Entrapment in food-grade transglutaminase cross-linked gelatin-maltodextrin microspheres protects Lactobacillus spp. during exposure to simulated gastro-intestinal juices

Dietary intake of probiotic bacteria has been shown to impart health effects, however, maintaining viable cells in foods and during passage of the adverse conditions in the upper gastro-intestinal tract is often a problem. The objective of this research was to develop and characterize novel food-grade phase-separated gelatin-maltodextrin (G-MD) microspheres, where the gelatin was cross-linked with transglutaminase (TGase), to determine if encapsulated probiotic lactic acid bacteria were protected during exposure to simulated upper gastro-intestinal tract conditions. The stability, size, structure and protective ability of G-MD microspheres as a function of different TGase concentrations and gelatin bloom strengths were tested. The G-MD microspheres made with gelatin A 300 bloom and a TGase concentration of 10. U/g prevented pepsin-induced degradation of the microspheres in simulated gastric juice (pH 2.0, 2 h, 37 °C), resulting in significantly (p.