

virgin olive oil and health

special contribution

Jaén Journal
on Approximation

ISSN: 1889-3066
vol. 1 (1) (2009), 27M-29M

José J. Gaforio
Immunology Division,
Department of Health Sciences
University of Jaén, Jaén (Spain)
jgaforio@ujaen.es

A balanced diet is an essential part of a healthy life. We satisfy our nutritional requirements by ingesting a series of foodstuffs that together make up our diet. Three main types of nutrient are required for our bodies to function correctly: carbohydrates, fats and proteins. A surplus or a deficit of any of these nutrients is a risk for our health. The right amount of each nutrient guarantees that our organism can carry out its vital functions correctly. The recommended percentage of each of these nutrients in our daily calorie intake is:

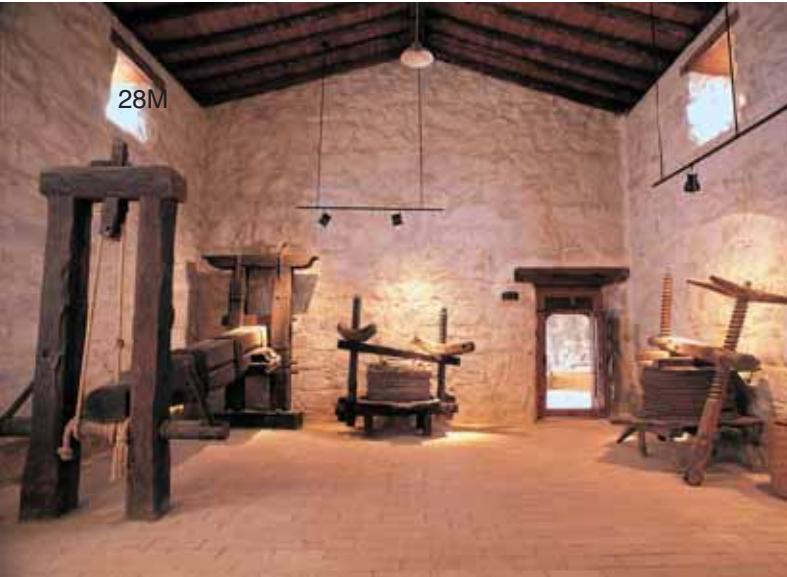
- Carbohydrates = 55-75%
- Proteins = 10-15%
- Fats = 15-30%

Fats, when consumed in moderation, are therefore essential for good growth and development and for maintaining a good state of health. Fats are our main source of energy and help us to absorb vitamins A, D, E and K. However, we must also bear in mind that: 1) fats provide our bodies with 9 kilocalories per gram of fat consumed, which means that we must control the amount of fat we eat, because if not we may become overweight or obese. 2) It is not only important to control the quantity, but also the quality, because some

fats are considered healthy and others less so. There are two types of fats, animal and vegetable fats. There is a general consensus worldwide in recommending that we should reduce our consumption of animal fats (high in saturated fats), and that conversely we should be encouraged to consume vegetable fats. But not all vegetable fats are as healthy as others. The most obvious example are the fats known as trans fatty acids which are normally found in food processed with partially hydrogenated vegetable oils, such as vegetable lard, some margarines, salted biscuits, sweets, snacks, fried and oven-cooked food. There is a lot of research showing the harmful effects for our health of this type of fat.



28M



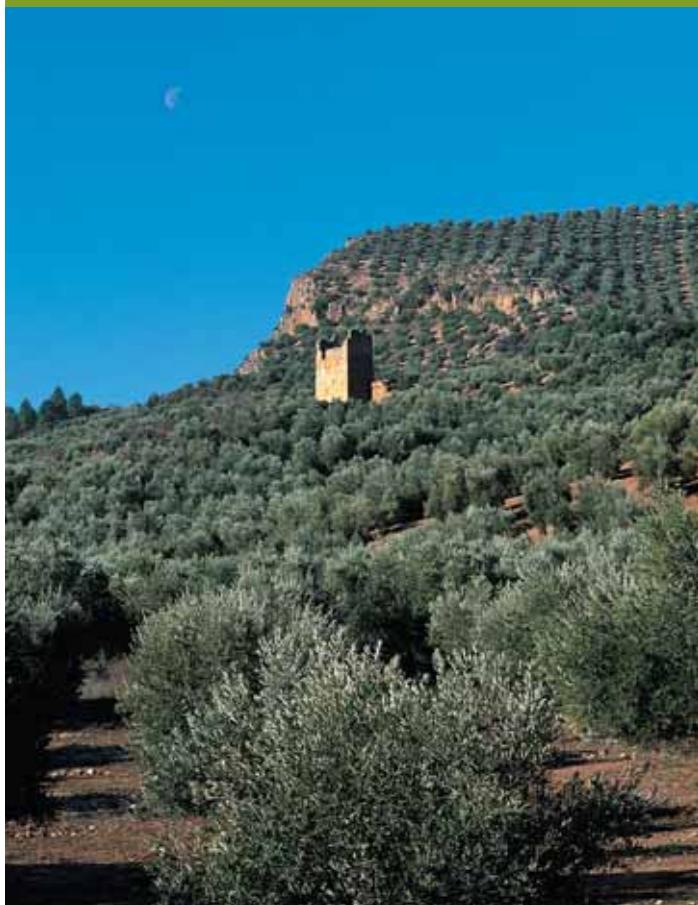
In addition, certain vegetable fats such as coconut oil and palm oil have high levels of saturated fats, which make consumption inadvisable.

Experts today recommend a moderate intake of mono and poly unsaturated fats, which provide a lot of health benefits, while advising against the consumption of saturated and hydrogenated fats (trans fatty acids), which among other things, increase the levels of “*bad*” cholesterol (LDL).

One of the most well-known characteristic of the Mediterranean diet is the presence of virgin olive oil as the principal source of energy from fat. In contrast to other edible oils with a similar fatty composition, namely sunflower, soybean and rapeseed canola oils, virgin olive oil is a natural juice, while the seed oils must be refined before consumption, thus changing its original composition during this process. Therefore, virgin olive oil is a real juice from the olive and is a source of healthy fatty acids (monounsaturated fats) but also for hundreds of micronutrients, especially antioxidants, as phenol compounds, vitamin E or carotenes.

Virgin olive oil composition depends, among others, on the type of olives, degree of maturation, and the manufacturing process (1). It has two distinct fractions:

1. Majority fraction (saponifiable): this makes up almost all (between 98% and 99% of the total) of the oil. This is mostly composed of triglycerides, but it also contains free fatty acids and phospholipids. In virgin olive oil, monounsaturated fatty acids (oleic acid) dominate, make up 80% of the total.



- Minority fraction (unsaponifiable): this covers the rest and is therefore by a very long way the smaller fraction. This fraction contains compounds relating to the taste (polyphenols), colour (chlorophyllic pigments and carotenoids), and smell of the oil (volatile compounds). It is made up of the so-called minority components. These are extranutritional constituents that are very diverse in terms of chemical structure and function and which appear in food in very small quantities. They are also known as “Bioactive compounds” because they have certain interesting properties that are beneficial for health. We should also emphasize that the

abundance and variety of these compounds is a defining characteristic of virgin olive oil and sets it apart from refined olive oil or other kinds of seed-based oils. These compounds include: terpenic alcohols such as cycloasterol; sterols, such as beta-sitosterol; carotenes, such as beta-carotene or vitamin A; tocopherols, such as alpha-tocopherol or vitamin E; chlorophylls; simple phenolic compounds, such as tyrosol and hydroxytyrosol; triterpenic hydrocarbons, such as squalene; lignans, such as acetoxypinoresinol and pinoresinol; secoiridoids, such as oleuropein; flavonoids, such as luteolin and apigenin.

In summary, virgin olive oil, an important constituent of the Mediterranean diet, is considered a major factor in preserving a healthy population, and it has been widely associated with the prevention of several pathologies like cancer (2), heart disease (3), and aging by inhibiting oxidative stress (4, 5). These beneficial properties are mainly attributed to its composition, a high percentage of monounsaturated acids (oleic acid) and significant amounts of minor components with strong antioxidant activity (6).



Literature cited:

- Allouche Y, Jiménez A, Gaforio JJ, Uceda M, Beltrán G. How Heating Affects Extra Virgin Olive Oil Quality Indexes and Chemical Composition. *J. Agric. Food Chem.* **2007**, 55: 9646-9654.
- Escrich E, Ramirez-Tortosa MC, Sánchez-Rovira P, Colomer R, Solanas M, Gaforio JJ. Olive oil in cancer prevention and progression. *Nutr. Rev.* **2006**, 64: 40–52.
- Estruch R, Martínez-González M. A.; Corella, D.; Salas-Salvadó, J.; Ruiz-Gutierrez, V.; Covas, M. I.; Fiol, M, Gómez-García E, López-Sabater MC, Vinyoles E, Arós F, Conde M, Lahoz C, Lapetra J, Sáez G, Ros E. Effects of a Mediterranean style diet on cardiovascular risk factors. A randomized trial. *Ann. Intern. Med.* **2006**, 145: 1–11.
- Owen RW, Giacosa A, Hull WE, Haubner R, Würtele G, Spiegelhalter B, and Bartsch H. Olive-oil consumption and health: the possible role of antioxidants. *Lancet Oncol.* **2000**, 1: 107-112.
- Quiles JL, Ochoa JJ, Ramirez-Tortosa MC, Huertas JR, Mataix J. Age related mitochondrial DNA deletion in rat liver depends on dietary fat unsaturation. *J. Gerontol.: Biol. Sci.* **2006**, 61: 107–114.
- Perez-Jimenez F, Alvarez de Cienfuegos G, Badimon L, Barja G, Battino M, Blanco A, Bonanome A, Colomer R, Corella-Piquer D, Covas I, Chamorro-Quiros J, Escrich E, Gaforio JJ, García-Luna P, Hidalgo L, Kafatos A, Kris-Etherton PM, Lairon D, Lamuela-Raventós R, Lopez-Miranda J, Lopez-Segura F, Martínez-González MA, Mata P, Mataix J, Ordovas J, Osada J, Pacheco-Reyes R, Perucho M, Pineda-Priego M, Quiles JL, Ramirez-Tortosa MC, Ruiz-Gutierrez V, Sanchez-Rovira P, Solfrizzi V, Sorriquer-Escofet F, de la Torre-Fornel R, Trichopoulos A, Villalba-Montoro JM, Villar-Ortiz JR, Visioli F. International conference on the healthy effect of virgin olive oil. Consensus report, Jaén 2004. *European Journal of Clinical Investigation* **2005**, 35:421-424.