Consumer preferences toward local rice in Medan

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Abstract. The purposes of this research were to analyse the influence of consumer characteristics and preferences toward local rice buying decision in Medan. The research method used in this study is the conjoint analysis method using 8 attributes of local rice i.e. taste, colour, broken grains, hygiene, flavour, durability, similarity of rice grains, and purchase price per kilograms. The results showed that consumers' preferences in choosing local rice were attributes and order are tasty local rice, a price level of ≥ IDR 12,000/kg, clean local rice, durability of local rice more than 1 month, less broken grains, white bright colour, have a fragrant flavour of rice, the similarity of the local rice are similar. There is a strong relationship between estimation preferences and actual preferences, or high predictive accuracy in the conjoint process means that local rice which is the preference of sample consumers can describe consumer preferences whole (population).

1. Introduction

Rice is one of the food sources of energy as well as the main food ingredient for most Indonesians, the link to rice as a staple food for problems related to problems, namely the compilation of demand continues to increase, while demand cannot fulfill it. The food problem was then interpreted as a problem of the adequacy of rice so that the government prioritized efforts to provide rice. Consumption of rice as a staple supported by large course has a variety of characteristics and preferences of consumers who buy rice. Many choices of rice products in terms of rice, packaging, price, taste, and other things as well as differences in cultural environment, social class, purchasing power, motivation, and lifestyle that shape different consumer motivations. This requires producers to provide products that are in accordance with consumer demand, specifically targeted market segments. So far, the government has tried hard to increase domestic rice needs to meet domestic needs. But besides increasing quantity, growing preferences and satisfaction demand an increase in the quality of rice that has been consumed so far.

Knowledge about preferences needs to be done so that every decision taken does not conflict with consumer expectations, considering that all consumption decisions are in the hands of consumers [1]. With changes to local rice products both from policy, inventory, and from the attribute side, make a benchmark for behaviour in addressing these changes, especially about rice to be consumed. Provision of rice in the market with a variety of attributes will influence consumer purchasing decisions. Consumers want rice according to their preferences. Therefore, farmers or business actors are required to know what is the preference or preference of consumers and offer the best according to consumer preferences [2].
Based on the background described, the problem in this study can be identified as follows; What is the consumer preference for the attributes of local rice in the city of Medan; What attributes are the main considerations of consumers in the decision to buy local rice; What is the level of accuracy of predictions between estimation results and actual results in the conjoint process; The Influence of Characteristics and Consumer Preferences on the Decision to Buy Rice in Medan City uses 7 attributes on rice, namely taste, flavour, broken grain, durability, packaging, price and distance of purchase locations whose combinations are arranged with an orthogonal approach and then analysed using the conjoint analysis method with SPSS 16. As it is known that the attributes that being a main considerations of consumers in buying rice decisions are the taste, price and distance of the location of purchase [3]. Based on the description above, the purpose of this study is to analyse consumer preferences for attributes on local rice in Medan, analysing rice attributes which are the main consideration of consumers in purchasing rice decisions in Medan, and analysing the level of accuracy of predictions between estimation results and actual results in conjoint processes.

2. Data and methods

2.1 Methods for determining research areas
This research was conducted in Medan. Medan was chosen because the role of Medan City is quite important and strategic both regionally and nationally. In addition, the city of Medan is the centre of the economic activities of the people of North Sumatra with diverse socio-economic characteristics. The selection of research locations was done purposely.

2.2 Method for sample determination

The population research was all rice consumer households in Medan. The method of determining the sample used is a probability sampling method. Calculation formula for the number of samples used is the formula from the Slovin method.

\[ n = \frac{N}{1+Ne^2} \]  

Information : \( n \) = number of samples; \( N \) = total population; \( e \) = tolerance limit

With the number of households as many as 383,643 Household and an tolerance limit of 10%, the number of samples in this study are :

\[ n = \frac{383.643}{1+383.643(0.1)^2} \]  

\[ n = \frac{383.643}{1+383.643} = 99.98 \text{ sample} \]  

2.3 Analysis conjoint

Conjoint analysis which is a technique used to decide how consumers prefer goods or services. Analysis is based on consumer thinking in evaluating the value of an object against a combination of their respective attributes [4,3,5].

Utility is the conceptual basis for measuring values in conjoined analysis which is an assessment of subjective preferences that are unique to each individual. Products with higher utility values have a higher preference and have a higher chance of being chosen [6].

\[ Y = x1 + x2 + x3 \ldots + xn \]
Which: Independent variables (X1, X2, X3, ..., Xn) are factors and levels of each factor. The independence variable is in the form of non-metric data, while the dependent variable (Y) is the overall preference of respondents to the level of each factor of a product. The basic process of conjoint analysis as described consists of:

- Determine the attribute and level design
- Designing Stimuli
- In this study, using a full-profile method that evaluates several factors.
- Gathering the opinions of respondents on any stimuli that exist through questioner
- Perform a conjoint process with inputting existing data.
- Analysis results in the form of Utility Values, Importance Values, Pearson and Kendall’s Tau [5].

### Table 1. Attribute and attribute level of local rice

| Number | Attribute          | Attribute Level | Description       |
|--------|--------------------|-----------------|-------------------|
| 1      | Taste              | 1               | Tasty             |
|        |                    | 2               | Average           |
|        |                    | 3               | Not tasty         |
| 2      | Colour             | 1               | White bright      |
|        |                    | 2               | Broken white      |
|        |                    | 3               | Not white         |
| 3      | Broken Grains      | 1               | Less              |
|        |                    | 2               | Average           |
|        |                    | 3               | Many              |
| 4      | Hygiene            | 1               | Clean             |
|        |                    | 2               | Average           |
|        |                    | 3               | Not clean         |
| 5      | Flavour            | 1               | Very fragrant     |
|        |                    | 2               | Had fragrant      |
|        |                    | 3               | Not fragrant      |
| 6      | Durability         | 1               | <1 Month          |
|        |                    | 2               | 1 Month           |
|        |                    | 3               | >1 Month          |
| 7      | Similarity of rice grains | 1 | Similar |
|        |                    | 2               | Moderate          |
|        |                    | 3               | Not similar       |
| 8      | Price/kg           | 1               | IDR 8,000-IDR 9,000/kg |
|        |                    | 2               | IDR 10,000-IDR11,000/kg |
|        |                    | 3               | ≥IDR12,000/kg     |

3. Results and discussion

3.1 Consumer preferences on local rice attributes in Medan City

Local rice products become consumer preferences seen from utility values which are the greatest among the levels / levels on each attribute. The following are the results of the research that have been carried out using the conjoint analysis process. The results of this study can be seen from overall statistics on SPSS.
Table 2. The result of conjoint analysis on local rice in Medan

| No | Attribute                | Level/Sub-Attribute | Utility Values |
|----|--------------------------|---------------------|----------------|
| 1  | Taste                    | Tasty               | .123           |
|    |                          | Average             | .052           |
|    |                          | Not tasty           | -.176          |
| 2  | Colour                   | White bright        | .110           |
|    |                          | Broken white        | .012           |
|    |                          | Not white           | -.122          |
| 3  | Broken grains            | Less                | .138           |
|    |                          | Average             | -.016          |
|    |                          | Many                | -.122          |
| 4  | Hygiene                  | Clean               | .150           |
|    |                          | Average             | .012           |
|    |                          | Not clean           | -.162          |
| 5  | Flavour                  | Very fragrant       | -.077          |
|    |                          | Had fragrant        | .071           |
|    |                          | Not fragrant        | .006           |
| 6  | Durability               | <1 Month            | -.046          |
|    |                          | 1 Month             | .020           |
|    |                          | >1 Month            | .026           |
| 7  | Similarity of rice grains| Similar            | .117           |
|    |                          | Moderate            | -.006          |
|    |                          | Not similar         | -.111          |
| 8  | Price/kg                 | IDR 8,000-IDR 9,000/kg | -.081       |
|    |                          | IDR 10,000-IDR 11000/kg | -.011       |
|    |                          | ≥IDR 12,000/kg      | .092           |

Based on conjoint analysis on each attribute based on the stimuli that have been formed, therefore, the matrix results for local rice are obtained which become consumer preferences. The taste which is the choice of consumers is rice with a high level of tastiness. Tasty rice where the rice is cooked when rice is softer and not hard. In their own colour attributes, consumers tend to pay attention to colour to buy rice, where consumers like rice that is brighter in colour. Because the white rice looks more attractive in terms of colour so consumers are more interested. The item attribute that is the choice of consumers of local rice is local rice with a broken grain level which is a little because there is no excessive broken rice. The hygiene attribute for local rice which is the choice of consumers is clean local rice because, the rice will be consumed and consumers are very concerned about the cleanliness of something to be consumed. Attribute of the flavour of local rice which is the choice of consumers, namely local rice which has a flavour, namely, rice with fragrant but not too much on it because it is a characteristic of rice that has good taste. Resilience attributes that are the choice of consumers, namely, the attributes of local rice that have a durability of more than 1 month. Because the time is in accordance with the time of consumption of rice. Similarity of local rice that is the choice of consumers is rice with similar rice grains, where there is no other rice or other particles mixed in the rice. The price of local rice that is the choice of consumers is the price with a range of ≥IDR 12,000/kg. Because, it has been difficult to find local rice that is priced below, and consumers themselves think the price also determines the quality of local rice needed.

The results showed that consumers choose local rice with the specifications of tasty local rice, white bright colour, less broken grains, clean local rice, had a fragrant flavour of rice, durability of local rice more than 1 month, the similarity of the local rice are similar, with a price level of ≥ IDR 12,000/kg. So, the combination of stimuli is the choice of consumers in buying local rice products in Medan.
3.2 Most important order of local rice attributes according to consumer preferences

The level of importance of attributes is the level of importance that is obtained as a whole from the conjoint analysis step which explains the level of consumer preference towards the preference for a predetermined product attribute [7]. The importance of the highest attribute indicates that the attribute is more considered by consumers than other attributes and levels that influence consumer preferences in choosing the product to consume.

| Attribute                | Importance Values |
|--------------------------|-------------------|
| Taste                    | 14.17             |
| Colour                   | 13.58             |
| Broken grains            | 13.54             |
| Hygiene                  | 12.92             |
| Flavour                  | 12.90             |
| Durability               | 12.18             |
| Similarity of rice grains| 11.51             |
| Price/ kg                | 11.17             |

Taste attributes is the attributes that consumers consider first because taste of local rice can influence consumer decisions going forward. Price attribute is the second highest value where price is the initial basis for forming consumer purchasing decisions for local rice even though rice is a staple food. The hygiene attribute is considered important with the third order that cleanliness affects health and consumers pay attention to this in taking purchase decisions. The durability attribute is in the fourth order because if the local rice owned by the consumer still has a time period to be stored, the consumer will also have consideration in buying the local rice. Broken grains that are not well known or understood by consumers which are in accordance with the standards resulting in the value of the importance of this attribute being fifth. The colour attribute is in sixth ranks because local rice will also be washed latter and pay attention to whether the local rice uses something safe to consume that being contained to the colour of the rice. Flavour is an attribute in the seventh order because the distinctive flavour of local rice itself is a characteristic and attraction of local rice products. And the last is the attribute of similarity where the lowest value is because the local rice has also been packaged so it cannot be seen visually at the time of purchase.

3.3 Level of accuracy of prediction of conjoint analysis results model

Conjoint analysis in principle aims to estimate the opinion pattern of respondents from conjoint results with the opinions of actual (actual) respondents on the stimuli process. The accuracy of predictions is reflected by the existence of a high correlation and significance between the results of the conjoint and the results of the respondents.

To determine the accuracy of the prediction model results conjoint analysis can be seen through the correlation value Pearson’s R and Kendall’s Tau. In Table 4 shows the resulting correlation number is high both on the Pearson's correlation value (0.981) and Kendall’s Tau (0.930) which shows the accuracy of the conjoint process.

Based on the significance values of Pearson's and Kendall’s Tau which are equal to 0.000 where 0.000 <0.05, Ho is rejected so the interpretation is that there is a strong relationship between estimation preferences and actual preferences, or high predictive accuracy in the conjoint process. Likewise, the value of the Kendall's Tau for Holdouts correlation where Holdouts is the result of test stimuli obtained from the conjoint process which is worth 0.025 and the value is smaller than 0.05 (sign. <0.05), it can be said that local rice is the sample consumer preference can describe overall consumer preferences (population).
4. Conclusions

The preference of local rice consumers with conjoined methods results in usability values that describe consumer ratings of the level of attributes that show the level of preference of consumers. The combination that consumers like based on the value of use is the combination attribute combinations, which are tasty local rice, white bright colours, less broken grains, clean local rice, had a fragrant rice flavour, local rice durability that more than 1 month, the similarity of the local rice are similar, with a price level of \( \geq \) IDR 12.000/kg. The order of local rice attributes that are considered important by consumers are the taste, the price, the hygiene, the product durability, the broken grains, the colour, flavour, and similarity of rice grains. There is a strong relationship between estimation preferences and actual preferences, or high predictive accuracy in the conjoint process means that local rice which is the preference of sample consumers can describe consumer preferences whole (population).

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