What olive oil descriptors tell us about quality

How cultivars, harvest time, terroir and above all, milling practices determine sensory profiles and achieve quality (or not).

The big EVOO umbrella

A look at some chemical standards

	IOC	COOC	Premio Montiferru/TR E E	EVOOs of excellence
FFA	0.8	0.5	0.3	<0.20
Peroxides	20	15	10	<5
Phenol count	NR	NR	250	> 400 ppm (HPLC method)
Tocopherols	NR	NR	160	>160 ppm

The current EVOO chemical standards allow to include under the same denomination:

- Olive oils close to being virgin rather than EVOO (borderline ones).
- Olive oils with initial sensory problems (micro-fermentations and initial oxidations).
- Olive oils destined to have a short shelf life (high FFA and peroxides, high moisture content, low phenol count).
- Olive oils that are correct, without a problem, though limited/scarce in their sensorial characteristics.
- Good olive oils.
- Olive oils of excellence.

How Cultivars affect the sensory profile

- If they’re olive oil, table olive or dual purpose cultivars.
- Olive oil cultivars: Offer high yield, produce medium to high phenol content olive oils (i.e.: Arbequina, Frantoio, Maurino, Koroneiki, Coratina, Hojiblanca, Picual).
- Table olive cultivars: Offer low yield, produce low phenol content olive oils. Being high in water and sugars, and low in phenols, they have a high risk of fermentation (i.e.: Sevillano, Kalamata, Santa Caterina, Lucques).
- Dual purpose: if harvested quite green (when phenols are present), can behave as olive oil cultivars. When riper, they behave as a table olive cultivar (i.e.: Manzanilla, Nocellara, Barouni, Ascolano, Trilye).

Cultivars and chances of making a quality EVOO

- The first group (olive oil varieties) has the highest chance to make olive oils of quality, in terms of freshness, shelf life and achieving good phenol count.
- The third group (dual purpose varieties) present more challenges than the first group though very good olive oil can be made from it. The phenol count and therefore, durability, will be lower.
- The second chance very rarely make olive oil without issues, with good shelf life and they’re characterized by the absence of a significant phenol count (and therefore, prone to rapid decay).

Arbequina

Leccino

Ascolano

Coratina

Coratina

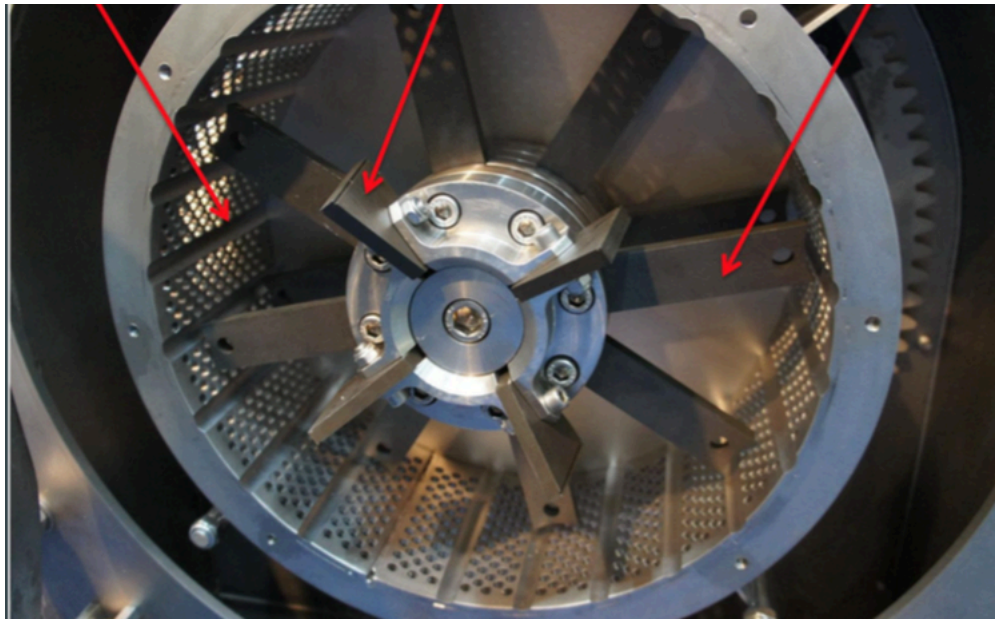
Sevillano (Gordal Sevillana)

Some cultivars offer specific sensory profiles

- Frantoio- Green almond / Artichoke/ Cardoon
- Coratina- Green almond / Artichoke/ Cardoon
- Buža- Green almond/Artichoke
- Ogliarola- Green almond / Artichoke/ Cardoon
- Leccino- Green almond / Grass/ if picked at ideal moment, Artichoke
- Trilye- Tomato leaf /Herbaceous/ sometimes Arugula.
- Picual/Hojiblanca- Tomato leaf / Herbaceous
- Mission- Tomato leaf/ Herbaceous
- Nocellara- Tomato leaf/Herbaceous
- Koroneiki-Tomato leaf/ Herbaceous/Floral/Green Banana


I THINK IT'S VARIETAL...

When are aromas formed? 75%-85% in the crushing.



Where do aromas get lost?

By using high temperatures (both at the crushing and while malaxing).

Excess use of water and high temperature in the decanter (particularly with the 3 phase system).

In storage, due to lack of enough phenol presence, or from other sources of decomposition (light, heat, self-oxidation from enzymatic activity).

Excessive malaxing time. Over 20’ will imply a loss from 10-70% of phenols and also, green aromas.

Malaxing time formula

(Loading malaxor time + emptying malaxor into decanter time: 2)

+

malaxing time

Total time of quality production

- The whole process from washing the olives to the extraction of the oil should be less than **one hour**.

Temperature, the main key to aromas

Low enzymatic activities	<60F	
Aldehydes	18-24C (60 - 75F)	green fruit aromas
Esters	18-24C (60 - 75F)	fresh floral aromas
Alcohols	25-28C (76-82F)	ripe fruit aromas
Loss of volatiles	29C and up (>82F)	

How to control temperature

- Terroir- First of all, not as important as in wine. Then, very important regarding weather patterns. The two more important are temperature and rainfall.
- Harvest time. Ideally, after some cold days.
- New equipment and solutions: harvesting in the coolest times of the day, refrigerated rooms or coolers, replacing hammer-mills for new crushers that don’t heat up as much, mills that are able to condition the temperature of the crusher and malaxer, if needed. When cooling, it’s good not to produce abrupt jumps (up or down) of temperature.
- Using low temperatures in the malaxer.

Where do aromas get lost, too?
In the stress (airation/oxygenation) of the final separator.

Freshness, essential aspect of quality

- Freshness is attained when milling olives at optimal ripeness with lower temperatures and short malaxing times. The type of mill will contribute or detract from this aim (i.e.: type of crusher, type of malaxer, final separator or not).
- The resulting olive oil will manifest the benefits of reduced stress/oxidation. Therefore, it'll express the true characteristics of the cultivar before these ones are affected by negative impacts (oxidations, enzymatic reactions, high temperatures, etc., all contributors of degradation).

How loss of freshness manifests

There's an overall loss of intensity and greenness.

- Green almond becomes ripe or dry almond
- Tomato leaf becomes green or ripe tomato
- Green banana becomes ripe banana
- Green apple becomes ripe apple
- Green floral becomes dry floral
- Other enzymes become active and overpower/dominate the green aromas (as it happens with some Ascolano, dominated by ripe tropical/ripe peach though sometimes retaining some tomato leaf).
- More serious cases (due to oxidation) are grass becoming hay or the oil becoming buttery.

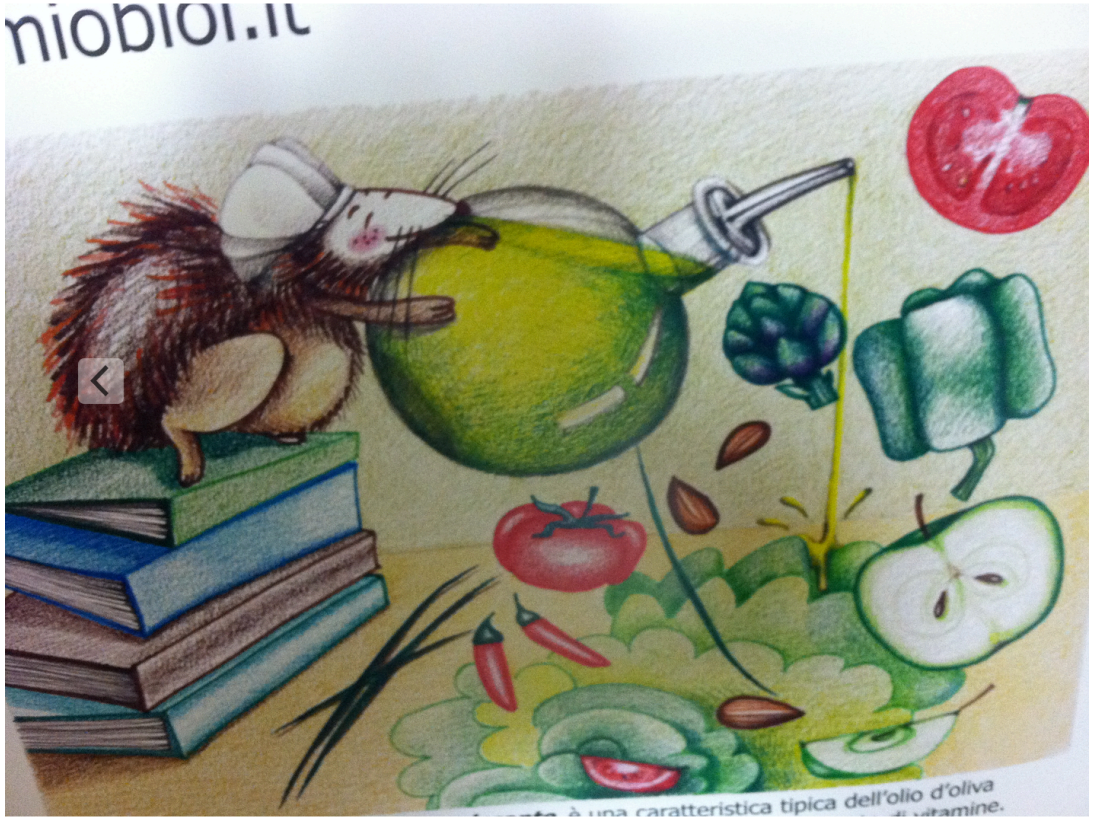
Why phenol content is important

- It’s the most important element of the nutritional value of olive oil: these powerful anti-oxidants with anti-inflammatories properties, delivered in a fat matrix (fat soluble).
- For durability and shelf life. A good olive oil will age gracefully, without defects, from, at least, harvest to harvest.
- It’ll indicate a well crafted, well structured olive oil.
- It’ll mean thoughtful / careful milling practices.
- Not all cultivar can reach the same level of phenols, though you can have a good count (specific to each variety) with most of them.

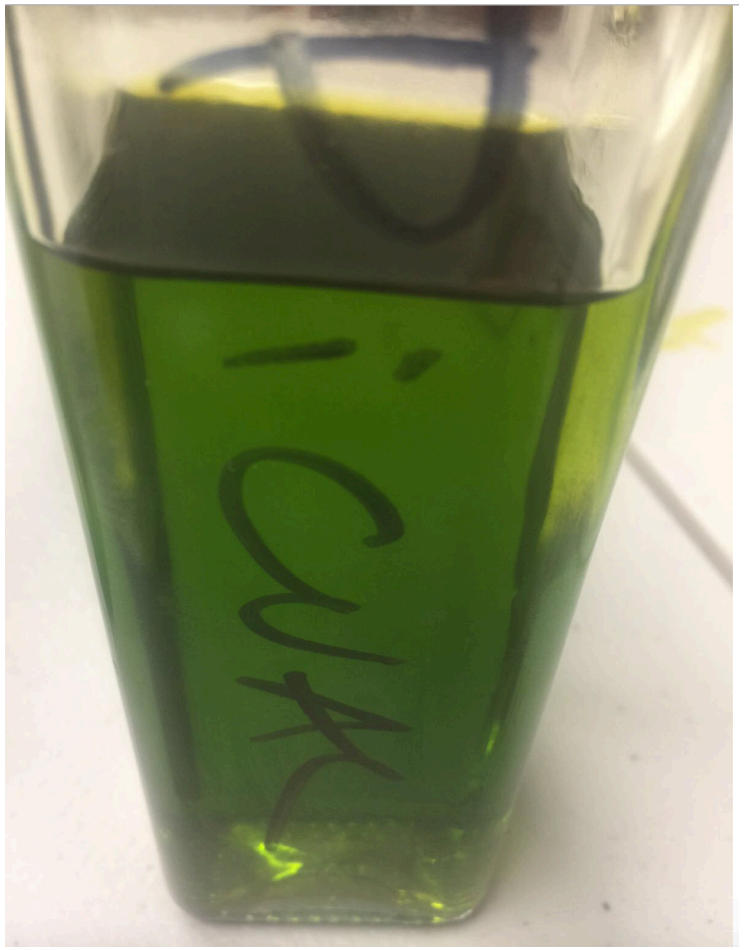
Where do phenols get lost?

- By physical contact with water.
- By hydrolysis (through hydrophilic enzymes).
- By oxidation.
- By enzymatic action, when temperatures over 27C are reached (enzymes peroxidase and lipoxidase, in the pit, produce peroxidase in presence of O2, and enzymes in the pulp, also in presence of O2, produce poliphenolixdase –a degradation of phenols).

Education- Key for the existence of EVOOs of excellence (picture from BIOL, Puglia, Italy).



The best education? A good product.



We are, collectively, creating an olive oil culture- An exciting time.