

Selecting Prebiotics in a Targeted Way

Prebiotics are not nonspecific “dietary fibers” – they can be used specifically as substrates to promote particular bacterial groups and microbial functions. The new table is therefore intended to help derive a suitable prebiotic strategy from the individual microbiome and metabolome test results.

Why a differentiated selection of prebiotics matters

Many therapeutically relevant changes can be influenced particularly well with prebiotics. The main focus is on promoting *Akkermansia muciniphila* and *Faecalibacterium prausnitzii* and on stimulating endogenous butyrate production.

For these axes in particular, prebiotics are a meaningful complement to probiotic therapy: instead of merely supplying additional microorganisms, the aim is to specifically nourish existing, functionally important bacteria and support their metabolic activity.

Basic principle: Identify deficit based on test results → select the appropriate target axis → choose the prebiotic based on effect AND tolerability.

Three particularly important target axes

Reduced *Akkermansia*

2'-Fucosyllactose (2'-FL) is rated in the table as particularly effective for promoting *Akkermansia*. In addition, *Akkermansia* can be supplied as a pasteurized bacterium/postbiotic.

Reduced *F. prausnitzii*

Since *F. prausnitzii* cannot simply be replaced as a conventional probiotic, specifically promoting the existing strain with suitable prebiotic substrates is particularly worthwhile.

Reduced butyrate production

Prebiotics can promote existing butyrate producers and thereby stimulate the body's own microbial butyrate production. If needed, butyrate can also be administered directly, either as an alternative or in addition.

2'-Fucosyllactose: Strong for *Akkermansia*

In the original table, 2'-fucosyllactose (2'-FL) reaches the highest efficacy level for *Akkermansia* (+++++). If *Akkermansia* is the central target axis, 2'-FL is therefore a particularly promising approach.

If the aim is to promote a broader spectrum at the same time – e.g., *F. prausnitzii*, bifidobacteria, lactobacilli and butyrate production – combining 2'-FL with other prebiotic agents may be useful. BG Prä AB&L is an example of such a broader activity profile in the table.

Ranking, Tolerability and HMO Quality

Ranking – A practical summary parameter

The ranking column combines the equally weighted functional effects in the table into a quick overall overview. It is particularly helpful when the aim is not to address a single target axis, but to support several bacterial groups and functions simultaneously.

A high ranking value is especially relevant when *Akkermansia* and *F. prausnitzii* as well as bifidobacteria and lactobacilli are to be promoted as broadly as possible. In addition, it should always be checked how strongly the prebiotic stimulates butyrate production and how well it is tolerated by the individual patient.

Important: The ranking is a guide to the overall effect – the target axis that is abnormal in the individual patient remains decisive for selection.

Tolerability: Not every prebiotic suits every patient

The functionally strongest substance is not automatically the best choice. In irritable bowel syndrome, SIBO (small intestinal bacterial overgrowth), IMO (intestinal methanogen overgrowth) or pronounced fermentation, tolerability can largely determine the selection. The table therefore also includes the "Fermentation" column as well as information on lactose intolerance and fructose malabsorption.

For sensitive patients in particular, the question should therefore not only be "What is most effective?", but also "What is this patient likely to tolerate well?"

Therapeutic selection = desired effect + tolerability + individual pattern of test findings.

HMOs: Dosage and purity are decisive

For HMOs (human milk oligosaccharides), the table shows that dosage can make a considerable difference. In addition, the degree of purity is particularly important.

Products with a purity of only about 90% often contain more residual lactose, glucose or fermentation by-products and may be less well tolerated, especially by sensitive patients – e.g., those with SIBO, IMO or lactose intolerance.

Practical rule: For HMOs, aim for a purity of 98–99% whenever possible.

How do I work with the table?

1

Determine the target axis from the test results

e.g., *Akkermansia* ↓, *F. prausnitzii* ↓, butyrate production ↓ or several deficits at once.

2

Compare suitable agents

First look at the columns for the target axes that are actually relevant.

3

Use the ranking for multiple targets

The ranking helps to identify prebiotics with a broad functional activity profile more quickly.

4

Check tolerability as well

Include fermentation as well as lactose and fructose tolerance in the decision.

Original Prebiotics Table with Explanations

First check the deficits in the test results, then select the prebiotic. In addition to the target axes, ranking, fermentation and tolerability provide further guidance.

Agent	Akkermansia	Bifidobacteria	F. prausnitzii	Lactobacilli	Butyrate production	Anti-inflammatory	Milieu	Fermentation ¹	Ranking	Lactose intoler.	Fructose malab.
2'-Fucosyllactose	+++++	++	+++	–	(+)	+++	++	++	7.1	✓	✓
GOS	(+)	+++	–	++*	(+)	+	+++	++	7.7	✓ (pure)	✓
AXOS	+++	++	+++	(+)	++	+++	++	+++	7.8	✓	✓
Polydextrose	+++	+	+++	–	+++	+++++	+++	+++	7.9	✓	✓
Berberine	+++	–	(+)	–	+	+++	(+)	+++++	6.1	✓	✓
Inulin	(+)	(+)	–	–	(+)	(+)	(+)	–	5.2	✓	✗
FOS	(+)	+	–	(+)	(+)	(+)	+	–	5.2	✓	✗
Acacia fiber	(+)	(+)	–	–	(+)	(+)	(+)	++	5.6	✓	✓
Resistant starch	(+)	(+)	(+)	–	+	+	(+)	++	6.4	✓	✓
HMO mix (1 g/day)*	–	(+)	–	–	–	(+)	–	++*	5.2*	✓*	✓
HMO mix (6 g/day)*	+++++	+++	+++	(+)	+++	+++++	+++	++*	8.6*	✓*	✓
XOS	+++	+++	(+)	(+)	+	+++	++	+	7.3	✓	✓
BG Prä AB&L (Mix)	+++++	+++	+++	++*	+++	+++++	+++++	+++	8.9	✓	✓

The table rates prebiotics according to their functional effect on the microbiome and the gut milieu; the ranking is the mean of the equally weighted effects. Check the deficiencies identified in the test results, then select the prebiotic.

Explanation: Efficacy is shown qualitatively using plus signs: +++++ = very strong, +++ = strong, ++ = good, + = moderate, (+) = low, – = very low to no effect. Fermentation/tolerability in IBS, SIBO, IMO and sensitive patients: +++++ = very well tolerated to – = poorly tolerated.

Abbreviations: FOS = fructooligosaccharides, XOS = xylooligosaccharides (fructose-free), AXOS = arabinoxylan oligosaccharides, HMO = human milk oligosaccharides, BG = BactoGena.

HMO purity: For HMOs, please choose products with the highest possible purity (ideally 98–99%). Products with lower purity (e.g., around 90%) often contain more residual lactose, glucose or fermentation by-products and may be less well tolerated, particularly by sensitive individuals (e.g., those with SIBO, IMO or lactose intolerance).

Quick reading guide

- **Akkermansia as main focus:** Pay particular attention to 2'-FL.
- **Several target bacteria at once:** Check broad combinations and the ranking.
- **Butyrate deficiency:** Assess butyrate production separately.
- **Sensitive patients:** Consider fermentation, tolerability and HMO purity.

Key principle: Don't look for the "best prebiotic" – look for the prebiotic that matches the patient's target axis, overall profile and tolerability.