



## Consumer Preferences of Packaged Cooking Oil in Bandar Lampung City

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Packaged cooking oil is a food product that is needed by every household. In the market, packaged cooking oil products have various brands and packaging forms such as refillable plastic packaging, plastic bottles, and jerrycans. The purpose of this study is to determine the combination of attributes of packaged cooking oil that consumers prefer the most and identification of important attribute for consumers. The research employs survey method involving 100 respondents of packed cooking oil in Bandar Lampung City, Lampung Province. The study reveals that consumers are between 38 and 52 years old with 4-6 family members. Family income are between IDR 8,000,000 and IDR 15,000,000 per month, and the highest education of housewives is high school. The most widely used brand of packaged cooking oil is Bimoli with the 2 liters plastic packaging, with an average household consumption at 3.714 liters per month. Based on conjoint analysis, it is concluded that consumers prefer price combination of IDR 11,000-13,000 per 1, 2 liters packaging size, clear, and the bottled packaging. The most important attribute is the clarity of packaged cooking oil with value of 29,693.

## INTRODUCTION

Entering the era of free trade, many competing manufacturers will emerge and companies face intense competition. Cooking oil is one of the daily basic needs of people, especially in Indonesia at various levels of society. Cooking oil consumption tends to increase every year with an average growth of 3.57% from 2014-2018 (Badan Pusat Statistik, 2019).

There are two types of cooking oils in the market, i.e.: in bulk and packaged cooking oil. Bulk cooking oil is marketed using plastic and is generally sold in kilograms, while packaged cooking oil is branded cooking oil and is marketed in the form of plastic refills, plastic bottles, and jerry cans (Etriya et al., 2004).

Basically, the price of bulk cooking oil is much cheaper than packaged cooking oil. However, bulk cooking oil is not guaranteed to be halal and clean. Many people, especially household consumers in urban areas, prioritize cleanliness in choosing the products they will consume. In addition, the regulation of the Ministry of Trade Number 36 of 2020 concerning mandatory packaging of palm cooking oil in April 2020 has made people gradually change their habit of using bulk oil into packaged cooking oil.

Lampung Province is one of the provinces with a high level of consumption of cooking oil products.

**Table 1.** Per capita consumption of cooking oil in Lampung Province

Year	Consumption	
	Per capita (month)	Growth (%)
2015	1,08	-
2016	1,09	0,93
2017	1,17	7,34
2018	1,13	-3,34
2019	1,16	2,65
Average	1,126	1,895

Source: Central Bureau Statistics, 2020

Table 1 presents the average growth of cooking oil consumption in Lampung Province in 2015 to 2019 is 1.895% (BPS, 2020).

Bandar Lampung City is the capital city of Lampung Province with a population of 1,051,500 people in 2019 (BPS, 2020). Bandar Lampung City is the center of various government, social, political, educational and cultural activities, as well as the center of economic activity in the Lampung region.

Bandar Lampung city is a potential trading area. One of them is marketing of cooking oil products. The more brands of packaged cooking oil that appear which can be caused by the increasing consumption, the more intense the competition between packaged cooking oil producers.

Different brands of packaged cooking oil have their own characteristics, each brand offers a different level of attributes. These attributes may include color, price, package size, clarity, and type of packaging. The attribute of cooking oil used by consumers is the combination that consumers prefer in the packaged cooking oil they buy.

Conjoint analysis is a research tool that is widely used in marketing and consumer research (Calegari et al., 2018) In this method, respondents are presented with various combinations of components formed by attributes and attribute levels classified from a product or service (Veitch et al., 2017).

Currently, consumers are becoming more critical in owning a product that is offered by the market in terms of product quality, design, price, services provided and others. Many similar and varied products make consumers more selective in choosing a product to consume, especially packaged cooking oil products.

There are so many packaged cooking oil brands circulating in the market, this research needs to be done so that producers can adjust their products according to consumer preferences to be able to continue to increase sales and be able to retain their customers, maybe even new customers. Based on the description above, the

purpose of this study is to find out consumer preferences for packaged cooking oil attributes in Bandar Lampung City and find out the most important packaged cooking oil attributes according to consumer preferences.

## RESEARCH METHODS

The location of the research was determined purposively in the city of Bandar Lampung by considering the city of Bandar Lampung as a trading center area because it is a transit area for economic activities between the islands of Sumatra and Java. In addition, the average expenditure per capita per month (Rp) for the food group is ranked first in Lampung Province (BPS, 2018).

The study employs survey. According to Sugiyono (2013), survey method is a descriptive method approach to obtain data from a representative sample of the population. The survey method is usually used to draw generalization from observations that are not in-depth, the resulting generalization can be accurate when using a representative sample. Information was obtained by compiling a list of questions in the questionnaire and direct interviews with respondents (Sugiyono, 2013).

Respondents were divided into upper middle class and lower middle class so that the results of the interviews were spread throughout the community. Based on the results of direct observations on infrastructure and environmental conditions, 2 sub-districts representing the upper middle class were chosen, namely Way Halim and Sukabumi sub-districts, and 2 sub-districts representing the lower middle class, namely Tanjung Karang Timur District and Tanjung Karang Pusat District.

Determination of the sample in the study was carried out using purposive sampling method. The calculation of determining the number of samples is calculated using the formula according to Yamane (1967):

$$n = \frac{N}{Nd^2 + 1} \dots\dots\dots (1)$$

Where,  $n$  is sample size;  $N$  is Total Population; and  $d$  is the precision level (10%). Using population of Bandar Lampung City, the sample size was set at 100 respondents.

Criteria of respondent includes (1) housewives, (2) be 18 years or older and married, and (3) has purchased and consumed packaged cooking oil products at least once in the last two months.

The study collects primary and secondary data. The consumer preferences with regard to attribute of packaged cooking oil is analyzed using conjoint analysis.

Conjoint analysis is a research tool widely used in marketing and consumer research (Donadini et al., 2017). In this method, respondents are presented with various combinations components formed by the attributes and classified levels of a product or service (Pleger et al., 2020). Using this method, entrepreneurs can recognize the impact of each attribute on consumer purchase intentions (Sampalean et al., 2020).

Research on consumer preferences using conjoint analysis for packaged cooking oil is not widely found in Indonesia and also in the world. Based on searching on Google Scholar and other search engines, the latest research on the use of conjoint for consumer preferences for cooking oil in Indonesia is done by Lubis (2021) in village area of North Sumatra. The study used conjoint analysis for the attributes of cooking oil. However, it does not specifically indicate consumer preferences for cooking oil brands.

Then Tanaem and Ernah (2021) used conjoint analysis for consumer preferences for palm cooking oil in Bandung. The research does not describe the attributes and brands that consumers preferred. In 2002, a study by Herawati et al. (2002) used the same method for cooking oil products (but did not mention specifically whether packaging or not). This study did not mention the brand of the product under study, but only describes combination of attributes of the research.

At the international level, there are no studies that specifically use conjoint analysis for cooking oil.

Therefore, the novelty of this study is in terms of using conjoint analysis for determining combination of attributes and brands of packaged cooking.

In order to apply conjoint analysis, it is necessary to identify all the attributes that will form part of the study, as well as establish the level associated with each attribute (Bernabéu et al., 2008). Through the initial questionnaire and literature review, the most representative attributes and levels in the process of purchasing packaged cooking oil were selected. The attributes (and their levels) identified as most important when purchasing packaged cooking oil can be explained below:

There are 2 levels of color attributes to analyze, namely golden yellow (C1) and dark yellow (C2). The price attribute consists of an attribute level of Rp 11,000-Rp 13,000 (P1) and Rp 14,000-Rp 16,000 (P2). Packaging size attribute with attribute level 1 liter (S1), 2liter (S2), and <1 liter (S3). The clarity attribute consists of the clear (K1) and cloudy

(K2) attribute levels. The last attribute is type packaging consisting of two attribute levels, namely plastic (refill) (PT1) and bottles (PT2).

The combinations that should be produced on 5 attributes and levels are 48

combinations (2x2x3x2x2). The main difficulty here is how to provide quality data. In order to obtain valuable and reliable data, two basic principles of orthogonality and equilibrium are taken into account.

The main difficulty here is how to provide quality data. In order to obtain valuable and reliable data, two basic principles of orthogonality and equilibrium are taken into account (Toklu, 2017): Too many combinations can make it difficult for consumers to evaluate attributes. The combination is simplified through orthogonal procedures in order to obtain a combination of attributes that only measures the main effect (fractional factorial design), while interactions between attributes are not measured or ignored, so that the number of stimuli formed will be less (Sari et al., 2010). The resulting combinations can be listed in Table 2.

Consumers give score from the most preferred combination (8) to the least preferred combination (1). The study estimates that combination attributes of color, price, size, clarity, packing type, and level of stimuli determine consumer preference.

**Table 2.** Combination of attributes after orthogonal computation

Color	Price/liter (rupiah)	Size (liter)	Clarity	Packing Type	Stimuli
-Dark yellow (C2)	14.000-16.000 (P2)	1 (S1)	Cloudy (K2)	Bottle (PT2)	1
-Dark yellow (C2)	14.000-16.000 (P2)	1 (S1)	Clear (K1)	Plastic (PT1)	2
-Golden yellow (C1)	14.000-16.000 (P2)	2 (S2)	Cloudy (K2)	Plastic (PT1)	3
-Golden yellow (C1)	14.000-16.000 (P2)	<1 (S3)	Clear (K1)	Bottle (PT2)	4
-Golden yellow (C1)	11.000-13.000 (P1)	1 (S1)	Clear (K1)	Plastic (PT1)	5
-Golden yellow (C1)	11.000-13.000 (P1)	1 (S1)	Cloudy (K2)	Bottle (PT2)	6
-Dark yellow (C2)	11.000-13.000 (P1)	<1 (S3)	Cloudy (K2)	Plastic (PT1)	7
-Dark yellow (C2)	11.000-13.000 (P1)	2 (S2)	Clear (K1)	Bottle (PT2)	8

Source: Data Processed, 2020

The basic model used in conjoint analysis is as follows (Malhotra, 1993):

$$\mu(x) = a_0 + a_{1j} X_{1j} + a_{2j} X_{2j} + a_{3j} X_{3j} + a_{4j} X_{4j} \dots \dots \dots (2)$$

Where,  $\mu(x)$  is Utility of each packaged cooking oil stimulus  $x$ ;  $a_0$  is Constant or total utility of all attributes;  $a_{ij}$  is Attribute utility (i) at level (j); and  $X_{ij}$  is Value 1 if attribute (i) and level (j) occur, 0 other.

Furthermore,  $\mu(x)$  is the total utility,  $X_{ij}$  is the utility associated with level  $j$  ( $j = 1, 2, \dots, m$ ) of attribute  $i$  ( $i = 1, 2, \dots, n$ ), and  $X_{ij}$  is a dummy variable that takes the value of 1 (or 0) in the case of presence (or absence) of the  $j$ th level of the  $i$ th attribute. For the qualitative attributes, the part-worth model was used because of its flexibility (Sampalean et al., 2020). The higher the part-worth (both positive and negative), the greater the effect on overall utility.

According to Julianisa et al., (2016), Conjoint analysis can also measure the relative importance of each factor. The accuracy of the analysis is measured by the correlation coefficient. It can be concluded that the model is accurate if the Pearson's R and Kendall'S Tau values are below  $= 0.05$ . If it is significantly different, then the processing of the data obtained from these 100 respondents is quite good and valid. (Ariyanti et al., 2019).

## RESULTS AND DISCUSSION

The characteristics of consumers in this study were based on age, number of family members, last education, and monthly family income. The results of research on the characteristics of household consumers of

packaged cooking oil are listed in the following table.

The average age of housewives consumers in this study was in ranging from 38 to 52 years, which amounted to 54 people with a percentage of 54%, followed by the age range of 53-67 which amounted to 24 people with a percentage of 24%, and lastly, namely the age range of 22-37 is 22 people with a percentage of 22%.

The number of family members of packaged cooking oil household consumers in Bandar Lampung in this study was between 1-3 consisting of 19 consumers with a percentage of 19%, consumers who had a number of family members between 4-6 people consisted of 77 consumers with a percentage of 77%. , and for consumers who have family members between 7-9 as many as 4 consumers with a percentage of 4%.

Monthly family income was between IDR 500.000,00 and IDR 7,999.000,00 totaling 74 consumers with a percentage of 74%, then family income between IDR 8,000,000.00 and IDR15,990,000.00 totalling 23% of respondents and family income per month between IDR 16,000,000.00 and IDR 23,000,000.00 totaling 3% of respondents.

**Table 3.** Characteristics of respondents

Characteristics.	Category	Respondents	Presentage
Age (Years)	22-23	22	22,00
	38-52	54	54,00
	53-67	24	24,00
Number of family members (person)	1-3	19	19,00
	4-6	77	77,00
	7-9	4	04,00
Total income of all family members (Rp/month)	500.000-7.999.000	74	74,00
	8.000.000-15.999.000	23	23,00
	16.000.000-23.000.000	3	03,00
Level of education	Primary school	10	10,00
	Junior high school	13	13,00
	Senior high school	41	41,00
	D3 degree	4	04,00
	Bachelor degree	29	29,00
	Master (magister)	3	03,00

Source: Data Processed, 2020

The most purchased brand by consumers is Bimoli with percentage of 31%, followed by Sania brand 19%, Rosebrand 16, Fortune brand

6%, Filma and Tawon brands 5%, Sovia 4%, Sunco and Delima 3% each, and Kunci Mas 1%.

**Table 4.** Distribution of cooking oil brand purchased by consumers in Bandar Lampung.

Brand	No of consumers	Percentage
Bimoli	31	31,00
Sania	19	19,00
Rosebrand	16	16,00
Tropical	7	07,00
Fortune	6	06,00
Tawon	5	05,00
Brand	No of Consumers	Percentage
Filma	5	05,00
Sovia	4	04,00
Sunco	3	03,00
Delima	3	03,00
Kunci Mas	1	01,00
Total	100	100,00

Source: Data Processed, 2020

However, majority of consumers often change their preferred brand for several reasons,

**Table 5** total household consumption and monthly household consumption of packaged cooking oil products

Information	Number of consumers (person)	Percentage
Total Household Consumption		
0,5-3	45	45,00
4-6	53	53,00
7-9	2	02,00
Average Household Consumption (liters/month)		3,714
Total Consumption Per capita		
0,30-0,79	45	45,00
0,80-1,29	45	45,00
1,30-1,70	10	10,00
Average Consumption Per capita (liters/month)		0,863

Source: Data Processed, 2020

The amount of consumption in this study is calculated by how much packaged cooking oil is consumed and per capita per month consumption. Table 5 suggests that majority consumers consumed between 4 and 6 liters per month and the lowest was between 7 and 9 liters. The average monthly consumption of packaged cooking oil consumers is 3.714 liters.

The majority of consumption of cooking oil per capita per month is between 0.30 and 0.79 liters and between 0.80 and 1.29 liters which also constitutes 45% of consumer. Average per capita consumption is 0.863 liters per month.

such as: effect of promotion and discount of other brands, availability of preferred brand, and price of preferred brand as compared to other brands when he/she purchased packed cooking oil. Another 24% consumers are considered loyal consumers as they stick with their preferred brands.

The type of packaging that most consumers of packaged cooking oil use in this study is plastic packaging with a percentage of 86%, because prices tend to be more affordable. The most widely used packaging size by consumers is the size of 2 liters with a percentage of 70%.

The amount of consumption in this study is how much packaged cooking oil is consumed by households and per capita per month by household consumers in liters.

The majority of consumers purchase cooking oil 1-2 times per month, while the remaining is purchasing 3 to 4, and 5 to 6 times per month.

**Table 6.** Frequency of monthly purchases of packaged cooking oil consumers.

Purchase Frequency (times/month)	Number of consumers (person)	Percentage
1-2	72	72,00
3-4	26	26,00
5-6	2	02,00
Amount	100	100,00

Source: Data Processed, 2020

In addition, there are various location to purchase cooking oil, including stall, traditional market, minimarket, wholesaler, supermarket, and cooperative. Table 7 describes where consumers purchase packaged cooking oil.

**Table 7.** Location to purchased packaged cooking oil

Place	Number of Respondents (Person)	Percentage
Stall	6	6,00
Traditional Market	29	29,00
Minimarket	39	39,00
Supermarket	15	15,00
Wholesalers	10	10,00
Cooperative	1	1,00
Amount	100	100

Source: Primary Data, 2020

Most consumers choose to buy cooking oil at minimarkets with a total of 39 respondents and a percentage of 39%, this is because minimarkets are very easy to find everywhere and the price is also relatively cheap, so household consumers

like to buy at minimarkets. A total of 29 consumers answered that the place where they bought their packaged cooking oil was in the market with a percentage of 20%, purchases at supermarkets were preferred by 15 consumers with a percentage of 15%. A total of 10 consumers made purchases at wholesalers with a percentage of 10% and there was 1 respondent who made purchases at cooperatives with a percentage of 1%.

Consumer preference is consumer decision to purchase products independently about products he/she preferred (Munandar *et al.*, 2012).

Conjoint analysis is used to analyze household consumer preferences for packaged cooking. Utility value describes consumer evaluations of each attribute level, where positive and negative numbers represent consumer's preference levels. Table 6 explains the usability value of each attribute

**Table 8.** Utility values at each attribute level based on consumer preferences

Attribute	Level	Utility Values
1. Color	Golden yellow	1.067
	Dark yellow	-1.067
2. Price	Rp 11.000-Rp 13.000	0.702
	Rp 14.000-Rp 16.000	-0.702
3. Packaging Size	1 l (liter)	0.073
	2 l	0.713
	<1 l	-0.787
4. Clarity	Clear	1.252
	Cloudy	-1.252
5. Packing type	Plastic ( <i>refill</i> )	-0.163
	Bottle	0.163

Source: Data Processed, 2020

Table 6 presents the results of the conjoint analysis. The table suggest that the utility values of each attribute level is varied. For color attributes, consumers prefer golden yellow as compared to dark yellow. This is because consumers perceive the golden yellow color represents good quality and will not degraded easily (Khuzaimah *et al.* 2020).

For the price attribute, consumers preferred cheaper prices, which are between IDR 11,000 and IDR 13,000 compared to prices between IDR 14,000 and IDR 16,000

For the packaging size attribute 2-liter packaged cooking oil is most preferred followed by the 1 liter package. The least preferred was the < 1 liter package size. With 2-liter packaged

cooking oil, consumer do not need to buy packaged cooking oil frequently.

The clarity attribute has two levels, it is clear and cloudy. Consumers preferred clear cooking oil cloudy one.

In terms of type of packaging attribute, consumers prefer bottle packaging as compared to plastic packaging at the same price, because bottle packaging is considered more durable and able to keep quality of cooking oil.

Based on the table of importance values, the attribute of clarity has the highest importance value. This means that consumers consider clarity of cooking oil is the most important value, followed by color, packaging size, price, and type of packaging. Table 9 provides analysis of important value of each attribute.

**Table 9.** Importance values of attributes

Number	Atributte	Importance Value
1.	Color	24,706
2.	Price	17,842
3.	Packing size	20,088
4.	Clarity	29,693
5.	Packing type	7,672

Source: Data Processed, 2020

This is because consumers perceive clear packaged cooking oil offered better quality. This is confirmed by the research of Herlina et al. (2017), that clarity has been an indicator of oil quality for many years. The clearer the cooking oil, the lower the absorbance of the oil.

The prediction accuracy is reflected by the high correlation and significance between the conjoint results and the respondent's results. It can be seen in Table 8 the correlation coefficient of conjoint analysis.

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**Table 10.** Conjoint analysis correlation coefficient

	Value	Sig
Pearson's R	1,000	0,000
Kendall's tau	1,000	0,000

Source: Data Processed, 2020

The Sig value of Pearson's R in this study is 0.000 < 0.05 and the Sig value of Kendall's tau is 0.000 < 0.05, which mean that the accuracy between the assessments based on the estimation results is significant (Salmiah et al., 2019).

Conjoint analysis has provided important insights on consumer behavior in purchasing packaged cooking oil. This particularly important for food products as consumers behavior is complex that are influenced by psychology, sensory, and marketing (Toklu, 2017). Therefore, ability of conjoint analysis in determining consumers preference is very useful.

However, there is limitation in applying the model. Green & Srinivasan (2009) suggest to limit the number of attributes to be less than six to avoid consumers confusion. This study has followed the above suggestion.

## CONCLUSION

The study concludes that golden yellow color, prices between IDR 11,000 and IDR 13.000 per liter, 2 liter packaging, clear color, and bottled packaged are preferred by consumers. In addition, the attribute that has the highest importance value is the clarity attribute.

Quantity of purchasing is ranging from 4 to 6 liter per month, while the most preferred brand is Bimoli. Minimarket is the most preferred location to purchase packaged cooking oil.

The study also suggests that the clarity of packaged cooking oil is the most important attribute for consumers.

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