FACTORS THAT INFLUENCE CONSUMPTION BEHAVIOUR OF CONSUMERS ON FRUITS AND VEGETABLES IN KLANG VALLEY

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UNIVERSITY PUTRA MALAYSIA

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FACTORS THAT INFLUENCE CONSUMPTION BEHAVIOUR OF CONSUMERS ON FRUITS AND VEGETABLES IN KLANG VALLEY

By

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APPROVAL FORM

This project report entitled Factors that Influence Consumption Behaviour of Consumers on Fruits and Vegetables in Klang Valley is prepared by Ng Yin Choo and submitted to Faculty of Agriculture in fulfillment the requirement of project paper (PPT4999A and PPT4999B) for the award of the degree of Bachelor Science Agribusiness is based on my own original works.

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ABSTRACT

Fruits and Vegetables are the significant elements of a healthy diet which can maintain body health and reduce the risk of getting disease. However, most of the Malaysian are still insufficient on consumption fruits and vegetables. The overall objective of this study is to investigate the factors that influence on consumption behaviour of fruits and vegetables among consumers in Klang valley. Systematic random sampling is applied to select 400 respondents in Klang Valley during the survey. The data after collected from survey by answering questionnaire will be analyse with using descriptive analysis, chi-square analysis and factor analysis.

According to the results of descriptive analysis, majority of the respondents think that fruits and vegetables are the mainly heathy diet but most of them still consume insufficient fruits and vegetables every day. This is because of the result founded that most of the respondents are consume fruits in between 3 to 4 times in a week while vegetables is more than 7 times in a week. Most of the respondents are not purchase fruits and vegetables every day but is purchase the fruits and vegetables in between 3 to 4 days once with spend only RM100 or less every month for each respectively.

Based on the result of chi-square, various demographic factors are significant influence the consumption behaviour of consumers on fruits and vegetables. For the result of factor analysis, there are 5 factors were generated and significant influence the consumption behaviour of consumers on intake fruits and vegetables which are price, attitude, availability, quality and subjective norm. From the result of this study, it allow people to understand the consumption behaviour of Malaysian on consuming fruits and vegetables in order to overcome the problem of consume insufficient on fruits and vegetables. Thus, government, marketer and producer

should promoting the factors founded in this study to encourage consumers increase the consumption rate on fruits and vegetables.

ABSTRAK

Buah-buahan dan sayur-sayuran adalah unsur yang penting dalam diet yang sihat untuk mengekalkan kesihatan badan dan mengurangkan risiko dapat penyakit. Namun, kebanyakan rakyat Malaysia masih tidak mencukupi untuk memakan buah-buahan dan sayur-sayuran. Objektif keseluruhan kajian ini adalah untuk mengkaji faktor-faktor yang mempengaruhi kelakuan pengambilan buah-buahan dan sayur-sayuran di kalangan responden di Lembah Klang. Pensampelan rawak sistematik digunakan untuk memilih 400 responden di Lembah Klang semasa tinjauan. Data selepas dikumpulkan dari tinjauan dengan menjawab soal selidik akan dianalisis dengan menggunakan analisis deskriptif, analisis chi-square dan analisis faktor.

Analisis deskriptif menyatakan majoriti responden berpendapat bahawa buah-buahan dan sayur-sayuran adalah diet yang paling sihat untuk badan tetapi kebanyakannya masih tidak cukup memakan buah-buahan dan sayur-sayuran setiap hari. Hal ini kerana keputusan yang diasaskan bahawa kebanyakan responden hanya mengambil buah di antara 3 hingga 4 kali seminggu manakala sayur-sayuran lebih daripada 7 kali dalam seminggu. Kebanyakan responden tidak membeli buah-buahan dan sayur-sayuran setiap hari tetapi mereka membeli buah-buahan dan sayur-sayuran di antara 3 hingga 4 hari sekali dengan hanya menggunakan RM100 atau kurang daripada RM100 setiap bulan untuk masing-masing.

Berdasarkan chi-square, pelbagai faktor demografi akan mempengaruhi responden dalam pengambilan buah-buahan dan sayur-sayuran. Dalam analisis factor, terdapat 5 faktor yang akan mempengaruhi responden makan buah-buahan dan sayur-sayuran adalah harga, sikap, boleh didapati, kualiti dan norma subjektif. Kesimpulannya, hasil kajian ini membolehkan orang memahami kelakuan pengambilan orang Malaysia untuk mengambil buah-buahan dan sayur-sayuran dan juga dapat mengatasi masalah kekurangan makan buah-buahan dan sayur-sayuran. Oleh itu, kerajaan, pemasar dan pengeluar harus mempromosikan faktor-faktor yang

dihasilkan daripada kajian ini untuk menggalakkan responden meningkatkan kadar pengambilan buah-buahan dan sayur-sayuran.

CHAPTER 1

INTRODUCTION

1.0 Fruits and Vegetables

Fruits are grow up from the flower and seed. It is not only promote assortment, taste, esthetic appeal but also contain a lot of essential nutrient which used to boost up the body health (Osman, 2011). Fruits can be consume in two ways which divided into ripen and unripen. When the fruits consumed under the condition with fresh and ripen, the taste of fruits are sweet and juicy. There are many varieties of fruit such as banana, papaya, orange and apple (MOH, 2006).

Vegetables can be formed in many varieties form such as dark-green, red and orange, starchy, bean, stems and others. Vegetables can be consume in both cooked and uncooked. Examples of the vegetables are spinach, long bean, lettuce, pumpkin, cabbage, loofah, cucumber, celery and others (MOH, 2006). Fruits and vegetables are significant in healthy diet which contain of vitamins, minerals and fibres that can help to prevent deficiencies of vitamin and reduce the risk of chronic diseases (Nurul et al., 2012).

1.1 Overview of Fruits and Vegetables Industry in the World

According to FAO (2012), the estimation of the total population size in worldwide will raise from 6.9 billion in 2010 to 9.15 billion in 2050. Total size of the world population increase will cause the high demand on consumption agricultural products and the production should increase 60 per cent in 2050 to fulfil the demand of people (FAO, 2012).

According to World Bank (2017), the GDP per capita for worldwide is increase from 12,834.30 thousand in 2010 to 16,143.06 thousand in 2016. According to FAO (2017), the total average

income for whole world people recently are increase around 1.4 times compare with year 1990 and this world economic grows will influence the demand patterns on agricultural products.

World Bank Group reports that the percentage of land area in world applied for agricultural are slightly decrease from 37.5 per cent in 2010 to 37.3 per cent in 2015. The world production of fruits and vegetables are increase 3 per cent from the last decade (FAO, 2013). There are around 640 million tonnes of fruits and over 1 billion tonnes of vegetables are harvested from the whole world in 2011(FAO, 2013).

According to FAOSTAT, the world area harvested fruit and world production fruit are increase from 2010 to 2016. For world area harvested fruit which are raising from 4,539,566 hectares in 2010 to 5,652,326 hectares in 2016. While the world production fruit which are raising from 28,282,688 tonnes in 2010 to 33,252,906 tonnes in 2016. The average of production share of fresh fruit by region in year 2010 to year 2016 which included 70.7 per cent from Asia, 16.2 per cent from Africa, 8.1 per cent from Americas, 3.5 per cent from Oceania and 1.6 per cent from Europe. While the world area harvested vegetables and world production of vegetables are increase from 2010 to 2016. For world area harvested vegetables which are raising from 18,400,753 hectares in 2010 to 20,573,058 hectares in 2016. The world production vegetables which are raising from 259,721,091 tonnes in 2010 to 290,130,864 tonnes in 2016. According to FAOSTAT, the average of production share of fresh vegetables by region in year 2010 to year 2016 which included 86.3 per cent from Asia, 6.7 per cent from Africa, 4.0 per cent from Europe, 2.7 per cent from Americas and 0.2 per cent from Oceania.

The major world producer of fruits and vegetables are China which accounted estimate 20 per cent from the total production of fruits and estimate that are over 50 per cent from the total production of vegetables (FAO, 2013).

According to FAOSTAT, the total world production of the selected fruits in year 2016 are higher ranking from watermelon, bananas, apples, grapes, oranges, coconuts, mangoes, mangosteens and guavas, pears, pineapples, papayas and strawberries which are 113,280,302 tonnes, 117,022,560 tonnes, 89,329,179 tonnes, 77,438,929 tonnes, 73,187,570 tonnes, 59,010,635 tonnes, 46,508,697 tonnes, 27,345,930 tonnes, 25,809,038 tonnes, 13,050,749 tonnes and 9,118,336 tonnes for each respectively.

Food and Agriculture Organization of the United Nations Statistics (FAOSTAT) mentions that China and United States of America are the country which majority produce apples, grapes, strawberries and pears. India is the country which more to produce bananas, oranges, coconuts, mangoes, mangosteens, guavas and papayas. Besides, China also significant in production of watermelon and bananas. Pineapples are mainly production in Costa Rica, Brazil and Philippines.

According to FAOSTAT, the total world production of the selected vegetables in year 2016 are higher ranking maize, cassava, tomatoes, sweet potatoes, dry onions, cucumber and gherkins, cabbages and other brassicas, carrots and turnips, chillies and peppers and spinach which are higher ranking from 1,060,107,470 tonnes, 277,102,564 tonnes, 177,042,359 tonnes, 105,190,501 tonnes, 93,168,548 tonnes, 80,616,692 tonnes, 71,259,199 tonnes, 42,711,830 tonnes, 34,497,462tonnes and 26,684,493 tonnes for each respectively.

Food and Agriculture Organization of the United Nations Statistics (FAOSTAT) mentions that China is the largest vegetables producer in world and produce a lots of different varieties of vegetables which included maize, tomatoes, sweet potatoes, dry onions, cabbages and other brassicas, cucumber and gherkins, carrots and turnips, chillies and peppers and also spinach. Nigeria is the country that mainly produce cassava.

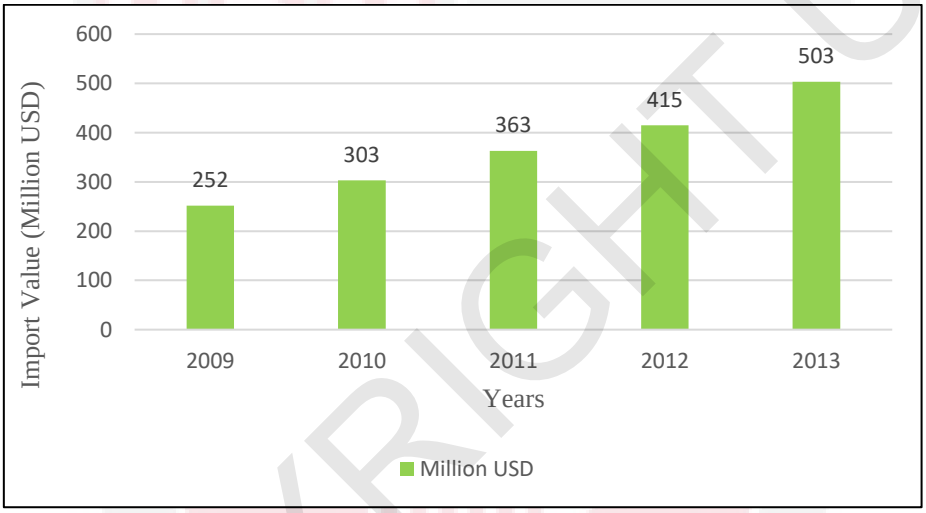
According to COMTRADE United Nations, the country which is largest import fruits and vegetables are Netherland and followed by U.S.A, France and Mexico. Most of the high-income countries are high quantity and value of import fresh fruits and vegetables than the upper middle income countries, lower middle income countries and low-income countries. Diop and Jaffee (2004) also write that Europe country is the main market and provider fruits and vegetable in global. According to the report of Food and Agriculture Organization of the United Nations (FAO), most of the developed countries are higher value in import fruit as there are not involved subsidize for planted but focus on export activities with low tariff.

World Economic Situation and Prospects (2014) reports that countries can classify into high-income countries, upper middle income countries, lower middle income countries and low-income countries which are determined by the gross nation income (GNI) of each country. Examples of the high-income countries are Netherland, U.S.A, France and Japan. For the examples of upper middle income countries are China, Malaysia, and Thailand. India and Indonesia will be consider as the examples of lower middle income countries. For the examples of low-income countries are Ethiopia, Nepal and Uganda.

1.2 Overview of Fruits and Vegetables Industry in Malaysia

The population of Malaysian estimated increases 1.3 per cent which are from 31,633.5 people in 2016 to 32,049.7 people in 2017. This population growth are involved 28.7 million of citizens and 3.3 million of non-citizens (Department of Statistics Malaysia, 2017). The world population grows will increase the demand of food and cause the insufficient on food (Pimentel, Huang, Cordova & Pimentel, 1997). As the population growth will cause several problem in agriculture sector, such as small amount of the work force in rural have to produce large quantity of food and fibre for fulfil the population (FAO, 2009).

According to the Department of Statistics Malaysia (2017), the GDP per capita of Malaysia is increase RM 1,764 from RM 37,123 in 2015 to RM 38,887 in 2016. The higher value of GDP per capita by state in 2016 are RM 101,420 of WP Kuala Lumpur, RM 61,833 of WP Labuan, RM 47,322 of Pulau Pinang, RM 44,616 of Selangor, RM 44,333 of Sarawak and RM 41,363 of Melaka. According to IDAL Invest in Lebanon (2014), the total amount of GDP in 2013 are divided into 48.1 per cent of services sector, 40.6 per cent of industry and 11.2 per cent of agriculture sector.

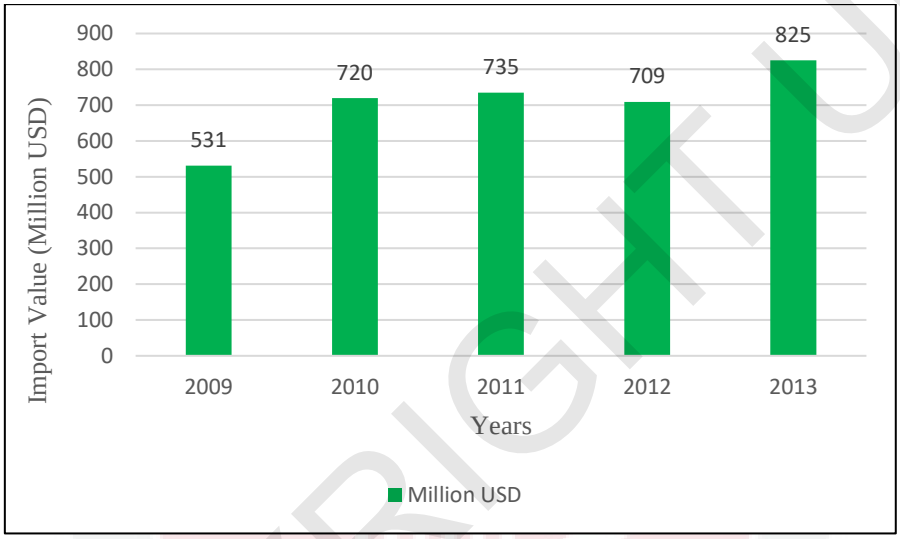


Source: Fruits and Vegetables Market of Malaysia. IDAL Invest In Lebanon (2014)

Figure 1.0: Malaysia Import Value for Fruits (2009-2013)

Figure 1.0 shows the Malaysia import value for fruits (Million USD) in 2009 to 2013. The fruits import value grows from USD 252 million in 2009 to USD 503 million in 2013. This figure proves that the request of import fruit are increase as the higher demand of consumption on fruits. According to IDAL Invest in Lebanon (2014), the total amount of grapes import to Malaysia are increase from 32,579 tonnes in 2009 to 44,595 tonnes in 2013. In 2013, the fruit that import to Malaysia also included 23,463 tonnes of pears, 90,353 tonnes of oranges, 78,382 tonnes of apples and 44,595 tonnes of mandarin.

According to the report from Export gov (2017), Malaysia is located at tropical area and not suitable for the temperate fruit growth. The demand on intake temperate fresh fruit increases and this includes citrus, apples and grapes. The total fruits imported is around USD 174 million (Mohamed & Rokiah, 2010). Most of the temperate fresh fruit are imported from U.S which is raising from 79 USD millions in 2016 to 83 USD millions in 2017. The citrus and apples are majority imports from China, but grapes and cherry are imports from U.S. (Export gov, 2017).



Source: Fruits and Vegetables Market of Malaysia. IDAL Invest In Lebanon (2014)

Figure 1.1: Malaysia Import Value for Vegetables (2009-2013)

Figure 1.1 shows that Malaysia import value for vegetables in between 2009 and 2013. In overall, the import value for vegetables are increase. The vegetables import value grows from USD 531 million in 2009 to USD 825 million in 2013. The total quantity of potato import to Malaysia are increase 3.5 per cent from the last 5years which are raising from 162,191 tonnes in 2009 to 185,205 tonnes in 2013. For the onion and garlic are decline in quality that import to Malaysia which are decrease from 456,111 tonnes in 2009 to 390,540 tonnes in 2013 and 94,998 tonnes in 2009 to 52,985 tonnes in 2013 for each respectively. According to Mohamed and Rokiah (2010), most of the vegetables are import from China, Taiwan and Thailand which cost around USD 401.7 million.

Table 1.0: Trade Data of Fruits and Vegetables (2011-2015)

	Fruits			Vegetables		
	Exports (RM Million)	**Imports (RM Million)**	**Balance of Trade (RM Million)**	**Exports (RM Million)**	**Imports (RM Million)**	**Balance of Trade (RM Million)**
2011	626	1,592	-966	751	2,735	-1,984
2012	616	1,804	-1,189	766	2,701	-1,935
2013	676	2,150	-1,474	889	3,221	-2,332
2014	793	2,321	-1,528	827	3,175	-2,348
2015	964	3,177	-2,212	1,097	4,481	-3,384

Source: Agrofood Statistics 2015. Ministry of Agriculture and Agro-Based Industry Malaysia (MOA)

Table 1.0 shows that the trade data of fruits and vegetables in between 2011 and 2015. The import value of fruits are increase from RM 1,592 million in 2011 to RM 3,177 million in 2015 while the export value of fruits are overall increase from RM 626 million in 2011 to RM 964 million in 2015. For the vegetables, the overall of import value are increase from RM 2,735 million in 2011 to RM 4,481 million in 2015 while the export value are overall increase from RM 751 million in 2011 to RM 1,097 million in 2015. In overall, even though the value of import and export for fruits and vegetables are growth but the import value of fruits and vegetable are still higher than the export value and this lead to negative trade balance in both fruits and vegetables grows in Malaysia.

The land used in agriculture sector are influenced by the government policies and globalization (Olayini, Ramli, & Sood, 2013). This can encourage to use the land for planted and increase the production. According to IDAL Invest in Lebanon (2014), the land area applied for agricultural purpose is estimate 20 per cent from the total land area in Malaysia which includes 77 per cent for the industrial crops and only 16 per cent for the paddy, fruits, vegetables and coconut.

According to World Bank Group, there are increase percentage of land area used from 22.7 per cent in 2010 to 23.9 per cent in 2014. This expansion of the land used in agriculture sector have

achieve the objective of National Agriculture Policy (DPN 3) 1998-2010, and the National Agro Food Policy (NAP) 2011-2020. Both policies are contribute to enhance the food security, improve the quality of food and promote the agricultural sector grows (Rubiah Abu Bakar & Abdul Manam Mohamad, 2015). The total land area used for fruit planted in Malaysia is approximate 310,000 hectares and the total production of fruit are 1.8 million metric tonnes while the total land area used for vegetables planted in Malaysia is approximate 44,000 hectares and the total production of vegetables are 637,000 million metric tonnes (Mohamed & Rokiah, 2010).

Table 1.1: Hectareage and Production of All Type of Fruit Crops by State, Malaysia (2012 – 2016)

Negeri *States*	2012		2013		2014		2015'		2016	
	Luas Bertanam *Planted Area* (ha)	Pengeluaran *Production* (mt)	Luas Bertanam *Planted Area* (ha)	Pengeluaran *Production* (mt)	Luas Bertanam *Planted Area* (ha)	Pengeluaran *Production* (mt)	Luas Bertanam *Planted Area* (ha)	Pengeluaran *Production* (mt)	Luas Bertanam *Planted Area* (ha)	Pengeluaran *Production* (mt)
JOHOR	54,002.6	589,067.0	42,512.2	511,365.8	45,057.9	599,715.0	48,626.7	652,125.6	41,440.9	532,249.2
KEDAH	12,689.8	83,542.3	11,394.5	80,041.7	8,986.7	54,311.8	11,202.7	71,392.4	12,218.1	71,064.8
KELANTAN	18,282.7	110,864.2	26,896.9	176,889.5	24,070.3	165,997.1	22,578.2	144,936.4	22,024.3	147,734.8
MELAKA	7,361.3	72,173.7	6,513.1	42,744.9	4,523.0	35,658.5	5,269.7	45,438.7	5,117.8	48,199.8
NEGERI SEMBILAN	7,922.3	61,901.7	8,332.4	81,913.3	9,029.7	85,445.0	6,829.2	70,251.9	6,746.1	72,172.7
PAHANG	20,604.9	106,805.7	25,839.0	120,349.0	30,847.7	202,005.4	30,701.2	218,940.8	27,569.2	253,031.2
PERAK	13,795.6	95,084.6	13,234.1	112,271.4	13,722.3	98,290.5	12,442.1	127,873.2	12,134.6	114,764.0
PERLIS	317.6	3,621.8	968.1	3,904.5	403.3	922.7	2,851.1	20,642.9	2,828.5	8,892.1
PULAU PINANG	2,656.8	20,228.3	5,663.4	27,899.2	2,221.3	14,963.4	2,285.5	17,067.7	2,359.1	19,366.0
SELANGOR	10,617.2	106,092.3	2,477.8	29,395.5	3,985.4	24,588.9	2,279.1	20,042.9	2,554.9	28,724.3
TERENGGANU	4,848.2	35,250.8	6,201.3	48,789.1	4,745.3	44,465.4	6,698.0	53,637.2	8,623.3	72,681.3
SEM. MALAYSIA *Peninsular Malaysia*	**153,099.1**	**1,284,632.5**	**150,032.6**	**1,235,564.0**	**147,594.0**	**1,326,363.8**	**151,763.5**	**1,442,349.6**	**143,616.8**	**1,368,880.1**
SABAH	17,673.6	141,280.0	17,087.2	131,745.8	16,659.0	139,408.8	16,295.7	142,222.5	16,950.6	145,239.8
SARAWAK	34,462.8	168,318.2	35,131.0	176,406.7	35,072.8	155,659.1	35,280.4	183,623.4	34,237.7	150,289.1
W.P. LABUAN	231.6	547.8	342.5	1,001.2	243.7	543.6	222.3	526.9	165.0	384.4
MALAYSIA TIMUR *East Malaysia*	**52,368.0**	**310,146.0**	**52,560.7**	**309,153.7**	**51,975.5**	**295,611.5**	**51,798.4**	**326,372.8**	**51,353.3**	**295,913.3**
MALAYSIA	**205,467.1**	**1,594,778.5**	**202,593.3**	**1,544,717.7**	**199,569.5**	**1,621,975.3**	**203,561.9**	**1,768,722.5**	**194,970.0**	**1,664,793.3**

Source: Fruit Crop Statistics MALAYSIA 2016, Department of Agriculture Putrajaya, Malaysia (DOA)

Table 1.1 shows the hectareage and production of all type of fruit crops according state in Malaysia from year 2012 to year 2016. The land area used for fruits planted and the total production of Peninsular Malaysia is higher than East Malaysia in between 2012 to 2016. In overall, the land area used for fruits planted in Malaysia are decline from 205,467.1 hectares in

2012 to 194,970.0 hectares in 2016. While the total production of fruit in Malaysia are increase from 1,594,778.5 metric tonnes in 2012 to 1,664,793.3 metric tonnes in 2016.

Table 1.2: Hectareage and Production of Vegetables by State, Malaysia (2012-2016)

NEGERI *State*	2012		2013		2014		2015		2016	
	Luas Berhasil *Harvested area* (Ha)	Pengeluaran *Production* (Mt)	Luas Berhasil *Harvested area* (Ha)	Pengeluaran *Production* (Mt)	Luas Berhasil *Harvested area* (Ha)	Pengeluaran *Production* (Mt)	Luas Berhasil *Harvested area* (Ha)	Pengeluaran *Production* (Mt)	Luas Berhasil *Harvested area* (Ha)	Pengeluaran *Production* (Mt)
Johor	7,661.3	161,106.7	11,186.6	325,326.0	13,851.5	278,027.4	14,375.5	250,466.0	14,235.0	228,956.6
Kedah	1,147.8	13,637.0	1,138.5	13,789.4	931.8	11,073.6	1,385.5	19,385.5	1,211.9	14,093.1
Kelantan	3,196.4	66,186.2	3,471.5	78,283.1	3,197.6	59,639.6	3,144.7	71,462.5	4,374.6	169,509.8
Melaka	1,235.7	25,922.1	1,606.7	16,072.6	1,572.6	17,350.8	1,779.5	18,963.5	1,599.4	19,249.4
Negeri Sembilan	1,320.7	24,294.2	1,842.4	23,042.4	2,094.2	31,851.9	1,861.8	25,896.2	1,607.7	21,293.7
Pahang	17,172.8	409,496.4	22,220.2	615,564.0	25,030.0	757,822.9	24,449.9	721,447.5	17,821.9	473,974.5
Perak	3,118.2	40,196.7	4,153.2	54,268.9	3,971.0	58,496.1	4,408.3	69,032.4	5,220.7	88,503.0
Perlis	28.7	436.7	67.7	693.8	68.6	930.3	72.9	895.0	81.4	1,421.7
Pulau Pinang	944.6	13,483.5	985.5	15,438.2	881.3	12,429.6	1,024.1	14,344.2	888.2	11,738.2
Selangor	5,223.1	82,478.2	5,380.5	81,533.9	5,012.6	62,643.2	2,701.1	38,149.5	2,584.3	36,210.2
Terengganu	756.3	9,956.8	1,118.2	14,011.4	885.6	11,390.4	917.7	14,184.9	1,029.1	14,817.8
Sem. Malaysia *Peninsular Malaysia*	**41,805.7**	**847,194.5**	**53,171.1**	**1,238,023.6**	**29,779.0**	**1,301,655.8**	**56,121.0**	**1,245,227.3**	**50,654.2**	**1,079,768.0**
Sabah	2,083.6	23,449.9	3,426.5	42,050.2	2,808.0	36,912.6	2,687.1	30,250.9	3,301.0	38,960.4
Sarawak	3,707.3	44,245.2	3,939.0	46,041.9	4,020.2	46,131.3	4,019.2	46,701.0	4,333.4	50,361.2
W. P. Labuan	154.2	1,030.6	123.6	388.3	153.1	414.8	151.9	346.5	72.4	320.1
Jumlah *Total*	**47,750.7**	**915,920.2**	**60,660.1**	**1,326,504.0**	**35,955.0**	**1,385,114.5**	**62,979.2**	**1,322,525.6**	**58,361.0**	**1,169,409.7**

Source: Vegetables and Cash Crops Statistics MALAYSIA 2016, Department of Agriculture Putrajaya, Malaysia (DOA)

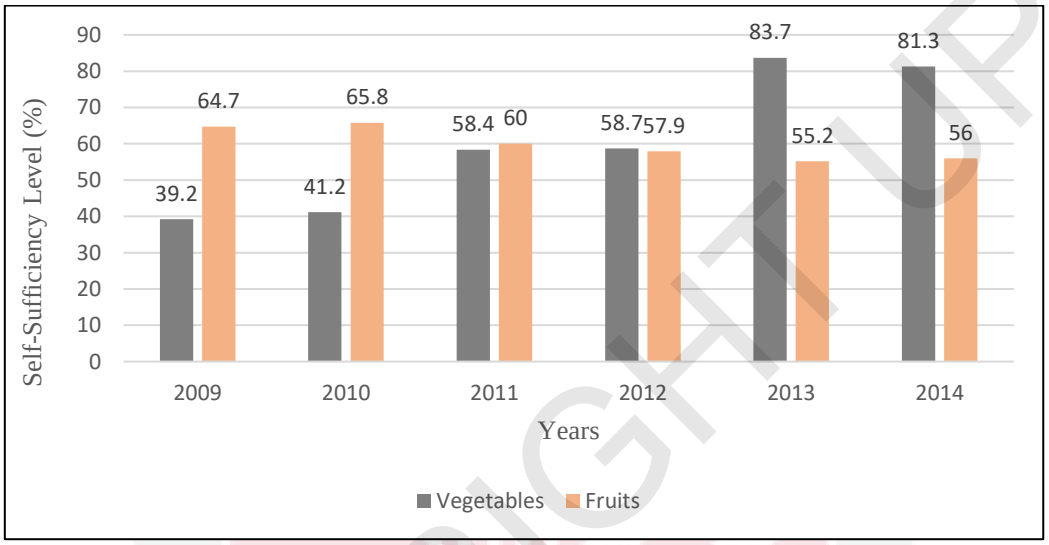
Table 1.2 shows the hectareage and production of vegetables according state in Malaysia from year 2012 to year 2016. The harvested area and the total production of vegetables of Peninsular Malaysia is higher than East Malaysia in between 2012 to 2016. Even though there had decline in harvested area and production of vegetables between years but for overall the vegetables harvested and the total production of vegetables are increase in 2016 if compare with the year 2012.

According to Department of Agriculture Putrajaya Malaysia (DOA), the planted area of fruit in Malaysia ranking from durian, banana, rambutan, pineapple, watermelon, cempedak, dokong, mango, duku and jackfruit. Durian is the highest hectareage for planting which are 39.8 per cent or 66037.5 hectares and the production is 302645.8 metric tonnes. Following by banana which is 16.9 per cent or 28036.4 hectares of planted area and 309507.6 metric tonnes

of production. The planted area of rambutan is 9.3 per cent or 15386.6 hectares and 63699.9 metric tonnes of production. The planted area of pineapple is 7.9 per cent or 13148.9 hectares and 391714.4 metric tonnes of production. The planted area of watermelon is 7.2 per cent or 11986.8 hectares and 192909.8 metric tonnes of production. The planted area of cempedak is 4.6 per cent or 7584.6 hectares and 28929.2 metric tonnes of production. The planted area of dokong is 4.0 per cent or 6645.8 hectares and 33832.5 metric tonnes of production. The planted area of mango is 3.5 per cent or 5816.4 hectares and 17429.7 metric tonnes of production. The planted area of duku is 3.4 per cent or 5663.1 hectares and 23130.6 metric tonnes of production. The planted area of jackfruit is 3.3 per cent or 5413.9 hectares and 28767.2 metric tonnes of production.

Department of Agriculture Putrajaya Malaysia (DOA) mentions that the harvested area of vegetables in Malaysia ranking from brassica, maize, cucumber, spinach, water spinach, long bean, cabbage, chilli, tapioca and lady's finger. Brassica is the highest hectareage for harvested area which are 26 per cent or 14,097.8 hectares and the production is 224,126.2 metric tonnes. Following by maize which is 19 per cent or 10,042.0 hectares of planted area and 64,867.3 metric tonnes of production. The planted area of cucumber is 8 per cent or 4,358.8 hectares and 97,621.1 metric tonnes of production. The planted area of spinach is 8 per cent or 4,276.1 hectares and 54,823.3 metric tonnes of production. The planted area of water spinach is 8 per cent or 4,136.8 hectares and 45,041.8 metric tonnes of production. The planted area of long bean is 8 per cent or 4,090.9 hectares and 63,472.9 metric tonnes of production. The planted area of cabbage is 7 per cent or 3,773.6 hectares and 101,258.4 metric tonnes of production. The planted area of chilli is 6 per cent or 3,175.8 hectares and 43,738.1 metric tonnes of production. The planted area of topioca is 6 per cent or 3,148.2 hectares and 61,160.6 metric tonnes of production. The planted area of lady's finger is 6 per cent or 3,126.9 hectares and 49,057.4 metric tonnes of production.

According to FAO (2013), the total production of fruit and vegetables in Malaysia are 2.28 million tonnes but the fruit and vegetables waste generated in Malaysia are around 0.68 million tonnes from the total amount of production, This included 25 per cent losses and wastage in processing, 10 per cent losses and wastage in distribution and 7 per cent losses and wastage in consumption.



Source: Agrofood Statistics 2015. Ministry of Agriculture and Agro-Based Industry Malaysia (MOA)

Figure 1.2: Self-Sufficiency Level of Major Food Commodities (2009-2014)

Figure 1.2 shows that self-sufficiency level of the vegetables and fruits in between 2009 and 2014. The overall self-sufficiency level of vegetables in Malaysia are increase which are raising from 39.2 per cent in 2009 to 83.7 per cent in 2013, even though it is slightly decline in the following year which accounted 81.3 per cent. For the overall self-sufficiency level of fruits in Malaysia are decrease from 64.7 per cent in 2009 to 56.0 per cent in 2014.

According to Department of Agriculture Putrajaya Malaysia (DOA), the average price of the major selected fruits in Malaysia are higher ranking from durian, mangoesteen, mango, starfruit, rambutan, guavas, jackfruit, banana, pineapple, papaya and watermelon. Most of the average retail price of this selected major fruit are increase according years and the average retail price for the major selected fruits which produce in Malaysia are higher price. According to

Department of Statistics Malaysia (2017), the average price for Apple Fuji is cost RM 1.68 in 2016. While the apple with green skin and apple with red skin are cost only RM 1.11 and RM 1.19 for each respectively.

Department of Agriculture Putrajaya Malaysia (DOA) mentions that the average price of the vegetables in Malaysia are higher ranking from red chilli, green chilli, ginger, four angled bean, French bean, lettuce, lady's finger, Chinese kale, long bean, leaf mustard, taro, brinjal, bitter gourd, angled loofah, tomato, Chinese spinach, sweet potato, cabbage, water spinach, yambean, pumpkin and cucumber. Most of the average retail price of the vegetables are raising according years and the average retail price for the vegetables which produce in Malaysia are not lower.

1.3 Fruits and Vegetables Intake in the World

The significant elements of health diet are fruits and vegetables as it can ensure the body health and far away from the non-communicable diseases (NCDs). According to World Health Organization (2003), lack of intake fruits and vegetables will cause around 1.7 million or 2.8 per cent of the mortality worldwide. Inadequate consumption of fruit and vegetables lead to worldwide death and this included 14 per cent of gastrointestinal cancer, 11 per cent of heart disease and 9 per cent of stroke. According to IARC (2003), there are only Israel, Italy and Spain from the total twenty-one countries are achieve in eating fruits and vegetables with 400g per capita in daily. According to Pollack (2001) mentions that the per capita per year consumption on fruits and vegetables of low income countries are only 86 kg but for the per capita per year consumption on fruits and vegetables of high income countries are 223kg. For examples, there are only 100g of fruits and vegetables daily consumed by the individual from India, Mali, and Pakistan, 300g of fruits and vegetables daily consumed by the individual from

Australia, European and United States of America and 400g of fruits and vegetables daily consumed by the individual from Israel, Italy, and Spain.

Table 1.3: EU-28 Daily Consumption of Fruit and Vegetables (2014)

		Daily	
	Not Daily	**From 1 to 4 Portions**	**5 Portions or More**
EU-28	34.4	51.4	14.1
Belgium	16.1	71.2	12.7
Bulgaria	58.6	37.0	4.4
Czech Republic	46.3	44.6	9.1
Denmark	37.6	36.5	25.9
Germany	45.2	44.9	9.9
Estonia	34.9	47.8	17.3
Greece	30.1	62.1	7.8
Spain	25.0	62.6	12.4
France	34.7	50.4	14.9
Croatia	27.5	65.5	7.0
Italy	23.0	65.2	11.9
Cyprus	32.6	51.3	16.1
Latvia	48.5	40.2	11.4
Lithuania	41.5	44.5	14.1
Luxembourg	36.2	48.7	15.1
Hungary	33.1	56.8	10.1
Malta	35.6	47.6	16.8
Netherlands	45.9	29.0	25.0
Austria	31.8	61.1	7.2
Poland	33.2	56.8	10.1
Portugal	20.7	61.1	18.2
Romania	65.1	31.4	3.5
Slovenia	27.0	65.5	7.5
Slovakia	46.6	42.6	10.8
Finland	42.3	44.8	12.9
Sweden	36.5	54.5	9.0
United Kingdom	21.3	45.6	33.1
Norway	30.9	62.6	6.5
Turkey	33.7	63.2	3.0

Source: The Fruits and Vegetables Sector in the EU. Eurostat (2016)

Table 1.3 shows the daily and not daily consumption of fruits and vegetables among 28 countries in EU in year 2014. In overall, most of the population in all of the countries are not daily consume fruits and vegetables or even consume but still not enough 5 portions of fruits and vegetables per day. For the population in all the 28 countries who do not consume daily

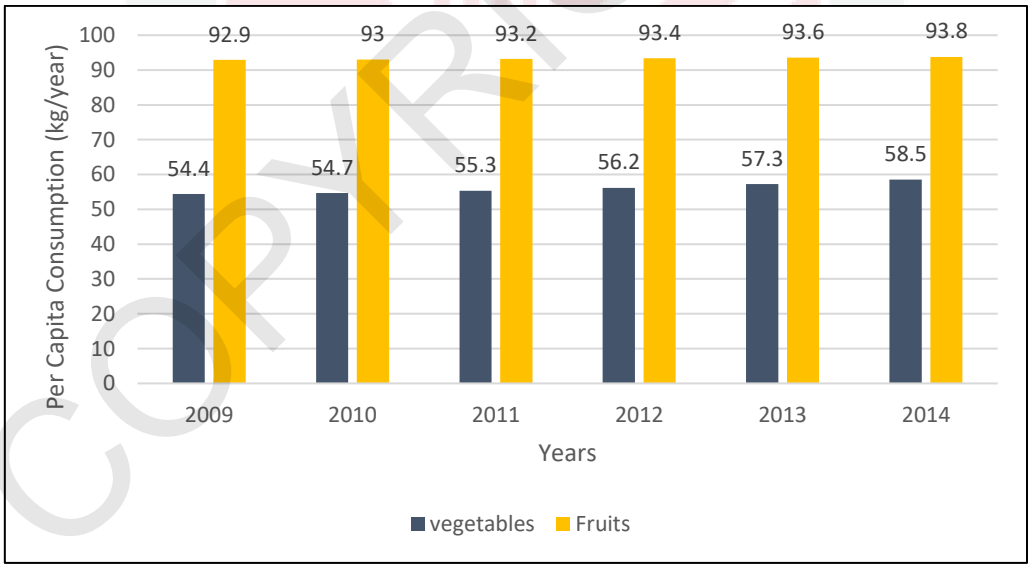
are 34.4 per cent, while for the daily consume but not enough 5 portions are 51.4 per cent and 14.1 per cent for the daily consume 5 portions of fruits and vegetables. Among the countries which highly consume 5 portion of fruits and vegetables daily are 33.1 per cent from United Kingdom, 25.9 per cent from Denmark and 25.0 per cent from Netherlands while Turkey have only 3.0 per cent to consume enough 5 portions daily. For the countries which highly consume from 1 portion to 4 portions of fruits and vegetables daily are 71.2 per cent from Belgium, 65.5 per cent from both Croatia and Slovenia. In turn, Netherlands have only 29.0 per cent for consumption of fruits and vegetables in between 1 portion to 4 portions. For the countries which higher lacking on consume fruits and vegetables daily are 65.1 per cent from Romania, 58.6 per cent from Bulgaria and 48.5 per cent from Latvia but Belgium have only 16.1 per cent for lacking consumption. According to Eurostat (2016), the intra EU trade is active in fruit and vegetables which are 61.5 per cent of fruit and 38.5 per cent of vegetables from the total value of internal trade. Even though there are higher trading value in fruit and vegetables but the daily consumption portion of fruit and vegetables still not achieved by the population.

According to World Health Organization and FAO (2003), WHO/ FAO workshop is develop for encourage more and more people to consume sufficient fruits and vegetables so that can increase their body health in order to overcome the problem of lack of having fruits and vegetables, especially for control the non-communicable disease. There is a report of Fruits and vegetables for health is mentions that the important for raising intake of fruits and vegetables are organize at WHO Kobe Centre for Health Development in Japan. In Australia, there are organize the programme with title of Go for 2 and 5 to encourage people more consume fruits and vegetables through the mass media campaign (Pomerleau, Lock, Knai, & McKee, 2005).

1.4 Fruits and Vegetables Intake in Malaysia

According to Department of Statistics Malaysia (2017), the mortality rate based on medically in Malaysia is increase from 51.8 per cent in 2015 to 52.8 per cent in 2016. The death rate is totally increase 1.0 per cent. Ischaemic heart diseases cause 13.7 per cent of people death in 2015 and 13.2 per cent in 2016. Even though it is decline 0.5 per cent of death but still is the major cause of death in Malaysia. Followed by Pneumonia which also higher rate of cause death and this cause increases from 10,200 in 2015 to 10,678 in 2016. The cause of death along Malaysian in 2016 also included 6.9 per cent from cerebrovascular diseases, 5.4 per cent from transport accidents and 2.2 per cent from malignant neoplasm of trachea, bronchus and lung. Approximately 8.7 million of Malaysian adults did not achieve the recommended intake of 5 servings of fruits and vegetable daily (MOH, 2006). The dietary guidelines suggested by WHO is not achieve in Malaysia (Yen, Tan, & Nayga, 2011). The total consumption of fruit and vegetables per capita daily are below 400 grams from the guidelines which are accounted 228 grams and this indicate that Malaysian are not intake enough of fruit (Yen et al., 2011). According to Ministry of Health Malaysia (2015), there are more and more people getting non-communicable disease nowadays because lack of having healthy diet. Dr Mohd Jusoh (2016) said that there are only one of the Malaysian is enough in intake fruits and vegetables every day from the total fifteen of the Malaysians and this unhealthy intake behaviour will cause the people high risk in getting obesity and non-communicable disease. The percentage of intake fruits and vegetables every day among Malaysian are decrease 6 per cent from the 7.5 per cent in 2011. A research had done with determine that only one of the people from the total 41 people in Terengganu is intake sufficient of fruits and vegetables every day (Dr. Mohd Jusoh, 2016). Malaysia is the country which lowest intake behaviour on fruits and vegetables from the 52 countries in world (Justin et al., 2009). Othman et al. (2013) mentions that the behaviour of intake fruits and vegetables of Malaysia are still lower than other countries.

According to Othman et al. (2013), the most favourable fruits consumed by the adults in Malaysia are import fruits such as apple and orange. While the most favourable Vegetables consumed by the adults in Malaysia is chilli. From the result in this research, the weekly consumption of fruit ranking from 71.8 per cent of apple, 69.3 per cent of banana, 65 per cent of orange, 57.5 per cent of watermelon, 51.9 per cent of papaya, 49.2 per cent of mango, 39 per cent of grape, 37.4 per cent of honeydew, 37.1 of rambutan and 35.5 per cent of pears. While for the higher weekly consumption of vegetables are 76.1 per cent of chilli and follow by 68.5 per cent of cabbage, 66.2 per cent of cucumber, 62.9 per cent of leaf mustard, 60.8 per cent of tomatoes and 59.2 per cent of water convolvulus. Abdul (2016) writes that most of the large food retailer like hypermarket and supermarket are hot selling in import food from the western countries. In the large food retailer, the temperate fruits are distribute in large quantity than local production fruits such as U.S cherries (Abdul, 2016).



Source: Agrofood Statistics 2014. Ministry of Agriculture and Agro-Based Industry Malaysia (MOA)

Figure 1.3: Per Capita Consumption of Fruits and Vegetables (2009-2014)

Figure 1.3 shows that per capita consumption of the fruits and vegetables in between 2009 and 2013. Per capita consumption of fruits and vegetables are slightly increase from 2009 to 2013 For per capita consumption of vegetables which are increase from 54.4 kg to 58.5 kg. While

for the per capita consumption of fruits are increase from 92.9 kg to 93.8 kg. Dr.Subramaniam (2017) mentions that there are more than 85 per cent of the people are not adequate intake fruits and vegetables in every day. Most of the nations are lack of awareness in consume fruits and vegetables and they are more likely to consume the food which are higher in cholesterol and calories. According to Cheong et al. (2017), most of the old people are not sufficient in having fruits and vegetables daily which around 91.9 per cent from the total amount of 2752 respondents are not achieve the dietary guidelines.

Dr Mohd Jusoh (2016) held a campaign with the title of Eat Vegetables and Fruits Daily 2016 in Jalan Padang Hiliran, Cabang Tiga to encourage Malaysian intake more or sufficient fruits and vegetables every day. According to Ministry of Health Malaysia (2003), there are implemented a campaign to encourage people more awareness toward the health with intake the healthy diet and reduce the risk of getting disease among the nation. This campaign named as Healthy Lifestyle Campaign which was started at 1991. Besides, the World Health Survey held in year 2002 and year 2003 founded a result which shows that there are 85 per cent of male and 85.5 per cent of female are still not sufficient in intake fruits and vegetables (Hall et al., 2009).

1.5 The Nutritional Value of Fruits and Vegetables

According to WHO and FAO (2003), the significant elements of a healthy diet are fruits and vegetables which can reduce the risk of getting major disease if the people are enough having the fruits and vegetables every day. US Department of Agriculture (2010) reports that each individual should follow the dietary guidelines and the food pyramid with consume five or excess five portions of fruits and vegetables in each day. According to World Health Organization and FAO (2003), each people should having minimum 400g or five portions of

fruits and vegetables per day to reduce the risk of getting diseases, such as chronic diseases. Ministry of Health Malaysia (2010) suggests that two portions of fruits and three portions of vegetables are required to consume by everyone in each day. Two portions of fruits are indicate that 160 g of fruits while three portions of vegetables are indicate that 240 g of vegetables (Nurul et al., 2012). According to WHO and FAO (2003), having a lot of different types of fruits and vegetables can make sure an individual is sufficient in nutrient and fibre that required by body but this is not included potatoes, cassava and other starchy roots.

According to U.S Food and Drug Administration (FDA), apple, banana, pear and sweet cherries are high in calories and carbohydrate. For the dietary fiber which involved high amount are pear, apple and kiwifruit. Apple also contain higher gram of sugar which is 25g and followed by 20g of grape and watermelon and 19g of banana. Cantaloupe contain 120 per cent of vitamin A and grapefruit contain 35 per cent and 30 per cent from watermelon. Vitamin C along the fruits that higher amount in kiwifruit, strawberries, orange and grapefruit. For the fruits that high contain of calcium are grapefruit, kiwifruit and tangerine. Watermelon also contain high amount of iron than others.

According to U.S Food and Drug Administration (FDA), potato, sweet potato, sweet corn, onion, broccoli and carrot are high in calories and carbohydrate. For the dietary fiber which involved higher amount are sweet potato, onion, broccoli and Green (Snap) Beans. Onion contains higher gram of sugar which is 9g and followed by 7g of sweet potato and 5g of sweet corn and carrot. Leaf lettuce contains 130 per cent of vitamin A and sweet potato contains 120 per cent of vitamin A and carrot contains 110 per cent of vitamin A. Vitamin C along the vegetables that higher amount in broccoli, bell pepper and cauliflower. Broccoli is the vegetable that higher contain of calcium. For the vegetables that contain higher amount of iron are broccoli and potato.

United States Department of Agriculture (USDA) mentions that the suggestion of daily fruits consumption for everyone. For the children, they are require around 1 cup to 1 ½ cups of fruits. Women are requires around 1 ½ cups to 2 cups of fruits. While for the men are needed 2 cups of fruits in every day. 1 cup is not only indicate that means of 1 cup of fruits but also can be described as 100 per cent of fruits juice and ½ cup of dried fruits. For apple, half of the large size apple or one small size of apple can be consider as 1 cup. While for the banana, one large slide of banana is consider as 1 cup.

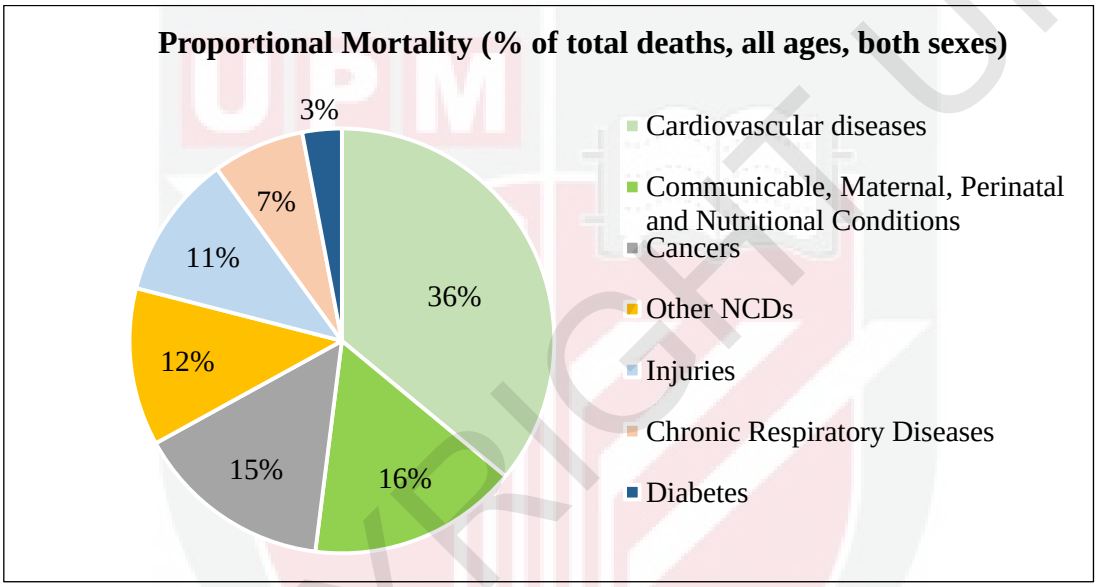
United States Department of Agriculture (USDA) suggested that the daily vegetables consumption for the children are require around 1 cup to 1 ½ cups of vegetables. Women requires around 2 cups to 2 ½ cups of vegetables. While for the men are needed 2 ½ cups to 3 cups of vegetables. Dark green vegetables likes spinach which counted as 1 cup are one cup of spinach cooked or two cups of uncooked. Tomato is one of the red and orange vegetables and one large in size of raw tomato is considered as 1 cup. For the beans, one cup of the whole or mashed cooked will be considered as 1 cup. Corn is one of the starchy vegetables and 1 cup of the corn can describe as one large ear of corn. For other vegetables likes lettuce, this is requires two cups of raw shredded lettuce for considered as 1 cup.

1.6 Risk of Lacking Intake on Fruits and Vegetables

Inadequate of eating fruits and vegetables will cause digestive issues as it contains insoluble fibre and lack of this fibre will cause constipation and haemorrhoids. Shortage of intake fruits and vegetables will increase the risk of getting diseases because lack of soluble fibre to regulate blood levels with absorb the glucose and cholesterol. Insufficient eating fruits and vegetables will also increase risk of getting high blood pressure or stroke due to lack of potassium (Bazzano, 2005).

Moreover, lack intake of fruits and vegetables will lead to deficiency of vitamin or mineral. This deficiency makes improper function on wound healing and blood clotting. Shortage of eating fruits will bring inflammation and tumor because lack of phytochemical (Zalilah et al., 2013).

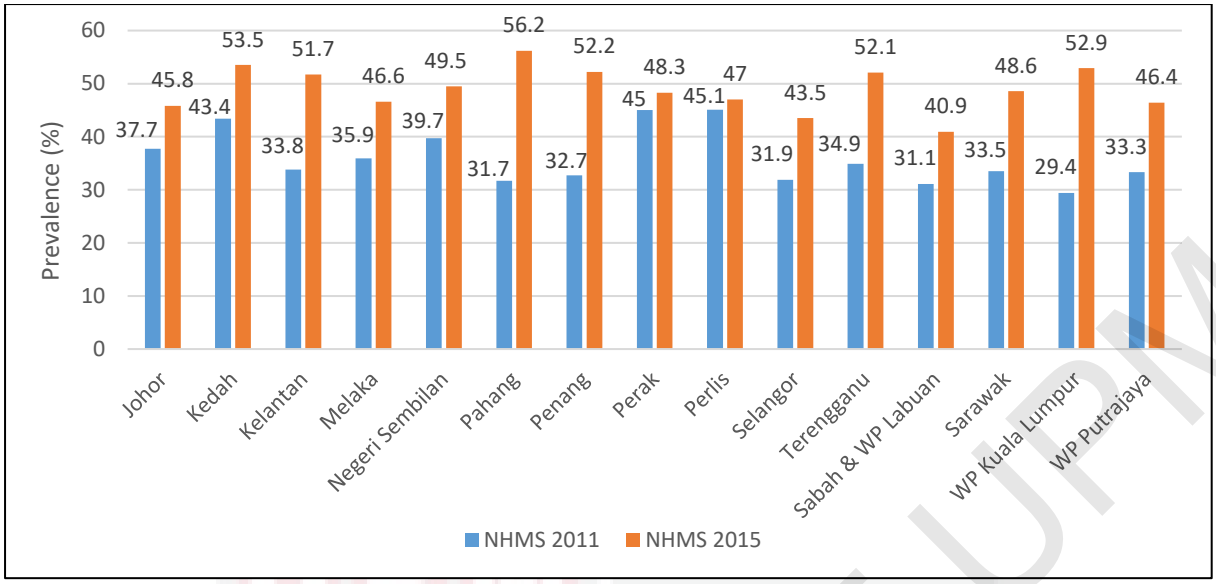
According to World Health Organization and FAO (2003), insufficient in consumption of fruits and vegetables are the top 10 mortality risk factors.



Source: Non-Communicable Diseases: Malaysia in Global Public Health (2014). WHO

Figure 1.4: Proportional Mortality (% of total deaths, all ages, both sexes)

Figure 1.4 shows the proportional mortality of Malaysia in between 2000 and 2012. The total amount of deaths are 146,000 people and death caused by NCDs are around 73 per cent. The majority are caused by cardiovascular diseases which are 36 per cent and the following by 16 per cent of communicable maternal, perinatal and nutritional conditions. This proportional mortality also included 15 per cent of cancers, 12 per cent of other NCDs, 11 per cent of injuries, 7 per cent of chronic respiratory diseases and 3 per cent of diabetes. According to Ministry of Health Malaysia (2015), there are approximate 3.5 million people getting diabetes disease, 6.1 million people getting hypertension and 9.6 million people getting hypercholesterolemia.



Source: National Health & Morbidity Survey 2015, NCD Risk Factors. Ministry of Health Malaysia (MOH)

Figure 1.5: Prevalence of Hypercholesterolemia for Who Are More Than 18 Years by State, NHMS (2011 & 2015)

Figure 1.5 shows that the prevalence of hypercholesterolemia among the people who are aged above 18 by state in between 2011 and 2015. There are more and more people who are aged above 18 are getting hypercholesterolemia in Malaysia. In overall, most of the people who are aged above 18 getting hypercholesterolemia are come from Pahang, Kedah, WP Kuala Lumpur, Penang, Terengganu and Kelantan in 2015.

1.7 Problem Statement

Population global grows which estimate from 6.9 billion in 2010 to 9.15 billion in 2050 and this also included the growth of population of Malaysia (FAO, 2012; Department of Statistics Malaysia, 2017). The demand of consumption food and fruit will be increase as the population growth (FAO, 2012). The GDP per capita of Malaysia is increases (Department of Statistics Malaysia, 2017). This cause the purchasing and consumption behaviour of people changed (FAO, 2017). According to Dr.Subramaniam (2017), most of the Malaysian are like to consume the high cholesterol and calories foods and this cause more than 85 per cent of the people are not adequate intake fruits and vegetables in every day.

WHO and FAO (2003) reports that fruits and vegetables are the important foods for promote body health because fruits and vegetables can help for reduce the risk of getting disease if the individual are adequately in consumption fruits and vegetables. There is also founded a dietary guideline with consume minimum at 400 grams or 5 portions of fruits and vegetables for an individual per day to maintain the body health (Ministry of Health Malaysia, 2010). Even this is very important issue but most of countries still are not achieve the consumption of fruits and vegetables based on the dietary guideline and this is also included Malaysia (World Health Organization, 2003). Malaysia is lower consumption on fruits and vegetables than other countries (Othman et al., 2013).

In the same time, this insufficient consume fruits and vegetables are increases the risk of getting non-communicable disease such as diabetes, high blood pressure, hypercholesterolemia, cancers, stroke and obesity among Malaysian and the mortality rate of Malaysian which caused by the non-communicable disease are also raising (Ministry of Health Malaysia, 2015). However, Malaysian still lack of awareness consumption toward fruits and vegetables (Hall et al., 2009).

Thus, there is needed to understand the factor that influence Malaysian in consumption on fruits and vegetables in order to overcome the problem. This can bring helpfulness information for the marketer and supplier of distribute fruits and vegetables in Malaysia so that they can undergo an efficient action or profitable plan for manage in this fruits and vegetables industry. Besides, Government also can more understanding the factors that influence consumption behaviours of consumers on fruits and vegetables so this can help them efficiency in encourage nations promote the heathy diet in order to overcome this problems.

1.8 Objective

The overall objective of this study is to investigate the factors that influence on consumption behaviour of fruits and vegetables among consumers in Klang valley.

Specific objectives are:

1. To determine the consumption behaviour of consumers towards fruits and vegetables.

2. To identify the association between socio demographic characteristics and the consumption behaviour of fruits and vegetables.

1.9 Significance of the Study

The purpose of this study is to determine the factors that influence on consumption behaviour of fruits and vegetables among customers in Klang Valley. Each individual have their different own behaviour on consumption and the factors that influence consumption of each individual. From this study, this can investigate well and find out the factors that influence on consumption behaviour of fruits and vegetables among consumers.

The information of this study after completed is also can become as a reference for students. This can provide some useful information for the students who are interesting to do the relevant research on this topic.

Furthermore, this study also can bring helpful for the marketer and supplier. The information of this study makes the marketer and supplier can more understanding on the consumer's consumption behaviour and then distribute the varieties of fruits and vegetables depend on the factors that influence on consumption behaviour of consumer. This can makes the marketer and supplier to reach the satisfaction of consumer with supply the consumer's needs and wants.

Thus, this can help the marketer and supplier to achieve succeed in their business and earn profits.

This study also provide a useful information for Government to encourage the people to eat more fruits and vegetables. This is because government can be more understanding the factors that influence people still low in consumption on fruits and vegetables in order to overcome the problem.

Apart from that, this study also provide important information to community which can cause people to be more awareness on healthy diet. Most of the people still lack of alertness on the risk of lacking intake fruits and vegetables so the information of this study can be helpful for encourage people to intake more fruits and vegetables in order to overcome the problem.

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