

## **A new mixed ca-alginate-carob galactomannan gel to preserve viability and cholesterol assimilation capacity of probiotics**

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This study aimed to use the extracted galac-tomannan of the carob seeds endospermes in the development of a mixed calcium alginate gel for the encapsulation of a new human isolated strain of *Lactobacillus rhamnosus* LBRE-LSAS compared with the probiotic strain of *Bifidobacterium animalis* subsp. *lac-tis* Bb12. Influence of microencapsulation was tested under deleterious digestive envi-ronment (bile secretions and stomach acidity), to verify if both bacteria preserve their viability and their cholesterol assimilation capacity. High viable loads of 6.97 and 8.66 of 9 Log CFU. g<sup>-1</sup> of LBRE-LSAS and Bb12 were registered, respectively. Conversely, the non-encapsulated bacterial levels strongly ( $P < 0.05$ ) decreased during exposure to the diges-tive simulated conditions. We suggests that the galactomannan gel employed herein was advantageously incorporated in the alginate matrix, allowing more rigidity to beads, de-spite probable different acid and bile salt tolerances of the assayed bacteria.

The effects of the galactomannan –ca-alginate mixed gel on cholesterol uptake abilities of the same bacteria are shown in figure 1. The both strains were able to assimilate cholesterol in the presence of 3 g L<sup>-1</sup> bile. Our new galactomannans beads seems to enhance Bile survival which regarded as required condition for better efficacy of probiotics. The cholesterol uptake capacity was conse-quently boosted in the protected cells compared with the non-encapsulated ones.

According to the obtained results, we succesfully introduce galactomannan in the ca-alginate gel matrix. The new gel formed permit to improve 1.8-fold on average the cholesterol assimilation capacity of probiotic bacteria.

Considering the increasing interest for the use of probiotic bacteria as natural and healthy solutions in lowering serum cholesterol in humans, we underlined the possible use of these bacteria protected in carob-galactomannan-ca-alginate beads.

**Keywords:** galactomannan, carob-ca-alginate gel, probiotics, survival, beads, cholesterol assimilation.