Exploring Japanese olive oil consumer behavior

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Abstract— **During the last two decades, olive oil consumption in Japan is showing an increasing trend due to dietary and health concerns. Traditional olive oil producer and exporter countries such as Italy, Spain and Tunisia have interest to reinforce and to increase their penetration in the Japanese market. This study examines Japanese olive oil consumer behaviour by the use of the conjoint analysis technique. Five attributes have been chosen to design the experiment: region of origin, price, olive oil type, taste and colour. Two models have been estimated where the price variable was introduced in its discrete form in the first model and in its linear and quadratic from in the second model. In a second step, consumer segmentation was undertaken based on consumption frequencies. Two groups have been identified: "heavy consumers" and "light or potential consumers".**

The main results indicate the importance of the selected variables in Japanese olive oil consumer' choice. Olive oil with Mediterranean or Tunisian origin has higher probabilities to be chosen than Italian or Spanish one. Japanese consumers prefer a green with bland taste olive oil. Concerning olive oil type, results indicate that refined olive oil has more probability to be chosen than virgin or extra-virgin one, indicating low awareness of Japanese consumers about olive oil. The price variable estimates have shown a convex utility curve indicating a decrease of consumers' utility when price increases till a maximum price. Above that price, consumers' utility increase indicating in that case that olive oil is considered as a luxurious product. Differences as well as similarities have been detected among consumer segments.

Keywords— **Olive oil, Japan, consumer behavior.**

I. INTRODUCTION

Hervieu [1] ascertain that the Mediterranean region is best defined by its food and diet. The Mediterranean diet is officially recognized by the WHO to be the first reference with regard to food and nutrition [2]. The Mediterranean region offers a great food heritage which deserves to be valued by consumers, distribution systems and food industry.

At the time of the prevalence of international food quality systems and the multiplicity of quality schemes ranging from national and regional to proprietary and industry level arrangements, would it be appropriate to think that consumers in other parts of the world may better perceive the Mediterranean food to be a quality reference.

In particular, if we think of olive oil being typical Mediterranean product, countries like Tunisia, located at the southern part of the Mediterranean, may gain by collaborating with its partners in the Northern part to offer products labeled "Mediterranean foodstuffs" instead of embracing specific quality labels to compete in niche-markets.

Consumption of olive oil has been limited to and associated with the producing regions of the world. Consumption in non-traditional markets however has increased since the 1990s. Japan is among the emerging markets with an annual consumption of 19.000 tonnes (Table 1). Such a growing acceptance is due to the perceived nutritional and health characteristics but also because olive oil embodies the traditional Mediterranean diet model [3].

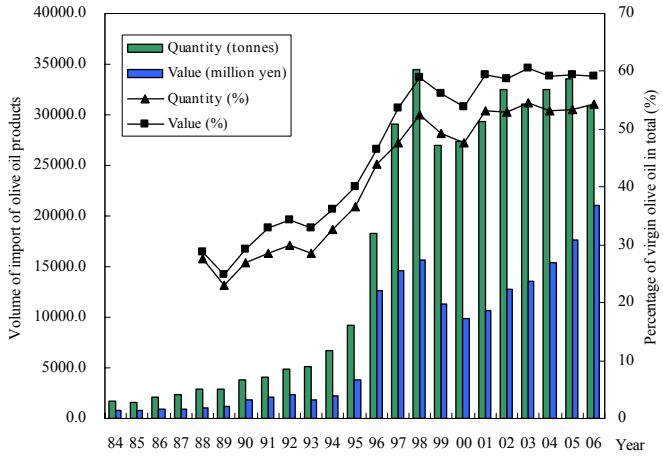
Table 1. Principal non-traditional (non producer) purchasers of olive oil (1990/91 – 2002/03 campaigns)

Country	Average/campaign (1000 t)	Coefficient of variation (%)
USA	140,50	28,71
Germany[1]	22,58	49,95
U. Kingdom[1]	22,40	46,29
Australia	20,69	29,37
Brazil	20,62	25,84
Japan	19,50	62,24
Canada	17,35	31,72
Switzerland	5,46	46,30
Netherlands[1]	4,26	61,75
Mexico	3,15	66,44

[1]includes intra + extra EU imports.
Source: Mili [3]

According to the official statistics of import reported by the Japan Tariff Association (Figure 1), Japan started her import of olive oil in 1984 which was 1.702 tones with the value of 795 million yen annually (the Japan Tariff Association [4] reported trade statistics of the export and import, excluding small amount of values less than 200 thousand yen). Almost 99 percent of the import was from Spain and Italy [5]. The volume of import gradually increased until the first half of the 1990s, yet skyrocketed after the mid-1990s. It hit its peak in 1998 where the volume was 34.487 tones with the value of 15,6 billion yen. The origin of import was diversified during the 1990s, including Greece, France, Portugal, US, Turkey and Tunisia.

Since the latter half of the 1990s, the volume of imports in terms of quantity fluctuated but flattened, despite the import in value terms showed a steady increased after the year 2000. Japan's economy plummeted into decade-long stagnation after the burst of the asset-price bubble in the early 90's, entering into periods of near zero economic growth. However, this consistent increase in import suggested that demand for olive oil is steady in Japan's market, imported majority of them from Mediterranean countries.



(Note) The value is based upon the CIF value. "The virgin olive oil" is defined as virgin olive which is not chemically modified.
(Source) Japan Tariff Association, *Japan Exports & Imports, commodity by Country*, various editions.

Figure1. Volume of Import of Olive Oil Products

As shown in the Figure 1, the percentage of virgin olive oil in total import in terms of value had been increased from 28,8% (1988) to 58,8% (1998) as increasing in the volume of import. Almost 60 percent of total import accounted for the virgin olive oil. Normal olive oil and its fractions, other oils and their fractions obtained sole from olives were less than half of the total import. This fact implies that Japanese consumer prefer pure olive oil, reflecting the increase in demand for health and better nutrition.

Although a substantial literature has been devoted to analyzing consumption behaviour in Japan, studies about consumption of olive oil are merely absent. The aim of this paper is to fill such a gap and provide a first insight about consumers' behaviour and determining factors of olive oil consumption in Japan.

Although most studies on buying decisions are directly related to food products, it is nevertheless the distribution channels that are of utmost importance for both consumers and suppliers [6]. This paper endeavours to examine the role of distribution system in shaping consumers' perceptions and draw implications for Tunisian oil exporters as well as other actors. This paper presumes that consumers in Japan perceive olive oil initially as Mediterranean food even though a country like Italy has introduced this product for quite a long time with Italian label.

The paper uses a conjoint methodology applied to a set of primary data drawn from a survey conducted in January 2008 in Japan. The paper is organized as follows. In the next section, a literature review of product quality and consumers' perception is considered. The third section includes a description of the methodology used in the analysis as well as the data collection and survey design. The main results are reported in the fourth section, while the final considerations and conclusions are highlighted in the last part of this paper.

II. PRODUCT QUALITY AND CONSUMERS' PERCEPTION

Studies about product quality consider both consumers' perception of product quality as well as experts' opinions. The marketing literature seems to favour consumers' opinion as it matters more in the market place. Zeithaml [7] defines consumer's quality

perception as an overall judgment related to the superiority of the product. In other words, the perception of the product indicates the positioning of the product in the mind of the consumer. As such, the perception is more important for the purchase of the good than its real characteristics [8]. Perceived quality leads to purchase only when the quality as perceived is high enough for the consumer to be willing to pay the price. The relationship between perceived quality and price is often referred to as value for money [7].

The decision making involvement of the consumer to simple processed foods is generally low whereas in highly processed foods (requiring processing, packaging etc) there is likely to be high involvement of purchase decision as well as high influence of consumer's habits. For the latter products brand loyalty (an industry brand vs retailer's brand or product origin) plays an important role [9].

The literature about olive oil consumption behaviour is relatively recent and has primarily focused on traditional consumer markets. Krystallis and Ness [10] developed a consumers' cognitive map for olive oil in Greece, including the links between olive oil quality attributes, use benefits and consumers' values. The findings of the study show that "high quality", "healthiness/safety," "tastiness," "convenience" and "ethical consciousness" constitute the main drivers of quality olive oil brands by consumers with high income and educational level.

Mili and Rodriguez [11] developed a conceptual framework to assess future developments in international olive oil markets. Their article forecasts the main trends and likely developments affecting the Spanish olive oil export business over the next decade. The study employed a Delphi experiment method and showed that besides consumers' preferences the main factors determining success in foreign markets are product characteristics, pricing structure, relationships with distribution chains and communication policies. It also emphasized that pricing strategy will not be chief determinant for competing in emerging markets.

Mili [3] investigated trends in non-traditional markets and observed that the relatively low consumption of olive oil in these countries may be explained by the lack of knowledge about the product which is the result of a weak marketing effort directed to this segment of the world market. It is nevertheless worth to notice that growing demand in these non-traditional markets has contributed to the equilibrium between supply and demand of this product. A main feature of olive oil consumption in these new markets is the absence of a reference price such as the case in traditional markets. Mili suggested that the absence of reference price is due to lack of familiarity and consumer expertise in olive oil consumption and that this trait of the market is particularly important to determine the willingness to pay for olive oil.

The UK is considered among the emerging markets despite a rapid growth in olive oil consumption in recent few years. The UK consumers still consider Olive oil for specific uses other than cooking and therefore in order to enhance consumption, olive oil needs to be seen by UK consumers as an 'everyday' cooking oil along with standard vegetable oils [12]. Garcia et al. argue in this paper that standard olive oil needs to be repositioned and distanced from extra virgin olive oil. A conjoint analysis was used to reveal the preferred product choice of UK users which was found to be one packed in medium sized bottles at a price of £2,99.

In another setting, Ronald et al. [13] studied German consumers' attitudes to the country of origin as an attribute of olive oil. They used multinomial logit models and found that demographics, product characteristics, and information sources are the main factors determining buying olive oil of Spanish, Italian and Greek origins. The study points the important role of promotions to Spain's olive oil.

III. DATA COLLECTION AND METHODOLOGY

A. Data collection

The survey was conducted by the NTT Resonant Inc. which provides internet research services in Japan. Total number of monitors living in Tokyo of which the company possesses was 19.415 when this survey was conducted. As the ratio of men to the total monitor was 42,9%; this survey introduced purposive sampling reflecting the distribution of men and women population in Tokyo prefecture. The Tokyo Metropolitan Government, Department of General Affairs reported that the total number of population in Tokyo was 12.805.039 in January 2008. The number

of male population was 6.373.750 (49,8%). Randomly selected 1,470 monitors were questioned through the web-questionnaire during the first week of January 2008. A total sample of 329 persons responded to the questionnaire. Internet users in Japan in 2007 were about 82.266 thousands, (64%) of the Japanese population.

The questionnaire could be divided into three blocks. The first block included questions about olive oil consumption and purchase frequency, olive oil uses, place of purchase and prices, important criteria for choosing olive oil, and the other vegetables oils substitutes. The second block is composed by the conjoint experiment, whereas the third block includes respondents' socio-demographic characteristics. At the beginning of the questionnaire, respondents were asked whether they consume olive. Three response options were provided: 1) Yes; 2) No, but I may use olive oil if the future; 3) No, and I may not use olive oil in the future; generating the respective response frequencies: 222; 64 and 43. Only respondents who chose responses 1 or 2 (286) participated to the conjoint experiment.

The conjoint cards were described by five attributes: country of origin, price, olive oil type, taste and colour. The choice of these attributes was based on the results of a qualitative research carried out by the economic division of the Spanish Embassy in Japan [14], on the results of olive oil consumer behaviour researches conducted in other countries [11, 12, 13, 15] and on the observation of the Japanese olive oil market and marketing strategies. The selected attributes and their corresponding levels are shown in table 2.

The combination of the five attributes with their corresponding levels lead to a total number of 192 hypothetical products, making the respondents' task very hard. To reduce the number of cards, we used an orthogonal design procedure (SPSS. 13) leading to a final design with 16 products. To avoid respondents' fatigue, which could result in biased results, we blocked the 16 cards into two different survey versions with 8 cards each, by the way of a two level additional variable. Respondents were asked to rank the eight cards from 1: the least preferred the, to 8 most preferred product.

Table 2. Selected olive oil attributes and their corresponding levels

Attributes	Levels
Region of origin	Italy Spain Tunisia Mediterranean
Price (250 ml bottle)	800 Yen 1000 Yen 1300 Yen 1600 Yen
Olive oil type	Extra virgin Virgin Olive oil (refined)
Taste	Bland Strong
Color	Yellow Green

B. Methodology

The conceptual foundation of conjoint analysis arises from the theory of Lancaster [16, 17] which stipulates that utility is derived from the properties or characteristics that goods possess (bundle of attributes), rather than the good per se. Since its first development during the 70s [18, 19], the conjoint analysis technique has grown in popularity. Throughout the years, the use of conjoint analysis has been extended to many disciplines such as transportation, telecommunication, environment, marketing and human health.

Regarding agro-food products, various studies have used conjoint analysis to explore consumers' behaviour: Steenkamp [20] for ham products, Loader [21] for fruits and vegetables demand on the UK market, Ness and Gerhardy [22] for the UK market of eggs, Mesias et al. [23] concerning ham consumption in Spain, Souza and Lucas [24] for cheese consumption in Portugal, van der Lans et al. [25] for extra virgin olive oil demand in Italy, García et al. [12] for olive oil consumption in the UK, Orth and Krska [26] for wine consumption, Luckow et al. [27] for yogurt consumption, Krystallis and Ness [10] for olive oil consumption in Greece, Nelson et al. [28] for peanuts consumption, Feliciano and Albisu [29] for prepared dishes in Spain, Boughanmi et al. [30] for

fish products in Oman, and Haddad et al. [31] for concentrated yogurt consumption in Lebanon.

Taking into account the nature of the responses (ordered) and the discrete character of the dependent variable (could take the values: 1, 2, 3, 4, 5, 6, 7, 8), an ordered probit model has been selected for data estimation. The model is built around a latent regression [32]:

$$y_i^* = \beta' x_i + \varepsilon$$

y^*: unobserved dependent variable

β : coefficients vector to estimate

x_i : independent variable vector, which corresponds in this study to the olive oil attributes levels.

ε : error terms vector which follows a normal distribution

y^* is unobserved and what we do observe is the ranking variable y :

$$y = 1 \text{ if } -\infty \le y^* \le \mu_1,$$

$$y = 2 \text{ if } \mu_1 < y^* \le \mu_2,$$

$$y = 3 \text{ if } \mu_2 < y^* \le \mu_3,$$

.

.

$$y = 8 \text{ if } \mu_7 \le y^*$$

The μ_j are unknown parameters (thresholds) to be estimated with β :

$$0 \le \mu_1 < \mu_2 < \ldots < \mu_{j-1}$$

IV. RESULTS AND DISCUSSION

Respondents provided their socioeconomic information, for instance gender, age, structure of household, level of income and education. They also responded to a series of question to determine their attitudes toward olive oil, such as consumption and purchase frequencies, purchase stores, purchase criteria and their preference.

Selected socio-economic characteristics of the sample were summarized in Table 3. 52% percent of the respondents were males, indicating that men are relatively more interested in consumption of olive oil than women. The average sample age was 40 years old. More than half of them were married and are living with his/her wife/husband. The average number of household, children was 2,65 and 0,571, respectively. The medium income was between 4 million and 6 million yen per year. More than 60 percent of the respondents graduated university.

Sample of 222 in 329 respondents consists 67% of the samples have experience to consume olive oil, whereas 64 respondents (19%) may use olive oils in the future. Questions regarding purchase frequencies, purchase stores and purchase criteria of olive oil were asked to the sample of 222. The sample of 286 was questioned about his/her preference to olive oil, including the conjoint analysis task.

Table3. Selected Sample Characteristics

Characteristics	Definition	(%)
Gender	Male	52,89
	Female	47,11
Civil Status	Single	41,34
	Married	53,50
	Divorces, Widow/er	5,17
Education level	Junior high school	2,13
	Senior high school	21,58
	University	63,22
	Professional/tech. school	11,55
	Others	1,52
Household income (million Yen/year)	income ≤ 2	7,29
	2 < income ≤ 4	17,02
	4 < income ≤ 6	24,01
	6 < income ≤ 8	21,58
	8 < income ≤ 10	12,16
	10 < income ≤ 15	13,37
	15 < income	4,56
Age in years	Mean	40,08
	Min./median/max.	14/40/78
Number of persons in household	Mean	2,65
	Min./median/max.	1/2/6
Number of children in household	Mean	0,57
	Min./median/max.	0/2/4

Concerning the conjoint responses, and as stated in the methodological part, we used ordinal probit model to estimate the data. Two models were estimated. In model 1, all variables are considered in their discrete form including the price attribute. In model 2, the price variable is considered continuous where the linear form (price) and quadratic form $(price)^2$ are estimated. Since that the other variables are effect coded with values taking (-1) or (+1), we decided to divide the price variable by 1000, so that getting new values ranging between (0,8) and (1,6). The obtained results are summarized in table 4.

The log likelihood ratio tests (LR1) and (LR2) respectively for models (1) and (2) indicate the overall significance of both models. All coefficients of the two models are statistically significant, except the 1000 Yen price for model (1). Regarding the olive oil type variable, we decided to merge the "extra virgin" and the "virgin" levels, for two reasons. First, the obtained results when estimating each level per separate shows a non statistical coefficient for one of the two levels. Second, since that this attribute has three levels, and respondents were asked to rank between eight levels, the olive oil level was present four times whereas the remaining two levels were present only two times to preserve the orthogonality of the conjoint design. The threshold parameters (μ) are all statistically significant. The first threshold parameter (μ_1) was arbitrarily set to zero. The discrete dependent variable takes the number from 1 to 8. One corresponds to the least preferred product whereas eight corresponds to the first ranked product.

Considering the origin attribute in Model 1, the results show that the highest coefficients correspond to the Tunisian and the Mediterranean origin, while Italy and Spain present the lowest values. This indicates that, an olive oil from Tunisia or an olive oil with "product of the Mediterranean" indication has more probability to be chosen than an Italian olive oil or a Spanish one. This result is quite surprising because, actually in the Japanese market Italian olive oil has the largest market share (about 80%), whereas the remaining part is shared by Spain and other countries. In a previous question to the conjoint task, respondents were asked if they have heard about Tunisia as an olive oil producing country, and the results have shown that only 7% responded yes. When respondents were asked to indicate some olive oil producing countries, the most mentioned countries were Italy and Spain, cited respectively by 54% and 18% of respondents. It is important to emphasize that 34% of the respondents were unable to mention any country name (this percentage is almost the same, 31%, when considering only olive oil consumers).

Table 4. Parameters estimates of the ordered probit model[a]

Variable	Model 1	Std. Error	Model 2	Std. Error
Constant	1,174***	0,0339	2,6278***	0,4383
Spain	-0,1633***	0,0373	-0,1632***	0,0373
Tunisia	0,1311***	0,0374	0,1308***	0,0374
Mediterranean	0,0994***	0,0374	0,0991***	0,0374
Italy	-0,0672[b]	—	-0,0667[b]	—
800 Yen	0,0660*	0,0374	—	—
1000 Yen	0,0192	0,0371	—	—
1300 Yen	-0,1418***	0,0373	—	—
1600 Yen	0,0566[b]	—	—	—
Price	—	—	-2,5183***	0,7637
$(Price)^2$	—	—	1,0217***	0,3159
Extra or virgin	-0,0524**	0,0215	-0,0525**	0,0215
Olive oil	0,0524[b]	—	0,0525[b]	—
Bland taste	0,0504**	0,0216	0,0502**	0,0216
Strong taste	-0,0504[b]	—	-0,0502[b]	—
Yellow	-0,1527***	0,0216	-0,1522***	0,0216
Green	0,1527[b]	—	0,1522[b]	—
μ_2	0,4835***	0,0266	0,4822***	0,0266
μ_3	0,8418***	0,0315	0,8404***	0,0314
μ_4	1,1676***	0,0344	1,1662***	0,0344
μ_5	1,4976***	0,0369	1,4958***	0,0369
μ_6	1,8682***	0,0399	1,8660***	0,0398
μ_7	2,3599***	0,0451	2,3582***	0,0450
N. Obs.[c]	2288		2288	
LR1 $\chi^2_{(16)}$	105,6***			
LR2 $\chi^2_{(15)}$			101,6***	

[a] Dependent variable takes discrete values from one to eight. 1 corresponds to the least choice and 8 corresponds to the first choice.

[b] Represents the base level. Effects codes have been used rather than dummy variables for coding the attributes. The parameter value of the base level is equal to the negative of the sum of the estimated coefficients from the other levels.

[c] Number of observations is equal to the product of the number of respondents (286) who responded to the conjoint task by the number of cards (8) that they responded to.

*** significant at 1%; ** significant at 5%; * significant at 10%

These results suggest two possible deductions. First, the prevalence of the "Mediterranean label" to the "country label" in the case of Italy and Spain, which could be explained, as we stated at the beginning of this research, by the link with the Mediterranean and healthy diet. In the case of Tunisia, it is possible that respondents ignore its geographical location (in the Mediterranean Basin) and may see it as a differentiated and "exotic" origin in comparison with Italy and Spain. The second deduction is that an important part of olive oil consumers (more than 30%) did not pay much attention to the product origin during their purchase.

Concerning the olive oil type, as explained before we merged the "extra virgin" and "virgin" olive oil levels and compared it to the olive oil level. The obtained coefficients indicate that consumers prefer buying a bottle where it is indicated "olive oil" (it is the refined olive oil) rather than "extra virgin" or "virgin". This result is also surprising, considering the results obtained in a previous question about the olive oil type that respondents know and where four possibilities have been presented: Extra virgin, virgin, olive oil (refined) and olive-pomace oil, where respectively 82%, 66%, 75% and 2% of positive responses have been obtained. This indicates that Japanese consumers know these three different olive oil types, but they do not really know the difference between them, choosing finally the "secure option" with the olive oil label.

Regarding the sensory attributes, the statistically significant results show that respondents prefer a bland taste olive oil rather than a strong one. Respondents show also a higher preference for a green coloured olive oil compared with a yellow one.

Finally, concerning the price attribute, the results show, as expected, that for the first three price levels (800; 1000 and 1300 Yen) respondents' utility decreases when price increases. Nonetheless, the positive 1600 Yen price coefficient, indicates that respondents' utility increases again in comparison to 1000 and 1300 Yen levels. To better understand this unexpected price pattern, we estimated Model 2 including the price variable in its linear and quadratic form and we plotted (Figure 2) the utility function along price values maintaining all other variables constant, ceteris paribus. Utilities from olive oil with prices above 1600 Yen were calculated using the estimated parameters of model 2, so some extrapolation has been provided.

Model 2 parameters estimates are very similar to Model 1, the unique difference between them is the price variable form. Concerning this latter attribute, the linear and quadratic price coefficients obtained are statistically significant and of negative and positive sign, respectively.

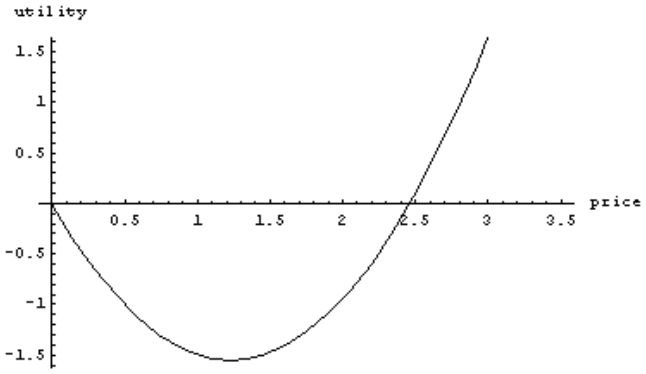


Figure 2. The utility function along price values
(real prices = current prices x 1000)

Figure 2 shows that the utility function along price values has a convex shape, indicating that initially consumers' utility decreases when price increases till a maximum price (about 1232 Yen). Above this maximum price, respondents' utility increases. This shows the complex price importance in consumers' purchasing decision. A possible explanation is that consumer could consider the olive oil as normal good; in that case, a lower price represents a higher utility (we recall that the four price levels are for purchasing a 250 ml olive oil bottle) and induces frequent consumption. For high relatively prices (above 1300 Yen), it is possible that consumers consider the olive oil as luxury product and that the price attribute is used as proxy to infer olive oil quality. But, in this case, consumption and purchase frequencies are expected to be lower.

On the bases of a question related to consumption frequency, we segmented respondents to two groups: heavy olive consumers group which includes respondents who consume olive oil every day or some

days during the week, and light and potential olive oil consumers group which includes respondents who consume olive oil some days per month or rarely and respondents who did not yet consume olive oil. We estimated the conjoint data with each group of consumers (table 5).

Table 5. Parameters estimates of the consumer segmentation model[a]

Variable	Model 3 (heavy)	Std. Error	Model 4 (Light)	Std. Error
Constant	2,8701***	0,6607	2,4404***	0,5860
Spain	-0,1238**	0,0562	-0,1959***	0,0499
Tunisia	0,1284**	0,0563	0,1333***	0,0500
Mediterranean	0,1346**	0,0565	0,0722	0,0499
Italy	-0,1392[b]	—	-0,0096[b]	—
Price	-2,9695***	1,1506	-2,1676**	1,0213
$(Price)^2$	1,2170***	0,4758	0,8714**	0,4225
Extra or virgin	-0,0699**	0,0325	-0,0392	0,0288
Olive oil	0,0699[b]	—	0,0392[b]	—
Bland taste	0,0186	0,0325	0,0751***	0,0288
Strong taste	-0,0186[b]	—	-0,0751[b]	—
Yellow	-0,1221***	0,0325	-0,1768***	0,0290
Green	0,1221[b]	—	0,1768[b]	—
μ_2	0,4824***	0,0401	0,4824***	0,0355
μ_3	0,8416***	0,0474	0,8404***	0,0420
μ_4	1,1677***	0,0518	1,1666***	0,0460
μ_5	1,4965***	0,0556	1,4983***	0,0494
μ_6	1,8637***	0,0600	1,8725***	0,0534
μ_7	2,3534***	0,0677	2,3693***	0,0605
N. Obs.	1008		1280	
LR3 $\chi^2_{(15)}$	41,6***			
LR4 $\chi^2_{(15)}$			67,6***	

[a] Dependent variable takes discrete values from one to eight. 1 corresponds to the least choice and 8 corresponds to the first choice.
[b] Represents the base level. Effects codes have been used rather than dummy variables for coding the attributes. The parameter value of the base level is equal to the negative of the sum of the estimated coefficients from the other levels.
*** significant at 1%; ** significant at 5%; * significant at 10%

The obtained results show that for the "heavy" consumers group, the region of origin coefficients levels are all statistically significant, with the highest utility for the "Mediterranean label" followed by Tunisia, Spain and finally Italy. Whereas for the "light or potential" consumers group, olive oil from Tunisia still having the highest probability to be chosen, followed by the "Mediterranean label" and then Italy and Spain (the Mediterranean coefficient is not statistically significant).

Concerning the olive oil type, "heavy" consumers allocate higher utility for an "olive oil" branded bottle than for an "extra virgin or virgin" one. For "light or potential" consumers the coefficient is not statistically significant which was expected since that these consumers have low knowledge about olive oil. An inverse pattern is observed for the taste attribute, where its coefficient is statistically significant and of negative sign for the "light or potential" consumers group showing their preference for a bland taste product, while this attribute is not significant for the "heavy" consumers group. Concerning the colour attribute, both groups prefer a green olive oil than a yellow product.

Finally, concerning the price attribute, for the two consumers' segments, the linear and quadratic price coefficients are statistically significant. The corresponding curves shown in Figure 3 reveal that "heavy" consumers are more sensitive to price variation than "light or potential consumers".

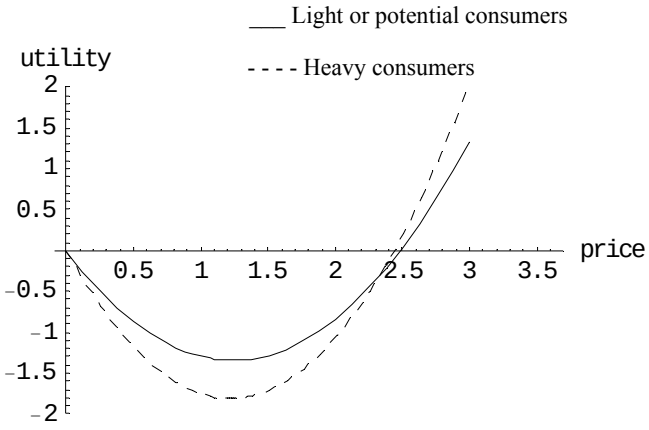


Figure 3. The utilities' functions along price values of consumers segments
(real prices = current prices x 1000)

V. CONCLUSION

The aim of this research was to explore Japanese consumer behaviour, since that olive oil consumption in Japan has been increasing from almost twenty years. A survey was sent via e-mail to a panel of Tokyo residents, and 329 persons responded to the questionnaire. The main results obtained have shown that, although Italy and Spain are the most known olive oil producing countries for Japanese consumers, the latter prefer an olive oil with a "Mediterranean label" which is linked to the "Mediterranean diet", or a Tunisian olive oil which could be perceived as an "exotic" origin. The results obtained have also shown a preference of Japanese consumers to "refined" olive oil in comparison to extra virgin or virgin olive oil. We believe that this result is due to a lack of knowledge of Japanese consumers about the existing difference between these three types, although previous result form the questionnaire have shown that respondents have already heard about these olive oil types. The traditional price variable was found to have a convex pattern when plotted in terms of utility. That is, consumer utility decreases when price increases, until a maximum price level, and above that price, utility increases. This could be explained by the fact that for a high price level, olive oil is considered by Japanese consumers as a luxurious product of high quality. Concerning the sensory attributes like olive oil taste and olive oil colour, it was found that Japanese consumers prefer a green olive oil with a bland test.

Consumers have been segmented into two groups on the basis of their olive oil consumption frequencies. These groups are: "heavy consumers" and "light or potential consumers". The obtained results show differences among these two groups especially concerning the origin, price and olive oil types attributes.

From a marketing point of view, the obtained results regarding the country or region of origin attribute are promising for traditional and non-know olive oil producer countries such as Tunisia or Syria. Tunisia is a traditional olive oil producer and one of the most important exporters in the world. Nonetheless, Tunisian olive oil exports have always been in bulk and directed to the European Union market (Italy and Spain). This makes Tunisian olive oil product unknown by the final European and other consumers. The obtained results show that Tunisia has the possibility to increase its market share in Japan in spite of the presence of well-known olive oil producer such as Italy and Spain. The simultaneous indication of Tunisian and Mediterranean origin on the olive oil bottle label could be a successful strategy. If big quantities are targeted to be sold, it is recommended to fix a reasonable price level (ranging between 500 and 1000 Yen for a 250 ml size bottle). However, if small quantities are aimed to be sold, higher consumers' segment could be targeted with higher price level but with also a high quality product.

As future research implications, it is important to undertake other experimental research on Japanese olive oil consumption behaviour by the use of other techniques such as the choice experiment technique, in order to consolidate the results obtained in this research. It is also important; to compare the stated preference results, obtained via experimental data, with real or revealed preference results derived from real olive oil purchase data.

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