



THE ROLE OF HEALTH AWARENESS AND SUBJECTIVE KNOWLEDGE IN PREDICTING INTENTION TO PURCHASE OMEGA-3 EGGS

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Increasing health consciousness has driven the demand for functional food products, including omega-3 eggs. This study aims to analyze the factors influencing consumer purchase intention toward omega-3 eggs using the Extended Theory of Planned Behavior (E-TPB) framework, integrating health consciousness and subjective knowledge. A survey was conducted among 100 respondents in Jabodetabek who were aware of omega-3 eggs, and the data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results show that health consciousness, subjective knowledge, and consumer attitudes do not significantly influence purchase intention. Conversely, subjective norms and perceived behavioral control have a significant positive effect on purchase intention. These findings confirm that consumer purchase intention for omega-3 eggs is largely driven by external factors namely social influence and product accessibility rather than internal cognitive factors or personal evaluations. Therefore, marketing strategies are recommended to focus on social approaches (such as influencer recommendations and word-of-mouth marketing) and improving product availability in the market. Additionally, this study is limited by a relatively small sample size; thus, future research is recommended to expand the respondent coverage and explore additional variables, such as trust, perceived usefulness, or emotional factors, to gain a more comprehensive understanding.

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INTRODUCTION

Meeting the need for nutritious food, particularly animal protein, is a key factor in improving human capital. Evidence suggests that improvements in childhood nutrition can generate long-term benefits in health, educational attainment, and economic outcomes, highlighting the important role

of nutrition in human capital development (Lundborg et al., 2022). Animal-source foods are crucial sources of high-quality protein, as it contains essential amino acids required for growth, tissue repair, and normal physiological functions (Beal et al., 2023; Sheffield et al., 2024). Moreover, global demand for livestock-derived foods, including eggs, is expected to increase as a result of population growth, rising incomes, and changing consumer preferences (Komarek et al., 2021).

However, Indonesia still faces supply deficits in several animal-source food commodities, particularly beef and milk, while domestic production of eggs and poultry meat has already exceeded national requirements (Ministry of Agriculture, 2025). In this situation, eggs represent an important domestically available source of animal protein. Eggs are nutrient-dense foods that provide high-quality protein as well as essential nutrients such as choline, folate, vitamin D, iodine and B vitamins (Myers & Ruxton, 2023). Additionally, eggs are relatively easy to produce, affordable, and accessible to people, compared with other animal-protein foods, including meat, poultry, and fish, which strengthens their potential contribution to improving access to nutritious diets (Walker & Baum, 2022).

Nevertheless, the consumption of conventional eggs is often associated with concerns about their cholesterol content, which is believed to potentially increase the risk of cardiovascular disease (Xia et al., 2020). However, evidence regarding the relationship between moderate egg consumption and cardiovascular risk remains mixed, suggesting that concerns surrounding egg consumption should be interpreted within the context of overall dietary patterns (Dehghan et al., 2020). One approach to further enhance the nutritional profile of eggs is the development of omega-3-enriched eggs.

The development of omega-3 eggs is a response to these health concerns and an effort to increase the value of livestock products. Omega-3 eggs are produced by fortifying layer hens' feed with sources of omega-3 fatty acids, resulting in a product with a higher content of polyunsaturated fatty acids (Ehr et al., 2017). Studies have demonstrated that dietary supplementation of laying hens with sources such as fish oil, linseed oil, and other omega-3-rich ingredients can substantially increase the concentrations of alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA) in eggs (Vlaicu et al., 2021; Radanović et al., 2023). Through this nutritional enrichment, omega-3 eggs can be regarded as functional foods that provide additional nutritional value beyond that of conventional eggs (Vlaicu et al., 2021).

In line with growing public awareness of healthy lifestyles, demand for functional foods continues to rise (Baker et al., 2022). The global functional food market has shown significant growth, expanding from US\$182.60 billion in 2015 to US\$278.96 billion by 2021, with a compound annual growth rate of 7.1% (Transparency Market Research, 2016). Similarly, the omega-3 market is projected to reach a global market size of USD 2,336.39 million by 2023. The omega-3 industry is projected to grow from USD 2,477.74 million in 2024 to USD 4,459.28 million by 2032, with a compound annual growth rate (CAGR) of 7.6% over the forecast period (2024–2032) (Polaris Market Research 2023).

This market growth indicates significant opportunities for the development of omega-3-based products, including omega-3 eggs, which have high economic value. However, a large market potential does not automatically guarantee a product's success in the market. Consumer purchasing decisions are influenced by various factors, including psychological factors related to consumers' perceptions and evaluations of a product's benefits. Therefore, understanding consumers' purchase intention is important for assessing their willingness to accept and potentially purchase functional food products.

From the perspective of consumer behavior theory, purchase intention is an important predictor of actual purchasing behavior. It reflects an individual's willingness to purchase a particular product and may arise from consumers' evaluations of the product, perceived social influence, and

their perceived ability to perform the purchase. According to the Theory of Planned Behavior (TPB), these factors are represented by attitude toward behavior, subjective norms, and perceived behavioral control, respectively (Ajzen, 1991). However, several studies, such as (Pienwisetkaew et al., 2022; Yusuf et al., 2025) revealed consumer purchase intention may also be influenced by additional factors beyond the core TPB constructs, particularly in the context of food consumption. Therefore, this study extends the TPB framework by incorporating health consciousness and subjective knowledge to examine their roles in shaping consumers' attitudes and intention to purchase omega-3 eggs.

The novelty of this study lies in extending the Theory of Planned Behavior (TPB) by incorporating two additional explanatory variables, namely health consciousness and subjective knowledge, to examine consumers' purchase intention toward omega-3 eggs. These two variables are included to capture health-related considerations and consumers' perceived knowledge that may complement the core TPB constructs in explaining consumer decision-making. Therefore, this study applies an Extended Theory of Planned Behavior (E-TPB) framework to examine the roles of health consciousness and subjective knowledge in shaping consumers' attitudes and purchase intentions toward omega-3 eggs.

First, health consciousness is a key factor influencing consumers' attitudes in purchasing a product. Health consciousness reflects the extent to which individuals care about and are committed to their personal health. Previous studies indicate that greater health consciousness can contribute to more favorable attitudes and stronger purchase intentions toward health-related and functional food products (Rana & Paul, 2020; Sari & Wardi, 2025). In addition, the growth of the functional food market has been driven by increasing health concerns, preventive health awareness, and demand for products that support long-term health and quality of life (Arshad et al., 2025; Marcia-Fuentes et al., 2026). Consumers with greater health consciousness tend to place more value on the perceived health benefits of functional foods, which may strengthen their attitudes and purchase intentions (Baker et al., 2022; Jia & Liu, 2025).

Second, subjective knowledge refers to consumers' perceptions of how much they know about a product (Xin & Seo, 2019). Greater subjective knowledge may help consumers distinguish functional foods from conventional products and evaluate their characteristics more confidently. Previous studies have shown that consumer knowledge is positively related to functional food acceptance and purchase intention, although the strength of this relationship may differ across contexts (Baker et al., 2022). Subjective knowledge has also been found to positively influence purchase intention toward functional foods (Xin & Seo, 2020). More recent research shows that consumers with higher self-reported knowledge tend to have more positive attitudes toward functional foods, although knowledge may have a weaker direct effect on actual purchasing behavior (Nowak-Marchewka et al., 2026).

By taking these additional research variables into account, it is hoped that we can predict the intention to purchase omega-3 eggs more specifically. Therefore, the research questions to be addressed in this study are: 1) How do attitudes toward behavior, subjective norms, and perceived behavioral control influence the intention to purchase omega-3 eggs in the Jabodetabek area, and 2) How do health awareness and subjective knowledge influence the intention to purchase omega-3 eggs. The research results are expected to provide theoretical contributions to the development of consumer behavior studies in the context of functional foods, as well as practical implications for industry players and policymakers in designing more effective marketing strategies based on consumers' psychological characteristics.

METHOD

This research was conducted in the Jakarta, Bogor, Depok, Tangerang, and Bekasi (Jabodetabek) region. The study location was selected purposively, given that Jabodetabek is a metropolitan area with a large population and serves as a national center for trade and finance. These factors make the region one of the primary locations for food industry players, in both the food and beverage sectors (Permadiyansach et al., 2025). Respondents were selected using a non-probability, purposive sampling technique based on the following criteria: (1) residing in the Jabodetabek area, (2) being at least 17 years old, and (3) being aware of omega-3 eggs.

The sample size was determined by multiplying the total number of model parameters by 5 (Hair et al., 2021). Thus, the total number of respondents in this study was 100 participants, corresponding to 20 indicators. The variables measured in this study included health consciousness, subjective knowledge, attitude toward behavior, subjective norm, perceived behavioral control, and purchase intention.

Data collection was carried out through a Google Forms questionnaire. Subsequently, the data were processed using Microsoft Excel for descriptive analysis and SmartPLS 4 for Partial Least Squares–Structural Equation Modeling (PLS-SEM) analysis, which comprises two evaluation stages (Hair et al., 2021). First, the outer model evaluation was conducted to assess the validity and reliability of the instruments using the following criteria: loading factor (> 0.7), Average Variance Extracted (AVE > 0.5), Cronbach's Alpha (> 0.7), and Composite Reliability (> 0.7). Second, the inner model evaluation assessed the relationships between latent variables using the bootstrapping procedure, evaluated based on the coefficient of determination (R^2), path coefficients, t -statistics, and p -values. The overall model fit was determined by meeting the criteria for validity, reliability, and the significance of the relationships between variables.

This research proposed following hypotheses:

- H1: An increase in health consciousness will increase consumers' positive attitudes.
- H2: An increase in health consciousness will increase purchase intention.
- H3: An increase in subjective knowledge will increase consumers' positive attitudes.
- H4: An increase in subjective knowledge will increase purchase intention.
- H5: An increase in subjective norm support will increase consumers' positive attitudes.
- H6: An increase in subjective norm support will increase purchase intention.
- H7: An increase in perceived behavioral control will increase consumers' positive attitudes.
- H8: An increase in perceived behavioral control will increase purchase intention.
- H9: An increase in positive attitude will increase purchase intention.

RESULT AND DISCUSSION

Demographic Characteristics of Omega-3 Egg Consumers

The respondents in this study were consumers who had purchased omega-3 eggs in Jabodetabek area, with a total of 100 participants. The respondent characteristics examined were age, gender, place of residence, highest level of education, marital status, occupation, and monthly income. These characteristics are expected to provide an overview of the distribution and background of the respondents. The respondent characteristics in this study are presented in Table 1.

Table 1 presents the demographic characteristics of the respondents, indicating that the majority are young females aged 20–29 years. Most respondents have attained a relatively high level of education, predominantly at the bachelor's degree (S1) level, and are primarily domiciled in the Jabodetabek, particularly Bogor. In terms of occupational status, a substantial proportion of respondents are students, with monthly incomes generally below IDR 3.000.000. These demographic characteristics provide important context for analysing consumer behaviour towards omega-3 eggs.

Younger individuals with higher educational attainment are generally associated with greater health awareness and are more receptive to nutritional information, as well as to functional food products that offer long-term health benefits (Vorage et al., 2020). Purchasing characteristics of omega-3 egg consumers are presented in Table 2.

Table 1. Demographic characteristics of omega-3 egg consumers

Characteristics	Categories	Total (n)	Percentage (%)
Domicile	Jakarta	25	25
	Bogor	63	63
	Depok	4	4
	Tangerang	3	3
	Bekasi	5	5
Age	< 20	11	11
	20-29	63	63
	30-39	19	19
	40-50	5	5
	> 50	2	2
Gender	Female	74	74
	Male	26	26
Last Education	Senior High School	37	37
	Associate Degree	1	1
	Bachelor's Degree	59	59
	Master's Degree	3	3
Occupation	Student	67	67
	Civil Servant	6	6
	Housewife	6	6
	Private Employee	21	21
Monthly Income (IDR)	< 3,000,000	59	59
	3,000,000-5,000,000	27	27
	5,000,000-7,000,000	12	12
	7,000,001-9,000,000	1	1
	>9,000,000	1	1

Source: Data processed, 2025

The results in Table 2, indicate that the consumption of omega-3 eggs has not yet become a regular habit among most respondents. A majority of respondents (58%) reported consuming omega-3 eggs irregularly, while 19% consumed them only once per month, suggesting that approximately 77% of respondents have a low consumption frequency. This pattern reflects that omega-3 eggs are still not integrated into consumers' daily dietary habits and are likely perceived as occasional or non-essential products.

Interestingly, despite the low level of consumption, health considerations (74%) and nutritional content (68%) were identified as the primary drivers influencing purchasing decisions. This suggests a gap between consumers' awareness of health benefits and their actual consumption behaviour. Furthermore, most respondents (93%) reported spending less than IDR 500.000 per month on omega-3 eggs, indicating relatively low willingness to allocate expenditure toward these products, possibly due to price perceptions or limited perceived added value compared to regular eggs.

In terms of information sources, social media was the dominant channel (63%), highlighting its significant role in shaping consumer awareness and interest in functional food products. This finding supports previous research suggesting that digital platforms are critical in influencing

consumer adoption of innovative food products (Calvo-Porrall et al., 2021). Overall, these findings indicate that although awareness of the health benefits of omega-3 eggs is relatively high, market penetration remains limited, thus requiring more targeted education and marketing strategies to bridge the gap between awareness and actual consumption (Okubanjo et al., 2025).

Tabel 2. Purchasing characteristics of omega-3 egg consumers

Characteristics	Categories	Total (n)	Percentages (%)
Monthly expenditure on omega-3 eggs (IDR)	<500,000	93	93
	500,000-1,000,000	4	4
	>1,000,000	2	2
	Never consumed	1	1
Consumption frequency	Almost daily	1	1
	Once a week	12	12
	Several times a week	10	10
	Once a month	19	19
	Irregularly	58	58
Sources of Information on omega-3 eggs	Friends	11	11
	Parents	26	26
	Social media	63	63
Reasons for consuming omega-3 eggs	Desire to try new flavours	16	16
	Health considerations	74	74
	Recommendations from others	6	6
	Dissatisfaction with regular eggs	4	4
Key attributes considered in purchasing omega-3 eggs	Price	16	16
	Nutritional content	68	68
	Certification labels	11	11
	Brand	2	2
	Taste and Aroma	3	3

Source: Data processed, 2025

Analysis of the Measurement Model

Before conducting path analysis, it is necessary to assess the measurement model (outer model), including tests of validity and internal reliability in Table 3. First, the Cronbach's alpha values for all constructs exceed the recommended threshold of 0.70 (Hair et al., 2021) indicating adequate internal consistency. Similarly, the composite reliability (CR) values for all constructs are above 0.70, further confirming the reliability of the measurement model. Overall, these results suggest that the indicators used in this study consistently measure their respective latent constructs.

Second, convergent validity was assessed using factor loadings and the average variance extracted (AVE). All factor loadings are greater than the recommended threshold of 0.70, ranging from 0.860 to 0.971, indicating that the indicators strongly represent their respective constructs. In addition, all AVE values exceed 0.50, demonstrating that a substantial amount of variance is captured by the constructs, thereby confirming convergent validity.

Finally, discriminant validity was evaluated by comparing the square root of AVE with inter-construct correlations. The results show that the square root of AVE for each construct is higher than its correlations with other constructs, indicating that each construct is empirically distinct. Although the Cronbach's alpha value for the subjective norm construct is relatively lower compared to other constructs, it remains above the acceptable threshold, confirming that the measurement model demonstrates satisfactory reliability and validity.

Table 3. Loading factor and indicators of internal consistency and realibility

Variable	Item	FL	CA	CR	AVE
Health Conciousness	KK1	0.960	0.966	0.975	0.907
	KK2	0.938			
	KK3	0.956			
	KK4	0.956			
Subjective Knowledge	PS1	0.933	0.947	0.962	0.864
	PS2	0.954			
	PS3	0.925			
	PS4	0.904			
Attitude Toward the Behavior	STP1	0.927	0.956	0.968	0.883
	STP2	0.950			
	STP3	0.939			
	STP4	0.942			
Subjective Norm	NS1	0.939	0.785	0.900	0.819
	NS2	0.869			
Perceived Behavioral Control	PKP1	0.909	0.899	0.937	0.834
	PKP2	0.966			
	PKP3	0.860			
Purchase Intention	NP1	0.950	0.955	0.971	0.917
	NP2	0.971			
	NP3	0.952			

Source: Data processed, 2025

Analysis of the Structural Model

The evaluation of the structural (inner) model is essential to assess the influence of exogenous latent variables on endogenous latent variables. This evaluation focuses on key parameters, including the coefficient of determination (R^2) and the path coefficients (or t-values) for each hypothesized relationship. The R^2 value indicates the proportion of variance in the endogenous constructs explained by the exogenous constructs, with values of 0.75, 0.50, and 0.25 representing substantial, moderate, and weak explanatory power, respectively (Hair et al., 2021).

The results show that the R^2 value for purchase intention is 0.670 and for attitude toward the behavior is 0.691 (in Table 4). This means that 67% of the variance in purchase intention and 69.1% of the variance in attitude toward the behavior are explained by the exogenous constructs in the model. Based on the recommended criteria, these values can be categorized as moderate, indicating that the model has acceptable explanatory power. Furthermore, the adjusted R^2 values (0.652 and 0.678) remain relatively close to the R^2 values, suggesting that the model maintains consistent explanatory power after accounting for the number of predictors.

Table 4. R-Square

Variable endogenous	R^2	Adjusted R^2
Attitude Toward the Behavior	0.691	0.678
Purchase Intention	0.670	0.652

Source: Data processed, 2025

In evaluating the structural (inner) model, the next step involves examining the significance of the relationships among health consciousness, subjective knowledge, subjective norm, perceived behavioral control, attitude toward the behavior, and purchase intention. The significance of these relationships was assessed using the bootstrapping output in SmartPLS 4. Statistical significance was determined based on a t-statistic greater than 1.96 and a p-value less than 0.05 at a significance level of $\alpha = 5\%$ (Hair et al., 2021). The complete results of the significance testing can be seen in Table 5.

Based on the bootstrapping results presented in Table 5, health consciousness does not have a significant effect on purchase intention ($t = 0.503$; $p = 0.615$). This suggests that although consumers may be aware of health-related issues, such awareness alone is not sufficient to directly drive their intention to purchase omega-3 eggs. This finding is consistent with previous studies (Rasanjalee, 2021; Permatasari et al., 2024), which indicate that health consciousness does not always translate into actual purchase intention for functional foods. In other words, being aware of health benefits does not necessarily mean that consumers are motivated to act on that awareness. In contrast, health consciousness has a positive and significant effect on attitude toward omega-3 eggs ($t = 6.570$; $p < 0.001$). This indicates that consumers with higher levels of health awareness tend to evaluate omega-3 eggs more positively. This result aligns with prior research (Ghaith, 2024; Pan et al., 2025), which highlights that individuals who are more concerned about their health are more likely to form favorable attitudes toward functional food products. These positive evaluations are likely shaped by their perception of the nutritional benefits associated with omega-3 eggs.

Table 5. Result of bootstrapping hypothesis testing

Path Relationship	Original Sample	T-Statistic	P-Value
Health Consciousness → Attitude Toward the Behavior	0.549	6.570	0.000
Health Consciousness → Purchase Intention	0.051	0.503	0.615
Subjective Knowledge → Attitude Toward the Behavior	-0.127	1.685	0.093
Subjective Knowledge → Purchase Intention	-0.063	0.656	0.512
Subjective Norm → Attitude Toward the Behavior	0.297	3.517	0.000
Subjective Norm → Purchase Intention	0.381	2.790	0.005
Perceived Behavioral Control → Attitude Toward the Behavior	0.239	2.661	0.008
Perceived Behavioral Control → Purchase Intention	0.362	3.200	0.001
Attitude Toward The Behavior → Purchase Intention	0.216	1.675	0.094

Source: Data processed, 2025

Subjective knowledge does not have a significant effect on purchase intention of omega-3 eggs ($t = 0.656$; $p = 0.512$), nor on attitude toward the product ($t = 1.685$; $p = 0.093$). This indicates that consumers' perceived knowledge about omega-3 eggs is not sufficient to influence their evaluation or intention to purchase. In many cases, subjective knowledge tends to be less accurate and less stable than objective knowledge, which may explain its limited role in shaping consumer behavior. This finding contrasts with Xin and Seo (2020) who found a significant effect of subjective knowledge on attitude and purchase intention toward functional foods. However, it is consistent with Menozzi et al., (2023), who suggest that knowledge does not always directly influence purchase intention, but may instead operate through other factors such as trust or perceived benefits. Therefore, although consumers may feel informed, this perception alone may not be strong enough to drive actual purchasing decisions.

Subjective norm has a positive and significant effect on both purchase intention ($t = 2.790$; $p = 0.005$) and attitude toward omega-3 eggs ($t = 3.517$; $p < 0.001$). This indicates that social influence plays an important role in shaping both consumers' evaluations and their intention to purchase. Consumers are more likely to develop positive attitudes and stronger purchase intentions when influenced by people around them, such as family, friends, or social groups. This finding is consistent with Nguyen et al. (2020) who highlighted the role of social pressure in encouraging the adoption of functional foods.

Similarly, perceived behavioral control has a significant positive effect on purchase intention ($t = 3.200$; $p = 0.001$) and attitude ($t = 2.661$; $p = 0.008$). This suggests that when consumers perceive that purchasing omega-3 eggs is easy and within their control—such as being affordable or easily accessible—they are more likely to form positive attitudes and stronger intentions to buy. This result supports the Theory of Planned Behavior, where perceived behavioral control is considered a key determinant of behavioral intention (Hung et al., 2025). Furthermore, perceived behavioral control also has a significant effect on consumers' attitudes. This indicates that when consumers feel they have sufficient control over resources such as price, access, and purchasing ability, they are more likely to form positive evaluations of the product. This finding is consistent with Andaregie et al. (2024) who reported that perceived behavioral control has a strong and significant positive influence on attitudes toward the consumption of spirulina-enriched bread among consumers in Ethiopia.

In contrast, attitude toward the behavior does not have a significant effect on purchase intention ($t = 1.675$; $p = 0.094$). This finding suggests that even though consumers may hold positive evaluations of omega-3 eggs, these attitudes do not necessarily translate into purchase intentions. This indicates that other factors, particularly social influence and perceived control, may play a more dominant role in driving consumer behavior in this context, as also noted in previous studies (Glenisson et al., 2025; Jia & Liu, 2025).

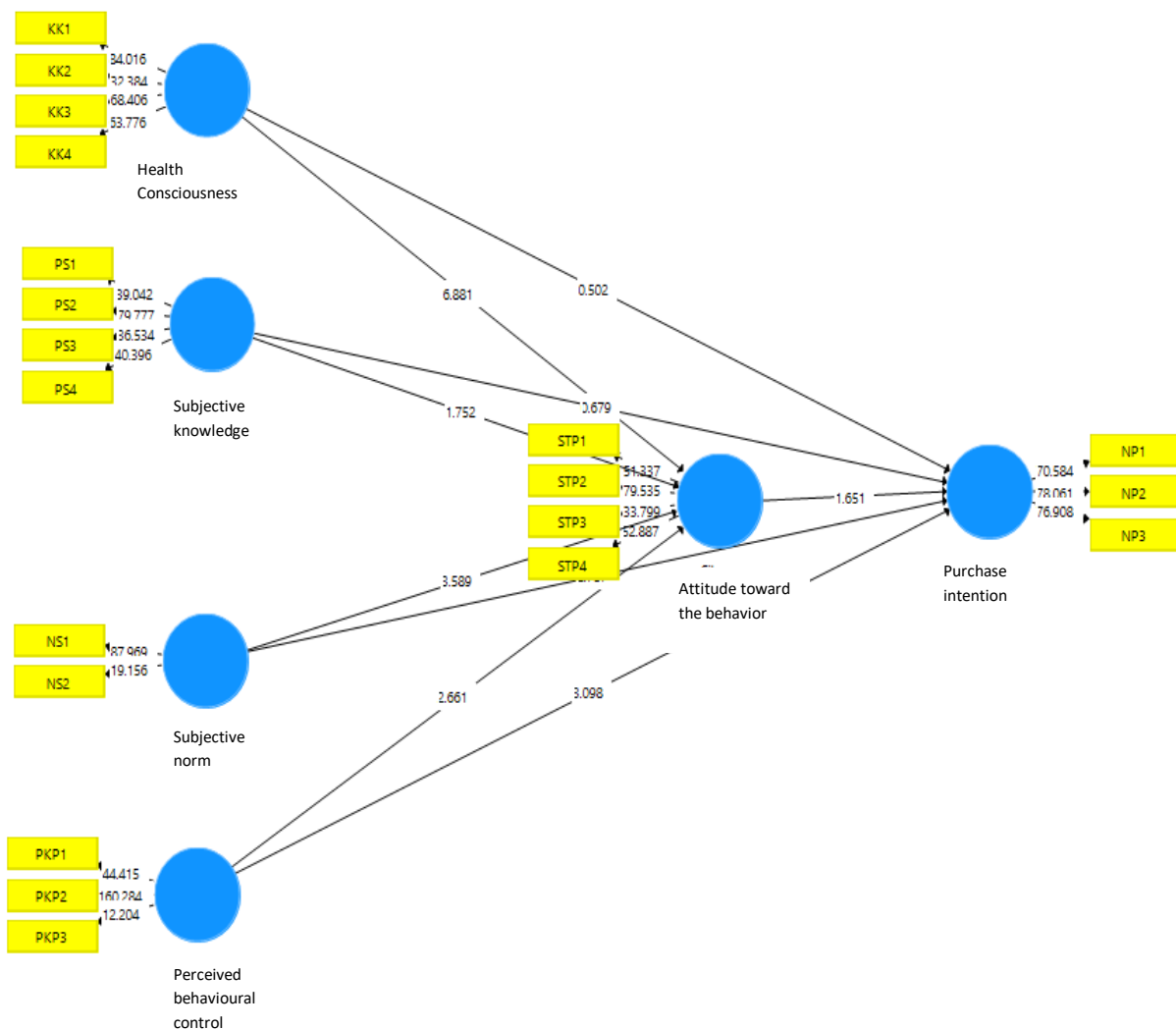


Figure 2. SEM-PLS outer model results

Source: Data processed, 2025

Figure 1 provides a visual summary of the structural relationships and their bootstrapping results in the E-TPB model. Overall, the figure shows that subjective norm and perceived behavioral control have significant relationships with both attitude toward the behavior and purchase intention, while health consciousness has a significant relationship only with attitude toward the behavior. The figure therefore supports the detailed hypothesis-testing results presented in Table 5.

CONCLUSION

Consumers' purchase intention for omega-3 eggs is driven neither by internal cognitive factors nor personal evaluations such as health consciousness, subjective knowledge, and consumer attitudes but is predominantly influenced by external factors, namely subjective norms (social influence) and perceived behavioral control (ease of access and affordability). Based on these findings, marketing strategies are recommended to focus on social-based approaches (influencer endorsements and word-of-mouth marketing) as well as enhancing product availability. Meanwhile, future research is encouraged to explore additional variables such as trust, perceived usefulness, or emotional factors to gain a more comprehensive understanding of consumer purchase intention formation.

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