

DEFENCE ANNOUNCEMENT

Final Examination for the Degree of MSc

DAVID AYLWARD

Date: May 30, 2018

Time: 9:00 am to 12:00 pm

Location: FS241

Examining Committee

Dr. Mike Rogers, Chair

Dr. Douglas Goff, Advisor

Dr. Alejandro Marangoni, Advisory Committee Member

Dr. Iris Joye, Department Member

TITLE: Investigating the attenuation of starch hydrolysis by synergistic interaction of xanthan and guar gum fortification during *in vitro* digestion

ABSTRACT: The effects of a simulated *in vitro* digestion model on the solution viscosity and ability to reduce the rate of glucose absorption and diffusivity of 0.81%, xanthan, 1.0% guar and 0.86% (80:20 ratio) guar-xanthan-fortified 4% pre-gelatinized starch solutions was examined in this study. Solutions were formulated with comparable apparent viscosities (50^{-1} s) after simulated digestion (without the addition of digestion enzymes) then passed throughout a 30 minute gastric and 2 hour small intestinal simulated digestion protocol. After 60, 90 and 120 min of simulated intestinal digestion, the xanthan gum-treated solution demonstrated a pronounced ability to retain its viscosity after 2 h of simulated intestinal digestion when compared to guar and guar-xanthan. Additionally, despite having dissimilar viscosities, the guar-xanthan and xanthan gum solutions both demonstrated the greatest suppressive effect on glucose release (GOPOD) and diffusion (dialysis) perhaps implying the significance of non-viscosity-related mechanisms influencing the release and diffusivity of glucose.