Integrated multi-omics of the gut microbiome: assessing the beneficial effects of fermented foods to human health.

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Integrated multi-omics of the gut microbiome:

Assessing the beneficial effects of fermented foods to human health

A. Bester[1], M. Toribio-Mateas[3], K. Mileva[2], N. Gaoua[2]

[1] Food Nutrition and Health Research Group, School of Applied Science, London South Bank University.
[2] Sport and Exercise Science Research Centre, School of Applied Science, London South Bank University.
[3] School of Health and Education, Middlesex University.

Introduction

Evidence for health benefits of probiotic foods are increasing, studies support the potential to prevent and treat disease, suggesting fermented foods should be part of national dietary recommendations.

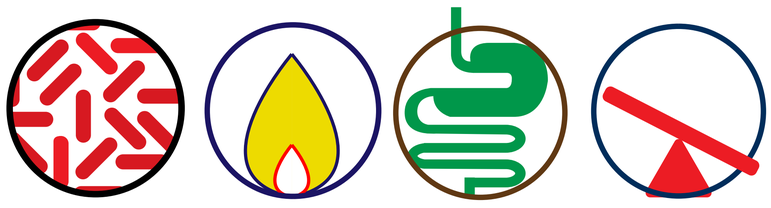
Increasingly understood, is the potential for enhanced nutritional and functional properties due to transformation of substrates and formation of bioactive or bioavailable end-products. Many also contain living microorganisms, some of which are genetically similar to strains recognised as probiotics and potentially psychobiotics.

There is a need for systematic clinical trials that measure outcomes which reflect a direct benefit for humans to better understand the effects of regular use of fermented foods as part of the diet.

Ingested bacteria can temporarily complement residential communities as part of a transient microbiome. Extent of integration is highly specie and strain dependent, and may vary depending on dietary context and baseline microbiota structure. Delivery matrix may affect the health benefits.

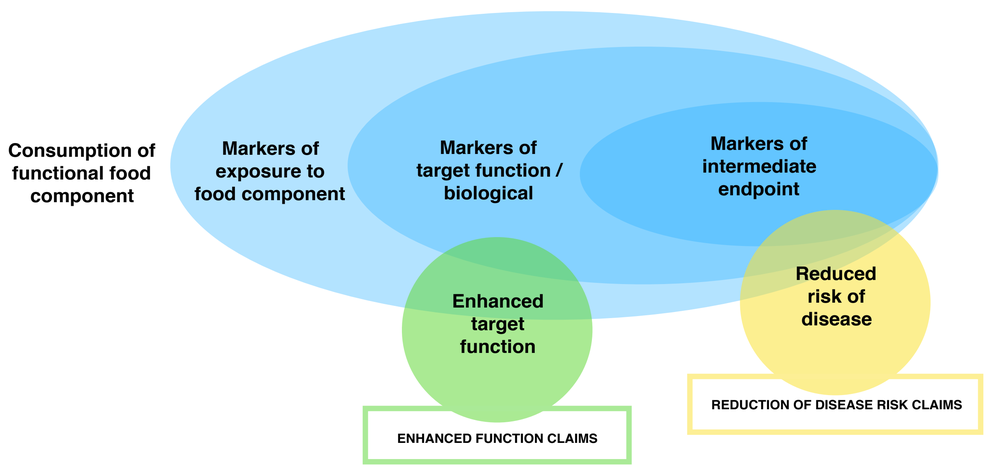
Aim

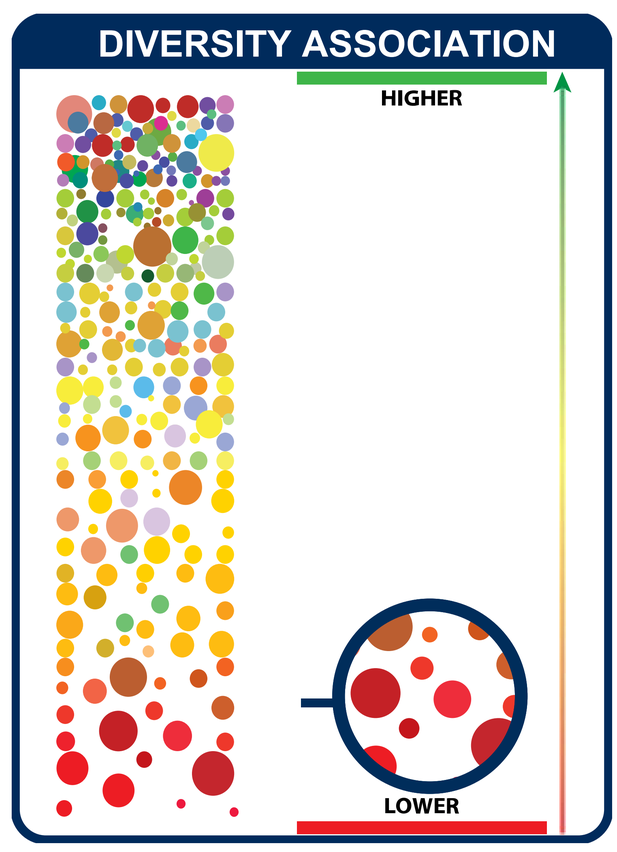
We hypothesise that regular consumption of unpasteurised fermented foods will improve gastrointestinal health biomarkers, host-microbe interaction, and cognitive function.

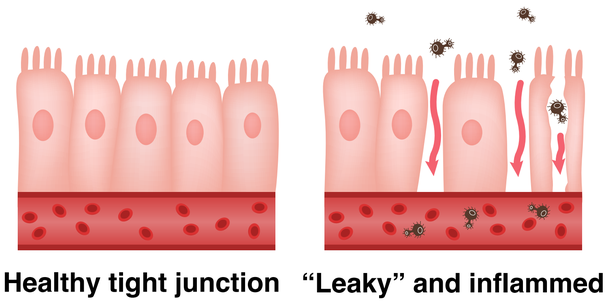


Multi-Omics Approach

We propose a multi-omics approach, providing more evidence for biological mechanisms, which is best suited to the complex nature of fermented foods. Faecal samples will be tested for biomarkers of digestive function and intestinal inflammation; metabolic indicators of host-microbe interactions; Commensal Bacteria; a PCR evaluation of 24 key bacterial groups/species; and Bacterial and Mycologic Culture.







Healthy tight junction "Leaky" and inflammed

Foodomics

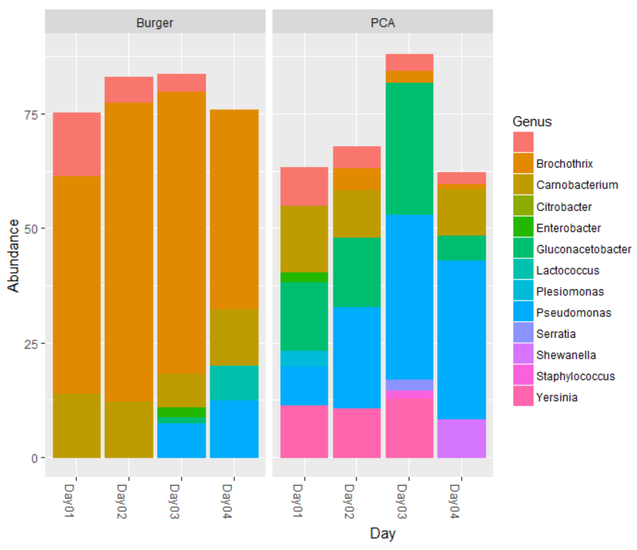
Metagenomic sequencing of the 16s gene of the fermented foods over the course of its viable shelf life.

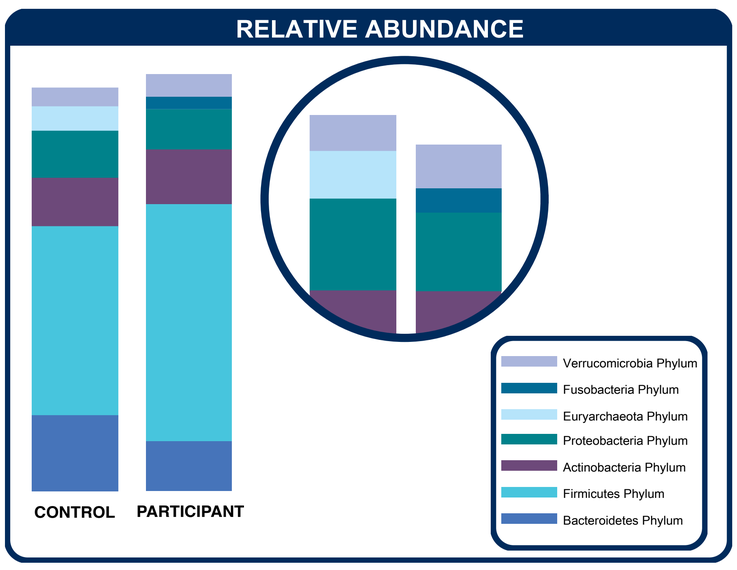
Psychobiotics

Cognitive function and baseline mood.

PROMs

Participant self-reported outcomes: MYMOP and PSYCHLOPS.





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