Table 10. Chi square test analysis of considered attributes of all products

| Product       | Attributes                          | fo | fh | fo-fh | (fo-fh)² | X²  |
|---------------|-------------------------------------|----|----|-------|---------|-----|
| Fish Balls    | The package colour                  | -  | -  | -     | -       | -   |
|               | The product colour                  | 2  | 7.5| -5.5  | 30.25   | 4.03333 |
|               | The kind of package                 | 4  | 7.5| -3.5  | 12.25   | 1.63333 |
|               | Flavour                             | 22 | 7.5| 14.5  | 210.25  | 28.03333 |
|               | Price                               | 2  | 7.5| -5.5  | 30.25   | 4.03333 |
|               | Total                               | 30 | 30 | -     | -       | 37.73333 |
| Jambal Salted Fish | The package colour                  | -  | -  | -     | -       | -   |
|                | The product colour                  | 10 | 7.5| 2.5   | 6.25    | 0.83333 |
|                | The kind of package                 | 1  | 7.5| -6.5  | 42.25   | 5.63333 |
|                | Flavour                             | 17 | 7.5| 9.5   | 90.25   | 12.0333 |
|                | Price                               | 2  | 7.5| -5.5  | 30.25   | 4.03333 |
|                | Total                               | 30 | 30 | -     | -       | 22.5333 |
| Shredded Fish | The package colour                  | 2  | 7.5| -5.5  | 30.25   | 4.03333 |
|                | The product colour                  | 2  | 7.5| -5.5  | 30.25   | 4.03333 |
|                | The kind of package                 | 2  | 7.5| -5.5  | 30.25   | 4.03333 |
|                | Flavour                             | 23 | 7.5| 15.5  | 240.25  | 32.0333 |
|                | Price                               | 1  | 7.5| -6.5  | 42.25   | 5.63333 |
|                | Total                               | 30 | 30 | -     | -       | 45.7333 |
| Fish Nuggets  | The package colour                  | 2  | 7.5| -5.5  | 30.25   | 4.03333 |
|                | The product colour                  | -  | -  | -     | -       | -   |
|                | The kind of package                 | 1  | 7.5| -6.5  | 42.25   | 5.63333 |
|                | Flavour                             | 22 | 7.5| 14.5  | 210.25  | 28.03333 |
|                | Price                               | 5  | 7.5| -2.5  | 6.25    | 0.83333 |
|                | Total                               | 30 | 30 | -     | -       | 34.5   |
| Fish Cake     | The package colour                  | 2  | 15 | -13   | 169     | 11.2667 |
|                | The product colour                  | -  | -  | -     | -       | -   |
|                | The kind of package                 | -  | -  | -     | -       | -   |
|                | Flavour                             | 28 | 15 | 13    | 169     | 11.2667 |
|                | Price                               | -  | -  | -     | -       | -   |
|                | Total                               | 30 | 30 | -     | -       | 11.2667 |

According to Sugiyono [6] a research is considered valid if the Cronbach's Alpha value is higher than 0.6, meaning that customer preference data for all items is reliable. As a result, the data shown above is consistent and reliable.

### 3.10 Test Chi Square

Table 10 shows the result of the chi square tests of consumer preferences for all items.

Based on the chi-square calculation results in Table 16. It shows that the total of all chi-square products has a value. Based on df = 4 with an error of 5%, the square table value of 9.49 can be obtained. Each attribute of the entire processed product was found to be significantly different with a 95% level of confidence, implying that the null hypothesis (H₀) is rejected and the alternative hypothesis (H₁) is accepted because the X² count is higher than Table X².

### 4. CONCLUSION

Based on the results of research and analysis that has been done, it can be concluded that:

1. Processed fish products at Central Jakarta’s Bendungan Hilir Market. Consumer preferences provide fish cake, fish balls, shredded fish, fish nuggets, and jambal salted fish, with the taste of each product being the most important aspect.
2. Consumers consider the color of white packaging, the color of natural products, the type of plastic packaging, and the original flavours of processed fish products when deciding whether to buy fish balls, jambal salted fish, shredded fish, fish nuggets, and fish cake at Bendungan Hilir Market Jakarta. Fish balls and fish cake are priced between Rp. 15,000 and Rp. 20,000, while jambal salted fish, shredded fish, and fish nuggets are priced above Rp. 20,000.
COMPETING INTERESTS

Authors have declared that no competing interests exist.

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