Analysis of the relation between organic products consumption and box schemes use in Alicante (Spain)

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ABSTRACT

Box-schemes or organic food subscription plans consist on a regular delivery of a box of seasonal fruits and/or vegetables, preferably organic, cultivated in the vicinity at a specified point using subscription, The object of the present work is trying to examine whether there is a relationship between consumer knowledge about these short distribution channels and the consumption of organic products in the province of Alicante. A survey has been conducted among 400 usual food buyers in this Spanish province. It has been found that the consumption of organic products and the knowledge of such initiatives are linked. We recommend to companies that use this type of distribution channel to publicize its benefits.

Keywords: Box-Scheme; Environmental; Consumer; Knowledge; Distribution

1. INTRODUCTION

A box-scheme is a regular home delivery (or at a central sale point), through subscription, of a seasonal fruit and/or vegetables box, preferably organic, locally cultivated. Factors identified as success keys of this marketing channel are: supply variety, price/quality ratio, high-quality and reliable delivery (Alonso and Guzmán, 2002 [1] and 2006 [2]; Alonso et al., 2002 [3]; Haldy, 2004 [4]; Midmore et al., 2004 [5]; Padel et al., 2004 [6]; Cavard and Baros, 2005 [7]; Seyfang, 2006 [8]; Baros, 2007 [9]; Brown et al., 2009 [10]; Diaz et al., 2009 [11]; Gliessman and Rosemeyer, 2010 [12,13]). Main operational features of this distribution tool are: regular delivery; product range and limited customer choice.

Spanish fresh fruit and vegetables consumption tends to equalize models in European developed countries based on differentiation and segmentation factors according to demographic and social trends, and the in-corporation to the demand function of product new features and values of new features and values relative to the product (Sanchez et al., 2001 [14]; Brugarolas and Rivera, 2001 [15]; Colom and Saez, 2001 [16]; Soler et al., 2002 [17]; Bernabéu et al., 2004 [18]; Montoro and Castaneda, 2005 [19]; Brugarolas et al., 2005 [20] and 2007 [21]).

Spain, despite being a major producer of organic farming, has a weak market and most of this production (around 85%) is exported (Alonso, 2001 [22]; Guzmán and Alonso, 2003 [23]). The growth of emerging environmental markets need to maintain and enhance short distribution channels and farmers cooperation (Alonso and Guzmán, 2000 [24]; Cobo and González, 2001 [25]; Vicente and Ruiz, 2003 [26]; Padel et al. 2004 [6], Alonso, 2004 [27]; Midmore et al., 2004 [5]; Diaz et al., 2009 [11]).

This work aims to examine if there is a relationship between consumer knowledge of these distribution channels and consumption of organic products in Alicante province. Variables related to fresh product characteristics that were most important for consumers have been defined as factors. Then, segmentations have been made attending organic products consumption and the box-schemes level of knowledge. Finally, relationship between both is analysed.

2. MATERIALS AND METHODS

400 surveys were made throughout the province of Alicante, with a maximum error of 5% and a level of confidence of 95%, through a conglomerates sampling with ramdom subsampling, looking for usual market basket buyers of the usual food basket in entrance access to facilities (supermarkets, hypermarkets, central markets, street markets, etc.).

In order to get a self—weighed up resulting sample, the selection of conglomerates was done related to their size at the first stage. Participation units in the sample were also proportional to the size of the conglomerate at the second stage. A pre-test to 20 people was done to

detect possible errors in the questionnaire design. Surveys were conducted during June, October and November 2007 in order to avoid making surveys in the summer period due to the great possibility of finding non-residents during July and August. Surveys were conducted in Alcoy, Alicante, Villena, Elda, Petrer, Novelda, Denia, Javea, Calpe, Benidorm, Villajoyosa, Altea, San Vicente del Raspeig, San Juan, Elche, Crevillente, Torrevieja, Orihuela and Pilar de la Horadada.

The survey consisted of 26 closed questions. It included a filter question to rule out those who do not usually perform familiar food purchasing. The questionnaire asked about organic products knowledge and consumption frequency. It looked at buying and fruit/vegetables consumption habits. It also asked about the willingness to consume them. It also looked for identifying which the most important features of fresh products were in order to be purchased, the most valued characteristics of the box-scheme, population lifestyles and the most relevant socio-economic characteristics of the respondent.

3. RESULTS AND DISCUSSION

As it has been said, the more valuated (by respondents) variables related to the fresh product characteristics of the fresh product were simplified in factors before the segmentations (Diaz *et al.*, 2009) [14]).

The first group of variables, consisting of three factors (which explain a total variance of 63.95%), refer to *valued attributes in fruit and vegetables*. The first factor, "product composition" includes attributes such as nutriational value, health and texture; along with those production methods that guarantee a more natural product composition (organic and integrated production). A second factor would be "production method and origin regardless of the price" and it groups production related attributes (local origin, D.O., etc.). The third factor, "organoleptic characteristics", focuses on fresh product

taste, aroma and visual appearance.

A second group of variables would be *box-scheme product/service features*. The three extracted factors explain a total variance of 66.73%. The first one, "product characteristics and environmental benefits", groups features related to the product (freshness, local origin, healthy, organic) and the environmental benefits that this type of direct sale produces (packaging and food miles reduction, biodiversity improvement, etc.). The second, "social and economic benefits" encompasses variables related to support local economies and rural development. Finally, the "personal benefits" factor groups variables which impact directly on consumers (home delivery service and shopping experience).

Finally, the third group of factors, *consumer lifestyle*, shows two factors which explain a total variance of 53.60%. The first factor, "concern for health and nutrition" encompasses aspects related to food and exercise. The second factor, "social and environmental awareness and responsible consumption" groups variables related to environmental concern and collaboration with non-governmental organizations and the fact of reading the product labels.

3.1. Segmentation Based on the Level of Organic Product Consumption

Alicante consumers have been segmented in four groups based on organic products consumption (**Table 1**): usual (9.2% of population), occasional and/or test (45%), potential (those who do not consume but stated that they could do it, 41.2% of respondents) and non consumption (those who stated that they would not consume such products, 4.6%). **Table 2** shows the characterization of these four segments attending different descriptive variables (the table only shows those variables that have statistically significant relationships).

Table 1. Consumers segment characterization according to their organic product consumption based on several variables.

Variables/Factors	Segment 1 Usual consumption (9.2%)	Segment 2 Occasional consumption (45.0%)	Segment 3 Potential consumption (41.2%)	Segment 4 Non consumption (4.6%)
Fruits and vegetables attributes				
Product composition*	1.292[a]	–0.308[b]	0.066[b]	–0.148[b]
Production method and origin regardless of the price*	1.288[a]	–0.043[b]	–0.210[b]	–0.262[b]
Organoleptic characteristics*	–0.389[a]	–0.064[a,b]	0.090[a,b]	0.605[b]
Box-scheme product/service features				
Product characteristics and environmental benefits*	1.354[a]	–0.108[b]	–0.136[b]	–0.424[b]
Social and economic benefits	0.348	–0.047	0.018	–0.400
Personal benefits	–0.099	–0.111	0.116	0.237
Consumer lifestyle				
Concern for health and nutrition*	1.001[a]	–0.168[b]	0.031[b]	–0.625[b]
Social and environmental awareness and responsible consumption*	1.030[a]	0.102[b]	–0.278[b]	–0.560[b]

*Significant differences for p < 1%; Averages with different letters at the same row are statistically different (Tukey, p < 0.05).

Table 2. Consumers segment characterization according to their organic products consumption based on different descriptive variables.

	Segment 1	Segment 2	Segment 3	Segment 4	Total
Country of origin**					
Spanish	58.3%	83.1%	98.1%	100.0%	87.8%
EU citizen	33.3%	13.6%	1.9%	0.0%	9.9%
Non EU citizen	8.3%	3.4%	0.0%	0.0%	2.3%
Monthly family incomes*					
<1.000 €	0.0%	5.1%	1.9%	0.0%	3.1%
1.001 - 1.500 €	0.0%	20.3%	9.3%	16.7%	13.7%
1.501 - 2.000 €	16.7%	20.3%	33.3%	83.3%	28.2%
2.001 - 3.000 €	25.0%	37.3%	42.6%	0.0%	36.6%
>3.000 €	58.3%	16.9%	13.0%	0.0%	18.3%
Fruits and Vegetables buying places**					
Supermarkets	75.0%	71.2%	64.8%	83.3%	69.5%
Hypermarkets	25.0%	18.6%	33.3%	50.0%	26.7%
Discount	16.7%	8.5%	5.6%	33.3%	9.2%
Traditional shop	75.0%	71.2%	75.9%	66.7%	73.3%
Central markets	66.7%	39.0%	38.9%	0.0%	39.7%
Street markets	41.7%	20.3%	5.6%	0.0%	15.3%
Others	8.3%	1.7%	0.0%	0.0%	1.5%
Knowledge about Box-scheme*					
They know it	75.0%	18.6%	1.9%	0.0%	16.0%

*, **Significant differences for p < 1% and 5% respectively.

Thus, organic products usual consumers value product composition when choosing fruit and vegetables. They pay attention to production systems that are environmental respectful (organic and integrated production) and the local origin of the product regardless of price. They consider product features and environmental benefits as the most important features when they valuate box-scheme model. Regarding lifestyles, these consumers are particularly concerned about their health and nutrition. They also show a strong social and environmental awareness. They show the highest visit frequency to central markets and street markets (**Table 2**). This can be due to the fact that it is the segment where there are more European Union citizens. It is also the segment with higher incomes.

3.2. Segmentation Based on the Level of Knowledge about Box-Scheme

Consumers have been segmented in three groups regarding their level of knowledge about this distribution channel: low, medium or high (**Table 3**). The first segment is composed by consumers with a low level of knowledge (it represents 29% of the population). The second segment comprises those consumers with a medium level of knowledge (46.6%). The third segment represents those consumers whose knowledge is high

(24.4% of respondents).

Consumers that show a low level of knowledge about box-scheme are characterized by having no interest on product composition, environmentally friendly production methods and product origin. They pay attention to price when they choose fresh products. They do not appreciate box-schemes and they note a great ignorance about similar initiatives. They do not show any concern about health or nutrition, neither about environmental and social issues. They usually buy fruit and vegetables at hypermarkets (higher proportion than the total average). Their purchase frequency is higher than the rest of segments. The socio-economic and demographic variables stress their national character, their lower educational levels and the less variety of occupations (with housewives highest proportion). This segment also shows the lowest income levels (**Table 4**).

The second segment (consumers that showed a medium level of knowledge about box-schemes) shows some interest on fresh product composition when choosing it. However, they do not note it regarding production system or origin. They value product characteristics and environmental benefits of box-schemes. They do not value its social benefits. Their lifestyles seem slightly concerned about health and nutrition, without a strong social or environmental awareness. Their fruits and vegetables purchase habits reflect those of the average total except

lightweight differences (they buy more in supermarkets and less in street markets). Their knowledge about box-schemes is slightly lower than the average.

The third segment corresponds to consumers who showed a high knowledge about box-scheme. They greatly appreciate the production method and fruit and vegetable origin regardless of price. They give importance to product composition. They perceive box-scheme as positive, mainly because of product characteristics and its environmental benefits, and, to a lesser extent, because of its social benefits. Regarding their lifestyles, they show a strong social conscience and environmental concern. They also note a high concern for health and nutrition. There is a higher proportion of consumers who buy at central, street markets and discount (this last may due to the high proportion of EU citizens in this segment) and a lower proportion of shopping at hypermarkets. As we found in the previous segmentation regarding usual consumers, this segment shows shorter purchase frequencies. This segment comprises the highest levels of studies and the highest incomes.

3.3. Analysis of the Relation between Organic Aroduct Consumption and the Level of Knowledge about Box-Scheme

The data obtained from both segmentations can be compared. Firstly, it is possible to look at consumers characteristics in segments that declare to consume organic products on a regular basis (Segment 1, **Table 1**) and those with a high level of knowledge about short distribution channels (Segment 3, **Table 3**).

Both segments value product composition, environmentally friendly production systems and the local origin of the product regardless of price. Both groups also perceive box-scheme positively, mainly because product features and its environmental benefits.

Regarding their lifestyles, both are particularly concerned about their health and nutrition and possess a strong social and environmental awareness. In their fruit and vegetables purchase habits, both groups have the shortest purchase frequencies. They also are those who visit the most central markets and street markets.

Finally, looking at other socio-economic and demographic variables, both groups show a greater presence of University studies and a higher income level.

Similarly, it would also be possible to compare consumer features of the segment that declares not to consume such products (Segment 4, **Table 1**) and consumer features with a low level of knowledge about box-scheme (Segment 1, **Table 3**).

Both segments value above all fresh product attributes its organoleptic characteristics, and are more concerned about price. Similarly, they prefer the personal benefits that box-scheme would bring them.

Their lifestyle similarities must be underlined. Both groups do not show any concern about health, nutrition and the environment. They are characterized by a lack of a strong social conscience. Both groups presented the highest percentages of shopping in supermarkets, hypermarkets and discounts.

Regarding socio-economic and demographic variables, we observe their Spanish character, a higher percentage of housewives and the lowest income level.

Table 3. Consumers segment characterization according to their level of knowledge about box-scheme based on several variables.

Variables/Factors	Segment 1	Segment 2	Segment 3
	Low level (29.0%)	Medium level (46.6%)	High level (24.4%)
Fruits and vegetables attributes			
Product composition*	–0.524[a]	0.124[b]	0.386[b]
Production method and origin regardless of the price**	–0.364[a]	–0.134[a]	0.687[b]
Organoleptic characteristics	0.130	0.019	–0.191
Box-scheme product/service features			
Product characteristics and environmental benefits*	–0.672[a]	0.029[b]	0.743[c]
Social and economic benefits**	–0.199[a]	–0.053[a,b]	0.336[b]
Personal benefits	0.033	0.134	–0.295
Consumer lifestyle			
Concern for health and nutrition*	–0.501[a]	0.080[b]	0.442[b]
Social and environmental awareness and responsible consumption*	–0.446[a]	–0.040[a]	0.607[b]

*Significant differences for $p < 1\%$; Averages with different letters at the same row are statistically different (Tukey, $p < 0.05$).

Table 4. Consumers segment characterization according to their level of knowledge about box-scheme based on different descriptive variables.

	Segment 1	Segment 2	Segment 3	Total
Country of origin*				
Spanish	97.4%	90.2%	71.9%	87.8%
EU citizen	2.6%	6.6%	25.0%	9.9%
Non EU citizen	0.0%	3.3%	3.1%	2.3%
Studies**				
School	21.1%	8.2%	3.1%	10.7%
Compulsory Education	26.3%	19.7%	6.3%	18.3%
High School	21.1%	19.7%	6.3%	16.8%
Professional Education	15.8%	16.4%	31.3%	19.8%
Degree	15.8%	36.1%	53.1%	34.4%
Job**				
Housewife	42.1%	36.1%	3.1%	29.8%
Liberal Professions	2.6%	6.6%	15.6%	7.6%
Autonomous	7.9%	4.9%	31.3%	12.2%
Employee	31.6%	42.6%	25.0%	35.1%
Civil Servant	5.3%	0.0%	6.3%	3.1%
Civil Servant with degree	2.6%	3.3%	9.4%	4.6%
Retired	7.9%	1.6%	3.1%	3.8%
Student	0.0%	1.6%	3.1%	1.5%
Businessman	0.0%	3.3%	3.1%	2.3%
Monthly family incomes**				
<1.000 €	5.3%	3.3%	0.0%	3.1%
1.001 - 1.500 €	26.3%	9.8%	6.3%	13.7%
1.501 - 2.000 €	36.8%	27.9%	18.8%	28.2%
2.001 - 3.000 €	31.6%	39.3%	37.5%	36.6%
>3.000 €	0.0%	19.7%	37.5%	18.3%
Fruits and Vegetables buying places *				
Supermarkets	63.2%	72.1%	71.9%	69.5%
Hypermarkets	36.8%	26.2%	15.6%	26.7%
Discount	7.9%	8.2%	12.5%	9.2%
Traditional shop	76.3%	73.8%	68.8%	73.3%
Central markets	36.8%	39.3%	43.8%	39.7%
Street markets	10.5%	11.5%	28.1%	15.3%
Others	0.0%	0.0%	6.3%	1.5%
Fruits and vegetables buying frequency**				
Every 2 days	26.3%	11.5%	21.9%	18.3%
Every 3 - 4 days	44.7%	75.4%	75.0%	66.4%
Once per week	28.9%	13.1%	3.1%	15.3%
Knowledge about Box-scheme**				
They know it	2.6%	11.5%	40.6%	16.0%

*, **Significant differences for p < 1% and 5% respectively.

4. CONCLUSIONS

The objective of this work was to examine whether there was a relationship between the organic product consumption and the use of box-scheme in the province of Alicante.

It has been seen how there are many similarities between members of the segments that declare to consume organic products regularly and those that show a high level of knowledge about these short distribution channel. Something similar can be said about the consumer segment that declares not to consume these products and the consumer segment with a low level of knowledge about box-scheme.

So, it can be said that consumption and knowledge are linked. It would be interesting to analyse if knowledge precedes consumption or vice versa in further research. In any case, it seems clear that companies that use this type of distribution channel must work to publicize its benefits.

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