AN OVERVIEW OF NUTRITIONAL STATUS AND FOOD CONSUMPTION PATTERN AMONG MALAYSIAN POPULATION

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Introduction

Food is one of the basic human needs. Humans need food to live. However, food is not only used to live, but also serve as a luxury item. According to the Malaysia Household Income and Expenditure Survey (HIES) for 2009/10, food and non-alcoholic beverages is the second highest expenditure among Malaysians with 20.3 percent of average total expenditure (Malaysia Department of Statistics, 2012). Furthermore, the overeating of food among Malaysians has increased the prevalence of obesity and overweight. The World Health Organisation (WHO) (2013) reported that Malaysia was ranked as the sixth in Asia for the highest adult obesity rate. This is caused by the imbalance diet and high consumption of energy-dense food and low intake of vegetables and fruits. Furthermore, the study by Norimah *et al.* (2008) showed that 97 percent of Malaysian adults consume rice, marine fish and sweetened condensed milk daily whereby this type of food were reported as energy-dense. Even though rice is the staple food for Malaysians, but rice contributes more energy than other food in Malaysia. Zainal Badari *et al.* (2012) also reported that typical Malaysian diet consists mainly of protein-based and energy-based food and low intake of fruits and vegetables. In order to know more about the pattern of Malaysian food intake, several factors need to be clarified, such as household income, food expenditure, nutritional status and eating pattern. This paper will provide a clear overview of the factors that contribute to the nutritional status and food consumption pattern of the Malaysian population.

The Malaysian situation

The Malaysian population in 2010 was 28.3 million, with the proportion of racial groups being 67.4 percent Bumiputera, 24.6 percent Chinese, 7.3 percent Indian, and 0.7 percent others. The Malays were the predominant ethnic group in Peninsular Malaysia (63.1%). The total population in the working age group (15-64 years old) was 19.1 million, of which 72.8 percent were from urban areas while the rest were from rural areas (Malaysia Department of Statistics, 2011). This number represents the human resources of Malaysia for the country's development and growth. In the past decade, Malaysia has been enjoying rapid growth and a low inflation rate. However, at the beginning of 2004, the consumer price index (CPI), which measures the inflation showed an increase due to the increases in fuel price. Consequently, the imbalance in income among Malaysians has increased since 2005, especially in the rural and urban areas, albeit in 2009, the overall income distribution was more balanced (Malaysia Prime Minister's Department, 2010). The household income categories for Malaysians were based on the monthly income of less than MYR2300 (lower-income), MYR2301-MYR5599 (middle-income) and equal or more than MYR5600 (higher-income). In 2012, 40.0 percent of Malaysian households had a monthly income of less than MYR2300, with the mean for monthly income being MYR1847. Of this total, 90.6 percent were lower-income households. Based on the strata, the distribution of lower-income households between rural (48.6%) and urban (51.4%) areas was evenly distributed (Malaysia Prime Minister's Department, 2014).

At the same time, Malaysia plans to reduce the poverty rate among the population to 0.0 percent by year 2020. The poverty rate declined from 8.7 percent in 1995 to 6.0 percent in 2002, and continued to decline to 1.7 percent in 2012. The hard-core poverty rate also reduced from 2.0 percent in 1995 to 0.2 percent in 2012 (Malaysia Department of Statistics, 2014). It seems that the incidence of poverty and hard-core poverty among rural households was also reduced from 14.8 percent in 1999 to 3.4 percent in 2012 and 3.6 percent to 0.6 percent respectively, within the same period (Malaysia Prime Minister's Department, 2014). The incidence of poverty was based on the poverty line where those who had a monthly income below than MYR720 (Peninsular Malaysia; urban: MYR740; rural: MYR700), MYR830 (Sarawak; urban: MYR860; rural: MYR810), and MYR960 (Sabah; urban: MYR970; rural: MYR940) were considered poor (Malaysia Prime Minister's Department, 2006). The poverty line of Malaysia is divided into two categories: food poverty line and non-food poverty line. The food poverty line refers to the energy requirement of individuals based on the nutritional balance from cereals and cereal products, chicken, eggs, fish, milk, fat and oils, sugar, fruits and vegetables, and legumes. Starting from

2005, the food poverty line for Peninsular Malaysia was MYR430 (urban: MYR420; rural: MYR440), Sarawak (MYR520; urban: MYR530; rural: MYR500), and Sabah (MYR540; urban: MYR540; rural: MYR540). Households with a monthly income below this line were considered as hard-core poor (Malaysia Prime Minister's Department, 2006).

For the non-food poverty line, the components are clothes, housing, transportation and other expenses based on the household expenditure survey. A household income below MYR663 (urban) and MYR657 per month (rural) for Peninsular Malaysia; MYR881 (urban) and MYR897 (rural) for Sabah; MYR777 (urban) and MYR753 (rural) for Sarawak for non-food poverty line is considered poor (Malaysia Prime Minister's Department, 2006). Based on these lines, the household income are not enough, especially between the lower-income and middle-income group, to satisfy their nutrient intake due to the increase in food prices.

The Consumer Price Index (CPI) measures the changes in food price. The CPI calculates the percentage change in the cost of purchasing a constant basket of goods and services in a specified time period (Malaysia Department of Statistics, 2012). The CPI for Malaysia represents the expenditure pattern of Malaysian households and is collected by the Malaysian Department of Statistics every year. The CPI of the food basket for the base period (every five years) was assigned a value of 100.0. Since 2003, the CPI for food and non-alcoholic beverages has increased (Malaysia Department of Statistics, 2012) as shown in Table 1. For 2004, the CPI for food and non-alcoholic beverages increased 2.0 percent compared to 2003, and the incremental increase in this category from 2005-2009 was 20.7 percent The increase in CPI is due to the increase in petrol and diesel fuel prices. Other factors that contribute to the increment of CPI include the freight rates, insurance premiums and other transportation-related costs (Jinap, Mad Nasir & Mohd Salim, 2003).

Even though socio-economic development has increased since Malaysia's independence in 1957, the economic downturn in 1997 and again in 2007 has decreased the spending power among Malaysians, especially for those in the lower-income group. Some efforts have been made to sustain consumer spending. For example new technologies, new brands developed for local products, and the increasing use of biotechnology through the Ministry of Agriculture (Jinap *et al.,* 2003). Based on these efforts, there are many opportunities for the food industry and agricultural sectors to increase their production, and, at the same time, reduce food prices in the market. Consumers can spend less to buy healthier food, which will provide many advantages for lower income households. However, a report by the Malaysia Department of Statistics (2011) showed that food and non-alcoholic beverage

expenditure among Malaysian households between 2004/05 and 2009/10 increased by 13.0% due to the increase in the food prices. This is likely to have increased the budget constraints of lower-income households in Malaysia (Heng & Guan, 2007).

Table 1: Consumer Price Index (2005=100; 2010=100) by Food and Non-alcoholic Beverages and Alcoholic Beverages and Tobacco Group, 2003-2011, Malaysia

Year	Group		
	Total	Food & non-alcoholic beverages	Alcoholic beverages & tobacco
Weight (2005 & 2010=100)	**100**	**31.4**	**1.9**
2003	95.7	94.4	79.0
2004	97.1	96.4	87.8
2005	100.0	100.0	100.0
2006	103.6	103.4	106.9
2007	105.7	106.5	115.2
2008	111.4	115.9	123.6
2009	112.1	120.7	131.1
2010	100.0	100.0	100.0
2011	103.2	104.8	104.6

Source: Malaysia Department of Statistics (2012)

The nutritional status of the Malaysian population

The nutritional status of Malaysians is undergoing a transition (Khor *et al.,* 2002). Changes in lifestyle, including food production, food preferences, dietary habits, and other factors related to food are associated with the changes in the health and disease patterns of Malaysians (Khor *et al.,* 1998). The health statistics show that heart disease and diseases of pulmonary circulation (16.5%) are the major causes of death for Malaysians in 2008 (Malaysia Ministry of Health, 2009). At the same time, the prevalence of obesity and overweight among children is increasing (Kasmini *et al.,* 1997; Ismail & Tan, 1998; Ismail & Vickneswary, 1999), which will lead to risk factors for type two diabetes, hypertension, hyperlipidemia and obesity when they become adults (He & Evans, 2007).

Lifestyle changes in adults lead to unhealthy eating habits, socioeconomic pressure, and smoking and decreased physical activity, which will lead to an increase in chronic disease risk factors (Lam & Khor, 1997). The principle causes of death in Malaysia among men and women aged 15-64 years old in

2007 were ischemic heart disease and cerebrovascular disease (Malaysia Ministry of Health, 2009), which are assumed to increase yearly. Some research shows that these diseases are related to unhealthy food intake. Another study shows that poor dietary habits and sedentary lifestyles were the major weight gain contributors (Norlaila, 2008).

The causes of overweight and obesity are complex and are subject to many contributory factors. In this case, genetic make-up, activity levels, age, gender, behaviour, environment, culture and energy intake (Williams, 2004) are some of the factors that contribute to the prevalence of obesity and overweight among adults. The changes in lifestyle also lead to the changes in energy requirements of the individuals. Even though some people need to consume higher energy food because of their active lifestyle, most of them lead inactive lifestyle, and, therefore, need fewer calories. In addition, they need to cut their energy intake to maintain their ideal weight (Williams, 2004). However, the high intake of energy-dense food and sedentary lifestyle among Malaysians (Noor, 2002) have increased the problem of overweight and obesity among them.

The problem of overweight and obesity among adults in Malaysia is higher than most of the other Asian countries except for South Asian countries where the overweight rate was 17.4 percent and is higher in women (26.0%) than men (7.2%) (Kee *et al.,* 2008). Overweight and obesity are related to cardiovascular disease, depression and diabetes (Burke *et al.,* 2005). The results from the Malaysian Third National Health and Morbidity Survey (NHMS III) in 2006 showed that 29.1 percent of the adults were overweight (BMI 25.0-29.9 kg/m^2) and 14.0 percent of the adults were obese (BMI $\geq$ 30.0 kg/m^2). In addition, women have higher obesity prevalence (17.4%) than men (10.0%). Based on these results, it seems that the level of overweight and obesity among adults has increased three times compared to the results from Malaysian NHMS II in 1996 (Noor Safiza *et al.,* 2008). However, the Malaysian Adult Nutrition Survey (MANS) in 2003 reported that the energy intake among adults was lower than RNI 2005, which suggests that the underestimation of dietary intake in some people may reflect on the energy intake of the population (Mirnalini *et al.,* 2008). Chee, Ismail and Zawiah (1997) in their study showed that, in general, Malaysian adults have increased their fat derived energy intake from 23.0 percent to 27.0 percent while the energy intake from carbohydrates decreased from 63.0 percent to 59.0 percent.

Narayan and Abdul Rashid (2007), in their research of body mass index and nutritional status among adults in two rural villages in Malaysia, showed that the prevalence of underweight was 9.8 percent, overweight 25.9 percent and obesity 17.0 percent. This study also showed that women, especially

housewives, were obese and that half of them had hypertension. Besides hypertension, other conditions such as diabetes are also common. Another study showed that the prevalence of overweight among men was 51.0 percent and 35.0 percent in women, while obesity was present in 27.0 percent of women and 22.0 percent of men. It was pointed out that overweight and obesity are potential health problems among adults, especially in the rural areas (Norimah & Haja Mohaideen, 2003).

Some studies have been conducted to determine the nutritional status among children and the elderly in Malaysia. Suriah *et al.* (1996) found that the mean energy intake among the elderly were below the Recommended Dietary Allowance (RDA). The percentage of carbohydrates from total calories was higher than fat and protein, while there were no respondents who consumed less than 1/3 RDA of protein in this study. The study by Zalilah *et al.* (2000) among schoolchildren from low-income families in Kuala Lumpur showed that 52.0 percent of the children were underweight, 50.0 percent were stunted, and 30.0 percent of them were borderline wasted. This study also showed that more boys were underweight, stunted, wasted, and overweight compared to the girls. Even though there were cases of under-nutrition, many studies have shown that children tend to be overweight and obese in Malaysia (Ismail & Tan, 1998; Ismail & Vickneswary, 1999; Chee *et al.,* 2002; Lekhraj Rampal *et al.,* 2007).

From the literature collected so far, the nutritional status of the Malaysian population seems to show a trend towards over nutrition. According to Tee (1999), the fat and protein intake from 1961 to 1997 increased, and appear to increase every year. Data on the food balance sheet for Malaysia, taken from the Food and Agriculture Organization (FAO, 2012) showed an incremental increase in energy intake from food supply (kcal/capita/day) every five years starting from 1980 to 2009 (Table 2). From 1980 to 2009, the energy intake from food supply increased gradually from 2765 kcal/capita/day to 2902 kcal/capita/day. In 1995, the intake was highest (2943 kcal/capita/day). The total fat and protein intake for the same period also showed an incremental increase.

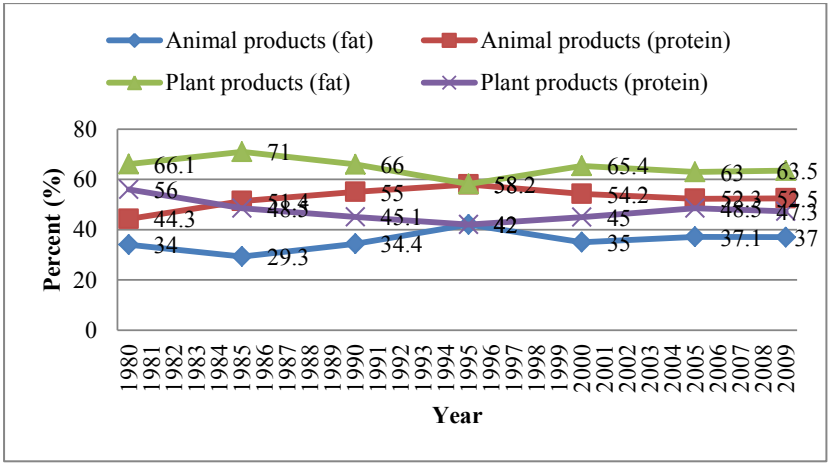
The total fat supply for 1980 increased from 77.4 g/capita/day to 84.7 g/capita/day in 2009. For protein, the supply increased from 59.1 g/capita/day in 1985 to 79.0 g/capita/day in 2009. The percentage of total supply from plant sources for fat in this period increased from 51.2 percent to 53.8 percent with the highest percentage in 1985 (Figure 1). For protein supply, it showed a gradual increment, except for the years 1985-1995 (FAO, 2012). However, the fat and protein supply from animal sources increased year by year. Based on this data, it shows that Malaysians get more energy from animal sources, which has led to the increased risk of chronic diseases. As reported by Khor

(2012), the calories obtained from animal products rose about 82.0 percent from 1967 to 2007, even though there was a noticeable decline during that period.

Table 2: Food Balance Sheet Data by Food, Fat and Protein Supply, 1980-2009, Malaysia

	Year						
Item	**1980**	**1985**	**1990**	**1995**	**2000**	**2005**	**2009**
Food Supply (kcal/capita/day)	2765	2671	2656	2943	2864	2820	2902
Fat Supply (g/capita/day)	77.4	92.1	90.1	89.3	84.4	83.8	84.7
Protein Supply (g/capita/day)	59.1	58.6	63.0	76.0	76.0	77.1	79.0

Source: FAO (2012)



Source: FAO (2012)

Figure 1: Percentage of Fat and Protein from Animal and Plant Products based on The Food Balance Sheet of Malaysia, 1980-2009

Based on previous studies, overweight and obesity among Malaysians become a challenging trend for the public's health. The latest survey shows the pre-obese and obese among Malaysian adults were 33.3 percent and 27.4 percent respectively, while 3.9 percent of Malaysian children were obese (Malaysia Ministry of Health, 2011). Furthermore, obesity is a core risk factor for several chronic diseases. Therefore, the government should take the necessary action by developing policies and programs that can reduce the problems of overweight and obesity among Malaysian.

Food consumption pattern of the Malaysian population

The food consumption survey is normally used to assess the food consumption at the national, household or individual level, with the data being expressed in terms of nutrient and/or food (Gibson, 2005). The food balance sheet was used to assess the food available nationally, and the data were presented based on a per capita basis using population estimation. The food balance sheets were also used to monitor food consumption trends over certain periods within an individual country and to compare the supply of food available between countries (Gibson, 2005). Many studies have been conducted to measure the food consumption pattern of Malaysians. Chee *et al.* (1996) reported that Malay estate workers consumed a lot of rice, cooking oil and sugar, while Indian estate workers consumed more rice, cooking oil and instant coffee. These food items were the main source of energy in their diet. The source of protein mainly comes from fish while meat, poultry and fish products were consumed among these workers.

Other studies reported low intake of micronutrients and vitamins, such as calcium, vitamin A, thiamine, riboflavin and niacin, due to the low consumption of meat, fruits, vegetables and milk among rural adults in Malaysia and higher intake of meat and chicken among urban adults resulting in the higher intake of fat in their diet (Chee *et al.,* 1997). The study by Khor (2012) also reported that rice, anchovies and marine fish were highly consumed by Malay rural households, and contributed to the energy and protein in their diet. The same results were obtained by Norimah *et al.* (2008) in the MANS, which showed rice, marine fish, green vegetables and sweetened condensed milk are among the foods that were highly consumed by adults. Rice and sugar were excessively consumed by urban adults in Malaysia while green vegetables, chicken and sweetened condensed milk were consumed moderately in the current study of food consumption pattern in Malaysia (Zainal Badari *et al.,* 2012).

It seems that from 1996 to 2012, energy-dense foods, such as rice, were consumed in higher amounts among Malaysians, while milk, vegetables and fruits were consumed moderately or in low amounts. However, the intake of rice per capita of Malaysians decreased about 15.0 percent from 1990 to 2005 even though rice is a major staple food, while the consumption of poultry and meat products increased within the same period (Warr, Rodriguez & Penm, 2008). The increased consumption of poultry and meat products increases the intake of fat and protein in the diet and is one of the risk factors of overweight and obesity among Malaysians (Norlaila, 2008; Kee *et al.,* 2008; Noor Safiza *et al.,* 2008). The demand for wheat based products and rice among Malaysian (Sheng *et al.,* 2008) also increased the factors of overweight and obesity.

The food balance sheet data from FAO shows the increasing trend availability per capita of the macronutrient calories, fat and protein of Malaysia (FAO, 2012). The steady decline of calories from complex carbohydrates, and unchanged availability of fruits and vegetables were also shown in this data. The rise of intake of fat and protein foods that provide high calories can result in overweight and obesity among Malaysian. As the intake of food varies widely in previous studies among Malaysia, other factors should be taken into account such as food preferences and socioeconomic factors to measure the food consumption among Malaysians.

Conclusion

Although many studies have been conducted to measure the nutritional status and food consumption pattern of the Malaysian population, several factors need to be considered as well for future research, such as household income, poverty line, consumer price index, prevalence of overweight and obesity and type of food consumed. This paper can be used as a reference for researchers interested in the food consumption pattern and food expenditure pattern of Malaysian population. In addition, this paper can be used as a guideline in developing studies related to food consumption by households, either in urban or rural areas. The factors described above should be given special attention in the methodology development of food consumption studies.

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PANDUAN KEPADA PENULIS

Jurnal Pengguna Malaysia mengalu-alukan sumbangan manuskrip berkaitan isu ekonomi pengguna dan keluarga samada di dalam Bahasa Melayu atau Bahasa Inggeris. Manusip akan dinilai oleh embaga Pengarang. Sila kemukakan artikel anda berdasarkan garis panduan berikut kepada Ketua Pengarang Jurnal Pengguna Malaysia, Fakulti Ekologi Manusia, Universiti Putra Malaysia, 43400 Serdang, Selangor. Email: macfea@upm.edu.my

Penulisan dan Kertas Kerja

Manuskrip perlu ditaip selang dua baris menggunakan kertas A4 dengan 1" margin untuk bahagian atas muka surat, 1.5" kiri dan 1" kanan. Bilangan muka surat tidak melebihi 15 muka surat. Semua teks mesti menggunakan saiz 12 dan Times New Roman.

Tajuk

Tajuk artikel, nama pengarang dan pengarang yang lain, alamat lengkap institusi dan email perlu dinyatakan. Tajuk atau sub-tajuk menggunakan fon 14. Sila kemukakan dua salinan kertas manuskrip dan satu salinan lembut untuk tujuan pengeditan.

Kata kunci

Berikan antara tiga hingga lima kata kunci dan letakkan di bahagian bawah abstrak.

Jadual

Kesemua jadual perlu diletakkan di akhir manuskrip selepas rujukan dan menggunakan angka Arab. Setiap jadual perlu dinyatakan dan perlu diberi penjelasan dalam teks.

Ilustrasi

Ilustrasi termasuk gambarajah-gambarajah dan graf-graf perlu dinyatakan di dalam teks. Kesemua foto yang sesuai perlu dicetak hitam dan putih. Ilustri perlu dicetak pada kertas yang berasingan.

Ejaan dan pengukurn

Bagi merujuk ejaan, Kamus Bahasa Inggeris Oxford dan Kamus Dewan Bahasa yang terkini hendaklah digunan. Unit - unit metrik mesti digunakan untuk ukuran empirikal.

Rujukan

Rujukan ditulis mengikut gaya penulisan APA.

Pendapat yang terkandung di dalam jurnal ini tidak semestinya menggambarkan pendapat Lembaga Pengarang dan Kementerian Perdagangan Dalam Negeri, Koperasi Dan Kepenggunaan