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# THE IMPACT OF FOOD MARKETING FACTORS ON THE ATTITUDE OF ALGERIAN CONSUMERS TOWARDS OLIVE OIL

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**Abstract**

*The study examines the impact of food marketing factors (quality, packaging, price and brand) on Algerian consumers' attitudes to olive oil. A nationwide survey of 305 respondents was carried out to explain the food marketing elements influencing their attitudes towards the choice, purchase and consumption of olive oil. Descriptive, regression and principal component analysis (PCA) were used to review and discuss the data collected. The results reveal that perceived quality is the most influential factor explaining 61% of consumer attitudes, followed by packaging (66%), brand (63%) and price (56%). The study underlines the importance of cultural and social factors, and emphasizes the growing demand for high-quality, sustainable products, with transparency and authenticity being key elements in building consumer confidence. Finally, the study proposes appropriate food marketing strategies to improve the penetration of Algerian olive oil companies in the national and international markets.*
**Keywords:** *Food consumption, marketing techniques, consumer attitudes, olive oil, Algeria.*
**JEL Codes:** *D12, M31, Q13, Q18.*

## 1. Introduction

World consumption of olive oil almost doubled from 1990 to 2021, reaching around 3,125,000 tonnes in 2020/21 and an estimated 3,214,500 tonnes for 2021/22 (IOC, 2022). In 2022, the global olive oil market was estimated at US$22.30 billion, and is expected to grow at a compound annual rate of 5.2% from 2023 to 2030. Although the data are indicated by the International Olive Oil Council as provisional, world production for the 2023/24 campaign is said to have reached 2,564,000 tonnes, down 7% (-196,000 t) on the previous campaign. Consumption fell to 2,780,000 tonnes (-3%) (IOC, 2024). The virgin olive oil segment is expected to expand at a rate of 6.1% over this period (Aceites De las Heras, 2024). This illustrates the growing trend in olive oil consumption both globally and in the Mediterranean region. In Algeria, olive oil consumption stands out for its moderation compared to other Mediterranean countries. It is estimated at around 6 liters per inhabitant per year, with regional variations (up to 11 liters in Kabylie). In Spain, olive oil consumption is around 13 liters per capita per year. In Greece, consumption is very high, reaching around 20 liters per inhabitant per year, often due to its integration into local cuisine. In Italy, it is around 12 to 14 liters per capita per year, also a country where olive oil is essential to gastronomy (Hadjou et al. 2013; Djazagro, 2024). Olive oil production in Algeria represents around 1.7% of world production and 1.5% of world consumption. The majority of its production is destined for domestic consumption (Boudi, 2013). Spain, Italy, Greece and Tunisia are the countries that dominate the market with massive productions together representing nearly 75% of world production

(Bouyoucef-barr & Moussouni, 2014, Latino, 2022; European commission, 2024; Fondo Gionino, 2025). With annual olive oil production of over 100,000 tonnes, Algeria ranks among the world's leading olive oil producing countries (ranked 10th) (FAO, 2023). This food product, deeply rooted in local culinary traditions, is not only a staple food but also a symbol of health, longevity and authenticity (Dekhili & D'Hauteville, 2006; Lamani, 2014; Boudi et al., 2022). However, faced with increased competition and product diversification on the market, economic operators and local players in the sector need to understand the factors that influence consumer attitudes towards olive oil. Olive oil occupies a central place in Algeria's food and economic culture, not only for its nutritional benefits but also for its strong cultural value (Chikhi & Bendidjelloul, 2022). Faced with a rapidly expanding market, agri-food companies are seeking to develop marketing strategies to attract and retain consumers.

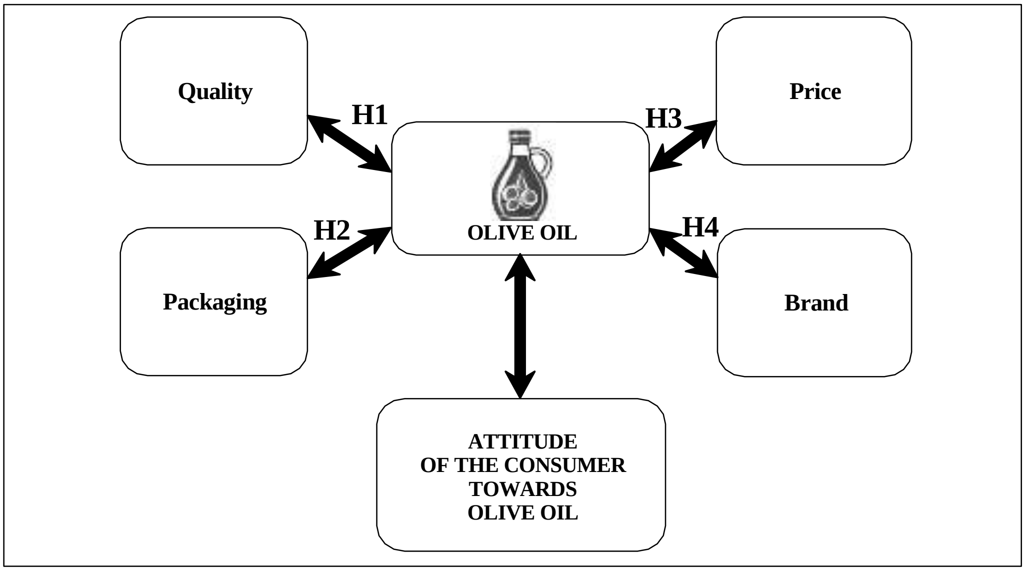
Despite the cultural and economic importance of olive oil in Algeria, few studies have examined the impact of food marketing elements on consumer attitudes. Yet in a rapidly changing market, where local traditions coexist with global influences, marketing strategies play a crucial role in shaping this attitude (Kotler et al., 2022). Key questions arise: What are the most influential food marketing elements? How do Algerian consumers perceive olive oil quality, price, promotion, distribution, branding and packaging? What are the implications for producers and distributors? These strategies should not only improve visibility, but also foster the link with consumers, particularly young people, who appreciate the sustainability and authenticity of food products (Designer, 2024; ESAO, 2025). This study aims to fill these gaps by examining the impact of food marketing elements on Algerian consumers' attitudes towards olive oil. Its aim is to: 1/ Identify the main food marketing factors influencing consumer attitudes; 2/ Analyze perceptions of olive oil quality, price, promotion, distribution and packaging in Algeria; 3/ Propose marketing strategies for players in the olive sector.

Indeed, the impact of food marketing on consumer attitudes towards the purchase of olive oil is a multifaceted field of study that examines how intrinsic and extrinsic attributes influence consumer preferences and behaviors (Yangui et al., 2016; Blazquez-Resino, 2021). Understanding the attitudes of Algerian consumers is therefore essential for optimizing marketing strategies and improving market penetration. Recent research highlights that factors such as product quality, packaging, brand image and sustainability play an important role in consumer decision-making in the olive oil sector, reflecting broader trends in consumer behavior with regard to health and environmental awareness (Chikhi & Bendidjelloul, 2022; Souar & Almi, 2024). Intrinsic factors, including olive oil's sensory attributes such as taste, aroma and perceived health benefits, are key to influencing consumer preferences. Studies indicate that consumers show a strong preference for high-quality extra virgin olive oil, motivated by their concern for their health and by the oil's nutritional profile, which includes monounsaturated fats and antioxidants that are highly beneficial to the human body (Cicerale et al., 2016; Berboucha et al., 2024).

At the same time, extrinsic factors such as packaging design, brand reputation and marketing communication are increasingly important, as attractive and informative packaging can significantly improve consumer expectations and willingness to buy (Cicerale et al., 2016; Chikhi & Bendidjelloul, 2022). Cultural and social influences further complicate consumer attitudes, as local culinary traditions and family recommendations can influence purchasing decisions. Word-of-mouth plays a key role, with consumers often relying on personal recommendations from friends and family to choose olive oil products (Paul, 2024). This social aspect underlines the importance of forging links with the community and leveraging consumer trust to promote products that align with quality and sustainability values. Despite the growing interest in high-quality, eco-friendly olive oil, controversy exists over the authenticity of marketing claims and the actual sustainable practices of producers. Several emerging issues such as greenwashing have aroused consumer distrust and underline the need for transparency and genuine sustainability efforts in marketing strategies (Erraach, 2021).

Ultimately, a nuanced understanding of these food marketing factors is essential to respond effectively to the evolving preferences of Algerian consumers in the olive oil market. We therefore formulated the following research problem: *What is the impact of food marketing factors on the attitude of the Algerian consumer in the process of choosing and purchasing olive oil?* In order to give a quantitative dimension to the research problem, which can be confirmed by statistical indicators, four research hypotheses were stated and tested in the study:

*H1:* Quality has an impact on the attitude of Algerian consumers when buying olive oil.
*H2*: Packaging influences the attitude of Algerian consumers when buying olive oil.
*H3*: Price has an impact on the attitude of Algerian consumers when buying olive oil.
*H4*: Brand influences the attitude of Algerian consumers when buying olive oil.




**Source:** Designed by the author (2024).

**Figure 1. Proposed Conceptual Model**

## 2. Literature Review

Today, consumers are particularly sensitive to “product” and “marketing” innovations in packaging, service quality (ease of purchase, storage and preparation) and the health value of food (Feillet, 2022). Technological innovations in extraction and storage have improved the quality and sustainability of olive oil (Mili & Bouhaddane, 2021). However, the sector faces major challenges, including climate change, olive tree diseases and price fluctuations (European Commission, 2019). It is essential for manufacturers and marketers to understand the factors that influence consumer attitudes and purchasing decisions in this sector, especially given the market expansion in emerging economies such as China and Japan (Peršurić et al. 2021; Latino et al., 2022). The food industry employs savvy and creative marketers who have pioneered many modern marketing tools (Chandon & Wansink, 2012; Aurier & Sirieix, 2016). Food marketing factors play a decisive role in shaping consumer attitudes and preferences when purchasing olive oil. Research indicates that various attributes including brand, price, organic certification and origin significantly influence consumer choices and willingness to pay for olive oil products (Liberatore et al., 2018; Canavari et al., 2018; Latino et al., 2022;

Thøgersen, 2023). In the context of olive oil, these elements take on a particular dimension due to the cultural and economic importance of the product in Algeria. Chikhi and Bendidjelloul (2022) analyzed olive oil consumption trends in Mediterranean countries, with a particular focus on Algeria. These authors examined the attitudes of Algerian consumers towards olive oil, particularly with regard to price, frequency of consumption and type of product consumed. They also propose marketing strategies to increase consumption and develop the olive oil sector in Algeria

Among the food marketing factors influencing consumer attitudes is perceived quality. According to Dekhili and D'Hauteville (2006), geographical origin and traditional production methods are key indicators of food product quality. In Algeria, olive oil is often associated with specific regions renowned for their production, such as Kabylie or Oranie, reinforcing its perception as a local product (Lamani, 2014). According to Van der Lans et al (2001), geographical origin can reinforce consumer confidence and justify a higher price. Traditional production methods such as manual harvesting and cold extraction are also indicators of quality. According to Trabelsi and Giraud (2010), these methods are perceived as more authentic and respectful of the environment. Certifications or labels such as BIO or Protected Designation of Origin (PDO) also play a growing role in consumer confidence. According to Huguenel-Durand and Durand (2015), certifications reinforce product credibility and justify a higher price. In addition, the health benefits associated with olive oil, notably its high monounsaturated fat and antioxidant content, enhance its appeal to health-conscious consumers (Berboucha et al., 2024; Souar & Almi, 2024).

Price is therefore also a determining factor in a market where consumers are sensitive to perceived value. According to Zeithaml et al (2024), too high a price can deter buyers, while too low a price can arouse doubts about a product's quality. In Algeria, where purchasing power varies considerably, pricing strategies need to be adapted to different consumer categories and market specificities. According to El Badaoui and Ait El Mekki (2017), high-income consumers are willing to pay more for premium olive oil such as extra virgin, while those on modest incomes favor affordable products such as virgin or regular. According to Kotler et al (2022), dynamic pricing based on consumer segmentation can maximize sales and customer satisfaction. Companies that strategically position their products across the price spectrum can attract diverse consumer segments maximizing their market reach (Del Giudice et al., 2015). Purchasing power and consumption habits vary considerably in Algeria. According to El Badaoui and Ait El Mékki (2017), high-income consumers are more sensitive to product quality and origin, while those with modest incomes prioritize price and availability. According to Kotler et al, (2022), segmentation based on income and consumption habits can maximize the effectiveness of marketing campaigns. Growing competition in the Algerian olive oil market is forcing producers to innovate and differentiate their products. According to Aaker (2010), a strong, consistent brand image is essential to stand out from the crowd

Promotional campaigns, whether advertising or based on special offers, strongly influence consumer attitudes. According to Chandon and Wansink (2012), promotions can increase brand awareness and encourage product trial. In Algeria, local promotions during agricultural and food fairs play an important role in promoting olive oil. According to Trabelsi and Giraud (2010), these events enable producers to meet consumers directly and reinforce their brand image. Today, social media have become an essential tool for promoting products and services, particularly olive oil. According to Bernoussi and Sirieix (2020), advertising campaigns on Facebook and Instagram can reach a wide audience and reinforce positive consumer attitudes.

Product availability is another key factor. Efficient distribution, whether in supermarkets, local markets or online, improves accessibility and reinforces positive consumer attitudes. In Algeria, traditional distribution channels coexist with modern ones (Chikhi, 2022). According to Ding et al (2023), producers need to adapt their distribution strategies to meet the needs of different consumer segments. At the same time, e-commerce is growing rapidly in Algeria. According to Gulfraz et al. (2022), online platforms enable consumers to access a wider variety of products and compare prices easily. Packaging also plays a crucial role in the perception of product quality and appeal. According to Shukla et al (2022), attractive and informative packaging can boost consumer confidence. In Algeria, the use of traditional materials (such as glass bottles) and labels in Arabic and French is often appreciated (Chikhi, 2022). According to Zindy et al. (2017), careful design and clear label information can reinforce positive consumer attitudes. Label information such as geographical origin and certifications has a considerable influence on purchasing decisions (Huguenel-Durand & Durand, 2015).

Furthermore, consumer attitude is a multidimensional concept comprising cognitive, affective and conative aspects (Darpy & Guillard, 2020; Helfer et al., 2023). In the context of olive oil this attitude is influenced by biological, psychological and socio-demographic (person-related) factors, as well as economic, marketing and cultural (environmental) factors (Salazar-Ordóñez et al., 2018). In Algeria, olive oil is deeply rooted in culinary and cultural traditions. According to Bouguerra (2016), consumers attach great importance to the product's authenticity and local origin. Olive oil is an essential ingredient in many traditional Algerian dishes. It is used to make vinaigrette sauces, but more often than not it is added in the cooking process, adding a special flavor to dishes (Benmostefa, 2022). According to Lamani (2014), this cultural dimension reinforces the positive attitude towards olive oil, particularly among the older generations. Olive oil is also associated with symbolic values, such as health and longevity. According to Dekhili (2010), these associations reinforce consumers' positive attitude. Boudi, Chehat and Cheriet (2022) examined the links between the regional specificities of olive oil and the quality attributes sought by consumers in Algeria. Exploratory surveys conducted in four wilayas (Tizi-Ouzou, Bejaia, Algiers and Laghouat) reveal that consumers' geographical proximity and familiarity with olive oil from Kabylie significantly influence their perceptions and preferences. The results show that consumers in producing regions have a marked preference for this oil, attributing particular importance to its origin and intrinsic characteristics. This familiarity makes it possible to distinguish differences in perception both in terms of the image of the region of origin and in terms of the product's qualitative attributes. Thus, consumers' proximity to and experience of Kabylie olive oil appear to be key variables in the evaluation of its quality and in purchasing decisions.

As mentioned above, food marketing elements (quality, price, promotion, distribution and packaging) play a key role in shaping consumer attitudes. According to Aaker (2010), a strong, consistent brand image can reinforce consumer loyalty and their patent attitude towards the product. A strong brand image is essential to influence consumer attitudes. According to Bernoussi and Sirieix (2020), consumers are more likely to buy products from brands they perceive as reliable and authentic. Consumer loyalty is another key indicator of positive attitude. According to Solomon (2020), loyal consumers are more likely to recommend the product to friends and family.

A wealth of recent research has highlighted the significant impact of various food marketing factors on consumer preferences for olive oil, including brand recognition, pricing strategies and certifications, particularly extra virgin olive oil. Studies indicate that consumers prioritize organic certifications and geographical origin, associating them with a guarantee of quality and a willingness to pay a higher price (Peršurić et al. 2021; Latino et al., 2022). In addition, consumer segmentation according to demographic factors such as age, income and environmental awareness plays an important role in purchasing behavior, thus highlighting the need to adapt marketing strategies (Del Giudice et al., 2015; Desygner, 2024). Today, questions about transparency and consumer confidence are major challenges for processing companies and oil mills, which highlight the need for a rigorous regulatory framework and ethical marketing practices to protect consumers and ensure fair competition on the market. In addition, research indicates that various factors influence consumer choice, including product attributes such as price, color, packaging and taste (Erraach et al., 2021; Di Vita et al., 2021). These attributes can be classified into search, experience and credibility characteristics. Search attributes are those that consumers can evaluate before purchasing (e.g. price and packaging), experience attributes are evaluated after consumption (e.g. taste) and credibility attributes are associated with quality claims that may require trust (e.g. organic certification and health claims) (Loureiro, et al., 2022).

The segmentation of consumers according to their socio-economic characteristics has also been the subject of numerous marketing studies. Effective differentiation of products, particularly between different olive oil brands, enables companies to respond to the diverse needs and preferences of consumers, thus optimizing their market penetration (Latino et al., 2022). Factors such as nutritional content, health benefits and organic labeling are essential elements taken into account in the segmentation process, underlining the need for tailored marketing strategies to meet specific consumer demands (Laraichi, 2021). Growing public concern for the environment has fostered the emergence of a new category of consumers known as "*Green Consumers*", who prioritize sustainability in their purchasing behavior, hence the creation of *Eco-labels* (Latino et al., 2022). In addition, younger consumers tend to place more importance on the social and environmental impact of products, while older consumers may prioritize quality and reliability. Moreover, gender differences reveal that women often take emotional and relational aspects into account in their purchasing decisions, which may influence their choice of olive oil brands (Desygner, 2024). Thus, consumers are increasingly motivated by sustainability in their purchasing decisions. They prioritize authentic flavor and quality over brands and packaging when choosing olive oil (Mouchtaropoulou et al., 2024).

As a result, there is a proven importance of food marketing factors in shaping consumer attitudes towards olive oil. Perceived quality, price, promotion, distribution and packaging are key factors influencing this attitude. Our research aims to explore the specifics of the Algerian market and propose appropriate strategies. Figure 1 presents the proposed conceptual model.

## 3. Methods and Materials

### 3.1 Questionnaire Administration

Our study examines the attitudes of Algerian consumers towards olive oil. It attempts to apprehend the influence of food marketing factors on consumption attitudes towards a local food product par excellence, olive oil, and all the attributes linked to it (consumption experience, preference and purchase motivation). A survey was carried out on a predominantly young population with a high level of education living in rural or urban areas, likely to have adopted certain attitudes towards olive oil consumption. The underlying hypothesis being that young urban dwellers are resolutely oriented towards branded olive oil with packaging meeting quality standards, and that people living in rural areas would be  to traditional and artisanal products without food marketing features (packaging, brand, etc.)  than those living in urban areas. The population sample was selected on the basis of geographical diversity and population representativeness. A nationwide survey was carried out using an online questionnaire on Google Forms. Data were collected automatically between March and June 2021, resulting in a total of 305 fully usable responses. The sample size was determined based on fieldwork constraints while ensuring a representative diversity of sociodemographic profiles. With a 95% confidence level, the sample offers a statistically acceptable margin of error, thus ensuring the robustness and reliability of the analyses conducted. The aim is to understand the determinants of olive oil choice in relation to marketing strategies, in particular packaging, price, advertising and brand awareness. A descriptive and analytical approach based on quantitative analysis was used to process the results.

**Table 1. Socio-demographic Characteristics of Respondents (n = 305)**

| **Parameters** | | **n** | **(%)** |
|---|---|---|---|
| Type | Men | 89 | 29,18 |
| | Woman | 216 | 70,82 |
| Age | < 18 years | 3 | 1 |
| | From 18 to 25 years old | 155 | 50,82 |
| | From 26 to 45 years old | 108 | 35,41 |
| | From 46 to 65 | 31 | 10,16 |
| | > 65 years | 8 | 2,62 |
| Family situation | Single | 196 | 64,26 |
| | Married | 100 | 32,79 |
| | Other | 9 | 2,95 |
| Education level | Medium | 3 | 0,99 |
| | High school | 22 | 7,21 |
| | University | 280 | 91,80 |
| Profession | Student | 133 | 43,61 |
| | Liberal profession | 30 | 9,84 |
| | Public service | 80 | 26,23 |
| | Retired | 9 | 2,95 |
| | Unemployed | 53 | 17,38 |
| Income level | < 20.000 DZD | 28 | 9,18 |
| | From 20,000 to 50,000 DZD | 55 | 18,03 |
| | From 50,001 to 80,000 DZD | 39 | 12,79 |
| | > 80,000 DZD | 32 | 10,49 |
| | No income | 151 | 49,51 |
| Location by region | East | 64 | 20,98 |
| | North | 79 | 25,90 |
| | West | 142 | 46,59 |
| | South | 20 | 6,56 |
| Residential zone | Suburban | 52 | 17,05 |
| | Rural | 31 | 10,16 |
| | Urban | 222 | 72,79 |

**Source**: Author's own calculations (2024).

### 3.2 Analysis of Survey Data

The methodology employed in the analysis of the survey data is based on a mixed approach combining descriptive and quantitative analysis to explore and interpret the data. First, a descriptive analysis was carried out to characterize the study population and describe the main trends observed. Next, a quantitative analysis was carried out using a multiple linear regression model and correlation analysis to identify significant relationships between variables and measure their impact. At the same time, a principal component analysis (PCA) was used to reduce the dimensionality of the data and segment the population into homogeneous clusters, enabling distinct profiles to be identified and the sample to be segmented. Finally, the identified clusters were cross-referenced with the results of multiple linear regressions to explore the specificities of each group and to deepen the interpretation of relationships between variables. This methodological approach enables us to offer an in-depth understanding of the dynamics underlying the data analyzed. A statistical analysis was performed using IBM SPSS Statistics version 26.

As a result, women account for a significant majority of respondents (70.82%). This over-representation of the female gender compared to the Algerian demographic reality, where women represent 49.4% and men 50.6% (ONS, 2023), implies that women are more involved in the purchase and consumption of olive oil, or that they are more likely to participate in this type of survey. We also found that respondents in the West region were higher than in other regions of the country. For this reason, it is important to point out that we attempted to reach all 58 wilayas (i.e., districts) of Algeria, for greater regional representativeness, but alas, only 43 wilayas were reached (**Table 1**). The most represented age group was 18-25 (50.82%), followed by 26-45 (35.41%). Very few people were under 18 or over 65.

Single people make up the majority of respondents (64.26%), followed by married people (32.79%). There are very few divorced or widowed respondents. This may be linked to the structure of the population studied, or to differences in consumption patterns between different family situations. The level of education is very high, with the majority of respondents having a university degree (91.80%). This shows that people with a high level of education are more interested in olive oil for health reasons, or more likely to participate in this type of survey. Students accounted for a significant proportion of respondents (43.61%), followed by people working in the civil service (26.23%) and the unemployed (17.38%). The liberal professions and retired people are less represented. This may be linked to the structure of the population studied, or to differences in consumption between different professions.

Income levels are fairly diversified, with a high proportion of respondents with no income (49.51%), which may include students and the unemployed. Other income brackets are more evenly distributed, with a slight predominance of incomes below 20,000 DZD (9.18%) and between 20,000 and 50,000 DZD (18.03%). The West region is the most represented (46.59%), followed by the North (25.90%) and the East (20.98%). The South is less well represented (6.56%). This may reflect the geographical distribution of the population studied, or differences in consumption between regions. The majority of respondents live in urban areas (72.79%), followed by suburban areas (17.05%) and rural areas (10.16%). This may be linked to the structure of the population studied, or to differences in consumption between different types of housing area.

### 3.3 Quantitative Analysis

To measure the impact of food marketing on the attitude of Algerian consumers in the choice and purchase of olive oil, we propose the following multiple linear regression model. Correlation analysis measures the association between consumer attitudes and each food marketing factor.

Consumer attitudes ($A$) can be expressed as a function of several marketing factors ($X_i$) as follows:

$$A=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\cdots+\beta_{(n)}X_n+\varepsilon \quad (1)$$

Where:

- $A$ represents consumer attitudes
- $X_i$ are explanatory variables related to food marketing (perceived quality, price, brand, packaging)
- $\beta_i$ are the coefficients to be estimated, measuring the impact of each factor on consumer attitudes
- $\varepsilon$ is the error term

The coefficients $X_i$ represent the respective influence of each factor on attitude.

### 3.4 Study Variables

The independent variables of food marketing factors are: quality, packaging, price and brand. The dependent variable is the attitude of the Algerian consumer towards olive oil (**Table 2**).

**Table 2. Presentation of study variables and their symbols**

| Variables | | symbol |
|---|---|---|
| | Quality | Q |
| *Independent variable* Food marketing factors | Packaging | E |
| | Price | P |
| | Brand | M |
| *Dependent variable* The algerian consumer's attitude to olive oil | | *Acaho* |

**Source**: Author's own calculations (2024).

*Cronbach*'s alpha coefficient, with a value of 0.85, indicates very good internal consistency of the variables measured in the survey, meaning that the questionnaire questions are well correlated and reliably measure consumer attitudes (**Table 3**). In addition, *the Shapiro-Wilk* test, which tests the normality of the data, gives a value of 0.96, indicating that the data follow a normal distribution, which is essential for the validity of statistical tests.
The *p-value* of 0.07 is greater than 0.05, confirming that we do not have sufficient evidence to reject the null hypothesis, thus reinforcing the normality of the data.

**Table 3. Assessment of data reliability and normality**

| **Indicator** | **Value** |
|---|---|
| Cronbach's Alpha | 0.85 |
| Shapiro-Wilk test | 0.96 |
| p-value | 0.07 |

**Source**: Author's own calculations (2024).

The data are reliable ($\alpha = 0.85$) and normally distributed ($p = 0.07$). This information is important when choosing statistical tests: parametric tests can be used, since normality is respected.

Regression analysis (**Table 4**) reveals that packaging ($R = 0.81$, $R^2 = 66\%$, $B = 0.41$, p-value = 0.01) has the strongest influence on Algerian consumers' attitudes towards olive oil, explaining the greatest proportion of variance and demonstrating a positive and significant effect. Brand ($R = 0.79$, $R^2 = 63\%$, $B = 0.35$, p-value = 0.02) also plays a crucial role, closely following packaging in terms of explanatory power and impact. Quality ($R = 0.78$, $R^2 = 61\%$, $B = 0.32$, p-value = 0.02) and price ($R = 0.75$, $R^2 = 56\%$, $B = 0.28$, p-value = 0.03) also contribute to consumer attitudes, although their effects are slightly weaker. All factors are statistically significant ($p \leq 0.03$), confirming their importance in consumer behavior. These results demonstrate that food marketers should give priority to improving packaging and strengthening brand image, while ensuring high quality and competitive prices to maximize positive consumer attitudes and guide purchase decisions in the olive oil market.

**Table 4. Analysis of the impact of food marketing factors on Algerian consumers' attitudes towards olive oil: Linear regression results**

| Model | *f* | *f*(*t*) | *R* | $R^2$ | *A* | *B* | *sig* |
|---|---|---|---|---|---|---|---|
| *Q* / Acaho | 5.23 | 2.31 | 0.78 | 0.61 | 1.45 | 0.32 | 0.02 |
| *C* / Acaho | 7.12 | 3.14 | 0.81 | 0.66 | 2.10 | 0.41 | 0.01 |
| *E* / Acaho | 4.89 | 2.05 | 0.75 | 0.56 | 1.80 | 0.28 | 0.03 |
| *M* / Acaho | 6.54 | 2.88 | 0.79 | 0.63 | 1.95 | 0.35 | 0.02 |

**Source**: Author's own calculations (2024).

## 4. Discussion of the Results

Analysis of the results highlights the influence of four key factors on the attitude of Algerian consumers when buying olive oil: quality, packaging, price and brand. Each of these elements plays a significant role, but with varying degrees of impact. Perceived product quality explained 61% of the variation in consumer attitudes ($R^2$=0.61), with a regression coefficient of 0.32 (p=0.02), indicating a positive and significant relationship. This confirms that Algerian consumers attach major importance to quality when choosing olive oil, which is consistent with consumer behavior theories that emphasize perceived quality as a key determinant of satisfaction and loyalty.

Packaging emerges as the most influential factor, with a coefficient of determination of 0.66 ($R^2$=0.66) and a regression coefficient of 0.41 (p=0.01). This means that 66% of the variation in consumer attitudes is explained by product packaging. Well-designed packaging is perceived as an indicator of quality, authenticity and tradition, which reinforces its impact on the purchase decision. Price, on the other hand, although significant ($R^2$=0.56, B=0.28, p=0.03), has a relatively weaker impact compared to the other factors. This suggests that consumers are willing to pay a higher price for a higher-quality product, underlining the importance of value for money in their decision-making process.

Finally, brand plays a crucial role, explaining 63% of the variation in attitude ($R^2$=0.63, B=0.35, p=0.02). A recognized brand acts as a signal of trust and quality, strongly influencing consumer preferences.

The global model integrating these four factors is formulated by the following equation:

$$Acaho=0{,}95+0{,}32(Q)+0{,}41(C)+0{,}28(E)+0{,}35(M)+\varepsilon \quad (2)$$

This confirms their combined impact, with packaging leading the way (B=0.41), followed by brand (B=0.35), quality (B=0.32) and price (B=0.28). These results underline the importance for companies to focus on marketing strategies focused on improving packaging and strengthening brand awareness, while maintaining a balance between quality and price to meet the expectations of Algerian consumers.

**The cluster analysis**: Cluster analysis is a statistical technique that groups individuals (or observations) according to their similarities. It is useful for identifying different groups of consumers who share common characteristics (e.g. preferences, consumption habits). Principal component analysis (PCA) enabled us to segment consumers according to their socio-demographic characteristics and olive oil purchasing criteria. There are 3 illustrative variables in this analysis: age, gender and income level. Table 5 below illustrates the three clusters identified according to their main characteristics:

*Cluster 1: Young consumers influenced by quality*: The majority are young people (18-25). With student status and living in urban areas, they have a proven preference for quality olive oil. They are sensitive to recommendations from friends and family, and to product packaging.

*Cluster 2: Price-sensitive consumers:* aged between 26 and 45, they consume olive oil and are clearly influenced by price. With average incomes of between 20,000 DZD and 50,000 DZD/month, they buy their olive oil from local shops.

*Cluster 3: Traditional buyers loyal to artisanal channels:* They are mostly older people over 45, have a perceptible preference for local, artisanal olive oil and usually buy it from traditional oil mills. They are indifferent to brand and packaging.

**Table 5** below illustrates a typology of olive oil consumers in three groups identified according to their main characteristics.

**Table 5. The three clusters identified according to their main characteristics**

| N° | Cluster | % | Average age | Price sensitivity | Preference for quality | Main purchasing channel |
|---|---|---|---|---|---|---|
| **1** | Young consumers influenced by quality | 40 | 22 years old | Low | Very strong | Specialist stores, recommendations |
| **2** | Price-sensitive consumers | 30 | 35 years old | High | Average | Local shops |
| **3** | Traditional consumers loyal to artisanal channels | 30 | 50 years | Average | Strong | Artisanal oil mills |

**Source**: Author's own calculations (2024).

These results confirm that perceived quality is the dominant factor in the purchase of olive oil in Algeria. Consumers are above all looking for a product with satisfactory organoleptic criteria (taste, smell, texture). However, price remains a major constraint. Although olive oil is a prized local product, a significant proportion of consumers consider it too expensive, which limits regular consumption. Brand impact is relatively low, suggesting that consumers rely more on personal recommendations (word-of-mouth) and artisanal origin than on a specific brand. Finally, glass packaging is widely preferred, confirming the importance of packaging in Algerian consumers' perception of quality.

To better explain and compare the impact of marketing factors (Quality, Packaging, Price and Brand) on consumer attitudes according to socio-demographic variables (age, income, location, etc.), we will cross-tabulate the 3 clusters with the results of the linear regression to see how the impact of marketing factors varies according to consumer profiles (**Table 6**).
Below is a comparative analysis of the impact of marketing factors by consumer cluster:

The comparative analysis of consumer clusters illustrated by several statistical indicators (Mean ($\mu$), Standard Deviation ($\sigma$), Confidence Interval CI (95%) and hypothesis test (p-value) reveals distinct attitudes and purchasing behaviors and marked preferences according to demographic and socio-economic profiles. Cluster 1, made up of young urban consumers (18-25 years old), shows strong sensitivity to quality ($\mu$=8.9, $\sigma$=0.8, IC95%=[8.7; 9.1], p=0.01) and packaging ($\mu$=8.5, $\sigma$=0.7, IC95%=[8.3; 8.7], p=0.02). These results, confirmed by narrow confidence intervals and significant p-values, indicate that this segment values upscale, well-presented products. Suitable marketing strategies include the use of quality labels, premium packaging and digital campaigns exploiting online reviews and the influence of social networks to capture their attention (Chikhi & Bendidjelloul, 2022; Gulfraz et al., 2022).

Cluster 2, represented by price-sensitive consumers (26-45 years, middle income), places price at the heart of its purchasing decisions ($\mu$=9.2, $\sigma$=0.6, IC95%=[9.0; 9.4], p=0.005). The low dispersion of responses ($\sigma$=0.6) and the narrow confidence interval underline the homogeneity of this group in its search for value for money. This segment is particularly responsive to promotions, volume discounts and convenience store availability. Targeted strategies should therefore focus on competitive offers and financial incentives to maximize perceived value (Erraach et al., 2021; Di Vita et al., 2021; Loureiro, et al., 2022).

**Table 6. Impact of Marketing Factors by Consumer Profile**

| Cluster | Consumer Profile | Dominant Factors | Key Marketing Impact | Mean (μ) | Standard Deviation (σ) | Confidence Interval (95%) | Hypothesis Test (p-value) | Adapted Strategies |
|---|---|---|---|---|---|---|---|---|
| **Cluster1 (40%)** | Young consumers (18-25 years old, urban, students) | Quality (Q) & Packaging (E) | Attracted by high quality and well packaged oils | Q: 8.9, E: 8.5 | Q: 0.8, E: 0.7 | Q: [8.7; 9.1], E: [8.3; 8.7] | Q: 0.01, E: 0.02 | Quality labels, premium packaging, influence of online reviews |
| **Cluster2 (30%)** | Price-sensitive consumers (26-45 years old, average income) | Price (P) | Sensitive to promotions and value for money | P: 9.2 | P: 0.6 | P: [9.0; 9.4] | P: 0.005 | Volume discounts, targeted promotions, availability in local stores |
| **Cluster3 (30%)** | Traditional buyers (45 years and older, artisanal circuits) | Quality (Q), indifference to brand and packaging | Loyal to local artisanal oils | Q: 8.7 | Q: 0.9 | Q: [8.5; 8.9] | Q: 0.03 | Promotion of short circuits, product traceability, local labels |

**Source**: Author’s own calculations (2024).

Finally, Cluster 3, made up of traditional buyers (aged 45 and over), values quality above all else ($\mu$=8.7, $\sigma$=0.9, IC95%= [8.5; 8.9], p=0.03), while displaying a marked indifference to brand and packaging. This segment, loyal to artisanal channels and local producers, favors authenticity and direct trust with producers. Appropriate strategies include promoting short circuits, product traceability and the use of local labels, while avoiding overly sophisticated marketing approaches (Mouchtaropoulou et al., 2024). These consumers are looking for a buying experience rooted in tradition and transparency.

In summary, this in-depth statistical analysis highlights the need for a differentiated marketing strategy for each cluster (Latino et al., 2022). For young urbanites, the focus should be on perceived quality and attractive design, exploiting digital levers. For price-sensitive consumers, promotions and competitive offers are essential. Finally, for traditional buyers, promoting local produce and short distribution channels remains the key. These quantitative insights, based on robust indicators (means, standard deviations, confidence intervals and hypothesis testing), provide a solid basis for directing sales strategies in a targeted and effective way, aligning marketing actions with the specific expectations of each segment (Cicerale et al., 2016; Di Vita et al., 2021; Ding et al., 2023).

## 5. Conclusion

An analysis of the attitudes of Algerian olive oil consumers compared with those of other major producing countries such as Spain, Italy, Greece, Tunisia and Morocco sheds some light on national and international segmentation strategy. In Algeria, as in these countries, quality is a central factor, but its importance varies according to socio-economic and cultural contexts. In Spain and Italy, consumers value geographical origin and quality labels (PDO, PGI), similar to traditional Algerian buyers attached to artisanal channels. In Greece, freshness and traceability are priorities, while in Tunisia and Morocco, price sensitivity dominates, with openness to international brands and modern packaging, particularly among young urbanites.

For the domestic market, three consumer groups have been identified. Young urban consumers (Cluster 1) who are sensitive to quality and design, then price-conscious consumers (Cluster 2) who are attracted by promotions, and then older and traditional buyers (Cluster 3), loyal to artisanal channels. Food marketing strategies need to include "*Premium*" packaging and digital campaigns for the young, competitive offers for the price-conscious, and the promotion of short distribution channels for the traditional.

In an international approach, the results of our study can be transposed with local adaptations. Young urban consumers, present in all countries, share a preference for quality and innovative packaging, requiring a targeted digital strategy. Price-sensitive consumers, active in Algeria, Tunisia and Morocco, demand promotions and good value for money. Finally, traditional buyers in Algeria, Spain and Italy prefer authenticity and local labels, requiring communication focused on traceability and artisanal methods. However, certain limits can be revealed. Increased competition in Spain and Italy, tariff barriers in Tunisia and Morocco and a preference for local products in Greece.

Ultimately, an international segmentation strategy must combine in-depth knowledge of local preferences with common trends, such as the importance of quality, price sensitivity and the appeal of innovative packaging. By adapting marketing strategies to the specificities of each market, while capitalizing on these transversal results, olive oil producers and distributors can strengthen their position on the national and international scene, by responding to a diversified but very demanding demand in terms of quality and authenticity.

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