Title: **MICROBIOTA SPECIFIC MODULATION BY TWO DIFFERENT SOURCES OF UNAVAILABLE CARBOHYDRATES**

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Abstract:

The gut microbiota plays an important role in maintaining host's overall health. Nutrients, such as non-digestible, fermentable carbohydrates, can affect gut microbiota composition and modulate microbial-host interactions, which in turn maintain and/or promote health. The aim of this work was to evaluate the effects of the regular consumption of (UBF) or Inulin on the intestinal microbiota. Healthy volunteers (n=48) participated in this double blind, parallel, placebo-controlled study, distributed into: Control group (maltodextrin) , Inulin group (5g) and UBF group (8 g), over 6 weeks of regular consumption (3 times/week). Microbiome profiling, blood biochemical data (lipid profile), 24-h dietary recall and gastrointestinal functioning questionnaires were performed at baseline and after the intervention. Stool samples were collected, DNA was extracted and the bacterial 16S rDNA was sequenced to determine the microbial dynamics in the gut microbiome. Sequences were processed using Qiime and Picrust, and analyzed using the R environment for statistical computing. The analysis of the microbiome using the 16S rDNA gene showed that there are two clusters of individuals, which respond differently to the dietary intervention, one more *Prevotella* prevalent (Cluster A) and other more *Bacteroides* prevalent (Cluster B). The UBF consumption by volunteers with a *Prevotella* dominant microbiome showed an increase in genes related to anaerobic carbohydrate degradation (792 *Kegg orthologs*, FDR=0.05), such as members of the starch and glucose metabolism, propanoate metabolism and butyrate metabolism. At the same time, other genes were reduced, including the biosynthesis of lipopolysaccharides. Cluster A under Inulin group intervention showed a much smaller modulation (49 *Kegg orthologs*, FDR=0.05) and Control group almost none (1 *Kegg ortholog*, FDR=0,05). Cluster B, showed no differences after the UBF, Inulin or Control intervention. Biochemical parameters and gastrointestinal functioning questionnaires had different outcomes for each intervention. We demonstrated that the consumption of UBF or Inulin can promote the overall health of the human host, but UBF has a much stronger modulating effect on the intestinal microbiome in healthy individuals, and that this effect is dependent on the enterotype present.

Key words: microbiome, functional ingredient, picrust.

Funding Agency: FAPESP