Green harvest: consumer attitudes as seeds of change towards a sustainable food revolution

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Abstract. The breakthrough of organic food plays a crucial role in mitigating climate change. This is based on several research findings stating that organic food can reduce the use of chemicals, improve soil conditions, reduce greenhouse gas emissions, and support biodiversity. However, the high price constraint of organic food leads most people to prefer non-organic food daily. The focus of this research is to determine the level of consumer willingness to pay more (WTPM) for organic food by examining the role of knowledge of organic food (OFK), price consciousness (PC), and consumer attitudes (CA). The 300 respondents were collected from all islands in Indonesia, including Java, Bali, Kalimantan, Sumatra, Nusa Tenggara, Sulawesi, Bangka Belitung, and Papua. This study uses Structural Equation Modeling (SEM) to test the research hypothesis. The research results indicate that OFK and PC directly and significantly influence CA. Furthermore, PC and CA also directly and significantly affect WTPM. Interestingly, OFK does not directly drive consumer WTPM. On the other hand, CA plays a significant mediating role between OFK and PC regarding WTPM. The implications of this research finding are that to increase the adoption of organic food as a climate change mitigation measure; efforts are needed to enhance consumers’ knowledge and awareness of the benefits of organic food to form a more positive attitude towards the product. This, in turn, can improve their willingness to pay a slightly higher price to support organic food consumption in Indonesia.

1 Introduction

In the past two decades, global organic food sales have experienced phenomenal growth, rising from $18 billion in 2000 to $132.74 billion in 2021 [1], and is expected to reach $294.54 billion by 2023 at a CAGR of 13.7% [2]. However, this positive growth occurs within a broader global context, where regional factors and specific economic conditions influence consumer consumption patterns. While organic food is becoming a mainstream choice in many European and North American countries [3], social and economic challenges in developing countries such as Indonesia may limit access and adoption of organic food despite the potential benefits.

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Organic food, far from being just a contemporary trend, is pivotal in global climate change mitigation and sustainability efforts. Its cultivation bolsters soil health, cuts greenhouse gas emissions, and produces superior-quality food, promoting ecological stability and human health [4,5]. Despite these advantages, the global market share of organic products is still minor, only about 5% [3]. This is particularly evident in developing countries such as Indonesia, where people are aware of organic food's health and environmental benefits but are still hesitant to consume it, mainly due to cost concerns [6]. Higher prices often deter the general public, who are focused on efficient daily spending, causing stagnation in the growth of the organic food market.

While numerous studies have identified factors influencing low organic food consumption, including higher perceived prices and a lack of understanding of its benefits [6,7], more profound challenges related to pricing still need to be solved. The tendency of organic food to command higher prices than conventional food often serves as a primary barrier for consumers despite their awareness of the associated ecological and health advantages [8]. Therefore, this study aims to analyze the impact of knowledge about organic food and price consciousness on consumer attitudes and intentions to consume organic food products.

This study uses Ajzen's Theory of Planned Behavior (TPB) to explore the factors influencing consumers to switch to organic food [9], using the willingness to pay more as a proxy for behavioral intention [10]. We aim to provide insights into pricing strategies that make organic food more accessible to low- and middle-income Indonesians. The findings will guide policymakers in promoting the understanding and consumption of organic food in developing countries, particularly Indonesia, and provide insight into the impact of price on the acceptability of organic food.

2 Materials and Method

2.1 Materials

This study examines the phenomenon of organic food consumption in Indonesia by taking a sample of respondents consisting of regular consumers or those who have at least once consumed organic food, with a minimum age of 17 years. The sample selection includes the islands of Java, Bali, Kalimantan, Sumatra, Nusa Tenggara, Sulawesi, Bangka Belitung, and Papua. Data was collected through an online questionnaire (Google Form) distributed via WhatsApp and Instagram messages, which was explicitly addressed to organic food consumers using a purposive sampling method. The questionnaire instrument consisted of 13 questions answered on a four-level Likert scale ranging from strongly disagree to agree strongly. This questionnaire is based on existing literature [11–13]. From a total of 305 respondents, we processed data from 300 respondents, as some data were incomplete and there were outliers. The collected data were analyzed using Partial Least Squares (PLS) within the Structural Equation Model (SEM) framework.

2.2 Method

2.2.1 Hypotheses Development.

The Theory of Planned Behavior (TPB) has been frequently used to study behavioral intentions, including its application in pro-environmental behavior [9,14]. Several studies have demonstrated its effectiveness in predicting consumers' purchase intentions for green products [15] and their readiness to pay more [16]. At its core, the TPB examines the attitudes individuals perceive and approach behavior [17]. A wealth of evidence underscores a robust correlation between attitudes and the inclination to invest more in eco-friendly products. Kirmani's research [16] found that attitudes toward green products significantly and positively influence the willingness to pay a premium. However, Pileliene and Tamuliene's
findings [18] diverged from this perspective, suggesting that consumers in Lithuania maintain a negative attitude towards organic food and are disinclined to pay higher prices for such products. Given the discrepancies in previous research outcomes, this study seeks to revalidate the relationship between attitudes and willingness to pay more, leading to the formulation of the following hypothesis:

**H1:** Attitudes towards organic food significantly influence the willingness to pay more

Consumer knowledge significantly influences purchasing decisions. When individuals assimilate and analyze product information, their depth of understanding greatly influences their interpretation of product labels, tags, and displays [19]. A study conducted by Peterson et al. [21] indicated that a deep understanding of environmental impact enhances consumers' confidence and appreciation of the benefits associated with organic food. This underscores the pivotal role of consumer awareness and knowledge of organic food in shaping their purchase decisions. Previous studies have consistently supported that knowledge about organic food influences consumers' attitudes toward such products [14], subsequently affecting their willingness to pay more [10,16]. Based on these findings, the following hypothesis is proposed:

**H2:** Product knowledge significantly affects attitudes toward organic food

**H3:** Product knowledge substantially affects the willingness to pay more

Price is pivotal in shaping consumer attitudes and intentions regarding product purchases. Despite various factors fostering a cheerful disposition towards organic food products, their typically higher costs than conventional food often serve as a deterrent [20]. This scenario is particularly noticeable among consumers who prioritize affordability, revealing a potential negative correlation between price consciousness and the propensity to purchase organic food [21]. Contrarily, recent research by Matharu et al. [22] indicates that price consciousness does not significantly diminish the enthusiasm or purchase intent for organic food among young Indian university students. This inconsistency in empirical insights necessitates further investigation into the dynamics of the relationship. Therefore, this study seeks to shed light on this aspect by proposing the following hypothesis:

**H4:** Price consciousness negatively influences consumer attitudes toward organic food

**H5:** Price consciousness has a negative influence on the willingness to pay more for organic food

There is ample evidence indicating a cause-and-effect relationship among product knowledge (PK), price consciousness (PC), consumer attitude (CA), and willingness to pay more (WTPM) [12,16,22,23]. Several researchers have investigated PK, PC, CA, and WTPM relationships. Sun and Wang [14] and Suprihartini et al. [24] have identified direct relationships among these variables, with PK and PC influencing CA and CA affecting WTPM. However, previous research has yet to explore the potential mediating role of CA in connecting PK, PC, and WTPM. Previous studies have established that PK affects CA, and both PK and PC positively influence CA, with CA having a direct positive impact on WTPM. Furthermore, CA has been recognized as a crucial factor and has been considered a mediator in several studies [14,15]. Based on these findings, this study incorporates attitudes toward organic food as a mediator, formulating the following mediation hypotheses:

**H6:** CA mediates the negative effect of PC on consumers' WTPM for organic products

**H7:** CA mediates the effect of PK on consumers' WTPM for organic food products.
3 Results and Discussion

3.1 Descriptive Statistics

The demographic characteristics of the respondents in this study have been categorized based on several factors, namely gender (36% male, 64% female), age (with the majority of respondents falling within the age range of 17-26 years, 55%), family income level (where the majority of respondents have an income between 1-3 million, 46%), and also based on educational level (divided into three categories: high school, bachelor's degree, and postgraduate), with the majority of respondents having a bachelor's degree education background (45%). Additionally, most respondents responded that the reasonable price difference for consuming organic food over non-organic food is approximately 10-20% (47%). This result is in line with the findings of Suharjo et al. [27] in Indonesia and Kranjac et al. [25] in Serbia, that consumers are willing to pay more for organic food with a difference of 10%-20% compared to conventional food.

3.2 Indicator Test

In indicator evaluation, analysis is conducted on the measurement model to evaluate validity and reliability based on specific criteria. These criteria include convergent validity evaluated based on factor loadings, discriminant validity through Average Variance Extracted (AVE), and composite reliability based on Composite Reliability. The findings showed factor loadings for all indicators exceeded 0.6, which confirmed their validity based on significant correlations with their constructs. Furthermore, the discriminant validity of each variable was identified as good, with AVE values exceeding 0.50. Overall, composite reliabilities for all constructs proved firm, with values above 0.70, indicating high consistency and stability. In conclusion, the instrument proved reliable in measuring the variables under study, with integrity that has been exhaustively validated [26].

3.3 Hypothesis Testing

This study proposed seven predictions of causal relationships. Statistical analysis confirmed six relationships while not confirming one relationship, H2. Hypothesis testing was conducted using SmartPLS 3.3, applying the Bootstrapping method, and focusing on the T-statistic and P-value. Critical evaluation criteria included the T-statistic value to be greater than 1.96, the P-value to be less than 0.05 (5%), and the requirement for the beta coefficient to be positive. Full details of the hypothesis testing results are presented in Table 1.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Effect</th>
<th>Original Sample (O)</th>
<th>T Statistics (O/STDEV)</th>
<th>P Values</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1 OFK -&gt; CA</td>
<td>Direct</td>
<td>0.384</td>
<td>5.891</td>
<td>0.000</td>
<td>Accepted</td>
</tr>
<tr>
<td>H2 OFK -&gt; WTPM</td>
<td>Direct</td>
<td>0.146</td>
<td>1.561</td>
<td>0.12</td>
<td>Rejected</td>
</tr>
<tr>
<td>H3 PC -&gt; CA</td>
<td>Direct</td>
<td>0.425</td>
<td>6.079</td>
<td>0.000</td>
<td>Accepted</td>
</tr>
<tr>
<td>H4 PC -&gt; WTPM</td>
<td>Direct</td>
<td>0.423</td>
<td>5.177</td>
<td>0.000</td>
<td>Accepted</td>
</tr>
<tr>
<td>H5 CA -&gt; WTPM</td>
<td>Direct</td>
<td>0.212</td>
<td>2.576</td>
<td>0.01</td>
<td>Accepted</td>
</tr>
<tr>
<td>H6 OFK -&gt; CA -&gt; WTPM</td>
<td>Indirect</td>
<td>0.081</td>
<td>2.152</td>
<td>0.032</td>
<td>Accepted</td>
</tr>
<tr>
<td>H7 PC -&gt; CA -&gt; WTPM</td>
<td>Indirect</td>
<td>0.09</td>
<td>2.493</td>
<td>0.013</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

Based on the results of the path coefficient in Table 1, the meal can be explained as follows: The results of this analysis reaffirm that individuals' attitudes toward organic food significantly impact their willingness to pay more. These attitudes are fundamentally influenced by experiences and personal beliefs, which are constructed through various forms
of education related to the health benefits of organic food, as well as support for environmental issues. This finding is consistent with Kirmani's research [16], where people responded positively despite the higher price of organic food.

The analysis also shows that a more profound knowledge of organic food correlates with a more positive attitude. This understanding reduces consumer hesitation and creates a positive emotional response due to its nutritional quality. This knowledge can also influence social perceptions, encourage consumption, and change views on its price. This finding aligns with the study of Peterson et al. [27], who asserted that knowledge influences consumer appreciation and trust in organic food.

However, the results of our analysis show that even if there is knowledge about organic food, this does not necessarily correlate with willingness to pay more. Contrary to what we hypothesized, there is no significant influence between knowledge and willingness to pay more. Factors such as price considerations and socio-cultural aspects may influence purchasing decisions. This is consistent with Khoirunnisa's [28] findings, which indicate that good knowledge about a product does not always result in a desire to buy it.

In addition, the results showed a negative but significant correlation between price awareness and attitude and willingness to pay more for organic food. The more sensitive consumers are to price, the less likely they are to be willing to pay more for organic food. This is consistent with the research of Aschemann-Witzel and Zielke [29], who found that price is a significant barrier to purchasing organic food.

In light of these findings, individual attitudes are critical in linking consumers' knowledge and willingness to incur additional costs, especially in the 10-20% range [30]. Our research revealed that, although organic food is often perceived as exclusive and expensive [6], a 10-20% increase in organic food is still affordable for low- to middle-income consumers in Indonesia. This signifies the unexplored potential to increase organic food penetration in this segment. Through careful pricing strategies and inclusive tactics such as subsidies or discount programs, access to organic food can be expanded, embracing consumers from different economic strata. This approach opens up new opportunities for producers and supports healthier and more sustainable consumption in an increasingly diverse society.

Therefore, policymakers and producers must design inclusive approaches that focus on making pricing more affordable and making organic food accessible to different segments of society, including those with low and middle incomes.

4 Conclusion

This study confirmed the significant impact of attitude towards organic food on willingness to pay more for organic food. Product knowledge shapes positive attitudes, although the effect on willingness to pay more is insignificant. On the other hand, price awareness has a significant influence on attitude as well as willingness to pay more for organic food. In this context, attitude towards organic food is a potential mediator between the effects of product knowledge and price awareness on willingness to pay more. This study clarifies previous findings on the tolerance limit of price increases, which is around 10-20%, which can be an essential guide in formulating tax incentives. This will facilitate access to organic food for various segments of Indonesian society. By utilizing practical literacy and appropriate marketing strategies, organic food consumption can be increased sustainably, thus potentially contributing to climate change mitigation.

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