

## ANALYSIS OF CONSUMER PREFERENCE COMPARISON TOWARD SOURCES OF ANIMAL PROTEIN: APPLICATION OF THE THEORY OF PLANNED BEHAVIOR



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### Abstract

This study aims to analyze consumer behavior regarding animal-based protein consumption in Indonesia using the Theory of Planned Behavior (TPB). The research focuses on the influence of attitude, subjective norm, perceived behavioral control, and past experience on the intention to consume protein sources such as chicken, fish, eggs, and beef. A quantitative approach was employed using Partial Least Squares-Structural Equation Modeling (PLS-SEM), supported by Multigroup Analysis to examine differences across demographic groups, including age, education, income, and region. The results show that all TPB constructs significantly influence consumption intention, with Past Experience emerging as the most dominant predictor. The multigroup analysis revealed a statistically significant difference only in the Subjective Norm → Behavioral Intention path based on regional residence. These findings offer practical insights for food industry stakeholders and policymakers to design more targeted strategies to promote animal protein consumption.

**Keywords:** Theory of Planned Behavior, Animal Protein, PLS-SEM, Consumption Intention, Multigroup Analysis

## INTRODUCTION

As a developing country with a large population and diverse cultural landscape, Indonesia faces unique challenges in meeting the animal protein needs of its people. Animal protein especially from chicken and fish is a key component of the Indonesian diet due to its widespread availability, relatively affordable price, and broad cultural acceptance. According to data from the Central Bureau of Statistics (BPS, 2024), per capita protein consumption in Indonesia has increased to 61.70 grams per day. However, this figure remains significantly lower than that of neighboring countries such as Malaysia (159 grams), Thailand (141 grams), and the Philippines (93 grams). This gap highlights the need for culturally and economically appropriate strategies to increase animal protein intake.

To address this issue, the Indonesian government launched a program providing free food including milk to more than 80 million schoolchildren and pregnant women (Reuters, 2024). The goal is to improve animal protein intake and reduce malnutrition while also stimulating national dairy industry growth. Despite these efforts, several barriers remain, including consumer preferences, affordability, and product quality. Therefore, further research is necessary to develop effective strategies tailored to the local context.

Previous studies have shown regional differences in animal protein consumption. Coastal areas tend to consume more fish, while beef is more common in wealthier urban areas. Chicken and eggs are widely consumed across both rural and urban regions due to their flexibility and affordability (de Boer & Aiking, 2018). These choices are influenced not only by economic factors but also by cultural values, traditions, and accessibility.

Environmental sustainability is also becoming increasingly important. Research by Grunert et al. (2014) emphasizes the need for sustainable livestock practices that do not compromise economic or cultural aspects. In Indonesia, improving environmentally friendly farming methods is essential to ensure the long-term availability of animal protein.

The Theory of Planned Behavior (TPB) offers a useful framework for understanding consumption behavior. According to TPB, three main factors influence behavioral intention: attitude toward the behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). In the context of protein consumption, attitudes may be shaped by perceptions of health benefits; subjective norms reflect social influences from family and friends; and perceived behavioral control relates to access and affordability.

In collectivist societies like Indonesia, subjective norms play a significant role. Family and community recommendations often influence food choices. Additionally, access to animal protein varies between urban and rural areas. Urban residents typically have better access through modern markets, while rural communities rely more on traditional markets, which can limit options.

Recent studies suggest that adding past experience to the TPB model enhances its predictive power. Zhang et al. (2022) and Verbeke & Vackier (2005) found that prior consumption experiences strongly influence future intentions. Incorporating this variable into TPB could provide deeper insights into Indonesian consumers' behavior toward chicken, fish, eggs, and beef. As noted by Kotler and Keller (2006), consumer decisions are shaped by both internal motivations and external social and cultural influences. Changes in lifestyle and income levels are shifting dietary habits, including greater demand for convenience foods.

While TPB has been widely applied internationally (e.g., Sen et al., 2022 in Turkey; Zhang et al., 2022 in China), its use in the Indonesian context—particularly regarding animal

protein consumption—remains limited. Few studies have comprehensively examined consumer preferences across various sources of animal protein using a systematic theoretical approach.

This study aims to fill that gap by analyzing the psychological factors influencing animal protein consumption intentions among Indonesians using an extended TPB model that includes past experience. By doing so, it contributes to both consumer behavior theory and provides empirical support for evidence-based nutrition policies and marketing strategies tailored to the Indonesian context.

## REVIEW OF LITERATURE

As a foundational theory in understanding consumer behavior, the Theory of Reasoned Action (TRA) was introduced by Ajzen and Fishbein in 1975 within the field of social psychology (Ajzen & Fishbein, 1975). This theory links elements such as belief, attitude, intention, and behavior, emphasizing that human actions are primarily driven by behavioral intention. According to TRA, intention is shaped by two key components: attitude toward the behavior and subjective norms. Attitude reflects an individual's personal evaluation of a behavior based on their beliefs about its outcomes, while subjective norm refers to the perceived social pressure to perform or not perform the behavior, influenced by the expectations of others. The combination of these two factors significantly influences decision-making processes, including consumer choices (Solomon, 2009).

Ajzen later expanded TRA into the Theory of Planned Behavior (TPB) in 1991 by adding a third component perceived behavioral control to better explain situations where individuals do not have full autonomy over their actions (Ajzen, 1991). TPB posits that behavioral intention is determined by three constructs: attitude toward the behavior, subjective norm, and perceived behavioral control. These constructs together influence the strength of an individual's intention to perform a given behavior, making TPB a robust tool for predicting and explaining consumer behavior, particularly in food choice decisions. Attitude represents an individual's overall evaluation of a behavior, formed through beliefs about its benefits, risks, and consequences. Lacroix et al. (2016) indicate that positive evaluations of a behavior increase the likelihood of forming strong intentions to engage in it. In the context of animal protein consumption, attitude is often shaped by perceptions of health benefits, taste, nutritional value, and environmental impact. For example, consumers who believe fish is healthy and beneficial for heart health are more likely to develop a positive attitude toward its consumption (Grunert et al., 2014). Ajzen and Gilbert Cote (2008) note that attitude is one of the strongest predictors of behavioral intention, especially when linked to prior knowledge and experience.

Subjective norm refers to the influence of social pressures on an individual's decision to perform a behavior. It is shaped by two elements: normative beliefs (what others think the individual should do) and motivation to comply (the desire to meet those expectations). In collectivist cultures like Indonesia, family and community opinions strongly influence food choices. For instance, cultural traditions or religious practices may encourage fish consumption on certain days. Similarly, health campaigns or peer recommendations can shift preferences toward specific sources of protein (Vermeir & Verbeke, 2008). The stronger the perception of support from significant others, the higher the likelihood of engaging in the behavior.

Perceived behavioral control captures an individual's belief in their ability to perform a behavior. It is influenced by past experiences, anticipated barriers, and available resources such as time, money, and access. In the case of protein consumption, availability, affordability, and ease of preparation play crucial roles. In rural areas of Indonesia, fresh fish might be more accessible than beef due to local markets and fishing activities. Meanwhile, urban residents may prefer chicken and eggs due to wider availability in supermarkets (Grunert et al., 2014). Thus, perceived behavioral control acts as a mediator between intention and actual behavior, especially when external constraints exist.

Past experience is an extension of the TPB model that enhances its predictive power. Research by Zhang et al. (2022) shows that individuals with prior engagement in similar behaviors such as choosing fish or avoiding red meat are more likely to repeat those behaviors in the future. This is because past experiences strengthen beliefs and values, reinforcing habitual patterns. Studies by Sommer (2011) and Delistavrou & Tilikidou (2022) confirm that actual experiences with a behavior positively affect behavioral intention. In the context of protein consumption, individuals who regularly consume chicken or avoid beef for ethical reasons are likely to maintain these habits, demonstrating the importance of incorporating past experience into behavioral models.

Socioeconomic characteristics such as income level, education, and geographic location significantly moderate the relationship between behavioral intention and actual behavior. Zhang et al. (2022) found that higher levels of nutrition literacy correlate with greater resistance to unhealthy food consumption, while lower-income individuals may show stronger resistance due to cost and accessibility issues. Schüz et al. (2017) and Darabi et al. (2017) further highlight how socioeconomic background influences lifestyle choices, including dietary habits. In Indonesia, household income, educational level, and regional access to protein sources (e.g., fish vs. beef) are critical determinants of consumption preferences. These factors must be considered when analyzing consumer behavior within the TPB framework.

Animal protein plays a vital role in meeting the nutritional needs of Indonesians. Key sources include fish, chicken, beef, and eggs, each with distinct consumption patterns across regions and income levels. Fish is the most widely consumed animal protein due to its abundance in coastal areas and relatively low cost. The Indonesian Central Bureau of Statistics (BPS, 2024) reported average per capita fish consumption at 10.5 grams per day in 2023. Government initiatives like the "Gemar Makan Ikan" campaign have also contributed to increased awareness of fish as a healthy food option (Rahmawati & Putra, 2023).

Chicken consumption has been steadily rising, driven by affordability and widespread availability. Santoso et al. (2023) report annual per capita chicken consumption at 6.3 kg, although this remains below levels seen in neighboring ASEAN countries. Efforts are underway to boost domestic poultry production to meet growing demand. Beef consumption remains relatively low due to high prices and limited domestic supply. Prasetyo et al. (2023) note that per capita beef consumption in Indonesia stands at only 2.5 kg annually. Strategies to increase local production and reduce reliance on imports are being pursued to stabilize prices and improve access.

Eggs are among the most affordable and widely consumed protein sources in Indonesia. Nugroho et al. (2024) report per capita egg consumption reaching 9.8 kg annually

in 2023. Eggs are valued not only for their protein content but also for their rich vitamin and mineral profile.

Consumer preferences for protein sources are evolving globally, influenced by health consciousness, sustainability concerns, and technological advancements in food production. Van Loo et al. (2020) found that U.S. consumers still favor conventional beef over alternatives like plant-based or lab-grown meat. However, a segment of consumers is willing to pay a premium for sustainable options when informed about their benefits. In Belgium, Angela and Michael (2021) observed growing acceptance of plant-based meat, increasing from 44% in 2019 to 51% in 2020. Environmental and animal welfare concerns were key motivators.

Wang et al. (2023) found Chinese consumers preferred plant-based products emphasizing health benefits such as low fat and cholesterol-free claims, though pure vegan labels had less appeal. Chia et al. (2024) reported Australians showed greater acceptance of plant-based meat compared to lab-grown or insect proteins, with naturalness being a major concern. Vegconomist (2024) highlighted Brazil's alternative protein market growth, with plant-based meat and seafood sales reaching R\$1.1 billion in 2023, driven largely by younger, educated consumers seeking healthier and sustainable options.

This study aims to examine how the constructs of the Theory of Planned Behavior (TPB)—attitude, subjective norm, perceived behavioral control, and past experience—influence consumer preferences and intentions toward animal protein consumption (specifically beef, fish, chicken, and eggs) in Indonesia. It also seeks to identify differences in behavioral tendencies across demographic groups based on gender, age, education level, income, and eating habits.

Drawing from previous studies, this research adopts an extended TPB model with past experience and applies multigroup analysis to explore psychological drivers of animal protein consumption in Indonesia. By doing so, it contributes both theoretically to consumer behavior literature and practically to evidence-based policy and marketing strategies tailored to the Indonesian context.

## RESEARCH METHOD

This study employs a quantitative research approach with a descriptive design to analyze consumer preferences toward animal protein sources, particularly chicken, fish, eggs, and beef. The research framework is built upon the Theory of Planned Behavior (TPB) developed by Ajzen (1991), which has been widely applied in food consumption studies. The TPB model was selected due to its ability to comprehensively explain consumer behavior through three core constructs: attitude toward behavior, subjective norms, and perceived behavioral control. This model was further enriched with the addition of past experience, as demonstrated in Zhang et al. (2022), and contextual adjustments based on Şen et al. (2022), who examined fish consumption behavior in Turkey. These prior studies consistently showed that TPB constructs significantly influence behavioral intention, although with variations in context and additional variables.

Data collection was conducted using an online survey via Google Forms, allowing respondents to complete the questionnaire flexibly using computers or mobile devices. A cross-sectional design was used, meaning data were collected at a single point in time to reflect current consumer preferences and intentions. Prior to full-scale distribution, a pre-test

was carried out involving 65 respondents to assess the validity and reliability of the instrument. Confirmatory Factor Analysis (CFA) was performed to ensure convergent and discriminant validity, while Cronbach's Alpha test was used to measure internal consistency. Any items found to be ambiguous or poorly understood were revised based on feedback from the wording test, which evaluated clarity and comprehension of the questionnaire items.

The primary data used in this study were collected directly from respondents through a structured Likert-type questionnaire developed based on established theoretical frameworks and previous studies, particularly those by Ajzen (1991), Verbeke & Vackier (2005), and Şen et al. (2022). The questionnaire includes indicators measuring behavioral intention, attitude toward behavior, subjective norms, perceived behavioral control, and past experience. In addition to these psychological constructs, the questionnaire also collects demographic information such as age, gender, educational background, income level, and place of residence, enabling comparative analysis across different consumer segments.

The type of data collected is predominantly quantitative, focusing on numerical responses that reflect the strength of agreement or disagreement with statements related to each construct. The use of a five-point Likert scale allows for nuanced responses, capturing the intensity of respondents' attitudes and intentions toward consuming various animal protein sources.

For data analysis, the study utilizes Partial Least Squares Structural Equation Modeling (PLS-SEM) with the aid of SmartPLS software version 3.2.9. This method is appropriate for testing complex structural models involving latent variables and their respective indicators. The analysis begins with the evaluation of the outer model to assess convergent validity, discriminant validity, and internal consistency of the measurement scales. Convergent validity is examined using factor loadings and average variance extracted (AVE), while discriminant validity is evaluated using the Fornell-Larcker criterion. Internal consistency is measured using Cronbach's Alpha and Composite Reliability, both of which should exceed the recommended threshold of 0.7 (Hair et al., 2019).

Following the assessment of the measurement model, the inner model is analyzed to determine the strength and significance of the relationships between constructs. This involves examining path coefficients, t-values, and R<sup>2</sup> values to evaluate the predictive power of independent variables on the dependent variable—behavioral intention. Bootstrapping with 5,000 subsamples is employed to test the significance of the path coefficients, using a 5% significance level. A relationship is considered statistically significant if the t-statistic exceeds 1.645 (one-tailed test) and the p-value is less than 0.05 (Hair et al., 2022).

In addition, Multigroup Analysis (MGA) is conducted to explore whether the relationships between constructs differ significantly across selected demographic groups. This technique compares path coefficients across groups such as gender, age, education level, income, and geographic location (Java vs. non-Java regions). The MGA is performed using a bootstrapping procedure within PLS-SEM, and differences are considered significant when the p-value falls below or above the 0.05 threshold, indicating a moderating effect of the demographic variable on the structural relationships (Henseler et al., 2009; Sarstedt et al., 2011).

The questionnaire consists of five main sections: introduction, screening questions, respondent profile, core section, and closing remarks. The introduction provides background information about the researcher and the purpose of the study, along with instructions on how

to complete the questionnaire. The screening section filters respondents based on criteria such as regular consumption of animal protein in the last three to six months, age above 18 years, and access to food quality information. The respondent profile collects demographic data, including domicile, age, gender, occupation, and monthly income. The core section contains the main research variables, all measured using a 5-point Likert scale ranging from “strongly disagree” to “strongly agree.” Finally, the closing section thanks respondents for their participation and assures them of data confidentiality.

To ensure generalizability, the minimum sample size was determined by multiplying the number of indicators (29) by five, following Hair et al. (2019), resulting in a minimum required sample of 145 respondents. The sampling method used was non-probability sampling with a purposive approach, targeting adult consumers who regularly consume animal protein sources. This approach ensures that the collected data are relevant and representative of the broader Indonesian population.

By integrating past experience into the TPB model and applying multigroup analysis, this study aims to provide empirical insights into the psychological and social determinants of animal protein consumption in Indonesia. It contributes both theoretically to consumer behavior literature and practically to evidence-based policy and marketing strategies tailored to the Indonesian context.

## RESULTS AND DISCUSSION

This study aims to explore how psychological and social factors influence consumer behavioral intention toward animal protein consumption in Indonesia, particularly chicken, fish, eggs, and beef. The research integrates the Theory of Planned Behavior (TPB) framework with past experience as an additional construct, following Zhang et al. (2022). Data were collected through an online survey targeting adult consumers across various regions in Indonesia. A total of 523 valid responses were analyzed using Partial Least Square Structural Equation Modeling (PLS-SEM) via SmartPLS software version 3.2.9.

Prior to data analysis, a wording test was conducted with 10 respondents to ensure clarity and comprehension of the questionnaire items. Respondents provided feedback on unclear questions and suggested revisions. This process improved the readability and interpretability of the instrument, ensuring that all questions were clearly understood by participants during the main data collection phase.

A pre-test involving 65 respondents was carried out to assess the validity and reliability of the measurement model. Confirmatory Factor Analysis (CFA) was used to evaluate convergent validity, while the Fornell-Larcker criterion was applied to confirm discriminant validity. Internal consistency was measured using Cronbach’s Alpha and Composite Reliability. As shown in Table 4.4, all constructs demonstrated acceptable levels of validity and reliability, with Cronbach’s Alpha values above 0.6, indicating good internal consistency (Maholtra, 2016).

Descriptive statistical analysis revealed high average scores across all variables, suggesting strong positive attitudes, social norms, perceived behavioral control, and past experiences related to animal protein consumption. Behavioral Intention had a mean score of 4.485, indicating a strong tendency among respondents to continue consuming animal protein sources. Similarly, Attitude Toward Behavior showed a mean of 4.464, Subjective Norm

4.489, and Perceived Behavioral Control 4.491, reflecting favorable perceptions and supportive environments influencing consumer behavior.

The structural model evaluation confirmed a good fit between the proposed theoretical model and the empirical data. The Normed Fit Index (NFI) value was 0.951, and the Standardized Root Mean Square Residual (SRMR) was 0.028, both indicating an acceptable model fit (Hair et al., 2019). The coefficient of determination ( $R^2$ ) for Behavioral Intention was 0.704, meaning that 70.4% of its variance could be explained by the independent variables—Attitude Toward Behavior, Subjective Norm, Perceived Behavioral Control, and Past Experience. This suggests a strong explanatory power of the model in predicting consumer intentions.

Hypothesis testing revealed that all four constructs significantly influenced Behavioral Intention. Attitude Toward Behavior showed a significant positive effect (path coefficient = 0.218, t-statistic = 6.124, p-value < 0.001), supporting H1. This indicates that consumers who perceive animal protein as healthy, tasty, and beneficial are more likely to form strong intentions to consume it regularly. These findings align with previous studies showing that health consciousness and taste perception strongly drive food choices (Zhang et al., 2022; Wang et al., 2023).

Subjective Norm also had a statistically significant effect on Behavioral Intention (path coefficient = 0.317, t-statistic = 9.496, p-value < 0.001), supporting H2. Social influences such as family recommendations, peer discussions, or community expectations play a crucial role in shaping consumer decisions. This result is consistent with findings from Sun et al. (2022), which emphasized the importance of normative beliefs in collectivist societies like Indonesia, where food choices are often made collectively rather than individually.

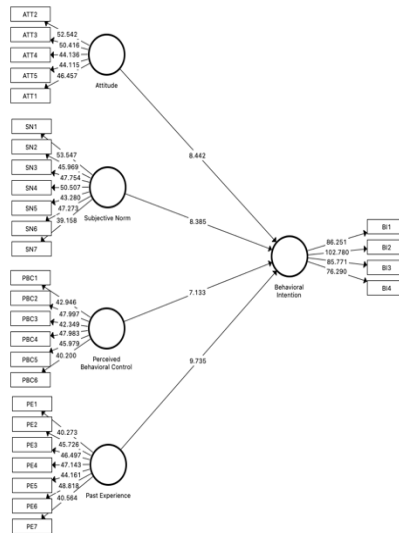
Perceived Behavioral Control significantly affected Behavioral Intention (path coefficient = 0.245, t-statistic = 7.813, p-value < 0.001), confirming H3. Consumers' belief in their ability to access and afford animal protein products is essential in determining whether they will act on their intentions. In Indonesia, availability in local markets, affordability, and ease of preparation are key facilitators of consumption. These findings support earlier studies that highlight the importance of accessibility in influencing dietary habits (Grunert et al., 2014; Rahmawati & Putra, 2023).

Finally, Past Experience was found to have the strongest impact on Behavioral Intention (path coefficient = 0.342, t-statistic = 10.962, p-value < 0.001), validating H4. Consumers who have previously consumed animal protein regularly are more likely to maintain those behaviors due to habit formation and familiarity. This result confirms the added value of incorporating past experience into the TPB model, as suggested by Zhang et al. (2022), and underscores the importance of habitual consumption patterns in shaping long-term dietary behavior.

Multigroup analysis was conducted to examine differences in behavioral tendencies across demographic groups. When comparing results by age group, no significant differences were found in the strength of relationships between constructs (p-value > 0.05), indicating that behavioral intention is similarly shaped across generations. However, when analyzing differences based on education level, significant variations emerged. Specifically, the relationship between Past Experience and Behavioral Intention was stronger among respondents with higher education (path coefficient difference = -0.242, p-value = 0.005),

suggesting that educated individuals may rely more heavily on prior experiences when making food choices.

Analysis based on income level also showed no statistically significant differences in path coefficients ( $p$ -value > 0.05), implying that regardless of economic status, consumers generally share similar motivations and constraints in relation to animal protein consumption. Similarly, no significant differences were observed between respondents living in Java and other regions, indicating that geographic location does not strongly moderate the relationships in this model.



**Figure 1**  
**Research Model**

**Table 1**  
**Hypothesis Testing**

Hypothesis	Path	Path Coefficient	t-statistic	p-value	Conclusion
H1	ATT -> Behavioral Intention	0.314	7.791	0.000	Accepted
H2	SN -> Behavioral Intention	0.317	9.496	0.000	Accepted
H3	PBC-> Behavioral Intention	0.291	7.124	0.000	Accepted
H4	PE -> Behavioral Intention	0.366	10.046	0.000	Accepted

These findings contribute to both theoretical and practical knowledge. From a theoretical perspective, the integration of past experience into the TPB model enhances its predictive power, especially in contexts where habitual behavior plays a significant role in decision-making. Practically, the results suggest that interventions aimed at increasing animal protein consumption should focus on reinforcing positive attitudes, leveraging social

norms, improving access and affordability, and encouraging repeated consumption to build habits.

## CONCLUSION

The findings of this study reveal that several psychological and social factors significantly influence consumer behavioral intention toward animal protein consumption in Indonesia. Attitude toward behavior was found to have a strong positive effect on behavioral intention, indicating that individuals with favorable perceptions of animal protein particularly regarding health benefits and taste are more likely to form strong intentions to consume it regularly. Subjective norm, while still significant, had a relatively lower impact compared to other constructs, suggesting that although social influences such as family and peer recommendations play a role, they are not the primary drivers of consumption decisions.

Perceived behavioral control emerged as a key determinant, highlighting the importance of accessibility, affordability, and ease of preparation in shaping consumer behavior. Most notably, past experience demonstrated the strongest influence on behavioral intention, underscoring the role of habitual consumption patterns and previous exposure in reinforcing future intentions. These results align with and extend the Theory of Planned Behavior (TPB) framework by emphasizing the added value of incorporating past experience into the model, particularly in food consumption contexts where routine and familiarity strongly affect choices (Ajzen, 1991; Zhang et al., 2022). Multigroup analysis revealed some variations across demographic groups—especially in terms of education level—where subjective norms and past experience showed differential effects between high- and low-educated consumers. However, most differences were not statistically significant, indicating a relatively consistent pattern of behavioral intention across gender and age groups.

Theoretical implications include the need to refine TPB by prioritizing perceived behavioral control and past experience in models predicting dietary behaviors. Practically, these findings suggest that strategies aimed at promoting animal protein consumption should focus on improving access and affordability, enhancing consumer knowledge about nutritional benefits, and leveraging habitual behaviors through repeated exposure and convenience-based marketing. Future research could expand on these findings by integrating economic and cultural variables, exploring alternative protein sources, and examining longitudinal changes in consumer attitudes and behaviors.

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