Profiling Tunisian olive oil Consumers based on the Environmental Sustainability value perception

EMNA OUERTANI [1,2*], MOHAMED ZIED DHRAIEF [2]

[1] Higher School of Agriculture, Mograne (ESAM), University of Carthage, Tunis, Tunisia
[2] Rural Economics Laboratory, National Agronomic Research Institute of Tunisia (INRAT), University of Carthage, Tunis, Tunisia

* Corresponding author: ouertaniemna2015@gmail.com

Several research papers about olive oil consumption behaviour are based on quality attributes and indicators. Consumption values have not been explored, especially for olive oil consumption. This study provides an analysis of the Tunisian consumer's behaviour toward olive oil, based on consumption values, especially environmental sustainability value since olive oil is typically a sustainable product. Based on a survey of a Tunisian household sample, an exploratory factor analysis reveals nine dimensions among olive oil consumption values. The main factor is "Environmental sustainability value". A cluster analysis was performed exploring these nine constructs of consumer values. It revealed three consumers groups. A group with about 25% of the sample represents consumers with environmental sustainability concerns. In addition, to evaluate the impact of consumers' values on olive oil purchase decisions, a binomial logistic regression is proposed. It revealed that "Environmental sustainability value" has a positive and statistically significant impact on olive oil purchase.

1. Introduction

The olive crop is deeply rooted in the traditions of Tunisia, both in terms of production and consumption. Olive oil sector pruning, picking, transportation, grinding, storage, sale, etc.), has a significant socio-economic weight (IOC, 2017). Tunisian olive oil sector generates 50 million working days/ year and contributes up to 5% of Tunisia's agricultural added value. It involves more than 309 000 farmers, with orchards covering one-third of the country's crop area (1.68 million hectares of olive plantations) including 40% in organic mode, with some certification of origin (Clodoveo et al., 2021; IOC, 2017). Olive farming is characterized by an extensive, rain-fed system, with low inputs and high labour use (IOC, 2017). Tunisian olive oil is a typical example of a sustainable product, with positive social, environmental, and ethical attributes (Luchs et al., 2010).

Domestic consumption of olive oil in Tunisia is based on family reserves, direct supply of olive mills, or the use of informal circuits. Estimating olive oil consumption is difficult due to the different practices and purchasing channels. Domestic consumption is not only varying from 20.000 to 60.000 tons/year but also decreasing. While olive oil consumption has improved in most consuming countries, Tunisia has seen a drop in olive oil consumption from 6 kg/capita/year before 2000 to approximately 3.5-4 kg/capita/year in 2015. Tunisian consumption is less than the average for producing countries (20 kg/capita/year in Greece; 12

kg/capita/year in Spain and Italy) (Karray et al., 2015; IOC, 2017).

This low and declining consumption was due to the marginal actions to promote olive oil trade and consumption in the local market. The focus of the promotion is on overseas markets. In addition, the government sets prices for other vegetable oils and strengthens local refining, packaging, and trading of vegetable oils such as sunflower oil and corn oil. However, olive oil can be five times more expensive than other vegetable oils (IOC, 2017).

The ratio of olive oil domestic consumption to Tunisian olive oil production is about 20%, against 150 % in Italy, 70 % in Greece, and 40 % in Spain (Karray et al., 2015). Moreover, Tunisian consumers traditionally buy olive oil in bulk and directly from neighbouring olive oil processing units. Small quantities are sold in bottles, especially in supermarkets and hypermarkets in big cities (Mtimet et al., 2013).

Moreover, Tunisia's olive oil sector can be determined to be unsustainable, as is the entire agricultural food system. It faces several challenges:

- Environmental dilemmas consist of natural resources exhaustion, emissions into water, air, and soil, and large amounts of mills waste, etc. (Souliman et al., 2017; Erraach et al., 2021).

- Social challenges involve equity, fairness in the distribution of economic value, tradition and culture preservation, employment, working conditions, and remuneration (Erraach et al., 2021).

- Economic concerns require financial continuity, economic and regional development, and maximizing added value

- Economic concerns entail financial viability, economic and territorial development, maximization, and fair distribution of added value. (Erraach et al., 2021; Lombardo et al., 2021)

So, to promote simultaneously the three dimensions of sustainability (environmental, social, and economic), sustainable food labels and certificates were developed in the Tunisian olive oil sector such as organic certificates and geographical indications (Monastir

and Teboursouk olive oil) (Clodoveo et al., 2021). These labels can improve sustainable practices within olive oil producers. They are also a basis for marketing strategies if they are well communicated to consumers and if they are really preferred by a market segment. In fact, sustainability labels can inform consumers about products that are cost-effective, socially responsible, and/or eco-friendly (Erraach et al., 2021).

To achieve sustainability goals, improve consumption in the local market, and meet consumers' requirements, especially in terms of sustainability, it is becoming evident for the Tunisian olive oil suppliers and for policymakers to adopt marketing strategies based on client preferences. Therefore, this paper aims to understand how consumption values and especially environmental sustainability values affect olive oil consumption in the Tunisian market and to propose a consumers profiling based on it.

To determine the impact of consumption values, especially environmental sustainability, on Tunisian consumer behaviour towards olive oil, section 2 develops the literature review about sustainable consumption behaviour through an exploration of consumption theories and consumption values. Section 3 defines the research methodological approach. Finally, section 4 presents and discusses the derived findings and section 5 presents the limitations and implications of the research.

2. Literature review

2.1. Theoretical context

To clarify sustainable consumption behaviour, different models have been developed, such as the Theories of Reasoned Action and of Planned Behaviour (Lombardi et al., 2017). The theory of consumption values highlights the importance of consumption values in predicting consumer choice. Several studies have revealed the usefulness of this theory to investigate consumers choice behaviour. Concerning green choice behaviour, Lin and Huang (2012) used this theory to study the decisive factors on consumer choice behaviour for green products. Biswas and Roy (2015a, 2015b) also used this theory to explore the impact of consumption values on sustainable consumption behaviour across different consumer segments. Gonçalves et al. (2015) examine whether consump-

tion values predict green buying behaviour. Choe and Kim (2018) studied the effects of tourists' local food consumption value on attitude, food destination image and behavioural intention. Zailani et al. (2019) applied the Theory of Consumption Values to Explain Drivers' Willingness to Pay for Biofuels.

Indeed, consumer choice is a function of multiple consumption values. Value is a personal and a subjective notion with intrinsic requirements and knowledge concerns and some implicit factors such as experiential needs (Biswas and Roy, 2015a, 2015b).

2.2. Impact of consumption values on consumer choice behaviour

The central consumption values are functional value, social value, environmental value, conditional value, knowledge value and epistemic value (Biswas and Roy, 2015a, 2015b; Lin and Huang, 2012; Lee et al.,2015; Rahnama and Rajabpour, 2017; Zailani et al., 2019).

2.2.1. Functional value

Consumers' perception of product performance as durability, efficiency, reliability, price and quality is measured by functional value. It is considered the determinant factor of consumers' choice behaviour and decision to buy sustainable products (Sheth et al., 1991; Bei and Simpson, 1995; Biswas and Roy, 2015a, 2015b; Zailani & al., 2019; Rahnama and Rajabpour, 2017).

Bei and Simpson (1995) confirmed that consumers often find the products' price and quality as the most significant factors. Concerning sustainable products, practical interest is the first to control consumer choice behaviour. in the case of high-priced products, criteria other than the price would be selected by consumers (Zailani et al., 2019; Rahnama and Rajabpour, 2017).

Consumers' extreme sensitivity to the price of sustainable or pro-environmental products does not disclose much environmental responsibility (Malhotra et al., 2011, Zailani et al., 2019). In developed countries, the number of consumers willing to make radical reforms to fight against environmental degradation and willing to pay high prices for green products has improved (Wan and Birch, 2011; Lung, 2010; Zailani et

al., 2019).

Many studies about olive oil consumers' preferences and perceptions highlight the importance of functional benefits like the taste, and the price, which are considered as means of research and experience quality attributes for olive oil choice and during the purchase decision. In addition, health, nutritional value and body weight have a significant impact on olive oil consumer choice, they represent experience and credence quality attributes (Mtimet et al., 2013, Siriex, 1999, 2007; Del Giudice et al., 2015; José Jiménez-Guerrero et al., 2012; Mtimet et al., 2013; Rodolfo and Mónica, 2016, Sandalidou and Siskos, 2002; Cândido et al., 2017, Salazar et al, 2017).

Based on this research, hypotheses1a, 1b, 1c and 1d can be developed.

H1a. Functional value-taste positively affects olive oil consumers' purchase decisions.
H1b. Functional value-price has a positive effect on olive oil consumers' purchase decisions.
H1c. Functional value-health positively affects olive oil consumers' purchase decisions.
H1d. Functional value-body weight negatively impacts olive oil consumers' purchase decisions.

2.2.2. Emotional value

Emotional value refers to the product perceived value provoking feelings or affective states (interested, loving, pleasant, satisfied, secure) (Sheth et al., 1991; Rahnama and Rajabpour, 2017). Several studies (Desmet and Schifferstein, 2008; Gutjar et al., 2015; Johansen et al., 2011; King et al., 2010; O'Connor et al., 2005; Sosa et al., 2015; Rahnama and Rajabpour, 2017) proved the importance of emotion on foods choice and purchase. Consumers' behaviour regarding the environment is driven by emotional value (Lin and Huang, 2012; Sangroya and Nayak, 2017; Zailani & al., 2019; Rahnama and Rajabpour, 2017). So, hypothesis 2 is generated:

H2. Emotional value has a positive effect on olive oil consumers' purchase decisions.

2.2.3. Economic, social, and environmental sustainability values

Consumer concerns about sustainability with its three dimensions (social, economic, and environmental dimensions) grow every day. While conscious of the relationship between environment and development, consumers change their consumption patterns and engage in pro-environmental behaviour (Wang & al, 2013; Kilbourne and Pickett, 2008; Biswas and Roy, 2015a, 2015b). Sustainable consumption refers to the consumer decision to buy (or not) a product based on social (promote employment and wellbeing), economic (long-term economic growth) and environmental (decreased natural resource use) criteria (Ramirez, 2013; Kataria, 2016; Biswas and Roy, 2015a, 2015b).

Many studies investigate sustainable consumption behaviour: pro-environmental behaviour, green consumption behaviour (Wang & al, 2013), household recycling, waste management behaviour (Barr et al, 2005), and domestic energy-saving behaviour (Gadenne et al., 2011; Biswas and Roy, 2015a, 2015b). Regarding olive oil consumption in Tunisia, as a green product, hence hypotheses 3a and 3b can be generated:
H3a. Economic and social sustainability values impact positively olive oil consumers' purchase decisions in the Tunisian market.

H3b. Environmental sustainability value affects positively olive oil consumers' purchase decisions in the Tunisian market.

2.2.4. Social value

The social value measured the perceived utility resulting from belonging to special social groups (socioeconomic, demographic, or cultural group). Social pressure greatly affects consumer choice (Sheth et al., 1991; Bei and Simpson, 1995; Biswas and Roy, 2015a, 2015b; Zailani et al., 2019). Pro-environmental behaviours are motivated by social engagement and responsibility. Many studies found a positive correlation between social value and sustainable consumption behaviours (Biswas and Roy, 2015a; Sweeney and Soutar, 2001; Zailani et al., 2019). Nevertheless, some studies postulate that consumer decision or choice is more affected by personal and subjective factors than social norms or pressure (Shamdasani et al., 1993; Biswas and Roy, 2015a, 2015b). Commonly, the consumers' purchase intentions are positively related to their perceptions of social value. Thus, hypothesis 4 is postulated:

H4. Social value has a positive effect on olive oil consumers' purchase decisions.

2.2.5. Conditional value

Conditional value refers to the utility obtained in a particular situation. Studies by Ottman (1998), Saxena and Khandelwal (2010), Niemeyer (2010) and Gadenne et al. (2011) assume that changes in consumer situational variables can affect consumers' choices (Biswas and Roy, 2015a, 2015b). A condition is a situation in which a consumer bases its decision on every element related to specific times and places, in addition to personal knowledge and stimulus attributes (Zailani et al., 2019). When personal situations get transformed, consumer purchase behaviour may change (Laaksonen, 1993; Zailani et al., 2019). Biswas and Roy (2015a), Rahnama & Rajabpour (2017) and Zailani et al. (2019) state that conditional value has a significant contribution to the adoption of sustainable consumption behaviour. Thus, hypothesis 5 is formulated:

H5. Conditional value has a positive effect on olive oil consumers' purchase decisions in the Tunisian market.

2.2.6. Knowledge and epistemic values

Awareness interest refers to the perceived utility generated to fulfil the lack of knowledge and pursue novelty. Consumer inclinations to satisfy a need for knowledge about product characteristics have a beneficial impact on consumer behaviour towards buying sustainable goods (Laroche et al., 2001; Tanner and Kast, 2003). Insufficient information about these products contributes to a discrepancy attitude between consumers' environmental concerns and their actual buying behaviour (Ginsberg and Bloom, 2004; Biswas and Roy, 2015a, 2015b). Zailani et al. (2019) assumes that a lack of information about products impacts consumers' behaviour and pushes them to adopt a sustainable consumption behaviour. Many studies have proven a positive correlation between consumers' knowledge and awareness, epistemic value, and sustainable consumption behaviours (Lin and Huang, 2012; Rahnama and Rajabpour, 2017; Suki,

2016; Zailani et al., 2019). Therefore, hypothesis 6 was proposed:

H6: olive oil consumers' purchase decision is positively influenced by knowledge and epistemic values.

Figure 1 shows the proposed framework for the investigation of consumption values' impacts on Tunisian consumers olive oil choice.

3. Methodological approach

3.1. Database

This survey is based on data collected from a survey conducted on a sample of 250 households, of which 216 are usable questionnaires. Households are essentially localized in Tunis city centre and its suburbs, the north, and the centre of the country. They also originate in the different regions for better representativeness. Olive oil consumption differs by living environment. The questionnaire targets the household heads. The interviewees were 61% men, 68.5% married, 64% other than 31 years old and 44% with university educational level. 74% of the families are composed of more than four individuals (appendix 1). Income is an essential variable in determining olive oil consumption since it reflects the purchasing power of consumers. It is well distributed among the different income classes selected, with about 45% of the middle classes, whose income is between 1001 and 2000 TND (1EUR ≈3.2TND).

The questionnaire covers all the variables that can affect consumer behaviour. It is structured into four sections: consumption preferences and choice behaviour about edible oil, consumption values perception, purchases, and consumption (place of purchase, quantity, frequency, and budget) and finally, socio-demographic, and economic variables of the households.
Our assumptions focused on 34 items that we expect will influence consumer behaviour. These items belong to six dimensions of consumption values: functional, emotional, sustainability, social, conditional, and epistemic values. Each of the 34 items were measured with a score from 1 to 5, where 1 ="strongly disagree", 2 = "disagree", 3 = "indifferent", 4 = "agree ", 5 =" strongly agree ". So, the 34 selected items are introduced into the database in numerical forms.
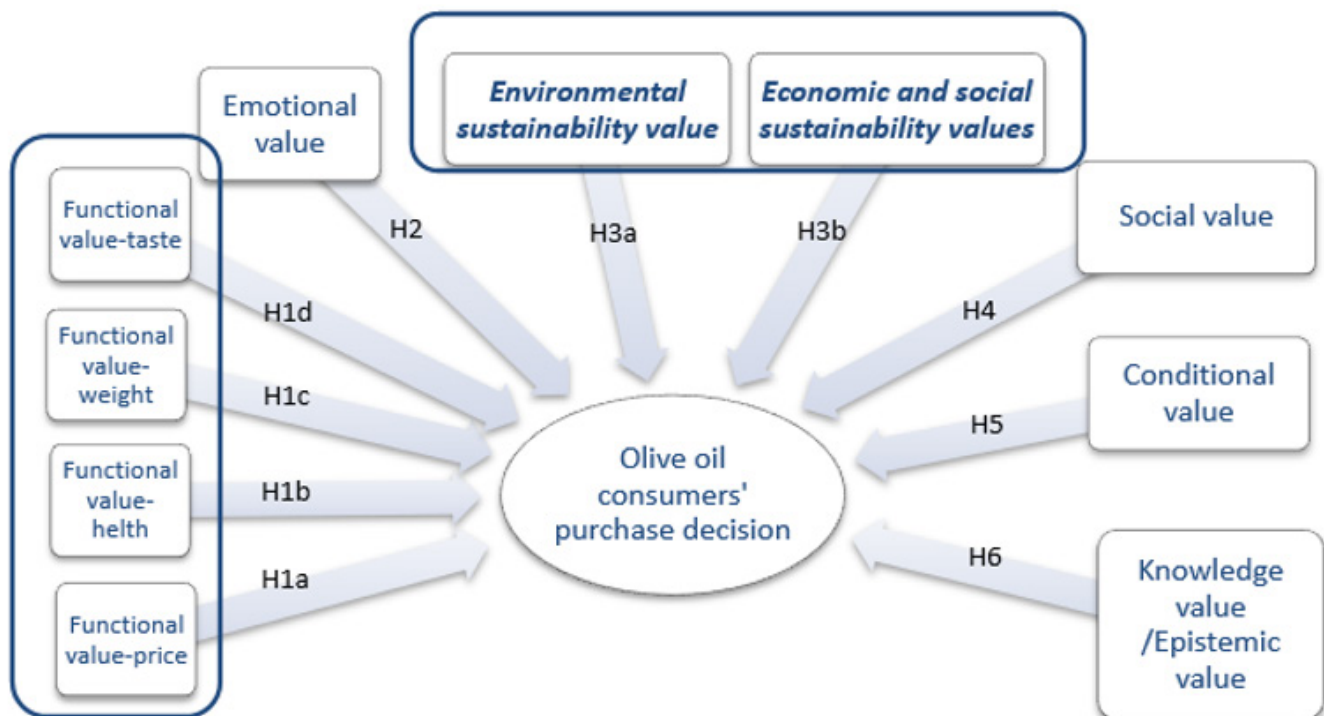

Figure 1. Research framework

3.2. Data statistical analysis

SPSS software (20.0) descriptive statistical analysis was used to determine the socio-demographic profile of the consumers and to describe respondents' behaviour towards olive oil (perception, purchase, and consumption).

An exploratory factor analysis was carried out to determine the principal dimensions among the variables. Out of the 34 items, 30 were factor-analysed, using principal component analysis (PCA) with the Varimax rotation method to establish the different dimensions of consumers' values. The varimax rotation is useful for maximizing the differences between the extracted components and to preserving the correlation within the components. The Kaiser–Meyer–Olkin (KMO) measure and Bartlett's test were used to determine the suitability of the data. A KMO measurement of 0.6 or above indicates sufficient data for PCA (Ding and He, 2004). The items factor-analysed sets out details about the different dimensions of consumers' values.

Subsequently, a classification analysis (dynamic cloud classification) was executed using the consumption values dimensions as variables of the research. Group selection is based on the significance between variables and the type of group. This significance was detected according to the ANOVA variance analysis procedure and the chi-two ($\chi2$) test. We then used a cross-tabulation procedure to determine consumer group profiles according to sociodemographic variables and consumption preferences. Knowing that the mathematical concept of logistic regression is to express the relationship between the outcome variable and predictor variables (independent variables) in terms of logit: the natural logarithm of odds, this method is helpful in this case study. It can be of different types, such as binomial (binary), multinomial, or ordinal, depending on the nature of the outcome variable. So, to evaluate the impact of consumers' value factors on olive oil purchase decisions, a binomial logistic regression is operated. The outcome variable has only two categories: it is a dichotomous outcome variable describing the purchase of olive oil ("1= olive oil purchase" and "0= non-purchase of olive oil"). The predictor variables refer to all the dimensions obtained from the previous factor.

4. Results and discussion

4.1. Tunisian consumers' behaviour toward olive oil

Our findings confirm that majority of olive oil purchased in Tunisia is in bulk. Indeed, more than 4/5 of our sample's (86.1%) purchase condition was in bulk. Opposite to the Italian and the US markets, the domestic consumption of Tunisian olive oil is based on family/friends' reserves and the direct supply of olive mills. More than half of the interviewees (53.7%) reported that they bought olive oil primarily from families and friends. 21.3% of interviewed consumers bought it directly from olive oil mills and producers. The market share of wholesalers, retail stores and weekly markets is less important, with respective percentages of 4.2 %, 4.6 % and 2.3% (appendix 2). The place of purchase is still related to consumers' culture and purchase habits. As detailed in appendix 3, Tunisian households consume on average 5,45 litres/month of olive oil with a standard deviation of 6,22; against an average of 6,59 litres/month of other edible oil (corn oil, sunflower seed oil, soybean oil, etc.) with a standard deviation of 3 litres/month.

By asking Tunisian consumers about their favourite edible oil, olive oil is ranked first for 82.4%of our household's sample. Corn oil, sunflower-seed oil, soybean oil, and other edible oils are preferred by 17.6% of our sample. Despite these preferences, Tunisians consume in more significant quantities the other edible oils sold at lower prices and even at State-subsidized prices because of budgetary constraints.
About the consumption mode, the olive oil is mainly used for breakfast for 83.3% of Tunisian consumers and for salad dressing (75.5 %); it is used as edible oil to add directly to the dishes for 67.1%. About half of our sample consider olive oil convenient for cooking. According to Tunisian dietary habits, olive oil is not appropriate for frying; only 2% use it for this purpose (appendix 4).

4.2. Factor analysis results of the olive oil consumption values

Respondents were asked to express, with a score from 1 to 5, what consumption values they consider when buying olive oil (appendix 5). Among the 34 items, the most important are "Health and nutritional prod-

ucts"(average score of 4.91), "Good taste products" (4.81)," Olive oil consumption is interesting" (4.68), " High Price Product"(4.61) and " It's pleasant to consume olive oil"(4.6). The less important values are "Increases body weight"(2.67), "I buy if the product is advertised" (2.41), "Easily substitutable product" (2.03), and "a cheap product" (1.44).

Using Principal Component Analysis (PCA) and the Varimax rotation method, we factor-analysed thirty items and established different dimensions of quality (appendix 6). Value of 0.731 for the Kaiser–Meyer–Olkin (KMO) measure indicates that data are adequate for PCA, and Bartlett's test was significant.

Exploratory factor analysis with Varimax rotation of the 30 variables resulted in a nine constructs solution that explains 69% of the total variance. All nine factors had Eigenvalues greater than 1 (appendix 6).

The first construct of consumption values was labelled as "Environmental sustainability value", which explained 15.85 % of the total variance. It is determined by items related to sustainable agricultural production systems with sustainable food labels and certificates, systems with less loss of waste, and systems based on fair trade since it is deeply connected to environmental protection in addition to social impact.

The second construct, "conditional value", includes five items and explains 11.01% of the total variance. In fact, consumers' olive oil preferences are subject to some conditions like promotion, advertisement, product availability on the market, State subsidies, and products' traceability.

The third construct, "Emotional value", focuses on four items: "pleasant to consume, makes the consumer relax, makes the consumer feel good". It explains 7.34% of the total variance.

The fourth construct, "Functional Value-Price», explaining 6.84% of the total variance, is determined by two items (Cheap Product/High Price Product).

The fifth construct called "Functional Value-Weight "combines the attributes related to the influence of olive oil consumption on weight. This dimension explains 6.49% of the total variance.

The sixth construct called "Economic and social sustainability values", which explained 6.25% of the total variance, covers two items "olive oil purchase help to promote employment in Tunisia" and "it contributes to the economic development of the country".

The seventh construct relative to "Social value" explains 5.8% of the total variance; it is based on the socio-cultural context of olive oil consumption in Tunisia: consumption habits and situations and modes of use.

The eighth construct, explaining 4.81% of the total variance, was labelled " Functional value- Health". It includes items related to the Tunisian perception of the impact of olive oil consumption on human health (Omega-3 and omega-6 antioxidants contents, nutritional value).

The "Epistemic value" represents the ninth construct of the Tunisian consumption values, with 4.57% of the total variance. It refers to three items about consumer information and innovation needs.

Figure 2 illustrates the components of the two main factors, environmental sustainability value, and conditional value, via a two-dimensional plot.

Knowing that the most common and reliable criterion in extracting factors is the use of Eigenvalues, all factors are with Eigenvalues greater than 1, so they were retained because they were considered significant. These nine dimensions of olive oil consumption values are used for cluster analysis (1) and as predictor variables to identify factors determining Tunisian consumers' preference for olive oil (2).

4.3. Cluster analysis of Tunisian olive oil consumers

Classification analysis was performed using nine factors of olive oil consumption to identify consumer segments. The option for three groups was selected based on the profile of the selected groups and the significance of the analytical variables. The ANOVA analysis shows the significance of five factors at p <0.001 (Environmental sustainability value, Emotional value, Functional Value-Price, Economic and social sustainability values, and Conditional Value).
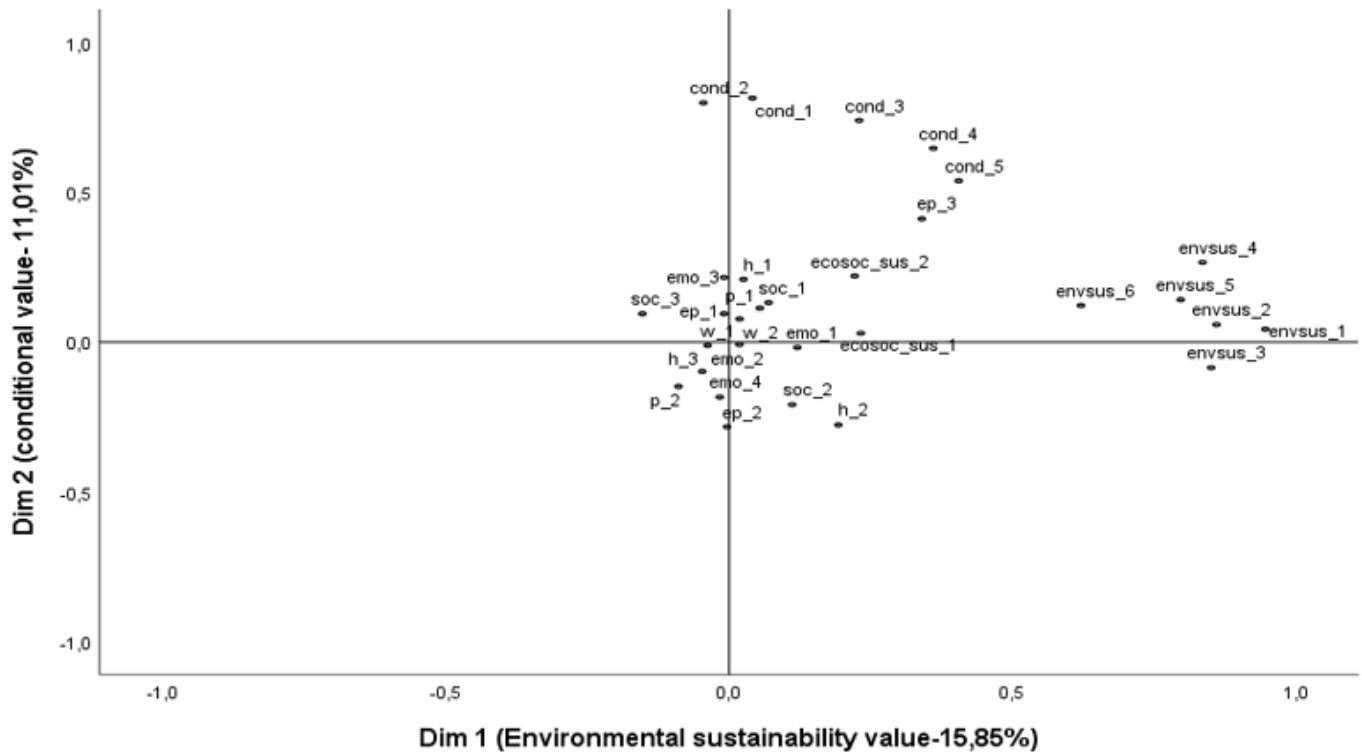Regarding the consumption values, the average score

Figure2. The components of the two principal factors Environmental sustainability value and
conditional value (2D plot)

(Abbreviations detailed in appendix 6)

of the selected groups varies between -0.33 and 0.1 (Table 1). This outcome confirms the difference between the three groups concerning their sensibility to the nine dimensions of consumption values. Price is the most critical factor in the cluster analysis (F=369). The first group represents "price-sensitive consumers", with a negative score for the price, as a functional value (score of -2,747). It includes 20 consumers representing 9.26% of the sample. The second group, "Consumers with environmental sustainability concerns", attributes modest scores to the different factors (scores between -1 and 0.5). This group gives special attention to environmental sustainability and represents the less emotional consumers. This group consists of 52 consumers (24.07% of the sample). Group 3, "Emotional consumers with economic and social sustainability concerns", is more concerned with the "Emotional value " with a score of 0.395 and "Economic and social sustainability value" with a score of 0.175. It has 144 consumers representing 66.67% of the sample.

Figure 3 illustrates the dispersion of Tunisian olive oil

consumers according to the three main classification factors: the price as a functional value, the emotional value, and the environmental sustainability value.

The analysis carried out highlights the segmentation of the olive oil market in Tunisia. The three consumer groups have different socio-demographic and economic profiles (Appendix 7). Statically significant variables are related to origin, location, and household size.

About 66% of "Price sensitive consumers" are from and live in Sidi Bouzid, which is the second olive production area in Tunisia (FAO, 2015). The vocation of the region of origin acts on consumers' values, habits, and decisions. This group is composed of the highest average household size (5). The whole group buy olive oil with different purchase frequencies. 40% of this group purchase olive oil 1-2/month, especially from family/friends (95%). They have the highest consumption (11 litres/month). Their consumption of large quantities of olive oil and their relatively large household size increases their price sensitivity. They

Table 1. Cluster analysis based on the nine constructs of olive oil consumption values

|			Consumer clusters		
			1	**2**	**3**
Number of observations per class			20	52	144
% Per class			**9,26**	**24,07**	**66,67**
Profit			**1**	**2**	**3**
Factors	**F**	**Sig**	Price sensitive consumers	Consumers with environmental sustainability concerns	Emotional consumers with economic and social sustainability concerns
Environmental sustainability value	**10,644**	*	-0,224	**0,533**	-0,161
Conditional Value	**6,471**	*	-0,326	-0,342	0,169
Emotional value	**69,009**	*	-0,004	-1,093	**0,395**
Functional value-Price	**369,654**	*	**-2,747**	0,373	0,247
Functional value-Weight	0,185		0,056	-0,071	0,018
Economic and social sustainability values	**8,691**	*	-0,024	-0,476	**0,175**
Social value	1,783		0,264	0,141	-0,088
Functional value- Health	0,362		-0,014	-0,100	0,038
Epistemic value	1,588		0,057	-0,215	0,070
Means	52,043		-0,329	-0,139	0,096

*Statistically significant for $p < 1\%$
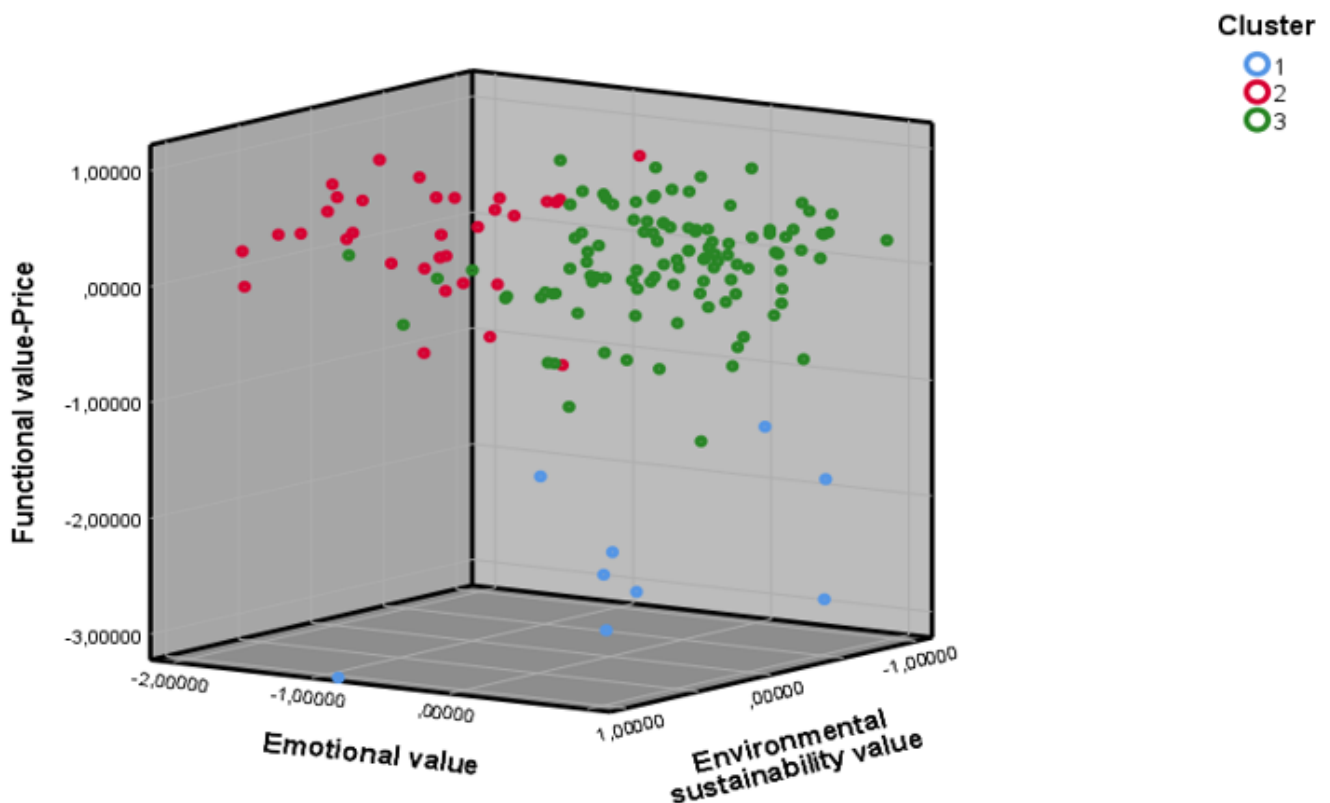
Figure3. Olive oil consumers dispersion according to the three main classification factors (3D plot)

are also concerned with social values since the product is part of their social heritage and their diet.

Almost half of the second group, qualified by "Consumers with environmental sustainability concerns", is also from and lives in Sidi Bouzid, with a household average size of 4 members. It represents 24% of the sample. This class of consumers has a different consumption and purchase behaviour: 23% of consumers belonging to this class buy olive oil only once per year, especially from family and friends for 60% of cases and from mils for 13.5%. They have an average monthly consumption of olive oil of about 7 litres. Compared with the first group, they consume less olive oil and buy it less frequently. They are less sensitive to price, and economic and social values and more concerned with environmental values.

The third consumers category, "Emotional consumers with economic and social sustainability concerns", is equivalent to 67% of the sample. These consumers are mainly from Kef and live there. Kef Governorate is ranked 14th in terms of olive growing area. These consumers also have an average household size of 4 members. About 49% of them buy olive oil monthly (1-2/month), from relatives (46%) and mills (26%). They have the lowest average olive oil consumption (4 litres/month). They are more sensitive to emotional values (pleasure, relaxation) than the two other groups and give significant weight to economic and social sustainability values during the purchase decision.

4.4. Consumer values determining olive oil purchase

All nine dimensions of the olive oil consumption values were taken into consideration in the Binary logistic regression analysis, and the dependent variable (categorical variable) was considered "the purchase of olive oil" with two values, 1 or 0:

1: olive oil purchase,
0: non-purchase of olive oil.

The logistic regression can use two indicators such as Cox and Snell R2 and Nagelkerke R2 to estimate the contribution of the predictor variables to the variability of the dependent variable. Nagelkerke R2 indicator

evaluates the contribution of all predictor variables to the variability of the dependent variable. Knowing that Cox and Snell R2 indicator usually underestimates the real value, the test results (Table 2) based on the nine predictor variables could explain 51% of the effect of the environment on the artefacts.

The results from the classification table (Table 3) showed that the mathematical model predicts 90.7% of cases correctly. Thus, it is considered as a performing model. Its regression coefficients (β) are shown in "Variables in the equation" (Table 4).

Nine predictive variables were investigated by regression analysis. Only six of them had a statistical significance: "Environmental sustainability value, Conditional Value, Emotional value, Functional Value-Price, Social value and Epistemic value".

"Functional Value-Weight", "Economic and social sustainability values", and "Functional value- Health" have no statistically significant effect on the olive oil purchase decisions. Therefore, the assumptions H1c, H1b and H3b are invalid.
Environmental sustainability value has a positive and statistically significant impact on the purchase decision. The probability of buying olive oil increases as consumers' sensitivity to "Environmental sustainability value" increases (Odds ratio=3.13). In addition, consumers who attach greater importance to emotional value have a higher probability of purchasing olive oil (Odds ratio=1.66). Moreover, consumers who attach greater importance to social value have a relative likelihood of olive oil purchase 3.35 times more substantial. It is the same with "Epistemic value" that has a positive and statically significant impact on olive oil purchase decisions in the Tunisian market. Thus, the assumptions H2, H3a, H4 and H6 are empirically valid.

The more importance Tunisian consumers attach to conditional value and olive oil price (as functional value), the lower the probability of buying olive oil (Odds ratio conditional value=0.192, odds ratio price=0.418). Thus, hypotheses H1a and H5 are to be qualified since these two consumers' values have a negative and statically significant impact on the olive oil purchasing decisions. Indeed, the more sensitive the consumer is to the price, the more he connects the

purchase of olive oil to promotions and subsidies.

Since many studies have used quality attributes to investigate the purchasing and consumption of olive oil behaviour (Nicole et al., 2010; Karipidis et al., 2005), Santosa and Guinard (2011), through a means-end chains analysis, tried to explore olive oil consumption and buying motivations in the Californian market. It highlights the attributes and values that are relevant to this consumer behaviour. It reveals the importance of environmental caring and sustainability, financial responsibility (functional value /price), functional value/health, supporting the local economy (social and economic sustainability value) et especially pleasure (emotional value). Accordingly, environmental sustainability, price as a functional value and emotional value are mean values determining olive oil purchase in both Tunisian and Californian markets. Unlike the Californian consumers, epistemic and social values affect Tunisian consumers' purchase decision of olive oil. Besides, Californian consumers based their olive oil purchase decision on health as functional value and social and economic sustainability value.

5. Conclusion

In this study, we explored the impact of consumer values and especially the value of environmental sustainability in order to examine the behaviour of Tunisians regarding olive oil. A descriptive analysis of Tunisian consumers' behaviour toward olive oil was proposed. The results of our research prove that the purchases of olive oil on the Tunisian market are made essentially in bulk contrary to the Italian and the US markets. The place of purchase is still related to consumers' culture and purchase habits. Tunisian households consume, on average, 5,45 litres/month of olive oil, against an average of 6,59 litres/month of other edible oil (corn oil, sunflower-seed oil, soybean oil, etc.). But olive oil remains the most preferred. Olive oil is mainly used for breakfast and salad dressing. Half of our sample considers olive oil convenient for cooking and not for frying.

For Tunisian consumers, the essential values considered for purchase decisions are health and nutritional value, taste, price as functional values, and interesting and pleasant consumption as emotional values. In

Table 2. Binary logistic regression of the model— (Backward stepwise LR)

Model summary			
Step	−2 log-likelihood	Cox and Snell R^2	Nagelkerke R^2
4	102,399 [a]	,282	,510

[a] Estimation terminated at iteration number 7 because parameter estimates changed by less than 0.001.

Table 3. Binary logistic regression of the model (Backward stepwise LR)- Classification table [a]

		Predicted		
		Olive oil preference		
		0.00	1.00	Percentage correct
Observed	Olive oil preference			
	0.00	17	13	56,7
Step 7	1.00	7	179	96,2
	Overall percentage			90,7

[a] The cut value is 0.500.

Table 4. Results of binary regression model—Backward stepwise LR

	Parameters	β	S. E.β	Wald χ₂	Degrees of freedom	P-value	Exp (β)
Step4 [a]	**Environmental sustainability value**	1,141	,430	7,040	1	,008 [b]	3,130
	Conditional Value	-1,651	,455	13,151	1	,000 [b]	,192
	Emotional value	,510	,206	6,133	1	,013 [c]	1,665
	Functional value-Price	-,873	,479	3,314	1	,069 [d]	,418
	Social value	1,210	,257	22,103	1	,000 [b]	3,353
	Epistemic value	,805	,325	6,127	1	,013 [c]	2,237
	Constant	3,477	,540	41,483	1	,000 [b]	32,347

a. Nine variables entered in step 1
b. Statistically significant for p < 1%
c. Statistically significant for p < 5%

contrast, the less important values are impact on body weight as functional value, conditional values such as advertisement dependency, in addition to product substitutability.

The exploratory factor analysis reveals nine dimensions among consumers' values. The first construct of consumption values is "Environmental sustainability value", and it explains 15.85 % of the total variance; it is determined by items related to sustainable agricultural production systems. The second construct, "conditional value", explains 11.01% of the total variance. "Emotional value, Functional value-Price, Functional value-weight, Economic and social sustainability values, Social value, Functional value-Health, and Epistemic Value" are dimensions that also derive from our analysis.

Based on these nine constructs of consumers values, a cluster analysis was performed and revealed three consumers groups: "price-sensitive consumers" (9.26% of the sample), "Consumers with environmental sustainability concerns" (24.07%), and "Emotional consumers with economic and social sustainability concerns" (66.67%).

To evaluate the impact of consumers' values on olive oil purchase decisions, a binomial logistic regression is proposed. Results release that "Functional value-Weight, Economic and social sustainability values and Functional value- Health" have no statistically significant effect on the olive oil purchase decisions. However, "Environmental sustainability value, Emotional value, Social value, and Epistemic value" had a positive and statistically significant impact on olive oil purchase, unlike conditional value and functional value/Price, which had a negative and statically significant impact on olive oil purchase.

These findings are beneficial for Tunisian olive oil suppliers and policymakers to adopt marketing strategies based on client preferences. The originality of the paper consists in revealing the values on which consumers base their choice and purchase of olive oil. At the same time, almost all studies have used only quality attributes and indicators for this purpose.

According to these results, promoting olive oil on the Tunisian market may be based on "Environmental sustainability value, Emotional value, Social value, and Epistemic value". Firms must communicate about the contribution of the olive oil sector to environmental sustainability through organic production systems and protected designations of origin. Marketing olive oil may also be based on emotional (pleasure, feelings, relaxation, etc.) and social consumer values (Tunisian diet, family events, substitutability, etc.). Managers must communicate about olive oil origin, crushing techniques, varieties, and taste. They must offer more innovation to Tunisian consumers like aromatized and vaporizing oils. In addition, firms' mix marketing, especially regarding price and advertising, must

consider the sensitivity of consumers to prices and to promotion. These recommendations emerge from our exploratory analysis of a small sample of Tunisian olive oil consumers. The descriptive approach represents the main limitation of this work. Further investigation of olive oil consumer behaviour based on consumption values should be conducted for a better extrapolation of the results.

Conflict of interest: The authors declare no conflict of interest.

Appendix 1. Socio-demographic profile of the sample (N=216)

Gender						
Male	Female					
61,1	38,9					

Age						
≤30	31-40	41-50	> 50			
9,3	**30,6**	**33,3**	**26,9**			

Origin						
Tunis city		North	Centre	South		
18		41,3	37,1	3,7		

Marital status						
Married	Other					
68,5	31,5					

Place of residence						
North	Tunis city		Centre	South		
32,9	33,3		33,3	0,5		

Educational level						
Analphabet	Koranic school	Primary	Secondary	University		
1,9	2,3	20,4	31,5	**44**		

Household monthly income						
≤500 TD	501-1000	1001-1500	1501-2000	2001-2500	2501-3000	>3000
5,6	27,3	**25,9**	**18,5**	9,3	6,5	6,9

Household's size						
1	2	3	4	5	>6	
3,7	9,7	13	**26,8**	**26,8**	**20**	

Appendix 2. Purchasing place choice for olive oil

Purchasing place of olive oil (%)					
No purchase	Retail stores	Olive oil producers/mills	Weekly market	Wholesalers	Friends and relatives
13,9	4,6	**21,3**	2,3	4,2	**53,7**

Appendix 3. Edible oil monthly consumption per Tunisian household (litres/month)

	Minimum	Maximum	Mean	Standard deviation (SD)
Olive oil	0	25	6,59	3,07
Other edible oil	0	42	5,45	6,22

Appendix 4. Consumption mode of olive oil

Consumption mode of olive oil (%)					
For salad dressing	Edible oil to add to the dishes	Frying oil	Cooking oil	Oil for pastries	Oil for breakfast
75,5	**67,1**	1,9	51,4	38,4	**83,3**

Appendix 5. Tunisian consumers' perception of proposed items of consumption values

Items of consumption values	Mean	Standard deviation (SD)
Health and nutritional products	4,91	0,438
Good taste products	4,85	0,431
Olive oil consumption is interesting	4,68	0,763
High Price Product	4,65	0,886
It's pleasant to consume olive oil	4,6	0,721
Part of our consumption Habits	4,37	1,048
Product with antioxidants	4,36	0,77
Product intended for export	4,3	0,939
Omega-3 and omega-6 rich product	4,19	0,751
Using olive oil, I have self-esteem	4,19	1,12
I buy if the product is organic	4,06	1,187
Consuming olive oil makes me feel good	3,98	1,27
Low in cholesterol and trans fatty acids	3,93	1,778
Consuming olive oil makes me relax	3,91	1,278
I buy if it is from sustainable agricultural production	3,85	1,115
I buy if the product is not being lost and wasted	3,81	1,046
I buy if it is with controlled label of origin	3,77	1,194
I buy if there are State subsidies	3,73	1,266
I buy if the product respects the environment	3,72	1,099
I buy if it respects fair trade	3,72	1,212
Product widely consumed in family events (weddings, parties, guests, etc.)	3,59	1,28
Before buying, I need some information	3,5	1,5
Through olive oil purchase, I am helping to promote employment in Tunisia	3,36	1,061
Body Weight Control	3,31	1,299
I buy olive oil if it contributes to the economic development of the country	3,23	1,071
I buy if available	3,18	1,235
I want new information about the product	3,09	1,232
I am looking for new and different products	3	1,263
I buy if there are promotions	2,94	1,428
Before buying, I want a lot of information	2,93	1,386
Increases body weight	2,67	1,272
I buy if the product is advertised	2,41	1,061
Easily substitutable product	2,03	1,27
A cheap product	1,44	0,933

Appendix 6. Factor analysis results of consumption values' items - Varimax rotation

Kaiser–Meyer–Olkin (KMO) Measure of sampling adequacy			0.731								

Bartlett's test for sphericity	Approx. chi-square	3230,71
	df	435
	Sig	0,000

	Code	FACTORS	1	2	3	4	5	6	7	8	9
Factor 1	envsus_1	I buy if it is from sustainable agricultural	0,946	0,043	-0,022	-0,011	-0,031	0,048	0,098	0,006	-0,024
Environmental	envsus_2	I buy if the product is not being lost and wasted	0,86	0,058	0,057	0,033	-0,087	0,032	0,055	0,048	-0,081
sustainability	envsus_3	I buy if it respects fair trade	0,851	-0,086	-0,134	-0,066	-0,011	0,094	0,109	0,034	0,049
value	envsus_4	I buy if the product is organic	0,835	0,265	0,068	0,069	-0,002	0,097	-0,047	0,071	0,052
	envsus_5	I buy if the product respects the environment	0,797	0,141	-0,003	0,017	0,057	0,11	0,127	0,04	0,069
	envsus_6	I buy if it is with controlled label of origin	0,621	0,122	0,128	0,202	0,124	0,21	-0,007	0,025	0,053
Factor 2	cond_1	I buy if there are promotions	0,041	0,815	0,05	0,161	-0,12	0,115	-0,093	-0,033	0,108
Conditional	cond_2	I buy if the product is advertised	-0,046	0,799	-0,018	-0,032	0,026	-0,104	0,034	0,071	-0,054
Value	cond_3	I buy if available	0,229	0,74	-0,066	0,163	-0,049	0,167	-0,044	-0,043	-0,141
	cond_4	I buy if there are State subsidies	0,36	0,647	0,008	0,19	0,11	0,136	-0,01	-0,1	-0,06
	cond_5	I buy if there is a product's traceability	0,405	0,538	0,161	-0,199	-0,059	0,086	-0,13	0,021	0,439
Factor 3	emo_1	It's pleasant to consume olive oil	0,12	-0,018	0,748	0,03	0,103	-0,023	0,094	0,147	0,001
Emotional value	emo_2	Olive oil consumption is interesting	-0,038	-0,012	0,713	-0,072	0,011	-0,037	0,038	0,05	0,067
	emo_3	Consuming olive oil makes me relax	-0,009	0,215	0,7	0,063	0,019	-0,106	-0,14	0,054	-0,074
	emo_4	Consuming olive oil makes me feel good	-0,017	-0,184	0,514	0,04	0,06	0,276	0,242	-0,209	-0,02
Factor 4	p_1	High Price Product	0,054	0,113	0,019	0,937	0,015	0,045	-0,059	-0,032	-0,016
Functional value-Price	p_2	A cheap Product	-0,089	-0,149	-0,024	-0,92	0,029	0,008	0,1	-0,027	0,041
Factor 5	w_1	Bodyweight Control	0,018	-0,009	0,078	-0,046	0,946	0,004	0,046	0,058	-0,039
Functional value-Weight	w_2	Increases bodyweight	0,018	0,077	-0,086	-0,052	-0,934	-0,046	0,024	-0,032	-0,062
Factor 6	ecosoc_sus_1	Through olive oil purchase, I am helping to promote employment in Tunisia	0,232	0,029	-0,005	0,007	0,003	0,805	0,069	0,04	-0,021
Economical and social sustainability	ecosoc_sus_2	I buy olive oil if it contributes to the economic development of the country	0,221	0,22	-0,069	0,039	0,057	0,781	-0,002	0,119	-0,039
Factor 7	soc_1	Product widely consumed in family events	0,07	0,131	-0,051	-0,1	0,004	0,051	0,842	0,077	0,03
Social value	soc_2	Part of our consumption Habits	0,111	-0,209	0,064	-0,093	-0,021	0,109	0,738	0,096	0,051
	soc_3	Easily substitutable product	-0,153	0,094	-0,32	-0,07	-0,063	0,269	-0,503	0,141	-0,077
Factor 8	h_1	Omega-3 and omega-6 rich product	0,025	0,209	0,131	0,04	0,028	0,098	0,079	0,824	-0,092
Functional	h_2	Product with antioxidants	0,193	-0,277	-0,015	-0,108	0,128	0,053	0,02	0,698	0,114
value- Health	h_3	Health and nutritional products	-0,047	-0,099	0,291	0,188	-0,263	0,017	0,03	0,34	0,193
Factor 9	ep_1	I am looking for new and different products	-0,009	0,094	0,128	-0,088	0	-0,371	0,051	0,044	0,699
Epistemic value	ep_2	Information on olive oil markets, particularly for	-0,004	-0,284	-0,189	0,093	0,048	0,149	0,166	-0,007	0,593
	ep_3	Before buying, I want a lot of information	0,34	0,411	0,141	-0,199	-0,091	0,33	-0,121	0,069	0,441
FACTOR STATISTICS	Eigen values		4,755	3,303	2,201	2,051	1,946	1,876	1,74	1,445	1,373
	% of variance		**15,849**	11,01	7,338	6,837	6,488	6,253	5,8	4,818	4,576
	Cumulative variance		15,849	26,859	34,197	41,034	47,523	53,775	59,575	64,393	**68,968**

Appendix 7. Description of the three clusters of olive oil consumers

	Groups	Price sensitive consumers	Consumers with environmental sustainability concerns	Emotional consumers with economic and social sustainability concerns	χ_2 tests
Gender (%per group)	Male	60,00	63,46	60,42	,923
Age (%per group)	≤ 40	40,00	40,38	39,58	,528
	41-50	20,00	38,46	33,33	
	>50	40,00	21,15	27,08	
Origin (%per group)	Tunis	15,00	15,38	18,06	,000
	Kef	10,00	17,31	**42,36**	
	Sidi Bouzid	**60,00**	**51,92**	24,31	
	Other	15,00	15,38	15,28	
Location (%per group)	Kef	15,00	11,54	**43,06**	,000
	Tunis	10,00	13,46	16,67	
	Sidi Bouzid	**60,00**	**48,08**	24,31	
	Other	15,00	26,92	15,97	
Education (%per group)	Higher education	45,00	48,08	42,36	,746
Household income (%per group)	≤ 1500	35,00	**61,54**	**61,11**	,306
	>1501	**65,00**	38,46	38,89	
Household size (mean)	Household size	5,20	4,23	4,22	,023
Olive oil purchase (%per group)	Olive oil purchase	**100,00**	84,62	84,72	,169
Purchase frequency (%per group)	1/year	0,00	**23,08**	13,89	,001
	1-2/month	**40,00**	9,62	**48,61**	
Place of purchase (%per group)	Mills	5,00	13,46	26,39	,015
	Family/friends	**95,00**	**59,62**	45,83	
Olive oil consumed per month (mean in litres/month)		**11,09**	6,82	4,17	,000
Preference	Olive oil is the most preferred oil	85,00	86,54	80,56	,593

Reference list

Bei, L.-T., & Simpson, E. M. (1995). The Determinants of Consumers' Purchase Decisions for Recycled Products: An Application of Acquisition-Transaction Utility Theory. NA—Advances in Consumer Research, 22, 257–261. Retrieved from https://www.acrwebsite.org/volumes/7711/volumes/v22/NA%201322

Biswas, A., & Roy, M. (2015). Green Products: An Exploratory Study on the Consumer Behaviour in Emerging Economies of the East. Journal of Cleaner Production, 87(1), 463-468. doi: 10.1016/ j. jclepro.2014.09.075

Biswas, A., & Roy, M. (2015). Leveraging factors for sustained green consumption behaviour based on consumption value perceptions: Testing the structur-

al model. Journal of Cleaner Production, 95, 332-340. doi: 10.1016/j.jclepro.2015.02.042

Cândido, F. G., Valente, F. X., Da Silva, L. E., Leão Coelho, O. G., Gouveia Peluzio, M. C., & Gonçalves Alfenas, R. C. ((2018). Consumption of extra virgin olive oil improves body composition and blood pressure in women with excess body fat: a randomized, double-blinded, placebo-controlled clinical trial. European Journal of Nutrition, 57(7), 2445-2455. doi: 0.1007/s00394-017-1517-9

Choe, J. Y., & Kim, S. (2018). Effects of tourists' local food consumption value on attitude, food destination image, and behavioural intention. International Journal of Hospitality Management, 71, 1–10. doi: 10.1016/j.ijhm.2017.11.007

Clodoveo, M.L., Yangui, A., Fendri, M., Giordano, S., Crupi, P., & Corbo, F. (2021). Protected Geographical Indications for EVOO in Tunisia: Towards Environmental, Social, and Economic Sustainable Development. Sustainability, 13(20), 11201. doi: 10.3390/su132011201

Del Giudice, T., Cavallo, C., Caracciolo, F., & Cicia, G. (2015). What attributes of extra virgin olive oil are really important for consumers: a meta-analysis of consumers' stated preferences. Agricultural and Food Economics, 20. doi: 10.1186/s40100-015-0034-5

Desmet, P. M. A., & Schifferstein, H. N. J. (2008). Sources of positive and negative emotions in food experience. Appetite, 50(2-3), 290-301. doi: 10.1016/j.appet.2007.08.003

Ding, C., & He, X. (2004). K-means Clustering via Principal Component Analysis. Proceedings of the Twenty-First International Conference on Machine Learning. doi: 10.1145/1015330.1015408

Erraach, Y., Jaafer, F., Radic, I., & Donner, M. (2021). Sustainability Labels on Olive Oil: A Review on Consumer Attitudes and Behaviour. Sustainability, 13(21), 12310. doi:10.3390/su132112310

Gadenne, D., Sharma, B., Kerr, D., & Smith, T., (2011). The influence of consumers' environmental beliefs and attitudes on energy saving behaviours. Energy Policy, 39(12), 7684-7694. doi: 10.1016/j.enpol.2011.09.002

Ginsberg, J. M., & Bloom, P. N. (2004). Choosing the Right Green Marketing Strategy. MIT Slogan Management Review, 46(1). Retrieved from: https://sloanreview.mit.edu/article/choosing-the-right-greenmarketing-strategy/

Gonçalves, H. M., Lourenco, T. F., & Silva, G. M. (2015) Green buying behaviour and the theory of consumption values: A fuzzy-set approach. Journal of Business Research, 69(4), 1484-1491. doi: 10.1016/j.jbusres.2015.10.129

Gutjar, S., De Graaf, C., Kooijman, V., De Wijk, R. A., Nys, A., Ter Horst, G. J., & Jager, G. (2015). The role of emotions in food choice and liking. Food Research International, 76(2), 216-223. doi: 10.1016/j.foodres.2014.12.022

International Olive Council. (2017). OLIVAE No 124. Retrieved from http://www.iranioc.ir/images/OLIVAE_124_INGLES.pdf

Jiménez-Guerrero, J. F., Gázquez-Abad, J. C., Mondéjar-Jiménez, J.-A. and Huertas-García, R. (2012). Consumer Preferences for Olive-Oil Attributes: A Review of the Empirical Literature Using a Conjoint Approach. Olive Oil - Constituents, Quality, Health Properties and Bioconversions. doi: 10.5772/30390

Johansen, S. B., Naes, T., & Hersleth, M. (2011). Motivation for choice and healthiness perception of calorie-reduced dairy products. A cross-cultural study. Appetite, 56(1), 15-24. doi: 10.1016/j.appet.2010.11.137

Karipidis, P., Tsakiridou, E., Tabakis, N. (2005). The Greek Olive Oil Market Structure. Agricultural Economics Review, 6(1). doi: 10.22004/ag.econ.44093

Karray, B., Jackson, D., Paglietti, L., & Ribeiro, M. (2015). Analyse de la filière oléicole- Tunisie, FAO. European Bank for Reconstruction and Development (EBRD). Retrieved from https://www.fao.org/3/i4104f/i4104f.pdf

Kataria, A., Mukherjee, J. Biswas, S., & Garg, R. (2016). An Exploration of Consumers' Perceived Value of Sustainable Brands in India. Asian Journal of Business Research,6(2). doi: 10.14707/ajbr.160026

Kilbourne, W., & Pickett, G. (2008). How materialism affects environmental beliefs, concern, and environmentally responsible behaviour. Journal of Business Research, 61(9), 885–893. doi: 10.1016/j.jbusres.2007.09.016

King, S. C., Meiselman, H. L., & Carr, B. T. (2010). Measuring emotions associated with foods in consumer testing. Food Quality and Preference, 21(8), 1114-1116. doi: 10.1016/j.foodqual.2010.08.004

Laaksonen, M. (1993). Retail patronage dynamics: Learning about daily shopping behaviour in contexts of changing retail structures. Journal of Business Research, 28(1-2), 3-174. doi: 10.1016/0148-2963(93)90024-J

Laroche, M., Bergeron, J., & Barbaro-Forleo, G. (2001). Targeting Consumers Who Are Willing to Pay

More for Environmentally Friendly Products. Journal of Consumer Marketing, 18(6), 503-520. doi: 10.1108/EUM0000000006155

Lee, C. K. C., Levy, D. S., & Yap, C. S. F. (2015). How does the theory of consumption values contribute to place identity and sustainable consumption? International Journal of Consumer Studies, 39(6), 597-607. doi: 10.1111/ijcs.12231

Lin, P.-C., Huang Y.-H. (2012). The influence factors on choice behaviour regarding green products based on the theory of consumption values. Journal of Cleaner Production, 22(1),11-18. doi: 10.1016/j.jclepro.2011.10.002

Lombardo, L., Farolfi, C., Capri, E. (2021). Sustainability Certification, a New Path of Value Creation in the Olive Oil Sector: The Italian Case Study. Foods, 10(3), 501. doi: 10.3390/foods10030501

Lombardi, A., Carfora, V., Cicia, G., Del Giudice, T., Lombardi, P., & Pánico, T. (2017). Exploring Willingness to Pay for QR Code Labeled Extra- Virgin Olive Oil: An Application of the Theory of Planned Behavior. International Journal on Food System Dynamics, 8(1), doi: 10.18461/ijfsd.v8i1.812

Luchs, M. G., Naylor, R. W., Irwin, J. R., & Raghunathan, R. (2010). The Sustainability Liability: Potential Negative Effects of Ethicality On Product Preference. Journal of Marketing, 74(5), 18-31. doi: 10.1509/jmkg.74.5.018

Rahman, H. A. (2018). Green Consumerism.. Asian Journal of Environment, History and Heritage, 2(2), 43-54. Retrieved from: https://www.researchgate.net/publication/327416046_Green_Consumerism

Malhotra, G., Maheshwari, A. (2011). Green marketing : A study on Indian youth. International Journal of Management and Strategy, 2(3). doi: 10.4018/978-1-4666-5880-6.ch005

Mtimet, N., Zaibet, L., Zairi, C., & Hzami, H. (2013). Marketing Olive Oil Products in the Tunisian Local Market: The Importance of Quality Attributes and Consumers' Behaviour. Journal of International Food & Agribusiness Marketing, 25(2), 134–145. doi: 10.1080/08974438.2013.736044

Olynk, N. J., Tonsor, G. T., & Wolf., C. A. (2010). Consumer Willingness to Pay for Livestock Credence Attribute Claim Verification. Journal of Agricultural and Resource Economics, 35(2) , 261–280. doi: 10.22004/ag.econ.93215

Krystallis, A., & Ness, M. (2005). Consumer Preferences for Quality Foods from a South European perspective: A conjoint analysis implementation Greek olive oil. International Food and Agribusiness Management Association, 8(2), 62-91. doi: 10.22004/ag.econ.8161

Niemeyer, S. (2010). Consumer voices: Adoption of residential energy-efficient practices. International Journal of Consumer Studies, 34(2), 140–145. doi: 10.1111/j.1470-6431.2009.00841.x

O'Connor, E., Cowan, C., Williams, G., O'Connell, J., & Boland, M. (2005). Acceptance by Irish consumers of a hypothetical GM dairy spread that reduces cholesterol. British Food Journal, 107(6), 361-380. doi: 10.1108/00070700510602165

Ottman, J. A. (1993). Green Marketing: Challenges and Opportunities for the New Marketing Age. Lincolnwood, Illinois: NTC Business Books

Rahnama, H., & Rajabpour, S. (2017). Factors for consumer choice of dairy products in Iran. Appetite, 111, 46-55. doi: 10.1016/j.appet.2016.12.004

Ramirez, E. (2013). The Consumer Adoption of Sustainability-Oriented Offerings: Toward a Middle-Range Theory. Journal of Marketing Theory and Practice, 21(4), 415-428. doi: 10.2753/MTP1069-6679210405

Bernabeu, R., & Diaz, M. (2016). Preference for olive oil consumption in the Spanish local market. Spanish Journal of Agricultural Research, 14(4), e0108. doi: 10.5424/sjar/2016144-10200

Salazar, D. M., López-Cortés, I. & Salazar-García, D. C. (2017). Olive Oil: Composition and Health Benefits. In Olive Oil Sensory Characteristics, Composition and Importance in Human Health New York:

Nova Science Publishers.

Sandalidou, E., Baourakis, G., & Siskos, Y. (2002). Customers' perspectives on the quality of organic olive oil in Greece. A satisfaction evaluation approach. British Food Journal, 104(3/4/5), 391-406. doi: 10.1108/00070700210425787

Sangroya, D., & Nayak, J.K. (2016). Will Indian Industrial Energy Consumer Continue to Buy Green Energy? Organization & Environment. 30(3), 253–274. doi: 10.1177/1086026616634806

Santosa, M., & Guinard, J.-X. (2011). Means-end chains analysis of extra virgin olive oil purchase and consumption behavior. Food Quality and Preference, 22(3), 304-316. doi: 10.1016/j.foodqual.2010.12.002

Saxena, R., Khandelwal, P. K. (2010). Can green marketing be used as a tool for sustainable growth? A study performed on consumers in India- An Emerging economy. International journal of Environmental Cultural, Economic and Social Sustainability, 6(2), 277-292. doi: 10.18848/1832-2077/CGP/v06i02/54702

Shamdasani, P., Chon-Lin, G. O., & Richmond, D. (1993). Exploring green consumers in an oriental culture: Role of personal and marketing mix factors. Advances in Consumer Research, 20(1), 488-493. Retrieved from: https://www.acrwebsite.org/volumes/7504/volumes/v20/NA%20-%2020

Sheth, J. N., Newman, B. I., & Gross, B. L. (1991). Why we buy what we buy: A theory of consumption values. Journal of Business Research, 22(2), 159-170. doi: 10.1016/0148-2963(91)90050-8

Branger, A., Richer, M.-M., Roustel, S. (2007). Alimentation et processus technologiques. Dijon: Educagri Editions.

Siriex, L. (1999). La consommation alimentaire : Problématiques, approches et voies de recherche. Recherche et Applications en Marketing, 14(3). doi: 10.1177/076737019901400303

Safa, S., El-Abbassi, A., Kiai, H., Hafidi, A., Sayadi, S., & Galanakis, C. M. (2017). Olive oil production sector: Environmental effects and sustainability challenges. In Olive Mill Waste: Recent advances for the Sustainable ManagementEngland: Elsevier Inc. Academic Press. doi: 10.1016/B978-0-12-805314-0.00001-7

Sosa, M., Cardinal, P., Contarini, A., & Hough, G. (2014). Food choice and emotions: Comparison between low- and middle-income populations. Food Research International, 76(2), 253-260. Doi: 10.1016/j.foodres.2014.12.031

Suki, N. M. (2015). Consumer environmental concern and green product purchase in Malaysia: Structural effects of consumption values. Journal of Cleaner Production, 132, 204–214. doi: 10.1016/j.jclepro.2015.09.087

Sweeney, J. C. & Soutar, G. N. (2001). Consumer perceived value: The development of a multiple item scale. Journal of Retailing, 77(2), 203–220. doi: 10.1016/S0022-4359(01)00041-0

Tanner, C., & Kast, S. W. (2003). Promoting sustainable consumption: Determinants of green purchases by Swiss consumers. Psychology & Marketing, 20 (10), 883-902. doi: 10.1002/mar.10101

Wan, W. & Birch, J. (2011). A semi-parametric technique for the multi-response optimization problem. Quality and Reliability EngineeringInternational, 27(1), 47–59. doi: 10.1002/qre.1106

Wang, P., Liu, Q., & Qi, Y. (2014). Factors influencing sustainable consumption behaviours: a study of rural residents in China. Journal of Cleaner Production, 63, 152-165. doi: 10.1016/j.jclepro.2013.05.007

Zailani S., Iranmanesh M., Hyun S. S., & Helmi-Ali, M. (2019). Applying the Theory of Consumption Values to Explain Drivers' Willingness to Pay for Biofuels. Sustainability, 11(3), 668. doi:10.3390/su11030668