How Heating Affects Extra Virgin Olive Oil Minor Compounds and Quality Indexes

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Two monovarietal extra virgin olive oils from 'Arbequina' and 'Picual' cultivars were subjected to a heating treatment at 180ºC during 36 hours. Oxidation progress was monitored by measuring oil quality changes (peroxide value and conjugated dienes), and minor compound content.

Tocopherols and polyphenols were the most affected by the thermal treatment and showed the highest degradation rate although their behaviour was different for each cultivar. α-tocopherol loss was more important in 'Arbequina' oil whereas, total phenol content loss was greater in 'Picual' oil. The later showed an important decrease in hydroxytyrosol (3,4-DHPEA) and its secoiridoid derivatives (3,4-DHPEA-EDA and 3,4-DHPEA-EA), while lignans decrease was lesser. For 'Arbequina' oil these compounds remained stable, and a lowering tendency was observed for tyrosol (p-HPEA) and its derivatives (p-HPEA-EDA and p-HPEA-EA). In general, flavones content showed a decrease during heating, being higher for 'Arbequina' oil. On the other hand, oleic acid, sterols, squalene and triterpenic alcohols (erythrodiol and uvaol) and acids (oleanolic and maslinic) were quite constant, exhibiting a high stability against oxidation.

From these results, we can conclude that despite the heating conditions, VOO maintained most of its minor compounds and, therefore most of its nutritional properties.