

# Impact of simulated winter and summer transportation conditions on olive oil physicochemical-sensory quality

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## Introduction and objectives

Extra virgin olive oil (EVOO) is prone to lipid oxidation



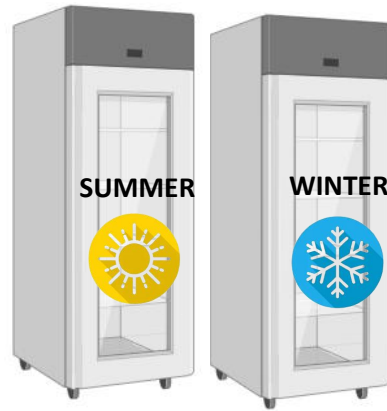
EVOO must preserve its chemical and sensory attributes throughout storage and transport, especially for long-distance exports.



This study investigated how temperature variations during transportation affect the quality of two EVOOs, under two simulated scenarios:

## Materials and methods

EVOO → Ripe & Light green oils



Plastic



Glass

Free acidity (FA)

Peroxide value (PV)

K<sub>232</sub> and K<sub>268</sub>

Antioxidant capacity: DPPH and TRC

Sensory analysis

45 Days Simulated Transportation Scenarios

T0 T15 T30 T45

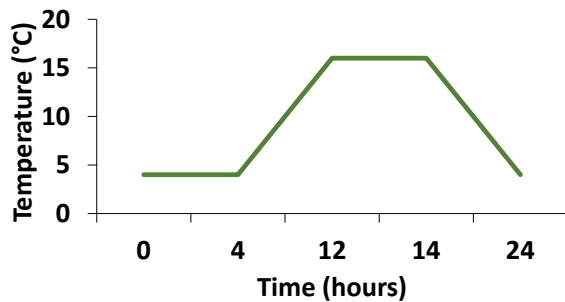


Fig.1 – Winter-like conditions (Temperature °C)

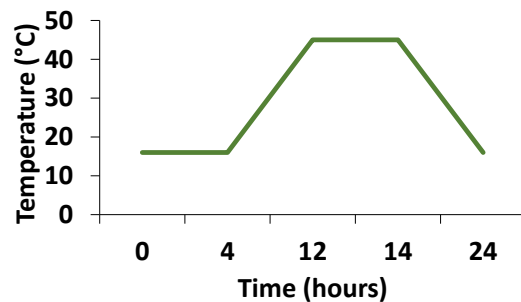


Fig.2 – Summer-like conditions (Temperature °C)

## Results and discussion

### Quality parameters

- The EVOO **quality parameters** remained within the legal thresholds during the 45 days of simulated winter and summer transportation conditions
- Progressive quality decline related to the raise of FA, PV, K<sub>232</sub> and K<sub>268</sub>

### Sensory analysis

- **Rancid defect** appeared in **ripe oils** stored in plastic bottles after 15 days for both transportation simulated conditions: EVOO → downgraded to VOO
- **Rancid defect** appeared in **light green oils** stored in plastic and glass bottles after 30 days for both transportation simulated conditions: EVOO → downgraded to VOO

### Antioxidant capacity

- **DPPH decreased** over time for both simulated transportation conditions for plastic and glass packaging: ~ 56% in ripe oils ~ 61% in light green oils
- **Total Reducing Capacity** sharply decreased under summer-like transportation conditions for **ripe and light green oils** stored either in plastic or glass

## Conclusion

Temperature fluctuations, during simulated transportation scenarios, especially under summer-like conditions, negatively affect the physicochemical-sensory quality of oils, emphasizing the importance of proper transport conditions.

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