

Factor Influencing Organic Food Buying Behaviour in Kuantan, Pahang: A Fuzzy Delphi Method

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To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v13-i4/16748> DOI:10.6007/IJARBSS/v13-i4/16748

Published Date: 10 April 2023

Abstract

Organic food is said to have a positive impact on people's health and wholesome to the environment due to its ecological nature. However, there are challenges for organic food retailers in Malaysia to create a marketing strategy since the number of consumers of organic foods is quite low compared to other countries. This aims of this research is to study factors and sub-factors influencing consumer buying behaviour for organic food in Kuantan, Pahang to firmly grasp the nature of organic food business industry. To achieve such objective, Fuzzy Delphi Method has been utilised to analyse the five factors considered which are price, behavioural intention, subjective norm, attitude, and consumer knowledge. The findings shown that the most influential sub-factor affecting consumer purchasing behaviour towards organic food under behavioural intention was that people usually consider purchasing organic food that meets their taste, while for subjective norms, the concept of organically grown food is the most influential sub-factor. Furthermore, the reasonable price, familiarity with products and health and fitness reasons are the leading sub-factors for price, consumer knowledge and attitude factors, respectively.

Keywords: Organic Foods, Buying Behavioural Factors, Fuzzy Delphi, Marketing Strategies

Introduction

Organic food has become a widely recognised and extensively followed trend in the world because people are becoming more worried about their health. According to Sadiq et al (2020), it is currently in high demand as a result of increased health awareness and underlying environmental circumstances. There are various advantages of consuming organic food, such as organic food are produced in an environmentally friendly manner. Organic food influences consumers' egoistic ideals and provides health benefits because it is grown without the use

of artificial chemicals. It may also reduce the chances of becoming infected with antibiotic-resistant germs. Besides, eating organic food has the ability to assist farmers in their quest to survive in a difficult farming climate (Jouzi et al., 2017).

Organic animal products, such as dairy and meats, are derived from animals that are often free to wander. These animals are fed organic diets and are not administered any type of steroids. This means that the effects of those hormones in food will not be felt by individuals. When people are aware of these advantages, it leads people to consume organic food. They will believe that organic food is beneficial for them because it helps reduce health risks such as cancer and others. Besides, there are many factors influencing buying behaviour for organic food, such as trust, which is the consumer's belief in the environmental performance of organic foods, price, health consciousness, consumer knowledge about organic foods, subject norms, behavioural intention, and food safety.

Therefore, it is important to know the main factor of consumer buying behaviour for organic foods, especially for organic food retailers and organic farmers. Understanding consumer buying behaviour is an important component of any marketing approach. In reality, it helps marketers to create a strategy in improving their business. To accomplish this purpose, an entrepreneur does research and acquires information about the consumer's buying behaviour which is who can be the potential buyers. Hence, this study proposed using Fuzzy Delphi Method (FDM) to clarify the main factors that determine consumer buying behaviour for organic food and provide a ranking of the factors based on the priority in purchase intention. In 1988, Kaufmann and Gupta were the first to introduce the Fuzzy Delphi Method (Mosayebi et al., 2020). FDM's strength is that it can shorten the research period by minimising the number of Delphi rounds. The usage of fuzzy elements is integrated into the Delphi technique, which can analyse the agreement in only one round (Kamarulzaman et al., 2015). Thus, Fuzzy Delphi is widely used in various sectors, such as in ranking systems based on electronic business Taghva et al (2022), education Ciptono et al (2019), transportation business Ebrahimi & Bridgelall (2021) and others.

Problem Statement

Nowadays, some people love to consume organic food because they have a positive mindset toward organic foods. However, the number of consumers of organic foods in Malaysia is quite low compared to other countries. According to the latest survey on organic food conducted by Rakuten Insight, 21% of the respondents in Malaysia stated that they buy organic food products often, and 38% of the respondents stated that they sometimes buy organic food. Due to the low purchasing of organic food, it affects the income of organic food retailers and organic food farmers.

Moreover, some organic food retailers cannot identify the main factors and patterns in consumer buying behaviour towards organic food due to the factors influencing consumer buying behaviour toward organic foods are inconsistent and vary according to the time and the area. For example, the main factor influencing consumer buying behaviour toward organic foods in Malaysia is not the same as the main factor influencing consumer buying behaviour toward organic foods in India.

Therefore, it is difficult for organic retailers, especially those who are new in the business industry, to get the actual factor influencing buying behaviour for organic food needed to create a marketing strategy for growing their business. Hence, the research about factors influencing buying behaviour for organic is essential, especially for organic food retailers and organic farmers. The motivation of this study is to help retailers gather as much information

on customer purchasing habits in order to identify potential buyers and helps them in developing a strategy for growing their business.

Literature Review

In this section, factors that are deemed to be essentials in influencing buying behaviour of organic food are discussed. Based on the previous studies and research, five factors are considered which are behavioural intention, subjective norms, price, consumer knowledge and attitude. Subfactors are also reviewed and presented in the following subsection.

Behavioural Intention

The behavioural intention to consume organic products refers to an individual's future intention to purchase or consume organic products. According to Qasim et al (2019), the epistemic value has a positive significant impact on the behavioural intention to consume organic food. The perceived net utility that a consumer derives from a product's ability to increase curiosity, provide novelty, and satisfy knowledge needs is measured as epistemic value. Behavioural intention refers to people who purchased organic food after considering the environmental impact of their use, consumers who purchased organic food that met their taste, and buyers who purchased organic food if they saw it on display.

Subjective Norms

Subjective norms have an impact on the other variables determining buy intention for organic food, in addition to directly influencing purchasing habits for organic foods. This can be supported by Bai et al (2019) which states that subjective standards play an important role in the theory of planned behaviour (TPB), which has few connections with organic food buying intention. According to the previous research, subjective norms are referred to those who influence consumer behaviours, such as family and close friends.

Price

Price was the most frequently considered factor according to researchers. Previous research has found that the most significant impediment to organic food purchases is the cost of organic foods (Arora et al., 2022). According to Zheng et al (2021), price consciousness acts as a negative moderator in the connection between purchase intention and actual purchase. For example, when purchasing intentions rise, those with low price consciousness are more likely to purchase organic products than those with high price consciousness.

Consumer Knowledge

Consumer knowledge refers to the level of knowledge of consumers that influence their opinions of organic food (Kuźniar et al., 2021). People can identify the brands and labels of the organic product that are safe for their health when they constantly read news or articles about organic food. The positive feedbacks of organic food product will influence people to consume organic food. According to Wang et al (2019), knowledge of organic food positively moderates the relationship among personal attitude and purchase intention.

Attitude

The extent to which an individual has a positive or negative evaluation of the behaviour under consideration is referred to as attitude. Attitude is one of the most important factors influencing organic food purchasing behaviour. Previous research discovered that attitudes

toward organic food predicted 37% of the variation in purchase attitude, even though purchase attitude is the most important antecedent of purchase intention (Bai et al., 2019). As a result of the study, consumers who have positive attitudes toward organic food are more likely to form stronger purchase intentions.

Fuzzy Delphi Method

According to Kamarulzaman et al (2015), the Delphi method is used by researchers to generate agreement among experts. Delphi produces a distribution of estimates on several future projections together with written comments (Di Zio et al., 2021). In 1988, Kaufmann and Gupta were the first to introduce the Fuzzy Delphi Method (FDM) (Mosayebi et al., 2020). FDM's strength is that it can shorten the research period by minimising the number of Delphi rounds. The usage of fuzzy elements is integrated into the Delphi technique, which is capable of analysing the agreement in only one round (Kamarulzaman et al., 2015). Hence, this study implements the Fuzzy Delphi Method to obtain expert consensus on the factors influencing buying behaviour for organic foods.

Methodology

Research design of this study can be summarized into four steps and is presented in Figure 1 below. Each step is discussed in depth in the following subsections.

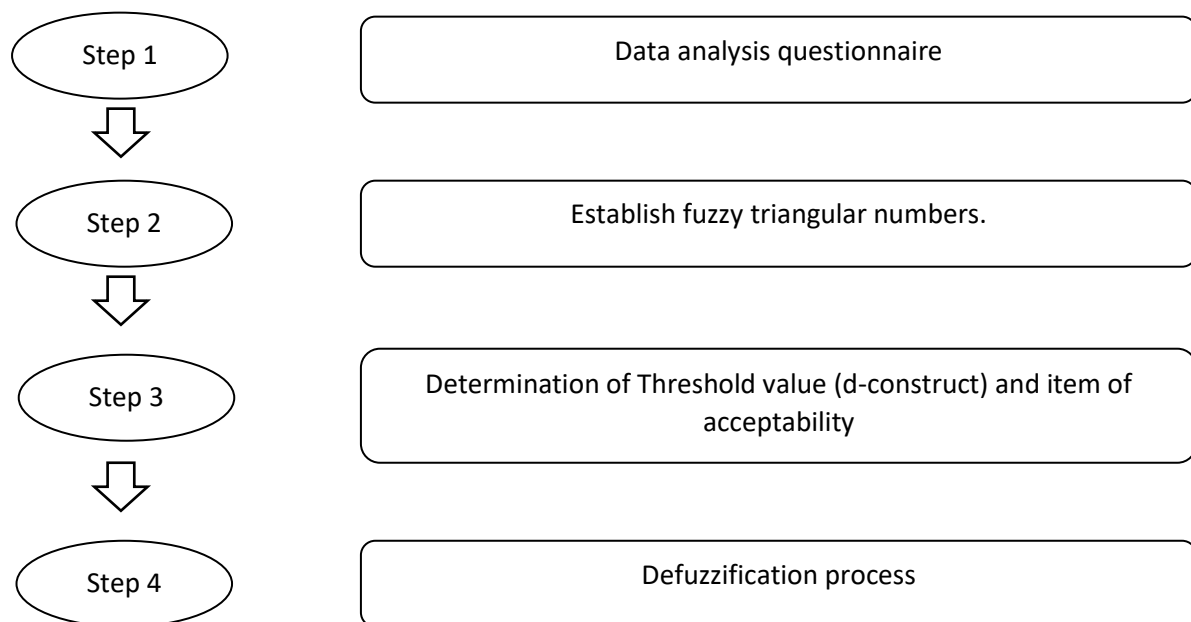


Figure 1: Research Framework

Data Analysis Questionnaire

Literature review is carried out to develop the research questionnaire. The minimum sample of experts in the Fuzzy Delphi studies is 10 to obtain high uniformity among experts (Adler & Ziglio, 1996; Jones & Twiss, 1978). Hence, 15 experts were chosen in this research using purposive sampling technique. They consisted of experts, retailers, and regular consumer of organic foods.

Triangular Fuzzy Number

In order to answer the research question, a five-point Likert scale score is used. Experts scores are then translated into fuzzy number as shown in Table 1.

Table 1

Likert Scale with Fuzzy Number

Likert Scale Score	Level of Agreement	Fuzzy Number
5	Strongly Agree	(0.6, 0.8, 1.0)
4	Agree	(0.4, 0.6, 0.8)
3	Moderate	(0.2, 0.4, 0.6)
2	Disagree	(0.0, 0.2, 0.4)
1	Strongly Disagree	(0.0, 0.0, 0.2)

Each recorded response had three values to consider, which are the minimum value (n_1), most reasonable value (n_2), and the maximum value (n_3). The fuzzy scores for each item were averaged as indicated by m_1 , m_2 and m_3 values for further Defuzzification process

Determination of Threshold value and item of acceptability.

A threshold value (d) for each item was found, by calculating the difference between average fuzzy number and each expert fuzzy number using the formula below:

$$d(\bar{m}, \bar{n}) = \sqrt{\frac{1}{3} [(m_1 - n_1)^2 + (m_2 - n_2)^2 + (m_3 - n_3)^2]}$$

whereas Percentage of Expert Group Consensus was determined by dividing the frequency of item with Threshold value less than or equal to 0.2 with the number of experts.

Based on the value, the acceptability of the construct was determined, whereby a construct was accepted if the threshold value (d -construct) is less than or equal to 0.2. Expert agreement on each evaluated item was also based on threshold value (d) for each item, whereby ($d \leq 0.2$) is accepted (Chen & Lin, 2002; Chen, 2000). The frequency of accepted values was presented as a percentage. Items with expert agreement of less than 75% were discarded (Chu & Hwang, 2008). Next defuzzification is the process of determining the fuzzy score value based on α -cut value of 0.5 (Tang & Wu, 2010). If the fuzzy score value is equal to or greater than 0.5, then the measured item is accepted whereas if less than 0.5, then the measured item is rejected. The rank of an item within a similar construct was determined after the defuzzification process.

Defuzzification Process

Defuzzification process (A_{max}) is a ranking process of each item in order to identify the importance level of each item. The ranking is based on the order from the highest to the lowest value. This ranking process helps to determine whether to keep or discard certain items based on the following formula:

$$A_{max} = 1/3(m_1 + m_2 + m_3)$$

Research Findings*Analysis of Expert Consensus on Behavioural Intention*

Table 2.1 illustrates the experts' evaluation of the items of behavioural intention construct.

Table 2.1

Experts' evaluation of the items of behavioural intention construct

Items	
B1	People buy organic food products after considering the effect of their use on environment
B2	People usually consider purchasing organic food that meet their tastes
B3	Buyers are more likely to purchase organic foods if they see them on display

The threshold value (d), expert consensus percentage, defuzzification and item position for the above items are depicted in Table 2.2.

Table 2.2

Analysis of behavioural intention construct

Item	Threshold Value, d	Percentage of Experts Group Consensus, %	Fuzzy Score	Position	Expert Consensus
B1	0.13	80	0.64	2	Accepted
B2	0.10	100	0.68	1	Accepted
B3	0.06	100	0.64	2	Accepted

Based on the findings in Table 2.2 above, all items recorded a value of threshold (d) ≤ 0.2 . This result indicates that all these items have gained an expert consensus and been accepted. The expert agreement percentage showed that all items are above 75% while the fuzzy scored a value greater than 0.5. Also, all defuzzification values for each item exceeded the value of α -cut = 0.5. Hence, this shows that the items in behavioural intention have gained consensus from the experts.

Analysis of Expert Consensus on Subjective Norms

Table 3.1 illustrates the experts' evaluation of the items of subjective norms construct.

Table 3.1

Experts' evaluation of the items of subjective norms construct.

Items	
S1	Close friends influence people in purchasing behaviour of organic foods
S2	Concept of organically grown food plays an important factor in organic food purchasing behaviour
S3	Family plays an important role in their organic food purchase

The threshold value (d), expert consensus percentage, defuzzification and item position for the above items are depicted in Table 3.2.

Table 3.2

Analysis of subjective norms construct.

Item	Threshold Value, d	Percentage of Experts Group Consensus, %	Fuzzy Score	Position	Expert Consensus
S1	0.00	100	0.60	2	Accepted
S2	0.10	100	0.68	1	Accepted
S3	0.06	100	0.56	3	Accepted

Based on the findings in Table 3.2 above, all items recorded a value of threshold (d) ≤ 0.2 . This result indicates that all these items have gained an expert consensus and been accepted. The expert agreement percentage showed that all items are above 75% while the fuzzy scored a value greater than 0.5. Also, all defuzzification values for each item exceeded the value of α -cut = 0.5. Hence, this shows that the items in subjective norms have gained consensus from the experts.

Analysis of Expert Consensus on Price

The following Table 4.1 illustrates the experts' evaluation of the items of price construct.

Table 4.1

Experts' evaluation of the items of price construct.

Items	
P1	Reasonable price is an important factor in purchasing decisions
P2	Organic food is worth paying
P3	People are willing to pay a premium for organic products that are essential for living a healthy life
P4	Buyers select organic products whose prices are similar to regular products

The threshold value (d), expert consensus percentage, defuzzification and item position for the above items are depicted in Table 4.2.

Table 4.2

Analysis of price construct.

Item	Threshold Value, d	Percentage of Experts Group Consensus, %	Fuzzy Score	Position	Expert Consensus
P1	0.10	100	0.68	1	Accepted
P2	0.13	80	0.56	2	Accepted
P3	0.13	80	0.44	-	Rejected
P4	0.06	100	0.44	-	Rejected

Based on the findings in Table 4.2 above, all items recorded a value of threshold (d) ≤ 0.2 . This result indicates that all these items have gained an expert consensus and been accepted. The expert agreement percentage showed that all items are above 75% while item for P1 and P2 have gained an expert consensus and accepted while item P3 and P4 were rejected since the fuzzy score for P3 and P4 were less than 0.5 at 0.44. Also, all defuzzification values for each item exceeded the value of α -cut = 0.5. Hence, this shows that the items in price have gained consensus from the experts.

Analysis of Expert Consensus on Consumer Knowledge

The following Table 5.1 illustrates the experts' evaluation of the items of consumer knowledge construct.

Table 5.1

Experts' evaluation of the items of consumer knowledge construct.

Items	
C1	People can identify the brands and labels of environmentally safe organic products
C2	Reading news or articles familiarises people with organic food items to buy
C3	People are familiar with products that comes in environmentally safe packages
C4	Organic food items are easily recognizable
C5	Buyers are aware of the organic food options that are available in the market

The threshold value (d), expert consensus percentage, defuzzification and item position for the above items are depicted in Table 5.2.

Table 5.2

Analysis of consumer knowledge construct.

Item	Threshold Value, d	Percentage of Experts Group Consensus, %	Fuzzy Score	Position	Expert Consensus
C1	0.19	60	0.64	-	Rejected
C2	0.08	100	0.60	3	Accepted
C3	0.10	100	0.68	1	Accepted
C4	0.06	100	0.64	2	Accepted
C5	0.18	60	0.52	-	Rejected

Based on the findings in Table 5.2 above, all items recorded a value of threshold (d) ≤ 0.2 . This result indicates that all these items have gained an expert consensus and been accepted. The expert agreement percentage showed that there were two items less than 75% which were C1 and C5 while for C2, C3 and C4 the percentage were 100%. This result indicates that item C2, C3 and C4 only have gained an expert consensus and accepted. Also, all defuzzification values for each item exceeded the value of α -cut = 0.5. Hence, this shows that the items in consumer knowledge have gained consensus from the experts.

Analysis of Expert Consensus on Attitude

The following Table 6.1 illustrates the experts' evaluation of the items of attitude construct.

Table 6.1

Experts' evaluation of the items of attitude construct

Items	
A1	Organic food purchases provide customers with a positive sense of contributing to environmental improvement
A2	Organic food keeps the consumer fit and healthy
A3	Organic food consumption makes the consumer feel energetic

The threshold value (d), expert consensus percentage, defuzzification and item position for the above items are depicted in Table 6.2.

Table 6.2

Analysis of consumer knowledge construct.

Item	Threshold Value, d	Percentage of Experts Group Consensus, %	Fuzzy Score	Position	Expert Consensus
A1	0.10	100	0.68	2	Accepted
A2	0.06	100	0.76	1	Accepted
A3	0.16	80	0.60	3	Accepted

Based on the findings in Table 4.2 above, all items recorded a value of threshold (d) ≤ 0.2 . This result indicates that all these items have gained an expert consensus and been accepted. The expert agreement percentage showed that all items are above 75% while the fuzzy scored a value greater than 0.5. Also, all defuzzification values for each item exceeded the value of α -cut = 0.5. Hence, this shows that the items in attitude have gained consensus from the experts.

Conclusion

This study aims to determine and rank the factor that influences consumer buying behaviour of organic food. The selected factors used in this research were behavioural intention, subjective norms, price, consumer knowledge and attitude. The Fuzzy Delphi Method has been applied and successfully achieved the objective of this study, specifically to determine and rank the important factor that influenced consumer buying behaviour for organic food. Hence, based on the results using Fuzzy Delphi, this study concluded that the most important factors under behavioural intention was people usually consider purchasing organic food that meets their taste.

Furthermore, for subjective norms, concept of organically grown food plays an important factor in organic food purchasing behaviour. For price factor, the most important in purchasing decisions was reasonable price. As for consumer knowledge, the most important factor was people are familiar with products that comes in environmentally safe packages while for attitude factor organic food keeps the consumer fit and healthy was the most important in purchasing decisions.

From the result, the ranking for each factor can be achieved by referring to the value of fuzzy score in defuzzification process. The first ranking for behavioural intention was people usually consider purchasing organic food that meet their tastes with fuzzy score 0.68 while the last ranking were people buy organic food products after considering the effect of their use on environment and consumers are more likely to purchase organic food if they see the items on display with fuzzy score 0.64.

For subjective norms, the first ranking was concept of organically grown food with fuzzy score 0.68 while the last ranking was family play an important role in their organic food purchase with fuzzy score 0.56. Furthermore, the first ranking for price factor was reasonable price with fuzzy score 0.68 while the last ranking was organic food is worth paying with fuzzy score 0.56. As for consumer knowledge, the first ranking was people are familiar with products that comes in environmentally safe packages with fuzzy score 0.68 while the last ranking was reading news or articles familiarizes people with organic food items to buy with fuzzy score 0.60. Lastly, the first ranking under attitude factor was organic food keeps the consumer fit and healthy with fuzzy score 0.76 while the last ranking was organic food consumption makes the consumer feel energetic with fuzzy score 0.60.

As a conclusion, this study will benefit organic food retailers and organic farmers in Kuantan, Pahang, because they will be able to identify the main factor of consumer organic food's buying behaviour. Retailers are now aware of how to develop and enhance a marketing strategy, thus they will be able to expand their company. This information will also highly contribute them to target the correct consumers and further increase their sales. Besides, the government could come up with more effective ways to promote organic food and increase the consumption level of organic food within that area.

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