Market segmentation and willingness to pay for organic products in Spain

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Abstract

In recent years, consumer concerns on environmental and health issues related to food products have increased and, as a result, the demand for organically grown production has grown. Higher costs of production and retailer margins generate a gap between real prices and those that consumers are willing to pay for organic food. In this article, consumer willingness to pay for organic food in two Spanish regions is analyzed. Markets in both regions are segmented considering consumers lifestyles. Results indicate that consumers concerned about healthy diet and environmental degradation are the most likely to buy organic food, and are willing to pay a high premium. Organic attributes are easily identified in perishable products as the premium consumers would pay for organic meat, fruits, and vegetables is higher. © 2001 Elsevier Science Inc. All rights reserved.

1. Introduction

Food consumption in most developed countries has attained a saturation point in quantity terms, and consumer food choices are broader than in the past. The result is more diversified consumption. In this saturated market environment, distribution channels, marketing activities, diversification strategies, and food quality are increasingly important. In addition, consumers have become more concerned about the nutrition, health, and quality of food they eat. The increasing importance of health and the impact that food production has on the environment and consumer food choice is well documented in the literature (Jolly et al., 1989; Jordan and Elnagheeb, 1991; Oude Ophius, 1991; Baker and Crosbie, 1993; Grunert

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and Juhl, 1995; Kleijn et al., 1996; Viaene and Gellynck, 1996; Chupitaz and Keslemont, 1997).

As a consequence, production and consumption of organic products has grown in recent years. The number of papers which have been devoted to the study of organic food markets has increased (Lampkin, 1989; Beharrel and MacFie, 1991; Landell Mills, 1992; Tregear et al., 1994; Lin et al., 1996; Vetter and Christensen, 1996; Thompson and Kindwell, 1998; among others). Organic farming refers to a farming system which uses organic manure, and avoids or largely excludes the use of synthetic fertilizers, pesticides, and chemicals. A recent study carried out by FAO (1998) has shown that adequate management of organic farming generates a positive impact on the environment (e.g., reduction of water "contamination," increased soil fertility because of crop rotation). On the demand side, consumers have positive attitudes towards organic products, since they perceive them as healthier than conventional alternatives (Beharrel and MacFie, 1991).

In the case of Spain, although the production of organic food products has considerably increased during the past decade, demand is still very low, as only 0.5% of food expenditure is allocated to such products. The main obstacle with organic production seems to be the difficulty in selling organic products in retail food markets. Although consumers search for more diverse, higher quality, and healthier food products, organic products face problems related to consumer product acceptability <new product, high price, and deficiencies in distribution channels (Roddy et al., 1994)>. On the production side, high costs, especially labor costs, and the difficulty of shifting from conventional to organic farming are also limiting factors (Vetter and Christensen, 1996; Hamiti et al., 1996). Furthermore, food availability and seasonality influence marketing activities, and make it difficult to establish appropriate retail outlets. Higher costs of production and retailer margins jointly may result in higher prices than consumers are willing to pay for organic food attributes.

The objective of this study is to estimate the willingness of different consumer segments in Spain to pay for organic products, to assess alternative price strategies carried out by producers. From other studies, it was expected that consumers would be willing to pay a premium for organic products. This expectation is based on the idea that these products are healthier, and may diminish negative environmental effects associated with conventional agricultural production. To expand the scope of our results, in this study we have considered a wide range of food products: (1) vegetables, (2) potatoes, (3) cereals, (4) fruits, (5) eggs, (6) chicken, and (7) red meat.

Among the different methodological alternatives to assess consumers willingness to pay, the contingent valuation (CV) approach was chosen (Hanemann, 1984, 1987). Although CV is a method primarily used for monetary evaluation of consumer preferences for nonmarket goods (e.g., unpriced natural resources), it is also useful in this context because the organic market is still too "thin," and organic products are not available in all retail outlets.

The paper is organized as follows. In the next section, some descriptive statistics on the evolution of organic farming in the European Union (EU) and, particularly, in Spain are shown. A brief description of the survey instrument used is then provided in the following section. Next, consumer market segments based on consumers' lifestyles are defined and characterized, taking into consideration both socioeconomic characteristics and attitudes towards organic food products and environmental concerns. This is followed by calculations

Table 1
Land under organic farming in European Union countries in 1992 and 1999 (1,000 ha and %)

	1992			1999		
	Area (1000 ha)	% UE	% Organic/ total*	Area (1000 ha)	% UE	% Organic/ total*
Austria	27.6	6.49	0.79	287.9[1]	9.7	8.4
Belgium	1.4	0.33	0.1	18.5[2]	0.6	1.4
Denmark	16.7	3.93	0.61	146.6[2]	4.9	5.5
Finland	13.3	3.13	0.53	137.0[2]	4.6	6.3
France	90.0	21.1	0.3	316.0[2]	10.6	1.1
Germany	158.5	37.2	0.94	416.3[1]	14	2.4
Greece	0.3	0.06	0.01	15.8[1]	0.5	0.47
Ireland	3.8	0.89	0.09	32.4[2]	1.1	0.7
Italy	16.9	3.97	0.1	788.0[1]	26.4	5.3
Luxembourg	0.6	0.15	0.5	1.0[2]	0.03	0.8
Netherlands	10.0	2.35	0.51	23.0[2]	0.77	1.2
Portugal	2.0	0.47	0.05	47.9[2]	1.6	1.2
Spain	7.9	1.86	0.01	352.1[2]	11.8	1.4
Sweden	42.4	9.97	1.25	155.6[2]	5.2	5.5
UK	34.0	7.99	0.19	240.0[3]	8.1	1.2
Total UE	425.4		0.3	2,978.6		2.2

*This ratio indicates the proportion of land devoted to organic production on total cultivated agricultural area.
[1]Data refers to 12-31-1998; [2]Data refers to 12-31-1999; [3]Data refers to 4-1-1999
Source: Foster and Lampkin (1999) and Lampkin (2000) (non published data).

of the willingness to pay of each segment and by product. A brief outline of the theoretical foundation of the CV method is also included. Finally, some concluding remarks are outlined.

2. Relative importance of organic agricultural production in the European Union and Spain

Land under organic farming in EU countries has dramatically increased from 425,000 ha in 1992 to 2.9 million ha in 1999 (Table 1). Although the area has grown sevenfold, it still represents only 2.2% of total cultivated agricultural land. The proportion of land devoted to organic production on total cultivated land varies from country to country. The highest values are found in Austria (8.4%), followed by Finland (6.3%), Denmark (5.5%), Sweden (5.5%), and Italy (5.3%). The lowest are found in the rest of the Mediterranean countries (Portugal, Greece and Spain), despite the important increase of land devoted to organic products in these countries. Among EU countries, the most spectacular increase in land devoted to organic production has taken place in Italy, although a high percentage is devoted to pastures.

Organic farming in Spain has been developed only recently but has increased rapidly during the past few years. Land devoted to organic production has increased from 7,900 ha

Table 2
Land under organic production in Spain by region in 1995 and 1999 (ha)

Regions	1995			1999		
	Ha	%	%* Organic/ total	Ha	%	%* Organic/ total*
Andalucía	5,522	22.79	0.12	62,318	17.70	1.36
Aragón	5,518	21.37	0.22	15,638	4.44	0.63
Asturias	43	0.18	0.01	64	0.02	0.02
Baleares	632	2.61	0.29	3,623	1.03	1.68
Canarias	337	1.39	0.51	5,075	1.44	7.70
Cantabria	1.75	0.01	0.00	842	0.24	0.38
Castilla La Mancha	357	1.47	0.01	7,632	2.17	0.17
Castilla–León	701	2.89	0.01	43,245	12.28	0.84
Cataluña	5,075	20.95	0.45	9,570	2.72	0.84
Extremadura	393	1.62	0.01	167,833	47.66	5.98
Galicia	3,933	16.23	0.64	182	0.05	0.03
Madrid	20	0.08	0.01	1,304	0.37	0.41
Murcia	289	1.19	0.06	8,407	2.39	1.77
Navarra	418	1.73	0.07	6,793	1.93	1.20
C. Valenciana	1,200	4.95	0.00	17,974	5.10	2.59
País Vasco	129	0.53	0.06	347	0.10	0.15
Total	24,229		0.10	352,164		1.42

*This ratio indicates the proportion of land devoted to organic production on total cultivated agricultural area.
Source: Sánchez et al. (1997); M.A.P.A. (Ministerio de Agricultura Pesca y Alimentación, 2000).

in 1992 to 352,000 ha in 1999, when it accounted for 1.4% of the total utilized agricultural land, still under the European average. Three-fourths of Spanish organic farming is concentrated in three regions: Extremadura (47%), Andalucía (17%), and Castilla-León (12%) (Table 2). In relative terms, regions with higher percentages of organic farming on total utilized agricultural area are Canarias (7.7%), Extremadura (6%), and Comunidad Valenciana (2.6%). Normally, organic production in each region is highly related to the crops that are traditionally produced there. At the national level, cereals and olives are the main organic crops followed by nuts and fruits. However, it is noticeable that a high percentage of land devoted to pastures is under organic production, mainly concentrated in the central and southern part of Spain. This explains the relative importance of Extremadura and Andalucía in organic production. Navarra, on the other hand, is the region with the most diversification, producing a wide variety of organic agricultural products (fruits, vegetables, cereals, and meat).

Available information on consumption is less precise. According to the European Commission, EU expenditures on organic products accounted for 1.5 million Euros in 1991, representing 0.3% of total food expenditures. The proportion varies from country to country. Expenditure on organic products in Denmark lies between 2% to 3% of total food expenditures; in Germany, it represents 1.2%; in the United Kingdom, Ireland, France, and the Netherlands it is less than 1%. In the case of Spain, the relative importance of organic food products is lower, accounting for only 0.5% of total food expenditures.

Comparing the Spanish figures on production and consumption of organic food products, it is clear that production has increased faster than consumption. The demand for organic

food in central and northern European countries is growing more rapidly than in Spain. The main consequence is that, today, more than 50% of organically produced fruits and vegetables are sold in foreign markets leaving, to a certain extent, consumers unattended in the domestic market. Producers get a premium when selling in foreign markets, and they expect and want to earn the same premium in the domestic market. In Spain, most of the conventional food products are less expensive than in other European countries (mainly pasta, fruits, and vegetables). We believe that the gap between conventional and organic products, which is higher in Spain, limits the expansion of organic food consumption.

This study tries to provide a better understanding of Spanish consumers in relation to organic food. Assuming that higher prices is the main limiting factor for increasing organic consumption, special attention will be paid to the maximum premium consumers are willing to pay for such products. Consumers will also be segmented according to their lifestyles, and market segments will be characterized, taking into account consumers' socioeconomic characteristics and attitudes towards organic food products and environmental concerns.

3. Data

The data used here come from a survey conducted in July through August 1997 in two Spanish regions: Navarra and Madrid. Navarra was selected not only because it is one of the most important producing regions in Spain, but also because it produces a wide variety of organic food products. Madrid is one of the most important regions, together with Cataluña, in terms of organic food products consumption.

Samples in both regions were selected using a stratified random sample of food buyers on the basis of age and district of residence.[1] Four hundred respondents were randomly selected and personally interviewed at home in each region. Respondents were the main purchasers of food products within the household. The first question in the questionnaire was respondents' degree of knowledge of what an organic product was. If the respondent did not know anything about them, he or she was not interviewed. So only respondents with at least some knowledge of organic products were considered.[2]

Only 10% of respondents in Navarra and 5% in Madrid claimed to buy organic products regularly, while another 55% in Navarra and 42% in Madrid were occasional buyers. These percentages are similar to those obtained in other studies (Mullen and Wohlegenant, 1991; Hansen and Sorensen, 1993).

4. Market segmentation for organic food

As mentioned above, the first step in this study was to group consumers into homogeneous clusters. Consumers were segmented according to their lifestyles because previous research has shown that the willingness to pay for an organic product might be influenced by individual ways of living rather than by the usual socioeconomic variables (Hartman and New Hope, 1997). Once the market segments were obtained, they were characterized, taking

into account both consumers' socioeconomic characteristics and their attitudes towards organic food products and environmental issues.

Among socio-economic characteristics, age, gender, education level, family size, and income were judged to be the most relevant. Lifestyles, as well as attitudes towards environmental issues on one hand, and towards organic food products on the other, were measured by three tested scales (the complete scales are shown in the Appendix). Respondents were asked to evaluate, assigning a value from 1 to 7, their agreement with different statements. These three scales have been reduced by a principal components analysis to extract the main dimensions on each aspect.[3] The main results from these analyses follow.

4.1. Lifestyles

Table 3 shows the correlation between the original variables (statements) and factors obtained from the principal components analysis in Navarra and Madrid. In Navarra, lifestyles was summarized in three factors which account for 53% of the total variance (Table 3, top). The first one, *Natural food consumption,* explains 30% of the total variance, and is linked to the consumption of fresh fruits and vegetables, and the concern for reducing the consumption of red meat, processed food, or food with additives. The second factor*, Life equilibrium,* explains 14% of the total variance, and refers to the existence of a real interest in keeping a balance between work and private life, living in a methodical and ordered way, and trying to reduce stress. Finally, the third factor contributes to 9% of the total variance. It is called *Health care,* and shows the interest of consumers in keeping themselves healthy through practicing sports, following a natural diet, controlling salt ingestion, and regularly checking their health.

In Madrid, four factors were selected which account for 62% of the total variance (Table 3). The first three factors are similar to those obtained in Navarra, but in a different order, indicating that their relative importance differs. The first factor here is, *Health care*, which explains 28% of the total variance, and is linked to consumers awareness to regularly check their health. The second factor, *Natural food consumption*, contributes to explain 13% of the total lifestyles variance and, as in the case of Navarra, is linked to variables indicating consumers consumption of healthier food products. The third factor, *Life Equilibrium*, has a similar interpretation to the case of Navarra. Finally, the fourth factor, *Mediterranean diet*, is related to a high consumption of fruits, and a moderate consumption of meat.

4.2. Attitudes towards environmental issues

In relation to attitudes about environmental issues, two factors were selected in both regions that explained 63% and 70% of the total variance in Navarra and Madrid, respectively (Table 4). The first factor, *Environmental conservation,* is related to variables indicating that consumers have an active interest in reducing the effect of environmental degradation by recycling products and using recycled products, and so forth. The second factor, *Environmental concerns,* is linked to those variables showing consumer awareness about the negative effect of development on the environment.

Table 3

Correlations between lifestyle variables and factors from principal components analysis

	NAVARRA		
	Factor 1 Natural food consumption	Factor 2 Life equilibrium	Factor 3 Health care
Without additives	**0.802**	0.152	0.006
No processed food	**0.674**	0.251	0.008
High fruit consumption	**0.527**	0.005	0.225
Moderate meat consumption	**0.494**	0.253	0.191
Working/private life	0.126	**0.839**	−0.007
Ordered life	0.214	**0.761**	0.008
Less stress	0.195	**0.668**	0.120
Vegetarian food	0.198	−0.009	**0.734**
Regular exercise	−0.166	0.350	**0.673**
Salt control	0.388	−0.004	**0.591**
Regular health control	0.341	0.009	**0.523**
% of total variance	30	14	9

	MADRID			
	Factor 1 Health care	Factor 2 Natural food consumption	Factor 3 Life equilibrium	Factor 4 Mediterranean diet
Regular health control	**0.783**	0.008	−0.005	0.101
Ordered life	**0.651**	−0.002	0.267	0.191
Salt control	**0.633**	0.210	−0.279	0.269
Less stress	**0.599**	0.349	0.324	−0.108
No processed food	0.002	**0.784**	0.164	0.174
Without additives	0.226	**0.727**	0.225	0.192
Vegetarian food	0.116	**0.700**	−0.156	0.002
Regular exercise	−0.115	0.191	**0.752**	0.002
Working/Private life	0.231	−0.005	**0.751**	0.006
High fruit consumption	0.156	0.002	0.107	**0.808**
Moderate meat consumption	0.121	0.285	−0.004	**0.705**
% of total variance	28	13	12	9

Note: Definitions of variables are in the Appendix. Bold values indicate higher correlation between variables and factors.

4.3. Attitudes towards organic food products

Table 5 shows the results of the principal components analysis carried out on variables related to consumers' attitudes towards organic food products. The original information was summarized in two and three factors in the cases of Navarra and Madrid, respectively (Table 5). In Navarra, the two factors account for 45% of the total variance. The first factor, *Positive aspects*, emphasizes the quality, taste, healthiness, attractiveness, and absence of harmful effects of these products. The second factor, *Negative aspects*, is related to the perception that organic products are only a new fashion, and more expensive than the conventional ones. In Madrid, the three factors explain 59% of the total variance. In this case, the organic food positive aspects were divided in two factors, *Quality and healthy aspects* and *External*

Table 4

Correlations between attitudes towards environmental issues and factors from principal components analysis

	NAVARRA			MADRID	
	Factor 1 Environmental conservation	Factor 2 Environmental concerns		Factor 1 Environmental conservation	Factor 2 Environmental concerns
Recycled products consumption	**0.777**	0.154	Environmental conservation	**0.835**	0.009
Environmental conservation	**0.750**	0.0002	Recycling practice	**0.793**	0.101
Recycling practice	**0.609**	0.203	Recycled products consumption	**0.730**	0.306
Development destruction	0.008	**0.875**	Development destruction	0.104	**0.888**
Environmental damage	0.195	**0.844**	Environmental damage	0.216	**0.841**
% of total variance	32	31	% of total variance	38	32

Note: Definitions of variables are in the Appendix. Bold values indicate higher correlation between variables and factors.

appearance (related to organic food products' attractiveness and taste). The *negative aspects* factor is related to the same attitudes as in the case of Navarra.

4.4. Market segmentation

The K-means cluster analysis technique (Malhotra, 1993) was used to identify market segments in relation to organic food products. Lifestyles factors (Table 3) were used as segmentation variables. Three segments in Navarra and four segments in Madrid were identified. Each segment was characterized taking into account: consumers' socioeconomic characteristics (age, gender, education level, family size, and income); factors related to attitudes towards environmental issues (Table 4); factors related to attitudes towards organic food products (Table 5); and the consumption level of organic food products.[4] Results from cluster analysis and market segments characterization are shown in Tables 6 and 7 for Navarra and Madrid, respectively.

4.4.1. Navarra

In Navarra, the first segment accounts for 25% of the sample (Table 6). It includes those people who show a leaning towards natural food consumption and a balanced life, but with no excessive care for their health. This is a potential consumer group of organic products because most of the respondents occasionally consume them, and a high proportion is willing to taste them in the near future. For this reason, the segment is labeled "Likely consumers."

Table 5
Correlations between attitudes towards organic food products and factors from principal components analysis

	NAVARRA			MADRID		
	Factor 1 Positive aspects	Factor 2 Negative aspects		Factor 1 Negative aspects	Factor 2 Quality and healthy aspects	Factor 3 External appearance
Quality	**0.74**	−0.27	Fraud	**0.79**	−0.21	−0.02
Tasty	**0.66**	−0.23	Fashion	**0.72**	−0.11	−0.08
Health benefit	**0.59**	−0.27	Worse	**0.64**	−0.22	−0.11
Attractive	**0.51**	0.17	Expensive	**0.62**	0.36	0.02
No harmful effects	**0.50**	−0.04				
Fraud	−0.14	**0.76**	No harmful effects	0.08	**0.74**	0.05
Fashion	−0.21	**0.71**	Health benefit	−0.31	**0.72**	0.07
Worse	−0.16	**0.59**	Quality	0.39	**0.57**	0.34
Expensive	0.35	**0.51**				
% of total variance	23	22				
			Attractive	0.06	−0.02	**0.85**
			Tasty	−0.19	0.22	**0.76**
			% of total variance	25	18	16

Note: Definitions of variables are in the Appendix. Bold values indicate higher correlation between variables and factors.

Consumers in this segment are mainly women, middle-aged, with an educational level of high school or less, and they positively assess the beneficial aspects of organic food products.

The second segment includes 52% of consumers. It is formed by respondents evenly split between men and women. They are also not well educated (high school or less), and 75% are of medium income. They are worried about health and the balance between private life and work, but pay less attention to following a natural diet. The percentage of regular and occasional consumers is the highest among all segments, therefore this segment is called "Organic food consumers."

It should be noted that the high proportion of regular and occasional consumers could reflect confusion among consumers between real organic products and those grown in home gardens, for self-consumption. This is very common in this area. Navarra is a very important producing region of fruits and vegetables, and many people living in town retain strong links with rural areas. This fact could also explain the negative value assigned to the "natural food consumption" factor. Furthermore, no need for a special consideration of healthy diet is shown, since it is intrinsic to consumption habits.

The third segment accounts for 23% of respondents. This is clearly the group least concerned with natural food consumption, life equilibrium, and health care, and includes the highest percentage of nonconsumers of organic products. The relatively low potential consumption together with the lack of awareness about health and more natural diets suggest that organic consumption in this group will not be stimulated. Therefore, this segment is labeled as "Unlikely consumers." Half of consumers in this segment are younger than 35 years old. Finally, it is important to note that among the "unlikely consumers" half of them have more than a high school education.

Table 6
Market segments in Navarra[1]

	Segment 1 Likely consumers (25%)[2]	Segment 2 Organic food consumers (52%)	Segment 3 Unlikely consumers (23%)
Gender*			
Male	34.4%	51%	48.2%
Female	65.6%	49%	51.8%
Family size			
One member	5.2%	4.5%	3.5%
Two members	15.6%	19.7%	11.8%
Three or four members	59.4%	48.5%	55.3%
More than four members	19.8%	27.3%	29.4%
Age*			
Less than 35 years old	34.4%	36.9%	51.8%
Between 35 and 60 years old	52.1%	43.9%	29.4%
More than 60 years old	13.5%	19.2%	18.8%
Education level*			
High school or less	70.8%	68.7%	50.6%
More than high school	29.2%	31.3%	49.4%
Income*[3]			
High	9.4%	5.1%	10.6%
Medium	59.4%	74.2%	68.2%
Modest	31.2%	20.7%	21.2%
Consumption level*			
No consumption	19.7%	21.9%	34.5%
Potential consumption	16.7%	8.6%	9.5%
Occasional consumption	54.2%	54.8%	46.5%
Regular consumption	9.4%	14.7%	9.5%
Lifestyles			
Natural food consumption*	0.821	−0.238	−0.372
Life equilibrium*	0.329	0.438	−1.394
Health care*	−1.001	0.539	−0.125
Organic products attitudes			
F1. Positive aspects*	0.187	0.006	−0.327
F2. Negative aspects	−0.007	−0.000	0.008
Environmental attitudes			
F1. Environmental conservation*	0.007	0.008	−0.284
F2. Environmental concerns*	0.009	0.006	−0.222

[1]An * indicates that significant differences exist among segments at the 5% probability level.
[2]Segment size.
[3]High: monthly earnings over 500,000 pta (1\$ = 150 pta).
Medium: monthly earnings between 250,000 and 500,000 pta.
Modest: monthly earnings below 250,000 pta.

4.4.2. Madrid

Results from segmentation in Madrid are different because of the heterogeneity of the population of more than 5 million people (Table 7). Four segments were identified. Half of the consumers within the first segment (23% of the population) are over 60 years old, and there are more households with 2 or fewer inhabitants than in the other groups. Consumers

Table 7
Market segments in Madrid[1]

	Segment 1 Unlikely mature consumers (23%)[2]	Segment 2 Unlikely young consumers (20%)	Segment 3 Likely consumers (22%)	Segment 4 Organic food consumers (35%)
Gender*				
Male	39.2%	61.4%	42.6%	39%
Female	60.8%	38.6%	57.4%	61%
Family size*				
One member	6.9%	4.5%	4%	13.5%
Two members	30.7%	14.8%	5.9%	21.2%
Three or Four members	41.6%	51.1%	52.5%	43.6%
More than four members	20.8%	29.5%	37.6%	21.8%
Age*				
Less than 35 years old	21.6%	54.5%	56.4%	35.8%
Between 35 and 60 years old	28.4%	35.2%	30.7%	44%
More than 60 years	50%	10.3%	12.9%	20.2%
Education level*				
High school or less	48%	78.4%	83%	75.5%
More than high school	52%	21.6%	17%	24.5%
Income*[3]				
High	10.8%	18.2%	22.8%	18.2%
Medium	50%	58%	58.4%	62.3%
Modest	39.2%	23.8%	18.8%	19.5%
Consumption level*				
No consumption	50%	54.5%	45.5%	22%
Potential consumption	12.7%	14.8%	9.9%	12.6%
Occasional consumption	34.3%	29.5%	41.6%	54.7%
Regular consumption	2.9%	1.1%	3%	10.7%
Lifestyles				
Health care*	0.624	−0.248	−1.236	0.522
Natural food consumption*	−0.945	−0.352	0.103	0.736
Life equilibrium*	0.769	0.354	−0.127	0.378
Mediterranean diet*	0.319	−1.400	0.449	0.284
Organic products attitudes				
F1. Negative aspects	−0.005	0.003	0.003	−0.002
F2. Quality and healthy aspects*	−0.009	−0.179	−0.006	0.162
F3. External appearance	0.003	0.004	−0.198	0.009
Environmental attitudes				
F1. Environmental conservation*	−0.501	−0.322	−0.004	0.529
F2. Environmental concerns*	−0.0006	−0.224	0.009	0.006

[1]An * indicates that significant differences exist among segments at the 5% probability level.
[2]Segment size.
[3]High: monthly earnings over 500,000 pta (1$ = 150 pta).
Medium: monthly earnings between 250,000 and 500,000 pta.
Modest: monthly earnings below 250,000 pta.

in this group are better educated than in other segments. However, almost 90% of consumers are of medium or modest income. They are not very aware of environmental problems, but are worried about health issues and try to follow a "balanced" life. A Mediterranean diet is

valued positively, but consumption of organic products is not of much interest for them, since they do not appreciate the positive organic food products attributes. Therefore, this segment is called "Unlikely mature consumers."

The second segment is similar to the previous one in terms of the consumption level, although the percentage of regular and occasional consumers is even lower. In relation to sociodemographic characteristics, consumers in this segment are younger than those of the first segment, the percentage of male consumers is higher, and, finally, family size is larger. They are not very involved in environmental issues, have a negative image of organic products, and are not worried about diet and health but try to maintain a certain equilibrium between working and private life. This segment is labeled "Unlikely young consumers" and accounts for 20% of the population.

The third segment (22% of the population) is also mainly formed by households with 3 or 4 members (usually a couple with one or two children). The percentage of consumers educated beyond high school is very low in this group (17%). Consumers within this segment are looking for a more natural diet in which Mediterranean products play an important role, although they show a negative attitude towards the external appearance of organic food products. They are occasional buyers of organic food, and are likely to increase their consumption if the natural attribute of such products is reinforced. Thus, this segment is called "Likely consumers."

Finally, the fourth segment accounts for 35% of the population and is labeled "organic food consumers." The percentage of regular and occasional consumers is the highest in relation to other groups. It is quite similar to the second segment found in Navarra, although it is smaller. Consumers do not show special socioeconomic profiles except that there is a noticeably high percentage of female consumers. People within this group participate more actively in environmental conservation tasks and are more concerned about food diet and health than consumers in other groups.

As it can be observed from Tables 6 and 7, market segments found in both regions present certain similarities, although they are more heterogeneous in the case of Madrid. The "organic food consumers" segment is larger in the producing region (Navarra) as previously discussed. In any case, different market segments, with different socioeconomic and lifestyle characteristics, normally mean differences in preferences. In this article, the main objective was to evaluate the consumer willingness to pay (WTP) for organic products. In the next section we will answer this question and will identify differences across segments in both regions.

5. Willingness to pay: the contingent valuation method

Consumers willingness to pay (WTP) for organic food products is measured using a direct valuation method: contingent valuation (CV). A mixed questioning procedure, normally called closed-ended with follow-up, was used. This procedure consists of a dichotomous choice (DC) question and a maximum WTP question. In the DC question, consumers are asked whether or not they are willing to pay a premium, A_i, to buy an organic food product instead of a conventional one. The amount A_i is a percentage over the price of the

conventional product, and differs across consumers (5%, 10%, 15%, and 20%).[5] Consumers responses are YES if they are willing to pay at least A_i for an organic product, or NO otherwise. Consumers are then asked for the exact premium they are willing to pay.

The dichotomous individual response is linked to the maximum utility choice which allows us to calculate the WTP from appropriate welfare measures (Hanemann, 1984). Hanemann (1984) assumed that consumers know, with certainty, their utility function before being asked and after paying the amount A_i for buying organic food products. However, some components of these utilities are unknown or unobservable by researchers who consider them as stochastic. This issue is the crucial assumption that explains the relation between statistical binary response models and the utility maximizing theory (Hanemann, 1984; Haneman, 1987). Assuming a linear utility function and a logistic distribution function for the binary question, the WTP can be measured through the estimation of the following logistic function (Hanemann, 1984):

$$P_i = (1 + e^{-(\alpha + \beta \, AI)})^{-1} \qquad (1)$$

where

P_i : 1 if consumers are willing to pay the amount A_i and 0 otherwise

A_i : the four premiums offered to consumers (5%, 10%, 15% and 20%)

Therefore, the mean of wtp is calculated as follows:

$$E(WTP) = \int_0^\infty (1 + e^{-(\alpha + \beta \, A)})^{-1} \, dA = -\alpha/\beta$$

Survey data consisted of 400 questionnaires, but only 360 were available in Navarra and 376 in Madrid for estimation purposes. The rest of the questionnaires were dropped because interviewees had not answered the dichotomous question. The model defined in Eq. (1) was transformed to a linear one:

$$DC_i = \alpha + \beta \, A_i \qquad (2)$$

where

DC_i : is the logarithm of the probability ratio $(P_i/1 - P_i)$

Tables 8 and 9 show the maximum willingness to pay for various organic products (vegetables, potatoes, cereals, fruits, eggs, chicken, and red meat) in Navarra and Madrid.[6] Since we were interested in knowing if WTP differences existed across market segments, we tested for differences in WTP using a covariance analysis method. The unrestricted model was equation (1) adding the appropriate dummy variables. Two types of restrictions were tested: (1) no differences across all segments; and (2) differences between any pair of segments. Results from Likelihood Ratio tests are shown in Tables 8 and 9.

Also, we tested for starting point bias, that is, if the premium offered to consumers biased WTP results. A linear regression was used to estimate consumers WTP as a function of the offered premium. A significant relationship would mean that WTP results were biased. Only in the case of potatoes in Madrid were results conditioned on the offered premium.

In the case of Navarra, all estimated parameters in segments 1 and 2 are individually

Table 8
Willingness to pay for organic products in Navarra (% premium over the conventional product price)[1,2]

	Differences among segments[3]	Segment 1 likely consumers			Segment 2 organic food consumers			Segment 3 unlikely consumers		
		α	β	WTP	α	β	WTP	α	β	WTP
Vegetables	a,c,d	3.00*	−0.14*	21.43	2.14*	−0.09*	23.77	0.19	−0.07	2.71
Potatoes	a,c,d	2.07*	−0.12*	17.25	2.68*	−0.18*	14.89	0.97	−0.13*	7.46
Cereals	a,c,d	1.76*	−0.11*	16.00	2.27*	−0.13*	17.46	0.75	−0.09*	8.33
Fruits	a,c,d	2.32*	−0.10*	23.20	2.26*	−0.10*	22.60	0.03	−0.01	3.00
Eggs	a,c,d	1.61*	−0.08*	20.13	2.29*	−0.13*	17.61	0.56	−0.06**	9.33
Chicken	a,c,d	2.12*	−0.09*	23.55	2.27*	−0.10*	22.70	0.07	−0.02	2.33
Red meat	a,c,d	2.40*	−0.13*	18.46	2.37*	−0.11*	21.54	0.08	−0.03	2.67

[1] An * indicates that parameters are statistically significant at 5% level; two ** indicates significant at 10%.
[2] α and β are parameters in Eq. (1).
[3] a indicates WTP differences at 5% level among all segments; b indicates differences between segments 1 and 2; c, between segments 1 and 3; and d, between segments 2 and 3.

significant at 5% level (Table 8). As expected, β coefficients are negative, meaning that the higher the premium (A_i) offered to consumers, the lower is the probability of answering YES. The third column in each segment shows the willingness to pay for organic products. The WTP is significantly different among all segments at the 5% significance level (first column in Table 8). However, no differences were found between segment 1 and segment 2, indicating that potential and actual consumers are willing to pay a similar premium for all products. In both segments, the WTP ranges from 15% to 25% over the price of conventional products. Consumers included in the third segment, "Unlikely consumers," are more reluctant to pay a premium for an organic product that is consistent with their attitudes and lifestyles. Most of the estimated parameters are not significant, indicating that their WTP is zero. Only in the case of eggs is the WTP close to 10%.

In general terms, consumers in Madrid were willing to pay a smaller premium for an organic product (Table 9). Furthermore, when compared to Navarra, results obtained in Madrid are substantially different as market segments differ. The most interesting result is that all segments are willing to pay a higher premium for fruits and vegetables than for other products. It seems that for perishable products, like fruits and vegetables, the specific characteristics of organic production are more appreciated by consumers.

Consumers' WTP is significantly different across all segments when jointly considered. However, the differences between segments 1, 2, and 3 are quite small, and not significant for most products. On the other hand, the "Organic food consumers" are willing to pay a higher and significantly different premium than the other segments for organic food products. Only for animal products (red meat, chicken, and eggs) are the differences between real and potential consumers (market segments 4 and 3) not significant. Among "unlikely consumers" (market segments 1 and 2), the older consumers, worried about natural food consumption, are willing to pay a higher premium for organic meat products than the younger consumers.

Table 9
Willingness to pay for organic products in Madrid (% premium over the conventional product price)[1,2]

	Differences among segments[3]	Segment 1 Unlikely mature consumers			Segment 2 Unlikely young consumers			Segment 3 Likely consumers			Segment 4 Organic food consumers		
		α	β	WTP	α	β	WTP	α	β	WTP	α	β	WTP
Vegetables	a,c,d,f,g	1.65*	−0.15*	11.00	2.00*	−0.13*	15.38	2.51*	−0.016	15.69	2.32*	−0.11*	21.09
Potatoes	a,d,f,g	1.01**	−0.18*	5.61	0.52	−0.12*	4.33	0.20	−0.06**	3.33	1.50*	−0.11*	13.63
Cereals	a,d,f,g	0.77**	−0.15*	5.13	0.87**	−0.11*	7.91	0.32	−0.08*	4.00	0.68*	−0.06*	11.33
Fruits	a,b,c,d,f,g	1.20*	−0.13*	9.23	2.13	−0.13*	16.38	2.21*	−0.14*	15.79	1.77*	−0.07*	25.29
Eggs	a,d	0.11	−0.06*	1.83	1.1*	−0.11*	10.00	0.21	−0.01	21.00	0.96*	−0.07*	13.71
Chicken	a,d,f	0.19	−0.03	6.33	0.12	−0.05	2.40	0.16	−0.02	8.00	1.07*	−0.08*	13.38
Red meat	a,d,f	0.52	−0.07**	7.43	0.18	−0.04	4.50	0.70**	−0.05**	14.00	1.71*	−0.09*	19.00

[1] See footnote 1 in Table 8.
[2] See footnote 2 in Table 8.
[3] a indicates WTP differences at 5% level among all segments; b indicates differences between segments 1 and 2; c, between segments 1 and 3; d, between segments 1 and 4; e, between segments 2 and 3; f, between segments 2 and 4; and g, between segments 3 and 4.

6. Conclusions

Organic farming practices are becoming increasingly popular among producers, although they still represent a marginal share of arable land. New possibilities of obtaining subsidies within the Common Agricultural Policy has favored a rapid growth of organic production, although a high percentage is devoted to pastures. On the demand side, increased concerns about health, diet, and environmental deterioration have, at least among some market segments, stimulated the demand for organic food.

In Spain, organic food production and consumption has grown more slowly than in other "northern" European countries. One of the main obstacles to organic food expansion in Spain is the existing gap between conventional and organic food prices. Approximately 75% of organic production are exported to foreign countries where food prices are higher than in domestic markets. As the producers price strategy is oriented to obtain more or less the same price level in both domestic and foreign markets (mainly in Germany and Denmark where the consumption of organic products has undertaken a noticeable increase in recent years), the result is that the premium Spanish consumers have to pay for organic food products is higher in comparison to other European countries.

Two issues were explored that can affect the future development of organic production in Spain. The first was to detect market segments that could be potential consumers of organic food. The second issue was the identification of the maximum premium the various market segments were willing to pay for such products to help producers to adopt adequate pricing strategies in domestic markets. The study was carried out in two Spanish regions: one is an active producing area (Navarra), while the other is the main food consumption market (Madrid). Differences between regions were also analyzed. Finally, one of the main outcomes of this paper is that it covers a wide range of products to make comparisons both between products and market segments.

In relation to the first issue, market segments were identified considering consumers lifestyles and were then characterized, taking into account not only consumers socioeconomic characteristics, but also consumption levels and attitudes towards organic food products and environmental issues. Similar segments were obtained in both regions, although more heterogeneity was found in the case of Madrid. In general terms, three broad market segments were identified: consumers, likely consumers, and unlikely consumers. The surprising result is that organic food consumers in both regions were larger than expected, taking into account expenditure figures that were presented. The answer to this surprising result is that in many areas consumers are supplying their own products. They consider them organic, simply because no fertilizers are used, when really they are not, as there is not any official certification. Despite this result, some conclusions may be reached. In general terms, consumers socioeconomic characteristics are not very relevant when explaining differences among market segments. Lifestyles and attitudes towards environmental issues are key factors explaining organic food consumption, and have to be considered when designing appropriate promotion strategies by producers or marketers.

In relation to the second issue, three main results were obtained. First, the WTP a premium for organic food products was almost zero for unlikely consumers. Only likely and actual organic food consumers showed positive attitudes towards organic food, and were willing to

pay a premium for their attributes. Second, among the wide range of products considered, consumers were willing to pay a higher premium for meat, fruits, and vegetables suggesting that for them the organic attributes are more important in fresh and perishable products, or at least it is easier to identify them in such products. In the case of the meat, the higher premium could be partly explained by food scares that have recently taken place in Europe (BSE, dioxins, etc.). Finally, regional differences were identified. In general terms, consumers were willing to pay a higher premium for organic products in the producing region (Navarra) than in the consuming region (Madrid).

Results suggest a number of recommendations to organic food producers. The market for organic food is small. Thus, an important task is to increase consumers' knowledge of what an organic product is and how to differentiate it in the market place. A second point is that marketing strategies should be targeted towards increasing consumption among those segments most appreciative of the positive attributes of organic food. However, to increase consumption, the existing gap between conventional and organic food prices should be reduced. Information presented here about the maximum premium potential consumers are willing to pay for organic food is a useful point of departure. In the near future, competition in foreign markets will considerably increase as developing countries have begun to export organic food products. Producers should consider focusing attention on domestic markets as they demonstrate the potential for future growth. In an attempt to reduce prices, attention should be paid to reducing marketing margins. Some efforts have been made. Producers are starting to sell production directly to specialty stores, and are collaborating with public institutions to periodically organize generic promotion activities in collaboration with other typical regional products. However, further research is needed to explore alternative distribution strategies and their impact on the final price, taking into account the relatively small premium consumers are willing to pay for organic products.

Among the different market segments, special attention has to be paid to "likely consumers." They represent a potential for market growth, and specific-marketing strategies should be addressed to them. A better knowledge of their socio-demographic characteristics is needed. Results from this study show that the "likely consumers" segment in Navarra and Madrid are formed by consumers living in households with three or more members, with a lower level of education (high school or less), and are concerned with following a natural diet. In the case of Navarra, likely consumers are mainly female, while in Madrid a higher percentage is relatively young (less than 35 years old). Therefore, marketing campaigns should be addressed to young people trying to create new food habits, and emphasizing the natural attributes of organic food products.

Notes

1. Census data were available in both regions.
2. Only consumers with at least a certain knowledge of what organic products are were interviewed. In a previous qualitative research, 90% of the respondents said they had heard or knew something about organic products. More or less the same

percentage was found in this survey. Thus, the sample seems reasonably representative.

3.   The nonlinear principal components analysis (De Leeuw and Rijckevorsel, 1980) was also used as an alternative to condense the information. Results were almost identical to those presented.

4.   Four categories were defined: (1) regular consumption; (2) occasional consumption; (3) no consumption but probably yes in the near future; (4) no consumption at all.

5.   Consumers are randomly offered a premium of 5, 10, 15, or 20% above the marketed price for a conventional product. Our 400 interviews resulted in 100 questions for each premium A_i.

6.   For comparison purposes, the sample average WTP for different products in Navarra and Madrid are respectively: vegetables (13%, 12%); potatoes (9%, 9%); cereals (10%, 8%); fruits (13%, 13%); eggs (10%, 11%); chicken (13%, 9%); and red meat (14%, 11%).

Appendix

1. Lifestyle questions in the questionnaire

Answer your degree of disagreement or agreement (on a 1 to 7 scale where 1 is "strongly disagree" and 7 is "strongly agree") with the following sentences:

I follow a low-salt diet (salt control)
I am vegetarian (vegetarian food)
I do exercise regularly (regular exercise)
I avoid eating processed food (no processed food)
I often eat fruits and vegetables (high fruit consumption)
I rarely eat red meat (moderate meat consumption)
I avoid eating food products with additives (without additives)
I take regular health check-ups (regular health control)
I try to reduce my stress (less stress)
I try to have an organized and methodical lifestyle (ordered life)
I try to balance work and personal aspects (working/private life)

2. Environmental attitudes questions in the questionnaire

Answer your degree of disagreement or agreement (on a 1 to 7 scale where 1 is "strongly disagree" and 7 is "strongly agree") with the following sentences:

The current development path is destroying the environment (development destruction)
I prefer consuming recycled products (recycled products consumption)
I dispose of my garbage in different containers (recycling practice)

Unless we do something, environmental damage will be irreversible (environmental damage)

I practice environmental conservation tasks (environmental conservation)

3. Organic product attitudes questions in the questionnaire

Answer the degree of disagreement or agreement (1 to 7 scale where 1 is "strongly disagree" and 7 is "strongly agree") with the following sentences:

Organic products *are healthier* (health benefit)
Organic products *have superior quality* (quality)
Organic products *are a fraud* (fraud)
Organic products *are more tasty* (tasty)
Organic products *are worse than the conventional ones* (worse)
Organic products *are more expensive* (expensive)
Organic products *are more attractive* (attractive)
Organic products *have not harmful effects* (no harmful effects)
Organic products *are in fashion* (fashion)

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