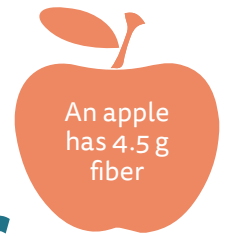


# Understanding Prebiotics and Fiber



Both prebiotics and fiber are dietary tools to promote health

## What is a prebiotic?

In simple terms, a prebiotic is food for beneficial members of your resident microbial community – we can't digest prebiotics, but certain beneficial microbes can. Your resident microbes can produce a variety of beneficial compounds (for example, short chain fatty acids) from utilization of prebiotics. These can promote a healthy gut – and beyond. In more technical terms, a prebiotic is a substance that is selectively utilized by host microorganisms conferring a health benefit.

## What is fiber?

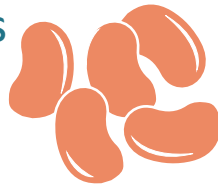
Fibers are non-digestible plant-derived carbohydrates comprising at least 3 units of individual sugars. Most fibers are components of plants. Depending on regulations where you live, if fiber is isolated from whole plants or synthesized from sugars, demonstration of physiological benefits is needed to be able to call them 'fiber' on a food label.

## Do we need both fiber and prebiotics?

Most of us do not get enough fiber in our diets. Increasing fiber-rich foods and prebiotic-containing foods or supplements will help promote gut health and benefit your gut microbiota, too.

## Health benefits of prebiotics

- Improve mineral absorption
- Modulate immune system
- Modulate satiety
- Improve bowel habits<sup>1</sup>
- Reduce occasional constipation, diarrhea
- Promote metabolic health (insulin resistance, healthy blood lipid levels)
- Help with symptoms of irritable bowel syndrome
- Reduce risk of allergy



Black beans have 15 g fiber per cup

## Prebiotics are selectively utilized by resident microbes.

Prebiotics have targeted effects on our bacteria. Most microbes won't be affected. Selective utilization is a *requirement* for a prebiotic. Prebiotics encourage the activities of a subset of your microbiota that have beneficial functions, including those commonly used as probiotics (*Lactobacillus* and *Bifidobacterium*). Many fibers are likely also selectively utilized by gut microbes, but this is not a requirement for fiber.

## Health benefits of whole food fibers

- Laxation<sup>2</sup>
- Improve blood lipids<sup>2</sup>
- Improve blood glucose regulation<sup>2</sup>
- Improve mineral absorption
- Modulate immune system
- Modulate satiety

<sup>1</sup>Benefit accepted by European Food Safety Authority for inulin

<sup>2</sup>Benefits accepted by the U.S. Food and Drug Administration

## Fiber

- ✓ Not digested by humans, but some fibers are utilized by gut microbes
- ✓ Naturally present in many whole grains, fruits, vegetables and legumes
- ✓ Adequate Intake values specified. Daily Value of 28 g/d based on 2000 kcal/d diet
- ✓ Can be soluble or insoluble

## Prebiotics

- ✓ Not digested by humans, but acted on by gut microbes
- ✓ Naturally present in a wide range of foods from plants (e.g. chicory root, vegetables, whole grains). Usually isolated from whole plants or synthesized from sugars
- ✓ No Adequate Intake level or Daily Value
- ✓ Many current prebiotics are a type of soluble dietary fiber

### Insoluble

e.g. Cellulose

### Soluble

e.g. Psyllium

### Fiber prebiotics

Inulin, fructo-oligosaccharides (FOS), and galacto-oligosaccharides (GOS). Promising candidates are resistant starch, polydextrose, xylo-oligosaccharide (XOS) and isomalto-oligosaccharide (IMO).

### Non-fiber prebiotics

Lactulose, promising candidates Polyphenolics, and polyunsaturated fatty acids

Some microbiome modulation

Proven microbiome modulation associated with health benefits

Degree of microbiome modulation

Broccoli has 4 g fiber



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