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Factors Explaining the Consumers' Willingness-to-Pay for a "Typical" Food Product in Spain: Evidence from Experimental Auctions

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Factors Explaining the Consumers' Willingness-to-Pay for a "Typical" Food Product in Spain: Evidence from Experimental Auctions

1. Introduction

The so-called "typical" food products have occupied a preferential place within the agro-food sector because their particular identity is supported by the quality and origin of its raw materials, as well as the peculiarity of the production method used. "Typical" food products may be referred to both non-processed and processed products. Within the former, the level of quality and differentiation has been determined either by the land's natural characteristics and/or climatic conditions or by the particular farming systems. Yet, for the initially processed products, the typicality results from the posterior production method, permitting the raw materials to be autochthonous or imported from other areas (Caldentey and Gomez, 1996). According to Letablier and Nicolas (1994), the typicality of a food product seems to be highly linked to its territory of origin. Probably, this close link between typicality and territory explains why "typical" food products are usually referred as Origin Labeled Products (OLPs) even when there is no specific legal instrument protecting their name. Within food quality policy, the European Union has recently strengthened its action to protect OLPs, in particular through EC Regulation 2081/92, by introducing Protected Designations of Origin (PDOs) and Protected Geographical Indications (PGIs) as two legal instruments for protection.

In Spain, at the end of 2005, 138 PDOs and PGIs were officially registered (excluding wines), from which 17 (12%) were located in Catalonia (North-East of Spain, being Barcelona the main town) (MAPA, 2005). Each year new "typical" products request being recognized as PDO or PGI One of these products is "Mongeta Ganxet". "Mongeta" means white bean

(Leguminous) and "Ganxet" is the name of traditional variety cultivate in the countries of Valles and Maresme (around 50 Km away from the Barcelona Metropolitan area, the main consumption market).

In spite of the intensive research that has been undertaken to recover this variety as well as its organoleptic characteristics and to allow a controlled production system, there is a necessity to obtain additional information regarding the real productive situation (providing the possibility to learn about the existing competition in the market) and foremost, regarding the market potential for such a variety.

This paper aims at analyzing the market potential of the "Mongeta Ganxet" (MG) in Barcelona. The measurement of the market potential is approached by calculating, through an experimental auction, the consumers' willingness-to-pay (WTP) a price premium for this variety over the conventional counterpart. Unlike other hypothetical valuation methods, such as the contingent valuation, where the surveyed person tends to overestimate the valuation of the product; experimental auctions try to simulate a real market situation by offering the participants real products and allowing an exchange of real money. In this way, the participant may incur in real costs if he or she deviates from his or her equilibrium strategy. In our work, we used the random nth price auction as an auction mechanism to measure the participants' WTP for the MG¹. This paper also seeks to better understand the consumers' making decision process by estimating a model to explain main determinants of the calculated WTP.

The contribution of this paper is threefold. First, it is one of the first attempts in Spain to use experimental auctions to elicit the WTP for a food product². Second, although from a methodological point of view this paper applies established methods in the experimental protocol (the random nth price auction, the introduction of referenced prices and the release of additional

¹ For a discussion about the advantages of random nth price auction in relation to other auction mechanisms, see Shogren et al. (2001)

² Gil and Soler (2006) is the only published work in this area.

information during the experiment, including tasting), up to our knowledge, it is the only one which combines the three elements. Finally, this paper is unique in the analysis of the experimental data in the sense it provides a modelling framework to determine main factors affecting the consumers' WTP.

2. Design and implementation of the experimental auction

2.1 Sample, auctioned good and questionnaire

To achieve the experiment, we surveyed a random sample of people from Barcelona and its metropolitan area who were responsible for food shopping in their household. In total, 90 participants carried out the experiment during July 2006. The auctioned good was one kilogram of the variety 'Ganxet' white bean, stored in a cloth bag. Before auctioning the product, participants were requested to fill in a questionnaire food consumption habits and regarding various aspects related to white beans and, specifically, to the 'Mongeta Ganxet'.

2.2. Auction Mechanism

In practice, the random n th price auction works as follows: each one of the participants offers a bid for the auctioned product. Then the auctioneer orders the bids from highest to lowest and selects randomly a number n from a uniform distribution between 2 and k (k participants). The $n-1$ highest bidders are declared winners of the auction and the auctioneer sells them one unit of the auctioned good at the n th price. For example if $n = 4$, the three highest bidders each will buy one unit of the auctioned good priced at the fourth highest bid (Shogren, 2001).

2.3. Experimental Treatments

An additional goal from the experiment consisted in analyzing the sensitivity of the price premium participants were willing-to-pay for the Mongeta Ganxet under different marketing

strategies. Two main effects have been tested: 1) the potential presence of prices from substitute products (as a proxy of a real purchase situation); and 2) the provision of additional information about the auctioned product during the experiment. With respect to the first effect, besides the priceless product to be auctioned, three different levels of information were provided: 1a) retail prices of conventional white beans; 1b) retail prices of both conventional and high value (PDO) white beans; 1c) control level: no information on prices. Regarding the second effect, again three levels of information were provided to participants: 2a) a promotional leaflet, informing about the organoleptic and nutritional characteristics of the product, as well as recipes of some typical plates based on the 'Mongeta Ganxet'; 2b) product taste (cooked with salt and seasoned exclusively with olive oil); and 2c) control level: no information. Table 1 shows the nine experimental treatments (sessions) derived from the combination of levels of the two effects considered (roughly 10 participants per treatment).

Table 1. Experimental treatments considered in the study

Session 1 (N=9)	Session 2 (N=11)	Session 3 (N=11)
<ul style="list-style-type: none"> ◆ No reference on products' prices ◆ No information 	<ul style="list-style-type: none"> ◆ Reference on conventional products' prices ◆ No information 	<ul style="list-style-type: none"> ◆ Reference on conventional and PDO products' prices ◆ No information
Session 4 (N=11)	Session 5 (N=10)	Session 6 (N=9)
<ul style="list-style-type: none"> ◆ No reference on products' prices ◆ Leaflet 	<ul style="list-style-type: none"> ◆ Reference on conventional products' prices ◆ Leaflet 	<ul style="list-style-type: none"> ◆ Reference on conventional and PDO products' prices ◆ Leaflet
Session 7 (N=11)	Session 8 (N=9)	Session 9 (N=9)
<ul style="list-style-type: none"> ◆ No reference on products' prices ◆ Taste 	<ul style="list-style-type: none"> ◆ Reference on conventional products' prices ◆ Taste 	<ul style="list-style-type: none"> ◆ Reference on conventional and PDO products' prices ◆ Taste

N: Number of participants in each session

2.4. Steps followed in the Experiment

The process to obtain the relevant information in this study consists of four steps. In step 1 and after taking a seat and given a welcome, each participant received an envelope which contained 15 Euros as compensation for their participation, his or her number of identification, ten bidding cards and a questionnaire which have to be completed before the beginning of the experiment. In step 2, the operating procedure of the random nth price auction was described orally. Afterwards, a practical example was carried out with the auction of a 330 ml. bottle of water, during three rounds. In step 3, participants were requested to come close to a table where a few units of 'Mongeta Ganxet' were placed along with or without other brands of priced-white beans, depending on the treatment. Participants were then provided an opportunity to closely examine the auctioned product. Once all participants had finished inspecting the product, each one had to report how much he or she would be willing-to-pay for the offered product. After the first round was finished, the bidding cards were collected and ordered, n was randomly selected from a uniform distribution and the winner(s) was (were) announced. The same process was repeated during three additional rounds. In step 4, the auction was interrupted after the fourth round, when the additional information was granted, and consequently the next four rounds were made till completing a total of eight rounds. At the end of the eight rounds, one round was chosen randomly to determine the winner(s). The winner(s) of such round was (were) appointed as the winner(s) of the auction. Once the results were announced, the experiment ended by handing the product to the winner(s) who had to pay the corresponding market-clearing price.

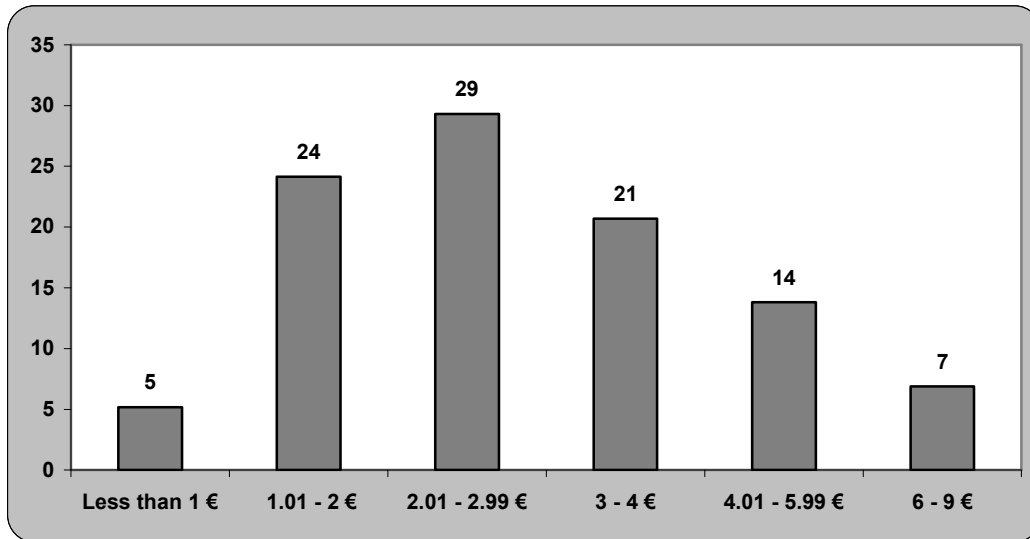
3. Results

3.1. Willingness-to-pay for the Mongeta Ganxet

Figure 1 shows the distribution of frequencies of the average bids made by the participants during the last four rounds in order to make homogeneous comparisons among treatments. As mentioned in the previous section, the additional information about the auctioned product was

provided at the end of the fourth round; thus, taking into consideration the last four rounds will enable us also to compare the effects of the introduction of such information.

Figure 1. Average willingness to pay for the “Mongeta Ganxet” (%)



Considering that the average market price for the conventional white bean 1.85€, results from Figure 1 suggest that 58% of the participants are not willing-to- pay an extra price for the MG. A 35% of participants are willing-to-pay a price between 3 and 6 Euros/kg. This price range is higher than the price for the conventional product but it is below the price for the white bean 'Ganxet' at bulk paid directly to the producer or in local markets, which is around 6 Euros/kg. In general terms, it is a segment of consumers heterogeneously mixed between young and elder persons, frequent buyers of white beans (70%), and occasional consumers of MG. The majority is employee and 85% earns an average salary between 1,000 and 2,000 Euros. Taking also into account the results from the questionnaire, this segment is willing to sacrifice additional money if the product provides them higher quality. In fact, participants in this segment assign (in a scale from 0 to 10) an average score of 8.70 to the phrase: "I'll pay more if the product has a guaranteed quality" and 7.85 to the phrase: "I don't mind paying more if the product has more quality".

Only 7% of the participants are willing-to-pay between 6 and 9 Euros for the MG. In other word this is the real market potential for the auctioned product as the price premium is over the minimum market price you may purchase the MG directly to the producer or usually in the local market, at bulk³. All members in this segment are regular consumers of MG. Around 50% are between 35 and 49 years old and have a university degree. All are employees and have monthly earnings between 2,000 and 3,000 Euros. At the same time, these are the consumers that allocate a higher valuation (in a scale from 0 to 10) to the phrases: " I'll pay more if the product has a guaranteed quality" and "I don't mind paying more if the product has more quality" (9 and 8.25, respectively). The previous experience (score of 9.67), the product creaminess (9.50) and the texture of the skin (8.75) are the principal attributes influencing their decision to purchase the Mongeta Ganxet white bean.

3.2. Effect of the presence of reference prices in the willingness-to-pay for the MG

As can be observed in Table 2, the presence of PDO priced-substitutes increases significantly participants' valuation of the 'Mongeta Ganxet'; the average price that participants are willing-to-pay when prices for PDO white beans are provided is significantly higher than in the other two cases. Second, it seems not to be any significant difference when providing only prices of conventional white beans and providing no information on prices (the average WTP is 2.86 and 2.76 Euros for cases without providing reference prices and providing only conventional products' reference prices, respectively).

³ In any case, no participant manifested paying the real market price for the auctioned product in a cloth bag, which was 11.60 Euros/kg.

Table 2. Sensitivity of bids to reference prices

<i>Treatment</i>	<i>Mean</i>	<i>Significance level</i>
No reference prices	2.86	.004
Prices of conventional white beans	2.76	
Prices of conventional and PDO white beans	3.63	

Comparison of means: Bonferroni test

<i>Treatment</i>	<i>Significance level</i>	
Prices of conventional and PDO white beans	No reference prices	.018
	Prices of conventional white beans	.006

3.3. Effect of the provision of additional information about GM characteristics

The second effect we were interested in was the provision to participants during the auction of additional information regarding the characteristics of the Mongeta Ganxet. As can be observed in the Figure 2, providing information about the organoleptic, nutritional and gastronomical characteristics of the MG, seems to not have any effect on consumer willingness to pay for the MG. This result is statistically confirmed by the information shown in Table 3 that provides the comparison of the average bids made by participants in the first four rounds and in the last four rounds under the three scenarios considered. As we can be observed there are no significant differences in mean values and therefore neither the leaflet information nor the taste have effect on the WTP for the MG. This result can be explained by the learning effect which seems to offset the effect of releasing new information. The learning effect has been deeply analyzed in Shogren et al. (1994) and Shogren et al. (2000) who showed that as the rounds go on participants tend to decrease significantly their bids.

Figure 2. Average willingness-to-pay in each round for the Mongeta Ganxet

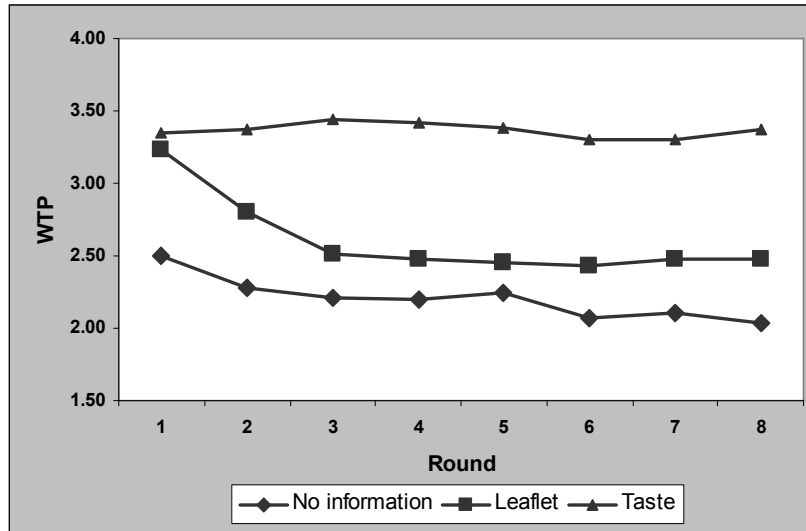


Table 3. Sensitivity of bids for the Mongeta Ganxet to leaflet information and taste.

	Mean Round 1 to 4	Mean Round 5 to 8	Significance level
No information	2.29	2.11	0.29
Leaflet	2.75	2.46	0.35
Taste	3.40	3.34	0.44

3.4 Factors affecting the willingness-to-pay for the Mongeta Ganxet

As we mentioned in the introduction, in this study we are not only interested in knowing the willingness-to-pay a price premium for the MG, but also in analyzing main factors affecting such decision. In this study, the price premium is measured as the difference (denoted by "y") between the average bids of each individual in the last four rounds and the average price of the conventional brands of white beans used in the experiment⁴. If the difference lies between the average and one positive or negative standard deviation we have assumed that the willingness-to-pay is zero. In our case, only 13% of the average bids were not statistically different from the average price of the conventional white beans.

The price premium presents two important characteristics: it is censored at 0 and the decision with respect to the price premium each individual is willing-to-pay may be preceded by a decision

to pay or not to pay, an extra price. Therefore, a bivariate ‘‘Sample Selection’’ model fits adequately for the purpose of this study. The Sample Selection model is defined as the following:

$$\begin{aligned}
y_{1,i}^* &= x_{1,i}\beta_1 + \varepsilon_{1,i} \\
d_{1,i} &= \begin{cases} 1 & \text{if } y_{1,i}^* > 0 \\ 0 & \text{if } y_{1,i}^* \leq 0 \end{cases} \\
y_{2,i}^* &= x_{2,i}\beta_2 + \varepsilon_{2,i} \\
y_{2,i} &= \begin{cases} y_{2,i}^* & \text{if } d_{1,i} = 1 \\ 0 & \text{if } d_{1,i} = 0 \end{cases}
\end{aligned}
\quad \forall i = 1, \dots, N$$

being $y_{1,i}^*$ the difference between the average bids made by each individual in the last four rounds and the average market price of the conventional counterpart; $y_{2,i}^*$ the overprice that he or she is willing to pay, that is observable if and only if $y_{1,i}^* > 0$; $x_{j,i} = (x_{j,i}^1 \dots x_{j,i}^{k_j})$ $j = 1, 2$ are vectors of explanatory variables corresponding to each decision; $\beta_j = (\beta_{j,1} \dots \beta_{j,k_j})' \in R^{k_j}$, $j = 1, 2$ are vectors of parameters to estimate; and, finally $\varepsilon_{j,i}$ which are assumed to be normally distributed $(N(0, \sigma_j^2))$, $j = 1, 2$ such that $E(\varepsilon_{1,i}\varepsilon_{2,i}) = \sigma_{12} \quad \forall i = 1 \dots N$. Model (1) is estimated by Maximum Likelihood (ML).

Results from the estimated Sample Selection model are shown in Table 4. In the decision whether to pay or not to pay a price premium (first equation), among the socio-demographic variables, only employment and the education level affect significantly the probability of paying an over price for the MG. In the case of the education level (EDUCAT), the negative sign of the parameter indicates that as the participant has a higher education level his or her probability to pay a price premium for the MG decreases. This result has to be interpreted taking into account the nature of the auctioned product. The auctioned white beans require a minimum of two hours cooking. Participants with higher education level have less free time to cooking and, then, convenience

becomes a relevant attribute⁴. As a consequence, those participants have a lower probability to enter in the market which would explain the negative sign found from our estimated model. Regarding the employment effect (PROFESS), the positive sign of the parameter shows that participants who are self-employed or employees have a higher probability of entering the market of the 'Mongeta Ganxet' in comparison to the other labour categories.

As expected, the consumption level of white beans (CONSUMP) (the low knowledge about the auctioned product (LOWKNOW)) affects positively (negatively) the probability to pay a price premium for it. In fact, as shown in Table 4, those participants that have declared in the survey a higher consumption level of white beans, have more probability to pay a higher price premium. At the same time, those participants that have shown a higher level of knowledge about the MG present a higher probability of paying a higher price for such product. This result suggests the need to provide more and better addressed information regarding the product from producers to consumers with the aim of increasing the market potential for MG. In this sense, quite recently mass media in Barcelona has started to pay attention to current research aimed at improving the organoleptic characteristics of the MG.

Among 'Mongeta Ganxet' attributes, two have resulted in having a significant effect on the probability of participants' willingness-to-pay a price premium. The first one is price (HIGPRICE). The negative sign indicates, as expected, that when the price of the product plays a key role in the consumer decision process the probability of paying an extra price for the MG decreases, as this variety is relatively more expensive than other substitutes. The second relevant attribute is "convenience" (TIME), which has a negative effect over the probability of participants' WTP. In other words, the participants who highly value cooking time when purchasing white beans are less likely to buy the MG, as it requires more care cooking than the conventional counterpart.

⁴ Results obtained from both a preliminary focus group and the implementation of the pilot questionnaire indicated that among the different attributes consumers look for when purchasing white beans, respondents with higher education level ranked convenience among the highest valued attributes.

Table 4. Estimated parameter of the Sample Selection model

First equation (DWTP)		
<i>Variables</i>	<i>Estimated value</i>	<i>Pr > t </i>
Constant	0.598	0.30
LOWKNOW	-0.734	0.04
CONSUMP	0.184	0.01
PROFESS	0.763	0.07
EDUCAT	-1.280	0.01
TIME	-1.084	0.04
EXP	1.005	0.02
F21	0.473	0.02
HIGPRICE	-0.927	0.01
Second equation (PWTP)		
<i>Variables</i>	<i>Estimated value</i>	<i>Pr > t </i>
Constant	1.066	0.02
FREQMG	2.192	<0.01
LOWPRICE	0.392	0.44
σ_{22}	1.287	<.01
<i>Rho</i>	0.009	0.99
<i>Pseudo R2</i>	0.3125	

Previous experience (EXP) also plays a relevant role in purchasing decision. In this sense, participants that have given a higher score to this attribute are more likely to pay a price premium for the Mongeta Ganxet. Finally, among the four attitudinal variables that have been introduced initially in the model, only the variable "willingness-to-pay more for higher quality food" (F21) has a significant effect. The positive sign indicates that participants, who are willing to sacrifice money in exchange of an improvement in the quality of the food, are also more likely to pay more for the 'Mongeta Ganxet'.

Once the consumer has decided to pay an extra price for the MG, the second decision is to determine how much to pay with respect to the conventional product. The results obtained in the estimation of the model show that this decision is solely based on the participants' experience with Mongeta Ganxet (FREQMG). That is, after deciding to participate in the market, only the fact of being a usual or an occasional consumer is the main determinant of the price premium he or she is willing to pay. The positive sign of the parameter indicates that the more experience the consumer has (usually but not only associated to a better knowledge of market prices, as

consumption away-from-home plays an important role in this case) the higher is the amount of money that he or she is willing to pay for such product.

4. Concluding remarks

This study has aimed at analyzing, on one hand, the market potential of MG in the metropolitan area of Barcelona and, on the other, main determinant factors affecting such decision. Results suggest a number of points. First, the market for "Mongeta Ganxet" is still narrow out of the local production area. Despite the majority of the participants acknowledging the organoleptic quality of the MG, only 7% of participants would be willing to pay a price superior to the minimum price for which the MG may be purchased directly to the producer or in the local producing market and none of the participants was willing-to-pay the real market price of the auctioned product.

Our results from the analysis of the main factors explaining consumers' purchasing intentions are quite consistent with those found in the empirical literature regarding the consumption of high value-added products but also we have found some interesting results which are product specific. As in previous studies, the psychographic characteristics of the participants are more relevant than their economic characteristics when making food choices. Moreover, as expected, the likelihood of purchasing the product increases with experience and with a positive attitude to pay more for higher quality products. Finally, results indicate that a better knowledge about the product and a larger previous experience in the consumption of MG increase the probability of paying a price premium for such product.

However, some results have to be with the nature of the product itself and, to certain extent, are opposite to those found in previous similar studies as the price and convenience attributes affect negatively the probability of entering into the market of MG. In relation to the later attribute, while in most studies convenience plays a positive role (or, at the worst, no significant role) in

explaining the WTP for a high-value food product, in this study the relationship is negative, as the cooking time for such a product is around two hours and needs periodic inspection. In relation to the price, conventional white beans are a relatively cheap product and an important source of energy. While in most studies prices of high-valued food products lie between one or two times the price of the conventional counterparts, in this case, MG is around seven times more expensive than the price of the conventional white beans. In this context, communication and promotion strategies should be very careful in explaining the reasons behind price differentials and, second, some further research is needed to improve the convenience attribute as this will limit its market potential for an increasing share of the population.

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