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Olive oil guide



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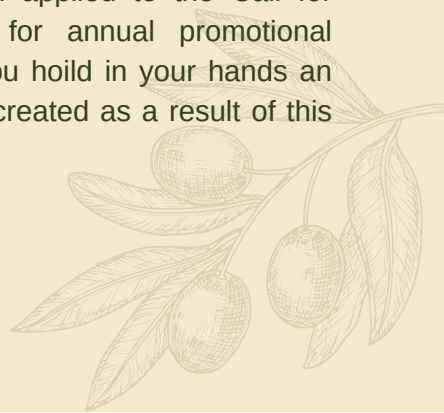
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Introductory word

The Olive Oil Guide was created as a result of an analysis conducted in 2014 by the Ministry of Agriculture and Rural Development as part of the Sectoral Study for the Development of the Agriculture and Rural Development Strategy 2014-2020. Estimates at the time showed that less than half a liter of olive oil per capita is consumed in Montenegro, while in Spain, Italy and Greece over 15 liters of olive oil are consumed per capita. The aspiration of the authors of the Guide was to reduce the imbalance in olive oil consumption in relation to other Mediterranean countries through promotion at various levels. The first Guide was prepared in 2015 in cooperation with the Montenegro Business Alliance (MBA), the first private business association in Montenegro, which prepared an application for the project and enabled Montenegro to receive a grant from the International Olive Council (IOC) for the first time in its history. The project of preparation and promotion of the Guide was implemented under the auspices of the IOC, with the support of the Ministry of Agriculture and Rural Development, and had an excellent response from olive growers and olive oil consumers. In January 2019, the Association of Olive Growers of Bar, in cooperation with the authors of the previous Guide, applied for funding within the Public Competition for the allocation of funds from the budget of the Municipality of Bar for 2019 with the aim of supplementing the Guide with new content, translating it into English and thus making it available to tourists who are increasingly visiting the Bar Riviera. In 2025, the Bar Olive Growers Association applied to the Call for proposals for the awarding of grants for annual promotional programmes in IOC member countries. You hold in your hands an updated version of the Guide, which was created as a result of this project.

Authors





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1. INTRODUCTION

The olive, one of the few constant companions of the development of human civilization, was cultivated more than 4,000 years ago in Mesopotamia and Syria, while in Ancient Rome the olive oil trade was of exceptional importance. However, its history is even older – it was already known in the New Stone Age, and the first remains of the olive tree date back as much as 45,000 years ago. Even 8,000 years ago, small fruits of the wild olive were used. As a traditional symbol of peace, prosperity and the renewal of life, the olive tree and its oil are now revered around the world, with the continuous expansion of production to new areas such as Australia, Argentina,



China, Vietnam, New Zealand and the United States of America. Montenegro, as a Mediterranean country, is an area where olives have been grown continuously for more than 2,000 years, as evidenced by modern measurements of the age of the Old Olive in Bar. With the development of tourism and agriculture, the production of olive oil is becoming more and more

important. At the same time, knowing the benefits of its consumption as well as the numerous misconceptions that accompany olive oil, is becoming increasingly important for modern consumers.

This guide is primarily intended for consumers and aims to provide basic, reliable and practical information about olive oil. We believe that the parts of the guide related to olive oil categories, the importance of sensory analysis and the most common misconceptions will be particularly useful and interesting. Nevertheless, we are confident that the content will also attract the general public, and especially producers, who have a great responsibility to constantly improve the quality of olive oil and other olive products.

The content of the guide is organized in a simple and understandable way, taking into account the complexity of olive cultivation and olive oil production. Our intention is to further promote the consumption of olive oil, which is currently at a very low level in Montenegro. That is why we have included a number of specific, practical advice, as well as a glossary of terms, in the text, with the aim of bringing readers closer to the importance of the proper selection and use of olive oil.

In order to make this guide useful to everyone who will use it, we end the introduction with the following message:

**„Indocti discant et ament¹
meminisse periti“**



1. Those who don't know should learn, and those who know should find pleasure in reminding themselves

2. OLIVE GROWING IN BAR

The old olive tree has long been a tourist attraction of Montenegro, and the confirmation that its "peers" survive in its surroundings creates the preconditions for the improvement of the tourist offer, i.e. the improvement of the brand of local olive oil.



With the top quality of olive oil, luxurious and modern packaging with the exclusivity of the origin of the oil obtained from olives harvested from trees that are older than 2,000 years, Montenegro has an exceptional chance for the placement of domestic olive oil²

From the group of 50 very old olives on which the age was determined, two must be singled out that are older than 2,000 years, namely:

Old olive tree

In Bar, in Mirovica, a very old olive tree has survived for centuries, which is owned by the state of Montenegro. The age of this olive tree was estimated at 2,240 years at the time of scientific research (February 2015). The value of the Old Olive Tree is priceless, it is a real natural and cultural treasure for Bar and Montenegro. Although it is more than two thousand years old, it still regularly produces fruits from which top quality oil is produced.

It is a privilege to live in a city where an olive tree was planted before the new era, a tree of peace, love and friendship, in a city whose inhabitants, distant ancestors, knew how to preserve it and pass on this obligation to future generations. The surroundings of the olive tree are landscaped and it is a natural monument that is visited daily by many tourists from all over the world.

2. Alković Ć. Determining the age of olive trees in order to improve Montenegrin olive oil brand. VIII International olive Symposium, Book of abstracts. 2016; p.79

The Old Olive is an incentive and an obligation for all Bar olive growers to continuously work on improving olive growing both in Bar and throughout Montenegro. Barani lovingly and respectfully preserve the old trees planted by their distant ancestors, and also plant new olives and form modern olive groves.

Bega's olive

Also, a very old olive tree, known as Bega's olive, grows in Mrkojevići, i.e. in the village of Pečurice, and is privately owned by olive grower and oil producer Vebija Abazović. The age of this olive tree was estimated at 2,056 years at the time of research (February 2015).

With the realization of this project, this olive tree has also become interesting for tourists, so it is visited by an increasing number of visitors every day. The Abazović family picks each fruit from this tree with special care, processes it into top quality oil and places it on the market at high prices as something special.





3. OLIVE OIL OBTAINED FROM OLIVES OLDER THAN 2000 YEARS

In order to differentiate Bar and Ulcinj olive oil, which is obtained from thousand-year-old olive trees, the Association of Olive Growers from Bar, together with UNIDO (United Nations – Industrial Development), has initiated and implemented a project activity to determine the age of 50 very old olive trees from the area of Bar and Ulcinj. This activity was intended to achieve the separation of olive oil obtained from extremely old olives and the creation of preconditions for its placement through the improved tourist offer of Montenegro.

Experts from the "Istanbul University Wood Anatomy and Tree Ring Research Laboratory" came to Montenegro, took samples from selected olive trees and took them to the laboratory in Istanbul. After conducting the research, the experts made a final report on determining the age of 50 olive trees from the area of Bar and Ulcinj.

Among other things, it could be concluded from the report that:

- 16 investigated trees are less than 500 years old,
- 26 investigated trees are between 500 and 1,000 years old,
- 6 investigated trees are between 1,000 and 2,000 years old and
- 2 of the trees studied are more than 2,000 years old.

For each old olive tree, a certificate is made that contains its estimated age, ownership information and location with geographical coordinates.



Scientific confirmation that olive trees that are older than two thousand years still survive in Bar and Ulcinj, and that these trees (regardless of their age) bear fruit abundantly and provides fruits from which top quality olive oil is made, gives Bar and Ulcinj olive growers the opportunity to develop the branding of their product in this direction and use the inherited wealth.





Rules for Producing Top-Quality Olive Oil

1. Olives are harvested exclusively from the tree when they are optimally ripe and healthy
2. Olives are stored in perforated plastic containers (crates) until processing, while plastic and other bags, closed containers, etc. should be avoided due to damage to the fruit and the processes that start in the fruit if they are closed in airless environments.
3. Olives can be stored for a maximum of 48 hours from harvest to processing in a cool, dark and airy place, and it is recommended that no more than 24 hours pass from harvest to processing.
4. Processing is carried out in mills that separate the oil by cold squeezing and mechanical process, respecting modern hygiene standards. It is important to note that the processing temperature at any stage should not exceed 28° C and the recommendation is that it be in the range between 25 and 27° C The percentage of oil ranges between 6-25%, depending on the variety of olives and the time of harvest.
5. After processing, the oil is filtered or separated and stored in stainless steel tanks. It would be desirable for stainless steel tanks to have a closed system that allows nitrogen to be inserted into the empty space, which is inert and does not react with the oil, i.e. preserves it. If filtration or separation is not carried out before settling, then a period of precipitation must pass, after which the oil is separated from the sediment and bottled.



6. The legal shelf life of olive oil is 24 months from the moment of production, and it must be taken into account that this applies to quality oils that are stored in appropriate conditions. It is recommended that the oil is consumed within one year (from harvest to harvest).



4. CATEGORIES OF OLIVE OIL



The general definition of virgin olive oil provides that this oil is obtained from the fruit of the olive tree exclusively by mechanical or other physical processes under conditions which do not lead to changes in the oil, which have not undergone any processes other than washing, decanting, centrifugation or filtering, to the exclusion of oils obtained by means of solvents or additives having chemical or biochemical reactions. or re-esterification processes, and any mixing with other types of oil.

According to the Law on Olive Growing and Olive Oil of Montenegro,³ virgin olive oils are divided into the following categories:



Extra virgin olive oil from the aspect of chemical parameters contains a maximum of 0.8 grams of free fatty acids expressed as oleic acid per 100 grams of oil, has a peroxide number of ≤ 20 mEq O_2 /kg, while from the aspect of organoleptic, i.e. sensory characteristics, this oil must be "fruity", i.e. its median fruitiness must be greater than zero, and it must not have any defect. Actually, its median defect must be equal to zero.

The use of extra virgin olive oil is recommended in the daily diet, raw as a spice, but also for cooking and even frying, but by increasing the temperature above 28 degrees Celsius, we will lose some of its positive properties.

3. Official Gazette of Montenegro, no. [45/2014](#), [39/2016](#), [84/2024](#) - Second Act and [92/2025](#)

Virgin olive oil from the aspect of chemical parameters contains a maximum of 2 grams of free fatty acids expressed as oleic acid per 100 grams of oil, has a peroxide number ≤ 20 mEq O₂/kg, while from the aspect of organoleptic, i.e. sensory characteristics, this oil must be "fruity", i.e. its median fruitiness must be greater than zero, and it can have a slight defect or its median defect must be less than 3.5.

This oil is also edible, but it is of lower quality than extra virgin oil, and therefore cheaper.

Lampante olive oil contains more than 2 grams of free fatty acids expressed as oleic acid per 100 grams of oil, or has a more intense defect or defect whose median is equal to or greater than 3.5. This oil is considered unfit for human consumption and must go to processing to make it edible.

It should be especially noted that on store shelves there are often **oils made from olive pomace oil** (Italian: olio di sansa), with modest nutritional values and low overall quality. It is popular in the world because of its relatively low price, but in Montenegro there are unreasonably and unjustifiably high prices of the same.

Kategorija maslinovog ulja	Udio slobodnih masnih kiselina % SMK	Organoleptička ocjena	
		Mediana defekta	Mediana voćnosti
Ekstra djevičansko maslinovo ulje	$\leq 0,8$ % SMK	Md = 0	Mv > 0
Djevičansko maslinovo ulje	≤ 2 % SMK	Md $\leq 3,5$	Mv > 0
Maslinovo ulje lampante	% SMK > 2	Md > 3,5	-

Table 1. Limit values of individual indicators for virgin oils

Source: Ćazim Alković, Sensory Quality Assessment in the Function of Olive Oil Categorization, Belgrade, Quality and Excellence 1-2 2018

OTHER TYPES OF OLIVE OIL

Refined olive oil means an oil obtained from the refining of virgin olive oil, which does not contain more than 0.3 grams of free fatty acids, expressed as oleic acid per 100 grams of oil, and which satisfies the test and evaluation criteria laid down in this Law;

Olive oil, composed of refined olive oil and virgin olive oil, is an oil obtained by blending refined olive oil and virgin olive oil, other than lampante olive oil, which does not contain more than 1 gram of free fatty acids, expressed as oleic acid, per 100 grams of oil and which satisfies the test and evaluation criteria laid down in this Law;

Crude olive-pomace oil is an oil obtained by processing olive-pomace by mechanical processes and/or by extraction of olive-pomace with organic solvents, without refining and esterification and without mixing with oils of another type and which satisfies the test and evaluation criteria prescribed by this Law;

Refined olive-pomace oil is an oil obtained by refining crude olive-pomace oil, which does not contain more than 0.3 grams of free fatty acids, expressed as oleic acid per 100 grams of oil, and which satisfies the test and evaluation criteria laid down in this Law;



5.SENSORY ANALYSIS OF OLIVE OIL

Sensory analysis of virgin olive oils is a scientifically based and standardized analytical procedure for testing the organoleptic properties of oils, which is carried out by a trained panel of evaluators, under controlled conditions and according to a prescribed methodology⁴. The aim of sensory analysis is to determine the presence and intensity of positive traits (fruitiness, bitterness and pungency), as well as possible sensory defects, in order to objectively assess the quality and classify virgin olive oils into appropriate categories (extra virgin, virgin, lampante).

Sensory analysis of virgin olive oils is carried out by the panel.

The Panel⁵ for Sensory Analysis of Virgin Olive Oils is an expert body composed of specially selected, trained and verified evaluators (tasters), acting under the leadership of the panel leader, whose task is to organoleptically (sensory) evaluate virgin olive oils using a standardized methodology in order to classify them by quality categories and determine possible sensory defects and positive properties

The oil quality assessment panel consists of 8 to 12 trained sensor evaluators. The training harmonizes the work of the panels in such a way that there are minimal deviations between their individual grades (e.g. the result of the panel is acceptable if the coefficient of variation for a given property in ten panelists does not exceed 20%).

The space for sensor analysis should meet special requirements in terms of equipment (cabin, glasses, heater, other), temperature (20-22°C), light (uniform and neutral), humidity (60-70%)⁶.

4. COI/T.20/Doc. No 15 – Sensory analysis of olive oil – method for the organoleptic assessment of virgin olive oil coi/t.20/doc. no 15/rev. 11/2024

5. COI/T.20/Doc. No 14 – Guide for the selection, training and quality control of virgin olive oil tasters- qualifications of tasters, panel leaders and trainers

6. COI/T.20/Doc. No 6 – Guide for the installation of a test room

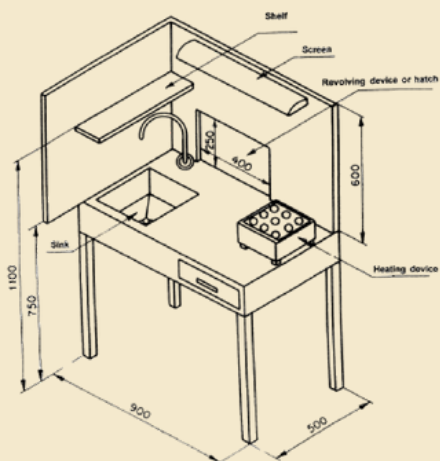


Figure 1: Layout of the olive oil sensory analysis booth

As the color of the oil is not an indicator of the quality of the oil, testing must be done in dark blue glasses, which "preserve" the evaluator from a grade based on color. The glass has a glass lid that preserves the aromas and ensures that they remain in the glass so that the evaluator can feel them as much as possible. More recently, sensory evaluation glasses can also be burgundy in color.⁷

The testing period is usually mid-morning and/or mid-afternoon, due to the sharpening of the senses, but also less likely to feel hungry and/or full. The maximum number of samples to be tasted consecutively should not be exceeded. After the sensory analysis of the three samples, it is necessary to take a break before continuing with the evaluation. The evaluation of each sample is recorded in writing on a standardized form.



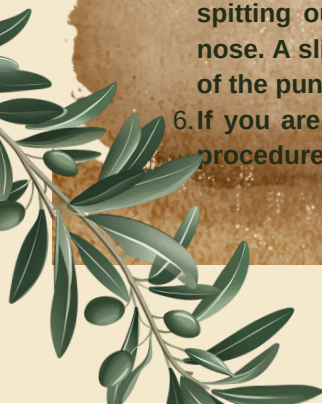
7. COI/T.20/Doc. No 5 – Glass for oil tasting



A useful set of rules for oil tasting is given in the following appendix:



1. Before tasting olive oil, avoid consuming alcohol, coffee, spicy food, smoking, or anything that can impair the ability of the senses (e.g. smell and taste).
2. Olive oil is tasted from standardized small glasses, usually dark blue in color. Consumers who want to taste olive oils at home can use small plastic cups, white or transparent.
3. About 14–16 ml of olive oil (or one tablespoon) is enough to evaluate the smell/taste. The glass with oil needs to be heated on standardized oil heaters at a temperature of $28^{\circ}\text{C} \pm 1^{\circ}\text{C}$. If the evaluator wants to do it himself, and he does not have professional glasses and heaters, he will put the glass in the palm of his hand and then wrap it around his palm and fingers in order to transfer the temperature of the body to the glass and heat the oil at approximately the appropriate temperature.
4. During heating, the glass is covered by hand. With light movements, we mix the oil, with the aim of releasing the aromas that remain in the glass until the moment when we remove our hand, open the glass, bring it to the nose and smell it. Desirable aromas are fruity, green and fresh.
5. To evaluate the taste, it is necessary to take a sip of oil, while it is kept in the mouth for a few seconds, in such a way that it spills over the entire surface of the tongue and oral cavity. It is recommended to inhale slowly several times, in order to make it easier to determine the level of fruitiness, bitterness and piquancy. After swallowing (or spitting out) the oil, it is necessary to exhale through the nose. A slight burning sensation in the throat is an indicator of the pungency, but also the freshness of the olive oil.
6. If you are not sure about the characteristics of the oil, the procedure should be repeated.





During sensory analysis or tasting of olive oil, it is possible to identify desirable and undesirable properties.

The desirable properties are typical of virgin olive oils, which are characterized by the pure natural juice of the olive fruit. The three basic desirable properties of virgin olive oils are: **fruitiness, bitterness and pungency.**

Fruitiness



Olive oil has the characteristic of fruitiness when the smell and taste are reminiscent of a ripe or green olive or freshly cut grass.



Bitterness

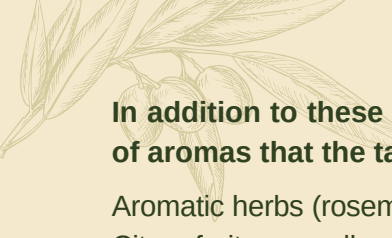
Bitterness is the characteristics of the oil obtained from green and partially green olives, and is felt on the back of the tongue a few seconds after taking the oil into the mouth.

Pungency



The peculiarity of pungency creates a burning sensation in the mouth, and especially in the throat. The burning sensation in the throat, or pungency, lasts for a short time, usually less than one minute.





In addition to these three basic qualities, olive oil has a number of aromas that the taster can "find" in virgin olive oil, such as:

Aromatic herbs (rosemary, lavender, etc.) Artichoke, Almond (menduo), Citrus fruits – smell reminiscent of citrus fruits (lemon, orange); Berries (blackberry, raspberry, blueberry, currant), Flowers, Exotic fruits (pineapple, banana, mango, papaya); Eucalyptus, Apple, Chamomile, Pear, Olive leaf, Fig leaf, Unripe fruit, Walnut (walnut kernel), Pepper (red or green), Pine (seed), Green olive fruit, Ripe olive fruit, Tomato, Grass (green, freshly mowed), Vanilla, Green pepper, Bitterness (taste of green or partially dark olives), Sweet (the taste of the oil of fully ripe olives), After-taste persistence (refers to the sense of smell and taste after ingesting oil), Fluidity, Pungency – a burning sensation in the throat.

On the other hand, the typical undesirable properties of olive oil are:

Inflammation – the smell and taste of oil obtained from olives that have been stored for a certain time in a compressed state (e.g. bags) before processing, and have undergone a wide degree of fermentation.

Moldiness (moisture) – the taste and smell of oil obtained from olives that were stored in humid conditions for a certain period of time before processing, and there was a significant development of mold and yeast.

Oil sediment – the smell and taste of oil that has remained in contact with the deposited sludge/mud in the warehouse/barrels for a certain time.

Wine (vinegar) – smell and taste reminiscent of wine or vinegar, caused by fermentation that led to the formation of acetic acid, ethyl acetate and ethanol.

Metallic – taste reminiscent of metal, less frequent smell, caused by prolonged retention of oil in contact with metal surfaces.

Rancid – smells and tastes caused by oxidation processes.

Overheated – smells and tastes typical of oils obtained with excessive and/or too long heating of the ground paste during processing.

Hay-wood – mthe smell and taste of oil obtained by processing dried fruits.

Coarse (doughy) – a feeling of density, stickiness and gooeyness in the mouth.

Lubricant – taste and smell reminiscent of petroleum, mineral oil or lubricating grease.

Vegetable water – taste and smell that occurs due to prolonged contact of oil with vegetable water.

Brine – the taste and smell of oil obtained from olives that have been kept in brine before processing.

Basket – the taste and smell of oil obtained by squeezing with new platinum/vegetable fiber baskets.

Soil – the taste and smell of oil obtained from olives collected from the ground or soiled with soil that has not been removed before processing.

Wormy – the taste and smell of oil obtained from olives that have been attacked by olive flies.

Cucumber – the taste and smell of oil that has remained hermetically sealed in cans for a long time.

Flavored olive oils

Recently, there has been a trend of mixing olive oil with different fruits and vegetables in order to expand the range of olive products. The most popular are olive oils with the aroma of lemon, parsley, orange, coffee, onion, truffle, etc. However, it is also necessary to point out the negative side of this new trend. Namely, with strong aromas (e.g. lemon) it is possible to cover up defects in the oil, and in this way, by mixing the so-called lampante oil with lemon, get a flavored oil, with a pleasant smell but basically inedible, i.e. unfit for human consumption. If we buy such oils, it is necessary to choose the manufacturer carefully. Such oils cannot be labeled as extra virgin and virgin.



6. OLIVE OIL COUNTERFEITING

The most common forms of olive oil counterfeiting are:

- Incorrect declaration of oil (e.g., extra virgin oil is indicated, and it belongs to a lower category);
- Pomace oils and refined oil are declared as extra virgin;
- Extra virgin with a considerable proportion of pomace oil and refined oil, but this is not declared;
- Mixing olive oil with other vegetable oils.

One of the ways to protect consumers from such oils is to know the basics of sensory analysis, i.e. the desirable and undesirable properties of olive oil.

7. BENEFITS OF USING OLIVE OIL

The key advantages of using good olive oil are:

- It stands out for its pleasant aroma and taste, and is often consumed in a very simple way (e.g. with bread).
- Olive oil is the cold-pressed "juice" from the fruit, and is one of the few vegetable oils that is obtained by simple pressing without solvents and/or industrial refining, as is the case with some other oils. It is edible immediately after squeezing.
- It is a fundamental element of the Mediterranean diet with a proven beneficial effect on the human body.
- It contains an abundance of antioxidants, as well as vitamin E, which affects the action of free radicals on the body's cells.
- It helps prevent atherosclerosis, coronary cardiopathy and stomach problems.
- It has a positive effect on slowing down the aging of brain cells, reduces the level of so-called "bad" cholesterol (LDL) and increases the concentration of "good" cholesterol (HDL), the so-called artery cleaner, and has a preventive effect on the occurrence of tumors and cell deterioration.

- Olive oil, which is similar in composition to breast milk, is recommended when weaning babies from suckling, as well as in their advanced age.
- It is more stable, i.e. It is more resistant to high temperatures than some other vegetable oils, so it is recommended to prepare (e.g. fry, boil) food with extra virgin olive oil. Namely, olive oil has one of the highest "smoke points" because it tolerates temperatures close to 200°C. However, with each temperature crossing above 28°C, there is a loss of positive properties, so it is not economically viable. In other words, it is expensive to use olive oil for frying, but it is definitely recommended.

Benefits of organically produced olive oil

- The organic product was created in controlled production without the use of synthetic chemicals, pesticides and fertilizers, preservatives, emulsifiers, hormones, radiation, etc.
- It does not contain residues of pesticides, heavy metals, hormones, etc.
- It has an increased biological and nutritional value, which is reflected in the increased content of vitamins and minerals, especially antioxidants.
- It has more life energy because it is obtained in harmony with nature.
- It has a beneficial significance in children's nutrition.
- Production does not pollute the environment, but respects the ecological balance and uses sustainable energy sources (e.g. biomass, wind...).



8. POLYPHENOLS IN OLIVE OIL

Polyphenols in olive oil are natural bioactive compounds of plant origin, powerful antioxidants, which give olive oil not only special sensory properties (bitterness and pungency), but also exceptional nutritional and health value. It is thanks to polyphenols that extra virgin olive oil is rightly considered a functional food and one of the key elements of the Mediterranean diet.

The European Union has recognized the special importance of polyphenols in olive oil and their beneficial effects on human health. In accordance with Regulation (EU) No 432/2012, the following health claim is permitted:

„Polyphenols from olive oil contribute to the protection of blood lipids from oxidative stress.“

This claim may only be used if the olive oil contains at least 5 mg of hydroxytyrosol and its derivatives (e.g. oleuropein complex and tyrosol) in 20 g of oil, equivalent to approximately one tablespoon of oil per day. In practice, this condition is recalculated to about 250 mg/kg of total polyphenolic compounds, which is now considered the lower limit for olive oils with high antioxidant potential. That is why, in everyday speech, oils with such a pronounced content of polyphenols are often called "medicinal".

More recently, olive growers have been producing olive oils that contain up to 1,000 mg/kg of polyphenols. This means that only oils with a high enough content of natural polyphenols can carry this health message.

Why are polyphenols so important for health?

Polyphenols act as powerful antioxidants – they protect the body's cells from damage caused by free radicals (oxidative stress). Their regular intake through olive oil is associated with a number of positive effects:

- protection of the heart and blood vessels,
- reduction of oxidation of LDL ("bad") cholesterol,
- anti-inflammatory (anti-inflammatory) effect,
- support for the immune system,
- possible protection against chronic diseases of modern times.

As a result of these properties, polyphenols are now intensively studied in the field of prevention of cardiovascular and metabolic diseases

Polyphenols as natural guardians of oil quality

In addition to protecting human health, polyphenols also protect olive oil itself. They slow down the processes of oxidation and rancidity, thus prolonging the freshness, stability and durability of the oil. Oils rich in polyphenols lose their positive properties more slowly and retain their high quality longer.

That is why the freshness of the olive, the speed of processing, the way the oil is stored and the protection from light, heat and air are key factors for the preservation of polyphenols.

How can a consumer identify an oil rich in polyphenols?

Olive oil with a high content of polyphenols usually has:

- pronounced bitterness,
- moderate to intense pungency in the throat,
- fresh, herbal and fruity aromas.



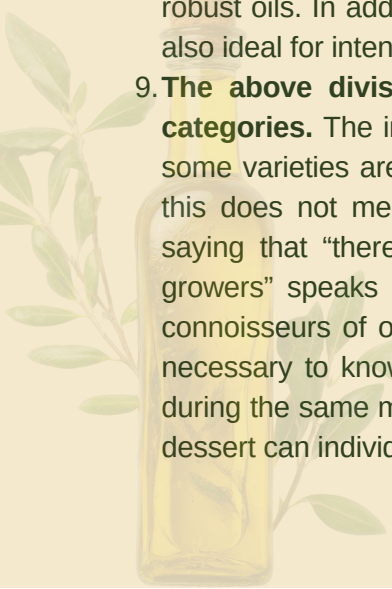
These signs are not a flaw, but rather an indicator of healing properties and high quality oil. A slight "stinging" in the throat is due to the presence of oleocanthal (oleocanthal), one of the most important phenolic compounds with a strong anti-inflammatory effect.

9. OLIVE OIL AS A SEASONING AND PAIRING WITH FOOD

It is known that olive oil can be used as food, medicine and spice. Historically, olive oil has been used for many other purposes (eg lighting, soap production, maintaining hygiene and beauty, etc.), but these three uses are still the most prominent. As in the past, so today, the nutritional properties and especially the health benefits of olive oil attract the most attention. As a result, we get the impression that the ability of oil to improve and significantly change the experience of consuming food is the least recognized. Most often, only wine is attributed this ability, and olive oil is not taken into consideration or is used like other spices, without excessive thinking about spiciness, fruitiness and bitterness as elements that can make a significant difference and drastically change the impression of the sense of taste. Therefore, it is necessary to list the 12 most important principles of pairing olive oil and food.



1. **Extra virgin olive oil is the only category that is acceptable for pairing with food in terms of enhancing the quality of the meal and the food experience.** Virgin oils should not be considered for this purpose, because such oils, although edible, due to defects in basic properties (eg fruitiness) can negatively affect the quality of the food experience.
2. **Olive oil should not be used in the same way as salt, pepper or vinegar.** It is a much more sophisticated type of spice that has the property, like wine, to improve the quality and intensity of the experience with proper pairing, while unlike wine, it is applied directly and in quantities that depend on the way of serving food, side dishes, wine, etc.
3. **No olive oils are the same.** Even oils of the same variety can have important differences that will have a different effect on the potential of the oil to improve the dish and the experience of eating. As a result of this specificity, top quality extra virgin oils are always different and it is necessary to get to know them first through the tasting technique and only then to determine their potential in certain dishes, i.e. appetizers and desserts.
4. **Olive oils, especially monovarietal ones, have their own distinct organoleptic profiles, i.e. recognized and expected values (and types) of fruitiness, bitterness and spiciness.** It is known that Žutica, as the most famous Montenegrin variety, has a recognizable aroma of freshly cut grass and green apple, with possible admixtures of delicate notes of nuts, banana and/or artichoke, depending on numerous environmental factors that can further enrich the aforementioned genetically defined tones and characteristics.
5. **Olive oils in terms of pairing with food are divided into delicate or low-intensity, medium or moderate-intensity and robust or high-intensity.** The values of fruitiness, bitterness and spiciness are most often assessed on a scale of 0-10. If the median value of the given values is less than 3.0, it is a delicate oil, and the median between 3.0 - 6.0 indicates medium oils. When the property value is greater than 6.0, such oils are called robust.

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6. **Delicate olive oils are also called "shy" oils and their weak intensity should not be taken as a disadvantage.** Namely, such intensity can contain very subtle, elegant and attractive tones of exotic fruit notes (eg green tomato, artichoke, etc.). These oils are ideal with light dishes such as salads, white fish, mild cheeses, vegetable dishes, shellfish and other seafood. They are also recommended with fruit, where e.g. an interesting combination with orange. Delicate oils are ideal for the so-called summer menus and types of dishes that are most suitable for that season.
7. **Medium or moderate olive oils are commercially the most interesting and attractive because they can be used in most dishes and the possibility of error is the least.** Bitterness, and especially spiciness, are properties that are more dominant than fruitiness, which is why they are most often used for pastas, meat dishes (e.g. chicken, lamb) and fish. They are interesting when used only with bread, as well as for desserts, especially chocolate treats. The list of dishes where these oils can be used is probably the widest compared to the other two types.
8. **Robust oils can take on the strongest of foods and won't get lost in the crash.** Dishes made of veal or beef, pork and lamb, stews, ragouts, stews, dried meat specialties are ideal for such strong oils. Everything prepared with fire and smoke calls for robust oils. In addition, strong cheeses and similar specialties are also ideal for intense olive oils.
9. **The above division of oils is by type, and not by quality categories.** The intensities of oils are genetically determined and some varieties are naturally weaker or more moderate. However, this does not mean that they are of lower quality. Namely, the saying that "there are no bad olives (varieties), only bad olive growers" speaks best on this topic. After all, true admirers and connoisseurs of olive oils know that for complete enjoyment it is necessary to know how to use all the above types of oils, even during the same meal. Namely, an appetizer, a main course and a dessert can individually require completely different oils

10. **How to start?** The easiest thing to do is to start with medium oils and understand their potential in relation to most dishes. Where the intensity of the dish exceeds moderate oils in the sense that the oil is lost in the taste, you should switch to using intensive oils. On the other hand, delicate specialties that do not tolerate stronger notes of oil should be paired with equally delicate oils.
11. **The above rules regarding types of oils should not be followed blindly, because tastes are different after all.** To get to know the oil, it is necessary to experiment with types, intensities and quantities. Thus, delicate cheeses can be very interesting with robust oil, as can delicate oil on side dishes be served with lamb. Finally, pairing local oils with local food and wine is the most natural pairing.
12. **Varieties and oils should be discovered in Montenegro, because our country has as many as twelve distinctive indigenous varieties.** The most famous is Žutica, while other varieties are insufficiently known and promoted. Montenegrin indigenous varieties are žutica, sitnica, šarulja, zinzulača, fran, drobnica, gloginja, lumbardeška, dužica, crnica, lombardina and barkinja. The most represented variety is Žutica 65%, Crnica 18%, Sitnica 6%, Lumbardeška 6%, Šarulja 3%, other varieties 2% (Zinzulača, Fran, Drobnica, Gloginja, Lombardina, Dužica and Barkinja).





10. THE MOST COMMON MISCONCEPTIONS ABOUT OLIVE OIL

Misconception 1: The proportion of free fatty acids in olive oil can be felt by tasting the oil

Truth 1: The percentage of free fatty acids can only be measured by laboratory (physico-chemical) analysis.

Misconception 2: The color of olive oil is an indicator of quality.

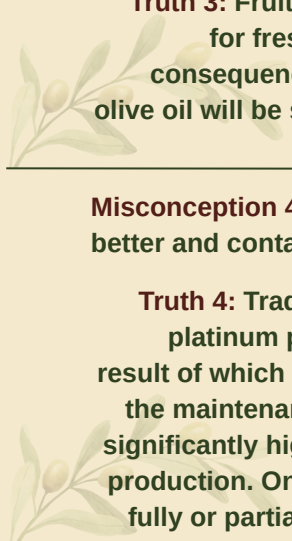
Truth 2: The color, which generally ranges in shades of green and yellow, depends largely on the type (variety) of the olives and the time of harvest. Color is not a (primary) indicator of oil quality, which is why professional oil tasting is done in blue glasses, which "hide" the color and "protect" the evaluator from making a premature decision about the quality of the oil

Misconception 3: Olive oil should not be bitter, nor should it have notes of "green" and fruity taste.

Truth 3: Fruitiness, pungency and appropriate bitterness are typical for fresh, young and high-quality olive oil, because they are a consequence of the presence of polyphenols or antioxidants. Bad olive oil will be sour, vinegary (vinegary), rancid, inflamed, followed by undoubted unpleasant feelings.

Misconception 4: Olive oil obtained in the traditional way (pressed) is better and contains more nutrients and health-promoting substances.

Truth 4: Traditional processing technology in stone (iron) mills and platinum presses (baskets) are "open" processing systems, as a result of which contamination is higher. This has a negative impact on the maintenance of sanitary and hygienic standards, which requires significantly higher costs (e.g. cleaning time, processing time, etc.) of production. On the other hand, modern mills, made of stainless steel, fully or partially automated, provide a more consistent quality and a higher level of hygiene during olive processing.



Misconception 5: Olive oil from the first pressing is the best.

Truth 5: There is only one squeezing that produces olive oil, after which the pomace is no longer squeezed or pressed. More specifically, squeezing the pomace produces an oil that cannot be categorized as virgin or olive (see oil categories in Part 2). This is why it is not correct to use the term "first squeezed" olive oil. Namely, this is one of the most common examples of misleading consumers, which abuses their trust

Misconception 6: If olive oil "burns" in the throat, it is a good oil.

Truth 6: Extra virgin olive oil causes a "burning sensation" in the throat, where the same disappears after a few seconds. If the burning sensation lasts longer, with a certain level of discomfort, then it is an oil that is of poor quality, which should be avoided. It is common for rancidity or other defects to cause this or a similar unpleasant taste when tasting oil.

Misconception 7: The smell of olive oil is not important for determining its quality.

Truth 7: Quality olive oil should possess pleasant fruity and green aromas (e.g. olive leaves, grass, almonds, tomatoes, apples, bananas, etc.). Bad olive oil usually has a smell of brine, dry grass, moisture, soil, metal, burning wood, etc.

Misconception 8: Chemical analysis (e.g. fatty acids) is sufficient to determine the quality/category of the oil.

Truth 8: Olive oil is one of the few food products for whose presence on the market, in addition to the analysis of physicochemical indicators, the analysis of taste and smell is necessary. Therefore, in addition to chemical analysis, it is necessary to conduct sensory analysis, which, as an analytical procedure, is objective, accurate and reproducible. It is indispensable in the classification of oils (e.g. extra virgin), the determination of the organoleptic profile of olive varieties (e.g. leccino, ascolana, kalamata) and the definition of geographical indications.

Misconception 9: Maslinovo ulje je otporno na sunce, temperaturu, kiseonik i svjetlost.

Truth 9: The three biggest enemies of olive oil are temperature, light, and oxygen. For this reason, it is best to store the oil in dark glass bottles (but also in aluminum), at room temperature, avoiding keeping it in the refrigerator (i.e. below 7°C) as well as any heating of the oil (i.e. above 28°C). As the oil is sensitive to light, you should avoid keeping the oil in bright places and especially in the sun. It is recommended to use an open bottle of oil within a reasonably short period of time (e.g. a few weeks) because contact with air/oxygen leads to oxidation that reduces the quality of the oil (so-called rancidity). In this sense, smaller packages (e.g. 0.5 or 0.75 l) are more practical.

Misconception 10: Olives need to be picked from the ground and the oil obtained from such olives is good.

Truth 10: A good oil (e.g. extra virgin) can be obtained exclusively from healthy, optimally ripe fruits harvested from the tree, processed in the next 48 hours, by cold squeezing mechanically, i.e. in a mill that is clean and where the temperature does not exceed 27°C. Olives picked from the ground can generally produce oil with a high content of SMC, often unsuitable for human consumption.



11. HOUSE OF OLIVES - Stari Bar

More than ten years ago, the Association of Olive Growers from Bar initiated the idea of building the Olive House in Stari Bar with the Ministry of Agriculture and the Government of Montenegro. Negotiations with the Ministry lasted a long time, especially because other olive organizations from Montenegro were interested in the House being built in the area where they operate. In particular, justified initiatives can be singled out for the House to be built in the Bay of Kotor or in Ulcinj in the olive grove of Valdanos. In the end, however, the Ministry made a decision to build the House in Stari Bar. The process of securing documentation for the construction was lengthy and exhausting for the company because it was not easy to provide all the necessary documentation.

The construction of the House of Olives in Stari Bar is a capital project of the state of Montenegro, where the Municipality has given the land for construction free of charge. The House of Olives was supposed to be a strategic facility for the olive growers of Bar, as well as for the olive growers of Montenegro and the region. In addition to the administrative part and space for the education of olive growers, the Olive House will contain an olive processing plant where processing is carried out according to modern methods and the production of top quality oil.



In addition to olive processing capacities, space is also provided for storage, bottling and labeling of olive oil. The House of Olives should be an example of good practice where all oil producers, olive growers, consumers, tourists and everyone else will be able to see a modern and standardized complete process of olive oil production.

In addition to these facilities, the House of Olives will also have a sales area where Montenegrin olive growers can exhibit and sell their olive oil, but only the one that fully meets the quality standards and whose packaging meets all the requirements of laws and regulations.

Visitors can taste olive oil in a specially equipped tasting room and attend short courses and special trainings in the field of sensory evaluation of olive oil quality.

The House of Olives is basically planned as a center of Montenegrin olive growing where all olive growing organizations of Montenegro would have their headquarters. However, the Ministry of Agriculture decided to change the originally conceived concept of the functioning of the House of Olives and assigned it to the Municipality of Bar, which formed a municipal company in whose management and work olive organizations of Montenegro do not participate. The House of Olives is available to all olive growers, but it has not fulfilled its original role of connecting and associating all olive organizations and forming the National Federation of Olive Organizations of Montenegro. In other words, it has not become the center of Montenegrin olive growing.



12. DICTIONARY

Vegetable water – liquid residue after processing and squeezing the oil.

Centrifuge – part of the olive processing line, which separates the oil from the water due to its specific gravity, and is an alternative to pressing.

Phenols – substances naturally present in olive oil. They act as natural antioxidants that preserve oil, but also have a beneficial effect on the health of the human body.

Bitter – the taste characteristic of oils obtained from green and/or partially colored olives (the so-called šara).

Harmony (harmonious oil) – a trait/attribute of olive oil created as a result of the presence of appropriate stimuli in a suitable relationship..

Cold Squeezing – the process of squeezing oil where the temperature does not exceed 27°C.

Pomace – a solid residue after processing olives and squeezing the oil.

Continuous processing – the principle of operation of modern mills, which continuously (without interrupting any of the phases) and in parallel carry out washing, grinding, mixing and squeezing of oil. On the other hand, traditional stone mills do not have this capability.

Monocultivar – olive oil obtained by processing olives of only one variety. Nevertheless, mixing the fruits of different varieties in processing, to a certain extent, provides the possibility of obtaining a higher quality oil, especially in terms of organoleptic characteristics.

Panel – a group of evaluators who are selected and trained for sensory analysis of olive oil under certain conditions (e.g. room, equipment, temperature, etc.).

Spicy – a burning sensation in the throat and oral cavity that is characteristic of oils obtained from unripe olives (e.g. during early harvest).

Radman – the proportion of oil in the olive fruit depends on the chemical composition of the fruit conditioned by the variety and growing conditions, and ranges from 6 to 25%.

Early harvest – harvest that usually begins in early or mid-October, where the pungency, but also the overall value of the oil quality indicators, is higher.

Sensory analysis – analytical procedure in which the human senses, especially the sense of smell and taste, are used as a detector. The results of this analysis should be accurate, objective and reproducible. In addition to laboratory analysis, it is necessary for the market classification of oils

Free fatty acids (SMA) – are an indicator of the quality of olives at the time of processing. They affect the oxidation of the oil, which contributes to the faster spoilage of the oil. Olive oils with an SMA content of less than 0.8 are acceptable for human consumption.

Tank – protects the oil from light, oxygen, heat and moisture, easily washable, inert to the oil and must not release ingredients into the oil. The most common materials are stainless steel, steel, sheet metal, glass and plastic. Traditional stone or ceramic containers are not suitable for storing oil.

Oil(s) precipitate – a dark precipitate that forms at the bottom of the container in which the oil is stored and needs to be removed in a timely manner. Modern barrels for storing oil have a conical bottom with a tap, which greatly facilitates this work. In the case of prolonged retention of sediment (the so-called murga), the oil may take on an unpleasant odor with a noticeable decrease in quality.



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