

Accepted Manuscript

Preparation of low- and medium-molecular weight chitosan nanoparticles and their antimicrobial evaluation against a panel of microorganisms, including cheese-derived cultures

Karen A.M. O'Callaghan, Joseph P. Kerry



PII: S0956-7135(16)30235-3

DOI: [10.1016/j.foodcont.2016.05.005](https://doi.org/10.1016/j.foodcont.2016.05.005)

Reference: JFCO 5018

To appear in: *Food Control*

Received Date: 10 February 2016

Revised Date: 3 May 2016

Accepted Date: 4 May 2016

Please cite this article as: O'Callaghan K.A.M. & Kerry J.P., Preparation of low- and medium-molecular weight chitosan nanoparticles and their antimicrobial evaluation against a panel of microorganisms, including cheese-derived cultures, *Food Control* (2016), doi: 10.1016/j.foodcont.2016.05.005.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

**Preparation of low- and medium-molecular weight chitosan nanoparticles
and their antimicrobial evaluation against a panel of microorganisms,
including cheese-derived cultures**

Karen A. M. O' Callaghan and Joseph P. Kerry*

Food Packaging Group, School of Food and Nutritional Sciences, University College Cork, Ireland

* Corresponding author, Tel + 353-490-3798; fax: + 353-21-42-70001 E-mail address: joe.kerry@ucc.ie

Abstract

This study employed the technique of ionic gelation in the manufacture of low- and medium-molecular weight chitosan nanoparticles. Nanoparticles were characterised (size, size distribution, surface charge and morphology) and their antimicrobial activity assessed against cheese-derived cultures, as well as a select panel of Gram-positive and Gram-negative microorganisms. Antimicrobial activity was determined by the minimum inhibition concentration via the micro dilution method using 96-well microplates. Synthesised particles were small-sized, with a moderate size distribution and positive zeta potential. Generated nanoparticles exhibited successful solubility in both water and acetic acid. Acidic nanosuspensions demonstrated greater microbial reduction than water-based nanoparticles, with no difference in activity observed between molecular weights. Cheese-derived cultures were effectively controlled, and Gram-negative species were more susceptible than Gram-positive species to the action of nanoparticles in acetic acid. Nanoparticles suspended in an acidic-based medium show promise as antimicrobial agents, particularly for use with cheese products.

Download English Version:

<https://daneshyari.com/en/article/6390057>

Download Persian Version:

<https://daneshyari.com/article/6390057>

[Daneshyari.com](https://daneshyari.com)