

Brief Overview on Olive Oil Health Benefits

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The traditional Mediterranean diet (MD) is characterized by high consumption of vegetables, fruits, unprocessed cereals and fish on the one hand and by low consumption of meat (and/or meat products) and dairy products on the other [1]. A number of health benefits, including reduced mortality risk and lower incidence of cancer, cardiovascular disease and both prevention and treatment of diabetes mellitus, are linked to the MD [2]. In addition, Carnevale, *et al.* [3] have highlighted the high antioxidant activity of the MD.

Thanks to the high vegetable fat content, especially monounsaturated fatty acids, the olive oil is the key component of the MD [4]. In Mediterranean populations it is estimated that each person consumes between 25 and 50 mL of olive oil per day, while the mean yearly intake of olive oil varies between a few kg/head in France to about 17 kg/head in Greece [5]. Therefore, considering an average polyphenols intake of 1600 mg/die, the olive oil may theoretically contribute for 0.3 - 1.6% of it [6]. Thus, the consumption of virgin olive oil and in particular of extra virgin olive oil (EVOO), appears to be a main determinant to ensure the MD health benefits [2]. Indeed, the European Food Safety Authority report that a daily consumption of 20g of EVOO and its derivatives can protect the people from oxidative damage [7].

Nowadays, it is known that the olive oil health benefits are due by phenolic fraction (potent antioxidant and anti-inflammatory properties), together with high intakes of squalene and the monounsaturated fatty acid [8]. There are almost 230 chemical compounds in olive oil including aliphatic and triterpenic alcohols, sterols, hydrocarbons, volatile and phenolic compounds. The main antioxidants compounds are carotenes and phenolic compounds including lipophilic and hydrophilic phenols [9]. Polyphenols in olive oil ranges from 50 to 800 mg/kg depending on the cultivar, ripening stage, processing techniques, storage and geographical origin [10]. Polyphenols compounds identified and quantified in olive oil belong to four different classes: flavonoids (i.e. luteolin), lignans (i.e. pinoresinol), simple phenols (i.e. hydroxytyrosol, tyrosol); and secoiridoids (i.e. oleuropein and ligstroside) [10]; and the last two groups can be found exclusively in olive oils [11].

For example, oleuropein is the most abundant phenolic compound, detected in different tissue of olive trees, such as: leaves, seed, pulp and unripe olives (14% of the dry weight) [12]. This phenolic compound has shown antioxidant potential similar to those exerted by ascorbic acid (vitamin C) and α -tocopherol (vitamin E), with protective effects against, for example, cell apoptosis and versus low-density lipoprotein (LDL) oxidation [12]. Besides, oleuropein may have neuroprotective and neurorestorative properties which could be of interest as a potential treatment of Parkinson's disease [12].

Another important phenolic compound contained in the olive oil is the Hydroxytyrosol (HT) (mainly derived by oleuropein). HT concentrations in olive oils may range from 1.9 mg/kg for to 163.6 mg/kg on oleuropein content [9]. Nevertheless, health studies have

shown that HT is a important compound this is of interest in the context of making nutraceuticals [13]. Moreover, some studies report that HT is one of the most important antioxidants present in olive oil and has a promising potential in the prevention of neurodegenerative disorders [13,14].

Health studies have shown that HT is an important compound this is of interest in the context of making nutraceuticals with doses higher than the ones compatible with the MD [13] and the scientific knowledge accessible shows that HT is one of the most important antioxidants present in olive oil and has a promising potential in the prevention of neurodegenerative disorders [13,14]. Finally, recent studies have shown a phenolic compound found mainly in freshly pressed EVOO namely Oleocanthal. This is a phenylethanoid compounds whose pungency induces a strong stinging sensation in the throat, has been found to share the same mechanistic anti-inflammatory and antimicrobial as the nonsteroidal drug, ibuprofen pathway.

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