

## MODERATING EFFECT OF SELF-EFFICACY ON THE RELATIONSHIP BETWEEN CONSUMER ATTITUDE AND WILLINGNESS TO CONSUME HEALTHY FOOD

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**Abstract:** The demand for healthy food consumption, such as functional food, has increased due to the prevalence of certain diseases that relate to unhealthy eating. Functional food is a new category of product that is fortified with nutrition and has been proven scientifically to prevent the risks of certain diseases and improve overall health. Healthy life will affect positively on household income, productivity and national economic prosperity because it may enable an individual to increase quality of life. Therefore, functional food consumption reflected the concept of sustainable diets that will contribute to the enhancement of sustainable livelihood, good health and well-being, as well as the economic and environment sustainability as a whole. Despite gaining acceptance among consumers, the information regarding the process of consumer behaviour, the influencing factors, and consequences are presently insufficient. Thus, there is a need to investigate the antecedent factors that influence the consumer willingness to consume healthy food in order to prevent diseases, increase good health and well-being as well as reducing medical costs. Attitude plays a role as guidance on how information regarding functional food is noticed, adopted, accepted or rejected. With this in view, attitude was found to be one of the key factors that influence the behavioural of individuals towards healthy food choice. This study aimed to investigate the attitude dimensions that can predict consumer willingness to consume functional food and to examine the effect of self-efficacy as the moderator on the relationship between attitude dimensions and consumer willingness to consume such food. Four dimensions of functional food-related attitudes were examined in this study, which are; a reward from using functional food, a necessity for functional food, a safety of functional food, and a confidence in functional food. A mall-intercept survey was conducted with the sample of 452 respondents by using the self-administered questionnaire. The results revealed that only reward and necessity significantly influence consumer willingness to consume functional food. However, confidence and safety have no significant influence on consumer willingness to consume functional food. The moderator of self-efficacy was statistically significant and moderates the relationship between attitude dimensions and consumer willingness to consume functional food. The results from this study would be valuable for the marketers in the healthy food industry to formulate effective marketing communication strategies in order to facilitate favourable attitudinal change towards good health and sustainable livelihood.

Keywords: Attitude, consumer willingness, self-efficacy, functional food, sustainable livelihood.

### Introduction

Hippocrates, the father of medicine, once said: "Let food be thy medicine and medicine be thy food". These words acknowledge the benefit of consuming healthy food and the capability of certain foods for good health and well-being. Generally, product used to cure diseases known as medicinal products and not food. However, a

healthy diet comprises of food with functional properties that can improve physiological functions and mental well-being, can also diminish the risk of developing certain diseases. As reported by World Health Organisation (World Health Organization, 2015), unhealthy food, unhealthy eating habits and less physical activity may lead to the global burden of non-communicable diseases (NCDs), which

although non-infectious, are often referred to as chronic diseases. NCDs, such as hypertension, kidney disease, diabetes, chronic lung diseases, heart disease, high cholesterol and certain types of cancer, are increasing, affecting people of all age groups in all around the world.

Following the trends, consumers have changed the priority of consuming food from needs to satisfy hunger to the needs to become healthy and promote sustainable livelihood. Several studies demonstrate that consumers are progressively reflective concerning health issues and willing to adopt health-oriented changes in their eating routine (Niva, 2007; Kraus, 2015). Hence, to prevent NCDs, individuals must consume a healthy diet, such as consuming more functional foods and carry out physical activity. Apart from that, an increase in life expectancy, the desire for the better quality of lives, and the greater cost of medical and long-term rehabilitative care are the major motivations for an increasing demand for functional foods in the market designed to provide health benefits (Roberfroid, 2000). In this study, the term functional food was illustrated as food and drinks that provide health benefits that reduce the risk of some diseases in addition to its nutritional value (Urala & Lahteenmaki, 2007). Howlett (2008) and Kraus (2015) reported that functional food provides various health benefits and plays a role in several aspects of human health and well-being from the perspective of the availability of target functions that might be susceptible to dietary influence. Some of the functional food benefits are; to improve memory and eyesight, to promote optimal heart health and to promote optimal physical performance and health recovery (Kraus, 2015).

Previous studies discovered that individuals who consume more of functional foods have been scientifically proven to reduce the rate of many diseases, thus, will improve the overall health of individuals (Pereira *et al.*, 2004). Therefore, this study intended to develop more understanding towards factors that affect the issue of healthy consumption behaviour among Malaysian, which indeed leads to the healthy life and good

well-being. The finding would shed further light on the knowledge in the area of functional food consumption behaviour, especially when it comes to discussing the relationship that attitude dimensions (i.e. reward, necessity, confidence, safety) have on willingness to consume functional food and the effect of self-efficacy on the relationship between consumer attitude and willingness to consume functional food.

In previous literature, the elements of attitude towards food choice, including functional foods were measured using general attitude scales such as “bad to good” and “pleasant to unpleasant” (Poulsen, 1999). Since functional food are known as a novelty product with credence attributes and categories as healthy food that come with special health benefits, thus, attitude measurements that directly emphasize the health-focus studies are needed (Urala & Lahteenmaki, 2004; 2007). In order to have a better prediction of consumer willingness to consume functional food, this study adopted four dimensions of attitude developed by Urala and Lahteenmaki (2007) that are more relevant to functional food-related attitudes, which are; reward from using functional foods, necessity for functional foods, confidence in functional foods, and safety of functional food.

These four dimensions of attitude were chosen because the functional food is different from conventional food in terms of extra benefits gained from consumption of such food. Individual consumed functional food not just to satisfy their hunger but also to obtain the reward from using functional food such as being healthy and lower the risk of getting certain diseases. Therefore, attitude towards necessity to consume functional food is important for individuals in order to obtain good health and well-being (Urala & Lahteenmaki, 2007). In terms of attitude dimensions of confidence and safety, in order for consumption behaviour to be performed, individuals need to have a strong confidence and trust in food safety and benefit claimed by the manufacturer from using the functional food products (Landstrom *et al.*, 2007; Urala & Lahteenmaki, 2007).

Urala and Lahteenmaki (2007) describe reward as a feeling of satisfaction and enjoyment in terms of health, mood, and well-being resulted from functional food consumption and they stated that perceived reward dimension is the most crucial factor in consumer acceptance towards functional food. Prior studies also found that consumer attitude that linked towards the perceived rewards, which mainly related to the healthiness of the food and well-being that they will get from consuming functional food, is the best predictor towards willingness to consume functional food (Bech-larsen & Grunert, 2003; Verbeke, 2005; Landstrom *et al.*, 2007; Urala & Lahteenmaki, 2007; Barcellos & Lionello, 2011; Carrillo *et al.*, 2013; Kraus, 2015). Hence, the hypothesis was proposed as:

Hypothesis 1: Perceived rewards of using functional food influence consumer willingness to consume such food.

The necessity for functional food measures how essential the consumers think that functional food is for themselves or for people in general (Urala & Lahteenmaki, 2004; 2007). In other words, the necessity for functional food is an attitude towards the perceived need for such foods due to the possible benefits for health. Urala and Lahteenmaki (2004; 2007) reported that there was a positive correlation between the necessity for functional food and the willingness to consume such food, however, the influence of necessity for functional food among Finnish consumers became weaker. Chen (2011) stated the necessity for functional food consumption significantly influences the willingness to use functional food among Taiwanese. However, a study by Landstrom *et al.* (2009) on Swedish consumers, aimed at examining consumer attitudes, perceptions and the perceived need for functional food, reported consumers felt that functional foods were unnecessary if the person did not suffer from any health problems and that a lifestyle change would not result in optimal health. With this in view, the following hypothesis was proposed:

Hypothesis 2: Perceived necessity for functional food influence consumer willingness to consume

such foods.

Confidence in functional food was measured as the confidence that the consumers have in functional food as food that promote health and the reliability of scientific basis and research of the promised health effect (Urala & Lahteenmaki, 2004; 2007). Thus, the term confidence is defined as consumer attitude towards the information and claims about functional food, particularly on functional food benefits related to health effects. Urala and Lahteenmaki (2004; 2007) reported apart from reward, confidence in functional food was also the important factor that influences the behavioural intention towards functional food consumption among consumers. Chen (2011) also found that confidence in functional food demonstrated a significant relationship towards consumer willingness to use functional food products in Taiwan. In addition, confidence and trust in food companies and the health benefits from using functional food are the most superior factor influencing the acceptance of functional food (Verbeke, 2005; Markovina *et al.*, 2011; Siegrist *et al.*, 2015) Moreover, Annunziata and Vecchio (2011) stated that the source of information plays an important role towards consumer confidence of the information about functional food. Previous results described that consumers had a lower level of confidence in information from newspaper, functional food's manufacturer and retailer, while a high level of confidence is afforded to dieticians, nutritionists, doctors and government (Barcellos & Lionello, 2011). Thus, the hypothesis was proposed as:

Hypothesis 3: Perceived confidence in functional food influence consumer willingness to consume such food.

Finally, the safety dimension is operationalized as how respondents perceive the related risk or possible harmful effects when functional food are consumed (Urala & Lahteenmaki, 2004; 2007). Factors related to functional food safety, health benefits and functional food as medicine are the important determinants towards willingness to consume functional food among consumers in Thailand (Methakornkulnan *et al.*, 2013). Some of the functional food was modified using

sophisticated scientific methods by adding and/or removing the component of a food. Therefore, some consumers perceived functional food to be risky and were not safe to be consumed due to unnaturalness in food (Frewer *et al.*, 2003). A study on functional food in Canada stated that consumers would disregard the health benefits of the functional food if the production technology seems frightening (Labrecque & Charlebois, 2011). Therefore, the perceived risks from functional food consumption would prevent the consumers to consume the functional food. However, studies on consumer attitudes by Urala and Lahteenmaki (2004) and Chen (2011) argued that the perceived safety towards the possible harmful effects of functional foods does not influence the consumer's acceptance to use functional food in general. Hence, the following hypothesis was proposed:

Hypothesis 4: Perceived safety of functional food influence consumer willingness to consume such food.

The above explanation demonstrated that the results of the relationship between attitude dimensions and the consumer willingness to consume functional food from previous studies were inconsistent. Baron and Kenny (1986) stated that there may be some contingent (moderator) variable that has not investigated which could be the cause of this inconsistency. Therefore, the construct of self-efficacy was introduced as moderator in this study. Despite the health benefits obtained from consuming functional food, it is difficult to change consumer behaviour, especially towards healthy consumption. Therefore, individuals need to have a strong and high level of internal motivation of self-efficacy in order to participate in healthy consumption behaviour, because high

self-efficacy leads to a strong confident that they can perform the behaviour (Conner & Norman, 2005). Self-efficacy in this study deals with the strong internal believe that individuals have on their own capabilities and potential to perform the chosen behaviour as well as confidence in defeating the obstacles to achieving that behaviour (Bandura, 1986).

Prior studies also found that individuals who had strong confidence in their self-efficacy would change their behaviour towards a healthy diet and were less likely to relapse to their previous unhealthy diet (Mai & Hoffman, 2012; Fitzgerald *et al.*, 2013). Supported by Conner and Norman (2005) and Hall *et al.* (2015) they stated that perceived self-efficacy is directly related to health-related behaviour. Moreover, Robles *et al.* (2014) and Nastaskin and Fiocco (2015) reported that the stronger the individual's self-efficacy, the higher his/her obligation to consume healthier food. Therefore, the following hypothesis is proposed:

Hypothesis 5: Self-efficacy moderates the relationship between attitude dimensions and consumer willingness to consume functional food.

The main objectives of this study are; to examine the factors related to attitude dimensions that may influence the behaviour of the consumer towards willingness to consume functional food, and to examine the moderating effect of self-efficacy on the relationships between attitude dimensions and consumer willingness to consume such food.

## Methodology

The research framework for this study is as shown in Figure 1.

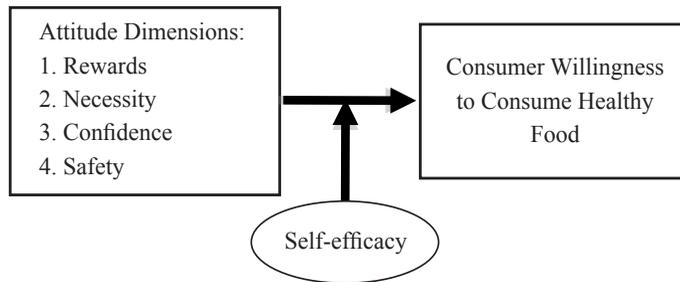


Figure 1: Research framework

This study uses the cross-sectional method to answer the study’s research questions in which data were gathered once. This study employs quantitative methodology involving individual consumers aged 18 and above who went shopping at 12 hypermarkets in Klang Valley, Malaysia. The convenience sampling technique was used in this study because a complete list of exact members of the population for this study cannot be determined, and the numbers of the population are more than 1,000,000 and the subjects are also widely scattered. Based on Krejcie dan Morgan (1970), it should be noted that as the population increases, the sample size increases at a diminishing rate and remains constant at 384 cases when the population reach 250,000 and above.

A self-administered questionnaire was distributed to the respondents personally by

using mall intercept survey method. Eight hundreds questionnaires were distributed and a total of 452 questionnaires were usable with a successful response rate of 56.5%. In the case where the respondent could not complete the questionnaire on site, they were given a pre-stamped envelope with the researcher’s address to return it by mail. Some of the questionnaires were not returned, incomplete and unusable.

The willingness to consume functional food, attitude dimensions and self-efficacy construct were measured on a five-point Likert scale, ranging from “strongly disagree” (1) to “strongly agree” (5). According to Table 1, willingness to consume functional food was measured using four items based on Verbeke and Vackier (2005) and five items were developed to examine self-efficacy based on Armitage and Conner (1999).

Table 1: Measurement of the constructs

Construct	Scale Items	Statement Items	Sources
Willingness to Consume Functional Food	WC1	I will eat/drink functional food to make myself healthier	Verbeke and Vackier (2005)
	WC2	I intent to eat/drink functional food to prevent me from certain chronic diseases	
	WC3	I want to eat/drink functional food product if I can trust it contains healthy component	
	WC4	I expect to consume more functional food in the future	
Reward	R1	My mood improves when I consume functional food	Urala and Lahteenmaki (2007)
	R2	Functional foods helps to improve my performance	
	R3	Healthy lifestyle is easier to follow by eating functional foods	
	R4	Eating functional foods regularly can prevent certain disease	
	R5	The idea that I can take care of my health by consuming functional foods gives me happiness	
	R6	Functional foods can fix the damage caused by an unhealthy diet	
	R7	I am ready to compromise on the taste if the food is functional	
	R8	I am actively looking for information regarding functional foods	
Necessity	N1	Eating functional foods are completely unnecessary (R)	Urala and Lahteenmaki (2007)
	N2	Functional foods are fraud (R)	
	N3	The increasing number of functional foods in the market is a bad trend for the future (R)	
	N4	For a healthy individual, it is useless to consume functional foods (R)	
	N5**	It is good that new technology enable the development of functional foods	
	N6**	I only want to eat foods that do not have any medicine-like effects (R)	
	N7	Health effects are not suitable in delicacies (R)	
	N8	Functional foods are consumed mostly by individuals who have no need for them (R)	
Confidence	C1**	Functional foods upgrade my well-being	Urala and Lahteenmaki (2007)
	C2	The safety of functional foods has been very thoroughly studied	
	C3	I believed that functional foods fulfil their promises	
	C4	Functional foods are science-based top products	

Safety	S1	Consuming too much of functional food can be harmful to health (R)	Urala and Lahteenmaki (2007)
	S2	In some cases, functional foods may be harmful to healthy people (R)	
	S3*	Consuming functional foods is completely safe	
	S4	The new components of functional foods carry unforeseen risks (R)	
	S5	Exaggerated information is given about health effects of functional foods (R)	
Self-efficacy	SE1	Whether or not I consume functional foods is entirely up to me	Armitage and Conner (1999)
	SE2	I am confident that I can consume functional food regularly	
	SE3	I am very sure that I would be able to consume functional foods next week	
	SE4	I am certain that I will be able to refrain myself from consuming foods that are not healthy	
	SE5	If I wanted to, it would be very easy for me to consume functional food every day	

Note: (R) denotes items requiring reverse scoring. Item S3\* was moved from the original safety dimension to confidence dimension and items N5\*\*, N6\*\* and C1\*\* were deleted in the subsequent analysis.

Further, as shown in Table 1, attitude towards willingness to consume functional food in this study was operationalized by using four distinct attitude dimensions – reward, necessity, confidence, and safety – developed by Urala and Lahteenmaki (2007) with 25 functional food-related items. Accordingly, reward and necessity consist of eight items each, confidence with four items and safety with five items were produced.

Multiple regressions analysis was used to examine the amount of variance of consumers’ willingness to consume functional food explained by the attitude dimension, and hierarchical regression analysis was utilized to examine the effect of self-efficacy as a moderator on the relationship between attitude dimensions and consumer willingness to consume functional food. For the purpose of this study, the three-step hierarchical regression was performed (Hair, 1998).

For ease of interpretation, for the results of descriptive statistics of the study, the range of the five-point Likert scale was grouped into similar sized categories of low, moderate and

high. In which, scores of below than 2.33 [4/3 + lowest value (1)] are reflected as low, scores of 3.67 and above [highest value (5) – 4/3] are reflected as high, and those in between are reflected as moderate (Nor Azila *et al.*, 2012). Based on recommendation from Hair *et al.* (1998), the measure of Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy will be explained using the following guideline: below 0.50, unacceptable; 0.50 to 0.59, poor; 0.60 to 0.69; moderate; 0.70 to 0.79, good; and 0.80 and above, excellent. Factor analysis is considered appropriate if the value of KMO measure of sampling adequacy index with the minimum of 0.60 and Bartlett’s test of sphericity should be significant with  $p < 0.05$ . Reliability analysis was performed on factors extracted to test the internal consistency of the measurement and the acceptability of reliability scale was determined by using the value of Cronbach’s Alpha coefficients. Sekaran and Bougie (2009) suggested that reliability coefficient less than 0.60 is poor, those in 0.70 ranges is acceptable, and over 0.80 are good.

**Results**

***Characteristics of the Respondents***

General demographics characteristics of the respondents were also collected as in Table 2. There are large numbers of female respondents that demonstrated 70.4% of the samples and only 29.6% are male. The majority (74.6%) of the respondents are 18 to 40 years old. In terms of respondents' religion, the majority are Muslims,

with 76.8% and it is consistent with the ethnicity in which the percentage of Malays is 75.7%, 18.1% are Chinese, 5.1% are Indians and 1.1% are from other ethnic groups. The majority of the respondents are married (68.4%). In relation to education background, most of the respondents completed tertiary education (80.1%). Finally, the majority of respondents' household income is more than RM3,000 (76.5%) per month.

Table 2: Characteristics of the respondents

Characteristics	Categories	N	%
Gender	Male	134	29.6
	Female	318	70.4
Age	18-30 years old	169	37.4
	31-40 years old	168	37.2
	41-50 years old	101	22.3
	More than 50 years old	14	3.1
Religion	Muslim/Islam	347	76.8
	Buddhism/Taoism	73	16.2
	Hinduism	21	4.6
	Christianity	10	2.2
Ethnicity	Others	1	0.2
	Malay	342	75.7
	Chinese	82	18.1
	Indian	23	5.1
Marital Status	Others	5	1.1
	Single	138	30.5
	Married	309	68.4
Education level	Divorce/Widowed	5	1.1
	Primary/Secondary School	90	19.9
	Certificate/Diploma	85	18.8
	Degree	190	42.0
	Masters/Doctorate	87	19.2
Monthly Income	RM3,000 or less	106	23.5
	RM3,001-RM5,000	175	38.7
	RM5,001-RM7,000	75	16.6
	RM7,001-RM9,000	50	11.1
	More than RM9,000	46	10.2

### Descriptive Analyses

Table 3 shows the results of descriptive statistics for the variables of the study. The mean values for consumer willingness to consume functional food and self-efficacy are 4.35 and 3.87 respectively. Clearly, according to Nor Azila *et al.* (2012), it shows that the respondents exhibit a high level of willingness to consume functional food, and their internal forces of self-efficacy

are responsive to change towards healthy eating in order to be healthy. The mean values for attitude dimensions (reward, necessity and confidence) are generally high, which are in the range of 3.76 to 3.98, except for safety, falls in the moderate range (2.87). It explains that the respondents have doubts in trusting the safety of functional food.

Table 3: Descriptive statistics for all of the variables

Variables	Mean	Std. Deviation
Willingness to Consume FF	4.35	0.52
Reward	3.87	0.61
Necessity	3.98	0.87
Confidence	3.76	0.64
Safety	2.87	0.73
Self-efficacy	3.87	0.57

### Factor Analysis

Table 4 presents the results of Factor analysis. The values of Cronbach's Alpha were all higher than the lower limit of acceptability ( $\alpha > 0.60$ ), showing a highly reliable measurement for all of the variables. For the construct of consumer willingness to consume functional food, factor analysis was conducted based on four items. The result reveals a KMO value of 0.80, which shows that the data were free from multicollinearity and exceeds the recommended value of 0.50 (Hair *et al.*, 1998). In addition, Bartlett's test of sphericity was highly significant ( $p < 0.05$ ), supporting the factorability of the correlation matrix. The principal components analysis indicated that only one component is present with an eigenvalue exceeding 1, which showed that the factor represents 68.28% of the total variance in the item. The factor loadings are between 0.80 and 0.87. The reliability for this factor is high, with the Cronbach's Alpha value of 0.81. All of the items are included because the item-to-total correlation showed that removal of any item would not increase the alpha above 0.81.

The attitude construct, which consists of four dimensions – reward, necessity, confidence, and safety – were factor analyzed based on 25 items altogether. The assumption of factor analysis was met, with KMO value was discovered to be 0.88 and the Bartlett test was highly significant ( $p < 0.05$ ). The attitude constructs produced 5 factors with eigenvalues more than 1, which explained 61.45% of the total variance of the items. The results of Varimax rotation indicated some cross-loadings among the items. Item N5 loaded on 3 factors, and item C1, which loaded on two factors, has a value of factor loading quite similar. Factor 5 was found to have only one item in it (N6). As a normal practice, item N5, C1 and N6 were deleted to improve the scale reliability and decrease the inconsistent correlation among the factors (Hair *et al.*, 1998). With four factors remaining, the final factor loadings of the items were between 0.58 and 0.90, which are larger than the minimum value ( $> 0.30$ ) needed for a sample size of 350 and above (Hair *et al.*, 1998). The Cronbach's Alpha value of the reliability analysis for reward ( $\alpha = 0.86$ ), necessity ( $\alpha = 0.91$ ), confidence ( $\alpha = 0.82$ ), and safety ( $\alpha = 0.78$ ), indicate high reliability. The results of

item-to-total correlations demonstrated the deletion of any item would not increase the value of Cronbach's Alpha; therefore all of the scale items were included. Item S3 from the original safety dimension was included in the confidence dimension.

The results for self-efficacy reveals the KMO value of 0.75 and Bartlett's test of sphericity was highly significant ( $p < 0.05$ ), validate the factorability of the correlation matrix as recommended by Hair *et al.* (1998). Principal

components analysis indicates that only one factor was extracted with an eigenvalue more than 1. This factor explained 49.51% of the total variance in the items, with the factor loading of 0.51 to 0.80. The value of Cronbach's Alpha of 0.73 shows an acceptable reliability. Item-to-total correlations demonstrated that elimination of any items would not strengthen the value of Cronbach's Alpha, thus supporting the inclusion of all scale items.

Table 4: Confirmatory factor analysis results

Construct	Scale Items	Factor Loadings	Cronbach's Alpha	Kaiser-Meyer-Olkin	Bartlett's Test of Sphericity	% of variance
Willingness to Consume Functional Food	WC1	0.84	0.81	0.80	0.00	68.28
	WC2	0.87				
	WC3	0.80				
	WC4	0.80				
Reward	R1	0.78	0.86	0.88	0.00	61.45
	R2	0.77				
	R3	0.69				
	R4	0.58				
	R5	0.71				
	R6	0.69				
	R7	0.59				
	R8	0.61				
Necessity	N1	0.88	0.91			
	N2	0.90				
	N3	0.80				
	N4	0.85				
Confidence	N7	0.71				
	N8	0.76				
	C2	0.78				
	C3	0.80				
Safety	C4	0.77	0.82			
	S3	0.61				
	S1	0.80				
	S2	0.80				
	S4	0.74				
Self-efficacy	S5	0.68	0.78			
	SE1	0.51				
	SE2	0.80				
	SE3	0.79				
	SE4	0.60				
	SE5	0.77	0.73	0.75	0.00	49.51

### Correlation Analysis

Correlation analysis was performed to enquire an understanding of the relationship between variables and the correlation coefficient values demonstrated the strength of the relationship. The result in Table 5 indicate that the overall values of the positive correlation among variables were between 0.05 and 0.56, thereby indicating weak and moderate associations between these variables. The correlations amongst the measures of reward, necessity, confidence and safety indicate weak associations between those variables with correlation values ranging from 0.10 to a high of 0.56. The results show that safety is significantly correlated with necessity and confidence with correlation values of 0.34 and 0.16, respectively. The reward is also

significantly correlated with confidence ( $r=0.56$ ) and necessity. However, the association with necessity is very weak ( $r = 0.10$ ). On the other hand, it was found that both reward and safety, and, necessity and confidence were significantly not related. Generally, this suggested that those variables does not lead to each other and should be addressed independently. On the other hand, all of the variables except safety are statistically significantly correlated with consumer willingness to consume functional food with correlation values ranging from 0.23 to a high of 0.54. The results of these correlations indicated that higher consumer willingness to consume functional food is mostly associated with higher scores in reward, confidence, necessity, and self-efficacy.

Table 5: Pearson correlations

Factors	WC	R	N	C	S	SE
Willingness to Consume Functional Food (WC)	1.0					
Reward (R)	0.54**	1.0				
Necessity (N)	0.23**	0.10*	1.0			
Confidence (C)	0.37**	0.56**	0.08	1.0		
Safety (S)	0.05	0.05	0.34**	0.16**	1.0	
Self-efficacy (SE)	0.49**	0.52**	0.20**	0.50**	0.11*	1.0

Note: \* $p < .05$ ; \*\* $p < .01$

### Multiple Regression Analysis

Table 6 shows that the relationship between consumer willingness to consume functional food and attitude dimensions was significant ( $F=56.68$ ;  $p < .01$ ). The model showed a moderate relationship with antecedent variables explained 53% of the variation in consumer willingness to consume functional food. The regression equation comprises four variables, and two of them appeared as significant predictors of consumer willingness to consume functional

food, which is reward and necessity. Reward and necessity positively influenced consumer willingness to consume functional food. Therefore, hypotheses 1 and 2 were accepted. Whereas, confidence and safety have no significant influence on consumer willingness to consume functional food and, leads to the conclusion that hypotheses 3 and 4 were not supported. The results also explained that reward ( $\beta = 0.46$ ) was a stronger predictor than necessity ( $\beta = 0.16$ ).

Table 6: Factors influencing consumer willingness to consume functional food

Independent Variables	B	SE B	β
Reward	0.43	0.06	0.46**
Necessity	0.09	0.02	0.16**
Confidence	-0.03	0.04	-0.05
Safety	-0.04	0.03	-0.07

Note: R<sup>2</sup>= 0.53; F= 56.68; Sig. F= 0.00; \*\*p<0.01; B= Unstandardised coefficient beta; SEB= Standard error of regression coefficient; β= Beta coefficient

**Hierarchical Regression Analysis**

Table 7 reports the results. In model 1, reward and necessity emerged as a predictor of consumer willingness to consume functional food, explaining 32.2% of the variance. Self-efficacy was then, included in step 2 as shown in Model 2. It was reported as an improvement with a significant increase in R-square of 37.1%. In model 3, a significant value of R-square is increased (R<sup>2</sup> = 0.412) with a significant F

change value (R<sup>2</sup> change = 0.041, p<0.01). This indicated that the self-efficacy explained an increase of 4.1% of the variance in consumer willingness to consume after controlling for reward and necessity. The self-efficacy was statistically significant (β = 0.783, p<0.01) and moderates the relationship between attitude dimensions (reward and necessity), and consumer willingness to consume functional food. Therefore, hypothesis 5 is accepted.

Table 7: Self-efficacy as a moderator in the relationship between attitude dimensions and consumer willingness to consume functional food

Independent Variable	Model 1 β	Model 2 β	Model 3 β
Reward	0.520**	0.397**	-0.089
Necessity	0.184**	0.142**	0.116
Moderating Variable : Self-efficacy		0.264**	-0.122
Interaction Terms : Self-efficacy x Reward			0.783**
R <sup>2</sup>	0.322	0.371	0.412
R <sup>2</sup> change	0.322	0.049	0.041
Sig. F change	0.000	0.000	0.000

\*\*p< 0.01

**Discussion**

It was demonstrated that two out of four attitude dimensions influence consumer willingness to consume functional food; reward and necessity. This shows that Malaysian consumers perceive the consumption of functional food as personally rewarding in terms of health benefits and it is necessary for them to consume functional foods in order to maintain and promote good health and sustainable well-being. In other words, Malaysian consumers believe that

functional foods are essential in promoting a healthy lifestyle and believe that people need to consume more functional food to stay healthy and ward off diseases. The result is congruent with Urala and Lahteenmaki (2007), Landstrom *et al.* (2007), Chen (2011), Carrillo *et al.* (2013) and Kraus (2015) who reported that consumers showed a positive attitude towards functional foods and regarded the foods as rewarding particularly in health benefits, health promoting and necessary to be consumed. Thus, this shows

that Malaysian consumers' willingness to consume functional food is linked to the strong beliefs and positive perceptions relating to the positive effects and benefits from functional food consumption.

Consequently, functional food consumption reflected the concept of sustainable diets that promoting food sustainability is important in encouraging a healthy diet among individuals, which leads to a healthy lifestyle, sustainable livelihood, as well as the social and environment sustainability (Johnston *et al.*, 2014). Supported by Bech-Larsen and Scholderer (2007) and Niva (2007), they mention that functional food represents a sustainable category in the food market. Some of the favourable benefits of sustainable diet through functional food consumption can be seen by means of reduced in related chronic diseases, economic sustainability in terms of reducing healthcare cost of individual household and government fund for medical cost, and social sustainability such as healthy lifestyle and increase in physical well-being.

The other two dimensions of attitude; confidence and safety were reported to be of no significance. This may be due to the lack of confidence and trust among Malaysian consumers in the safety of the food and in the claims of its benefits by the manufacturers. For instance, if the manufacturer claims that the functional food can reduce the risk of diseases or promote improved well-being, unfulfilled promises and undetectable effects could create dissatisfaction and lack of confidence among consumers towards such food. This might hinder them from buying and consuming functional food products. Therefore, Malaysian consumers' impression in functional food safety and benefits would not determine the consumption of such food. This is in line with Landstrom *et al.* (2007) who noted that safety of functional food and consumer confidence seems to fail to have an impact on consumer willingness to consume such food. In addition, Chen (2011) reported that perceived safety towards possible harmful effects of functional food does not

influence the consumption of functional food in general. However, the result for the construct of confidence is contradicted with the findings of previous studies, which revealed that confidence in the functional food that was said to have positive health effects demonstrated a positive relationship with consumer willingness to consume functional food (Verbeke, 2005; Markovina *et al.*, 2011; Siegrist *et al.*, 2015). Likewise, Urala and Lahteenmaki (2004: 2007) and Chen (2011), reported that confidence in functional foods significantly influences the consumer willingness to consume functional foods after perceived reward.

Furthermore, this study reveals that the reward from using functional food is the strongest predictor of consumer willingness to consume functional food, followed by necessity. This means that the stronger the consumers' belief in the rewards they will receive from using functional food (for example, promote their well-being, performance, health and mood), the greater their willingness to consume functional food would be. In addition, the strong belief among Malaysian consumers in the necessity to consume functional food in order to stay healthy as well as getting beneficial health rewards has increased their willingness to consume such food. This is consistent with Urala and Lahteenmaki (2007) and Chen (2011) who found that perceived reward and necessity are the most important dimensions of attitude in influencing consumer willingness to consume functional food.

Individuals may originally want to participate in healthy eating; however, many not succeed to achieve this target. Self-efficacy has been known to be an effective factor for behaviour to occur (Conner & Norman, 2005; Mai & Hoffman, 2012; Fitzgerald *et al.*, 2013; Robles *et al.*, 2014; Hall *et al.*, 2015; Nastaskin & Fiocco, 2015). The moderator of self-efficacy shows a significant positive effect on the relationship between attitude dimensions (reward and necessity) and willingness to consume functional food. This result demonstrates that the internal forces of

self-efficacy occur when the individual feels the rewards and the necessity to consume functional food, thus, the chances of them consuming functional food would increase. Consequently, the predictive power of attitude dimensions towards willingness to consume functional food will also increase. In other words, the findings explain that the positive relationship between attitude dimension (reward and necessity) and consumer willingness to consume functional food will be stronger when their internal force of self-efficacy is high. Therefore, a strong self-efficacy among individual will determine the increase of healthy foods consumption among consumers.

The research findings show that feeling rewarded from the consumption of functional food, belief in the necessity for functional food to be consumed in order to be healthy, and having strong self-efficacy are important in influencing the behavioural intention towards functional food consumption among Malaysian consumers. Therefore, to formulate effective advertising and promotional strategies, marketers should emphasise the rewards that consumers will obtain from the consumption of functional foods, for example, lowering the cholesterol and blood pressure levels, and many other health advantages. In addition, marketers should provide an encouraging testimony and scientifically proven messages about health claims of functional food products to reduce the lack of trust and confidence among Malaysian consumers towards the health related product, especially concerning the health claims and side effect. Indirect monitoring, and verbal encouragement and reinforcement can increase an individual's self-efficacy (Bandura, 1986). Thus, when applied to healthy consumption behaviour, an individual could be guided on the steps required in avoiding illness through the concept of sustainable diets, such as consuming more functional food, fruits and vegetables and avoiding eating oily and fatty food. In addition, campaigns and advertisements relating to the benefits of consuming a healthy diet or the negative effects of not consuming a healthy diet

should be continuously exposed to the target population.

In the planning of tailored health communication interventions towards social sustainability such as healthy lifestyle through improving sustainable dietary behaviour among Malaysian, marketers and the government, particularly the Ministry of Health, can develop the promising messages in the advertisement, media and health educational campaign to be delivered by the appropriate sources such as nutritionists, dieticians, physicians and trusted celebrities. The interest in losing weight, to maintain the ideal body figure and a captivating self-image among individuals becomes more important than being healthy when making a decision about food choice. Therefore, the government should also emphasise programmes that promote healthy body images and ideal weight rather than focusing on preventing diseases, especially for women and schoolgirls. In addition, Malaysian government should play its part in initiating policies to ensure that healthy food including functional food is available, accessible, sustainable and affordable for Malaysians to buy because this will facilitate and encourage consumers towards practising healthy consumption.

The limitations of this study may include the selection of samples. The collection of data was confined to only one area, the Klang Valley. These features may not be reflective of the overall population in Malaysia. Thus, the results cannot be used to generalise to the whole population of Malaysia. Future studies should, therefore, be extended with data collection in another part of states to portray the real picture of functional food consumption in Malaysia. This study explored the Malaysian consumers' behaviour towards functional food in general. Therefore, questions referring to all the constructs in this study referred to the general concept of functional food without focusing on different functional food categories. Thus, for future research, the study should focus on specific functional food categories with separate unique components that could cure different

health problems or reduce the risk of different disease, because when consumers are making a choice towards functional foods, their reasons maybe dissimilar within the separate food categories.

In addition, the data in this study were obtained randomly from adult consumers aged 18 and above. Other segments, such as teenagers and university students, who may have different sustainable food consumption behaviour, should be investigated. Additional studies comparing consumption behaviour towards healthy food from the different region of Malaysia might produce different findings. It is also recommended that to investigate the impact of functional food processes and consumption on sustainable livelihood, socio-economic and environmental sustainability. Despite the limitations, the results and recommendations are important to consumer behavioural domain of sustainable food category, functional food industry and academic perspective.

## Conclusion

The study was conducted to examine the influence of attitude dimensions (i.e. reward, necessity, confidence, and safety) on consumer willingness to consume functional food among Malaysian consumers, and at the same time to examine the moderating effect of self-efficacy on the relationship between attitude dimensions and consumer willingness to consume functional food.

With regards to the factors influencing consumer willingness to consume functional food among Malaysian consumers, it was found that the reward and the necessity are the attitude dimensions that influence the consumer willingness to consume functional food in their daily diet. It can be concluded that consumer willingness to consume functional food appears to be facilitated by the perceived reward and necessity. In other words, Malaysian consumers believe it is necessary and important for them to consume functional foods in order to obtain the positive reward in terms of good health, well-being and sustainable livelihood. The

result also shows that the reward from using functional food was the strongest predictor of the consumer willingness to consume functional food, followed by the necessity. Another two dimensions (i.e. confidence and safety) appear to have no significant relationship.

It appears that the relationship between attitude dimensions (reward and necessity) and the consumer willingness to consume functional food is improved with the presence of the self-efficacy as a moderator. This shows that a strong self-efficacy that internally motivates consumers to be healthy drives them to seek for healthy food, which they believe are associated with health benefits, wellness and longevity. This reveals that the strong self-efficacy that Malaysian consumers have does translate into healthy consumption.

The finding would shed further light on the knowledge in the area of functional food consumption behaviour, especially when it comes to discussing the relationship between attitude dimensions, self-efficacy and consumer willingness to consume functional food. Thus, marketers and the government can use this information in promoting functional food buying and consumption, as well as developing strategies and promotion campaigns towards practicing a healthy diet and a healthy lifestyle among Malaysians.

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