Analysis of consumers preferences of rambutan as a leading commodity in Langsa City

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Abstract. Rambutan is one of the exotic fruits that are spread throughout Indonesia. It is also one of the leading fruits and the second largest fruit product in Langsa City. The aim of this research is to identify the consumer preferences of rambutan fruit. The result can be used as a basis for farmers to produce fruits with the quality that consumers want so that the product absorption in the market can be increased which further can lead to the increasing of regional income. This research was conducted in Langsa City Market with total sample 60 consumers that were chosen through accidental sampling method. The analysis conducted using factor analysis method to see consumer preferences of rambutan fruit. The results showed that there were four aspects in consumers’ preferences in which the aspect of fruit appearance had the greatest diversity value which supported by the aroma and fruit maturity as the main consideration variables.

1. Introduction
Consumers’ perceptions of local fruit are not very good and the consumer awareness of consuming local fruit is not high. Rochaeni [1] study shows that consumer preferences for local fruit were lower than imported fruits. Riska [2] state that producers must maintain local citrus fruits by continuously improving their quality and availability, and a policy is needed to restrict imported fruit. Barrett et al. [3] argued that consumers in developing countries tend to believe that products produced by local producers are not as good as imported products. Throughout 2016 – 2019, the number of imported fruits has a positive trend with a growth rate of nearly 50% in which mostly were imported from China. Meanwhile, there were 10 leading fruit commodities in Indonesia which had the largest production in 2018 with positive growth in general, except salak. Rambutan fruit is an exotic fruit that can only be found in the tropics and this fruit is one of the largest fruit production categories in Indonesia. Rambutan fruit production has grown by 36.71% [4].

Bone and Mills in Pasek et al. [5] stated that rambutan has compounds that are good for the human body that can overcome disease so that this fruit has the potency to be developed. Besides that, [7] stated that the consumers tend to choose organic local fruit compare to non-organic imported fruit. Aceh Province is one of the largest producers of rambutan in Sumatra Island with an increasing trend. In 2018, the production of rambutan fruit in Aceh province was divided into 4 quarters in 2018. In the first quarter, the production was 1,517 tons which followed with increasing number into 4,683 tons in second quarter. However, there were a slightly decrease in production during the quarter 3 into 3,805 tons, but then in quarter 4, the production elevated up to 9,674 tons [4]. In Langsa City, rambutan is
the second largest fruit product in 2019 with 1,046 tons of production under bananas [7]. In every season of rambutan, many sellers were selling it at their fruit booth in the market or on the side of highway using motorbikes. The great number of rambutan sellers increases the option for consumers to choose rambutan following their preferences. That troubled some traders to sell their rambutan completely so that some of the rambutan became rotten. According to Bradford et al. [8], the variables that influence consumer to buy local products consist of healthiness, lower price, support from the community, product quality, taste, nutrition, and freshness. Understanding the consumer preference provides an important insight that influence the decision-making process. Therefore, consumer preferences play an important role in providing information to farmers and other market players to produce rambutan that meet the demand of consumers’ preferences.

2. Methodology

2.1. Method of determining the research location
The data collection of this research was conducted in a traditional markets in Langsa City and some rambutan sellers outside the market.

2.2. Method of determining sample
The nonprobability method was conducted to determine the sample. Respondents were chosen by accidental sampling with a total amount of 60 respondents. Accidental sampling is a sampling technique where the person encountered by chance or anyone that considered as suitable respondents is selected as the data source. Respondents in this study were the consumers who decided to buy rambutan. Data used in this study consisted of primary data and secondary data.

2.3. Method of data analysis
The data collected through a combination question which given to the consumer in the form of questionnaires to find out the level of desired attributes by consumers. In the questionnaire, the level of attributes was assessed by likert scale (1 = very unlikely, 2 = unlikely, 3= normal, 4= like, and 5 = very like). The product attributes consisted of fruit shape, color, flavors, freshness, scent, packaging/arrangement, local fruits, easy to get, price according to quality, cheaper local fruit prices and discount. The next analysis tool used in this research was factoring analysis. This analysis was used to determine consumer preferences on the decision to buy rambutan. The results obtained from this analysis were the order of preferences formulation desired by the respondents and the level considered important. This type of descriptive research can describe and analyze consumer preferences and the combination of the most desirable of rambutan attributes.

3. Results and discussion

3.1. Kaiser-Meyer-Olkin and Bartlett’s tests
In order to do the analysis, several steps were done to ensure the feasibility of the questions. The first conducted step was Kaiser-Meyer-Olkin and Bartlett’s test to find out whether the questions were suitable for inclusion in factor analysis. In this test, to measure and determine the adequacy of the sample used, KMO coefficient were used. KMO Measure of Sampling Adequacy above 0.50 declared strong enough which presented in Table 1.

Table 1. KMO and Bartlett’s Test result

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | .549 |
| Sphericity | Approx. Chi-Square | 102.967 |
| Df | 55 |
| Sig. | .000 |
3.2. Factoring
The next stage was factoring. Factoring, namely extracting/reducing the original variable into several factors that can represent all the original variable were analyzed using the Principal Component Analysis (PCA) method. The variables with value >0.50 mean that the variables are able to define the factors. Based on the results of the study, it is found that all variables had extraction values > 0.50 which indicated that the tested variables were able to explain the factor analysis that presented in Table 2.

| Fruit Shape          | Initial | Extraction |
|----------------------|---------|------------|
| Fruit Color          | 1.000   | .615       |
| Fruit Flavors        | 1.000   | .758       |
| Fruit Freshness      | 1.000   | .830       |
| Fruity Scent         | 1.000   | .772       |
| Fruit packaging / arrangement | 1.000 | .753   |
| Local Fruits         | 1.000   | .545       |
| Easy To Get          | 1.000   | .655       |
| Price according to quality | 1.000      | .695   |
| Cheaper Local Fruit Prices | 1.000  | .611       |
| Discount             | 1.000   | .694       |

Table 2. Communalities test

3.3. Eigenvalues
The determination of the number of factors formed can be seen in the total eigenvalue value. To determine the number of factors formed is seen in the total value of eigenvalue > 1. Based on the results of the analysis, four factors are formed and able to explain 64.264% of the variation that can be seen in Table 3.

| Component | Initial Eigenvalues | Rotation Sums of Squared Loadings |
|-----------|---------------------|-----------------------------------|
|           | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1         | 2.501 | 22.738 | 22.738 | 2.501 | 22.738 | 22.738 |
| 2         | 1.746 | 15.874 | 38.612 | 1.746 | 15.874 | 38.612 |
| 3         | 1.548 | 14.075 | 52.687 | 1.548 | 14.075 | 52.687 |
| 4         | 1.273 | 11.577 | 64.264 | 1.273 | 11.577 | 64.264 |
| 5         | .977  | 8.878  | 73.142 |
| 6         | .822  | 7.477  | 80.618 |
| 7         | .662  | 6.014  | 86.632 |
| 8         | .508  | 4.617  | 91.249 |
| 9         | .364  | 3.312  | 94.561 |
| 10        | .347  | 3.158  | 97.720 |
| 11        | .251  | 2.280  | 100.000 |
3.4. Loading factor
At this stage, the appropriate variables were grouped according to their correlation to each factor. The table below shows the loading factor value which shows the magnitude of the correlation of each variable in the four factors formed.

Table 4. Component matrix

| Component                  | 1    | 2    | 3    | 4    |
|----------------------------|------|------|------|------|
| Fruit Shape                | -.525| -.284| .355 | -.364|
| Fruit Color                | .108 | .190 | .746 | .391 |
| Fruit Flavors              | -.018| .042 | .885 | -.212|
| Fruit Freshness            | .477 | .625 | -.189| -.343|
| Fruity Scent               | .866 | .027 | -.021| -.035|
| Fruit packaging / arrangement | .726 | -.028| .106 | .073 |
| Local Fruits               | -.048| -.799| -.027| -.112|
| Easy To Get                | .108 | .190 | .746 | .391 |
| Price according to quality | -.385| -.301| -.086| .602 |
| Cheaper Local Fruit Prices | -.186| .104 | -.067| -.258|
| Discount                   | .080 | .158 | -.026| .814 |

From the table above, the variables were grouped into four established consumer preference factors. Then, the factors that are formed in the results of the factor analysis can be named based on the variables that are formed or variables that has the highest value. In this study, the naming was carried out based on the presentation of the names of the variables that were formed which can be seen in Table 5.

Table 5. Factors affecting consumer decisions in buying rambutan fruit

| Factor                              | Loading Factor | Variance (%) |
|-------------------------------------|----------------|--------------|
| **Fruit display aspect**            |                |              |
| The scent of ripe and fragrant fruits | .866           |              |
| The fruit is put in a good and clean place or container | .726 | 22.738 |
| Symmetrical / uniform / interesting/proportional shape of the fruit | -.525 |              |
| **Originated fruit aspect**         | -.799          | 15.874       |
| The fruit comes from Langsa City    | .625           |              |
| The freshness of purchased fruit    |                |              |
| **Physical Fruit aspect**           | .855           |              |
| Sweet taste                         | .746           | 14.075       |
| The colour of the fruit is bright and clean according to the level of maturity of the fruit | .746 |              |
| Local fruit is easy to get          | .746           |              |
| **Price Aspect**                    | .814           | 11.577       |
| Get a discount when buying a certain amount of fruit | .814 |              |
| The price of the fruit offered is by the quality | .602 |              |
| The price of the fruit offered is by the quality | -.258 |              |

Based on the result, there are four factors that influence consumers’ preference. The dominancy of the factors affecting consumer preferences to buy rambutan can be seen through the diversity value which can be explained by each factor. The following table shows the order of the factors that influence consumer preferences.
3.5. *Fruit display aspects*

Based on table 6, the first factor that is formed and most dominant is the physical aspect of the fruit, which affects consumers in buying rambutan fruit with a diversity level of 22.738%. The highest variable in this aspect is the aroma of ripe and fragrant fruit. It is chosen based on the habit of the respondent to try the fruit sample provided by the seller before buying it. Another variable in this factor is the loading factor. Most of the rambutan seller using basket in that was placed in a motorbike that is easily accessed. The loading factor value of this variable is 0.800.

| No | Factor                  | Variance (%) |
|----|-------------------------|--------------|
| 1  | Fruit display aspect    | 22.738       |
| 2  | Originated fruit aspect | 15.874       |
| 3  | Physical Fruit aspect   | 14.075       |
| 4  | Price Aspect            | 11.577       |

3.6. *Aspects of fruit origin*

The aspect of fruit origin became the second factor formed with a diversity level of 15.874%. The aspect of fruit origin that consumers pay attention is the fruit that produced in Langsa City. The distribution of rambutan production in Langsa City is can be found in almost all sub-districts. Rambutan is the second highest production fruit with a total production of 10 tons in 2019. Rambutan fruit in Langsa City is generally sold within the city itself, so the fruit is still fresh and resulted to the value of 0.625 in fruit origin factor.

3.7. *Physical aspects of the fruit*

The third aspect is the packaging and origin of the fruit with an indicator of the diversity value 14.075%, where the biggest variable that affects is a fruit originating from outside Langsa City. Some respondents buy rambutan that come from outside the city because the desired rambutan is by consumer tastes with a loading factor value of 0.571.

3.8. *Fruit price aspects*

The next aspect is the price aspect, non-local fruit dimers which are cheaper than local fruits with a diversity value of 14.075%. The aspect of cheap fruit prices is an important price indicator for consumers in buying bananas. The loading factor value is -0.471, this indicates that the higher the price of non-local rambutan, consumers will not choose to buy them.

4. Conclusion

The biggest consumer preference in buying rambutan fruit in Langsa City is the aspect of fruit appearance which supported by aroma of ripe and fragrant fruit and placement of the fruit in a good and clean basket. In this case, rambutan sold in the market is more preferable to rambutan sold on the roadside. Therefore, the local government should have a policy whereby traders are prohibited from selling on the highway and establish a special fruit market in Langsa City.

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