

**Title:** Usage of sugar ester in the preparation of avocado oil nanoemulsion

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**Abstract:** Objectives: Due to the high dynamics of pharmaceutical products markets, developments of new products using latest innovative technology are becoming a norm of many pharmaceutical companies. Nanoscale materials such as nanoemulsion (NE) offer advantages such as the controllable droplet size, long-term stability, and power solubilization ability. It is beneficial in various delivery systems either for transdermal, ocular, nasal, vaginal, and parenteral drug delivery. The objective of the study was to prepare avocado oil NE using different surfactants to find the most suitable nanosized droplets, as avocado oil offers a variety of purported nutritional and medicinal benefits. Methods: Sucrose esters, glycerol, and avocado oil with different ratio were used to produce pre-NE by phase inversion technique then pre-NE were self-emulsified with water to produce NE. The influence of the sucrose esters surfactants on the NE formulations were determined using three different types of sucrose esters surfactant (laureate, oleate, and palmitate). Stability study was conducted for NE at different temperatures (4°C, 25°C, and 40°C) for 6 months. Results: The NE contained sucrose laureate produced best nanosized formulations compared to other oleate and palmitate, with optimum droplet size  $106 \pm 1.70$  nm, size distribution  $0.156 \pm 0.01$ , and zeta potential  $-30.4 \pm 0.70$ . The NE formulations were very stable at 4°C compared to 25°C and 40°C while at 25°C NE showed moderate stability, but it was unstable at 40°C. Conclusion: Sucrose laureate was able to produce NE with phase inversion and self-emulsification techniques and the ideal storage condition for NE is 4°C.