

Characteristics, stability and release of peanut sprout extracts in powdered microcapsules by spray drying

ABSTRACT

This study was carried out to investigate the characteristics of powdered microcapsules from peanut sprout extracts prepared by spray drying. The microcapsules were made from medium-chain triglyceride (MCT) as primary coating material and whey protein concentrate (WPC) or maltodextrin (MD) as selected secondary coating materials. The microcapsule studies conducted were microphotograph, scanning electron microscopy (SEM), Fourier-transform infrared (FT-IR), particle size, moisture contents, sorption, zeta potential, storage stability, and in-vitro study. The surface of microcapsules coated with WPC were rough and smooth, and particle size ranged from 2.86 to 8.59 μm . An FT-IR study revealed that absorption bands at 1,537 and 1,657 cm^{-1} of microcapsules can be attributed to the protein amide I and II bands of WPC overlapped by the conjugated C=C. The moisture content was 1.33% in the microcapsules coated with WPC. The moisture sorption increased until 18% at the 90% RH. The yield of peanut sprout extracts from microcapsules was 89.01%. In the in-vitro study, the microcapsules released 2.48 and 6.01% at pH 2.0 and 4.0, respectively, in simulated-gastric fluid, and 61.07 and 89.24% at pH 6.0 and 8.0, respectively, in simulated-intestinal fluid. The preservation rate of the microcapsules dropped down to 60.43% from 89.01% during six months of storage. The stability of peanut sprout extracts in the microcapsules was over 80% at 4 and 20°C during 10-day storage. The zeta-potential of microcapsules was stable with 30 mV. Based on the data obtained from the present study, the powdered peanut-sprout-extract microcapsules coated with WPC exhibited high stability during storage. Therefore, the powdered microcapsules by spray drying may be useful as a functional ingredient.

Keyword: In vitro; Microencapsulation; Peanut sprout extracts; Spray drying; Stability; Whey protein concentrates (WPC)