"Consumers' preferences for organic food applying conjoint analysis – the case of tomato in Albania"

Abstract

Albania has potential for the development of the organic agriculture sector; however the production of organic food remains negligible. There are several constraints for the organic sector developments – one of such constraints, is the lack of understanding of consumer behaviour and preferences for organic products in Albania. Therefore, understanding consumer preferences and behaviour toward organic (bio) products is important in the decision-making for food chain actors in Albania, as well as for public support schemes for the agriculture sector. The objective of this survey is to evaluate preferences of Albanian consumers for organic tomatoes based on a conjoint choice experiment (CCE) approach. The research finds that organic tomatoes are clearly preferred to non-bio tomatoes revealing an important market potential for bio products in Albania.

Keywords: Consumer Preferences, Organic, Tomatoes Albania.

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Introduction

Albania has favourable climatic conditions for a wide range of agricultural products including organic (bio)[1] products (Bernet and Kazazi, 2011). However, organic farming in Albania is weakly developed compared to its potentials. The organic agriculture sector is under process of consolidation in the recent years. The cultivated area has been doubling since 2006 and the number of organic farmers has been increasing 5 folds. In 2010 the area covered with organic certification resulted in 252 thousand hectares, or an increase with 100 thousand hectares since 2006 (Bernet and Kazazi, 2012) while also the number of farms converting to organic agriculture has been reported to grow (MoAFCP, 2013).

Vegetables production is an important subsector of the Albanian agriculture. With a rather high labour to land ratio, as in case of Albanian agriculture, labour intensive industries are an economically justified business opportunity[2] (Skreli and McCalla, 2013). Given the potential for development, vegetables production is considered a priority sector by the Albanian government for the period 2014 – 2020 (MAFCP, 2013).

During the last decade, production of tomatoes increased significantly by 27 per cent and imports reduced by more than two fold between 2006 and 2011 after a sharp increase in 2005 compared to 2000 . Trade is negligible when compared with production, despite the rapid increase exports from 2005 to 2011 (Table 1).

Table 1: Production, trade statistics of tomatoes in Albania in selected years from 2000-2011

Mt

Item	2000	2005	2006	2010	2011
Production	162,000	152,000	164,853	192,283	205,000
Import	2,263	6,514	7,985	3,429	3,061
Export	0	123	216	6,573	11,349
Supply	164,263	158,391	172,622	189,139	196,712
Export/import	0%	2%	3%	192%	371%
Export/production	0.0%	0.0%	0.0%	3%	6%
Import/supply	1.4%	4.1%	4.6%	2%	2%

Source: FAOSTAT (production), UNSTAT (Trade)

Tomatoes are also the main vegetable produced in greenhouses – more than half of the total greenhouse area is cultivated with tomatoes (GTZ, 2010). The production of greenhouse tomatoes is highly concentrated in the district of Lushnja, one of the most productive areas in Central Albania, while production of field tomatoes is common in all parts/regions of Albania. Local organic tomatoes are hardly found in the market.

The organic sector faces several challenges related to legislation, institutional capacities and private sector capacities in terms of financial capacities and technologies. Another major challenge for the development of the organic product sector in Albania is the limited overall awareness of Albanian consumers of organic products though demand is increasing; low

[1] Bio and organic are used interchangeably as equivalent based on EU definitions.

[2] The average Albanian farm is very small – 1.2 Ha. On the other hand, the labor cost in Albania is quite low, therefore labor intensive activities represent a potential for competitiveness.

awareness hampers potentials for a sizable development of organic products. Understanding consumer preferences and behaviour is important in the decision-making of producers. The increasing commitments from the government and the introduction of the subsidy scheme for organic agriculture in 2008 makes consumer preference analysis an important tool for fine tuning the national and the EU support policies accordingly. Furthermore if the sector continues to grow, entrepreneurs may consider investing in organic agriculture however there is a dearth of information on consumer preferences.

Objectives

The objectives of this survey are to describe consumer awareness of organic farming, to evaluate preferences of Albanian consumers for organic tomatoes.

Specifically, the research objectives are:

1. Group consumers according to their preferences for the main tomato attributes.
2. Assess consumer preferences of each identified class for the given attributes.
3. Provide marketing and policy recommendations for the sector's stakeholders, with particular focus on farmers and policy-makers.

Literature Review

A vast amount of literature on consumer perception of organic food is currently available. Since the inception of its market success, organic food is widely perceived as more environmentally friendly and safer compared to conventionally produced food, thus the concern for human health and safety is an important factor that influences consumer preference for organic food (Yiridoe et al, 2005; Zanoli and Naspetti, 2002). However, scientifically robust studies on effects on health of organic food consumption are lacking (Dangour et al, 2010). Consumers of organic products prefer organic as their lifestyle choice, based on their orientation to food quality, taste and nourishing values as a source of pleasure and wellbeing (Yiridoe et al, 2005).

Consumer's values play a role, especially moral norms, that is belief on what is right or wrong, which are in turn affected by subjective norms and the characteristics of Naturalness and Authenticity associated to organic products (Guido et al, 2009). However, the word "organic" has many meanings, while consumers of organic foods are not homogeneous in demographics or in beliefs (Hughner et al, 2007). Also Yiridoe et al (2005) confirms that consumers are not consistent in their perception of what is organic food product and, it is not clear whether most consumers consider particular organic products as normal goods, or if consumers consider such products as luxury goods.

A long list of product attributes has been identified as important to consumers when purchasing organic produce. Freshness and nutritional attributes have been identified as the most important attributes in purchasing organic products (Buzby and Skees, 1994). Magnusson et al. (2001) indicates that the most important purchase criterion for Swedish consumers was good taste, and the least important was "organically produced". Zhao et al (2007) found that overall, organically and conventionally grown vegetables did not show significant differences in consumer liking or

consumer-perceived sensory quality. Other studies found mixed evidences of consumer preference of organic food (Hemmerling et al, 2013), and it is usually difficult to rule out the effect of the credence attribute over liking (Fernqvist and Ekelund, 2014).

Magnusson et al. (2001) and Ekelund and Tjarnemo (2004) found that most consumers perceive organic products as more expensive compared to conventional ones. According to Ekelund and Tjarnemo (2004), price was by far the most important criterion among Swedish consumers when purchasing food. On the contrary, Goldman and Clancy (1995) consumers who usually buy found that organic food are more concerned about food safety than price. Positive attitudes towards environmental issues were found to be positively correlated to the buying of organic foods and the frequency of purchases (Grunert and Juhl, 1995). Specifically, concern for pesticide residues is a significant factor affecting preference for organic food (Wilkins and Hillers, 1994). Associated to environment, health benefits were demonstrated to be more strongly related to attitudes and behaviour toward organic foods than were environmental benefits (Shepherd et al, 2005).

Most of the available research, however, is based on the analysis of consumer studies performed in the US or Western Europe. More recently, many studies on consumers in less developed countries are available, but they were performed in very different cultural contexts (e.g., Roitner-Schobesberger et al, 2008; Chen & Lobo, 2012). Few works are focused on consumers in the Balkans. A study by Kuhar & Juvancic (2010) on organic and integrated fruit and vegetables in Slovenia found that the main factors were the perception of health and environmental benefits, while constraints were availability in retail outlets, household's income, and visual attractiveness of organic products.

To the best of our knowledge, Albanian consumers' preference on organic tomatoes has not been studied so far. In our opinion, the Albanian consumer is an interesting case because of its characteristics of belonging to a unique European cultural group and in fact until recently were immersed in a rural environment that was abruptly exposed to an urban and Western European style culture. For this reason, organic food market in Albania is in its inception stage and consumers in Albania are just beginning to be exposed to the organic market.

Methods and data

We apply a conjoint choice experiment (CCE) approach to analyse consumer preferences, and to perform clustering/segmentation, and assess preferences for each of the identified consumer classes/groups and for the attributes considered of Albanian tomato consumers.

CCE was developed by Louviere and Woodworth (1983) starting from the previous literature on conjoint analysis (Green and Rao, 1971; Green and Srinivasan, 1978). The method originated theoretically from Lancaster (1966) in which the utility of a product is based on the bundle of attributes it represents and on the random utility theory developed by McFadden (1974). As an empirical method it has been used widely in market research.

The advantage of CCE compared to other methods, stands in the fact that the method is based on different product attributes, and for each product attributes there are several levels, which enable assessment of consumer preferences for the products through partial contribution of product features (Hauser and Rao, 2004).

Using the conjoint choice method with Latent Class Analysis (LCA) to analyse the data collected is an improvement on the traditional (i.e. one class) aggregated model analysis in terms of the ability to accommodate heterogeneity of preferences. The standard aggregated model has to deal with the independence of irrelevant alternatives problem, which affects the predictions of market niches. Latent classes take into consideration different segments with different utility preferences within a certain group or class (Vermunt and Magidson, 2000). In LCA, respondents are grouped, according to their choices in the CCE. The choices that respondents made are considered mainly based on their attribute preferences and their socio-demographics.

Conjoint Choice Design

Selecting Product Attributes and their Levels

We used a questionnaire to collect data from consumers. It was designed according to a review of the literature, expert interviews and a focus group with consumers. The questionnaires consisted of choice sets and additional structured questionnaires of tomato attributes and attribute levels, the product attribute levels were then combined into choice sets made up of three concepts or profiles (Table 2). Seven versions of twelve choice sets are included in each questionnaire.

Tomato attributes selected are (i) type of tomatoes production practices: organic versus conventional tomato; (ii) origin within Albania: Korca tomato versus Lushnja tomato; (iii) technology: greenhouse versus open field tomato, and (iv) tomato price; price levels were determined based on field observations by authors and available statistics (Table 2).

Table 2: Tomatoes attributes and their levels

Attributes	Levels			
Type	Not bio	Bio		
Origin	Lushnje	Korce		
Technology	Greenhouse Tomatoes	Field Tomatoes		
Price (ALL[3]/kg)	40	80	120	160

Source: Authors estimations

Type. Organic is the main attribute of interest in this study.
Origin. Origin was found to be one of the main factors influencing consumer purchases for tomatoes (Brumfield et al, 1993). Previous studies have found that there is a strong preference for domestic food to imported ones in Albania (ChanHalbrend et al, 2010; Imami et al, 2011; Skreli and Imami, 2012; Zhllima et al, 2012) including also the organic food specifically (Imami and Skreli 2013a). Most Albanian consumers consider the region of origin (within Albania) as a very important attribute when choosing to buy domestic food products (Imami and Skreli

[3] ALL is the Albanian currency (Albanian Lek). Approximately 100 ALL = 1 USD

2013b). Regions of Lushnja and Korca regions are well-known are major production regions for vegetable including tomatoes and are well-known by consumers for tomatoes production – therefore these two regions have been chosen to represent levels of "origin" attribute.

Technology is expected to affect consumers' decisions according to the focus group. There are Two types of technologies are commonly used in Albania to grow tomatoes – greenhouse production and field production.

Price levels have been assigned to embrace the whole range of prices through consulting price level databases, observing the green markets and discussions in focus groups.

Other attributes highlighted in the literature review such as flavour, firmness and ripeness are perceived to be the biggest problems with tomatoes among Australian consumers (Parks and Newman, 2005; Causse et al, 2010). In Alabama, the GMO attribute was found to be important considering the consumers attitude toward the use of genetic modification technology in food production, their opinion about labelling as well as their negative perceptions about the safety of GM foods (Bukenya and Wright, 2007). However, we did not include such attributes in this experimental study, in order to avoid the practical complexity that can result from increasing the number of attributes, and furthermore, considering that GMO is unlikely to be relevant for Albanian consumers since GMO products are rarely observed in Albania).

Choice of Experimental Design and Construction of Choice Sets

The idea that all goods can be described by their characteristics, also known as attributes, is the basis of CCE. For CCE, the most important attributes and their levels have to be determined when designing the study.

Table 3 gives a brief description of the design stages of a CCE (Green and Wind 1975; Halbrendt et al. 2010).

Table 3: Design stages for a CCE

Stage	Description
Selection of attributes	Selection of tomato attributes has been done based on the literature review, expert interview, market observations and focus groups discussions.
Assignments of attributes level	The range of attributes is also determined by literature review, expert interview and market observations. The attribute levels have been assigned such as to be reasonable and realistic.
Choice of experimental design	Fractional factorial design is used to reduce the possible combinations which combine the levels of the attributes that reduce respondents fatigue and also provide efficiency in model estimation.
Construction of choice sets	The concepts identified by the experimental design are then paired and classed into choice sets to be presented to respondents.

Source: Chan-Halbrendt et al. 2010

In this study, a Conjoint Choice Experiment (CCE) was used to design the survey and Latent Class Analysis (LCA) was used to analyse the data. Sawtooth Software SSI Web v 6.6 was used to design the survey and to prepare the data for processing, and Sawtooth Software Latent Class for CBC v 4.0.8 was used for data processing.

After tomato attributes have been selected and attribute levels assigned, the last have been combined into choice tasks composed of triple concepts or alternatives, as in Table 4:

Table 4: Choice task for surveying tomato preferences

If these were your only options, which would you choose? Choose by putting an X under preferred alternative.		
Tomato		
Greenhouse tomato	Field tomato	Greenhouse tomato
Regular	Organic	Organic
Lushnja	Korça	Lushnja
ALL40	ALL80	ALL160
I would choose		
↓ ☒	↓ ☐	↓ ☐

Source: Authors estimations

Twelve choice sets of triple concepts were included in each questionnaire, and each respondent was asked to choose 12 concepts, one for each triple choice sets.

Data Collection, Survey Location, Sample Size and Survey Technique

Sample

This study was designed to be conducted through face-to-face interviews. Altogether, 220 face-to-face interviews were carried out in Tirana which is the capital city and the largest urban area and market in Albania. Various sites within Tirana were chosen, as suggested by the focus groups discussions. Interviews took place close to green markets and supermarkets – people were intercepted randomly and after completing each face-to-face interview, interviewers would approach the next closest person who walked by. We chose the urban area of Tirana for three reasons: (i) purchasing power is concentrated mainly in Tirana, and (ii) Tirana is a reasonably good representative area of the country - due to internal migration; (During the last twenty years, Tirana has grown from 200,000 to around 700,000 inhabitants. Because of people from all over Albania have migrated to Tirana therefore it represents the whole variety of subcultures within the country and (iii) interviews in Tirana reduce substantially travelling and subsistence costs.

Table 5 shows the gender and age structure of Tirana survey respondents and Tirana population. Older people are also over-represented compared to younger people – it is common in the Albanian average households, that older people do the food shopping. Whereas gender structure does not differ significantly between the sample and the population.

Table 5: Socio- demographic comparison of survey respondents with Tirana's population[4]

		Survey Respondents (%)	Tirana Population (%)
Gender	Male	47	49
	Female	53	51
Age	18-34	20	42
	35-54	51	32
	55-64	20	13
	Over 64	9	13

Source: Survey results and Albanian Institution of Statistics, Available at: http://www.instat.gov.al/

Data collection, data entry and validation

Data have been collected by well trained (student and graduate) interviewers and the process has been closely followed by the principal authors of this paper. The questionnaire has been properly coded in order to better manage data entering and data processing.

Data Analysis: Conjoint Choice Model Using LCA Approach

This is the final stage of the research design. The Latent Class Model is a random utility model. According to this model, a respondent's utility can be written as equation that has an observable, deterministic component and an unobservable, random component, as follows (Milon and Scrogin 2006; Halbrendt et al. 2010):

$$U_{nj/k} = \beta_k X_{nj} + \varepsilon_{nj/k} \quad (1), \text{ where}$$

U is the utility that individual n receives from choosing concept j, when the respondent belongs to class k. β is a vector parameter per j concept specific to class k; X is a vector of attributes of the j concept; and ε is the random component.

The deterministic component of utility can be further divided into a component representing the attributes of the selected concept, and a component that is related to the socio-demographic characteristics of the individual, as in the following formula:

$$\Pr nj/k = \sum_{k=1}^{K} \left[\frac{\exp(\alpha_k S_n)}{\sum_{k=1}^{K} \exp(\alpha_k S_n)} \right] \left[\frac{\exp(\alpha_k S_n)}{\sum_{j=1}^{J} \exp(\beta_k X_j)} \right] \quad (2)$$

Where $\Pr_{nj/k}$ is the probability that individual n chooses j conditional on belonging to class k; α is a vector parameter corresponding to socio-demographic characteristics, S is a vector representing socio-demographic characteristics, and X is a vector of attributes of the j concept and β is a vector parameter per j concept specific to class k. Thus the first term of the equation states the probability that individual n belongs to class k. The second term states the probability that the same individual chooses concept j based on the fact that he or she belongs to class k. Also, β_k are

[4] Census of households and dwellings 2011 data, INSTAT

marginal utilities or part worth utilities of each attribute level based on class membership. This means that the model generates parameters that are different across the latent classes.

In our study, only product attributes (Type: organic/conventional, origin: Lushnja/Korca, Technology: greenhouse/open field and price: 4 levels considered as linear) have been considered, therefore an individual's probability of choosing concept *i* was considered as a function of tomato attributes.

Results

Selection of the model with optimal number of distinct classes

We have chosen to group tomato consumers in the sample into three clusters, after comparing best replications for 2, 3, 4 and 5 consumer classes. Consistent Akaike Information Criterion (CAIC) is used to determine the best model. The CAIC falls drastically when moving from 2 class segmentation to 3 class segmentation; it falls more slowly when moving from 3 class to 4 class segmentation and even more slowly when moving from 4 class to 5 class segmentation. Based on CAIC "behaviour", we choose the 3 class segmentation of tomato consumers for interpretation.

Class sizes and importance of attributes

Class 1 is the largest consumer class, entailing more than half of the respondents (52.8%), Class 2 represents 30.6% of the whole sample, and Class 3, is the smallest representing 16.6% of the sample (Table 6).

Table 6: Class sizes and importance of attributes

Attributes	Levels	Class 1	Class 2	Class 3
Size (%)		52.8%	30.6%	16.6%
Attribute importance (%)				
Price		3.6%	67.5%	19.6%
Type (bio)		84.4%	18.1%	29.7%
Origin		1.0%	2.3%	17.9%
Technology		11.0%	12.1%	32.8%

Source: Authors calculations

Product type (organic versus conventional tomato) is by far the most important attribute for Class 1 which can be named the 'bio-ready consumers' Class. More than 8 in 10 respondents of Class 1 – the Class representing more than half of respondents - consider product type as the most important attribute. Price is the most important attribute for Class 2 which we have named 'Price sensitive' Class. About 7 in 10 respondents in this class are strongly price sensitive. Technology (green house versus open field tomato) is the most important attribute for Class 3; one third of respondents consider technology more important than other attributes.

Consumer preferences

Product type is the most important attribute for *Class 1.* Consumers in this class prefer bio to not bio tomato (Table 7). Additionally, consumer in Class 1 prefers field tomato to greenhouse tomato. However, origin within the country (Lushnja versus Korca - two quite distinct major areas of tomato production) is not significant.

Members of Class 2 prefer bio to not bio tomato, open field to green-house tomato and Lushnja to Korca tomato. This is the strongly price sensitive consumer class.

Technology is the most important attribute for *Class 3* - **c**onsumers in this class prefer open field to greenhouse tomato. Bio is referred to not bio tomato and Korca is preferred to Lushnja tomato. Consumers in this class show a positive sign of the price coefficient, which presumably means that price can be interpreted as a signal of quality, although not the most important one.

Table 7: Estimated parameters

Attributes	Levels	Class 1	Class 2	Class 3
Type	Not bio	-1.81610**	-0.54046**	-0.46551**
	Bio	1.81610**	0.54046**	0.46551**
Origin	Lushnja	-0.02257	0.06919**	-0.28112**
	Korca	0.02257	-0.06919**	0.28112**
Technology	Green house tomatoes	-0.23682**	-0.36125**	-0.51370**
	Field tomatoes	0.23682**	0.36125**	0.51370**
Price		-0.05082**	- 1.34162**	0.20530**

** Significant at 1%

* Coefficients shown are calculated for the prices coded 1,2,3,4, therefore they prefer to price increases of 40 ALL

Source: Authors calculations

A main results of this study is that bio tomato is preferred to not bio tomato across the board – the three consumer classes prefer bio to not bio tomato; estimated parameters or part worth utilities associated with bio product are all positive and significant (Table 6).

Conclusions

This study sheds some light on consumer preferences for tomatoes in Albania, specifically on those for product attributes such as type, origin, and technology. It allows providing an identification of consumer groups with similar preferences, which indicates potential market segments that can be targeted by producers/traders.

Overall, type of product and price are the main attributes (Table 6) for the largest group of consumers (first group), price is by far the main attribute for the second group followed by type, and for the third group technology and type are the main attributes. It comes out clearly therefore that the product type (bio and not bio) is very important for the three groups. Bio products are clearly preferred to non-bio products. This may be reasonable since the origin of preference of Albanian consumers for bio products has been reported to be mainly related to health-related concerns. Since there is a strong belief that excessive chemicals used for plant protection and

nutrition in Albania is the cause of several diseases, the purchase of organic products can be seen as a risk reduction strategy by many consumers.

In order to develop market potentials, several issues have to be considered by both private producers and government agencies. The former may consider opening special bio product shops, negotiate dedicated areas in supermarkets, and develop on farm sale combined with tourism and the like. Government agencies have also an important role to play by subsidizing bio production, developing certifications programmes.

Two important limitations of this study must be highlighted: the sample is small and not representative of the whole country population, and the choice was hypothetical, which usually determines an overestimation of willingness to pay that can be calculated based on estimated parameters.

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