



The impact of value orientations on the relative preference of environmental, functional and price attributes of products

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Abstract

We simultaneously evaluated the environmental, functional and price attributes of a food product by means of a choice-based conjoint experiment. A sample of 146 consumers chose the product most preferred from among many product profiles, which were systematically varied across choice sets with respect to attributes such as organic, fair trade and certified vegan, nutritional value, taste and price. Data on the choices and on value orientations were analyzed using a conditional logit model. This approach enabled us to model product choice as a function of three environmental characteristics, two functional and price attributes and of consumer characteristics. The latter made possible a market segmentation of preference data. The results showed that consumers' preferences for product features depend on their value orientations and that environmental attributes are given relatively more importance by individuals with higher altruistic value orientations, whereas functional attributes are preferred more by individuals with higher egoistic value orientations. We also observed differences among the environmental attributes in terms of their effect on choice.

Keywords: *Food Product Attributes, Value Orientations, Conjoint Analysis*

Değer eğilimlerinin ürünlerin çevresel, fonksiyonel ve fiyat özelliklerinin göreceli tercihlerindeki etkisi

Özet

Gıda ürünlerinin çevresel, fonksiyonel ve fiyat özelliklerini tercihe bağlı Konjoint Analizi yoluyla eş zamanlı olarak inceledik. 146 kişiden oluşan örnekleme, tüketiciler sistematik olarak çeşitlendirilmiş tercih setleri arasından en çok tercih ettikleri ürün profilini seçtiler. Bu tercih verileri koşullu logit modeliyle analiz edildi. Bu yöntem ürün tercihinin; üç çevresel özellik, iki fonksiyonel özellik, bir fiyat özelliği ve tüketici karakterleri olarak modellememize olanak sağladı. Özellikle tüketici karakterleri değişkeninin modellemeye dâhil edilmesi tercih verilerinin pazar bölümlendirmesinde kullanımı için olanak sağladı. Sonuçlar tüketici ürün özellikleri tercihlerinin değer yönelimlerine bağlı olarak değiştiğini gösterdi. Ayrıca, sonuçlar çevresel ürün özelliklerinin altruistik değerleri daha ağır basan tüketiciler tarafından daha çok tercih edildiğini ortaya çıkardı. Diğer yandan fonksiyonel özelliklerin de egosantrik değer eğilimleri ağır basan tüketiciler tarafından daha çok seçildiği görüldü. Ayrıca çevresel özelliklerin de tercihe etkileri bakımından kendi aralarında farklılık gösterdiği gözlenmiştir.

Anahtar Kelimeler: *Gıda Ürün Özellikleri, Değer Eğilimleri, Konjoint Analizi*

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1. Introduction

The market for environmentally friendly products, defined as products that address certain environmental issues, is growing dramatically. A study by TerraChoice, an environmental marketing agency, suggests that the total number of environmentally friendly products increased by an average of 79% in both 2007 and 2008 and by 73% since 2009 [1]. In particular, food products have been appealing to consumers through their environmental attributes, as well as through functional attributes such as taste and nutritional value. Several studies have compared the functional and environmental attributes of food products in terms of their effect on buying behavior. For instance, Bougherara and Combris [2] studied how the addition of one environmental label to a conventional food product changed consumers' willingness to pay (WTP), and they examined the extent to which the WTP for environmentally friendly products is due to functional attributes. McEachern and McClean [3] compared consumer attitudes towards food safety, organic standards and food ethics in terms of their effects on organic product choice. Within that line of inquiry, this study goes further by addressing the environmental, functional and price attributes of a food product in terms of a *trade-off* affecting the relative importance of attributes perceived by consumers in their food-buying decisions.

The values of environmentally friendly products may also differ based on the specific issue involved, that is, food products can have different types of environmental attributes. Although a number of different categorizations are conceivable, for the purpose of this study, we categorized food attributes into three main groups. The first group benefits the natural environment by restricting the use of synthetic pesticides and chemical fertilizers. The second group benefits animal well-being by preventing animal cruelty. The third group benefits people by assuring them that farmers and workers are justly compensated and that forced child labor is strictly prohibited. Since each of these groups represents a different aspect of environmental issues, we assumed that each might have a different effect on product choice decision. Several studies have found that consumers respond differently to different environmental labels [4-6]. Accordingly, we studied the relative importance of three particular attributes (organic, fair trade, and certified vegan), each of which belongs to one of the three categories defined above, in a realistic product choice situation. Unlike previous studies, we considered a *between-attributes effect* on choice decision, such as *environmental* versus *functional*. We also considered a *within-attributes effect* on choice decision, primarily within three environmental attributes and secondarily within two functional attributes. We anticipated that the category of the environmental attribute would make a difference in the relative importance given to each of the environmental and functional attributes in a product choice decision.

Individuals are heterogeneous and, consequently, they have different values, different life styles, different perceptions of environmental problems and different prior informational levels [7]. Many studies have examined this heterogeneity among consumers in terms of their effects on proenvironmental behavior [8-11]. People choose products to achieve their value-oriented goals [12], and individuals who make consumption choices based on their values are increasing [13]. In this study, we examined the impact of individual differences related to a dichotomy of values, namely altruistic and egoistic value orientations. By definition, altruistic value orientations motivate individuals to increase the welfare of "others," such as the natural environment, animals and people [14]. Egoistic value orientations lead individuals to look for ways to boost personal welfare [15]. In particular, we wanted to study how altruistic/egoistic value orientations affect the importance placed on various attributes in a food product choice. In other words, we wanted to examine whether the importance placed on each of three environmental and on the two functional attributes varies according to whether

individuals have higher levels of altruistic or egoistic values. Previous studies have examined values in terms of their effect on whether or not a consumer buys an environmentally friendly product (e.g. a cloth diaper versus a disposable diaper—see [16]) or on a consumer's willingness to pay for an environmentally friendly product (e.g. [17]). Unlike these previous studies, this study used values to explain the relative importance placed on attributes and to explore the levels of attributes that are preferred by consumers when choosing an environmentally friendly food product.

In a methodological sense, this paper builds on the model of consumer multi-attribute choice as a *trade-off* among several product alternatives that vary regarding several attributes and their levels. Unlike many earlier studies that have focused on describing the underlying values, attitudes and intentions towards environmentally friendly products, we try to explore consumer behavior in a more realistic choice situation, one in which consumers have to balance their preferences in light of different product attributes. Our aim was to evaluate the extent to which consumers value environmental attributes in their food product choices compared with other product characteristics and to illuminate how this varies among the three environmental attributes.

Therefore, the objectives of this study were threefold. First, we compared two groups of attributes (environmental and functional) in terms of the relative importance consumers gave them in their food product choices. Second, we compared three environmental attributes (organic, fair trade, and certified vegan) in terms of their relative effects on product choice. Finally, we assessed whether the importance placed on the two groups of attributes (environmental and functional) varied, based on whether individuals had higher levels of altruistic or egoistic values.

2. Literature Review

2.1. Products as Multi-Attributes

The food consumption literature regards product attributes as one way to understand consumption behavior (e.g. [18, 19]). Therefore, a product can be seen as a bundle of attributes in light of which consumers make choices based on their value orientations [20, 21]. Different classifications of food attributes are found in the literature. For instance, several researchers [22-24] advocated the use of an *intrinsic versus extrinsic* distinction among attributes. Intrinsic attributes are related to product functionality and physical characteristics (e.g. taste, nutritional value), whereas, extrinsic attributes are not physically a part of the actual product, but are strongly associated with it (e.g. brand, price). Another classification of attributes divides them into *search attributes*, *experience attributes* and *credence attributes* [25-27]. Search attributes can be identified prior to consumption through examination (e.g. nutrition value). Experience attributes can only be identified after consumption of the product (e.g. taste). Credence attributes, on the other hand, cannot be easily identified, even after consumption (e.g. environmental friendliness). In this study, we used one or more attributes from each of these groups, namely, nutritional value and price as search attributes, taste as an experience attribute and three environmental attributes as credence attributes. However, for the purpose of this study, classified the attributes into three groups, named *environmental*, *functional* and *price* attributes. In our context, the term *environmental* refers to attributes that benefit the natural environment, animals and people. The term *functional* refers to the functionality of the product, involving attributes such as taste and nutritional value. The term *price* refers to the monetary value that consumers need to pay for transfer of ownership of a particular product. Here, it is good to note that the interrelationship between the environmental and functional attributes of an environmentally friendly product is a debatable issue. However, there is no conclusively proven cause-effect relationship between a food product's environmental and functional attributes, in the

sense that the environmental attributes of a food product would lead to better functionality (e.g. better taste and higher nutritional value). For example, an organic label does not assure that a product is healthier, more nutritious or tastier than its conventional counterpart [28]. Therefore, this study was built on the assumption that the environmental characteristics of food products are not a guarantee of better functionality. We assumed that they are an independent characteristic.

Several studies have examined functional and environmental attributes to explain the reasons for buying environmentally friendly food products. However, there is no consistency among the results reported by these studies. Bougherara and Combris [2] noted that consumers' WTP for environmentally friendly products does not derive from perceived higher taste or safety attributes. McEachern and McClean [3], on the other hand, suggested that consumers' motivation for buying environmentally friendly products is due to self-interest, focusing on taste or safety rather than environmental attributes. We assume that this inconsistency may be the result of consumer misconceptions about these attributes. Consumers may simply think that the environmental characteristics of a food product may lead to better functionality (e.g. better taste, higher nutritional value). In fact, sometimes they may have to trade off between organic and nutritional value. Therefore, a research design that cuts the positive connection between environmental and functional attributes prevents, or at least decreases, the misconception that environmental attributes certainly lead to better functionality. With the help of such a design, we may be able to learn on which attributes consumers place higher levels of importance compared to others. In short, we aim to compare environmental and functional attributes in terms of the relative importance placed on them by consumers.

On the other hand, environmental friendliness comprises a range of issues. To gauge their relative effects on product choice, we grouped them into three main categories that they benefit: the natural environment, animals and people. We believed that investigating one category of environmental issue is not sufficient to support generalizations on overall consumer behavior. Although they have commonalities, fundamentally each one of these categories involves a distinct type of environmental issue. For example, while an individual may care about animal well-being, he or she may not be interested in farmers' rights in South America, or vice versa. Therefore, the relative importance assigned by consumers can be quite diverse across different environmental dimensions.

While there is extensive research that focuses on one specific attribute category, such as organic or fair trade (e.g. [8, 29-32]), very few studies investigate consumer behavior differences for a variety of environmental attributes. Howard and Allen [4] analyzed different types of labels: "humane," "living wage," "locally grown," "small-scale US-grown" (placed together with an organic label). They found that the humane treatment of animals received the highest level of support by consumers. Loureiro and Lotade [5] examined consumer preferences for environmentally friendly coffee under three label categories: "organic," "fair trade" and "shade-grown," and concluded that consumers are willing to pay more for the fair trade and shade-grown eco-labels than for the organic. In another study [6], researchers analyzed environmental labels in the apparel industry and found a significant and robust premium for the organic label, but not for environmental-friendly label. Therefore, there is empirical evidence for consumers' preference differences being keyed to different environmental issues. Previous studies that assessed consumer preferences for different labels generally aimed to measure willingness to pay. However, to the best of our knowledge, there is no study that compares three broad environmental issues in terms of their relative impact on buying choices. The purpose of our study, distinct from previous studies reported in the literature, is to evaluate whether the attributes sought by consumers, based on their value orientations, vary across three different environmental categories. To this end, we selected three different attributes

that correspond to each of the three broad categories of the natural environment, animals and people. The first is *organic*; it corresponds to the protection of the natural environment by reinforcing low or zero use of chemically synthesized inputs. The second is *certified vegan*; it benefits animal well-being by preventing animal cruelty. The third is *fair trade*; it benefits people by assuring consumers that farmers and workers are justly compensated and that forced child labor is strictly prohibited.²

2.2. Environmentally Friendly Products

Environmentally friendly buying behavior is related to multifaceted activities such as the prevention of environmental degradation, the minimization of pollution, the appropriate use of nonrenewable resources, the prevention of animal cruelty, and the protection of farmers' rights.³ Given this, we prefer to use the term *environmentally friendly* to refer to buying behavior in accord with these multifaceted benefits. The actions taken by consumers can be organized under two broad categories as *positive* (e.g. buying an environmentally friendly product) or *negative* (e.g. boycotting an environmentally unfriendly product). On the other hand, this type of behavior can also be categorized into two groups, as *consumption behavior* (e.g. buying an environmentally friendly product) and *non-consumption behavior* (e.g. recycling). This study is structured to analyze consumer behavior that is in the *positive* and *consumption* forms.

Wide-ranging research on the buying behavior for environmentally friendly products focuses on aspects such as the socio-economic determinants of green consumers⁴ and their willingness to pay premiums for environmentally friendly products [2, 17, 33]. In general, demographic variables are not found to be successful predictors of environmentally friendly behavior (e.g. [8]).⁵ Therefore, many scholars lean towards psychographic variables such as personality traits (e.g. [9]), life styles (e.g. [10]), and values (e.g. [11]) to explain environmentally friendly consumer behavior. This study will concentrate on values to predict the relative importance placed on the environmental attributes of a food product compared to other product characteristics.

2.3. Altruistic and Egoistic Value Orientations

In a general sense, values are principles that express an individual's self-concept [34]. They can be viewed as motivators for actions, since they are the basis of the formulation of personal attitudes, beliefs and behaviors, such as choosing and justifying actions, and evaluating people and objects [35]. Contrary to attitudes that are more content-and situation-specific, values are conceptualized as trans-situational guides, and as such they are considered better predictors of behavior [36]. Rokeach [37] stated that once a value is learned, it becomes a part of a value system that guides behavior. According to Solomon and his colleagues [12], consumption activities are connected to a set of personal values; people choose products to achieve their value-oriented goals. Hoyer and MacInnis [38] argued that values are one of the important factors that should be considered when investigating factors affecting buying decisions. More specifically, personal values are found to be an important element that influences environmentally

² These selected attributes are the most extensively used environmental attributes in actual products.

³ Many different terms (e.g. *ecological*, *environmental*, *environmentally-friendly*, *environmentally responsible*, *ethical*) are used in the literature and media to refer to roughly the same concept.

⁴ A green consumer is someone who is very concerned about environmental issues and only buys products that are environmentally friendly.

⁵ Several studies have found females with children to be significantly different than others in terms of environmentally friendly food buying behavior (Loureiro, McCluskey & Mittelhammer [33]).

friendly food choice [29, 39]. Similarly, Dickson [34] discussed the relevance of values in ethical consumption behavior.

Some value orientations vary significantly from individual to individual. Many studies on environmentally friendly consumer behavior have used value orientation differences among individuals as an explanation of variations in proenvironmental behavior (e.g. [40-43]). Fritzsche [44] suggested that the values of people who behave ethically differ significantly from the values of people who do not. Littrell and Dickson [45] found that the buyers of fair-trade products place more importance on altruism, equality, peace, and a beautiful and environmentally secure world, and less importance on inner-directed values such as self-respect and inner harmony.

Earlier studies have used different groups of values. For instance, Honkanen et al. [11] explored the impact of ethical, political and religious values on organic food buying behavior. Oreg and Katz-Gerro [46] examined postmaterialist and harmony value dimensions to predict proenvironmental behavior. Baker et al. [29] investigated values concerned with health, wellbeing and the enjoyment of life to explain organic food choice. One broad categorization applied to this line of inquiry as a predictor of environmentally friendly food consumption behavior is the dichotomy of altruism versus egoism (e.g. [9]).⁶ *Altruism* refers to one's motivation to increase the welfare of someone else [14], while *egoism* refers to one's motivation to increase personal welfare [15]. Several papers touch upon this conceptual distinction in order to explain the reasons for buying environmentally friendly products. For instance, some argue that people engage in environmentally friendly behaviors primarily because they care about others' well-being (e.g. [14, 47, 48]). Others assert that environmentally friendly consumption behavior is primarily driven to increase personal welfare (e.g. [3, 49]).

In our context, we considered this dichotomy (altruism versus egoism) to consist of two opposite value orientations. Moreover, we examined how individuals differ by analyzing their relatively higher levels of either altruism or egoism. We believe that altruistic values lead individuals to increase the welfare of the natural environment, animals and people, whereas, egoistic values lead individuals to increase personal welfare by affecting their preferences. Given this distinction, in this study we sought an interrelation between values and the attributes sought for in a food product. In other words, we examined how the relative importance placed on environmental attributes and other product characteristics varies, based on whether an individual has higher levels of altruistic or egoistic values. More specifically, we assumed that a strong concern for the welfare of others leads to a higher level of importance placed on the environmental attributes of a product. Similarly, we expected that higher egoistic values, namely, a strong concern for enhancing personal interest, will increase the importance placed on functional attributes.

H₁: Individuals who have higher levels of altruistic values place more importance on environmental attributes, compared to individuals who have higher levels of egoistic values.

H₂: Individuals who have higher levels of egoistic values place more importance on functional attributes, compared to individuals who have higher levels of altruistic values.

H₃: There are differences among environmental attributes in terms of the relative importance placed on them in consumer product choice.

⁶ Although most of the papers refer roughly to the same meaning, different names are used to specify this dichotomy in the literature. For example, Bougherera and Combris (2009) [2] used *selfish* and *altruistic*. McEachern and McClean (2002) [3] used *self-interest-centered* and *altruistic*.

It is hard to show a conjoint model graphically, due to the many factors affecting choice, but a graphic representation of our model is shown in Figure 1. The arrows represent relationships.

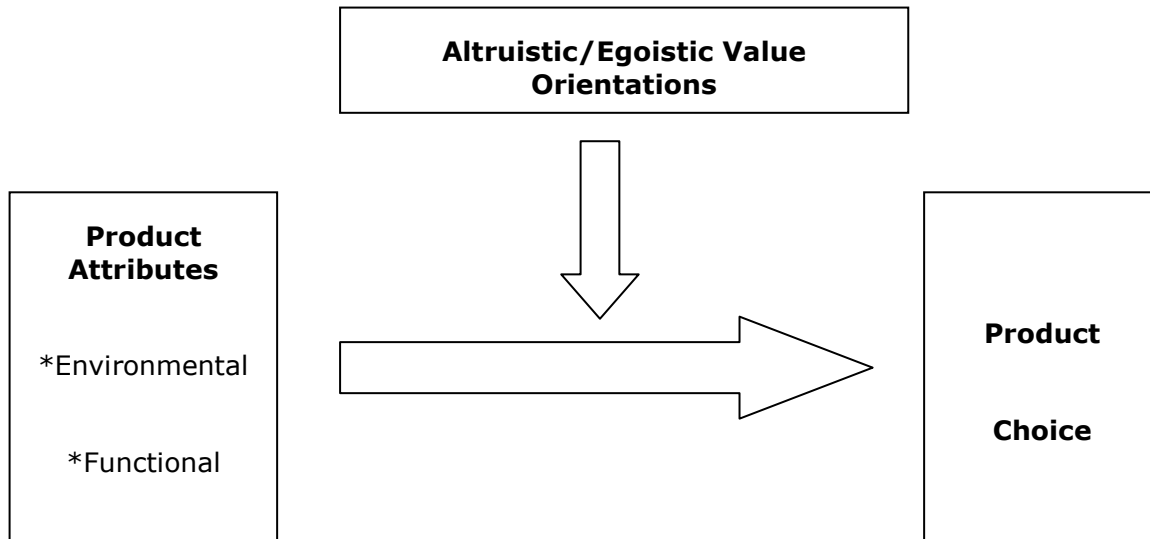


Figure 1 The Graphical Representation of the Model

3. Methodology

We used the survey method as the instrument for collecting data because it enabled us to easily access many respondents in a short period of time and to collect data that would be otherwise difficult to observe. Surveys are a popular method of data collection, although they can be open to social desirability bias. However, a careful design of survey questions may help to reduce the bias created by the survey method [50].

3.1. Pilot Study

A pilot study was conducted for two reasons. First, we wanted to validate the attributes that are actually important to consumers in their environmentally friendly food buying decisions. Second, we wanted to establish which value items relate to egoism or altruism in consumers' minds. A sample of 35 respondents completed an online survey. For the first question, they were asked, "Which of these product characteristics come to your mind when you think of buying an environmentally friendly food product?" Answers were scored on a seven-point Likert scale (on which 1 = Never and 7 = Always). We determined the relevant attributes by choosing the items that had an average score of three or greater. For the second question, 46 value items were presented for evaluation. The value items were adapted from the Rokeach Value Inventory and a study by Stern, Dietz and Guagnano [51]. Respondents were asked, "In your judgment, please identify the following items on a scale basis whether it relates to altruism or egoism?" Here, we used a seven-point Likert scale, as follows: 1= certainly egoism, 2 and 3 were unlabeled, 4 = neither egoism nor altruism, 5 and 6 were unlabelled, and 7= certainly altruism. For this question, we considered the items that had an average value greater than or equal to five as associated with altruism, and less than or equal to 3.5 as associated with egoism.⁷ Finally, 11 items were selected as measures of altruistic values, and 8 items

⁷ We thought answers related to egoism might be influenced by social desirability bias. Therefore, we selected items that had an average score less than or equal to 3.5 instead of 3.

were selected as measures of egoistic values (see Table 1). We discuss the reliability of these scales in the main study section of this paper.

Table 1 List of Value Items

Altruism	Egoism
Equality	A Comfortable Life
Forgiveness	Ambition
Helpful	An Exciting Life
Loyalty	Authority
Obedience	Choosing Own Goals
Politeness	Curiosity
Preventing Pollution	Independence
Protecting the Environment	Wealth
Respecting the Earth	
Responsibility	
True Friendship	

3.2. Main Study

For the main study, a choice-based conjoint analysis was conducted to compare consumer preferences regarding the environmental, functional and price attributes of food products. Conjoint analysis is one of the most popular methods for analyzing consumer preferences [52, 53]. The underlying idea of conjoint analysis is to simulate the trade-offs that consumers face in real-life buying situations. By modeling consumer decisions, it reasonably predicts consumer behavior.

In this method, the consumer's overall perception of utility⁸ is separated into a combination of part-worth utilities provided by various product attributes and their levels. In *choice-based* conjoint analysis, respondents express their preferences by choosing the best product profile among two or more alternatives, which vary in regard to various attribute compositions. This type of conjoint analysis more closely resembles real-life situations where consumers need to choose among alternatives. In such an analysis, the selection of attributes and their levels are highly important. First of all, they should reflect the characteristics of actual products in the marketplace. Second, they should be products that consumers really consider in their buying decisions. Because of that, we conducted a pilot study beforehand to determine the attributes that were to be used in the main study. In addition, it was important for the number of attributes and their levels to be at the optimum level. That way, one could still assess a variety of features without having to make too complex a decision.

⁸ Utility is the level of satisfaction consumers receive from products with specific attributes.

We chose six attributes for this study, with two levels for each. These were chosen from two groups, environmental and functional attributes, to compare the effects of each on product evaluations. The environmental attributes chosen were organic, fair trade and certified vegan. These are, in fact, specific labels that correspond to relevant attributes. The functional attributes were nutritional value and taste. In order to reduce possible misconceptions regarding the meanings of environmental attributes, we defined them briefly in the questions. *Organic* was defined for the respondents as “products that have low or zero use of chemically synthesized inputs.” *Fair trade* was defined as “products that assure farmers and workers are justly compensated and enjoy safe working conditions, and forced child labor is strictly prohibited.” *Certified vegan* was defined as “products that do not contain animal products and that have not been tested on animals.” These three environmental attributes reflect a variety of issues that may be of concern to environmentally concerned consumers. It is good to note that these three attributes/terms actually appear on labels that are extensively used in the marketplace. By using actual labeling terms, we expected the choice tasks would be more realistic for the respondents. All of the environmental attributes included two binary choices, indicating whether or not the product addressed the particular environmental issue (organic/not organic, fair trade/not fair trade, certified vegan/not certified vegan). Functional attributes (taste and nutritional value) also included two alternatives: low/high in taste and low/high in nutritional value). We also included price as an attribute, and two levels were chosen for this study (\$1.50, \$2) to enable respondents to experience the choice task as a real-life buying decision (see Table 2).

Table 2 Attributes and Their Levels

<u>Attributes:</u>	<u>Levels:</u>
Organic	Organic/Not Organic
Fair Trade	Fair Trade/Not “Fair Trade”
Certified Vegan	Certified Vegan/Not “Certified Vegan”
Taste	Low/High
Nutritional Value	Low/High
Price	\$1.5/\$2

We wanted to be as specific as possible in choosing the product for the study in order to make choice tasks easier for the respondents. The choices were based on two criteria. First, the product had to be available on the market in all the product forms, so that it could carry all three environmental attributes. Second, it had to be known to respondents, to minimize the novelty bias in choice evaluations. Therefore, we chose iced tea in a 16-ounce can.

Based on the chosen attributes and their levels, we created a sample design table, which we used to assign *priors* to the levels of attributes via the Choice Design platform of JMP statistical software. Employing the prior information, JMP created the final design table for the survey, maintaining the coincidence of uncorrelated levels of different attributes appearing together. This design assured that an estimate of the importance of one attribute would be unaffected by estimates of other attributes.

The survey instrument was presented to participants in the form of a five-page online survey. On the first page, respondents were notified of their rights and responsibilities. The second page of the instrument included twelve questions related to the conjoint analysis, each corresponding to a choice set. A total of twelve conjoint choice sets were presented to each respondent, using a random sampling of choice tasks. Each of the twelve choice sets included three product alternatives, with different combinations of

attribute levels (see the appendix for an example of a choice task). For each choice task, respondents were asked to select the best product alternative they would like to purchase. The third page of the instrument included value items for defining the respondents' altruistic and egoistic value orientations. Respondents were asked to answer the question, "How important are the following words to you, as guiding principles in your life?" using a seven-point Likert scale, where 1 indicated "not at all important" and 7 indicated "extremely important." On the fourth page of the instrument, respondents were asked to answer eleven demographic questions relating to gender, age, education, household income, number of children, place of residence, past experience with buying environmentally friendly products and level of vegetarianism. The final page of the survey included items to measure three concepts that were considered to be control variables for the study: environmental concern, perceived consumer effectiveness, and perceived environmental effectiveness. Three statements were presented for each concept. Respondents were asked to indicate their level of agreement with a set of statements for each concept, using a seven-point Likert scale on which 1 indicated "strongly disagree" and 7 indicated "strongly agree."

In a methodological sense, the determinants of food product choice were modeled by three groups of attributes, altruism/egoism value orientations and socio-demographic factors. Therefore, the dependent variable was a discrete variable that represented the choice made by the consumer. Consumers were presumed to make choices based on utility, which was an unobservable latent variable.

4. Results

The online survey had 158 respondents. Data were collected from a convenience sample of consumers based on a self-completion questionnaire. Overall, 146 complete and usable questionnaires were obtained.

4.1. Respondent Demographics

The respondents who completed the survey were more likely to be female (63%), better educated (93% with some college and over) and younger (94% with age below 35) (see Table 3). The vast majority of the sample of respondents (85%) reported buying some type of environmentally friendly product in the past month (18% one, 25% two, 7% three and 35% four or more). Finally, 99% of the respondents were non-vegans, which mirrored the population statistics.⁹

⁹ A 2009 survey for the Vegetarian Resource Group, a non-profit group, reported that one percent of Americans identified as vegan [54].

Table 3 Respondent profiles in terms of background variables (n =146)

Variable	Frequency (%)
Gender	
Female	63
Male	37
Age (years)	
18-24	55
25-34	39
35 and over	6
Marital Status	
Single	74
Married	25
Divorced	1
Education	
High School	7
Some College	47
College Graduate	18
Post Graduate	28
Household Income	
Under \$25,000	47
\$25,001-\$49,999	23
\$50,000-74,999	9
\$75,000-\$99,999	10
\$100,000-\$149,999	8
\$150,000 and over	3
# of Children	
None	67
One	14
Two	12
Three	3.5
Four or more	3.5
Residence	
Urban	59
Suburban	36
Rural	5
# of Environmentally Friendly Products Purchased over the Past Month	
None	15
One	18
Two	25
Three	7
Four or more	35
Veganism	
Non-Vegans	99
Vegans	1

4.2. Reliability

Cronbach's coefficient alpha [55] was computed to determine the internal consistencies of the altruistic and egoistic value scales. The Cronbach's alpha coefficient produced by the altruism scale was 0.89 and by the egoism scale 0.82. Therefore, all of the items were considered to measure the desired underlying concepts, and the scales were reliable.

4.3. Main Results

4.3.1. Model 1: The Relative Effects of Attributes on Choice

In the first model, we wanted to analyze the attribute effects on choice for the entire sample without making any differentiations regarding subject characteristics. If we look at the results, we see that every attribute that we included in the model (organic, fair trade, certified vegan, taste, nutritional value and price) appeared to be significant.¹⁰ The results confirmed our selection of attributes by showing that all of the selected attributes significantly affect choice (see Figure 2). Nutritional value attribute had the highest relative importance for the total sample, contributing to 27% of overall utility, and taste came second, with a relative importance of 26% on average. The fair trade and organic attributes placed third and fourth, respectively, with an almost negligible difference in importance, contributing to 18% of overall utility. The certified vegan attribute followed, judged as the fifth-most important factor, with a relative importance of 6%. Finally, price had a minor impact, with a relatively lesser importance of 5%. However, one has to exercise caution when considering the impact of the price attribute. First, the product that we used in the study (iced tea) is low-priced, and second, the price differences between forms of the product (50 cents) were small. We think that this could explain why price appeared to be relatively less important.

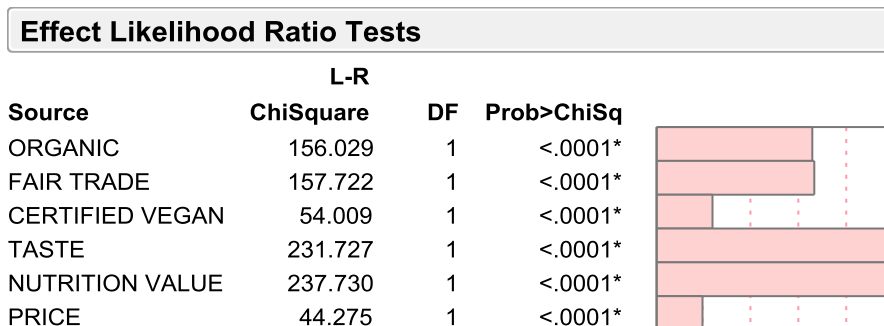


Figure 2 The Relative Attribute Importance For The Entire Population

On the other hand, the association between attribute levels appeared as expected (see Figures 3 and 4). For example, being organic as opposed to non-organic had a positive effect on the choice decision. This was exactly same for the other environmental attributes. Similarly, higher nutritional value and better taste had a positive effect on the choice decision compared to their low alternatives. Finally, as expected, low-price was preferred to high-price. These results support the reliability of this study.

¹⁰ All of the main effects were statistically significant, yielding χ^2 with probabilities less than 0.01.

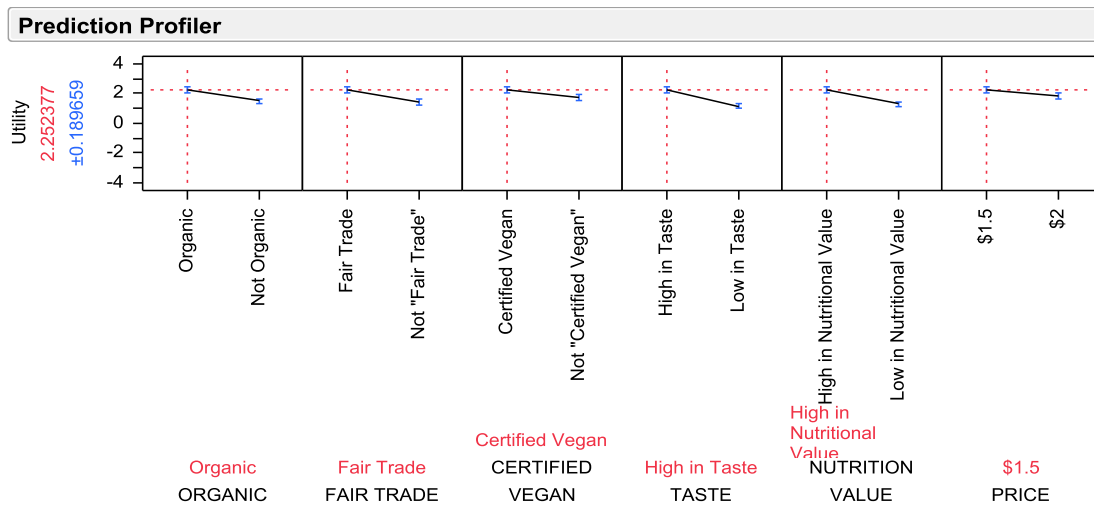


Figure 3 The Relationship Between Attribute Levels for The Entire Population

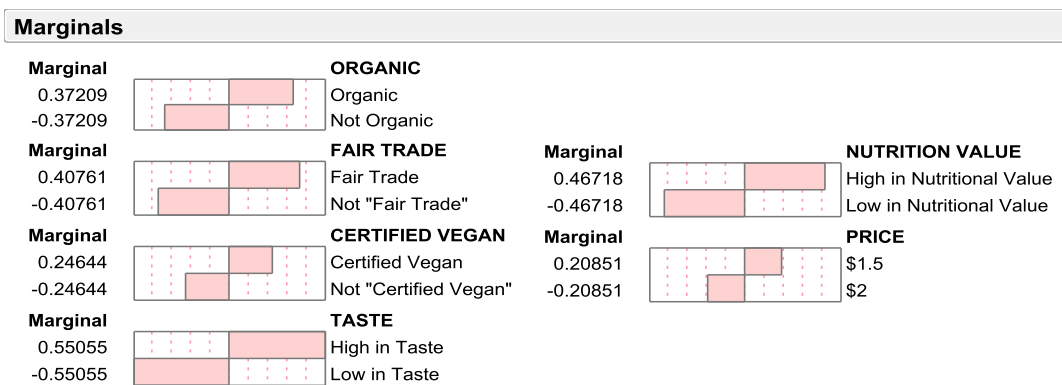


Figure 4 The Relationship Between Attributes and Levels for The Entire Population

The resulting parameter estimates are referred to as part-worths. Each part-worth is the coefficient of utility associated with a particular attribute. These estimates are based upon the Firth bias-corrected maximum likelihood estimators. Therefore, they are considered to be more accurate than MLEs without bias correction. Based on these definitions, being organic compared to non-organic, on average, increased the utility by .37 units. Being fair trade as opposed to non fair-trade increased the utility by .41 units, whereas being certified vegan compared to non-certified vegan increased the utility by .25 units. On average, high taste compared to low taste increased the utility by .55 units, and high nutritional value compared to low nutritional value increased the utility by .21 units (see Table 4).

Table 4 The Comparison of Model 1 and Model 2

Source	Model 1 (AIC=3105.6935)		Model 2 (AIC=3006.9714)	
	Estimates	Prob>ChiSq	Estimates	Prob>ChiSq
ORGANIC[Organic]	0.37208597	<.0001***	-0.3696447	0.3274
FAIR TRADE[Fair Trade]	0.40760927	<.0001***	0.74249094	0.0709*
CERTIFIED VEGAN[Certified Vegan]	0.24644072	<.0001***	-3.3221316	<.0001***
TASTE[High in Taste]	0.55055103	<.0001***	2.30917155	<.0001***
NUTRITION VALUE[High in Nutritional Value]	0.46717922	<.0001***	0.50803926	0.1944
PRICE[\$1.5]	0.20851073	<.0001***	0.21509603	0.5754
Altruism/Egoism*ORGANIC			0.00906446	0.0446**
Altruism/Egoism*FAIR TRADE			-0.0037634	0.4457
Altruism/Egoism*CERTIFIED VEGAN			0.04286463	<.0001***
Altruism/Egoism*TASTE			-0.0209525	0.0002***
Altruism/Egoism*NUTRITION VALUE			-0.0003013	0.949
Altruism/Egoism*PRICE			-0.0000173	0.997

This first model allowed us to confirm that there are differences between environmental and functional attributes, in that functional attributes were given relatively more importance by the entire sample. As we hypothesized, there were also differences in the relative importance of environmental attributes among each other. As the results show, the organic and fair trade attributes had quite a higher impact on product choice than certified vegan. This suggests that all of the attributes within the environmental category did not create the same impact on choice, which confirms our third hypothesis.

Overall, examining the relative importance of attributes showed how on average respondents valued the different product attributes. In the following section, we will go beyond a focus on the average importance of each attribute and identify how the effects of these attributes on choice varied according to the values represented by the altruism/egoism scale.

4.3.2. Model 2: The Moderating Effect of Value Orientations

In the second stage, we wanted to analyze how the value orientation variables moderated the effects of the attributes on choice. Therefore, we included the altruism/egoism scale as an interaction term in the model. As the results demonstrate, the variables of altruism and egoism significantly affect product choice. The effect appeared as more important than price and somewhat less important than other attributes (see Figure 5). For the purpose of this study, we analyzed whether this variable moderated the relationship between product attributes and choice. Therefore, we were more interested in the interaction terms than the main effects.

When we look at the main effects, we see that some of the attributes (organic, nutritional value and price) became insignificant because they have a different meaning when we included the interaction terms (see Table 4). After an interaction term was added to the model, the main effect coefficients predicted the effects of attributes - when the

altruism/egoism scale equals zero. Since no such people exist in this study (the scale rates values from 60 to 100), this isn't particularly interesting. Therefore, a change in the significance of some of the attributes reflects nothing but the fact that these coefficients have different meanings in the two models. On the other hand, the main effects of certified vegan and taste remained significant, since each had a *p-value* less than 0.01.

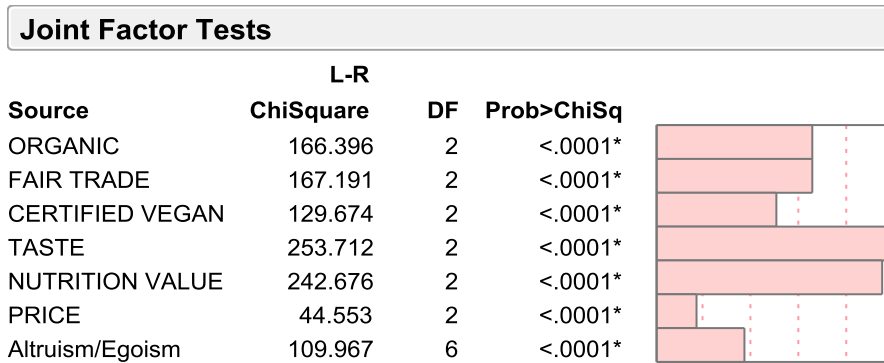


Figure 5 The Relative Attribute Importance After Altruism Egoism Scale Added

The results also show that the interaction between the value orientation variable and certified vegan, taste and organic are significant (with a *p-value* less than 0.01 for the two former and 0.045 for the latter). One should carefully interpret the main effect coefficients after adding the interaction term, because they alone may not be meaningful. Therefore, the coefficients corresponding to the main and interaction effects should be interpreted together, and while doing that, it is important to know the range of values that the value orientation variable represents. This variable is a continuous variable, ranging in value from 60 to 100, with a mean of 83 based on consumers' responses.¹¹ That is, it is a continuum with egoism on the low end (at 60) and altruism on the high end (at 100); consequently, the higher the value, the more altruistic is the orientation of an individual.

In order to gauge the total effect of the certified vegan attribute, we need to combine the main and the interaction effects.¹² If we move through the continuum from the lower values to higher, which means from egoistic value orientations to altruistic value orientations, having the certified vegan attribute (compared to not having that attribute) increases utility. In other words, certified vegan gains in importance as one moves up the scale toward higher altruistic value orientations. Similarly, the organic attribute is given more importance by individuals with higher altruistic value orientations than individuals with higher egoistic value orientations, because the combined coefficient becomes greater for higher values on the value orientation variable.¹³ For the taste attribute, if we move from egoism to altruism on the scale, the relative effect of taste on choice decreases.¹⁴

¹¹ The value orientation variable could take values from 19 to 133 for each individual.

¹² The total effect of certified vegan attribute = (-3.32 + A/E 0.043).

When A/E=60, the coefficient becomes (-.75); when A/E=100, it becomes (.96).

¹³ The total effect of organic attribute = (-0.37 + A/E 0.009).

When A/E=60, the coefficient becomes (.17); when A/E=100, it becomes (.54).

¹⁴ The total effect of taste attribute = (2.31 + A/E (-0.021)).

When A/E=60, the coefficient becomes (1.05); when A/E=100, it becomes (.21).

As the numbers show, all of the significant results confirmed our hypotheses, which suggest that individuals with a higher altruistic value orientation place relatively more importance on environmental attributes than on functional attributes, and individuals with a higher egoistic value orientation place relatively more importance on functional attributes than on environmental attributes. If we ignore the significance of the coefficients, we can say that all of the results (except those for fair trade) are as we hypothesized. That is, for the environmental category, the effects of the attributes increase as we move toward the higher values on the value orientation variable, whereas the effects of functional attributes decrease. Since the interaction effect is not significant for fair trade, nutritional value and price, we can say that these results partially confirm our first two hypotheses. The insignificance of the interaction effects demonstrates that the value orientation variable does not make a difference with regard to these attributes. In other words, the importance placed on these attributes (fair trade, nutritional value, and price) does not vary based on whether someone has a higher altruistic or egoistic value orientation.

Overall, the value orientation variable significantly moderates the relationships between half of the attributes and choice. Moreover, if we compare the corrected Akaike's Information Criterion (AIC)¹⁵ of the two models, we see that the second model explains choice better, as it has a lower AIC score (see Table 4), confirming that the value orientation variable is an important predictor of choice.

5. Discussion and Implication

There seems to be considerable demand for food products that not only satisfy traditional consumers' expectations (e.g. better taste and high nutritional value) but also benefit the natural environment. Marketers can be better off if they realize that the criteria used by consumers to evaluate the food products have changed. Consumers now consider environmental consequences along with functional characteristics in their product evaluations [30]. First of all, it is important to know which product attributes consumers consider in their buying choices. However, just knowing the attributes of a particular product that consumers desire may not be sufficient for marketers to develop an efficient marketing strategy. Consumers want the best combinations, such as a product that addresses environmental issues, tastes good, and has high nutritional value and a low price. What is more important to know is that preference trade-offs with regard to these attributes become crucial to incorporating product features that represent optimal trade-offs from the perspective of the consumer.

The data gathered for this study were used to determine which of the six attributes (organic, fair trade, certified vegan, taste, nutritional value and price) of the target product, iced tea, were most important. In particular, we compared not only environmental (organic, fair trade, certified vegan) and functional attributes (taste, nutritional value), but also within-environmental attributes in terms of their effects on product choice. In other words, we analyzed how the effects of the environmental attributes on choice differed from each other and from the functional attributes. Therefore, in this study, the type of the environmental concern (not just the presence or absence of one environmental attribute) was also incorporated as a product attribute. We believed that this would provide more insight into the importance placed on attributes for different types of environmental issues in terms of what or whom they benefit (the environment, people or animals).

¹⁵ AICc = $-2\log\text{likelihood} + 2k [2k (k + 1)/(n - k - 1)]$, where k is the number of estimated parameters, including intercept and error terms in the model, and n is the number of observations in the data set.

As results show, all of the six attributes significantly affected the choice decision. Nutritional value appears to be the prime criterion on which consumer choices of products are based. Taste is a close second. These are followed by organic and fair trade attributes, which differ negligibly from each other. Certified vegan and price are superseded by other criteria; certified vegan came fifth, and price was given less importance by consumers. Much beneficial information can be gained from these results. First, the results show the relative importance placed on these attributes by the average consumer. Second, they demonstrate that the effect of an environmental attribute depends on what or whom it concerns. This study suggests that products that concern the natural environment and the working conditions of farmers and child labor are on average more important for consumers than animal well-being. Therefore, analyzing proenvironmental behavior as a whole can produce misleading conclusions. Attributes should be examined separately by marketers, as their levels of importance differ.

Although the result regarding the price attribute seems to be surprising, if considered carefully, it is not too surprising. The product used in this study was a low-priced item, so price differences between the different labelings of the product were very small (50 cents). We think that this is why price was a less important criterion than expected. As the focus of this study was on a comparison of environmental and functional attributes, we will not elaborate on the details of the price attribute.

One important implication of this study is that it provides marketers with information about the relative importance of product attributes. Marketers can use this information to develop optimum products and satisfy consumers' preferences better. For example, they can obtain information on how changing the price, or other attributes, of a food product affects its desirability or utility, as perceived by potential buyers. Therefore, these results can be used for pricing products with different attributes.

We believe that all consumers are not the same in terms of the importance they place on the environmental and functional attributes of food products. A careful analysis of socio-demographic and psychometric variables is needed for efficient segmentation and targeting. Because socio-demographic factors are not sufficient to explain this kind of consumer behavior [5], our study focuses on value orientations (altruistic and egoistic) to segment consumers. As values are desired end states, the buying behavior of consumers in regard to food products can be considered a means to achieve these values. It is an obvious advantage for marketers if personal values can be activated and related to the attributes consumers find important in a food product. Therefore, we assessed whether the importance placed on attributes by consumers vary based on their value orientations. As the results of this study show, when buying food products, individuals with higher altruistic value orientation place more importance on environmental attributes, namely organic and certified vegan, whereas those with higher egoistic value orientation place more importance on taste, which is a functional attribute. Therefore, a product that addresses the natural environment and animal well-being can be more successful in the market, if consumers with strong altruistic value orientations are targeted. Similarly, a product that features good taste can be highly advantaged if consumers with strong egoistic value orientations are targeted. Advertisers can also benefit from these results by designing ads that appeal to these values and emphasize related attributes. For example, certified vegan products, which are not tested on animals, could be portrayed as beneficial to the welfare of "others," which is a desired end state for those holding higher altruistic value orientation.

Another implication of this study is that the findings can be used to promote new products, since values can influence consumers' reactions' to new products. The more consistent the attributes of a new product are with dominant consumer values, the greater the likelihood of its success. Examining the target segment's value profile can help marketers develop more appealing promotional campaigns. The more compatible a

product is with consumers' values, the more likely consumers are to become involved in the message and find it relevant. Clearly, marketers should connect product attributes and benefits to consumer values. Because values represent the end state consumers desire to achieve, they are the driving force behind the consumption of products.

Overall, the current findings hold important implications for marketing managers. Organizations can use these findings to maximize the effectiveness of their marketing strategies. The results suggest that marketers should identify individuals based on value domains, namely, the dichotomy of altruism and egoism, for targeting purposes. Messages for each group of individuals should focus on the superiority of relevant features of the food product.

6. Limitations and Future Research

This work also opens the potential for many avenues of fruitful future research. One limitation is the method we used to analyze the effect of the taste attribute on product choice – through asking questions. Consumer preferences can be confounded without having them actually taste the product, so future research could involve a laboratory experiment where consumers actually taste the product.

Another limitation of the current research is that this study did not involve the actual purchasing of products. Instead, it focused on choice decisions. Future studies could be conducted in an actual marketplace to examine buying behavior in a context of real product choice decisions. Furthermore, this study could be expanded by analyzing the data generated by retail scanners, so that actual consumer purchase data can be employed. Nevertheless, it is reasonable to believe that our findings are likely to correspond to actual behavior, since we presented a choice situation to consumers in a close-to-reality setting. By this method, actual product choice decisions were measured by including simultaneously relevant product attributes and simulating real-life trade-offs, instead of simply measuring attitudes towards behavior.

Another avenue for future research is to investigate how a different product might produce different results. We used iced tea in this study because it could carry all the environmental attributes that we wanted to analyze, and it is a convenience good. However, it would be interesting to determine if the relative importance placed on various attributes, or the impact of altruistic and egoistic value orientations on product choice, differs with the type of product – for instance, a higher-priced one – and if so, why.

7. Conclusion

The research reported in this paper contributes to knowledge, first by simultaneously modeling six product attributes as predictors of product choice, and second, by studying the dichotomy of altruistic and egoistic value orientations in the context of product choice decisions. The findings reported in this study are important in furthering our understanding of the role of product attributes and values in the purchasing of food products. Therefore, marketers can use values to understand the product attributes that consumers in a particular segment may find important and that may motivate them to choose one product over another.

Kaynakça

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Appendix

Sample conjoint question from the survey

In this section, there are 12 questions. In each question, you will be asked to choose one out of three iced tea products. These iced tea products vary in terms of 6 product features. These are: 1.Organic vs Not 2. Fair Trade vs Not 3. Certified Vegan vs Not 4. High in Nutrition Value vs Low 5. High in Taste vs Low 6. Price (\$1.5 vs \$2)

Organic: Products that have low or zero use of chemically synthesized inputs.

Fair Trade: Products that assure farmers and workers are justly compensated and enjoy safe working conditions, and forced child labor is strictly prohibited.

Certified Vegan: Products that do not contain animal products and that have not been tested on animals.

Think of your choice as though you were actually considering buying a 16 oz can iced tea, which one would you like to buy? Please treat this task as realistically as possible – just as you would if you were really considering buying iced tea.

Please consider each product combination carefully. Which one would you like to buy?

Organic: Products that have low or zero use of chemically synthesized inputs.

Fair Trade: Products that assure farmers and workers are justly compensated and enjoy safe working conditions, and forced child labor is strictly prohibited.

Certified Vegan: Products that do not contain animal products and that have not been tested on animals

	Organic	Organic	Organic
	Not "Fair Trade"	Fair Trade	Fair Trade
	Not "Certified Vegan"	Certified Vegan	Certified Vegan
	High in Taste	Low in Taste	Low in Taste
	Low in Nutritional Value	Low in Nutritional Value	Low in Nutritional Value
	\$1.50	\$1.50	\$2
Please mark one of them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>