Consumer preferences towards Padang Sidempuan and Pondoh snake fruit

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Abstract. This study is aimed to investigate consumer preferences towards the attribute combination of Padang Sidempuan and Pondoh snake fruit in Medan City, Indonesia, and to analyse the attributes order of Padang Sidempuan and Pondoh snake fruit due to its most important based on consumer preferences. According to the formula for determining sample size for studying preferences, the number of samples obtained for this study is 100 people. The sampling method for this study is the accidental sampling. The study used the conjoint analysis method. In this study, seven attributes that affect size, weight, skin colour, price, and taste, thickness of fruit flesh and thickness of fruit skin were used. The results reveal that Padang Sidempuan and Pondoh snake fruit which became consumer preferences had the same preferences, namely snake fruit with medium size, heavy in weight, blackish brown skin colour, affordable, sweet taste, thick fruit flesh and thin fruit skin. In conclusion, consumers of Padang Sidempuan and Pondoh snake fruit consider the attributes of flavour as the most important factor in making decisions to consume Padang Sidempuan and Pondoh snake fruit.

1. Introduction
Salak is an important commodity in North Sumatra because it is popular within Sumatra people. Padang Sidempuan snake fruit is originated from the Padang Sidempuan area, South Tapanuli, North Sumatra, Indonesia. The shape of the fruit is ovoid and has large sides and the skin of the is brownish black. The main characteristic of this snake fruit is the yellow flesh with a red tinge. It tastes sweet mixed with sour with old fruit does not taste as tight. On the other hand, Pondoh snake fruit is originated from the Sleman area, Yogyakarta, Indonesia. This snake fruit is a very popular superior variety. One of the advantages is that its sweet taste, even though the fruit is still young. Moreover, Pondoh snake fruit is triangular or inverted oval in shape. The flesh of the fruit consists of three septas and has a slightly yellowish white colour. The thickness of the fruit flesh is around 0.8-1.5 cm and the texture is hard. In each fruit, there are 1-3 hard and blackish brown seeds [1].

The behaviour of consumers in the purchase of foodstuffs continues to develop. The increase in public incomes results in demands on quality. Changes in the demographic structures such as educational level, knowledge, lifestyle, technology, transportation, and communication affect consumer preferences and satisfaction [2].

The development of Padang Sidempuan snake fruit in Medan City is currently in a decline phase. From the interview results, as much as 60% of snake fruit was distributed outside the city of Medan, resulting a decline in sales in Medan. The development of Pondoh snake fruit in Medan is currently in
the maturity phase. There is a tendency concluding that Padang Sidempuan and Pondoh snake fruit showing the market share displacement. This is certainly not favourable where the two local commodities should support each other and developed. Therefore, it is necessary to investigate consumer preferences towards the attributes of Padang Sidempuan and Pondoh snake fruits to develop and refine the products, in order to make consumers more satisfied. Finally, Padang Sidempuan and Pondoh snake fruit are expected to not eliminating each other and developing both market share.

2. Methods

2.1 Research location determination

The determination of the location of the study was performed purposively, which was determined intentionally by considering the objectives of the study. The study was carried out in the city of Medan, namely at the snake fruit Unloading Centre in Bandar Selamat, Medan Belawan District, Indonesia for Padang Sidempuan snake fruit and Traditional Market, Medan Tuntungan District, Indonesia for Pondoh snake fruit. The reason for choosing the location was because the place has a high consumption rate towards Padang Sidempuan and Pondoh snake fruit, so that it is easier to find consumers who have high fanaticism to Padang Sidempuan and Pondoh snake fruit.

2.2 Data collection

Data collected in this study are categorized as primary and secondary data. Primary data was obtained directly through interviews with respondents using a questionnaire that has been made in advance. On the other hand, secondary data was obtained from other relevant sources and other relevant agencies that can support the completeness of the research data.

2.3 Sampling techniques

The population in this study was consumers who consumed Padang Sidempuan and Pondoh snake fruit. According to [3], the formula for determining sample size for studying preferences is obtained by the formula of:

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\text{Number of samples} = (\text{level} - \text{attribute} + 1) \times 5
\]  

(1)

The number of samples obtained for this study is 100 people. The sampling method for this study is the accidental sampling. Accidental sampling is a technique of determining samples based on coincidence, that is anyone who accidentally meets a researcher can be used as a sample, if it is deemed that the person met by chance is suitable as a source of data [4].

2.4 Data analysis

In order to investigate and analyse consumer preferences for the attributes combination, the order of attributes and the most important preferences of Padang Sidempuan and Pondoh snake fruit in Medan City, a conjoined analysis were performed. The purpose of conjoint analysis is to find out a person's perception of an object consists of one or many parts. The main results of conjoint analysis are a form (design) of a product, service or a particular object desired by most respondents. [5].

Preferences are choices or something that is preferred by consumers. Consumers possess different attitudes in looking at attributes that are considered important, and further will give the greatest attention to the attributes that provide the benefits for them [6].

Conjoint analysis can be utilized to perform the utility quantification for potential consumers who intend to buy, based on certain product attributes. Through the quantification of product attribute utilities, the optimal utility of attributes can be identified and used to design products with the most consumer preferences [7].

In order to analyse the value of willingness to pay for each attribute with descriptive analysis, interviewing the willingness of consumers to pay at each level of the attribute was conducted. Then,
the results of the levels of each attribute are obtained through the average willingness to pay for all consumers.

Willingness to pay is the maximum value that consumers are willing to purchase a product, or in other words, to measure the level of consumers value an item. The value of willingness to pay for consumers can be more than the market price, equal to the market price or even smaller than the market price [8]. Furthermore, descriptive analysis is used to analyse the characteristics of Padang Sidempuan and Pondoh snake fruit in accordance with consumer preferences. This is performed by firstly surveying the characteristics of the Padang Sidempuan and Pondoh snake fruit properties sold in Medan City, Indonesia.

3. Result and discussion

3.1 Conjoint analysis result of consumer preferences towards Pondoh snake fruit

According to [9] states that in the conjoint analysis the value of the maximum utility rule is also called the first choice rule. If this rule is used, then we assume the respondent will choose the product with the highest (maximum) utility. The results of the conjoint analysis can be seen in Table 1.

| No. | Attribute | Level          | Utility values |
|-----|-----------|----------------|----------------|
| 1   | Size      | Big            | -.019          |
|     |           | Medium         | .113           |
|     |           | Small          | -.094          |
| 2   | Skin Colour | Brown        | -.094          |
|     |           | Blackish Brown | .118           |
|     |           | Black          | -.094          |
| 3   | Price     | Expensive      | -.170          |
|     |           | Moderate       | -.094          |
|     |           | Affordable     | .264           |
| 4   | Weight    | Heavy          | .188           |
|     |           | Moderate       | .113           |
|     |           | Light          | -.301          |
| 5   | Taste     | Sweet          | .264           |
|     |           | Sweet to Sour/Tighten | .113 |
|     |           | Sour/Tighten   | -.376          |
| 6   | Fruit Flesh Thickness | Thick | .264 |
|     |           | Moderate       | .037           |
|     |           | Thin           | -.301          |
| 7   | Skin Thickness | Thick | -.170 |
|     |           | Moderate       | .057           |
|     |           | Thin           | .113           |

In Table 1, it can be seen that the preferred Pondoh snake fruit is with medium size specifications, heavy in weight, blackish brown skin colour, affordable, sweet taste, thick fruit pulp and thin fruit skin. Based on the results of the conjoint analysis, it is found that the most important sequence of Pondoh snake fruit according to consumers starts from the taste (17.622), the price (16.874), the weight (16.758), the thickness of fruit flesh (16.525), size (11.523), thickness of skin fruit (11.053), and as well as the colour of skin (9.644).

Based on the significance value of Pearson's and Kendall's Tau which are equal to 0.000, where 0.000 <0.05, Ho is rejected and H1 is accepted. So, the interpretation is given as a strong relationship between estimation preference and actual preference, or high predictive accuracy in the conjoint
process. Therefore, it can be said that the conjoint process that uses these samples can be aligned, if used in the population of consumers of snake fruit.

Thus, the Willingness to Pay of Consumers towards the attributes of Pondoh snake fruit which have the highest value are namely the medium size, heavy weight, blackish brown skin colour, sweet flavour, thick fruit flesh and thin fruit skin. Therefore, the attributes of Pondoh snake fruit that are in accordance with consumer preferences are taste, price, and thickness of fruit skin.

3.2 Conjoint analysis result of consumer preferences towards Padang Sidempuan snake fruit

According to [9] states that in the conjoint analysis the value of the maximum utility rule is also called the first choice rule. If this rule is used, then we assume the respondent will choose the product with the highest (maximum) utility. The results of the conjoint analysis can be seen in Table 2.

| No. | Attribute                | Level                  | Utility values |
|-----|--------------------------|------------------------|----------------|
| 1   | Size                     | Big                    | .057           |
|     |                           | Medium                 | .113           |
|     |                           | Small                  | -.170          |
| 2   | Skin Colour              | Brown                  | -.019          |
|     |                           | Blackish Brown         | .188           |
|     |                           | Black                  | -.170          |
| 3   | Price                    | Expensive              | -.245          |
|     |                           | Moderate               | -.019          |
|     |                           | Affordable             | .264           |
| 4   | Weight                   | Heavy                  | .188           |
|     |                           | Moderate               | .113           |
|     |                           | Light                  | -.301          |
| 5   | Taste                    | Sweet                  | .264           |
|     |                           | Sweet to Sour/Tighten  | -.188          |
|     |                           | Sour/Tighten           | -.452          |
| 6   | Fruit Flesh Thickness    | Thick                  | .188           |
|     |                           | Moderate               | .113           |
|     |                           | Thin                   | -.301          |
| 7   | Skin Thickness            | Thick                  | -.245          |
|     |                           | Moderate               | -.019          |
|     |                           | Thin                   | .264           |

In Table 2, it can be seen that the preferred Padang Sidempuan snake fruit of consumers, is namely with specifications of medium size, heavy weight, blackish brown skin colour, affordable, sweet flavour, thick fruit flesh and thin fruit skin. Based on the results of the conjoint analysis, it is discovered that the most important sequence of Padang Sidempuan snake fruit attributes according to consumers starts from the taste (17.549), fruit skin thickness (17.421), prices (13.897), skin colour (13.216), thickness of fruit flesh (12.834), weight (12.630) and size (12.453).

Based on the significance value of Pearson's and Kendall's Tau which are equal to 0.000, where 0.000 < 0.05, then Ho is rejected and H1 is accepted. It is implying a strong relationship between estimation preference and actual preference, or in other words, high predictive accuracy in the conjoint process is indicated. Therefore, it is said that the conjoint process that uses these samples can be aligned for its use to snake fruit consumers.

The Willingness to Pay of consumers on the attributes of Padang Sidempuan snake fruit which possess the highest value, are namely medium size, heavy weight, blackish brown skin colour, sweet flavour, thick fruit flesh and thin fruit skin. Therefore, the attributes of Padang Sidempuan snake fruit
that have matched the preferences of consumers are skin colour, weight and thickness of fruit flesh respectively.

4. Conclusion
The preferred Padang Sidempuan and Pondoh snake fruit for consumer are sharing the same preference, namely medium size, heavy weight, blackish brown skin colour, affordable, sweet flavour, thick fruit flesh and thin fruit skin. Consumers of Padang Sidempuan and Pondoh snake fruit consider the attributes of snake fruit flavour as the most important factor in making decisions to consume Padang Sidempuan and Pondoh snake fruit. Based on the significance value of Pearson's and Kendall's Tau, the samples of preferred Padang Sidempuan and Pondoh snake fruit can illustrate the overall consumer preferences for snake fruit. Willingness to Pay of consumers towards the attributes of Padang Sidempuan and Pondoh snake fruit which have the same greatest value are namely the medium size, heavy weight, blackish brown skin colour, sweet flavour, thick fruit flesh and thin fruit skin. The attributes of Pondoh snake fruit that has been in accordance with consumer preferences are taste and thickness of fruit skin. On the other hand, the attributes of Padang Sidempuan snake fruit that have matched the consumers’ preferences are namely skin colour.

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