

FACTORS INFLUENCING PUBLIC INTENTION TOWARDS PURCHASING GREEN FOOD IN MALAYSIA

Phuah Kit Teng^a, Golnaz Rezai^b, Zainalabidin Mohamed^c, Mad Nasir Shamsudin^d

^{a, b, c, d} Department of Agribusiness and Information Systems, Faculty of Agriculture,
Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.

^a Corresponding author: girlyphuah@yahoo.com

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Abstract: Food is the most basic need for all human being. However, shifts in the demographic and economic structures have influenced the food consumption pattern directly or indirectly. Changes in the consumers' lifestyle, taste and preferences, food safety awareness, environmental protection, health and animal welfare have a great impact on the demand for healthy and nutritious foods. Green foods are used to name as a healthy, environmental friendly, concern on food safety and animal welfare products. However, the concept of green foods is still very new in Malaysia and there is only a little knowledge about what factors influence the public intention to purchase green foods. These paper aims to assess consumers' perception and the factors that can influence their perception towards green foods consumption in Malaysia. 1355 respondents were interviewed. Descriptive statistic and factor analysis were used to analyze the information on public intention to purchase green foods. Factor analysis was used to determine the factors which can influence the consumers' purchasing behaviour and binary logistic model was used to determine the extent to which selected socio-economic/demographic characteristics and the extracted factors form factor analysis influence the public intention to purchase green foods. The results indicated that socio-demographic variables play an important role in explaining consumers' green purchasing behaviour. The major factors determining Malaysian consumers' green purchasing behaviour

are consumers' referent, knowledge towards green foods, purpose to purchase green foods, motivation to consume green foods, green concept understanding and product price.

Keywords: Binary logistic regression, factor analysis, green foods, intention, Malaysia

INTRODUCTION

Food safety, environmental friendly and animal welfare are necessary and important concerns during production, processing, storage, manufacturing, distribution of foods to ensure the safety, wholesome, healthy and nutritious for human consumption [15]. Growing environmental awareness combine with concerns about animal welfare and food safety has led people to purchase green foods [8]. Such phenomena have caused an increasing demand for green foods which considered being healthier, safer and better quality than conventional produce foods by most consumers [16].

Developing countries like Malaysia face a great challenge to ensure a balance between development and environmental sustainability [13]. In Malaysia, the air quality status is different according to the populated area, traffic conditions, geographical locations and the industrial and commercial activities [13]. However, the three main sources of air pollution come from the agriculture (irresponsible open burning activities and excessive use of chemical fertilizer and pesticides), motor vehicles and the

industries [1]. In Danish, [3] found that 30% to 40% of the environmental issues are brought by the consumption activities of private household. However, in Malaysia for example there is over 15,000 tons of rubbish that are produced locally every day [7].

Food safety awareness is very important factors while purchasing food products [10]. There are many factors contribute to food safety concern. They can be named as the inadequate access to clean and safe water, increasing use of pesticides and other chemicals in agriculture, excessive food additives in food processing and lack of consumer education [4]. In early 1987, there was a case where Singapore rejected import of vegetables from Malaysia due to high dithiocarbamate residue [9]. Similarly in 1993 Brunei rejected vegetables from Sabah and Sarawak due to high level of pesticide residue [5].

Another aspect of sustainable agriculture which becomes important concern among consumers is about the animal welfare issues especially the improvement of animal welfare in animal husbandry, transportation, handling and slaughtering [11]. Consumers often link the issues of animal welfare with environmental sustainability, food quality and human health. Malaysian government had launched the good agricultural practices (GAPs) to promote to the farmers, animal and fish breeders to enhance the objectives of sustainable agriculture and improve the food quality, safety, security and productivity. Furthermore, Malaysian Farm Accreditation Scheme (SALM) was implemented by the Department of Agriculture in 1992 to recognize and certify the farms which adopt good agricultural practices (GAPs). SALM was first developed for fresh fruits and vegetables sector which operated in a more environmental friendly way and yield products that are safe and high quality and now SALM has been applied to livestock husbandry and aquaculture.

Besides SALM, Malaysia government also introduce Malaysia Organic Scheme (SOM) which is a certification program that accredits the farmer who operates his farm in compliance with the standard conditions set by the national organic standard. It provide guidelines on the production, processing, labelling and marketing of plant based on organically produced foods which is according to the Malaysia Standard [2]. Since synthetic fertilizers and pesticides are prohibited to use under the organic farm system, it will minimized the environmental pollution and the incidental poisoning of farm workers. Therefore, these schemes will benefits to not only the consumer but also the producers, environment and worker.

The progressive impulse from the government on the green movement can be seen as for establishing the

“Ministry of Energy, Green Technology and Water (KeTTHA)” in 2009. The ministry is to provide an environment which can support the development of green technology through both monetary and physical and raise awareness of green technology, environment, food production among others to the public.

The green foods concept

Green products are known as environmental friendly products or ecological products [13]. In addition green products define as the products that will not threaten the environment, deplore the natural resources, can be recycle, reduced packaging or using less toxic materials [12]. In general, green products are products that will not cause any health hazard to human being and animal; will not include materials derived from the endangered species or threatened environments; will not contribute to excessive waste in its use or packaging; will not harm animals and the products are efficient in its use of resource during manufacture, use and disposal.

Green foods concept refer to foods that are safe to be consumed, fine quality and nutritious food produces under the principle of sustainable development. Green foods can be divided into 2 groups. The first group allows using a certain amount of chemical materials and the second group is known as organic foods. Green foods emphasize on the sustainable improvement to the eco-environment and coordinates among the social, economic and eco-environmental efficiency [6]. However green foods can be organic but it's not necessary for all the organic food to be green. Green foods is also refer to foods that is healthy to consume, use less chemicals, more concern on food safety and environment and it achieve consistently high standard of animal health and welfare than conventional foods. The marketing method and packaging that use to market green foods is more environmental friendly. For example, paper bags or environmental friendly bag are use in marketing green foods. The production way of green foods is using the combination of traditional excellent way and modern agriculture.

Green purchasing behaviours are different from country to country. The concept of green is still very new to Malaysian people although green campaign has been carried out for quite sometimes and the market for green products in Malaysia is at the infancy stage. Thus the objective of the study is to investigate the factors that are likely to influence or intention to purchase green food and green food products after knowing about the advantages of such product in the development of sustainable agriculture, conservation of natural resources and environmentally friendly production process.

MATERIALS AND METHODS

Theory of Planned Behaviour (TPB) is used as the conceptual framework to explain the relationship between consumers' perception, behavioural intention and choosing behaviour. It assumes the attitude of consumers' towards a particular behaviour, subjective norms and perceived behavioural control which are three main conceptual independent determinants of the intention to purchase green foods.

The intention of consumers' to purchase or consume green foods is made up of their belief and awareness towards the concept of green foods which they accumulate from their lifetime. Consumers' attitude and their buying behaviour may also base on the external factors such as socio demographic profiles and influence by their religious, knowledge, information and advertisement. All this factors will built the consumers' confidence and trust towards purchasing green foods and lead him or her to perform a positive intention to perform green purchasing behaviour.

This study used data collected from a survey which was conducted in July 2010 until January 2011 in Peninsular Malaysia. A random sampling method was used and the survey was done in supermarkets such as Jusco, Tesco, Carrefour and Cold storage because consumers' from all walks of life usually shop at supermarkets. A total of 1355 respondents were interviewed using structured questionnaire. A Likert scale of 1 to 7 (1 represent strongly disagree and 7 represent strongly agree) was used to measured the consumers' perception and intention on 24 statements formulated in relation to green foods consumption. Consumers' socio-demographic backgrounds were also collected.

Data were analyzed by using SPSS 16.0. Descriptive statistics, factor analysis and binary logistic were used to analyze the information gathered from the questionnaire. Descriptive analysis was used to summarize the socio-demographic data into a simpler summary to make it easier to understand and measure while factor analysis is used to indicate the underlying factors that might influence the consumers' perception towards green foods consumption. Binary logistic model was used to determine the extent to which the socio demographic and factors that affect the consumers' intention to purchase green foods.

Explanatory factor analyses were performed. The reliability of the results factors were tested by using the Cronbach's alpha to measure the internal reliability consistency. The principal component method was used while using factor analysis and

relevant factors were extracted by using varimax method. The criteria for the number of factors to be extracted were the KMO must be more than 0.50 and eigenvalue of each factors had to be more than one.

RESULTS AND DISCUSSION

The Cronbach's alpha value for "perception", "subjective norms", "perceived behavioural control" and 'intention' were 0.946. This showed that there is consistency among the theory of planned behavioural elements and therefore the model can fit for this study.

Demographic profile of the respondents

Table 1 shows the socio-demographic profile of respondents. The result shows that most of the respondents were females 728 (53.7 percent). Around 28.3 million people in Malaysia at 2010 are consists of three major races which is Malay, Chinese and Indian. In this study, it shows that the majority of the respondents were Malays (57.1 percent), followed by Chinese (30.6 percent) and Indians (12.3 percent). The percentage of respondents from urban and rural area was 72.0 percent and 28.0 percent respectively. More than half of the respondents were married (60.7 percent) and majority age were between 26-40 years (45.8 percent).

In term of education background 71.3 percent of the respondent have gone through tertiary education and only small amount of respondents gone through secondary education (15.6 percent) and 13.1 percent were higher tertiary graduated. About 42.4 percent of the respondents have income between RM3,001-RM4,500 per month, and a smaller percentage of respondents (6.4 percent) have incomes above RM6,001, while 9.3 percent of respondents have income RM 1,500 and below. As shown in table 1, most of the respondents have household size between 4 to 6 people (62.0 percent) and there were only 2.2 percent have above 10 household sizes.

Dimensions of consumers' awareness and perception towards green food consumption

The relationship between consumers' awareness and perception was also measured by asking five questions about the level of awareness and perception towards green foods (Table 2). The result indicates that almost half of the respondents (52.3%) are aware about the concept of green foods. Approximately 92% of respondents stated that green foods are more concerned above the environment and have superior quality or more safe to be consumed than conventional foods. The result of the survey also shows that 85.2 percent of respondents indicated that green foods production was more concerned about animal welfare.

Table 1: Socio-demographic profile of respondents (n=1355)

Characteristic	Percentage	Characteristic	Percentage
Gender		Education level	
Male	46.3	Secondary	15.6
Female	53.7	Tertiary	71.3
Ethnic (Race)		Higher tertiary	13.1
Malay	57.1	Income	
Chinese	30.6	Below 1500	9.3
Indian	12.3	1501-3000	34.5
Area		3001-4500	42.4
Urban	72.0	4501-6000	7.3
Rural	28.0	Above 6001	6.4
Marital Status		Household size	
Single	39.3	1-3	21.8
Married	60.7	4-6	62.0
Age		7-9	13.9
Below 25	16.7	10 above	2.2
26-40	45.8		
41-60	31.7		
Above 60	5.9		

Table 2: Consumers' awareness towards green foods (n=1355)

	Percentage
Have you heard about the concept of green foods?	
Yes	52.3
No	47.7
Green foods are more concerned about the environment.	
Yes	92.5
No	7.5
Green foods have superior quality and safe to be consumed.	
Yes	92.6
No	7.4
The production of green foods is more concerned about animal welfare.	
Yes	85.2
No	14.8

Table 3: Kaiser-Meyer-Olkin (KMO) and Bartlett's test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.915
Bartlett's Test of Sphericity	Approximate Chi-square	1.369E4
	d.f	276
	Significance	0.000

With the significance level of $p < 0.000$, Bartlett's test for Sphericity showed the correlation matrix was at an appropriate level to perform factor analysis on the data for each scale. The desired values for KMO test which more than 0.5 are considered satisfy for factor analysis. Low values indicate the diffuse correlations with no substantive groupings.

From the above discussion, one can conclude that consumers are familiar with the concept of green foods and have a good knowledge of green foods as the concept since the connotation of 'Green' is widely publicized in Malaysia. This is due to the green labelled food logo which consumers found on the food products such as Malaysian Farm Accreditation Scheme (SALM), Malaysian Aquaculture Farm Certification Scheme (SPLAM), Good Animal Husbandry Scheme (SALT) and Malaysian Organic Scheme (SOM). Therefore, the increase in the knowledge has made the consumers' more aware about the foods they intend to purchase or consume.

Factor Analysis

As mentioned earlier, factor analysis was used to uncover the latent factors underlying consumers' perception and intention to purchase green foods. Respondents answered 55 statements which were all seven point Likert scale about their attitudes, perception, subjective norm, perceived behavioural control and intention towards the green foods consumption. The result shows for factor analysis shows that out of 55 statements, there were only 24 statements that related to consumers' perception and factors influence them to purchase green foods. Kaiser-Meyer-Olkin (KMO) test of sampling adequacy and Barlett's test of Sphericity were first performed on all the statements to confirm the appropriateness of conducting factors analysis [14]. In this study, the result of KMO test reached the values of at least 0.915 (Table 3) which indicates that the sampling adequacy and factor analysis can be carried out by using the 24 statements.

After the varimax rotation of the consumers' responses to the 24 statements relating to their perception towards green foods, the factor loading from the principal component factor analysis was obtained. From the results of the rotated factor matrix, only item with a factor loading of at least 0.5 and above are considered as a significance items. The factor loading for six factors is from 0.621 to 0.817 (Table 5). The factors were named based on the sub-variables which fall within each factors. The Cronbach's Alpha was used to measure the reliability of 24 relevant variables. A measure of internal reliability consistency significant was determined by using the Cronbach's Alpha score. Six latent factors are identified and have sufficient internal reliability consistency as indicated by Cronbach's Alpha scores which shows in *Table 4*.

The six latent factors which account for about 64.562 percent of the total variance are summarized as follow.

Consumers' referents

This factor consists of five sub- variables and has a total variance of 12.951 percent; environmentalists think that I should buy green foods (0.754). This followed by my teachers or lecturers encourage me to purchase green foods (0.727), green society or environment friendly society makes me to purchase green foods (0.710), government encourages me to purchase green foods (0.678) and green movement makes me aware of green foods (0.624). The results show that consumers' attitudes or behaviour to purchase green foods can influence by the society.

Knowledge about green concept and foods

This factor has a total variance of 11.925 percent and comprises of four sub-variables; purchase green foods if I know that green foods are healthier and safer to be consumed (0.817). This is followed by purchase green foods because I am concerned about the pesticide residue in conventional foods (0.760), purchase green foods if I know they are more nutritious (0.750) and if I am being exposed to more green information, I am in favour to purchase green foods (0.677). The results indicate consumers' knowledge and awareness of the underlying advantages that comes with green foods are associated with intention to purchase these products

Intention

This factor has a total variance of 11.528 percent and comprises of four sub- variables: intend to purchase green foods because it is more concern on food safety (0.816), followed by want to purchase green foods because it is more environmental friendly (0.801), plan to purchase green foods because I concern about animal welfare (0.682) and try to consume green foods for my long term health benefits (0.633). The result shows that the consumers are more likely to purchase or consume green foods because there is an existence intention will affect their behaviour towards green foods consumption.

Green food Attribute

This factor has a variance of 10.705 percent and consists of four sub-variables. Green foods prevent food poisoning or food allergy has the highest factor loading (0.805) followed by green foods are contaminating free (0.759), green foods taste better than conventional foods (0.668) and green foods are better than other food products (0.621). The result shows that consumers believe that there are benefits or qualities that obtained by the green attributes which make green foods is better than conventional foods.

Table 4: The result of reliability test

	Cronbach's Alpha score	Number of items
Consumers' referents	0.820	5
Knowledge towards green concept and foods	0.846	4
Intention	0.834	4
Green food attribute	0.782	4
Motivation of consumption	0.815	4
Product price	0.555	3

Table 5: Summary of factor analysis results

Items	Factor Loading					
	F ₁	F ₂	F ₃	F ₄	F ₅	F ₆
Consumers' referents						
Environmentalists think that I should buy green foods	0.754					
My teachers or lecturers encourage me to purchase green foods	0.727					
Green society or environment friendly society makes me to purchase green foods	0.710					
Government encourages me to purchase green foods	0.678					
Green movement makes me aware of green foods	0.624					
Variance (percent of explained)	12.951					
Knowledge towards green concept and foods						
Purchase green foods if I know that green foods are healthier and safer to be consumed		0.817				
Purchase green foods because I am concerned about the pesticide residue in conventional foods		0.760				
Purchase green foods if I know they are more nutritious		0.750				
If exposed to more green information, I am in favour to purchase green foods		0.677				
Variance (percent of explained)		11.925				
Intention						
Intend to purchase green foods because it is more concern on food safety			0.816			
Want to purchase green foods because it is more environmental friendly			0.801			
Plan to purchase green foods because I concern about animal welfare			0.682			
Try to consume green foods for my long term health benefits			0.633			
Variance (percent of explained)			11.528			
Green food Attribute						
Green foods prevent food poisoning or food allergy					0.805	
Green foods are contaminating free					0.759	

Green foods taste better than conventional foods	0.668
Green foods are better than other food products	0.621
Variance (percent of explained)	10.705
Motivation of consumption	
Advice from my close friends	0.795
Society think about my purchasing behaviour does matter to me	0.794
Advertisement can convince me to purchase green foods	0.653
Doing what environmentalists do encourage me to purchase green food	0.647
Variance (percent of explained)	10.634
Product price	
High price of green foods sometimes stop me from purchasing them	0.690
Price gap between the green foods and conventional foods is huge	0.720
Green foods is costly	0.713
Variance (percent of explained)	6.819
Total percentage of variance	64.562

Table 6: Estimated logit model for consumers' intention to purchase green foods

Variables	Estimated Coefficient	Standard Error	Significant Level	Exp(B)
Gender	-0.187	0.133	0.162	0.830
Area	-0.070	0.145	0.630	0.932
Income	1.166	0.173	0.000***	3.208
Age	0.051	0.136	0.706	1.053
Education level	0.462	0.173	0.008**	1.587
Consumers' referents (Factor 1)	0.400	0.067	0.000***	1.492
Knowledge towards green concept and foods (Factor 2)	0.400	0.067	0.000***	1.492
Intention (Factor 3)	0.353	0.065	0.000***	1.423
Green food Attribute (Factor 4)	0.269	0.066	0.000***	1.309
Motivation of consumption (Factor 5)	0.117	0.064	0.070*	1.124
Product price (Factor 6)	0.398	0.068	0.000***	1.488
Constant	-1.367	0.404	0.001	0.255
-2 Log Likelihood	1419.452	Nagelkerke R Square		0.277
Cox and Snell R Square	0.199	Hosmer and Lemeshow Test		0.137

***Statistically significant at 0.001 level, **at the 0.05 level and *at the 0.10 level

Motivation of consumption

This factor has total variance of 10.634 percent with 4 sub-variables. The factor advice from my close friends has the highest factor loading (0.795). This followed by society think about my purchasing behaviour does matter to me (0.794), advertisement can convince me to purchase green foods (0.653) and doing what environmentalists do encourage me to purchase green food (0.647). The result shows that the society has great impact on motivating consumers to consume green foods therefore they will encourage saving the planet by going green.

Product price

This factor with a total variance of 6.819 percent and includes three sub-variables: price gap between the green foods and conventional foods is huge (0.720), followed by green foods is costly (0.713) and high price of green foods sometimes stop me from purchasing them (0.690). The result indicated that price is an important factor that influences the consumers' purchasing behaviour. If the price of green foods is expensive, consumers are not willing to purchase the green foods.

Binary Logistic Analysis

Binary logistic model was used to determine the extent to which selected socio-demographic characteristic and factors will influence the consumers' intention to purchase green foods. The estimates parameters and the statistical significance levels were show in Table 6. The dependent variable "intent to purchase green foods in the near future" had two categories which are "respondents' intent to purchase green foods in the near future" was coded as one and otherwise coded as zero. The result of this study found that out of eleven variables, eight variables were positive and statistically significant. Thus, the socio-demographic factors and six factors that found in factor analysis are relevant to determine the consumers' green purchasing behaviour.

Based on the statistically significant coefficients, education level and income were the only socio-demographic characteristics which have positive sign and significant with the consumers' intention to purchase green foods (Table 6). The results show that respondents who have higher education level have 1.587 times higher intention to purchase green foods in near future than that respondents who have lower education level. Similarly respondents who have higher income, the likelihood of their level of intention to purchase green foods will increase 3.208 times than the respondents with low income. Furthermore, six factors which result from the factor analysis which are consumers' referents, knowledge towards green concept and foods, intention, green foods attribute, motivation of consumption and

products price are important determinant for consumer intention to purchase green foods and the effect is positive.

CONCLUSION

It is important to measure consumers' perceptions and intention to purchase green foods because behaviour and perception can express the awareness of respondents in performing the green food purchasing behaviour. This study shows that there is three independent factors that affect the intention of consumers to purchase green foods which is knowledge and attitude, subjective norms (environmentalists, teachers or lecturer, green society, government and green movement) and perceived behaviour control (animal welfare, health, environment and food safety). The results of this study show that respondents were aware about the concept of green foods although the concept of green foods is still new in Malaysia. Majority of the respondents have great knowledge about the advantages to consume green foods.

The factor analysis on the other hand indicates factors that will influence consumers' intention in green purchasing behaviour towards green foods. Perceived opinion or belief of the people who are special or important to the respondents such as environmentalists, government, green society, green movement and lecturers can influence their perception and purchasing behaviour towards green foods consumption. The consumers' referents can motivate consumers to purchase or consume green foods.

Others variables such as knowledge of green foods were also an important factors that influence consumers perception and purchasing behaviour. It is important for the food industry to know how the consumers' understanding and their knowledge towards green foods so that they can produce foods products that can satisfy their want and needs. The study also shows that consumers' intended to purchase or consume green foods are due to the quality of the green foods that they perceived. Consumers' tend to consume foods that were environmental friendly, safer to consume, healthy, more nutritious or concern about animal welfare. They will choose the foods which were more hygiene, contamination free, prevent food poisoning or allergy and can provide them a healthy living. Therefore, consumers' will have higher intention to purchase the foods products that meets all the criteria they want to satisfy their need.

Green foods attract consumers with certain level of income and environment awareness. The price of green foods is normally about 10 percent to 50 percent higher than conventional foods (Liu, 2003).

Therefore, price is an important factor that needs to be considered that could affect or influence consumers' purchasing behaviour. Thus study on willingness to pay for green foods need to be conducted in order to gauge the price disparity between conventional and green foods. The markets for green foods in Malaysia are at the beginning of its development. Marketing strategy for green food must take into consideration of market segmentation as the product has its own niche market. Consumers' need to be aware of the advantages and concept of green foods as foods products that in a long run could protect the environment and safe the world from degradation and green house gases phenomena.

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