

Encapsulation of *Lactobacillus reuteri* 20016 with alginate/psyllium and evaluation in simulated gastrointestinal condition

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Background and Aims: A number of health benefits have been claimed for probiotic bacteria such as *Lactobacillus reuteri*. Microcapsulation of probiotic bacteria can be used to enhance the viability during processing, and also for the targeted delivery in gastrointestinal tract. This article describes preparation and characterization of beads of alginate and psyllium containing *Lactobacillus reuteri*.

Methods: Different formulations containing alginate (ALG) and alginate-psyllium (ALG-PSL) as mono and three layers were prepared using extrusion technique. The prepared beads were characterized in terms of size, morphology and surface properties, encapsulation efficiency, viabilities in acid medium (pH 1.8, 2h) and release in intestinal pH conditions. The results showed that spherical beads with narrow size distribution, encapsulation efficiency higher than 95% were achieved. Furthermore, addition of PSL into ALG increases number of bacteria in intestinal condition after 10 hours.

Results: Incorporation of PSL into alginate beads improved viability of the bacteria in acidic conditions as well as bile conditions. Also stimulating effect of PSL on the probiotic bacteria was observed through 10 h incubation in intestinal pH solution.

Conclusions: According to our invitro studies, PSL in the beads not only produced similar protective effect of ALG on *L. reuteri* against acid conditions, but it also showed a stimulating effect on the bacteria. Therefore PSL can be a suitable polymer candidate for partial substitution with ALG for probiotic coating.

Keywords: *Lactobacillus reuteri*; Alginate; Psyllium; Microcapsulation