

## Consumption Pattern on Fruits and Vegetables among Adults: A Case of Malaysia

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### Abstract

*The increasing growth of expenditure on fruits and vegetables in Malaysia is related to the consumers' health awareness and increasing spending power. However, the consumption pattern on fruits and vegetables in Malaysia is still very low in comparison with other countries. Hence, this study aims to explore fruits and vegetables purchasing behavior and its consumption pattern in Malaysia. The research was conducted among adults by using quantitative approach. Self-administered questionnaires were distributed among 1200 respondents in seven selected cities around Malaysia. Eventually, the outcomes indicated that fruits like apple, orange, banana, watermelon and papaya were the most preferred fruits; meanwhile vegetables such as chili, cabbage, cucumber, leaf mustard, tomatoes and water convolvulus were most favorable to consume by adults. Moreover, quality and nutritional contents in the fruits and vegetables set as priority factors for respondents when they were shopping for it at the markets. In conclusion, the findings will beneficially provide information for marketers to plan better promotional strategies to increase fruits and vegetables consumption among adults in Malaysia.*

**Keywords :** *Fruits, Vegetables, Purchasing behavior, Consumption pattern, Malaysia*

### 1. Introduction

Fruits and vegetables provide vitamins, mineral and good source of dietary fiber for human body. It was proved by an adequate consumptions of fruits and vegetables may reduce the risk of 31% of ischemic heart disease, 20% of esophageal cancer 19% of ischemic stroke 19% gastric cancer and 12% of lung cancer (Lock, Pomerleau, Causer, Altmann, McKee, 2005). However, results from Malaysian Adult Nutrition Survey, 2003 revealed that fruits and vegetables is still low among Malaysian (Norimah et al., 2008). There is also limited data regarding to the fruits and vegetables consumption in past few years. Additionally, In the study by Justin, Spencer, Sam, and John (2009) claimed that many developing nations lack of this data in their population. Therefore, in order to address fruits and vegetables consumption, purchasing behavior and consumption pattern needs to be identified concurrently. By assessing food purchasing behavior and consumption pattern may help describe the dietary practices (Dillon, 2011) hence increase the

consumption of fruits and vegetables. It is also important to examining and understanding food consumption pattern to promote fruits and vegetables selections among adults in Malaysia. Previous research also supported that food shopping behaviors leads to food consumption where the general consumption is that individual consume most of they purchased and the importance for consumption at home (Hersey et al., 2001).

Data from Federal Agriculture Marketing Authority of Malaysia (FAMA) demonstrated the increasing per capita consumption for fruits from 80.4kg in 2006 to 93kg in 2010 (Ministry of Agriculture, Malaysia, 2012). Meanwhile, for vegetables commodities, per capita consumption per person shows slightly declined from 58kg in 2006 to 54.7 in 2010. In line with the data from Justin et al. (2009), reported the fruits and vegetables consumption worldwide among adults from the 52 countries mainly low including Malaysia. According to the report, 78 percent of total respondents consumed less than the minimum recommended of five daily servings of fruits and vegetables. Largely, 77.6 percent of men and 78.4 percent of women consumed fewer than the minimum recommended level. Similar findings have been obtained from high income countries during the same time frame. As evidenced in studies by Blanck, Gillespie, Kimmons, Seymour, and Serdula (2008), 75.3 percent which encompasses 81.1 percent of men and 71.1 percent of women in United State citizen consumed less than five serving of fruits and vegetables.

Study by Subaratty and Jowaheer (2001), examined the consumption pattern of fruits in Mauritius which obtained factors such as age, sex and income were the important determinant for the consumption of fruits in Mauritius. Furthermore, fruits like apple, pears, oranges, bananas, grapes, kiwi and papaya mostly consumed by respondents in Mauritius. It was interesting to note that, quality and availability exerted an important influence as a reason for high consumption of fruits and vegetables. In contrast, Nurul Izzah et al (2012) found that the most preferred fruits in Selangor state in Malaysia were banana, apple and watermelon while for vegetables commodities, vegetables like celery, spinach, water spinach, long beans, french beans, carrot, potato and chinese mustard were the most frequent consumed vegetables. Respondents prepared vegetables in their ingredients in foods such as soup, rice dishes, varieties of noodles and in traditional snacks. On the contrary, findings from Yen, Tan and Feisul (2012) attempted to profile respondent in a daily consumption which higher educated person, high income level, female, non-smoker, longer work hours and lived in East Peninsular Malaysia were likelyhood to consume fruits and vegetables daily.

Several studies (Blitstein, Snider, Evans, 2012; Brunt et al, 2007; Baranowski et al., 2006; Winkler et al., 2005) shows that fruits and vegetables purchases of an individual are influenced from variety of factors such as prices, family influences, assessibility and availability, income level, and social support, attitude, habit, knowledge and practices. Some qualitative research highlighted the major influences on food purchased were taste, preferences, habit and nutritional concern (Henry et al., 2003; Reicks et al., 2003). Leibtag and Kaufman (2003) suggested lower-income families economizes on their food expenditure by purchasing foods on sale, store brand, less expensive meat, fruits and vegetables. In the line with Palwasha, Ali, Khan, Andaleeb and Khan (2011), demonstrated that food consumption pattern is changed by different variables such as price of food item, income of individual, high population and preferences of consumers. In addition, they stated that, when people are more educated or with the advancement in the education, in general especially in health education people are trying to shift from less nutrient diet to more nutrient diet. Previous research regarding to the purchasing behavior and consumption pattern were explored from abroad based on gender and living arrangement (Morse & Driskel, 2009; Brunt & Rhee 2008; Wardle et al., 2004). Besides the personal factors, the previous study (Blanchette, & Brug, 2005) showed that environmental attributes as the contributing factors for fruits and vegetables consumption. Availability and accessibility, social condition, as well as cultural condition including financial situation are the determinants for fruits and vegetables consumption (Carljin et al., 2006). Some researchers found that a person who consumes Mediterranean diet such as those coming from countries like Spain, Italy, Turkey, Egypt, Syria and Croatia consumes more fruits and vegetables than those who consume conventional Western diet (Cordain et al., 2005).

## 2. Research Methods

The study by using self-administered questionnaire was distributed in selected cities in Malaysia. The cities were chose as the sampling frame for the reasons of residents who lives in cities claimed to have strong purchasing power and largely responsible for the rise of consumerism (Zheng, 2008). Furthermore, according to Department of Statistics of Malaysia, 2010, the proportion of urban population increased to 71.0 percent compared to 62.0 percent in 2000. Seven selected cities were chose which were Subang Jaya (Selangor), Johor Bahru (Johor), Kota Kinabalu (Sabah), Kuching (Sarawak), Ipoh (Perak), Alor Star (Kedah), and Kota Bahru (Kelantan). Those cities were the most populated cities in Malaysia. Based on a purposive sampling technique, the most crowded and the most visited shopping centre of each city was chosen. Frank Small and Association found that Malaysian adults (above eighteen years old) spent most of their

leisure time in shopping centres or mall (Zafar, 2007). The study states that a shopping centre is also a community centre for social and recreational activity among Malaysian adults. Therefore, the main reason for choosing the shopping mall was to obtain an adequate number of respondents. The sampling method used for this study was non-probability sampling (convenience sampling method). Even though this method would hardly lead to representative samples, it may be the best method available due to the unavailability of an accurate sampling frame for total adults visiting shopping mall (Trochim, 2006). Multiple choice questions which asked the respondents regarding to the consumer behaviour of fruits and vegetables such as frequency of buying, place for buying, total expenditure in a week, and the person who responsible to buy fruits and vegetables. In addition fruits and vegetables frequency questionnaire section also included. A final section was the socio-demographic profile of respondents. All of the questions were adopted from previous researches (Ahlstrom, 2009; Engelhaupt, 2006; Richards, 2007; Richards, 2004; Stables, 2001). The sample size of this research was 1,200 respondents.

### 3. Results and Discussion

Only 1049 surveys were useable for data analysis. A total of 151 questionnaires were excluded from the final analysis because some of them were incomplete and too many missing values and unreliable answer given by respondents. The data analyzed by using frequency, chi-square and cross-tabulation. Respondents participated in this study, 638 (60.8%) were female and 408 (38.9%) male adults. Most of the respondents were Malay 777 (74.1%), followed by other ethnics, 125 (11.9%) (Bumiputera from Sabah: Kadazan, Dusun, Bajau, Suluk, Murut, Bisayah. Bumiputera from Sarawak: Iban, Bidayah, Orang Ulu/ Dayak, Melanau and Penan). Based on Malaysia statistics population 2010 (Department of Statistics, 2010), majority of Malaysian (67.4%) were Malay and this respondents profile were merely followed the statistics. Others' ethnic become the second largest respondents because most of voluntarily person in Sabah and Sarawak were from others group. 95 of total respondents were Chinese (9.1%), and 47 were Indian (4.5%). From the results, 617 (58.8%) were single while 419 (39.9%) were married and 10 (1%) were divorced. Respondents were asked about their educational background and the results shows the highest participants were from the secondary school level (35.2%). Besides, most of the participants' household income (38.9%) was in the range of RM1001 to RM3000.

Respondents were asked about their frequent buying fruits and vegetables. Figure 1 show that 10 percent of respondents bought fruits everyday and 15 percent bought 4 to 6 times a week. It comprises 25 percent respondents bought fruits weekly. Meanwhile, 38 percent respondents bought 2 to 3 times a week which considered as moderate buyers. 37 percent of respondent were found bought less frequent fruits in a week which constitute 29 and 8 percent bought fruits once a week and fewer than once a week respectively. 33 percent of respondent bought vegetables everyday and 18 percent of respondent bought 4 to 6 times a week. It constitutes of 51 respondent frequently bought fruits weekly. 25 percent of Malaysian adults moderately (2 to 3 times) purchased vegetables in a week. It was found that 24 percent of respondents less frequently purchase vegetables which constitute 17 percent bought vegetables in a week and 7 percent fewer than once a week. Briefly, Malaysian adults bought fruits 2 to 3 times a week. Meanwhile, 33 percent bought vegetables on a daily basis. This is due to the fact that vegetables are more perishable, cheaper and accessible than fruits. Furthermore, vegetables were consumed as regular part of a daily meal. On the contrary, Malaysian adults consumed fruit as pleasurable snack (Yen, 2012).

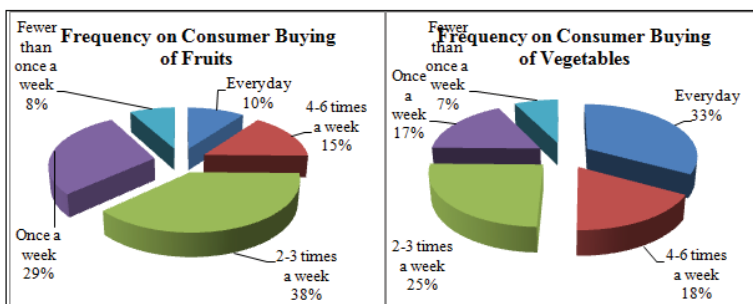


Figure 1. Frequency on Consumer Buying Fruits & Vegetables

Demographic factors were used to identify the purchasing behavior among Malaysian adults by using cross-tabulation

analysis. Chi-square test for age ( $\chi^2 = 18.49$ , sig-  $\chi^2 = 0.018$ ), ethnics ( $\chi^2 = 18.48$ , sig-  $\chi^2 = 0.005$ ) and educational level ( $\chi^2 = 20.02$ , sig-  $\chi^2 = 0.029$ ) were significant and indicating these variables associated with the frequently purchase fruits. Respondents who purchased less frequent were from age group of 27 to 35(38.30%) and 36 to 43 (46.40%). Half of the Chinese respondents (52.60%) purchased less frequent fruits. Those who have higher university degree holder comprises of degree (43.40%) and postgraduate (50.00%) purchased less frequent fruits. This is due to higher educational level have a time constraints due to their job career to purchase frequently. Chi-square test for marital status ( $\chi^2 = 9.894$ , sig-  $\chi^2 = 0.042$ ), ethnics ( $\chi^2 = 35.51$ , sig-  $\chi^2 = 0.000$ ), educational level ( $\chi^2 = 29.47$ , sig-  $\chi^2 = 0.001$ ) and household income ( $\chi^2 = 14.18$ , sig-  $\chi^2 = 0.028$ ) indicating these variables were significantly associated with the frequently of purchasing vegetables. The pattern can be observed among ethnics group where Chinese (44.20%) less frequently purchased vegetables while Malay (51.00%) and others ethnics (51.10%) purchased more frequent. Echoing results of fruits frequently purchased, the similar findings found that respondents with higher educational level purchased vegetables less frequent

In the same vein, figure 2 shows the expenditure of fruits and vegetables in a week.

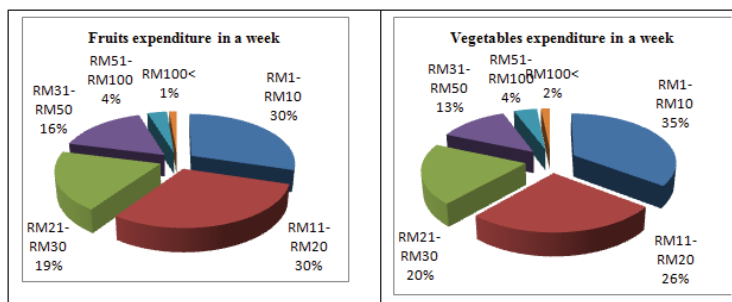


Figure 2. Consumer Weekly Expenditure on Fruits and vegetables

The highest expenditure for fruits was from RM11 to RM20, whereas for vegetables the range was from RM1 to RM10 weekly. This is due to the fact that vegetables are cheapest than fruits.

Similar analyses by using cross tabulation were conducted for understanding the purchasing behavior among adults between demographic factors and consumer expenditure. The chi-square test for gender ( $\chi^2 = 14.7$ , sig-  $\chi^2 = 0.001$ ), marital status ( $\chi^2 = 17.58$ , sig-  $\chi^2 = 0.001$ ), and household income ( $\chi^2 = 0.186$ , sig-  $\chi^2 = 0.000$ ) were significantly effects towards estimated expenditure of fruits. Obvious pattern of higher percentage was seen for higher income level (More than RM5000) tend to spent for fruits in a week RM31to RM50 while lower income group (41.7% of income less than RM1000) buy fruits RM1 to RM10. The chi-square test for age ( $\chi^2 = 33.87$ , sig-  $\chi^2 = 0.000$ ), gender ( $\chi^2 = 17.12$ , sig-  $\chi^2 = 0.000$ ), marital status ( $\chi^2 = 18.9$ , sig-  $\chi^2 = 0.001$ ), ethnics ( $\chi^2 = 23.28$ , sig-  $\chi^2 = 0.001$ ), and household income ( $\chi^2 = 49.96$ , sig-  $\chi^2 = 0.000$ ) towards estimated expenditure of vegetables. Findings shows that 25.9 percent of Chinese and 29.8 percent among Indian spent RM21-RM30 vegetables in a week while 37.7 percent of Malay and 36.8 percent of other races spent RM1 to RM10 for vegetables. Based on the results, Malay and others ethnics spent less but their frequency is higher compared with Chinese and Indian. In the other hand, Chinese and Indian spent more for purchasing fruits and vegetables but in less frequency.

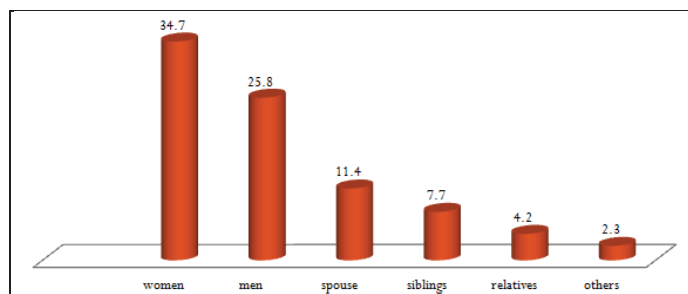


Figure 3. Responsible person to purchase fruits and vegetables

Findings found that almost adults (62.2%) buy fruits and vegetables in supermarket. Supermarkets can be found everywhere in the cities and is considered more convenient and accessible. Results from cross tabulation found that, adults purchased fruits and vegetables at the supermarket regardless of age groups. However, almost adults aged 51 to 59 years purchased fruits and vegetables at the wet market whereas younger adults aged 27 to 43 years preferred the hypermarket. Figure 3 indicate that 34.7 percent of women are responsible for purchasing fruits and vegetables. It follows by men (25.8%), spouse (11.4%), siblings (7.7%), relatives (4.2%) and others (2.3%). Based on the results of this study, the main purchaser of fruits and vegetables are women and it is because of their role in providing home necessary choose and purchases food related products.

**Table 1.** Factors affecting purchasing behavior among adults for fruits and vegetables

	Fruits	Vegetables
Quality	6.43	6.37
Nutritional Content	6.41	6.34
Taste	6.32	6.16
Availability	6.04	6.03
Price	5.72	5.77
Appearance	5.54	5.59
Packaging	5.50	5.50
Promotion	5.27	5.27
Advertising	5.22	5.11

Table 1 above shows the mean for factors affecting while purchasing fruits and vegetables among adults in Malaysia. Respondents could choose in seven point Likert-scale for the nine attribute above while they purchase fruits and vegetables. Results indicates that Malaysian adults seeks quality as the most important factors.

**Table 2.** Total Percentage for Malaysian adults in weekly fruits consumption

No	Fruits	Percentage (%)
1.	Apple	71.8
2.	Banana	69.3
3.	Orange	65
4.	watermelon	57.5
5.	Papaya	51.9
6.	Mango	49.2
7.	Grapes	39
8.	Honeydew	37.4
9.	Rambutan	37.1
10.	Pears	35.5

**Table 3.** Total percentage for Malaysian adults in weekly vegetables consumption

No	Fruits Vegetables	Percentage (%)
1	Cucumber	66.2
2	Tomatoes	60.8
3	Lady Fingers	43.9
No	Leafy Vegetables	Percentage (%)
1	Cabbage	68.5
2	Leaf Mustard	62.9
3	Water Convolvulus	59.2
4	Spinach	54.7
No	Stem, Stalks & Flower	Percentage (%)
1	Lettuce	45.7
2	Mushroom	44.4
3	Cauliflower	39.6
4	Broccoli	36.6
	Seeds or pods	Percentage (%)

1	Long bean	49.7
2	Bean Sprout	48.4
3	French Beans	32.7
<b>Roots and Tubers</b>		Percentage (%)
1	Potato	58.6
2	Carrot	55.8
3	Sweet Potato	30.5
<b>Herbs and Spices</b>		Percentage (%)
1	Chilli	76.1
2	Cosmos Plant	25.4
3	Indian Pennywort	21.4

There were 40 list of fruits in the questionnaire and Table 2 shows the top ten of most frequently consumed fruits based on the number of respondents which were apple, banana, orange, watermelon, and papaya with 71.8 percent, 69.3 percent, 65 percent, 57.5 percent, and 51.9 percent, respectively. They consumed less consume on pomegranate (9.8%) ,Roselle (7.2%), rambai (6.2%) .Meanwhile, the most frequently consumed vegetables among Malaysian adults which shows in table 3 was chilli (76.1 percent), followed by cabbage, cucumber, mustard leaf tomatoes, and water convolvulus with 68.5 percent,66.2 percent, 62.9 percent, 60.8 percent and 59.2 percent, respectively. Chilli was categorized under herbs and spices and this herbs are commonly use in Malaysian typical dishes.

#### 4. Conclusion and Recommendation

The research highlighted the consumption pattern and purchasing behavior among adults in selected cities in Malaysia. Currently, imported fruits like apple and orange were the most likely consumed while spices like chillies were the frequent consumption by adults. In short Malaysian adults consumed varieties of fruits and vegetables. In order to keep abreast of the fruits and vegetables consumption pattern, marketers should increase the supply of highly consumed fruits and vegetables in markets and pe increase the popularity of less consumed. In accord with the findings, supermarket was the most preferred place by Malaysian adults to purchase fruits and vegetables, thus authorities could provide the continuous supply for fruits and vegetables in supermarket and educate farmers to retain the network with supermarket chain. Besides, study have shown that Malsyan adults seek for quality and nutritional content for fruits and vegetables. Consequently, Increase freshness and quality standard of fruits and vegetables in market will increase the fruits and vegetables consumption among Malaysian adults.

There were few limitations of this study. Firstly, the data only captured for the respondents of urban population in Malaysia while disregard urban population. By obtained the urban and rural population could compare the pattern between urban and rural population among Malaysian adults. It also suggested that future studies, should using different method such as in depth interview and observation to gain more knowledge on fruits and vegetables consumption pattern among Malaysian adults.

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