

## FACTORS INFLUENCING FOOD CHOICE AMONG STUDENTS IN A RESIDENTIAL COLLEGE OF A MALAYSIA PUBLIC UNIVERSITY

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### ABSTRACT

*This study examines factors influencing food choice among students in a residential college of a Malaysian public university. A simple random sampling method was used to select 250 respondents. Data were collected using self-administered questionnaire. Food Choice (Stephens, Pollard and Wardle, 1995) and Food Frequency Questionnaires were used to measure food choice factors and dietary intake, respectively. The food choice factors included internal factors (sensory appeal, natural content and health) and external factors (ethics, weight control, convenience, familiarity, mood, and price). Results indicated that health (internal factors) and price (external factors) were the most important food choice factors for students. Ethics was the least important factor. Results indicated significant relationship between both internal and external food choice factors with dietary intake. Pork intake was related to ethics concerned ( $r = -0.28, p < 0.01$ ). Weight management led to less burger intake ( $r = -0.16, p < 0.05$ ). High health concern could incur consumption of carrot ( $r = 0.21, p < 0.01$ ). Consumption of sweetened condensed milk was positively related to sensory appeal ( $r = 0.14, p < 0.05$ ) and familiarity ( $r = 0.19, p < 0.01$ ). In conclusion, the students were concerned with both health and price factors. With limited resources, students most concerned price of the food rather than other factors. Interestingly, price becomes the barrier to eating healthy. Further studies should be conducted at different geographical areas and education institutions.*

**Keywords :** Food Choice, Students, Dietary Intake, Factors

### ABSTRAK

*Kajian ini meneliti faktor-faktor yang mempengaruhi pemilihan makanan dalam kalangan mahasiswa di sebuah kolej kediaman universiti awam di Malaysia. Pensampelan rawak mudah digunakan untuk memilih 250 responden. Data dikumpulkan dengan menggunakan borang soal selidik tadbir sendiri. Soal Selidik Pemilihan Makanan (Stephens, Pollard dan Wardle, 1995) dan Kekerapan Makanan masing-masing digunakan untuk mengukur faktor*

*pemilihan makanan dan pengambilan makanan. Faktor pemilihan makanan termasuk faktor dalaman (sensori, kandungan semula jadi dan kesihatan) dan faktor luaran (etika, kawalan berat badan, keselesaan, kebiasaan, emosi dan harga). Hasil kajian menunjukkan bahawa kesihatan (faktor dalaman) dan harga (faktor luaran) adalah faktor utama pemilihan makanan bagi mahasiswa. Etika merupakan faktor yang paling kurang penting. Hasil kajian menunjukkan bahawa terdapat perkaitan yang signifikan antara faktor dalaman dan luaran pemilihan makanan dengan pengambilan makanan. Pengambilan daging babi mempunyai berkaitan dengan etika ( $r = -0,28, p < 0.01$ ). Pengurusan berat badan menyumbang kepada pengurangan pengambilan burger ( $r = -0,16, p < 0.05$ ). Keprihatinan kesihatan yang tinggi mempunyai perkaitan dengan pengambilan lobak merah ( $r = 0,21, p < 0.01$ ). Pengambilan susu pekat manis berkait secara positif dengan sensori ( $r = 0,14, p < 0.05$ ) dan kebiasaan ( $r = 0,19, p < 0.01$ ). Kesimpulannya, mahasiswa prihatin dengan faktor kesihatan dan harga. Dengan sumber yang terhad, mahasiswa prihatin dengan faktor harga berbanding dengan faktor-faktor lain. Walau bagaimanapun, faktor harga menjadi penghalang kepada pemakanan sihat. Kajian selanjutnya perlu dijalankan di kawasan georafikal dan institusi pendidikan yang berbeza.*

**Kata Kunci:** *Pemilihan Makanan, Mahasiswa, Pengambilan Makanan, Faktor*

## INTRODUCTION

Food is one of the basic needs for human being. Without food, human being will suffer from starvation. Drought, rising of food price and lack of infrastructures caused shortage of food and over four millions of African suffering famine and starvation (Gutman, 2002). According to Maslow (1943), food, water, shelter, and air are basic or biological needs of human being, which is at the first stage in hierarchy of needs. Without fulfilling this stage, the daily life of human being cannot function well and one can eventually die. Fulfillment of the first stage is require to fulfill higher stages in Maslow's hierarchy of needs, such as needs for safety, affection, esteem, and self-actualization.

There was several factors influence food choice. Food choice could be affected by food related factors or internal factors and external factors, such as economic and social environment within which the choice is made (Shepherd, 1999). Internal factors include nutrient contents as well as physical and chemical properties in food. Whereas, external factors consist of price, brand, social and cultural which will affect food choice. However, perception of sensory attribute and psychological differences (personality, mood,

experience, and belief) might result in different food choice motives among individual (Shepherd, 1999).

Sensory factors like taste, appearance texture and preference can affect people food choice. These factors cause people to perceive that higher fat food was tasty (Gilbert and Hutton, 2008). Other than that, non-sensory factors also take place in affecting food choice of children, such as hunger, familiarity, family habits and feeding practices, peer pressure, schools and teachers, media and advertising, and product price (Gilbert and Hutton, 2008). Marketing strategies practiced by the marketers also affected people food choice (O'Mahony and Hall, 2007). To generate more profit, marketers like to promote their product via advertisement, gift, promotion, attractive package, and sold in place that consumer can easily buy. Consumers tended to buy food based on the advertisement, package, distribution, price, and promotion rather than nutrition needed by the body.

Eating behavior might be formed during childhood, which determined by personal choice, influenced by parent, and after that affected by peers and society. It might change if there is a major transition and new influence comes into people's life (Sloan, Legrand and Chen, 2008). Furthermore, Sloan et al. (2008) reported that younger group is highly influenced by peer and immediate environment rather than government intervention and origin of ingredients. Young people were more likely to change their food preference to adapt with the environment. However, when age rise, eating habits would less likely to be change.

Nowadays, changes of the societies have changed people's food choice and eating pattern (Sloan et al., 2008). Other than fulfilling biological needs, people choose their food by considering whether it fulfill their enjoyment, mood and special occasions or otherwise (Narine and Badrine, 2007). During stressful moment, people tend to consume less healthy food in order to cope with their stress (Oliver, Wardle and Gibson, 2000; Barlas, 2006). Other than that, people tend to choose food that is convenient and could reduce the preparation cost and time, such as ready meal (Ahlgren, Gustafsson and Hall, 2004).

Besides, globalization and urbanization dramatically changed dietary intake of Asian from traditional dominance of rice to western diet. Asian people have increased their consumption of wheat, temperate zone fruit and vegetables, high protein and energy dense diet as well as convenience food and beverage (Pingali, 2006). Moreover, fast food has become an important

feature of not only the diet of children in the United States but also increasingly throughout the world (Bowman, Gortmaker, Ebbeling, Pereira, and Ludwig, 2004).

In addition, diet is significantly associated with health. Adequate dietary intake has positive outcome on health. Improper eating habit would lead to undesirable diseases. Types II diabetes is developed in later life, which is associated with diet that is high in sugar and fat. Gallstones are due to obesity and dieting with rapid weight loss. Calcium stones are caused by high intake of protein, sodium, simple carbohydrate, vitamin D, calcium, alcohol, spicy food, and low in cereal, fiber and water (Ogden, 2010).

Government and education institution in Malaysia continuously promote dietary guideline to Malaysian. Public are aware of their daily dietary intake and understand which component of dietary are needed. However, young people are more likely chosen foods that are tasty rather than considered about its health impact of the food (Gilbert and Hutton, 2008). In addition, dietary intake of young people usually low in fruit, vegetables, calcium-rich food, highly taking fat as well as skipping meal to save cost or to control weight (Sloan et al., 2008).

Family primarily influences dietary pattern of students. During studying in university, students are undergoing transition to independent living. Students are required to make their own food choices without the supervision of family, which often results in poor eating habits (Sloan et al., 2008). Younger group tend to reject certain food because taste of the food. Meat and vegetables are the food that most frequently rejected by college students (Mooney and Walbourn, 2001). There were several reasons for food avoidance and rejections, such as maintain body weight, avoiding health impact of meat consumption as well as ethical concern.

This study aims to determine factors influencing dietary intake among students in a residential college of a Malaysian public university. A further aim was to identify internal factors (sensory appeal, natural content and health) and external factors (ethical concern, weight control, mood, convenience, familiarity, and price) of students' food choice. Dietary intakes of students were identified by using Food Frequency Questionnaire (FFQ). Relationship between internal and external factors influencing food choice with dietary intake of students is an important topic, which provides useful information to food marketers.

## METHODS

### *Design*

Cross-sectional design was used in this study. Instrument of this study used the existing validated scales. Self-administered questionnaire with English and Bahasa Malaysia items is used to collect data of this study. Pre-test were conducted in order to check the language, phrasing and understanding of questions. About 12 respondents were involved in pre test to ensure that the questions were comprehensible to the respondents.

### *Subjects*

Students in a residential college of a Malaysian public university were being selected as this study population. A sample size of 250 students was needed for this study and simple random sampling was used to select samples for this study (Raosoft, 2004).

### *Food Choice Questionnaire (FCQ)*

FCQ is a multidimensional measure of health and non-health related factors influencing food choice (Steptoe et al., 1995). Nine factors can be assessed, which include sensory appeal, natural content, health, ethical concern, weight control, mood, convenience, familiarity, and price. FCQ consists of 36 items with four-point Likert, ranging from 1 = “not at all important” to 4 = “very important”. High score of FCQ indicated that factors significantly affect respondents’ food choice (Steptoe et al., 1995). Each variable’s score computed by averaging weighted rating for individual items.

### *Food Frequency Questionnaire (FFQ)*

FFQ consisted of 80 food items and listed into 12 categories of food, which included cereal and product of cereal, meat and products of meat, fish and seafood, egg, nuts, milk and dairy products, vegetables, fruits, beverage, confection, bread spread, and flavoring. There were four options for frequency of intake categories. Hence, the respondents were required to report their frequency of intake within a day, a week, a month or never consuming the food during previous 30 days and only provided one option for each food item. Scoring system was based on frequency of intake: everyday = 7, three to six times weekly = 4, once or twice weekly = 1, and less than once a week = 0. Only food items that were consumed at least once weekly contributed to the scoring and the scores represented numbers of food intake weekly. Scoring of food frequency was divided into 3 categories, low (0-2), medium (3-4) and high (5-7) (Clausen, Charlton, Gobotswang, and Holmboe-Ottesen, 2005).

### **Analysis**

The data were processed using Statistical Package for Social Science (SPSS) version 12. Descriptive analysis was used to describe the frequency, percentage, mean, and range of the data. This analysis present the characteristics of each single variable in the study, such as background, internal and external factors of food choice as well as dietary intake of respondents. Moreover, bivariate analysis was analyzed using Pearson's correlation to determine relationship between internal and external food choice factors toward dietary intake.

## **RESULTS**

Approximately 83.2% of the respondents were female and 16.8% were male. Age of the respondents ranged from 19 years old to 27 years old with mean age  $20.9 \pm 1.5$  years old. In addition, about 54.8% Malay, 38.8% Chinese and 4.4% Indian were involved in this study. Only 2% of the respondents were from other races namely, Bidayuh, Dusun, Kadazan, Kelabit, and Rungus. Moreover, approximately 42.8% of the respondents were students from Faculty of Economics and Management and 1.6% of the respondents were from Faculty of Education Studies. About 36% of the respondents were first year students. Mean income of respondents was RM  $3238.20 \pm 1186.10$  per semester. Demographic and socio-economic characteristics of the respondents are shown in Table 1.

**Table 1: Demographic and Socio-Economic of Respondents**

<b>Characteristics</b>	<b>n</b>	<b>%</b>
<b>Gender</b>		
Male	42	16.80
Female	208	83.20
<b>Age</b>		
19 - 21	168	67.20
22 - 24	80	32.00
25 - 27	2	0.80
Mean $\pm$ SD*	$20.87 \pm 1.50$	
Min - max	19 - 27	
<b>Race</b>		
Malay	137	54.80

Chinese	97	38.80
India	11	4.40
Others	5	2.00
<b>Program**</b>		
FEP	107	42.80
FBMK	51	20.40
FSAS	35	14.00
FEM	32	12.80
FSKTM	21	8.40
FPP	4	1.60
<b>Year of study</b>		
1	90	36.00
2	84	33.60
3	60	24.00
4	16	6.40
<b>Income per semester</b>		
1999 and below	31	12.40
2000 - 3999	157	62.80
4000 and above	62	24.80
Mean $\pm$ SD	3238.20 $\pm$ 1186.07	
Min - max	760 - 7400	

\* SD - Standard deviation

\*\*FEP - Faculty of Economic and Management

FBMK - Faculty of Modern Language and Education

FSAS - Faculty of Environment Studies

FEM - Faculty of Human Ecology

FSKTM - Faculty of Science Computer and Information Technology

FPP - Faculty of Education Studies

Table 2 showed the mean scores with standard deviation of internal and external food choice factors. Health ( $3.40 \pm 0.56$ ) was the most important internal factor when choosing food, continuing by sensory appeal ( $3.32 \pm 0.47$ ) and natural content ( $3.22 \pm 0.63$ ). Among the external food choice factors, price ( $3.39 \pm 0.65$ ) was the most important factor for students and followed by convenience ( $3.25 \pm 0.52$ ), weight control ( $3.15 \pm 0.71$ ), mood ( $3.09 \pm 0.58$ ), familiarity ( $3.01 \pm 0.55$ ), and ethics concern ( $2.84 \pm 0.72$ ).

**Table 2: Mean Scores with Standard Deviation of Internal and External Food Choice Factors**

<b>Factors</b>	<b>Mean</b>	<b>SD</b>
<b>Internal factors</b>		
Health	3.40	0.56
Sensory appeal	3.32	0.47
Natural content	3.22	0.63
<b>External factors</b>		
Price	3.39	0.65
Convenience	3.25	0.52
Weight control	3.15	0.71
Mood	3.09	0.58
Familiarity	3.01	0.55
Ethics	2.84	0.72

In Table 3, mean frequency of rice intake was  $5.84 \pm 2.48$  times in a week. Consumption of noodles was low and about  $2.25 \pm 2.25$  times in a week. In relation to the source of protein, respondents consumed chicken at around  $4.88 \pm 2.65$  times weekly. Non-Muslim students had low intake of pork with mean  $0.74 \pm 1.72$  times. Consumption of fish was low ( $2.14 \pm 2.52$ ). The students had medium intake of egg ( $3.04 \pm 2.60$ ). In average, weekly frequency of powdered milk ( $1.26 \pm 2.42$ ) and sweetened condensed milk ( $0.87 \pm 1.92$ ) consumption were low. The respondents consumed green leafy vegetables at approximately  $4.69 \pm 2.81$  times in a week. The mean frequency of fruits consumption was relatively low, i.e. about  $1.29 \pm 2.02$  times of apple and  $0.24 \pm 0.77$  times of longan in a week. The respondents had medium weekly intake of chocolate-based drink ( $3.34 \pm 2.98$ ) and low consumption of syrup cordial ( $0.70 \pm 1.62$ ).

**Table 3: Weekly Frequency of Selected Food Intake**

<b>Types of food</b>	<b>Mean</b>	<b>SD</b>
<b>Grains</b>		
Rice	5.80	2.48
Noodles	2.25	2.25

<b>Protein</b>		
Chicken	4.88	2.65
Pork	0.74	1.72
Burger	1.41	1.90
Fish	2.14	2.52
Egg	3.04	2.60
Salted egg	0.44	1.34
<b>Dairy products</b>		
Powdered milk	1.26	2.42
Sweetened condensed milk	0.87	1.92
<b>Vegetables</b>		
Green leafy vegetable	4.69	2.81
Carrot	3.80	3.01
<b>Fruits</b>		
Apple	1.29	2.02
Longan	0.24	0.77
<b>Beverage</b>		
Chocolate drink	3.34	2.98
Syrup cordial	0.70	1.62

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Correlation between food choice factors and types of food are shown in Table 4. The study found that there was no significant relationship between both external and internal factors with rice. There was a significant negative relationship between natural content and pork ( $r = -0.14, p < 0.05$ ). Moreover, consumption of sweetened condensed milk was correlated with influence of sensory appeal ( $r = 0.14, p < 0.05$ ). There was a significant relationship between health and carrot intake ( $r = 0.21, p < 0.01$ ). Natural content was correlated with longan intake ( $r = 0.14, p < 0.05$ ). There was a significant negative correlation between natural content ( $r = -0.16, p < 0.05$ ) and health ( $r = -0.15, p < 0.05$ ) with syrup cordial. Furthermore, the study found that there was a significant negative relationship between ethics and pork ( $r = -0.28, p < 0.01$ ). Consumption of burger was negatively correlated with weight control ( $r = -0.16, p < 0.05$ ). Influence of convenience was correlated with salted egg intake ( $r = 0.13, p < 0.05$ ). Furthermore, powdered milk intake was negatively correlated with influence of mood ( $r = -0.14, p < 0.05$ ). Familiarity was highly correlated with consumption of sweetened condensed milk ( $r = 0.19, p < 0.01$ ). There was a significant negative relationship between price and syrup cordial ( $r = -0.18, p < 0.01$ ).

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Table 4: Correlation between Food Choice Factors and Types of Food

Types of food	Internal factors				External factors				
	Sensory appeal	Natural contents	Health	Ethics	Weight control	Convenience	Familiarity	Mood	Price
<b>Grains</b>									
Rice	-0.01	-0.01	-0.08	0.02	-0.10	-0.10	-0.09	-0.02	-0.00
<b>Protein</b>									
Pork	-0.03	<b>-0.14*</b>	-0.07	<b>-0.28**</b>	-0.09	0.12	-0.11	-0.04	-0.04
Burger	-0.00	-0.60	-0.04	-0.04	<b>-0.16*</b>	0.06	0.07	0.04	-0.04
Salted egg	0.03	0.03	0.03	0.03	-0.07	<b>0.13*</b>	0.05	0.05	-0.09
<b>Dairy product</b>									
Powdered milk	-0.01	-0.03	-0.02	0.05	0.04	-0.07	-0.05	<b>-0.14*</b>	-0.12
Sweetened condensed milk	<b>0.14*</b>	0.02	0.04	0.11	-0.06	-0.01	<b>0.19**</b>	0.11	0.11
<b>Vegetables</b>									
Carrot	0.10	0.05	<b>0.21**</b>	0.07	0.03	0.02	0.06	0.08	-0.01
<b>Fruits</b>									
Longan	0.06	<b>0.14*</b>	0.05	0.05	0.10	0.05	0.08	0.06	0.08
<b>Beverage</b>									
Syrup cordial	-0.00	<b>-0.16*</b>	<b>-0.15*</b>	0.03	0.05	-0.06	-0.05	-0.09	<b>-0.18**</b>

Note: \* $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

## DISCUSSION

The result of the study showed that health was the most important factor when choosing foods. Prescott, Young, Yau, and Stevens (2002) found that health was the most important consideration of Malaysian food choice. Students would choose the food, which is good for their health rather than getting attracted by its tasty, smell and texture. Normally, healthy food was not tasty and unable attract people sense of smell and sniff. This was due to the fact that healthy food was of less sugar, sodium and fat. In the study, the mean score of health and sensory appeal were almost equal. In certain situation, students may consider sensory appeal of the food rather than its nutrients. Therefore, to meet the demand of enjoyment of food and healthy lifestyle, a lot of restaurant started to provide healthy meal to the customers (Narine and Badrie, 2007).

The students would consider natural content for their food choice decision. According to Prescott et al. (2002), Malaysian ranked natural content as important food choice factor after health concern. This factor was associated with health concern factors. Natural contents of the food, i.e. additives, artificial ingredients, coloring, and other chemical ingredients have negative impacts on health and safety, although additives are good for consumer appeal and convenience. Eiser, Coulson and Eiser (2002) contended that some people would not concern additives in food. Due to convenience and availability of food, students, who live independently in campus and outside, could not avoid additives on the food.

As compared to findings identified by Prescott et al. (2002), Malaysian rated price less important than other factors, i.e. health, natural content, weight control, and convenience. The difference that is caused by price was an important consideration of students' food choice decision and then determined their food consumption (Pollard, Steptoe and Wardle, 1998). Cost would be the barrier to eating healthy (James, 2004). Students would need to spend more money to get good quality or healthy food, such as organic food. The food with lower price, readily available and delicious usually contained a lot of fat, sodium and sugar (Shankar, Dilworth and Cone, 2004). This showed that students had significant possibility to take unhealthy diet.

Convenience of the food played an important role in food choice decision. This finding supported Prescott et al. (2002) study, which was conducted among Malaysian, Taiwanese, and New Zealander's on-campus students living independently in hostel. Lack of cooking tools, skills and even

transport caused them to consider food which is available at the food court and shop nearby hostel as important determinant of food choice.

In this study, weight control was the third important external food choice factor. Mooney and Walbourn (2001) found that weight control was the most important determinant of food avoidance factor. Most of the study showed that women were more aware of their weight as compared to male (Mooney and Walbourn, 2001; Contento, Basch and Zybert, 2003; O'Mahony and Hall, 2007). As most of the respondents in this study were female, so weight control was ranked high among the external food choice factors.

Mood was one of the factor can change people's food choice, i.e. stress could induce high-energy intake (Oliver et al, 2000). Similar with previous studies (Steptoe et al., 1995; Prescott et al., 2002), mood was rated as a less important factor. According to a study by Honkanen and Frewer (2009), students are not categorized as mood consumers as without having high level of income, they are unable to choose food that help them to relax and made them feel good. In addition, limited food choice in campus caused them to be less concern this factor.

Familiarity and ethics were the least important food choice factors. This finding was consistent with previous FCQ studies (Steptoe et al., 1995; Lindeman and Väänänen, 2000; Prescott et al., 2002). In term of familiarity, consumers would initially reject the novel food to avoid the risk of trying the new food products (Steptoe et al., 1995). However, familiarity was less important for students. Students who lived in hostel had limited food choice as they most depend on food court on the campus.

Ethics was the least important factor concerned by the students. Vindigni, Janssen and Jager (2002) found that knowledgeable consumers were concern with ethics, such as environmental issue and other aspects such as convenience and price of the food. Education institutions and government continuously have promoted a wide range of environmental knowledge to students. However, efforts have yet able to increase student's awareness of environmental issue.

The students had medium intake of rice. As compared to the findings by Norimah et al. (2008), about 97% of the respondents consumed rice daily. Globalization caused a lot of novel food and variety of food entered the local market (Pingali, 2006). Among a wide range of food choice, consumers no longer chose rice as the dominant food. The trend was more significant among

students rather than adults in the study by Norimah et al. (2008). Variety of food choice caused noodles becomes an alternative to rice when choosing food.

According to Mooney and Walbourn (2001), college students most frequently rejected meat. Low consumption of meat, especially red meats (beef, mutton and pork) was due to weight management, health and ethical concern. A lot of research proved that meat was unhealthy and increased mortality risk (Lea and Worsley, 2001; Mooney and Walbourn, 2001; Norat, Lukanova, Ferrari, and Riboli, 2002). Among the students, consumption of fish was relatively low. Joanna (2005) reported that fish consumption among young people has decreased. This may due to the limited variety of fish provided in the food court and high price. Additionally, they may interchange consumption between foods that are categorized under the same group (protein) in Malaysian Food Pyramid, i.e. poultry, meat and fish to obtain the source of protein. The students had medium intake of egg. The trend was similar with the findings by Norimah et al. (2008). Egg was affordable to the students and contained high source of protein, it was the best choice to having economical and nutritious meal.

Consumption of dairy products was relatively low among the students. This might be associated with low awareness of students about the benefit of milk. The students were still young and were not aware of the osteoporosis's risk, which can be preventing by increased milk or calcium intake.

The respondents had medium intake of green leafy vegetables. Logio (2008) found that students did not consumed vegetables frequently. The different might be due to local students' belief in the health benefit of vegetables. Family eating habits also had considerable impact on their vegetables intake. Low-income group had less fruits and vegetables intake as compared to high-income group (Anderson and Morris, 2000). Students were one of the low-income groups. Price was a barrier to eating healthy. Therefore, consumption of fruit was relatively low.

Norimah et al. (2008) reported that Malaysian adult consumed chocolate-based drinks and syrup cordial on a daily basis. Chocolate-based drink was one of the sources of energy for students. Syrup cordial contained high level of sugar (Sherina and Rozali, 2003). Low consumption of syrup cordial might due to high health awareness among the students. High-level of sugar intake would resulted in high-energy intake and leded to weight gain and obesity.

Greatly concerned about natural contents of food would incur low pork intake. This finding was consistent with previous research findings, which found that belief about meat has impact on meat consumption (Steptoe et al., 1998; Lea and Worsley, 2001). If the students believed that red meat lead to mortality of risk, the consumption would reduce despite it being one of the recommended daily foods in Malaysian Food Pyramid. Additionally, most of the respondents in this study were Malay. They are inhibiting to consume pork because their religious belief is intact and clear.

Moreover, concerning on sensory appeal of food would increase consumption of sweetened condensed milk. According to Pszczola (2009), dairy ingredient in food products will improve its appearance and texture. So that sweetened condensed milk was used to increase sensory appeal of the drink or food. If the students greatly considered health aspect, they would increase consumption of carrot (Steptoe et al., 1998; Wardle, Parmeter and Waller, 2000; Lemon et al., 2009). Vegetables and fruits are good sources of vitamin and mineral and it helps to prevent heart disease, obesity, stroke, cancer, and digestive problems.

Consumption increased if longan free from chemical ingredients. High chemical ingredient on the food would reduce longan intake. Presence of chemicals on the food would avoided by people (Eiser et al., 2002). Natural content of the food were the most important factors that motivate people to consume organic food which is free from pesticides, herbicides, growth hormones and so on (Lockie, Lyons, Lawrence, and Mummery, 2002). Students who concerning natural content of food will consume longan, if it contained low level of pesticide.

High awareness on natural content and health was associated with low consumption of syrup cordial. This finding was similar with the finding of Sherina and Rozali (2003). Syrup cordial is one of the foods avoided by diabetic patient due to rich-sugar content. One of the factors leading to diabetes was high intake of sugar and also when one's insulin is unable to take up all sugar in the body. The students less consumed syrup cordial to avoid the negative impact on their health, such as diabetes and obesity.

Higher ethics concern would reduce pork intake (Mooney and Walbourn, 2001). Reason for reducing meat consumption included animal rights, and environmental ethics reasons. Greatly concern on weight management will result in less burger intake. Burger was one of the foods need to be avoided when one tries to lose weight (Chan, 2007). In order to manage one's weight,

the students tend to reduce burger intake, which lead to high fat and calories intake. Availability and convenience would increase consumption of salted egg. According to Norimah et al. (2008), availability of eggs cause consumer to consume it frequently.

Consideration on mood caused the students choose food that helped them coping with life, relax and made them feel good. Highly intake of powdered milk was related to low mood motive. The finding was inconsistent with previous finding reported by Hakkarainen et al. (2004). Consumption of milk was related to mood motive as it could help people to relax and released them from sleep disorder. The differences may be cause by students' belief in the benefit of health rather than mood motive in milk intake. Familiarity would increase consumption of sweetened condensed milk. Consumers tend to choose milk that they are familiar with especially in term of taste and product appearance (Viaene, Verbeke and Sufiati, 2000).

Price was an important food choice factor for students. Despite a decrease in the price of and rich-sugar content in syrup cordial, consumption of syrup cordial increased (Sherina and Rozali, 2003). Cost was the barrier to eating healthy (James, 2004) and affordability was the main concern rather than the quality of the food (Green, Draper and Dowler, 2003).

## CONCLUSIONS

In conclusion, health was the most important internal factor in food choice of students and followed by sensory appeal and natural content of food. Among external food choice factors, price was the most important factors and followed by convenience, weight control, mood, familiarity, and ethics concern. Health (internal) and price (external) was the most important factors of food choice. Mean scores of both factors were almost equal. Price was barrier to eating healthy. Cost of eating healthy was high and the students need to trade off one of them. Most of the time, healthy quality may be costly. With limited resources, students mostly are concern with the price rather than quality of the food. Hence, this may cause students to practice unhealthy eating habit.

Findings of this study gave a clear picture about the complexity of food choice behavior and dietary pattern of the students. This study contributes useful information in market analysis of food marketers and provides guidance for promoting the food products among youths. Findings of the study can be use to design an effective health promotion campaign as well as develop

health policies. In addition, health professional can develop and implement nutritional programs to promote adequate nutrient intake and healthful methods to manage weight. Authorities of university can monitor and control price and nutrition of the food in food courts. Future researches should cover a different geographical location. Different environment might play an important role in affecting youths' food choice and dietary intake.

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