

## **Do Health Consciousness and Perceived Benefits Play a Role in Motivating Buyers to Purchase Functional Foods?**

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### **Abstract**

Functional foods gained more attention with their benefits in the post-pandemic era, and this has caused the demand for functional foods to increase dramatically in the post-pandemic era. Empirically, the factors determining consumers to purchase functional foods are widely investigated. However, inconsistent findings regarding their effect on purchase intention remain in the literature. Besides, studies considering health consciousness and the perceived benefits of purchasing functional foods in a single study are rare. Therefore, further study was required to re-examine these factors' effect on the functional foods eater's purchase intention. Through purposive sampling, 167 functional food buyers in Malaysia participated in this study, and their responses were further analysed using the partial least squared-structural equation modelling (PLS-SEM). The result revealed that only three factors (attitudes, subjective norms, and health consciousness) significantly affected functional food purchase intention, while perceived behavioural control and perceived benefits had an insignificant effect. The importance-performance map analysis (IPMA) result further showed that the effort and resources should be concentrated on the subjective norms due to unsatisfactory performance. The theoretical and practical implications of the study are further discussed in this study, and it's expected to be beneficial for the stakeholders to cultivate the purchase intention of functional foods. For instance, stakeholders such as government agencies and businesses must maintain their existing attitudes and health consciousness efforts as the current performance for both constructs is satisfactory. However, more improvement efforts and resources should be concentrated on subjective norms. It is one of the most influential constructs in determining the buyers' purchase intention on functional foods, but its performance is unsatisfactory.

**Keywords:** Functional Foods, Health Consciousness, Perceived Benefits, Purchase Intention, Theory of Planned Behaviour

### **Introduction**

The demand for functional foods has been increasing recently due to the COVID-19 pandemic. This is in line with the report from Markets and Markets (2021), where they projected that the global functional food ingredients market will grow to USD 137.1 billion in 2026. This showed that more and more consumers are more aware and conscious of their health conditions, thus demanding functional foods. Functional foods are processed foods with extra nutrition and are beneficial to improve health conditions, such as oats, orange juice with extra calcium and others. Additional benefits are expected from functional foods, compared to basic satiety and nutrition and these benefits may support well-being and minimise the disease risk (Natarajan, Nair, & Jaypal, 2022). In addition, functional foods also refer to foods that could prevent disease and

promote health conditions (Lakhdar & Smaoui, 2021). Therefore, maintaining health conditions and reducing the risk of diseases and sickness could be the primary purpose of consuming functional foods.

Due to the functional foods' unique features, other factors must be considered when purchasing functional foods (Ling, Wong, Mohamed, Wasli, & Bajat, 2023). Since functional foods are consumed to improve health conditions, the consciousness of health conditions is crucial to determining their purchase intention (PI) (Alam, Wang, Lin, Masukujjaman, & Ho, 2022) remarked that high PI is expected for consumers who are more conscious of their health. Similar findings were also remarked in the literature regarding the influence of health consciousness (HC) on functional food PI (Huang, Bai, Zhang, & Gong, 2019). Besides, functional foods tend to provide additional advantages to consumers to prevent diseases and further improve their immune systems. Therefore, the expected benefits obtained by consuming are also anticipated to play a crucial role in their purchasing intention. Rezai, Teng, Shamsudin, Mohamed, and Stanton (2017) noted that consumers tend to have high intentions to purchase natural functional foods if they believe they could improve their health conditions. Similarly, the positively significant effect of perceived benefits (PB) on the PI of functional foods is also remarked in the literature (Natarajan *et al.*, 2022; Lee, Wei, Wu, & Hsieh, 2020). In agreement with the literature, HC and PB are projected to significantly determine functional foods' PI.

Empirically, numerous studies have investigated the determinant factors of the PI of functional foods. These studies are conducted by using different perspectives in different contexts. For example, Xin and Seo (2020) examined the PI of imported functional foods in Korea using an extended theory of planned behaviour (TPB) model, including consumer ethnocentrism, country image, and subjective knowledge. Natarajan *et al.* (2020) further utilised TPB, health belief model and value-attitude-behaviour framework to examine subjective norms (SN)' moderator role on the branded functional beverages consumption behaviour. Moreover, the mediating effect of purchase attitude and the moderating role of food neophobia on functional foods PI has also been investigated by Huang *et al.* (2019). In a recent study, Ling *et al.* (2023) examined the impact of COVID-19 on functional food PI in Malaysia.

Although these empirical studies offer rich perspectives on influencing consumers to purchase functional foods, the evidence is inconclusive as mixed findings still exist in the literature. For instance, the effect of HC on PI is still not conclusive, whereas both significant (Hsu, Chang & Lin, 2016; Huang *et al.*, 2019; Alam *et al.*, 2022) and insignificant findings are still documented in the literature (Hoque, Alam & Nahid, 2018; Ling *et al.*, 2023). Similarly, the mixed results of the influence of the three factors of TPB have still been discovered in recent studies. The detailed discussion of these inconclusive findings could be referred to in the later section. With that, it is essential to study the functional foods PI to further identify the significant determinant of the functional foods PI by using an extended TPB model with two additional factors (HC and PB).

## **Literature Review and Hypotheses Development**

### *Theory of Planned Behaviour (TPB)*

The TPB model is a framework that Ajzen (1985) proposed to describe human behaviour. According to TPB, the human's behavioural intention could be explained by three main factors, namely attitudes (ATT), SN, and perceived behavioural control (PBC) (Ajzen, 1985). ATT is defined as an individual's feelings towards a behaviour (Ajzen, 1991), whether the feeling is positive or negative. Besides, the influence of the people who are essential towards individuals'

behaviour is called SN (Ajzen, 1991), and PBC refers to the perception of difficulty in performing a behaviour (Ajzen, 1991). Theoretically, TPB proposed that an individual will be highly likely to accomplish specific behaviour if they have good or positive ATT towards that behaviour. Besides, suppose the people in their social context, like their parents, relatives, friends, and others, perceive that behaviour nicely. In that case, it will encourage them to engage in that behaviour. Lastly, an individual is expected to have high intention to perform a behaviour if they perceive it as easy and not require additional effort. This model has been broadly utilised as the foundation to investigate the PI and behaviour of different products, such as certified food products (Qi, Tian, & Ploeger, 2021), green food (Qi & Ploeger, 2021), organic foods (Prakash, Singh, Ahmad, & Kumar, 2023; Zayed, Gaber, & Essawi, 2022; Tran & Nguyen, 2021), and others. However, some studies have integrated other factors in the TPB model to enhance the predictability of the model, as the TPB was introduced for general behaviour. With that, it's necessary to extend the model with some factors to better capture the special and unique characteristics of the study settings (Ling *et al.*, 2023). Consistent with Nystrand and Olsen (2020), Xin and Seo (2020), and Ling *et al.* (2023), this study further extends the TPB model with HC and PB to develop a novel framework that may examine the matter comprehensively.

#### *ATT on PI*

Ajzen (1991) defined ATT as the perception of an individual toward a particular behaviour. Specifically, these ATT could be positive or negative, and it is a crucial factor that may influence individual behaviour. A favourable ATT increases their likelihood of buying functional foods (Xin & Seo, 2020). With that, it is expected that a good or positive ATT is required to increase the intention of consumers to buy functional foods. The significant effect of ATT towards functional foods on PI is widely acknowledged in the literature (Prakash *et al.*, 2023; Alam *et al.*, 2022; Nystrand & Olsen, 2020). For example, Ling *et al.* (2023) found a significant impact on the ATT towards functional foods PI. Similarly, Rezai *et al.* (2017) also remarked on the same positive effect of ATT on the natural functional food PI. Even though the significant influence of ATT towards PI is noted in the literature, Tran and Nguyen (2021) still explored the insignificant impact of ATT on organic food PI in Vietnam. Therefore, further investigation is required to investigate the relationship between the ATT toward PI, and the hypothesis below is proposed.

H1: ATT is positively significant with PI.

#### *SN on PI*

Besides personal ATT, those around them likely influence an individual's behavioural intention. SN refer to the influence of the people surrounding them towards an individual's behaviours (Ajzen, 1991). People surrounding individuals could be their parents, siblings, friends, colleagues, and others who are present in their social contexts. Individuals will not behave if those around them disapprove of them (Natarajan *et al.*, 2022). Therefore, a positive influence of subjective norm is postulated toward the functional foods' PI. This postulation is supported by evidence in the literature (Ling *et al.*, 2023; Prakash *et al.*, 2023; Nguyen, Nguyen, Nguyen, Tran, Nguyen, Nguyen, Cao, & Nguyen, 2020). For instance, Rezai *et al.* (2017) discovered that the PI of natural functional foods is positively significantly impacted by SN. Liu, Sun, Chang, Yang, Liu, and Yang (2021) also remarked on the same positive influence of SN on dietary supplement PI in China. Unfortunately, some studies also discovered SN' insignificant effect on different food PI (Xin & Seo, 2020; Qi & Ploeger, 2021; Pienwisetkaew Wongthahan,

Naruetharadhol, Wongsachia, Vonganunsuntree, Padthar, Nee, He, & Ketkaew, 2022). To better reveal SN's effect on PI, the following hypothesis is suggested in this study.

H2: SN is positively significant with PI.

#### *PBC on PI*

PBC is related to the level of difficulty in performing a behaviour (Ajzen, 1991). With that, it is about how easy an individual is to engage in a specific behaviour. For example, in this study, the functional foods buyers will likely purchase functional foods if they perceive that it is easy to get them without additional effort and costs. Empirical studies have supported this supposition, whereas PBC's positive effect on PI is well documented in the literature (Lee *et al.*, 2020; Liu *et al.*, 2021; Prakash *et al.*, 2023). For instance, Sumaedi and Sumardjo (2021) revealed that PBC positively impacted traditional functional foods in Indonesia. Besides, Qi and Ploeger (2021) also remarked on the positive effect of PBC on the PI of green food in China. However, an insignificant influence of PBC on functional food PI was also reported (Nystrand & Olsen, 2020; Pienwisetkaew *et al.*, 2022; Ling *et al.*, 2023). Hence, further study is required to examine the effect of PBC on functional food PI. The hypothesis below is formulated for this purpose.

H3: PBC is positively significant with PI.

#### *HC on PI*

HC refers to the understanding level of an individual towards the changes in their health status and the health requirements (Hsu *et al.*, 2016). Ling *et al.* (2023) also defined it as an individual's anxiety level towards their health habits. Theoretically, an individual buys healthy product with high consciousness and health awareness. This assumption is proved in the literature whereby the positively significant impact of HC on PI is documented (e.g., Hsu *et al.*, 2016). For example, Huang *et al.* (2019) acknowledged the significant effect of HC on functional food PI in China. Besides, the considerable positive influence of HC on healthy food PI is also explored in Malaysia (Alam *et al.*, 2022). However, the impact of HC on PI is inconclusive as some studies also remarked on the insignificant role of HC, such as Hoque *et al.* (2018), Zayed *et al.* (2022), and Ling *et al.* (2023). The following hypothesis is proposed in this study to confirm the effect of HC on functional food PI.

H4: HC is positively significant with PI.

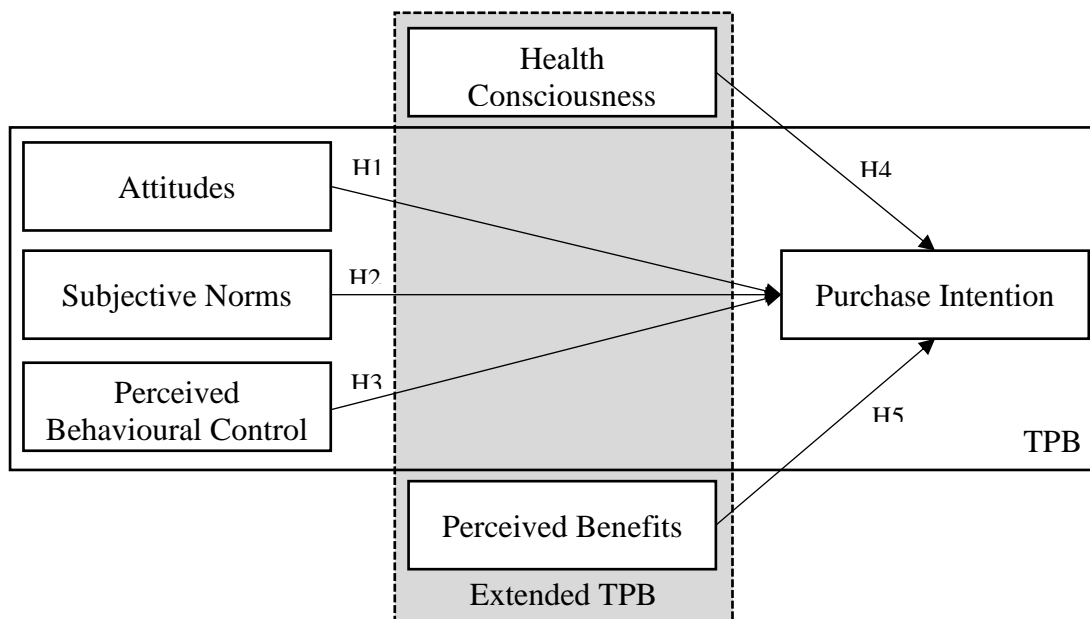
#### *PB on PI*

Functional foods contain ingredients that may provide several health benefits to the users; therefore, these benefits may affect individual purchase decisions. Rezai *et al.* (2017) define PB as an individual's belief towards risk and severity reduction due to a particular action or prevention. Besides, PB is the expected advantage of engaging in a specific behaviour. As mentioned by Natarajan *et al.* (2022), an individual is expected to drink functional beverages to minimise the possibility of disease or sickness. Thus, in this study, functional food buyers are expected to have more intention to buy functional foods if they perceive to gain more benefits. A positive relationship is anticipated between PB and functional foods PI, proven in the literature (Loh & Hassan, 2022; Lee *et al.*, 2020). For instance, Natarajan *et al.* (2022) revealed the PB positive effect on functional beverage PI in India. Similarly, Rezai *et al.* (2017)

also found a similar effect on the intention to purchase natural functional foods in Malaysia. With that, the hypothesis below is formulated.

H5: PB is positively significant with PI.

Figure 1 illustrates the proposed research framework of the study that is developed based on the discussion above. As discussed, the TPB model has been used as the foundation of the research and further extended with two additional factors, namely HC and PB, as the effect of both factors on the functional foods PI has been proved in literature.



**Figure 1: Proposed Research Framework**  
Source: Own developed

### Methodology

The quantitative approach has been used in this study by collecting the quantitative primary data from the targeted population. This is because the study's main objective is to validate the relationships in the proposed research framework; thus, the quantitative approach is the appropriate way. In this study, the targeted population was the functional food buyers in Malaysia. Empirically, the evidence on the determinant factors of functional foods purchase intention from functional foods buyers is relatively limited, as most studies focus on the general public. As they are existing buyers of functional foods, it could provide more valuable insight than the general public. With that, the purposive sampling technique has been used to select the respondents, as only those functional food buyers are welcome to complete the survey. The use of purposive sampling is because only the respondents who fulfilled the selection criteria are eligible to participate in the study to generate more accurate insight from this group of buyers. The main criteria for selecting the eligible respondents are the respondents must be functional food buyers in Malaysia. Thus, screening questions have been used in the survey to ensure their eligibility. With the advantages of the online survey compared to the traditional

survey, Google Forms has been used as the data collection platform to collect the responses from the respondents. As determined by the power analysis based on the complexity of the proposed research framework, the minimum number of study samples is 138, using a 0.15 effect size and a power level of 0.95 with five predictors. Therefore, the final valid sample of 167 is considered sufficient for the study as it is greater than the minimum sample size of 138.

Table 1 presented the respondents' characteristics of the study and showed the number of female respondents (53%) is greater than males (47%). Besides, approximately half of the respondents are aged between 21 and 30, followed by 31 to 40. In terms of occupation, the majority of the respondents were employees (46%), followed by students (29%) and self-employed (15%). For the income ranges, most respondents (37%) only earned RM1500 and above. Lastly, 68% of the respondents have received tertiary education, followed by primary and secondary education (18%) and postgraduate education (13%). These characteristics of the respondents have shown that the respondents are from diverse backgrounds and, thus, could appropriately represent the opinions of functional food buyers in Malaysia.

**Table 1: Characteristics of Respondents**

Characteristics	Frequency	Percentage
<b>Gender</b>		
Male	79	47.31
Female	88	52.69
<b>Age Ranges</b>		
20 YO and below	15	8.98
21 – 30 YO	83	49.70
31 – 40 YO	42	25.15
41 – 50 YO	18	10.78
51 YO and above	9	5.39
<b>Occupation</b>		
Employees	76	45.51
Self-Employed	25	14.97
Students	49	29.34
Housewife	12	7.19
Retiree and Others	5	3.00
<b>Income Range</b>		
RM1500 and below	62	37.13
RM1501 – RM2500	26	15.57
RM2501 – RM3500	26	15.57
RM3501 – RM4500	21	12.57
RM4500 – RM5500	14	8.38
RM5501 and above	18	10.78
<b>Highest Education Qualification</b>		
Primary and Secondary School	30	17.96
Certificate, Diploma, and Bachelor Degree	114	68.26
Master and PhD	22	13.17
Others	1	0.60

Source: Authors (2023)

Besides a screening question asked in the online survey, the questionnaire survey of the study also included five characteristic questions that aimed to provide some background information about the respondents, such as gender, age range, occupation, income range, and highest education qualifications. Moreover, 27 measurement items have also been included in the questionnaire to measure the six involved factors of the study. These items are adapted from previous studies such as Xin and Seo (2020), Natajara *et al.* (2022), Pienwisetbaew *et*

*al.* (2022), and Zayed *et al.* (2022). The seven-point Likert scale is used to evaluate the agreement and disagreement levels on the measurement items of the study.

### Analysis of Results

The collected primary data was then tested using the multivariate normality test of Mardia. The result found that the skewness coefficient (21.9414) and kurtosis coefficient (97.5307) are greater than the threshold level of 20, and this further showed that the data are not normally distributed (Byrne, 2013; Kline, 2011). Therefore, the most appropriate statistical technique to analyse this unnormal distributed data is the partial least square-structural equation modelling (PLS-SEM) (Hair, Risher, Sarstedt, & Ringle, 2019). Therefore, SmartPLS version 4 has been used to analyse the data using the PLS-SEM. In addition, the full collinearity approach has also been used to evaluate the possibility of the common method bias, and the variance inflation factors (VIF) values from the assessment are provided in Table 2. The VIF values for all factors are between 1.8260 and 3.8620, which signified that the CMB is not an issue in the study as the VIF is lower than 5 (Anwar, Zaki, Thurasamy, & Memon, 2021; Hair, Hult, Ringle & Sarstedt, 2017).

The study was then first assessed the outer model of the study by utilising validity and reliability tests. The results of these validity and reliability tests are provided in Table 2 below. The loading values for all items are between 0.7959 and 0.9337, which is higher than 0.7080 (Hair *et al.*, 2017), except for HC4, which was deleted due to the low loading. The average variances extracted (AVE) values for all factors are between 0.6949 and 0.7872, greater than the threshold value of 0.5000 (Bagozzi & Yi, 1988). Both loading and AVE signified that the convergent validity was established as it exceeded the minimum threshold level. Besides, all factors' composite reliability (CR) further confirmed the internal consistency as the CR values for all factors are greater than 0.7000 (Hair *et al.*, 2017). The Heterotrait-Monotrait (HTMT) correlation ratio was also employed to assess the study's discriminant validity and the result reported in Table 3. The result has proved that discriminant validity is achieved in this study as the values of the HTMT are not greater than the conservative criterion level of 0.9000 (Gold, Malhotra, & Segars, 2001). Establishing and achieving these validity and reliability tests showed that the study's data are valid and reliable for further analysis.

**Table 2: Validity and Reliability Tests**

Factors	Items	Loadings	AVE	CR	VIF
Attitude (ATT)	ATT1	0.8817	0.7636	0.9509	3.8620
	ATT2	0.8124			
	ATT3	0.8800			
	ATT4	0.8974			
	ATT5	0.8949			
	ATT6	0.8740			
Subjective Norms (SN)	SN1	0.8530	0.8009	0.9414	1.9430
	SN2	0.9281			
	SN3	0.9311			
	SN4	0.8645			
Perceived Behavioural Control (PBC)	PBC1	0.8454	0.7798	0.9340	1.8260
	PBC2	0.8845			
	PBC3	0.8763			
	PBC4	0.9242			
Health Consciousness (HC)	HC1	0.8810	0.8257	0.9343	2.3430
	HC2	0.9247			
	HC3	0.9197			
Perceived Benefit (PB)	PB1	0.7959	0.6949	0.9192	3.6360
	PB2	0.8395			
	PB3	0.8479			
	PB4	0.8773			
	PB5	0.8048			
Purchase Intention (PI)	PI1	0.9228	0.8583	0.9604	2.1860
	PI2	0.9309			
	PI3	0.9337			
	PI4	0.9183			

Source: Authors (2023)

**Table 3: Heterotrait-Monotrait Ratio of Correlations for Discriminant Validity**

	ATT	SN	PBC	HC	PB	PI
ATT						
SN	0.6842					
PBC	0.6932	0.5449				
HC	0.6923	0.5915	0.5461			
PB	0.8699	0.6561	0.5634	0.8085		
PI	0.7113	0.6560	0.5821	0.6321	0.6649	

Source: Authors (2023)

The inner model assessment was then performed after completing the outer model assessment. In this inner model assessment, the R-squared ( $R^2$ ) value of 0.5425 first showed that the five factors could explain 54.25% of the variances in PI. Supporting the coefficient of determination ( $R^2$ ), the predictive relevance ( $Q^2$ ) value of 0.4465 further indicated the predictive ability of the five independent factors, as the  $Q^2$  value is greater than zero (Hair *et al.*, 2017). In addition, the effect size ( $f^2$ ) values in Table 4 are also used to evaluate the effect of each factor on the PI. By following the guideline suggested by Cohen (1988), the result showed that ATT, SN, and HC possess a small effect on the PI ( $0.02 > f^2 < 0.15$ ), while no effect size was determined for both PBC and PB ( $f^2 < 0.02$ ).

The path coefficient and hypotheses testing results are presented in Table 4 and Figure 2. The study revealed that, out of the five proposed hypotheses, only three were supported (H1, H2, and H4), while another two hypotheses (H3 and H5) were not supported. Specifically, ATT ( $\beta = 0.2854$ ,  $p < 0.05$ ) is positively significant with PI, and thus H1 is supported. A similar

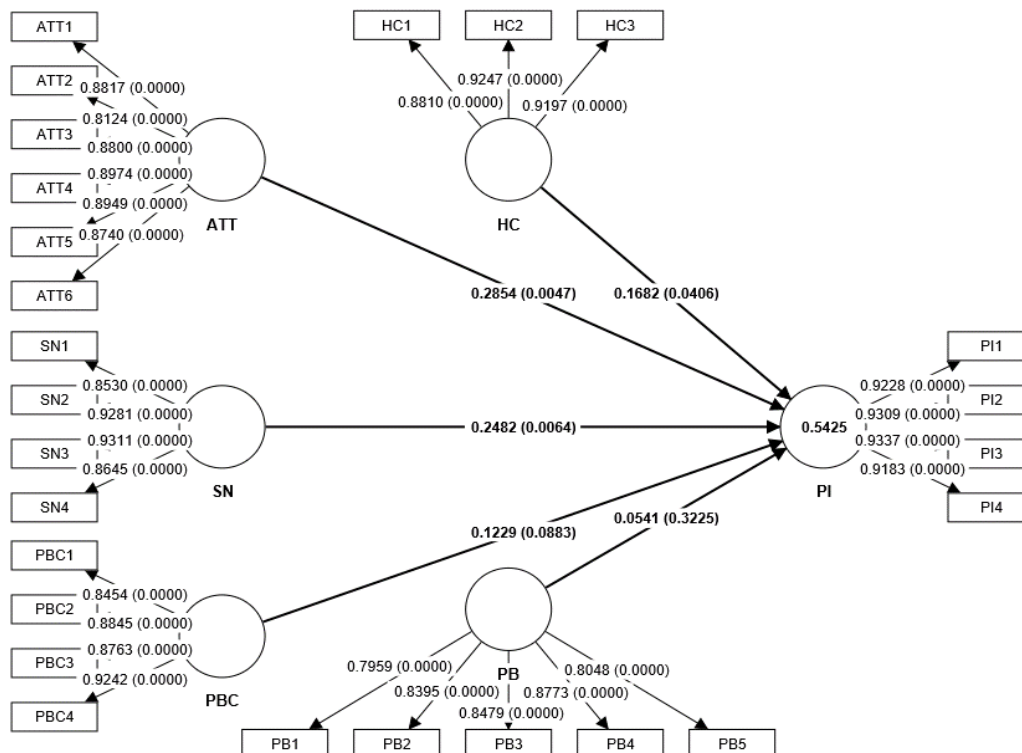


effect was also found for SN ( $\beta = 0.2482, p < 0.05$ ), supporting the H2. However, PBC ( $\beta = 0.1229, p > 0.05$ ) insignificantly affects PI. For the HC ( $\beta = 0.1682, p < 0.05$ ), the study proved that it significantly affected the PI. In contrast, the study found an insignificant influence of PB ( $\beta = 0.0541, p > 0.05$ ) on PI. These results signified that ATT, SN, and HC significantly influence the functional food buyers' PI but are insignificantly impacted by PBC and PB.

**Table 4: Results of Path Coefficients and Hypotheses Testing**

Hypo.	Path	Coeff.	t-value	p-value	BCI-LL	BCI-UL	f2	Result
H1	ATT -> PI	0.2854	2.6006	0.0047	0.1142	0.4691	0.0483	Supported
H2	SN -> PI	0.2482	2.4887	0.0064	0.0828	0.4105	0.0744	Supported
H3	PBC -> PI	0.1229	1.3517	0.0883	-0.0432	0.2591	0.0184	Not Supported
H4	HC -> PI	0.1682	1.7438	0.0406	0.0070	0.3262	0.0271	Supported
H5	PB -> PI	0.0541	0.4609	0.3225	-0.1391	0.2477	0.0018	Not Supported

Source: Authors (2023)



**Figure 2: Results of Path Coefficients and Hypotheses Testing**

Source: SmartPLS

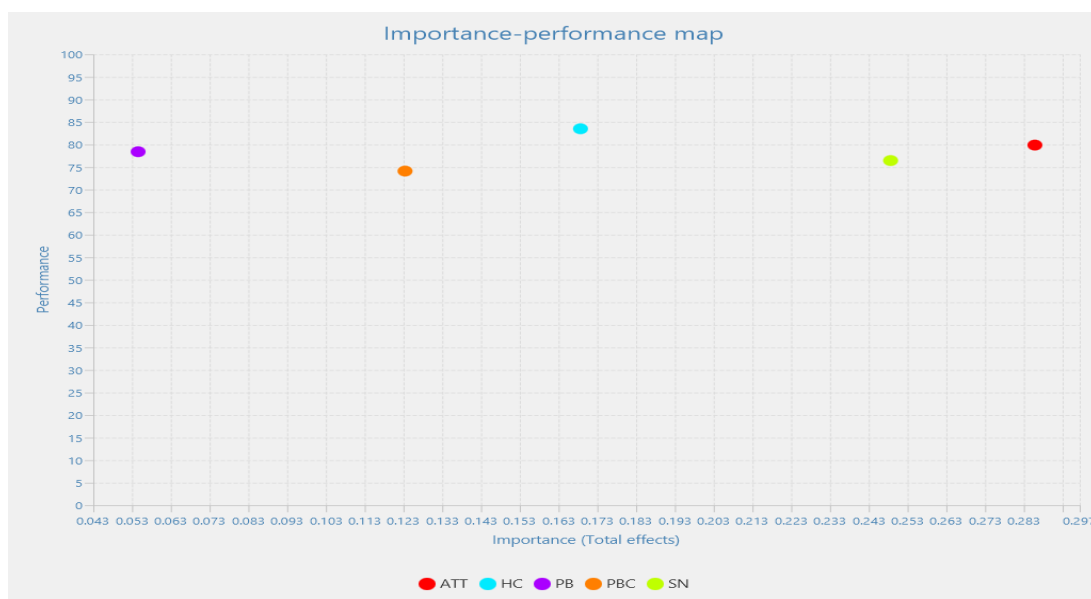
Furthermore, the study also applied the importance-performance map analysis (IPMA) to identify each factor's current performance further. IPMA offer more valuable findings as it could provide the relative performance level of each predicting construct on the outcome construct rather than the importance level from the PLS-SEM. This finding is particularly crucial in determining the priority of the improvement, especially when the improvement resources are limited. As provided in Table 5 and Figure 3, the result of IPMA showed that ATT and SN were the two most important factors in determining the PI of functional food buyers. However, ATT and HC presented the highest performance level in the current state. This finding suggests that effort should be put into improving the performance of SN rather than PB and HC, as both are relatively less important than SN. The finding of IPMA provides

a slightly different perspective compared to path coefficients as it could determine the current performance level of each factor corresponding to the importance level.

**Table 5: Results of Importance-Performance Map Analysis**

Factors	Importance	Performance
ATT	<b>0.2854</b>	<b>79.8883</b>
SN	<b>0.2482</b>	<b>76.4560</b>
PBC	0.1229	74.1248
HC	0.1682	<b>83.5068</b>
PB	0.0541	78.4139
Average	0.1758	78.4780

Source: Authors (2023)



**Figure 3: Results of Importance-Performance Map Analysis**  
 Source: SmartPLS

### Discussion

The study examines factors significantly affecting buyers' intention to purchase functional foods. The results of hypotheses testing revealed that ATT, SN, and HC significantly influence the buyers to purchase functional foods, while PBC and PB have insignificant effects on PI. The significant relationship between ATT and PI aligns with most previous studies (Nguyen et al., 2020; Nystrand & Olsen, 2020; Xin & Seo, 2020). This finding confirmed that buyers of functional foods' positive and favourable ATT toward functional foods would motivate them to purchase them. Similar results also remarked on SN, whereas the influence of the people essential to the buyers tends to affect their purchasing decisions. Consistent with Rezai *et al.* (2017), Nguyen *et al.* (2020), and Liu *et al.* (2021), the approval of the people around the functional foods buyers may further cultivate their decision to purchase functional foods. However, the insignificant association of the PBC toward the PI is found in this study, and this is in agreement with Pienwisetkaew *et al.* (2022), Zayed *et al.* (2022), and Ling *et al.* (2023), but contradicts Lee *et al.* (2020), Sumaedi and Sumardjo (2021), and Qi *et al.* (2021), who remarked the significant influence of PBC on the PI of different types of foods. The

insignificant effect of PBC showed that the functional foods' difficulty or costs were not their primary consideration. The diverse target populations of the study may lead to this insignificant result, as this study focused on functional food buyers who typically have vast experience in purchasing functional foods. Therefore, for them, the easiness or the prices of functional foods is not a significant determinant influencing their PI.

Besides, the result further proved that the PI of functional foods is also significantly influenced by HC. Paralleled to Hsu *et al.* (2016), Xin and Seo (2020), and Qi and Ploefler (2021), the findings of the study also verified the significant relationship between HC and the PI of functional foods. This finding showed that the more the buyers are conscious and aware of their health condition, the more likely they will purchase functional foods to improve their health conditions. Nevertheless, the association of the PB of the functional foods on the buyers' PI is not supported, and as a result, showed insignificant effects between factors. This insignificant relationship is contrary to Rezai *et al.* (2017), Natarajan *et al.* (2022), and Loh and Hassan (2022), who revealed a significant association between the PB and the PI of different types of foods. The insignificant effect of PB may indicate that the buyers' purchase decision is not significantly influenced by the PB that may be gained from consuming the functional foods. This insignificant impact of PB on PI may be due to the different targeted populations of the study, as this study only focused on existing functional food buyers. Usually, the existing buyers know the advantages and benefits of functional foods, and this understanding may diminish the influence of PB on PI.

In addition, the result of IPMA further proved that ATT and SN are highly important in driving buyers' PI to purchase functional foods. Besides, the current performance of each factor was also determined and revealed that ATT and HC performed better than average performance levels. The higher level of performance for both ATT and HC indicated that the existing efforts on both constructs are effectively and successfully cultivating the buyers' PI on functional foods. Furthermore, when combining both the importance and performance level of each construct, the result further revealed that the current effort on the ATT should be maintained as it has the highest value in both importance and performance values. However, more improvement efforts should concentrate on improving the SN as it is one of the most influential factors, but its current performance is unsatisfactory as it has a lower performance value than the average. This signified that to leverage the SN's influence on the buyer's PI, more enhancement efforts should be focused on the person in their social contexts, such as parents, siblings, relatives, friends, and others. Unfortunately, the resources and efforts should not focus on PB as it is the least important factor in determining the buyers' PI on functional foods. Therefore, to more efficiently and effectively allocate the improvement effort on the constructs that determine the buyer's PI on functional foods, more resources should be focused on SN and not on PB. In contrast, the enhancement efforts should continue on both ATT and HC.

### **Implications**

This study has some important implications. Theoretically, the extension of the TPB model by including both HC and PB was among the study's implications. The extended TPB model provides new insights and contributes to the existing literature, especially in the functional foods literature, as the determinant factors that foster the current buyers to purchase functional foods were determined in this study. As proposed by Ajzen (1985), the TPB model was introduced for general behaviour. Therefore, the three factors in the TPB model may not

sufficiently predict the purchasing behaviour of functional foods. Thus, additional constructs must be added to improve the explainability of the proposed model. This study successfully proved that the extension version of the TPB model is applicable in explaining functional food buyers' behaviour, as the five proposed predictors predicted more than 50% of the variation in PI. Besides, as found in this study, the TPB is still relevant to predicting human behaviours, even though only two factors in the TPB model significantly influence PI. In addition, the study further verified the need to include other important factors as it may capture the study's unique features that may not be accounted for in the TPB model. For instance, this study explored the significant effect of HC on functional foods' PI and showed the need to include HC when studying functional foods' PI.

Several practical implications are also offered in this study, and the stakeholders can refer to it in increasing the intention of buyers to purchase functional foods. For example, government agencies such as the Ministry of Health and functional foods manufacturers and sellers have to spread the advantages and benefits of consuming functional foods for health conditions as it may establish positive or favourable ATT toward functional foods. As proved in this study, functional food buyers have higher intentions to purchase functional foods if they have good and positive ATT. Besides, health information such as how to practice healthy lifestyles, prevent several diseases, and others must be shared with the public to enhance the consciousness and awareness of functional foods. The more conscious functional food buyers are toward their health conditions, the more likely they will purchase functional foods. Therefore, the stakeholders should continue disseminating information that may establish a favourable and positive ATT among the buyers, as it is crucial in cultivating their PI on functional foods.

Furthermore, the influence of the social context on functional food buyers is also recognised in this study. This finding indicated that the buyers' purchasing decision is not only decided independently but tends to be affected by the people surrounding them, such as family members, friends, colleagues, and the like. However, as proved in IPMA, the current performance of SN is at a lower level. Therefore, the efforts of these stakeholders, such as government agencies and retailers in increasing the ATT toward functional foods and HC have to concentrate more on the people around the functional foods' buyers, as they tend to have a crucial impact on their purchasing intention. When the people surrounding the buyers have a great ATT and are highly conscious of their health condition, it will significantly affect the buyers to purchase functional foods. Lastly, suppose the relevant stakeholders have limited resources to increase the buyers' intention to purchase functional foods. In that case, the IPMA result further suggests that the improvement efforts can be focused more on the SN as it was the critical factor but performed is low. Besides, the stakeholders may switch resources from PBC and PB to SN as the IPMA result showed that these two factors are unimportant in determining the buyers' PI on functional foods. By doing so, it is expected that the PI of functional food buyers could be enhanced, ultimately improving their health.

### **Conclusions and Recommendations for Future Study**

The importance of functional foods in enhancing human health has been widely acknowledged, especially in the post-pandemic era. Hence, the demand for functional foods increased dramatically. With the inconclusive findings in the literature on the determinants that significantly influence functional food buyers to purchase functional foods, especially for the role of HC and PB, this study takes the initiative to investigate the factors that may determine

functional food buyers' PI. An extended TPB model with HC and PB has been proposed in the study and further validated using a valid sample of 167 functional food buyers in Malaysia. The results revealed that ATT, SN, and HC significantly impacted the buyers' PI. However, PBC and PB are seen to be insignificant to the PI. Furthermore, the IPMA also proved that the improvement efforts and resources must be focused on SN, as its current performance is relatively low. This initiative is better to enhance functional food buyers' PI. This study has also discussed several essential implications from theoretical and practical perspectives.

Some recommendations may help increase the future study's usefulness as the current study consists of a few limitations. For instance, future studies are suggested to include other important factors that may comprehensively examine the functional food PI of the buyers, such as trust, price sensitivity, health awareness and the like. The main reason is that this study only extends the TPB model with two additional factors (HC and PC), which may limit the study's predictability. Besides, this study only examined the direct relationships between the predictors and outcome construct. Therefore, mediator(s) and/or moderator(s) can also be considered included in future studies to examine the matter better, as the consumer's decision-making typically involves a complicated process. In addition, the current study assumed all respondents were homogenous and didn't consider the possible heterogeneity among the respondents. For that reason, to provide more reliable and solid findings, future studies may consider doing a comparison study among the respondents, such as functional eaters vs non-eaters, males and females, and the like. Doing so may provide more precise findings as different groups of respondents may have different perspectives. The number of respondents may have to be increased in future studies as the current study only involved 167 respondents, which may be considered low compared to other studies. Lastly, as the respondents were only gathered in Malaysia, the findings were from other contexts or countries. With the different cultural and social norms, expanding the geographical scope of the study is advisable to examine further the impact of the different cultural and social norms of the countries on the buyer's PI on functional foods. Future studies are expected to generate more robust and reliable findings if these recommendations can be considered.

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### References

- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In: Kuhl J., Beckman J. (eds) *Action Control*. SSSP Springer Series in Social Psychology. Springer, Berlin, Heidelberg.
- Ajzen, I. (1991). The theory of planned behavior. *Organisational Behavior and Human Decision Processes*, 50(2), 179-211.
- Alam, S.S., Wang, C.K., Lin, C.Y., Masukujjaman, M., & Ho, Y.H. (2022). Consumers' buying intention towards healthy foods during the COVID-19 pandemic in an emerging economy. *Cogent Business & Management*, 9(1), 2135212.
- Anwar, R.H., Zaki, S., Thurasamy, R., & Memon, N. (2021). Trait emotional intelligence and ESL teacher effectiveness: Assessing the moderating effect of demographic variables using PLS-MGA. *Journal of Legal, Ethical and Regulatory Issues*, 24(6), 1-20.

- Bagozzi, R. & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Sciences*, 16, 74-94.
- Byrne, B.M. (2013). Structural equation modelling with AMOS: Basic concepts, applications, and programming. Routledge, New York.
- Cohen, J. (1988). Statistical power analysis for the behavioral sciences. 2<sup>nd</sup> Edition. New York, NY: Routledge Academic.
- Gold, A.H., Malhotra, A., & Segars, A.H. (2001). Knowledge management: An organisational capabilities perspective. *Journal of Management Information Systems*, 18(1), 185-214.
- Hair, J.F., Hult, G.T.M., Ringle, C.M., & Sarstedt, M. (2017). A primer on partial least squares structural equation modelling (PLS-SEM). 2nd Edition. Thousand Oaks, CA: Sage.
- Hair, J.F., Risher, J.J., Sarstedt, M., & Ringle, C.M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2-24.
- Hoque, M.Z., Alam, M.N., & Nahid, K.A. (2018). Health consciousness and its effect on perceived knowledge, and belief in the purchase intent of liquid milk: Consumer insights from an emerging market. *Foods*, 7(9), 150.
- Hsu, S.Y., Chang, C.C., & Lin, T.T. (2016). An analysis of purchase intentions toward organic food on health consciousness and food safety with/under structural equation modeling. *British Food Journal*, 118(1), 200-216.
- Huang, L., Bai, L., Zhang, X., & Gong, S. (2019). Re-understanding the antecedents of functional foods purchase: Mediating effect of purchase attitude and moderating effect of food neophobia. *Food Quality and Preference*, 73, 266-275.
- Kline, R.B. (2011). Principles and practice of structural equation modeling. 2nd Edition. New York: Guilford Press.
- Lakhdar, S. & Smaoui, F. (2021). Making context matter: unravelling functional foods' constructions by Tunisian consumers. *Qualitative Market Research: An International Journal*, 24(4), 470-496.
- Lee, K.Y., Wei, C.Y., Wu, M.H., & Hsieh, C.M. (2020). Determinants of the public health promotion behavior: Evidence from repurchasing health foods for improving gastrointestinal tract functions. *International Journal of Environmental Research and Public Health*, 17(20), 7604.
- Ling, P.S., Wong, L.J., Mohmed@Wasli, S.M., & Bajat, C.D.A. (2023). Sorry COVID-19! You don't moderate my intention to purchase functional foods. *Malaysian Journal of Consumer and Family Economics*, 30, 330-354.
- Liu, C., Sun, C.K., Chang, Y.C., Yang, S.Y., Liu, T., & Yang, C.C. (2021). The impact of the fear of COVID-19 on purchase behavior of dietary supplements: Integration of the theory of planned behavior and the protection motivation theory. *Sustainability*, 13(22), 12900.
- Loh, Z. & Hassan, S.H. (2022). Consumers' attitudes, perceived risks and perceived benefits towards repurchase intention of food truck products. *British Food Journal*, 124(4), 1314-1332.
- MarketsandMarkets. (2021). Functional food ingredients market. Retrieved on 20 November 2023. Retrieved from <https://www.marketsandmarkets.com/Market-Reports/functional-food-ingredients-market-9242020.html>
- Natarajan, T., Nair, J.G.R., & Jayapal, J. (2022). Subjective norms as a moderator in the consumption behaviour of branded functional beverages post-COVID-19 pandemic: a pragmatic view. *Asia-pacific Journal of Business Administration*, Vol. ahead-of-print No. ahead-of-print. 10.1108/APJBA-03-2022-0130

- Nguyen, N., Nguyen, H.V., Nguyen, P.T., Tran, V.T., Nguyen, H.N., Nguyen, T.M.N., Cao, T.K., & Nguyen, T.H. (2020). Some key factors affecting consumers' intentions to purchase functional foods: A case study of functional yogurts in Vietnam. *Foods*, 9(1), 24.
- Nystrand, B.T. & Olsen, S.O. (2020). Consumers' attitudes and intentions toward consuming functional foods in Norway. *Food Quality and Preference*, 80, 103827.
- Pienwisetkaew, T., Wongthahan, P., Naruetharadhol, P., Wongsachia, S., Vonganusuntree, C., Padthar, S., Nee, S., He, P., & Ketkaew, C. (2022). Consumers' intention to purchase functional non-dairy milk and gender-based market segmentation. *Sustainability*, 14(19), 11957.
- Prakash, G., Singh, P.K., Ahmad, A., & Kumar, G. (2023). Trust, convenience and environmental concern in consumer purchase intention for organic food. *Spanish Journal of Marketing – ESIC*, 27(3), 367-388.
- Qi, X. & Ploeger, A. (2021). Explaining Chinese consumers' green food purchase intentions during the COVID-19 pandemic: An extended theory of planned behaviour. *Foods*, 10(6), 1200.
- Qi, X., Tian, X., & Ploeger, A. (2021). Exploring Chinese consumers' online purchase intentions towards certified food products during the COVID-19 pandemic. *Foods*, 10(11), 2729.
- Rezai, G., Teng, P.K., Shamsudin, M.N., Mohamed, Z., & Stanton, J.L. (2017). Effect of perceptual differences on consumer purchase intention of natural functional food. *Journal of Agribusiness in Developing and Emerging Economics*, 7(2), 153-173.
- Sumaedi, S. & Sumardjo. (2021). A model of traditional functional food consumption behaviour. *British Food Journal*, 123(1), 13-30.
- Tran, A.T.V. & Nguyen, N.T. (2021). Organic food consumption among households in Hanoi: Importance of situational factors. *Sustainability*, 13(21), 12496.
- Xin, L. & Seo, S.S. (2020). The role of consumer ethnocentrism, country image, and subjective knowledge in predicting intention to purchase imported functional foods. *British Food Journal*, 122(2), 448-464.
- Zayed, M.F., Gaber, H.R., & Essawi, N.A. (2022). Examining the factors that affect consumers' purchase intention of organic food products in a developing country. *Sustainability*, 14(15), 5868.