

Relative Importance of Attributes of Locally Grown Apple that Affects Consumer's Choice in Malang, Indonesia

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Abstract: As the result of the emergence of middle class, and the awareness raising of consuming healthy food in Indonesia, the trend of diet and consumption pattern is gradually changing. People are getting aware of consuming fruit, such as apple. The provision of high quality fruit and appropriate fruit retailer easily access to consumers are important. These supports must comply with consumer's needs and wants, because consumer's attitude and preferences in selecting food is complex. Therefore, it is essential to comprehend consumers' valuation towards attributes of the locally grown apple based on their preferences. The objective of the study is to identify attributes that are considered relatively important by consumers when purchasing locally grown apples in Malang, Indonesia. The study employed an intercept survey involving 200 consumer respondents. The sample was randomly selected at four different retailer types, namely, traditional wet market, road side stall, supermarket and modern fruit shop. A structured questionnaire was designed to collect the primary data regarding quality attributes of locally grown apples considered important by the consumers while buying locally grown apple. The study focused on 14 attributes of locally grown apple, comprising of twelve intrinsic attributes and two extrinsic attributes. Data were analyzed by using descriptive statistics. The results revealed that color, fineness, crispness, chewiness, sweetness, sourness and price had the highest mean values (above or equal to four), indicating that these attributes were considered relatively important for the consumers in decision making for buying locally grown apple.

Key words: Apples, fruit attribute, consumer, wet market, buying behavior, Indonesia.

1. Introduction

Eating a diet rich in fruits as part of an overall healthy diet is highly recommended. Fruit consumption may reduce risk for some chronic diseases. Fruit provides nutrients vital for health and maintenance of human body. Most fruits are naturally low in fat, sodium and calories, also as sources of many essential nutrients such as potassium, dietary fiber, vitamin C, and folate (folic acid) (United States Department of Agriculture, 2017).

As the result of the emergence of middle class, and the awareness raising of healthy food consumption in Indonesia, the trend of diet and consumption pattern is gradually changing. People are getting aware of consuming fruits, as well as aware of the health benefits of fruits. Apple fruit is one of favorite fruits in Indonesia. Fresh apple contains high fiber pectin, low calories, and are free from cholesterol, fat and sodium (Imami *et al.*, 2013). Also, every 100 g of fresh apple contains antioxidants equal to 1,500 mg of vitamin C (Eberhardt *et al.*, 2000). The consumption of apples could reduce the risk of cancer and coronary heart disease whilst reducing weight (Konopacka *et al.*, 2010).

In Indonesia, apple production is predominant in East Java province, specifically in the regions of Malang, Batu and Nongkojajar Pasuruan. These areas have natural characteristics suitable for growing apples, such as, temperate climate with average temperatures of 16 – 27°C, soil types with good drainage and high lands with elevations of 700 – 1400 m above sea level (Indonesian Citrus and Subtropical Fruits Research Institute, 2016). Apple varieties mostly grown are Manalagi, Rome Beauty and Anna. These locally grown apples are mainly marketed in Malang city, Indonesia.

With regards to such condition, the provision of high quality fruits and appropriate fruit retailers easily accessed by consumers are important in order to improve the consumption of locally grown apples. The supports coming from apple grower, supporting service and retailer must comply with consumer's needs and wants, because consumer's attitude and preferences in selecting food is complex. Therefore, it is important to comprehend consumers' valuation towards attributes of the locally grown apple based on their preferences. With respect to this matter, the objective of the study is to identify attributes that are considered relatively important by consumers when purchasing locally grown apples, specifically in Malang, Indonesia.

The paper is organized as follows. The introduction presents the background and the objective of the study. The next section discusses the methods employed in this study, then followed by the main results and discussion. Subsequently, conclusions are presented at the end of this paper.

2. Methodology

The study was conducted in Malang city, East Java as it is one of the major marketing areas of locally grown apples generated from the production zones. Geographically, this city lies between 112.06° – 112.07° East Longitude and 7.06° – 8.02° South Latitude. The size of Malang is 110.06 km² and the population is approximately 820,243 people with an average annual population growth rate of 0.8% (Statistics of Malang city, 2014).

An intercept survey method was employed in this research. The survey technique is appropriate to learn about behaviors or self-belief and is the most common method for quantitative data collection generated from a sample of respondents (Neuman, 2014). Furthermore, a face-to-face survey mode was used in order to get a quick response from the respondents in collecting detailed information regarding their attitudes and quality valuation towards locally grown apples. This survey involved 200 respondents of consumers who were at least at 18 years of age and consumes locally grown apples. They were randomly selected at various retailer types, namely: (a) traditional wet markets, where stallholders or peddlers (often a personal business) sell produce and other food items are gathered in an open or covered area (Wei *et al.*, 2003), (b) roadside stalls, where semi-permanent/permanent outlets owned and operated by personal businesses sell fruits along the side of the road, (c) supermarkets operated as national chains, and (d) modern fruit shops with automatic check-outs. As Indonesian consumers frequently shop at traditional wet markets (Wei *et al.*, 2003), the composition was allocated as follows: 40% sample taken from wet markets, 30% sample taken from roadside stalls and 30% sample taken from supermarkets and modern fruit shops. A similar approach in determining the sampling method was employed in a study on red lentils (Ariyawardana and Collins, 2013).

A structured questionnaire was developed in order to gather proper information that could be used to reach the objectives of the study and to examine the relative importance of quality attributes of locally grown apples. The questionnaire development followed three steps; these were making a draft, pre-testing and refining the wording of the questions. The draft of the questionnaire was developed from a review of previous studies regarding apple attributes and agri-food preferences. Subsequently, an early draft of the questionnaire was pre-tested to ensure that the constructed questions did not make any ambiguous wording errors. This stage was necessary to ensure the validity of the items designed in the questionnaire, to ascertain that the questions were relevant and easily understood by the respondents and to obtain feedback from respondents. Afterwards, the questionnaire was refined.

The questionnaire was designed into three parts. The first part was intended to gather data on general pattern in buying locally grown apples. The second part concentrated on investigating quality attributes that were

considered important by the consumers while buying locally grown apples. There were 14 attributes of locally grown apples included in the study, comprising of twelve intrinsic attributes and two extrinsic attributes. The intrinsic attributes were further classified into four search attributes, namely, color, size, fineness (smoothness of the fruit), and aroma; and eight sensory attributes, namely, firmness (force required to bite the apple), toughness of the skin (force required to penetrate the skin), mealiness (mealy feeling while chewing apple), crispness (force for first bite and its noise intensity), chewiness (duration and number of masticatory cycles before swallowing the apple), juiciness (amount of liquid released during chewing), sweetness and sourness (Table 1). While the extrinsic attributes consisted of price and packaging (Table 1). Consumers' attitudes and perceptions towards these 14 variables were measured using a five-point Likert scale where 1 = not at all important, 2 = somewhat not important, 3 = neutral, 4 = somewhat important and 5 = very important. Finally, the last part of the questionnaire searched for information regarding demographic characteristics of the respondents.

Table 1 – Variables used in the analysis.

Attributes	Search	Sensory
Intrinsic	Color	Firmness
	Size	Toughness of the skin
	Fineness	Mealiness
	Aroma	Crispness
		Chewiness
		Juiciness
		Sweetness
		Sourness
Extrinsic	Price	
	Packaging	

The enumerators were recruited and trained in a one-day session in early June 2016 before conducting the survey. The training focused on their understanding of the scope of the study and the refined questionnaire. The session was also employed to provide the enumerators with knowledge regarding standard operating procedures in administrating the survey by distributing and collecting questionnaires from the respondents. Reviewing all questionnaires for completeness was necessary before proceeding with data entry. This was to ensure that the completed questionnaires were acceptable, while questionnaires with incomplete and unsatisfactory responses were discarded. Subsequently, data generated from the consumer survey were tabulated and analyzed by using the statistical software package IBM SPSS. The analysis procedure included two aspects. Firstly, describing demographic features of consumer respondents, as well as general facts about

consumption and buying patterns of locally grown apple consumers, presented by using descriptive statistics such as frequency distribution, percentages and cross tabulation. Secondly, analyzing the relative importance of locally grown apple attributes that perceived by the consumers.

3. Results and Discussion

Respondents of locally grown apple consumers in Malang have certain socio economics characteristics as follows (Table 2). The survey respondents predominantly comprised of female (65.5 %), while 34.5 % were males. This is consistent with general shopping habits in Indonesia and in line with previous research findings of Rahayu *et al.* (2012), where the females usually become the primary grocery shoppers for the households. Most of the respondents were 21–30 years of age (30%) and followed by those of 31–40 years of age (28%). In terms of education, more than half of the sample had an education level of senior high school or higher degree, that is, senior high school (41.5%) and undergraduate degree (36.5%). Meanwhile, with regards to occupation, most respondents were private employees (44.5%) followed by self-employed (24.5%) and housewife (17%). Furthermore, most of the respondents (45%) earned Indonesian Rupiah (IDR) 3,000,000 to IDR 9,000,000 per month as household income.

Table 2 – Socio-economics characteristics of the research sample (n=200).

Characteristic	Category	Percentage (%)
Gender	Male	34.5
	Female	65.5
Age (years)	Up to 20	4.0
	21–30	30.0
	31–40	28.0
	41–50	26.5
	51–60	9.0
	Above 60	2.5
Education	No education	0.5
	Elementary school	9.0
	Junior high school	9.5
	Senior high school	41.5
	Undergraduate degree	36.5
	Postgraduate degree	3.0
Occupation	Housewife	17.0
	University student	3.0
	Self-employed	24.5
	Government employee	7.0
	Private employee	44.5
	Retired person	1.5
Household income (IDR/month)	Other	2.5
	< 3,000,000	40.5
	3,000,000–9,000,000	45.0
	9,000,001–15,000,000	12.0
	15,000,001–21,000,000	2.5

In terms of consumption and buying pattern of locally grown apples (Table 3), the respondents usually consumed locally grown apples two or three times a month (31.5%), while others consumed once a month (20%) and less than once a month (20%). According to Agricultural Information Data Center (2016), the average of apple consumption rate in Indonesia is 1.2 per capita per year.

With respect to consumers' buying pattern, that is purchase quantity, most respondents (58%) generally purchased 1 kg of locally grown apples, and 27.5% of respondents normally purchased 2 kg of locally grown apples in one shopping time. Meanwhile, for retailer type for shopping fruits, the respondents mostly bought locally grown apples at traditional markets (59%), some others purchased locally grown apples at road side stall (20.5%) and the remaining got the fruit from supermarket and modern fruit shop. Respondents said that

while they went for shopping groceries at traditional market, they would also buy some locally grown apples at the same place. As for road side stall, respondents said that this type of outlet was easy to find and accessible. Hence, traditional market and road side stall were dominantly favored by the respondents.

Table 3 – Consumption and buying pattern for locally grown apples (n=200).

Preferences	Categories	Percentage (%)
Frequency of consumption	Every day/almost every day	2.0
	Two or three times a week	13.5
	Once a week	13.0
	Two or three times a month	31.5
	Once a month	20.0
	Less than once a month	20.0
Purchase quantity	< 1 kg	1.5
	1 kg	58.0
	2 kg	27.5
	≥ 3 kg	13.0
Retailer	Traditional wet market	59.0
	Supermarket	15.5
	Modern fruit shop	5.0
	Road side stall	20.5

Primary data regarding relative importance of apple attributes generated from all respondents were analyzed by using descriptive statistics. The minimum and maximum data of attributes importance valued by the respondents could be found in Table 4. The value for mean and standard deviation of each attribute valuation were also presented in the same table.

The result showed that locally grown apple attributes that were highly rated (≥ 4) were color, fineness, crispness, chewiness, sweetness, sourness, and price. While the rest of the locally grown apple attributes were rated lower (< 4). This indicated that consumers considered the attributes of fruit color, fineness, crispness, chewiness, sweetness, sourness and price were relatively important while buying locally grown apples, and they considered the attributes of size, aroma, firmness, toughness of the skin, mealiness, juiciness and packaging were less important in making decision on selecting locally grown apples.

Table 4 – Relative importance of locally grown apple attributes valued by the research sample.

Attributes	Minimum	Maximum	Mean	Standard Deviation
Color	1.00	5.00	4.02	1.039
Size	1.00	5.00	3.52	1.037
Fineness	1.00	5.00	4.11	0.969
Aroma	1.00	5.00	3.49	0.987
Firmness	1.00	5.00	3.98	1.005
Toughness of the skin	1.00	5.00	3.79	1.064
Mealiness	1.00	5.00	3.41	1.048
Crispness	1.00	5.00	4.15	0.914
Chewiness	1.00	5.00	4.39	0.782
Juiciness	1.00	5.00	3.84	0.888
Sweetness	3.00	5.00	4.52	0.642
Sourness	1.00	5.00	4.02	0.967
Price	1.00	5.00	4.13	0.994
Packaging	1.00	5.00	3.21	1.257

It was typical when consumers considered the color of apple in selecting this fruit because fruit color usually represented the fruit variety. Generally, consumers had different preferences for varieties. As locally grown apples in the market were available in three dominant varieties, consumers prefer Manalagi, Rome Beauty or Anna.

Other attribute of locally grown apple rated equally as color attribute was sourness. This attribute was also regarded important for consumers, even though the score was not higher than the other highly rated attributes. This means that a combination of sour taste in the fruit, not merely sweet flavor, was one of considerations in making decision on buying locally grown apples.

Meanwhile, fineness was also taken into account by consumers when buying locally grown apples. Fineness represented good overall appearance of the locally grown apples. Mostly, consumers would prefer apple fruits with no blemishes.

Next highly valued attribute was price, even though the score was moderate among the other most important attributes. This reflected that the price was included as the extrinsic attributes considered important by consumers when buying locally grown apples, compared to the importance of other intrinsic quality attributes of the fruit. Also, crispness was taken into account by consumers when purchasing locally grown apples since this attribute similarly got a high valuation by the respondents. Crispness showed the force for first bite and its noise intensity. Hence, this attribute was also relatively important for the consumers while buying locally grown apples.

Subsequently, chewiness and sweetness were two attributes perceived the most important in buying locally grown apples, since the chewiness and sweetness attributes received the second and the first highest valuation, respectively. Chewiness reflected the duration and number of masticatory cycles before swallowing the apple, and sweetness reflected the sweet taste of the fruit. Hence, in purchasing locally grown apples, consumers would firstly consider the sweetness characteristic of the fruit before looking at other quality attributes.

The results of this study were similar to previous studies on apples that sweet taste was the most important attribute for consumers in several countries in Europe when they make decisions to buy apples, and this attribute was suited to the consumers preferences (Bonany *et al.*, 2013; Galmarini *et al.*, 2013). However, the results of this study were in contrast to other findings indicated that quality represented by number of blemishes was the most important apple attribute for consumers in Pennsylvania (Wirth *et al.*, 2011). This suggests that geographic and demographic factors might have influence in consumer's preferences, since all these studies were conducted in different countries. As pointed out by the study of Galmarini *et al.* (2013), consumers of different cultural backgrounds from different countries in Europe had different valuation towards apple quality attributes.

4. Conclusions

This study has provided comprehensive information regarding the relative importance of intrinsic attributes and extrinsic attributes of locally grown apple for consumers when they make decisions to buy locally grown apple. The intrinsic attributes highly rated by consumer sample were color, fineness, crispness, chewiness, sourness and sweetness, while the extrinsic attributes highly rated by consumer sample was price. The sweetness became the most relatively important attribute for consumers in decision making for locally grown apple purchase since this attribute got the highest rate value. As for other intrinsic attributes such as size, aroma, firmness, toughness of the skin, mealiness, and juiciness, as well as extrinsic attributes such as packaging were less important in decision making for purchasing locally grown apples.

Therefore, locally grown apple attributes needing for focus and improvement were color, fineness, crispness, chewiness, sweetness, sourness, and price, so that these quality attributes were in line with the consumers' needs and wants. The improvement for intrinsic attributes category can be done by value chain actors mainly in the production level, which is farmers, by conducting a good farming practice to produce high quality fruit with such important attributes. A relevant supporting service such as research institute also plays an important role in selecting apple accessions with such characteristics consistent with consumers' wants and releasing as new locally grown apple varieties for development.

At retailer level, since traditional markets and road-side stalls were the most dominant retailer outlets for purchasing locally grown apples, such retailers should be supported to provide convenience and ease for consumers to shop at these sites. Also, a marketing strategy that communicates the predominant characteristics of locally grown apples to stimulate consumers can be conducted at the outlets. Thereby, consumers would be more conscious about quality attributes of locally grown apples in line with their preferences, and expectedly increase their fruit consumption.

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