

CONSUMER PREFERENCE TOWARDS THE ATTRIBUTES OF AQUAPONICS PRODUCTS AT PT. TANIKOTA

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Submitted 14 December 2022; Approved 08 May 2023

ABSTRACT

The increasing awareness of healthy lifestyle among the public has made consumers more selective in choosing their food, particularly vegetables. Aquaponic vegetable products, which are free from pesticides, have emerged as an alternative for health-conscious consumers. This study aimed to identify the characteristics of consumers who purchase aquaponic vegetables based on product attributes at PT. Tanikota and to determine the ranking of attributes of aquaponic vegetables according to consumer preferences. The research method employed in this study was a case study, using a whole population of 70 aquaponic vegetable consumers at PT. Tanikota as the respondents. Data were analyzed using descriptive analysis of frequency distribution. The results of the study revealed that the characteristics of consumers who buy aquaponic vegetables at PT. Tanikota were generally women aged 26-35 years, holding an undergraduate degree, with 3 family dependents, employed in private sectors, and having an income range of 2,600,000-Rp 5,200,000/month. The attributes of aquaponic vegetables at PT. Tanikota were ranked based on consumer preferences, with the level of freshness of vegetables, variety of vegetables, color of vegetables, method of payment, method of purchase, physical form of vegetables, vegetable size, distance, vegetable packaging, and the price of vegetables, respectively. The lower rank of price attributes can be attributed to the lack of aquaponic vegetable cultivation in the city of Bandung, which makes it difficult for consumers to compare the prices offered by PT. Tanikota with those offered by other companies.

Keywords: *aquaponic, attributes, consumers, preference*

BACKGROUND

In Indonesia, it is experiencing rapid development in the agricultural sector. This is due to the availability of natural resources (SDA) and labor in the agricultural sector which is quite adequate. Agriculture has an important role in supporting the economy of the Indonesian nation. Given the diverse range of horticultural crops available, it is important to understand the consumption patterns of households for different types of crops. According to Sutarni et al. (2018), there are about 90 kinds of horticultural crops that are commercially and widely developed, including 26 types of fruits, 24 types of ornamental plants, 15 types of medicinal plants, and 25 types of vegetables. Understanding the consumption patterns of households for different types of horticultural crops is crucial, given the wide range of available options. Sutarni et al. (2018) reported that there are approximately 90 commercially developed horticultural crops, comprising 26 types of fruits, 24 types of ornamental

plants, 15 types of medicinal plants, and 25 types of vegetables. Notably, household consumption patterns for vegetables have exhibited fluctuations over the years, as depicted in Figure 1.

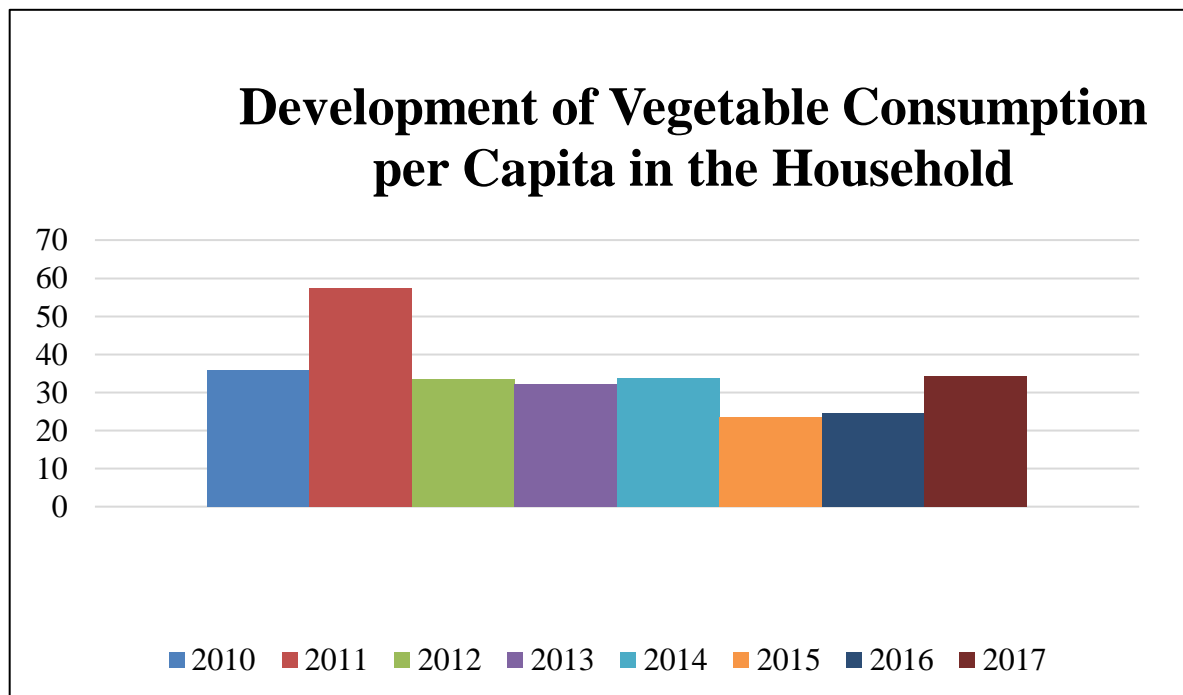


Figure 1. Per Capita Vegetable Consumption in Households

The province that has great potential in agriculture is West Java and almost all types of vegetables can be grown in the West Java region. In West Java, there are several agribusiness companies that sell vegetable products and produce quality vegetables that will later be sold to people in various regions and also export. Bandung City and Regency is a central area of vegetable production, many vegetables grown have been engineered with various cultivation technology systems, such as soil organic vegetable systems, hydroponics and aquaponics. PT. Tanikota's aquaponic vegetable in the provided text. However, to add more context and relevance to the information presented, here are some potential statistics and data that could support the claims about the agricultural potential of West Java and its vegetable production.

West Java is the largest agricultural producer in Indonesia, with over 5 million hectares of land dedicated to agriculture. In 2019, the agricultural sector in West Java contributed 18.36% to the province's GDP. The vegetable subsector is one of the main agricultural commodities in West Java, with an annual production of 5.8 million tons. In 2019, West Java's vegetable exports reached \$37 million USD, with Japan, Malaysia, and Singapore as the main destinations. Bandung City and Regency are indeed known as the main vegetable production centers in West Java, with around 7,000 hectares of land dedicated to vegetable farming. The use of cultivation technology systems, such as hydroponics and aquaponics, is becoming increasingly popular among West Java's vegetable farmers. For example, in 2018, there were already 93 hydroponic centers and 14 aquaponic centers in the province.

To provide more context and relevance to the information presented, it would be helpful to include some data or statistics to support the claims made about PT. Tanikota's aquaponic vegetable products. For example, including information on the nutritional content of the vegetables or the sales figures and customer satisfaction rates of the company could add more weight to the discussion.

Furthermore, the statement "The purpose of this study is to determine the characteristics of consumers who buy aquaponic vegetables based on product attributes at PT. Tanikota, and to find out the ranking of Aquaponic vegetable attributes at PT. Tanikota that are in accordance with consumer preferences" suggests that this is part of a larger research project. Therefore, it may be helpful to provide more background information on the study design, research questions, and methodology in order to give readers a better understanding of the scope and purpose of the research. PT. Tanikota is an agribusiness company located in Dago, Bandung, which was established in 2016. The company produces organic vegetables with an Aquaponic farming system, which is a cultivation technology that combines water, fish, and vegetables. The company grows various types of vegetables using this system, including spinach, kale, naibai, lolorosa, lolobiondi, kale, pagoda, samhong, siamak, batavia, butterhead, endive, romaine, sorrel, white pakcoy, green pakcoy, naibai, and red okleaf.

One of the main advantages of PT. Tanikota's vegetables is that they are free from pesticides and have good nutritional content. These attributes are particularly important to consumers who are becoming more health-conscious and want to ensure that the food they eat is safe and nutritious. Consumer preferences play a crucial role in determining the success of vegetable producers or traders. PT. Tanikota pays close attention to consumer preferences and argues that vegetable producers or traders in determining preferences require data on consumer tastes. Based on a preliminary survey, when viewed from its attributes, consumers are interested in buying vegetables from PT. Tanikota because they have physical characteristics of vegetables that are different from vegetables from other companies. The preference of consumers who buy vegetables from PT. Tanikota will certainly also look at the attributes of vegetables. Vegetable attributes become the most important factor in purchasing decisions.

The purpose of this study is to determine the characteristics of consumers who buy aquaponic vegetables based on product attributes at PT. Tanikota and to find out the ranking of Aquaponic vegetable attributes at PT. Tanikota that are in accordance with consumer preferences. The results of this study will provide valuable information to PT. Tanikota about the characteristics of its customers and the product attributes that are most important to them. In conclusion, PT. Tanikota's Aquaponic vegetables are becoming increasingly popular among health-conscious consumers who are looking for safe and nutritious food. The company's focus on consumer preferences and the quality of its products has helped it to build a loyal customer base. By continuing to pay attention to consumer preferences and providing high-quality products, PT. Tanikota can continue to grow its business and meet the needs of its customers.

RESEARCH METHODS

This research was conducted at PT. Tanikota Jalan Cisitu Indah VI No. 1A, Bandung which is one of the agribusiness companies that work on Aquaponic vegetables. The research was conducted at PT. Tanikota because it is one of the agribusiness companies that work on Aquaponic vegetables, and the study aimed to investigate consumer preferences towards the attributes of aquaponic vegetable products. Therefore, it was appropriate to choose a company that specialized in producing and selling these products to collect data from its consumers. PT. Tanikota Jalan Cisitu Indah VI No. 1A, Bandung was selected as the location of the research because it is the physical address of the company and the place where the consumers purchased the aquaponic vegetables. Conducting the

research at the location where the products are sold and consumed provides a realistic and accurate understanding of consumer preferences towards the attributes of the aquaponic vegetable products.

In this case, the population is all consumers who have purchased aquaponic vegetables from PT. Tanikota from January 2019 to September 2021. The researcher collected data from a sample of 70 consumers who had purchased aquaponic vegetables from PT. Tanikota during that time period. The types of data used in this study are primary and secondary data. The primary data source used in this study came from interviews with consumers who bought aquaponic vegetables at PT. Tanikota using questionnaires as a guide for researchers when conducting research in the field. Secondary data sources are obtained from journals, libraries, and related institutions such as the Central Statistics Agency (BPS), ministries and related agencies. The main purpose of this data was to understand the consumer behavior, preferences, and perceptions related to aquaponic vegetables. Secondary data refers to data that was collected from existing sources such as journals, libraries, and related institutions like the Central Statistics Agency (BPS), ministries, and related agencies. The secondary data was used to support the analysis of the primary data and to provide a broader context for the study. The analysis technique used in this study is descriptive analysis with a descriptive research tool frequency distribution which is a way of formulating and interpreting existing data as a whole, so as to provide a clear picture of the company in general.

RESULT AND DISCUSSION

Consumer Characteristics

The characteristics of consumers who bought aquaponic vegetables in this study consisted of age, gender, education, family dependents, income and occupation.

Gender

Based on the data provided in Table 1, it can be inferred that women (78.6%) are the main consumers of aquaponic vegetables at PT. Tanikota. This could be due to several reasons, such as women generally being more health-conscious and more likely to prioritize the health of their family members, including their diet. Women are also often responsible for grocery shopping and meal preparation in many households, which could explain their higher frequency of purchasing aquaponic vegetables.

Table 1. Consumer Characteristics by Gender

Gender	Frequency (People)	Percent (%)
Man	15	21.4
Woman	55	78.6
Amount	70	100.0

Source: Primary Data

Age

Moving on to Table 2, it can be seen that the majority of consumers (72.8%) are between 21-35 years old. This age range is typically when people become more aware of their health and are willing to invest in healthier food options. The higher frequency of consumers in this age range could also be due to the fact that they are more likely to be tech-savvy and aware of new food trends and innovations, such as aquaponics.

Table 2. Consumer Characteristics by Age

Age	Frequency (People)	Percent (%)
21-28 years	25	35.7
29-35 years	26	37.1
36-43 years	16	22.9
44-51 years	3	4.3
Amount	70	100.0

Source: Primary Data

Education

The education level of consumers seems to have an impact on their purchasing behavior. The majority of consumers (52.9%) have completed S1 higher education, which suggests that they may have a higher awareness and understanding of the importance of consuming healthy foods, such as aquaponic vegetables. It is possible that their education has equipped them with the knowledge and information necessary to make informed decisions about their health and nutrition.

Table 3. Consumer Characteristics by Education

Education	Frequency (People)	Percent (%)
D3	3	4.3
S1	37	52.9
S2	8	11.4
S3	1	1.4
Senior High School	20	28.6
Junior High School	1	1.4
Amount	70	100.0

Source: Primary Data

Family Dependents

Family dependents seem to play a significant role in the purchasing decisions of consumers. The majority of consumers (68.5%) have 2 to 3 family dependents, which suggests that they may be more conscious of the health and nutritional needs of their family members. Parents, in particular, may be motivated to purchase healthy foods such as aquaponic vegetables to ensure the well-being of their children.

Table 4. Consumer Characteristics by Family Dependents

Family Dependents	Frequency (People)	Percent (%)
0	2	2.9
1	9	12.9
2	22	31.4
3	26	37.1
4	10	14.3
5	1	1.4
Amount	70	100.0

Source: Primary Data

Job

The occupation of consumers also seems to be a factor in their purchasing behavior. The majority of consumers (62.8%) are housewives and private employees, suggesting that income may

be a key driver in their decision-making process. It is possible that consumers with higher incomes are more willing and able to spend money on healthier food options, such as aquaponic vegetables. . In line with research conducted by Arya et al (2009) that high income from the results of work affects a decision in purchases.

Table 5. Consumer Characteristics by Occupation

Job	Frequency (People)	Percent (%)
Advocate	1	1.4
Freelance day laborer	1	1.4
Doctor	1	1.4
Teacher	1	1.4
Housewives	19	27.1
Private Employees	25	35.7
Legal Advisor	1	1.4
Student	4	5.7
Civil Service	9	12.9
Entrepreneur	8	11.4
Sum	70	100.0

Source: Primary Data

Income

Based on table 6, it can be seen that consumer income is generally (68.6%), which ranges from Rp2,000,000 – Rp8,999,999. The greater the income received, the greater the expenditure, especially in terms of food.

Table 6. Consumers Characteristics by Income

Revenue (Rp/Month)	Frequency (People)	Percent (%)
2,000,000-8,999,999	48	68.6
9,000,000-15,999,999	14	20.0
16,000,000-22,999,999	2	2.9
23,000,000-29,999,999	4	5.7
30,000,000-36,999,999	2	2.9
Amount	70	100.0

Source: Primary Data

Preferences towards the Attributes of Aquaponic Vegetable Products

Validity Test

Based on Table 7, the size of r Table with a significant rate of 5% and the number of samples of 70 people is 0.235. If it is known that the value of r Calculate > r Table so that it can be said that all the questions that support this research are valid and able to measure or reveal the purpose of this study.

Table 7. Validity Test Results

Attribute	r Count	r Table	Information
Vegetable Color	0.721	0.235	Valid
Freshness of vegetables	0.523	0.235	Valid
Physical Form of Vegetables	0.616	0.235	Valid
Vegetable Size	0.651	0.235	Valid
Vegetable Packaging	0.618	0.235	Valid
Vegetable Prices	0.727	0.235	Valid
Vegetable Diversity	0.539	0.235	Valid
How to Purchase	0.687	0.235	Valid
How to Pay	0.645	0.235	Valid
Distance	0.538	0.235	Valid

Source: Primary Dat

Reliability Test

Based on Table 8, it is known that the value of Cronbach Alpha is 0.817 which means more than 0.60 so it can be concluded that the answers from respondents over time are consistent or in other words the data is reliable.

Table 8. Reliability Test Results

Cronbach's Alpha	N of Items
0.817	10

Percentage Test

Based on the percentage table, it can be seen that the order of attributes most preferred by consumers is the level of vegetable freshness, vegetable diversity, vegetable color, payment method, mode of purchase, physical shape of vegetables, size of vegetables, distance, vegetable packaging, and price of vegetables.

Table 9. Results of Likert Scale Calculations in Percent Form (%)

Attribute	Skala Likert										Total
	1 (Strongly Disagree)		2 (Don't agree)		3 (Simply Agree)		4 (Agree)		5 (Strongly agree)		
	Number of people	Persentase (%)	Number of people	Persentase (%)	Number of people	Persentase (%)	Number of people	Persentase (%)	Number of people	Persentase (%)	
Vegetable Freshness	0	0%	0	0%	1	1,4%	4	5,7%	65	92,9%	100%
Vegetable Diversity	0	0%	0	0%	1	1,4%	10	14,3%	59	84,3%	100%
Vegetable Color	0	0%	0	0%	1	1,4%	13	18,6%	56	80%	100%
Payment method	0	0%	0	0%	3	4,3%	13	18,6%	54	77,1%	100%
How to Purchase	0	0%	1	1,4%	3	4,3%	17	24,3%	49	70%	100%
Physical Form of Vegetables	0	0%	0	0%	4	5,7%	22	31,4%	44	62,9%	100%
Vegetable Size	0	0%	0	0%	2	2,9%	30	42,9%	38	54,3%	100%
Distance	0	0%	0	0%	11	15,7%	28	40%	31	44,3%	100%
Vegetable Packaging	0	0%	1	1,4%	13	18,6%	31	44,3%	25	35,7%	100%
Vegetable Prices	0	0%	1	1,4%	11	15,7%	39	55,7%	19	27,1%	100%

Freshness

The most preferred consumer preference of the Aquaponic vegetable attribute at PT. Tanikota is the freshness of vegetables. The system implemented by PT. Tanikota is currently a "direct harvest" system and 92.9% of consumers admit that the vegetables received by consumers are vegetables with

a high level of freshness, so, consumers really like the level of freshness of Aquaponic vegetables produced by PT. Tanikota.

Diversity

The most preferred consumer preference of the Aquaponic vegetable attribute at PT. Tanikota is the diversity of vegetables. At PT. Tanikota there are 18 types of Aquaponic vegetables that are cultivated including spinach, kale, naibai, lolorosa, lolobiondi, kale, pagoda, samhong, siomak, batavia, butterhead, endive, romaine, sorrel, white pakcoy, green pakcoy, naibai, and red okleaf. With so many types of Aquaponic vegetables on offer, consumers have many options for them to buy. Based on the results of the study, 84.3% of consumers rated that aquaponic vegetables produced by PT. Tanikota have various types of vegetables that can be purchased by consumers.

Color

The most preferred consumer preference of the Aquaponic vegetable attribute at PT. Tanikota is the color of the vegetable. PT. Tanikota implements a planting pattern system that can produce vegetables that match the level of maturity every day so that the vegetables received by consumers are not too young and not too mature. The results of the study stated that 80% of consumers rated that the color of aquaponic vegetables produced by PT. Tanikota had a very high level of brightness.

How to Pay

The most preferred consumer preference of the Aquaponic vegetable attribute at PT. Tanikota is the payment method. Generally, as many as (77.1%) consumers of PT. Tanikota strongly agree with the payment method implemented by PT. Tanikota. The payment methods applied by PT. Tanikota are currently cash and non-cash. Consumers can choose what payment method they can choose to pay for the aquaponic vegetables they buy. The purpose of providing these two options is expected not to make it difficult for consumers to make payments.

How to Purchase

The most preferred consumer preference of the Aquaponic vegetable attribute at PT. Tanikota is the way to buy. PT. Tanikota currently implements 2 payment methods, both offline and online. For consumers who want to come and buy aquaponic vegetables directly, they can go directly to PT. Tanikota, and for consumers who want to order aquaponic vegetables via online, they can order via PT. Tanikota whatsapp.

Physical Form

The most preferred consumer preference of the Aquaponic vegetable attribute at PT. Tanikota is the physical form of the vegetable. Consumers generally (62.9%) are very fond of the physical form that aquaponic vegetables produce. PT. Tanikota certainly pays attention to the physical form of aquaponic vegetables that will be packaged before being given to consumers.

Size

The most preferred consumer preference of the Aquaponic vegetable attribute at PT. Tanikota is the size of the vegetable. As many as 54.3% of consumers really like the size of aquaponic

vegetables offered by PT. Tanikota. PT. Tanikota always strives for the size of the vegetables produced always with a large size in order to attract the attention of consumers to buy them.

Distance

The most preferred consumer preference of the Aquaponic vegetable attribute at PT. Tanikota eighth is distance. PT. Tanikota is located in the center of Bandung and residential areas. It is expected to bring in buyers because of its easy access and close to the city center Based on the results of the study, it is also stated that 44.3% of consumers really do not feel that there is a problem regarding the distance between PT. Tanikota and where they live.

Packaging

The most preferred consumer preference of the Aquaponic vegetable attribute at PT. Tanikota is the vegetable packaging. Vegetables are also neatly packaged so that vegetables do not spoil when received by consumers. As many as 35.7% of consumers strongly agree about the packaging provided by PT. Tanikota. This can be caused because plastic packaging is packaging that is not environmentally friendly, and is not suitable to be juxtaposed with aquaponic products which are healthy vegetables for consumption.

Prices

The most preferred consumer preference of the Aquaponic vegetable attribute at PT. Tanikota is the price of vegetables. Based on the results of the study, as many as 27.1% of consumers really like the price of aquaponic vegetables, as many as 55.7% of consumers like the price of aquaponic vegetables, as many as 15.7% of consumers who quite like the price of aquaponic vegetables, as many as 1.4% of consumers who do not like the price of aquaponic vegetables, and not a single consumer who does not like the price of aquaponic vegetables. It states that the price of aquaponic vegetables offered by PT. Tanikota is a price that is comparable to the quality and quantity provided.

Implication

The research shows that consumers with higher levels of education are more willing to pay for aquaponik drinks labeled fair trade. Education level influences consumers' mindsets and their willingness to pay. Similarly, higher educational backgrounds also positively contribute to consumers' willingness to pay for organic products. Consumers with higher education tend to be more responsive to information and make informed choices about products. On the other hand, income does not significantly affect consumers' willingness to pay for aquaponik drinks labeled fair trade. Although there is a positive coefficient value for income, it does not have a significant impact on the willingness to pay. Level of education significantly affect willingness to pay consumers of the coffee Based on the research results show that the majority of respondents did purchase of aquaponik drinks labeled fair trade undergraduate level. Education level in directly or indirectly will affect someone's mindset will affect the willingness to pay consumers (Fajria et al., 2020). Level education is a positive contributor on consumers' willingness to pay on organic products. This positive relationship indicates that the higher the educational background consumers, the higher the tendency of consumers to be willing pay for the aquaponik. Consumers with backgrounds of higher education will be very responsive to information and will influence the choice of species product. The obtained odds ratio shows that on the variable level of education, the higher consumer education then the probability of

the consumer's willingness to pay against aquaponik labeled fair trade at a higher price is be more times greater than consumers with lower education level. Consumers who have levels Higher education is considered more easy to receive related information with certified aquaponik and good for consumed.

Income variable is not significantly affect willingness consumers pay for drinks aquaponik labeled fair trade. Coefficient value income variable regression shows a positive value (with end.008) which means at any increase in income then it will increase the willingness to pay value consumer. Price variable is not significantly affect willingness to pay consumer shows that the consumer not considering the price factor in deciding to be willing or not willing to pay more for the drink. This is because that the price factor is not a factor important influence willingness to pay consumers. Most consumers do not mind responding to product prices high organic. It shows that consumers are increasingly understanding the importance of organic products that must be consumed by consumers.

Quality variable significantly effect on willingness to pay consumers of aquaponik coffee drinks fair trade. Consumers are willing to pay more for get organic products. Evaluation related to the quality of drinks that with the insight of each individual, lifestyle as well as self-concept, so that every consumer will have that perception and judgment different in assessing aquaponik drinks labeled dairtrade. Meanwhile, with the odds ratio, consumers provide more value high for the quality of the Aquaponik, with 7,474 times greater chance willing to pay a higher price which is offered. This is due to that consumers feel they get coffee with good quality, so willing to pay more on that drinks. This agrees with some opinion that if product price increases organic, consumer taking into account the quality and health will still be willing to pay to get a quality product the good one.

CONCLUSION AND SUGGESTION

Based on the research that has been discussed, conclusions can be drawn including:

1. The characteristics of consumers who buy aquaponic vegetables at PT. Tanikota are generally women aged 21-35 years, S1 education, have family dependents of 2 to 3 people, work as housewives and private employees, and income of IDR 2-9 million per month.
2. Ranking of Aquaponic vegetable attributes at PT. Tanikota that suits consumer preferences is the level of vegetable freshness, vegetable diversity, vegetable color, payment method, purchase method, physical shape of vegetables, vegetable size, distance, vegetable packaging, and vegetable prices
3. The results of the study stated that the aquaponic vegetable attribute of PT. Tanikotawhich is in the last order is the price of vegetables. The minimya of cultivation with an aquaponic system in the city of Bandung makes consumers unable to compare the prices offered by PT. Tanikota with the prices offered by other companies.

Based on the results of research that has been carried out, it is recommended that PT. Tanikota pay attention to the attributes of aquaponic vegetables that are not liked by consumers, namely by reducing the price of vegetables by streamlining production costs in the use of production factors such as seeds, fertilizers, medicines, nutrients, labor used in aquaponic farming.

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