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Origin or organoleptic characteristics of Pears: which is more valued in the market?

by

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Abstract

Consumers' decision when buying fruit and vegetables is determined by tangible and intangible attributes. In general, intangible attributes, such as the origin of the variety, are not perceived by consumers before or after purchase; thus, information on these characteristics of products must be provided. The origin of the variety is a particularly important intangible attribute in the case of fruit and vegetables. Its relevance is due to the role that traditional varieties may play in the conservation of biodiversity, and also in the local economy. In many instances, however, the higher production costs and lower profitability associated with traditional varieties discourage the continuation of this activity. Arguably, the farmers shall then be compensated by the market (through a price premium) to ensure the maintenance of local traditional varieties. The purpose of the present study is to enhance information about the relative importance of several attributes or characteristics of the product Pears, and to assess consumers' willingness to pay for the specific attribute Origin of Variety, detecting and quantifying the potential existence of a price premium.

Keywords: Valuation methods, Agro-food economics, BDM-mechanism; Hypothetical bias

JEL: C90, Q10, Q20, Q50

1. Introduction

When buying fruits and vegetables, many aspects can be used by consumers to perform their choices. It is widely agreed that while taste and other sensory qualities are very important, they only partially account for consumer's food related behaviours. Among others, absolute and relative price of the good, perception of quality, own and substitute goods availability, origin and production methods, are attributes often cited in the literature. In a more systematized way, using the classification proposed by Nelson (1970, 1974) and Darby and Karni (1973) and followed by Sloof *et al.* (1996), attributes can be gathered into *search attributes*, *experience attributes* and *credence attributes*. Unlike search attributes (e.g. price, size, colour) and experience attributes (e.g. taste, firmness, durability) which can be observed during purchase procedures or determined after consumption, respectively, credence attributes (e.g. healthiness, mode of production, origin) are less apparent and involve a high level of uncertainty from the consumers' perspective. As pointed out by Napolitano *et al.* (2010), credence attributes must be communicated to be perceived by consumers as they cannot be confirmed either before or after purchase. The provision of information may therefore increase consumers' awareness, and eventually enhance their willingness to pay (WTP) for products with specific intangible attributes.

Concerning specifically the consumption of pears, there is little literature that identifies the key determinants of consumer choices. Still, in recent years some research has been done in this direction. Concerning search attributes, Kapel *et al.* (1995) asked Canadian consumers and panellists to rate a pear cultivar against their own perception of an "ideal" pear. They found that medium size pears, with a bright yellow skin and pyriform shape, were rated as "ideal". Round fruit or very elongated fruit, and green or red skin, were considered less favourable features. The findings of Gamble *et al.* (2006) go in the same general direction. The authors carried out a conjoint study among Australian and New Zealand consumers showing that, in the presence of pears differing in shape and colour, the preference was for green and yellow colours with intermediate-straight or elongated-concave shapes. Similarly, Simões *et al.* (2008), in an extensive Portuguese consumer survey, concluded that one of the most important characteristics in pear choice was appearance.

With respect to experience attributes, Harker *et al.* (2003) applying a preference mapping technique, showed that New Zealand consumers over the age of 61 years tend to have preferences that are focused on soft sweet pears, while younger age groups respond more broadly across a range of flavours and tastes. Performing a sensorial analysis to the main pear cultivar grown in Emilia-Romagna, Italy, Predieri *et al.* (2005) concluded that fruit appreciation was highly correlated to sweetness and aroma. The estimation results confirmed that the attributes sweetness, juiciness, and firmness were important for consumers' purchase decisions and for their willingness to pay for pears. Regarding the determinant factors in pear choice by Portuguese consumers, Combris *et al.* (2007) applied experimental auctions to the most popular pear in Portugal, to conclude that consumers are willing to pay significantly more for fully ripe pears, with better sensory characteristics. Simões *et al.* (2008) also found taste to be one of the most important pears' features for consumers.

In their study, Simões *et al.* (2008) also addressed the issue of credence attributes in pears consumer's choices, finding that the majority of the Portuguese consumers have shown a clear preference for pears produced in Portugal. On the one hand, Combris *et al.* (2007) concluded that quality assurances related to production methods, such as the absence of pesticides, are also relevant aspects for consumers. However, the results of their study suggest that "taste beats food safety", because even when consumers are well informed about safer products, they prefer the tastier alternative.

Concerning consumers' willingness to pay for "origin", the literature has addressed various aspects, including country of origin (McEachren and Warnaby, 2004; Enneking, 2004; Loureiro and Umberger, 2007; Pouta *et al.*, 2010), designation of origin (Loureiro and McCluskey, 2000; Winfree and McCluskey, 2005; Perrouty *et al.*, 2006; Thiene *et al.*, 2013) and local production (Brown, 2003; Pouta *et al.*, 2010; Costanigro *et al.*, 2011; Adalja and Hanson, 2013; Tempesta and Vecchiato, 2013). However, throughout the literature on consumer willingness to pay for the "origin" attribute, the issue of origin of variety has been mistreated. Actually, with respect to regional varieties or landraces, with few exceptions (Brugarolas *et al.*, 2009; Dinis *et al.*, 2011), little has been made in order to understand consumer behavior. Although for Adams and Salois (2010) the concept of local food includes heritage varieties as an element, traditional varieties are more than just locally produced. They were locally shaped by successive

generations of farmers and that difference it is not always clear for researchers and participants in the few surveys that addressed that question.

In order to fill this gap, here we focus on regional varieties as opposed to foreign varieties while maintaining the same their country of production. Thus, the general purpose of this study is to assess the effects of different attributes on consumers' WTP for pears (*Pyrus communis* L.), comparing the impact of search attributes (appearance) and experience attributes (sensory characteristics) with a particular credence attribute – the specific “origin” of the variety. Specifically, we propose to answer the following four questions: (1) what are the main determinants of consumers' choice for pears? (2) Are consumers willing to pay different prices for national and foreign varieties? (3) Does familiarity with specific varieties of pears play a role in consumers' willingness to pay? (4) What is most important for consumers, the organoleptic characteristics of pears, or the origin of the variety?

2. Materials and methods

2.1 Procedures for data collection

Surveys were administered in person at fruit specialty stores located in the Portuguese cities of Coimbra, Porto and Lisbon, between July and November 2012. A total of 180 participants were recruited among the stores' clients. Each subject took part in one of two treatments or survey versions: an *hypothetical* version, and a *real* purchasing situation. All the participants tasted the pears (taste panel), and were asked to state their willingness to pay for each variety. After that, the participants were provided with information regarding the origin of the variety, and then they were given the possibility of revising their willingness to pay.

Participants were informed that they would taste two pears varieties (A and B) placed on a table in front of them. In the first stage, participants were allowed to taste Pear A (left side of the table) first and then Pear B (right side). Each participant only tasted one of the 10 possible pairs of Pears included in this study. As shown in Table 1, each pair/combination is formed by a Portuguese traditional variety (*Carapinheira*, *Pérola*, and *Rocha*) and a foreign variety (*Morettini*, *Clapp's Favourite*, and *General Leclerc*).

To control for the possibility of tasting order effects, Pear A was the foreign variety and Pear B was a traditional Portuguese variety in 50% of the combinations, and the order was reversed in the remaining combinations.

(Table 1 about here)

After tasting, the participants were asked to complete a rating sheet (hedonic classification) for scoring the following pears' attributes: appearance, texture, taste and smell (from the least preferred (1) to the most preferred (5)). They were also asked to give an overall score (1-5) for each variety.

The *hypothetical* treatment applies the contingent valuation method to assess the willingness to pay for two distinct pears varieties. Participants were asked to state their WTP for one kilogram (kg) of each pear variety before and after the information regarding the origin of the variety was given. In addition, at a final stage, participants were given the possibility to purchase the pears at the stated WTP. We also elicit the degree of certainty regarding the expressed WTP values (in a scale ranging from 0-10, where 0 means low certainty, and 10 corresponds to absolute certainty).

The *real* treatment is similar to an experimental market, applying the Becker-DeGroot-Marschak (BDM) procedure (Becker *et al.*, 1964). The participants were informed that in case they agreed to participate in the study, they may had to buy 1 kg of pears (one of the two presented varieties). For this purpose, after tasting and rating the two pear varieties, participants were asked to submit the maximum price they would agree to pay for 1 kg of each variety. In a second stage, participants received information about the origin of the varieties and were asked to resubmit their willingness to pay. In this stage, a selling price was drawn at random from the interval [5 cents; 400 cents] and, for each variety, if the resubmitted WTP exceeded or equaled the selling price, the participant would take 1 kg at the randomly selected selling price; otherwise, the participant paid nothing and could not get the pears.¹ Finally, both treatments included a final section to collect purchase behavior's data and socio-demographic information. Table 2 summarizes the tasks involved in each treatment.

¹ It was carefully explained to the participants (through several numeric examples) that it was in their own best interest to bid exactly the amount that the pears were worth to them, that is, to reveal truthfully the value they were actually willing to pay. One of the examples stated: "If you are willing to pay 1 Euro but you submitted a bid of 50 cents, in case the randomly selected selling price turns out to be 51 cents, you will not get the pears; however, if you had said the real value you are willing to pay, you would get the pears at only 51 cents. Also, if you really are only willing to pay up to 50 cents, and you tell us that you will pay 1 euro, in case the randomly selected selling price turns out to be 1 euro, you must buy the pears for 1 euro, when in fact your real value is 50 cents only".

(Table 2 about here)

2.2 Selection of pears

Our main concern in selecting the specific pear varieties was to ensure variability on their appearance, organoleptic features, and market prices. Because most pear varieties have a very low conservation capacity, an additional choice criterion was pear availability, both in quantity and quality, at the time of the field work. The concern about pear availability was particularly important in the choice of traditional Portuguese varieties since most of them face the risk of disappearance and are absent from the market. Furthermore, an effort was made in order to choose traditional varieties from different regions of Portugal. While *Carapinha* and *Rocha* come from the West region, *Pérola* comes from the North of the country. The choice of the variety *Rocha* was inevitable since this traditional Portuguese variety represents 97% of the global pear production in Portugal, it is the most purchased by Portuguese consumers, and it is well recognized all over the country (Simões *et al.*, 2008).

3. Results

3.1 Descriptive and unconditional statistical results

Detailed descriptive information characterizing the 180 individuals that, across treatments and places, participated in this study is presented in the Appendix. The results (Table A) show that, on average, the participants' are 50 years old with a *per capita* household net income of about 668 euros per month, a figure that compares well with the national counterpart of about 760 euros as reported by the national authorities for 2010/2011 (INE, 2012). About 60% of the participants are employed, 28% are retirees, and 11% are unemployed. With respect to schooling, the results show that most respondents have completed secondary education (32%), followed by those having an undergraduate degree (24%), and then by those having less than completed elementary education (18%). Male and married participants comprise about 17% and 61% of the total number of respondents, respectively. In 95% of the cases, the respondent is the person in charge of doing the household shopping.

Concerning fruit consumption, 19.5%, 37.4%, and 17.8% of the participants reported eating fruit every day, two to five times per week, and just once a week, respectively. Peach and other stone fruit collect the fruit preferences of participants, followed by oranges and bananas, with pears appearing in the 6th place of participants' ordering. On average, and consistent with these preferences, participants reported buying approximately 5 Kg of fruit per week, of which only 1.2 kg are pears.

When asked if they knew traditional varieties of pears, 93% of the participants answered affirmatively. Most of these participants reported that such knowledge was acquired in-store (49%), or through experience in a rural area (29%). Importantly, 63% of the participants stated that they usually take notice of the product information provided in the store shelf or packages when buying pears. The most important attribute considered by the participants when buying pears is their appearance, followed by their origin, and then by their taste and price (only a relatively small percentage of the respondents consider smell and texture as the most important pear attributes – Table B).

Interestingly, appearance was not the highest rated attribute of the pears participants tasted in this study. After tasting both pears placed on the table in front of them, but prior to knowing their origin, participants were asked to rate each of the pears with respect to appearance, texture, taste, and smell. They were also asked to provide a global rating using, in each case, a 1 (lowest rating) to 5 (highest rating) point scale. The results are provided in Table 3. These results show that the mean global score given by participants is about the same for both the Portuguese and foreign pear varieties. However, taste clearly is the highest rated attribute in the case of the Portuguese varieties, while texture (closely followed by appearance) is the highest rated attribute in the case of the foreign varieties. Comparing the mean scores of the attributes across Portuguese and foreign varieties, the results in Table 3 also reveal that the former varieties are rated higher than the latter in all the attributes but for appearance. In fact, the highest score difference across the varieties is observed with respect to appearance, with the Portuguese varieties receiving a substantially lower score than the foreign varieties on this attribute.

(Table 3 about here)

Kernel density estimates of the distribution of respondents' willingness to pay by origin of variety and treatment are depicted in Figure 1. The figure shows that the distributions

are very similar between treatments and origin of varieties, except for dispersion which seems to be higher in the real treatment than in the hypothetical treatment.

(Figure 1 about here)

The results are summarized in Table 4 for both information conditions. As can be seen in Table 4, mean WTP is lower for national varieties than for foreign varieties in the real treatment, and this difference is statistically significant at conventional significance levels (p-values based on t-tests are reported in Table 5). In the hypothetical treatment, however, the difference is not statistically significant (Table 5). These results hold irrespective of the information condition. However, providing information on the origin of the variety has a significant effect on the WTP for national varieties, both in the hypothetical and real treatment, according to t-test's results reported in Table 6. In the case of foreign varieties, providing information on the origin has, on the contrary, a significant negative effect on the WTP but only in the hypothetical treatment (Table 6).

(Table 4, 5 and 6 about here)

3.2 Conditional statistical results

The unconditional analysis, although useful for descriptive purposes, may hide some important insights regarding the determinants of consumers' WTP for pears. The analysis of consumers' WTP controlling for the socio-demographic composition of the participants, their preferences for pears, and treatment conditions may reveal some important features. In addition, the main research question of the paper requires that we compare the relative importance, and eventually the interaction, between origin of variety (an intangible attribute) and the tangible attributes like the organoleptic characteristics of the pears as determinants of consumers' WTP. To this end we estimate a hedonic valuation function controlling for the panel structure of the data. The model adopted to explain consumers' stated WTP for pears, after learning their origin, includes three sets of explanatory variables, falling under the headings of *Varieties and treatments*, *Experience and buying behavior*, *Socio-demographic*.

The set *Varieties and treatments* includes a dummy variable for national variety (*VarNational*); one for hypothetical treatment (*Hypothetical*), a set of dummies for the global rating attributed to each pear (*GlobalRate2*, *GlobalRate3*, *GlobalRate4*,

GlobalRate5; each of these variables take the value 1 if consumer rated the pear 2, 3, 4 and 5 respectively, and zero otherwise), rating of individual attributes (*Texture, Taste, Smell, Aspect*); a dummy variable for the correct identification of the name of the variety (*CorrectVar*), and two dummies for the city of inquiry (*Lisboa, Coimbra*). But for these last two variables, all others are included additively and interacted with the variable *NationalVar*. We hypothesize that the effect of consumers rating of pears both globally and with respect to individual attributes, and the correct identification of the variety, may determine their WTP differently for the cases of national and foreign varieties.

The set *Experience and buying behavior* includes four dummy variables to account for how the consumer knew the variety (*KnowRural_exp* takes the value one if the consumer knows the variety by experience in a rural area); if the consumer usually buys a specific variety of pear (*BuySpecifVarieties*); if pear is his/her favorite fruit (*PearFavorite*), and if he/she consumes pears daily (*PearsDaily*).

The set *Socio-demographic* includes variables characterizing the sample: net household per capita income (*Income_pc*), age of respondent (*Age*), and gender (*Male*).

(Table 7 about here)

As shown in Table 7, most of the coefficients are statistically significant. The variables included in *Attributes and Treatments* reveal that the values elicited in the hypothetical treatment are, on average, higher than in the real treatment and that this effect is even stronger for national varieties, which is in line with the unconditional results reported in the previous section.

As hypothesized, consumers rating of pears, both globally and with respect to each of the four attributes considered, are significant determinants of their WTP. These effects, however, vary between national and foreign varieties. In particular, the global rating of the pears has a higher positive effect on consumers' WTP for national varieties than for foreign, and the effect is not linear, as the price premium differs by rating.

Importantly, the results show that the correct denomination (*CorrectVar*) of the variety has a significant effect on consumers' WTP. Thus, consumers discriminate based on their knowledge of the variety, and positively reward national varieties relative to foreign.

We also observe some local variation in consumers' WTP: consumers in Porto attribute higher values to the pears than consumers in Coimbra, but lower than consumers in Lisbon. This observed local variation in consumers' WTP may be explained by different actual selling price levels in the three cities (eventually, selling prices in the stores provided a reference to the participants, who were recruited among their regular customers). In fact, fruit prices were higher in the stores in Lisbon, than in Porto or Coimbra. In particular, the prices in Lisbon for the *Rocha* variety, the most sold pear variety in all of the stores, were 15-20% higher than those recorded in Coimbra and Porto. This suggests that, irrespective of their own evaluation of the quality of the products, consumers may *anchor* their stated WTP for fruits (and food in general) on selling prices familiar to them, a phenomenon that has been overlooked in the literature but deserving further examination.

As expected, the variables characterizing consumers *Experience and buying behavior* are also statistically significant determinants of consumers WTP. Overall, taking the joint influence of all the considered covariates, results in a predicted WTP of 1.1784 Euros for foreign varieties and 1.1816 Euros for national, that is, a predicted price premium for the national varieties of 0.32 cents per Kg.

4 Conclusions and discussion

The main research question posed in the present work is whether organoleptic characteristics are valued higher than the origin of pear varieties by consumers. Based on a first analysis of the data, the reported preliminary results indicate that we cannot separate the effect of these two factors, since they are related. In particular, organoleptic characteristics have a different, in general more favorable, effect on consumers WTP for national than for foreign varieties. Thus, the credential attribute, *origin* of the variety, can be a positive differentiating factor *when associated* with good evaluations of the organoleptic characteristics of the variety.

In spite of the relatively small effect of the origin of variety on the predicted price premium, the results show two encouraging ways in which national varieties may survive the competition of foreign varieties. On the one hand, there is a statistically significant difference in consumers' WTP for national varieties before and after information; on the other hand, as the price premiums received by consumers rating of

the varieties are higher for national varieties, suggests that producers of national varieties may use information on origin as a successful marketing tool, as it raises consumers' WTP both directly and indirectly through its effect on attributes rating.

Thus, the results obtained so far support some important implications with respect to the market potential of national varieties in the pears market. The most significant result is that national pears are rated and valued more highly than foreign varieties. Hence, if the often voiced argument that traditional varieties are less productive and, as a consequence, need a higher market price to be produced, is correct, then our preliminary results are encouraging in the sense that such a market premium price exists. Notwithstanding, it is important to stress that the observed price premium of national varieties is not independent of consumers' rating of those varieties.

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Table 1 - Tasting combinations

Combination	Panel Position	
	Left (Pear A)	Right (Pear B)
A	Morettini	Carapinha*
B	Morettini	Pérola*
C	Clapp's Favourite	Carapinha *
D	Clapp's Favourite	Pérola *
E	Carapinha*	Morettini
F	Carapinha*	Clapp's Favourite
G	Pérola*	Morettini
H	Pérola*	Clapp's Favourite
I	General Leclerc	Rocha*
J	Rocha*	General Leclerc

*Portuguese traditional variety

Table 2 - Tasks in each treatment

Order of task	Real version	Hypothetical version
1	Tasting and rating the apples' attributes	Tasting and rating the apples' attributes
2	WTP elicitation (open ended question)	WTP elicitation (open ended question)
3	Pear Variety' Information	Pear Variety' Information
4	New WTP elicitation (open ended question)	New WTP elicitation (open ended question)
5	BDM procedure	
6		Degree of certainty about the stated WTP
7	Possibility of purchasing at the selling price for those who do not win the auction	Possibility of purchasing at the stated WTP
8	Purchase behavior and socio-demographic information	Purchase behavior and socio-demographic information

Table 3 - Participants' rating for national and foreign varieties after tasting (%)

Variety	Attribute\Score	1	2	3	4	5	Mean Score
National	Appearance	0.00	10.00	33.33	38.89	17.78	3.64
	Texture	0.00	4.44	25.00	38.89	31.67	3.98
	Taste	1.11	5.56	19.44	31.11	42.78	4.09
	Smell	1.67	8.89	35.56	43.33	10.56	3.52
	Global	0.76	6.06	27.27	39.39	26.52	3.85
Foreign	Appearance	1.11	3.89	20.56	49.44	25.00	3.93
	Texture	1.67	3.33	23.33	42.78	28.89	3.94
	Taste	1.67	6.67	21.67	41.11	28.89	3.89
	Smell	2.78	11.67	36.11	36.67	12.78	3.45
	Global	2.27	6.06	21.97	43.18	26.52	3.86

Table 4 – Mean (SD) WTP by treatment and origin of variety

	Hypothetical		Real	
	National	Foreign	National	Foreign
WTP_No Info	1.1327 (0.4104)	1.1789 (0.4532)	1.0330 (0.4155)	1.1956 (0.4758)
WTP_With Info	1.1854 (0.4221)	1.1539 (0.4486)	1.0557 (0.4288)	1.1939 (0.4796)

Table 5 - t-tests on effect of origin and treatment by Information (p-values)

	Hypothetical	Real
	National/Foreign	National/Foreign
WTP_With_Info	0.4965	0.0116 (Foreign>National)
WTP_No Info	0.3075	0.0031(Foreign>National)

Table 6 - t-tests on effect of information on the WTP by treatment, origin (p-values)

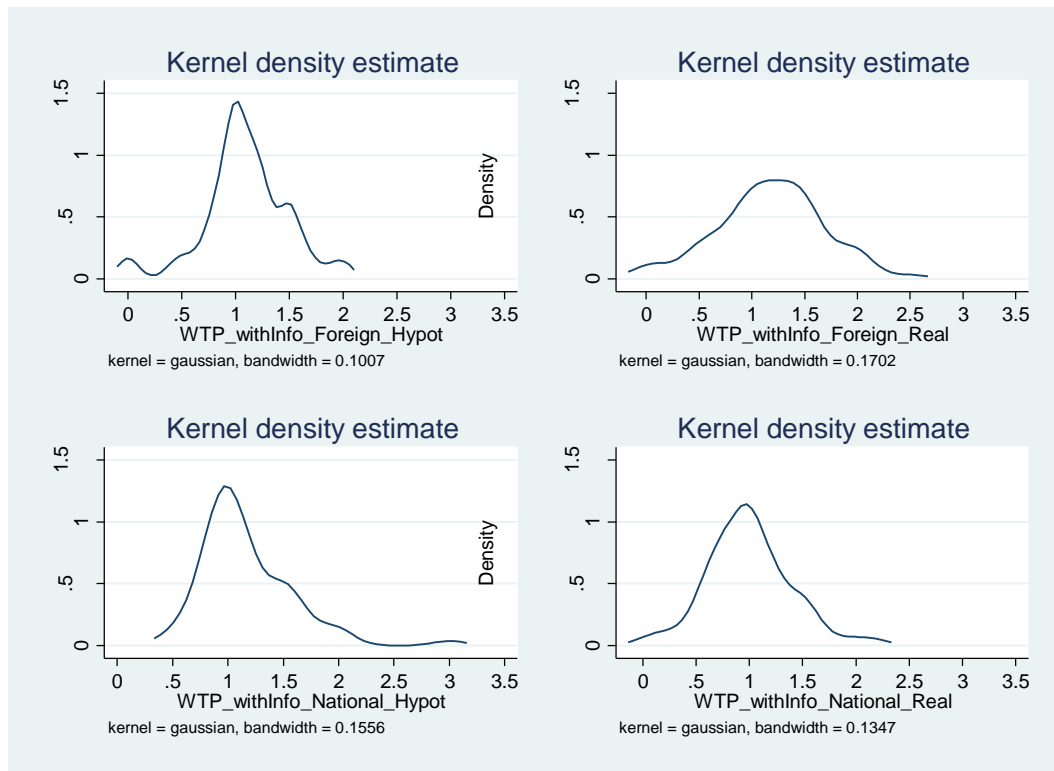
	With Info/No Info
WTP National_Hypothetical	0.000 (WTPWithInfo>WTPNoInfo)
WTP Foreign_Hypothetical	0.0490 (WTPNoInfo>WTPWithInfo)
WTP National_Real	0.0494 (WTPWithInfo>WTPNoInfo)
WTP Foreign_Real	0.8415

Table 7 - Valuation function estimates (Tobit model^γ)

	Independent variables	Marginal effects	Robust Std. Err.
Attributes and treatments	VarNational	-1.0340*	0.0354
	Hypothetical	0.1224*	0.0259
	Varnnational*Hypoth	0.1280*	0.0321
	GlobalRate2	2.5154*	0.0277
	GlobalRate3	2.9447*	0.0335
	GlobalRate4	3.2265*	0.0249
	GlobalRate5	3.5328*	0.0251
	VarnNat* GlobalRate2	0.4495*	0.0456
	VarnNat* GlobalRate3	0.4107*	0.0354
	VarnNat* GlobalRate4	0.2119*	0.0279
	Texture	0.0759*	0.0072
	Taste	-0.0551*	0.0071
	Smell	-0.0466*	0.0081
	Aspect	-0.0660*	0.0075
	VarnNat*Texture	0.0489*	0.0084
	VarnNat*Taste	0.0542*	0.0074
	VarnNat*Smell	-0.1013*	0.0096
	VarnNat*Aspect	0.1529*	0.0088
	CorrectVar	-0.1388*	0.0303
	VarnNat CorrectVar	0.2136*	0.0316
	Lisboa	0.1528*	0.0140
Coimbra	-0.5540*	0.0293	
Experience and buying behavior	KnowRural_exp	-0.0873*	0.0227
	BuySpecifVarieties	0.0979*	0.0285
	PearFavorite	0.0215	0.0215
	PearsDaily	-0.1338*	0.0215
Socio-demographic	Age	-0.0085*	0.0006
	Male	0.0060	0.0190
	Income_pc	-0.0001*	0.0001
Regression diagnosis	Number obs=110 LL=-31.436039	F(29,112)=1.53E+07 Prob>F=0.0000	
	sigma	0.3164	0.0002
PredictedWTP	Total	1.1800	
	National	1.1816	
	Foreign	1.1784	

γ clustered on individual ; *Significant at 1%.

Figure 1: Distribution of consumers' willingness to pay by treatment and origin of variety



Appendix

Table A - Summary statistics

Variable	N	Mean	Standard Dev	Min	Max
EducationPhD	180	0.0111	0.1051	0	1
EducationMaster	180	0.0167	0.1284	0	1
EducationLic	180	0.2444	0.4309	0	1
EducationBach	180	0.0278	0.1648	0	1
Education>secund	180	0.0222	0.1478	0	1
Education(12)	180	0.3222	0.4686	0	1
Education(7,9)	180	0.1278	0.3348	0	1
Education(4,6)	180	0.0389	0.1939	0	1
Education<4years	180	0.1778	0.3834	0	1
Income	174	1507.67	921.1	250	4875.5
Incomepc	174	667.838	434.345	75.1	2375.5
Age	180	49.98	14.60	18	88
Male	180	0.1722	0.3786	0	1
NumChildren	180	0.2111	0.5789	0	4
NumberYoung	180	0.1444	0.4244	0	2
NumberAdults	180	2.1944	0.9519	1	6
NumberHouse	180	2.55	1.1972	1	7
Employed	180	0.4889	0.5013	0	1
Self-employed	180	0.0833	0.2772	0	1
Retired	180	0.2833	0.4519	0	1
Student	180	0.0278	0.1648	0	1
Housewife	180	0.0278	0.1648	0	1
Married	176	0.6079	0.4895	0	1
Widow	176	0.0852	0.2800	0	1
Single	176	0.1591	0.3668	0	1
Divorced	176	0.1477	0.3558	0	1

Table A_ Summary statistics (cont.)

Variable	N	Mean	Standard Dev	Min	Max
Shops_household	179	0.9553	0.2072	0	1
Recognizesvariety	144	0.6458	0.4799	0	1
RecognizesDenom	100	0.3700	0.4852	0	1
KnowTradVariet	144	0.9375	0.2429	0	1
Knowbycomercial	136	0.4853	0.5016	0	1
KnowRural_exp	136	0.2794	0.4504	0	1
Knowbyfamily	136	0.0882	0.2846	0	1
Knowby publicity	136	0.0882	0.2846	0	1
Knowbyothers	136	0.1397	0.3479	0	1
KnowbyNresp	136	0.0661	0.2495	0	1
QuantFruitWeek	137	5.1131	4.0160	0	40
QuantPearWeek	135	1.214	.9384	0	6
QuantPearToday	143	0.3636	.5998	0	2
ValueFruitWeek	98	1.7224	1.1632	0	6
ValuePearWeek	39	1.0674	.2245	.5	1.8
PearsDaily	143	.2028	.4035	0	1
Pears2_5Week	143	.3706	.4847	0	1
Pears1Week	143	0.1958	.3982	0	1
PearsRarely	143	0.2238	.4182	0	1
PearsNever	143	.007	.0836	0	1
BuySpecifVarieties	180	0.6833	0.4665	0	1
PearFavorite	180	0.0833	0.2772	0	1
CorrectVarN	66	0.5303	0.5029	0	1
CorrectVarF	66	0.0606	0.2404	0	1

Table B - Pear attributes considered by participants (%)

Attribute	Not considered	1st	2nd	3rd	N
Appearance	19.58	43.36	21.68	15.38	143
Texture	69.93	5.59	16.78	7.69	143
Taste	49.65	11.19	18.88	20.28	143
Smell	67.13	6.29	11.19	15.38	143
Origin	58.04	23.08	8.39	10.49	143
Price	36.36	10.49	23.08	30.07	143

