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Fermented Foods: Olives[1]

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What are olives?

Olives are small fruit that grow on the olive tree, scientifically known as *Olea europaea*. These fruit have been cultivated and consumed for thousands of years, primarily in the Mediterranean region. Known for their distinct flavor and texture, olives are commonly used as a food ingredient, particularly in Mediterranean cuisine. There are many different varieties of olives, each with its own unique taste and characteristics. They can range in color from green to black, while variations in flavor and texture depend on the ripeness and processing method.

In addition to being a popular ingredient in salads, pasta dishes, and sandwiches, olives are also used to produce olive oil, which is widely recognized for its numerous health benefits and diverse culinary applications. A range of individuals can benefit from the nutritional profile and health-promoting properties of olives. Olives are rich in monounsaturated fats, which are known to be heart-healthy (Gorzynik-Debicka et al. 2018). These fats can help lower bad cholesterol levels (LDL cholesterol) and reduce the risk of cardiovascular diseases when consumed as part of a balanced diet. Olives can also benefit those looking to increase their intake of nutrients: Olives are a good source of vitamin E, iron, and calcium. Incorporating olives into meals can help individuals meet their nutritional needs and diversify their intake of essential nutrients (Mazzocchi et al. 2019; Rocha et al. 2020).

What are the potential health benefits of olives?

Table olives are a good source of vitamin E (Rocha et al. 2020). Vitamin E is a fat-soluble vitamin that acts as an antioxidant in the body (Rocha et al. 2020; Gillingham et al. 2011; Ferrara et al. 2000). It helps protect cells from damage caused by free radicals, which are unstable molecules that can lead to oxidative stress and contribute to various chronic diseases. The presence of vitamin E in table olives adds to their antioxidant properties. Vitamin E also supports immune function, maintains healthy skin, and promotes proper cell function (Rocha et al. 2020). While the specific content of vitamin E in table olives may vary depending on factors such as olive variety and processing methods, it is generally recognized as a beneficial component of table olives in terms of their potential health effects.

Olives contain monounsaturated fats that are good for your health in several ways (Gillingham et al. 2011). The consumption of table olives has been linked to a reduced risk of cardiovascular diseases (Xia et al. 2022; Guasch-Ferré et al. 2014). The monounsaturated fats in olives can help lower LDL cholesterol levels and improve the overall lipid profile (Ferrara et al. 2000).

What are the possible risks of consuming olives?

It is important to note that food producers usually preserve olives in brine, which has a high salt content. Over time, excessive intakes of salt can lead to high blood pressure, heart attacks, and stroke (Rocha et al. 2020; Hunter et al. 1993). Therefore, olives are appropriate to add to one's diet, but people should eat them in moderation (Hunter et al. 1993).

What are the methods of olive curing?

Olives can be cured in many ways, but these four are the most common:

Natural Brine Curing

In this curing process, olives are harvested and put into brine tanks within 24 hours. The brine, simply composed of sea salt and water, is maintained at an exact salinity. The process can take anywhere from 3 to 12 months, depending on the variety (Regoli 2016).

Lye Processing Before Natural Brine Curing

Often called a “Spanish cure,” lye processing before natural brine curing involves “cutting” the olives with lye (also referred to as caustic soda or sodium hydroxide). Once harvested, olives are washed in a lye solution for 8 to 12 hours. This process expedites the debittering process by quickly leeching out the oleuropein and phenolic compounds. Once this has been achieved, the olives are thoroughly washed up to three times to ensure no traces of lye remain. The olives are then put in natural brine to ferment—a process that allows bacteria present in the

brine to convert the naturally occurring sugars in the olives into lactic acid. Because it quickly debitters the olives, this process can take at least one month but no more than three (Regoli 2016; DeLallo, n.d.; Barbaro et al. 2014).

Salt Curing

In areas of the Southern Mediterranean, olives are typically salt-cured. This curing process originated due to the hot, arid climate, as well as the closeness of the sea for an unlimited salt supply. Once olives are harvested, they are placed in drums where they are alternately layered between sea salt. To promote dehydration, olives are rolled in their drums weekly. After bitter compounds have been removed, usually through water curing, olives are rinsed and coated with olive oil (Regoli 2016; DeLallo, n.d.).

Air Curing

In some instances, olives can be fermented either on the branch or, once picked, by exposure to hot temperatures and the sun. The resulting olive has an extremely chewy texture and a powerful bitterness (Hunter et al. 1993; Regoli 2016).

What are oleuropein and phenolic compounds?

Oleuropein is a natural compound found in olives and olive leaves. It belongs to a group of plant-based chemical compounds known as phenolic compounds, which have various health benefits. Phenolic compounds are known for their antioxidant and anti-inflammatory properties. Oleuropein is particularly abundant in green olives, giving them their characteristic bitter taste. It acts as a natural defense mechanism for the olive tree against pests and diseases. However, the processing of olives, such as curing or fermentation, can break down oleuropein, leading to a reduction in bitterness (DeLello, n.d.; Barbaro et al. 2014).

Phenolic compounds have been associated with various physiological effects, such as reducing oxidative stress; protecting against chronic diseases, including cardiovascular diseases and certain types of cancer; and promoting overall well-being (Regoli 2016; DeLallo, n.d.).

Oleuropein and other phenolic compounds in olives contribute to the fruit's potential health-promoting properties. However, it is important to note that the concentration of these compounds can vary depending on the olive variety, maturity, and processing methods.

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