



UNIVERSITI PUTRA MALAYSIA

***FACTORS INFLUENCING HEALTHY EATING INTENTION AMONG
MALAYSIAN ADULTS***

ISMAWATI BINTI SHARKAWI

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ISMAWATI BINTI SHARKAWI

**DOCTOR OF PHILOSOPHY
UNIVERSITI PUTRA MALAYSIA**

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AMONG MALAYSIAN ADULTS**

By

ISMAWATI BINTI SHARKAWI

**Thesis Submitted to the School of Graduate Studies,
Universiti Putra Malaysia, in Fulfilment of the
Requirements for the Degree of Doctor of Philosophy**

November 2014

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Doctor of Philosophy

**FACTORS INFLUENCING HEALTHY EATING INTENTION
AMONG MALAYSIAN ADULTS**

By

ISMAWATI BINTI SHARKAWI

November 2014

Chairman: Professor Zainal Abidin Mohamed, PhD
Faculty: Agriculture

There is rising awareness among Malaysians on the importance of practising healthy eating habits. However, statistics show that there is severity of the health problems among the Malaysian population. Despite the various programs and campaigns being promoted by the Ministry of Health (MOH) on healthy eating and lifestyles, they seem fail to meet the objectives. In response to this problem, this study in general aims to investigate the healthy eating intention among Malaysian adults.

Primary data were collected throughout Malaysia via a self-administered questionnaire and multi-stage stratified sampling based on geographical disaggregation was carried out. The Theory of Planned Behavior (TPB) is extended to incorporate the health motive from Food Choice Questionnaire (FCQ), and two variables from Health Belief Model (HBM) namely the perceived barriers on healthy eating and perceived susceptibility to health risk to better understand the factors influencing respondents' intention on healthy eating.

A total of 1,719 adults responded to the survey and showed high intention towards practicing healthy eating. In food choice motives, the religion factor turned out to be the most important factor, followed by health motives, price, sensory appeal and convenience factors. The findings also indicate that there were four factors derived from the perceived barriers to healthy eating, namely self motivation; cost and physical attribute; lack of time; and unavailable healthy choices. Results from the structural equation modelling showed that all variables significantly influence healthy eating intention. Perceived behavioral control turned out to be the strongest predictor and subjective norm the weakest predictor towards healthy eating intention. The moderation test further indicate that gender, age, income and education level were found to be moderators on the overall model.

The empirical findings of this study offer theoretical and practical contributions to the body of knowledge and related parties including food industry players and public health policy makers. In theoretical contribution, the findings of this study add to the literature on utility of the extended TPB in the domain of healthy eating. The results indicate that people's intentions to eat healthily are better modelled with models that not only include the original dimensions of the TPB, but also incorporate other elements including health motives, perceived barriers and perceived susceptibility.

With regard to practical contribution, the study reflects the needs for the food marketers to provide healthy foods which are *halal*, not expensive, tasty and convenient. The efforts should be supported by the government which may consider offering incentive for food industry players which produce/offer healthy food options. In terms of designing more effective intervention programs on promoting healthier eating behavior, the MOH should focus on changing internal factors including enhancing the people's self-control and changing their attitude toward healthy eating. Different campaign should be targeted to different group of interest to achieve the desired change of healthy eating habit. To enhance the awareness of risks associated with unhealthy eating practices to strengthen individual's self control, the campaign should be targeting man and young adults. On the other hand, low income and lower educated people are the target groups in promoting programs to reduce barriers to healthy eating.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

FAKTOR MEMPENGARUHI NIAT PEMAKANAN SIHAT DALAM KALANGAN ORANG DEWASA DI MALAYSIA

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Terdapat kesedaran yang semakin meningkat dalam kalangan rakyat Malaysia dalam mempraktikkan tabiat pemakanan sihat. Walaubagaimanapun, statistik menunjukkan wujudnya permasalahan kesihatan yang serius dalam kalangan populasi Malaysia. Di sebalik pelbagai program dan kempen yang dipromosikan oleh Kementerian Kesihatan Malaysia (KKM) ke atas pemakanan dan gaya hidup sihat, ia seolah-olah gagal menepati objektif yang disasarkan. Justeru itu, kajian ini secara umumnya bertujuan untuk menyelidik niat pemakanan sihat dalam kalangan golongan dewasa di Malaysia.

Data primer dikutip di seluruh Malaysia melalui borang kaji selidik seliaan sendiri dan pensampelan berstrata pelbagai peringkat berdasarkan pecahan geografi dilaksanakan. Teori Tingkah Laku Terancang (*Theory of Planned Behavior*, TPB) dilanjutkan dengan menggabungkan motif kesihatan daripada Kaji Selidik Pilihan Makanan (*Food Choice Questionnaire*, FCQ) serta dua pembolehubah daripada Model Kepercayaan Kesihatan (*Health Belief Model*, HBM) iaitu persepsi halangan terhadap pemakanan sihat dan persepsi kerentanan terhadap kesihatan untuk lebih memahami faktor yang mempengaruhi niat responden ke arah pemakanan sihat.

Sejumlah 1,719 orang dewasa menyertai survei dan menunjukkan niat yang tinggi ke arah mengamalkan pemakanan sihat. Bagi motif pilihan makanan, faktor agama merupakan faktor yang paling penting, diikuti oleh motif kesihatan, harga, tarikan deria dan faktor kemudahan. Hasil kajian juga menunjukkan terdapat empat faktor terhasil daripada persepsi halangan kepada pemakanan sihat iaitu motivasi sendiri, sifat fizikal dan kos, kekurangan masa dan ketiadaan pilihan makanan sihat. Hasil daripada analisis pemodelan persamaan struktur menunjukkan bahawa semua pembolehubah mempengaruhi dengan signifikan niat pemakanan sihat dengan persepsi kawalan tingkah laku sebagai peramal terkuat dan norma subjektif sebagai peramal terlemah ke arah niat pemakanan sihat. Ujian

moderasi seterusnya menunjukkan yang jantina, umur, pendapatan dan taraf pendidikan merupakan moderator ke atas keseluruhan model.

Dapatan empirikal kajian ini memberikan sumbangan secara teoritikal dan praktikal kepada ilmu pengetahuan dan pihak berkaitan termasuklah industri makanan dan penggubal dasar kesihatan awam. Bagi sumbangan teoritikal, dapatan kajian ini menambah literatur dalam utiliti lanjutan TPB dalam domain pemakanan sihat. Hasil kajian menunjukkan bahawa niat untuk makan secara sihat adalah lebih baik dimodelkan dengan model yang bukan sahaja menggunakan dimensi asal TPB, tetapi turut menggabungkan elemen lain termasuklah motif kesihatan, persepsi halangan dan persepsi kerentanan.

Dengan mengambil kira sumbangan praktikal, kajian ini mencerminkan keperluan bagi pemasar makanan untuk menyediakan makanan sihat yang halal, tidak mahal, sedap dan mudah. Usaha sebegini haruslah disokong oleh kerajaan yang mungkin boleh mempertimbangkan untuk menawarkan insentif kepada peserta industri makanan yang mengeluarkan/menawarkan pilihan makanan sihat. Dari segi penggubalan program intervensi dalam mempromosikan tingkah laku pemakanan yang lebih sihat, KKM harus memfokuskan kepada mengubah faktor dalaman termasuklah meningkatkan kawalan sendiri rakyat dan mengubah sikap mereka ke arah pemakanan sihat. Kempen yang berbeza haruslah disasarkan kepada kumpulan yang berbeza untuk mencapai perubahan yang diinginkan dalam amalan pemakanan sihat. Untuk meningkatkan kesedaran tentang risiko yang berkaitan dengan amalan pemakanan tidak sihat dalam mengukuhkan kawalan sendiri individu, kempen haruslah mensasarkan golongan lelaki dan dewasa muda. Sebaliknya, golongan berpendapatan dan berpendidikan rendah merupakan kumpulan sasaran dalam mempromosikan program bagi mengurangkan halangan kepada pemakanan sihat.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as partial fulfillment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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LIST OF ABBREVIATIONS

AGFI	Adjusted goodness-of fit index
AMOS	Analysis of moment structures
CFA	Confirmatory factor analysis
CFI	Comparative fit index
EFA	Exploratory factor analysis
FAFH	Food away from home
FAH	Food at home
FAO	Food and Agriculture Organization of the United Nations
FCM	Food Choice Motives
FCQ	Food Choice Questionnaire
GFI	Goodness-of-fit index
GNI	Gross National Income
HBM	Health Belief Model
HEI	Healthy Eating Index
JAKIM	Department of Islamic Development Malaysia
MCOM	Malaysian Council for Obesity Prevention
MDG	Malaysian Dietary Guidelines
MI	Modification indices
MIDA	Malaysian Investment Development Authority
MOE	Ministry of Education
MOH	Ministry of Health
NCD	Non-communicable disease
NFI	Normed fit index
NGO	Non-governmental organization
NHMS	National Health and Morbidity Survey
NNP	National Nutrition Policy
NPANM	National Plan of Action for Nutrition of Malaysia
PBC	Perceived behavioral control
RMSEA	Root mean square error of approximation
SEM	Structural equation modeling
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

1.1 Introduction

Food is undoubtedly a vital factor in sustaining human health and life. While food generally provides all the vital nutrients, vitamins and minerals that the body needs, a plethora of epidemiological studies provide evidence of the crucial role of healthy eating in preventing obesity, diabetes, cardiovascular diseases and several types of cancer (McKevith, 2004; Bingham, 2003; World Health Organization, WHO, 2003). Interestingly, healthy food behavior may become the most important determinants of health and well-being in the developed nations (Shahar *et al.*, 2005).

An understanding of food choice behavior should be first grasped before promoting healthier food options and healthy eating campaign intervention. Food choice is a complex human behavior and will be influenced by not only physiological factors, but also by social and cultural factors (Sobal and Bisogni, 2009; Gibson, 2003). Some people may be influenced by the health factor in their food decisions, while others may perceive other factors such as price, taste, religious concerns as having more importance. Once the food choice determinants are thoroughly understood, then the focus of healthy eating could be shifted to explore factors influencing healthy eating behavior including attitudinal, normative and self-control. Other influential factors could be the possible barriers perceived to be important by the people in preventing them from eating healthily. Given the association between healthy eating and disease prevention, how people perceive the risks associated with unhealthy eating habits may influence their behavior toward healthy eating.

In the Malaysian context, although there seems to be a growing concern on the importance of healthy eating among the general public, this does not translate into practice. Over a decade since the "Healthy Lifestyle Campaign" ended, the public's knowledge on food and nutrition has increased considerably. However, the population's behavioral change has yet to take place. Most of the people may not have transformed their nutrition knowledge into healthier eating habits. This is witnessed by the poor health state of Malaysians. The latest National Health and Morbidity Survey (NHMS 2011) points out that 4.4 million adults are obese and another 5.4 million are overweight (Ministry of Health, MOH 2012). The government has expressed its concern over the population's health via the Country Health Plan 2011-2015 which states that there is a wide gap between Malaysians' knowledge and their behavior (MOH, 2011). Given the alarming statistics of the so called diet-related diseases, various initiatives and integrated efforts have been implemented to reduce the national burden of non-communicable diseases amongst the population by the government and non-governmental organisations (NGOs) in addition to, support by the food industry to promote healthy eating habits.

However, statistics show that there is severity of the health problems with the Malaysian population. The government of Malaysia through the MOH is promoting various programs and campaigns on healthy eating as early as infant stage to instil a desired healthy lifestyle. Despite the various programs and campaigns being

promoted by the MOH on healthy eating and lifestyles, they fail to meet the objectives. This was witnessed by a dramatic increase in the prevalence of behavior-linked diseases, including a 250 percent increase in obesity, 88 percent in diabetes and 43 percent increase in hypertension within the ten year period (1996-2006). In this country, one in five adults has diabetes with 2.6 million cases alone in the year 2011. These alarming statistics indicate that the health issues are far more serious in Malaysia than in any other country in the region. It reflects a scenario that Malaysians are not responsive to campaigns and also they cannot care the least about the effects of unhealthy eating.

Therefore, this study focuses on factors influencing healthy eating intentions among Malaysian adults. Some backgrounds of the Malaysian food systems, current health issues pertaining to eating behavior and programs promoted by the government will be discussed to better understand Malaysians' healthy eating intention.

1.2 Global Food Systems

One of the most important concepts in understanding the interaction between food, nutrition and health is the food system. In general, the concept of food system is used in discussions regarding food, nutrition, health, community economic development and agriculture (Maxwell and Slater, 2003). The food systems are changing dramatically around the globe and this could be due to changes in factors such as rise in household income, increased percentage of women in the workforce, urbanization and more affluent lifestyles. The best way to corroborate the changes in the food system is to compare the features of traditional and modern food systems. Table 1.1 highlights some of the changing features in the food systems.

Table 1.1. Comparisons of “Traditional” and “Modern” Food Systems

Food system feature	Traditional food systems	Modern food systems
Principal employment in food sector	In food production	In food processing, packaging and retail
Supply chain	Short, local	Long with many food miles and nodes
Food production system	Diverse, productivity varied	Few crops predominate; intensive, high inputs
Typical farm	Family-based, small to moderate	Industrial, large
Typical food consumed	Basic staples	Processed food with a brand name; more animal products
Purchased food bought from	Small, local shop or market	Large supermarket chain
Nutritional concern	Under-nutrition	Chronic dietary diseases
Main source of national food shocks	Poor rains; production shocks	International price and trade problems
Main source of household food shocks	Poor rains; production shocks	Income shocks leading to food poverty

Food system feature	Traditional food systems	Modern food systems
Major environmental concerns	Soil degradation, land clearing	Nutrient loading, chemical runoff, water demand, greenhouse gas emissions
Influential scale	Local to national	National to global

(Source: Maxwell and Slater, 2003)

In the traditional food systems, foods typically consumed by the people were basic staples such as rice and wheat. Alternatively in the modern food systems, people are relying more on processed food and animal-based products as the main source of nutrients. This may hold true in some parts of the world but in order to understand the changing pattern of this attribute, the food consumption trends should be closely observed. Table 1.2 shows the per capita consumption of food in various countries from 1980 to 2003. In developing countries, per capita consumption of staple foods shows interesting patterns. While per capita consumption of rice in developing countries shows not much change from 65.4 kg in 1980 to 65.7 kg in 2003, the per capita consumption of wheat rose from 52.9 kg to 58.6 kg in the same period. This indicates the important role of wheat as a close substitute for rice in the developing countries.

An important change can be seen from the per capita consumption of meat products in the developing countries. It shows a drastic growth with two-fold increase from 14.3 kg in 1980 to 28.9 kg in 2003. The consumption of nutritious foods such as vegetables and fruits also show increasing trends in the developing nations. In 1980, per capita consumption of vegetables and fruits were 121 kg and 38 kg respectively. Both commodities have shown an increasing trend of consumption over the years. The per capita consumption has increased to 187 kg for vegetables and 55 kg for fruits in 2003. The diet which is more towards higher intake of meat, vegetables and fruits is known as “westernization” in which the developing and “transition” economies, particularly from the Asian countries are maintaining similar diets as in western countries (Chern *et al.*, 2003). In the developed countries, food choices have not shown much change over the years.

Table 1.2. Per Capita Food Consumption in Developing and Developed Countries, 1980 – 2003

Commodity	Developing countries (in kg)						Developed countries (in kg)					
	1980	1985	1990	1995	2000	2003	1980	1985	1990	1995	2000	2003
Cereals	157	167	170	167	161	156	130	129	130	132	130	131
Wheat	52.9	59.6	60.4	62.3	60.2	58.6	98.1	98.2	99.6	100.4	98.0	98.4
Rice	65.4	71.5	72.6	71.4	69.4	65.7	11.5	11.0	10.9	10.8	11.5	11.5
Others	38.5	35.7	37.1	33.1	31.0	32.2	20.7	20.0	19.3	20.6	20.7	21.3
Sugar	16.9	18.3	18.5	19.0	19.8	20.1	44.6	43.7	45.5	42.1	44.4	45.6
Vegetables	121	124	128	145	175	187	183	190	186	187	195	195
Fruits	38	40	41	50	53	55	74	74	81	77	86	87
Meat	14.3	16.1	18.6	24.1	27.6	28.9	75.4	77.4	81.9	76.2	77.2	80.3
Beef	4.7	4.8	5.0	5.8	6.3	6.2	26.8	27.2	27.5	23.7	22.2	22.3
Mutton	1.2	1.3	1.4	1.6	1.7	1.8	2.8	2.8	3.0	2.5	2.2	2.1
Pork	5.4	6.6	7.8	10.0	11.2	12.0	29.4	29.3	30.1	27.8	28.2	29.1
Poultry	2.5	2.9	3.8	6.1	7.8	8.3	14.7	16.6	20.0	20.9	23.2	25.5
Others	0.5	0.6	0.5	0.6	0.6	0.7	1.6	1.5	1.3	1.3	1.4	1.4
Milk	34	37	38	42	45	48	194	203	201	193	196	202
Eggs	2.5	3.4	4.1	5.9	7.0	7.5	14.0	14.1	13.7	12.1	12.5	12.8
Fish, Seafood	7.5	8.3	9.9	12.7	14.1	13.9	23.4	26.2	26.1	23.7	23.7	24.0

(Source: Food and Agriculture Organization of the United Nations, 2007)

Looking at the nutritional aspects, the main concern during the past was under-nutrition. Statistics from the Food and Agriculture Organization, FAO (2013) indicate that 870 million people or 12.5 percent of the world's population were undernourished in the period of 2010 - 2012. Of this, 852 million undernourished people were from developing countries. The number of undernourished in the developing world was found to steadily decline over a twenty years period. In 1992, about 980 million or 23.2 percent of the citizens in the developing countries were classified as undernourished. The number was reduced to 852 million or 14.9 percent in 2012 (Table 1.3).

Table 1.3. Undernourishment in the Developing World, 1992 – 2012

Undernourishment	1992	2001	2006	2009	2012
Number (million)	980	901	885	852	852
Percentage	23.2	18.3	16.8	15.5	14.9

(Source: FAO, 2013)

Today, the nutritional issues are shifted to the growing concern of chronic dietary diseases including obesity, diabetes and certain types of cancers. These diseases are claimed to be highly associated with the unhealthy eating practises amongst the people. It is estimated that 65.0 percent of the world's population live in countries where being overweight and obesity kill more people (WHO, 2012).

Among other diseases, obesity represents one of the most severe public health problems and has become a global epidemic in both the developed and the developing countries. Statistics from the WHO show that in 2008, 1.5 billion of world adult were overweight, and 500 million were classified as obese. In 2010, nearly 43 million children under the age of five were overweight. In the developed countries, for example the United States has reported that obesity is common in the country and the numbers continue to be high among adults of all ages and gender (Flegal *et al.*, 2010). In the past, obesity epidemic was typically associated with the developed nations. However, it is now has become global, and even in nations where hunger exists (UNEP, 2012). For example, the number of overweight or obese people in Brazil and Columbia is approximately 40.0 percent, comparable to the number in more developed countries in the Europe. There is even a rise in obesity rate in Sub-Saharan Africa, where hunger is a prominent issue (Pouane *et al.*, 2002; FAO, 2012).

1.3 Food Systems in Malaysia

The emerging economy of most Asian countries has led to dramatic changes in the food systems. Furthermore, urbanization and globalization which have taken place in the modern economy have created a major shift in the Asian dietary patterns known as "nutrition transition". The Asians are shifting from traditional diets of staples to animal-based and dairy products and adopting diets similar to that in the Western countries (Pingali, 2007). Malaysia is not an exception and the following sub section will focus on the discussion of food systems in the country with regard to the food consumption patterns, food industry, nutrition concerns as well as the association between food and health issues.

1.3.1 Food Consumption Patterns in Malaysia

Economic development in the country has resulted in changes in food consumption as well as expenditure patterns of the population. Malaysians have changed their preferences for food over time. As can be seen in Table 1.4 in 1973, almost half (45.1 percent) of the household budget was spent on food. By 2009, the budget share decreased to only 31.0 percent. Consumption of food away from home (FAFH) plays an increasingly larger role in the Malaysian diet. In 1973, 8.9 percent of the total expenditure or 19.7 percent of the total food share was spent on FAFH. The share rose to 10.7 percent of the total expenditure (34.5 percent of the total food budget) in 2009. On the other hand, spending on food at home (FAH) has declined drastically from 36.2 percent of the total household expenditure to 20.3 percent in the same period. A number of factors have contributed to the trend of increased FAFH, including a rise in income, higher percentage of women in the employment sector, two-earner households, more affordable and convenient fast food outlets, and modern lifestyles.

Table 1.4. Percentage Expenditure on Food per Household

	1973*	1980*	1993/94	1998/99	2004/05	2009/10
Total	45.1	35.4	35.6	35.1	30.6	31.0
At home	36.2	28.4	23.8	22.6	20.1	20.3
Away from home	8.9	7.1	11.8	12.5	10.5	10.7

* Peninsular Malaysia

(Source: Household Expenditure Surveys (1973 – 2009), Department of Statistics, Malaysia)

In terms of food consumption patterns, the per capita consumption indicates that Malaysians have diversified their food choices over the years. The increasing trend of per capita consumption of wheat indicates its greater role in substituting rice as the main staple food in the country. As can be seen in Table 1.5, per capita consumption of rice declined from 121.0 kg to 70.8 kg within 1961 – 2003 whereas the per capita consumption of wheat rose substantially from 27.7 kg to 65.6 kg in the same period.

Fish and seafood remain as the major source of protein in the country, followed closely by meat products. The per capita consumption of fish and seafood recorded a tremendous increase from 22.1 kg in 1961 to 55.9 kg in 2003, with marine fish as the major contributor (16.6 kg in 1961 to 44.3 kg in the same period). A rise in the per capita consumption of freshwater fish from 0.4 kg to 3.2 kg within a 32 years period may have resulted by the efforts made by the government in the aquaculture production.

In the case of meat products, it shows a similar trend with fish consumption. Per capita consumption of meat rose from 13.2 kg in 1961 to 48.5 kg in 2003. The price of poultry product is relatively cheaper than fish due to the large production in the livestock sector. This may explain the increasing importance of poultry products as one of the main sources of protein in the Malaysian diet.

Malaysian food consumption for healthy foods including vegetables and fruit show mixed patterns. While per capita consumption of vegetables increased from 41.0 kg in 1961 to 59.0 kg in 2003, per capita consumption of fruit decreased from 58.9 kg to 54.7 kg in the same period. As an overall, although the trend in Malaysian diets is moving towards “westernization” with high meat products intake, the consumption of healthy food is still low. As comparison, per capita consumption of vegetables and fruit in developed nations were 195.0 kg and 87.0 kg respectively in 2003.



Table 1.5. Per Capita Consumption of Foods in Malaysia, 1961 - 2003

Food Category	Per Capita Food Consumption (in kg)									
	1961	1965	1970	1975	1980	1985	1990	1995	2000	2003
Cereals	150.5	157.0	158.3	154.8	148.8	123.0	124.0	126.2	152.1	156.2
Rice	121.0	118.5	121.3	121.8	109.2	83.4	84.8	86.8	86.1	70.8
Wheat	27.7	33.8	31.6	28.8	34.1	33.4	31.1	29.8	35.6	65.6
Vegetables	41.0	37.6	50.8	45.9	51.4	56.4	55.8	61.3	59.3	59.0
Fruits	58.9	59.7	60.1	54.3	57.7	54.2	53.7	55.2	55.1	54.7
Meat	13.2	14.4	15.8	20.8	23.4	29.4	37.9	52.8	45.5	48.5
Poultry	3.5	4.9	6.9	9.3	10.1	15.5	20.7	33.1	32.0	33.8
Pork	6.7	6.3	6.6	9.3	9.9	9.9	13.2	14.3	7.2	8.4
Beef	2.3	2.1	1.7	1.7	2.3	3.0	3.6	4.9	5.7	5.8
Fish, Seafood	22.1	23.6	24.3	30.6	42.8	44.5	48.0	57.9	60.4	55.9
Marine fish	16.6	15.3	16.9	26.0	29.1	34.7	38.4	46.1	46.7	44.3
Fish, Seafood	2.0	1.5	3.0	1.6	4.3	4.8	5.9	5.3	3.8	3.7
Freshwater fish	0.4	0.6	0.6	0.8	0.8	1.5	1.3	1.9	3.7	3.2

(Source: FAO, 2007)

1.3.2 Food Industry in Malaysia

Perhaps the best way to discuss the Malaysian food system in terms of the food industry performance is to look at relevant statistics of important players in that industry. Thus, the discussion of food industry in Malaysia focuses on the sub-sector of the industry, the retail sector, the food service profile and also the *halal* food industry. All of these domains may provide better understanding of the Malaysians' nutrition and consumption behavior.

i. Sub-sector of Food Industry in Malaysia

In general, the Malaysian food industry is lucratively attractive with support by both local and imported products. The food processing industry in Malaysia is predominantly owned by locals and is dominated by small and medium scale establishments. The major sub-sectors are the fish and fish products, livestock and livestock products, fruits, vegetables and cocoa. The processed food and beverage industry has become an important component in the agro-based industry in line with the government's emphasis on the agriculture sector. In 2010, the food processing industry contributed approximately 10.0 percent to the Malaysian manufacturing output with a total of RM1.972 billion in 69 projects (MIDA, 2012).

Packaged food is becoming an important sub-sector in the food industry. Overall, this sub-sector recorded 4.15 percent growth in sales volume in 2010 (Table 1.6). The highest growth in terms of production and also sales volume can be seen for pasta products (12.50 percent growth in sales volume and 6.67 percent in production volume). This is followed by noodles (11.08 percent growth in sales and 4.39 percent in production), and meal replacement products (8.48 percent growth in sales volume). By the year 2014, the packaged food sector in Malaysia is expected to increase to US\$4.6 billion in sales volume with a growth rate of close to 4.5 percent (Euromonitor, 2011). The increasing trend of packaged food may have resulted by the growing demand for convenient food to cater to the busy lifestyle of the population. It also demonstrates that the Malaysian diet is moving towards "westernization".

Table 1.6. Growth of Production and Sales of Packaged Food, 2009-2010

Type	Production volume (in 1000 tons)*			Sales volume (in RM million)		
	2009	2010	Growth (%)	2009	2010	Growth (%)
Baby food	-	-	n.a	1218.3	1316	8.02
Bakery	259.8	263.4	1.39	2406.5	2463.3	2.36
Canned/Preserved food	86.6	88.7	2.42	902.5	931.2	3.18
Chilled processed food	5.3	5.4	1.89	250.3	259.1	3.52
Confectionary	29.3	29.8	1.71	894.3	917.5	2.59
Dairy	-	-	n.a	2891.4	3006.2	3.97
Dried processed food	818.9	848.8	3.65	2794.1	2991.7	7.07
Frozen processed food	37.6	38.7	2.93	474.1	491.5	3.67
Ice cream	44.1	45.2	2.49	534.8	548.6	2.58
Meal replacement	0.8	0.8	0.00	130.9	142	8.48
Noodles	104.7	109.3	4.39	939.9	1044	11.08
Oils and fats	699.8	713.8	2.00	2223.5	2281.6	2.61
Pasta	1.5	1.6	6.67	11.2	12.6	12.50
Ready meals	6.4	6.6	3.12	101	105	3.96
Sauces, dressings and condiments	77.5	79.7	2.84	1158.4	1192.9	2.98
Snack bars	0.2	0.2	0.00	7.2	7.7	6.94
Soup	2.6	2.7	3.85	49.2	51.8	5.28
Spreads	10.3	10.6	2.91	129.7	134.7	3.86
Sweet and savoury snacks	31.1	31.9	2.57	603.7	623.2	3.23
Impuls and indulgence products	-	-	n.a.	3592.3	3688.6	2.68
Nutrition/staples	-	-	n.a.	10256	10759.3	4.91
Meal solutions	209.6	215.3	2.72	2836.5	2928.6	3.25
Total packaged food	-	-	n.a.	16666.3	17357.2	4.15

* in million litres

(Source: Euromonitor, 2011)

ii. Retail Sector in Malaysia

With regard to food purchasing pattern, Malaysian urban population is relatively brand conscious and prefers to shop in stores which provide convenience and wide selection of products. Lifestyle changes have led to an increase in demand for convenient and healthy food. The current total retail sales of Malaysian food and beverages is estimated at US\$11 billion and is forecasted to continually grow by 10.0 percent per annum over the next three to five years (Euromonitor, 2010).

As depicted by Figure 1.1, the retail food sales in Malaysia are channelled through three major structures which are: (1) provision and grocery stores, (2) supermarkets/hypermarkets and department stores, and (3) convenience and petrol station stores. According to Retail Group Malaysia, the traditional stores such as provision stores, grocery stores, specialty food stores and other sundry shops have dominated the retail food sales by approximately 60.0 percent, followed by modern stores such as supermarkets, hypermarkets and department stores (43.0 percent). Although only one percent of retail food is purchased at convenience stores and petrol marts, a recent study conducted by a retail consultant in Malaysia indicates that shopping at convenience stores and petrol marts is gaining popularity. Consumers have become more sophisticated and demand a wider range of better quality ready-to-eat snacks and hot-and-chilled beverages (Retail Group Malaysia, 2011).

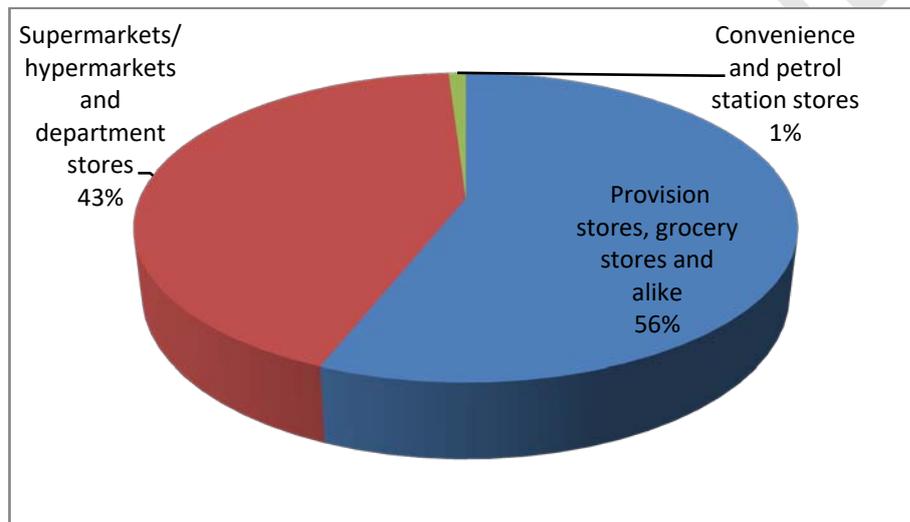


Figure 1.1. Distribution of the Retail Food Channels in Malaysia in 2009
(Source: Retail Group Malaysia, 2011)

With regard to major retailers operating in Malaysia, competition among retailers is stiff. International retailers particularly hypermarkets like Tesco, Giant, Big Aeon to name a few frequently engage in price wars to establish their position as major players in the national retail market. For example, Big Aeon has successfully launched the price cut strategy for 1,200 products in their stores. Meanwhile, being the largest supermarket and hypermarket chains in Malaysia, Giant is reported to sacrifice profits in order to maintain the low-price leader status. Pressure is mounting for local retailers operating in smaller scale such as Econsave and The Store to maintain competitive prices in order to compete with their larger international counterparts.

iii. Food Service Profile in Malaysia

The Malaysian food service sector is growing rapidly due to the changes in tastes and preferences, and also lifestyles of the country's population. The choice of food eateries is in abundance and they offer a wide variety of food with price range to cater the needs of all walks of life. In addition, there is a growing number of food establishments operating around the clock.

According to the USDA (2010), the food service sector in Malaysia is largely dominated by other areas of the industry such as self-service restaurants, cafés, canteens, stalls and hawkers (70.0 percent) while food caterers accounted for around 19.0 percent of the total of food service sector as highlighted in Figure 1.2. This is followed by full service restaurants (8.0 percent) and fast food restaurants (3.0 percent). With its population of 29.2 million, the total value of consumer food service sector in Malaysia was approximately US\$6.65 billion in 2009 and is forecasted to reach US\$8.10 billion in 2014 (Euromonitor, 2010).

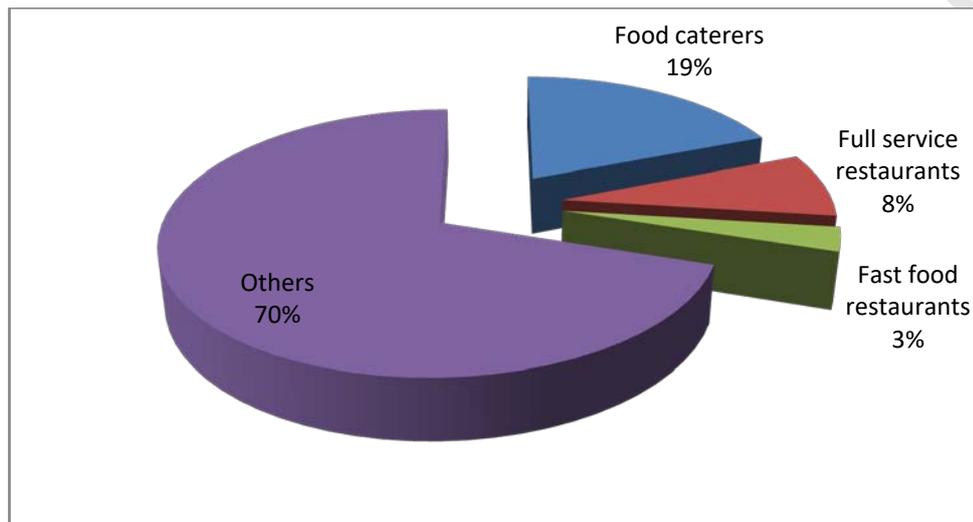


Figure 1.2 Distribution of the Malaysian Food Service Sector in 2007
Source: USDA, 2010)

Table 1.7 shows the market value of food service sector in Malaysia for the period of 2004 to 2009. Overall, the consumer food service has experienced a 48.6 percent in absolute growth within the five year period. The fast food service sector has recorded the highest absolute growth; of 72.1 percent in the market value while keeping in mind that 100% home delivery and pizza consumer food service sectors have a much lesser market share in the Malaysian food service sector (107.6 percent and 87.1 percent absolute growth respectively).

Table 1.7. Market Value of Food Service Sector in Malaysia, 2004 – 2009

	in US\$ million						Absolute growth (%)
	2004	2005	2006	2007	2008	2009	
Consumer food service	4,475.0	4,926.8	5,463.3	6,148.3	6,533.5	6,651.5	48.64
Full-service restaurants	1,990.9	2,139.6	2,311.8	2,517.3	2,646.8	2,649.1	33.06
Street stalls/kiosks	991.6	1,126.1	1,284.0	1,468.2	1,514.3	1,537.8	55.08
Cafés/bars	860.2	982.4	1,125.5	1,312.8	1,385.0	1,415.7	64.58
Fast food	502.1	539.1	591.3	689.0	813.4	863.9	72.06
Self-service cafeterias	114.2	121.1	129.0	138.0	146.3	152.0	33.1
Pizza	86.9	104.8	119.2	132.6	153.2	162.6	87.11
consumer food service							
100% home delivery/takeaway	15.9	18.5	21.8	23.0	27.9	33.0	107.55

(Source: Euromonitor, 2010)

In terms of total number of food service outlets, the increased popularity and availability of food away from home (FAFH) in Malaysia is evidenced by approximately 28,610 food service outlets operating in 2009 to cater to the wide range of consumers' tastes and preferences. Table 1.8 presents the total number of outlets and their absolute growth in the period of 2004 to 2009. Overall, the consumer food services reported a 20.0 percent in absolute growth. The fast food sector was the leader in new outlets, recording an absolute growth of 66.6 percent. This is followed by the full-service restaurant sector, and the café and bar segment with 20.2 percent and 15.0 percent respectively. While the self-service cafeterias, pizza food service and home delivery/takeaway recorded higher growth than the full-service restaurant sector or café and bar segment, it should be noted that the number of outlets for these sectors represent only a small fraction of the total consumer food service outlets.

Table 1.8. Number of Food Service Outlets in Malaysia, 2004 – 2009

	2004	2005	2006	2007	2008	2009	Absolute growth (%)
Consumer food service	23,849	24,981	25,966	27,249	28,187	28,610	19.96
Street stalls/kiosks	9,509	9,816	10,114	10,417	10,645	10,756	13.11
Full-service restaurants	8,106	8,577	9,010	9,434	9,717	9,742	20.18
Cafés/bars	4,256	4,354	4,464	4,669	4,804	4,894	14.99
Fast food	1,647	1,873	1,988	2,312	2,574	2,743	66.55
Pizza consumer foodservice	312	339	368	396	429	450	44.23
Self-service cafeterias	180	200	220	240	258	268	48.89
100% home delivery/takeaway	151	161	170	177	189	207	37.09

(Source: Euromonitor, 2010)

The past ten years has seen a tremendous increase in number of fast food chains operating in the country. Kentucky Fried Chicken (KFC) and McDonalds remain as the leaders in the fast food brands in Malaysia, representing 46.6 percent and 30.1 percent share of the market respectively in 2009 (Table 1.9). Beside these two established fast food chains, there are an abundance of new players in the market. Names like Nando's, Kenny Rogers, Burger King, Starbucks just to name a few, have now become popular choices for family dining, social meetings and celebration events. Malaysians love fast food and this has led the country to become an important exporter of fast foods chains. Marrybrown and Secret Recipe are homegrown fast food chains that have made their presence in regional markets. In fact, there are a number of small town kopitiam making it big in cities like Kuala Lumpur and other major cities in Malaysia. Old Town Kopitiam and Kluang Station for example are family-run kopitiam which have managed to thrive in the competitive fast-food market segment by exploiting on Malaysians' obsession for fast food.

Table 1.9. Brand Shares of Fast Food Chains in Malaysia, 2006 – 2009

Fast food	Global Brand Owner	Percentage			
		2006	2007	2008	2009
KFC	QSR Brands Sdn Bhd	44.6	45.0	46.6	46.6
McDonalds	Golden Arches Sdn Bhd	29.1	29.3	29.6	30.1
Marrybrown	Marrybrown Fried Chicken Sdn Bhd	3.9	4.2	3.8	3.4
7-Eleven	7-Eleven Malaysia Sdn Bhd	-	3.4	3.3	3.1
A&W	KUB/A&W (Malaysia) Sdn Bhd	2.2	1.7	1.5	1.6
Burger King	Cosmo Restaurants Sdn Bhd	2.1	1.9	1.6	1.6
Baskin-Robbins	Golden Scoop Sdn Bhd	1.4	1.3	1.2	1.2
Sugarbun	SB Franchise Management Sdn Bhd	1.5	1.1	1.0	1.2
Others		15.2	12.1	11.4	11.2
Total		100.0	100.0	100.0	100.0

(Source: Euromonitor, 2010)

iv. *Halal* Food Industry in Malaysia

Given the fact that Islam is the official religion in Malaysia and also growing concern for Muslims on the consumption of *halal* food as outlined in Islam, it is appropriate if not compulsory, to discuss the *halal* food industry to provide some insights on the overall food consumption in Malaysian context. The government is also aiming to put Malaysia at the forefront of global *halal* food industry. To become the leader in *halal* food industry, it is a necessity to have a well structured *halal* certification and regulatory frameworks locally. Restaurants and food industry players are generally divided into *halal* or non-*halal*.

In 2010, the estimated Muslim population worldwide was 1.8 billion, and forecasted to grow at twice the rate by 2030 representing 27.0 percent of global population (Pew Research Center, 2009). This provides a huge market for *halal* food which is estimated at US\$547 billion a year (Dierks, 2011). The term *halal* in Arabic means “allowed” or “permissible” by Islamic law. The Malaysian *Halal* Hub (2013) has given a thorough description of *halal* food as the following:

- (a) does not stem from or consist of any part of or item from animals that are forbidden to Muslims by Islamic law, or animals that have not been slaughtered according to Islamic law;
- (b) does not contain any substance that is considered impure in Islamic law;
- (c) is not prepared, processed or manufactured using equipment or utensils that are not free from impurities as defined by Islamic law; and
- (d) that, in the preparation, processing or storage stage, does not come in contact with or is stored near any kind of food that does not meet the requirements of paragraphs (a), (b) or (c) or any substances that are considered impure by Islamic law.

The prospects of *halal* industry in Malaysia are promising with the emphasis from the government on promoting the country as the international *halal* hub. Being one of the active members of the Organization of Islamic Conference (OIC), Malaysia's export of *halal* products to OIC countries has increased from six percent (USD1.3 billion) in 2010 to nine percent (USD7.3 billion) in 2011 (*Halal* Industry Development Corporation, HDC 2012). The value of *halal* food industry is currently estimated at being within the range of US\$600 billion to US\$2.1 trillion (MIDA, 2013).

The Malaysian Standard on *Halal* Food (MS 1500:2009) was established by the Department of Standardization Malaysia (DSM) under the Ministry of Science, Technology and Innovation, to replace the former *halal* food standard, MS 1500:2004. The new MS 1500:2009 covers comprehensive aspects of *halal* food production, preparation, handling and storage. In recent years, the *halal* standard in food products have been extended from meat and meat products to non meat-based products including dairy, bakery, confectionery, beverages and snacks. The government and related agencies are promoting the *halal* standards as a new benchmark for quality, hygiene and safety (JAKIM, 2013). In the Malaysian context, *halal* certification for *halal* products and ingredients are perceived to have added to the market value (USDA Foreign Agricultural Service, 2012). As a result, the players in the food industry including food manufacturers, retailers and food service operators are prompted to obtain the *halal* certificate for non meat-based food products as well as ingredients.

1.3.3 Nutrition and Health Concern Scenario in Malaysia

The rapid economic development is normally accompanied by improvements in a country's food demand and supply. On the demand side, the demand of the modern generation is food that is easy to prepare and consume which reflects the changes in their lifestyles. This scenario shifts the demand and supply of food and beverages around the globe. The dietary changes include the shifts in diet pattern towards one greater in saturated fat and added sugar, reduced complex carbohydrates and fibre, and reduced consumption of fruit and vegetables.

In the past, the nutrition concern was typically interpreted to malnutrition or under-nutrition. In more recent years, other issues related to nutrition specifically over-nutrition including being overweight and obese is considerably gaining attention (UNEP, 2012). This scenario holds true amongst Malaysian, too. The issues of dietary habits among Malaysians have changed over time. In the 1970s, the main concern of the related health authorities with regard to dietary practices was malnutrition (New Straits Times, 2013). During that time, the majority of the population did not consume sufficient vitamins and minerals. Ironically, the main issue today is over-eating habits among the population. Being a multiracial country, Malaysia provides a wide range of local cuisines. Malaysians are spoilt by many choices of food available to them, from the street stalls to five star restaurants, to the availability of 24-hour food eateries offering a place to hang out at nights. Prior to this, Malaysians were practicing an unhealthy diet by eating heavy supper at late night (The Star, 2010). Besides that, with the number of fast food restaurants on the rise, less healthy options are offered to the people. The diet towards "westernization" is also believed to contribute to the nutrition-related diseases. Although Malaysians

seem to get some of their dietary requirements with the consumption of cereals, fruit and vegetables based on recommendations from the Malaysian Dietary Guidelines (MDG), the consumption of meat, milk and dairy product are however not met (Norimah *et al.*, 2008). Malaysians consume an excessive amount of meat while less amount of milk and dairy products are part of their diets.

1.3.4 Health Issues Related to Unhealthy Eating Behavior in Malaysia

The shift in dietary pattern or "nutrition transition", along with sedentary lifestyle such as reduced physical activity and increased other non-physical activities (for examples, watching television and internet-related activities) has brought about undesired health implications to the population. Various diseases are related to the unhealthy diet such as diabetes, cardiovascular diseases and certain types of cancers which are now more common in modern societies.

According to WHO (2010), the leading global risks for mortality in the world is contributed mainly by the diseases related to lifestyle including high blood pressure (13.0 percent), tobacco use (9.0 percent), high blood glucose (6.0 percent), physical inactivity (6.0 percent), and overweight and obesity (5.0 percent). These risks are the main causes of the rising risk of chronic diseases such as heart diseases, diabetes and certain types of cancers.

There is no exception for Malaysia as one of the most developed countries in Southeast Asia. The country is following a similar trend. Malaysians are adopting unhealthy eating behavior, not to mention a sedentary lifestyle. This may explain the increasing rate of the prevalence of overweight and obesity in the country. Within the region, Malaysia ranked top in the prevalence of overweight and obesity among adults, placed sixth in Asia and 39th in the world of obesity (WHO, 2010). The association between obesity and a multitude of diseases including diabetes, heart diseases, cardiovascular disease, hypertension, and certain types of cancers is well documented in the literature (for example Tee, 1999; S.-Y. Chou *et al.*, 2004; Binkley, 2006).

The alarming statistics is supported by findings from NHMS III which shows that the total prevalence of overweight and obesity has risen rapidly by more than two folds within a ten year period from 21.0 percent in 1996 to 43.1 percent in 2006. The percentage indicates that almost half of the adult population in the country could be overweight or obese. The NHMS III has also included children below 18 years in the survey (Table 1.10). The prevalence of overweight among children was 5.4 percent. The latest NHMS 2011 shows that all of the prevalence discussed is on the rise. Other than this nationwide survey, a number of studies in Malaysia have reported a growing percentage of overweight and obesity among adults (Ismail *et al.*, 2002), and also children and adolescents (Wan *et al.*, 2012; Lekhraj Rampal *et al.*, 2007; Sidik and Rampal, 2009).

Table 1.10. Prevalence of Non-communicable Disease Risk Factors

Age group	NHMS II (1996)	NHMS III (2006)		NHMS 2011
	≥30 years	≥18 years	≥30 years	≥18 years
Prevalence of diabetes	8.3%	11.6%	14.9%	15.2%
Prevalence of hypertension	32.9%	32.2%	42.6%	32.7%
Prevalence of selected NCD risk factors:				
Overweight		29.1%		33.3%
Obesity		14.0%		27.2%
Hypercholesterolaemia		20.6%		35.1%

(Source: Ministry of Health Malaysia, 2008-2011)

In addition to that, the prevalence of diabetes is on the rise and it is estimated that 2.6 million adults 18 years and above or 15.2 percent were diabetics in 2011 (MOH, 2012). To make things worse, 7.2 percent of the diabetic people are known to have diabetes and a higher percentage (8.0 percent) are previously undiagnosed with diabetes. Malaysia ranked as the 17th country worldwide in the prevalence estimates of diabetes mellitus in 2010.

Regarding the non-communicable disease (NCD) risk factors in Malaysia, the latest NHMS 2011 report on NCD revealed that the prevalence of NCD risk factors continues to rise. More than 17 million Malaysians or 60.7 percent of the population are living with NCD, not to mention many more who are still undiagnosed (one third of Malaysians is estimated has been undiagnosed in 2009). Currently, it is estimated that about 6.2 million Malaysian adults have hypercholesterolaemia, 5.8 million have hypertension, 4.4 million have obesity and overweight, and 2.6 million have diabetes (MOH, 2011).

The NHMS 2011 also shows that about 38.0 to 40.0 percent of total deaths are due to NCD, with premature deaths (below the age of 60) representing 29.0 to 35.0 percent of the total deaths. All of these health risk factors are highly associated with poor dietary practices and lifestyle of the population. Currently, cardiovascular diseases are the country's number one killer. In 2003, there were 2,697 deaths due to cardiovascular diseases, increased to 2,948 in 2004 and 3,038 in 2005. Eighty percent of heart diseases were caused by a combination of factors such as poor eating habits, lack of exercise and smoking (New Straits Times, 2007).

It is estimated that more than RM500 million has been spent on health campaigns alone by the MOH since 1980s but the results are far from achieving the objectives. For example, the 11 years (1991-2002) "Healthy Lifestyle Campaign" promoted by MOH costs RM5.9 million and can be regarded as a failed effort in promoting the desired lifestyle to the general public.

As far as this study has found, there has been no prior research to specifically measure the economic costs of overweight and obesity in Malaysia. However, based on several studies in developed countries, it is estimated that the costs range between two to six percent of the total health care costs. Given the annual total expenditure on health in Malaysia of RM33.7 billion in 2009, the economic costs attributable to obesity and its comorbidities is estimated at approximately between RM674 million

and RM2.02 billion. These estimates do not include implicit economic costs such as low productivity, sickness absence, early retirement and mortality.

Other than the economic costs incurred for the obesity problems and its comorbidities, the Ministry of Health spent a considerably large amount of its annual budget on drugs for hypertension, diabetes and high cholesterol. Medicines for the three diseases would incur an annual cost of between RM150 and RM200 million. Thus, it proves that the health conditions of the population have significant implications on the escalating health care costs including expensive treatment and long-term rehabilitative care. To make things worse, the NCD is the main cause of premature deaths amongst Malaysian adults. In other words, the disabilities and premature deaths caused by the diseases are among the economically productive members of the population. WHO has reported that the world life expectancy would increase by about seven to ten years if all the primary global health risks are eradicated. NCD factors are preventable and could be avoided if the population practices a healthy lifestyle. Thus, the health care costs associated with this could be saved and used for other beneficial purposes.

1.4 Programs Promoted by the Government

Having realized the dangers of the so called lifestyle diseases among the population, the Malaysian government via the MOH has set a goal to reduce premature deaths due to NCD by 25 percent in line with the global target by the year 2025 (New Straits Times, 2012). To achieve this goal, on 17 December 2010 the Malaysian cabinet approved the National Strategic Plan for Non-Communicable Diseases (NSP-NCD) 2010-2014. The plan was developed in line with the mandates of WHO with reference to the "2008-2013 Action Plan for the Global Strategy for the Prevention and Control of NCDs" and the "Western Pacific Regional Action Plan for NCDs" (MOH, 2012). NSP-NCD provides the framework for strengthening NCD prevention and control program in Malaysia. The cabinet committee for a Health Promoting Environment was set up to support the implementation of NSP-NCD. The main objective of this committee is to determine policies that create a living environment which supports positive behavioral changes of the population towards healthy and active living.

The growing concern on health issues has prompted the government via the MOH to promote healthy eating behavior by launching various campaigns and programs. Despite the fact that various programs or campaigns are sponsored by the MOH to promote healthy habits among the population, this study will only discuss selected campaigns/programs associated with healthy eating. This includes National Plan of Action for Nutrition of Malaysia (NPANM II) 2006-2015, Malaysian Council for Obesity Prevention (MCOM), "Healthy Lifestyle" campaign, "Reduce Sugar Intake", campaign, selected campaigns for children, Guidelines on the Implementation of Healthy Eating in the Public Sector, Nutrition Information Centres (NIC) and other relevant programs. In general, the campaigns objectives were to promote people to eat healthily, reduce their sugar intake, exercise regularly and generally maintain a healthy lifestyle.

1.4.1 National Plan of Action for Nutrition of Malaysia (2006–2015)

The government of Malaysia has recognised the role of nutrition in combating the major causes of morbidity and mortality related to unhealthy eating habits and sedentary lifestyle of the population and for this purpose, the National Nutrition Policy (NNP) was established in 2005 to address the role of nutrition in reducing these problems. In line with the NNP, the National Plan of Action for Nutrition of Malaysia NPANM II (2006–2015) was developed to achieve and maintain optimal nutritional well-being of Malaysians. The NPANM II has outlined strategies and activities to reduce the problems of under and over nutrition. One of the key activities spelt out in the NPANM II is the development and promotion of the new dietary guidelines, the Malaysian Dietary Guidelines (MDG) which was launched on 25 March 2010, replacing the prior dietary guidelines published in 1999. The updated MDG 2010 consists of 14 key messages and 55 recommendations. It covers thoroughly the issues of food and nutrition, ranging from the importance of consuming a variety of foods according to specific food groups, encouraging physical activities, consuming safe food and beverages, and using nutrition information on food labels effectively (Tee, 2011). The 14 key messages recommend Malaysians to;

- Key Message 1: Eat a variety of foods within their recommended intake
- Key Message 2: Maintain body weight in a healthy range
- Key Message 3: Be physically active everyday
- Key Message 4: Eat adequate amount of rice, other cereal products (preferably whole grain) and tubers
- Key Message 5: Eat plenty of fruit and vegetables everyday
- Key Message 6: Consume moderate amounts of fish, meat, poultry, egg, legumes and nuts
- Key Message 7: Consume adequate amounts of milk and milk products
- Key Message 8: Limit intake of foods high in fats and minimise fats and oils in food preparation
- Key Message 9: Choose and prepare food with less salt and sauces
- Key Message 10: Consume food and beverages low in sugar
- Key Message 11: Drink plenty of water daily
- Key Message 12: Practise exclusive breastfeeding from birth until six months and continue to breastfeed until two years of age
- Key Message 13: Consume safe and clean food and beverages
- Key Message 14: Make effective use of nutrition information on food labels

The new Malaysia Food Pyramid was introduced in the revised MDG. The Malaysia Food Pyramid is a visual tool used as a guide in designing a healthy diet. It provides recommendations on combination of types and amounts of food that can be consumed to maintain a healthy diet. As shown in Figure 1.3, the recommended number of servings per day from each group is suggested in the food pyramid. The pyramid suggests that the recommended daily intake for a person is between 1,500 and 2,500 calories. The size of each food group becomes smaller from bottom to the top, indicating that food at the base of the pyramid should be eaten more while consuming less of the food at the top of the pyramid.

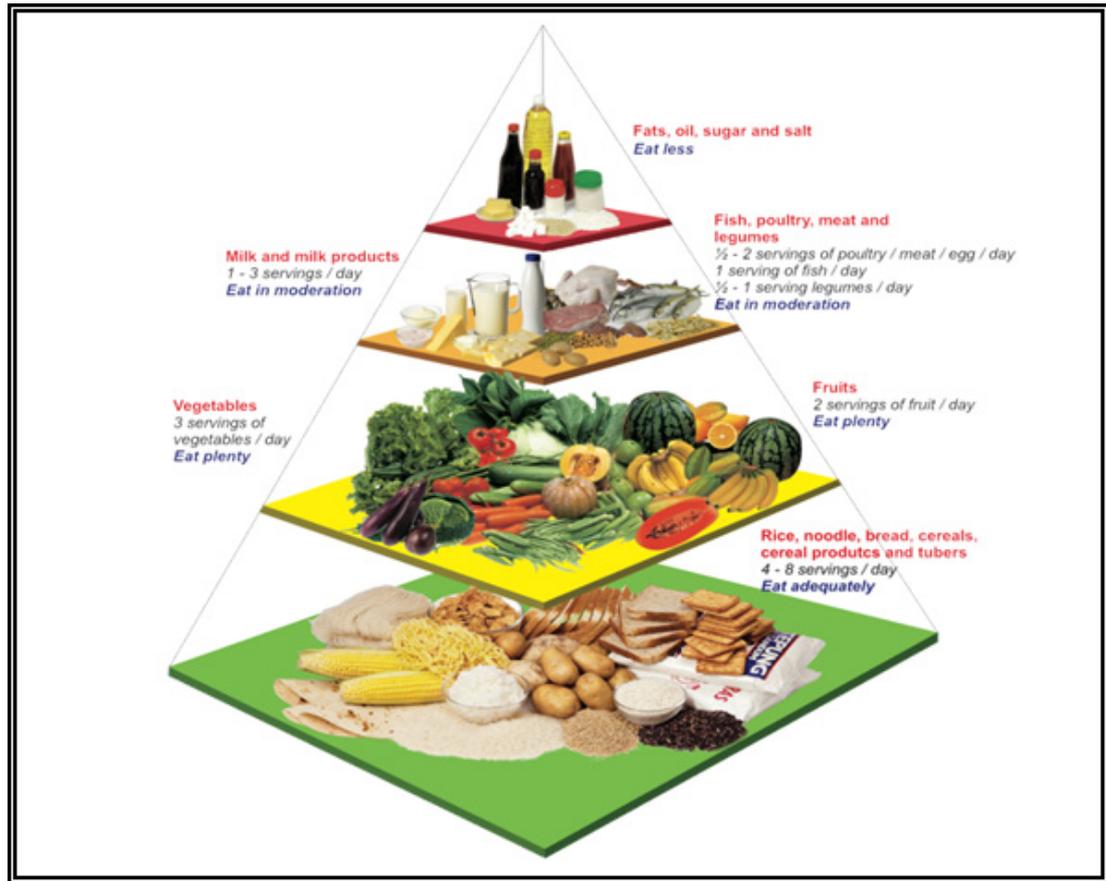


Figure 1.3. The Malaysia Food Pyramid
(Source: Ministry of Health, 2011)

1.4.2 Malaysian Council for Obesity Prevention

The Malaysian Council for Obesity Prevention (MCOM) was officially launched on 10 April 2010 with its common goal, "Healthy weight for all Malaysians". This council has registered 13 members to assist the government in combating the overweight and obesity issues amongst the population, which are: Federation of Malaysian Consumers Association, Malaysian Association for the Study of Obesity, Malaysian Diabetes Association, Malaysian Dietitians' Association, Malaysian Endocrine and Metabolic Society, Malaysian Medical Association, Malaysian Nurses Association, Malaysian Paediatric Association, National Diabetes Institute, National Heart Association of Malaysia, National Heart Foundation of Malaysia, National Kidney Foundation of Malaysia, and Nutrition Society of Malaysia. The MCOM has established eight objectives;

- i) to promote and raise awareness of healthy lifestyle for Malaysians especially in the prevention and control of overweight and obesity in line with the national 'Vision for Health';
- ii) to facilitate programs and activities of Members of the Council on prevention and control overweight and obesity so as to promote optimal health;
- iii) to strengthen and generate services and programs on overweight and obesity by non-governmental organizations (NGOs);

- iv) to encourage, support and undertake research on overweight and obesity and to maintain a database of these studies;
- v) to develop and conduct health promotion programs in the prevention and control of overweight and obesity for the general public;
- vi) to be a Malaysian national reference centre for overweight and obesity and to collaborate with other national and international agencies including for the programs, the epidemiology, prevention and control of overweight and obesity;
- vii) to provide advisory and consultancy services to government, industry and other organisations pertaining to overweight and obesity for the promotion of health;
- viii) to strengthen and establish close collaborations with relevant government ministries and agencies in order to achieve the aims and objectives of the council.

The MOH plans to introduce Anti-Obesity Law by year 2020 (New Straits Times, 2011). The idea is inspired by an implementation of maximum waistline size in Japan for adults above 40 years old. Currently, the proposed law is still being under reviewed by relevant divisions within the Malaysian Ministry of Health.

1.4.3 “Healthy Lifestyle Campaign” (1991 – 2007)

Despite the fact that the first stage of this national campaign has ended more than a decade ago, its implication on the Malaysian well-being is still debatable. Nevertheless, the campaign indicates the concerted efforts by the government of Malaysia in promoting a healthy lifestyle amongst Malaysians. The MOH has launched a "Healthy Lifestyle Campaign" in 1991 emphasizing on community roles, regardless of age and sex, to lead a healthy and wholesome lifestyle. The aim was to reduce risk of the people to chronic diseases, including diabetes and cancers. The first phase of the campaign (1991 – 1996) focused on specific diseases which were strongly associated with the lifestyle and practices of the community. The second phase (1997 – 2002) shifted attention on specific health behaviors and their long term effects. Even though healthy eating component was emphasized in 1997 campaign, it has always been one of the main strategies in the overall campaigns. This is due to the recognition of the importance of food and nutrition in the prevention of these diseases. Table 1.11 summarizes the annual themes for the campaign.

Table 1.11. The Annual Themes of Healthy Lifestyle Campaigns

Year	Theme
Phase I (1991 – 1996)	
1991	Cardiovascular Disease
1992	AIDS/STD
1993	Food Safety
1994	Child Health
1995	Cancer
1996	Diabetes Mellitus
Phase II (1997 – 2002)	
1997	Promotion of Healthy Eating
1998	Promotion of Exercise and Physical Activity
1999	Promotion of Safety and Injury Prevention
2000	Promotion of Mental Health
2001	Promotion of Healthy Family
2002	Promotion of Healthy Environment
New Phase (2003 – 2007)	
2003 - 2004	Healthy for Life – School setting
2005 - 2007	Healthy for Life – Workplace setting
My Sihat Strategic Plan	
2013 - 2017	Be Healthy for Life

(Source: Health Education Division, MOH, 2011)

The MOH had experienced some challenges in promoting the healthy lifestyle campaign amongst the population. Among other, challenges identified were too many themes to be developed, implemented and sustained as well as too many complex health behaviors are targeted within a yearlong campaign that makes it difficult for planning, implementation and evaluation (Health Education Division, 2002). Due to this, the "Healthy Lifestyle Campaign" was improvised in 2003, focusing on a single broad theme (with two different settings) to make the campaign more manageable and easier to implement without draining or stretching resources. The two themes focus on "Healthy for Life" for school setting (2003 – 2004) and workplace setting (2005 – 2007). For the healthy eating media campaign, in 2010 alone, the Ministry of Health has produced seven trailers and seven short videos on healthy eating, and seven computer games on nutrition (Nutrition Division, 2012).

Annual media campaigns have been conducted since 2006 to assess the achievements of the overall "Healthy Lifestyle Campaign". The survey figured out that 64.0 percent of people do physical activity or exercise in one form or another, 74.0 percent practice healthy eating, 85.6 percent practice healthy lifestyle to curb stress, 72.8 percent avoids alcohol drinking and only 17.0 percent are serious to stop smoking (Healthy Lifestyle Media Campaign and Smoking Cessation Media Campaign 2006/2007).

Since the last phase of “Healthy Lifestyle Campaign” has ended in 2007, the MOH via MySihat Strategic Plan 2013-2017 has set five priorities for focus: reducing smoking; promoting healthy diet; promoting physical activity; promoting mental health; and reducing harmful use of alcohol. Its second Key Result Areas (KRA 2) has specifically stressed on the promotion of healthy lifestyle and awareness. Under the overall theme of “Be Healthy for Life”, four basic elements including healthy eating, physical activity, not smoking, and handling stress were taken into consideration in conveying relevant health messages to the general public.

1.4.4 “Reduce Sugar Intake Campaign”

The campaign was initially introduced in 1997 highlighted in Healthy Lifestyle Campaign with the theme “Promotion of Healthy Eating”. In 1998, the campaign was further extended and targeted towards food outlet operators including food stalls, hawkers, canteens, coffee houses, hotels, franchises and caterers with the slogan "1 is enough, less is better". The health education programs include one-minute advertisement on television, "How to Reduce Sugar" pamphlets and "Less Sugar, Please!" posters.

In 2007, the “5M Media Campaign” was implemented which also emphasized on reducing the sugar intake among the population. The campaign was re-launched in Mac 2010 with the theme of "Stop at One, Less is Better". The main objective of the campaign was to encourage consumers to reduce sugar intake in their daily diet. The MOH has produced advertisement on television and pamphlets targeting food operators, housewives and school children. In addition, a series of dialogues with the food industries were conducted to achieve the objective.

1.4.5 Programs and Campaigns for Children

Healthy eating habit should be developed from a young age. Due to this concern, the government has promoted some strategies and campaigns gearing to instilling a positive dietary habit to combat the obesity problems among the children. The nutrition education and strategies were developed as early as the infant stage to achieve and maintain the nutritional well-being of Malaysians.

For example, the Guidelines for the Feeding of Infants and Young Children were established to provide nutrition education on the feeding of infants and children. At pre-school stage, the MOH has designed Nutrition Module for pre-school children. In addition, in collaboration with Ministry of Education (MOE), the Nutrition Guideline for Childcare Centres enlists menus and recipes for childcare centres operating throughout the country.

As for school children, some of the strategies include integrating the topics of nutrition into the school curriculum including KBSR and KBSM, implementing School Milk Program (PSS) and School Feeding Program (RMT), providing menu for boarding schools, organizing National School Health Quizzes, and incorporating the importance of health and physical activity in the school curriculum. In addition, physical activities are organised via co-curricular activities.

The aim of the health education curriculum is to help students improve health knowledge, foster positive attitudes towards health, and adopt a healthy lifestyle. At the teachers' training level, Department of Physical Education and Health was established in 2000 to assist the implementation of physical and health education at school level as envisaged by the MOE. The department collaborates with other related agencies such as the National Sports Council, Department of Health and Sports Association and State Sports Council to ensure the curriculum of Physical and Health education is successful in achieving the objectives.

In 1989, the Young Doctors Program, a school-based health promotion program was introduced at primary school level to empower the school children with knowledge and skills to improve their health status. By June 2009, a total of 1,058 schools set up their own Young Doctors Program with 28,796 young doctors (Young Doctors Program, 2009). The MOE has taken this program as part of the primary schools' co-curricular activities since 2007.

Later in 2007, the MOH launched the Healthy School Canteen Pilot Project for primary schools in Penang, Malacca, Putrajaya and Kuala Lumpur. The project outlined three objectives as follow;

- (a) to increase the parents, school canteen operators and teachers' awareness of the importance of healthy eating, physical activity and controlling weight
- (b) to educate teachers and parents to become role models for their children to practice a healthier lifestyle
- (c) to increase the children's knowledge about food and healthy lifestyle.

To improve healthy eating environment in schools, the MOE is planning to implement the new healthy eating guidelines in schools. The guideline is proposed to have three components, which are;

- (a) body mass index (BMI) measurement of students twice a year, and the results will be reported to their parents
- (b) healthy menu in school canteens
- (c) depiction of calorie contents of food sold in school canteens.

Prior to this, the School Canteen Management Guideline is revised in 2012 by the MOE and MOH to ensure healthier eating environments in schools. The food list and frequency of food items being sold are being set and failure to adhere to the guidelines may result in termination of the canteen contracts. In addition, the MOH collaborates with the Department of Local Governments to standardise the by-laws on prohibition of any sale of food and beverages by vendors outside school perimeters.

1.4.6 Guidelines on the Implementation of Healthy Eating in the Public Sector

The workplace campaign is the ideal way to instil healthy eating environment among workers. Workplace programs have proven to reduce 27.0 percent in sick leave and absenteeism, 26.0 percent in healthcare costs and 32.0 percent in workers' compensation and disability claims (National Heart Association of Malaysia, 2010). In order to cultivate healthy eating habits amongst 1.4 million civil servants, the

MOH has issued an unprecedented circular through the Public Service Department on the Guidelines on the Implementation of Healthy Eating in the Public Sector in February 2012. The ministry initiated the guidelines with the support of the government Chief Secretary, the Public Service Department (PSD) director-general and the general secretaries of all ministries (The Star, 2012).

The MOH has outlined two guidelines of healthy eating among the civil servants which include the guidelines on the preparation of healthy menu during meeting, and guidelines on the implementation of healthy food and beverages from vending machines in public service premises. Generally, the objective of the former guidelines is to control the food intake during meeting and to inculcate the habit of healthy eating among the civil servants. The latter guidelines aim to ensure the food and drink products sold via the vending machines are of healthier choices.

The guidelines of healthy menu preparation during meeting cover some useful tips and examples on how food should be prepared. The content of the guidelines include the importance of serving healthy meals during meetings; individual serving size guidelines; eight healthy eating practices; eight basic principles of serving food during meetings; serving and labelling procedures; and sample of menus according to time (Nutrition Division, 2012).

Meanwhile, the guidelines on the implementation of healthy food and beverages from vending machines are applicable to all government facilities that provide such vending machines. The guidelines outline two major components, which are: the healthy food and beverages products of vending machines, and rules of vending machine placement. The categories of products allowed for sale is listed in the guidelines and in compliance with the Food Regulations 1985. In addition, the placement of vending machines should comply with the Food Act 1983, Food Hygiene Regulations 2009, Chapter 6 (Article 53-55).

1.4.7 Nutrition Information Centres

Nutrition Information Centres (NIC) was set up to disseminate accurate nutrition information to the public, government and non-government agencies. It promotes nutrition through healthy eating as early as in infant stage to elderly population. The centres play the main role as a reference centre for the general public to access to information regarding nutrition. In 2011, a total of 15 NICs is operating throughout the country (Country Health Plan, 10th Malaysia Plan 2011-2015). The nutrition information distributed in institutions is as follows;

- (a) Menu and diet scale for prison inmates (2001 and 2010)
- (b) Menu for institutions under Home Affairs Ministry, Malaysia (2008)
- (c) Caregiver Training Module – Basic Care of People with Disabilities in Institution and Home
- (d) Nutrition Guidelines for Children with Special Needs from Birth to 18 years old
- (e) Booklet – Nutrition for Children with Special Needs

The Healthy Community Kitchens (*Dapur Sihat*) were established in health centres and there are 57 outlets operating so far. The objective of the Healthy Community Kitchens is to enhance nutritional status amongst family and community through

attractive and effective healthy eating and food safety promotion. In achieving the objective, the Nutrition Division of MOH have organized various activities to educate the community on food choices and cooking methods in order to improve the public's nutritional status. The activities include cooking sessions and demonstration, talks, preparation and distribution of food for specific groups, health screenings, economic activities, leisure activities, trainings and local campaigns (Nutrition Division, 2012). As of September 2009, a total of 17,602 people were involved in these activities.

1.4.8 Other Programs

The MOH has taken some proactive steps collaborating with stakeholders outside the health sectors to create a health-promoting environment in Malaysia. Some dialogues with the food and beverages industry have been conducted, in which some commitments were made by the industry to increase the production and promotion of healthy food choices, and also adopt an active role in multi-sectoral partnership with the ministry.

Other than the aforementioned campaigns, MOH has gazetted a nutrition labelling and claims in 2003. Malaysia was the pioneer in the ASEAN region in the development of this regulation. However, under the Malaysian Food Regulations 1985, it is not compulsory for food labels to have nutrition labelling, except for "special purpose foods" including prepared cereal foods and bread; various types of milk products; flour confections, canned meat, fish, and vegetables; canned fruit and various types of fruit juices; salad dressing and mayonnaise; and various types of soft drink (Ministry Of Health, 2011). The law is also mandatory for products making nutrition claims.

In addition, the MOH requires all fast food restaurants to present their nutrition information on the wrapper or on brochures, pamphlets or posters. Besides that, the MOH has enforced guidelines for the advertising of fast food on children. Among other, the guidelines stipulate that the fast food industry is prohibited from sponsoring children programs on television. A number of quick service restaurant (QSR) establishments have taken some initiatives to support these guidelines. For example, KFC Malaysia offers nutritional value of every meal available on its official website.

1.5 Problem Statement

Like any other countries, there is rising awareness among Malaysians on the importance of healthy eating habits. Over a decade since the "Healthy Lifestyle Campaign" ended, the public's knowledge on food and nutrition has increased considerably. This can be translated into the premise that Malaysians are getting more health-conscious.

However, statistics show that there is severity of the health problems among the Malaysian population. Despite the various programs and campaigns being promoted by the MOH on healthy eating and lifestyles, they fail to meet the objectives. Most of the people may not have transformed their nutrition knowledge into healthier eating habits. It reflects a scenario that Malaysians are not responsive to campaigns and also

they cannot care the least about the effects of unhealthy eating. The government has expressed its concern over the population's health via the Country Health Plan 2011-2015 which states that there is a wide gap between Malaysians' knowledge and their behavior (MOH, 2011).

In response to this problem, the question whether the much improved consciousness can be translated into Malaysians have changed their eating habits should be examined. To understand this, the first endeavour is to explore the motives behind the food choices Malaysians make. The decisions may be influenced by various motives including health concerns, price, taste or religious concerns. If Malaysians are motivated by the health factor, it is therefore worthy to explore whether health motives have a significant role on their healthy eating intention.

Once the food choice motives have been explored, the most important concern to take into account is to develop some basis for understanding the Malaysians healthy eating intention. As such, the people's beliefs about healthy eating are translated into their attitudes, and further extended to their intention of performing healthier eating behavior. A vital assumption regarding the attitude concept is the belief that attitudes in some ways may guide, influence and predict the actual behavior. Most of the researchers agreed that attitude contributes most of the changing behavior. Other than attitudes, the desired intention of healthy eating might be influenced by other factors such as normative and individual's self control. Normative or social factors may influence people to perform desired healthier eating behavior to comply with the expectation from others. In addition, one's self control might be important factor in guiding people to practice a healthy eating. It seems logical that the greater the self control is, the greater is the intention to eat healthily.

Other than the attitudinal, normative and self-control factors, the possible barriers of eating healthily may explain why people fail to exercise healthy eating behavior, even when they have the intention to do so. Some of the barriers perceived by people could be time constraint due to busy lifestyle, price, the availability of healthy food around, or taste. Another important aspect that should be taken into account is the influence of perceived susceptibility or risks of health conditions that might occur if one is not practising a healthy diet. It would be important to explore if such risk perceived by the people could change their eating habit into a healthier one. Family history of relevant health conditions may also influence people in their healthy intention. Some people would practise a healthy diet to avoid them from having the same diseases while others may not.

Finally, the question of how socio demographic factors play an important role in understanding various factors that influence people in their healthy eating intention should be answered. Different interest groups may demonstrate different responses in healthy eating intention. Therefore, further understanding of the differences between groups would provide better insights on the healthy eating intention.

1.6 Objectives of the Study

The general objective of this study is to investigate the factors influencing healthy eating intention among Malaysian adults. The specific objectives of the study are:

- i) to identify the importance of different motives of food choice;
- ii) to determine the underlying factors of perceived barriers to healthy eating;
- iii) to investigate the relationships among factors significantly influencing consumers' healthy eating intention;
- iv) to determine the ability of socio demographic variables to moderate the relationship among variables in the model.

1.7 Significance of the Study

The findings of this study would be beneficial to the agribusiness marketers in segmenting market, targeting promotions and positioning healthy food products to offer healthier food options that can satisfy the consumers' motives for food choice. The findings will also be beneficial to the public health educators to thoroughly understand the general publics' food choice motives, attitudes, barriers, and intention towards healthy eating. Hence, further strategies can manoeuvre both towards the appropriate formulation and effective implementation of promoting healthy eating as well as to reduce perceived barriers to healthy eating.

1.8 Organization of the Study

This study is organized into five chapters. Chapter 1 discusses the introduction part covering food consumption, health related issues and programs implemented to battle the diet-related diseases in Malaysia. Chapter 2 discusses a list of literature review of relevant studies in the areas of healthy eating definitions, food choice motives, perceived barriers to healthy eating and theoretical framework of the TPB and HBM. The conceptual framework, methodology used and statistical analysis techniques employed in this study are covered in Chapter 3. The statistical results are discussed in Chapter 4 which covers the findings of descriptive, factor analysis and structural equation modelling (SEM). Finally, Chapter 5 includes the summary of analysis, conclusion and relevant recommendations of the study.

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