Xylo-oligosaccharides inhibit pathogen adhesion to enterocytes in vitro

We previously reported that the non-digestible carbohydrates inulin and apple pectin promoted Listeria monocytogenes infection in guinea pigs, whereas xylo- and galacto-oligosaccharides (XOS and GOS), prevented infection by this pathogen. In the present study, mechanisms that could explain the previous in vivo observations were explored. Mixing bacterial cultures with XOS significantly (P < 0.05) decreased the ability of two out of three strains of L. monocytogenes to adhere to Caco-2 cells. Additionally, 2 h incubation with XOS followed by washing of the bacteria significantly (P < 0.05) decreased the ability of all three strains to adhere to Caco-2 cells. Consistently, expression of the adhesion-relevant genes inlA and lap was reduced by the presence of XOS. The observation that XOS inhibit the adhesion of Listeria to the intestinal epithelium in vitro may explain the reported preventive effect of XOS on Listeria infection in guinea pigs in vivo, while the preventive effect of GOS was not explicable by the assays chosen here.