

Physical stability of nanoemulsions with emulsifier mixtures: Replacement of tween 80 with quillaja saponin

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Consumer demand for "natural" products has led the food industry to substitute synthetic ingredients with others of natural origin. Nanoemulsions are thermodynamically unstable systems, so an emulsifier is necessary to maintain their stability during processing and storage. The aim of this work was to study the replacement of a synthetic emulsifier (Tw80: Tween 80) with one of natural origin (QS: quillaja saponins), evaluating its effect on the physical stability of nanoemulsions under different treatments (ionic strength and temperature). Avocado oil-based nanoemulsions were prepared using different emulsifier mixtures: 5% soy lecithin (SL) and 1% Tw80, which was replaced by different QS proportions (1:0, 3:1, 1:1, 1:3, 0:1 Tw80:QS). Results showed that by increasing QS proportion particle size, polydispersity index and electronegativity of nanoemulsions also increased. All nanoemulsions remain stable after centrifugation process, since no creaming formation was observed. The ionic strength treatment had an effect on zeta potential values, but not on PS. The incorporation of quillaja saponin in nanoemulsions increases their thermal stability. Thus, the ternary emulsifier mixture (Tw80-QS-SL) can be used in the elaboration of pasteurized and sterilized emulsion-based food products.