What are the Attributes that actually Catch our Eye? A Choice Experiment to Understand

Latin American Coffee & Cocoa Consumers' Preferences

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Introduction

Coffee and cocoa are globally consumed beverages (De Carvalho Couto et al., 2021) with rising demand for differentiated and high-quality products (Blare et al., 2020). While developing countries are the primary producers of cocoa, it is predominantly consumed in developed nations (Duana-Ávila et al., 2023). Understanding the attributes influencing consumer behavior in the coffee and cocoa industries is crucial for effective market segmentation (Barahona et al., 2020). Intrinsic attributes like smell, taste, and appearance, along with extrinsic attributes such as price, labeling, and personal values, play a significant role in classifying these beverages (Barahona et al., 2020). Additionally, certifications like fairtrade, organic, and shade-grown labels are used by farmers to showcase their social and environmental efforts and generate premium value (Fuller et al., 2022).

Price, type, country of origin, and certifications are key attributes that influence consumer purchasing behavior in the coffee and cocoa markets (Lee & Bateman, 2021). Price has been extensively studied, and certifications like organic and socio-environmental certifications hold distinct motivations for consumers. Country-of-origin labeling addresses food safety and traceability concerns while highlighting unique regional characteristics (Valenciano-Salazar et al., 2021). Socio-environmental certifications promote social justice, environmental sustainability, and economic development (Lee & Bateman, 2021).

The type of product is also an important characteristic influencing consumer purchasing behavior. Specialty coffees have distinctive qualities and flavors associated with specific regions, soils, and climates (Jenkins & Barbosa, 2020). In the cocoa market, commercial varieties include sweet, unsweetened, and cocoa powder with sweeteners, catering to different consumer preferences and usage requirements (Quelal-Vásconez et al., 2020).

Understanding and leveraging these attributes allow businesses to effectively target and cater to consumer preferences in the coffee and cocoa industries, ultimately driving sales and brand loyalty (Lee & Bateman, 2021). Choice experiments (CE) are valuable tools for understanding consumer preferences (Poelmans & Rousseau, 2016), particularly for coffee and cocoa products. However, there is a research gap in the literature, especially in Latin America, which is the largest coffee and second-largest cocoa producer worldwide.

Therefore, this study aims to address this research gap and define the attributes Latin American coffee and cocoa consumers consider in their purchase decisions. The study has three objectives: 1) identify consumers' purchase habits of ground coffee and cocoa powder in Latin America; 2) evaluate consumers' preferences for attributes represented in a bag of ground coffee and cocoa powder; and 3) analyze the socio-demographic characteristics that influence consumers' preferences for attributes in ground coffee and cocoa powder. By achieving these objectives, we can gain insights into the preferences and behaviors of Latin American consumers in the coffee and cocoa markets.

Literature Review

Coffee consumption

Coffee is made from beans from a plant belonging to the Rubiaceae family (Pradana-López et al., 2021), with *Coffea arabica* and *Coffea canephora* the most common commercial cultivated species (Couto et al., 2019). Approximately 500 billion cups of coffee are consumed daily, making it one of the most popular beverages worldwide (Czarniecka-Skubina et al., 2021). However, coffee consumption differs from place to place and is highly influenced by various factors, including consumer characteristics (Sales et al., 2020) such as genetics, physiology, and socio-cultural factors (Spinelli et al., 2017).

The primary reason for consuming coffee is its flavor and aroma, which are the driving force behind its purchase by consumers (Czarniecka-Skubina et al., 2021). However, little is known about the factors that motivate consumption, highlighting the importance of understanding consumers' perceptions and the factors involved in consumption and purchase (Sales et al., 2020). Recent studies have identified the leading motives for coffee consumption: functional, taste and pleasure, habit, tradition and culture, and socialization (Samoggia & Riedel, 2018, 2019). The two first ones are the leading ones across cultures.

Global coffee consumption has increased by 67.9% over the past 26 years (Torga & Spers, 2020), presenting an existing and growing opportunity for premium coffee attributes such as organic, sustainable, and country of origin (Esquivel, 2021). The increasing demand for coffee and the expansion of the industry have driven farmers to differentiate their products and offer added value to increase their market shares (Discua Cruz et al., 2020).

Today, coffee consumers are enticed by product quality, origin, and sustainability (Samoggia & Riedel, 2019). As a result, it may be possible to target specific consumer segments more willing to purchase certified coffee (Williams et al., 2021). Coffee is popular in certain regions of Latin America (Kutschbach, 2020), where consumers purchase coffee in different presentations (e.g., green beans, roasted beans, ground, and instant (soluble)) (Jenkins & Barbosa, 2020). Ground coffee[1], in particular, is an option for coffee farmers that want to generate more income instead of selling in bulk, especially for a local market. Fortunately, the equipment and structures for making ground coffee are still basic (Awuk et al., 2022).

Cocoa consumption

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[1] Ground coffee refers to coffee beans that have been roasted and subsequently ground into small particles of various sizes

Cocoa consumption is a topic that often leads to confusion as the terms' cacao', 'cocoa,' and 'chocolate' are used interchangeably in the literature (Wattnem et al., 2022). First, however, it is essential to clarify the differences between them. 'Cacao' refers to the tree species (*Theobroma cacao L.*) whose seeds are used to make chocolate products (Cadby & Araki, 2021). 'Cocoa' is a processed product that results in cocoa powder sold for drinking or food manufacturing purposes (Wattnem et al., 2022). On the other hand, 'chocolate' is a widely consumed food item containing significant amounts of fats, proteins, carbohydrates, polyphenols, and other bioactive substances. Its main ingredient is cocoa beans (Barišić et al., 2019). While chocolate is the most common cacao-based product in the literature, there is a gap in knowledge of cocoa powder, which is comparable to ground coffee. Cocoa powder literature is often related to human health (Katz et al., 2011).

Cocoa and its by-products are highly valued globally for their aroma, color, and beneficial properties, making them a commodity of significant economic worth (Figueroa et al., 2020; Quelal-Vásconez et al., 2020). In Latin America, the growing middle provides an ideal customer base to market cacao products mainly due to consumers' cultural ties to these products (Blare et al., 2020). The flavor is the most important criterion for chocolate quality and consumer acceptance; volatile compounds are key features for this attribute (Cemin et al., 2022). However, poorly defined standards disadvantaged farmers allowing buyers to wield more bargaining power over producers (Cadby & Araki, 2021; Tennhardt et al., 2022). Due to consumers' social awareness and demand for sustainably and ethically produced chocolates, buyers have become more concerned about sourcing quality cacao and supporting the rural communities that produce it (Blare et al., 2020).

Attributes

Understanding the advantages customers receive from using products and services is essential to achieve effective market segmentation (Barahona et al., 2020). Coffee and cocoa beverages can be classified based on intrinsic and extrinsic attributes (Barahona et al., 2020). Intrinsic attributes are the inherent qualities of the beverage that cannot be changed without altering its fundamental properties (e.g., smell, taste, and appearance) (Barahona et al., 2020). Extrinsic attributes are the external factors associated with the product, such as price, labeling, and personal values (Barahona et al., 2020).

In the coffee industry, quality can vary depending on several factors, such as genetics, climate, environmental conditions, management practices, and harvesting techniques (Ahmed et al., 2021). Some farmers use third-party certifications such as fair trade, organic, or shade-grown labels to highlight their social and environmental efforts in production, get a market differential for existing brands, and generate a premium value (Fuller et al., 2022).

Similarly, the quality of cocoa depends on the same factors as coffee, plus fermentation which is a critical process (Escobar et al., 2021). In the literature, depending on the area of research. Some crucial attributes that consumers consider are price, sustainability certifications, taste, type, quality, and loyalty to brands and products (Lee & Bateman, 2021).

However, when purchasing coffee and cocoa, four primary attributes are crucial: price, type, country of origin, and certifications. The influence of price on consumer behavior has been extensively documented in the literature. It is important to note that this study assessed organic labels or certifications separately from socio-environmental certifications. The reasons behind consumers choosing to purchase Fair Trade and certified organic products may differ (Lee & Bateman, 2021).

Organic

Certification programs are essential for ensuring that organic products meet the required standards. These programs are typically indicated by labels (González & Parga-Dans, 2020). In the US, for instance, food operations that claim their products are organic must obtain certification from the United State Department of Agriculture (USDA) (Carter et al., 2022). The USDA authorizes third-party agents to evaluate and certify producers and processors and monitor their compliance with organic standards (Carter et al., 2022). However, certification procedures and enforcement can vary in other countries. Regardless of the location, certification is crucial for providing producers with the confidence that they can use terms like "organic" legally and without infringing on intellectual property rights (González & Parga-Dans, 2020).

Country of origin

In response to concerns over food safety and traceability, several countries, including the European Union and the United States, have made it mandatory to label the country of origin on various food items (Valenciano-Salazar et al., 2021). Highlighting the unique characteristics associated with a particular geographic region can differentiate one's product (Discua Cruz et al., 2020). The country-of-origin effect has been extensively studied for the past 50 years, primarily focusing on how a product's place of origin influences consumer perceptions (Parente-Laverde et al., 2022; Qu et al., 2021).

Major coffee and cacao producers in Latin America (LA) include Brazil, Colombia, Ecuador, Honduras, El Salvador, and Guatemala. Some of these countries are known globally for producing higher quality products compared to others. Past research has shown that consumers use the image of a product's country of origin as a cue to determine its quality, which directly affects their preference for a particular brand (Nguyen & Alcantara, 2020). For instance,

Rodriguez and Epperson (2001) study revealed that Colombian and Guatemalan organic coffee commanded the highest price premiums due to being perceived as having superior quality.

Socio-environmental certifications

Market and academic research consistently show that a large group of conscientious consumers prioritize products that promote social justice and environmental well-being (Lee & Bateman, 2021). Estimates suggest that the certified production area for coffee globally ranges between 26% and 45%, followed by cocoa, with estimates ranging from 23% to 38% (Schleifer & Sun, 2020). There are several existing socio-environmental certifications. These five are among the most common for coffee and cocoa: Fairtrade, Shade Grown, Good Agricultural Practices (GAP), Rainforest Alliance, and UTZ Certified.

Fair-trade Certification programs promote economic, social, and environmental development by enhancing the capacity of marginalized producers and workers, particularly in the Global South, and improving the distribution of profits in commodity markets (Lee & Bateman, 2021). Shade-grown coffee has numerous environmental benefits, including assisting with climate change adaptation by lowering temperatures, controlling pests through birds, and providing food and other valuable economic products (Hernandez-Aguilera et al., 2019). Implementing GAP can result in improved soil fertility, water quality, erosion control, pest, and disease management, better land use efficiency, and reduced environmental degradation, including pressure on forested land and greenhouse gas emission intensities (Schoneveld et al., 2019).

Rainforest Alliance Certification is a comprehensive standard based on three pillars: environmental sustainability, social sustainability, and economic worth. The certification promotes sustainable farming practices, protects biodiversity, ensures proper living and working

conditions for workers, and provides access to education for children (Prihandono & Relig, 2019). UTZ Certification was established to encourage sustainable coffee production from a multi-stakeholder scheme (Chkanikova & Sroufe, 2021). Producers seeking certification must undergo an independently conducted audit process and accept regular checks and record-keeping (Prihandono & Relig, 2019).

Type

The type of product is another essential characteristic that influences consumers purchasing behavior. Based on the literature, several types of coffee and cocoa have been identified. For instance, Barahona et al. (2020) categorized coffee types as: traditional, gourmet, premium or excel, and social-content. According to Kadić-Maglajlić and Arslanagic-Kalajdzic, (2019), the coffee market can be segmented using various classifications, and based on the product type, there are four categories: roasted, instant, ready-to-drink, and specialty coffee. The first three categories are based on the intrinsic attributes of the product, and the first three are related to the physical characteristics. Coffee beans with distinctive quality and flavor characteristics are found in certain regions thanks to specific soils and climates, were effectively communicated and marketed to consumers as Specialty Coffee (Jenkins & Barbosa, 2020). Therefore, we found the three consistent labeled types for the four countries under study: traditional (or commodity), premium (or gourmet), and specialty coffees.

Recently, there have been changes in the global demand for cocoa and the sensory, functional, and safety attributes required for cocoa (Quelal-Vásconez et al., 2020). While the literature typically describes two types of cocoa powder – natural and alkalized (Muhammad et al., 2021) – the Latin American market offers three commercial varieties: sweet, unsweetened, and cocoa powder with sweeteners. The most prevalent type is sweet cocoa powder, which has

sugar added to it in varying amounts. Unsweetened cocoa powder, on the other hand, contains 100% cocoa with no added sweeteners. Finally, cocoa powder with sweeteners is cocoa powder that has been sweetened with non-sugar sweeteners. It is worth noting that this product does not use sugar as a sweetener.

Choice Experiments

Choice experiments (CE) are valuable because products available in the market often represent a limited range of combinations of product features, where, for instance, fair-trade products will always come at a higher cost (Poelmans & Rousseau, 2016). CEs have been widely used in the literature assessing consumer preferences. Li and Kallas (2021) conducted a meta-analysis of 80 studies to examine consumers' willingness to pay (WTP) for sustainable food products. Their findings revealed that, on average, consumers are WTP at a 29.5% premium for sustainable food products. However, the WTP estimates varied depending on gender, region, specific sustainable attributes, and food categories. Notably, the study found that consumers in Asia had a higher WTP estimate than those in North America. Out of the 80 studies analyzed, eight focused on coffee, and one study was conducted in Latin America (specifically, in Mexico) but focused on meat products. These results highlight the potential market for sustainable food products and their relevance in food production and marketing decision-making.

Coffee WTP. Consumers' WTP for 'sustainable' coffee products has been extensively researched recently. For example, Lappeman et al. (2019) used conjoint analysis to examine the ethical buying behavior of South African consumers regarding fair trade labeled coffee. They found that participants were segmented based on their WTP for fair trade labeled coffee, with 'Fair Trade Lovers' willing to pay a higher premium than 'Brand Likers.'

Abdu and Mutuku (2021) conducted a meta-analysis of 22 primary studies, with 97 individuals' WTP estimates for eco-labeled coffee. The study found that consumers are willing to pay a premium for eco-labeled coffee, with organic, country of origin labeling, and fair-trade coffee being the most valued attributes. The organic attribute had the most significant effect on WTP for eco-coffee. Regional differences in consumers' preferences for eco-labeling were also observed. Despite concerns about multiple eco-labeling reducing consumers' trust and WTP over time, the study concluded that consumers in selected countries are pro-eco-coffee. It is worth saying that 18 of the 22 studied in Europe and North America, and the remaining in Africa and Asia.

Fuller et al. (2022) investigated US consumers' WTP for various sustainability credence attributes in coffee. They found that consumers are willing to pay a premium for coffee labeled with Fair Trade, USDA Organic, Rainforest Alliance, Direct Trade, and a combination of Fair Trade and USDA Organic. The study also found that consumers' motivations for WTP include altruistic, egoistic, and biospheric value orientation and the warm glow effect. The results suggest that sustainability labels influence consumers' WTP for coffee.

Liu et al. (2019) explored consumers' importance of coffee certification attributes and their WTP. The study collected 568 valid responses from those who had habitually purchased coffee beans in Taiwan. The results indicated that traceability, organic, graded, environmentally friendly, and fair-trade certifications are ranked highest to lowest regarding consumers' WTP. This study provides insights into consumers' preferences related to the selection of coffee certification attributes.

Gatti et al. (2022) analyzed consumer preferences for sustainability attributes of Bird Friendly® coffee certification through a CE. Consumers valued the agrochemical-free (organic)

label more than a biodiversity conservation label and were willing to pay a premium of $2.20 per 12 oz for Bird Friendly coffee over conventional coffee. The premiums were higher for organic ($5.80) and pesticide-free coffee ($3.60) and lower for shade-grown coffee ($1.40). Therefore, eco-labels should prioritize enforcing and promoting agrochemical standards to maximize consumer interest.

In Latin America, the study conducted by Valenciano-Salazar et al. (2021) examines the willingness of Costa Rican consumers to pay for environmental certifications in the coffee market, including Carbon Neutral, Fair-trade, and ISO 14001. The study's findings reveal that consumers are willing to pay premiums of approximately 30% for all three certifications, with Carbon Neutral being the most highly valued. The study concludes that environmental certifications can potentially assist coffee producers in enhancing their environmental performance and facilitating their participation in green markets.

Numerous studies have investigated consumers' WTP for sustainable and eco-labeled coffee products. Overall, the studies suggest that consumers are willing to pay a premium for eco-labeled coffee, with attributes such as Organic, Fair Trade, and environmentally friendly certifications being the most highly valued. Consumers' have various motivations that drive their WTP. However, the premiums paid for specific attributes vary across regions and types of eco-labels. The studies provide insights into how eco-labels can influence consumers' coffee choices and facilitate producers' participation in green markets. Notably, the literature regarding WTP for coffee in Latin America remains incomplete.

Cocoa WTP. Cocoa and chocolate products are globally popular and have been the subject of numerous studies to understand consumers' preferences, attitudes, and WTP for different attributes. The subsequent studies examined factors influencing cocoa consumers'

decision-making and how different aspects, such as sensory, sustainability, and origin labeling, impact WTP.

Vecchio and Annunziata (2015) study investigated young Italian consumers' WTP for chocolate bars with different sustainability labels. The results indicated that age, gender, and household income positively influenced WTP, while lifestyle and food consumption habits also played a role. These findings offer valuable insights for policymakers and practitioners promoting sustainability-labeled food consumption among young consumers.

Semenova et al. (2023) study compared Electroencephalography (EEG) neuro metrics with traditional survey methods to evaluate WTP for chocolate. The results showed that perceived taste and EEG beta power were independently correlated with WTP, suggesting that combining these factors could improve WTP modeling. The study also found that chocolate packaging had a significant impact on WTP, with respondents exposed to packaging having different WTP estimates than those who were not.

Ballesteros et al. (2023) study explored the impact of sensory and external cues, such as award and origin labels, on consumer choice and WTP for craft chocolates. The results indicated that taste was the most critical factor in choosing tablea, while award and origin labels could enhance perceived quality and value. The study also found that participants were willing to pay a premium to switch their endowed tablea to the three auctioned tablea. In addition, award and origin significantly improved sensory ratings and WTP premiums for the three variants.

German consumers were surveyed by von Grafenstein et al. (2022) study to assess the impact of information content and source on their WTP premium for Fair-trade chocolate. The study found that despite limited knowledge about certification, consumers were willing to pay a high price premium for Fairtrade-labeled chocolate. WTP was relatively robust to additional

supportive information, but the purchasing intention could rise due to information provided by a retailer or the government. The study emphasizes the need for targeted information campaigns to Increase purchasing frequency and highlights the risk of generalized science communication in forming public opinion.

Puchol-Miquel et al. (2022) study investigated the relationship between chocolate labeling and purchase intention and perception. Sustainability labeling information influenced consumers' purchase decisions and sensory scores, showing that many consumers were willing to pay extra money for cocoa and chocolate manufactured following ethical principles and with sustainability labels on the packaging.

Finally, Schott et al. (2022) study investigated how US consumers' impressions of the economic status and perceived food quality and safety of different regions could affect their taste preferences and WTP for food, including chocolate bars from developed and developing regions. The results showed that participants preferred the taste of and were willing to pay more for chocolate from developed regions, with European chocolate being the most preferred. Surprisingly, origin labels raised taste evaluations and WTP, even for chocolate from developing regions, suggesting that consumers appreciate the benefits of origin information. The study suggests that labeling could help raise product evaluations, even for food from developing regions.

The literature suggests that consumer WTP for cocoa products is influenced by age, gender, income, lifestyle, food habits, taste, packaging, sustainability labeling, origin, and information source. Chocolate companies can increase product value by incorporating these factors into marketing and labeling. Sensory cues, sustainability labeling, and origin labeling can

influence WTP for cocoa products and contribute to a more sustainable industry. Unfortunately, there is a lack of literature focused on Latin America.

Gaps in the literature

Research on the demand for coffee has been conducted since 1958 (Capps et al., 2023). Over the past decade, there has been a noticeable rise in demand for coffee and cocoa that meet voluntary sustainability standards (Voora, Bermúdez, & Larrea, 2019; Voora, Bermúdez, Larrea, et al., 2019). Despite the extensive literature on WTP for coffee and cocoa products, most research has been conducted with consumers from developed countries who have the purchasing power to access specialty coffees with unique attributes such as country of origin, sustainability certifications, or organic certification.

Studies are usually conducted with consumers from developed countries. That makes sense since they have the purchasing power to access it with special attributes such as the country of origin, sustainability certifications, or organic certification. However, Latin America is a crucial region for coffee and cocoa production and consumption, where the literature regarding consumers' WTP remains incomplete. Therefore, this study aims to address this gap in the literature by investigating consumers' WTP in four Latin American countries where coffee and cocoa are extensively produced and consumed. By shedding light on this aspect, we can gain insights into the preferences and behaviors of Latin American consumers regarding coffee and cocoa products that meet sustainability standards.

Methods

A survey instrument was developed and distributed online to collect data from coffee and cocoa consumers in four Latin American countries (Ecuador, Colombia, Guatemala, and El Salvador), collecting data from 809 randomly selected coffee consumers.

Research Approach

A choice experiment design was carefully selected for studying coffee and cocoa products. The design incorporates five key attributes: organic type, country of origin, socio-environmental certifications, type of product, and price (Table 1). For the attribute of organic type, two options were considered: (1) USDA Organic and (2) non-USDA organic. These options represent different organic certifications that consumers may consider when purchasing. The country-of-origin attribute offers a range of choices to the participants. Five countries were selected based on their significance in coffee and cocoa production: (1) Ecuador, (2) Colombia, (3) Guatemala, (4) El Salvador, and (5) Brazil. These options represent different geographical origins that may influence consumer preferences. Socio-environmental certifications, another important attribute, were divided into five categories: (1) fairtrade, (2) shade grown, (3) GAP, (4) rainforest alliance, and (5) UTZ certified. Each of these certifications represents a specific set of socio-environmental practices associated with the production of coffee and cocoa. The type of product varied between coffee and cocoa. For coffee, the options were (1) traditional and (2) premium, representing different quality levels. For cocoa, the options were (1) sweet and (2) with sweetener, representing different flavor profiles or additional ingredients. To determine the price attribute, the average price of a 400g bag of coffee and cocoa was considered for each country. This ensured that the price levels in the choice experiment were realistic and based on the average market prices for the respective products in the selected countries. Data were

retrieved from the major online supermarket platforms in each country, including brand, price,

and presentation (weight).

Table 1. Ground coffee and cocoa powder product attributes and levels

Attribute	Attribute level
Organic	USDA Organic
	Organic claim
Country of Origin	Ecuador
	Colombia
	Guatemala
	Honduras
	El Salvador
	Brazil
Certification	Fairtrade
	Shade Grown
	GAP
	Rainforest Alliance
	UTZ Certified
Type of Cocoa	Sweet
	Unsweet
	With Sweetener
Type of Coffee	Traditional
	Premium
	Specialty

In the choice experiment, participants were presented with six choice scenarios, each

involving comparing two bags of coffee or cocoa with different attribute combinations. This

allowed for a comprehensive analysis of consumer preferences by evaluating the trade-offs they

made between the various attributes. By incorporating these attributes and options into the choice

experiment design, the study aims to gain insights into consumer preferences for coffee and

cocoa products, taking into account organic certification, country of origin, socio-environmental

certifications, type of product, and price.

The experimental design was created using the SAS software with 100 individual product profiles resulting from the combinations of all the attributes and levels (2 x 5 x 5 x 2). The possible number of choice scenarios with products from different origins can be calculated using C_n^r, the formula for combinations of n objects taken r at a time (Wackerly et al., 2014)Thus, we have estimate more than 4950 possible combinations of products for choice scenarios. Hence, a fractional factorial design was applied to choose only choice scenarios that minimize the D-efficiency criterion. The design was then blocked into two different versions of the questionnaires, where each respondent was offered only six choice scenarios in the experiment. Before presenting the choice scenarios, consumers were provided with a script which included a description of the experiment and the cocoa and coffee product attributes. The script also suggested consumers to make choices as if they were facing a real purchase decision in a retail market and reminded them about their budget constraint. Figure 1 and 2 shows the choice experiments design.
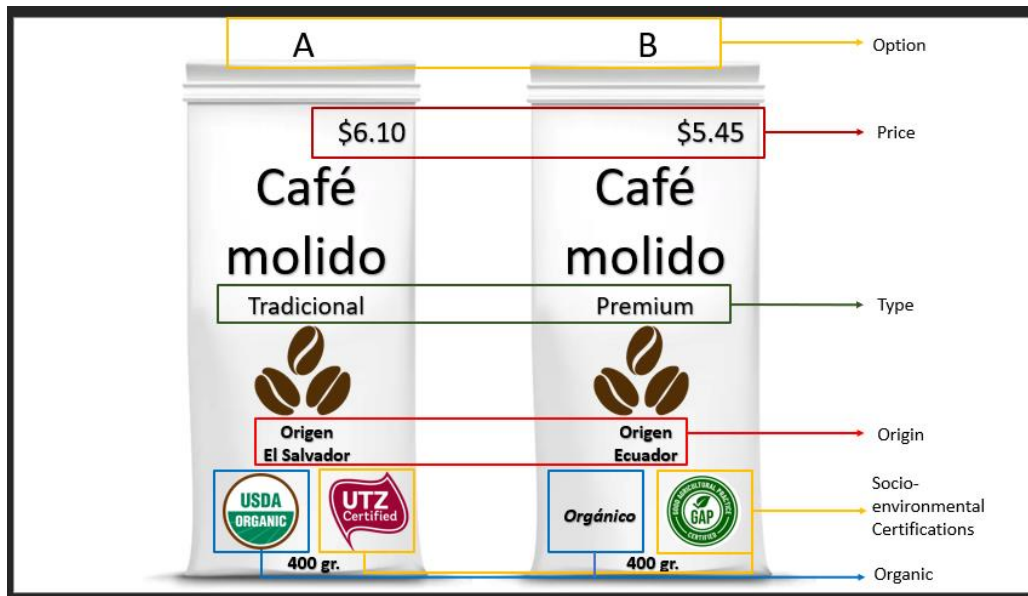
Figure 1. Coffee choice experiment example
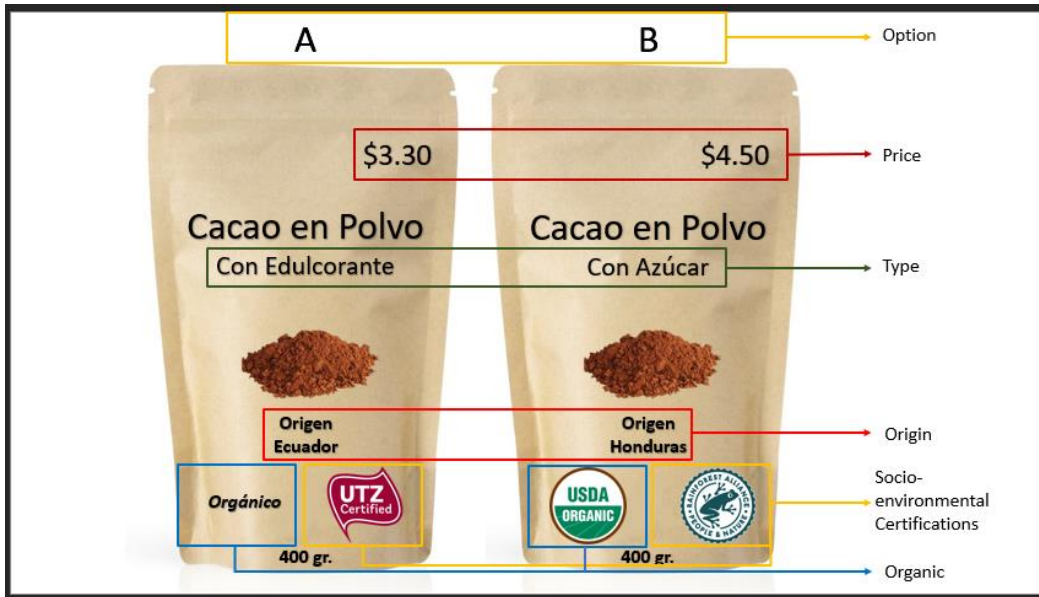
Figure 2. Coffee choice experiment example

Data

The survey had five sections: 1) coffee purchase habits and preferences, 2) a set of stated choice experiments to assess preferences on five types of attributes in ground coffee, 3) cocoa purchase habits and preferences, 4) a set of stated choice experiments to assess preferences on five types of attributes in cocoa powder, and 5) socio-demographic characteristics (adjusted to each country).

Consumers' purchase habits of ground coffee and cocoa powder in LA

The purchasing behavior of consumers regarding ground coffee is outlined in Table 2. Overall, the majority of consumers (71%) showed a preference for purchasing coffee from supermarkets. It was observed that consumers tend to buy coffee quite frequently, with 35% making purchases once a week and 32% every two weeks. Regarding the preferred presentation, 46% of consumers favored coffee packaged in the range of 250-499 grams. Furthermore, glass (35%) and paper (24%) were the most popular packaging materials. Regarding package attributes, the two key factors influencing consumer choices were the coffee brand (39%) and the information provided on the package (34%). These findings remained consistent across the four countries.

Table 2. Consumers' purchase habits of ground coffee (n = 809).

	All countries	Colombia	Ecuador	El Salvador	Guatemala
Variable	**Percentage**	**Percentage**	**Percentage**	**Percentage**	**Percentage**
What is your preferred location to buy coffee?					
Supermarket	70.91	72.25	67.34	75.12	68.84
Market	10.33	13.61	10.05	9.27	8.54
Convenience store	12.97	7.85	17.59	12.20	14.07
From the producer	2.39	2.62	2.01	1.95	3.02
Online	0.25	0.52	0.50	0.00	0.00
Coffee store	2.14	1.05	2.51	0.49	4.52
Other	1.01	2.09	0.00	0.98	1.01
How often do you buy coffee?					
Once a week	35.08	33.51	41.62	36.14	28.93

Every two weeks	31.76	33.51	25.89	35.15	32.49
Once a month	24.23	21.81	24.37	21.78	28.93
Occasionally	6.25	7.45	6.09	4.95	6.60
I'm not sure	2.68	3.72	2.03	1.98	3.05
What is your preferred presentation?					
1000 grams or more	6.35	10.00	2.54	3.82	9.14
750 – 999 grams	7.49	7.89	5.08	9.31	7.61
500 – 749 grams	21.07	23.68	19.29	22.06	19.29
250 – 499 grams	46.19	43.16	48.22	47.06	46.19
Less than 250 grams	18.91	15.26	24.87	17.65	17.77
What is your preferred package presentation?					
Paper	23.52	21.35	21.61	22.44	28.64
Aluminum	14.59	14.58	12.06	13.66	18.09
Plastic	17.61	18.23	22.61	19.02	10.55
Glass	35.47	32.29	36.68	34.63	38.19
I don't know/I'm indifferent	8.81	13.54	7.04	10.24	4.52
What is the most important attribute in the package?					
Package design	22.24	18.23	21.61	21.36	27.64
Package color	5.03	4.69	5.53	2.43	7.54
Package information	33.67	33.85	37.69	33.50	29.65
Coffee brand	39.07	43.23	35.18	42.72	35.18

The purchasing behavior of consumers regarding cocoa powder is depicted in Table 3. Generally, supermarkets emerged as the preferred location for buying cocoa powder, as reported by 75% of the surveyed consumers. In addition, it was noted that consumers tend to make relatively frequent purchases of cocoa powder, with 29% buying it once a week and 26% every two weeks. In terms of preferred presentation, 46% of consumers favored cocoa powder packaged in the range of 250-499 grams. Furthermore, when it comes to packaging materials, plastic was the preferred choice for 33% of consumers, followed by paper at 22%. Regarding package attributes, the two main factors influencing consumer decisions were package information for 36% of respondents and the brand for 31% of consumers. Notably, these findings remained consistent across the four countries.

Table 3. Consumers' purchase habits of cocoa powder (n = 809).

	All countries	Colombia	Ecuador	El Salvador	Guatemala

Variable	Percentage	Percentage	Percentage	Percentage	Percentage
What is your preferred location to buy cocoa powder?					
Supermarket	75.07	79.47	74.49	69.94	76.74
Market	14.08	13.91	10.20	19.02	13.95
Convenience store	8.80	5.30	14.80	7.36	6.40
From the producer	1.91	0.66	0.51	3.68	2.91
Online	0.15	0.66	0.00	0.00	0.00
How often do you buy cocoa powder?					
Once a week	29.01	20.20	41.38	26.83	27.45
Every two weeks	25.56	24.24	25.62	26.34	25.98
Once a month	22.96	29.29	22.17	21.46	19.12
Occasionally	12.59	10.61	8.37	14.63	16.67
I'm not sure	9.88	15.66	2.46	10.73	10.78
What is your preferred presentation?					
1000 grams or more	3.63	5.61	3.00	1.96	4.00
750 – 999 grams	6.38	5.61	4.50	7.84	7.50
500 – 749 grams	16.43	18.37	21.00	11.76	15.50
250 – 499 grams	45.75	42.35	52.00	42.65	46.00
Less than 250 grams	27.63	28.06	19.50	35.78	27.00
What is your preferred package presentation?					
Paper	22.40	22.89	10.24	23.67	32.84
Aluminum	14.32	6.97	12.20	19.32	18.63
Plastic	33.41	33.33	49.76	28.02	22.55
Glass	14.32	15.92	17.07	12.08	12.25
I don't know/I'm indifferent	15.54	20.90	10.73	16.91	13.73
What is the most important attribute in the package?					
Package design	26.20	23.74	30.24	23.30	27.45
Package color	6.27	5.56	5.37	6.31	7.84
Package information	36.04	35.86	35.61	37.38	35.29
Cocoa brand	31.49	34.85	28.78	33.01	29.41

In both instances, it was evident that consumers predominantly chose supermarkets as their primary location for purchasing both ground coffee and cocoa powder. However, comparing the two, it became apparent that ground coffee was purchased more frequently than cocoa powder, as a significant majority reported making at least one monthly purchase. Interestingly, nearly half of the consumers preferred the 250-499 gram presentation size for ground coffee and cocoa powder. When it came to packaging, consumers displayed varying preferences. For ground coffee, the preferred material was glass, while plastic was the material of choice for cocoa powder. Furthermore, the most influential packaging attributes for consumers

were the brand and information provided on the package, indicating their importance in shaping consumer choices for both products. These tendencies remained consistent across countries, with slight variations.

Results

WTP estimates

The choice CE results revealed consumers' WTP for attributes represented in a package of 400 grams (14.1 oz). Four attributes were analyzed: organic certification, country of origin, socio-environmental certification, and type. The mixed logit models were estimated using data from respondent selections in the choice experiments for ground coffee and cocoa powder in Tables 4 and 5, respectively. The coefficients represent the parameters of the mean of the distribution of the random coefficients for the price and non-price attributes presenting differences in statistical significance across countries and attributes. Therefore, the presented coefficients can be interpreted as the effects of the different levels of the attributes on the indirect utility function. The different signs presented in level attributes, represented with dummy variables, show respondents' change in utility concerning their baseline. Thus, positive estimated values indicate that respondents obtain higher levels of utility when consuming products with specific attributes. Contrarily, the negative signs indicate that respondents prefer the baseline option. In addition, the negative sign for the alternative specific constant (ASC) indicates that respondents prefer to consume the selected product rather than choosing the "none" option. Finally, the negative coefficients for the price attributes in ground coffee and cocoa powder indicate prices decrease demand for the products.

Table 4. Results from mixed logit regression for ground coffee

	All countries	Colombia	Ecuador	El Salvador	Guatemala
Attribute	**Coefficient**	**Coefficient**	**Coefficient**	**Coefficient**	**Coefficient**

	(1)		(2)		(3)		(4)		(5)	
Organic attribute										
USDA Organic	0.380	***	0.392	***	0.170		0.923	***	0.352	***
	(0.060)		(0.118)		(0.123)		(0.201)		(0.118)	
Organic claim	0.196	***	0.016		0.249	*	0.444	***	0.097	***
	(0.068)		(0.127)		(0.144)		(0.183)		(0.142)	
Country-of-Origin										
Ecuador	-0.247	**	-0.937	***	0.967	***	-1.188	***	0.004	
	(0.106)		(0.207)		(0.263)		(0.297)		(0.191)	
Honduras	-0.708	***	-1.438	***	-0.688	***	-1.009	***	0.036	
	(0.108)		(0.252)		(0.221)		(0.282)		(0.213)	
Guatemala	-0.347	***	-1.472	***	-0.424	**	-0.872	***	1.056	***
	(0.102)		(0.228)		(0.212)		(0.288)		(0.238)	
El Salvador	-0.227	***	-1.345	***	-0.257		0.560	**	0.243	
	(0.090)		(0.205)		(0.183)		(0.258)		(0.189)	
Brazil	-0.678	**	-1.455	***	-0.484	*	-1.325	***	0.150	
	(0.135)		(0.278)		(0.272)		(0.384)		(0.280)	
Certification										
Fairtrade	0.265	***	0.146		0.276		0.101		0.713	***
	(0.088)		(0.190)		(0.179)		(0.237)		(0.185)	
Shade Grown	0.210	**	0.249		-0.056		0.426	*	0.381	**
	(0.088)		(0.170)		(0.181)		(0.252)		(0.185)	
GAP	0.399	***	0.333	**	0.421	**	0.075		0.737	***
	(0.086)		(0.165)		(0.184)		(0.231)		(0.194)	
Rainforest Alliance	0.397	***	0.546	**	0.382		0.276		0.612	***
	(0.114)		(0.232)		(0.240)		(0.339)		(0.219)	
UTZ Certified	0.331	***	0.265		0.508	**	0.097		0.532	***
	(0.097)		(0.185)		(0.215)		(0.248)		(0.199)	
Type of Coffee										
Premium	0.060		-0.055		0.008		-0.076		0.287	**
	(0.060)		(0.112)		(0.124)		(0.168)		(0.116)	
Specialty	-0.074		-0.070		-0.258	*	-0.350	**	0.282	**
	(0.066)		(0.131)		(0.139)		(0.178)		(0.142)	
Price	-0.452	***	-0.157	*	-0.418	***	-0.927	***	-0.528	***
	(0.044)		(0.089)		(0.093)		(0.152)		(0.100)	
ASC	-10.728	***	-9.054	***	-11.445	***	-13.882	***	-13.474	***
	(0.902)		(1.391)		(2.053)		(1.849)		(3.016)	
Observations	14,613		3,618		3,669		3,690		3,636	
Log Likelihood	-3512.3999		-863.7064		-857.7214		-799.7203		-833.6858	

Standard error in parenthesis. ***indicates significance at 1%, ** indicates significance at 5%, and * indicates significance at 10%. No label in the product is used as baseline for the organic and certification attributes. Colombia used as baseline for country-of-origin attribute. Traditional coffee is used as baseline for type of coffee attribute. ASC is the acronym of "Alternative Specific Constant" or the "None" option.

Table 5. Results from mixed logit regression for cocoa

Attribute	All countries Coefficient		Colombia Coefficient		Ecuador Coefficient		El Salvador Coefficient		Guatemala Coefficient	
Organic attribute										
USDA Organic	0.662	***	0.671	***	0.432	***	1.347	***	0.642	***
	(0.071)		(0.154)		(0.156)		(0.247)		(0.138)	
Organic claim	0.449	***	0.497	***	0.748	***	0.580	***	0.301	*
	(0.082)		(0.171)		(0.200)		(0.215)		(0.157)	
Country-of-Origin										
Ecuador	0.225	**	-0.110		1.879	***	-0.333		-0.246	
	(0.111)		(0.228)		(0.313)		(0.293)		(0.199)	
Colombia	0.415	***	0.768	***	0.591	**	0.723	**	0.032	
	(0.108)		(0.260)		(0.250)		(0.284)		(0.203)	
Guatemala	0.222	**	-0.319		0.487	*	0.052		0.817	***
	(0.111)		(0.234)		(0.256)		(0.291)		(0.250)	
El Salvador	0.317	***	0.067		0.497	*	1.136	***	0.024	
	(0.111)		(0.221)		(0.262)		(0.316)		(0.224)	
Brazil	0.060		-0.011		0.309		-0.273		0.192	
	(0.119)		(0.246)		(0.264)		(0.338)		(0.2570	
Certification										
Fairtrade	0.278	***	0.341		0.778	***	0.031		0.067	
	(0.094)		(0.215)		(0.211)		(0.237)		(0.205)	
Shade Grown	0.372	***	0.443	**	0.270		0.662	***	0.361	**
	(0.092)		(0.211)		(0.206)		(0.247)		(0.181)	
GAP	0.631	***	0.520	***	1.249	***	0.622	**	0.461	**
	(0.097)		(0.197)		(0.224)		(0.267)		(0.198)	
Rainforest Alliance	0.482	***	0.590	**	0.956	***	0.330		0.234	
	(0.124)		(0.283)		(0.299)		(0.323)		(0.220)	
UTZ Certified	0.494	***	0.385		1.209	***	0.459		0.338	
	(0.113)		(0.238)		(0.303)		(0.280)		(0.219)	
Type of Cocoa										
Sweet	-0.784	***	-0.954	***	-0.896	***	-1.162	***	-0.606	***
	(0.085)		(0.185)		(0.200)		(0.242)		(0.154)	
With sweetener	-1.022	***	-1.066	***	-0.919	***	-1.694	***	-1.137	***
	(0.097)		(0.209)		(0.201)		(0.332)		(0.195)	
Price	-0.386	***	-0.437	***	-0.348	***	-0.617	***	-0.423	***
	(0.048)		(0.115)		(0.104)		(0.145)		(0.092)	
ASC	-7.799	***	-8.823	***	-6.580	***	-9.472	***	-8.139	***
	(0.572)		(1.247)		(1.078)		(1.533)		(1.109)	
Observations	14,700		3,633		3,678		3,720		3,669	
Log Likelihood	-3609.3064		-885.6159		-849.0240		-875.2999		-884.0311	

Standard error in parenthesis. ***indicates significance at 1%, ** indicates significance at 5%, and * indicates significance at 10%. No label in the product is used as baseline for the organic and certification attributes. Honduras used as baseline for country-of-origin attribute. 100% Cacao – unsweet is used as baseline for type of type of cocoa attribute. ASC is the acronym of "Alternative Specific Constant" or the "None" option.

Several estimated standard deviations of the coefficients' distributions were also significant (Appendixes 1 and 2), indicating heterogeneity in respondents' preferences for some product attributes. Mixed logit model results suggest respondents have heterogeneous preferences for different certifications and country of origin options. The coefficients were used to estimate the marginal WTP in Table 6 for ground coffee and Table 7 for cocoa powder. The findings reveal interesting insights into consumer WTP for specific characteristics.

In the case of ground coffee (Table 6), starting with organic certification, consumers displayed a WTP an additional $0.84 when comparing coffee with a USDA organic label to coffee without any organic label. Surprisingly, consumers were also willing to pay an additional $0.44 for a label indicating organic status, even if an actual certification didn't back it. Moving on to the country of origin, consumers demonstrated a preference for Colombian coffee, willing to pay more. In contrast, Honduras and Brazil were the least preferred origins, with consumers indicating a WTP $1.57 and $1.50 less for coffee from these countries, respectively, compared to Colombian coffee. When considering socio-environmental certifications, it was surprising to find that the GAP certification garnered the highest WTP at an additional $0.89, closely followed by the Rainforest Alliance certification at $0.88, both in comparison to coffee without any socio-environmental certification. Fairtrade, often studied in the context of coffee, received an additional WTP of $0.73. Interestingly, no significant difference in WTP was observed among the three assessed types of coffee (traditional, premium, and specialty).

Table 6. Estimated Marginal WTP for ground coffee attributes.

Attribute	WTP Calculation	Mean WTP				
		All countries	Colombia	Ecuador	El Salvador	Guatemala
Organic attribute						
USDA Organic	$-(\beta_{USDA}/(\beta_{price}))$	-0.841 ***	2.490 *	0.407	0.996 ***	0.668 ***
Organic claim	$-(\beta_{Organic}/(\beta_{price}))$	0.435 ***	0.103	0.595 *	0.479 **	0.184
Country-of-Origin						
Ecuador	$-(\beta_{Ecuador}/(\beta_{price}))$	-0.546 **	-5.951 *	2.311 ***	-1.281 ***	0.007
Honduras	$-(\beta_{Honduras}/(\beta_{price}))$	-1.568 ***	-9.134	-1.645 **	-1.089 ***	0.068
Guatemala	$-(\beta_{Guatemala}/(\beta_{price}))$	-0.769 ***	-9.342 *	-1.013 *	-0.941 ***	2.002 ***
El Salvador	$-(\beta_{El\ Salvador}/(\beta_{price}))$	-0.503 **	-8.5466 *	-0.613	0.604 **	0.461
Brazil	$-(\beta_{Brazil}/(\beta_{price}))$	-1.500 ***	-9.245	-1.156	-1.429 ***	0.284
Certification						
Fairtrade	$-(\beta_{Fairtrade}/(\beta_{price}))$	0.588 ***	0.932	0.659	0.109	1.352 ***
Shade Grown	$-(\beta_{SG}/(\beta_{price}))$	0.464 **	1.583	-0.134	0.459 *	0.722 **
Good Agricultural Practices	$-(\beta_{GAP}/(\beta_{price}))$	0.885 ***	2.116	1.005 **	0.081	1.397 ***
Rainforest Alliance	$-(\beta_{RA}/(\beta_{price}))$	0.878 ***	3.470	0.914	0.298	1.160 **
UTZ Certified	$-(\beta_{UTZ}/(\beta_{price}))$	0.733 ***	1.688	1.214 **	0.104	1.009 **
Type of Coffee						
Premium	$-(\beta_{Premium}/(\beta_{price}))$	0.134	-0.352	0.018	-0.082	0.543 **
Specialty	$-(\beta_{Specialty}/(\beta_{price}))$	-0.165	-0.446	-0.617 *	-0.378 **	0.534 *

Notes. ***indicates significance at 1%, ** indicates significance at 5%, and * indicates significance at 10%.

Consumers' preferences for cocoa powder attributes are displayed in Table 7. Consumers are generally WTP an additional $1.72 for a USDA organic certification compared with no organic label. Interestingly, consumers are also willing to pay an additional $1.16 for an organic label. This label is not related to an actual certification. Regarding the country of origin, consumers are WTP more for Colombian ($1.08) and El Salvador ($0.82) cocoa powder when

compared to Honduras. When analyzing the socio-environmental certifications, GAP had the highest WTP, an additional $1.64, followed by UTZ ($1.28) and Rainforest Alliance ($1.25). All compared to not having a socio-environmental certification. Consumers' WTP for Fairtrade, which is often studied in cocoa, was $0.72. Last, consumers' WTP for unsweetened cocoa powder is $2.03 higher than sweet and $2.65 more than cocoa powder with sweetener.

Table 7. Estimated Marginal WTP for cocoa attributes.

Attribute	WTP Calculation	Mean WTP				
		All countries	Colombia	Ecuador	El Salvador	Guatemala
Organic attribute						
USDA Organic	$-(\beta_{USDA}/(\beta_{price}))$	1.716 ***	1.537 ***	1.243 **	2.182 ***	1.517 ***
Organic claim	$-(\beta_{Organic}/(\beta_{price}))$	1.162 ***	1.134 ***	2.151 ***	0.939 **	0.712 *
Country-of-Origin						
Ecuador	$-(\beta_{Ecuador}/(\beta_{price}))$	0.583 *	-0.252	5.404 ***	-0.539	-0.581
Colombia	$-(\beta_{Colombia}/(\beta_{price}))$	1.076 ***	1.758 **	1.701 *	1.171 **	0.762
Guatemala	$-(\beta_{Guatemala}/(\beta_{price}))$	0.546 *	-0.729	1.402	0.084	1.929 ***
El Salvador	$-(\beta_{El\ Salvador}/(\beta_{price}))$	0.822 ***	0.154	1.430 *	1.841 ***	0.056
Brazil	$-(\beta_{Brazil}/(\beta_{price}))$	0.155	-0.026	0.890	-0.441	0.453
Certification						
Fairtrade	$-(\beta_{Fairtrade}/(\beta_{price}))$	0.721 ***	0.781	2.237 ***	0.049	0.159
Shade Grown	$-(\beta_{SG}/(\beta_{price}))$	0.964 ***	1.013 **	0.776	1.072 ***	0.852 **
Good Agricultural Practices	$-(\beta_{GAP}/(\beta_{price}))$	1.635 ***	1.191 **	3.591 ***	1.007 **	1.090 **
Rainforest Alliance	$-(\beta_{RA}/(\beta_{price}))$	1.248 ***	1.349 *	2.750 **	0.535	0.552
UTZ Certified	$-(\beta_{UTZ}/(\beta_{price}))$	1.279 ***	0.881	3.478 ***	0.743	0.799
Type of Cocoa						
Sweet	$-(\beta_{Premium}/(\beta_{price}))$	-2.033 ***	-2.184 ***	-2.577 ***	-1.882 ***	-1.431 ***
With Sweetener	$-(\beta_{Specialty}/(\beta_{price}))$	-2.647 ***	-2.440 ***	-2.642 ***	-2.743 ***	-2.687 ***

Notes. ***indicates significance at 1%, ** indicates significance at 5%, and * indicates significance at 10%.

Factors affecting WTP values

Certain socio-demographic characteristics, such as age, college education, and gender, were examined to understand their potential influence on consumer preferences for ground coffee and cocoa powder. While income is typically an important demographic variable, the results obtained were not meaningful or consistent, leading to its exclusion from the analyses. Four models were estimated for ground coffee and powder cocoa to evaluate the effect of demographic characteristics in the different attributes. Model 1 report the effects of demographic characteristics on the organic attribute, model 2 for country-of-origin

The results regarding the impact of demographics on consumer preferences for ground coffee attributes are presented in Table 8. The analysis includes four models that examine different aspects of consumer behavior. In Model GC1, it was found that individuals with a college education displayed a higher WTP of $0.08 for USDA organic certification compared to those without a college education. Model GC2, on the other hand, did not reveal any significant differences among demographic variables concerning the country-of-origin attribute. This suggests that age, college education, and gender did not have a notable impact on consumer preferences for the country of origin of ground coffee. In Model GC3, age was observed to have a negative effect on preferences for socio-environmental certification. Specifically, consumers were willing to pay $0.03 less for ground coffee with socio-environmental certification for every ten years increase in age. Lastly, in Model GC4, college education once again showed a positive association with consumer preferences. Individuals with a college education exhibited a higher WTP of $0.06 for specialty ground coffee compared to those without a college education.

Table 8. Panel random effect regression results for ground coffee attributes

Attribute	All countries Coefficient		Colombia Coefficient		Ecuador Coefficient		El Salvador Coefficient		Guatemala Coefficient	
Model GC1										
Organic attribute										
USDA Organic	0.405	***	0.413	***	0.278	***	0.474	***	0.457	***
	(0.025)		(0.051)		(0.050)		(0.050)		(0.048)	
Demographic characteristics										
Age	-0.001		0.001		-0.001		-0.007	***	-0.000	
	(0.001)		(0.002)		(0.003)		(0.003)		(0.003)	
Male gender	-0.101		-0.104	**	0.061		0.052		-0.041	
	(0.026)		(0.052)		(0.053)		(0.055)		(0.052)	
College graduated	0.082	***	0.087		0.076		0.065		0.114	**
	(0.028)		(0.062)		(0.058)		(0.053)		(0.051)	
Constant	0.426	***	0.387	***	0.375	***	0.595	***	0.401	***
	(0.045)		(0.092)		(0.099)		(0.098)		(0.102)	
Observations	1624		402		408		410		404	
Model GC2										
Country of origin										
Ecuador	0.966	***	0.906	***	1.357	***	0.791	***	0.809	***
	(0.033)		(0.041)		(0.046)		(0.040)		(0.042)	
Honduras	-0.068	***	-0.063		-0.078	*	-0.068	*	-0.062	
	(0.003)		(0.041)		(0.046)		(0.040)		(0.042)	
Guatemala	0.732	***	0.717	***	0.717	***	0.730	***	0.764	***
	(0.002)		(0.041)		(0.046)		(0.040)		(0.042)	
EL Salvador	0.998	***	0.957	***	0.985	***	1.056	***	0.992	***
	(0.005)		(0.041)		(0.046)		(0.040)		(0.042)	
Demographic characteristics										
Age	0.000		-0.000		0.003	*	0.001		-0.001	
	(0.000)		(0.001)		(0.002)		(0.001)		(0.002)	
Male gender	0.002		0.034		0.004		0.004		-0.044	
	(0.013)		(0.026)		(0.030)		(0.028)		(0.029)	
College graduated	0.003		-0.025		0.059	*	-0.023		-0.025	
	(0.013)		(0.032)		(0.033)		(0.027)		(0.028)	
Constant	-1.509	***	-1.495	***	-1.632	***	-1.514	***	-1.423	***
	(0.022)		(0.052)		(0.062)		(0.054)		(0.061)	
Observations	4060		1005		1020		1025		1010	
Model GC3										
Certification										
Fairtrade	-0.145	***	-0.145	*	-0.146	*	-0.145	*	-0.145	*
	(0.000)		(0.078)		(0.082)		(0.079)		(0.079)	
Shade Grown	-0.268	***	-0.268	***	-0.269	***	-0.268	***	-0.268	***
	(0.000)		(0.078)		(0.082)		(0.079)		(0.079)	
GAP	0.151	***	0.152	*	0.151	*	0.151	*	0.152	*
	(0.000)		(0.078)		(0.082)		(0.079)		(0.079)	
Rainforest Alliance	0.153	**	0.299	***	-0.106		0.373	***	0.045	
	(0.063)		(0.078)		(0.082)		(0.079)		(0.079)	
Demographic characteristics										
Age	-0.003	**	-0.006	***	-0.002		-0.001		-0.002	
	(0.001)		(0.002)		(0.003)		(0.003)		(0.003)	
Male gender	-0.022		-0.040		-0.078		-0.009		0.048	
	(0.025)		(0.049)		(0.003)		(0.055)		(0.054)	
College graduated	-0.005		-0.031		-0.049		0.044		0.038	
	(0.028)		(0.098)		(0.059)		(0.053)		(0.054)	

Constant	0.841	***	0.973	***	0.891	***	0.738	***	0.752	***
	(0.045)		(0.098)		(0.112)		(0.106)		(0.115)	
Observations		4060		1005		1020		1025		1010
Model GC4										
Type of Coffee										
Specialty	-0.297	***	-0.160	***	-0.416	***	-0.300	***	-0.312	
	(0.031)		(0.059)		(0.053)		(0.058)		(0.056)	
Demographic characteristics										
Age	-0.000		0.003		-0.004		0.002		-0.003	
	(0.001)		(0.003)		(0.003)		(0.003)		(0.003)	
Male gender	0.009		0.042		-0.040		-0.005		0.031	
	(0.026)		(0.060)		(0.055)		(0.063)		(0.061)	
College graduated	0.056	**	0.048		-0.016		0.078		0.137	**
	(0.028)		(0.071)		(0.060)		(0.061)		(0.060)	
Constant	0.091	*	-0.123		0.322	***	0.033		0.170	
	(0.054)		(0.106)		(0.104)		(0.112)		(0.120)	
Observations		1624		402		408		410		404

Notes. ***indicates significance at 1%, ** indicates significance at 5%, and * indicates significance at 10%.

The results pertaining to the influence of demographics on consumer preferences for cocoa powder attributes are presented in Table 9. The analysis encompasses four models that examine different aspects of consumer behavior. In Model CP1, it was observed that age negatively affected preferences for USDA organic certification. Specifically, consumers were willing to pay $0.01 less for cocoa powder with USDA organic certification for every ten years increase in age. Model CP2, however, did not yield any significant differences among demographic variables concerning the country-of-origin attribute. This indicates that age, college education, and gender did not have a notable impact on consumer preferences for the country of origin of cocoa powder. In Model CP3, age was found to have a negative effect on preferences for socio-environmental certification. For every ten years increase in age, consumers were willing to pay $0.03 less for cocoa powder with socio-environmental certification. Lastly, in Model CP4, age and college education were associated with consumer preferences for cocoa powder with sweetener. Again, age exhibited a negative effect, whereby consumers were willing to pay $0.01 less every ten years increase in age. On the other hand, college-educated consumers

were willing to pay $0.10 more for cocoa powder with sweetener than those without a college

education.

Table 9. Panel random effect regression results for cocoa powder attributes

Attribute	All countries Coefficient		Colombia Coefficient		Ecuador Coefficient		El Salvador Coefficient		Guatemala Coefficient	
Model CP1										
Organic attribute										
USDA Organic	0.557	***	0.523	***	0.492	***	0.638	***	0.574	***
	(0.014)		(0.023)		(0.025)		(0.025)		(0.023)	
Demographic characteristics										
Age	-0.001	**	-0.000		-0.000		-0.003	**	-0.002	
	(0.000)		(0.001)		(0.001)		(0.001)		(0.001)	
Male gender	0.019	*	0.011		0.032		-0.006		0.030	
	(0.0.11)		(0.023)		(0.026)		(0.027)		(0.025)	
College graduated	0.007		0.016		0.008		0.026		-0.010	
	(0.011)		(0.027)		(0.029)		(0.027)		(0.025)	
Constant	1.180	***	1.167	***	1.153	***	1.226	***	1.196	***
	(0.019)		(0.041)		(0.049)		(0.049)		(0.049)	
Observations	1636		404		410		414		408	
Model CP2										
Country of origin										
Ecuador	0.435	***	0.346	***	0.730	***	0.333	***	0.331	***
	(0.029)		(0.039)		(0.036)		(0.039)		(0.036)	
Colombia	0.925	***	0.923	***	0.910	***	0.960	***	0.907	***
	(0.010)		(0.039)		(0.036)		(0.039)		(0.036)	
Guatemala	0.427	***	0.378	***	0.379	***	0.453	***	0.497	***
	(0.016)		(0.039)		(0.036)		(0.039)		(0.036)	
EL Salvador	0.673	***	0.665	***	0.658	***	0.707	***	0.659	***
	(0.010)		(0.039)		(0.036)		(0.039)		(0.036)	
Demographic characteristics										
Age	0.000		0.000		0.001		0.002		0.000	
	(0.000)		(0.001)		(0.001)		(0.001)		(0.001)	
Male gender	0.008		-0.007		-0.010		0.024		0.030	
	(0.011)		(0.025)		(0.024)		(0.027)		(0.025)	
College graduated	-0.007		-0.013		-0.004		-0.026		0.007	
	(0.012)		(0.030)		(0.026)		(0.026)		(0.024)	
Constant	0.135	***	0.169	***	0.137	***	0.059		0.125	**
	(0.023)		(0.049)		(0.049)		(0.053)		(0.052)	
Observations	4090		1010		1025		1035		1020	
Model CP3										
Certification										
Fairtrade	-0.556	***	-0.543	***	-0.553	***	-0.569	***	-0.560	***
	(0.011)		(0.103)		(0.109)		(0.099)		(0.099)	
Shade Grown	-0.312	***	-0.305	***	-0.318	***	-0.317	***	-0.307	***
	(0.011)		(0.103)		(0.109)		(0.099)		(0.099)	
GAP	0.356	***	0.339	***	0.404	***	0.373	***	0.307	***
	(0.021)		(0.103)		(0.109)		(0.099)		(0.099)	
Rainforest Alliance	-0.043		0.055		-0.282	***	0.182	*	-0.130	
	(0.081)		(0.103)		(0.109)		(0.099)		(0.099)	

Demographic characteristics										
Age	-0.003	*	0.001		-0.005		-0.006	**	-0.003	
	(0.002)		(0.003)		(0.004)		(0.003)		(0.004)	
Male gender	-0.006		0.121	*	0.004		-0.058		-0.093	
	(0.032)		(0.066)		(0.072)		(0.068)		(0.068)	
College graduated	0.009		0.066		-0.068		0.007		0.015	
	(0.003)		(0.078)		(0.079)		(0.066)		(0.067)	
Constant	1.360	***	1.130	***	1.472	***	1.523	***	1.409	***
	(0.054)		(0.129)		(0.148)		(0.133)		(0.144)	
Observations	4090		1010		1025		1035		1020	
Model CP4										
Type of Cocoa										
With sweetener	-0.602	***	-0.322	*	-0.575	***	-0.557	***	-0.950	***
	(0.093)		(0.181)		(0.184)		(0.176)		(0.181)	
Demographic characteristics										
Age	-0.012	***	-0.014	*	-0.014		-0.019	**	-0.000	
	(0.004)		(0.008)		(0.011)		(0.009)		(0.010)	
Male gender	0.130		-0.159		0.296		0.252		0.123	
	(0.090)		(0.183)		(0.192)		(0.191)		(0.196)	
College graduated	0.099	**	0.174		-0.130		0.276		0.096	
	(0.097)		(0.218)		(0.211)		(0.186)		(0.194)	
Constant	-1.789	***	-1.823	***	-0.169	***	-1.751	***	-1.956	***
	(0.172)		(0.322)		(0.364)		(0.343)		(0.385)	
Observations	1636		404		410		414		408	

Notes. ***indicates significance at 1%, ** indicates significance at 5%, and * indicates significance at 10%.

Discussion

The findings of this study indicate that consumers' purchasing habits for ground coffee and cocoa powder remain consistent across the examined countries. Most consumers purchase these products at least once a month, with supermarkets being the primary source. Even though many products are purchased at supermarkets, according to Machín et al. (2020), there is little empirical evidence about decision-making in supermarkets, and they observed limited information search from consumers.

When it comes to packaging preferences, coffee consumers favor glass and paper packages, while cocoa consumers lean towards paper and plastic packaging. The key attributes that consumers value in the package are the brand and the information provided. Samoggia and Riedel (2019) found that price is a significant factor for health-conscious coffee consumers, with extrinsic factors such as aroma, brand, information, and emotions playing a secondary role. Also, a study by Czarniecka-Skubina et al. (2021) revealed that the origin of the coffee was more important for Polish consumers than packaging and presentation. On the other hand, Baptista et al. (2021) study found that packaging colors significantly affected the expectations of sweetness, bitterness, fruitiness, melting, and liking. A review by Spence and Velasco (2018) showed significant effects of packaging colors on other food and beverage products, but the only previous research reported no significant effect of colors of packaging on tastiness and attractiveness.

In terms of WTP, consumers exhibit a higher WTP for products with USDA organic certification and those labeled as organic. Fuller et al. (2022) found that consumers are willing to pay a higher premium for coffee with USDA organic certification than Fairtrade. Colombian

origin garners the highest WTP for ground coffee and cocoa powder, likely due to Colombia's global reputation for coffee production.

Consumers generally show a higher WTP for socio-environmental certifications, with the GAP certification being the preferred choice among coffee and cocoa consumers. Consumers with strong sustainability attitudes are willing to pay a premium for sustainably produced coffee (Samoggia & Riedel, 2019). Puchol-Miquel et al. (2022) also found that a substantial portion of global consumers are willing to pay a higher price for cocoa and chocolate that adhere to ethical principles and carry sustainability labels. However, Lingnau et al. (2019) discovered that while certification does not significantly impact the average consumer's WTP, socially non-sustainable practices are strongly discouraged. Lee and Bateman (2021) discuss additional strategies for companies manufacturing certified products to enhance market competitiveness beyond price matching and sustainability certification labels. It is important to note that preferences for socio-environmental certifications vary among countries, as Sepúlveda et al. (2021) highlighted in their study comparing dark chocolate consumers in Ecuador and Spain.

Although consumers did not demonstrate a significant difference in WTP for different types of coffee, they exhibited a higher WTP for unsweetened cocoa powder. Unsweetened products have gained popularity among consumers for various reasons, and ongoing research is exploring the benefits of unsweetened cocoa powder and other cocoa-based products (Zeli et al., 2022).

Among socio-demographic characteristics, age, and college education were influential in consumers' preferences. Jeong and Lee (2021) suggest considering demographic factors such as education, gender, and specific age groups in cross-cultural studies, as they can affect findings due to differences in consumer composition and cultural factors. Age impacted preferences for

organic certification and socio-environmental certifications, with older consumers exhibiting a lower WTP. College education was associated with a higher WTP for USDA organic certification, socio-environmental certifications, and specialty coffee and cocoa powder.

García-Herrero et al. (2019) identified several gaps between consumer expectations and chocolate value-chain expert knowledge, including a lack of understanding of labels, insufficient information about cocoa crops and their link to deforestation, and limited studies examining the social, economic, and environmental impacts throughout the life cycle of chocolate.

Overall, these findings highlight the consistent preferences and WTP patterns among consumers for ground coffee and cocoa powder while also emphasizing the influence of certain socio-demographic factors on consumer preferences and valuation of various attributes.

Conclusions

In summary, the study concludes that consumers' purchasing habits for ground coffee and cocoa powder are consistent across the studied countries in Latin America. Most consumers buy these products at least once a month from supermarkets, preferring packages sized between 250-499 grams. Coffee consumers prefer glass and paper packaging, while cocoa consumers lean towards paper and plastic. The brand and information provided on the package are important to consumers.

Consumers show a higher WTP for products with USDA organic certification and labeled as organic. Colombian origin is highly valued for both coffee and cocoa powder. Consumers generally have a higher WTP for socio-environmental certifications, with the GAP certification being the preferred choice. However, preferences for socio-environmental certifications vary among countries. Consumers did not show a significant difference in WTP for different types of coffee, but they had a higher WTP for unsweetened cocoa powder.

Socio-demographic factors such as age and college education influence consumer preferences. Older consumers exhibit a lower WTP for organic certification and socio-environmental certifications. College education is associated with a higher WTP for USDA organic certification, socio-environmental certifications, and specialty coffee and cocoa powder.

Overall, the study highlights consumers' consistent preferences and WTP patterns for ground coffee and cocoa powder. It also emphasizes the influence of socio-demographic factors on consumer preferences and valuation of different attributes.

Recommendations

We recommend a targeted approach to marketing coffee and cocoa products based on consumers' purchasing behavior and preferences. Since consumers are willing to pay more for certified products, it is beneficial to emphasize the use of certifications. However, it is crucial to select the appropriate certifications based on the specific market strategically. This ensures that certifications align with consumer values and preferences in each region.

Efforts should be focused on potential customers by leveraging their socio-demographic characteristics. Understanding the influence of age, education, and other demographic factors allows for tailored marketing strategies that resonate with specific consumer segments. This personalized approach can effectively capture the attention and loyalty of target consumers.

Additionally, exploring the potential market for ground coffee and cocoa powder in Latin America and other developing countries is recommended. Investigating emerging niches within these regions can uncover new opportunities for growth and expansion. By identifying and supplying the demands of these growing markets, businesses can establish a strong presence and tap into the untapped potential of these regions.

By aligning marketing strategies with consumer behavior, emphasizing certifications, targeting specific consumer segments based on socio-demographic characteristics, and exploring opportunities in emerging markets, businesses can optimize their approach to the ground coffee and cocoa powder industry.

Implications

The findings have important implications for both producers and consumers in the coffee and cocoa industry. Firstly, producers should take note of the growing local market that exhibits specific interests and preferences for various attributes. By recognizing and understanding these preferences, producers can tailor their products to align with consumer demands, increasing their market share and competitiveness. Producers must stay informed about consumers' evolving tastes and preferences to stay ahead in a dynamic market.

Secondly, consumers need to be well-informed about the attributes they value in coffee and cocoa products. Understanding the impact of certifications, origin, packaging, and other factors can help consumers make more informed choices and select products that align with their preferences and values. Increased consumer awareness can drive demand for products that meet their desired criteria, encouraging producers to focus on delivering high-quality offerings.

Lastly, researchers can bridge the existing knowledge gap, particularly in developing countries, by providing valuable insights and information from consumers. While there is a considerable body of literature on WTP for coffee and cocoa products, there may be a lack of research in certain regions. Researchers can contribute by conducting studies that shed light on consumer preferences, behaviors, and WTP in these untapped markets, providing valuable data to producers and informing their decision-making processes.

Overall, the implications suggest the importance of aligning product offerings with consumer preferences, promoting consumer awareness, and filling knowledge gaps through research. By doing so, both producers and consumers can benefit from a more informed and thriving coffee and cocoa market.

Limitations

The study presents some limitations. Although the research found strong preferences and positive WTP for the attributes presented in ground coffee and powder cocoa across countries, the product attributes are available for consumers of all ages; however, our study population was limited to consumers 18 years or older, and regular consumers of ground coffee and cocoa powder. The samples used for the statistical analysis are not totally representative of the countries population.

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Appendix

Appendix 1. Standard deviation results from mixed logit regression for ground coffee

Attribute	All countries Coefficient		Colombia Coefficient		Ecuador Coefficient		El Salvador Coefficient		Guatemala	
Organic attribute										
USDA Organic	0.671	***	0.571	***	0.782	***	1.266	***	0.588	**
	(0.096)		(0.204)		(0.192)		(0.275)		(0.251)	
Organic claim	0.012		0.113		0.037		0.054		0.155	
	(0.136)		(0.331)		(0.308		(0.243)		(0.418)	
Country of Origin										
Ecuador	0.967	***	0.119		1.388	***	1.023	***	0.505	
	(0.145)		(0.624)		(0.310)		(0.371)		(0.605)	
Honduras	0.285		0.788	**	0.029		0.419		0.872	
	(0.210)		(0.383)		(0.255)		(0.463)		(0.594)	
Guatemala	0.210		0.058		0.190		0.619		0.598	
	(0.278)		(0.385)		(0.406)		(0.529)		(0.422)	
El Salvador	0.327		0.135		0.404		0.980	**	0.119	
	(0.230)		(0.293)		(0.450)		(0.452)		(0.457)	
Brazil	0.070		0.076		0.056		0.134		0.018	
	(0.267)		(0.518)		(0.325)		(0.898)		(0.364)	
Certification										
Fairtrade	0.001		0.043		0.019		0.024		0.031	
	(0.164)		(0.450)		(0.269)		(0.374)		(0.331)	
Shade Grown	0.034		0.094		0.002		0.394		0.116	
	(0.233)		(0.460)		(0.530)		(0.648)		(0.389)	
Good Agricultural Practices	0.043		0.051		0.103		0.251		0.182	
	(0.243)		(0.343)		(0.356)		(0.645)		(0.870)	
Rainforest Alliance	1.424	***	1.360	***	1.614	***	2.387	***	1.126	***
	(0.175)		(0.342)		(0.349)		(0.546)		(0.396)	
UTZ Certified	0.044		0.075		0.308		0.024		0.027	
	(0.181)		(0.459)		(0.443)		(0.287)		(0.314)	
Type of Coffee										
Premium	0.695	***	0.503	**	0.366		1.044	***	0.349	
	(0.107)		(0.246)		(0.336)		(0.276)		(0.597)	
Specialty	0.488	***	0.439		0.251		0.692	**	0.658	**
	(0.119)		(0.272)		(0.315)		(0.308)		(0.257)	
ASC	4.676	***	4.325	***	5.831	***	3.896	***	6.434	***
	(0.619)		(0.749)		(1.449)		(0.660)		(1.665)	
Observations	14,613		3,618		3,669		3,690		3,636	
Log Likelihood	-3512.3999		-863.7064		-857.7214		-799.3203		-833.6858	

Standard error in parenthesis. ***indicates significance at 1%, ** indicates significance at 5%, and * indicates significance at 10%. No label in the product is used as baseline for the organic and certification attributes. Colombia used as baseline for country-of-origin attribute. Traditional coffee is used as baseline for type of coffee attribute. ASC is the acronym of "Alternative Specific Constant" or the "None" option.

Appendix 2. Standard deviation results from mixed logit regression for cocoa

Attribute	All countries Coefficient		Colombia Coefficient		Ecuador Coefficient		El Salvador Coefficient		Guatemala Coefficient	
Organic attribute										
USDA Organic	0.428	***	0.162		0.773	***	1.204	***	0.023	
	(0.159)		(0.297)		(0.261)		(0.317)		(0.310)	
Organic claim	0.247		0.006		0.005		0.370		0.036	
	(0.305)		(0.425)		(0.838)		(0.452)		(0.306)	
Country of Origin										
Ecuador	0.796	***	0.501		0.434		1.226	***	0.004	
	(0.169)		(0.429)		(0.570)		(0.367)		(0.407)	
Honduras	0.169		1.151	**	0.109		0.115		0.119	
	(0.213)		(0.446)		(0.491)		(0.435)		(0.295)	
Guatemala	0.449	*	0.687	*	0.189		0.168		0.928	**
	(0.262)		(0.414)		(0.652)		(0.488)		(0.427)	
El Salvador	0.013		0.082		0.025		0.923		0.082	
	(0.245)		(0.376)		(0.482)		(0.563)		(0.355)	
Brazil	0.469	*	0.801	*	0.031		1.112	**	0.977	*
	(0.284)		(0.469)		(0.561)		(0.534)		(0.528)	
Certification										
Fairtrade	0.244		0.629		0.057		0.098		0.787	**
	(0.337)		(0.417)		(0.331)		(0.410)		(0.392)	
Shade Grown	0.130		0.587		0.072		0.236		0.004	
	(0.216)		(0.456)		(0.384)		(0.624)		(0.340)	
Good Agricultural Practices	0.590	**	0.054		0.336		1.342	**	1.025	***
	(0.245)		(0.400)		(0.609)		(0.578)		(0.389)	
Rainforest Alliance	1.533	***	1.957	***	2.071	***	2.382	***	0.991	**
	(0.200)		(0.484)		(0.466)		(0.599)		(0.395)	
UTZ Certified	0.501	**	0.147		1.189		0.440		0.628	*
	(0.218)		(0.447)		(0.369)		(0.777)		(0.372)	
Type of Cocoa										
Sweet	1.240	***	1.167	***	1.635	***	1.630	***	1.185	***
	(0.126)		(0.255)		(0.268)		(0.375)		(0.250)	
With Sweetener	1.047	***	0.816	***	1.288	***	1.548	***	1.080	***
	(0.126)		(0.278)		(0.261)		(0.366)		(0.250)	
ASC	3.387	***	4.518	***	2.785	***	3.239	***	3.034	***
	(0.309)		(0.741)		(0.509)		(0.625)		(0.598)	
Observations	14,700		3,633		3,678		3,720		3,669	
Log Likelihood	-3609.3064		-885.6159		-849.0240		-875.2999		-884.0311	

Standard error in parenthesis. ***indicates significance at 1%, ** indicates significance at 5%, and * indicates significance at 10%. No label in the product is used as baseline for the organic and certification attributes. Honduras used as baseline for country-of-origin attribute. 100% Cacao – unsweet is used as baseline for type of type of cocoa attribute. ASC is the acronym of "Alternative Specific Constant" or the "None" option.