THE ANALYSIS OF CONSUMER PREFERENCE ON PRODUCT ATTRIBUTES OF KOELINER ECOE TARO CHIP

Verren Lionyta Dos Reis, Helena Sidharta, I Bagus Yosia
Universitas Ciputra, UC Town, Citraland, Surabaya 60219, Indonesia

Abstract: Consumer preference on the attributes of a product can be helpful for the company; one of them is to predict the appropriate outcome for consumers. The company can improve and provide a product based on consumers’ choice of attributes preferred and desired. Koellner Ecoe is one of the UMKM that can take advantage of consumer preference to allocate capital according to the consumers in choosing Koeliner Ecoe taro chip product. This research aims to know the product attributes that are the most preferred and considered by the consumers in determining the taro chip product to assist the company in arranging improvement strategy and product development in the future. The research site is located in Citraland, West Surabaya. The sample collection uses the purposive sampling technique by distributing the questionnaire to 90 people. The analysis model in this research uses conjoint analysis with a fractional factorial design approach. The results of this research show that product attribute levels of taro chip that are the most preferred by the consumers is that using standing pouch doff packaging with sticker one-sided (front) packaging design, the desired price of Rp 7,000, the selected flavor variant is savory salted with slightly red yellow chip color. The order of importance of attribute which affects consumer preference in choosing taro chip based on significant value from the highest priority to the lowest value is that price, packaging, packaging design, flavor, and chip color.

Keywords: consumer preference, food product attributes, conjoint, fractional factorial design

1. INTRODUCTION

Data from the Central Statistics Agency (2019) shows that the manufacturing industry sector is one of the industry sectors that can contribute the largest
GDP in Indonesia, increasing from year to year. The manufacturing industry sector is also one of Indonesia’s economic growths (Kemenperin, 2017). The manufacturing industry sector is the first rank with 19.86% contribution percentage. The manufacturing industry is divided into two sub-sectors: non-oil gas and oil-gas; the non-oil gas sector contributes more than the oil and gas industry sub-sector (Kemenperin, 2017). Based on data from Kemenperin (2017), the food and beverage industry are included in the non-oil and gas subsector, which is a priority in Indonesia, where the priority industry sector is the industry sector prioritized in the development process compared to another industrial sector.

The food and beverage industry sector are an industry sector that has a vital role in economic growth in Indonesia and the government’s priority as a national economic driver so that establishing a business in this sector has good prospects in the future (Kemenperin, 2016). People who run business in this sector are not only dominated by old business actors who have excellent reputations in the Indonesian food and beverage industry but are also enlivened by new business actors (Kemenperin, 2017). One of the businesses that took this opportunity was Koeliner Ecoe.

Koeliner Ecoe is a micro company engaged in food and beverage that produces snacks using taro as the main primary ingredient. Products manufactured by Koeliner Ecoe are Ecoe chip (taro chip), Serulas (Taro Serundeng), and Ringlas (Dried Taro), which are sold in the market both in the Business to Business to Customer sector. Among in three products, Ecoe Chips (taro chips) is the most popular product and provides a significant sales contribution to the Koeliner Ecoe company; therefore, this research will focus on Ecoe Chips.

Based on internal data, from 2017 until 2019, Koeliner Ecoe had a problem with the raw material supply, which is taro stock from the supplier. From January to June, consumer demand for taro chips always increases, but the data from sales state differently. Deals cannot grow because of the constraint of raw materials stock. For example, two years in a row (2018 and 2019), due to increased demand for taro chips, Koeliner Ecoe has a problem with the availability of raw materials that impact the production capacity of Koeliner Ecoe. To overcome this problem, Koeliner Ecoe tries to produce all variants with the same amount. They want to have stock of all their variant product, so their customer always have the variants they like to buy.
That’s strategy makes a new problem: there are deficiencies in specific variants and advantages in other variants. Koeliner Ecoe can still overcome the shortage of taro chip products by using a pre-order system, even though consumers who want Koeliner Ecoe products must wait for the product to be produced in less than one week due to the limited supply of taro raw materials. Based on that problem, Koelinoe Ecoe Owners need to understand which product their customer most like to buy. Knowledge of the product attributes preferred by consumers is essential because the product attributes influence consumers in choosing a product (Mehta and Bhanja, 2018; Utami and Harjono, 2017; Sakolwitayanon et al., 2018). Therefore, researching what attributes consumers actually like Koeliner Ecoe will help companies manage their inventory systems.

Koeliner Ecoe, as a small business that tries to maintain its existence, does not have many resources. That way understanding what their customer wants is mandatory. They can be prepared their production plan based on which attributes their customer will be chosen. If they produce based on what the owner feels is good or make all the same number in their variants, it can be made some of their product cannot be sold or be sold only with the discount. Because of that, this study can help Koeliner Ecoe reduce the uncertainty will make a production plan; its analysis is also helpful for other small businesses to understand how vital customer preferences are.

The purpose of this research is to determine the reasons consumers continue to choose and buy Koeliner Ecoe taro chip even though they have to go through a pre-order system and find out what product attributes make consumers like and want Koeliner Ecoe taro chip so that Koeliner Ecoe can focus on developing the details to reach the standard of consumer preferences. Hopefully, if Koeliner Ecoe can know which attribute their customer like, they can produce variants that meet their customer wants.

2. LITERATURE REVIEW

2.1 Choice Based Conjoint Analysis

Choice-Based Conjoint Analysis presents several questions in which the customer can select to express what they’re like to choose. Louviere & Woodworth (1983) introduce the integration of conjoint analysis and discrete choice theory
econometrics to make a new approach to understanding customer choice. Chrzan (1994) supports that theory. Using several options which customers can choose, they can find the pattern. Using that pattern, they can understand which attributes customers will love to buy or use. Desarbo, Ramaswamy & Cohen (1995) also state that one of the advantages of using this theory is even the data may not be complete, we can use this method. To understand customer preference, choice-based conjoint analysis brings the company the advantage and can make them understand the customer preference pattern.

2.2 Consumer Behavior

According to Kotler and Keller (2016: 179), consumer behavior is an attitude carried out by individuals, groups, and organizations in choosing, buying, and using a product or service to fulfill their needs and desire. Understanding what customers want to make a business can produce with a better plan. Consumer behavior is underlying the feeling that is being experienced and the actions that are being taken in making a purchasing decision. According to Howard and Seth (2018: 23), some things taken into consideration when someone decides to buy a product or service are price, design, packaging, etc. According to Firmansyah (2019), in general, consumer behavior is divided into two:

1. Rational consumer behavior: consumer behavior in purchasing a product or service by prioritizing general aspects of consumer such as the benefit of the product or service, the level of primary needs, and the level of urgent needs.
2. Irrational consumer behavior: consumer behavior that is easily influenced by promotion without regard to the terms and needs of the product or service. Therefore, understanding which product or service customers prefer to buy or use is powerful knowledge. It may not a hundred percent guarantee customers will buy the product or service, but it is a close prediction to their purchase decision.

2.3 Consumer Preference

According to Kotler and Keller (2016: 469), consumer preference is a consumer’s attitude towards a product formed through an evaluation of the
various choices available. According to Kotler in Sentoso & Poniman (2017) research, consumer preferences are choices of whether or not someone likes a product or service that is consumed. According to Cahyanti and Najib (2017), consumer preference is a preference for a product or service compared to others. According to Kotler and Keller (2016: 117), five steps must be followed until consumer preferences are formed: It is assumed that consumers see products as a set of attributes.
1. Each consumer sees the level of importance of the attributes vary according to their needs and desires. Consumers have different assessments of the essential qualities.
2. Price attribute is one of the most critical attributes in influencing consumers to make a purchase.
3. Consumers develop a certain amount of trust in each attribute of a product.
4. The level of customer satisfaction varies according to the different attributes of a product.
5. Consumers will arrive at attitudes towards different brands through evaluation procedures.

2.4 Product Attribute

According to Kotler and Armstrong (2008: 272 in Nugroho et al. 2018), developing a product or service involves defining the benefits. These attributes include quality, features, style, and design. Details are elements owned by a product that consumers consider necessary and are used as the basis for purchasing decisions (Tjiptono, 2008: 103 in Anwar & Basuki, 2017). There are several types of attribute indicators used in this study; there are: packaging design, price, flavor, and chip color.

2.5 Relationship between Product attributes and Consumer Preference

Product attributes become the basis of consumer preferences in choosing a product. According to Simamora in Sentoso & Poniman, (2017), several steps must be passed until consumers form biases. First, it is assumed that consumers see products as a set of attributes; different consumers have different perceptions about what attributes are relevant. Second, the level of importance of attributes
varies according to the needs and desires of each. Consumers have different emphases in what attributes are the most important. Third, the level of customer satisfaction with the product varies according to differences in attributes, and the fourth consumer will arrive at attitudes towards different brands through evaluation procedures.

According to Kotler and Armstrong (2018: 209), consumers will choose based on product attributes that will shape consumer preferences to arrive at a final decision during the purchase process. In this stage, consumer preferences will be formed by meeting the product attributes by their desires. Companies must pay attention to product attributes to influence consumer preferences in making purchasing decisions.

3. RESEARCH METHODS

3.1 Methods

The method used in this study is a quantitative research method with conjoint analysis using the SPSS 23 program. The population in this study was consumers of Koeliner Ecoe taro chips in Citraland, West Surabaya. The sampling technique used in this study was the purposive sampling technique, and the number of samples used was 90 respondents. The data source in this study uses primary and secondary data sources. Secondary data in this study were obtained from literature studies through data collection and information from references and literature related to this research. Primary data collection in this study using a questionnaire method. The measurement scale used in this research is a Likert scale with very dislikes (1), dislikes (2), enough, (3), likes (4), and very likes (5).

The combination attributes used in this study are based on Koeliner Ecoe Data. The first attribute is the packaging. The business used two different packaging types based on packaging: an ordinary standing pouch (transparent, so customers can easily see the chips) and a Doff standing pouch. For the packaging design, they have packaging with full print on two sides of packaging dan only a sticker in front of the packaging. They also have two different prices with the same weight, Rp 7,000 and Rp 10,000. The additional price happens because of the packaging de-
sign. The other attributes are flavor and chips color. They have two different flavors: sweet, spicy, and savory salted. For the color of the chip, they have light yellow and yellow rather than red. Based on these attributes, this study has eight combinations in which the respondent must choose their preferences.

The results of this study indicate that of the 90 respondents, 74% or 67 respondents were female, and the remaining 26% or 23 respondents were male. Most respondents aged between the ages of 20–25 years. Most jobs are students/students with total expenditure per month to buy food in Rp 500,000–1,000,000. Based on respondents who filled out this questionnaire, consumers from Koeliner Ecoe are students. The average consumer is a student with a monthly expenditure of Rp when viewed from age. 500,000–1,000,000. The results showed that as many as 41 respondents from 90 have made repeat purchases more than twice. The results of the analysis of the respondents showed that the respondents were the intended population of this study. Therefore, the sample taken is suitable for the population and can be used to describe the Koeliner Ecoe’s consumer.

Before testing the conjoint analysis, this study test the validity and reliability of the instrument used. The validity will be checked using a significance value <0.05. If the value is more than 0.05, the instrument is not valid. Cronbach’s Alpha will be used to measure the reliability. If the value of Cronbach Alpha is more than 0.7, then the instrument is reliable. Table 1 below shows the value of validity and reliability test in this study.

### 3.2 Result

<table>
<thead>
<tr>
<th>Attribute Combination</th>
<th>Pearson Correlation</th>
<th>Sig. Value (2-Tailed)</th>
<th>Information</th>
<th>Cronbach Alpha</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute combination 1</td>
<td>0.621</td>
<td>0.000</td>
<td>Valid</td>
<td>0.868</td>
<td>Reliable</td>
</tr>
<tr>
<td>Attribute combination 2</td>
<td>0.607</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attribute combination 3</td>
<td>0.782</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attribute combination 4</td>
<td>0.804</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attribute combination 5</td>
<td>0.708</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attribute combination 6</td>
<td>0.809</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attribute combination 7</td>
<td>0.792</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attribute combination 8</td>
<td>0.767</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Based on the results data in Table 1, the validity shows that all instrument combination questionnaires in this study are feasible to use (valid) because they have a significant value <0.05. Cronbach’s Alpha test results have a coefficient of >0.7 which means that the entire questionnaire instrument in this study has a level of reliability that can be well accepted. These validity and reliability results prove that the instruments used in this study can be justified and worthy of further use in research.

Utility value show which the customer prefers in each attribute. Utility estimates predict customer preference. Table 2 below will show that the value of utility estimates each choice in attributes.

Table 2 Utility Value of Overall Respondents

<table>
<thead>
<tr>
<th>Utilities</th>
<th>Utility Estimate</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packaging</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ordinary standing pouch</td>
<td>-0.593</td>
<td>0.191</td>
</tr>
<tr>
<td>Standing Pouch Doff</td>
<td>0.593</td>
<td>0.191</td>
</tr>
<tr>
<td>Packaging design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full printing two-sided (front and back)</td>
<td>-0.331</td>
<td>0.162</td>
</tr>
<tr>
<td>Sticker one-sided (front)</td>
<td>0.331</td>
<td>0.162</td>
</tr>
<tr>
<td>Price</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rp 7,000 (100 gram)</td>
<td>0.651</td>
<td>0.191</td>
</tr>
<tr>
<td>Rp 10,000 (100 gram)</td>
<td>-0.651</td>
<td>0.191</td>
</tr>
<tr>
<td>Flavor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweet spicy</td>
<td>-0.222</td>
<td>0.182</td>
</tr>
<tr>
<td>Savory salted</td>
<td>0.222</td>
<td>0.182</td>
</tr>
<tr>
<td>Chip color</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light yellow</td>
<td>-0.085</td>
<td>0.156</td>
</tr>
<tr>
<td>Yellow rather red</td>
<td>0.085</td>
<td>0.156</td>
</tr>
<tr>
<td>(Constant)</td>
<td>3.767</td>
<td>0.156</td>
</tr>
</tbody>
</table>

Table 2 shows the results of the attribute use data at each level. The table shows consumers’ choices at each level of product attribute used in this study. In connection with the answers of respondents from this study, the explanation for each of the following attributes is as follows.

a. Packaging: *Standing pouch doff* packaging has a high and positive utility number (0.593), so in general, respondents like the Koeler Ecoe tawo chip packaging using *standing pouch doff* packaging.

b. Packaging Design: Utility results show that overall respondents liked the design of one-sided (front) sticker packaging, as seen from the positive and...
high number of utility designs of one-sided (front) sticker packaging is (0.331).

c. Price: The utility rate for the positive Rp 7,000 price is 0.651 compared to the utility figure for the Rp 10,000 price. The overall respondents prefer the Koeliner Ecoe taro chip products for Rp 7,000 (seven thousand rupiah).

d. Flavor: The utility rate of savory salted flavors is 0.222 higher than the utility value for sweet-spicy. Then it can be concluded that overall, respondents prefer Koeliner Ecoe taro chips with savory salted flavor.

e. Chip color.

The utility result on the color attribute of chips is 0.085 seen at the level of the yellow rather red color have a positive and high utility number compared to the light-yellow color which means that respondents prefer light yellow color to the Koeliner Ecoe taro chips.

This part will analyze the importance value of overall respondents. The importance value shows which attribute is essential for the customer when they decide on Koeliner Ecoe products.

**Table 3 Importance Value of Overall Respondents**

<table>
<thead>
<tr>
<th>Importance Values</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Packaging</td>
<td>28.597</td>
</tr>
<tr>
<td>Packaging design</td>
<td>17.378</td>
</tr>
<tr>
<td>Price</td>
<td>32.065</td>
</tr>
<tr>
<td>Flavor</td>
<td>11.930</td>
</tr>
<tr>
<td>Chip color</td>
<td>10.030</td>
</tr>
</tbody>
</table>

Table 3 shows the importance level of 5 product attributes. Importance value shows that consumers will consider the attributes above by this level of importance in choosing a product. This analysis indicates that the preference attributes are considered more important by all respondents in sequence, starting from the largest to the smallest percentage, namely the price with a rate (32%). Packaging is (29%), packaging design is (17%), the taste is (12%), and what is considered not necessary by all respondents is the color with a percentage is (10%). Based on this result, price is the first factor customers think; they will look for packaging. The chip’s color is the last they will feel when they buy it.
Table 4 Correlation Value of Overall Respondents

<table>
<thead>
<tr>
<th>Correlationsa</th>
<th>Value</th>
<th>Sig.</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson’s R</td>
<td>0.953</td>
<td>0.000</td>
<td>Contribute and significant</td>
</tr>
<tr>
<td>Kendall’s Tau</td>
<td>0.857</td>
<td>0.001</td>
<td>Contribute and significant</td>
</tr>
</tbody>
</table>

a. Correlations between observed and estimated preferences

Pearson’s R and Kendall’s Tau were used to measure the accuracy of this Analysis prediction. Table 4 shows the results of the value of Pearson (0.953) and Kendall (0.857) more than 0.5. This indicates that the relationship between estimation and actual is relatively strong or the process of high predictive accuracy. For the significant number on Pearson is 0.000, which is less than 5%, so it can be said that the overall respondent’s answer is accurate or significant.

4. DISCUSSION

From the results seen in the overall utility (Table 4.4), the respondent’s preference for Koeliner Ecoe taro chips is to use a standing pouch doff packaging using a one-sided (front) packaging design sticker for Rp 7,000, for the preferred flavor is savory selted with the yellow rather red color.

The respondent preferences regarding the type of Koeliner Ecoe taro chip packaging can be accepted because the standing pouch doffs packaging is more vital in maintaining the integrity of the taro chip products and is in line with current trends. Packaging has a critical role in maintaining the integrity and quality of a product. In addition, attractive packaging can also influence consumers in choosing a product. The results obtained are by the theories of Kotler and Keller (2016: 368) and Kotler & Armstrong (2012 in Samodro, 2018). The plan of Koeliner Ecoe taro chips will use standing pouch doff packaging to maintain product integrity and take advantage of current packaging trends.

The packaging design in this study refers to the layout of the branding of Koeliner Ecoe. Based on the results obtained, the creation of one-sided (front) sticker packaging is the attribute level consumers prefer. The wrong sticker packaging design (front) has a striking color combination and a brief, solid, and clear product information explanation compared to the two-sided complete
printing design with a predominantly white color combination and the arrangement of product information writing that is less organized with neat. Attractive packaging design and can explain the product in detail can direct consumers’ views of a product by Kotler and Keller’s theory (2016: 396). Using packaging based on customer perspective can support business marketing plan. Rihayana et al. (2018) state that marketing performance needs to improve so that company can develop further. The goal of Koeliner Ecoe taro chips will be to enhance the old packaging design or design a new one-sided plan that is more attractive and by the packaging used.

The following important attribute for consumers is price. Based on the results obtained, the price of Rp 7,000 per product is the attribute level most preferred by respondents and also shown by the Importance Values table that price is the essential attribute for respondents. This study proves that the results obtained are by the supporting research of Kulshreshtha (2017), which found that price is one of the critical factors influencing consumers’ purchasing decisions. In the future, the price of Koeliner Ecoe taro chips will be sought for Rp 7,000 for a net weight of 100 grams.

Koeliner Ecoe sells food. Therefore the taste attribute is one of the essential attributes for its consumers. The salty, savory taste is the preferred flavor of the respondents. The salty, tangy taste is the same as the original taste, so it can choose if you do not like the sweet and spicy flavor. Performance attributes such as taste describe how a product performs its function; each of these characteristics can only be evaluated after using the product. Each person’s taste perception is different (Tarwendah, 2017). Plans will produce more salty taro flakes compared to sweet and spicy.

In choosing food products, color attracts consumers. For the color choice of taro chip, the respondent preferred was slightly red, which is a color that is not too bright and not too dark. Koeliner Ecoe taro chips which are light yellow, tend to pale colors, so it is less attractive to respondents this is supported by research conducted by Marsya & Anggraita (2016) that colors on the psychological side have a strong influence on a person’s mood and emotions. Plans will produce taro chips with slightly red yellow chips because previously, the light-yellow color did not have an intense color or pale yellow.
Based on the essential attributes, price ranks first. These results are consistent with Mehta and Bhanja (2018) research, where consumers of wine products choose price as the first attribute they choose. Kwandy (2017) found that price significantly affects customer intention to buy a product. In the study by Ikmanila et al. (2018), price is not the first attribute, but the taste is the first choice for consumers, while for consumers Koeliner Ecoe, the taste is in the fourth-order of features that they think influences their choice. Research Sakolwitayanon et al. (2018) did not show any importance for organic rice consumers. Based on the results of this study and supported by Mehta & Bhania and Sakolwitayanon research, the order of attributes varies depending on the consumer and the type of product. Regarding chips, where there are many direct and indirect competitors, price is essential in consumer consideration, so prices in snack foods such as taro chips are very competitive. This is by Kotler and Armstrong (2018), who say competitive prices make products competitive in the market.

The second attribute product of Koeliner Ecoe consumers considers the packaging followed by the packaging design. Lou (2021) state the importance of packaging to make customer intend to buy. This study found that packaging is the second and the packaging design is the third attribute for Koeliner Ecoe customer to buy a product. The fourth is the taste as discussed, and the last is the color of chips. This attribute sequence applies to Koeliner Ecoe taro chips products. Where Kotler and Armstrong (2018) state that when making a purchase, consumers will choose. The product attributes make up their preferences to arrive at a purchasing decision. Therefore, the order of the attributes above is Koeliner Ecoe’s consumer preferences related to its taro chips products.

5. CONCLUSION

The preference of product attributes that consumers want from Koeliner Ecoe taro chips products has been answered by the results of this study. The results showed that the product characteristics influencing consumer preferences of taro chip products in sequence from the highest value to the lowest value are price, packaging, packaging design, flavor, and chip color. The results of this research show that product attribute levels of Koeliner Ecoe taro chip that are the most preferred by the consumers is that using standing pouch doff packaging
with sticker one-sided (front) packaging design, the desired price of RP 7,000, the selected flavor variant is savory salted with slightly red yellow chip color.

Based on this research, understanding consumer choice will help businesses prepare when they produce their product. Management can better allocate their resources, especially for micro and small business. This will be a good step to give their limited resources and reduce their extended selling inventory. This research also contributes to the customer behavior theory. Understanding what customers want to buy can help the business, and not all business owners/managers think it is the same. Based on this research, customers do not focus only on price, but they prefer to look at packaging first, so the packaging design is essential.

Koeliner Ecoe needs to know the taste of the market target of taro chips very well. From this research, Koeliner Ecoe recommended using the results of the respondent preference attributes as a benchmark in improving and developing taro chip products in the order of importance and sub-attributes that have been selected. From the 5 attributes and sub-attributes that have been set, overall consumers. Based on the essential qualities, it is recommended that Koeliner Ecoe focuses on consistent and permanent development of the three product attributes, there is the price of Rp. 7,000, standing pouch doff packaging and one-sided (front) sticker packaging design because consumer preference in purchasing Koeliner Ecoe taro chip product is the most affected product attributes. Research with this conjoint analysis model helps a business to find out the consumers’ desired preferences for taro chips, especially for Citra land, West Surabaya, but this research can be a reference for further similar studies in the next few years with broader attributes and get more profound results with the aim of knowing consumer preferences at the time so that they can be applied and useful for similar businesses.

6. REFERENCES


