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Development of milk chocolate supplemented with microencapsulated *Lactobacillus plantarum* HM47 and to determine the safety in a Swiss albino mice model

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Abstract

Our study aimed to evaluate the survivability and safety of *Lactobacillus plantarum* HM47 strain supplemented in milk chocolate during storage and transit through gastrointestinal tract of mice. The milk chocolate was supplemented with microencapsulated *Lactobacillus plantarum* HM47 isolated from human breast milk. Water activity (a_w), pH, and sensory attributes of the milk chocolates containing *L. plantarum* HM47 were analyzed. The HM47 were found to be viable up to 180 days of storage at 25°C (>8 log CFU/g) and the overall acceptability results suggested that the addition of probiotic had no significant effect ($p>0.05$) on the sensory attributes of the milk chocolate. An acute oral toxicity of the microencapsulated *Lactobacillus plantarum* HM47 in albino mice demonstrated no treatment related illness or mortality and feed consumption when compared to control mice. The 28 day administration of probiotic powder and probiotic milk chocolate to mice demonstrated that there was no observed adverse effect in the haematological parameters and vital organs of mice. Also the consumption of the probiotic powder and probiotic milk chocolate significantly ($p<0.05$) enhanced the intestinal lactic acid bacteria (LAB) count and suppressed the enteric pathogenic bacterial count in mice suggesting the colonization of HM47 in the intestine. Thus, the present study suggest that the milk chocolate could be used as a good