# DEVELOPING SYNBIOTIC POWDERS USING WATER SOLUBLE YELLOW MUSTARD MUCILAGE BY FREEZE-DRYING

Water soluble yellow mustard mucilage (WSM) has proven prebiotic effects tested on selected strains of probiotics. Our previous study has tested WSM, citrus pectin, inulin, and curdlan as the selected prebiotics on the following probiotic strains: Lactobacillus.rhamnosus, Lactobacillus.plantarum, Lactobacillus.casei, Lactobacillus.acidophilus, and Bifidobacterium. bifidum. Results have shown that WSM exhibited superior prebiotic effects among the tested prebiotics. Further investigations are needed to understand the effects of WSM, as a major carrier, on the growth rate and the number of viable cells of probiotic strains while developing synbiotic products using freeze-drying technology. WSM was applied as a primary ingredient in synbiotic formulas and was compared with citrus pectin, gum Arabic, and galactomannans, which are commonly used encapsulation ingredients in synbiotic powders. The growth rate of probiotic strains after inoculation, viable cells, and the effect of concentrations of prebiotics in the formula were investigated.

The results have demonstrated a superior prebiotic effect of WSM on two tested strains, Lactobacillus.plantarum and Bifidobacterium.bifidum, respectively. The tested concentrations of prebiotics ranged from 0.5, 1, 1.5, and 2% (w/w), respectively. The result indicated a positive correlation between the number of viable cells and the growth rate after inoculation with the concentration of prebiotics. This may be due to a thicker matrix of WSM at a higher concentration around the cells, thus providing better protection for the cells.

Further studies will continue to investigate the effect of the developed synbiotic powders on the gut microbiome using in.vitro and in vivo methods.

KEYWORDS: water soluble yellow mustard mucilage (WSM), synbiotic, freeze-drying