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Consumer Preferences for Quality Foods from a South European Perspective: A Conjoint Analysis Implementation on Greek Olive Oil

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Abstract

The objective of the present study is to describe the preferences of younger, more educated and higher income Greek consumers for "quality" olive oil brands – quality being defined as a bundle of extrinsic quality cues such as quality assurance labels, health-related information, country-of-origin indication, bottling material and price. The aim of the research is, with the implementation of a conjoint analysis task, to describe and analyze consumer preferences using a random, stratified, sample of urban consumers. The extrinsic quality attributes of olive oil, strongly linked to a previous qualitative, Means-end Chains (MEC) analysis survey, is used as starting points for the development of conjoint profiles. Special emphasis is given to the development and evaluation of different quality marketing mixes and the analysis of the importance consumers attach to the series of extrinsic quality cues used. The identification of different consumer segments in terms of this importance and the development of their socio-demographic and behavioral profile is also emphasized. The final step of the research is the measurement of demand for quality through the calculation of potentially larger market shares across segments of different quality (hypothetical) brands in comparison to the common (real).

Keywords: quality extrinsic cues, conjoint analysis, segmentation, market shares

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Introduction

The contemporary importance of olive tree cultivation in Greece is considerable. Tsiaousi (1998) estimated that 350,000 to 400,000 of agricultural household incomes rely upon olive oil. Furthermore, olive oil and its products account for 14.5% of agricultural GDP (Tzouramani and Mattas, 1999). During the 90's, annual olive oil production in Greece fluctuated around 320,000t, 75% of which constituted the highest quality extra-virgin oil (Eurofood, 1998; FAO, 1997; ICAP, 1996). During the same period, annual per capita consumption (approximately 18L) was the highest in the world. Prior to Greece's accession to the EU (1981), olive oil exports were particularly limited, yet since early 80's exports increased substantially and averaged 95,000t during the 90's. However, they exhibit intensive yearly fluctuation, an indication that exports mirror olive oil production, since 95% of olive oil is exported in bulk.

Despite strong state financial support received during the 90s, the main problem faced by the industry is associated with insufficient investment in the adoption of modern marketing strategies. As a result, only 35-38% of domestic consumption is represented by well-known brands of bottled olive oil, packed according to EU legislation. It is typical that, while both of the leading Greek olive oil companies in the domestic market (ELAIS and MINERVA) are certified according to the HACCP protocol, this information does not appear on the label of their products and thus is not directly communicated to consumers. Their leading brands are bottled in 1L plastic bottles, without any quality indication on their labels apart from the "extra virgin" claim. Only recently (spring 2002) ELAIS launched in the domestic market an organic type of its leading brand "ALTIS". Consequently, another important problem concerns lack of consumer confidence in the origins and quality standards of olive oil, due to various cases of adulteration in the past. Furthermore, consumers are confused because of the complicated terminology used to classify different olive oil types. Things are expected to deteriorate, since there is no effective quality control of the massive quantities distributed bulk in the domestic market. Hence, it is possible that consumers follow risk-averse behavior with respect to safety and turn towards substitute oils. On the other hand, many urban-based Greek families traditionally provide for their household needs with olive oil bought directly from producers. Yet, they know little about olive oil qualities and even less about how to distinguish among them. According to ICAP (1996), 30-33% of annual consumption relies upon this traditional source and an additional 30-35% is distributed regionally in bulk by individual farmers.

Earlier research in the domestic market by Siskos, Grigoroudis, Matsatsinis, Baurakis and Neguez (1995) revealed that the percentage of Greek consumers using extra virgin olive oil is significant (70%). The study identified two segments according to frequency of usage and three segments according to preference for packaging. Extra virgin olive oil is associated with daily usage. The same study

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concludes that Greek consumers use extra virgin olive oil in almost all purposes and especially in salads and it is preferred to other oils mainly for its taste, aroma, healthiness, color and liquidity (structure). In terms of packaging, three main consumer groups were identified. One was associated with a preference for large metallic cans (17L) bought directly from producers.[1] A second was associated with a preference for smaller plastic cans (5L), while a third was associated with a preference for plastic bottles (1L), both purchased mainly from supermarkets. A slight preference for glass bottles by some members of the third segment was particularly associated with younger age groups, while preference for larger cans was associated with larger families and lower income. Extra virgin olive oil brand selection criteria were associated with company image (88%), packaging attractiveness (55%), influence of different information sources (52%), and overall brand perceived quality (40%). The price of extra virgin olive oil as selection criterion had little influence (only 3%).

The aim of the study is to employ conjoint analysis (CA), to describe and analyze the preferences of relatively younger and of higher educational and income level urban Greek consumers for "quality" olive oil brands. The structure of the paper is as follows: after the introduction, the first section concerns the designation of the quality conscious consumer profile as described in the international literature. The second section describes the research methodology and is followed in the third section by the presentation and discussion of the empirical results. The final section provides a discussion, managerial implications and conclusions.

The Profile of the Quality-Conscious Food Consumer

Food has a symbolic character in the social and cultural traditions of many European societies. Yet, in recent years serious doubts about the actual quality of food have become widespread. Today, one finds across Europe a steadily broadening "niche" of quality markets derived from particular traditional farming systems (most notably organic food and labelled regional foods PDO/PGIs), or from quality-certified food systems (ISO-series or HACCP-certified products). The Commission found the overall EU quality market in 1990 to represent 7.5 percent of total food expenditure, and predicted a 50 percent growth rate by 2000, including an eight-fold increase in the organic market (Commission for the European Communities, 1991). Bouquery (1994, in Trognon et al, 1999) had estimated the market value of "typical" quality foods (most identified with a territorial identity) to be 7.5 percent of the EU food market value (€ 45billion) and foresaw an increase of 1 to 2billion € per year. At the end of 1997, 63 percent of the collective food quality marks in the EU-15 were approved under an EU quality scheme, with a prevalence of PDO/PGIs among them (Peri and Gaeta, 1999, Figure 1).

[1] From 1/11/2002, distribution of olive oil in 17L metallic cans in the Greek market is prohibited after EU Council Regulation.

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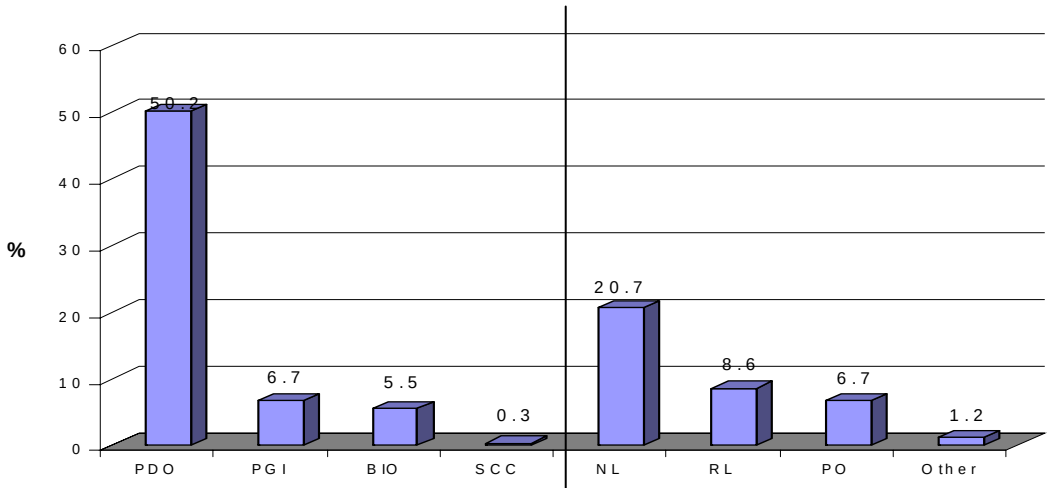

PDO: Protected Denomination of Origin
PGI: Protected Geographical Indication
BIO: Product of Organic Agriculture
SCC: Specific Characteristics Certificate
(European marks: 63%)

NL: National (Public) label
RL: Regional or Local label
PO:Producers' Organisation private label

(Other: 37%)

Figure 1: Distribution of Collective Quality Marks in Europe by Promoting Organization (total: 1861)
Source: Peri and Gaeta, 1999.

There are several reasons why consumers are becoming more concerned about food quality. An ample supply of cheap food has been achieved through the industrialization of agriculture, including a dramatic intensification of production. The externalities of intensive food production have been high, in particular in terms of environmental over-exploitation. Environmental issues have helped create a sector of consumers motivated by quality concerns and willing to support initiatives supplying food products, whose quality represents an alternative to that of the intensive model (MacKenzie, 1990). Other related issues, for example extravagant patterns of food transportation, the loss of gene pools and seasonality, over-packing, and in particular food health and hygiene problems, have further undermined consumer faith in the function of the conventional agri-food industry and increased the demand for alternative quality food produce (Henson, 1995; Shine et al, 1997a).

Beyond these more conscious considerations about food quality deeper cultural influences on consumer food choice can be found. As global corporate powers pursue the agri-food model of exerting increasing authority over both food marketing and production, the consumer demand for "traditional" food products furnished by extensive and independent producers seems to counter precisely the standardization offered by industrialization. This situation seems to offer consumers a continuum, with the standardized produce of intensive agriculture at one end and, alternatively, quality produce from extensive agriculture at the other (Gilg and Battershill, 1998). There may be a division here between urban and rural

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consumers and between those in Northern and Mediterranean Europe, in that North European urban consumers may have little knowledge about how food is actually produced, compared with their rural or Mediterranean counterparts, who have remained closer to farming and the realities of food production.

Consequently, it has become necessary to explore consumers' attitudes and perceptions towards food quality, healthiness and safety. On this perspective, numerous surveys can be found in the literature:

Trognon et al. (1999) argue that the main assumption regarding the profile of the quality conscious consumer is that the socio-demographic, perception, knowledge and attitude factors interact in order to influence *in fine* consumer behavior. The *age* of the consumer is particularly influential, mainly on the criteria for perceiving quality and differentiation. Other socio-demographic factors include the *source and level of income* and the *education level* of the respondent. Some influence does come from the *gender* and the *place of residence*. The *level of knowledge and awareness* of quality products are also very important in determining consumer behaviours. The attitudinal factor of *confidence through official quality marks* is extremely influential, with the expectation to *pay more for quality assured products*. In that aspect, Acebron and Dopico (2000) argue that most of the studies about quality have found that price and quality are positively related: the greater the price, the greater the expected quality. Within the perception factors, *differentiation from other similar products* is also influential, according to Trognon et al. (1999). It appears that quality consumers prefer the visual confirmation of quality through official certification, which in turn influences the perception of product attributes and the comparison with other products. Similarly, Acebron and Dopico (2000) claim that brands or designations of origin exert a positive influence on the expected quality. Hence, Trognon et al. (1999) conclude that, for a variety of EU countries (Greece included), the typical quality consumer: a) seldom perceives quality food as being much more expensive than average; b) thinks the origin of the product is important; c) thinks quality food supports local or regional (small) business; d) expects to pay extra for it and thinks it is worth the extra cost; e) claims to have knowledge about official quality marks.

Furthermore, Tse (1999) claims that a market niche to be reckoned with in the world of food marketing nowadays is the safety-conscious consumer segment. Consumers are willing to pay for improved food product safety incorporated into the wider quality concept. He further suggests that perceived safety is affected by a number of product-related factors, such as *price* (higher prices are associated with a higher level of product safety, in accordance with the argument of Acebron and Dopino (2000 for quality-certified foods), *product and brand reputation, country-of-origin perceptions,* and *type of information source*.

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Shine at al. (1997a), questioning the effectiveness of nutrition labelling, add that *education* is the key to the improvement of an individual's health, in line with the findings by Trognon et al. (1999), but also by Nayga Jr. (1999), Wandell (1995) and Abbot (1997). The factors that differentiate those who read nutrition and health labels from those who do not also includes *gender* (with females having completed tertiary education being the typical health information seeker). *Age, socio-economic statuses, marital status, children in the household and household size also affect* the health conscious behaviour. Health-conscious consumers generally perceive nutritional content as an important quality attribute of a food product. Overall, Shine et al. (1997b) report that quality (referring to intrinsic factors other than taste) is found to be the most important food attribute for the contemporary average consumer, nutritional value and safety are deemed second, followed by taste and price, and with convenience and brand being of less importance. And Henson and Northen (2000) conclude that extrinsic quality cues such as, mainly, the country-of-origin and, then, the organic label are among the most important indicators of safety for a variety of EU countries.

The aim of the study is to employ conjoint analysis (CA) to describe and analyze the preferences of relatively younger and of higher educational and income level urban Greek consumers for "quality" olive oil brands. The latter are defined in terms of a number of extrinsic quality cues selected from the wider spectrum identified in the literature presented above and elicited with means of a qualitative, Means-end Chain (MEC) analysis-based phase. These extrinsic cues are: "organic label[2]", "PDO label[3]", "ISO certification", "HACCP certification[4]", "Health-related information",

[2] In 1996, the organic sector in Greece represented 0.15% of utilizable agricultural area, the lowest in the EU-15. However, it has since grown at an average annual rate of 50% (the highest in the EU-15) so that by 2000 it exceeded 0.6% of utilizable agricultural area. In 1998/99 the five most important organic food groups in terms of market share were vegetables: (30%), olives and olive oil (20%), cereals (15%), fruits and nuts (15%), and wine (10%). In the case of organic olives and olive oil, only 10% of output by value is distributed through supermarkets. In 1997/98 producer price premiums were 15-50% while price premiums paid by consumers were 25-50%. More than 80% of organic production of olives and olive oil are exported. There are three authorized private, organic certification bodies in Greece: Vio-Hellas, Dio, and Fisiologiki. Additionally, Agro-cert is a state-supervised organization whose role is to supervise the private bodies, as well as certify organic – among other quality-certified – agricultural and food products. Dio constitutes the most important and active certification body, which in 1998 controlled 2,385 (56%) organic producers.

[3] The use of Protected Denomination of Origin/Protected Geographical Indication (PDO/PGI) labels has been adopted by some Greek food companies as a marketing strategy as a type of branding. Such labels provide consumers with information on the area of production and thus imply originality and authenticity. Simultaneously, the consumer is assured that a product complies with EU Regulation 2801/92, which describes the production, processing and standardization methods used. Both public and authorized private organizations are eligible for certifying PDO/PGI products. By the end of 1997, 63% of the 1,861 food quality labels within the 15 EU member-states had been issued according to various EU Regulations. The majority of these certificates concerned PDO/PGI products. Additionally, a total of 211 Greek food products have been approved by the EU, ranking Greece third, after Italy and France.

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"Country-of-origin", "Glass bottle" and "Price". The results of CA are employed in extended analyses to establish consumer segments in terms of preferences and demographic profiles and, subsequently, to simulate the market shares of specified brands. The research objective is to improve targeting of younger, more educated and of higher income consumer segments through more effectively differentiated marketing mix strategies. In this way, the research has the ambition to improve the performance and effectiveness of, especially, SME olive oil firms, which traditionally engage in quality marketing strategies (Iliopoulos and Krystallis, 2002).

Methodology

Conjoint analysis models the nature of consumer preferences in the form of consumer trade-offs amongst multi-attribute concepts. The conjoint model assumes that products can be defined as a series of specific levels of attributes and that the total utility that the consumer derives from a concept is determined by the partial utilities (part-worths) contributed by each attribute level. It provides for the identification of attribute combinations that are most preferred by respondents and the identification of the relative importance of each attribute. Extended analyses provide for segmentation on the basis of preferences and market share simulation.

There are several techniques for identifying product attributes (or "factors") and attribute levels that are relevant to consumers' preferences. Harrison, Ozayan and Meyers (1998) recommend the use of unstructured focus group interviews combined with a series of semi-structured, open-ended questions. Bech-Larson, Nielsen, Grunert and Sorensen (1997) suggest the use of in-depth interviews for identifying attributes of low involvement products on which consumers spend little time, effort and money. In this study, the selection of olive oil attributes has been based on the results from means-end chain analysis, with the use of 40 MEC "laddering" qualitative interviews conducted in Athens during summer 1999 (Krystallis and Ness, 2004). The aim of these interviews was to identify the most preferable quality, safety and health-related olive oil attributes, the benefits consumers sought from

[4] As far as the implementation of different quality standards in Greece is concerned, the majority of companies (approximately 80%) today employ ISO (mainly) or HACCP systems, among which a large percentage belong to food industries. According to 1998 data by the four main certification bodies (ELOT, BVQI, TUV Hellas, and DNV), 679 firms were certified according to ISO9001 (180) and ISO9002 (499), 11.5% (78) of which belonged to the food and drinks industry. Data from the International Standardization Organization (ISO) for the year 2000 estimate number of ISO-certified firms to be 2,173. HACCP is widely recognized in the food industry as an effective approach to establish good manufacturing practices for the production of safe food. In the EU, there is a general requirement that an HACCP-based food safety control system should be in place (Directive 43/93, effective for Greece from 1/1/1996), although the exact of this system is not specified (Henson and Caswell, 1999). A survey of 166 food manufacturers by Efstratiadis, Kapirti and Arvanitoyannis (2000) found that 82% employ some type of quality assurance/safety system, 36% of which employed HACCP. According to personal communication data provided by the main certification bodies operating in Greece, the number of HACCP-certified food companies in 2001 was approximately 120 (14%) out of 850 certified firms of all types.

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their use and their personal values which impose the elicitation of those benefits for younger and relatively better educated consumers.

The factors selected through MEC for the development of the conjoint model concern 8 concepts of quality, safety and healthiness of olive oil (Table 1) expressed as extrinsic cues: "organic label", "PDO label", "ISO certification", "HACCP certification", "Health-related information", "Country-of-origin", "Glass bottle" and "Price". Within conjoint analysis,[5] the study employed an additive part-worth model. An orthogonal experimental design was generated using the Orthoplan procedure in the SPSS Version 8.0 (SPSS, 1997), providing for the estimation of 16 product profiles (Table 3). All the profiles concern extra virgin olive oil, which traditionally contains no additives or preservatives. Since the price of organic olive oil carries an average premium of 40% (Olive and Olive Oil, 2000) and it is always bottled in glass, it was necessary to modify unrealistic stimuli whenever an organic label is being included in a particular profile.

Table 1: Levels of the CA Factors Selected and their Relationships, Extra Virgin Olive Oil

Factors	**Organic label**	**PDO label**	**ISO certif.**	**HACCP certif.**	**Health info**	**Glass bottle**	**Country of Origin**	**Price levels** [1]
Levels no:	**2**	**2**	**2**	**2**	**4**	**2**	**2**	**4**
Level description:	1:YES, 0: NO	1: YES, 0: NO	1YES 0: NO	1: YES, 0: NO	1:Best before date 2:Keep until instructions 3: Additives/ preservatives free 4:Cholesterol free	1:YES 0: Other (*)	1: Written on the label 0: Not written on the label	1: 3.25 Euro 2: 4.41 Euro 3: 5.88 Euro 4: 6.76 Euro
Relation:	Linear more (direct)	Linear more	Linear more	Linear more	Discrete	Linear more	Linear more	Linear less (inverse)

1: Price levels were identified from averaged retail prices in Athens, for the period April-May 2000 (Olive and Olive Oil, 2000).
* 'Other' usually implies plastic bottle

The 16 profiles were presented on cards with a metric preference scale (0 = "not preferable at all", 10 = "totally preferable"). Prior to the presentation of the 16 stimuli, each respondent was provided with a definition of the "organic label", "PDO label", "ISO certification" and "HACCP certification" concepts and asked to indicate his/her awareness of the subjects in a 5-point scale (1= "I am totally aware of", 5= "I am totally unaware of"). Moreover, each respondent was informed about the average retail price of 1L extra virgin olive oil (€ 3.72) and organic extra virgin olive oil (€ 5.2) prevailing in Athens during the period April-May 2000. In addition to the

[5] There is a large number of CA recent application surveys in the international literature (Table 2). For more information on CA see Hair, Anderson, Tatham and Black, 1998.

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conjoint study, the questionnaire included further sections concerning shopping behavior, olive oil purchase involvement, overall attitude towards olive oil and consumers' socio-demographic profile.

Table 2: Selection of Various Recent CA Applications, 1995-2001

Authors	Sample size	Data collection method	Topic	Factors	Levels' relationship model
1. Gerhardy and Ness, 1995	160	Home interviews	Consumer preference for eggs	Production method, Price, Country of origin, Freshness	Linear additive
2. van der Pol and Ryan, 1996	375	Mail survey	Fruits and vegetables consumer preference	Quality, Package, Convenience rice	Linear additive
3. Batt and Katz, 1997	572	Telephone-mail-telephone survey	Enhanced voice mail service perceptions	n.m.	n.m.
4. Gil and Sanchez, 1997	289	Personal interviews	Consumer preference for wine attributes	Year, Price, Area of origin	Linear additive
5. Halbrendt, Pesek and Lindner, 1997	557	Personal interviews	Consumer acceptance of GM pork	Price, GM label, Fat content	Linear interactive
6. Harrison, Ozayan and Meyers, 1998	155	Mail survey	Seafood new product development	Price, Form, Flavour	Linear additive
7. Quester and Smart, 1998	303	Personal interviews	Preference for wine attributes under different involvement and purchase situations	Region of origin, Price,Variety, Style	Additive
8. Walley, Parsons and Bland, 1999	120	Street interviews	Means beef quality assurance labels	Brand name, Price, Quality label, Overall quality, Packaging	n.m.
9. Knight, 1999	87	Computer-aided personal interviews	Consumer perceptions on country-of-Origin	Brand, company's country of origin, country of manufacture, price, quality	n.m.
10. Murphy, Cowan and Hension, 2000	153	Personal interviews	Consumer preferences for honey	Texture, color, producer, price, packaging	Linear additive
11. Jaeger, Hedderley and MacFie, 2001	105	Group interviews with students	Consumer preferences for pre-packed apples	Variety, number of varieties in the pack, country of origin, other information	Choice-based conjoint analysis
12. Bech-Larsen, Grunert and Poulsen, 2001	1533	Personal interviews	Acceptance of functional food	Product, enrichment, claim, processing, price	Linear interactive
13. de Souza Monteiro and Ventura Lucas, 2001	269	Personal interviews	Consumer preference for traditional cheeses	Price, label, texture, size	Linear additive
14. Krystallis, Papadopoulou and Chryssohoidis (in press)	200	Street interviews	Consumer choices of PDO cheese	Country of origin, type of milk, price, brand name	Linear additive

n.m.: not mentioned

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Table 3: Survey's Fractional Factorial Design (SPSS Conjoint 8.0), Extra Virgin Olive Oil

Olive oil profile	Organic label	PDO label	ISO certif.	HACCP certific.	Health info	Bottle	Country of origin	Price € / L
1	No	Yes	Yes	No	Keep until instructions	Other than glass	Not Written	3.25
2	Yes	No	No	Yes	Additives/ Preservatives free	Glass	Not written	5.88
3	Yes	Yes	No	No	Best before date	Glass	Not written	6.76
4	No	No	Yes	No	Best before date	Glass	Not written	4.41
5	Yes	No	Yes	Yes	Keep until instructions	Glass	Written	5.88
6	Yes	Yes	Yes	Yes	Best before date	Glass	Written	6.76
7	No	No	No	Yes	Best before date	Other	Written	4.41
8	No	No	No	No	Cholesterol free	Other	Written	3.25
9	No	Yes	No	Yes	Keep until Instructions	Glass	Written	4.41
10	Yes	Yes	Yes	No	Cholesterol free	Glass	Written	5.88
11	Yes	Yes	No	Yes	Cholesterol Free	Glass	Not written	6.76
12	No	Yes	Yes	Yes	Additives/ Preservatives free	Other	Not written	4.41
13	Yes	No	No	No	Keep until instructions	Glass	Not written	5.88
14	No	Yes	No	No	Additives/ Preservatives free	Glass	Written	3.25
15	No	No	Yes	Yes	Cholesterol free	Glass	Not written	3.25
16	Yes	No	Yes	No	Additives/ preservatives free	Glass	Written	6.76

Data were collected from a series of personal interviews conducted in the region of Attiki (Athens) in May-July 2000. The selected recruitment areas consisted of two municipalities in the metropolitan area of the City of Athens, two nearby suburban municipalities and two small towns within a 35km radius from Athens. A total of 160 randomly chosen interviews took place with younger, better educated and of higher income consumers, almost equally divided in each one of the six recruitment areas, with residents aged from 25 to 70 years (Table 4).

The high percentage of women in the sample guarantees the inclusion of the main food purchase decision-maker of the household. The sample is biased towards relatively younger age groups and clearly higher educational and income levels, according to the objectives of the research and following the qualitative MEC phase.

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Table 4: Sample's Socio-demographic Profile, n=160

Frequency					Percentage %				
AGE GROUP									
25-35	**36-45**	**46-55**	**56-70**		**25-35**	**36-45**	**46-55**	**56-70**	
42	52	27	39		26.3	32.5	16.9	24.4	
GENDER									
Male	**Female**				**Male**	**Female**			
53	107				33.1	66.9			
EDUCATION									
Elementary	**High school**	**Technical**	**University**	**Post-grad.**	**Elementary**	**High school**	**Technical**	**University**	**Post-grad**
31	57	11	43	18	19.4	35.6	6.9	26.9	11.3
PRE-TAX YEARLY INCOME, €									
<5,870	**5,870 - 11,740**	**11,740 - 17,610**	**17,610 - 29,347**	**>29,347**	**<5,870**	**5,870 - 11,740**	**11,740 - 17,610**	**17,610 - 29,347**	**>29,347**
27	73	36	19	5	16.9	45.6	22.5	11.9	3.1
Married	**Unmarried**				**Married**	**Unmarried**			
111	49				69.4	30.6			
NO OF CHILDREN									
0	**1**	**2**	**>2**		**0**	**1**	**2**	**>2**	
60	28	57	15		37.5	17.5	35.6	9.4	
WORKING WOMAN IN THE HOUSEHOLD									
yes	**no**				**yes**	**no**			
105	55				65.6	34.4			

The complexity of the stimuli evaluation method and the unfamiliarity of the average Greek consumer with the concepts under investigation made the inclusion of younger people necessary for the accomplishment of the task. This also is the main reason that justifies the bias appeared in respondents' education status towards higher levels. Moreover, there appears to be a serious bias towards average and higher income levels. Given that the upper age limit of the sample has been 70 years and that only 9 people (5%) are older than 65, effectively, traditionally low-income, pensioners were excluded from the survey. The rational behind this exclusion was the perception that older people traditionally constitute bulk olive oil consumers with very limited interests in innovations such as those under examination.

Empirical Results

Food and Olive Oil Purchase/Consumption Behavior, Olive Oil Involvement and Overall Attitude

In terms of the food and olive oil purchase behavior questions that open the questionnaire, 85.6% of the sample purchase food at least once per week, 83.1% spend for food at least € 44 per week and 76.3% buy at least 1L of olive oil per week, indicating that the sample is mostly comprised of heavy olive oil users.

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Concerning place of purchase, 82.5%, 86.3% and 58.1% of the sample never purchase olive oil at minimarkets/local stores, specialty shops, and hypermarkets respectively. In addition, 70% never buy bulk olive oil directly from producers. The most popular place of bottled olive oil purchase is the supermarket (40%).

Pomace olive oil, sunflower oil, soy oil and other vegetable oils are frequently preferred as substitutes for olive oil by only 6.3%, 10.6%, 3.1% and 23.1% of respondents respectively. Furthermore, the most frequent usage of olive oil is raw in salads (95%), followed by its use in boiling (87.5%) or frying (64.4%). This indicates Greek consumers' familiarity with olive oil and its great importance to their everyday diet as a source of nutrients.

In terms of purchase involvement, 80.6% of the sample strongly agree that they are interested in knowing how a specific olive oil brand is produced, 75.6% have compared different brands before purchase, 81.9% believe that there are substantial differences among different brands, and 71.9% have a preferred brand. Yet, only 41.9% strongly agree in having a good overall knowledge of the product.

Respondents' overall attitudes towards olive oil are highly positive. Thus, there is full agreement (100%) that olive oil is good for health and that it is tasty in salads, natural (98.2%), traditional (92.5%), and a high quality product (88.2%). However, the fact that one third of respondents believe that olive oil is being consumed out of habit somewhat decreases respondents high stated involvement in olive oil purchase. Finally, 80.6% of respondents believe that olive oil offers reasonable value for money.

With respect to awareness of the four quality labels/certifications under investigation, the results reveal that awareness decreases from labels to certification (Figure 2). This result was expected, given the nature and purpose of each of the four schemes and the delayed adoption of the ISO and HACCP strategies by the Greek food industry, compared with other industrial sectors (Mandaraka and Kormetza, 2000).

Conjoint Analysis Results

Conjoint analysis was conducted using the conjoint procedure in SPSS (SPSS, 1997; Table 5). Goodness of fit is indicated by Pearson's R and Kendall's Tau statistics, based upon the correlation of actual and predicted preference scores. Both significance statistics indicate that a null hypothesis that the correlation is not significant is rejected ($p<0.001$). The part-worth scores ("utilities") indicate the influence of each factor level on respondents' preference for a particular combination, following the additive model (Table 6).

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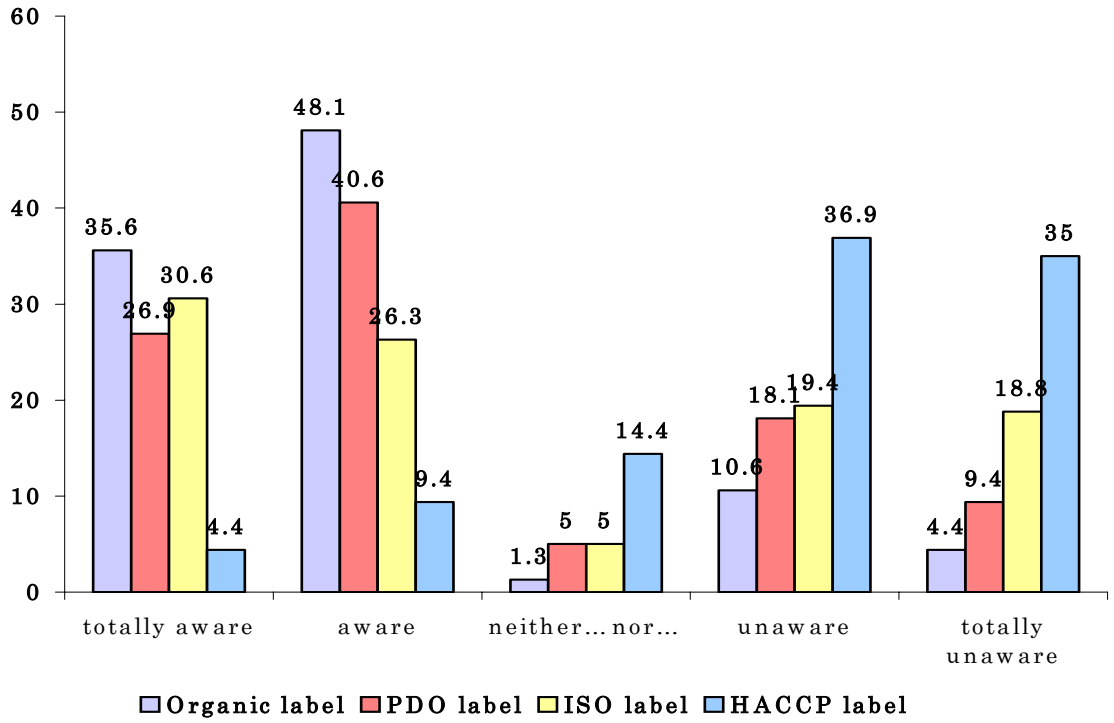

Figure 2: Sample Awareness of the Four Quality Schemes under Investigation (%)

Table 5: SPSS 10.0 Estimated Aggregate Conjoint Model

FACTORS	AVERAGE IMPORTANCE %	UTILITY		LEVELS
HEALTH	**16.96**	.2469		'Best before' date
		.0440		'Keep until' instructions
		-.5173	-	'Additives free' sign
		.2264		'Cholesterol free' sign
ORGANIC LABEL	**19.07**	.0000		NO
		1.5660	---	YES
		B=1.5660		
PDO LABEL	**8.1**	.0000		NO
		.6399	-	YES
		B=.6399		
ISO CERTIFICATION	**9.58**	.0000		NO
		.7673	--	YES
		B=.7673		
HACCP CERTIFICATION	**11.11**	.0000		NO
		.9701	--	YES
		B=.9701		
GLASS BOTTLE	**6.29**	.0000		NO
		.4135	-	YES
		B=.4135		
Country Of Origin SIGN	**21.71**	.0000		NO
		2.0094	----	YES
		B=2.0094		
PRICE / L	**7.17**	.0318		3.25 €
		.0635		4.41 €
		.0953	----	5.88 €
		.1270		6.76 €
		B=.0318		
Constant		2.4057		
	Pearson's R=**.995,** Kendall's Tau=**.967**			Significance = .0000
	Kendall's Tau=**1.000 for 2 holdouts**			Significance = .0000

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Table 6: Predicted Preference for the 16 Olive Oil Profiles According to their Total Utilities

Rank	Profile Number and Description	Predicted Preference (actual preference)
1	6: Organic and PDO olive oil, with ISO and HACCP, 'best before' date and the Greek origin on the label, bottled on glass and with the highest price (6.76Euro)	**MOST PREFERRED** 9.1460 (9.00)
2	5: Organic olive oil, with ISO and HACCP, 'keep until' instructions and the Greek origin on the label, bottled on glass and with average for organic olive oil price (5.88Euro)	8.2703 (8.05)
3	10: Organic and PDO olive oil, with ISO, 'cholesterol free' sign and the Greek origin written on the label, bottled on glass, with average for organic olive oil price (5.88Euro)	8.1235 (7.893)
4	9: PDO olive oil with HACCP, 'keep until' instructions and the Greek origin written on the label, bottled on glass, with average for conventional olive oil price (4.41Euro)	6.5461 (6.587)
5	11: Organic and PDO olive oil, with HACCP, 'cholesterol free' sign written on the label, bottled on glass, with the highest price (6.76Euro)	6.3486 (5.831)
6	7: Olive oil with HACCP, 'best before' date and the Greek origin on the label, bottled on other than glass bottle, with average for conventional olive oil price (4.41Euro)	**INDIFFERENT** 5.6956 (5.393)
7	16: Organic olive oil with ISO, 'additives/preservatives free' sign written on the label, bottled on glass, with average for organic olive oil price (6.76Euro)	5.6716 (6.218)
8	3: Organic and PDO olive oil, with 'best before' date written on the label, bottled on glass, with the highest price (6.76Euro)	5.3990 (5.131)
9	14: PDO olive oil with the 'additives/preservatives free' sign and the Greek origin on the label, bottled on glass, priced cheaply (3.25Euro)	**LEAST PREFERRED** 4.9830 (5.137)
10	2: Organic olive oil, with HACCP, 'additives/preservatives free' sign, bottled on glass, with average for organic olive oil price (5.88Euro)	4.9333 (4.737)
11	15: Olive oil with ISO and HACCP, with the 'cholesterol free' sign written on the label, priced cheaply (3.25Euro)	4.8148 (4.937)
12	8: Olive oil with 'cholesterol free' sign and the Greek origin written on the label, bottled on other than glass bottle and priced cheaply (3.25Euro)	4.6733 (4.768)
13	13: Organic olive oil with 'keep until' instructions on the label, bottled on glass, with average for organic olive oil price (5.88Euro)	4.5245 (4.425)
14	12: PDO olive oil with ISO and HACCP, with 'additives/preservatives free' sign written on the label, bottled on other than glass bottle, with average for conventional olive oil price (4.41Euro)	4.3292 (4.381)
15	4: Olive oil with ISO and 'best before' date written on the label, bottled on glass, with average for conventional olive oil price (4.41Euro)	3.8969 (4.268)
16	1: PDO olive oil, with ISO, 'keep until' instructions written on the label, bottled on other than glass bottle, priced cheaply (3.25Euro)	3.8887 (3.653)

The aggregate model provides for the identification of the most preferred or "ideal" product and the relative importance of the attributes. The ideal brand is one that has a "best before date" on the label, both organic and PDO labels, both ISO and HACCP certification, is presented in a glass bottle, country of origin information, for a price of € 6.76/L. Average importance percentages indicate that the most important features are those indicating country of origin, organic labeling and health information, and that PDO labeling, price and glass bottle are of lesser importance.

At the individual level, each respondent was also asked to consider each of the 16 profiles and provide a final "yes" or "no" answer to the question: "if this version of the product at this price were available today, would you buy it?" This step was added to allow the researcher to avoid having to make subjective judgements as to the meaning of self-estimated preference ratings (Batt and Katz, 1997). In effect, the inclusion of the binary choice question allows the respondents themselves to

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calibrate their purchase probabilities. As such, it eliminates the "subjective probabilities versus objective choices" issue that is sometimes regarded as weakness of the conjoint technique against related trade-off methodologies. Although there has been some inconsistencies with two profiles (no. 16: 5.671 and no. 11: 6.348), casual observation of the plot (Figure 3) suggests a high level of correspondence between high or low preference scores and associated "yes" or "no" responses for the remaining 14 profiles.

Segmentation of Consumer Preferences

Conjoint results for individual consumers were used as a basis for the identification of consumer segments. Following a popular approach (Hair, Anderson, Tatham and Black, 1998), the variables that were used as the cluster criterion were respondents' percentage importance for the eight olive oil attributes. The cluster method employed the k-means procedure within SPSS Version 10.0, with the option of identifying 3, 4 or 5 clusters considered as the most appropriate, after implementation of hierarchical cluster analysis and in relation to the size of the sample. The 5-cluster solution was finally selected as ideal and easiest to interpret, also in relation with the variables used as background information (Table 7). Information about cluster membership in the form of a nominal cluster-identity variable was saved for subsequent analysis. Significant differences between clusters were substantiated by discriminate analysis, with the between-cluster variances

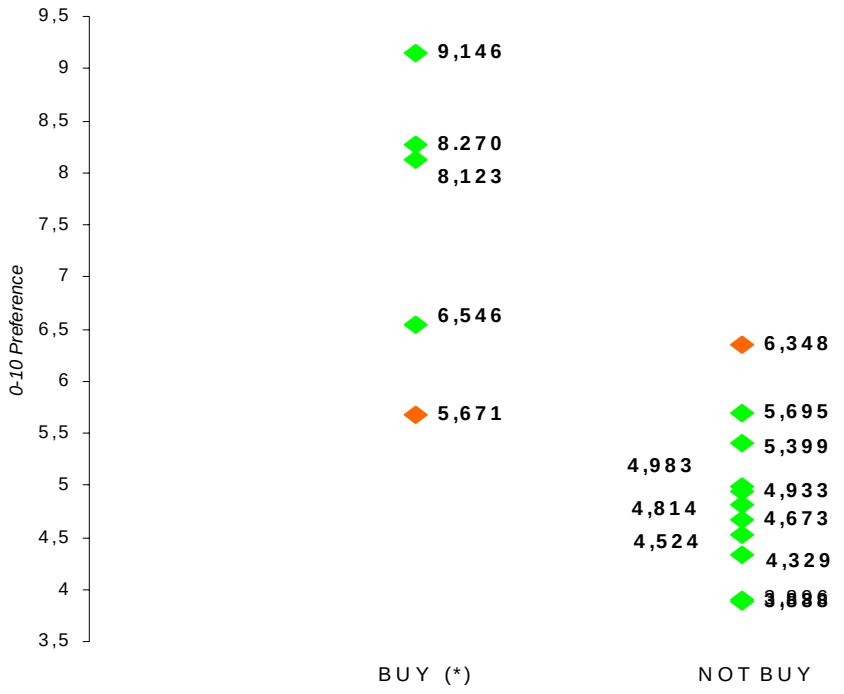

Figure 3: Purchase Question by Predicted Preference of the 16 Profiles
* : When more than 50 percent of respondents would buy the specific profile.

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Table 7: Clusters of Respondents with Respect to Attribute % Importance (n=159)

	Attribute importance, % CLUSTERS				
Attributes ("factors")	**1 (n=40, 25%)**	**2 (n=21, 14%)**	**3 (n=10, 8%)**	**4 (n=60, 37.5%)**	**5 (n=28 18%)**
Country of origin sign	13.87	**44.66**	5.79	**27.19**	9.64
Organic label	**22.71**	8.71	9.37	13.25	**37.58**
Health information	**19.88**	14.51	16.30	**19.06**	10.40
HACCP certification	10.52	9.77	**31.60**	8.64	**10.91**
ISO certification	**11.87**	5.71	**11.92**	9.24	9.11
PDO label (*)	7.96	6.61	**11.40**	7.85	**8.78**
Price (*)	**8.38**	5.98	**7.43**	7.41	5.75
Glass bottle	4.81	4.05	6.20	**7.36**	**7.83**

* : not statistically significant

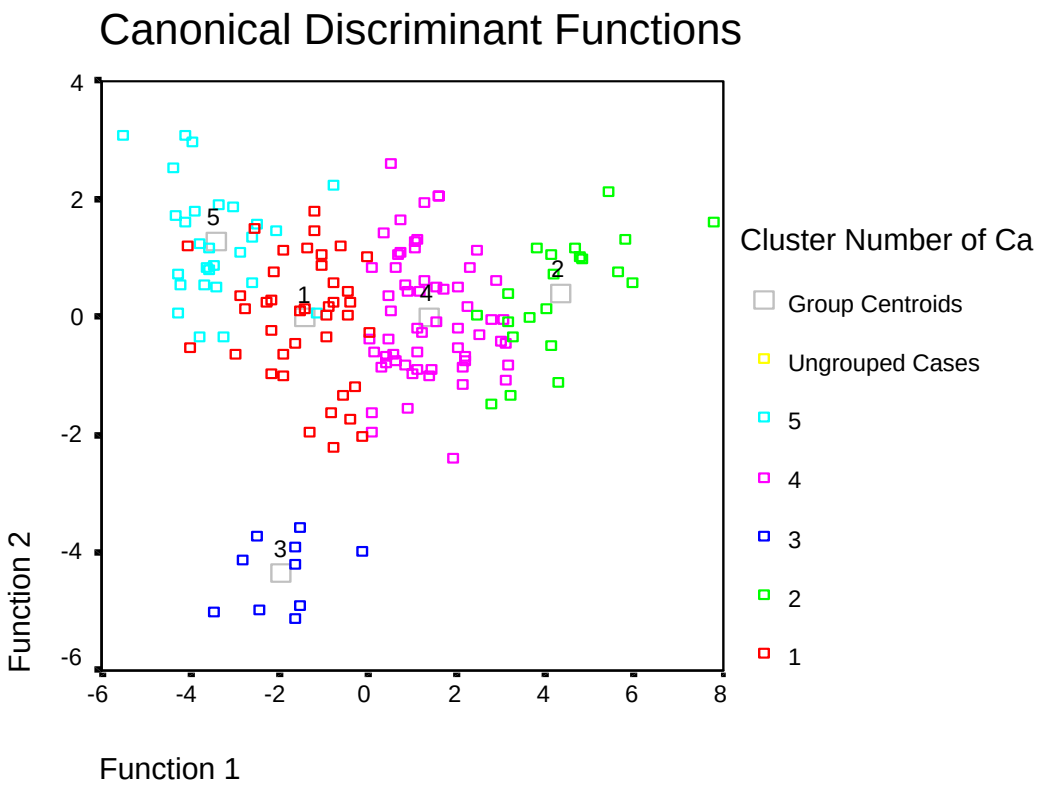

Figure 4: Discriminate Analysis' All-groups Scatter Plot (n=159)

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being larger than those within-clusters (Wilk's Lambda: .035 and *F:* .0001). When a linear discriminate function was used to re-substitute respondents in clusters, 96.2% were correctly classified (Figure 4).

The remaining statistically significant variables with discriminating power among the five clusters was established using One-way ANOVA in the case of scale variables or chi-square contingency tests for $p<0.01$ in the case of nominal variables. In terms of socio-demographic variables, all are statistically significant for $p<0.01$, fact that constitutes a 5-cluster solution's advantage over the 3 and 4-cluster ones

Table 8: Chi-square and One way ANOVA Tests of All Variables (n=159)

Socio-demographic	**df**	**$F_{.01}$**	**Sig.**	
1.Age	4, 154	3.825	.005	**
	df	***x^2***	**Sig.**	
2.Education	4	43.250	.000	**
3.Number of children in the household	4	83.938	.000	**
4.Income level	4	81.875	.000	**
5.Working woman in the household	1	15.625	.000	**
6.Marital status	1	24.025	.000	**
7.Gender	1	18.225	.000	**
Awareness level	**df**	***$F_{.01}$***	**Sig.**	
8.Awareness of the organic label	4, 154	.837	.504	n.s.
9.Awareness of the PDO label	4, 154	4.425	.002	**
10.Awareness of the ISO certification	4, 154	7.366	.000	*
11.Awareness of the HACCP certification	4, 154	1.839	.124	n.s.
Food and Olive oil purchase behavior	**df**	***x^2***	**Sig.**	
12.Food purchase frequency	2	25.963	.000	**
13.Food expenditure	2	54.388	.000	**
14.Olive oil purchase quantity	2	66.613	.000	**
	df	***$F_{.01}$***	**Sig.**	
15.Olive oil purchase place: minimarket	4, 154	.421	.793	n.s.
: supermarket	4, 154	4.228	.003	**
: hypermarket	4, 154	.686	.603	n.s.
: speciality shop	4, 154	6.499	.000	*
: bulk from producers	4, 154	1.880	.117	n.s.
: own production	4, 154	3.463	.010	***
16.Olive oil substitute: pomace oil	4, 154	.204	.936	n.s.
: sunflower oil	4, 154	.348	.845	n.s.
: soy oil	4, 154	.735	.569	n.s.
: other vegetable oils	4, 154	3.358	.011	***
17.Olive oil use: frying	4, 154	8.508	.000	*
: boiling	4, 154	.522	.720	n.s.
: in salads	4, 154	.722	.578	n.s.
Olive oil involvement and overall attitude	**df**	***$F_{.01}$***	**Sig.**	
18.Interested in production method	4, 154	1.390	.153	n.s.
19.Compare olive oil brands before buying	4, 154	1.418	.231	n.s.
20.Olive oil brands have differences	4, 154	1.172	.325	n.s.
21.Preferable olive oil brand	4, 154	1.011	.404	n.s.
22.Good overall knowledge about olive oil	4, 154	.816	.517	n.s.
23.Olive oil is: good for health	4, 154	.643	.633	n.s.
: good cooking ingredient	4, 154	.689	.601	n.s.
: good substitute of other oils	4, 154	1.977	.101	n.s.
: tasty in salads	4, 154	.536	.710	n.s.
24.Olive oil has: nice aroma	4, 154	1.840	.124	n.s.
25.Olive oil is: of high quality	4, 154	1.236	.168	n.s.
: natural product	4, 154	4.558	.002	**
: environmentally friendly	4, 154	1.104	.357	n.s.
: traditional Greek product	4, 154	18.683	.000	*
: consumed out of habit	4, 154	2.022	.094	***
26.Olive oil has a reasonable price	4, 154	5.056	.001	**

n.s.: not significant, *: $p<0.001$, **: $p<0.01$, ***: $p<0.1$

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Table 9: Description of the Profile of the Five Clusters in Terms of the Statistically Significant and Selected Non-Significant Variables (n=159)

VARIABLES	Cluster 1: 25% The health and quality conscious	Cluster 2: 14% The ethnocentric	Cluster 3: 8% The innovators	Cluster 4: 37.5% The common consumers	Cluster 5: 18% The organic funs
% Attribute Importance					
Country of origin		Very important	Least important	Second important	
Organic label	Second import.	Least important		Average	Very important
Health information	Very important	Average	Average	Second important	Least important
HACCP certification			Very important	Least important	Second import.
ISO certification	Second import.	Least important	Very important	Average	
Glass bottle		Least important		Second important	Very important
Socio-demographic					
Age	40% in their 30's 32,5% in their 40's	66.7% in their 40's or older	60% in their 40's or younger 40% older than 60	63.3% in their 40's or younger	60.7% in their 50's or older
Education	57,5% at least BA	66.7% of highschool or lower	60% at least BA	56.7% of high school or lower	42.9% of basic level
Family size	2.8	3.67	2.9	3.08	3.75
Pre-tax yearly income, € (1)	5,870-17,610: 50% >17,610: 27.5%	5,870-17,610: 52.4 < 5,870: 33.3	5,870-17,610: 80%	5,870-17,610: 78.3%	5,870-17,610: 78.6 >17,610: 14.2
Working woman	55%	85.7%	100%	71.7%	42.9%
Married	52.5%	81%	70%	65%	92.9%
Female	55%	81%	50%	61.7%	89.3%
Awareness level	(fully) aware of..:				
Organic (*)	87.5%	80.9%	90%	86.7%	75%
PDO	82.5%	76.1%	70%	68.3%	39.4%
ISO	70%	57.2%	90%	63.4%	14.1%
HACCP (*)	17.5%	4.8%	20%	16.7%	7.1%
Food and Olive oil purchase behavior					
Food purchase frequency	52.5% 1/week	47.6% more than 1/week	80% more than 1/week	84% at least 1/week	89.3% at least 1/week
Food expenditure per week	52.5% at least € 44	76.2% more than € 44	80% more than € 44	56.7% more than € 44	64.3% more than € 44
Monthly olive oil purchase quantity	42.5% > 1L 40% < 1L	66.7% > 1L	40% > 1L 30% < 1L	68.3% > 1L	89.3% > 1L
Bought at supermarket	47.5% "never"	52.4% "frequently"	60% "frequently"	51.7% "never"	71.4% "frequently"
Bought at speciality shop	95% "never"	95% "never"	30% "frequently"	86.7% "never"	92.9% "never"
Bought directly from producers	42.5%	33.3%	10%	31.7%	7.1%
Other vegetable oils frequently	20%	14.3%	20%	16.7%	50%
Olive oil frying frequently (2)	77.5%	71.4%	30%	75%	32.1%
Involvement and overall attitude	(totally) agree				
High olive oil knowledge level *	47.4%	33.3%	70%	38.4%	39.3%
Natural product	97.5%	95.3%	60%	100%	100%
Traditional	97.5%	90.5%	40%	95%	100%
Out of habit	45%	23.3%	0%	23.4%	32.2%
'Value for money' priced	80%	85.7%	40%	78.3%	96.4%

* Not significant for $p<0.01$.

1: <5,870: low income level, 5,870-17,610: average income level (5,870-11,740: low-average, 11,740-17,610: upper-average), >17,610: high income level (NSSG, 1998)

2: Greek consumers mainly use cheaper but less healthy vegetable oils when frying. Frequent use of olive oil when frying is considered as indication of health conscious behavior.

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(Table 8). In order to develop the profiles of each one of the five clusters, a cross-tabulation process took place between cluster membership and the statistically significant variables. Non-significant differences exist between the five clusters in terms of the "existence of PDO label" and "price" importance levels, their organic and HACCP schemes' awareness (very high and very low respectively), and the majority of the "food and olive oil purchase/consumption behavior" and "olive oil involvement and overall attitude" (highly positive) variables. It should be emphasized that only 40% of respondents claim to have good overall olive oil knowledge (Table 9).

Choice Simulation Experiment

After the conjoint model has been estimated, the researcher can specify any number of sets of stimuli for simulation of consumer choices. The role played by choice simulators is to help CA achieve its other primary objective: using "what-if" analysis to predict the share of preferences that a stimulus (real or hypothetical) is likely to capture in various competitive scenarios of interest to management.

In the present study, three olive oil brands have been tested: first, an organic, glass bottled, HACCP-certified, with "country-of-origin" and "keep until" information on the label of high price (€ 6.76/L). Second, a PDO-protected, glass bottled, HACCP-certified, with "country-of-origin" and "best before" date on the label, and high price for conventional olive oil (€ 4.41/L). And third, a common brand of the market, without any quality certification (not bottled in glass) with the "country-of-origin"

Table 10: Simulation Olive oil Brands' Choice, Predicted Preferences and Market Shares

No. of Profile	*Average Predicted Preference*					
	Cluster 1*	Cluster 2*	Cluster 3*	Cluster 4*	Cluster 5*	All sample
1st	6.875	8.124	6.530	7.493	8.525	7.493
2d	6.337	8.195	6.990	6.996	5.750	6.724
3d	4.500	6.923	3.560	4.986	3.289	4.843
	Predicted Market Shares (**)					
	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	All sample
	BTL model					
1st	39.36%	34.98%	38.56%	38.91%	48.9%	40.2%
2d	35.28%	35.34%	40.91%	35.9%	32.63%	35.43%
3d	25.36%	29.68%	20.53%	25.18%	18.47%	24.37%
	Logit model					
1st	55.96%	40.72%	40.03%	56.09%	86.16%	58.16%
2d	30.8%	43.28%	56.41%	36.42%	12.24%	33.04%
3d	13.23%	16.01%	3.56%	7.49%	1.6%	8.8%

*: All preferences within each cluster statistically significant for p<.001

**: Real market shares should be decreased by approximately 30-40% for clusters 1, 2 and 4 and by 7-10% for clusters 3 and 5, due to consumers' consumption of own-produced olive oil.

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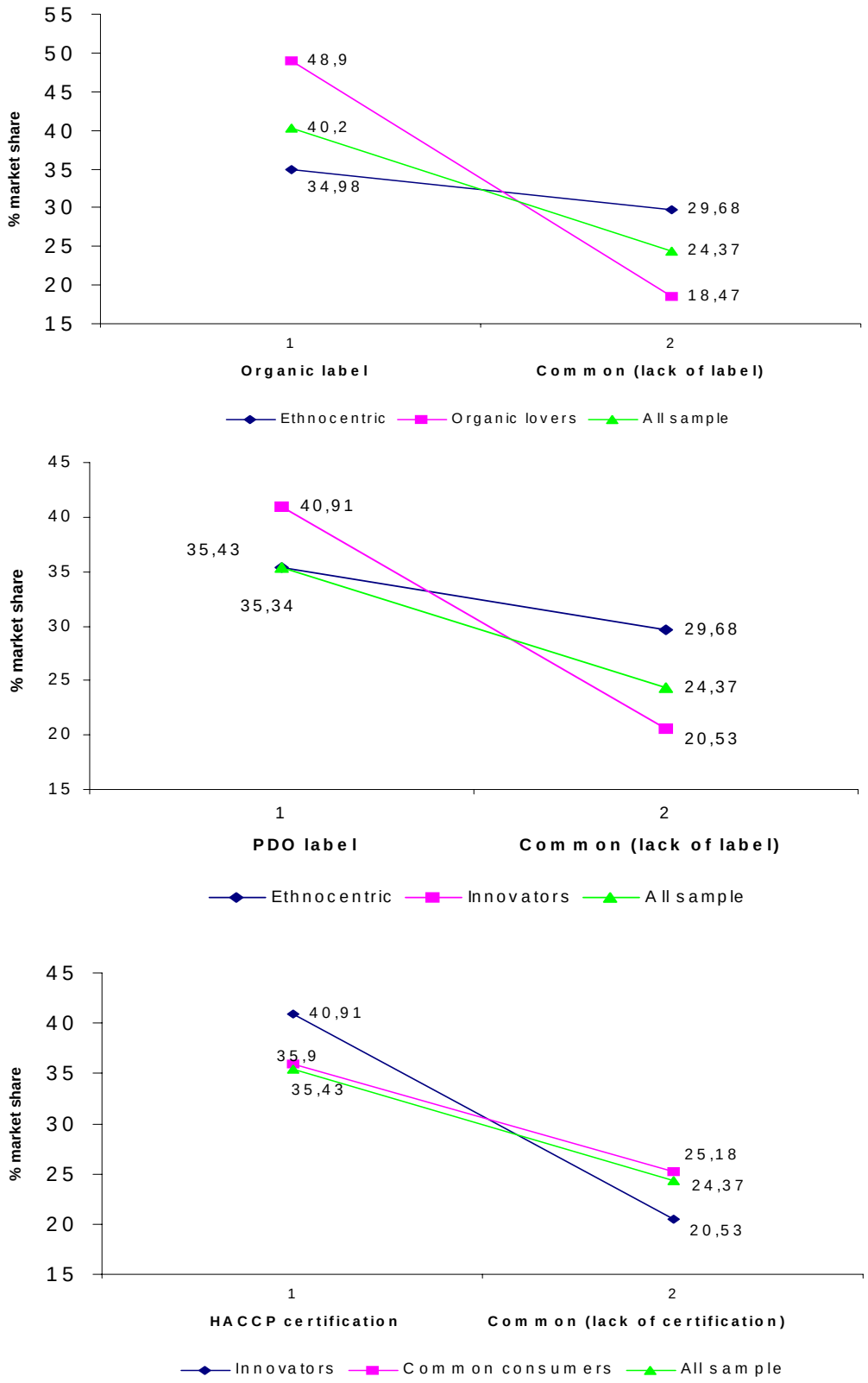

Figure 5: Market Share as a Function of Organic label, PDO label and HACCP Certification (Clusters for which the relevant quality scheme had the highest and lowest importance).

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and "best before" date clearly indicated on the label, and common price (€ 3.25/L). The aim of the choice simulator study is to prove that both of the quality brands could acquire significant market share, much larger than the common olive oil.

The market share simulation used the simulation sub-procedure within conjoint procedure in SPSS. Predictions of the expected market shares were made with the probabilistic (BTL and Logit) model, which is best suited to repetitive purchasing situations, for which purchases may be more tied to usage situations over time (Table 10). Figure 5 presents the analyses of market share (BTL method) change due to variations in the level of three quality schemes, on the assumption that the levels of the remaining attributes were unchanged. These analyses were undertaken for those clusters for which the relevant quality scheme had the highest and lowest importance. The change in market share for the pooled sample was also analyzed. It is clear that the higher the importance difference of the quality scheme between two clusters, the higher the market share difference between them. For example, organic olive oil's market share was seriously reduced among cluster 2-members in comparison to those of cluster 1, and vice versa for the common olive oil's market share.

Discussion

At the different attribute levels selected for CA implementation, three observations can be made: first, given that a negative utility corresponds to consumers' dislike, the lack of any quality label, of the country-of-origin sign and of a glass bottle exhibit zero utilities and, thus, exercise a kind of "neutral" effect on respondents. The corresponding olive oil brand might be regarded indifferently. These are the most common olive oil brands that Greek consumers are very familiar with, and this may possibly be the reason behind the appearance of zero utilities for common characteristics in comparison to the innovating ones, such as quality labels or glass bottles. Second, the "additives/preservatives free" claim as health information is the only factor level with negative utility. This fact is surprising, given that one would expect this to have a positive influence on consumers' preference. A possible explanation may be that, in accordance with the findings of Wright (1997) regarding the "no added sugar" claim for the UK consumers, Greeks are generally aware of the fact that olive oil does not contain any kind of chemical additives or preservatives. Hence, the "additives/preservatives free" claim may be considered as irrelevant or even misleading for a food product such as olive oil. Third, all the remaining factor levels have positive part-worths, representing preferred product attributes. This is especially the case with respect to price, as all the specified levels have positive utilities for consumers. As a matter of fact, the higher the price the greater the utility derived from it. Given the high stated purchase involvement of Greeks, it seems that the notion of a "value for money" olive oil price is being generally satisfied by the actual price levels of the Greek olive oil brands.

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Strategic Analysis of the Five Clusters' Profiles

The profiles of the five clusters are comprehensive. As we have seen, each one of the five clusters is discriminated by the statistically significant variables and well-structured consumer segments can be identified:

The typical consumer is represented by the larger Cluster 4, which can be termed the "average consumer" potentially health and quality conscious. This cluster's socio-demographic characteristics, behavioral characteristics, and awareness level of the quality schemes under investigation are closer to the sample's average than for any other cluster. The same can be said about the fact that one in three common consumers purchase olive oil directly from producers, a percentage equal to the national average. In terms of olive oil attribute importance, the common consumer does not seem to have a strong preference for any of the eight examined here. Moreover, this consumer admits to having low overall knowledge of olive oil, and although this is not statistically significant, it reveals that the involvement and stated positive attitude is theoretical rather than an indication of a thorough search process. On the other hand, the importance attached to country of origin, health information and glass bottle are high enough to demonstrate a possible existence of an underlying quality and health consciousness. Under these conditions, and given that olive oil price is regarded as reasonable, a sub-segment of the typical consumers could become potential purchasers of higher quality olive oil brands.

In contrast, consumers in Cluster 3 can be described as "innovators", well educated consumers, skeptic towards olive oil, of both genders. These consumers seem familiar with the food choice process, given that they exhibit the highest food purchase frequency and expenditure, despite small family size. They claim to be olive oil experts. Their attitudes seem to indicate a thorough search process, since none of them agree that olive oil is consumed out of habit. Moreover, they are especially well educated and exhibit the highest awareness of all labels and schemes under examination. This consumer maintains a skeptic stance towards olive oil's traditional and natural character and value-for-money price, arguments enthusiastically adopted by all other clusters. This skepticism, together with the fact that olive oil is predominantly purchased from supermarkets and specialty stores, while purchasing directly from producers is practically non-existed, provides a strong motive for the purchase of highly quality olive oils such as the PDOs and the HACCP/ISO-certified brands, which they find very important.

Two clusters are associated with two types of female consumers. Cluster 2 may be described as the "ethnocentric", middle-aged, low educated, working mother, and Cluster 5, as the "organic funs" older, low educated, wealthy, housewife and mother. Of those who buy olive oil, they purchase in large quantities and generally spend a lot on food, perhaps due to their families' large size. The main difference between these two clusters is that they comprise women of different generations, with the

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typical member of Cluster 2 being a middle-aged working woman whilst her counterpart in Cluster 5 is older and not at work. This reflects one of the major social changes in Greece during the last two decades (NSSG, 1999; Self-service Review, 1999).

The working women, possibly due to their low education and income levels, exhibit a rather simplistic attitude towards olive oil, whose only important attribute seems to be its Greek origin. They agree with the traditional attitude that an olive oil brand is better than any other just because it is Greek, indicating a rather superficial acceptance of the so-called "olive oil culture". One third of them consume olive oil purchased directly from producers and, as a consequence, exhibit average frequency of olive oil purchase at supermarkets. They claim to have average awareness of the quality schemes under investigation –apart from HACCP, possibly due to their work out of home. They do not seem to constitute potential buyers of any quality assured olive oil, but only of common brands.

The profile of the housewives brings in mind the typical older Greek mother, whose main interest has been her family's welfare. This may explain the importance they attach to organic olive oil and the corresponding glass bottle, coupled with the highest agreement on olive oil's reasonable price. Generally, their profile is contradictory, given, for example, that they attach the least importance to health information, possibly due to their low education level. Another explanation of their positive attitude towards organic olive oil has been that they might use it as a means of indicating a rather "nouveau-riche" stance, given that they belong to upper-average or high income levels. They constitute an almost certain buyer of organic, glass-bottled olive oil brands. Both female clusters have a low overall knowledge of olive oil. Although not statistically significant, this suggests that purchase involvement and positive attitudes of both types of women do not suggest engagement in a thorough search process, in a similar manner to the common consumers of Cluster 4.

Finally, Cluster 1 can be termed the "highly health and quality conscious", young, educated, wealthy consumer of both sexes. Almost half of this cluster's members are non-married, reflected by the lower average family size. It is the cluster that satisfies more than any other the hypothesis of the existence of a health and quality conscious consumer group. Cluster 1 members exhibit very high awareness of the quality schemes, similar to that of Cluster 3, and have better overall knowledge of olive oil than the common consumers and both types of female clusters. They attach the highest importance of all clusters to health information, the second highest to the organic label and ISO certification, and an average importance to the country of origin and HACCP certification, overall indicating high level of health and quality consciousness. This result makes Cluster 1 members almost certain buyers of high quality olive oil, a result that carries serious managerial implications when coupled with the cluster's large size and very high income level. However, there are two

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constraints that limit the cluster's potential as buyers of high quality olive oil brands: they purchase a high percentage of olive oil directly from producers, and almost half of its members agree that olive oil is consumed out of habit.

Choice Simulator Results' Analysis

Regarding the choice simulation results, for the overall sample the organic brand with HACCP is preferred to the PDO brand with HACCP, while both profiles are preferred to the common olive oil with the country-of-origin information. When examined separately for each cluster, a series of *t*-tests established that the preference differences for all three brands within each cluster are statistically significant. Both quality brands' predicted preferences are higher than 6 (except for the PDO brand for Cluster 5 of the older housewives), in other words both brands belong to the "most preferred" part of the 0-10 preference scale for all clusters. The organic brand is most preferred for Cluster 5 and the PDO brand for Cluster 3, as expected, given the profile of these clusters. In Clusters 1 and 2 both brands exhibit a similar predicted preference, with the organic brand slightly leading. Yet, for Cluster 4, the organic brand's superiority is clear, as it is for the overall sample.

Regarding the common olive oil brand, all clusters' predicted preferences are (much) lower than those for the quality brands. Overall, we can conclude that both the organic and PDO brands with HACCP are preferable to the common olive oil for the overall sample and each of the five clusters, with obvious implications for the profitability of the corresponding micro-scale, family-based olive oil firms. At the aggregate level, the quality brands' market shares are high: more than 40% for the organic brand and 27% for the PDO brand. Even the common olive oil succeeded in gaining a satisfactory market share from 9 to 24%, possibly due to its high availability in the market, consumers' increased familiarity, and the inclusion of the most important "country-of-origin" attribute in its profile.

Managerial Implications

The substantial structural problem of the Greek olive oil supply chain, stressed by many industry experts (Kiritsakis, 1996; Tokouzbalidis, 1996; Tsiaousi, 1998), is also revealed by the present study. Although the most usual places of bottled olive oil purchase are supermarkets (40% of respondents), the remaining 60% of consumers of the specific socio-economic profile do not seem to strongly prefer a specific outlet, despite the fact that they are heavy users. In addition, only two thirds of respondents always buy olive oil from the commerce, with the remaining one third consuming own-produced olive oil. An additional 13% of respondents frequently buy bulk olive oil directly from producers, decreasing the percentage of those who buy bottled olive oil at the usual retail outlets even further. This fact should be kept in mind in further analyses, since any predicted market share should be decreased by a third at average. Thus, estimations of the choice

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simulators should be adjusted downwards, to 28% for the organic, 24.8% for the PDO and 17% for the common brand respectively, for the overall sample (BTL model) and the five clusters.

Moreover, a second serious constraint is identified: when asked directly, less than half of respondents strongly agree to have a good overall knowledge of the product, with another approximately 40% being reluctant to express a firm opinion. This fact decreases their real level of purchase involvement in olive oil to a substantial degree. This conclusion is only partially related to the fact that olive oil has a great variety of flavors, aromas and colors so that it is difficult for an urban consumer to have full awareness, similarly to the lack of consumer expertise for wine. In reality, this observation is controversial, provided that everyday olive oil consumption constitutes real "culture" for Greeks. The same lack of awareness regarding food quality, safety and nutritional value is a common observation of many studies regarding the Greek consumer (Helsing, 1999; Lappalainen, Kearney and Gibnay, 1998).

Consequently, given that consumers are almost totally unaware of HACCP and almost 40% of them ignore ISO, many of the opinions about the two schemes stated are theoretical and should be used with caution. Moreover, in a number of surveys regarding choice of organic products in Greece (Fotopoulos and Krystallis, 2002a; 2002b) when consumers have been asked to provide a definition of the word "organic", a variety of inaccurate answers were revealed. Similarly, other studies indicate the very low penetration rate of the PDO scheme in Greece, even among rural populations (e.g. Fotopoulos and Krystallis, 2001; Fotopoulos and Krystallis, 2003), despite their (theoretically) very positive attitude towards PDO products revealed after provision of PDO's definition. Greek consumers seem to be in a permanent state of confusion concerning the real meaning of organic and PDO products. After all, a common conclusion of all the above surveys has been the need for a huge communication campaign to be undertaken in order to inform and educate consumers.

Conclusions

Implementation of CA and its corresponding findings validate the managerial objective of the present study. The identification of a well-defined quality and health conscious segment, in terms of size, socio-demographic composition and purchasing behavior, improves the state of knowledge of the segmentation of the Greek olive oil market. This can be coupled with the description of the remaining clusters in terms of different olive oil quality attributes. Further, it can serve as a positioning strategy guide. The fact that this quality and health conscious segment's purchasing motives and overall behavior can be accurately described should constitute a clear incentive for the highly competitive, market-oriented firms to

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target differentiated market segments and in this way, to satisfy the needs and wants of quality-conscious olive oil consumers.

The present study also satisfies more long-term objectives. Having accurately measured potential market shares acquired by high quality, differentiated olive oil brands, the current work contributes to the survival and profitability of those firms of the sector that would adopt the corresponding marketing strategy. These firms would mainly be the small-scaled family firms, which dominate the sector and exhibit innovative managerial behavior. Of course, this does not exclude larger firms from adopting the same proven successful strategy, with equally profitable results. However, it is particularly the micro firms of the sector that mostly are in need of a competitive marketing strategy. From this point of view, the present analysis reduces the observed deficiency of the Greek olive oil research towards a more effective marketing orientation and enhances Greece's effort to create quality food products with higher added value and worldwide competitiveness for the domestic and the global consumer.

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