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The consumer of food products in organic markets of central Mexico

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Abstract

Purpose – The purpose of this paper is to identify the characteristics of consumers of organic food, based on their motivations.
Design/methodology/approach – A questionnaire based on the Food Choice Questionnaire was applied to a 656 consumers. A multivariate factor analysis and cluster analysis was performed to the data.
Findings – Seven factors were identified: ecological concern; nutritional content; availability of natural products; sensory aspects; certifications, health and confidence; and economic aspects. Resulting clusters were named as: conscious and interested in certification; conscious with no interest in certification; opportunist in transition; unconscious opportunist. There are signs of different consumers. The consumers of these products are characterised by an interaction between hedonic and ethical motivations, where the most important motivation is environmental concern and the least important are the economic aspects.
Research limitations/implications – The reduced number of alternative markets in Mexico limits the amplitude of the research.
Practical implications – The work herein reported is pioneer and contributes to reduce the lack of studies on the motivations and characteristics of consumers of organic foods in Mexico. Findings may set a path for new research in other cultural contexts; as well as for more specific work in Mexico as of consumers of industrialised organic products.
Social implications – Characterising consumers of organic foods will enable the development of these markets.
Originality/value – Social studies of eating habits have taken place in European countries; and several works have been developed in other areas of the world to determine the way in which consumers build their preferences and food choice patterns. In Mexico, specifically in organic foods, studies have focussed in agrarian economics, but the analysis of motivations for choice has not been addressed. Therefore, it is important to research this issue given the relevance for consumers.

Keywords Organic food, Consumers, Motivations, Characterization

Paper type Research paper

Introduction

Since the nineteenth century, and especially after the Second World War, the industrialisation of food production and the so-called "green revolution" caused dietary changes in virtually all countries. The increase in food production and the strategic distribution of processed foods changed the territorial model and broke the bond between food products and the land (Pérez Izquierdo *et al.*, 2012; Montiel and Collado, 2010). The use of agrochemicals brought several benefits such as increased food production and access to cheap food, but it had a negative impact on the environment, which generated discontent and gave rise to a negative social perception of the global food system and agricultural industrialisation (Zanoli *et al.*, 2012; Pinstrup-Andersen, 2011; Krom and Mol, 2010; Montiel and Collado, 2010).

This problem, coupled with recurring food scandals, the most emblematic of which was the one involving Bovine Spongiform Encephalopathy (Krom and Mol, 2010; Calle Collado *et al.*, 2012), have resulted in the emergence, within some societies and sectors, of consumers considerably more concerned, critical and aware of the food they buy. One consequence was the popularisation of buying habits focussed on food safety (Olsen and Bánáti, 2014) and the

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increase in demand for healthy food (Viana *et al.*, 2014; Krom and Mol, 2010; Espeitx, 1996). This type of consumers value the natural aspects of food, the possibility of establishing a link with the producers and the consumption of local products (Zanoli *et al.*, 2012; Krom and Mol, 2010; Aguilar, 2007).

In response, there has been a change in some of the practices of food production (Pérez Izquierdo *et al.*, 2012); more importance has been given to organic agriculture, which combines tradition, innovation and science to benefit the environment and promote fair relationships and a good quality of life for all people involved in it (International Federation of Organic Agriculture, 2015; United States Department of Agriculture, 2014). This is what satisfies the wishes of alternative consumers (Krom and Mol, 2010).

However, the preference for organic products is very heterogeneous; some studies suggest the existence of two consumption trends. The first one is hedonistic or selfish consumption, in which pleasure and joy is produced by the act of buying itself (Bakırtaş and Divanoğlu, 2013; Alba and Williams, 2013), and which is driven by the search for individual health benefits such as safety, quality, taste, freshness, authenticity, naturalness and nutritional content.

The second trend is ethical or altruistic consumption, in which consumers consider the effect their purchase decisions have on the public welfare and the world around them (Langen, 2012). These include animal welfare, environmental protection, rural and local development and sustainable agriculture (Lee and Yun, 2015; Vega-Zamora *et al.*, 2013; Van Loo *et al.*, 2014; Zanoli *et al.*, 2012; Krom and Mol, 2010; Zander and Hamm, 2010).

In European countries, the consumption of organic food started earlier and has tended to increase in recent years (Calle Collado *et al.*, 2012), but in other regions, such as Mexico, it started only after 2000 (Secretaría de Agricultura, Ganadería, Desarrollo rural, Pesca y Alimentación (SAGARPA), 2013; Schwentesius Rinderman, 2010), which is paradoxical given that the production of organic food in the country dates back to the 1960s (Schwentesius Rinderman, 2010). México is considered a producer an exporter of organic foods, where 85 per cent of its organic production is exported and 15 per cent is for national consumption (SAGARPA, 2013; Schwentesius Rinderman, 2010).

In 2009, Mexico was the fifth country with more organic farms worldwide. It is currently recognised as the third country with more organic farmers and sixth with the highest surface devoted to organic production (International Federation of Organic Agriculture, 2016); as well as fourth in terms of volume of organic production (Secretaria de agricultura, ganadería, desarrollo rural, pesca y alimentación, 2016).

Demand for organic foods, as in other parts of the world, has grown in recent years (Calle Collado *et al.*, 2012), and therefore it has given rise to commercialisation initiatives through various channels of distribution. Growth in this sector required a regulatory framework for certification, which became official with the Mexican Law for organic products which gives certainty to farmers and consumers (Secretaría de Agricultura, Ganadería, Desarrollo rural, Pesca y Alimentación (SAGARPA), 2014a).

On the one hand, specialised stores, health food stores and supermarkets, where more than 50 per cent of the products are of foreign origin. On the other hand, the increasing number of "*tianguis*" (a word from nahuatl that gives name to the weekly street markets in each community or district) and local organic markets offering local products (Schwentesius Rinderman, 2010), as in the case of the "*Red Mexicana de Tianguis y Mercados Orgánicos*" (Mexican Network of *Tianguis* and Organic Markets), that have the seal of "Participatory Certification" that is recognised officially (Red Mexicana de Tianguis y Mercados Orgánicos, 2015).

According to Krom and Mol (2010), unlike specialized stores, these spaces provide direct contact with producers and enable a specific population of consumers to establish trust relationships with them. Several studies have established that the development and growth

of these markets depends largely on knowing the consumers and meeting their needs (Ruiz de Maya *et al.*, 2011; Zander and Hamm, 2010).

However, it noteworthy to mention that contrary to the above, the few studies on organic foods conducted in Mexico have addressed the point of view of their relationship with agricultural economics (SAGARPA, 2014a; Schwentesius Rinderman, 2010). There has been little interest in studying the role of consumers in the demand for these foods, which would be essential to develop a strong and dynamic domestic market for these products (Pérez Izquierdo *et al.*, 2012).

These studies are still scarce, but some research has already focussed on the perception of consumers, as in the study by Gutiérrez Pérez *et al.* (2011), who evaluated the social representations that consumers form about different types of markets. Pérez Izquierdo *et al.* (2012) conducted a study in the port of Veracruz, México, to identify the perceptions of consumers and producers/sellers of organic food; and Díaz Víquez *et al.* (2015) determined the characteristics of potential consumers of organic food in Mexico City. However, these studies have focussed on potential, not on actual consumers.

On the other hand, Espinoza-Ortega *et al.* (2016) identify in a study on the motivations for food choice by consumers in central Mexico that there is little or nul interest in issues related to the environment, animal welfare, quality seals, health care or weight control; which warrant deeper studies with specific groups of consumers, like consumers of organic foods.

Assuming that people who buy in organic products sale points are consumers interested in these foods, the present study aims to identify the motivations of consumers of organic foods in street markets (*tianguis*) of central Mexico.

Methods

Questionnaire

Data were collected by means of a questionnaire developed from the Food Choice Questionnaire (FCHQ) (Steptoe *et al.*, 1995), a tool to identify issues perceived as relevant in the choice of foods, that has been utilised in heterogeneous populations (Pula *et al.*, 2014; Fotopoulos *et al.*, 2009).

The questionnaire comprised three sections. The first one concerns the information that consumers have about these products and how frequently they consume it; the second section based on the scheme of the FCHQ (Steptoe *et al.*, 1995); that considers ten variables with three items each for a total of 30 items (Table I). Answers were measured using a five point Likert scale (Bryman and Cramer, 2011) where 1, not important and 5, very important (Lee and Yun, 2015; Mohamada *et al.*, 2014; Vega-Zamora *et al.*, 2013). The third section focusses on socioeconomic aspects like: sex, age, marital status, education and occupation (Fotopoulos *et al.*, 2009).

Data collection

Krom and Mol (2010) mention that these studies must be undertaken with the specific population of organic foods consumers, in the place of sale, enabling an easier search for consumers (Toivonen, 2012).

The questionnaires were applied to consumers that buy in organic markets in central Mexico. All products offered in these markets have the participatory certification. The questionnaires were distributed randomly by convenience sampling to consumers over 18 years of age (Díaz Víquez *et al.*, 2015; Ruiz de Maya *et al.*, 2011). The size of the sample was determined according to the study of Lee and Yun (2015), and to the rules for cluster analysis, which require five cases for each variable analysed (Field, 2013; Hair *et al.*, 2010), for a total of 656 cases.

Data analysis

Data were analysed using multivariate statistics with the software Statgraphics Centurion XVII. The 30 items were subject to a factor analysis (Aschemann-Witzel *et al.*, 2013;

Variable	Item
1. Nutritional content	I consume them due to their content of vitamins and minerals
	I consume them for their nutritional content
	I am indifferent to their nutritional content
2. Sensory aspects	I consume them because they look attractive
	I prefer them for their smell
	I choose them for their flavour
3. Natural content	I consume them because they are free of chemicals[a]
	I consume them for their natural ingredients[a]
	I consume them because they are free of artificial ingredients
4. Economic aspects	I consume them because their price is fair[a]
	I buy organic foods irrespective of their price
	The high price determines the frequency of my consumption
5. Health	When I consume them I think of cancer prevention
	Consuming these foods improves my health
	I consume them to prevent diseases
6. Familiarity	I always buy organic foods from the same seller
	I choose organic foods because they are produced locally[a]
	The origin of organic foods limits my consumption[a]
7. Ecological concerns	I consume them because they do not affect the balance of nature
	I consume them because they are packaged in a way that respects the environment
	I consume them because they do not pollute water with chemicals
8. Ethical intentions	I consume them because I contribute to a better world
	Their consumption reduces pollution
	When I consume them, I feel I am doing the right thing
9. Availability	I am interested in finding them easily
	I travel far to buy them[a]
	I search for specialised places to buy them
10. Safety	I verify that they have organic certifications
	I trust in what my seller tells me[a]
	I read the information on the label

Note: [a]Items that were omitted out of the results of commonalities in the factor analysis

Table I.
Variables and items in the questionnaire to obtained the motivation for choice of organic foods

Zander and Hamm, 2010), a multivariate statistical method used to identify the relationships between items related to the motivations for choice. Principal component analysis (PCA) was utilised (Fotopoulos *et al.*, 2009; Steptoe *et al.*, 1995) as the factor identification extraction method (Field, 2013; Hair *et al.*, 2010). Final analysis was done with 23 items that contributed significantly to the explained variance of the model.

The Kaiser-Meyer-Olkin index (KMO) was used as a measure of sample adequacy, with > 0.5 as an acceptable value for factor analysis. Varimax orthogonal rotation was used to facilitate the interpretation of the factors obtained (Field, 2013); and factors were named according to the items that the analysis included within each resulting factors.

The factor loadings obtained from PCA were used in a hierarchical cluster analysis (Martín *et al.*, 2008; Álvarez, 1995) using Ward's method as an agglomerative algorithm to measure the similarity among subjects and group them using the Euclidean distance (Field, 2013; Hair *et al.*, 2010), in order to group individuals with common characteristics and each cluster was named according to those characteristics (Field, 2013; Ruiz de Maya *et al.*, 2011; Fotopoulos *et al.*, 2009; Steptoe *et al.*, 1995).

The dendrogram and agglomerative outline obtained from Ward's method and the interpretation of the resulting solutions were used to establish the most meaningful number of clusters (Hair *et al.*, 2010).

Finally, nonparametric KrusKal-Wallis and Mann-Whitney tests were applied to identify statistical differences ($p < 0.05$) among groups in relation to the factors identified (Field, 2013; Hair *et al.*, 2010).

The analysis of the socioeconomic information by cluster was analysed with descriptive statistics once clusters were identified and named.

Also, the median and interquartile range was used as measures of central tendency and dispersion; since items were recorded in an ordinal scale. The reliability of the Likert type scale used in this study was ascertained with Cronbach's α coefficient of 0.7 or above (Field, 2013).

Results and discussion

Factor analysis

The analysis identified seven factors with a cumulative variance of 63.09 per cent and a KMO of 0.854 (Table II) as follows.

Factor 1: ecological concern. The positive items grouped in this factor account for 25.99 per cent of the cumulative variance. This factor was named as tis constituent items are related to an ecological concern. They are: interest in not to affecting the balance of nature, in building a better world, in packaging that respects the environment, in foods that reduce pollution, in not polluting water, in doing the right thing by consuming them, and in improving health.

Factor 2: named as nutritional content. This factor groups the following items: content of vitamins and minerals, nutritional content and importance of the nutritional value of the food. It accounts for 8.55 per cent of the cumulative variance.

Table II.
Factors obtained and their corresponding variances

Name of the factor	Item	% of variance	% of cumulative variance
1. Ecological concerns	I consume them because they do not affect the balance of nature	25.99	25.99
	I consume them because I help build a better world		
	Consuming them improves my health		
	I consume them because they are packaged in a way that respects the environment		
	Consuming them reduces pollution		
	I consume them because they do not pollute the water		
	I feel I'm doing the right thing by consuming them		
2. Nutritional content	I consume them because of their content of vitamins and minerals	8.55	34.54
	I consume them because of their nutritional content		
	I consider important their nutritional contribution		
3. Availability of natural products	I want to find them easily	7.18	41.72
	I consume them because they are free of artificial ingredients		
	I look for specialized stores to buy them		
4. Sensory aspects	I consume them because they look pleasant	6.47	48.19
	I prefer them for their aroma		
	I choose them for their taste		
5. Certifications	I look for an organic seal	5.53	53.72
	I read the information in the label		
6. Health and trust	I think of cancer when I consume them	4.73	58.45
	I buy organic foods always from the same seller		
	I consume them to prevent diseases		
7. Economic aspects	I buy organic foods regardless of price	4.64	63.09
	Their high price does not determine the frequency of consumption		

Product availability was the name of Factor 3. The items considered in this factor account for 7.18 per cent of the cumulative variance: searching for specialized stores, interest in easily finding organic food and the desire to consume foods free of artificial ingredients.

Factor 4: sensory aspects. This factor accounts for 6.47 per cent of the cumulative variance, and the named was clear due positive items related to the consumption of these products because of their looks, aroma and flavour.

Factor 5: certifications. This factor accounts for 5.53 per cent of the cumulative variance and has a positive association with the items related to the presence of an organic seal and the information contained in the label.

Factor 6: was named as health and confidence. The positive items related in this factor account for 4.73 per cent of the cumulative variance; these are: consumption to prevent disease, concern about cancer and buying always from the same seller.

Finaly, the name for Factor 7 was Economic aspects, since its items have a positive association with the acquisition of these foods regardless of price, which does not determine the frequency of consumption.

The number of variables or factors found in this study was lower compared to other studies that reported nine (Hjelmar, 2011) and ten (Zander and Hamm, 2010). However, we found more factors than Lee and Yun (2015), Mohamada *et al.* (2014) and Stolz *et al.* (2011), who reported five, and Vega-Zamora *et al.* (2013), who reported six; this suggests that the number of motivations varies with each population.

The most important factor was "ecological concern". Other studies mention this factor, but Lee and Yun (2015) ranked it third in importance, and Van Loo *et al.* (2014) ranked it fourth. Hjelmar (2011) mentions that the decision to buy organic food is influenced by ecological principles and animal welfare, as these foods are less toxic to the environment due to the absence of pesticides in their production process. However, Vega-Zamora *et al.* (2013) found that the preservation of the environment is only a mediating factor of the decision to buy these products.

Regarding "Nutritional content", Lee and Yun (2015) report it as the most important in the buying of these products, which are considered healthier than conventional products; furthermore, Aschemann-Witzel *et al.* (2013) mention that the fact that displaying the nutritional specifications gives confidence to the consumers. However, although various studies mention that organic foods have some nutritional benefits, they also show that these products are deficient in some components and that its nutritional superiority cannot be demonstrated (Griffiths *et al.*, 2012; Smith-Spangler *et al.*, 2012; Lairon, 2011; Reganold *et al.*, 2010). An example is organic milk, which contains up to 50 per cent more omega-3, vitamin E and linoleic acid than conventionally produced, but has less iodine content (Średnicka-Tober *et al.*, 2016), which shows that the nutritional superiority of organic foods is a matter of perception.

Regarding "Product Availability", Hjelmar (2011) names this variable as "Efficiency", since these products should be obtained easily and be constantly available so that consumers do not have to spend a lot of time looking for them. This is an important factor; according to Lim *et al.* (2014), it involves not only the proximity of the places that sell these products, but also the variety of available products. Chang *et al.* (2014) mention that the availability of products depends on the concentration of selling places, the regional supply and climate, among other circumstances. An increased number of spaces where organic foods are sold leads to an increased demand, producing a significant impact on eating habits, change in prices and an increase in the number of products offered (Chang *et al.*, 2014; Gottschalk and Leistner, 2013).

With regard to the factor named "Sensory aspects", results agree with those of Lee and Yun (2015), who ranked it on the same level of importance. Hjelmar (2011) mentions that the

taste of organic foods is better than conventional foods, partly because they are local and seasonal products; however, Lim *et al.* (2014) disagree. Moreover, a study conducted in Ireland using sensory panels to compare the sensory aspects of conventional and organic fruits and vegetables found no statistically significant differences (Tobin *et al.*, 2013).

The fifth factor, called "Certification", refers to the search for organic food seal and label information. Stolz *et al.* (2011) mention that communicating the attributes of these foods is a promising marketing strategy; the information should be specific and should make the products stand out by means of a seal or label (Wu *et al.*, 2014). In Mexico, the implementation of a seal for organic food arose from the need to provide certainty about these products (Consejo Nacional e Producción Orgánica, 2014; Secretaría de Agricultura, Ganadería, Desarrollo rural, Pesca y Alimentación (SAGARPA), 2014b); however, this seal is granted only to export products, whereas the products found in street and organic food markets do not have an official certification seal.

Small producers find it very difficult to obtain official certification and have to rely on "Participatory Certification". This type of certification requires minimal bureaucratic procedures; does not entail any cost for those involved (producers, consumers, academics) and is governed by a combination of official rules and the characteristics of each region were the food is produced (Pérez Sánchez, 2015; Márquez-Hernández *et al.*, 2010).

Regarding the factor "Health and trust", it is well known that health is one of the variables that influence the consumption of organic food (Goetzke *et al.*, 2014). Their supposed health benefits are very valued, and they are considered to be free of chemicals and harmless to the body due to the way in which they are grown (Mohamada *et al.*, 2014; Hjelmar, 2011; Zanoli *et al.*, 2012). However, there is no evidence of their effects on health (Średnicka-Tober *et al.*, 2016), and authors such as Vega-Zamora *et al.* (2013) and Smith-Spangler *et al.* (2012) mention that this aspect is difficult to assess and that no study has been done in populations that consume organic food due to the high costs involved. In sum, the consumption of organic foods is an act of trust. About this, Krom and Mol (2010) report that the trust is based on the information that circulates about the foods.

Finally, regarding the factor "Economic aspects", it has been mentioned that the higher price of these foods is a variable that limits their consumption and puts them in disadvantage compared to conventional foods (Lee and Yun, 2015; Marian *et al.*, 2014). However, the results obtained in this study show the opposite, as organic foods are purchased regardless of price, which does not determine the frequency of consumption. The explanation might be that consumers are not concerned about price once they are informed about the characteristics and benefits of these products (Lim *et al.*, 2014; Mohamada *et al.*, 2014; Zander and Hamm, 2010).

This is an issue for future study in detail, since in general organic foods are 20 to 40 per cent more expensive than conventional foods (FAO (Organización de las Naciones Unidas para la Alimentación y la agricultura), 2016; Gómez Cruz *et al.*, 2003).

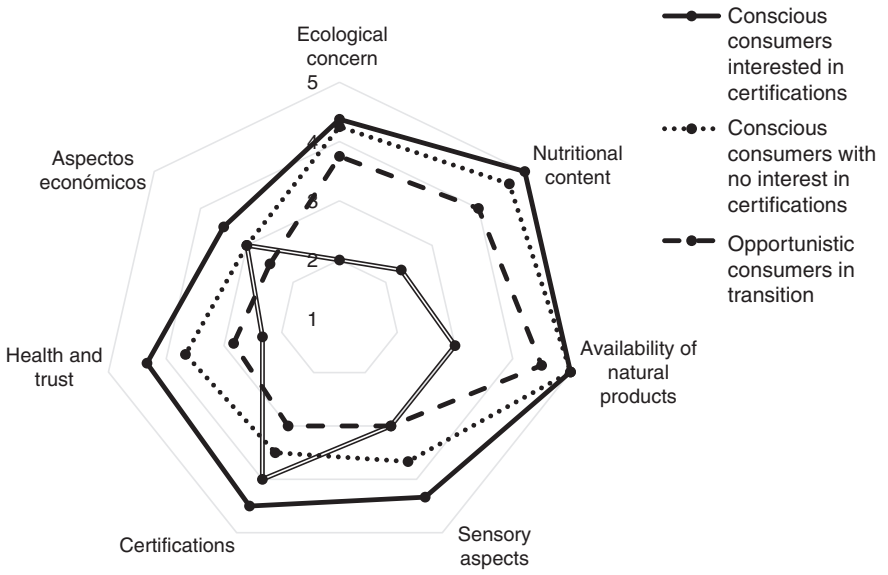
Analysis of the characteristics of group of consumers

The cluster analysis identified four groups of consumers that were named from the scores obtained for each factor within each group as: conscious consumers interested in certifications; conscious consumers with no interest in certifications; opportunistic consumers in transition; unconscious opportunistic consumers (Figure 1).

Table III shows the existence of statistically significant differences ($p < 0.001$) among groups in relation to the seven factors analysed, except for opportunistic consumers in transition and unconscious opportunistic consumers, in the variable certifications.

The characteristics of each group are described as follows.

The group named "Conscious consumers interested in certifications" represents 29 per cent of the consumers surveyed; it gave the highest scores to the seven factors compared to



Notes: 1, Not at all important; 2, a little important; 3, moderately important; 4, important; 5, very important

Figure 1. Characteristics of the groups according to the factors identified

Name of the factor	Conscious consumers interested in certifications ($n = 188$) Median	IQR	Conscious consumers with no interest in certifications ($n = 313$) Median	IQR	Opportunistic consumers in transition ($n = 138$) Median	IQR	Unconscious opportunistic consumers ($n = 17$) Median	IQR	p^2
1. Ecological concern	2.7[a]	5.9	1.7[b]	9.5	−3.1[c]	20.2	−18.5[d]	19.1	0.000
2. Nutritional content	1.8[a]	5.7	1[b]	10.4	−2.1[c]	12.9	−9.3[d]	13.5	0.000
3. Availability	1.9[a]	5.9	1.1[b]	7.1	−1.9[c]	12.3	−12.4[d]	16.2	0.000
4. Sensory aspects	1.7[a]	5.2	−0.1[b]	8.5	−1.4[c]	8.8	−3.9[d]	6.7	0.000
5. Certifications	1.6[a]	3.9	0.2[b]	6.2	−1.5[c]	6.9	−2[c]	7.9	0.000
6. Health and trust	1.6[a]	4.9	0.1[b]	6.4	−1.6[c]	6.05	−4.9[d]	6.04	0.000
7. Economic aspects	0.5[a]	5.8	−0.008[b]	5.7	−1.2[c]	6.8	−2.4[d]	3.8	0.000

Notes: IQR, Interquartile range; p^2, value of the Kruskal-Wallis test ($p < 0.05$); [a,b,c,d]Mann-Whitney U test by rows ($p < 0.05$)

Table III. Comparative analysis of the groups according to the factors obtained

the other groups. The consumers in this group think nutritional content, product availability, certification and ecological concern are important or very important; they are interested in the sensory aspects of organic food and in the health and trust aspects related to them, but not very much in economic aspects.

The group "Conscious Consumers with no interest in certifications" represents 48 per cent of the people surveyed. The behaviour of this group was similar to the first group with respect to environmental concern, nutritional content and product availability, but they attach less importance to certification, health and trust, and sensory aspects, and even less to economic aspects.

The group of "Opportunistic consumers in transition" represents 21 per cent of the surveyed consumers. The behaviour of this group shows evidence of a transition process; they only attach importance to ecological concern, nutritional content and product availability, but less than the previous two groups. They attach the greatest importance to product availability, which means that they consume these products because they are easily available to them.

Finally, the group of "Unconscious opportunistic consumers" represents only 2 per cent of the people surveyed. The name of this group was chosen because these consumers have the lowest scores for most factors in relation to the other groups.

Chen *et al.* (2014) identified different groups of consumers and named them as: "Consumers aware of safety"; this type of consumers are interested in certifications, coinciding with the "Conscious consumers interested in certifications"; "Gastronomic consumers"; this group pays attention to the country of origin of the products, something that was not included in the questionnaires used in this work; and "Skeptical consumers", which have a similar behaviour to the "Unconscious opportunistic consumers", but differ in that sceptical consumers attach the greatest importance to social status.

Tsourgiannis *et al.* (2015) identified other groups: "Curious consumers", who consume organic wine just for prestige and curiosity; "Opportunistic consumers" who are not influenced by any particular factor, and are very similar to the "Unconscious opportunistic consumers"; and "Conscious consumers", who are interested in buying these products because they are free of additives, do not damage the environment and have nutritional value, coinciding with the first two groups identified in this work.

Finally, Wu *et al.* (2014) identified three groups: "Consumers with low knowledge"; "Consumers with intermediate knowledge"; and "Consumers with high knowledge" about organic food. The authors associate this aspect with the willingness to pay a premium price for organic products; they found that consumers with intermediate and high knowledge were willing to pay it, coinciding with the first two groups of consumers identified in this work.

Authors like Bakırtaş and Divanoğlu (2013), Alba and Williams (2013) and Padrón Mercado and Barreto (2011) mention that the consumption of any product is driven by a combination of hedonistic and ethical motivations. The first two groups identified in this work show a combination of both types of motivations, since nutritional content, product availability, sensory aspects, certifications and health are considered hedonic or selfish motives, while ecological concern, trust and economic aspects are ethical or altruistic motivations. (Lee and Yun, 2015; Van Loo *et al.*, 2014; Vega-Zamora *et al.*, 2013; Zanoli *et al.*, 2012; Krom and Mol, 2010; Zander and Hamm, 2010). The behaviour of the different consumers identified in this work, especially the first two groups, may be related to the type of places where the study was conducted.

Street markets and organic markets are places where consumers establish a direct relationship with farmers and processors from specific locations who can sell their products directly without intermediaries (Red Mexicana de Tianguis y Mercados Orgánicos, 2015; Schwentesius Rinderman, 2010). These spaces are currently having increasing demand due to their support for the rural sector and environmental care.

They were created to stimulate the production and consumption of these products and to contribute to the empowerment and strengthening of local actors, in this case the producers, consumers and organisations involved; furthermore, these spaces help build relationships of solidarity and trust between them (Pérez Sánchez, 2015).

There has been great interest recently in providing the possibility to generate other forms of interaction between consumers and small producers in urban areas through economic, political and cultural processes. Spaces like street and organic markets stimulate local economies, increase the flow of money and facilitate new interactions that go beyond buying and selling; furthermore, they give rise to different ways of living in common,

collective organisation and local participation, strengthening the bonds that hold societies together (Cortés Marín *et al.*, 2008).

Street and organic markets are spaces in which trade and consumption can become political, social, ethical, educational and entertaining events. They are dynamic initiatives that support organic agriculture in a truly holistic sense, contributing to environmental and social sustainability (Nelson *et al.*, 2008).

Analysis of the socioeconomic characteristics of each group

Table IV shows the differences between the groups of consumers identified in this work with respect to sex, age, marital status, education and occupation.

Regarding gender, the group of conscious consumers interested in certification, the group of opportunistic consumers in transition and the group of conscious consumers with no interest in certifications had 81, 61 and 82 per cent of women, respectively; in contrast, the group of unconscious opportunistic consumers had 53 per cent men. These results are consistent with those found in several other studies in which the largest proportion of consumers of organic food found in street and organic markets are women (Çabuk *et al.*, 2014; Chen *et al.*, 2014; Mohamada *et al.*, 2014; Van Loo *et al.*, 2014; Wu *et al.*, 2014).

These studies show a high proportion of women among buyers of organic foods, which shows that they are still responsible for buying food products for the family in various parts of the world and that the decision to buy organic foods depends on them. However, the participation of men should not be set aside (Díaz Víquez *et al.*, 2015; Chen *et al.*, 2014; Van Loo *et al.*, 2014).

	Variable	Conscious consumers interested in certifications	Conscious consumers with no interest in certifications	Opportunistic consumers in transition	Unconscious opportunistic consumers
Gender %	Female	81	82	61	47
	Male	19	18	39	53
Age %	18-35	32.5	29	42	64.7
	36-55	47	50	44	35.3
	56-75	20	20	14	0
	+76	0.5	1	0	0
Marital status %	Single	4	37	50	59
	Married/UL	59	63	50	41
Children	Median/IQR	1.0 (7.0)	1.0 (7.0)	1.0 (4.0)	0 (3.0)
Education %	Basic	6	5	2	0
	High school/ technical school	17	12	12	6
	Professional/ graduate	77	83	86	88
	Without studies	0	0	0	6
Occupation %	Student	6	7	10	23
	Employee	40	46	56	41
	Independent activity	25	19	19	18
	Retired	6	6	5	0
	Housewife	23	21	9	12
	Unemployed	0	1	1	6

Note: IQR, Interquartile range

Table IV. Analysis of the socioeconomic variables of each group

With regards to age, the group of "conscious consumers interested in certifications", the "conscious consumers with no interest in certifications" and the "opportunistic consumers in transition" are similar in age, with 47, 44 and 50 per cent of the individuals in those groups ranging from 36 to 55 years, respectively. The group of "unconscious opportunistic consumers" is made up of younger consumers with an age of 18-35 years (64.7 per cent), consistent with the results of Díaz Víquez *et al.* (2015), who reported that potential consumers of these products in the city of Toluca (Mexico) are young adults aged 24-35 years, who are considered as economically active people. Petrescu and Petrescu-Mag (2015) report that people aged 36-45 years have stronger beliefs about environmental protection and the health benefits of organic foods, while the beliefs of young people are weaker. This is consistent with the degree of importance that the groups identified in this work gave to the different variables analysed.

Regarding marital status, the group of "Conscious consumers interested in certifications" and the group of "Conscious consumers with no interest in certifications" had 59 and 63 per cent of married people, respectively. The group of "Opportunistic consumers in transition" had the same proportion of single and married people (50 per cent), and the group of "Unconscious opportunistic consumers" consists mostly of single consumers (59 per cent).

The results of the first two groups agree with Lee and Yun (2015), Ozguven (2012), Çabuk *et al.* (2014), who reported a higher proportion of married people among these consumers (61, 70 and 52.7 per cent, respectively). The opportunistic group was the one that attached the least importance to the variables analysed compared to the other three groups. In this regard, Hjelmar (2011) mentions that the decision to buy these products is not only an individual matter, but one that concerns the whole family.

The four groups of consumers identified in this work are formed by people with a high educational level; 77-88 per cent of them had university or postgraduate studies. These results are similar to those of Díaz Víquez *et al.* (2015), who report that 54 per cent of the people in their sample had university studies. Chen *et al.* (2014) mention that 80 per cent of consumers of organic food found in street markets are professionals, and Stolz *et al.* (2011) report that more than 50 per cent the people in their sample had university studies.

The educational level of consumers influences their beliefs about organic foods (Petrescu and Petrescu-Mag, 2015); they become consumers willing to incorporate new types of foods and acquire information that allow them to decide what to consume (Olsen and Bánáti, 2014; Kriwy and Mecking, 2012).

The same behaviour is observed regarding occupation. The four groups contained 40-56 per cent of people employed. This may be related to the socioeconomic stratum to which they belong.

The monthly income of "Conscious consumers interested in certifications" ranged from US$249.96 to US$6,249.10 per month; the monthly income of the group of "Conscious consumers with no interest in certifications" ranged from US$62.49 to US$562.42; the income of the group of "Opportunistic consumers in transition" ranged from US$124.98 to US$499.93 per month, and the monthly income of the group of "Unconscious opportunistic consumers" ranged from US$499.93 to US$249.96.

The average income of the four groups is US$999.86-US$1,249.82 per month, a medium level, but some of the consumers in the first group have monthly incomes of up to US $6,249.10, which is a medium-high level. These results are consistent with Díaz Víquez *et al.* (2015), Lee and Yun (2015), Marian *et al.* (2014), Van Loo *et al.* (2014), Vega-Zamora *et al.* (2013), Zanoli *et al.* (2012) and Krom and Mol (2010), who reported that consumers most likely to buy organic foods are those that have a medium- to high-socioeconomic level. However, some consumers in the groups identified in this work had a very low-socioeconomic status, (US$62.49/month), showing that the consumption of organic food is associated with other motivations.

Authors like Contreras and Arnaiz (2008) and Ferreira de Almeida (2004) mention that eating is a complex and multidimensional phenomenon, which includes the decision on what food to eat with very diverse components affecting this choice.

The work herein reported is pioneer and contributes to reduce the lack of studies on the motivations and characteristics of consumers of organic foods in Mexico. Findings may set a path for new research in other cultural contexts; as well as for more specific work in Mexico as of consumers of industrialised organic products.

Conclusions

Results show that consumers of organic foods sold in markets in central Mexico choose to buy these products based on a combination between hedonic and ethical motivations, such as environmental concerns, nutritional content, product availability, sensory aspects, certifications, health and trust and economic aspects; and all these factors interact with each other. Therefore, it is not possible to speak of exclusively hedonistic or ethical consumers; rather, one should speak of groups of consumers in which both kinds of motivations are present in greater or lesser degree.

Four groups were identified, of which the ones named "Conscious consumers interested in certifications" and "Conscious consumers with no interest in certifications" attached greater importance to the factors that determine the decision to buy organic foods. The group of "Consumers in transition" was in the process of evaluating the products, and the group of "Opportunistic consumers" had no specific motivation to consume organic foods, but still did it.

The role played by women is clear in the first three groups, showing the influence that women have on the consumption of organic food among the Mexican population. The fourth group, which was mostly made up of men, and the group with the highest proportion of young people, attached little importance to the factors analysed. Finally, these consumers associate certain information with their consumption decisions; they dislike industrial food due to the different problems associated with their production, and prefer organic foods due to their perceived health and environmental benefits.

It is important to mention that the place where these consumers were found may influence their perceptions and motivations for the consumption of organic foods, since these spaces promote local consumption and dealing directly with the producers.

Finally this work contributes in reducing the vacuums that exist on the subject, by documenting the motivations and characteristics of consumers of organic foods, that may help farmers to focus with more certainty the growth of organic foods according to demands from consumers.

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