

**Effect of processing conditions on physicochemical properties of sodium caseinate-stabilized astaxanthin nanodispersions.**

ABSTRACT

The aim of the present study was to investigate the preparation of sodium caseinate-stabilized astaxanthin nanodispersions as potential active ingredients for food formulations in order to optimize processing conditions. Nanodispersions containing astaxanthin were prepared by an emulsification–evaporation processing technique. The influence of the processing conditions, namely, the pressure of the high-pressure homogenizer (20–90 MPa), the number of passes through the homogenizer (0–4) and the evaporation temperature (16–66 °C) on the physicochemical properties of the prepared astaxanthin nanodispersions were evaluated using a three-factor central composite design. Average particle size, polydispersity index (PDI) and astaxanthin loss in the prepared nanodispersions were considered as response variables. The multiple-response optimization predicted that using three passes through the high-pressure homogenizer at 30 MPa for the preparation of the astaxanthin nanoemulsion and then removing the organic phase (solvent) from the system by evaporation at 25 °C provided astaxanthin nanodispersions with optimum physicochemical properties.

**Keyword:** Astaxanthin; Sodium caseinate; Nanodispersions; Emulsification-evaporation; RSM.