

A new oil-based-double emulsion microcarriers for enhance stability and bioaccessibility of betalains and phenolic compounds from Opuntia fruit green extracts

CANO M. (1), PARRALEJO-SANZ S. (1), GEZ-LEZ I. (1,2), LOBO G. (3)

1 Instituto de Investigaci en Ciencias de la Alimentaci (CIAL) Madrid Consejo Superior de Investigaciones Cientificas, Madrid, Spain

2 Nutrition and Obesity group, Department of Nutrition and Food Science, Faculty of Pharmacy, University of the Basque Country (UPV/EHU), Vitoria, Spain

3 Instituto Canario de Investigaciones Agrarias (ICIA), Tenerife, Spain

In this work, two formulations based on double emulsions W1/O/W2 of different composition have been developed to efficiently encapsulate the green extracts obtained from Opuntia fruit tissues. These green Opuntia extracts are rich in betalains and phenolic compounds, what gives them a high potential biological interest. The study of the physical-chemical characteristics of the double emulsions obtained, their stability, and their encapsulation capacity of each individual compound of betalains and phenolic compounds present in the extracts has been carried out by means of HPLC-DAD coupled to a mass spectrometry detector (LCMS SQ 6120, Agilent) with an electrospray ionization (ESI). Likewise, the microscopy study of the double emulsions and their evolution during static gastro-intestinal digestion in vitro were conducted, evaluating the stability of the individual bioactive compounds during the different phases of digestion and their improved bioaccessibilities due to the protection produced by its encapsulation. This research was funded by the Spanish Ministry of Science and Innovation, project number PID2020-118300RB-C21.