



Analysis of Consumer Preferences in Selecting Processed Fish Products (Case Study in Cicadas Market, Bandung City, Indonesia)

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Authors' contributions

This work was carried out in collaboration among all authors. Author FI designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors AAHS and LPD managed the analyses of the study. Author IG managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

This study aims to analyze processed fish products which are preferred by the consumers in the Cicadas Market in Bandung City, (Country?) and to analyze the attributes that consumers consider the most in choosing processed fish products in the Cicadas Market in Bandung City. The method used in this research is a case study method using descriptive statistics. Data were collected by direct interview of the respondents who were in Cicadas Market using a questionnaire. The attributes observed were packaging color, type of packaging, product color, taste, and price. The questionnaire used has been tested using validity and reliability tests. Respondent characteristics and consumer behavior were analyzed descriptively, while preferences for processed fish products, such as Tuna fish, fish balls, and pempek, as well as the attributes in processed fish products that consumers consider in choosing processed fish products, were analyzed using Chi-Square. The results showed that the processed fish product which is the consumer preference in Cicadas Market is tuna fish mackarel. The most important aspects to consider in choosing Tuna

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fish mackarel product include the green packaging color, the type of packaging is the leaf, the natural product color, the spicy taste, and the tuna mackarel price of Rp. 15,000 - Rp. 20,000. The things that are most considered in choosing a fish meatball product are the color of the clear packaging, the type of packaging is plastic, the color of the natural product, the original taste, and the price of the processed fish meatball product <Rp. 10,000. The most important consideration in choosing a pempek product is the color of the clear packaging, the type of packaging is plastic, the color of the natural product, the spicy taste, and the price of the pempek product is Rp. 15,000 - Rp. 20,000.

Keywords: Attributes; consumers; preferences; fish processed products.

1. INTRODUCTION

Fishery business activities, included in fisheries development, are closely related to consumers. Consumer behavior is a decision made by consumers by using available resources, namely time, money and effort, to be exchanged for goods for consumption. In simple terms, consumer behavior includes decisions about what consumers buy, why, where, when, and how often they buy. Consumer behavior can also be defined as the process that a person goes through in looking for, buying, using, evaluating, and acting after product consumption [1].

Bandung City has a fish consumption level of 37.90 kg per capita/year. The value of the fish consumption level targeted by the Bandung City Government is 54.46 kg per capita/year (BPS, 2018). The Government of Bandung City held socialization for fondness (like to eat fish) to increase the value of fish consumption. The Food and Agriculture Office of Bandung City also continues to maintain fish supply to Bandung City, because fish consumption in Bandung City has reached 238 tons per day, while Bandung City's production target is 2,970 tons per year.

The city of Bandung has 12 traditional markets scattered in each district. Cicadas Market is one of the traditional markets which is located in the center of Bandung City, precisely in Cibeunying Kidul District. There are various processed fishery products in the cicadas market, for example, various kinds of fresh and processed fish. This processing process is divided into two, modern processing and traditional processing.

Products are everything that producers offer to consumers to meet consumer needs and be able to provide satisfaction to their users. Preference shows consumer preference from a variety of available products [2]. The concept of preference is in line with the concept of goods that are more desirable and provide greater satisfaction than

less desirable goods. Consumer preferences are very important to be studied because they serve as a guide in determining the characteristics of processed fish products in terms of packaging, types of processed fish and prices. This encourages researchers to analyze the characteristics of processed fish products that are of interest in the Cicadas Market in Bandung City, Indonesia.

2. RESEARCH METHODOLOGY

The research was conducted during May - July 2021 at the Cicadas Market, Bandung City. The method used is the case study method (case study). Types and sources of data are primary data and secondary data. Primary data obtained from interviews with respondents who are consumers that buy processed fish products at Cicadas Market, Bandung City. Secondary data to support this research is a source of data obtained from research reports from an agency, library materials, and the Central Bureau of Statistics.

The sampling technique used in this study was accidental sampling. The number of respondents used in this research is 100 people as consumers of processed fish products in Cicadas Market, Bandung City. Product samples to be used are fish meatballs, mackarel tuna, and pempek.

2.1 Data Analysis

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

2.1.1 Validity analysis

The validity test states that the instrument used to obtain data in the study can be used or not. The validity test of the instrument in this study was conducted to determine whether the

measuring instrument that has been designed in the form of a questionnaire can perform its function. The validity test is used with a statistical approach, namely through the correlation coefficient value of the statement item score with the statement item's total score, if the correlation coefficient is greater than or equal to 0.30 then the statement is declared valid.

2.1.2 Reliability analysis

The reliability test was carried out according to Sugiyono [3] to find out how far the measurement results remained consistent, if measurements were made twice or more for the same symptoms using the same measuring device. The reliability of each instrument used by the author uses the Cronbach alpha coefficient (α) using the Statistical Product and Service Solution (SPSS) version 20 for the type of interval measurement. An instrument is said to be reliable if the Cronbach alpha value is greater than the specified limit of 0.6 or the calculated correlation value is greater than the value in the table.

2.1.3 Analysis of consumer preferences

The method that is used in analyzing consumer preferences is a Likert Scale. The scale can be used as a research data collection tool. Likert scale is used to measure the behaviour, opinions and perceptions of a person or group of people about social phenomena. Behaviour scale is a type of scale used to measure a person's behaviour towards a particular object. The results are in the form of behaviour, namely: support (positive), reject (negative), and neutral. The answers to each instrument item that uses a Likert scale have gradations from very positive to very negative, in the form of words. Examples of likert scales used to measure consumer behavior use five assessment points, namely Strongly Agree Answer given a score of 5, Agree Answer are given a score of 4, Doubtful Answer are given a score of 3, Answer Disagree are given a score of 2, Very Disagree Answer are given a score of 1.

The data above uses a questionnaire data collection technique, for example the instrument is given to respondents with a certain amount, then an analysis will be conducted by grouping based on the behaviour assessment score. Based on these data the number of people who agree and strongly agree is calculated. Then, these results will show the answers most

frequently answered by respondents. The interval data can also be analyzed by calculating the average answer based on the score of each answer from the respondent (Fig. 1). The ideal score (criteria) for all the 5 items is multiplied by the number of respondents.

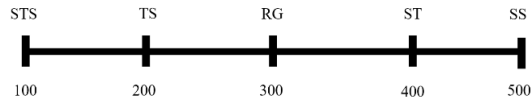


Fig. 1. Likert scale

2.1.4 Analysis of the attributes of fish products

Analysis of the attributes of processed fish products used the Chi Square test. According to Sugiyono [4] Chi Square is a statistical technique used to test hypotheses when a population consists of two or more classes of cicadas where the data is nominal and the sample is large.

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

Notes :

- χ^2 : Chi Square
- f_o : Frequency observed in research
- f_h : Frequency expected in research
- k : The attribute category in the processed fish product variable in Cicadas Market.

Where:

$$f_h = \frac{n}{k}$$

Notes:

- n : Number of respondents (people)
- k : The attribute category in the processed fish product variable in Cicadas Market.
- H_o : There is no difference in consumer preferences for the attributes of processed fish products
- H_a : There are differences in consumer preferences for the attributes that exist in processed fish products.

Testing at 95% confidence level with testing criteria:

- H_o is rejected if χ^2 count > χ^2 table
- H_o is accepted if χ^2 count \leq χ^2 table

3. RESULTS AND DISCUSSION

Consumers in this study are consumers who buy Processed Fish Products at Cicadas Market, Bandung City. The questionnaires distributed to 100 respondents included general characteristics of consumers, namely gender, age, education level, occupation, income, and number of family members.

3.1 Gender

Characteristics of consumers by gender are divided into two groups; male and female. Characteristics of consumers by gender are presented in Table 1.

Table 1. Consumer characteristics by gender

No	Gender	People	Percentage (%)
1	Male	21	21
2	Female	79	79
	Total	100	100

The results showed that most consumers of processed fish products were women with a percentage of 79% while male consumers constitute 21%. This might be so because women have the responsibility to set out the meal needs in the household.

3.2 Ages

The age group in this study was divided into four classes with a difference of 10 years. The age group of consumers who buy fish processed products in the Cicadas Traditional Market of Bandung City is 17-26, 27-36, 37-46, > 47 (Table 2).

Table 2. Consumer characteristics by ages

No	Ages	People	Percentage (%)
1	17-26	6	6
2	27-36	63	63
3	37-46	26	26
4	>47	5	5
	Total	100	100

Based on the research results, the age of the youngest consumers is between 17-26 years, which is 6%. The age group 37-46 years is 26%, the age group 27-36 years is the age group that is the most dominant as consumers in choosing processed fish products. The age group of respondents over 47 years old is 5%.

Respondents over 60 years of age consume less food because at this age someone is more careful in choosing and consuming food, that is, they prefer foods made from vegetables [5].

3.3 Education Level

The education level of the respondent will influence the decision process and consumption patterns of a person. A person's education level will also affect the way of thinking and even perception of a problem (Sumarwan, 2009). The level of education in this study was divided into 6; namely elementary, junior high, high school, Diploma, Undergraduate Degree (Table 3).

Table 3 shows that most respondents (51%) came from senior high school backgrounds, while the least respondents came from an elementary school background (6%).

3.4 Income Level

According to Sumardi [6], income is the total income of all family members who are contributed to meet the needs of family and the individuals. Consumer income of processed fish products is divided into 4 groups, As shown in Table 4.

Based on Table 4, 57% of Bandung City residents have the highest income level, (> Rp. 4,000,000), and the least is those who have the lowest (6%) income level, (<Rp. 1,000,000).

3.5 Occupations

According to Engel [7], consumer analysis considers employment as the best single indicator of social class. Work done by consumers influence their lifestyle (Table 5).

The percentage population of the city of Bandung according to the type of work shows that housewives have the highest percentage, (66%) and the lowest percentage of the population who do not work and students is 3% (Table 5).

3.6 The Number of Family Members

The number of family members is an important factor in influencing consumers' decisions to buy processed fish products. (Table 6).

Table 3. Consumer characteristics by education level

No	Education Level	People	Percentage (%)
1	Elementary School	6	6
2	Junior High School	20	20
3	Senior High School	51	51
4	Diploma	16	16
5	Undergraduate Degree	7	7
	Total	100	100

Table 4. Consumer characteristics by income level

No	Income	People	Percentage (%)
1	< 1,000.000	6	6
2	1,000.000-2,000.000	19	19
3	2,000.000-3,000.000	18	18
4	>4,000.000	57	57
	Total	100	100

Table 5. Consumer characteristics by occupations

No	Occupations	People	Percentage (%)
1	Civil Servants	4	4
2	Private Employees	9	9
3	Entrepreneurs	17	17
4	Housewives	66	66
5	Students	2	2
6	Unemployed	2	2
	Total	100	100

Table 6. Consumer characteristics by the number of family members

No	Number of family members	People	Percentage (%)
1	1-2	17	17
2	3-4	42	42
3	5-6	23	23
4	8	17	17
	Total	100	100

The consumers of processed fish products in Bandung City have a diverse number of family members (Table 6). It can be seen that the highest percentage (46%) is in families that have 3-4 members, and the lowest percentage (17%) of family members is shown in the number of 1-2 and 7-8.

3.7 Consumer Behaviour

Consumer behavior towards purchasing processed fishery products is an act of directly involving, seeking, obtaining, consuming, and spending processed fishery products. Respondents are taken as research material where consumer behavior is researched and analyzed to study processed fish product

marketers because marketers have an obligation to understand the respondent, how the respondent's tastes, and how the respondent makes the decision to buy processed fish products. Studying consumer behavior is very important because understanding respondents will lead marketers to the right and efficient marketing policies.

3.8 Consumer's Frequency of Fish Consumption

Based on the results of research conducted on 100 respondents, there are 97 people who consumed Fish and 3 people did not consume because of allergies to fish-based products.

Table 7. Behaviour measurement scale towards processed fish products

No	Attributes	Strongly disagree (1-100)	Not agree (101-200)	Doubtful (201-300)	Agree (301-400)	Strongly agree (401-500)
1	Mackarel Tuna				417	
2	Meatballs Fish					
3	Pempek			275	319	

Table 8. Chi square analysis of attributes considered by consumers of mackarel tuna

No	Tuna mackarel product	fo	fh	fo-fh	(fo-fh) ²	X ²
1	The package colour	37	20	11	121	6.05
2	The product colour	15	20	-5	25	1.25
3	The kind of package	13	20	-7	36	1.8
4	Flavour	28	20	8	64	3.2
5	Price	7	20	-13	169	8.45
	Total	100	100	0	-	18.8

Table 9. The calculated results of the measurement scale for mackarel tuna attribute

No	Attributes of mackarel tuna	Strongly disagree (1-100)	Not agree (101-200)	Doubtful (201-300)	Agree (301-400)	Strongly agree (401-500)
1	The package colour					401
2	The colour Product				413	
3	The kind of package					403
4	Flavour					437
5	Price					438

Table 10. Validity test results of mackarel tuna

Preference	Validity
The package colour	0.592
The product colour	0.573
The kind of package	0.394
Flavour	0.358
Price	0.471

Table 11. Results of mackarel tuna reliability test

Cronbach's alpha	Items total
0.750	5

Table 12. Chi square analysis of attribute preference considered by consumers of fish ball

No	Fish meatballs product	fo	fh	fo-fh	(fo-fh) ²	X ²
1	The package colour	22	20	2	4	0.2
2	The product colour	41	20	21	441	22.05
3	The kind of package	20	20	0	0	0
4	Flavour	17	20	-3	9	0.45
5	Price	0	20	-20	400	20
	Total	100	100	0	-	42.7

3.9 Frequency of Consuming Processed Fishery Products

Based on the results of this study, of the total 100 respondents who consumed > 4 times a month as many as 88 people a month. The second rank is 3 times a month as many as 12 people, the next rank is 2 times a month as many as 4 people and the last one time a month is 1 person. This shows that the purchasing power of the people in Cicadas Market for processed fishery products is quite high.

3.10 The Usual Place to Buy Processed Fishery Products

Based on the results of this study, as many as 84 out of 100 respondents chose to buy processed fisheries for consumption in traditional markets, while as many as 10 respondents chose to shop at supermarkets, 4 respondents chose to buy processed fish products at street vendors, and 2 persons chose to buy at a stall.

3.11 Consumer Preference

Consumer preference for processed fishery products is a choice of whether or not someone likes processed fishery products that are consumed. The choice varies between one respondent to another. (Table 7).

Table 7 shows that the most consumers like processed fish products in the form of tuna mackarel. Based on the results of the calculation

of the value of the behaviour calculation scale, how many tuna fish were obtained in the range of 417, while the fish meatballs were in the range of 319, and fish pempek was in the range of 275. Consumers mostly choose processed fish products in the form of tuna fish because this product is widely found.

The chi-square value is calculated as 18.8. Based on $df = 4$ with an error of 5%, it can be obtained that the Chi-square table value is 9.49. Each attribute of the mackarel tuna processed product that was observed was significantly different with a significant level of 95% which means that the null hypothesis (H_0) is rejected and the alternative hypothesis (H_a) is accepted because the count X^2 is greater than Table X^2 so that there are differences in consumer preferences for the attributes. There are tuna mackarel products by consumers in the cicadas market in Bandung City. The processed product attributes that consumers consider in making decisions to buy tuna mackarel products at Cicadas Market, Bandung City are green packaging color, the type of packaging is leaves, natural product color, spicy taste, and tuna mackarel price of Rp. 15,000 - Rp. 20,000.

Based on the results of the calculation of the scale of measuring behaviour towards the mackarel tuna product attributes, the highest value is obtained by the processed fish product price attribute with a score of 438, while the taste attribute gets a total score of 437, the product

color attribute gets a total score of 413, the packaging type attribute gets a total score of 403, and the lowest total score was obtained by the color of the packaging, namely 401. The results of the calculation of the behaviour measurement scale towards the mackerel fish processed product attributes show that the price attribute is the attribute most considered by consumers to buy mackerel tuna processed products.

3.12 Test Validity and Reliability

The results of the validity and reliability tests of consumer preferences for mackerel tuna products (Table 10).

The validity value of each of the mackerel tuna product attributes is declared valid because the validity value of each attribute is greater than 0.3 (Table 10). The results of this validity test are in accordance with Sugiyono [3] who stated that if the correlation coefficient is greater or equal to 0.30 then the statement is declared valid. Results of Mackerel tuna Reliability Test is on Table 11.

The calculated Cronbach's Alphas value is 0.750. Thus, data on consumer preferences for tuna products can be said to be reliable.

Results of the chi-square calculation is shown in Table 12., It shows that the chi-square value is 4.27. Based on $df = 4$ with an error of 5%, the square-Table value 9.49 can be obtained. Each of the observed product attributes of processed fish meatball is significantly different with a significant level of 95%, which means that the null hypothesis (H_0) is rejected and the alternative hypothesis (H_a) is accepted because the estimated X^2 count is greater than Table X^2 so that there are differences in consumer preferences for the attributes contained on fish meatball products by consumers in the cicadas market in Bandung. The most influential attributes are product color, packaging color, packaging type, taste, and price. The most considered attribute of processed fish meatball products is product color, it can be seen that 41 consumers consider the color of the product compared to other attributes. Fish ball product attributes that are preferred by consumers are clear packaging color, the type of packaging is plastic, natural product color, original taste, and the price of processed fish meatball products <Rp. 10,000 (Table 13).

Based on the results of the calculation of the scale of measuring behaviour towards the

attributes of fish meatball products, the highest value is obtained by the price attribute of processed fish products with a score of 446, while the taste attribute gets a total score of 415, the packaging type attribute gets a total score of 406, the product color attribute gets a total score of 390, and the lowest total score was obtained by the packaged color, namely 387. The calculation of the scale of measuring behaviour towards the attributes of processed fish meatball products shows that the price attribute is the most considered by consumers to buy processed fish meatball products.

3.13 Test Validity and Reliability

The results of the validity and reliability tests of consumer preferences for fish Meatballs products (Table 14).

Based on Table 14 the validity value of each of the fish Meatballs product attributes is declared valid because the validity value of each attribute is greater than 0.3. The results of this validity test are in accordance with Sugiyono's [3] that if the correlation coefficient is greater or equal to 0.30 then the statement is declared valid. Results of fish Meatballs Reliability Test is on Table 15.

The data on consumer preferences for Fish Meatballs products can be said to be reliable because the Cronbach's Alphas value is 0.764.

Based on the results of the chi-square calculation shown in Table 16, it shows that the chi-square value is 27.5. Based on $df = 4$ with an error of 5%, the square table value of 9.49 can be obtained. Each attribute of the Pempek processed product was observed to be significantly different with a significant level of 95%, which means that the null hypothesis (H_0) is rejected and the alternative hypothesis (H_a) is accepted because the X^2 count is greater than Table X^2 . Pempek product attributes that are preferred by consumers are clear packaging color, the type of packaging is plastic, natural product color, spicy taste, and the price of pempek product is Rp. 15,000 - Rp. 20,0.

Based on the results of the calculation of the scale of measuring behaviour towards fish pempek product attributes, the highest score was obtained by the taste attribute of processed fish products with a score of 441, while the price attribute got a total score of 419, the product color attribute got a total score of 409, the

Table 13. Measurement scale of attribute measurement of fish meatball attribute

No	Attributes of fish meatball	Strongly disagree (1-100)	Not agree (101-200)	Doubtful (201-300)	Agree (301-400)	Strongly agree (401-500)
1	The package colour				387	
2	The Product Colour				390	
3	The Kind Package				396	
4	Flavour					415
5	Price					446

Table 14. Validity test results of fish meatballs

Preference	The value of validity
The package colour	0.629
The product colour	0.841
The kind of package	0.557
Flavour	0.440
Price	0.321

Table 15. Results of fish meatballs reliability test

Cronbach's alpha	Items total
0.764	5

Table 16. Chi square analysis of considered attributes of consumers of pempek

No	Produk pempek ikan	fo	fh	fo-fh	(fo-fh) ²	X ²
1	The package colour	2	20	-18	323	16.2
2	The product colour	25	20	5	25	1.25
3	The kind of package	18	20	-2	4	0.2
4	Flavour	34	20	8	196	9.8
5	Price	21	20	1	1	0.05
	Total	100	100	-	-	27.5

Table 17. Scale of behaviour measurement of pempek attribute

No	Attributes of pempek	Strongly disagree (1-100)	Not agree (101-200)	Doubtful (201-300)	Agree (301-400)	Strongly agree (401-500)	
1	The Package colour						407
2	The Product Colour						409
3	The Kind Package						398
4	Flavour						441
5	Price						419

Table 18. Validity test results of pempek

Preference	The value of validity
The package colour	0.526
The product colour	0.461
The kind of package	0.563
Flavour	0.442
Price	0.456

Table 19. Results of pempek reliability test

Cronbach's alpha	Items total
0.725	5

packaging color attribute got a total score of 407, and the lowest total score was obtained by the type of packaging, namely 398. The results of the measurement scale calculation of behaviour towards the attributes of processed Pempek products show that the taste attribute is the most considered attribute by consumers to buy processed Pempek products.

3.14 Test Validity and Reliability

The results of the validity and reliability tests of consumer preferences for Pempek products are presented in Table 18.

Based on Table 8, the validity value of each of the Pempek product attributes is declared valid because the validity value of each attribute is greater than 0.3. The results of this validity test are in accordance with Sugiyono's [3] that if the correlation coefficient is greater or equal to 0.30 then the statement is declared valid (Table 19).

The data on consumer preferences for Pempek products can be said to be reliable because the Cronbach's Alphas value is 0.725.

4. CONCLUSIONS

This study revealed that:

1. Mackarel Tuna is the most preferred processed fish product in Cicadas Market in Bandung City, Indonesia and its most considered attribute is the colour of packaging while the most considered attribute of fish meatballs and pempek is the colour of the product. The processed product attributes that consumers consider in making decisions to buy tuna mackarel products at Cicadas Market, Bandung City are green packaging color, the type of packaging is leaves, natural product color, spicy taste, and tuna mackarel price Rp. 15,000 - Rp. 20,000. The attributes of fish meatball products that are preferred by consumers are clear packaging color, the type of packaging is plastic, natural product color, original taste, and the price

of processed fish meatball products <Rp. 10,000. Pempek product attributes that are preferred by consumers are clear packaging color, the type of packaging is plastic, natural product color, spicy taste, and the price of pempek product is Rp. 15,000 - Rp. 20,000.

CONSENT

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Wijayanti R. Analysis of consumer preferences in buying beef at Karanganyar traditional market. Essay. Sebelas Maret University; 2011.
2. Tjiptono F. Service marketing strategy. CV. Andi: Yogyakarta; 2009.
3. Sugiyono. Quantitative, qualitative, and R&D research methods. Bandung: Alfabeta; 2010.
4. Sugiyono. Statistics for research. Bandung: Alfabeta Publisher; 2014.
5. Hermanianto J, Andayani R. Study of consumer behavior and identification of cattle meatball parameters based on consumer preferences. DKI Jakarta; 2002.
6. Sumardi. Description and identification of quantitative characteristics of Bengkulu local gogo rice cultivars. Bengkulu: PT. Agrosia Deed; 2009.
7. Engel B. Consumer behavior. Tangerang: Binarupa Aksara; 2012.