

## Table Olives

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Spanish-style green table olives

### Table olives

Table olives are a traditional fermented vegetable elaborated with healthy fruits obtained from certain varieties of the cultivated olive tree (*Olea europaea* var. *sativa*). They must be harvested at the appropriate stage of size and maturity according to the further elaboration process which will be applied.

### Where are they produced?

The origin and the greatest production areas are located in the Mediterranean basin (Spain, Egypt, Turkey, Greece, etc.), although olive cultivation has also spread to South America (Peru, Argentina, Chile, etc.), North America (USA), Australia, and all those places where climatology allows olive tree cultivation.

### What are the ingredients?

Mainly olive fruits, although they may also be seasoned with thyme, oregano, garlic, etc., or pitted and stuffed with red pepper, anchovies, etc.

### How do we make them?

The olive is a fleshy drupe - a fruit containing a central “stone” containing the seed - that contains a bitter compound, oleuropein. For this reason, it cannot be consumed directly from the tree and must be processed to reduce this natural bitterness. Throughout the world, diverse processes have been developed to make olives palatable, the most important of which are:

- alkali-treated green olives (the so-called Spanish-style),
- ripe olives darkened by alkaline oxidation (the so-called Californian-style); and
- untreated or directly brined olives (natural green, black or turning colour olives).

Thus, reduction of oleuropein levels can be obtained by means of treatment with NaOH or after its diffusion after placement fruit in brine (water + salt). Then, the fermentation process begins.

## A child-centric microbiology education framework

### **The microbiology of the process**

Lactic acid bacteria, especially *Lactiplantibacillus pentosus* and *Lactiplanticacillus plantarum*, are responsible for consuming the sugars present in the fruits and transforming them into lactic acid, which reduces the pH to levels (<4,3) that inhibit the growth of undesirable (spoilage) microorganisms. However, yeasts including *Wickerhamomyces anomalus*, *Pichia membranifaciens*, *Pichia galeiformis*, and *Saccharomyces cerevisiae*, are also present during fermentation (especially in directly brined olives) producing aromas, vitamins, esterases, etc., which also determine quality, safety and flavour of the final product.

### **How/when do we use and enjoy it?**

Table olives give us three basic flavours that our palate detect: salty, acid, and bitter. Thus, they can be used in any culinary recipe that we can imagine. They can be offered in several presentation forms such as whole, pitted, stuffed, seasoned, paste, etc. and eaten in the morning, afternoon or evening, mainly as snacks/appetizers, or used as ingredient of some dishes (salads, cocktails, pate, pizzas, etc.).

### **Variations, regional variations**

Apart from the three main types of commercial table olive elaborations mentioned above, there are also other types of specialties found throughout the world, such as Campo Real (Madrid, Spain), Aloreña (Málaga, Spain), Picholine (Provenza, France), Bella di Cerignola (Foggia, Italy), Ascolana del Piceno (Ascoli, Italy), or even dehydrated olives produced only with salt in the process that very popular in countries like Turkey and Greece.

### **Beneficial properties**

For centuries, the olive tree and its products have been related with magical and healthy properties. Table olives should have all the benefits attributed to olive oil, as well as other important components with proven biological activities present in high concentrations in the pulp, such as natural antioxidants like polyphenols, triterpenic acids or monounsaturated fatty acids like oleic acid, among others. Moreover, in recent years, diverse studies have also demonstrated the probiotic potential of the microorganisms involved in table olive fermentation, and how fermented olives can be a carrier of >10 million live microbes/g to the final consumer. The main nutritional drawback of table olives is their relative high content of sodium, which is partially acquired during the production process.

### **Cultural roots and importance**

Table olives have a rich history spanning many centuries in many countries of the Mediterranean Basin, where they have played an important role in the culture and diet. The oldest written reference on the preparation of table olives is assigned to the Roman Lucius Columella in the year AC 54 (*De Re Rustica*). Nowadays, worldwide table olive production is approximately 3 million tons/year, with important production areas, in addition to the Mediterranean basin, in South America, the United States and even Australia.



Example of different types of table olives elaborations and presentations processed around the world.  
Picture courtesy of ASEMESSA ([www.aseμεσα.es](http://www.aseμεσα.es))