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# Reverse-enteric iron microencapsulation with blend of chitosan and maltodextrin using spray drying: Tea fortification

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Iron deficiency is a major contributor to maternal death in developing countries. Iron fortification of staple foods is a cost-effective method of combatting iron deficiency anemia. To maintain iron bioavailability and to prevent its reaction with other food components or fortificants, iron compounds must be encapsulated. In this project iron containing microcapsules were prepared with chitosan and blended with maltodextrin using spray drying followed by spray coating with soy stearin. Process parameters were optimized for yield, encapsulation efficiency and stability of microcapsules. Effect of different concentration of chitosan (0.2-1.5%), composition of wall material and iron loading (10-40% $FeSO_4$, w/w of total solids) on the bioavailability, particle morphology and surface iron exposure were evaluated. Findings: Iron release kinetics of microcapsules at pH 1, 4, 7 for 2 hours showed highest release (90%) within 30 min under stomach conditions (pH 1) and least (15%) at pH 7, exhibiting reverse-enteric behavior. External morphology of iron microcapsules, using SEM, revealed spherical structure with minimum cracks and deformations on the surface. Particle size as analyzed by SEM was in the range of 1.97-10.80 m. Microcapsules prepared by 40 % $FeSO_4$ coated by chitosan released only 24 % of the added iron at 95±5°C after 30 min, while addition of maltodextrin and spray coating with soy stearin releases only 20% - making it suitable for the fortification of "tea" – a staple that is widely consumed in South Asian countries with extensive iron deficiency, and thus may contribute to Saving Lives at Birth

## Biography

Dr. Juveria Siddiqui is a post-doctoral fellow in Professor Diosady's Food Engineering group. Her prime research interest is to understand the function of bioactive dietary components, their beneficial effects in human health, and nutraceutical development. The focus of her present research is the micronutrients fortification through development and optimization of iron-containing reverse-enteric coated micro-particles using spray drying technique. She is a recipient of research award from prestigious Schlumberger Foundation's "Faculty for the Future" competition for young scholar

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