CONSUMER PREFERENCES FOR TABLE OLIVES IN TIRANA

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Abstract

Table olive production sector is undergoing rapid changes, as the government is undertaking an ambitious program supporting the expansion of olive grove plantations. Despite the increase in domestic production, import of table olive is still high, due to constraints in quantity and quality of domestically supplied olives. In the context of import substitution strategy, embraced by producers and policy-makers, it is important to analyze the consumer preferences for table olives. The objective of this paper is to segment the table olive market according to preferences for table olives attributes applying Conjoint Choice Experiment (CCE) and Latent Class Analysis to collect and analyze the data. The research results show a strong consumer preference for domestic table olives whereas preferences for other attributes vary between consumer groups.

Keywords: Table olive, Consumer preferences, Conjoint Choice Experiment (CCE),

1. Introduction

There is a strong tradition in both production and consumption of table olives in Albania. Production of olives dates back thousands of years in Albania, similar to other Mediterranean countries, therefore, many olive trees are very old (hundreds of years). Olive industry sector is important to the Albania economy as it is estimated to produce an output of 30 million Euro with 118,000 farms producing olives [15].

In recent years the Government of Albania has been undertaking an ambitious policy for expanding the olive production base, a priority commodity by targeting a fivefold increase in the total number of olive trees to 25 million trees [17] while the current number of olive trees slightly exceeds 5 million. For this purpose, starting from the year 2007, subsidies have been provided to the olive industry [16]. There are many olive tree varieties with different product characteristics such as color, oil content and taste. About 15 - 20% of total olive production is processed and offered as table olives [4] and with the demand for table olives is growing, there is a structural deficit of table olives, which is mainly covered up by imports from Greece. Olive imports are sourced almost entirely from EU [4]. Since 2000, table olive imports have increased significantly, exceeding 3,500 tons in 2010 (Table 1). This increase takes place parallel to the continuous production increase of olives (over 1/4 for the same period) [4].

This growing import trend can be partially explained by the fact that the production of table olives has not grown as fast as the consumer demand. Consumer preferences study may explain partially the increasing imports trends (change of consumption patterns, safety concerns, etc.) which could help in assisting local producers and policy makers planning on meeting increasing domestic demand and replacing import.

Table 1: Import of table olives

	Semi-processed		Processed	
Period	**000 USD**	**Ton**	**000 USD**	**Ton**
2000	19	24	55	76
2005	233	313	546	380
2006	317	411	697	435
2007	699	732	1,258	836
2008	442	398	1,907	963
2009	994	963	1,879	942
2010	2,575	2,006	1,010	561

Source: UNSTAT Comtrade (international trade) Database

There has not been previous in-depth research on consumer preferences for table olives in Albania. Previous studies on this sector have focused on the production and value chain analysis [4]. This is the first time that a consumer survey on table olive is done in Albania and that CCE is applied to such

product. The results of this study will be useful to agroindustry, farmer association and policy-makers.

2. Objectives

The purpose of this study is to provide government officials, producers and marketers strategies for import substitution of table olives by analyzing consumer preferences in Albania. This study focused on the city of Tirana which is the largest urban area and where the major purchasing power of the country is concentrated.

Given that Albania table olive imports are considerable, it is important, in terms of import substitution, to identify the causes of the situation. More specifically, to what extent does it relate to consumer preferences for olive product characteristics?

The specific research objectives are the following:

- Evaluate consumer preference in Tirana for table olive with respect to the main product attributes;
- Group consumers and segment the market according to consumer preferences;
- Provide recommendations and marketing strategies for the industry and policymakers based on the research findings, aiming import substitution.

3. Methods

Conjoint Choice Experiment (CCE) is used for this study to design and conduct the survey. CCE have been used in several fresh and processed fruits and vegetables studies [5, 22, 23], including also table olives and its sub products [18, 3, 14].

Conjoint experiment is based on the idea that a product can be described by its attributes (e.g. color) and by the levels (states, e.g. "dark green") of those attributes [12, 13] and respondents can choose product profiles of varying attribute levels. There are several advantages to using conjoint choice experiments. First, the design of sets of attribute levels can mimic a change in the product, allowing measurements of tradeoffs on by choosing one profile (hypothetical product) over another. In addition, the survey design allows for the estimation of monetary values when including price as one of the attributes. Furthermore, the method allows researchers to quantify the product attribute levels' utilities based on the choices that respondents made. Finally, CCE uses discrete choices for choosing among pairs of product profiles, rather than rating or ranking ten or twelve product profiles at one time, thereby reducing the possibility of respondent's fatigue as is often seen in traditional conjoint analysis [2].

There are a number of steps that need to occur before the conjoint choice questionnaire is ready for data collection and analysis. The steps are: determine the most important product attributes and levels; using Sawtooth Software design the most efficient product choice sets for respondents to compare and choose; collect the data and analyze it using latent class analysis method.

3.1 Attributes and Levels

In our case, the purchasing attributes most appropriate for table olives are: Type, Price, Color and Origin (Table 1). Attributes and their levels, as well as the survey location were determined based on focus groups method and literature review of other studies related to olives purchasing and consumption. A focus group was organized with agrifood marketing experts and another one with consumers of table olives before the survey design (similar to [2, 8]). Both focus groups concluded that the main table olive attributes are type, origin and color (in addition to price, as shown below in Table 2).

Table 2: Table olive attributes and their levels

Attributes		**Levels**	
Type of Product	Seedless	Stuffed	With seed
Origin of the product	Import	Domestic	
Color	Green	Dark-brown	
Price(All/Kg)	200	250	300

ALL is the Albanian currency, 1USD ≈ 100 ALL

The levels of table olive Type chosen are seedless, stuffed and with seed, and of table olive Price are, 200 Lek /Kg, 250 Lek /Kg and 300 Lek/Kg. For table olives Origin, is either domestic or imports. The different levels of Color are green and black-dark-brown (Table 2). As mentioned above, attributes and their levels were determined based on the two focus groups and literature review.

Designing the CCE involves construction of interview questions with product profiles comparisons and socio-demographic questions. Product profiles for respondents to choose from are constructed by selecting one level from each product attribute and combining across among them. Using full factorial

design, there would be 36 (3*2*2*3) possible product profiles. 36 profiles would have been too much for respondents to evaluate and make decisions. In order to prevent this problem, we used fractional factorial design to select samples of profile combinations without losing the major information, which effectively tests the effects of the attributes on respondent's preference [6, 7].

Table 3: Examples of table olive profile scenario

Table olive attribute	Profile A	Profile B	Profile C
Origin	Imported	Imported	Local
Color	Dark-brown	Green	Dark-brown
Price (All/kg)	300	250	200
Type	Stuffed	Seedless	With seed

Using software from Sawtooth, Inc., we generated 3 different sets with 12 pairs of profiles per set, from the original set of 36 profiles. Each respondent was shown one set and asked to choose one profile from each of 12 pairs. An example of a pair of table olive product profiles is shown in Table 3. Having only 12 pairs to evaluate ensures the duration of the surveying exercise is short and does not unduly fatigue a respondent.

A sample of 240 persons was judged to be representative for the Tirana consumers population. According to [19], a conjoint study's sample size can range from 150 to 1,200 respondents. Using a Choice-Based Conjoint (CBC) rule of thumb, it was found that the sample size collected is sufficient [19, 11]. The next step is the data collection stage at where the surveys are conducted and data was collected from the respondents. The survey was carried in the urban part of Tirana during October-November of 2010. Tirana is the capital of Albania which is the biggest urban city of the country where more than one fifth of the Albanian population resides [9]. In order to obtain respondent's insights and ensure a sample that is representative of all urban consumers, we divided the sample population into two groups depending on where they commonly shop.

Table 4: Socio- demographic Comparison of Survey Respondents with Tirana's Population

		Survey Respondents	*Tirana Population*
		(%)	(%)
Gender	Female	34.1%	50.14
	Male	65.9%	49.86
Age	18-24	7.8%	12.89
	25-30	10.9%	7.66
	31-35	7.8%	10.74
	36-40	12.0%	11.4
	41-45	11.2%	11.75
	46-50	10.1%	10.48
	51-55	7.8%	8.59
	56-60	8.5%	6.67
	61-64	0.0%	6.54
	65 and up	24.0%	13.34
Education	Elementary	25.2%	13.92
	High School	40.7%	58.97
	College	31.8%	24.62
	Other	2.3%	2.49

Data sources: Institute of Statistics of Albania. Available at: http://www.instat.gov.al/ and survey data

One hundred of the respondents were from the wholesale market of "Uzina Dinamo" and one hundred fifty nine respondents from the largest outdoor food retail market, the "Pazari i Ri" in Tirana. The survey locations are places where table olives are primarily sold. There were interviewed 259 consumers, of which only 240 interviews were proper for the data analysis. The other questionnaires had partial or missing responses or in other cases the interviewee did not answer for all set of profiles.

First we will report on the representativeness of the study population when compared to the country

census. Table 4 shows the gender, age and education structure of the Tirana survey respondents. In the survey there are more male and older respondents. Younger and female are slightly underrepresented in this study, as in Albania it is more common for older men to do the food shopping, particularly for the older generations. The respondents profile is in line with previous research on consumer behavior in Albania [8, 2].

Data were entered into excel software and were analyzed using Latent Class Analysis (LCA). Sawtooth Software Latent Class for CBC v 4.0.8 was used for data processing. Segmenting/ clustering/ grouping of consumers were based on "Consistent Akaike Information Criterion," (CAIC). CAIC was proposed by [1], and an application similar to ours is described in [21]. Like all measures we report here, CAIC is closely related to the log likelihood. Our implementation of CAIC is given by the formula 1:

$$CAIC = -2Log\ Likelihood + (nk + k - 1)x(lnN + 1) \quad (1)$$

where k is the number of groups, n is the number of independent parameters estimate per class, and N is the total number of choice tasks in the data set. Smaller values of CAIC are preferred. CAIC value is decreased by larger log likelihoods, and is increased by larger sample sizes and larger numbers of parameters being estimated (Table 5). CAIC is not very useful for assessing the absolute level of fit of a particular solution, but it is sometimes useful when looking across alternative solutions taking into consideration the numbers of consumer classes that are obtained.

Table 5: The estimated CAIC statistics of different models

Model by class number	CAIC	ΔCAIC
1-Class Model	5,043	0.0%
2-Class Model	4,312	-14.5%
3-Class Model	4,068	-5.7%
4-Class Model	3,975	-2.3%
5-Class Model	3,910	-1.6%
6-Class Model	3,893	-0.4%
7-Class Model	3,873	-0.4%

From table 4 the smallest CAIC is 7-Class Model and can keep getting smaller. Perhaps more significant is the fact that CAIC decreases up to 4-Class clustering, and then becomes nearly flat for larger numbers of classes. Such an inflection point is probably a better indicator of the right number of classes than its absolute magnitude. Furthermore, many small classes are difficult to find significant differences among them.

CAIC drops sharply as we go from one to two and from two to three classes, and then smaller drop is observed from 3 to 4, but then stays fairly constant beyond that (Table 6). The estimated number of classes and class size for each model may help us choosing among solutions, as an efficient clustering is that, which not only meets statistical significance requirement but also has practical relevance. In our case, the five-group solution contains small groups, with no significant practical relevance (i.e. for marketing strategies). The 4-Class model solution was found to satisfy both requirements.

Table 6: Model by number and size of classes

Model by class number	Estimated group size				
3-Class Model	47.5%	31.6%	20.9%		
4-Class Model	47.5%	25.3%	18.6%	8.6%	
5-Class Model	47.7%	19.5%	17.4%	8.7%	6.7%

4. Results and Discussions

The results section will report on relative importance of attributes by class for the 4-Class model followed by the discussions of the estimated parameters. Classes 1 and 2 combined make up about 72,8% of the total number of respondents Class 1 has the largest class size with about 48% of respondents, followed by Class 2 at 25%, Class 3 at about 19% and Class 4 at 9% (Table 6).

Class 1 chose origin (64%) as the most important attribute followed by type (22%), price (12%) and color (2%). Minimal importance is given to color in this class. Class 2 chose color as the most important

attribute, followed by type at about 23%. Similarly to Class 2, the color of table olive (49%) and its price (23%) were the two most preferred attributes in Class 3. Whereas in Classes 4 price and then type are the most important attribute (49% and 32%, respectively), followed by origin and color (11% and 8%, respectively). Origin is the most important attribute in the largest class with 48 percent of the respondents. For the color attribute 2 classes deemed it to be the most important with a combined respondent's size of 44%. However, the color each class preferred is different. Table 7 below shows the relative importance of each attribute for each of the consumer classes. For the estimated parameters, Class 1 has significant attributes for all parameters estimated at the 0.01 level except for color. This group prefers domestic olives with seed at competitive price. Class 2 significantly prefers imports (+) and not domestic (significant at 0.01 level).

Table 7: Relative Importance of Table Olive Attributes by Class (in percent)

Class	**Class 1**	**Class 2**	**Class 3**	**Class 4**
Size (%)	47.50%	25.30%	18.60%	8.60%
Importance of attributes (%)				
Origin	**63.95**	20.08	17.08	10.95
Color	1.68	**43.32**	**49.39**	7.86
Price	12.29	13.15	23.43	**48.85**
Type	22.08	23.44	10.1	32.34

They prefer to purchase green olives and not dark-brown, stuffed and also with seed. Class 3 prefers domestic, dark-brown olives, with seed, whereas Class 4 prefers local produced table olives, seedless and dark-brown olives. All the classes have a significantly preferred competitive pricing (Table 8).

Table 8: Estimated Parameters of the Four Classes Model

Classes	**Class 1**	**Class 2**	**Class 3**	**Class 4**
Size (%)	47.5%	25.3%	18.6%	8.6%
Attributes				
Origin				
Imported	-2.28206**	0.19346**	-0.42806**	-0.34410**
Local	2.28206**	-0.19346**	0.42806**	0.34410**
Color				
Green		0.41732**	-1.23756**	-0.24708*
Dark-brown		-0.41732**	1.23756**	0.24708*
Price	-0.43844**	-0.12671*	-0.58707**	-1.53551**
Type				
Seedless		-0.29570**	-0.30753**	1.33678**
With seed	0.79860**	0.13976*	0.19847*	-0.69650**
Stuffed	-0.77752**	0.15594**		-0.64029**

* significant at 0.05 level, **significant at 0.01 level

5. Conclusions

In view of the existing structural deficit for table olives (mainly covered up by imports from Greece) and growing import trend for this product, the main goal of this study is to provide government officials, producers and marketers with strategies for import substitution of table olives by analyzing consumer preferences in Albania.

Further, this study enables identification of consumer groups by product attribute preferences – whereby these groups represent different potential market segments. All consumer classes show preference towards domestic table olives. Most of the classes show an orientation of the consumers to the traditional domestic table (mixed oily) olives, dark-brown color and with seed where the first group shows also higher surpluses for approaching this product scenario.

Each class showed distinctly top importance attribute: Class one for locally produced olives with seed, Class two for green olives stuffed or with seed originating from other countries, Class three for dark-brown, cheap locally produced olives with seed and Class four for seedless olives with acceptable price produced in Albania.

Commitment to meeting consumers' demand/preferences opens new investments and marketing opportunities for the industry and increased university involvement with the issue. University may take the lead in studying most of the table olive hybrids that properly met the needs of the consumers and cooperate with the extension service at the Ministry of Agriculture Food and Consumer Protection in informing farmers to carry investments for plantation toward these varieties. The result would be increase absorption rate of the domestic market and increase of self-sufficiency in the sector of table

olives. Furthermore any processing operation added in processing olives in order to reply to Class 2 and Class 4 would generate value added along the olive value chain. As most of the classes wants to pay more for domestic and green the best strategy, is to reduce the costs of the industry orientation by focusing only in the first three classes and create adequate profile for the color for the Class 2.

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