Olive Oil Filtration

Why is Olive Oil Filtered?

Extra virgin olive oil is often filtered during the last step in its production process. The goal is to remove suspended solids and humidity, which give the oil a cloudy appearance that is less appealing to consumers.

Suspended solids derived from the olive fruit, such as sugars, proteins and phospholipids may encourage hydrolysis and rancidity in the oil at later stages of storage (see *Trends in Food Science & Technology 21 (2010):201*). Thus, their removal by filtration may be desirable since it is known that after twelve months of storage, filtered oil may keep intense positive attributes better than unfiltered oil mainly because of a slower rate of hydrolysis.

On the other hand, filtration also affects the color, sensorial and chemical attributes of the oil: fruitiness, pungency and bitterness may decrease with filtration, while rancidity defects may be more pronounced.

Filtration may also compromise other positive attributes of the oil by reducing the levels of chemical constituents, such as polyphenols.

Filtration and Polyphenols

Olive oil polyphenols, which have been touted by their anti-oxidant and anti-inflammatory health benefits, impact also some of the oil's sensorial traits (bitterness and pungency) and its shelf-life. It is, therefore, valuable to know how filtration affects olive oil's polyphenols levels.

A recent study at the University of Granada, Spain (*Food Chemistry 124 (2011):1146*) compared the effects of different types of filters: diatomaceous earth, pregelatinised starch and two types of cellulose: *Vitacel L90®* and *Filtracel®*.

Polyphenol levels were measured in the filters and in two oils before and after filtration: Picual (a high polyphenol oil) and Arbequina (with low polyphenols).

The study findings were:

• Starch and *Filtracel* filters selectively retained certain polyphenols in high-polyphenols Picual, but not in the low-polyphenols Arbequina. Mostly secoiridoids, a class of polyphenols known to affect flavor and shelf life, were found in the filters.

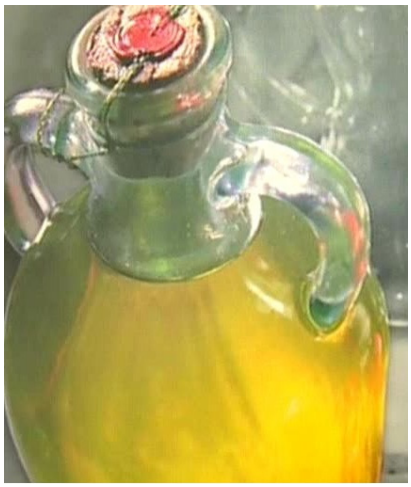
• Of all filters tested, *Vitacel L90®* cellulose retained polyphenols the least.

Also, when filters were compared as to filtration rate, diatomaceous earth was the slowest.

Conclusion

There are tradeoffs in filtering olive oil that affect not only the product's visual appeal, but also the intensity of its sensory attributes and potentially its shelf life. The goal of filtering should be water removal when it is present in large droplets, to avoid oil breakdown in storage.

When the decision is made to filter, the choice of filtration material is important, as it may adversely affect the level and composition of polyphenols in the olive oil.



What resources are available?

At Agbiolab we measure moisture and oil content for optimal harvest time, and evaluate fruit quality and polyphenols prior to milling. We also measure oil content, water content and polyphenols in pomace and vegetation water for a complete assessment of the milling process.

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