

Consumer Intention of Purchasing Plant-Based Milk in Indonesia

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ABSTRACT

Keywords: Attitude, Environment, Plant-Based Milk, Price.

In the context of achieving Sustainable Development Goals (SDGs), advancements in food technology, notably plant-based alternatives, are gaining popularity. Aligning with SDG targets such as good health and well-being (SDG 3), responsible consumption and production (SDG 12), and climate action (SDG 13), the adoption of plant-based milk signifies progress towards a sustainable food system. This study investigates the determinants influencing Indonesians' intention to purchase plant-based milk, addressing a notable research gap in developing markets. The study collected data from 300 respondents through social media, resulting in 297 valid responses. Analysis using SMARTPLS reveals that attitude, environmental concern, health consciousness, price, and subjective norms all have a significant relationship with the intention to purchase plant-based milk, with attitude and environment identified as the most potent drivers. These findings have practical implications for plant-based milk business managers and other stakeholders interested in improving their competitiveness while contributing to a more sustainable environment.



Introduction

As global demand and awareness for plant-based food continue to increase (Suhartanto et al., 2022), the plant-based milk market is predicted to proliferate, fueled by the rise of the vegan lifestyle. Indonesia has become the third-highest country in terms of vegetarianism growth, according to a Euromonitor International survey in 2018 (Dewi, Kurniati, & Dalilah, 2022). Furthermore, data from the European Union Indonesia Business Network (EIBN) in 2019 projected a rise in milk alternative sales from US\$ 39.6 million to US\$ 53.8 million in Indonesia by 2022, indicating a growing market interest in more sustainable, ethical, and healthier product alternatives (Dewi et al., 2022). Many factors influence the consumer choice of plant-based milk analogs. One important factor driving consumer interest in plant-based alternatives is the growing public awareness of the environmental impact of food production, which relates to SDG 12. With food production responsible for a sizeable 37% of greenhouse gas (GHG) emissions,

seeking more sustainable options is essential (Ercin et al., 2012). In this context, plant-based foods have emerged as an attractive option, producing only half the emissions compared with their animal-based counterparts.

A study has shown that cows' milk contributes up to 3.5 times more water footprint than its plant-based peers (Silva, Silva, & Ribeiro, 2020) and is one of the most significant greenhouse gas contributors environmentally (Haas, Schnepps, Pichler, & Meixner, 2019). This relates to SDG 13 on climate action, consumers increasingly know that industrial livestock contributes to global warming. As awareness of environmental concerns about food production grows, plant-based milk is increasingly seen as the most viable alternative for consumers seeking a more sustainable option.

Besides its environmental impact, growing plant-based milk consumption is for health reasons such as lactose intolerance or a lifestyle choice. The rise of highly processed foods and changing lifestyles has led to an increase in diet-related chronic diseases, such as type-2 diabetes, obesity, cancer, and cardiovascular diseases, as highlighted by research. This relates to SDG 3 of good health and well-being. However, recent studies have shown a significant correlation between plant-based foods and preventing mortality and cardiometabolic diseases (Lennernäs et al., 1997). An overall plant-based diet has been linked to a lower risk of type-2 diabetes and cardiovascular diseases. These findings are supported by (Ercin et al., 2012), who note that health concerns are a key factor driving the growing popularity of plant-based foods among young, urban Indonesians.

Along with health concerns, previous studies also confirmed a positive influence on attitudes and purchase intentions toward plant-based milk (Vanga & Raghavan, 2018), with subjective norms as an essential driving variable towards attitude.

Customers also consider price an essential factor in food choice (Lennernäs et al., 1997) and have suggested it become a factor in purchasing plant-based milk. Recent research by (Wang & Scrimgeour, 2021) indicates that price is the second most crucial factor in purchasing plant-based milk.

While consumer attitudes toward plant-based diets have been extensively studied in Western developed countries, research in developing Asian countries such as Indonesia is limited. Despite being the fourth largest country in the world, Indonesia has only recently entered the vegetarian food market, primarily among the middle-upper class. As plant-based milk alternatives become increasingly popular, it is essential to understand consumer behavior in this emerging market.

This is particularly important given the significant role that developing countries play in contributing to the sustainability of the global food system (Wang & Scrimgeour, 2021). As food trends shift toward vegetarianism in Indonesia, there is a unique opportunity for businesses to develop and strengthen strategies that promote sustainable behavior. This research aims to investigate the variables that drive consumer intention to purchase plant-based milk in Indonesia on the theme of sustainable innovations in food technology using the Theory of Planned Behavior (TPB). This study aims to contribute

to the literature on plant-based milk purchase intention in developing countries, providing marketers with a deeper understanding of consumer behavior in this emerging market.

Plant-based Product

Based on data from the, milk is the plant-based product with the highest growth in US plant-based food sales in 2021. Notably, a 4% increase in plant-based milk sales corresponds to a 2% decrease in animal-based milk sales. Sethi et al. (2016) highlight that plant-based milk is a growing segment using the latest technology in food product development and specialty beverages globally. Define plant-based milk as a water-soluble extract made from legumes, pseudocereals, cereals, oilseeds, vegetables, and nuts. The most significant components used to create plant-based milk are plant sources, water, emulsifiers, and additives. Plant-based milk benefits health or nutrition, the environment, and animal welfare because it does not involve animals. This has led to an increasing trend in the consumption of plant-based milk globally.

Theory of Planned Behavior

A modified theory of planned behavior (TPB) is used to identify which factors affect consumer attitudes and intention to purchase plant-based milk in Indonesian consumers. TPB is commonly used to study the relationships among attitudes, beliefs, and behavior in many areas, such as advertising, healthcare, and information systems. The TPB is employed in this study because previous research has demonstrated a significant association between attitude and subjective norms with consumer purchase intention.

Although initial studies on Western consumers have used the three-factor TPB to assess attitudes toward plant-based products (Pandey et al., 2021; Wang & Scrimgeour, 2021), this research aims to expand the model by incorporating environmental and health concerns, which have been identified as significant motivating factors in other studies related to plant-based diets.

Research Methods

This quantitative research targeted consumers in Indonesia, specifically those who have consumed plant-based before and those living in the Greater Jakarta area (Jakarta, Bogor, Depok, Tangerang, and Bekasi), representing the country's most populated area. Purposive sampling methods were applied in this research. The Google form link for the questionnaire was distributed randomly via WhatsApp, Instagram, and LinkedIn. To ensure the participants met the requirements, a filtering question was asked before participants were able to access the survey. A five-point Likert scale was adopted for the variables to determine how intensely subjects agreed or disagreed (Sekaran & Bougie, 2016). The questionnaire was developed based on past literature reviews and modified to adjust to the validity of the content.

For the price, five questions were adopted. For attitude, five questions were adopted from (Austgulen et al., 2018). For purchase intention, three questions were adopted from (Sethi et al., 2016). Participants' demographics were asked over the remaining six questions in the last section.

There were 37 bilingual questions in the questionnaire (English and Indonesian), and the questionnaire was distributed with a target of 300 respondents to become the minimum size sample for stability. Data collection was processed and analyzed through path analysis, descriptive analysis, and Partial Least Squares Structural Equation Modeling (PLS-SEM) in Smart PLS-3 software. The data was collected from March to April 2023. Three hundred questionnaires were distributed, and 297 respondents (response rate = 99%) met the requirements.

Results and Discussion

The profile of the respondents is shown in Table 1, with 50.2% (n=149) of respondents male, while 49.8% were female. Most of the respondents were in the age group of 20 to 30 years old (55.6%), followed by 31 to 40 years old (19.2%), 41 to 50 years old (14.1%), and below 20 years old (1.3%). Almost all of the respondents had university degrees (83.5%). This shows that the respondents were well-educated and capable of making sensible decisions. For the income per month, the majority of them earned Rp. 3,800,001 to Rp. Ten million per month (40.1%) indicated respondents had buying power in the market. For occupation, most of the respondents were private employees (n= 221, 74.4%).

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Table I
Demographic Profile Of Respondents

| Category | | Frequency | Percentage |
|----------------|-------------|-----------|------------|
| Gender | Male | 149 | 50.2 |
| | Female | 148 | 49.8 |
| Age | Below 20 | 4 | 1.3 |
| | 20-30 | 165 | 55.6 |
| | 31-40 | 57 | 19.2 |
| | 41-50 | 42 | 14.1 |
| | Above 51 | 29 | 9.8 |
| Last Education | High school | 24 | 8.1 |

| | | | |
|------------------|--------------------------------|-----|------|
| | Diploma | 22 | 7.4 |
| | Undergraduate | 215 | 72.4 |
| | Master or doctoral | 36 | 12,1 |
| Income per month | < Rp. 3,800,000 | 34 | 11.4 |
| | Rp. 3,800,001 - Rp. 10,000,000 | 119 | 40.1 |
| | Rp. 10,000,001 - Rp.20,000,000 | 76 | 25.6 |
| | > Rp. 20,000,001 | 68 | 22.9 |
| Occupation | Private employee | 221 | 74.4 |
| | Entrepreneur | 35 | 11.8 |
| | Student | 19 | 6.4 |
| | Housewife | 16 | 5.4 |
| | Retired | 6 | 2.0 |

Measurement Model

The current study used a two-step approach. Step one was to know the reliability and validity. The measurement model and structural model needed to be tested.

The reliability was tested using Cronbach's Alpha, and composite reliability (CR) exceeded a threshold of 0.7. The average variance extracted (AVE) needed more than 0.5. The results showed that only one item (price-1) was below the standard value, so the item

was removed. A discriminate validity test states that the square root of a construct's average variance must be larger than the correlation between the construct and any other construct. The reliability and validity test showed that data items had values between 0.828 to 0.931 for Cronbach's Alpha, 0.888 to 0.948 for composite reliability, and 0.604 to 0.785 for AVE. The results are displayed in Tables 2 and 3.

Table 2
Assessment Of Structural Model

| Variables | Items | Loadings | Cronbach's Alpha | rho_A | Composite Reliability | AVE |
|---------------------------|--------------|-----------------|-------------------------|--------------|------------------------------|------------|
| Attitude(ATT) | A1 | 0.866 | 0.931 | 0.932 | 0.948 | 0.785 |
| | A2 | 0.910 | | | | |
| | A3 | 0.878 | | | | |
| | A4 | 0.899 | | | | |
| | A5 | 0.875 | | | | |
| Environment Concern (EC) | EC1 | 0.851 | 0.907 | 0.916 | 0.930 | 0.727 |
| | EC2 | 0.851 | | | | |
| | EC3 | 0.873 | | | | |
| | EC4 | 0.867 | | | | |
| | EC5 | 0.822 | | | | |
| Health Consciousness (HC) | HC1 | 0.805 | 0.906 | 0.913 | 0.924 | 0.604 |
| | HC2 | 0.845 | | | | |
| | HC3 | 0.714 | | | | |

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|----------------------------|-----|-------|-------|-------|-------|-------|
| | HC4 | 0.712 | | | | |
| | HC5 | 0.755 | | | | |
| | HC6 | 0.805 | | | | |
| | HC7 | 0.783 | | | | |
| | HC8 | 0.791 | | | | |
| Intention to Purchase (IP) | IP1 | 0.909 | 0.906 | 0.907 | 0.941 | 0.842 |
| | IP2 | 0.925 | | | | |
| | IP3 | 0.920 | | | | |
| Price (P) | P2 | 0.667 | 0.828 | 0.852 | 0.888 | 0.668 |
| | P3 | 0.819 | | | | |
| | P4 | 0.855 | | | | |
| | P5 | 0.884 | | | | |
| Subjective Norms (SN) | SN1 | 0.727 | 0.920 | 0.922 | 0.941 | 0.762 |
| | SN2 | 0.912 | | | | |
| | SN3 | 0.936 | | | | |
| | SN4 | 0.896 | | | | |
| | SN5 | 0.878 | | | | |

Table 3
Criteria Of Fornell And Larcker Discriminant Validity

| | ATT | EC | HC | IP | P | SN |
|--------------------------|------------|-----------|-----------|-----------|----------|-----------|
| Attitude | 0.886 | | | | | |
| Environment Concern | 0.734 | 0.853 | | | | |
| Health Consciousness | 0.718 | 0.767 | 0.777 | | | |
| Intention to Purchase | 0.845 | 0.666 | 0.656 | 0.918 | | |
| Price | 0.724 | 0.686 | 0.724 | 0.681 | 0.817 | |
| Subjective Norms | 0.701 | 0.688 | 0.679 | 0.651 | 0.680 | 0.87 3 |

Structural Model

The hypothetical relationship was tested using structural equation modeling (PLS-SEM). PLS-SEM is one of the methods of choice for structural equation modeling that made this model eligible to be tested. When using PLS-SEM, the major assessment criterion for the structural model is R², assessed with the significance level of the path coefficients. As a consequence, in comparison with the research discipline. Table 4 shows the structural model results that stated 63% allocated variant to attitude and 72% price variant to intention to purchase. This concludes that price is an independent variable affecting the dependent variable.

Table 4
Structural Model

| Construct | R² | Adjusted R² | p-Value |
|--------------------------|----------------------|-------------------------------|----------------|
| Attitude | 0.639 | 0.635 | 0.000 |
| Intention to Purchase | 0.724 | 0.722 | 0.003 |

Figure 2 shows the path coefficient and significance level. The model was run using 5,000 bootstrapping samples from 297 responses. A direct relationship was tested, and all

the hypotheses were significant and positive. The results of the hypothesis analysis are summarized in Table 5.

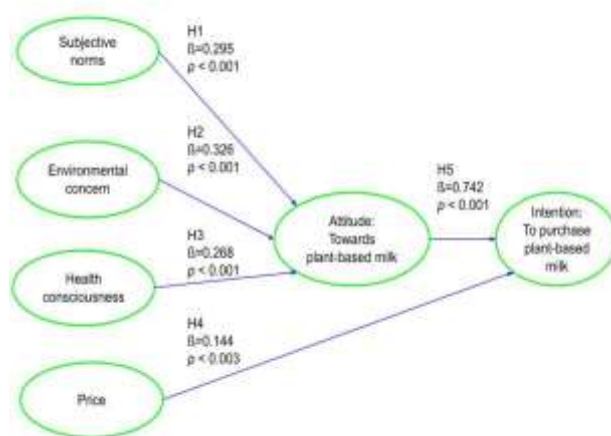


Figure 2
Patch coefficient of the model

Table 5
Path Coefficients

| Hypothesis | Relationship | β -Value | T-Statistic | p -Value | |
|------------|--------------|----------------|-------------|------------|-----------|
| H1 | SN → ATT | 0.295 | 5.550 | 0.000 | Supported |
| H2 | EC → ATT | 0.326 | 5.197 | 0.000 | Supported |
| H3 | HC → ATT | 0.268 | 4.108 | 0.000 | Supported |
| H4 | P → IP | 0.144 | 2.944 | 0.003 | Supported |
| H5 | ATT → IP | 0.742 | 16.512 | 0.000 | Supported |

Table 5 shows the following: SN → ATT ($\beta=0.295$, $t = 5.550$, $p < 0.001$), EC → ATT ($\beta=0.326$, $t = 5.197$, $p < 0.001$), HC → ATT ($\beta=0.268$, $t = 4.108$, $p < 0.001$) P → IP ($\beta=0.144$, $t = 2.944$, $p < 0.001$) and ATT → IP ($\beta=0.742$, $t = 16.512$, $p < 0.001$).

This study supported all the hypotheses; subjective norms and attitude (H1) showed the social influence or pressure from family and close friends on attitude toward plant-

based milk is perceived as positive and significant by an individual, which results in the individual developing a more positive attitude towards plant-based milk. This is in line with the study by Tarkiainen and Sundqvist, which shows that subjective norms influence the attitudes of consumers buying organic food in Finland.

The second hypothesis also showed a significant positive relationship between environmental concern and attitude (H2). This indicated that more environmentally conscious people may be more likely to consider the environmental impact of their food choices and make choices if the product is more sustainable and environmentally friendly to purchase. Several studies show the same result. In contrast, a study by [26] on consumers of organic products in Aceh shows no significant effect of environmental concern on attitude. This can happen because consumers in the area are more concerned about their health than environmental consciousness.

A significant and positive relationship was seen between health consciousness and attitude (H3). This showed that health consciousness could shape an individual's attitude toward plant-based products that claim to be healthier. This conclusion supports previous research that showed health consciousness directly had a significant and positive effect on attitude.

This study also gave price and intention to purchase a positive relationship (H4). With this result, it can be seen that the price of the plant-based product, which is usually more expensive than regular milk, does not give individuals any problems to purchase because they see that a high-quality product comes with a high cost. In addition, the profiles of many respondents showed that their salaries were above the range of Indonesia's minimum wage. Similar studies showed the same result that price and intention to purchase had a positive relationship [1], [15], [53]. This is opposite to the study conducted by Warganegara & Babolian Hendijani (2022), which showed no significant and positive relationship between price and intention to purchase online grocery shopping in Indonesia because the benefits of online grocery shopping were limited.

The last variable also showed that attitude and intention to purchase had a positive relationship (H5). The more positive buyers felt about plant-based milk, the more they would purchase it. Several studies supported this finding that consumer attitudes toward plant-based milk would affect their intention to purchase [12], [15], [27], [28], [45], [60]. This study found that environmental concerns had the highest effect on attitude, with a β -Value of 0.326, showing that growing awareness of environmental issues impacted the choice of a more environmentally friendly product. This was also supported in studies by Reyes-Jurado et al. (2023) that showed plant-based milk was more sustainable than dairy milk. In addition, the attitude had the highest effect on the intention to purchase plant-based milk with a β -value of 0.742, meaning that consumers with a more positive attitude about plant-based milk were more likely to display an intention to purchase plant-based milk. Similar results were also shown in studies of green purchase behavior among Malaysian and Chinese Millennial cohorts [6], [60].

Conclusion

In conclusion, this study found that subjective norms, environmental concerns, and health consciousness all positively and significantly impacted consumer attitudes toward plant-based milk. Additionally, price and attitude influence consumers' intentions to purchase plant-based milk. In this study, attitude and environment were the two strongest driving variables of consumer intention toward plant-based milk.

The findings of this study were consistent with prior research conducted in Finland, where the environment was identified as the most influential factor driving consumer intention. This may be attributed to recent research demonstrating that consumers who reacted positively to environmentally friendly products tended to have stronger purchasing intentions, providing insight into why attitude and environment emerged as the strongest drivers in this study. However, these results contrasted with other consumers, such as the Greeks, where health or nutrition was identified as the strongest driver of intention. Similarly, studies conducted in China and New Zealand identified subjective norms as the strongest influence on intention.

These discrepancies highlight the need for further research to explore how cultural behavior and country-specific factors may affect the prominence of each variable in shaping consumer intention. This study illuminates a knowledge gap within the plant-based food and beverage sector, emphasizing the pressing need for further investigation into sustainable food technology.

However, our findings unveil a promising trend: Indonesian consumers exhibit a notably positive attitude towards sustainable food production and consumption, particularly concerning plant-based milk. The evolving landscape of sustainable food technology may differ across countries, influencing consumer preferences and behaviors. Understanding these dynamics is pivotal for businesses aiming to navigate diverse markets effectively. In conclusion, as consumer awareness and demand for sustainable food options continue to grow, it becomes increasingly imperative for businesses to adapt and innovate their products and processes accordingly. The dynamic nature of food technology presents the need for ongoing innovation to advance toward more sustainable goals.

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