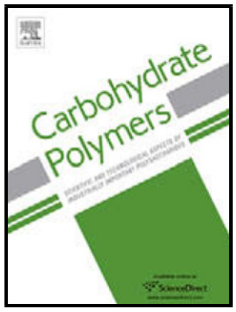

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PII: S0144-8617(17)30288-6
DOI: http://dx.doi.org/doi:10.1016/j.carbpol.2017.03.032
Reference: CARP 12121

To appear in:

Received date: 23-1-2017
Revised date: 8-3-2017
Accepted date: 9-3-2017

Please cite this article as: Huq, Tanzina., Fraschini, Carole., Khan, Avik., Riedl, Bernard., Bouchard, Jean., & Lacroix, Monique., Alginate Based Nanocomposite for Microencapsulation of Probiotic: Effect of Cellulose Nanocrystal (CNC) and Lecithin.*Carbohydrate Polymers* http://dx.doi.org/10.1016/j.carbpol.2017.03.032

Alginate Based Nanocomposite for Microencapsulation of Probiotic: Effect of Cellulose Nanocrystal (CNC) and Lecithin

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Highlights

- The nanocomposite microbeads were prepared by ionotropic gelation method.
- Addition of CNC improved the viability of probiotic during freeze drying.
- CNC increased the tensile strength of alginate microbeads.
- The optimized microbead improved the viability of probiotic during gastric passage.

Abstract: Probiotic (*Lactobacillus rhamnosus* ATCC 9595) was encapsulated in alginate-CNC-lecithin microbeads to produce nutraceutical microcapsules. Addition of CNC and lecithin in alginate microbeads (ACL-1) was improved the viability of *L. rhamnosus* during gastric passage and storage. The compression strength of the freeze-dried ACL-1 microbeads improved 40% compared to alginate microbead alone. Swelling studies revealed that addition of CNC and lecithin in alginate microbead decreased (around 47%) the gastric fluid absorption but increased the dissolution time by 20 min compared to alginate microbeads (A-0). During transition through the gastric passage, the viability of *L. rhamnosus* in dried ACL-1 microbeads was increased 37% as compared to A-0 based beads. At 25 and 4˚C storage conditions, the viability of *L. rhamnosus* encapsulated in ACL-1 microbeads decreased by 1.23 and 1.08 log respectively, whereas the encapsulation with A-0 microbeads exhibited a 3.17 and 1.93 log reduction respectively.

KeyWords: Cellulose Nanocrystals; ; ; ; , Probiotic, Microcapsule, Alginate, Freeze Drying.