PO105 - 24968 - CHARACTERIZION AND BIOACCESSIBILITY OF β-CAROTENE ENCAPSULATED ON MICROCAPSULES PRODUCED WITH STARCH AND PROTEIN FROM AMARANTH GRAIN

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Abstract

β-carotene is a carotenoid that, due to its scavenging free radicals property, presents a wide spectrum of biological activities (e.g., anti-cancer, anti-hypertensive, and anti-inflammatory). However, they are quite unstable under certain intrinsic food physicochemical properties and processing conditions, which limit their food application. In this work, β-carotene was encapsulated to improve its stability and bioavailability. Starch and protein extracted from Amaranth seed were used as materials for β-carotene microencapsulation by atomization. The encapsulation efficiency, particle size, ATR-FTIR, β-carotene stability and bioaccessibility were assessed. The total amount of b-carotene encapsulated in starch and protein microcapsules was 10 mg/L. The encapsulation efficiency was 68.62 ± 0.22% for starch-based and 64.09 ± 0.31% for protein-based microcapsules. The average size of the microcapsule composed of Amaranth protein and starch was 2.22 ± 1.84 µm and 1.55 ± 1.12 µm, respectively. The absorption bands in β-carotene are observed, FTIR spectra of the microcapsules exhibited peaks corresponding to 3,005 cm^{-1}, confirming the presence of the -OH stretch bond, the microcapsule spectra manifested distinctive peculiar peaks at 1,455 cm^{-1}, and stretching CH at the aromatic ring. Starch and protein-based microcapsules with β-carotene were stored under different conditions for 90 d (37 °C in the dark; at room temperature in the dark; at room temperature under lighting conditions; and at 8 °C in the dark). The stability of β-carotene within the protein microcapsules was better, even at higher temperatures than within the starch microcapsules. This could be due to protein higher retention network that can act as a physical barrier that isolated and protected the compound from external factors. The β-carotene bioaccessibility was 4.5 ± 1.2% and 5.7 ± 0.8%, for starch and protein, respectively. Results obtained suggest that starch and protein from Amaranth can be considered as potential wall materials for β-carotene encapsulation.

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