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## Design and evaluation of the release characteristics of caffeine-loaded microcapsules in a medicated chewing gum formulation

Nima Mohammadi Islamic Azad University, Iran

The aim of this study was to microencapsulate caffeine by the emulsion technique, trying to control its release from a medicated chewing gum. Three formulations were prepared using alginate, alginate-starch, and alginate-starch with chitosan coating as the wall materials. These microcapsules were characterized with regard to the morphology studied by using an optical microscope and scanning electron microscopy (SEM), particle size, and encapsulation efficiency. The microcapsules were then incorporated into the chewing gums. The chewing gums were characterized by thermal behavior (by differential scanning calorimetry [DSC]), texture profile analysis [TPA], and sensory evaluation. Furthermore, the release of caffeine from the chewing gum was studied *in vitro* using the masticatory simulator and *in vivo* by a chew-out study. The microcapsules revealed a spherical form and high encapsulation efficiency, representing the success of the technique. The outcomes indicated that it is possible to encapsulate caffeine with the techniques employed and the microcapsules prolonged the release of caffeine throughout mastication. The chewing gum containing alginate-starch with chitosan-coated microcapsules showed the great potential of the microcapsule in controlling the release of the caffeine from the chewing gum, thereby delaying its bitterness.

## **Biography**

Nima Mohammadi is from Islamic Azad University and working under professor Shabnam Haghighat in Iran.

nima.mohammadi@yahoo.com

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