



# Deciphering consumer purchase intention towards red palm oil as functional food: evidence from Malaysia

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This study aims to identify the determinants influencing consumer purchase intention toward red palm oil as a functional food with the application of an extended Theory of Planned Behaviour (TPB) among Malaysian consumers. A total of 370 data were collected via mall intercepts in Malaysia using convenience sampling. Partial least squares (PLS) analysis was used to evaluate the measurement and structural model of the study. The results demonstrated that attitudes, subjective norms, and perceived behavioural control have a positive and significant relationship with the purchase intention of red palm oil as a functional food. Additional variables like food involvement, environmental concern, perceived value, and perceived risk significantly affect consumers' purchase intention of red palm oil as a functional food. Surprisingly, there is no relationship found between food neophobia and healthy lifestyle purchase intention. The results showed that TPB constructs confirmed its explanatory influence on purchase intention and an extended TPB model with additional variables demonstrated a superior explanatory interpretation of the purchase intention of red palm oil as a functional food. This paper concludes with implications and limitations of the study, as well as suggestions for future research.

## 1. Introduction

Nowadays, healthy food consumption has become a norm since consumers are getting more health-conscious and pay close attention to healthy food choices, such as functional food. Functional food could be defined as “natural or processed foods that contain known or unknown biologically active compounds, which, in defined, effective non-toxic amounts, provide a clinically proven and documented health benefit for the prevention, management, or treatment of chronic disease” (-Martirosyan and Singh, 2015, p.215). According to Alongi and Anese (2021), functional food could be described as “food products that provide a specific health benefit, beyond basic nutrition”. Needless to say, healthy food choices such as

consuming functional food play an essential role in reducing the risk of chronic diseases (Provencher & Jacob, 2016) besides providing necessary nutrition for the benefit of consumers (Elsohaimy et al., 2015). Examples of functional food include quinoa seeds, oats, wheat, sprout, fibre, modified oil, food fortified with vitamins (Elsohaimy et al., 2015; Pasko et al., 2014), and red palm oil. Among the functional food, much of the functional food rich in multiple nutritious values such as vitamin E and saturated fatty acids was prepared using red palm oil (Palm Oil Health, 2019). Red palm oil contains 20 different types of beta-carotene, which is also known as the fount of natural plenty with mixed carotenes (Chin, 2019). According to Clemens



et al. (2017), dietary red palm oil enhances functional recovery in heart and brain diseases.

Malaysia is one of the biggest producing countries of palm oil (MPOC annual report, 2020). Based on the annual report (2020) available from the Malaysian Palm Oil Council (MPOC) website, revenue from exports of palm oil products increased by RM9.3 billion (14.6%) to exceed RM73 billion in 2020. Malaysian palm oil has received worldwide acceptance in which its specific properties could be used in a wide range of food products (Tan et al. 2021). For example, red palm oil as the cooking oil is one of the common applications of red palm oil in food products. As argued by Tan et al. (2021), at present, “red palm oil is still gaining acceptance” in the market. As stated by the Ministry of Plantation Industries and Commodities Malaysia, red palm oil would continue to be promoted to consumers considering its health benefits. Consumers who are practicing healthy lifestyles or those who are more health-conscious will have a favourable evaluation of red palm oil as a functional food. This also demonstrated that red palm oil as a functional food has great potential to promote healthy food consumption among consumers. With this in mind, an investigation of the consumer purchase intention toward red palm oil as a functional food is timely and relevant.

A growing body of literature has examined consumer purchasing intention towards different types of functional foods in Malaysia, such as natural functional foods (Rezai et al. 2017) and general functional foods (Febian et al. 2021). However, far too little attention has been paid to red palm oil as a functional food. While the consumption of functional food prepared with red palm oil has very high nutritional benefits for consumers (Loganathan et al., 2017), there is still insufficient data to understand consumers healthy food choices especially in choosing red palm oil as a functional food. Researchers have not considered red palm oil as a functional food in the consumer behaviour context.

Hence, the major objective of this study was to investigate the determinants influencing consumer purchase intention toward red palm oil as a functional food with the application of an extended Theory of Planned Behaviour (TPB) among Malaysian consumers. Drawing upon the stated objective, this study at-

tempts to examine whether TPB constructs could be extended with additional variables namely, food involvement, food neophobia, environmental concern, healthy lifestyle, perceived value, and perceived risk on consumer purchase intention towards red palm oil as a functional food. This study provides an exciting opportunity to advance our knowledge of potential determinants that influence consumer purchase behaviour concerning red palm oil as a functional food in the Malaysian context. For practitioners, this study helps to provide necessary insights that could help in developing a strategic marketing plan to promote the use of red palm oil as a functional food that encourages healthy eating habits.

## 2. Literature Review and Hypotheses Development

The theory of Planned Behaviour (TPB) model explained the influence of attitude, subjective norm, and perceived behavioural control on behavioural intention to perform a behaviour (Ajzen, 1991). Attitudes refer to the degree of favourable level or evaluation towards action or behaviour (Ajzen & Madden, 1986). Subjective norm refers to perceived social pressure from the environment exposed to an individual, they should either perform the specific behaviour or not (Ajzen, 1991). Perceived behavioural control refers to individual abilities to facilitate own perception of control towards behaviour by owning resources or opportunities to perform the act. Thus, for individuals who have more control and power to act a specific behaviour toward an object, their intention to buy that object will be high (Shin & Hancer, 2016). According to Kumar and Smith (2017), TPB is suitable and broadly applied in food-related studies. Scholars have suggested an extended TPB in food consumption studies for a better explanatory (Imani et al. 2021). Hence in this study, we have adopted the original TPB constructs with additional variables that include food involvement, food neophobia, environmental concern, healthy lifestyle, perceived value, and perceived risk on consumer purchase intention towards red palm oil as a functional food (see Figure 1).

According to Bell and Marshall (2003, p.236), food involvement could be defined as the level of involvement that is assigned as a personality characteristic of the individual toward the food. Food involvement is positively related to the level of engagement and the person's feelings toward the food (Farragher et al.,

2016). Food involvement is determined by the level of importance of foods for a person and enjoyment when a person expresses foods (Yangui et al., 2016). Consumers who are highly involved with food tend to choose more healthy food alternatives (Moons et al. 2018; Farragher et al., 2016). Bell and Marshall (2003) also argued that consumers who are highly engaged with food will have a higher tendency to try so-called "novelty" food, innovative food, healthy food, or functional food. Based on the above viewpoints, the following hypothesis is being proposed below:

**H1.** Food involvement has a positive effect on the purchase intention of red palm oil as a functional food.

Food neophobia has also been revealed to have a detrimental impact on consumers' purchase intention of newly launched functional food products containing unknown or unusual ingredients (Moons et al., 2018). Humans are more afraid of uncertainty, especially when it comes to food, and they prefer to buy known foods than novel or unusual foods (Verbeke, 2015). Similarly, the higher degree of awareness of environmental issues like food containing pesticide, genetic modification, and health effects influence consumers to shift their consumption patterns to healthy food like organic food (Loizou et al., 2013). The consumer with a higher degree of food neophobia would be less likely to consume functional foods or not even give them a try to these foods (Stratton et al., 2015).

A study by Mak et al. (2017) confirmed neophobia to be negatively correlated with food consumption intentions. Hence, the following hypothesis is proposed below:

**H2.** Food Neophobia has a negative effect on the purchase intention of red palm oil as a functional food  
Based on Yadav and Pathak's (2016) study, environmental concern is directed at the awareness of people towards the environmental issue and provides ways to resolve the issue being raised. Environmental concern is an important predictor that influences a consumer to change to better food consumption habits that have minimal effect on the environment (Moons et al., 2018). In a study by Imani et al. (2021), it was found that environmental concerns affect the intention to buy organic products significantly. According to Saleki et al. (2019), consumers preferred to buy ecological products that do not damage the environment. After all, consumer decision-making was greatly affected by

integrating those concerns, which was derived from consumers' tendency to consume red palm oil as a functional food. Thus, the discussion results in the following hypotheses:

**H3.** Environmental concern has a positive effect on the purchase intention of red palm oil as a functional food.

Some studies argued that the lifestyle of consumers affects their reaction and consumption pattern towards healthy products. For example, Küster-Boludaa and Vidal-Capilla (2017) argued that consumers who perceive a healthy lifestyle as an important goal for their day-to-day life are more willing to consume healthy foods. As a result, particularly health-conscious consumers are more inclined to purchase healthy food products (Miklavcic et al., 2015) such as red palm oil as a functional food. Thus, we claim that consumers' healthy lifestyle influences their purchase intention of red palm oil as a functional food. Hence, this study proposed:

**H4.** Consumers' healthy lifestyle has a positive effect on the purchase intention of red palm oil as a functional food.

According to Wang and Hazen (2016), perceived value is the products' ability that meets consumers' needs in terms of their quality, cost, and nutritional elements. An inspiring role in the market is a place where perceived value regularly takes place. Customers' purchase intention will be increased when they perceive the product's value or service as higher than alternative products. The perceived value of palm oil is useful for several purposes, from skincare to hair treatment, and the most important benefit for health, helping reduce cardiovascular disease (Clemens et al., 2017). It is often suggested that the enhancement of nutrition knowledge significantly contributes to accepting functional food. Thus, Hypothesis 5 is proposed as follows:

**H5.** Perceived value has a positive effect on the purchase intention of red palm oil as a functional food.

Perceived risk is defined as any decision of buying a product that might have an unpleasant experience, financial loss, or be unsafe for consumers' health (Bhukya & Singh, 2015). This study defines a product

that is judged to be risky to consume, which results in negative effects on consumers' health that might influence their tendency to buy that product. Hence, the relationship between perceived risk and functional food purchase intention using red palm oil is negative. If a product is judged to have a lower possibility to be risky, then the outcome of consumer purchase behaviour was positive, resulting in a higher tendency to purchase that product (Markos et al., 2018). Unknown products directed consumers to perceive a high degree of risk when making a purchase decision as they have little knowledge of the unknown food/ingredients, such as functional food. Therefore, the following hypothesis is submitted:

**H6.** Perceived risk has a negative effect on the purchase intention of red palm oil as a functional food.

One of the essential elements of the theory of planned behaviour is the attitude, which means a person's reaction is based on positive or negative feelings towards an object (Ajzen, 1991). Understanding how a person feels toward buying a product or using a service is based on their expectation and evaluation of the product or service (Ajzen & Fishbein, 1980). A positive attitude influences the intention to purchase (Imani et al. 2021). A favourable evaluation and a positive belief that the food is healthier tend to increase an individual's intention to purchase (James et al. 2019). According to Lim and Goh (2019) and Küster-Boludaa & Vidal-Capilla (2017) research, attitudes show a significant positive relationship with purchase intention. From the study of Ajzen (1991), when a person has a favourable attitude toward the product, they will be more likely to perform the behaviour to buy that product. Thus, Hypothesis 7 is proposed as follows:

**H7.** Attitude has a positive effect on the purchase intention of red palm oil as a functional food.

The second element in the theory of planned behaviour is the subjective norm, which explains a person's behaviour based on others' behaviour. A person's decision-making is mainly influenced by the people around them and others' social pressure (Ajzen & Fishbein, 2010; Teng & Wang, 2015; Lim & Goh, 2019). That means family members and friends who always buy healthy products might influence a person's purchase intention (Pedersen et al., 2015). As

a result, if someone close to them believes that functional food is good for health, they will have a high intention to buy that functional food. If, on the other hand, someone close to them believe that functional food is bad for their health, they will be less likely to purchase functional foods (Ghvanidze et al., 2016). Functional food using red palm oil is recognised as healthier and better food and environmentally friendly (Chin, 2019). Therefore, when people around them, who are important for them, believe that functional foods made with red palm oil are far superior than regular foods, the following can be hypothesised:

**H8.** Subjective norm has a positive effect on the purchase intention of red palm oil as a functional food.

There is one more element in the theory of planned behaviour, which is known as perceived behavioural control. It refers to the degree of ability of a person to have more control over the desirability to consume and purchase whatever they prefer (Quevedo-Silva et al., 2016; Vabo & Hansen 2016). If the buying process of a product is perceived to be easy to execute, there is a high tendency to buy that good (Quevedo-Silva et al., 2016). Ajzen and Fishbein (2005) also found that more resources and opportunities to buy a product will increase the intention to perform that behaviour. Thus, if consumers perceive to have more control over purchasing functional food using red palm oil, their purchase intention towards functional foods using red palm oil will be high. Hence, Hypothesis 9 is suggested as below:

**H9.** Perceived behavioural control has a positive effect on the purchase intention of red palm oil as a functional food.

### 3. Materials and Methods

#### 3.1 Data collection procedure and sample size

Data were collected through the distribution of questionnaires via face-to-face interviews and self-administered by the respondents in crowded shopping malls in Malaysia. In this study, respondents were briefed on the benefits of red palm oil as a functional food. A cross-sectional survey employing a convenience sampling technique is used. Potential respondents were required to answer two screening questions, whether

they were Malaysian and aged above 21. This survey yielded 370 valid (usable) responses. Based on the 10 times rule proposed by Barclay et al. (1995) and Chin and Newsted (1999) for acceptable minimum sample size, 370 is considered to be acceptable for PLS analysis. In this study, SPSS and Smart PLS 3.0 (Ringle et al., 2015) were used for data analysis. The respondent profile is summarised in Table 1.

### 3.2 Measurement of the variables

The measurement used in this study is adapted from past empirical studies. The sources of adapted items are stated in Table 2. All measurements applied a five-point Likert scale (1= strongly disagree to 5 = strongly agree) except purchase intention with a seven-point Likert scale (1= strongly disagree to 7 = strongly agree). Forty-three measurement items were adapted from various resources of previous studies were consisted of the ten constructs (see table 2).

## 4. Results

### 4.1 Testing for common method variance

Before data analysis, common method variance testing (Simmering et al., 2014) was conducted. The result showed that the R square with marker variable and without marker variable for the dependent variable (purchase intention) has the same R square value of 0.486, which is a 0% increment. Thus, common method variance is not a significant problem in this study.

### 4.2 Measurement model analysis

Hair et al. (2017) highly recommended that a study should run a convergent validation. It is used to check the validity of the results generated with the representative sample within the population. Hair et al.'s (2017) guidelines for indicator loading, average variance extracted (AVE), and composite reliability (CR)

**Table 1:** Demographic profile of respondents (N = 370)

| Variable                                   | Frequency | %    |
|--|-----------|------|
| <b>Gender</b>                              |           |      |
| Male                                       | 121       | 32.7 |
| Female                                     | 249       | 67.3 |
| <b>Age</b>                                 |           |      |
| 21 – 25 years old                          | 154       | 41.6 |
| 26 – 30 years old                          | 93        | 25.1 |
| 31 – 35 years old                          | 63        | 17.0 |
| 36 – 40 years old                          | 29        | 7.8  |
| 41 – 45 years old                          | 25        | 6.8  |
| Above 46 years old                         | 6         | 1.6  |
| <b>Nationality</b>                         |           |      |
| Malaysian                                  | 370       | 100  |
| <b>Occupation status</b>                   |           |      |
| Full-time (work more than 30 hours a week) | 262       | 70.8 |
| Part-time (work between 8-30 hours a week) | 9         | 2.4  |
| Student                                    | 94        | 25.4 |
| Unemployed                                 | 5         | 1.4  |
| <b>Education level</b>                     |           |      |
| Secondary school                           | 4         | 1.1  |
| Certificate/ Diploma                       | 45        | 12.2 |
| Bachelor's Degree                          | 277       | 74.9 |
| Master's Degree                            | 43        | 11.6 |
| Others                                     | 1         | 0.3  |

are above 0.70, 0.5, and 0.7, respectively. Based on the results, all the items were having factor loadings higher than 0.70 except FN1, HL3, PBC3, and PBC4. Those loading scores were between 0.5 to 0.69 and the items were kept because the latent variable fulfilled the AVE criteria (Hair et al., 2017). However, two measurement items, FI2 and FN3, were deleted due to loading less than 0.4. In terms of AVE value, all the items were found to meet the minimum value requirement of 0.50. The CR values were also found to be greater than 0.70, ranging from 0.752 to 0.931 (see Table 2). Then, discriminant validity was assessed. According to Hair et al. (2017), discriminant validity involves determining if each of the components differ from other constructs within the proposed model. In this study, discriminant validity was verified by adopting Heterotrait – Monotrait (HTMT). The HTMT value should be smaller than the HTMT value of 0.85 (Kline, 2011). Table 3 demonstrated that all the values were less than HTMT.85, indicating that discriminant validity was proven in this study.

### 4.3 Structural model analysis

In the next stage, this study analysed the structure model result. Hair et al. (2017) applied the bootstrapping technique to figure out the statistical significance. Based on a one-tailed test with 5000 bootstrap-

ping procedures, the variance explained for purchase intention is 48.6% (R<sup>2</sup> equal to 0.4486) for all independent variables. Table 4 shows how consumers' purchasing intentions for functional foods containing red palm oil are influenced by food involvement (FI) and environmental concern (EC).. Hence, H1 ( $\beta = 0.088$ ,  $p = 0.05$ ) and H3 ( $\beta = 0.095$ ,  $p < 0.05$ ) were both supported. However, food neophobia (FN) and healthy lifestyle (HL) had no effect on consumers' purchase intentions for functional foods containing red palm oil. Thus, H2 ( $\beta = -0.046$ ,  $p > 0.10$ ) and H4 ( $\beta = -0.022$ ,  $p > 0.10$ ) were not supported. According to H5, the relationship between perceived value (PV) and purchase intention of functional food containing red palm oil was supported as ( $\beta = 0.099$ ,  $p < 0.10$ ). As a result, H5 was supported. Whereas H6 and H7 were also supported. Perceived risk (PR) ( $\beta = -0.070$ ,  $p < 0.05$ ) and attitude (ATT) ( $\beta = 0.312$ ,  $p < 0.05$ ) influences the consumers' purchase intentions toward functional food containing red palm oil. Meanwhile, subjective norm (SN) influences consumers' purchase intention as well. Thus, H8 was supported ( $\beta = 0.099$ ,  $p < 0.10$ ). In terms of H9, perceived behavioural control (PBC) influences consumers' purchase intentions of functional foods containing red palm oil. Therefore, H9 was found to be supported ( $\beta = 0.085$ ,  $p < 0.10$ ). In Figure 1, the results of path coefficients are illustrated.

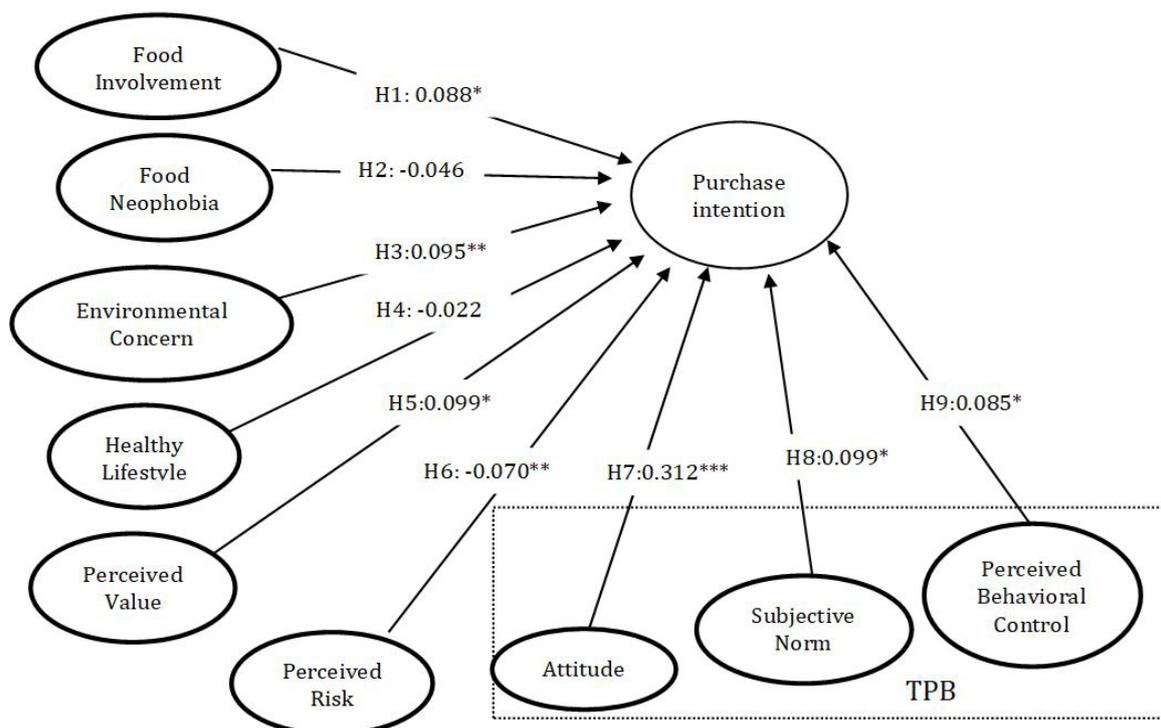


Figure 1. Research model

**Table 2.** PLS result of convergent validity

| Latent variable   | Measurement Item  | Loading | CR <sup>a</sup> | AVE <sup>b</sup> |
|---|---|---------|-----------------|------------------|
| Food Involvement<br>(Yangui <i>et al.</i> , 2016)           | FI1: Mainly, I eat healthy food.  | 0.702   | 0.789           | 0.556            |
|   | FI3: The food accounts for a significant part of the family's traditions.   | 0.785   |                 |                  |
| Food Neophobia<br>(Moons <i>et al.</i> , 2018)              | FI4: The food is a link to provide information about other cultures.  | 0.747   | 0.752           | 0.509            |
|   | FN1: Exotic food seems strange to me.   | 0.539   |                 |                  |
|   | FN2: At dinner parties, I will try new food.  | 0.786   |                 |                  |
| Environment Concern<br>(Yadav & Pathak, 2016)               | FN4: I like trying out restaurants where they serve food from everywhere.   | 0.787   | 0.880           | 0.649            |
|   | EC1: The balance of nature is very delicate and can be easily upset.  | 0.716   |                 |                  |
|   | EC2: Human beings are severely abusing the environment.   | 0.812   |                 |                  |
|   | EC3: Humans must maintain a balance with nature to survive.   | 0.834   |                 |                  |
| Healthy Lifestyle<br>(Küster-Boludaa & Vidal-Capilla, 2017) | EC4: Human interferences with nature often produce disastrous consequences.                                       | 0.853   | 0.832           | 0.555            |
|   | HL1: I participate in physical activities 30 minutes five to seven days a week.                                   | 0.739   |                 |                  |
|   | HL2: I eat two pieces of fruit a day.   | 0.820   |                 |                  |
|   | HL3: I eat vegetables every day.  | 0.658   |                 |                  |
| Perceived Value<br>(Wang & Hazen, 2016)                     | HL4: Normally, I avoid foods high in fat and calories.  | 0.754   | 0.897           | 0.687            |
|   | PV1: Buying functional food using red palm oil can lower purchase costs.  | 0.771   |                 |                  |
|   | PV2: Compared to other food, functional food using red palm oil has a better cost ratio.                          | 0.867   |                 |                  |
|   | PV3: Compared to other food, buying functional food using red palm oil can lead to resource and energy savings.   | 0.873   |                 |                  |
| Perceived Risk<br>(Wang & Hazen, 2016)                      | PV4: Buying functional food using red palm oil can reduce harmful effects on the environment.                     | 0.799   | 0.906           | 0.707            |
|   | PR1: I am afraid that the performance of functional food using red palm oil is inferior.                          | 0.865   |                 |                  |
|   | PR2: I am afraid that functional food safety using red palm oil is inferior and there are potential safety risks. | 0.871   |                 |                  |
|   | PR3: I am afraid that functional food's performance using red palm oil would cause indirect finance loss.         | 0.842   |                 |                  |
| Attitude<br>(Haque <i>et al.</i> , 2015)                    | PR4: I am afraid that functional food's quality warranty using red palm oil is not good.                          | 0.783   | 0.918           | 0.738            |
|   | ATT1: Functional food using red palm oil is safer to eat.   | 0.883   |                 |                  |
|   | ATT2: Functional food using red palm oil is healthier to eat.   | 0.902   |                 |                  |
|   | ATT3: Functional food using red palm oil is tastes better.  | 0.766   |                 |                  |
|   | ATT4: Functional food using red palm oil has superior quality.  | 0.878   |                 |                  |

Note: FI2 and FN3 were deleted due to low loading. <sup>a</sup> Composite Reliability (CR) <sup>b</sup> Average Variance Extracted (AVE)

**Table 2.** PLS result of convergent validity (continue)

| Latent variable  | Measurement Item   | Loading | CR <sup>a</sup> | AVE <sup>b</sup> |
|--|--|---------|-----------------|------------------|
| Subjective Norm<br><br>(Teng & Wang, 2015)             | SN1: My family thinks I should consume functional food using red palm oil.                                       | 0.831   | 0.881           | 0.649            |
|  | SN2: My friends think I should consume functional food using red palm oil.                                       | 0.866   |                 |                  |
|  | SN3: News and magazines affect my purchase decisions to consume functional food using red palm oil.              | 0.763   |                 |                  |
|  | SN4: Government supports for functional food affects my decisions to consume functional food using red palm oil. | 0.758   |                 |                  |
| Perceived Behavioural Control (Shin & Hancer, 2016)    | PBC1: I am confident that I could purchase functional food using red palm oil if I want to.                      | 0.849   | 0.832           | 0.557            |
|  | PBC2: For me to purchase functional food using red palm oil is easy.   | 0.826   |                 |                  |
|  | PBC3: The decision to purchase functional food using red palm oil is beyond my control.                          | 0.606   |                 |                  |
|  | PBC4: Whether I purchase functional food using red palm oil is entirely up to me.                                | 0.676   |                 |                  |
|  | AW4: It gives me confidence in buying functional food using red palm oil.  | 0.873   |                 |                  |
| Purchase Intention<br><br>(Moons <i>et al.</i> , 2018) | PI1: I have the intention to buy functional food using red palm oil soon.  | 0.893   | 0.931           | 0.817            |
|  | PI2: I will recommend buying functional food using red palm oil.   | 0.905   |                 |                  |
|  | PI3: I have the intention to buy functional food using red palm oil regularly.                                   | 0.913   |                 |                  |

Note: FI2 and FN3 were deleted due to low loading. <sup>a</sup> Composite Reliability (CR) <sup>b</sup> Average Variance Extracted (AVE)

**Table 3.** Heterotrait – Monotrait (HTMT)

|     | FI    | FN    | EC    | HL    | PV    | PR    | ATT   | SN    | PBC   | AW    | PI |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| FI  |       |       |       |       |       |       |       |       |       |       |    |
| FN  | 0.366 |       |       |       |       |       |       |       |       |       |    |
| EC  | 0.494 | 0.360 |       |       |       |       |       |       |       |       |    |
| HL  | 0.407 | 0.447 | 0.335 |       |       |       |       |       |       |       |    |
| PV  | 0.365 | 0.416 | 0.348 | 0.468 |       |       |       |       |       |       |    |
| PR  | 0.324 | 0.340 | 0.248 | 0.432 | 0.421 |       |       |       |       |       |    |
| ATT | 0.361 | 0.392 | 0.323 | 0.436 | 0.553 | 0.306 |       |       |       |       |    |
| SN  | 0.323 | 0.339 | 0.246 | 0.441 | 0.450 | 0.400 | 0.606 |       |       |       |    |
| PBC | 0.468 | 0.381 | 0.421 | 0.465 | 0.485 | 0.325 | 0.550 | 0.543 |       |       |    |
| AW  | 0.444 | 0.442 | 0.381 | 0.506 | 0.549 | 0.375 | 0.605 | 0.512 | 0.555 |       |    |
| PI  | 0.405 | 0.307 | 0.375 | 0.363 | 0.477 | 0.238 | 0.616 | 0.487 | 0.507 | 0.562 |    |

Note: Food Involvement (FI), Food Neophobia (FN), and Environmental Concern (EC), Healthy Lifestyle (HL), Perceived Value (PV), Perceived Risk (PR), Attitude (ATT), Subjective Norm (SN), Perceived Behavioural Control (PBC)



**Table 4.** PLS result of coefficient and hypotheses testing

| Hypothesis    | Relationships | Path Coefficients | T Values | P Values | Decision      | R <sup>2</sup> | Q <sup>2</sup> | F <sup>2</sup> |
|---------------|---------------|-------------------|----------|----------|---------------|----------------|----------------|----------------|
| Direct Effect |               |                   |          |          |               |                |                |                |
| H1            | FI -> PI      | 0.088             | 1.645*   | 0.050    | Supported     | 0.486          | 0.36           | 0.009          |
| H2            | FN -> PI      | -0.046            | 0.871    | 0.192    | Not Supported |                |                | 0.029          |
| H3            | EC -> PI      | 0.095             | 1.702**  | 0.044    | Supported     |                |                | 0.010          |
| H4            | HL -> PI      | -0.022            | 0.443    | 0.329    | Not Supported |                |                | 0.001          |
| H5            | PV -> PI      | 0.099             | 1.603*   | 0.052    | Supported     |                |                | 0.010          |
| H6            | PR -> PI      | -0.070            | 1.702**  | 0.044    | Supported     |                |                | 0.006          |
| H7            | ATT -> PI     | 0.312             | 4.661*** | 0.000    | Supported     |                |                | 0.084          |
| H8            | SN -> PI      | 0.099             | 1.632*   | 0.051    | Supported     |                |                | 0.010          |
| H9            | PBC -> PI     | 0.085             | 1.313*   | 0.095    | Supported     |                |                | 0.007          |

Note: \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$  (based on one-tailed test with 5000 bootstrapping)

## 5. Discussion

The current study found that attitudes, subjective norms, and perceived behavioural control have a positive and significant relationship with the purchase intention of red palm oil as a functional food. This finding provides the support that the TPB model predicts purchase intention. In addition, food involvement, environmental concern, perceived value, and perceived risk significantly affect consumers' purchase intention of red palm oil as a functional food. The inclusion of these additional variables can support the extended TPB model. On another note, it has come to our attention that there is no relationship between food neophobia and a healthy lifestyle and the purchase intention of red palm oil as a functional food. Out of the total nine hypotheses, two were not supported (i.e., H2 and H4).

In this study, food involvement is found to have a positive and significant relationship with consumers' purchase intention of red palm oil as a functional food. Consumers who demonstrated a greater level of food involvement are more likely to have a stronger purchasing intention than those with a lower regard for red palm oil as a functional food. This finding is consistent with Farragher et al. (2016) who proposed that food involvement influences consumption. This finding could assist the marketers in drafting a marketing campaign aimed at increasing consumer engagement in functional foods, namely those containing red palm oil for healthy consumption.

In contrast to earlier findings, no significant evidence was detected between the relationship of food neophobia and consumer purchase intention of red palm oil as a functional food. Even though this result differs from earlier work by Mak et al. (2017) that neophobia negatively influences food consumption intention, they are consistent with those who confirmed an insignificant relationship (Caber et al., 2018; Moons et al., 2018). It is difficult to explain this result, but it might be related to the younger consumers in this study. Young consumers tend to have higher acceptance to sample new food and hence the possibility of having food neophobia among them is very minimal.

Environmental concern was found to positively influence consumers' purchase intention of red palm oil as a functional food. When consumers have a greater environmental concern, the stronger is the purchase intention for red palm oil as a functional food. This confirms previous findings in the literature by Imani et al. (2021) on the organic product. Marketers are suggested to promote the use of red palm oil as a functional food produced from sustainable oil palm plantations that could help in conserving forest areas. With this in mind, a consumer who is more environmentally conscious will demonstrate a stronger purchasing intention with red palm oil as a functional food option. It is worth noting that there is no relationship between a healthy lifestyle and consumer desire to purchase red palm oil as a functional food. It is often assumed that health-conscious consumers tend to purchase healthy food products. Nonetheless, although there is no effect, previous research by

Küster-Boludaa and Vidal-Capilla (2017) found that a healthy lifestyle negatively influences the willingness to consume functional food.

In terms of perceived value, this variable positively influenced consumer purchase intention of red palm oil as a functional food. The finding was aligned with previous studies. The perceived value of palm oil (i.e., red palm oil) is useful for several purposes, from skin-care to hair treatment, and the most essential benefit in preventing cardiovascular disease (Clemens et al., 2017). On the other hand, perceived risk negatively influenced consumer purchase intention of red palm oil as a functional food. The finding was consistent with a past study (Yang et al., 2015). Untrusted and uncertainty are two main factors affecting consumer choices of novel food, such as functional food containing red palm oil. Additionally, respondents in this study were highly educated (75.1% with bachelor's degrees) and aware of the risk of consuming novel food. It is often suggested that acceptance of novel food can be enhanced by nutrition knowledge (Alphonse et al., 2020). Therefore, marketers and government bodies should continuously promote functional food using red palm oil by advertising the benefits in traditional media and social media (Reaz et al., 2020).

As predicted, our study proved that attitude, subjective norm, and perceived behavioural control all had a positive and significant relationship with red palm oil purchasing intentions as a functional food. This finding demonstrated that TPB may explain consumer purchase intention. A favourable attitude positively affects consumer purchase intention. Our results shared some similarities with Imani et al. (2021), James et al. (2019), and Lim and Goh (2019). When red palm oil as a functional food is considered to be a healthier food choice, the consumer tends to have a favourable evaluation and this leads to higher purchase intention. Subjective norm positively affects consumer purchase intention of red palm oil as a functional food. When consumers perceived that their family members and friend encourage them to try out red palm oil, their purchase intention could get influenced. The result was consistent with past studies (Imani et al. 2021; Lim & Goh, 2019; Teng & Wang, 2015; Yangui et al. 2016). Lastly, there is a positive and significant relationship between perceived behavioural control and consumer purchase intention of red palm oil as

a functional food. The consumer who feels confident and is capable of purchasing food such as red palm oil as a functional food will mostly lead to a stronger purchase intention. The result was aligned with Imani et al. (2021) and Yangui et al. (2016) findings.

## 6. Conclusion

In summary, this study presented several contributions. Firstly, this study adds to a growing body of literature on consumers' purchase intention of red palm oil as a functional food in the Malaysian context. Secondly, this study provided further evidence that TPB constructs are a robust model, and we confirmed its explanatory influence on purchase intention and an extended TPB model with the inclusion of additional variables provides a better explanatory interpretation of the purchase intention of red palm oil as a functional food. Nonetheless, we are aware that our study may have two limitations. The first is related to the cross-sectional design used in this study. It is not possible to examine the causal relationship between the variables. Moreover, this study measured purchase intention, not actual purchase behaviour. It is suggested that future studies could choose a longitudinal study that could observe the change in consumer purchase behaviour over an extended period. The second is the convenience sampling method which may have the potential for selection bias. Future studies could look into incorporating simple random sampling in the current context.

## Conflict of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, and in the decision to publish the results.

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