

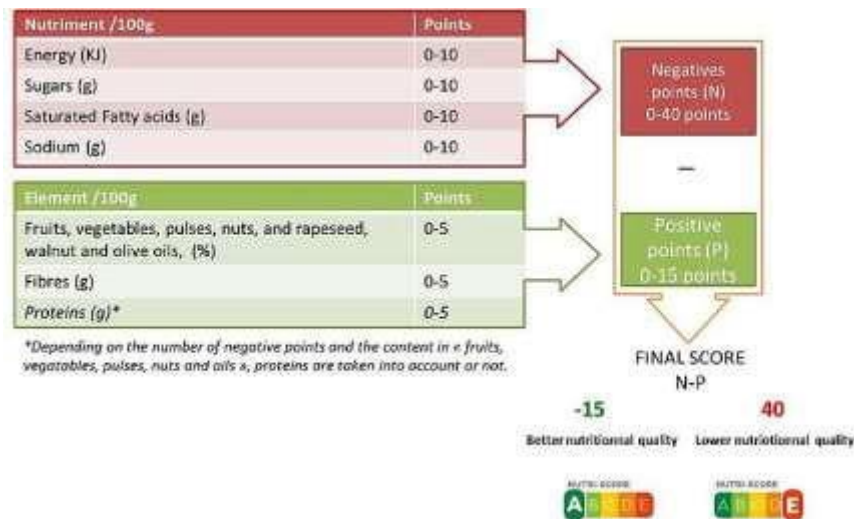
Olive Oil and NutriScore

Background

NutriScore, a front-of-pack labeling system (FOPL), has been proposed by the Nutritional Epidemiology Research Team (EREN), a French public nutrition research team and is based on the nutritional score created by the Food Standards Agency (FSA) in the UK.

The NutriScore was presented in the 2013 report "Proposals for a new impetus to the French public health nutrition policy in the framework of the National Health Strategy". The NutriScore advocates for the adoption of a system of grades from A to E on the front of food products to allow to easily compare the nutritional quality of products.

To calculate the NutriScore, favorable nutrients, which should be consumed in abundance, are set off against unfavorable nutrients, which should only be consumed in small quantities. Fiber, protein, fruit, and vegetables have a positive effect, while saturated fatty acids, sugar and salt have a negative effect. (source: <https://www.foodwatch.org/en/campaigns/sugar-fat-and-salt/how-the-nutri-score-works/>)



Prepared by:	Tassos C. Kyriakides, Ph.D. and Vasilis Vasiliou, Ph.D.; Yale School of Public Health
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The result is translated into a five-level color scale, which is backed by the letters A-E. Rather balanced products get a dark green A or light green B, in the middle range there is a yellow C and rather unbalanced products like sweets or fatty snacks get an orange D or even a red E.

Olive oils are natural fruit juices that physicians, nutritionists, and dietitians recommend, based on ever increasing clinical research evidence, to their patients in place of less healthy (or even deleterious) eating and cooking fats, for the prevention and treatment of certain diseases, mostly of chronic nature. According to the NutriScore algorithm, olive oil currently falls on the C color with a proposal to be upgraded to color B; this will unavoidably lead to confusion among consumers with dire consequences on their health.

Consequently, this can potentially discourage the public access to a superfood that has, time and again, proven to impact health benefits. Unarguably, this goes against the fundamentals of any sound Public Health policy in any country.

Olive oil should either (a) be assigned the Green-A grade or (b) not considered at all and thus not assigned any grade, in the NutriScore system. No other edible fat is as healthy and flavorful as olive oil, especially extra virgin olive oil.

Clearly, the proposed NutriScore labeling of olive oils will impede the realization of this superfood's multitude of associated health benefits. The European Food Safety Agency's (EFSA) approved health claims for olive oil are helping in the attempt to shift towards more healthful dietary eating patterns specifically including a Mediterranean-style nutrition—of which olive oil is the cornerstone. Recently, the Mediterranean diet was, for the fifth year in a row, named by an expert panel of nationally recognized experts in diet, nutrition, obesity, food psychology, diabetes and heart disease as the best diet overall (out of 35 diet plans) in the U.S News and World Report annual rankings.

Confusion that will arise from NutriScore labeling will certainly impact the public's ability to initiate and/or follow this healthy nutrition plan, with numerous downstream negative impacts on health and health-related costs. No matter how one tries to explain and justify the categorization of Coke Zero with a better NutriScore than extra virgin olive oil (B vs C), it is in clear contradiction to the accumulated science supporting and proving the health benefits of the natural juice from olives.

The European Union (EU) is by far the world's largest consumer of olive oil. According to IOC data, the E.U. was estimated to consume 1,545,000 metric tons in 2019.

Many of the health benefits of extra virgin olive oil are believed to be related to the presence of polyphenols, such as oleocanthal, which are unique to olive oils. In general, the more flavor an olive oil has, the higher its polyphenol content.

The new NutriScore label that classifies olive oil and extra virgin olive oil as less than a healthy option not only will potentially discredit the accumulated evidence-based science that has, for

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the last 50 years or so, proven the health impact of olive oil in the context of the Mediterranean nutrition paradigm. Further, the labeling of olive oil with the NutriScore level C will undoubtedly create confusion among and dampen the trust of consumers to European guidance and regulations, as it is in clear contrast to the EFSA health claim (Commission Regulation (EU) 432/2012). This health claim unequivocally emphasizes the health benefits imparted from olive oil and states:

Olive oil polyphenols contribute to the protection of blood lipids from oxidative stress. The claim may be used only for olive oil, containing at least 5 mg of hydroxytyrosol and its derivatives (e.g., oleuropein complex and tyrosol) per 20 g of olive oil. In order to bear the claim information shall be given to the consumer that the beneficial effect is obtained with a daily intake of 20 g of olive oil.

Replacing saturated fats in the diet with unsaturated fats contributes to the maintenance of normal blood cholesterol levels. The claim may be used only for food, which is high in unsaturated fatty acids, as referred to in the claim HIGH UNSATURATED FAT as listed in the Annex to Regulation (EC) No 1924/2006.

The NutriScore grade currently considered for olive oil needs to be reconsidered as this decision will not only affect a sector dedicated to health but also the consumer's overall trust in EU regulations, the olive oil sector and the countless studies on the product's positive affect on our bodies and overall health.

Prepared by:	Tassos C. Kyriakides. Ph.D. and Vasilis Vasiliou, Ph.D.; Yale School of Public Health
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Health Benefits of Olive Oil: The Evidence

Mediterranean nutrition, of which olive oil is the central food, has, over the decades, stood the test of time as the healthiest nutrition paradigm. Olive oil is a proven healthy superfood; a lot of scientific evidence has accumulated over the last fifty years, pointing to a plethora of direct and indirect health benefits of olive oil and other olive tree products like olives and olive leaves. Such health benefits are well-established and universally accepted by health experts, physicians, nutritionists, and dietitians. Multiple published reviews of the Mediterranean diet point to the numerous and varied health benefits on humans (1-8).

A summary of selected, important, and pertinent findings are provided as supporting evidence that, beyond doubt, the health benefits from olive oil and olives extend to many chronic diseases that greatly affect the human health.

1. **Cardiovascular/coronary heart disease.** This complex of disease conditions is a major public health burden. Heart disease is the leading cause of death in the United States among both men and women (9). Olive oil protects against heart disease due to its monounsaturated fatty acid profile, and, in the case of extra virgin grade, its polyphenol content, which operates in a number of different ways (10). The discovery of the anti-inflammatory (11-18) and antioxidant properties (19-21) of olive oils has shed light into such disease processes and downstream negative health impact.
 - a. **Inflammatory process:** Probably the key reason olive oil protects against heart disease is through its anti-inflammatory capacity (22). Oleic acid, an abundant monounsaturated fat in olive oil reduces inflammatory markers like C - reactive protein (CRP) (23). In addition, olive oil polyphenols—present in all olive oils, but especially in extra virgin—appear to be the main anti-inflammatory agents in olive oils (13). Some of the main polyphenols are the anti-inflammatory oleocanthal (14) as well as oleuropein. Oleocanthal has been shown to function as an anti-inflammatory like ibuprofen (18).
 - b. **Oxidative Process:** Phenols in olive oil have been shown to prevent oxidative DNA damage (20); further, phenolic compounds found in olive oil, especially extra virgin olive oil, along with other compounds like secoiridoids, lignans and squalene, have been shown to have antioxidant potential (21).
 - c. **HDL/LDL cholesterol:** Consumption of extra virgin olive oil has been shown to reduce age-related decrease in HDL in the context of anti-inflammatory activities (15); olive oil has also been shown to raise “good” HDL cholesterol and reduce “bad” LDL levels. In addition, unlike polyunsaturated oils which might also lower

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LDL, olive oil has been shown to protect LDL particles from oxidation (24), which is what makes LDL cholesterol “bad” because it is a factor in heart disease.

- d. **Endothelial function:** Cardiovascular health is further promoted by the extent to which olive oil improves the function of the lining of the blood vessels (25, 26).
- e. **Blood clotting:** Olive oil can help prevent dangerous blood clotting that could lead to heart attack and/or stroke (27, 28).
- f. **Blood pressure:** Numerous studies on the impact of olive oil on blood pressure and subsequent impact on cardiovascular health further support the benefits of olive oil (26, 29, 30). One study of hypertensive patients found that olive oil reduced blood pressure significantly and reduced the need for medication as well (31). In addition, the rich flavor profile of olive oil enables patients with high blood pressure to reduce sodium intake without sacrificing taste.

In addition to the evidence provided above in specific areas of cardiovascular health, numerous clinical research studies conducted since 1970 have repeatedly shown the cardiovascular health benefits that the use of olive oil can impact on humans (26, 32-50). Of note, for the first time evidence from the CORDIOPREV study concluded that in secondary prevention, the Mediterranean diet, of which olive oil is the main food component, was superior to a low-fat diet in preventing major cardiovascular events (32).

- 2. **Other Chronic Conditions/Diseases.** In addition to cardiovascular health, olive oil has also been shown to be positively related to the prevention and/or treatment of **cancer, cognitive/neurological conditions, diabetes, and endocrine/metabolic syndrome.** Given that it has been established that chronic inflammation is a key factor in the natural history of these conditions/diseases, the prevailing hypothesis is that this benefit is due to olive oil’s anti-inflammatory properties.
 - a. **Cancer:** Research in cancer and olive oil is rapidly expanding. One should note that studies have shown that people residing in the Mediterranean countries have a fairly low risk of cancer which may be connected to olive oil (51). Oxidative cell damage due to the presence of free radicals is considered a potential cause of cancer, and extra virgin olive oil is high in antioxidants that reduce oxidative damage (52). The oleic acid, olive oils predominant monounsaturated fatty acid, is also highly resistant to oxidation and has been shown to have beneficial effects on genes linked to cancer (53, 54). To support these theories, many studies in test tubes have shown that compounds in olive oil can help fight cancer at the molecular level (55, 56). Several studies have shown the positive effect olive oil can have in the prevention and/or treatment of cancer (57-65).

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- b. **Cognitive/Neurological Conditions:** A lot of research and evidence has been recently generated indicating the benefits of olive oil on cognitive and neurological health (66-85). Olive oil has been studied in the context of Alzheimer's disease, the world's most common neurodegenerative disease and a leading cause of dementia. One feature of Alzheimer's is a buildup of protein tangles called beta amyloid plaques, in certain neurons in the brain. A study in mice showed that oleocanthal can help to clear these plaques from the brain (86). Results from a recently completed randomized controlled clinical trial show that a Mediterranean diet that, by definition, includes olive oil had favorable effects on brain function and reduced the risk of cognitive impairment (87).

 - c. **Diabetes:** New clinical research projects as well as systematic reviews and meta-analysis are providing strong evidence that olive oil can help reduce the risk of Type-2 diabetes (T2D) and improve glycemic control in patients with T2D. Since these studies were carried out in the context of adherence to a Mediterranean diet, the hypothesis that olive oil, a main food in this dietary pattern, is the mediator of this positive health impact, has repeatedly been shown to hold (88-99)

 - d. **Endocrine/Metabolic Syndrome:** Early evidence, coming primarily from cross-sectional studies and meta-analyses, suggests that there is a positive association between a Mediterranean diet nutrition paradigm, of which olive oil is a main pillar, and metabolic health. Currently on-going and future research are expected to confirm findings and conclusions thus far reported (100-104).

It should be further noted that research in bone health and gut microbiome is extremely suggestive of the positive impact that olive oil can impart in this human health parameters (105, 106). Specifically, the gut microbiome is the subject of intense study in the recent years and has generated a lot of interest given its potential multi-faceted impact on human health (107).

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Concluding Remarks

Olive oil is a healthy superfood, and this is one of the primary reasons consumers purchase it. Use and application of the NutriScore algorithm on olive oil without consideration of its numerous health benefits, will substantially negatively impact its use. This, in turn, and unavoidably will have negative downstream effects on human health.

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Prepared by:	<i>Tassos C. Kyriakides. Ph.D. and Vasilis Vasiliou, Ph.D.; Yale School of Public Health</i>
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