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Innovative pulse and cereal-based food fermentations for human health and sustainable diets

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Investigating the effects of plant-based fermented foods on the gut microbiota by making use of an *in vitro* colon model

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Co-funded by the European Union

Schweizerische Eidgenossenschaft
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Research overview

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WHAT?

Determine whether the **fermentation of plant-based foods** delivers health benefits for consumers by **shaping** their **gut microbiome**

WHY?

Fermentation can **alter** the **composition** and **digestibility** of foods, **influencing substrate availability** for microorganisms in the colon

HOW?

Analyse and compare how the indigestible fraction of fermented and non-fermented plant-based foods affects the gut microbiota using ***in vitro*** **model systems**

Food products included in the experiments

Fermented plant-based food	‘Unfermented’ plant-based food
Gurt	**Porridge**
Faba bean-Oat tempeh	Boiled **faba beans and oats**
Fermented meat alternative	Non-fermented **meat alternative**
Sourdough white bread	Yeasted **white bread**
Sourdough wholemeal bread	Yeasted **wholemeal bread**

Methodology: an *in vitro* pipeline to study *in vivo* processes

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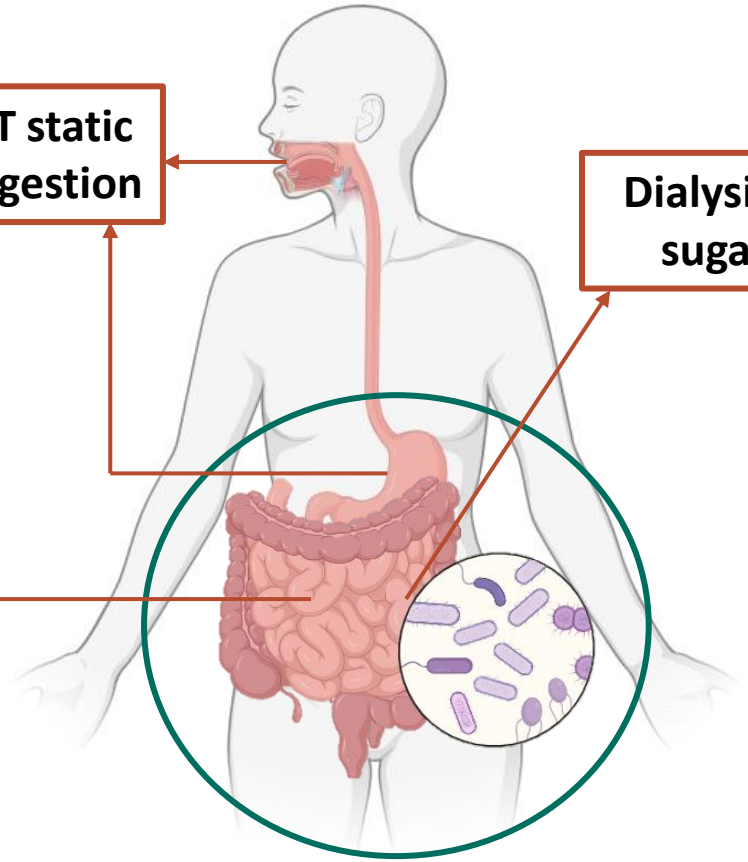
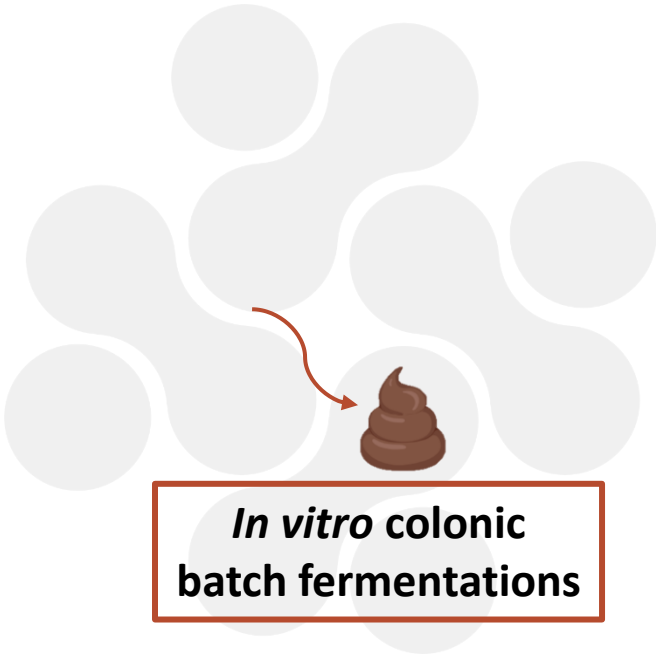
Digestion & absorption

INFOGEST static *in vitro* digestion

Dialysis of sugars



Colonic fermentation of undigested fraction by gut microbiota



***In vitro* colonic batch fermentations**

Interested in learning more about the experimental set-up? Come find my poster, let's have a chat!

A variety of fermented foods promotes the growth of more diverse gut communities in comparison to their non-fermented counterpart

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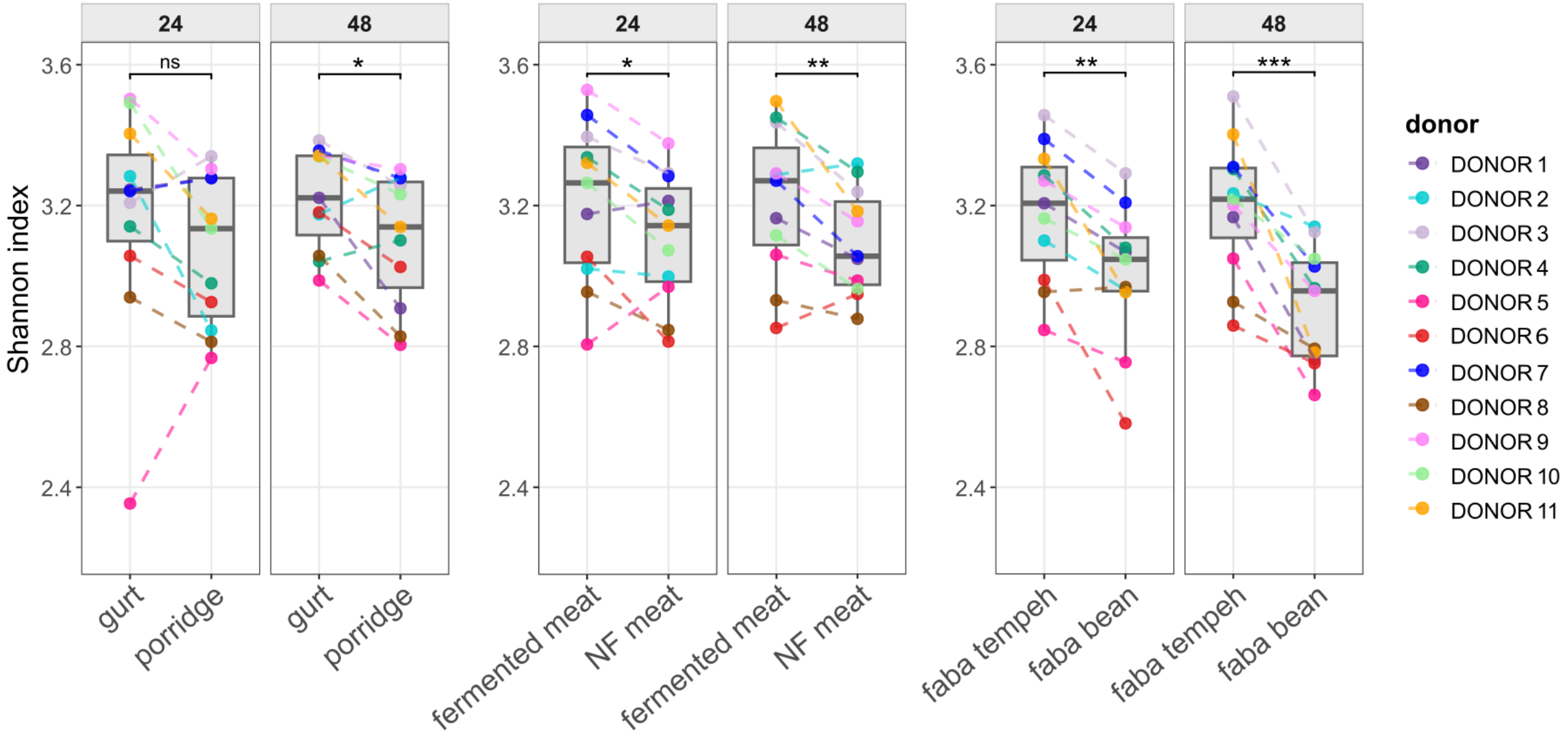

No significant differences in diversity of gut communities using any of the breads as fermentation substrate

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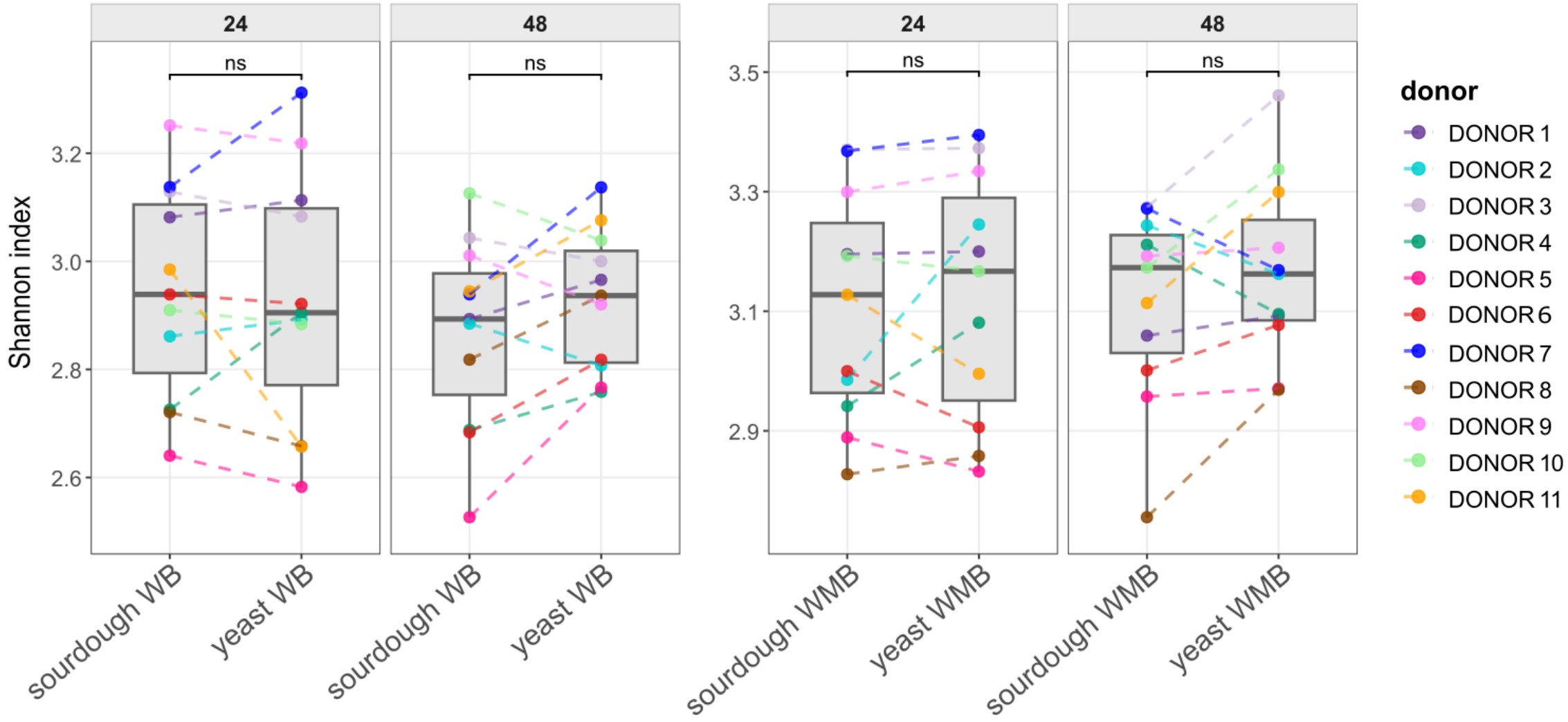

Several bacterial taxa are significantly enriched* and depleted* in gut communities using distinct fermented products as substrate…

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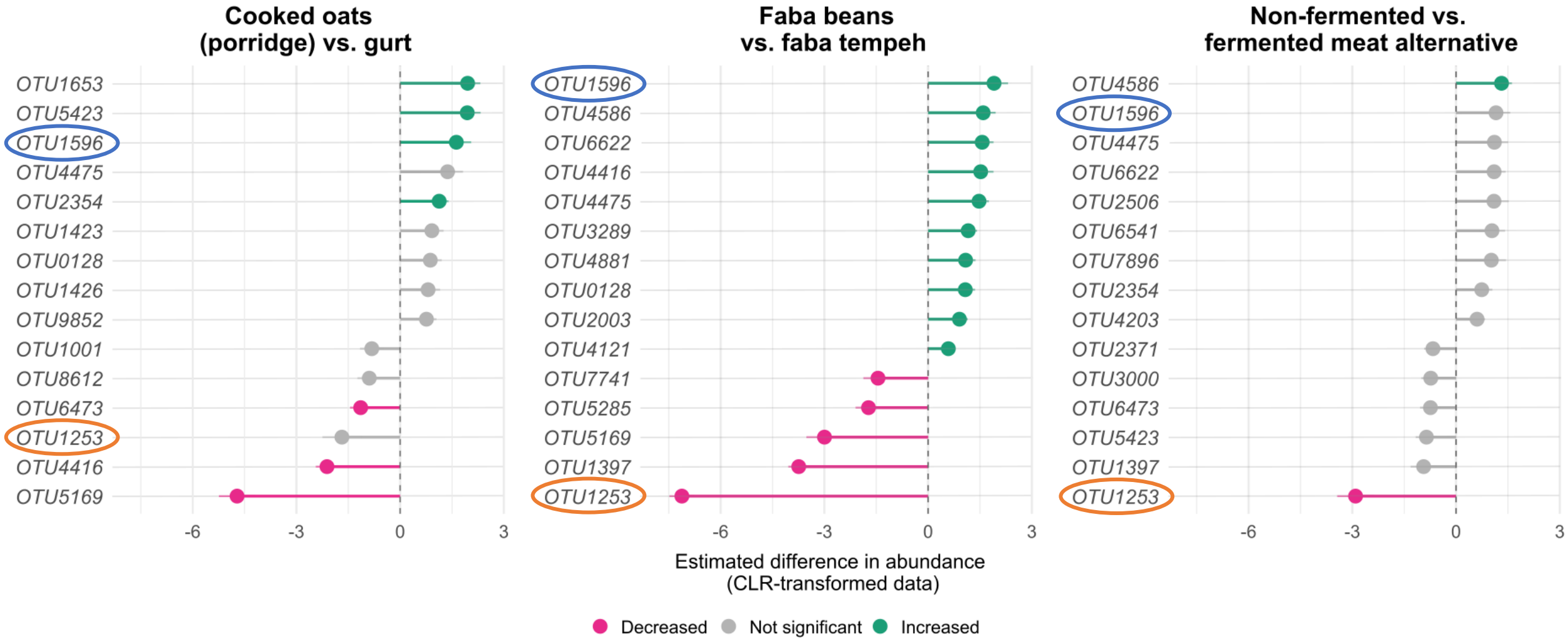

** relative to their non-fermented counterparts*

Take home message

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In this *in vitro* pipeline…

…the gurt, faba-oat tempeh and fermented meat alternative promoted the growth of more diverse gut communities, driven by consistent changes in relative abundance of specific gut bacterial taxa across food substrates

… the sourdough white and wholemeal breads had no significant impact on gut microbiome composition

Many thanks to…

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The partners of the HealthFerm consortium

LET'S CONNECT

Co-funded by the European Union

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