Design of microparticles of walnut oil using biopolymers along with antioxidants through spray drying technology

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Abstract

Walnut oil (WO) has composition of bioactive compounds such as phytosterols, tocopherols, polyphenols and fatty acid of type omega 6 and 3. However, the presence of polyunsaturated fatty acids (PUFA) makes the WO susceptible to oxidation, generating unpleasant odors and flavors (Calvo et al., 2012). In this context, microencapsulation through spray drying technique, using different biopolymers as encapsulating agents, has been proposed as an effective, economic and scalable alternative to protect oils (Bakry et al., 2016). However, since the oxidation of the oil continues during storage, the incorporation of antioxidants has been proposed. The objective of this work was to study the effect of different designs of WO microparticles varying the location of the antioxidant ethyl gallate (EG) in the parameters of encapsulation and oxidative stability of WO. Three systems of microparticles of WO were studied, using maltodextrin (MD) as encapsulating agent: (1) microparticles based on emulsion of WO without addition of EG (WO-MD); (2) microparticles based on emulsion of WO with EG in the dispersed phase (WO-EGO-MD) and (3) microparticles based on emulsion of WO with EG in the continuous phase (WO-EGA-MD). The WO-EGO-MD system presented the lowest values of TBARs formation and the lowest interfacial tension. This suggest that adding EG as an antioxidant in the dispersed phase would be more effective in preventing the oxidation of the AN, suggesting an arrangement of the EG in the oil-water interface.

Biography

Denisse Andrea Cáceres Pavez is an Agricultural Engineer. She has obtained her Master's degree in Agricultural Sciences from The University of Chile. Currently, she is a Doctoral candidate in Nutrition and Food from the Universidad de Chile. She is Laboratory Researcher of Microencapsulation Laboratory of Faculty of Chemical and Pharmaceutical Sciences, University of Chile. She has presented in the Congress of the Agronomic Society in Chile, and has one publication in the journal *Postharvest Biology and Technology*.

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