

## Factors affecting local fruit consumption decisions in Penang, Malaysia

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### Article history:

Received: 1 September 2022

Received in revised form: 24 October 2022

Accepted: 27 October 2022

Available Online: 11 November 2023

### Keywords:

Fruits,  
Local fruits,  
Consumption decision,  
Penang consumers

### DOI:

[https://doi.org/10.26656/fr.2017.7\(S2\).21](https://doi.org/10.26656/fr.2017.7(S2).21)

### Abstract

Local fruits have been recognized for their health benefits, as they contain vitamins, minerals and dietary fibre for the human body. Besides, consuming local food is essential to a healthy lifestyle in today's world, and everyone should be informed of and consume it. The objective of this research was to identify the factors affecting consumer's decisions on local fruit consumption in Penang, Malaysia. The price, product of origin, colour and appearance, texture and income were identified as the main factors for consumer's consumption of local fruits. A total of 414 respondents aged 15 years and above participated in the study. Both primary and secondary data were analyzed and tested using descriptive analysis and multiple linear regression analysis. Based on the study's findings, consumers' propensity to eat local fruit in Penang was influenced by all of the variables examined, with the exception of texture. This study was very useful to help farmers and retailers in identifying factors that attract consumers to consume local fruits as well as providing valuable follow-up actions that may further increase local fruit production.

## 1. Introduction

In Malaysia, the major season for local fruits is from June to August, with the off-season from December to February. Durian, mangosteen, *rambutan*, *duku*, *langsats*, and turnip are among the most famous local seasonal fruits in Malaysia that receive relatively high demand from consumers. In meeting the continuous demand, local fruit cultivation is mostly carried out on a modest scale, except for a small number of fruits such as pineapple, *durian*, and mango which are cultivated on a large scale or commercially. Previous studies have shown that Malaysian consumers have acknowledged the relevance of the nutritional benefits and their relationship with the increasing demand for fresh local fruits. Appropriate intake of fruits and vegetables could reduce the risk of ischemic heart disease by 31%, esophageal cancer by 20%, ischemic stroke by 19%, gastric cancer by 19%, and lung cancer by 12% (Roth and Murray, 2017). Tropical fruits also play a crucial part in creating a well-balanced diet, which helps to prevent obesity and other diseases. In 2018, the fruit sub-sector contributed 9% to the Gross Domestic Product (GDP) (Department of Statistics, Malaysia, 2019). The food industry is important to the farmer's economy with 5,570 hectares

of land covered with fruit cultivation in Penang (Penang Agricultural Policy Report, 2020). The Department of Agriculture Penang (2019) found that the pattern of local fruit consumption has shown an upward trend as shown in Table 1. The Per Capita Consumption (PCC) of local fruits showed an increase from 93.0 kg/person/year in 2015 to 93.6 kg/person/year in 2018.

Table 1. Per capita consumption for local fruits, Penang.

Item	2015	2016	2017	2018
Consumption (kg/person/year)	93.0	93.2	93.4	93.6

According to Fishbein and Ajzen (1975), the intention of consumers to engage in actual behaviour is a better predictor of actual behaviour than solely their attitudes towards an object. The Theory of Planned Behavior (TPB) is a popular theory that integrates attitudes and intentions for behavioural purposes. In the present study, TPB is applied to understand Penang's consumers' behavioural intentions in relation to local fruit consumption. According to research conducted by Mansoor and Jalal (2011), each member of the family plays a distinct function in the consumption of any type of local fruit. Besides, consumption decisions can also have an impact on consumer decisions to consume local

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fruits not just for their quality but also for their health (Kothe and Mullan, 2015). The factors affecting local fruit consumption decisions used in this research are as below:

### 1.1 Price

Price is recognized as crucial in influencing customer choice, on the other side, it is regarded as a hint to estimating food quality, while on the other hand, it can also be regarded as a barrier to purchasing (Rohr *et al.*, 2017). According to Mimi Liana (2010), price remains an important factor in consumers' consumption decisions. Furthermore, price and accessibility of consumption are two quality factors that are considered important in influencing customer decision-making (Moor *et al.*, 2014).

### 1.2 Product's origin

Consumer impression is important to the product's origin as it will affect their purchasing choice. However, as long as they are sure of its quality, consumers value the origin labelling of the goods (Deliana *et al.*, 2014). Moreover, country of origin (COO) labelling enables consumers to know where the food was produced or imported and thus helps them make better options through the COO labelling on food products (Stockley and Hunte, 2010).

### 1.3 Texture

Texture is a sensory method that affects the enjoyment of a sound food product. Consumers have clear expectations for the texture of fruits that are locally grown as soft fruits, like rock melon and mango, must be chewed without being mushy. Although consumers often refer to flavour as a key aspect of fruit quality, a good texture with a combination of flavours is more likely to result in fresh products being accepted (Harker *et al.*, 2003).

### 1.4 Colour and appearance

Another factor that is found to be a decisive attribute for consumers in consuming local fruits is colour and appearance (Zanoli and Naspetti, 2002). In relation to this, the outside appearance of an entire fruit is considered a sign of maturity, although it may be misleading (Shewfelt and Bruckner, 2000) and for a certain item, consumers have their preferred colours (Crisosto *et al.*, 2003).

### 1.5 Income

Income is a very important aspect to examine as it influences purchasing decisions. According to Pechey *et al.* (2015), people's income level is determined to be the

most important factor affecting their consumption of locally grown fruits. Higher minimum wages have also been linked to an increase in local fruit consumption. Clark *et al.* (2020) and Leibtag and Kaufman (2003) suggested that low-income families save on their food expenses by buying cheaper foods, fruits and vegetables.

The PCC of fruits is predicted to grow annually by 5.30% from 2021 to 2025 due to the expanding population and average income (Statista, 2020). Additionally, improvement in supply chains and the development of modern markets such as hypermarkets, supermarkets, district speciality stores, and minimarkets in cities are essential factors in speeding up this tendency. However, the consumption of local fruits is hindered by several factors such as rising prices of local fruits, the availability of local fruits in the market and misconceptions regarding health issues when consuming local fruits. Therefore, this research aimed to identify the factor affecting consumer's decision on local fruits consumption in Penang. These findings would serve enormous benefits to farmers, retailers and policy officers with the best recommendations for the future to increase the production and consumption of local fruits in Malaysia.

## 2. Methodology

The primary data for this study were obtained from an online survey that was distributed to a total of 414 respondents in Penang, Malaysia. The respondents for the study were randomly selected among individuals aged 15 years and above so that a subset of the population was unbiased and included the same number of occurrences from the entire population. The questionnaire was designed based on two sections: Section A gathers information regarding the demographic factors, while Section B identifies factors influencing local fruit consumption decisions. Descriptive analysis and multiple regression analysis were employed in this study to analyze the coefficient values of a dependent variable and independent variables using SPSS Statistics. Descriptive analysis provides a notion of the distribution of data, aids in the detection of outliers and typos, and allows for the identification of connections between variables, preparing for subsequent statistical analysis. Multiple regression analysis is one of the most powerful statistical techniques to predict a continuous dependent variable from several independent variables. In general, the multiple regression equation can be written as follows:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \dots + \beta_kX_k$$

A multiple regression model (MRM) for factors affecting local fruit consumption was also performed with price, product's origin, texture, colour and

appearance, and income as exogenous variables. The regression equation is provided as follows:

$$Y = \beta_0 + B_1P + B_2PO + B_3T + B_4CA + B_5I + \varepsilon_i$$

Where Q = Money spent to buy local fruits (RM), P = Price of fruit (RM), PO = Product of origin, T = Texture, CA = Colour and appearance, I = Income (RM) and  $\varepsilon_i$  = Error term.

### 3. Results and discussion

The demographic components of the questionnaire include six items on gender, age, marital status, ethnic group, employment and monthly income. Table 2 shows that 38.6% of the respondents were male respondents, while female respondents were about 61.4%. With regard to their age categories, a majority of the respondents were 18 to 28 years old (46.6%), followed by 29 to 39 years (27.9%) and 40 and above (19.1%). There were only three ethnic groups involved in this research which were Malay (86.7%), Chinese (8.7%) and Indian (4.6%) respondents. Meanwhile, as for employment, it was found that 36.2% of the respondents worked in the private sector while 31.6% of the respondents worked in the government sector, followed by 32.1% of full-time students. With respect to their marital status, a total of 200 respondents (48.3%) were married. As for their income, a majority of the respondents earned a monthly income of less than RM1,600 (43.2%), followed by RM1,600 to RM3,000 (28.7%), RM3,001 to RM6,000 (16.7%), and more than RM6,000 (11.4%) per month.

The coefficient of determination (R-square) reveals that the independent variables explained 78.6% of the consumption decision of local fruits, while the remaining 38.2% was explained by other variables. According to

Table 3, the price variable showed a negative relationship with consumption decisions and was statistically significant at a 5% level, which implies that an increase in the price will decrease the consumption decision of local fruits. This is in a similar vein to studies by Sabbe *et al.* (2009), Qing *et al.* (2012), and Gamble *et al.* (2010) who reported that price was associated with consumers' decisions to consume local fruits, which consumers were found to be unwilling to pay higher prices for local fruits. Meanwhile, the product's origin as the proxy of the quality of fruit showed a positive significance at of 1% level. It implies that every unit increase in the product's origin is projected to increase the consumption of local fruits by 0.322. This outcome is consistent with previous research by Kim *et al.* (2009) that consumers would consume more products if they knew the origin of the product because they may have different opinions and perspectives on it. Additionally, the colours and appearance variables also showed a positive relationship with consumers' decisions on local fruits. This finding supported Babicz-Zielińska and Zagorska's (1998), Wann *et al.* (2016) and Tait *et al.* (2015) studies which discovered that consumers' preference for eating local fruits were highly influenced by their perceptions of product qualities, especially on the colour and appearance. In addition, each unit increase in consumers' income will increase local fruit consumption by 0.28 units. This is evidenced by

Table 3. Results of regression coefficient.

Variable	Coefficient	Std. Error	Sig
Constant	4.865	0.159	0.000
Price	-0.180	0.070	0.011
Product's origin	0.322	0.076	0.000
Texture	-0.095	0.066	0.149
Colour and Appearance	0.110	0.050	0.029
Income	0.282	0.061	0.000

Table 2. Respondent's socio-demographic profiles.

Variable	Description	Frequency (n = 414)	Percentage (%)
Gender	Male	160	38.6
	Female	254	61.4
Age (years)	Below 18 years old	20	4.8
	18 - 28 years old	192	46.4
	29 - 39 years old	123	27.9
	40 and above	79	19.1
Ethnic group	Malay	359	86.7
	Chinese	36	8.7
	Indian	19	4.6
Employment	Government	131	31.6
	Private	150	36.2
	Full-time students	133	32.1
Marital Status	Married	214	51.7
	Single	200	48.3
Monthly income	Less than RM1,600	179	43.2
	RM1,600 - RM3,000	119	28.7
	RM3,001 - RM6,000	69	16.7
	More than RM6,000	47	11.4

previous studies by Kim *et al.* (2009) and Shaikh *et al.* (2008) who reported that high-income households are more likely to consume local fruits because there is an abundant supply of high-quality local fruits.

#### 4. Conclusion

In conclusion, the findings of this study highlighted that income, product origin, colour, as well as appearance have a positive relationship with the decision to consume local fruits. Besides, it was also discovered that consumers with excess income would consume more local fruits with a choice of better quality and more attractive appearance of fruits. In addition, price was found to be another factor that would influence consumers in deciding to consume local fruits. Based on the findings of the present study, it is proposed that the price of local fruits should be set at an affordable value for consumers to encourage more demand for local fruits as well as further strengthen the economy of the local fruit industry.

#### Conflict of interest

The authors have no conflict of interest to declare.

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