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Analysis of Consumer Preferences for Green Tea Products: A Randomized Conjoint Analysis in Thai Nguyen, Vietnam

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Abstract: How local economies can successfully develop remains an important issue for any developing country. One mechanism for promotion of economic development is government-driven policy. The problem is that it is not clear whether public-led economic promotion attracts consumers and which promotion factors are relatively significant for boosting particular goods. This paper examines attributes of green tea products likely influencing consumer preferences, focusing on the Thai Nguyen area in Vietnam as an example. In this area, the "One Commune, One Product" (OCOP) project has been implemented by the local government. This study employs randomized conjoint analysis based on data collected from 450 randomly selected consumers in several local supermarkets. Interestingly, the results show that online style sales have a negative preference for the purchase of green tea products, while transparency, such as the traceability of the product and product information, and reliability, such as certification, enhance the purchase of these products by consumers. However, this finding is not necessarily robust because our results indicate that approximately 90% of consumers tend to choose the default pair, which means that they do not actively prefer the product, possibly implying that this kind of public-led promotion is not yet broadly familiar to all people.

Keywords: conjoint analysis; green tea; OCOP; attributes for preference; Thai Nguyen; causal inference

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1. Introduction

Currently, the tea plant is predominantly recognized for its production of various types of tea. Over the past few decades, tea has consistently remained the most widely produced and consumed beverage globally, second only to water. Tea is consumed daily by millions of people [1–3]. The production and export of packaged tea play significant roles in contributing to the economic development of many countries [4–6]. The global tea industry is estimated to reach a retail value of USD 73 billion by 2024, with smallholder producers in Asian and African countries contributing approximately 70% of global tea output [6]. Thus, tea cultivation not only contributes to socioeconomic development in developing countries but also impacts the livelihoods of people in rural and mountainous regions [7,8].

Vietnam is currently one of the top 10 tea-producing countries globally, ranking sixth after China, India, Kenya, Sri Lanka, and Turkey [9]. Vietnam boasts approximately 130 thousand hectares of tea plantations, yielding a total output of 994.2 thousand tons, with an average yield of approximately 8 tons per hectare. However, tea exports reach only USD 230 million annually, which is at a lower level than coffee, rubber, and pepper exports [10]. Tea cultivation in Vietnam is predominantly concentrated in the northern

midland and mountainous regions, which account for approximately 70% of the country's total tea-growing area. Among these regions, the central highlands region occupies approximately 19%, the coastal mountainous and north central coast regions occupy 7%, and the Red River Delta region occupies 4%. Noteworthy provinces with significant tea-growing areas include Lam Dong Province, with 10.8 thousand hectares; Phu Tho Province, with 16.1 thousand hectares; Ha Giang Province, with 21.5 thousand hectares; and Thai Nguyen Province, with 22.3 thousand hectares. Vietnam's tea consumption market consists primarily of domestic consumption and exports. In the export market, black tea dominates, while green tea is primarily consumed domestically [11]. In recent years, the Vietnamese tea industry has contributed significantly to the economic value of society, generating numerous employment opportunities in various regions, augmenting incomes, improving livelihoods, and aiding in the advancement of agricultural development.

Currently, Vietnam, along with several other tea-growing countries worldwide, faces numerous challenges and difficulties. Apart from objective factors such as climate change leading to agricultural degradation and the declining yields and productivity of tea, subjective reasons for such challenges include limited and underdeveloped marketing choices, inadequate access, and ineffective responses to customer demands in the country, resulting in low levels of profitability [1,3,4,7]. Furthermore, the promotion of tea industry brands has been inadequate, as challenges in controlling food safety and quality are present, leading to a loss of consumer trust. Consequently, this situation jeopardizes the livelihoods of producers, particularly smallholder producers and rural areas where economic development remains slow and unsustainable due to the lack of market linkages [10–12]. Moreover, consumers are becoming increasingly discerning, placing stricter emphasis on quality, design, and information provided on product packaging [13,14]. The behavior of food consumers is also evolving, with their preferences and considerations shifting toward food safety and health [15].

The market demand for green tea products is highly significant. Apart from the focus on applying scientific technology in production and processing to enhance productivity and quality, the survival imperative for producers, enterprises, and distributors lies in ensuring the marketability of their tea products. One of the key determinants influencing the green tea product market is consumer behavior. Several previous studies in some of the world's largest tea-producing countries, such as China, India, and Sri Lanka, indicate that tea product attributes such as brand, origin, price, organic labels, product, marketing, taste, and quality influence consumer behavior [15–18]. Meeting consumer needs and preferences and building trust among customers demand specific strategies and effective customer engagement from producers, enterprises, and distributors. Therefore, we conduct this study using randomly combined levels of product attributes via a combination analysis method. We assess the influence of each attribute on customer preferences for green tea products.

This study makes significant contributions to the field of consumer behavior and the tea industry. To begin with, it extends the existing literature by examining the role of traceability certification and online shopping in influencing consumer preferences, an area that has not been fully addressed in previous research. In terms of methodology, the study employs conjoint analysis to provide a comprehensive view of consumer preferences. Additionally, these findings offer actionable insights for both policymakers and tea producers, advocating for the development of effective certification policies and targeted marketing strategies. Furthermore, by focusing on the specific context of Vietnam, this study fills a critical gap, providing localized insights that can drive regional market strategies and policy-making.

2. Literature Review

Numerous previous studies have investigated tea plants and products worldwide and in Vietnam. However, there is scarce research focusing on market research and consumer behavior, particularly regarding consumer preferences for specific attributes of green tea products. In China, Nam et al. [15] studied consumer preferences for green tea with

environmentally friendly certification, with the results showing that certain tea product attributes, such as the location of production, size of the production firm, certification, and type of green tea, affect consumer preferences, and thus, consumers are willing to pay more for green tea products with organic certification than for those without organic certification or without any certification at all. Another study by Yang et al. [16] shows that the origin, organic labels, and brand attributes of Oolong tea are significant factors influencing consumers' purchasing decisions. Attributes such as the product itself, its marketing, and consumer lifestyle influence consumers' decisions to purchase branded tea in Sri Lanka [17], whereas consumers in India are more concerned with the quality and taste of the product [18]. Sun et al. [19] conducted research assessing environmental impacts throughout the lifecycle of green tea production. Moreover, Xi et al. [20] conducted a study on the influence of potassium fertilizer on the quality of tea, while Lou et al. [21] studied the attitudes and behaviors of tea farmers toward pro-green control technology for pests and diseases in tea cultivation. In Vietnam, Hong et al. [5] conducted research assessing the economic losses and environmental impacts of chemical fertilizers and pesticides in tea production. Other studies have focused on enhancing the efficiency of irrigation water use for sustainable development in the Vietnamese tea industry [2]. Additionally, investigations have explored the impact of sustainable certification attributes on the income of tea farmers [22]. Also, Hanh [23] analyzed the current status of production, processing, and exports to enhance the value added for the Vietnamese tea industry. Furthermore, the competitive advantages of the Vietnamese tea industry in the international market have been examined [24].

While there has been limited previous research analyzing in-depth customer behavior or examining the influence of tea product attributes on consumer behavior, preferences, and decisions specifically for green tea products, there have been numerous studies analyzing the factors affecting consumer preferences and decisions regarding food and beverage products. For example, Khai and Yabe [25] employed a choice experiment method to analyze consumer preferences for the attributes of environmentally certified rice in the Mekong Delta region of Vietnam, revealing a positive correlation between attributes such as the number of Sarus cranes, degree of pesticide reduction, increased biodiversity, price, and consumer decisions. Additionally, numerous studies have utilized combined analysis methods to identify the factors influencing consumer preferences in product and beverage research. For example, Cerda and colleagues [26] employed a conjoint analysis method to determine the importance of the attributes of organic apple products in Chile on consumer preferences, revealing that variety, organic production methods, sweetness, and low price are factors influencing consumer preferences. A study conducted by Ranasingha and colleagues revealed that the color, size, and crispiness of fruits influence consumers' preferences and willingness to pay in Sri Lank [27]. Specifically, oranges are associated with attributes such as sweetness, shelf life, and price. Thus, consumers tend to prefer oranges with high levels of sweetness, longer shelf lives, and lower prices. Moreover, attributes such as brand, health benefits, price, and calorie content influence consumer preferences for milk and fruit-based beverages in India [28]. Furthermore, attributes, including pearl size, sugar content, ice amount, and price, positively affect consumer preferences for milk tea beverages in the Philippines [29].

Combination analysis is a widely utilized research method in marketing and consumer behavior research [21,30–38]. This method presents randomly combined scenarios involving different levels of product or service attributes, with respondents ranking their preferences for each randomized combination. Through this technique, researchers can identify the impact of each attribute on consumer preferences and purchase intentions [39,40]. Understanding consumer preferences and behaviors is the key to success for producers, businesses, and suppliers in product development, competition, and marketing.

3. Study Area and Sampling

This study aims to identify the product attributes influencing consumer preferences for green tea products through direct customer surveys in the city of Thai Nguyen, Thai Nguyen Province. Thai Nguyen is a midland province located in the northeast region of Vietnam, approximately 75 km from the capital city of Hanoi. With a land area of 3521.96 km^2 and a population of 1,323,150 inhabitants, this province ranks 25th in population density in Vietnam. The province's average gross regional domestic product (GRDP) per capita reached VND 95,100,000 (approximately USD 4161) in 2021. Agricultural land accounts for 85.73% of the total land area, with tea cultivation occupying a significant portion of the total land area. Thai Nguyen Province is one of the largest tea-growing regions in the country, with a tea cultivation area of 22,445 hectares and a processed green tea output of 50,146 tons, including 1.86 tons of green tea exported, valued at USD 2.03 million. The province consists of nine administrative units, including three cities and six districts, with the largest city, Thai Nguyen city, having the highest population density. Thai Nguyen city is considered the administrative and economic center of Thai Nguyen Province, with a population of 354,331 people, accounting for 26.78% of the province's total population. Thai Nguyen city serves as the primary economic hub and boasts the highest consumption level of green tea within the province [41]. For these reasons, we select Thai Nguyen city as the research site. The research was conducted from 6 October to 30 October 2023. The sampling process involves the following two steps: first, selecting the research area, and second, addressing customer sampling procedures.

In the first step, we selected six major supermarkets located in the city center of Thai Nguyen (Figure 1). These six supermarkets attract the most daily foot traffic for shopping purposes within the area, and notably, they all sell green tea products from Thai Nguyen Province. To ensure comprehensiveness in terms of sample size, budget, and study duration, we collected a total sample of 450 individuals across the six supermarkets. Specifically, 75 samples were collected from GO supermarket, 75 from Minh Cau 1 supermarket, 75 from Lan Chi supermarket, 75 from Minh Cau 2 supermarket, 75 from Vinmart supermarket, and 75 from Thanh Do supermarket.

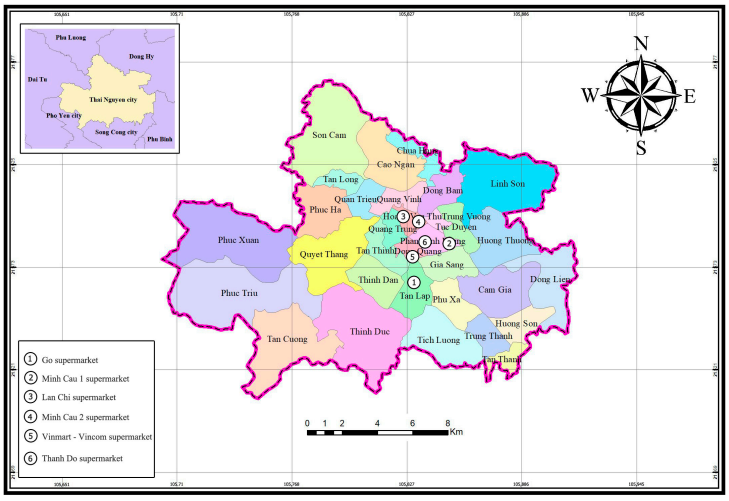


Figure 1. Map of Thai Nguyen city and the study area.

In the second step, we approached customers at the entrances and exits of supermarkets for direct interviews. Each respondent participated in a 10–15 minute interview, with a 30 minute interval between consecutive interviews to minimize respondent fatigue. This interval was measured from the completion of one interview to the start of the next interview. In cases where the initial respondent declined to participate after the introduction, the timing was reset for the subsequent interviewee. Throughout the experimental process, we developed a survey questionnaire comprising the following four steps: (1) personal information; (2) scenarios; (3) experimental choice sets; and (4) basic respondent demographics

such as age, gender, education level, ethnicity, occupation, average monthly household income, and household size. For steps (1) and (2), we provided information and scenarios directly to the respondents upon their agreement to participate in the interview. For steps (3) and (4), we conducted the interviews, and respondents selected their preferred choice in the combined experiments on a laptop computer.

In this study, we investigate and propose five attributes of green tea, namely, source traceability, "One Commune, One Product" (OCOP) star certification, producer information, product information, and purchase methods. The traceability of origin is defined according to the standard TCVN 12850:2019 of Vietnam as follows: the traceability of origin is a supervisory activity that identifies a product or service unit through each stage over time, as well as the location of the production, processing, storage, preservation, transportation, distribution, and trading processes. Such information is encoded on a quick response (QR) code and is designed by manufacturers and distributors to be displayed on product packaging [42]. Consumers can utilize software applications on smartphones or tablets to access product information. Additionally, the OCOP project is a program initiated by the Vietnamese government in 2018. The OCOP program is one of Vietnam's three national target programs for building new rural areas and serves as a solution to boost rural economic development and unleash the potential for locality growth. The program's focal point is the development of agricultural and nonagricultural products, along with local services, aiming to bolster economic growth and notably increase rural residents' incomes [43–45]. OCOP-certified tea products are those tea products that have undergone evaluation for OCOP product classification by the Vietnamese government. Products with OCOP certification meet the criteria concerning quality, package design, product characteristics, and local strengths. Currently, OCOP certification involves the following three levels: three stars, four stars, and five stars, with a higher number of stars indicating higher product quality. Producer information refers to the details provided by the manufacturer or distributor, such as the manufacturer's name, address and phone number, along with some historical background presented on the product packaging. Product information includes the details disclosed by the manufacturer on the packaging, such as the product name, ingredients, expiration date, usage instructions, manufacturing date, and warning information. The purchase method refers to the manner and method by which consumers access and conduct purchasing transactions.

In an actual interview, the combination of levels of attributes is randomly assigned and presented in the questionnaire. The levels of attributes in this study are chosen to be practically relevant to the attributes of green tea products and the research objectives. The levels of the attributes are specified in Table 1, including two levels for the origin traceability attribute, three levels for the OCOP certification attribute, four levels for the manufacturer information attribute, four levels for the product information attribute, and three levels for the purchase method attribute. There are five attributes with two, three, or four different levels each, resulting in 288 ($2 \times 3 \times 4 \times 4 \times 3 = 288$) potential scenarios for each attribute, with 10 observed choices per interviewee, resulting in a final sample size of 4500 ($450 \times 10 = 4500$).

Table 1. Attributes and levels for the conjoint analysis.

Attributes	Level 1	Level 2	Level 3	Level 4
Traceable	Yes	No		
OCOP star certification	3 stars	4 stars	5 stars	
Producer information	Name	Address	Contact number	Producer's history
Product information	Name	Ingredient	Instruction	Expiration date
Purchase	At stores	At supermarkets	Online	

OCOP: One Commune, One Product.

After understanding the experimental scenario, interviewees were asked to prioritize numbers in ascending order of one, two, and three according to random combination

groups labeled Groups (A), (B), and (C), respectively. Number one corresponds to the group of randomly combined levels of attributes that the interviewee prioritizes as his or her first choice, followed by numbers two and three. An example in Figure 2 illustrates this situation for the first respondent, where the random experiment yields three groups based on the levels of product attributes, and the interviewee then prioritizes numbers 1, 2, and 3 (Figure 2).

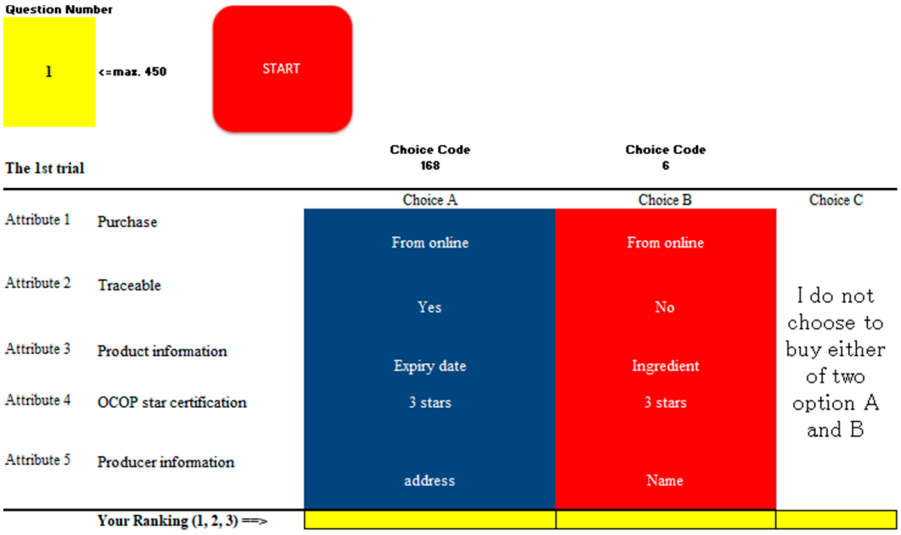


Figure 2. Sample of choice set.

4. Methods

Conjoint analysis is a method used in analyzing consumer behavior through a set of product and service characteristics, including their nature and attributes. Combined experiments present hypothetical scenarios, and respondents are selected, evaluated, and prioritized based on the levels of product attributes. In this choice and prioritization, respondents sometimes must trade off between attributes and decide which attribute takes precedence for them. In this study, we employ a conjoint analysis method proposed by Hainmueller et al. [46] to determine the probability of choice both internally and externally. This study identifies the nonparametric average marginal component effect (AMCE) for each attribute and level concerning the probability distribution of attributes across repeated samples. The levels of attributes are randomly selected, and ordinary least squares (OLS) regression is used to calculate the AMCE of each attribute as a linear regression coefficient. The model is as follows:

$$Y_{itj} = \beta_0 + \sum_{l=1}^{L} \sum_{d=2}^{Dl} \beta_{ld} \times a_{itjld} + u_{itj}$$

where a_{itjld} is a dummy variable for the d-th level of policy j in task t of respondent i;

$i = 1, \ldots, 450$, is the number of respondents;

$L = 1, \ldots, 5$, is the number of attributes, d is the number of levels;

$Dl = (D1, D2, D3, D4, D5) = (2, 3, 4, 4, 3)$ is the total of levels of the attributes, and

$t = 1, \ldots, 5$ is the number of choice repetitions.

β_{ld} is the coefficient, and u_{itj} denotes the error term. $Y_{itj} \in \{0, 1\}$ is a choice indicator variable; in the internal choice probability estimation, $Y_{itj} = 1$ if the preference rank of policy j is higher than its alternative policy and 0 if the rank is lower. The constant term β_0 can be interpreted as the possibility of respondents choosing the combination of benchmark attributes.

One of the most important attributes of this method is independence, and when $\left[u_{itj} \middle| a_{itj1,\ldots\ldots,} a_{itj5}\right] = 0$, the order of attributes for each driver of the selection is random; nonparametric analysis is performed using all dummy variables a_{itjld}.

5. Results and Discussion

5.1. Socioeconomic Characteristics

The descriptive statistic results indicate that most interviewees are individuals under 40 years of age, female, married, belonging to the Kinh ethnic group, employed in public services and owning small to medium-sized private enterprises, with predominant average household monthly incomes ranging from VND 10,000,000 (equivalent to USD 415.196) to VND 24,000,000 (equivalent to USD 996.471) and household sizes ranging from three to five members. Specifically, as shown in Table 2, the total number of observed samples is 450 individuals, among which 64% are under 40 years of age (Younger) and 36% are at least 40 years of age (Older). There are 200 male respondents, accounting for 44.44% of all respondents, and 250 female respondents, accounting for 55.56% of all respondents. The number of interviewees who are unmarried account for 22%, comprising 99 individuals, while 351 individuals are married, representing 78% of all respondents. Among the 450 interviewees, 192 have an education level below a bachelor's degree (42.67%), and 258 have a bachelor's degree or higher (57.33%). Regarding ethnicity, observations indicate that most interviewees belong to the Kinh ethnic group, with 342 individuals, accounting for 76% of all respondents. There are 65 individuals from the Tay ethnic group, constituting 14.44% of all respondents; 26 individuals from the Nung ethnic group, accounting for 5.78% of all respondents; 16 individuals from other ethnic groups, comprising 3.56% of all respondents; and 1 individual belongs to the Mong ethnic group, representing 0.22% of all respondents. Many interviewees are employed in public services, accounting for 30.67% of the sample, followed by business owners, accounting for 20.22%. Other occupations comprise 19.78% of the sample, private service providers constitute 16.89%, students make up 7.56%, homemakers account for 2.67%, farmers represent 2%, and individuals without employment constitute 0.22%. The average monthly household income of the interviewees ranges mainly from VND 10,000,000 (USD 415.196) to VND 24,000,000 (USD 996.471), with 24% of households having an average monthly income ranging from VND 15,000,000 to VND 19,000,000 (from USD 622.794 to USD 788.873), 23.11% earning between VND 10,000,000 and VND 14,000,000 per month (USD 415.196 to USD 581.275), and 22% earning more than VND 24,000,000 (USD 996.471) per month. The predominant household size among the interviewees is three to five members, accounting for 78.89% of the sample, while households with two or fewer members make up 22.44% of the total sample, with 51 households, and households with more than five members constitute 9.78% of the sample, with 44 households.

Table 2. Socioeconomic characteristics of respondents (n = 450).

Socioeconomic Characteristic	Respondents, *n* (%)
Age	
≤40	288 (64)
>40	162 (36)
Gender	
Male	200 (44.44)
Female	250 (55.56)
Marital status	
Single	99 (22)
Married	351 (78)
Education level	
Non-university	192 (42.67)
University	258 (57.33)

Table 2. *Cont.*

Socioeconomic Characteristic	Respondents, *n* (%)
Ethnicity	
Kinh	342 (76)
Tay	65 (14.44)
Nung	26 (5.78)
Mong	1 (0.22)
Others	16 (3.56)
Respondent occupation	
Unemployed	1 (0.22)
Student	34 (7.56)
Farmer	9 (2)
Housewife	12 (2.67)
Private service	76 (16.89)
Business owner	91 (20.22)
Public service	138 (30.67)
Others	89 (19.78)
Monthly household income (VND/month)	
<5,000,000	14 (3.11)
5,000,000–9,000,000	74 (16.44)
10,000,000–14,000,000	104 (23.11)
15,000,000–19,000,000	108 (24)
20,000,000–24,000,000	49 (10.89)
>24,000,000	101 (22)
Household size	
≤2	51 (22.44)
3–5	355 (78.89)
>5	44 (9.78)

Notes: VND denotes the currency of Vietnam, USD 1 is equivalent to VND 24.085 as of 4 October 2023.

5.2. Causal Impact of Product Attributes on Customer Decisions

The analysis allows us to calculate both the external and internal choice probabilities, which can also be referred to as the external and internal causal effects, respectively. We also calculate interaction and heterogeneous effects on consumer preferences for green tea products.

The AMCE of the effects of the attributes on the probabilities of external and internal choices for green tea products are specifically detailed in the core chart in Figure 3. The solid circle in the figure denotes the estimated AMCE score corresponding to each level of the attributes, while the horizontal bar indicates the cluster-robust 95% confidence interval. The levels of attributes utilized as the baseline are considered the optimal scenario for consumers, particularly for green tea products with attributes at the following levels: traceability attribute at the "yes" level, OCOP star certification attribute at the 3-star level, producer information attribute at the "name" level, product information attribute at the "name" level, and purchasing attribute at the "at stores" level.

Figure 3 and Table 3 show that approximately 90% of consumers tend to choose the default pair of each attribute of green tea products, specifically green tea products with information attributes such as traceability, 3-star OCOP certification, manufacturer name, product name, and availability of products at stores, which means that these consumers do not actively prefer the product. In addition, our analysis reveals a causal relationship between the probability of external choice and consumer preferences regarding the purchase attribute at the "online" level. Specifically, our findings demonstrate that the purchase attribute significantly influences consumer preferences. Consumers tend to relax their purchases of green tea products by 4.3% when considering purchasing at the "online" level, indicating a lack of interest among these consumers in purchasing green tea products online. The traceability attribute, OCOP star certification attribute, producer information

attribute, product information attribute, and purchase attribute are not significant at the 95% confidence interval.

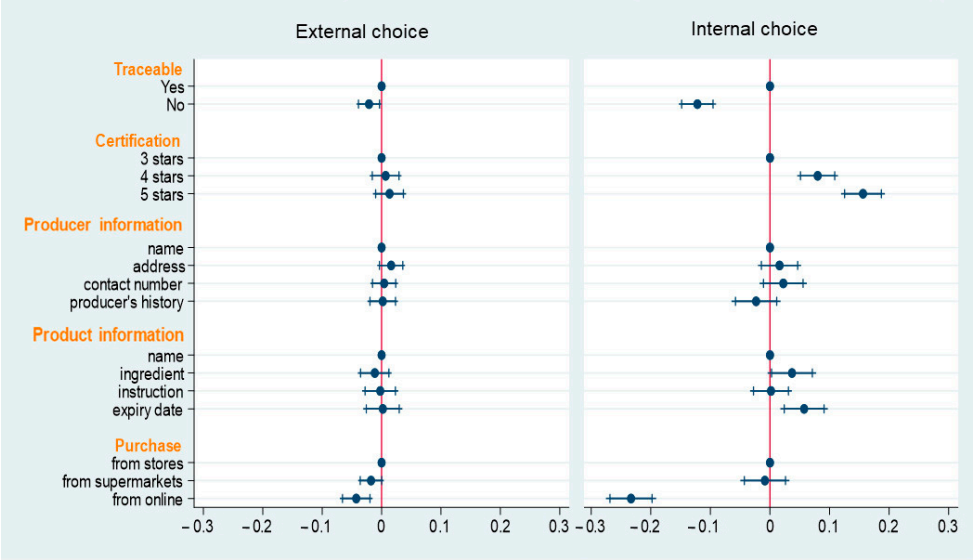


Figure 3. AMCE of the external and internal choice probabilities.

Table 3. Estimated effects on external and internal choice probabilities.

Attributes	External	Internal
Traceable		
No	−0.02115 (0.01074) *	−0.12184 (0.01595) ***
OCOP star certification		
4 stars	0.00678 (0.01361)	0.08003 (0.01746) ***
5 stars	0.01339 (0.01419)	0.15612 (0.01874) ***
Producer information		
Address	0.01606 (0.01194)	0.01607 (0.01846)
Contact number	0.00429 (0.01183)	0.02231 (0.02015)
Producer's history	0.00195 (0.01307)	−0.02330 (0.02095)
Product information		
Ingredient	−0.01145 (0.01446)	0.03692 (0.02076) *
Instruction	−0.00224 (0.01550)	0.00173 (0.01780)
Expiration date	0.00202 (0.01681)	0.05733 (0.02028) ***
Purchase		
At supermarkets	−0.01783 (0.01096)	−0.00851 (0.02096)
Online	−0.04268 (0.01401) ***	−0.23316 (0.02144) ***
Constant	0.90439 (0.02125) ***	0.53674 *** (0.02623)
Observations	4.500	4.500
R-squared	0.0052	0.0878

OCOP: One Commune, One Product. Notes: Robust standard errors are in parentheses. * $p < 0.1$. *** $p < 0.01$.

Concerning the internal selection probability, the findings derived from Figure 3 and Table 3 indicate that certain attributes exert a significant causal influence on consumer preferences. Specifically, the traceability attribute at the "yes" level, the OCOP star certification attribute at the 4- and 5-star levels, the product information attributes at the "expiration date" level and the purchasing attributes at the "online" level demonstrate significance at the 95% confidence interval. Consumers tend to reduce their purchasing of green tea products by 12.2% if the products lack traceability information or are at the "no" level. Consumers prefer green tea products possessing the OCOP star certification attribute,

experiencing an 8% increase at the 4-star level and a 15% increase at the 5-star level. This finding suggests that the degree of consumer preference increases with the number of OCOP star certifications on the products. Furthermore, consumers are concerned with the product information attribute, particularly at the "expiration date" level, showing a propensity toward green tea products that provide expiration date information, with a preference increase of 5.7%. The purchasing attributes of green tea products also significantly influence consumer preferences, with a 23.3% decrease in preference observed for products labeled with the "online" purchasing attribute. These findings suggest that consumers exhibit a preference for green tea products equipped with traceability and expiration date information. Moreover, a positive correlation emerges between the OCOP star certification level of the product and consumer preferences, indicating that heightened favorability among consumers is associated with higher certification levels. Additionally, the data reveal diminished preferences for the online purchasing attribute.

From the results of the external and internal choice probabilities, it is evident that the purchasing attribute at the "online" level has a causal effect on consumer preferences. Consumers tend to decrease their preference for online shopping, implying a lack of preference for online shopping for green tea products. Furthermore, other attributes of green tea products (e.g., the traceability attribute at the "no" level; the OCOP star certification attribute at the 4- and 5-star levels; the producer information attribute at the "address", "contact number", and "producer history" levels; and the product information attribute at the "ingredient", "instruction", and "expiration date" levels) do not influence consumer preferences for external choice probability. For internal choice probability, the traceability attribute at the "no" level, the OCOP star certification attribute at the 4- and 5-star levels, and the product information attribute at the "expiration date" level impact consumer preferences. However, the producer information attribute at the "address", "contact number", and "producer history" levels does not impact consumer preferences.

5.3. Subsample Analysis

In this study, subsamples are computed by partitioning across groups to identify heterogeneous factors that causally impact the attributes of green tea products. The results indicate that variables such as age, gender, marital status, and educational level significantly influence the attributes of green tea products, particularly the attributes of source traceability and purchase methods.

The results of the study, when analyzing subsamples based on age, reveal that source traceability at the level of no traceability information affects younger individuals (those aged 40 years and below), whereas it does not influence older individuals (those aged over 40 years). This finding implies that for green tea products without source traceability attributes, younger individuals decrease their product choices, which also affects their purchasing decisions. Furthermore, the purchase method at the level of online shopping also has a greater impact on younger individuals than on older individuals; specifically, younger individuals have a greater probability of choosing not to purchase green tea products through online means than do older individuals (Figure 4).

The purchase method is influenced by gender at the level of online shopping for both female and male individuals. However, the purchase method affects male individuals more than female individuals. Male individuals have a greater probability of choosing not to purchase green tea products through online means than do female individuals (Figure 5).

Additionally, Figure 6 illustrates that the attributes of origin traceability and purchase method influence individuals with a college degree but do not affect those without a college degree. Specifically, individuals with a college degree are less likely to choose tea products without origin traceability attributes, and they are less inclined to purchase green tea products through online means.

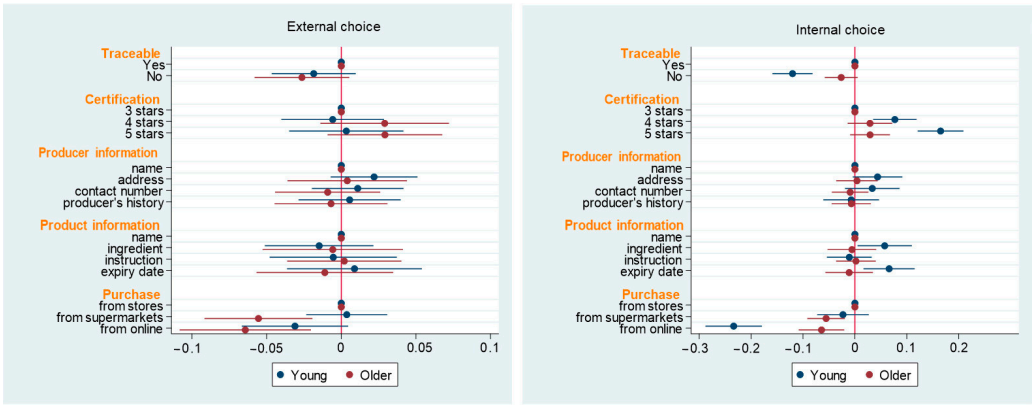


Figure 4. AMCE on the external and internal choice probabilities by age.

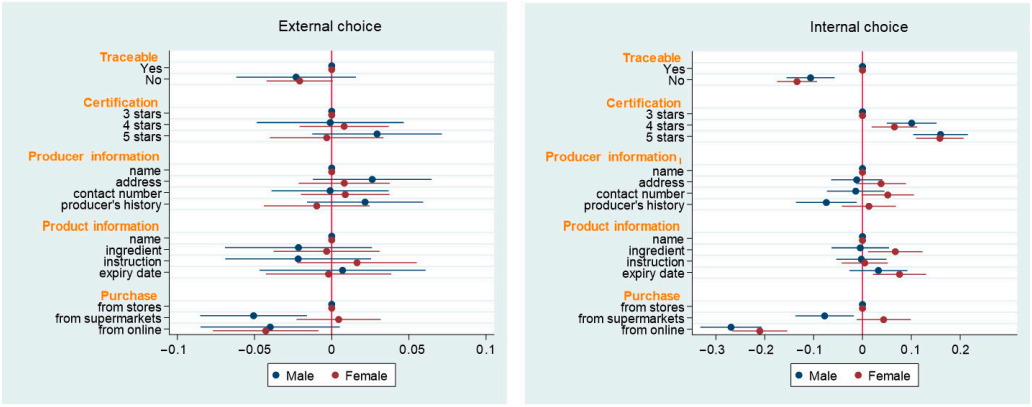


Figure 5. AMCE on the external and internal choice probabilities by gender.

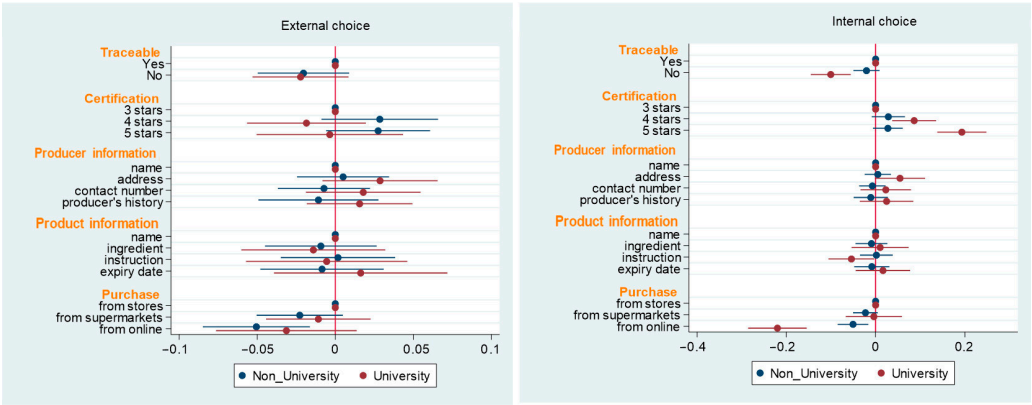


Figure 6. AMCE on the external and internal choice probabilities by education level.

6. Discussion

Product attributes are pivotal factors that directly influence customer preferences and decisions and determine the likelihood of product purchase. In this study, we identify several key attributes of green tea products that significantly impact consumer preferences. Specifically, attributes such as traceability, OCOP star certification, product information, and purchasing attributes have been found to influence consumer preferences. Subsample analysis reveals that respondents aged 40 years and below, married individuals, and those with higher levels of education are particularly interested in traceability and purchase methods. These findings indicate the importance of considering various demographic factors when understanding consumer preferences for green tea products.

Our research revealed that the attributes of origin traceability, OCOP star certification, production information and purchase method are key elements for developing product

strategies and marketing for tea manufacturers. In constructing product development and market strategies, manufacturers should consider enhancing product packaging with additional origin traceability, expiration date information and OCOP star certification. Moreover, efforts should be focused on expanding trade channels to ensure consumers' convenient and efficient access to products. Notably, our study highlights a prevailing tendency among current consumers to avoid purchasing green tea products online, despite the increasing global prevalence of digital technology, particularly in Vietnam. While online shopping offers convenience and speed in accessing information and products, it presents challenges for green tea manufacturers. Therefore, commercial promotion methods, product advertising, and services must be tailored to enhance consumer trust and ensure safety in online purchases, underscoring their importance in fostering consumer confidence and loyalty.

Currently, this study represents one of the few studies on consumer preferences regarding various attributes of green tea products in Vietnam. The attributes presented in this study are both rational and highly practically relevant to green tea products, complementing the previously studied attributes highlighted in other research endeavors. In particular, our investigation reveals several novel attributes specific to green tea products, such as producer information, product information, purchase method and, notably, OCOP star certification. Previous studies have consistently found that traceability and purchasing methods have a significant impact on consumer behavior. Specifically, origin traceability has been shown to influence consumers' preferences and willingness to pay across different contexts. For instance, research in China has demonstrated the impact of origin traceability on consumers' decisions when purchasing Oolong tea in China [16]. Consumers in Georgia value the origin traceability attribute for pork products [47]. In Vietnam, origin traceability affects consumers' decisions when purchasing clean food [48], with Vietnamese consumers showing a willingness to pay more for organic orange products with traceability attributes [49]. Our study reveals that the probability of consumers choosing online shopping methods for green tea products is lower than that of consumers choosing traditional shopping methods. This result aligns with several previous studies on the risks associated with online shopping, which have provided reasons why consumers do not prefer online shopping. e-Commerce is considered riskier than traditional commerce [50,51]. Customers who shop online are concerned about delivery and return issues and fall victim to fraud [52]. There are risks regarding perception and expectation; online consumers are particularly concerned about the performance risk of products, as they cannot physically inspect the products before purchase. Consumers worry that the product may not meet the standards and commitments made by the seller [53]. Consumers also perceive concerns about the security and confidentiality of their personal information and credit accounts when transacting online [54–56].

In addition, it is essential to emphasize the difference between this study and previous investigations on consumer preferences for green tea products. For instance, in a study examining consumer preferences for green tea products with eco-friendly certification in China [15], significant influences of attributes such as place of production, size of production firm, certification, and type of green tea were observed. Specifically, green tea produced in different regions of China has been shown to have varying impacts on customer preferences, with South China, Jiangnan, and Southwest China influencing customer preferences by 16.2%, 23.2%, and 23.4%, respectively. Similarly, the size of the production firm attribute has a notable effect on consumer preferences, with large and small firms impacting their preferences by 17.8% and 14.5%, respectively. Additionally, certification attributes, including nonpollution, green, and organic attributes, significantly influence consumer preferences by 32%, 39.7%, and 69.2%, respectively. Finally, green tea attributes such as whether it is Yuqian and Mingqian impact consumer preferences by 47.1% and 24%, respectively. In a study on Chinese consumers' preferences for organic labels on Oolong tea, Yan et al. [16] found that Chinese consumers tend to trust domestic organic certifications for tea more than those from other countries. Additionally, the place

of origin is a significant factor influencing consumer evaluations. Oolong tea originating from Fujian Province is rated higher in quality by many consumers. The highest premium for organic labels is approximately 203% for Chinese organic labels, followed by 160% for Japanese organic labels and 113% for the US organic label. Additionally, some other case studies from Sri Lanka and India show that 31% of product-related factors influence consumers' decisions to purchase branded tea in Sri Lanka [17]. In India, consumers prefer tea products with high-quality attributes that offer health benefits and unique flavors [18]. Although our study introduces different attributes than does previous research, these attributes prove suitable for research purposes and contribute to a more comprehensive understanding of consumer preferences for green tea products in Vietnam. Importantly, our results also indicate that the levels of these attributes significantly influence consumer preferences for green tea products. Notably, regarding traceability attributes, our research findings are consistent with those of Yang et al. [16]. For the OCOP star certification, our findings align with those of Nam and colleagues [15], Yang and colleagues [16], and Gowtham [18], revealing that green tea products certified with 4 and 5 stars according to OCOP in Vietnam influence consumer preferences by 8% and 15.6%, respectively. Notably, one of the prerequisites for green tea products to attain OCOP 4- and 5-star certifications is the possession of either organic or sustainability certifications, suggesting that consumers in China, Indian and Vietnam value products with quality and safety assurances.

Furthermore, based on the findings of this study, we wish to emphasize the importance of OCOP certification for green tea products. This is a crucial attribute that we include in our research to obtain more specific insights into the products and the current OCOP program in Vietnam, which the government is implementing in various localities. However, the results obtained from consumers' external choice probabilities suggest that the OCOP program and OCOP-certified green tea products currently lack widespread recognition. Despite the implementation of the OCOP program in Vietnam since 2018, there is a need for the government to enact more specific and cohesive policies. In addition to supporting the development and enhancement of products, policies should be directed toward promoting and facilitating the commercialization of OCOP-certified products to increase the awareness of their value among consumers. Entities with OCOP-certified green tea products should take proactive approaches. In addition to applying government policies in a reasonable and effective manner, these entities should conduct proactive market research and develop more effective customer engagement strategies. This is consistent with recommendations from previous studies done by Nam [15] and Bandara [17], suggesting that the government develop effective policies and tea businesses adopt targeted market strategies.

However, these results are derived from only a few studies, including randomized conjoint experiments conducted in Thai Nguyen Province. Therefore, additional similar studies are needed to establish more universally applicable findings to enhance the development of the green tea market.

7. Conclusions

This study represents a comprehensive examination of consumer preferences for green tea products in Thai Nguyen Province, Vietnam. Given the significant role of tea production in local economic development and its substantial impact on the livelihoods of many farmers and small to medium-sized business households in this region, understanding consumer preferences is of paramount importance. Our research specifically focuses on consumer preferences for green tea products within the framework of the OCOP project in Vietnam. To achieve this goal, we employ a conjoint experiment utilizing choice modeling, which comprises five attributes with 16 different levels for each attribute. The survey is conducted with 450 randomly selected customers at six supermarkets in the central area of Thai Nguyen city, Thai Nguyen Province, Vietnam. By utilizing a combined experiment based on choice sets for these 450 customers, we aim to gain valuable insights into consumer preferences for green tea products.

In addition, our study highlights several key findings concerning consumer preferences for green tea products. First, our analysis of the external choice probability reveals that approximately 90% of consumers tend to choose the default pair (green tea products with attributes including origin traceability, 3-star OCOP certification, producer's name, product name, and purchasing at stores), indicating consumers' lack of genuine interest in this type of product. Furthermore, we also identify the external effect on consumer preferences regarding the purchase method attribute. Consumers tend to relax their preferences for green tea products if purchased online by 4.3%. Second, regarding internal choice probability, attributes such as origin traceability, OCOP certification, product information, and purchase method have relatively strong causal impacts on consumer preferences. Specifically, the absence of origin traceability information leads to a notable decrease in preference of 12.2%, while the presence of OCOP star certification positively impacts preferences, with an increase of 8% at the 4-star level and 15% at the 5-star level. Additionally, the product information attribute at the "expiration date" level significantly influences consumer preferences by 5.7%, and the purchasing attribute at the "online" level influences consumer preferences by 23.3%. In addition, an even more interesting finding emerges during our subgroup analysis. Respondents aged 40 years and below, those who are married, and those with higher education levels demonstrate greater interest in origin traceability and purchase methods. Interestingly, both male and female respondents show interest in both origin traceability and purchase methods.

Furthermore, the findings of this study highlight the importance of transparency in product attributes such as origin traceability, certifications, and product information for green tea products among Vietnamese consumers. These results suggest that products featuring these attributes are more likely to attract consumers to purchase them than are other products. Interestingly, consumers tend to have a negative inclination toward online shopping for green tea products, despite the growing development of this business model in Vietnam.

In conclusion, these findings offer valuable insights for businesses, manufacturers, and managers aiming to develop products and strategies for the sale of green tea products effectively. First, there is a need for the enhanced management of production processes, ensuring traceability from raw materials to final products reaching customers. Second, providing additional origin traceability information on product packaging is crucial for businesses, manufacturers, and managers to meet consumer expectations. Third, manufacturers and enterprises should prioritize increasing their advertising and market communication efforts, enhancing the offline shopping experience, fostering stronger customer relationships, and expanding distribution channels to facilitate the consumption of green tea products by consumers. These recommendations are crucial for these managers and enterprises to meet consumer demand and drive growth in the green tea industry.

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References

1. Fao. World Tea Production and Trade Current and Future Development 2015. Available online: https://dc.sourceafrica.net/documents/119665-World-Tea-Production-and-Trade-Current-and.html (accessed on 1 February 2024).
2. Hong, N.B.; Yabe, M. Improvement in Irrigation Water Use Efficiency: A Strategy for Climate Change Adaptation and Sustainable Development of Vietnamese Tea Production. *Environ. Dev. Sustain.* **2017**, *19*, 1247–1263. [CrossRef]
3. Munasinghe, M.; Deraniyagala, Y.; Dassanayake, N.; Karunarathna, H. Economic, Social and Environmental Impacts and Overall Sustainability of the Tea Sector in Sri Lanka. *Sustain. Prod. Consum.* **2017**, *12*, 155–169. [CrossRef]
4. Deka, N.; Goswami, K. Organic Cultivation and Sustainable Value Chain Development for Tea Smallholders: Findings from Assam, India. *Sustain. Prod. Consum.* **2022**, *32*, 562–579. [CrossRef]
5. Hong, N.B.; Takahashi, Y.; Yabe, M. Environmental Efficiency and Economic Losses of Vietnamese Tea Production: Implications for Cost Savings and Environmental Protection. *J. Fac. Agric. Kyushu Univ.* **2016**, *61*, 383–390. [CrossRef]
6. Voora, V.; Bermúdez, S.; Larrea, C. Global Market Report: Tea; Sustainable Commodities Markettplace Series. 2019. Available online: https://www.iisd.org/publications/report/global-market-report-tea (accessed on 8 February 2024).
7. Biggs, E.M.; Gupta, N.; Saikia, S.D.; Duncan, J.M.A. The Tea Landscape of Assam: Multi-Stakeholder Insights into Sustainable Livelihoods under a Changing Climate. *Environ. Sci. Policy* **2018**, *82*, 9–18. [CrossRef]
8. Ganbold, N.; Fahad, S.; Li, H.; Gungaa, T. An Evaluation of Subsidy Policy Impacts, Transient and Persistent Technical Efficiency: A Case of Mongolia. *Environ. Dev. Sustain.* **2022**, *24*, 9223–9242. [CrossRef]
9. FAOStat. Crops and Livestock Products. 2024. Available online: https://www.fao.org/faostat/en/#data/QCL/visualize (accessed on 1 February 2024).
10. Nguyen-Thi-Lan, H.; Fahad, S.; Ho-Ngoc, N.; Nguyen-Anh, T.; Pham-Van, D.; Nguyen-Thi-Viet, H.; Do-Hoang, P.; Do-Kim, C.; To-The, N. Crop Farming and Technical Efficiency of Tea Production Nexus: An Analysis of Environmental Impacts. *J. Saudi Soc. Agric. Sci.* **2023**, *22*, 158–164. [CrossRef]
11. Current Situation and Solutions 2021. Available online: https://vioit.org.vn/vn/chien-luoc-chinh-sach/nganh-che-viet-nam--thuc-trang-va-giai-phap-4420.4050.html (accessed on 17 March 2024).
12. IFAD. Policy Case Studies in Vietnam: Review of Experience of the National Target Program for New Rural Development. 2016. Available online: https://www.ifad.org/documents/38714170/39135645/Policy+case+study+Viet+Nam+%E2%80%93+Review+of+experience+of+the+National+Target+Program+for+new+rural+development.pdf/bf68c25c-7489-4b06-b5ca-3095c9e4ab0f (accessed on 22 May 2024).
13. Bernués, A.; Olaizola, A.; Corcoran, K. Labelling Information Demanded by European Consumers and Relationships with Purchasing Motives, Quality and Safety of Meat. *Meat Sci.* **2003**, *65*, 1095–1106. [CrossRef]
14. God'swill Chinedu, C.; Christian, I.C.; Asemota, K.U. Product Packaging and Consumer Perception of Made in Nigeria Products. *Int. J. Curent Sci.* **2023**, *13*.
15. Nam, K.; Qiao, Y.; Ahn, B.I. Analysis of Consumer Preference for Green Tea with Eco-Friendly Certification in China. *Sustainability* **2022**, *14*, 211. [CrossRef]
16. Yang, X.; Chen, Q.; Lin, N.; Han, M.; Chen, Q.; Zheng, Q.; Gao, B.; Liu, F.; Xu, Z. Chinese Consumer Preferences for Organic Labels on Oolong Tea: Evidence from a Choice Experiment. *Int. Food Agribus. Manag. Rev.* **2021**, *24*, 545–561. [CrossRef]
17. Bandara, A.M.K.R.; Gayathri, H.M.M.; Lankapura, A.I.Y.; Thi, N.; Huong, T. Factors Affecting the Consumer's Branded Tea Purchase Decision: A Case Study in the Western Province, Sri Lanka. *Asian J. Econ. Bus. Account.* **2021**, *21*, 67–73. [CrossRef]
18. Gowtham. Study on consumer preferences towards various bands of tea. *Int. J. Creat. Res. Thoughts* **2023**, *11*, 797–801.
19. Sun, M.; Jia, X.; Yang, D.; Lu, B.; Han, F.; Shi, F. Life Cycle Environmental Impact Assessment of Green Tea Production in China. *J. Clean. Prod.* **2024**, *434*, 140377. [CrossRef]
20. Xi, S.; Chu, H.; Zhou, Z.; Li, T.; Zhang, S.; Xu, X.; Pu, Y.; Wang, G.; Jia, Y.; Liu, X. Effect of Potassium Fertilizer on Tea Yield and Quality: A Meta-Analysis. *Eur. J. Agron.* **2023**, *144*, 126767. [CrossRef]
21. Lou, S.; Zhang, B.; Zhang, D. Foresight from the Hometown of Green Tea in China: Tea Farmers' Adoption of pro-Green Control Technology for Tea Plant Pests. *J. Clean. Prod.* **2021**, *320*, 128817. [CrossRef]
22. Tran, D.; Goto, D. Impacts of Sustainability Certification on Farm Income: Evidence from Small-Scale Specialty Green Tea Farmers in Vietnam. *Food Policy* **2019**, *83*, 70–82. [CrossRef]
23. Hanh, V.T.H. Improving the Added Value of Vietnam's Tea Exports. *Vietnam Trade Ind. Rev.* **2022**, *13*, 127–133.
24. Mai, T.T. The Competitive Position of the Vietnamese Tea Industry in the Global Market. *Vietnam Trade Ind. Rev.* **2023**, *13*, 58–63.
25. Khai, H.V.; Yabe, M. Consumer Preferences for Agricultural Products Considering the Value of Biodiversity Conservation in the Mekong Delta, Vietnam. *J. Nat. Conserv.* **2015**, *25*, 62–71. [CrossRef]
26. Cerda, A.A.; García, L.Y.; Ortega-Farías, S.; Ubilla, Á.M. Consumer preferences and willingness to pay for organic apples. *Cienc. E Investig. Agrar.* **2012**, *39*, 47–59. [CrossRef]
27. Ranasingha, R.G.S.M.; Edirisinghe, J.C.; Ratnayake, R.H.M.K. Willingness to Pay for Fruit Attributes: A Conjoint Analysis. *J. Agric. Sci.-Sri Lanka* **2019**, *14*, 102–110. [CrossRef]

28. Khanna, V. A study on factors impacting consumer preference and purchase intention: With special refernce to beverage industry. In Proceedings of the International Conference on Recent Innovations in Science, Technology, Management and Eviroment, Indian Federation of United Nations Associatios, New Delhi, India, 18 December 2016.
29. Ong, A.K.S.; Prasetyo, Y.T.; Libiran, M.A.D.C.; Lontoc, Y.M.A.; Lunaria, J.A.V.; Manalo, A.M.; Miraja, B.A.; Young, M.N.; Chuenyindee, T.; Persada, S.F.; et al. Consumer Preference Analysis on Attributes of Milk Tea: A Conjoint Analysis Approach. *Foods* **2021**, *10*, 1382. [CrossRef] [PubMed]
30. Bikash, B.; Ichihashi, M. Household Preferences for Improved Solid Waste Management (SWM) Services: A Randomized Conjoint Analysis in Kathmandu Metropolitan Ward No. 10. *Sustainability* **2022**, *14*, 2251. [CrossRef]
31. Calegari, L.P.; Barbosa, J.; Marodin, G.A.; Fettermann, D.C. A Conjoint Analysis to Consumer Choice in Brazil: Defining Device Attributes for Recognizing Customized Foods Characteristics. *Food Res. Int.* **2018**, *109*, 1–13. [CrossRef] [PubMed]
32. Donadini, G.; Porretta, S. Uncovering Patterns of Consumers' Interest for Beer: A Case Study with Craft Beers. *Food Res. Int.* **2017**, *91*, 183–198. [CrossRef] [PubMed]
33. Fergus, L.; Long, A.R.; Holston, D. Modeling Behavioral Economics Strategies in Social Marketing Messages to Promote Vegetable Consumption to Low-Resource Louisiana Residents: A Conjoint Analysis. *J. Acad. Nutr. Diet.* **2023**, *123*, 876–888.e1. [CrossRef] [PubMed]
34. Koide, R.; Yamamoto, H.; Kimita, K.; Nishino, N.; Murakami, S. Circular Business Cannibalization: A Hierarchical Bayes Conjoint Analysis on Reuse, Refurbishment, and Subscription of Home Appliances. *J. Clean. Prod.* **2023**, *422*, 138580. [CrossRef]
35. Mok, M.S.; Sohn, S.Y.; Ju, Y.H. Conjoint Analysis for Intellectual Property Education. *World Pat. Inf.* **2010**, *32*, 129–134. [CrossRef]
36. Moore, W.L. A Cross-Validity Comparison of Rating-Based and Choice-Based Conjoint Analysis Models. *Int. J. Res. Mark.* **2004**, *21*, 299–312. [CrossRef]
37. Setiawan, R.P.; Kaneko, S.; Kawata, K. Impacts of Pecuniary and Non-Pecuniary Information on pro-Environmental Behavior: A Household Waste Collection and Disposal Program in Surabaya City. *Waste Manag.* **2019**, *89*, 322–335. [CrossRef] [PubMed]
38. Aryal, T.R.; Ichihashi, M.; Kaneko, S. How Strong Is Demand for Public Transport Service in Nepal? A Case Study of Kathmandu Using a Choice-Based Conjoint Experiment. *J. Econ. Struct.* **2022**, *11*, s40008–s40022. [CrossRef]
39. Eggers, F.; Sattler, H.; Head, B. Preference measurement with conjoint analysis. Overview of state-of-the-art approaches and recent developments. *GfK Market. Intell. Rev.* **2011**, *3*, 36–47. [CrossRef]
40. Hoppert, K.; Mai, R.; Zahn, S.; Hoffmann, S.; Rohm, H. Integrating Sensory Evaluation in Adaptive Conjoint Analysis to Elaborate the Conflicting Influence of Intrinsic and Extrinsic Attributes on Food Choice. *Appetite* **2012**, *59*, 949–955. [CrossRef] [PubMed]
41. GSO Thai Nguyen The Area, Population, and Population Density in 2021 Are Classified by District, Town, and City. Available online: http://cucthongkethainguyen.gov.vn/nien-giam-thong-ke/-/asset_publisher/H6ZZmmTe73rP/content/nien-giam-thong-ke-tinh-thai-nguyen-2021?inheritRedirect=true (accessed on 1 February 2024).
42. Ministry of Science and Technology of Vietnam. *National Standards TCVN 12850:2019: Traceability-General. Requirements for Traceability Systems*; Ministry of Science and Technology of Vietnam: Ha Noi, Viet Nam, 2019.
43. Hong, B.X.; Trung, H.Q. Current Situtation Assessment of Some Potentail Products Participating in the One Commune One Product Program in Chi Linh City, Hai Dương Province. *TNU J. Sci. Technol.* **2021**, *226*, 58–65.
44. Hong, B.X.; Trung, H.Q.; Huyen, D.T.T.; Hieu, H.M.; Bich, T.T.N. Research on Current Status Proposing Soulution for Developing Some Potential Product Participated in the OCOP Program Thai Nguyen Province. *Vietnam Trade Ind. Rev.* **2022**, *118*, 111–118.
45. Tien, N.M. Vietnam's "One Commune, One Product" Program. 2021. Available online: https://ocop.mard.gov.vn/Pages/xay-dung-ocop-tu-viec-chinh-nguoi-lanh-dao-mang-san-pham-di-ban.aspx (accessed on 22 May 2024).
46. Hainmueller, J.; Hopkins, D.J.; Yamamoto, T. Causal Inference in Conjoint Analysis: Understanding Multidimensional Choices via Stated Preference Experiments. *Political Anal.* **2014**, *22*, 1–30. [CrossRef]
47. Ubilava, D.; Foster, K. Quality Certification vs. Product Traceability: Consumer Preferences for Informational Attributes of Pork in Georgia. *Food Policy* **2009**, *34*, 305–310. [CrossRef]
48. Hao, D.D.Q. The Relationship Between Source Traceability Demand and Clean Food Purchasing Decision of Consumers in Hue City. 2021. Available online: https://tapchi.hce.edu.vn/index.php/sjme/article/view/88 (accessed on 1 February 2024).
49. Nhat, H.B.; Dut, V.V. Urban Households' Willingness to Pay for Organic Products: The Case of Organic Oranges in Long Xuyen City. *VNU J. Econ. And. Bus.* **2023**, *3*, 102–111. [CrossRef]
50. Comegys, C.; Hannula, M.; Väisänen, J. Effects of Consumer Trust. and Risk on Online Purchase Decision-Making: A Comparison of Finnish and United States Students. *Int. J. Manag.* **2009**, *26*, 295–308.
51. Yao, H.T. Walter Thoen Toward a Generic Model of Trust for Electronic Commerce. *Int. J. Electron. Commer.* **2014**, *2*, 61–74.
52. Cho, J. Likelihood to Abort an Online Transaction: Influences from Cognitive Evaluations, Attitudes, and Behavioral Variables. *Inf. Manag.* **2004**, *41*, 827–838. [CrossRef]
53. Hong, I.B. Understanding the Consumer's Online Merchant Selection Process: The Roles of Product Involvement, Perceived Risk, and Trust Expectation. *Int. J. Inf. Manag.* **2015**, *35*, 322–336. [CrossRef]
54. Johan, M.R.; Syed, M.A.; Adnan, H.M. Social Media and E-Commerce Online Shopping Perceived Risk among Micro SMEs in Malaysia. In *Forum Komunikasi*; 2019; Volume 14, pp. 20–39. Available online: https://www.researchgate.net/publication/339199970_Social_Media_and_E-Commerce_Online_Shopping_Perceived_Risk_among_Micro_SMEs_in_Malaysia (accessed on 1 February 2024).

55. Mehreen, K.; Roshan, R.; Gul, M. Psychological Factors Influencing the Adoption of Web-Based Shopping Behaviour of Female Consumers. *Lib. Arts Soc. Sci. Int. J. (LASSIJ)* **2020**, *3*, 169–184. [CrossRef]
56. Trang, B.T.; Tien, H.X. E-Commerce and Online Shopping Behavior of Vietnamese Consumer. *Vietnam Trade Ind. Rev.* **2020**, *441*, 111–118.

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