Young Consumers' Willingness to Payfor Greenvegetablein Emerging Markets: A Case of Vietnam

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Abstract
Young consumers have grown increasingly interested in organic items that are excellent for their health in recent years, with the development of consumer trends that are good for themselves. Using discrete choice experiment method, the research attempts to provide insights into young customers' willingness to pay for green broccoli and the trade-off between broccoli attributes such as green label, origin and quality. Young consumers are least willing to buy China-origin broccoli, while they see no difference between Vietnamese and imported broccoli. Consumers are willing to purchase eco-friendly broccoli as compared to organic broccoli as they are willing to pay for organicproduct at a higher price of 21.54% and eco-friendly product at a higher price of 116.35%. The study suggests the promotion of domestic agricultural products through product positioning and quality improvement. The study also provides an insight into consumers' preferences since they seem to be more sensitive to the term "eco-friendly" than "organic", suggesting enterprises should consider the language used when communicating with consumers.

Keywords: consumer behavior, discrete choice experiment,green food, willingness to pay

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I.   INTRODUCTION

While green consumerism has grown popular in rich nations, consumers in developing countries are still rather confused about this trend. Consumers are becoming more conscious of the gravity of environmental deterioration, and they are paying more attention to safeguarding their health by selecting consumer items for themselves. Consumers are becoming increasingly aware that their consumption decisions impact the environment and the workers who produce the products that they consume (Carrigan and de Pelsmacker, 2009). This awareness is translating into purchase decisions, and "ethical consumers" represent a growing market segment (Shaw and Tomolillo, 2004).

Many organic and eco-friendly items have been developed, however many people in Vietnam are still perplexed by this notion (Hoang Thi Bao Thoa, 2016). This implies that people are becoming more environmentally conscious, preferring to buy items from companies that are more committed to social responsibility, environmental dedication, and consumer health protection. A more extensive examination of the green product selection process can assist businesses in having complete information and selecting the proper items to deliver to the market, while also developing successful production and business strategies.

According to a survey by the Vietnam Report Joint Stock Company, the key trends in the food and beverage industry in the next years will be an explosion of natural and ecologically friendly goods. Furthermore, the research demonstrates the increase in consumer trust, real values, authentic tales about products and corporate branding, and the use of big data in manufacturing and distribution. Consumers' eating habits that prioritize product quality and the selection of green - clean - healthy items are causing a revolution in the fields of agricultural production, food, and beverage all over the world. According to Khanh Chi (2019), accorrding to AC Nielsen's organic food consumption trend research, 86% of Vietnamese consumers choose organic goods for their everyday meals due to its safety, nutrition, and great flavor.Furthermore, customers are prepared to spend 20%-25% more for organic items, according to Dinh Thi My Loan, president of the Vietnam Retailers Association (Vietnam Agriculture Magazine, 2022). This reflects the increased demand for this specialized market. As a result, green - clean - healthy is appealing and incredibly promising.

Broccoli is one of the most popular organic vegetable products. In examining the assessment of organic goods and eco - friendly products, the users' choice to buy organic and environmentally friendly broccoli is also influenced by the same subjective and objective variables as other vegetable products.

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During the Covid-19 pandemic, people have been more concerned with health protection, particularly when purchasing daily food such as vegetable. The findings of this study will assist firms in tailoring their products and business strategies to Vietnamese customers.

The primary objective of this study is to determine consumers' willingess to pay (WTP)for eco-friendly and organically labeled and conventionally grown broccoli. We use discrete choice experiment (DCE) to elicit consumers' WTP for green broccoli andquantify the trade-off between broccoli attributes such as green label, origin and quality. We also explore the role of broccoli attributes and consumers' demographic characteristics in purcha decisions.

The paper is organized as follows. First, we review the findings of previous studies related to green food consumption. Next, the authors address methods used for eliciting consumers' WTP and trade off among apparel attributes. We then present model results, result discussion and their implications for the food industry.

II.   LITERATURE REVIEW

Consumer Behavior

Consumer behavior, according to Valentin Radu (2020), is the study of customers and their processes of selecting, consuming, and discarding items and services. This process comprises the consumer's emotional, mental, and behavioral responses. Consumer behavior, according to DJ Team (2020), is defined as their online or offline behaviors prior to purchasing a product or using a service. Consumer purchasing behavior studies have revealed that the choice to pick, acquire, use, or reject a product or service is impacted by a variety of subjective and objective criteria. Consumer behavior analysis assists organizations in understanding the reasons behind their purchase decisions and discovering customer purchasing trends, allowing them to build production plans and promote items more efficiently.

Literature Review of International context studies

Numerous studies on consumers' attitudes regarding organic products are currently available. The majority of study, however, simply identifies variables that affect consumers' willingness to spend and how they view organic products (Kamal Aryal, Pashupati Chaudhary, Sangita Pandit, Govinda Sharma, 2009; Athanasios Krystallis, George Chryssohoidis, 2005; Yaowarat Sriwaranun, Christopher Gan, Minsoo Lee, David A Cohen, 2015).Most other studies (Griffith, Lars Nesheim, 2008; Weng Marc Lim, Juliette Li Shuang Yong, and Kherina Suryadi, 2014) show that, rather than demographic features, health and safety concerns and environmental protection are the two key variables influencing consumer purchasing decisions. Additionally, these studies didn't focus on any particular product, instead concentrating mainly on organic products in general, organic foods, and their many product lines.

The discrete choice experiment method has only been utilized in a small number of research to evaluate consumers' trade-offs and willingness to pay for particular organic broccoli product attributes. Furthermore, according to Yaowarat Sriwaranun, Christopher Gan, Minsoo Lee, and David A Cohen (2015) consumers are willing to pay 88% and 51% respectively for goods like kale, jasmine, and pork. According to a 2018 global survey by M. Shahbandeh (2020), 34% of UK customers, 48% of European and US consumers, and 70% of Chinese consumers are willing to pay more for organic products. However, there hasn't been any research on consumers' propensity to purchase organic broccoli up to this point.

Literature Review of Vietnam context studies

Vietnamese consumers are gravitating more and more toward organic goods. Recently, consumers have started to choose organic items. The majority of them appear to be in supermarkets in large cities, on the shelves. However, according to a report published in September 2022 by Vietnam Agriculture magazine, Vietnamese consumers choose products based on the following criteria: eye-catching, delicious, and palatable products (87%); safe products (80%); products with clear packaging (39%); and organic products (26%). As can be seen, organic products continue to play a little role in the overall consumption picture.

In Vietnam, research on eco-friendly and organic foods is still limited. Although a few studies have been conducted to identify the factors that influence a consumer's purchasing decision, almost no studies have been conducted to quantify consumers' willingness to pay for broccoli products. According Vietnam Agriculture magazine, the number of people ready to spend 20% extra for organic items is greatest in Hai Phong and Hanoi. Because of rising living standards and education levels, an increasing number of customers, particularly pregnant women, women with small children, and housewives, are worried about product quality and safety. Organic veggies' perceived use value, trust in organic certification labels, and family disposable income boost willingness to pay for organic vegetables in both rural and urban settings (Ha Thanh Mai, Shamim Shakur, Kim-Hang Pham Do, 2018). Furthermore, being an organic consumer increased customers' willingness to spend in urban regions but had no influence in rural areas. According to another study, "Consumption of organic food in an emerging market: The influence of individual consumer factors and green marketing practices of grocers"

(Hoang Viet Nguyen, Ninh Nguyen, Bach Khoa Nguyen, Antonio Lobo, and Phuong Anh Vu, 2019), customers' positive attitude toward organic food does not translate into actual purchases of organic meat. Premium pricing, on the other hand, make customers less likely to purchase organic meat.

According to the article "Finding a Boost for Vietnam's Organic Product Boom," a research on Nielsen's consumer confidence index in the first quarter of 2019revealed that 37% of customers claimed health is their top priority. Vietnamese consumers care about their health more than ever," she said. "Pollution in the air and in the environment are hot topics that are increasingly top of mind for people. With the current situation relating to pollution and increased consumer awareness, health is expected to continue to be a top concern in the third quarter (Khanh Chi, 2019). Furthermore, four out of five customers (80%) are concerned about the long-term consequences of artificial chemicals and want to learn more about the components that go into their everyday diet (76%). Furthermore, customers are prepared to spend 20%-25% more for organic items, according to Dinh Thi My Loan, president of the Vietnam Retailers Association. This reflects the increased demand for this specialized market. According to the article "Vietnamese customers care about environmental aspects and brands when shopping," Vietnamese consumers care the most about society and sustainable development in Southeast Asia. Their shopping habits are dominated by high-quality items (79%), health and beauty products (77%), and natural, fresh, and/or organic components (77%).

In general, the studies in Vietnam are similar in that they illustrate current consumption patterns as well as the factors influencing perception and desire to purchase organic products. However, the number of researches that employ discrete choice experiment method to assess consumer trade-offs and willingness to pay is relatively limited.

III. METHODOLOGY

This study identifies willingness to pay and trade-offs of Vietnamese consumers for the organic properties of products, thus predicting consumer behavior, identifying potential markets, proposing solutions to locate products, checking product origin and recommending appropriate development directions for businesses in the F&B industry in Vietnam.The chosen productis broccoli, which is familiar and popular with Vietnamese consumers.

To model the behavior of choice, this study uses discrete choice experiment known as the leading method in the field of studying customer behavior. Discrete selection behavior theory is based on the consumer behavior theory of Lancasters (1966), also known as multi-attribute utility theory; according to which the utility derived from product attributes is different from the utility proportional to the amount of product consumed, as assumed in classical microeconomics.

The selection exercises ask interviewers to pick the option that best suits them based on product qualities given at various levels. Data which quantifies the person's intentions through their statements is called stated data, and it is used to estimate the choice model.

The advantage that the customer derives from their decision is dependent on both observable and unobservable elements. The consumer's random utility function, which is determined by selecting product i from person n, may be expressed as follows:

$$U_{ni} = V_{ni} + \varepsilon_{ni}$$

In the above equation, V is the observable factor, which is measured by the consumer's evaluation of the selection set's attributes. ε is a random and unobservable element. It is typically believed that the observable utility factor, V_{ni}, has a linear connection with the product attributes. Therefore, V_{ni} may be written as follows:

$$V_{ni} = \beta X_{ni}$$

Where: X_{ni} is the vector of observation variables representing the i product selection of the individual n based on the selection set's attributes, β and is the vector explaining the observation variables' corresponding coefficients. If there is higher satisfaction, the interviewee is presumed to choose the product. However, because the utility of any given product is not immediately observable, the beta coefficients are approximated using probability. The probability that the respondent chooses product i over product j is represented by:

$$P_{ni} = \Pr[U_{ni} > U_{nj}]$$

Based on the conditional logit model, the probability of product selection i can be calculated as follows:

$$P_i = \frac{\exp(V_i)}{\sum_{j=1}^{N} V_i}$$

The study uses a mixed approach. In order to present the characteristic attributes of products that influence the purchasing decisions of consumers, the authors use the preliminary qualitative research method conducted by face-to-face interviews to understand the reactions of consumers to the attributes of broccoli. Price characteristics, label attributes, color attributes (indicating the freshness and fiber content, minerals of the product), and origin attributes are the four features of broccoli which most affect customer purchase decisions. Table 1 displays the qualitative research findings for attributes and corresponding levels:

Table I: Attributes and Attribute levels

	Attributes		Levels
1.	Label	-	Conventional
		-	Eco-friendly
		-	Organic
2.	Price	-	Unchanged
		-	25% increase
		-	50% increase
		-	75% increase
		-	100% increase
3.	Origin	-	China
		-	Viet Nam
		-	Japan
		-	Other countries (except Japan, China)
4.	Color	-	Greeny yellow
		-	Yellowish green
		-	Deep green

Direct interviews with young customers aged 18 to 30 in Hanoi were used for quantitative study. Interviewees are chosen at random to ensure that the sample is representative of Hanoi's youthful consumers. After conducting interviews, collecting and removing invalid votes from 200 questionnaires, the remaining 182 valid questionnaires (91%) were utilized for statistical analysis. The high response rate and great diversity of respondents guarantee that the sample size is enough for the study.

A full factorial design is the most comprehensive experimental design. Each level of each characteristic is combined with each level of all other qualities in this design (Hensher et., 2005). With the number of selected attributes and levels (2 attributes with 3 levels, 1 attribute with 4 levels and 1 attribute with 5 levels), the number of possible selection sets is 180 selection sets ($3^2 * 4^1 * 5^1 = 180$) is a large number that is difficult to achieve with the research team. As a result, the study team used orthogonal factional design to construct subsets of feature combinations from the full factor design, yielding an ideal number of 18 selection sets. The total number of selected sets is randomly divided into two sets (blocks), with each interviewer randomly answering one of the two sets. There were 3276 total observations (182 respondents x 9 choices x 2 options for each choice). The collected data will be statistically analyzed and processed using the STATA 16.0 software to validate the study hypotheses.

IV. RESULTS

Sample description

Demographic summary statistics of participant sample are presented in Table 2.

Table II:Demographic summary statistics of participant sample

(Bygender and income)

Subgroup		Number of people	%
Gender	Male	74	40.66%
	Female	108	59.34%
Monthly income	Under4million	41	22.53%
	4-8million	52	28.58%
	8-15million	55	30.23%
	Over15 million	34	18.66%

The Results
The results of the conditional logit regression model are shown in Table 3:

Table III: Estimated results of basic conditional logit regression model

Attributes	Regression coefficient	Standard deviation
Label (ref:conventional)		
- Organic	.261**	.112
- Eco-friendly	.413***	.115
Color (ref: Greeny yellow)		
- Deep green	.827***	.114
- Yellowish green	-.015	.115
Origin (ref: China)		
- Japan	2.879***	.170
- Viet Nam	1.660***	.134
- Other countries (excepy Japan, China)	1.677***	.135
Price	.012***	.002
ASC	1.258***	.099
Observations	3,276	
Pseudo R2	0.360	

*, **, *** respectively represent the 10%, 5% and 1% significance levels.
The estimated results of the conditional logit regression model are shown in Table 3. The Pseudo R2 is 36% and the confidence level is 95%. Almost label, color, origin, and price attributes levels have an influence on explaining customer decision when purchasing broccoli, specifically as follows:

Label attribute: Organic and eco-friendly labels have a beneficial influence on customer choice when purchasing broccoli products, with regression coefficients $\beta_1 = 0,261$ và $\beta_2 = 0.413$, respectively, at the 5% and 1% significance levels.

Color attribute: The color attribute considered is affected by two colors: dark green and yellowish green. While the deep green, which symbolizes the product's high fiber and mineral content, is an important factor in explaining customer choice- regression coefficient $\beta_3 = 0,827$ at 1% significance level (p-value = 0.000), the yellowish green is not. As a result, customers cannot figure out the difference between yellowish-green and greeny yellow.

Origin attribute: At the same 1% significance level, broccoli products from Japan, Vietnam, and imports (excluding Japan and China) had a positive influence on consumer utility, with regression coefficients of β_5= 2,879, β_6 = 1,660 and β_7 = 1,677, respectively. In other words, Chinese broccoli goods have a detrimental impact on consumer psychology.

Price attribute: The price feature has a positive influence on customer utility when selecting broccoli goods, with a regression coefficient of $\beta_8 = 0,012$.

To assess the level of customer's willingness to pay for each attribute of broccoli goods, the authors estimated the WTP for each statistic attribute with the level of consumer utility. The analyses' findings are as follows:

TableIV: WTP (%) for broccoli attribute levels

Attribute	Regression coefficient	CI (95%)	
		Upper	Lower
Label (ref: conventional)			
Organic	21.538	41.300	1.775
Eco-friendly	116.347	152.169	80.524
Color (ref: greeny yellow)			
Deep green	68.038	94.869	41.207
Origin (ref: China)			
Japan	236.963	319.459	154.467
Vietnam	136.662	180.244	93.080
Imports (except Japan, China)	138.464	183.464	92.555

WTP is measured as a percentage and represents the amount buyers are prepared to pay above the original product's typical price. According to model estimations, customers are willing to spend 21.54% more for organic items and 116.35% more for eco-friendly products when compared to products with conventional labelling. Deep green broccoli items attract customers, who are prepared to spend 68.04% more for them than dull broccoli products. The provenance of broccoli goods has the greatest effect on customers' readiness to pay; they are prepared to spend 236.96% more for Japanese items. Vietnamese origin and foreign imports had equal influence on customer choices, with consumers wanting to pay more 136.66 percent and 138.46%, respectively.

Table V: Probability of product selection changes when characteristics change

Attributes	Regression coefficient	Standard deviation
Price		
- 25% increase	.151***	.023
- 50% increase	.295***	.041
- 75% increase	.424***	.055
- 100% increase	.542***	.063
Lable		
- Organic	.130**	.055
- Eco-friendly	.609***	.036
Color		
- Deep green	.391***	.057
Origin		
- Japan	.894***	.017
- Vietnam	.681***	.036
- Imports (except Japan and China)	.685***	.036

*,**,*** respectively represent the 10%, 5% and 1% significance levels.

With 95% in confidence interval (CI), Table 5 indicates the chance of customers picking each product when the characteristic is changed. It can be shown that when the price rises, the likelihood of customers picking the product rises; in other words, the consumer is unconcerned about the price rise. To explain this, the authors feel that for a product whose price does not account for a big amount of customers' income and has a direct impact on health, the higher the price, the greater consumers' peace of mind. Both the organic and eco-friendly label qualities boost the likelihood of product selection. In which the eco-friendly label outperforms the organic label. The provenance of broccoli has a significant impact on consumer product selection decisions. Consumers are most happy with the choice of broccoli from Japan, nevertheless, broccoli from Vietnam or imported is chosen about equally.

V. DISCUSSION AND RECOMMENDATIONS

The findings illustrate the extent to which each characteristic influences the consumer's utility level. The findings of calculating the readiness to pay for each characteristic of broccoli goods reveal that customers are prepared to spend 21.54% more for the organic label and 116.35% more for the eco-friendly label, rather than buying items with conventional labels. Thus, the eco-friendly label attracts consumers and delivers a better degree of utility than the organic label. Regarding the color attribute, dark green broccoli has a favorable effect on customers and causes them to be 68.04% more eager to spend than for dull broccoli items. When it comes to the origin characteristic, buyers are more prepared to pay for goods coming from Vietnam, Japan, and other nations that draw customers at comparable rates, and all are higher than products from China. This demonstrates that buyers lack confidence in Chinese items, which prevents them from making a purchase. Customers are generally not price sensitive, therefore even when prices increase, they are still prepared to pay to obtain the benefits of broccoli. This implies that customers are becoming more and more concerned about their health and are prepared to pay significant sums to protect their health.

Broccoli goods with Japanese labeling are well received by consumers. This is a significant barrier for Vietnamese firms. In order to have the greatest quality broccoli goods and boost product value in the eyes of consumers, Vietnamese enterprises must focus on product research and development. They may then compete with broccoli goods originating in Japan, which is regarded as the origin of broccoli products. A significant difficulty for Vietnamese firms is the widespread sale of items from China, frequently of unknown provenance, on the market, which has a negative influence on customers. If businesses do not pay attention to product package design, it is likely that Vietnamese businesses' products will be confused with these items.

According to the findings of the study, customers are more satisfied with the "eco-friendly" label than with the "organic" one. As a result, firms must pay close attention to label placement and product design to cater to consumer preferences.

Consumers are gradually becoming savvy consumers and moving towards a green and healthy lifestyle through the use of organic foods and clean ingredients in the setting of people's average income growing, a large proportion of youthful population, and the strong development of the middle class. As a result, it is apparent that in order to fulfill the demands of the market and attract more and more consumers, businesses must be aware of the possibilities and difficulties, plan, and adapt business strategies to take a shortcut to catch the trend.

It is not difficult to be open regarding the quality of a company's products. In light of the prevalence of "dirty" food on the market, the traceability of commodities from production to consumption is a vital and effective strategy to re-establish customer trust, enable companies to establish transparency, and assist authorities in managing more efficiently and quickly. Businesses qualified to make organic food, like other commodity items, can paste barcodes for simple tracking by customers. Consumers may study and gather information about the items they have purchased in the most complete and thorough way, possible thanks to traceability.

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