

Impact of pouch packages on olive oil shelf-life stored at 30 and 40°C

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Introduction

Olive oil is highly prone to oxidation



Oxidation rates depend on storage conditions and packaging

Objectives

- Evaluate pouches as a packaging alternative for extra virgin olive oil (EVOO) storage
- Develop pseudo kinetic models to determine EVOO shelf-life (SL)

Pseudo kinetic models

$$\frac{dc}{dt} = k \times c^n$$

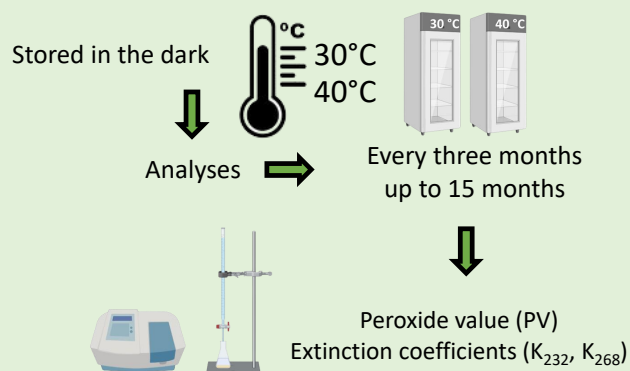
- c: parameter of interest
- t: storage time
- k: reaction constant rate
- n: reaction pseudo order (0, 1 or 2)

Materials and methods



Greenly Soft
EVOO

Greenly Intense
EVOO

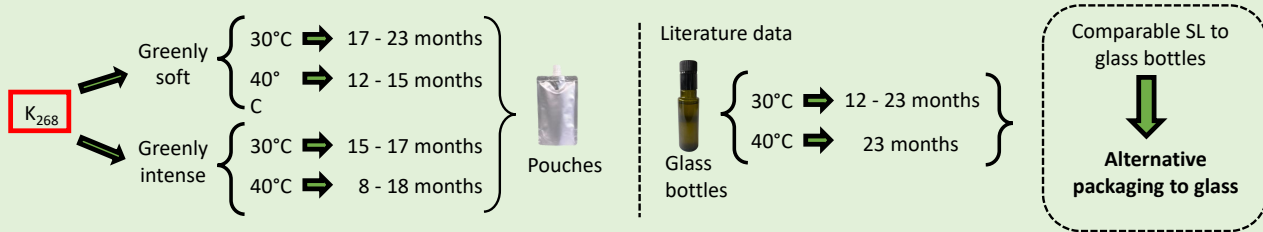


Results and discussion

Parameter	Temperature (°C)	Kinetic model	k	SL _{predicted} (months)
PV	30	2nd order	0.0050	20
	40	2nd order	0.0069	15
K_{232}	30	1st order	0.0153	23
	40	1st order	0.0222	16
K_{268}	30	2nd order	0.2601	17
	40	2nd order	0.3789	12

Parameter	Temperature (°C)	Kinetic model	k	SL _{predicted} (months)
PV	30	2nd order	0.0084	15
	40	2nd order	0.0069	18
K_{232}	30	Zero order	0.0048	17
	40	Zero order	0.0098	8
K_{268}	30	2nd order	0.1752	15
	40	Zero order	0.0098	8

- Closed glass bottles $\xrightarrow{\text{Literature}}$ after O_2 is consumed, secondary oxidation reactions start \Rightarrow K_{268} \Rightarrow Emerged as the best quality parameter to estimate SL of EVOO quality grade
- Pouches \Rightarrow lighter in weight than glass bottles \Rightarrow easier and more cost-efficient to transport \Rightarrow more resistant to breakage and damage than glass



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