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The Microencapsulated Ascorbic Acid Release *in Vitro* and Its Effect on Iron Bioavailability

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This study was carried out to examine the stability of microencapsulated ascorbic acid in simulated gastric and intestinal situation *in vitro*, and the effect of microencapsulated ascorbic acid on iron bioavailability. Coating materials used were polyglycerol monostearate (PGMS) and medium-chain triacylglycerol (MCT), and core material were L-ascorbic acid and ferric ammonium sulfate. When ascorbic acid was microencapsulated by MCT, the release of ascorbic acid was 4.7 at pH 5 and 13.2% at pH 2 in simulated gastric fluids during 60 min. When ascorbic acid was microencapsulated by PGMS, the more ascorbic acid was released in the range of 9.5 to 16.0%. Comparatively, ascorbic acid release increased significantly as 94% and 83% coated by MCT and PGMS, respectively, for 60 min incubation in simulated intestinal fluid. In the subsequent study, we tested whether ascorbic acid enhanced the iron bioavailability or not. In results, serum iron content and transferrin saturation increased dramatically in group consumed by both encapsulated iron and encapsulated ascorbic acid, compared with those in groups with uncapsulated iron or encapsulated iron without ascorbic acid. The present data indicated that microencapsulated ascorbic acid with both PGMS and MCT were effective means for fortifying ascorbic acid into milk and for enhancing the iron bioavailability.