

**INFLUENCES OF NUTRITIONAL INFORMATION ON FAST
FOOD PURCHASING BEHAVIOUR AMONG
UNDERGRADUATES AT UNIVERSITI SAINS MALAYSIA,
KUBANG KERIAN, KELANTAN**

By

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**PENGARUH MAKLUMAT PEMAKANAN KEPADA PEMBELIAN
MAKANAN SEGERA DALAM KALANGAN MAHASISWA UNIVERSITI
SAINS MALAYSIA, KUBANG KERIAN, KELANTAN**

ABSTRAK

Makan di luar, terutamanya pada makanan segera restoran sering dilihat sebagai pilihan yang tidak sihat dan yang berkaitan dengan isu-isu kesihatan seperti obesiti. Maklumat pemakanan sering disediakan di banyak restoran untuk membolehkan pelanggan untuk membuat pilihan bermaklumat. Oleh itu, kajian ini dijalankan untuk menentukan pengaruh menyediakan maklumat pemakanan pada menu restoran makanan segera, terutama di kalangan pelajar di Kampus Kesihatan Universiti Sains Malaysia, yang sering makan di luar dari kampus pada masa penggal. Kajian kuantitatif dijalankan menggunakan borang soal selidik yang disahkan dan diadaptasi daripada kajian sebelumnya telah digunakan untuk menentukan persepsi umum mengenai maklumat pemakanan, pengambilan nutrien dan tabiat pembelian ketika makan di luar. Seramai 185 pelajar mengambil bahagian dari tiga buah pusat pengajian yang berbeza, PPSP (n=54, 29.2%), PPSG, (n=54, 29.2%), PPSK (n=77, 41.6%) di USM, Kampus Kesihatan. Secara umum, majoriti mahasiswa makan makanan segera sekurang-kurangnya sekali dalam seminggu (n=105, 56.8%) dan kebanyakan mereka lebih suka makan di luar pada hujung minggu (n=156, 84.3), dan mereka mengambil makanan segera terutamanya untuk keluar bersama dengan rakan-rakan. Majoriti responden berpendapat bahawa ia adalah penting untuk menyediakan maklumat pemakanan di restoran makanan segera (n=183, 98.9%). Purata untuk kalori, lemak dan sodium komposisi pilihan makanan mereka berbeza secara ketara antara sebelum dan selepas menyediakan maklumat pemakanan barangan makanan pada menu makanan ($p < 0.001$). Majoriti menunjukkan bahawa mereka cenderung untuk membeli makanan yang lebih sihat apabila maklumat pemakanan telah disediakan (n=159, 85.9%). Tiada kaitan antara penggunaan maklumat pemakanan dan komposisi nutrien dari makanan yang dipilih melalui maklumat pemakanan ($p > 0.05$).

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ABSTRACT

Eating out, especially at fast food restaurants is often regardless unhealthy option and related to health issues such as obesity. Nutritional information is often provided in many restaurants to allow customers to make informed choice. Thus, this study was carried out to determine the influences of providing nutritional information on fast food restaurant menu, especially among undergraduates at Universiti Sains Malaysia Health Campus, who often eat outside the campus during semester. This is quantitative study, where validated questionnaire adapted from previous study was used to determine the general perception on nutritional information, nutrient intake and purchasing intention when eating out. A total of 185 undergraduates participate from three different school, PPSP (n=54, 29.2%), PPSG, (n=54, 29.2%), PPSK (n=77, 41.6%) in USM, Health Campus. In general, majority of the undergraduates eat fast food at least once in a week (n= 105, 56.8%) and most of them prefer to eat outside on weekend (n=156, 84.3), and they consume fast food mainly as socialising event with friends. Majority perceived that it is importance to provide nutritional information at fast food restaurant (n=183, 98.9%). Mean for calorie, fat and sodium composition of their food choices were significantly different between before and after providing nutritional information of the food items on the food menu ($p<0.001$). Majority indicated that they were likely to purchase healthier food items when nutritional information was provided (n=159, 85.9%). There is no association between the usage of nutritional information and nutrient composition from food selected upon receiving the nutritional information ($p>0.05$).

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CHAPTER 1: INTRODUCTION

1.1 Background of Study

Lifestyle changes that have taken place in many countries worldwide over the last few decades have been shown to impact food consumption patterns. One of the most prominent trends is the increasing of consuming food outside of the home environment (Jaworowska, Blackham, Davies, & Stevenson, 2013). For example, American obtain almost one third of their calories from food away from home and spend 49% of their food dollars on food consumed outside the home (Park, Yoon, Cho, & Haugtvedt, 2013). In Malaysia, about 62.6% of food intake of the population was obtained from outside either it was eaten outside or at home (Poulain, Tibère, Laporte, & Mognard, 2014).

The eating out had become trend among urban workers, students and even families with many factors such as working from home or working mothers which eventually they could not go home to eat and there is no food at home (Noraziah & Mohd Azlan, 2012). Consumers, especially students were known to have a high frequency of obtaining food away from their home as in they might staying away from the home. For example, student studying at university level tend to consume outside food more compared to home cooked food. It has been shown that, higher education level which are among college and university students was shown to have a high frequency of eating out (Poulain *et al.*, 2014).

In term of location of eating out, fast food establishment were the major contribution of the shift to eating out which the largest proportion of calories obtained away from home come from fast food establishment for about 12% of total calories and followed by restaurant with 10% of total calories (Guthrie, Lin, & Frazao, 2002). In addition, the coexistent of fast food restaurant in Malaysia had also expanded the eating

out trend among Malaysian (Wan Zawiyah & Abu Bakar, 2005). Looking on other perspective, increasing consumption of fast food were also associated with modern and faster pace of life in big cities led people to find quicker meal solution for shortened lunch hour (Hanson, 2002).

Many studies reported that food away from home especially fast food consumption have strong connection with unhealthy eating habits and negative health consequences. Eating out occasion that are linked to the fast food items such as, soft drinks, deep fried snacks, fast foods, and sweets and were positively associated with obesity and overweight (Bezerra & Sichieri, 2009). In Malaysia, the changes in where more families are eating out, skip meals, miss their breakfast and rely too much on fast food are also attributed to the prevalence of obesity (Sherina & Rampal, 2009). This indicate that eating out is one of the factors contributing to obesity.

As a native concern about obesity, legislators had required restaurants and food industry to provide nutrition information on menu boards and printed menus (Cranage, Conklin, & Lambert, 2004) and New York City has demand chain restaurant to post calorie information on menu boards (Roberto, Agnew, & Brownell, 2009). This legislation ordered restaurants to disclose fat, sodium and calorie content of each menu item (Cranage *et al.*, 2004). The purpose behind this legislation is that disclosure and displaying of nutrition information on menus at a point of sale would likely help customer make a direct connection between food choices and nutrients consumed (Cranage *et al.*, 2004).

Few studies have reported that providing nutritional information at a point of purchase in food establishment had encouraged a healthier choices among consumer and majority of population positively perceived the importance of providing nutritional

information and it will directly help consumer's purchase decision. For example, in fast food chains restaurant, customer who were reported to see and use nutritional information will purchased food with fewer calories than those who did not see and use nutritional information in making their meal's choices (Bassett *et al.*, 2008).

1.2 Problem Statement

Eating out has become a trend from different level age of group. However, among the younger generation, university or college students tend to have a high frequency of eating out and were likely to choose fast food when they eat out. The poor eating habits of university students are highly related with the high consumption of fatty fast food and sugary soft drinks (Bipasha & Goon, 2014). The dietary habits of young generation that were affected by high fast food consumption significantly extended grow of overweight and obesity problem among them (Yahia, Achkar, Abdallah, & Rizk, 2008). Therefore, US Patient Protection and Affordable Health Care Act had authorize that fast food and full service chains restaurant to make available nutrition information at a point of purchase

Exposure of calorie information on fast food choices among college or university students revealed that, it lead them to choose lower calorie meals, but this was observed among only in female and had no effect among male (Gerend, 2009). However, a significant concern in the use of nutritional information is that, it may not persuasive enough to encourage healthy eating habits (Guthrie, Derby, & Levy, 1999) as there is no effect in calorie purchasing among young adults when calorie information is provided in the fast food choices (Elbel, Gyamfi, & Kersh, 2011). Besides, only fewer consumer accessed nutrition information before making their purchase in major restaurant chains (Roberto *et al.*, 2009).

Apart from that, there is limited or no information whether Malaysian students especially at university use nutritional information whenever they eat outside the campus. Therefore, this research attempted to assess their perception on nutritional information and whether provision of nutrition information would affect their food choices in the sense that fewer calories would be purchased from food selected and their intention on purchasing changes with and without nutritional information.

1.3 Objectives of Study

1.3.1 General Objectives

To determine the influences of nutritional information of fast food restaurant menu on purchasing behaviour among undergraduates of Universiti Sains Malaysia Health Campus

1.3.2 Specific Objectives

- To determine general perception on nutritional information at fast food restaurant among undergraduates at USM
- To determine the usage of nutritional information at fast food restaurant among undergraduates at USM
- To determine nutrient composition (calorie, fat and sodium) of food selected without nutritional information on menu items among undergraduates at USM
- To determine nutrient composition (calorie, fat and sodium) of food selected with nutritional information on menu items among undergraduates at USM
- To determine the purchasing intention on healthier food choices when nutritional information was provided at fast food restaurant menu among undergraduates at USM

- To determine the differences in nutrient composition (calorie, fat and sodium) of food selected with and without information
- To determine the differences in nutrient composition of food selected with nutritional information between gender
- To determine the association between nutrient composition of food selected with nutritional information and usage of nutritional information

1.4 Hypothesis of the Study

1.4.1 Hypothesis 1

H₀₁: There is no significant difference in nutrient composition from food selected in the menu with and without nutritional information

H_{a1}: There is a significant difference in nutrient composition from food selected in the menu with and without nutritional information

1.4.2 Hypothesis 2

H₀₂: There is no significant difference in nutrient composition from food selected in the menu with nutritional information between male and female

H_{a2}: There is a significant difference in nutrient composition from food selected in the menu with nutritional information between male and female

1.4.3 Hypothesis 3

H₀₃: There is no significant difference in nutrient composition from food selected in the menu with nutritional information between the usages of nutritional information

H_{a3}: There is a significant difference in nutrient composition from food selected in the menu with nutritional information between the usages of nutritional information

1.5 Significance of the Study

Fast food associated with unhealthy menus but they have introduced healthier choices or have varied food in terms of calories, fat and sodium content. However, many are not aware of this because nutritional information is not widely available. The rationale to conduct this study was mainly to determine the influences of nutritional information provision on undergraduate's food choices when dining at fast food restaurant. Previous study revealed on important points of influenced in food consumption and purchasing intention when nutritional information was provided at a point of purchase. Thus, finding could be useful in determining the pattern of food selection of consumer especially at fast food restaurant especially among students. (Cranage *et al.*, 2004) claimed that, providing nutrition information will likely help customer make a direct connection between food choices and nutrients consumed but this is not well researched both in Malaysia and among university students.

Besides, finding could be useful in term of educating students on the importance and use of nutritional information in making healthier choices. For instance, study also suggested that education on vitamin, mineral, calories and fat content should be begin earlier as such making nutritional information available (Stutts, Zank, Smith, & Williams, 2011). Apart from that, government could make an effort to mandate food service operation [articular at fast food restaurant to provide the nutritional information as people concerned and demand on quality of product they choose (Norina, Mohd Salehuddin, & Shazali, 2011) as well as it might be helpful for them in choosing a healthier food when dining out.

Food service industry can improve in terms of provides healthier option one this legislation been made. This supported by previous finding by (Azlina *et al.*, 2011) which indicated on fast food restaurant in Malaysia that already implemented the provision of nutritional content in its menu acting as a safety guide for consumer in choosing healthy foods but it is not mandatory or widely displayed. In addition, it could be useful for the fast food operators, food manufacturers as well as other restaurant operators to come out with idea of producing nutrition labels as a new marketing strategy or tools to generate more income, because consumers are more and more aware about healthy eating when dining out.

1.6 Conceptual Framework

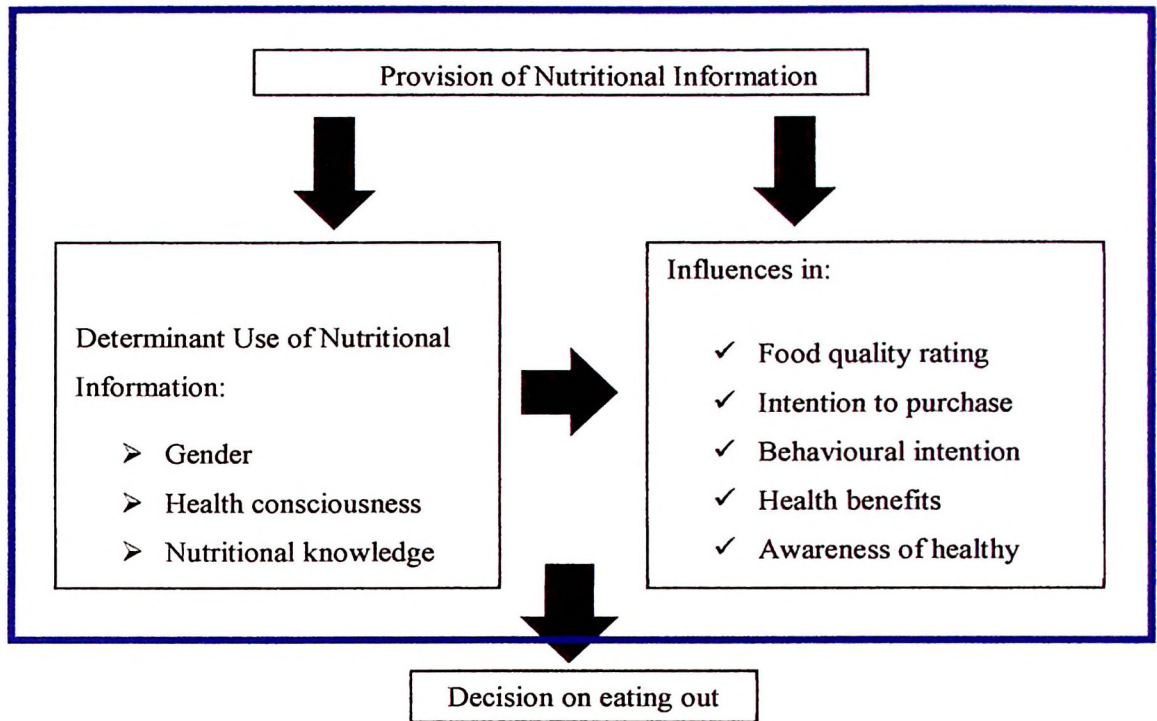


Figure 1.1: Influences of Nutritional Information on Foodservice Setting

Figure 1.1 above shows the conceptual framework that was used in this study. It identified the selected determinants is using nutritional information in making food choices in regard to the influences in provision of nutritional information that later may affect the decision people make when they eat out.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Eating out is often refer to food consumed away from home, which main involves meals and snacks provided by commercial foodservice establishments or eating spaces in non-commercial institutions (Dumagan & Hackett, 1995). Away from home food could also be define as food prepared at restaurants or foodservices firms regardless of where it is eaten (Guthrie *et al.*, 2002). Besides, people would describe that eating out as a food eaten outside of the home either at someone else's home or in a commercial institution too (Narine & Badrie, 2007). Recent study revealed that, 64.1% of Malaysian population eating at least one meal outside their home whereas, 22.7% of the population obtaining food from outside but it was eaten at the home.

Interestingly, about 11.2% of the population having their meals only at outside (Poulain *et al.*, 2014). Due to the lifestyle changes and urbanization, majority of Malaysian population, had changed their eating habits by choosing to eat out instead of prepare food at their home (Cullen, 1994). Those who live in urban area and those who were Chinese ate out more often. Besides, men had higher frequency of eating out as compared to women. However, women with higher educational level have high eating out frequency (Poulain *et al.*, 2014).

2.2 Trend of Eating Out

Eating out environment nowadays provides many choices that make unexceptional for people to eat outside home than being involved in the food preparation process. People tend to eat out mostly during dinner time (Epter, 2009). Contradicting with another finding indicated that, lunch was the most meals consumed outside the

homes which is between 11.45 am and 2.15 pm (Kearney, Hulshof, & Gibney, 2001). On the same study, men were much more likely to eat their lunch time meal out of home compared to women. Besides that, among university students in Korea, lunch was the most frequent meal when eating out (Ro, 1999).

In terms of place or location of eating out, many factors could be classified the choices and where to people choose to eat out. Study found that, full service and fast food restaurants were the main places which people usually dine out. (Stewart, Blisard, Bhuyan, & Nayga Jr, 2004). In another example, the most common venue selection was fast food outlets among consumers when eating out followed by restaurants and pizza houses (Narine & Badrie, 2007). However, differences in income may also affected people's preferences and specifically to the venue they choose to eat out. This is because, individual with higher income may spend more on eating out. Higher income people have been reported to consume at more expensive venues such as hotels (Narine & Badrie, 2007). Income has become a factor influences where consumers eat, making it more important factor as part of trends.

Age is another important factor since, eating out has become a trend between different ages of group. However, high frequency of eating out are among younger generation, university or college students (Poulain *et al.*, 2014). Malaysian eating out culture most likely dominated by younger generation compared to those in older age (Tan, 2010). A study in Korea indicate that, majority of students of universities eat out more than once per day (Chung & Kim, 2001). Being a students or younger generations can be one of the important meal. However, since they reside in hostels or away from home, the tendency to eat out is higher.

Majority university students for both gender typically eat out at fast food restaurant for lunch at least once weekly (Driskell, Meckna, & Scales, 2006). Frequency selecting fast food is greater than snack bar food when eating out among students (Chung & Kim, 2001). Study also found that, young adults were most likely to obtain less of energy intake at home and more at restaurants and fast food places (Nielsen, Siega-Riz, & Popkin, 2002). Therefore, it can be said that, younger generations, especially students tend to eat out more, where fast food is becoming their favourite places.

However, frequency of eating out may also differ among the youth depending on the region where they live. Urban area shows a high frequency of eating out with five times per week compared to those who live in sub-urban with once to twice per week of eating out (Kim & Jo, 2004). Urbanization and lifestyle changes have made dining out become a favour among Malaysians especially for those who are staying in most urban areas whereby people are busy and occupied with their daily life activities like working, studying and business (Department, 2015). Students especially university students are eating at fast food restaurant during their time at the university. Their choices of eating at fast food restaurants is considered as a trend that is taking place now.

2.3 Nutritional Value of Food Eaten Outside

Food eaten outside the home or food that were prepared outside the home were always associated with negative nutrient profiles. They are said to be predominantly high in calorie and lower in nutrient density compared to foods prepared at home. Eating out was associated with high calorie, high sodium and high fat intake, was further associated with negative health consequences. Study indicated that eating out at fast food and “sit down” restaurant may subject customers to high caloric density food, which in turn placing them at greater risk for excessive consumption of calories (Yamamoto,

Yamamoto, Yamamoto, & Yamamoto, 2005). The risk of excessive consumption of calories and fat not just occur at fast food restaurants, but for all restaurants as well (Yamamoto *et al.*, 2005), but it's generally associated with fast food.

Food eaten outside the home primarily in fast food restaurants not only tend to have a higher intake of energy and fats as well as lower intake of fibre, calcium, fruits and vegetables (Vanderlee & Hammond, 2014). Fibre densities of home and away from home foods have increased slightly, but it still remain far below the benchmark fibre density which remark the low intake of fibre among diners who often eat out (Lin, Guthrie, & Frazao, 1999). Increase in frequency of dining out at fast food places and restaurants, might in turn reverse the increase in fibre density of foods prepare at home (Lin *et al.*, 1999).

It was also noted that the rising of caloric intake from food eaten outside the home was also associated with a declining benchmark of calcium density in a person (Lin *et al.*, 1999). It showed that, in relation to food consume outside the home among youth in which those who frequently consume fast food, have a low healthful food choices specifically on fruits and vegetables (French, Story, Neumark-Sztainer, Fulkerson, & Hannan, 2001). Sodium intake was also higher for those who eat outside more frequently. However, it was considerably lower at high priced restaurant, although most items at high priced restaurant were higher in saturated fat (Auchincloss *et al.*, 2014).

2.4 Health Consequences of Eating Out

Generally, eating out is often reflected with various health consequences. The negative nutrient profile of food eaten outside the home particularly food that were prepared outside the home have strong links with some health consequences. The influence of total macronutrient intake on increased consumption of energy dense food along with higher energy intake outside the home have been linked to the one of the important determinant increase in obesity (Vanderlee & Hammond, 2014).

Many studies have indicated that eating out of home was associated with overweight and obesity (Binkley, Eales, & Jekanowski, 2000; Elbel *et al.*, 2011; St-Onge, Keller, & Heymsfield, 2003; Steenhuis & Vermeer, 2009). However, a quit contradicting to this, a study found that these consequences was only reported only among men, for women, eating sit down meals away from home was protective for obesity risk (Bezerra & Sichieri, 2009). This is mainly because women in this study made healthier food choices when they ate out. Nevertheless, obesity or overweight is one of the major concerned when eating out. Often people who eat out worry putting on weight.

Increased frequency of eating on restaurant's food and increase consumption of food away from home are positively correlated with increase in body fat and were likely to be contributing factors to incline obesity and linked with several health problem (Binkley *et al.*, 2000). Several other problem may arises of food eaten outside the home are, it may trigger health problem such as allergies, food intolerance and metabolic disorders (Binkley *et al.*, 2000).

Many cases of allergies and intolerance on restaurant's food were detected due to the ingredients contained in the food was "hidden" in a sauce, dressing or egg roll. Other than that, allergies was trigger through contamination caused primarily by shares

equipment and cooking or serving supplies, food selected from buffets or food bars and by skin contact or inhalation when dining out (Furlong, DeSimone, & Sicherer, 2001). Limited study have been found to discuss the direct connection between eating out and metabolic disorders. Nonetheless, it was found that there was significantly higher in metabolic risk when family reported that they purchased food from outside for dinner particularly fast food on weekly basis (Fulkerson *et al.*, 2011).

Besides, non-communicable diseases that were directly linked to the dietary practices are such diabetes and hypertension. These were all related to sugary and fats consumption especially trans-fatty acid (Oliveira, Costa Proenca, & Salles, 2012). To further explained the relation between eating out and hypertension is possibly due to dining out increase the difficulty for individuals to lower sodium intake in which high sodium intake can caused a high blood pressure which led to hypertension (Elmer, Grimm, Flack, & Laing, 1991).

2.5 Health Consequences of Eating Fast Food

Eating out particularly fast food is associated with negative health outcomes. Fast food being one of the most popular place people choose to eat out, tend to have greater impact on health outcome. Particularly, fast food consumption was associated with diet high in energy, energy density and low in essential micronutrients. Thus, frequent fast food consumption may contribute to weight gain (Bowman & Vinyard, 2004; Larson & Story, 2009). There are adequate information and research indicating that fast food is not really good for our health. Younger generation who frequently eat at fast food restaurants which served burgers and fries was associated with higher risk of obesity and overweight (Elbel *et al.*, 2011; Larson, Neumark-Sztainer, Laska, & Story, 2011).

Besides, frequent fast food consumption revealed association with increased in body mass index (BMI) among young adults (Duffey, Gordon-Larsen, Jacobs, Williams, & Popkin, 2007; Thompson *et al.*, 2004). Apart from weight gain, fast food consumption showed a strong positive association with insulin resistance, which in turn can increase the risk of obesity and Type 2 Diabetes (Pereira *et al.*, 2005). There are number of health consequences associated with not only fast food but also among a particular age group, the young adults.

2.6 Nutritional Information

2.6.1 Definition of Nutritional Information

Nutritional information is defined in a table in one section of food label that indicating certain amount of nutrients contained in the food ("Key Message 14: Make Effective Use of Nutrition Information on Food Label," 2007).

Nutrition Facts	
Serving Size 172 g	
Amount Per Serving	
Calories 200	Calories from Fat 8
% Daily Value*	
Total Fat 1g	1%
Saturated Fat 0g	1%
Trans Fat	
Cholesterol 0mg	0%
Sodium 7mg	0%
Total Carbohydrate 36g	12%
Dietary Fiber 11g	45%
Sugars 6g	
Protein 13g	
Vitamin A 1%	Vitamin C 1%
Calcium 4%	Iron 24%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.	
NutritionData.com	

Figure 2.1: Example of Nutritional Information at Food Product ("Self Nutrition Data: Know What You Eat," n.d)

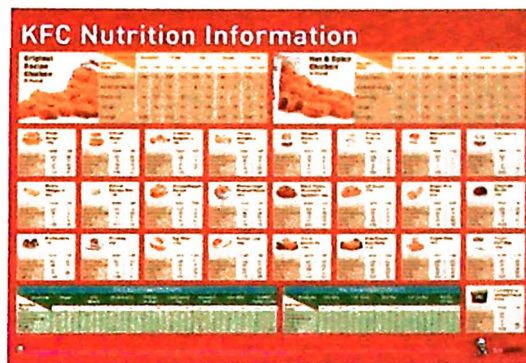


Figure 2.2: Example of Nutritional Information at Fast Food Restaurant
("KFC Nutrition Information," n.d)

2.6.2 Legislation of Nutritional Information

The main objective of nutrition labelling and claims that were significantly located at almost of food packaging is to describe the nutritional qualities of a food product factually and informatively, thereby aid the consumer in making better food choices ("Guide to Nutrition Labelling and Claims," 2010). Nutritional information is also provided for food prepared at the foodservice establishment such in fast food restaurant. Nonetheless, the information of nutritional content of the foods is limited compared to food purchased in retail stores (Guthrie *et al.*, 2002).

Provision of nutritional information was legalized in many countries after taking note that increasing prevalence of health consequences. It was notable that the frequency of food eaten away from home keep rising as the lifestyle changes and with few others factors that were related to that. These also affected in increasing the prevalence of obesity in population and few other health consequences as more calorie and energy dense food taken from outside. In addressing the obesity epidemic, legislators has mandated a food law on nutritional information on foodservice establishment as well (Cranage *et al.*, 2004).

In Malaysia, guidelines on the advertising and labelling of nutritional information on fast food restaurant has been suggested by requiring the labelling of nutrition information on the food products. It is to help the consumer to make informed choices in order to educate consumers regarding nutrient intake so that they will be more knowledgeable and able to make decisions on their purchasing. One of the guidelines stated that, labelling of nutrition information shall be made either on the packaging, boxes, tray liners, brochures, pamphlets or posters and should be placed in areas that are easily seen by consumers ("Garis Panduan Pengiklanan Dan Pelabelan Maklumat Pemakanan Makanan Segera," 2013).

However, even though many chain restaurants provided nutrition information for all of the menu items but usually limited to a brochure or on the website instead of being posted directly on the menu (Yamamoto *et al.*, 2005). For instance, 86% of chain restaurant provided nutrition information on the company website only which requires that people have Internet access and log on to a website to decide what to order before visiting the restaurant (Wootan, Osborn, & Malloy, 2006). In the same study, it was found that 59% of chain restaurants provided nutrition information but it was often on tray liners, which are generally not given to customers until after they have already ordered. In addition, only a few restaurants that did provide information had it on a poster hung on the wall. However, the brochure was not clearly visible due to place behind the candy machine, available for in-store display or available upon request only (Wootan *et al.*, 2006).

Besides, the understanding of nutritional content of food is often poor. It is possible that consumers do not understand or incorporating the information on the menu board and the links among a poor diet, obesity, and adverse health outcomes (Finkelstein, Strombotne, Chan, & Krieger, 2011). Besides that majority customer tend to

underestimate the calorie and other nutrient level such on nutrient fat, saturated fat, and sodium on many menu items. Those nutrient content were almost twice as high as consumer's estimates (Burton, Creyer, Kees, & Huggins, 2006). Customers were unaware of the high levels of calories, fat, saturated fat, and sodium found in many menu items in restaurants because of nutrition information is often difficult and if not impossible to obtain in most dinner house restaurants (Krukowski, Harvey-Berino, Kolodinsky, Narsana, & Desisto, 2006).

Customer underestimate the calorie content of restaurant's food probably from the fact that nutrition information at a point of purchase is not widely available in restaurants (Stutts *et al.*, 2011). Providing nutritional information at a point of purchase is to make consumer notice thereby aid them in making food choices by make it through available through menu cards, boards or packaging of the food. Furthermore, nutrition labelling on menu have been suggested as an action to educate general public on the nutritional content of food items prepared outside the home (Vanderlee & Hammond, 2014).

Many foodservice were adopted to provide nutrition information around the world. For example, New York City has required its chain restaurants to provide calorie information on its menu boards (Roberto *et al.*, 2009). Apart from that, US Patient Protection and Affordable Healthcare Act ordered fast food and full service restaurant chains to display nutritional information on calories, saturated fat, trans-fat, sodium and carbohydrate on its printed menus (Auchincloss *et al.*, 2014). Menu Education and Labelling (MEAL) also had instruct all medium size or large size chains to list the calories, trans-fat, saturated fat and sodium content on menu items at a point of purchase (Park *et al.*, 2013).

2.7 Factor Affecting Usage of Nutritional Information

2.7.1 Gender

Women were more likely to read nutrition information in an attempt to eat a healthier diet (Kearney, Gibney, *et al.*, 2001) compared to men as they are less interested in choosing low calorie foods (Cranage *et al.*, 2004). Besides, women are more likely to notice nutritional information than males in a foodservice establishment and will use it at a point of purchase (Vanderlee & Hammond, 2014). Women and men also showed different choices behaviour in viewing the nutritional information, as it reveal women would order fewer calories food when nutritional information was provided (Watson, 2013). It also found that, girls were most likely to use nutritional information than boys when choose to eat at fast food restaurant (Wethington, Maynard, & Blanck, 2013). Therefore, the use of nutritional information is define as influenced by gender.

2.7.2 Nutritional Knowledge

Nutritional knowledge of consumer was believed to have a strong connection with the use of nutritional information (Drichoutis, Lazaridis, & Nayga Jr, 2006). It was also directly linked with type of food choose by consumer (Drichoutis, 2005). For example, consumer with high level of nutritional knowledge were more likely to use nutritional information provided in the menu in making their choices (Krukowski *et al.*, 2006). Besides, consumers who were well informed on nutrition in were more likely to choose healthier items when full nutrition information is provided compared to when no or limited nutrition information was provided (Park *et al.*, 2013). Besides, the effect of providing nutritional information in restaurant setting is bigger when the consumer understand how to make use the nutritional information given (Finkelstein, French,

Variyam, & Haines, 2004). Successful use of nutritional information depends on consumer's understanding of it and about nutrition in food too.

2.7.3 Health Conscious

Individual who are really conscious about their health were most likely to read nutritional information on food labelling (Jayanti & Burns, 1998). Study also found, consumers who are more concerned about nutrition and health are more presumably will look up for the nutritional information before making their purchase (Drichoutis *et al.*, 2006). Besides, people will not only concerned about the look of the product but also the nutritional content of the food (Norina *et al.*, 2011) and they use the nutritional information when they are dining out (Josiam & Foster, 2009).

2.8 Influences on Providing Nutritional Information

2.8.1 The Use and General Perception of Nutritional Information

The provision of nutritional information could influence consumers in such many ways. Consumers would noticed the available nutritional information provided in the food products, packaging or menu card in restaurants or other foodservice establishment. Some may make use of the nutritional information in choosing their foods and may also perceived that nutritional information could affect their food choices. For example, the use of nutritional information often affected the fast food choices among female college students (Driskell *et al.*, 2006) and in dining facilities of college students (Martinez, Roberto, Kim, Schwartz, & Brownell, 2012).

Many also realized the importance of providing nutritional information in food service establishment. For example, majority of restaurants customers positively perceived that providing nutritional information in full service restaurants menu in Malaysia is important (Norina *et al.*, 2011), as well as customers acknowledge that it was

a good effort for the fast food restaurant in Malaysia to provide a nutritional labelling in a step towards healthier lifestyle (Azlina *et al.*, 2011).

2.8.2 Food Selection and Consumption

Providing nutritional information in foodservice setting have been linked to influence consumer's food choices positively in the sense that, consumers would choose on a healthier option. Few studies have indicated that consumer would choose food with lower calorie, and lower fat content in the food when nutritional information was provided particularly at fast food restaurant (Chu, Frongillo, Jones, & Kaye, 2009; Dumanovsky *et al.*, 2011; Roberto, Larsen, Agnew, Baik, & Brownell, 2010). At fast food restaurant setting, customer who were reported to see and use nutritional information, often purchased fewer calories than those who did not see and use nutritional information in making their meal's choices (Bassett *et al.*, 2008). Consumer who were reported to use nutritional information to select their food choices would eat out at fast food restaurants less often and would consume more salads (Vadiveloo, Dixon, & Elbel, 2011).

Other than fast food restaurant, studies in university dining facilities indicated that customers who were presented with nutritional information were more likely to choose healthier menu items such with lower fat and lower calorie (Cioffi, Levitsky, Pacanowski, & Bertz, 2015; Cranage *et al.*, 2004). Besides, the provision of nutritional information could influences consumers to a better dietary intake in reducing consumption of unhealthy foods (Drichoutis *et al.*, 2006). The consumption of unhealthy food with high sodium, high saturated fat and total fat significantly lower (Vanderlee & Hammond, 2014), and consumer were more likely to choose healthier food choices with low fat and low calorie content when nutritional information is provided (Burton *et al.*, 2006).

Apart from that, providing nutrition information such as on calories and fat content or healthy heart symbol on fast food menus influences the calorie and fat consumer selected among children age between 6 to 11 (Stutts *et al.*, 2011). This also suggest that, early exposure and education regarding healthy eating and nutrition is important to make a better understanding regarding the nutritional content of the food they eat.

2.8.3 Intention to Purchase

Providing nutritional information was linked to purchase decision or the customer's intention to repurchase menu items in future. For example, study conclude that the likelihood of college student to purchase on more healthful snack increased when being exposed with nutritional information was higher (Cranage, Conklin, & Bordi, 2003). Customer showed a positive feedback on purchasing intentions when good nutritional information was presented (Burton & Creyer, 2004). Besides, at university cafeteria setting, the intention to purchase was greater when nutritional information was displayed for food items such on main entrée compared to when there is no nutritional information provided (Cranage *et al.*, 2004).

However, purchasing intention might be different when nutritional information is provided in regard to the type or particular food item. Few studies found purchasing intention of unhealthy item decline when nutrition information is provided. For instance, the purchasing intention for food with low nutritional perception such as hamburger changes after the disclosure of nutritional information (Raine, 2005). On another study, consumer intention to purchase food items containing high fat and calorie content declined when nutrition information was provided (Burton *et al.*, 2006). The nutritional information provided gave impact to the customer's purchasing behaviour primarily

because consumers wanted to avoid negative nutrients on the food products (Drichoutis *et al.*, 2006).

2.8.4 Attitude and Behaviour

Attitude and behaviour of consumer may differ in many perspective when nutritional information is provided in catering settings. It also depends on the acceptance of the consumer whether there are willingly to change their food choices, their purchasing behaviour or their decision to eat at fast food restaurants. They may also show significantly favourable or unfavourable attitude based on the type of food choices available with the nutritional information given (Kozup, Creyer, & Burton, 2003).

Customer showed favourable attitude as they were willing to pay more for the low fat menu item when the nutritional information was provided and they also unwilling to purchase anything extra for the menu item they contemplate and claimed as unhealthy (Hwang & Lorenzen, 2008). Attitude toward food and behavioural intention toward unhealthy food significantly decreased when nutritional information was presented (Choi, 2015).

2.9 The Preferred Nutrient Content in Nutritional Information

The nutrient content to be included in the nutritional information box is crucial, as it has become the major concern for consumers. Nutrient content that were display in the nutritional information may be limited for a particular food product and also may have a full information on another products. Nevertheless, consumers believe that providing nutritional information are more valuable and authentic if more nutritional information were included in the menu (Park *et al.*, 2013).

Study found that, the most preferable nutrient information to be included in nutritional information focuses on calorie, protein, sugar and fat content in food retail product (Norina *et al.*, 2011) and on the restaurant menu (Thomas & Mills, 2006). Besides, customers also rate fat, saturated fat and trans-fat to be the most prominent information to be included in restaurant menu (Josiam & Foster, 2009). Students in university cafeteria choose ingredients also a part of most essential aspect to be included in the nutritional information (Martinez *et al.*, 2012).

2.10 Effective Way Providing Nutritional Information

Proper and attractive way on presenting the nutritional information on menu or food products will also influences customer's attention to make use of it. Study found attractiveness, ease of use and clear presentation of information were the most prominent factor influencing customer preferences for nutrition labelling formats (Cranage *et al.*, 2003). Precise and easy to understand nutritional information is a worthy public health goal that should be appraised as an important strategy among many to encounter obesity problem and poor diet. Furthermore, in an effort to improve food label's potential to grab consumer attention it should be such as reduce label complexity and disclose numeric nutrition information in simpler and more meaningful ways (Roberto & Khandpur, 2014).

A few innovation has been made in an effort to increase the effectiveness of providing nutritional information. For instance, the traffic light labelling system that was established in United Kingdom. The Food Standard Agency took an approach when it was showed that, consumer found existing nutritional labelling information complex and difficult to understand (Hawkes & Albert, 2010). Therefore, the Food Standard Agency (FSA) developed a traffic light label that gives consumer scientific dietary advice to help them make healthier choices quickly and easily ("Using Traffic Lights to Make Healthier