

Poster 43 Development and characterization of b-carotene microcapsules composed of starch and protein extract from Amaranth

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Studies that have explored the use of biopolymers of Amaranth as encapsulating materials for bioactive compounds^{1,2,3} demonstrate that it is possible to isolate and encapsulate bioactive compounds with Amaranth biopolymers. Therefore, the added value of Amaranth can be increased, evidenced and studied through the extraction of its compounds and the formation of microcapsules. The objective of this study was the evaluation of the ability of Amaranth biopolymers to microencapsulate a bioactive compound - β -carotene. The microencapsulation was performed by spray drying⁴, and β -carotene was added to the Amaranth (*Amaranthus cruentus*) starch or protein through a solution prepared at the ratio of 1:10 (polymer: β -carotene) in corn oil (1 %). The microcapsules were characterized by mean diameter (volume%), particle size distribution, microcapsules morphology by epifluorescence microscopy, microstructure by scanning electron microscopy (SEM), Fourier Transform infrared spectroscopy (FT-IR) and by measuring encapsulation efficiency. Microcapsules exhibited an average size of $2.22 \pm 1.84 \mu\text{m}$ and $1.55 \pm 1.12 \mu\text{m}$ for microcapsules composed of Amaranth protein and Amaranth starch, respectively. The microscopy images of both microcapsules showed good sphericity and presence of fluorescence, which indicates good encapsulation capacity of β -carotene. FT-IR results showed no differences between spectra of all samples, which indicates that there was no chemical bonding between the capsules and β -carotene, but rather an entrapment of β -carotene into starch and protein microparticles. The encapsulation efficiency was 71.29 % and 69.32 % for Amaranth starch and protein microcapsules, respectively. Therefore, it can be concluded that the biopolymers extracted from Amaranth can be considered good encapsulating agents for bioactive compounds, thus valorising their use in food formulations.

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