

## **The prebiotic effect of $\alpha$ -1,2 branched, low molecular weight dextran in the batch and continuous faecal fermentation system**

### **Abstract**

The aim of this study was to establish the effect of smaller molecular weight (0.5 and 1.0 kDa) on prebiotic efficacy and its putative sustainability in the human gut. The prebiotic effect of  $\alpha$ -1,2 branched, 0.5 and 1 kDa dextrans were evaluated in faecal batch fermentations as compared with inulin. Both dextrans induce similar selectivity towards *Bifidobacterium* sp., *Lactobacillus/Enterococcus* and *Bacteroides/Prevotella*, and producing similar concentrations of short chain fatty acids. However, the 0.5 kDa dextran was fermented faster than the 1 kDa dextran, where both produced lower amount of gas than inulin. The fermentation of 1 kDa dextran was further investigated in continuous gut models. The dextran increased *Bifidobacterium* and *Roseburia* sp. populations in the final vessel, while decreasing *Clostridium histolyticum* and *Faecalibacterium prausnitzii*. Overall, the  $\alpha$ -1,2 branched, 1 kDa dextran induced selective effect on the gut microbiota and stimulated short chain fatty acids, indicating prebiotic sustainability in distal regions of the gut.

**Keyword:** Prebiotics; Gluco-oligosaccharides; Faecal fermentation; Gut microbiota