



invivo[®]

Optimising Gut Health
with Personalised Prebiotics

Introduction



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The Human Microbiome Company

Supporting human health and ecology is our mission.

We are a B Corp certified organisation, offering a range of carefully and sustainably sourced supplements to target the microbiome.

Certified



Corporation

Learning Objectives

1. Define what prebiotics are and their main mechanisms of action.
2. Learn how prebiotics interact with the resident gut microbiome.
3. Review the evidence currently available for the use of prebiotics for gut health.
4. Understand how individualised features of the gut microbiome can affect responses to prebiotics.
5. Learn how gut microbiome testing can support in making personalised recommendations.
6. Review common clinical considerations to bear in mind when recommending prebiotic interventions.
7. Review a Case Study showing the benefits of personalised prebiotic recommendations in clinical practice.

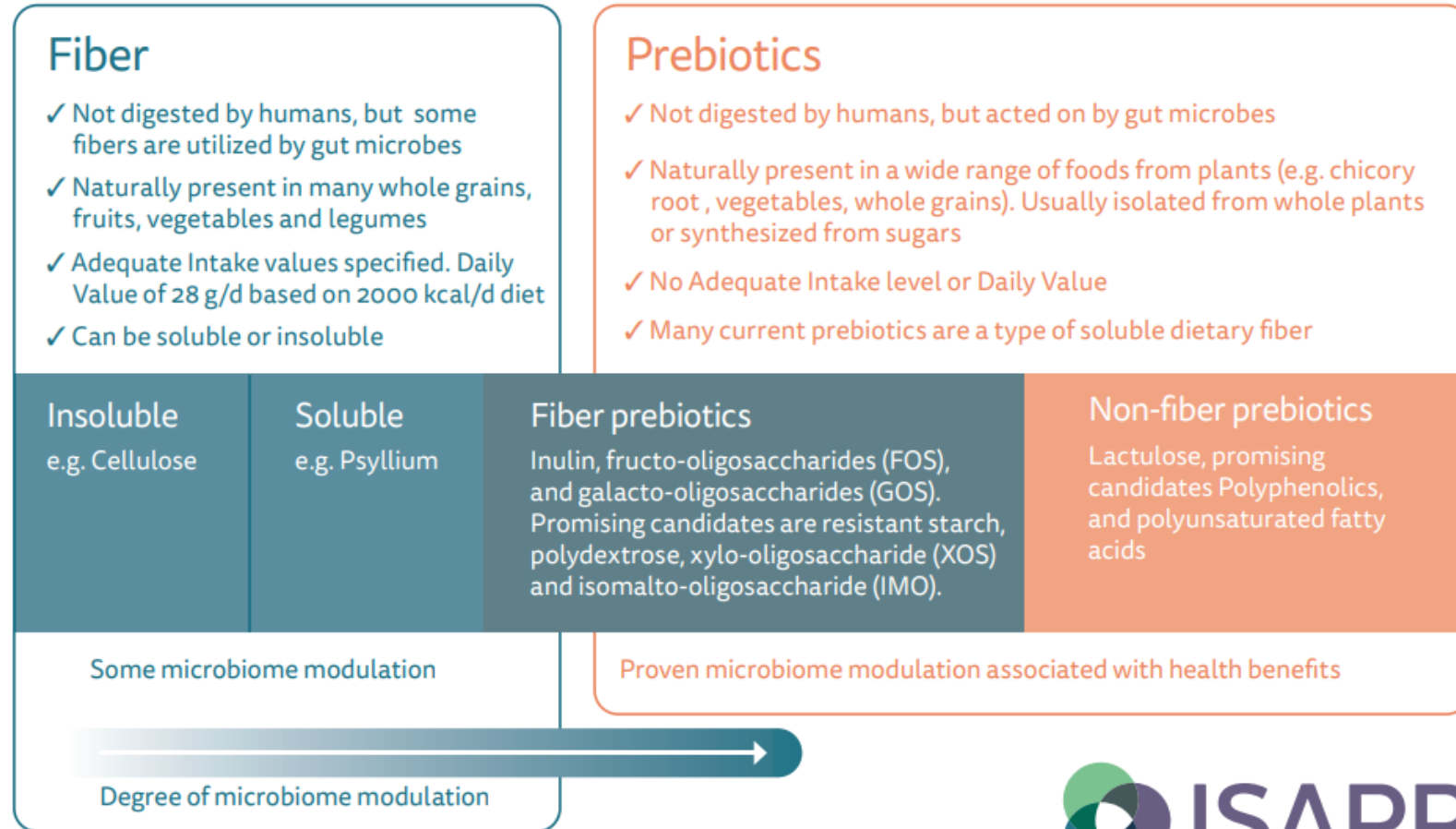
Introduction to Prebiotics

What are Prebiotics?

“A substrate that is selectively utilised by host micro-organisms conferring a health benefit” ¹

- Can include non-carbohydrate substances
- Diverse categories other than foods
- Applications to body sites other than the GI tract
- Utilisation must be selective
- Beneficial effects should be documented in humans

Fibre vs Prebiotics²



For more information visit [ISAPPscience.org/prebiotics](https://www.ISAPPscience.org/prebiotics)



Mechanisms of Action

Modulation of the gut microbiome

- Increase in butyrogenic bacteria
- Bifidogenic effect
- "Crowding out" pathobionts
- Altering colonic pH

Immunomodulatory

- Anti-inflammatory
- ↓ reactive oxygen species (ROS)

Increase in SCFA production

Decrease in secondary bile acid formation³

Effect on gut epithelial barrier



Prebiotic Effects on the Gut Microbiome

Prebiotics Impact on the Gut Microbiome

Prebiotic	Influence on microbial metabolites	Influence on microbial taxa
Inulin (medium/ long-chain)	↑ methane production* ↓ faecal beta-glucuronidase activity*	↑ Bifidobacterium spp. ^{4,5,6} ↑ Faecalibacterium spp. ⁴ ↑ Akkermansia muciniphila ⁷ ↑ Veillonella parvula/ atypica ⁸ ↓ Bilophila spp. ^{5,6}
FOS and short-chain inulin	↓ hydrogen sulphide production*	↑ Bifidobacterium spp. ^{9,10} ↑ Faecalibacterium spp. ^{9,10} ↓ Ruminococcus/ Faecalicatena spp. ^{9,10}

*MetaXplore Insight

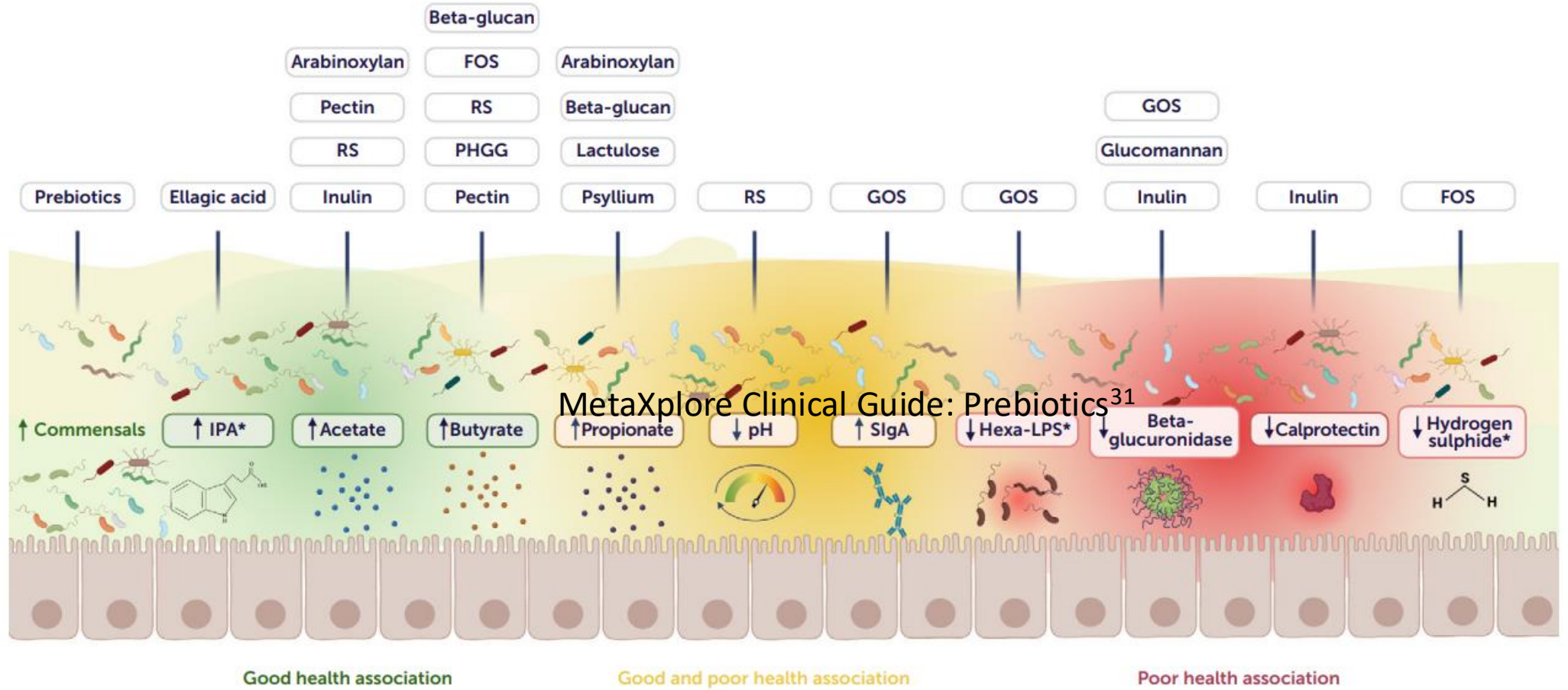
Prebiotics Impact on the Gut Microbiome

Prebiotic	Influence on microbial metabolite	Other microbiome impacts
GOS	↓ hexa-LPS-producing microbes (↓ E. coli)* ↓ faecal beta-glucuronidase activity*	↑ Bifidobacterium spp. ^{12,13,14,15} ↑ Anaerostipes spp. ^{12,13} ↓ Bacteroides spp. ^{14,15}
PHGG	↑ butyrate-producing microbes ¹¹	↑ Bifidobacterium spp. ¹¹ ↑ Faecalibacterium spp. ¹⁶
Resistant starch type 2 (RS2)	↑ butyrate-producing microbes* ↑ acetate production* ↑ methane production*	↑ Ruminococcus_E bromii ¹⁹

Prebiotics Impact on the Gut Microbiome

Prebiotic	Influence on microbial metabolites	Other microbiome impacts
Oat beta-glucan	<ul style="list-style-type: none"> ↑ butyrate-production* ↑ propionate* 	↑ Bifidobacterium spp. ^{17,18}
Glucomannan	↓ faecal beta-glucuronidase activity*	↑ Bifidobacterium spp. ²⁵
Acacia gum	↑ butyrate production ²⁰	↑ Bifidobacterium spp. ^{26,27}
Lactulose	<ul style="list-style-type: none"> ↑ propionate production* ↓ colonic production and absorption of ammonia^{21,22,23} ↓ faecal beta-glucuronidase²⁴ 	<ul style="list-style-type: none"> ↑ Bifidobacterium spp.²⁸ ↓ Faecalibacterium²⁹ ↓ Enterococcus²⁸ ↓ Escherichia-Shigella³⁰

*MetaXplore Insight



FOS - fructooligosaccharides
 GOS - galacto-oligosaccharides
 PHGG - partially hydrolysed guar gum
 RS - resistant starch

IPA - 3-indolepropionic acid
 SIgA - secretory IgA
 Hexa-LPS - hexa-acylated lipopolysaccharides

*Exclusive to the MetaXplore range

*Microba Clinical Guide: Prebiotics³¹

Prebiotics: Gastrointestinal Impacts ^{32,33,34,35,36,37}

GI IMPACTS	Inulin (LC/MC)	FOS/Inulin (SC)	GOS	PHGG	RS2	Lactulose
Transit time				↓	↑	
Improved stool form	↑		=	↑	=/↑	
Incomplete emptying	=		=	=		
Straining			↓	=/↓		
Flatulence	↑	↑	↓	↓<6g	↑	↑
Bloating	↑		↓	↑/=/↓	=	
Abdominal pain	↑		↓	=/↓	=	
Diarrhoea				↓	↓	

Individual Response ^{38,39,40}

Inulin

Better mood improvements in those with ↑ baseline **Coprococcus**

Better reduction in BMI in those with ↑ baseline **Akkermansia** +
Butyricoccus + ↓ **Anaerostipes**

Often ↑ baseline **Bifidobacterium** predicts ↓ magnitude of increase in
Bifidobacterium from prebiotic

Higher baseline fibre intake predicts broader taxonomic response to inulin
e.g. ↑ **Faecalibacterium**, not just ↑ **Bifidobacterium**

Individual Response^{41,42}

Resistant Starch Type 2

Hormonal and metabolic effects associated with baseline abundance of Streptococcus, F. torques, E. hallii

Condition-specific changes

Certain conditions have distinct microbiome signatures, and we may need to apply research from the specific patient group e.g. Crohn's disease

Prebiotics: Diet vs Supplements

Prebiotics in the Diet

Prebiotic	Food Sources	
Fructooligosaccharides (FOS)	Jerusalem artichoke Broccoli stalks	Red onion Watermelon
Galactooligosaccharides (GOS)	Borlotti beans Chickpeas	Green lentils Soy flour
Inulin	Jerusalem artichoke Asparagus	Globe artichoke Leek
Pectin	Mandarins Kale	Blackberries Avocado
Arabinoxylan	Pumpnickel bread Wholegrain rye	Wheat bran Popcorn
Resistant starch (RS)	Green banana Green banana flour	Barley Lentils
Beta-glucan	Oats Wholegrain barley	Wheat bran Sorghum

Why supplementation might be needed

Effect on gut metabolites	Evidence for high-fibre diet/foods	Evidence for supplemental prebiotics
↑ butyrate microbes	Rye bran-enriched bread (6-10 pieces/d)	RS2 with high RS foods (combination) PHGG (6g/d)
↓ BCAAs	Rye bread (8 pieces/d)	
↑ IPA production	Very high fibre diet; wholegrain wheat, rye	
↓ TMAO	Brussel sprouts (300g/day)	
↓ beta-glucuronidase enzyme	Grain/legume fibres	Glucomannan with low-fat diet (4.5 g/d) Inulin (5-20g/d) Lactulose (3g/d)
↓ hydrogen sulphide microbes		FOS (12g/d)
↓ hexa-LPS microbes		GOS (5.5g/d)
↑ secretory IgA		GOS (5.5g/d)

Clinical Considerations for Personalised Prebiotic Recommendations

Questions to ask before recommending prebiotics

Part 1: IF a prebiotic is indicated

- How is a prebiotic likely to influence the clinical picture?
- Is now a good time to start a prebiotic?

Part 2: WHICH prebiotic is most appropriate

- Which of the six **Personalised Prebiotic Considerations** are important here?
- In what order are they important?

Personalised Prebiotic Considerations

Specificity of feeding

Site of fermentation

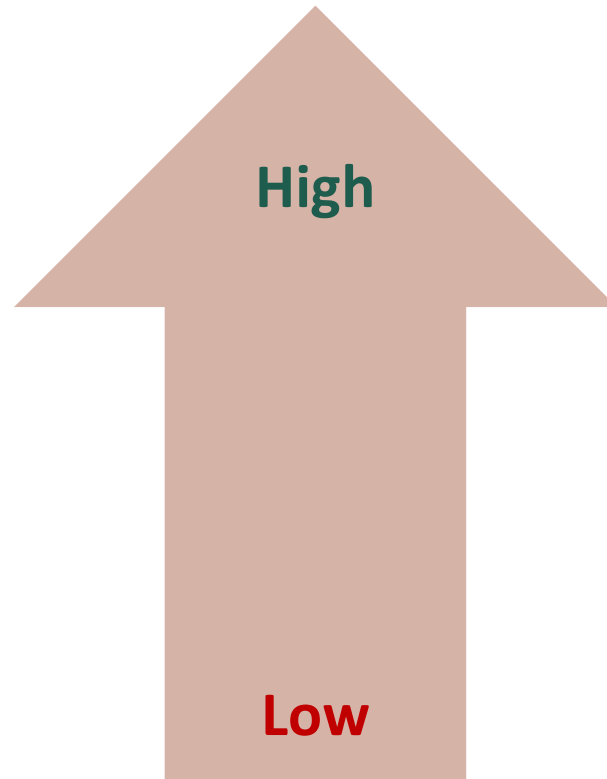
Ability to alter stool form

Tolerability & Palatability

Convenience

Dosing

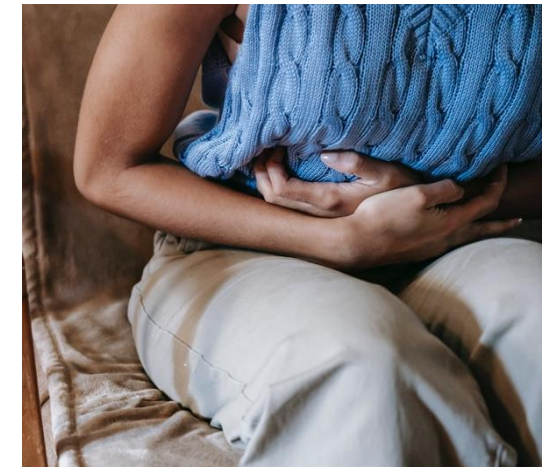
Tolerability




Acacia gum
Oat beta glucan
PHGG

Resistant starch
Glucomannan
GOS
MC and LC inulin

FOS and SC inulin
Lactulose



Palatability, Convenience & Dosing

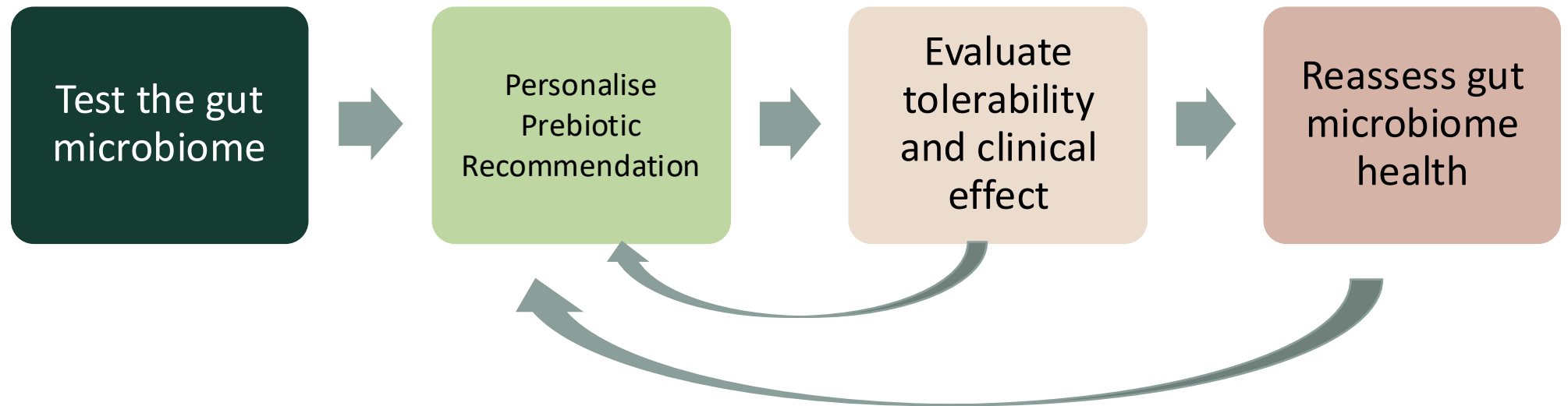


Prebiotic	Daily dosage range*	Common clinically effective dose	Flavour	Texture	Convenience
PHGG	5g – 20g	8g	Neutral	Soluble	Mixes in food/drink
Oat beta-glucan	3g – 6.6g	3.5g (lipids) 10g (stool form)	Slight oat	Viscous	Thickens, lumpy
Resistant starch type 2 (green banana flour)	10g – 40g	15g	Slight banana	Viscous	Thickens, separates
Glucomannan	4.5g	4.5g	Neutral	Viscous	Thickens, jelly-like
GOS	3g – 11g	5.5g	Sweet	Soluble	Mixes in food/drink
Inulin	10g – 15g	10g	Sweet	Soluble	Mixes in food/drink
FOS	7.5g – 30g	10g	Sweet	Soluble	Mixes in food/drink
Lactulose	3g – 25g	10g	Sweet	Liquid	Must be poured

*Used in research

*Microba Clinical Guide: Prebiotics³¹

How does gut microbiome testing allow me to make personalised prebiotic recommendations for my clients?



Case Study

Meet Dawn

Age/Gender: 66/Female

Diagnosed conditions: No diagnosed condition

Case history:

- Intermittent constipation (35 years) 1 BM every 3-5 days
- Left-side discomfort (bloating)
- Family history of colorectal cancer

Medication/supplements: Magnesium hydroxide (laxative)

Pathology: CRP 7 mg/L, homocysteine 15 $\mu\text{mol/L}$

Diet: Avoiding gluten, spelt, legumes, rice, and oats (low-fibre diet) as she believes these are not beneficial to health. No clinical symptoms when consuming grains.



Therapeutic Aims

Daily bowel
movement, which is
easy to pass

Reduce bloating on
the left-hand side

More energy to be
physically active

OUT OF RANGE

Gastrointestinal Health Marker ↑↓	Result	Reference Range	INSIGHTS	
Secretory IgA	ND	500.00 µg/g - 2,000.00 µg/g	INSIGHTS	
Pancreatic Elastase	ND	≥ 200.00 µg/ml	INSIGHTS	
Microbial Marker ↑↓	RESEARCH USE ONLY NOT FOR DIAGNOSTIC USE	Relative Abundance	Distance from Average	INSIGHTS
Microbial Diversity	ND		-1.71	INSIGHTS 7
Propionate producing microbes	ND		+3.54	INSIGHTS
Butyrate producing microbes	ND		-2.52	INSIGHTS 8
Hexa-LPS producing microbes	ND		+1.70	INSIGHTS 3
Mucin Degradation	ND		+1.38	INSIGHTS 1
Trimethylamine producing microbes	ND		+1.42	INSIGHTS 6

Patterns associated with:

- Intestinal Inflammation
- Systemic Inflammation
- Impaired intestinal barrier integrity

BORDERLINE

Microbial Marker ↑↓	RESEARCH USE ONLY NOT FOR DIAGNOSTIC USE	Relative Abundance	Distance from Average	INSIGHTS
IPA producing microbes	ND		-1.23	INSIGHTS 3
BCAA producing microbes	ND		+1.25	INSIGHTS 6

Initial Microbiome Results: Species

↕	Phylum ↕	Species ↕	Prevalence ↕	Relative Abundance % ↓	Distance from Average
⊖	Firmicutes_A	<i>Tyzzrella nexilis</i>	Rare	19.53%	
○	Verrucomicrobiota	<i>Akkermansia muciniphila_B</i>	Less common	10.09%	+2.79
⊖	Bacteroidota	<i>Bacteroides_B vulgatus</i>	Common	8.54%	+1.52
⊕	Bacteroidota	<i>Bacteroides uniformis</i>	Very common	3.29%	+1.22
○	Firmicutes_A	<i>CAG-917 MIC9481</i>	Rare	2.92%	
○	Firmicutes_A	<i>CAG-74 MIC8062</i>	Less common	2.67%	+3.73
○	Firmicutes_A	<i>Ruthenibacterium lactatiformans</i>	Common	2.40%	+4.25
⊖	Bacteroidota	<i>Parabacteroides johnsonii</i>	Less common	2.38%	+3.28
⊖	Proteobacteria	<i>Escherichia coli (coli_D)</i>	Less common	2.21%	+2.25
○	Firmicutes_A	<i>Flavonifractor sp000508885</i>	Less common	1.94%	+4.19
○	Bacteroidota	<i>Parabacteroides goldsteinii</i>	Less common	1.80%	+3.68
○	Bacteroidota	<i>Bacteroides thetaiotaomicron</i>	Common	1.76%	+2.86

↓	Phylum ↕	Species ↕	Prevalence ↕	Relative Abundance % ↕	Distance from Average ↕
⊕	Firmicutes_A	<i>Anaerotruncus colihominis</i>	Less common	0.26%	+3.92
⊕	Firmicutes_A	<i>Coprococcus_A catus</i>	Common	0.05%	-2.16
⊕	Firmicutes_A	<i>Dorea formicigenerans</i>	Very common	0.06%	-2.36
⊕	Firmicutes_A	<i>Intestinimonas butyriciproducens</i>	Less common	0.03%	-0.06
⊕	Bacteroidota	<i>Odoribacter splanchnicus</i>	Very common	1.28%	+3.75
⊕	Firmicutes_A	<i>Roseburia hominis</i>	Common	0.04%	-1.14
⊕	Firmicutes_A	<i>Ruminococcus_E bromii_B</i>	Common	0.45%	-1.20

Clinical Drivers

Insufficient dietary
fibre to soften and
bulk stool

Microbiome driving
systemic
inflammation

Lack of prebiotics
starving the
microbiome

Priorities

Regulate intestinal
transit time

Reduce overgrowth
of pathobionts

Increase dietary fibre
and diet diversity

Part 1: Is a prebiotic indicated?

How is a prebiotic likely to influence the clinical picture?



Symptoms, long-term health risks

Is now a good time to start a prebiotic?



Yes

Part 2: Which Personalised Prebiotic Considerations Are Important?

Specificity of feeding

Site of fermentation

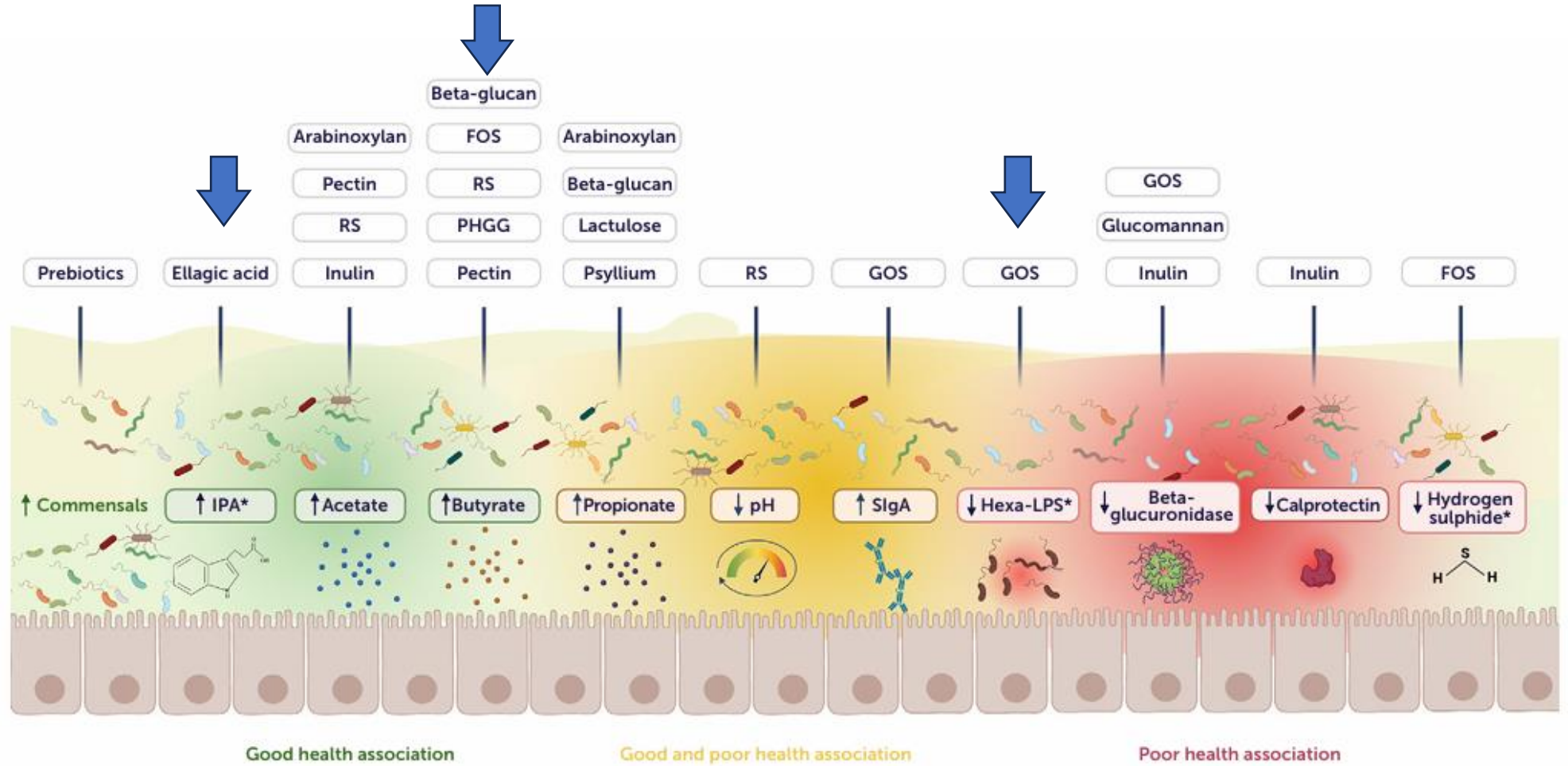
Ability to alter stool form

Tolerability & Palatability

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Personalised Prebiotic Recommendations



FOS - fructooligosaccharides
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 Hexa-LPS - hexa-acylated lipopolysaccharides

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Simplified Dietary Recommendations

Support Motility

- Stay well hydrated
- Eat 2 kiwifruits daily
- Flaxseeds & Chia seeds: Soak and consume daily in oats or smoothies, starting small and increasing gradually.
- Gradually increase fibre to 30g/day
- Gentle movement/exercise daily

Diversity

- Include 30 **different plant foods** in weekly diet; try new varieties.
- Add **fermented foods** like kombucha, sauerkraut, kimchi, or kefir daily
- Time in nature

Increase IPA

- 1 x serving per day of **berries** e.g. blackberries
- 1 x serving per day of **walnuts or chestnuts**
- 200ml **unsweetened pomegranate juice/day**
- 2 slices of **rye bread** 3x/week

Increase Butyrate (via RS, Pectin, Beta-glucans)

- **Green Banana Flour:** Add to Smoothies
- ½ cup **cooked apples** (with cinnamon and ginger) 4 times weekly
- Prepare **potato salad with cooked and cooled potatoes**
- **Over-night oats**

Supplements

Supplement	May	June	July	August	September	October
Digestive enzyme	3x daily	3x daily	3x daily	3x daily	3x daily	3x daily
GOS		2.5g	5g daily	5g daily		
HCL Support	3x daily	3x daily	3x daily	3x daily	3x daily	3x daily
PHGG	3g at night	3g at night	5g at night	5g at night	3g at night	3g at night
Commensal-sparing antimicrobial			1 twice daily (two weeks)	1 twice daily (one week)		
Beta-Glucan Powder					10g with breakfast	10g with breakfast

Change in Species: Most Abundant

↑↓	Phylum ↑↓	Species ↑↓	Prevalence ↑↓	Relative Abundance % ↓	Distance from Average
⊖	Firmicutes_A	<i>Tyzzarella nexilis</i>	Rare	19.53%	
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⊖	Bacteroidota	<i>Bacteroides_B vulgatus</i>	Common	8.54%	+1.52
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7 months

↑↓	Phylum ↑↓	Species ↑↓	Prevalence ↑↓	Relative Abundance % ↓	Distance from Average
⊕	Bacteroidota	<i>Bacteroides uniformis</i>	Very common	10.40%	+2.35
⊕	Firmicutes_A	<i>Ruminococcus_E bromii_B</i>	Common	6.38%	+0.85
⊖	Bacteroidota	<i>Bacteroides_B vulgatus</i>	Common	4.59%	+1.01
○	Firmicutes_A	<i>Gemmiger sp003476825</i>	Very common	3.02%	+1.09
⊕	Firmicutes_A	<i>Ruminiclostridium_E siraeum</i>	Common	2.95%	+1.52
⊕	Firmicutes_A	<i>Fusicatenibacter saccharivorans</i>	Very common	2.89%	+0.07
○	Firmicutes_A	<i>CAG-170 sp000432135</i>	Common	2.39%	+2.20
○	Firmicutes_A	<i>UBA1417 sp003531055</i>	Common	2.30%	+1.72
○	Bacteroidota	<i>Alistipes onderdonkii</i>	Common	2.09%	+2.09
○	Firmicutes_A	<i>Lachnospira eligens_B</i>	Common	2.01%	+1.43
○	Firmicutes_A	<i>Anaerostipes hadrus</i>	Very common	1.92%	+0.69
○	Firmicutes_A	<i>Agathobacter MIC6372</i>	Less common	1.79%	+0.98

↓	Phylum ↑↓	Species ↑↓	Prevalence ↑↓	Relative Abundance % ↑↓	Distance from Average
⊖	Bacteroidota	<i>Alistipes finegoldii</i>	Common	0.71%	+1.68
⊖	Bacteroidota	<i>Alistipes_A indistinctus</i>	Common	0.03%	-0.43
⊖	Bacteroidota	<i>Bacteroides ovatus</i>	Common	0.24%	+0.35
⊖	Bacteroidota	<i>Bacteroides_B dorei</i>	Common	0.43%	-0.34
⊖	Bacteroidota	<i>Bacteroides_B vulgatus</i>	Common	8.54%	+1.52
⊖	Desulfobacterota_A	<i>Bilophila wadsworthia</i>	Common	0.36%	+1.62
⊖	Campylobacterota	<i>Campylobacter_B ureolyticus</i>	Rare	0.04%	
⊖	Firmicutes_A	<i>Clostridium_M bolteae</i>	Less common	0.07%	+0.12
⊖	Firmicutes_A	<i>Clostridium_M citroniae</i>	Rare	0.03%	
⊖	Firmicutes_A	<i>Clostridium_Q symbiosum</i>	Rare	0.02%	
⊖	Actinobacteriota	<i>Eggerthella lenta</i>	Less common	0.61%	+1.38
⊖	Firmicutes	<i>Erysipelatoclostridium ramosum</i>	Less common	0.06%	-0.42
⊖	Proteobacteria	<i>Escherichia coli (coli_D)</i>	Less common	2.21%	+2.25
⊖	Proteobacteria	<i>Escherichia coli</i>	Less common	0.08%	+0.27
⊖	Firmicutes_A	<i>Faecalicatena torques</i>	Common	1.23%	+1.82
⊖	Firmicutes_A	<i>Flavonifractor plautii</i>	Less common	1.38%	+3.02
⊖	Euryarchaeota	<i>Methanosphaera stadtmanae</i>	Less common	0.29%	-0.08
⊖	Bacteroidota	<i>Parabacteroides johnsonii</i>	Less common	2.38%	+3.28
⊖	Firmicutes_A	<i>Peptostreptococcus anaerobius</i>	Less common	0.09%	+0.08
⊖	Bacteroidota	<i>Porphyromonas asaccharolytica</i>	Rare	0.07%	
⊖	Bacteroidota	<i>Porphyromonas somerae</i>	Less common	0.04%	+0.42
⊖	Bacteroidota	<i>Prevotella corporis</i>	Less common	0.24%	+2.02
⊖	Firmicutes	<i>Solobacterium moorei</i>	Rare	0.05%	
⊖	Firmicutes	<i>Streptococcus anginosus</i>	Less common	0.34%	+1.08
⊖	Firmicutes_A	<i>Tyzzrella nexilis</i>	Rare	19.53%	



7 months

Change in Pathobionts

↓	Phylum ↑↓	Species ↑↓	Prevalence ↑↓	Relative Abundance % ↑↓	Distance from Average ↑↓
⊖	Bacteroidota	<i>Alistipes finegoldii</i>	Common	0.61%	+1.53
⊖	Bacteroidota	<i>Alistipes_A indistinctus</i>	Common	0.09%	+0.88
⊖	Bacteroidota	<i>Bacteroides ovatus</i>	Common	1.38%	+2.02
⊖	Bacteroidota	<i>Bacteroides_B dorei</i>	Common	1.47%	+0.61
⊖	Bacteroidota	<i>Bacteroides_B vulgatus</i>	Common	4.59%	+1.01
⊖	Desulfobacterota_A	<i>Bilophila wadsworthia</i>	Common	1.01%	+2.79
⊖	Actinobacteriota	<i>Eggerthella lenta</i>	Less common	0.67%	+1.46
⊖	Firmicutes	<i>Erysipelatoclostridium ramosum</i>	Less common	0.02%	-1.12
⊖	Firmicutes_A	<i>Faecalicatena torques</i>	Common	0.82%	+1.50
⊖	Firmicutes_A	<i>Flavonifractor plautii</i>	Less common	0.05%	-0.19
⊖	Euryarchaeota	<i>Methanosphaera stadtmanae</i>	Less common	0.41%	+0.12
⊖	Bacteroidota	<i>Parabacteroides johnsonii</i>	Less common	0.30%	+0.89

Change in Commensals

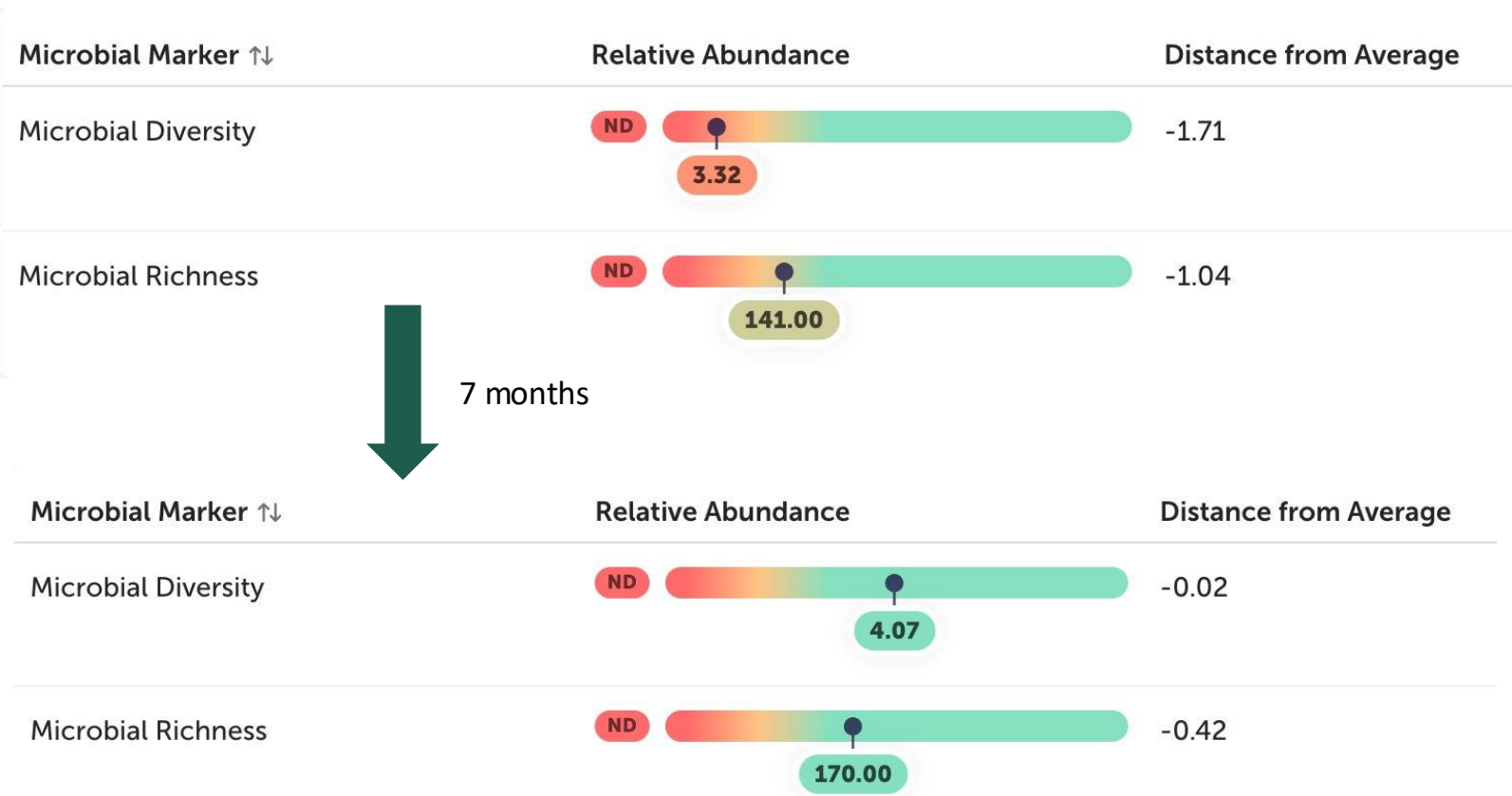
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+	Firmicutes_A	<i>Dorea formicigenerans</i>	Very common	0.06%	-2.36
+	Firmicutes_A	<i>Intestinimonas butyriciproducens</i>	Less common	0.03%	-0.06
+	Bacteroidota	<i>Odoribacter splanchnicus</i>	Very common	1.28%	+3.75
+	Firmicutes_A	<i>Roseburia hominis</i>	Common	0.04%	-1.14
+	Firmicutes_A	<i>Ruminococcus_E bromii_B</i>	Common	0.45%	-1.20



7 months

↓	Phylum ↑↓	Species ↑↓	Prevalence ↑↓	Relative Abundance % ↑↓	Distance from Average ↑↓
+	Firmicutes_A	<i>Agathobacter rectale</i>	Common	0.15%	-1.83
+	Bacteroidota	<i>Alistipes senegalensis</i>	Common	0.30%	+2.00
+	Firmicutes_A	<i>Clostridium_A leptum</i>	Less common	0.17%	+0.52
+	Firmicutes_A	<i>Coprococcus_A catus</i>	Common	0.12%	-0.88
+	Firmicutes_A	<i>Coprococcus_B comes</i>	Very common	0.05%	-2.47
+	Firmicutes_A	<i>Dorea formicigenerans</i>	Very common	0.17%	-0.41
+	Firmicutes_A	<i>Eubacterium_E hallii</i>	Common	0.83%	+0.35
+	Firmicutes_A	<i>Faecalibacterium prausnitzii_C</i>	Common	0.25%	-1.27
+	Firmicutes_A	<i>Fusicatenibacter saccharivorans</i>	Very common	2.89%	+0.07
+	Bacteroidota	<i>Odoribacter splanchnicus</i>	Very common	0.55%	+2.42
+	Firmicutes_A	<i>Roseburia hominis</i>	Common	0.18%	+0.64
+	Firmicutes_A	<i>Roseburia inulinivorans</i>	Common	0.16%	-0.32
+	Firmicutes_A	<i>Ruminiclostridium_E siraeum</i>	Common	2.95%	+1.52
+	Firmicutes_A	<i>Ruminococcus_E bromii_B</i>	Common	6.38%	+0.85

Change in Microbiome Diversity

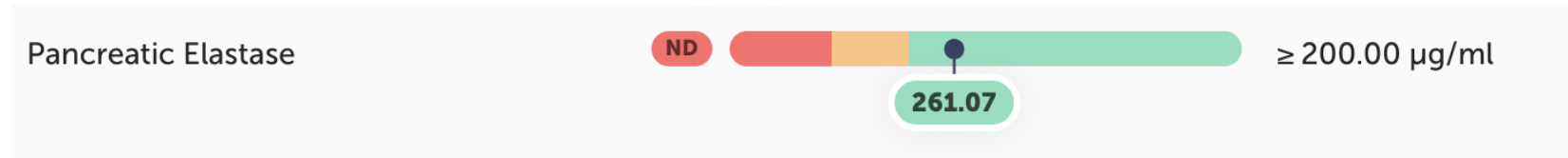
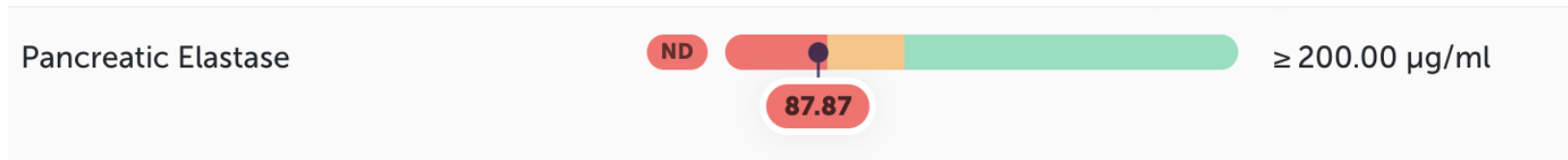


↑ 29

Clinical interpretation

An increase in species diversity driven by dietary variety and the use of targeted prebiotics

Change in Pancreatic Elastase



↑ 197%

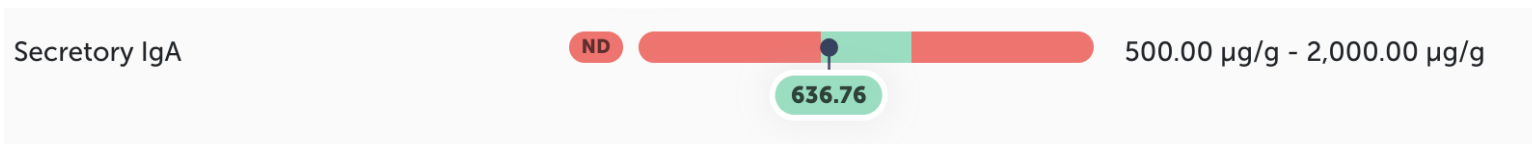
Clinical interpretation

Digestive enzymes and HCL support help create an optimal environment for the pancreas to function efficiently.

Change in sIgA



7 months



↓ 92%

Clinical interpretation

Reduced immune activation caused by pathobionts.

Change in Butyrate



7 months

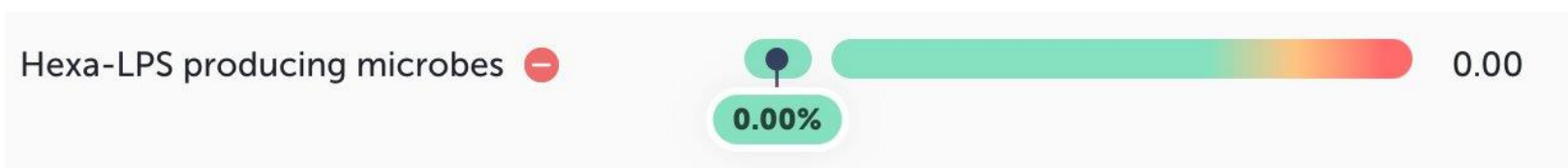


↑ 67%

Clinical interpretation

Targeted prebiotics like PHGG and beta-glucan and dietary fibre, such as resistant starch and pectin, have nourished butyrate-producing microbes.

Change in Hexa-LPS



Clinical interpretation

The combination of GOS and targeted selective antimicrobials has effectively reduced Hexa-LPS-producing species.

Change in Mucin Degradation



7 months



Clinical interpretation

The diet now supplies adequate fibre and prebiotics, enabling the microbiome to utilise fibre instead of mucin as its primary fuel source.

Change in IPA




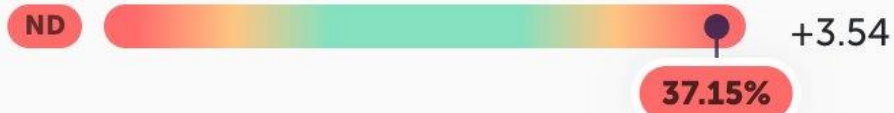
↑ 89%

Clinical interpretation

Consuming one serving of ellagic acid-rich foods daily has boosted IPA-producing microbes.

Change in Propionate

Propionate producing microbes 



7 months

Propionate producing microbes 

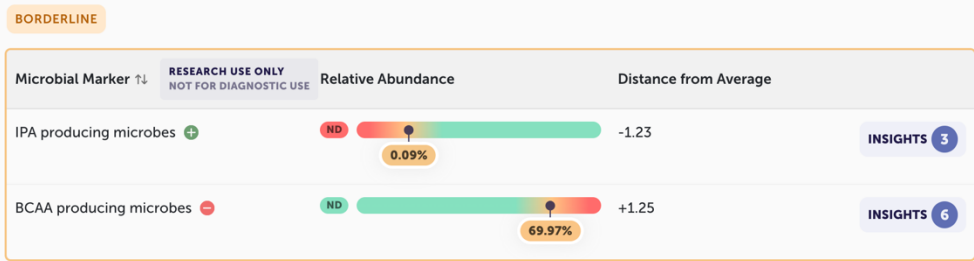


 90%

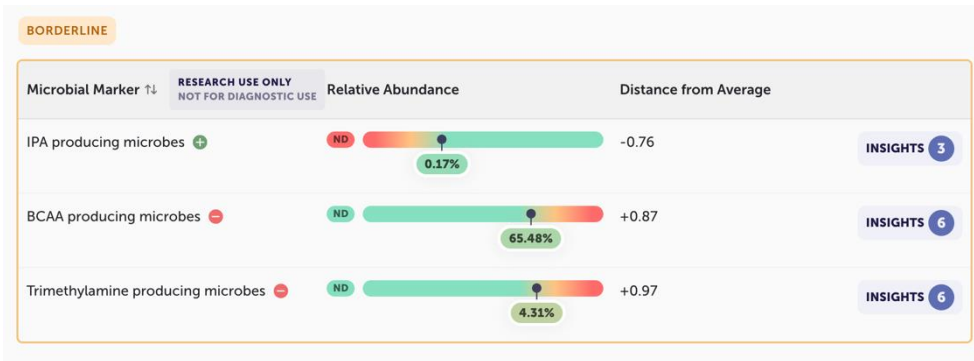
Clinical interpretation

Many pathobionts produce propionate, so their reduction has correspondingly lowered propionate levels.

Change in Microbiome Results



7 months

Symptom Presentation

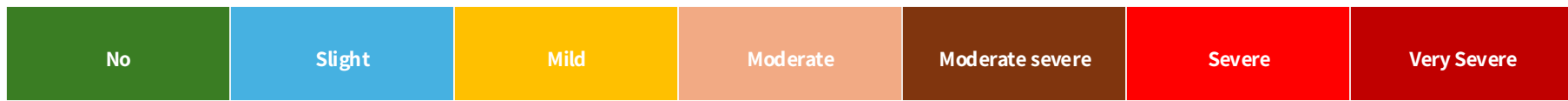
Before

- Reflux: Slight discomfort
- Abdominal pain: Slight discomfort
- Indigestion: Mild discomfort
- Diarrhoea: No discomfort at all
- Constipation: Severe
- GSRS: Mild discomfort



After

- Reflux: No discomfort at all
- Abdominal pain: No discomfort at all
- Indigestion: Slight discomfort
- Diarrhoea: No discomfort at all
- Constipation: Mild discomfort
- GSRS: Slight discomfort



Key Prebiotic Takeaways

- Research supports varying effects for different prebiotics on microbiome composition and function and GI health markers.
- The first step is to consider whether a prebiotic is indicated and whether now is the right time for introduction.
- To personalise your prebiotic to the individual, consider the 6 Personalised Prebiotic Considerations, while being guided by gut microbiome test results.
- Consider the appropriateness of both dietary and supplement interventions.
- Dosage varies considerably according to condition/therapeutic goal – be aware of the research rather than relying on product labels.
- Tolerance and acceptability can be a stumbling block – when in doubt, start low and slow.
- Re-testing the gut microbiome to evaluate effects and adapt recommendations can be beneficial.

Invivo Prebiotic Range





Nutritional Information	
Active	5g (3 tsp)
Sunfiber® AG (Organic Partially Hydrolysed Guar Gum)	5g

Bio.Me™ Prebio PHGG

A water soluble, long chain prebiotic fibre, which is low in FODMAPs, to support microbial diversity

WHAT IT CONTAINS

Partially hydrolysed guar gum

KEY BENEFITS

- + PHGG is a long chain prebiotic fibre that feeds keystone butyrate-producing commensal bacteria
- + Supports diversity of commensals and SCFA producing bacteria
- + Improves stool regularity and consistency in IBS – either diarrhoea or constipation
- + Reduces high intestinal methane gas, and SIBO safe
- + Binds to bile acids for excretion
- + To increase fibre in the diet

DOSAGE

☞☞☞ 3 teaspoons dissolved in hot water or food daily
Heat stable and flavourless so can be used in cooking

This information is intended for training purposes for healthcare professionals only



Nutritional Information	Per Dose
Active	2g (1/2 tsp)
Galactooligosaccharides (Milk)	2g
Allergens: See ingredients in bold	

Bio.Me™ Prebio GOS

Clinically researched galacto-oligosaccharides to support microbial diversity

WHAT IT CONTAINS

Pure GOS, with no fillers

KEY BENEFITS

- GOS is a short-chain prebiotic, which contains linkages that certain commensal bacteria metabolise
- To increase growth of *Bifidobacterium* spp. and other key commensals in the gut
- To aid immunomodulation and raise SIgA – decreasing the risk of allergic conditions
- IBS symptoms – has regulatory effect on stool consistency, bloating and flatulence
- Has also been shown to improve skin health

DOSAGE

🥄 ½ teaspoon a day in water or food
Heat stable so can be added to food or hot drinks

PRODUCT PARTNERS

- Bio.Me™ Barrier
- Bio.Me™ Essential

This information is intended for training purposes for health care professionals only



Nutritional Information	Per Dose
Actives	1 Capsule
Digestive Enzyme Blend	250mg
Alpha-Amylase	6,000 SKB
Glucoamylase	15 AGU
Protease 4.5	10,000 HUT
Protease 3.0	10 SAPU
Lipase	350 FIP
Lactase	500 ALU
Cellulase	500 CU
Bromelain	200,000 PU
Papain	50,000 PU
Alpha-Galactosidase	40 GAL
Fennel Seed Powder	50mg
Other Ingredients: Capsule Shell: Hydroxypropyl Methylcellulose	

Bio.Revive™ Digestive +

Vegan digestive enzyme formula, to support breakdown of fats, proteins, and carbohydrates in the gastrointestinal tract.


WHAT IT CONTAINS

Vegan digestive enzymes and fennel seed

KEY BENEFITS

- To support people struggling with their digestive capacity
- Contains fennel, to help calm symptoms of bloating, belching and indigestion with meals.
- To help relieve digestive comfort

DOSAGE

 2 capsules taken with food up to 3 times a day

PRODUCT PARTNERS

- Combines well with all our whole range, but especially **Bio.Me Essential**

This information is intended for training purposes for health care professionals only



Nutritional Information	Per Dose
Actives	2 Capsules
Wormwood Extract 4:1 (<i>Artemisia absinthium</i>)	300mg
Caprylic Acid (As Magnesium Caprylate)	240mg
Pau D'Arco Extract 4:1	200mg
Thyme Extract 4:1	200mg
Barberry Bark Extract 10:1	125mg
Clove Bud Powder	120mg
Sage Extract 5:1	100mg
Myrrh Extract 4:1	75mg
Other Ingredients: Capsule Shell: Hydroxypropyl Methylcellulose, Anti-Caking Agent: Spirulina	

Bio.Clear™ Microbia

A botanical blend to support microbial balance

WHAT IT CONTAINS

Botanicals carefully chosen for their antimicrobial impacts

KEY BENEFITS

- To rebalance dysbiotic microbiotas: gut, urinary tract, vagina etc
- Contains a blend of herbs that have been used for their antimicrobial, antifungal, antiparasitic and antihelmintic actions

DOSAGE

🍯/🍯 1 to 2 capsules a day as a part of a dysbiosis management plan
Can be titrated up to 4 a day for short duration in acute need

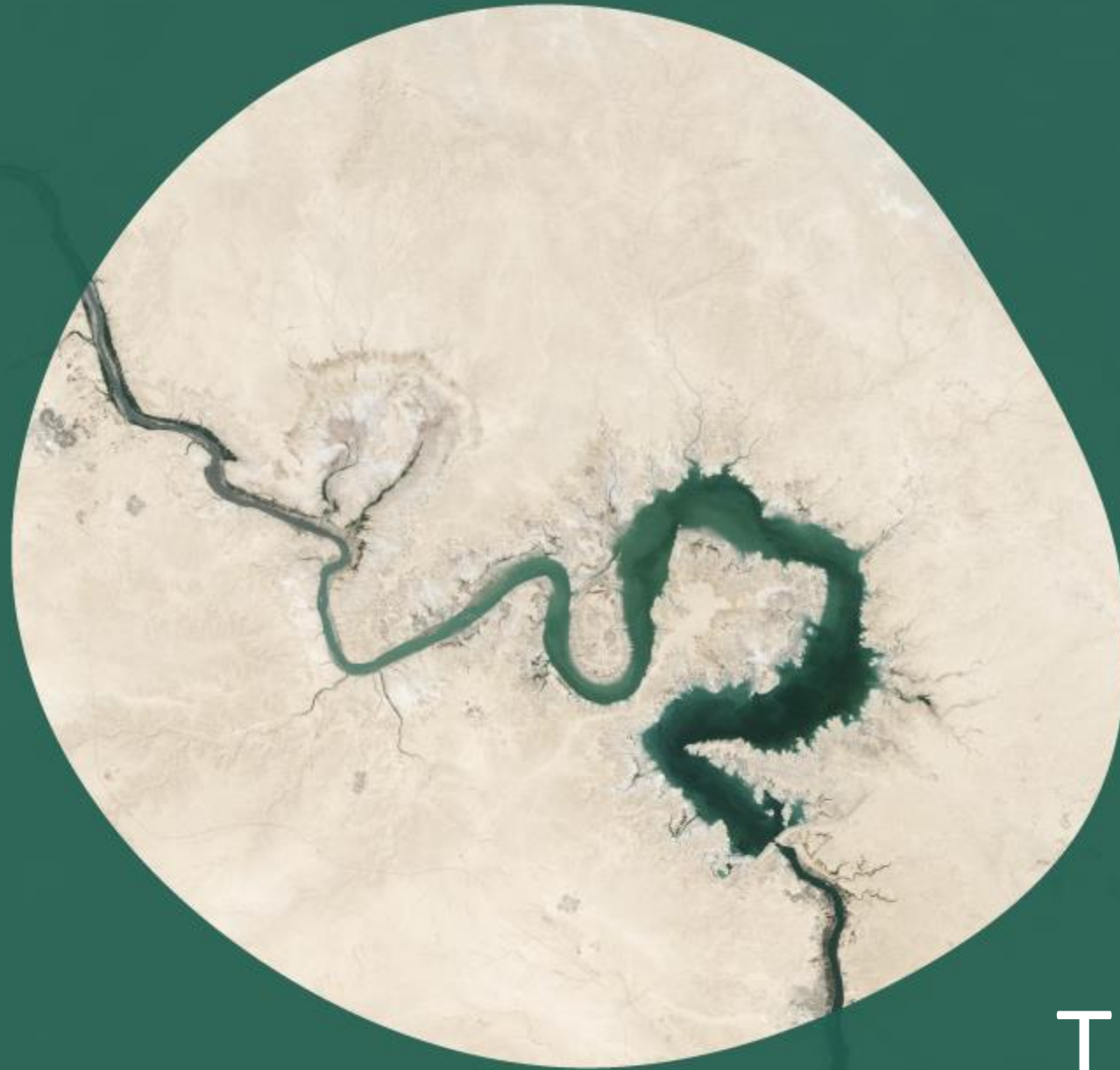
PRODUCT PARTNERS

- Bio.Me™ Prebio GOS/PHGG
- Bio.Me™ Essential
- Bio.Clear™ Range

This information is intended for training purposes for health care professionals only

invivo®

The Human Microbiome Company



Thank ***you***

A close-up photograph of two hands, one darker-skinned and one lighter-skinned, clasped together in a supportive grip. The hands are centered within a large, semi-transparent white circle that is set against a dark, gradient background. The lighting is soft, highlighting the texture of the skin and the interlocking fingers.

Questions?

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