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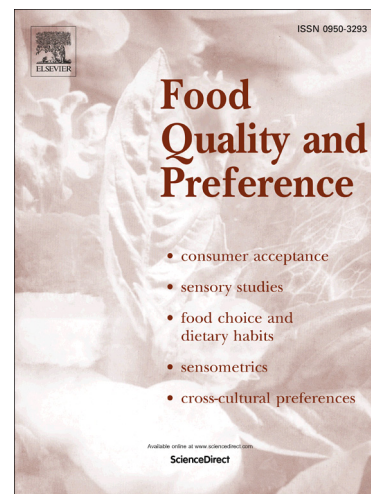
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# The Role of Organic and Fair Trade Labels when Choosing Chocolate<sup>1</sup>

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## Abstract

A number of assumptions need to be met in order to reach the maximal potential of labels as an environmental and social policy instrument. Firstly, consumers need to identify and recognize the labels. Secondly, they need to find the product information derived from a label reliable and trustworthy. Thirdly, sustainably produced goods should be more desirable than other goods. Fourthly, consumers need to have a positive marginal willingness to pay for sustainably produced goods. To test the applicability of these conditions in practice, we performed a survey including a stated choice experiment of consumer decisions concerning the purchase of chocolate in Flanders (Belgium), focusing on fair-trade and organic labels. Overall, we find that the conditions are much better fulfilled for fair-trade labels than for organic labels in the market of chocolate in Flanders. For a majority of consumers the organic label seems to become superfluous when selecting a self-indulgent treat such as chocolate.

**Keywords:** Labeling, chocolate, fair-trade, organic food, stated choice experiment

**JEL codes:** D12 Consumer Economics: Empirical Analysis; Q18 Agricultural Policy; Food Policy; Q5 Environmental Economics

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## The Role of Organic and Fair Trade Labels when Choosing Chocolate

### Abstract

We investigate to what extent consumers base food purchases on the information implied by the presence of a label. Firstly, we study whether consumers are able to identify the environmental and social labels associated with a particular good or service. Secondly, we analyze if consumers find the product information implied by the presence of a label trustworthy. Thirdly, we examine the desirability, including taste, of sustainably produced goods compared to conventional goods. Fourthly we calculate consumers' marginal willingness to pay for environment-friendly and socially desirable goods, and finally, we identify groups of consumers with different preference patterns. Specifically, we performed a survey including a stated choice experiment of consumer decisions concerning the purchase of chocolate in Flanders (Belgium), focusing on fair trade and organic labels. Overall, we find that fair trade labels for chocolate are more likely to influence consumer choice than organic labels in Flanders. For most of the consumers the organic label seems to become superfluous when selecting a self-indulgent treat such as chocolate.

**Keywords:** Labeling; chocolate; fair trade; organic food; stated choice experiment

**JEL codes:** D12 Consumer Economics: Empirical Analysis; Q18 Agricultural Policy; Food Policy; Q5 Environmental Economics

**Highlights**

- Potential of labels to influence consumer choice is limited
- Influence of fair trade labels is larger than that of organic labels
- Organic labels are largely ignored when choosing chocolate

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## I. Introduction

Consumers are increasingly interested in environmental and social criteria when buying food products and information found on packaging is often used by consumers to evaluate the sustainability of products (Bublitz et al., 2010). In order to better understand how consumers use the information found on product labels, we focus on the role of organic and fair trade labels in influencing sustainable food consumption. Five specific research questions lay at the basis of this study. Firstly, are consumers able to identify the environmental and social labels associated with a particular good or service? Moreover, do consumers find the product information implied by the presence of a label trustworthy? In addition, are sustainably produced goods perceived as more desirable than conventional goods, including taste perceptions? Fourthly, are some consumers willing to pay for environment-friendly and socially desirable goods? Finally, can we distinguish groups of consumers with different preference patterns?

In recent years a large volume of studies have investigated the impact of organic and/or fair trade labels on consumer behavior (e.g. Hughner et al., 2007; Aertsens et al., 2009; Young et al., 2010; Kollmuss and Agyman, 2012). Part of this literature has focused on describing the demographic characteristics of the organic (e.g. Hughner et al., 2007; Wier et al., 2008; Hjelmar, 2011) or ethical (e.g. Tallontire et al., 2001) food consumer. Another part has concentrated on consumers' motivations for purchasing organic (e.g. Honkanen et al., 2006; Hjelmar, 2011; Hsu and Chen, 2014) or fair trade (e.g. De Pelsmacker et al., 2005; Andorfer and Liebe, 2012) food products. Several arguments in favor of buying organic or fair trade food have been brought forward. On the one hand, health considerations are often quoted by consumers as an argument in favor of eating organic food (e.g. Schifferstein & Oude Ophuis, 1998; Brécard et al., 2008; Mondelaers et al., 2009; Lee et al., 2013; Goetzke et al. 2014). On the other hand, motivations such as better taste, reduced environmental impact or improved animal welfare were also documented (e.g. Padel and

Foster, 2005; Hughner et al., 2007). Yet another part of the literature has focused on consumers' willingness to pay a price premium for organic (e.g. Janssen and Hamm, 2012; Rousseau and Vranken, 2013) or fair trade (e.g. De Pelsmacker et al., 2005; Loureiro and Lotade, 2005) food products. Only a limited number of studies have focused on jointly estimating the willingness to pay for organic and fair trade. Yet, as argued by Zander and Hamm (2010), consumers are interested in additional ethical attributes of organic food such as animal welfare, integration of handicapped people or fair prices for farmers. Thus it is important to disentangle the separate impact of each of the two labeling programs to investigate which label influences consumer behavior most. Consumers' preferences for organic and fair trade food products have been studied specifically for yellow chili peppers (Garcia-Yi, 2015), pineapples (Poelman et al., 2008), coffee (Loureiro and Lotade, 2005; Tagbata and Sirieix, 2008) as well as chocolate (Tagbata and Sirieix, 2008), and in a more general setting for Italian consumers (Annunziata et al., 2011) and for consumers in Austria, Germany, Italy, Switzerland and UK (Zander and Hamm, 2010).

In this study we analyze the results from a stated choice experiment concerning the purchase of chocolate in Flanders (Belgium) to investigate the influence of labels – and their implied information – on consumption behavior. A stated choice experiment describes hypothetical varieties of a good in terms of its attributes and requires respondents to indicate their most preferred variety. We selected chocolate since it is a product that is well-known and frequently bought by consumers in Flanders, and the novelty bias when making choices in hypothetical markets should therefore be minimal (List & Shogren, 1999). In addition, chocolate is an interesting good to study the role of labels since it is often considered to be a luxury or a special treat. It is interesting to examine to what extent consumers still consider external effects such as labor conditions (revealed through the impact of a fair trade label) and environmental impacts (revealed through the impact of an organic label) when selecting such a self-indulgent treat. In

addition, health arguments in favor of organic consumption are less likely to hold when considering chocolate. Further, consumers cannot easily judge the environmental impact of chocolate and chocolate production. No easy proxies exist and some additional effort is needed to provide consumers information on the environmental impact of the product. The environmental and ethical impact of food products can thus be labeled as credence attributes (Darby and Karni, 1973).

To make these credence attributes searchable for consumers, several different labeling schemes such as organic labels or fair trade labels are available for chocolate and its main ingredient cocoa. In 2007, Barry Callebaut conducted a survey to investigate how large the consumer awareness for organic and/or fair trade chocolate is in both Europe and the US (Pay, 2009). The results of the survey show that consumer awareness is increasing: 33% of all consumers had already purchased fair trade chocolates, and 24% of the respondents had already purchased organic chocolate. These results show that: *“purchasers are no longer confined to the higher income groups, and the segment is making inroads into the mainstream chocolate market”* (Pay, 2009, p.6). Previously, consumers’ willingness to pay a price premium for organic and fair trade dark chocolate compared to unlabeled dark chocolate has been measured using an lab experiment combined with tasting by Tagbata and Sirieix (2008). This study found that consumers are willing to pay an almost identical price for organic chocolate as for fair trade chocolate (1.25 versus 1.31 euro), while consumers were willing to pay 0.7 euro for a standard chocolate bar.

In the next section we describe the choice experiments used to estimate the importance of different chocolate characteristics in consumers’ purchasing decisions. Next, in section 3, we discuss the dataset we collected. In section 4 we present the results and investigate the impact of labels on consumers choices and attitudes. These results are discussed in section 5 and some conclusions are formulated in section 6.

## II. Methodology

In this section we describe the design of the choice and taste experiments used to estimate the importance of different chocolate characteristics in consumers' purchasing decisions.

### 2.1 Choice experiments

A discrete choice experiment (DCE) is a quantitative technique used for eliciting individual preferences. It is a stated preference technique that is especially suited to deal with multidimensional choices such as food products. As Caswell (1998) and Yiridoe et al. (2005) note food products can be presented as a bundle of quality and safety attributes. Choice experiments allow us to explicitly reflect these different attributes and to analyze the impact of each attribute separately. This technique was initially developed by Louviere and Hensher (1982) and Louviere and Woodworth (1983). The DCE method describes a hypothetically marketed good in terms of their attributes and the levels that these attributes take (Hanley et al., 2001). While there is strong evidence in the literature of construct validity and convergent validity of stated preference results, the interpretation of these results has been questioned regarding the extent to which respondents may answer inconsistently when their choices do not have any real consequences (e.g. List and Gallet, 2001; Vossler et al., 2012). While such a hypothetical bias may be present, stated preference surveys are often the only practical approach to evaluate non-use values and preferences for non-market goods such as fair trade or soil quality improvements.

Respondents are presented with alternative varieties of a particular good, differentiated by their attributes and levels, and asked to select their most preferred variety. A baseline alternative, corresponding to the status quo or opt-out situation, is included in each choice set in order to be able to interpret the results in standard welfare economic terms. Typically, the method is used to



learn which attributes are most important for respondents' decisions and to predict respondents' willingness to pay (WTP) for marginal changes in attributes.

Attributes	Attribute levels ( <i>variable names</i> )
Taste (% cocoa)	White chocolate: less than 10% cocoa solids ( <i>reference</i> ) Milk chocolate: between 20 and 30% cocoa solids ( <i>tastemilk</i> ) Dark chocolate: more than 45% cocoa solids ( <i>tastedark</i> )
Fair trade label	Yes ( <i>withfairtrade</i> ) No ( <i>reference</i> )
Country of production	Belgium ( <i>belgium</i> ) Switzerland ( <i>swiss</i> ) The Netherlands ( <i>reference</i> )
Organic label	Yes ( <i>withorganic</i> ) No ( <i>reference</i> )
Price per tablet	1 euro 2 euro 3 euro 5 euro

**Table 1: Attributes and attribute levels**

Our un-labelled DCE offered three options per choice card: hypothetical chocolate variety A, hypothetical chocolate variety B and the opt-out option. Based on brainstorm sessions, pre-tests with students and previous literature (e.g. Tagbata and Sirieix, 2008), we selected the following attributes to describe a chocolate tablet of 100 grams: the taste of the chocolate, the presence of a fair trade label, the country of production, the presence of an organic label, and the price of the chocolate tablet. Taste was shown to be a critical factor in previous studies looking at preferences for labeled products (De Pelsmacker et al., 2005) as well as those studying preferences for chocolate products (Tagbata and Sirieix, 2008). For each attribute we then selected the relevant levels. For the country of production we selected two countries that are well-known for their chocolates, namely Belgium and Switzerland, and one country that is not typically associated with chocolates, namely The Netherlands (CAOBISCO, 2013). The price levels were determined by the range of actual retail prices from the largest supermarket in Flanders with an extensive range of

chocolate products ([www.collectandgo.be](http://www.collectandgo.be)<sup>2</sup>). The different attribute levels as well as the dummy, i.e. 0-1, variable names used later in the estimations are shown in Table 1. Using SPSS, we made an orthogonal design with 16 different chocolate varieties, which were randomly paired to construct 8 different choice sets. An example of such a choice set is presented in Table 2.

	<b>Chocolate tablet A</b>	<b>Chocolate tablet B</b>
Taste	Dark (>45% cocoa solids)	Milk (20-30% cocoa solids)
Fair trade label	With fair trade label	Without fair trade label
Country of production	The Netherlands	Belgium
Organic label	Without organic label	Without organic label
Price	2 euro/tablet	3 euro/tablet
<i>Which 100g tablet do you prefer?</i>		
<i><input type="radio"/> Tablet A.    <input type="radio"/> Tablet B.    <input type="radio"/> Neither of the two tablets.</i>		

**Table 2: Example of a choice card**

## 2.2 Taste experiment

The taste experiment was conducted with students only. The participants were asked to come to a class room where one of the tables contained six numbered plates with chocolate pieces. We presented three paired chocolate items: 2 white chocolate, 2 milk chocolate and 2 dark chocolate. For each pair, one piece of chocolate was conventional chocolate from a store brand and the other piece of chocolate was labeled fair trade and organic chocolate<sup>3</sup>. We did not mention this difference to the participants. The packaging and wrappings from the chocolate were carefully removed from the room and the brand could not be derived from the chocolate itself. Participants were allowed to talk to each other since no particular pressure towards liking or disliking chocolate was expected. Participants could start with any piece of chocolate and no specific order of tasting was imposed. Water and bread were available for the participants to cleanse the palate between tasting different pieces. The participants had to attribute a hedonic rating to each piece of

<sup>2</sup> The online prices are identical to the prices in the stores since online customers pay a fixed fee of 5.5 euro per order.

<sup>3</sup> The conventional and labeled chocolate needed to look similar and could not have the name of the producer visible on the chocolate itself in order to minimize the probability that respondents recognized the chocolate. This limited the available options. Moreover, we discovered that chocolate tablets with only one label are scarce and that most seem to have more than one label.

chocolate based on a linear scale from 1 ('I do not like the taste of this chocolate at all') to 10 ('I like the taste of this chocolate very much'). After tasting and rating the six chocolate pieces, the participants were asked to complete the online questionnaire (including the stated choice experiment) on one of the desktops available in the room.

### **2.3 Estimation method**

Data obtained from a choice experiment are often analyzed by conditional logit (CL) models. The CL model assumes a linear relationship between utility and attribute parameters, and requires the error term to be identically and independently distributed according to a Weibull distribution (Mariel et al., 2011). However, conditional logit models assume preference homogeneity across respondents. This implies that only one fixed vector of parameters is estimated for the choice attributes, and hence all respondents are assumed to have the same taste for the attributes (Hensher et al. 1999; Train, 2003). Conditional logit models can tackle heterogeneity by including socio-economic variables as interactions with attributes and alternative-specific constants, or by estimating different models for different subsets of data.

An alternative approach to allow for heterogeneous preferences is to estimate a latent class (LC) model (McFadden, 1986; Boxall & Adamowics, 2002). Latent class methods aim to distinguish consumer segments based on discrete observed measures such as reported attitudes. A LC model estimates consumers choices jointly with class membership based on the assumption that utility functions are different between classes, but identical within classes. Thus the LC model is a subset of the MXL model in which the mixing distribution consists of a finite set of distinct values (Boxall & Adamowics, 2002).

In our empirical analysis, besides estimating a standard conditional logit model, preference heterogeneity is tackled by estimating a latent class model.

## 2.4 Survey and questionnaire

In our study, respondents received a questionnaire with four parts. The first part dealt with socio-demographic questions such as nationality, age, gender, and current employment. The second part involved questions relating to the respondents' current purchasing and consumption behavior such as the responsibility for food purchases, the criteria used when buying chocolate and the frequency of chocolate consumption. The third part was the actual choice experiment which consisted of a series of choices between two chocolate varieties and the option not to buy any chocolate at all. The fourth part dealt with the knowledge and opinion of respondents concerning fair trade and organic labels as well as environmental attitudes. The questions were based on the survey used by Rousseau and Vranken (2013) and their validity was checked during pre-tests.

The survey was implemented online and respondents were invited by email to participate to the study. On November 15, 2012 some 130 students 'Environmental Economics' were asked to distribute the survey invitation to at least four other individuals with the Belgian nationality and who were at least 18 years old. A reminder was sent on November 22, 2012. In total we received 666 responses of which 601 were fully completed and 65 were partially completed.

### III. Description of the dataset

In this section we describe respondent characteristics and provide a general description of the chocolate purchasing behavior in the sample.

A description of the socio-economic characteristics of the respondents is given in Table 3. Clearly our sample is not representative for consumers in Flanders (Belgium) since some 60% were female and 70% were younger than 30. Unsurprisingly, a majority were university students. A minor fraction of respondents had a vegetarian lifestyle, while about 11% was member of nature protection organization such as WWF, *Natuurpunt* or Greenpeace. Finally, approximately half of

our sample eats chocolate several times a week, if not daily, in the form of bars, paste, pralines or chocolate sprinkles. Only some 15% of the respondents claimed to eat chocolate at most once per month. This illustrates that chocolate is indeed a commonly consumed and purchased food product in Flanders and that consumers should have a clear view of their preferences regarding chocolate.

Characteristic		Characteristic	
Percentage female	58.7%	Percentage member of nature protection organization	11.1%
Percentage students	60.7%	Frequency of eating chocolate (bar, paste, pralines...)	
Younger than 21	35.8%	- Every day	17.6%
Between 21 and 30	35.5%	- More than once per week, but not every day	35.0%
Between 31 and 40	5.1%	- Once per week	18.4%
Between 41 and 50	12.1%	- More than once per month, but not every week	15.9%
Between 51 and 60	7.8%	- Once per month	6.0%
Older than 60	3.7%	- More than once per year, but not every month	5.6%
Percentage vegetarians	3.0%	- Once per year	0.5%
		- Never	0.8%

Table 3: Respondents' characteristics

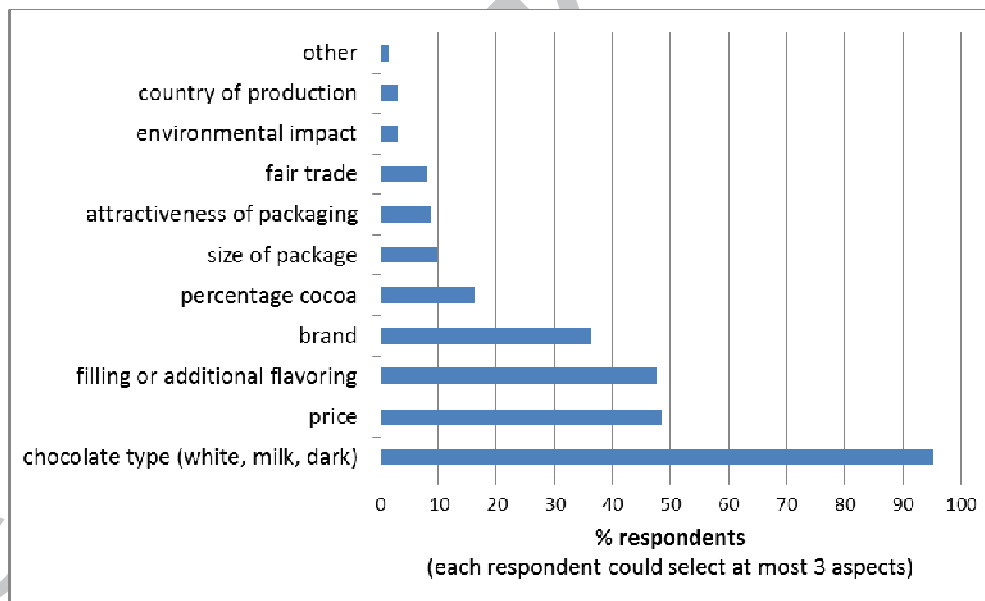


Figure 1: Aspects taken into account when buying chocolate

To gain more insight into the respondents' purchasing behavior and preferences, we asked them what aspects determine their choice when buying chocolate (Figure 1). Respondents could select at most three factors. Type of chocolate (white, milk, dark) is the single most important factor (95%), jointly second comes price (49%) and filling or flavoring (48%) and next comes the brand of

chocolate (36%). Clearly, chocolate consumption is all about taste since four of the five highest ranked aspects are related to sensory experiences. This is in line with existing literature such as Torres-Moreno et al. (2012). Besides taste, price also matters. However, aspects such as fair trade (8%) or environmental impact (3%) do not seem to be important when buying chocolate. Further, we learned that as a rule chocolate is bought in the supermarket. Still, some 57% of the respondents answered that they occasionally bought chocolate at a quality chocolate confectioner.

#### IV. Results

We now investigate the role of labels on consumer choice for chocolate in Flanders.

##### 4.1 Identification, reliability and desirability of labels

First we study whether consumers can identify and recognize labels and asked respondents to identify three commonly used labels: the EU organic label, the EU ecolabel and the fair trade label (Figure 2). From Figure 2, it is clear that respondents' knowledge varies greatly. The Fairtrade label is the best known label by far: some 60% of respondents were able to correctly identify this label. However, only 8% of respondents correctly recognized the EU ecolabel, even though this label was introduced some 20 years ago. The much more recent EU organic label, that was introduced in 2010, was correctly identified by 6% of respondents.

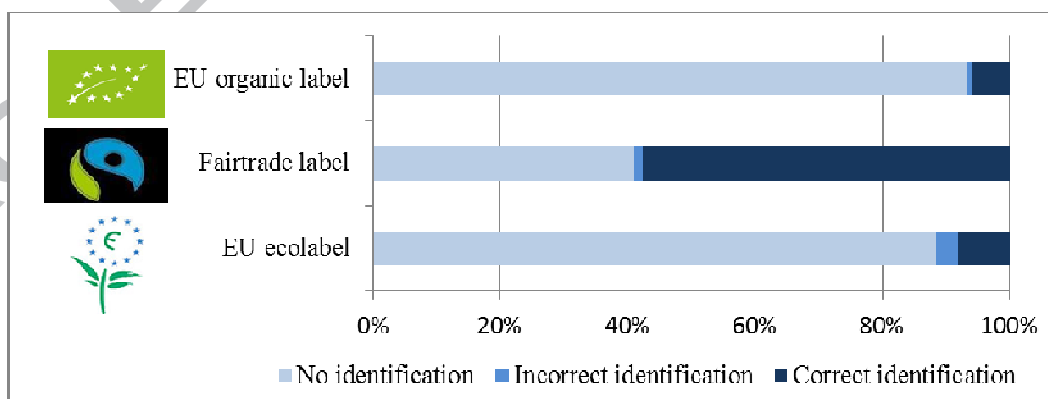


Figure 2: Respondents' knowledge of labels

Secondly we study whether consumers find the environmental and social quality information signaled by the labels reliable and trustworthy. To measure these aspects, we asked respondents to select the one statement out of five statements (Table 4) that most closely represented their opinion concerning organic or fair trade labels. We find that some 30% (fair trade labels) to 40% (organic labels) classify labels as marketing tools without guarantees of socially desirable outcomes. Only some 16% of respondents indicated that, according to them, all types of organic labels guarantee a sustainable and pesticide free production process, while some 22% indicated that all types of fair trade labels guarantee a sustainable and fair trade process.

	Statement	Organic	Fair trade
1	All types of (...) labels (private as well public) guarantee - a sustainable and pesticide free production process - a sustainable and fair trade process	15.5%	21.8%
2	(...) labels are a marketing tool, but do not always guarantee - a sustainable and pesticide free production process - a sustainable and fair trade process	42.9%	32.5%
3	Only (...) labels certified by the government guarantee - a sustainable and pesticide free production process - a sustainable and fair trade process	24.4%	29.9%
4	I have no opinion concerning (...) labels since they are useless anyway.	6.1%	4.9%
5	I do not agree with any of the above mentioned statements.	11.1%	10.9%
	<b>Total</b>	<b>100%</b>	<b>100%</b>

**Table 4: Reliability of organic labels**

Thirdly, besides recognition and trust, we study whether goods with a higher environmental or social quality are more desirable than goods with a lower environmental or social quality. First we discuss the characteristics respondents associate with labeled chocolate and next we look at the results from a taste experiment.

To measure whether consumers associate more positive characteristics with labeled chocolate than with conventional chocolate, we asked consumers which attributes they associate with labeled chocolate tablets (Table 5). Looking at organic chocolate, we see three central associations: the chocolate is more expensive, it causes less pollution due to production, and it uses sustainably

produced cocoa. Moreover, a minority (16%) of respondents indicated that organic chocolate is healthier than conventional chocolate. So, even for a not particularly healthy product such as chocolate, a sizeable portion of consumers still associates a less negative health impact with an organic product compared to a conventional product. In addition, some 16% of respondents think that organic chocolate uses fair trade cocoa, while these are actually two distinct concepts. While intentions are clearly green, there are no actual guarantees or goals formulated to ensure an environment-friendly production process within the fair trade program.<sup>4</sup> Looking at fair trade chocolate tablets, we again see three dominant associations (Table 5): the chocolate uses fair trade cocoa, it helps farmers in developing countries, and the chocolate is more expensive. Significantly fewer respondents associate fair trade with positive health effects compared to the results for organic chocolate (3% vs. 16%). Again some consumers associate fair trade chocolate with sustainable and environment-friendly production methods. Some 11% indicated that they thought that fair trade chocolate causes less pollution and some 20% indicated that fair trade chocolate uses sustainably produced cocoa.

	Statement	Organic	Fair trade
1	The chocolate tablet is healthier.	15.7%	3.0%
2	The chocolate tablet is more expensive.	39.6%	54.1%
3	The chocolate tablet causes less pollution due to production.	46.4%	10.7%
4	The chocolate tablet tastes better.	1.7%	2.3%
5	The chocolate tablet uses fair trade cocoa.	16.2%	70.6%
6	The chocolate tablet uses sustainably produced cocoa.	40.8%	20.0%
7	The chocolate tablet helps farmers in developing countries.	-	62.0%

<sup>4</sup> Based on the WFTO website World Fair Trade Organisation ([www.wfto.com](http://www.wfto.com), retrieved on 14 January 2014) the tenth principle entails 'respect for the environment'. This is explained as follows: "Organizations which produce Fair Trade products maximize the use of raw materials from sustainably managed sources in their ranges, buying locally when possible. They use production technologies that seek to reduce energy consumption and where possible use renewable energy technologies that minimize greenhouse gas emissions. They seek to minimize the impact of their waste stream on the environment. Fair Trade agricultural commodity producers minimize their environmental impacts, by using organic or low pesticide use production methods wherever possible. Buyers and importers of Fair Trade products give priority to buying products made from raw materials that originate from sustainably managed sources, and have the least overall impact on the environment. All organizations use recycled or easily biodegradable materials for packing to the extent possible, and goods are dispatched by sea wherever possible."



8	I do not attach special characteristics to organic chocolate tablets.	8.7%	7.3%
9	Other: The chocolate tablet tastes worse.	1.7%	1.7%

**Table 5: Perceived characteristics of labeled, organic chocolate (more than one option could be selected)**

Next, we discuss the results of the blind taste experiment to test whether labeled chocolate actually tastes different from conventional chocolate. We obtained perceived taste scores (ranging from 1 = ‘do not like taste at all’ to 10 = ‘like taste very much’) from 81 students for 6 samples: 2 white, 2 milk and 2 dark flavored chocolate. The results (Table 6) show that a majority of the respondents preferred the taste of conventional chocolate over that of labeled chocolate. Still there was a sizeable group of respondents who were indifferent between both types of chocolate or who even preferred the taste of labeled chocolate.

	Prefer conventional over labeled chocolate	Indifferent	Prefer labeled over conventional chocolate
White	72.84%	17.28%	9.88%
Milk	55.56%	8.64%	35.80%
Dark	70.37%	13.58%	16.05%

**Table 6: Taste experiment**

Using a linear regression to explain the perceived taste scores (Table 7), we see that the taste score was significantly lower (1.4 points on a scale of 10) when the respondent tasted fair trade and organic chocolate compared to conventional chocolate, keeping all else constant. In addition, dark chocolate was rated lower than milk or white chocolate. On average, women gave lower scores as well as respondents who recognized the EU ecolabel (‘knowEUeco’). Finally, respondents who frequently eat chocolate gave significantly higher scores.

Dependent variable = perceived taste score	Coefficient	Standard error	p-value
Fairtrade & organic	-1.4120	0.1972	0.000
Dark	-0.4549	0.2092	0.030
Female	-0.6432	0.1987	0.001
Frequently eat chocolate	0.4894	0.2013	0.015
KnowEUeco	-0.5368	0.2277	0.019
constant	7.9808	0.4440	0.000

Number of observations = 432  
 Prob. > F = 0.0000  
 R-squared = 0.1558

**Table 7: Estimation results explaining the hedonic taste score**

## 4.2 Willingness to pay for labels

Now we analyze whether consumers are willing to pay a premium for labeled products. We expect the marginal willingness to pay for environmental quality or fair trade to be positive. First we discuss the results<sup>5</sup> based on a conditional logit (CL) model. Next, in the section 4.3, we discuss the results of a latent class (LC) model.

To start, we estimate the willingness to pay (WTP) for different attributes of chocolate tablets using a conditional logit model to explain the probability that a certain chocolate tablet (of 100g) was chosen by consumers (Table 8). The estimation results show that the respondents like milk chocolate best, dark chocolate second best and white chocolate least, *ceteris paribus*. In addition, they prefer Belgian chocolate, then Swiss chocolate and finally Dutch chocolate least, keeping all else constant. Obviously, they prefer cheaper over more expensive chocolate. Respondents are also willing to pay a positive premium for chocolate with a fair trade label over conventional chocolate. Surprisingly, we find that the presence of an organic label has a negative impact on consumer choices.

	Coefficient	Robust	P>z	WTP	WTP	
		Standard error		(euro per 100g)	95% confidence interval	
tastemilk	1.1094	0.0900	0.000	3.85	3.24	4.47
tastedark	0.6292	0.0814	0.000	2.19	1.61	2.76
withfairtrade	0.5844	0.0544	0.000	2.03	1.61	2.45
belgium	0.5159	0.0626	0.000	1.76	1.24	2.27
swiss	0.3358	0.0815	0.000	1.17	0.54	1.79
withorganic	-0.1074	0.0408	0.008	-0.37	-0.32	-0.26
price	-0.2879	0.0157	0.000			
ASC1	1.3837	0.1418	0.000			

<sup>5</sup> We also tested for order effects by using two version of the questionnaire. Based on statistical tests (results are available from the author upon request), we find no evidence of order effects resulting for asking socio-demographic questions first or last, nor do we find evidence of priming effects resulting from asking respondents to answer the labeling questions before executing the choice experiment.

ASC2	1.3739	0.1301	0.000	
Observations	14544			
Pseudo R <sup>2</sup>	0.2258			

**Table 8: Conditional logit results and willingness to pay estimates (main effects)**

Based on the conditional logit estimation (Table 8), the price premium that respondents are willing to pay for a 100g chocolate tablet with a fair trade label is 2.03 euro on average and keeping all else constant, while the price premium for a 100g chocolate tablet with an organic label is -0.37 euro on average. The result that at least some consumers may have a negative willingness to pay for organic products is surprising and contradicts results from previous studies (e.g. Tagbata and Sirieix, 2008; Garcia-Yi, 2015). Therefore, we have a closer look at the findings and we identify different groups of respondents using a latent class model in order to gain more insight into consumers attitudes towards organic chocolate.

#### **4.3 Latent class model: Identifying consumer groups**

We now turn to the latent class estimation to have a closer look at the type and causes of observed consumer preference heterogeneity. We include four variables in the membership function to explain the latent classes: 1) whether the respondent recognized the fair trade label, 2) the frequency of eating chocolate, 3) income class, and 4) age. The model that performed best according to the Consistent Akaike Information Criterion (CAIC) and Bayesian Information Criterion (BIC) is reported in Table 9. We obtain a model with three classes: two larger segments (class 1 – 35% and class 3 – 55%) and one smaller segment (class 2 – 10%). In Table 9 we also report the estimated attribute levels per segment, the estimated membership function and the WTPs for each segment. The third segment is chosen as reference category.

Looking at the estimation results, we can describe the three segments as: Class 1: respondents who prefer white chocolate and who positively value fair trade – but not organic – chocolate; Class 2: respondents who do not like chocolate (ASCs are significantly negative), who prefer milk

chocolate if they eat chocolate, and who do not value labeled chocolate; Class 3: respondents who prefer dark chocolate, and who positively value fair trade chocolate and weakly value organic chocolate.

	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3
Attributes	Coeff. (s.e.)	Coeff. (s.e.)	Coeff. (s.e.)	WTP (euro per 100g)	WTP (euro per 100g)	WTP (euro per 100g)
tastemilk	-1.034 (0.996)	3.530*** (0.713)	0.757* (0.420)	(-2.19)	n.a.	n.a.
tastedark	-2.894*** (0.418)	1.756*** (0.639)	2.470*** (0.183)	-6.13	n.a.	n.a.
withfairtrade	1.012*** (0.352)	0.196 (0.396)	1.010*** (0.267)	2.14	n.a.	n.a.
belgium	1.179*** (0.320)	0.927* (0.535)	1.456*** (0.328)	2.50	n.a.	n.a.
swiss	1.287*** (0.414)	0.681 (0.566)	1.521*** (0.432)	2.73	n.a.	n.a.
withorganic	-0.385 (0.314)	-0.282 (0.350)	0.224 (0.177)	(-0.82)	n.a.	n.a.
price	-0.472*** (0.115)	-0.121 (0.131)	-0.092 (0.076)			
ASC1	3.393*** (0.571)	-3.063*** (0.947)	-0.402 (0.521)			
ASC2	4.119*** (0.886)	-3.474*** (1.049)	-0.156 (0.452)			
Class share (%)	0.351	0.101	0.548			
<b>Membership function</b>						
knowfairtrade	-0.539* (0.312)	-0.860 (0.561)				
Frequency class	0.079 (0.102)	0.376** (0.146)				
Income class	-0.089 (0.102)	0.249 (0.176)				
age	-0.022* (0.011)	-.002 (0.020)				
constant	0.879 (0.745)	-3.449** (1.430)				

\*= significant at 10% level; \*\* = significant at 5% level; \*\*\* = significant at 1% level

**Table 9: Latent class estimation**

So if we look at consumer preferences for organic labels, we see that the respondents in all the classes are indifferent. On the other hand, if we look at preferences for fair trade labels, a different picture emerges. A majority of respondents (classes 1 and 3) positively value fair trade chocolate,

while some 35% are indifferent (class 2). The willingness to pay for chocolate attributes could not be calculated for classes 2 and 3 because the estimated coefficient is not statistically significant (thus calculating the WTPs would require a division by zero), however for class 1 we see that respondents are willing to pay a premium of 2.14 euro per 100g for fair trade chocolate compared to conventional chocolate.

In Table 10 we describe some characteristics of the respondents in each segment by appointing respondents to the class with the highest conditional posterior membership probability. Based on these descriptives, we can take a closer look at the characteristics of the respondents in each of the consumer segments. Moreover, we can check the consistency between the directly reported attitudes and knowledge concerning labels (see sections 4.1) and the calculated preferences based on the stated choice experiment.

Means	Class1	Class2	Class3	class1 vs class2 (sign. t-test)	class1 vs class3 (sign. t-test)	class2 vs class3 (sign. t-test)
% female respondents	65.9	54.2	57.8	0.0000	0.0000	0.0465
Respondents' average age (years)	40.6	43.7	26.7	0.0000	0.0000	0.0000
% with a university degree	28.0	33.3	20.2	0.0046	0.0000	0.0000
% with a high income	40.2	33.3	11.2	0.0005	0.0000	0.0000
% who decide on household consumption	65.9	66.7	37.4	0.6757	0.0000	0.0000
% who frequently eat chocolate	54.9	41.7	52.4	0.0000	0.0184	0.0000
% who are member of a nature organization	13.4	4.2	11.0	0.0000	0.0003	0.0000
% who state that price is an important factor when buying chocolate	39.0	25.0	51.2	0.0000	0.0000	0.0000
% who recognize EU organic label	3.7	4.2	6.6	0.5159	0.0075	0.0000
% who recognize Fairtrade label	40.2	29.2	62.6	0.0000	0.0000	0.0000
% who think organic = healthier	17.1	8.3	15.8	0.0000	0.0990	0.0000
% who think organic = less pollution	47.6	33.3	74.8	0.0000	0.0000	0.0000
% who think fairtrade = fair	73.2	54.2	85.8	0.0000	0.0000	0.0000
% who think fairtrade = less pollution	17.1	12.5	27.2	0.0024	0.0000	0.0000
% who think organic = marketing	41.5	50.0	42.8	0.0000	0.1994	0.0001
% who think fairtrade = marketing	29.3	41.7	32.6	0.0000	0.0000	0.0000
% who trust government approved	19.5	20.8	25.4	0.0000	0.0000	0.0000

organic labels						
% who trust all organic labels	12.2	8.3	16.4	0.0000	0.0000	0.0000
% who trust government approved fairtrade labels	25.6	25.0	30.8	0.0000	0.0000	0.0000
% who trust all fairtrade labels	22.0	8.33	22.4	0.0000	0.0000	0.0000

**Table 10: Overview of respondents' characteristics for the three segments**

Class 1 includes respondents who have a higher income and who are least likely to believe that labels are just a marketing tool. These respondents are also more likely to believe that organic chocolate is healthier than conventional chocolate.

Class 2 includes respondents who are less likely to associate positive characteristics with labels and who are more likely to think that labels are just a marketing tool. In addition, members of class 2 are less likely to frequently eat chocolate. There are also significantly fewer members of nature protection organizations and fewer females. In addition, respondents in this class show the lowest probability of recognizing the fair trade label.

Class 3 consists of respondents who are relatively younger and who are more likely to consider price an important factor when buying chocolate. Note that this last element is not corroborated by the estimates based on their stated choices. This group of respondents also seems to put more trust into labels and to recognize them more easily.

## V. Discussion

In line with existing literature (Pedersen & Neergaard, 2006; Janssen and Hamm, 2012), we can conclude that labels are not exactly well-known by consumers in Flanders. This is especially problematic for the organic labels. A majority of respondents was able to recognize the fair trade labels, while only a fraction could recognize the EU ecolabel or the EU organic label. We also found that only half our sample considered, with certainty, that the information implied by fair trade and organic labels is credible. A lack of consumer trust in labeling schemes was also found by, among others, Aertsens et al. (2009) and Padel and Foster (2005). Moreover, some respondents

seem to confuse the concepts of fair trade processes and organic agriculture. Unfortunately, this casts additional doubts on the usefulness of labeling in providing credible information to consumers to stimulate them to make more socially desirable consumption choices. This is again in line with previous literature (Ajzen et al., 2011) that reports ambiguous effects concerning the impact of information provision on consumer attitudes and behavior.

Further, the results confirm that consumers do not always associate labeled chocolate with desirable characteristics, as is indicated by their subjective beliefs as well as by the, more objective, blind tasting experiment. Based on the blind tasting experiment some 50 to 70% of respondents ranked the taste of labeled chocolate below that of conventional chocolate. As in Lee et al. (2013), we find some evidence of an health halo effect since some 15% of respondents indicated that organic chocolate is healthier than conventional chocolate. The importance of subjective beliefs regarding the impact of organic labels on consumers' attitudes and preferences was also found by, among others, McEachern and Warnaby (2008) and Janssen and Hamm (2012). Moreover, we see that the price premium respondents are willing to pay for a chocolate tablet with a fair trade label is approximately 2 euro on average, while the price premium for a chocolate tablet with an organic label is slightly negative (-0.37 euro) or zero on average depending on the estimation method. Although more extreme, this preference for fair trade labels over organic was also found by Loureiro and Lotade (2005) for coffee in the US. Using a contingent valuation study, these authors found that consumers are willing to pay higher premiums for fair trade coffee or shade grown coffee than for organic coffee. According to their results, the additional WTP for fair trade coffee was 22 dollar cents per pound, for shade grown coffee 20 cents per pound and for organic coffee 16 cents per pound. However, our results do not correspond to those found by Tagbata and Sirieix (2008) in a lab experiment in France. They found that consumers are willing to pay an almost identical price for organic chocolate as for fair trade chocolate (1.25 euro versus

1.31 euro). Furthermore, Garcia-Yi (2015) found WTP estimates for organic yellow chili peppers (9.3 Peruvian soles) that were more than double than the WTP for fair trade peppers (4.4 Peruvian soles) in Peru. So it seems that consumers' willingness to pay for fair trade labels compared to organic labels for food products cannot be unambiguously ranked and that it may depend on the product under consideration or on the country that is being studied.

Looking more closely at different types of consumers, we find that respondents who frequently eat chocolate value fair trade and organic chocolate more than infrequent chocolate eaters. This is consistent with the observation that the impact of the environmental attributes is more noticeable for frequently bought products (Bjorner et al., 2004). Further, it seems that more knowledgeable consumers (i.e. those recognizing the fair trade label and those responsible for daily food purchases) have a lower willingness to pay for labeled products. Yet these estimates may actually be more reliable since estimates from less knowledgeable may be biased by warm glow considerations (Brécard et al., 2008).

Overall, we see that respondents tend to be consistent in their responses and that directly reported attitudes are logically correlated with the preferences revealed through the choice experiment. This points to the observation that measuring consumer preferences through choice experiments is not necessarily a random exercise, but actually measures the preferences consumers like to think they have. This does not necessarily mean that choice experiments estimate consumer behavior, but at least attitudes seem to be measured in a fairly reliable manner.

## **VI. Conclusion**

We executed an online survey of Flemish consumers focusing on chocolate to investigate the impact of labels on consumer attitudes and preferences. The results allow us to comment on the likelihood that labels for fair trade chocolate and for organic chocolate can be effective in



stimulating consumer demand for those products. Moreover, the analysis serves as a warning to avoid undue optimism about the impact labeling schemes can have on consumers' attitudes and intentions. This is especially true since our sample was biased towards higher educated, higher income and younger people, which are typically consumer groups that are more interested in labeled products. Overall, we find that fair trade labels are more likely to have an impact on consumer attitudes and preferences than organic labels in the market of chocolate in Flanders. To conclude, the consumption of chocolate is dominated taste and price, with aspects such as fair trade or environmental impact having only a minor impact.

The result that respondents are indifferent towards organic labels or that some respondents may even require a discount for a food product with an organic label is quite unique. Overall, the majority of the respondents does not seem to be interested in the presence of an organic label when choosing chocolate. This result suggests that the perceived link between healthy food and organic food is important to consumers and that the impact of this 'organic is healthy' idea is less prominent when it comes to 'unhealthy' food. This finding could stimulate interesting further research. It would be interesting to investigate whether the stated preference results are reflected in actual chocolate purchases and thus to investigate the presence of a hypothetical bias. Moreover, it would be worthwhile to check whether the results carry over to other countries and other 'unhealthy' food products such as sweets, biscuits or alcohol.

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