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MEETING ABSTRACT OP

Determination of the shelf life of olive oil using prediction models

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Abstract: The quality and shelf life of olive oil are critical factors determining its nutritional value, sensory attributes, and commercial acceptance. Predicting oxidative stability and shelf life through mathematical modeling has emerged as an efficient approach to support quality control and optimize storage conditions (Mendez et al., 2021). Key indicators such as peroxide value, oxidative stability index (OSI), phenolic content, and volatile profile are analyzed as predictive markers. First and zero-order kinetic models are evaluated for their ability to describe degradation rates of critical quality parameters under accelerated storage conditions. Models incorporating the Arrhenius equation provide temperature-dependent reaction rate constants, allowing extrapolation to real storage scenarios. Furthermore, chemometric techniques are used to improve prediction accuracy of the models. The combining kinetic and multivariate models enhances the precision of shelf-life estimations of olive oil compared to single-parameter analyses based on storage conditions and desired confidence levels (Khalil et al., 2023). This study reviews the principal mathematical models applied to estimate the shelf life of olive oil, focusing on kinetic modeling of oxidation reactions, Arrhenius-based temperature dependence, and multivariate predictive tools integrating physicochemical and sensory parameters.

Keywords: Olive Oil, shelf life, Arrhenius, kinetics

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