



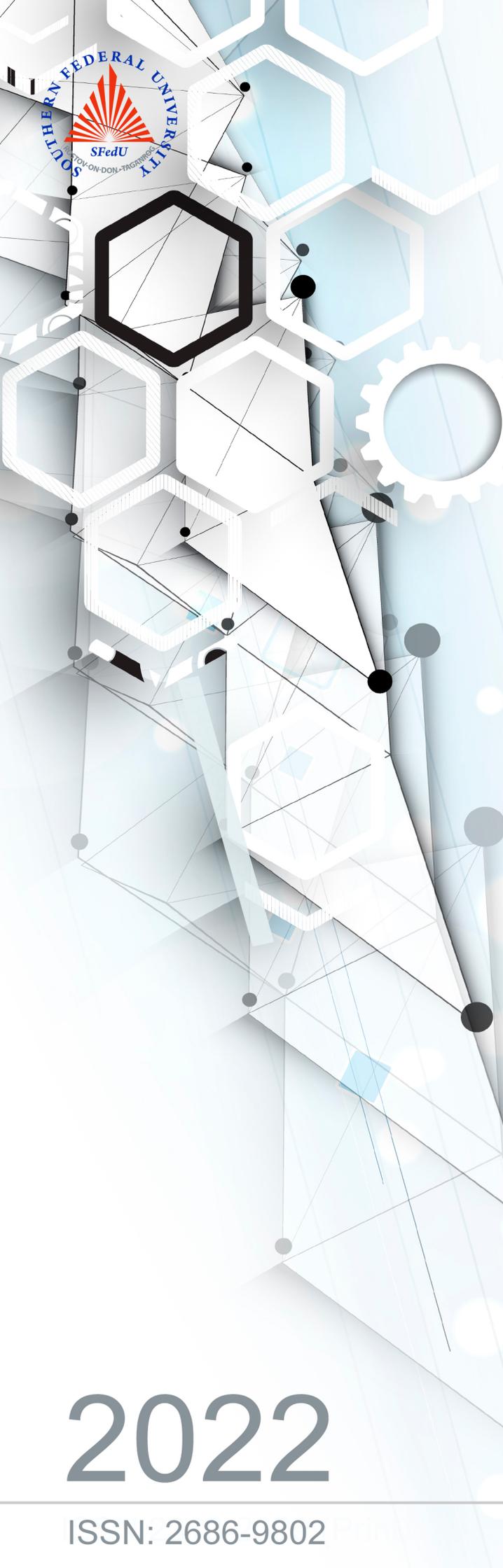
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Original article

THE ORIGIN OF PRODUCT IN THE INTERNATIONAL VIRGIN OLIVE OIL TRADE

Lkhoumsi Driss

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Master's degree student*

The purpose of this paper is to evaluate the place of the product origin in the international trade practices of virgin olive oil (VOO). In this regard, an analysis of a secondary data sources related to the import and export of VOO have been realized. In addition, a review of the international regulations' evolution regarding the quality and the trade of VOO was carried and the developed laboratory analysis' methods looking for the VOO origin authentication was realized. Our findings state that the dominance of certain producing countries on the international market for virgin olive oil and that the current international regulations do not facilitate the authentication of the origin of the product. Methods for verifying varietal origin and geographical origin are under development. Producing countries can strengthen the organization of their national olive sector while importing and non-producing countries can strengthen their control and inspection system, guide their companies working in the import of VOO to develop partnerships with companies working upstream of the VOO extraction value chain in order to educate and to ensure, for consumers, a good quality and a best experience of VOO consumption.

Keywords: virgin olive oil; origin; trade; regulations; quality.

Научная статья
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ПРОИСХОЖДЕНИЕ ПРОДУКЦИИ В МЕЖДУНАРОДНОЙ ТОРГОВЛЕ ПЕРВИЧНЫМ ОЛИВКОВЫМ МАСЛОМ

Лхумси Дрисс

*Южный федеральный университет,
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Целью данной статьи является оценка места происхождения продукта в практике международной торговли оливковым маслом первого отжима (МПО). В связи с этим был проведен анализ вторичных источников данных, связанных с импортом и экспортом МПО. Кроме того, был проведен обзор эволюции международных правил, касающихся качества и торговли МПО, и были реализованы разработанные методы лабораторного анализа для аутентификации происхождения МПО. Наши выводы показывают, что доминирование определенных стран-производителей на международном рынке оливкового масла первого отжима и действующие международные правила не способствуют установлению происхождения продукта. Методы проверки торгового и географического происхождения находятся в стадии разработки. Страны-производители могут укрепить организацию своего национального сектора оливкового масла, в то время как страны-импортеры и страны-непроизводители могут усилить свою систему контроля и инспекции, направить свои компании, работающие в области импорта МПО, на развитие партнерских отношений с компаниями, работающими выше по цепочке создания стоимости добычи МПО, чтобы обучать и обеспечивать потребителям хорошее качество и лучший опыт потребления МПО.

Ключевые слова: оливковое масло первого отжима; происхождение; торговля; правила; качество.

Globalization of virgin olive oil (VOO), as a Good, was done especially by main traditional country-producers which did generate a kind of « quality domiciliation » of that product in many markets. Thus, and even after decades of scientific researchs which did lead to the improvement of agricultural management of the olive tree and VOO extraction technological processes in addition to demonstrating the VOO health benefits, « quality recognition », especially by consumers, are not yet established.

By analyzing data related to the import and export of VOO, comparing the evolution of international regulations and reviewing the new developed methods related to VOO authentication,

this paper aims to recommend actions regarding VOO trade and consumption under current international regulations and trade practices.

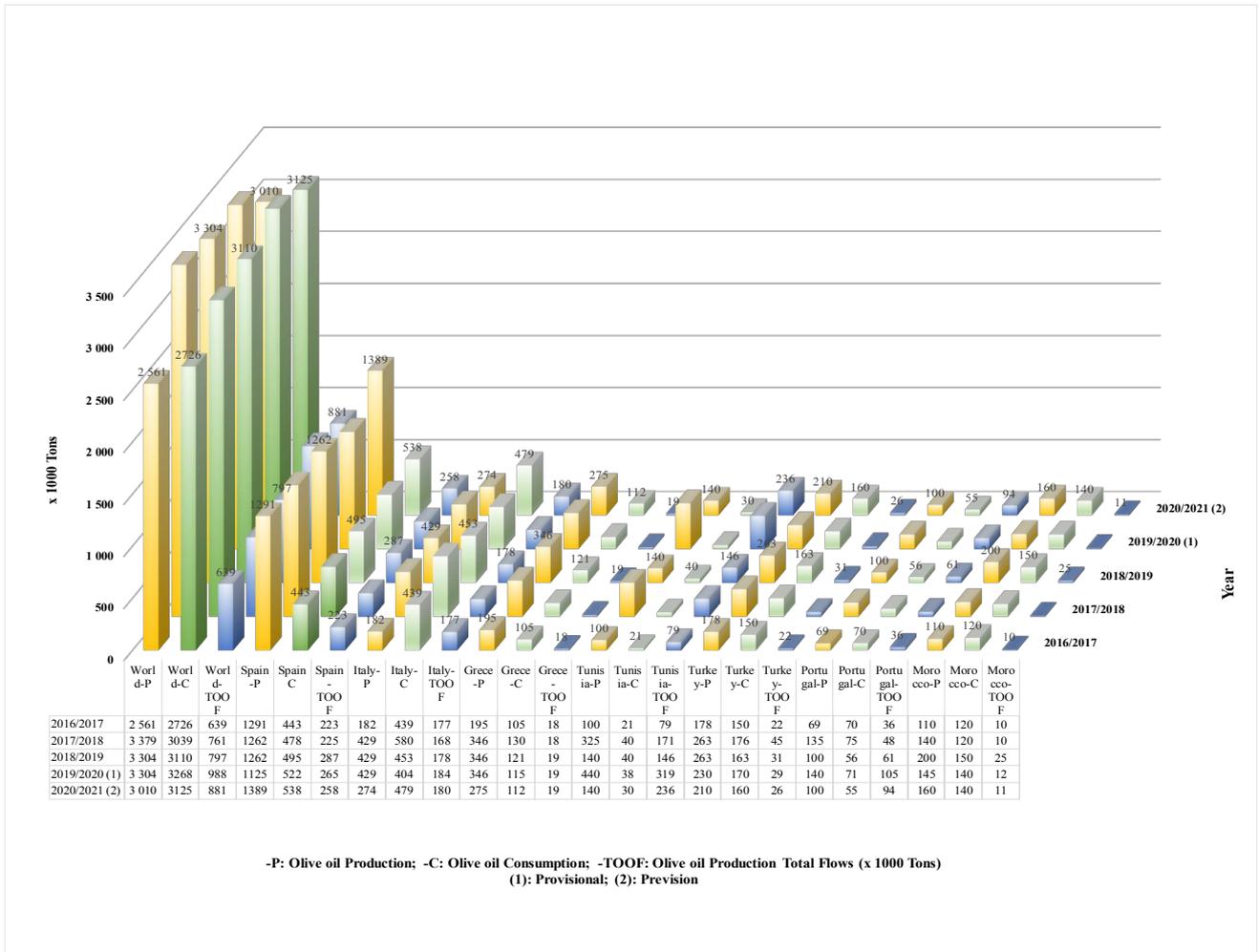
Having as cradle the Mediterranean Bassine, olive oil is obtained from olives (the fruit of *Olea europaea*; family Oleaceae) in the two hemispheres. Effectively, olive growing area counts, nowadays, more than 11 millions hectares in more than 60 countries across the five continents [1]. The total production of olive oil reached 3.01 millions tons in 2020/2021 with more than 1/3 which were imported by non-producers countries [2]. The production and trade of olive oil is dominated by traditional country-producers such as Spain and Italy which, together, ensured more than 55% of the total world production and more than 13% in term of imported olive oil quantities in 2020/2021. The main importers' markets are USA, Extra-European countries, Brazil, Japan, Canada, China, Australia and Russian Federation. In another hand, the Standard for olive oils and olive-pomace oils [3] describes 3 kinds of oil obtained from olives in a state for human consumption, namely olive oil, virgin olive oil and olive-pomace oil. Virgin olive oil is supposed to be obtained solely by mechanical or other physical means under conditions, particularly thermal conditions, that do not lead to alterations in the oil, and which have not undergone any treatment other than washing, decanting, centrifuging and filtration. In turn, virgin olive is classified in 3 categories (Extra virgin olive oil, Virgin olive oil and Ordinary virgin olive oil) based on its physico-chemical characteristics and its organoleptic properties.

According to the World Catalogue of Olive Cultivars established in 2000 [4], there are 139 olive cultivars from 23 countries which represented 85% of the surface dedicated to the cultivation of the olive tree. Some varieties are used for a single purpose (table olive or olive oil). In addition, Some varieties are specific to each country-producer while some others were introduced in other countries even in some olive traditional country-producers. In that sense, many studies did show that the VOO quality is affected by many factors including varietal origin, pedoclimatic conditions during olive growing, harvesting period, olive processing conditions, type of filtration and storage conditions and geographical origin [5].

Generally, olive oil is known by its health benefits and extra virgin olive oil (EVOO) is considered as a great resource of powerful and bioavailable components (phenolic compounds such as hydroxytyrosol, oleocanthal and oleuropein). Those components can counteract many diseases such as cancer, metabolic disorders, cardiovascular dysfunctions, inflammatory disorders, neurological degeneration, etc. However, more studies, especially in humans, are needed to fully clarify the benefits of precise EVOO monocultivars [6].

Since a while ago, new milling technologies can ensure the best production of extra virgin olive oils. Despite that, fraudulent practices such adulteration and new methods of refinement known as deodorization are commonplace in the virgin olive trade. Furthermore, the most frequent fraudulent practice is mixing with lower quality olive oils and EU, non-EU and mix of EU and non-EU oils are the cases which need more control activities in relation to false designations of origin [7]. Moreover, a common understanding of the criteria determining food fraud and a legal definition of food fraud at the EU level are not achieved and references regarding authenticity and integrity of the agri-food chains are not yet established [8].

Regarding the olive oil market, Spain was considered, in 2020/2021, as the major producer and consumer in the world with, respectively, more than 46% and 17% in terms of production and consumption (11.6 kg/inhabitant/year) (Figure 1). It is also the main actor in terms of import and export with a total olive oil flows exceeding 258.000 Tons (2020/2021). Therefore, and with its large firms, Spain leads worldwide the operations of supplying, packaging and pricing of olive oil. Italy is also an important producer and exporter but it uses import in order to satisfy its own internal demand while Grece is considered an important consumer (11 kg/inhabitant/year) and is less involved, as Turkey in worldwide olive oil export. Tunisia is an engaged actor in the olive oil export market, followed by Portugal whereas Morocco still encounters difficulties in positioning its olive oil on the international market despite its production capacities.



-P: Olive oil Production; -C: Olive oil Consumption; -TOOF: Olive oil Production Total Flows (x 1000 Tons)
(1): Provisional; (2): Prevision

Figure 1 – Comparison of the last 5 years evolution of the total olive oil production, consumption and olive oil total flows (thousand Tons) in the world and in the main traditional country-producers (Source: International Olive Council, 2022).

Mainly, the annual variation in terms of production and total flows depend on the phenomenon of alternance and some tree diseases that can affect olive orchards as well as the quality of olive oil demanded on the market. Thus, and in the event of a poor annual yield of olives, manufacturers resort to blending olive oil produced recently with that produced, from one or many varieties, during the previous year(s) and which is available in the stock or purchased from other suppliers operating inside or outside of the country of the origin. EVOO cutting is also used in order to satisfy some consumers’ preferences related to some organoleptic characteristics.

According to the Commission Regulation EU No. 29/2012 on marketing standard for olive oil, these products are considered as « Legal Blends » for EVOO and VOO [9]. While, for exemple in Italy, the EVOO with domestic origin gains a premium price equal to +35% (+2.13 €/liter) compared to a product labeled as a blend of European EVOOs, the misuse of country of origin label mostly occurs where foreign EVOO products are identified as Italian [10].

Also, and according to trade standard applying to olive oil and olive-pomace oil [11], blending, under the designations « Olive oil» and « Olive-pomace oil », can also be realized by mixing VOO (obtained by mechanical or other physical means under conditions) and refined olive oil or refined pomace olive-oil (obtained by means of refining methods from olive oil or olive-pomace).

Beside the existence of such standards and such practices, consumers are confused and education, likely, plays a role in correctly identifying the origin of the product in the case of EVOO for example, since it enhances consumers’ ability to process the information reported on the label of the product,

including information about the product's origins [9].

The major evolutions of olive oil standards in 1989 and in 2019 is related in the Figure 2.

Designation	CODEX STAN 33-1981 (Rev. 1-1989) (Formerly CAC/RS 33-1970) [10]	COI/T.15/NC No 3/Rev. 16 June 2021 [3]
Document name	CODEX STANDARD FOR OLIVE OIL, VIRGIN AND REFINED, AND FOR REFINED OLIVE-POMACE OIL	TRADE STANDARD APPLYING TO OLIVE OILS AND OLIVE POMACE OILS
Scope	Standard applies to VOO, refined olive oil, refined olive-pomace oil, blends of refined olive oil and VOO and blends of refined olive-pomace oil and VOO.	Standard applies to olive oils and olive-pomace oils that are the object of international trade or of concessional or food aid transactions.
Description or Definition and Designation	Description of Olive oil, VOO, Refined olive oil and Refined olive-pomace oil	Designations and Definitions of Olive oils (1. VOO : 1.1 VOOs fit for consumption as they are (EVOO, VOO, Ordinary virgin olive oil), 1.2. VOOs that must undergo processing prior to consumption (Lampante virgin olive oil), 1.3. Refined olive oil, 1.4. Olive oil composed of refined olive oil and VOO) ; 2. Olive-pomace oil (Crude olive-pomace oil, Refined olive-pomace oil, Olive-pomace oil composed of refined olive pomace oil and VOO)
Essential composition or Purty Criteria	Essential composition : GLC ranges of fatty acid composition ; Physical and chemical indices	Purity Criteria : Fatty acid composition as determined by gas chromatography ; Trans fatty acid content ; Sterol and triterpene dialcohol composition ; Wax content ; Maximum difference between the actual and theoretical ECN 42 triacylglycerol content ; Stigmastadiene content ; Content of 2-glyceryl monopalmitate ; Unsaponifiable matter.
Quality characteristics or Quality criteria	Quality characteristics : Colour, odour and taste ; Free acidity ; Peroxide value ; Specific extinction in ultra-violet.	Quality criteria : Organoleptic characteristics (odour and taste ; odour and taste (on a continuous scale) ; colour ; aspect at 20° C for 24 hours) ; Free acidity ; Peroxide value ; Absorbency in ultra-violet (K ^{1%}) ; Moisture and volatile matter ; Insoluble impurities in light petroleum ; Flash point ; Trace metals ; Fatty acid ethyl esters (FAEEs) ; Phenols content.
Packing and Labelling	Labelling : • Name of the food, • Labelling of Non-retail Containers (kind of containers not specified ; lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark).	Packing : Kind of containers and container filling tolerance specified (tanks/containers/vats ; metal drums ; metal tins and cans ; demi-johns/ glass bottles/bottles made of suitable macromolecular material). Labelling : • Name of the product, • Name and address (No differentiation between manufacturer, packer, distributor, importer, exporter or seller), • Country of origin (the country in which substantial processing is carried out shall be considered as the country of origin for labelling purposes), • Geographical indications ; The labels of VOOs may state their geographical indication) ; • Designations of origin (The labels of EVOOs may indicate

Figure 2 – Comparison of the olive oil standards between 1989 and 2019
(Source : Codex Alimentarius).

Because of the trade standard applying to olive oil and pomace-olive oil (COI/T.15/NC No 3/Rev. 16 June 2021) which, mandatory, considers the finished product, varietal origin, geographical origin and the « first manufacturer » origin are lost in the case of VOO. Regarding the latter, industrials with large storage and packaging capacities in addition to their distribution networks lead the worldwide traditional VOO market as it is known today. VOO Trade in bulk is a major characteristic for a semi-finished product and it is commonplace. The market pricing is dominated by Spanish firms and, for example, Italian producers of EVOO, who are often characterized by small local family businesses, are struggling to be competitive keeping high the quality of their product [11].

Moreover, and despite the implementation of protected designation of origin (PDO) quality certification in many countries including EU, consumers are willing to pay an additional price premium for PDO certified product but the market prices for EVOO with and without PDO certification are not significantly different [12].

In another hand, the identification of the olive oil type in legal blends, through a differentiation among "virgin olive oils", "refined olive oils" and "olive pomace oils", even if not yet required by the EU legislation, might ensure a better protection to the consumer [13].

Till today, there is no identified official analytical procedure to verify the origin of VOO. Yet, The International Olive Council adopts testing methods regarding the physico-chemical characteristics and organoleptic assessment methods and standards applied for the VOO finished product. Also, and considering the current practices on the market, the method for the organoleptic assessment of EVOO applying to use a designation of origin adopted in November 2005 [14] is outpaced.

Considering that geographic origin influences consumers' choice of VOO, many recent studies did tackle the problematic of the geographical provenance authentication in VOO, especially in the case of EVOO, blended VOO or origin-labeled VOO. Several approaches, based on different analytical techniques and/or statistical approaches, have been proposed [15]. Some methods such as profiling of phenolic and/or volatile aroma compounds [16], [17], determination of physicochemical properties, oxidative stability and fatty acid profile [18] and fluorescence spectroscopy and chemometrics [19] coupled to data exploratory analysis were recently used for varietal authentication purposes. If some of these cited approaches and other not cited seems to be easily applicable in testing laboratories, the task of geographical origin and the « first manufacturer » origin identification yet remains very difficult.

With globalization, new technologies of VOO extraction have been disseminated around the globe. The recent intensification of new areas of olive cultivation in other non-traditional producing countries such as USA, Argentina and China will induce new entrants to the international VOO market. While cataloging the varieties present in the world with the aim of guaranteeing the conservation of the olive heritage was a mandatory condition for obtaining new varieties two decades ago, a catalog of marketed monovarietal VOO is still missing.

With the recent discoveries relating to the benefits of VOO on human health, and in the absence of international regulations centered on the real needs and preferences of consumers, producing countries can strengthen the organization of their national olive sector in order to be more competitive on the international market by satisfying a growing informed consumers.

Importing and non-producing countries can strengthen their control and inspection system through data mining and through the encouragement of research and development partnerships between their universities and those of the countries from where VOO oil is imported. They can also guide their companies working in the import of VOO to develop partnerships with companies working upstream of the VOO extraction value chain in order to implement an adjusting mechanism of pricing and to educate and to ensure, for their consumers, a good quality and a best experience of VOO consumption.

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