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WHEY PROTEIN BASED MICROENCAPSULATION OF BIOACTIVE COMPOUNDS AND PROBIOTICS

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Ginsenosides is a group of the bioactive compounds in ginseng. Its application in functional dairy foods is limited due to the bitter taste and yellowish color of ginsenosides. Using polymerized whey protein as the wall material to encapsulate ginsenosides may effectively mask its bitter taste and improve the color. Probiotics are widely used in functional fermented foods. Polymerized whey protein based microencapsulation of probiotics might improve their survivability during digestion. The results showed that entrapment yield of the microencapsulated ginsenosides and *Lactobacillus Acidophilus* (*L. Acidophilus*) was $95.46 \pm 1.95\%$ and $92.90 \pm 3.97\%$, respectively. The probiotic yogurt chemical composition, texture, syneresis, viscosity and sensory properties were analyzed and compared between the experimental sample and the control. There was no significant difference in moisture and ash content between the experimental and the control sample ($p > 0.05$). The yoghurt with microencapsulated ginsenosides displayed the higher viscosity, gumminess, hardness and adhesiveness. The syneresis of experimental sample was significantly lower than that of the control ($p < 0.01$). Sensory evaluation (score scale 1-5) showed that the acceptability score of the experimental yoghurt (3.7) was much higher than the control (1.6). The population the probiotic was above 10^6 CFU/ml in the yoghurt for the first six-week storage. Results showed that the microcapsules of *L. Acidophilus* were intact after treated by gastric juice but *L. Acidophilus* were released in the small intestine juice while the free cells had died out. The results indicated that the polymerized whey protein based microencapsulation might be an effective technique to mask bitter taste and improve the color of probiotic yoghurt containing ginsenosides. They could be released from the capsules in small intestine. And the polymerized whey protein based microencapsulation might protect *L. Acidophilus* from the acidic gastric juice.

Biography

Mingrui Guo is a Food Chemist and Full Professor in the Department of Nutrition and Food Sciences at the University of Vermont (UVM), USA. He received his BS and MS from the Northeast Agricultural University (NEAU), Harbin, China. He was awarded his PhD degree from the National University of Ireland in 1990. In 1993, he joined the Department of Animal and Food Sciences at UVM. He was recruited as Associate Professor in the Department of Nutrition and Food Sciences at UVM in 1999 and promoted to Full Professor in 2007. He teaches Functional Foods: Principles and Technology at UVM. His scholarly interests include the utilization of whey in creating environmentally safe products; functional foods development, pre- and probiotics; component interactions in infant formula and nutritional products; biochemistry and technology of fermented dairy products; He published the first textbook on functional foods in the US in 2007. He has published more than 150 research articles, book chapters and conference proceedings.

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