



Title:

Use of probiotic bacteria to reduce the infectivity of noroviruses and the assessment of the ability of probiotics to bind to noroviruses

Authors:

Matthew Dallner

Affiliation:

Department of Food Science, University of Guelph

Abstract:

The main objective of this research project is to examine potential inhibitory activity of probiotic strains against norovirus and the ability of these same probiotics to bind to noroviruses. Human norovirus is the leading cause of foodborne illness in Canada. It is a common foodborne pathogen in seafood as well as in some ready-to-eat produce such as berries and leafy greens. It typically causes sporadic outbreaks, particularly in semi-enclosed living environments (cruise ships, hotels, hospitals, etc.). In 2018 reports of 176 cases of gastroenteritis in British Columbia, Alberta, and Ontario were linked to contaminated oysters from oyster farms in British Columbia. In this study, murine norovirus-1 (MNV-1) is being used to compare to HuNoV, as HuNoV culturing methods are not robust. 25 probiotic strains (members of *Leuconostoc*, *Lactobacillus*, *Lactococcus*, *Pediococcus*, and *Bifidobacterium*) were separated into 5 cocktails of 5 strains. Reductions in infectivity of MNV-1 in BV-2 cells were determined using cytotoxicity observations, plaque assay, and RT-qPCR. Current results have shown that 3 of the 5 cocktails showed significant reductions in viral titer compared to positive controls. When MNV-1 infectivity tests are completed the most promising probiotic strains will be used to attempt to bind to noroviruses. Binding of noroviruses by probiotics may be one of the ways that probiotics are able to prevent or reduce infection of noroviruses. This study will help to expand our knowledge on the control of norovirus infections in humans and the anti-viral potential of probiotic bacteria