CONSUMER'S PERCEPTION OF ORGANIC VEGETABLES TRACEABILITY IN JABODETABEK

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Abstract

Organic vegetables are one of the choices in ensuring safe and quality food that is beneficial for health. However, efforts to ensure organic vegetables that are free from pesticides or other chemicals must still be made as an effort to improve the quality of life. The purpose of this study was to determine customer perceptions of food traceability information on organic vegetables. The method used by the researcher was a quantitative method with descriptive statistical and perceptual analysis. Data were obtained by distributing questionnaires via Google Form. The technique used in selecting respondents was convenience sampling. Perceptions of food traceability information were assessed through five variables, namely informativeness, trustworthiness, food safety, reliability, product diagnosticity. Food traceability information on organic vegetables was rated very high on the five attributes of traceability information, namely informativeness, trustworthiness, food safety, reliability and product diagnosticity. The results showed that there was a significant difference between men and women in assessing the five attributes. Female respondents tended to rate the five attributes of traceability information on organic vegetables lower than male respondents. Suggestions for further research are that the objects used can be replaced with other food products or other research areas.

Keywords: Food Safety, Food Traceability, Information Perception, Organic Vegetables

INTRODUCTION

The increase in people's consumption of organic vegetables is in line with the increasing awareness of living a healthy lifestyle. Nutritional values and nutrients are things that are considered in consuming food. Based on data from the Indonesian Organic Agriculture Statistics in 2023, organic vegetables are one of the three most frequently consumed organic products. However, the amount of organic vegetable production shows a fluctuating trend every year. The highest production was 5400 tons in 2021. In addition, the decline in the budget for purchasing organic vegetables is also evidence of the decline in the level of purchasing and consumption of organic vegetables.

Organic vegetables are one of the choices in ensuring safe and quality food that is beneficial for health. However, efforts to ensure that organic vegetables are free from pesticides or other chemicals must continue to be made as an effort to improve the quality of life. The issue of food safety is still a problem today. Food safety problems can occur due to biological contamination, chemical contamination, physical contamination, misuse of prohibited substances and the use of food additives that exceed the maximum limit. In Indonesia itself, there were 72 food poisoning in 2022, where the number increased from the previous year, which was 50 cases (BPOM 2022). In addition, the latest issue in 2025 is the food poisoning from the Free Nutritional Meal Program or Indonesian called it as MBG (Makan Bergizi Gratis) which has been determined as a national food poisoning case. The issue of food safety is one of the public's concerns in consuming food whose quality and safety are not guaranteed.

Ensuring food safety is important to respond the issues in the food industry. Food distribution from producers to consumers is something that needs to be considered. Food traceability is one of the tools that food providers must currently master, playing an important role in improving food safety. Food traceability began to be implemented in the European Union in 2005 for agricultural commodities, namely the General Food Law. In Indonesia, food safety has been regulated in Government Regulation (PP) No. 86 of 2019, while food traceability is a mandatory capability that must be possessed by the food industry regulated in Perka BPOM No. 22 of 2017.

The determining factors of traceability in verifying good production practices include the customer's locus of control (Myae and Ellen 2012). Before deciding to buy and consume food, customers have expectations of product quality according to individual perceptions. Traceability information, such as composition and raw materials, nutritional content, producer data, production date, and certification logos from BPOM, Halal and SNI, contribute to increasing customer comfort in terms of quality assurance (Menozzi et al. 2015). In addition, growing public awareness will motivate farmers, producers and exporters to provide better traceability standards.

Organic claims may be enough to indicate the quality of food ingredients, but quality assurance from independent parties is needed. In the Indonesian Organic Agriculture Statistics in its survey, it was stated that respondents who stated that organic products still needed assurance increased from 73 percent in 2019 to 86 percent in 2022. This could be one of the causes of the decline in public interest in buying organic products. The researcher wants to know whether the existing traceability information is considered good by customers, so that the procurement of further traceability information carried out by producers or

independent parties procuring organic certificates can adjust the findings of this study. The aspects of traceability information used in this study are informativeness, trustworthiness, food safety, reliability and product diagnosticity (Choe et al. 2009; Chen & Chien-Hsien 2013; Yuan et al. 2020; Wu et al. 2021). Thus, this study aims to determine customer perceptions of food traceability information on organic vegetables.

REVIEW OF LITERATURE

Perception is an individual's assessment of an object that is passed through the process of selecting, organizing and interpreting information into a meaning. Customer perception is important for business people in developing their business. According to Gaspersz (1997), perception is influenced by several factors, namely the individual's past experience, desires or hopes and experiences of friends or those closest to them. Nasution (2005) added, in addition to these three things, perception is also influenced by advertising and marketing, where advertising and marketing are expected not to provide excessive information or product claims. Customer perception of traceability information is assessed through the attributes of informativeness, trustworthiness, food safety, reliability and product diagnosticity.

Traceability Information (Informativeness) is a collection of data, statements or ideas that can provide meaning to an object. Information is useful in decision making and developing strategies. Informativeness can be defined as the level of completeness and the extent to which the information provided can provide benefits. Information that can be provided regarding food traceability is the origin of the product, raw materials used, nutritional information, certification and others, where this information will be useful for customers to make decisions in purchasing a food product. Complete and accurate information can reduce doubts about the product. This is as stated in Chen and Chien-Hsien (2013) who stated that fast food outlets that implement a food traceability system get attention from customers because they can reduce the perception of customer doubts about the products purchased. In addition, Wu, et al. (2021) also stated that the perception of food traceability information has a positive effect on the intention to purchase organic food products.

Customer Trust (Trustworthiness) is important for business actors. According to Pavlou & Gefen (2004), trust is defined as the buyer's personal intention to accept vulnerability and believe that the seller does not behave opportunistically. One of the benefits of a food traceability system is to maintain customer trust in the quality of a product, even traceability can also increase customer trust. In the study by Choe et al. (2009), customer trust built through a food traceability system can reduce asymmetric information and fear of opportunism exploited by the industry. Guanqi and Mudassir (2022), in their research found that organic food traceability affects customer trust in food safety. Customer trust in the perception of the traceability system refers to the extent to which customers are willing to trust the information available, so they decide to buy organic vegetable products.

Food safety is a guarantee that ensures that food products do not pose a danger to customers only if the product is processed according to its use (FAO 1997). Food safety is a condition and effort so that products are free from biological, chemical or physical contamination. The traceability system is one of the tools that guarantees food safety which

refers to food standards or regulations that have been met as a quality requirement for a food product. In the study of Wang & Ming-Chieh (2019) it was stated that traceability that guarantees food safety can increase customer purchasing intentions for a food product.

According to Pavlou (2002), reliability is defined as a customer's belief that no one is harmed by a product they use. The reliability of a food traceability system is defined by the extent to which traceability information is reliable and trustworthy while customers consume the food product. Reliability reflects the quality of a product, so it can influence customer perceptions of a product. Research by Yuan et al. (2020) states that reliability has a positive effect on customer value perceptions, meaning that reliability in traceable food products increases customer preference or customer evaluation of food products.

Product diagnostics are defined as the extent to which customers believe that purchases are based on evaluating a product (Kempf and Smith 1998). Product diagnostics in food traceability are obtained from laboratory test information, certification or labels that describe the quality of the food product. Traceability systems can help customers avoid low-quality products and counterfeit labelling (Hobbs 2004). With product diagnostics, customers feel they have control.

RESEARCH METHOD

The research were carried out in the areas of Jakarta, Bogor, Depok, Tangerang and Bekasi (Jabodetabek). The object of this study was organic vegetables. The research was conducted from October 2024 to January 2025. This type of research is quantitative research and the data is in the form of primary data. Data were obtained through a survey method with a questionnaire tool on an ordinal Likert scale of 1 to 5 (Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree). The questionnaire was distributed to buyers of organic products, especially the vegetable group. Sampling was carried out using a convenience sampling method that was adjusted to the desired characteristics of the respondents. The criteria are respondents have purchased and consumed organic vegetables at least once, assuming that the experience is sufficient to provide an assessment of the product, respondents are 17 years of age and over because at this age a person is considered to have the ability to make choices and provide mature assessments, respondents come from the areas of Jakarta, Bogor, Depok, Tangerang or Bekasi as the focus of this study, respondents make organic vegetable purchases based on their own planning and decisions (not representing or being represented), so that the information provided is accurate and representative.

The four criteria above become four screening questions at the beginning of filling out the questionnaire, so that the researcher ensures that the respondents have met the criteria to continue filling out the questionnaire. The collection was carried out through an online survey using Google Form media. The questionnaire was distributed via Whatsapp and Instagram media to potential respondents during the period from October 2024 to January 2025. During that period, a total of 199 respondents were obtained, the total number of valid respondents and those who met the criteria was 186 people because 13 others did not meet the criteria. The amount of data that can be used is 186 respondents spread across the Jabodetabek area.

The data that has been obtained is processed using descriptive statistical analysis and perceptual mapping. Descriptive analysis is a method to analyse phenomena or objects in

detail. In this study, descriptive analysis is used to explain the characteristics of respondents, organic vegetable purchasing behaviour and perceptions of traceability information on organic vegetables. Descriptive analysis is explained with the help of tables and diagrams to facilitate explanation. There are five research attributes to assess respondents' perceptions of food traceability information, namely informativeness, trustworthiness, food safety, reliability and product diagnosticity. From the five attributes, there are 14 indicators, explained in Table 1.

Table 1.
Assessment Indicators

Variable	Indicator
Informativeness	1. The information provided is complete and detail. 2. The information provided is correct and accurate. 3. The authority of the information provided is impartial.
Trustworthiness	1. The information is easy enough to understand as an organic product. 2. The information is reliable. 3. I expect accurate and reliable information.
Food Safety	1. Organic vegetables use fertilizers and pesticides according to quality and safety standards. 2. Organic vegetables do not contain hazardous materials that endanger human safety.
Reliability	1. I believe that the planting, maintenance and production processes of the organic vegetables that I buy implement traceable quality and safety. 2. I believe that the food logistics of the organic vegetables that I buy implement traceable quality and safety. 3. I believe that the producers and distributors of the organic vegetables that I buy implement traceable quality and safety.
Product Diagnosticity	1. Traceability (product information) of organic vegetables can help me evaluate the product carefully. 2. Careful evaluation makes it easier for me to buy the product. 3. Traceability (product information) can help to gain real awareness of the product.

Perception is assessed by comparing the average score and categorized according to its interval (Sugiyono 2019). The assessment is divided into five categories, namely Very Low, Low, Medium, High, and Very High. The range of respondent answer scores can be seen in Table 2. Perceptual mapping shows the average superiority of each traceability information attribute on organic vegetables which is explained through a radar chart. Customer perception is assessed and compared based on the gender of the respondent. In addition, the z test was also conducted to determine any significant differences between men and women in assessing the traceability information attribute on organic vegetables. The z test is a statistical test to determine whether the average of two populations is different if in a large number of samples (> 30 samples).

Table 2.
Score Range

Category	Interval	Level
Strongly Disagree	1.00-1.79	Very Low
Disagree	1.80-2.59	Low
Neutral	2.60-3.39	Medium
Agree	3.40-4.19	High
Strongly Agree	4.20-5.00	Very High

Source: Sugiyono 2019

RESULTS AND DISCUSSION

The respondents in this study were 186 people, who were organic vegetable buyers in Jabodetabek. A total of 26 percent of respondents came from Bogor, 23 percent from Jakarta, 20 percent from Tangerang, 16 percent from Depok and 15 percent from Bekasi. The results showed that 60 percent of those involved in this study were women, while 40 percent were men. This shows that women are more dominant in household decision-making, especially for daily needs such as food. This statement is in line with research by Adawiyah (2021).

The largest age distribution in purchasing organic vegetables is in the 25-29 year age range, which is 34 percent. In addition, the age range of 30-34 years is 27 percent, 35-39 years is 17 percent, 17-24 years is 13 percent, 40-44 years is 6 percent and the age above 45 years is 2 percent. Most of the respondents involved in the study were mature and productive individuals, where this age is the time when individuals focus on work and health, thus encouraging their purchasing intention to buy healthy products such as organic vegetables. This is in line with research by Adawiyah (2021) where most of the respondents were also in the age range of 25-34 years.

Marital status is also a factor in determining the daily needs that will be purchased. In this study, 64 percent of respondents stated that they were married and 36 other respondents stated that they were not married. When married, a person tends to think about the best nutritional intake for their family members, thus increasing the intention to buy organic vegetables.

Respondents involved in this study had a minimum of 12 years of formal education, meaning that all respondents had completed high school. As many as 64 percent of respondents were Diploma 4 or Bachelor graduates, 16 percent were high school graduates, 11 percent were Diploma 3 graduates and 9 percent were postgraduate graduates. Slamet and

Akira (2017) in their research proved that education level is one of the factors that can influence the intention to buy organic vegetables, where someone who is well educated tends to decide to buy organic vegetables that can be traced. The majority of respondents' jobs in this study were Private Employees, which was 40 percent, followed by Housewives at 13 percent, Students and Civil Servants each at 12 percent, Self-Employed at 11 percent, Health Workers at 7 percent and BUMN Employees at 6 percent. Work is closely related to income. The income of respondents in this study was mostly in the range of IDR 5,000,001 - IDR 7,500,000 per month, which was 35%, followed by IDR 2,500,001 - IDR 5,000,000 at 33%, more than IDR 7,500,000 at 18 percent and IDR 0 - IDR 2,500,000 at 14 percent. Occupation and income are one of the characteristics considered in determining market segments. The price of organic vegetables which tends to be expensive makes someone with a high income tend to consider the health benefits more in daily food consumption.

In the questionnaire, respondents were asked to answer questions about purchasing organic vegetables. The frequency of purchases asked was classified into six parts, there are every day, once every two days, once every three days, once a week, once every two weeks and only when available. The frequency of purchase was asked to find out how regularly respondents buy organic vegetables. In this study, 26 percent of respondents routinely bought organic vegetables every three days, 25 percent routinely bought every two days, 18 percent routinely bought once a week, 13 percent routinely bought every day, 10 percent of respondents bought only when available and another 8 percent routinely bought every 2 weeks. The reasons respondents routinely buy and consume are because organic vegetables have good health benefits, tastier and fresher, and organic vegetables also have a good environmental impact. According to Maulana's research (2021), consumers routinely consume organic vegetables because they maintain long-term health and also have better quality, and are safe to consume.

Types of vegetables are classified into five groups, there are leaf vegetables, flower vegetables, fruit vegetables, root vegetables and stem vegetables. The types of vegetables were asked to find out the group of vegetable types that respondents preferred the most or the availability of organic vegetables at the place of purchase. As many as 39 percent of respondents admitted to buying leaf vegetables more often, such as spinach, kale, mustard greens, cassava leaf, lettuce, and others. Then 25 percent of respondents admitted to buying flower vegetables (broccoli, cauliflower) more often, 20 percent of respondents bought fruit vegetables (tomatoes, corn, chilies, cucumbers, eggplants) more often, 15 percent of respondents bought root vegetables (potatoes, carrots, radishes) more often and 2 percent of respondents bought stem vegetables (celery) more often. A study conducted by the Indonesian Organic Alliance showed that organic leaf vegetables are the type most in demand by buyers and consistently achieved the highest number of buyers in 2019 (AOI 2019). This is also possible because leaf vegetables are the easiest to get in various places where consumers shop.

When viewed from the place of purchase or how to shop, consumers can buy online or offline. Shopping methods include shopping at minimarkets/supermarkets, specialty stores (agents), e-commerce (online stores such as Shopee, Tokopedia, Blibli) and so on. Respondents' answer show that consumers tend to prefer shopping for organic vegetables at minimarkets or supermarkets, which is 46 percent. In addition, 31 percent shop for organic vegetables at specialty stores or agents, 20 percent shop for organic vegetables at online

stores and 4 percent shop for organic vegetables at other places. Consumers prefer shopping at minimarkets or supermarkets because they allow them to shop for other products at one time.

In this study, information on food traceability in organic vegetables was also studied, so respondents were also asked about their awareness of the importance of ensuring the quality assurance of organic vegetables. The question asked in the questionnaire was "Before buying, do you first search about the safety of the vegetable product? (For example, ensuring organic vegetables through a process of planting, maintenance, processing and distribution that is guaranteed in quality)". Respondents' answers show that 78 percent of respondents admitted that they always pay attention to product quality assurance before buying organic vegetables, 17 percent of respondents admitted that they sometimes do it and 5 percent never do it. Most respondents stated that the way to ensure that the product complies with organic standard rules is by looking at the information on the packaging label, accessing the manufacturer's website and accessing the manufacturer's social media. Meanwhile, respondents who never did it admitted that they only relied on the belief that the organic vegetable products they bought could provide the expected benefits.

This study consists of five variables with a total of 14 indicator questions answered by 186 respondents. The variables include informativeness, trustworthiness, food safety, reliability and product diagnosticity. The results of the questionnaire answer choices from all respondents were analysed using Microsoft Excel. Customer perceptions of food traceability information on organic vegetables are assessed from the five attributes mentioned previously. In this section, the average score of respondents' answers to the five variables is compared with the characteristics of the respondents, namely domicile, gender, age, marital status, last education, occupation and monthly income. The results can be seen in Figure 1.

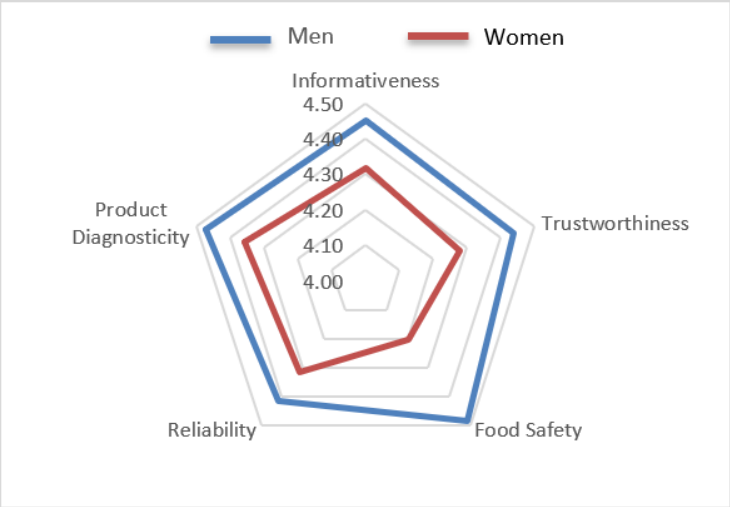

Figure 1.
Customer Perception of Organic Vegetable Traceability Information Based on Gender

Based on Figure 1, the perception of food traceability information on organic vegetables that shows informativeness, trustworthiness, food safety, reliability, and product diagnosticity tends to be rated higher by male respondents with an average value of 4.45, compared to female respondents. This study also used the z-test to determine whether there

was a significant difference in the perception of organic vegetable traceability information between men and women. The z-test was conducted with a significance value of 0.05. The results can be seen in Table 3.

Table 3.
Z-Test Result

	Men	Women
Mean	4,453	4,261
Known Variance	0,129	0,288
Observations	74	114
Hypothesized Mean Difference	0	
z	2,929	
P(Z<=z) one-tail	0,00169	
z Critical one-tailed	1,645	
P(Z<=z) two-tail	0,00339	
z Critical two-tailed	1,959	

Table 4 shows that the calculated z value is 2.929, which is greater than the z table value (1.96). Thus, it can be said that there is a significant difference between the perception of organic vegetable traceability information for male and female respondents. Women's perception of food traceability is lower than men's due to the possibility of domestic roles and dual roles that burden women, especially those who are married, so women focus more on availability and affordability, and also the components of the food menu to be consumed, compared to aspects of food traceability, such as details of the supply chain. Female respondents in this study dominate the purchasing decisions for organic vegetables, making them more thorough and critical in assessing information, not just labels or organic claims. Furthermore, women are more sensitive to health and food safety issues, making them more skeptical of incomplete or questionable information. If traceability information is deemed insufficiently detailed, non-transparent, or difficult to access, women tend to give it a lower rating. In addition, farming management is usually carried out more often by men, so men have broader knowledge of the traceability system than women. According to Tessitore et al. (2020), men pay more attention to supply chain transparency, while women pay more attention to nutritional value and nutrition, so this allows male respondents to rate traceability information on organic vegetables higher.

CONCLUSION

Food traceability information on organic vegetables is rated very high on the five attributes of traceability information, namely informativeness, trustworthiness, food safety, reliability and product diagnosticity. The results showed that almost all respondents, both male and female, rated the five attributes very high. The results also showed that there was a significant difference between male and female respondents. Female respondents tended to rate the five attributes of traceability information on organic vegetables lower than male respondents. Consumers expect food traceability information on organic vegetables to be comprehensive, detailed, easy to understand and easy to access, thus increasing their confidence in buying and consuming organic vegetables.

Suggestions for further research are that the perception of food traceability information can be carried out on other objects, such as respondents in other regions where the region produces large amounts of organic vegetable products. This research can aim to determine whether food traceability information has become a concern in improving food safety in the region. In addition, research can also be conducted on objects of food types where consumers are more likely to be careful in determining the purchase of the product, for example, processed organic products or processed products with the ultra-processed (UPF) method. Processed organic food products or ultra-processed food products typically have a more complex traceability system because these food products undergo a lengthy process and supply chain, making research on these products a valuable opportunity for the development of new scientific knowledge.

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