

# Prebiotics and their health benefits



Inspired by Inulin

# 1. Introduction

'Prebiotic' is a positive and familiar term to most of us, but what exactly are prebiotics, and what do they do for our health? This paper outlines what prebiotics are and what their importance is to human health.

In short, prebiotics selectively increase friendly microbes, like bifidobacteria, in the intestine. This contributes to a healthy gut, and improves our overall health and well-being.

# 2. Dietary fibers

Most of us will have a good idea of what fibers are. All kinds of plants, including plants we do not typically consume, produce fiber. Fibers can also come from animals, for example animal hair, or can be man-made synthetic fibers. Specifically dietary fibers refer to the fibers from plant food sources, and so they can be found in fruits, vegetables, legumes and other plant material<sup>1</sup>. In developed countries, the amount of dietary fiber consumed is currently below recommendations from government health organizations, creating a so called 'fiber gap', i.e. a difference between the daily recommendations and the actual intake. Remarkably, although 68% of people questioned said they find their fiber intake important, about 80% of them doesn't know the

recommended daily intake of dietary fiber<sup>2</sup>. This is a missed opportunity since dietary fibers are well known for their positive influence on health and well-being. Furthermore, they improve digestive health, support weight reduction and are implicated in various other benefits such as reducing stress.

The exact definition of dietary fibers is described by regulatory organizations and slightly differs between countries, though most definitions include 'non-digestible carbohydrate' with a 'beneficial physiological effect'<sup>3</sup>. What is less well-known, is that some special dietary fibers may also be classified as prebiotics.

# 3. What are prebiotics?

A recent survey showed that most persons (88%) have heard of the term prebiotics<sup>2</sup>. However, half of them did not exactly know what prebiotic stands for, and even fewer (10%) could explain the exact meaning. The International Scientific Association for Probiotics and Prebiotics (ISAPP) defines a prebiotic as 'a substrate that is selectively utilized by host microorganisms conferring a health benefit'<sup>4</sup>. Selectivity means that a prebiotic must be used by only one or several friendly microbes present in the

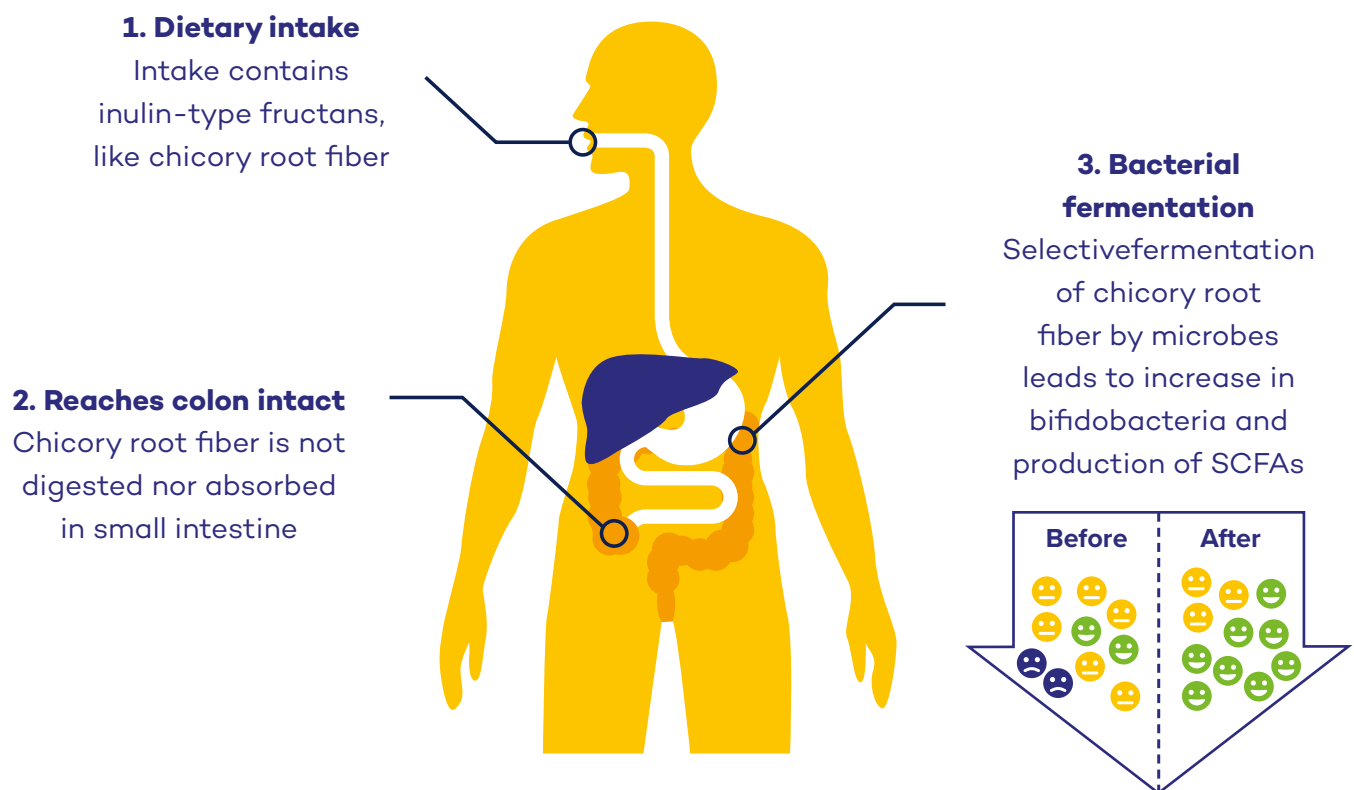
intestine, but not all. Furthermore, a prebiotic must show a health benefit that is scientifically proven and supported by well-controlled human research studies. Inulin and oligofructose extracted from the roots of the chicory plant are among the few ingredients, and the only plant-based ones, that are officially recognized as prebiotics by ISAPP<sup>4</sup>. In addition, they are also dietary fibers, i.e. chicory root fiber.

## 4. Health benefits of prebiotics

Chicory inulin and oligofructose reach the human colon intact where bifidobacteria ferment them as energy source to short chain fatty acids (SCFAs), while growing and increasing in number<sup>3</sup>. This selective fermentation of chicory inulin and oligofructose by bifidobacteria, the so-called 'bifidogenic effect', is key to the health benefits. The SCFAs are absorbed and used as an energy

source by the whole body. Especially the colon cells will function better and support a regular digestion with softer stools, besides improving our protection against chemicals and pathogens<sup>5</sup>. Furthermore, there is science that chicory root fiber can play a role in preventing overweight/obesity and reduce inflammation which underlies many conditions in today's society<sup>6-8</sup>.

### Chicory root fiber fermentation leads to increase in bifidobacteria and production of SCFAs



## 5. Prebiotics versus probiotics and synbiotics

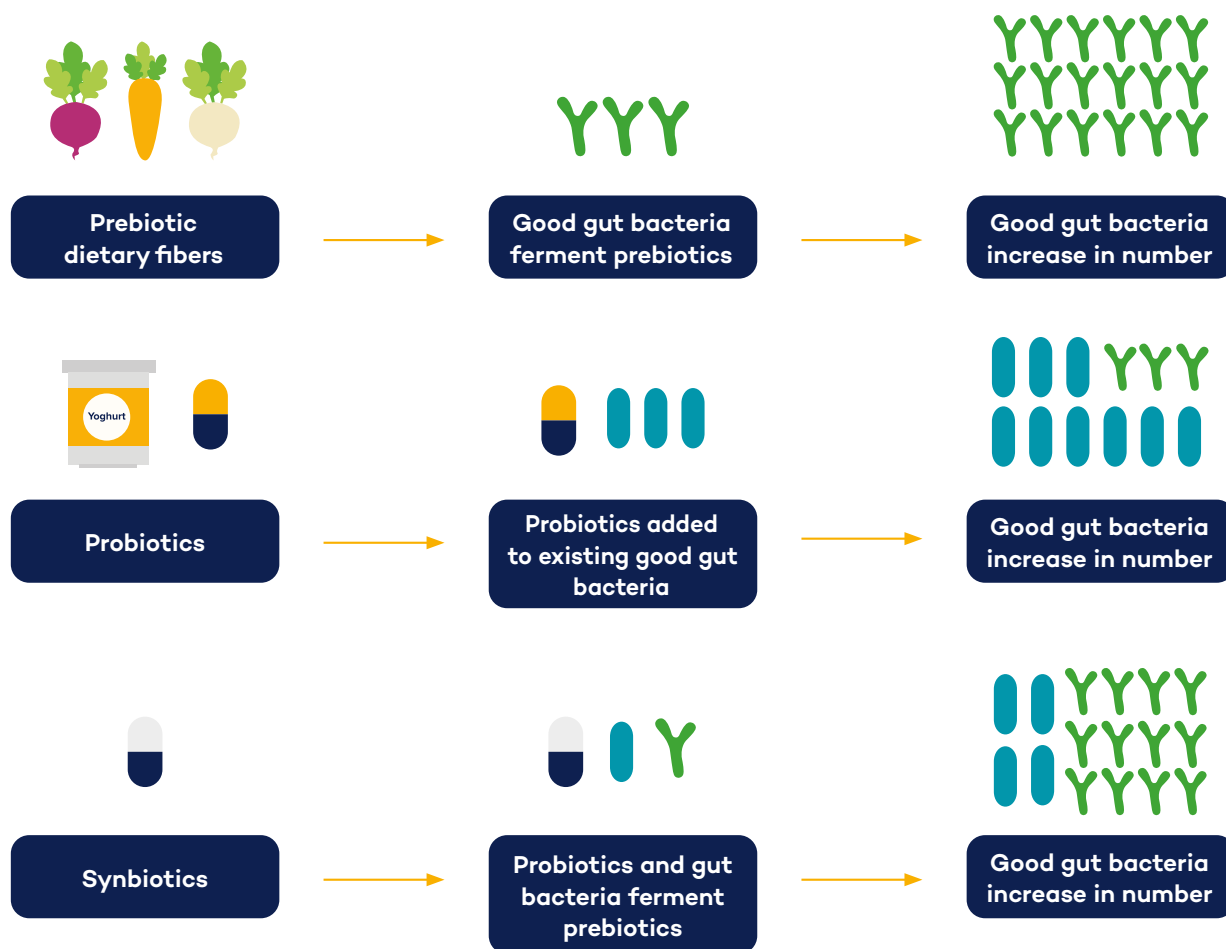
**Prebiotics** should not be confused with **probiotics** that have been defined as 'live microorganisms that, when administered in adequate amounts, confer a health benefit on the host'<sup>9</sup>. Probiotics are often added to refrigerated foods, like yoghurts,

or may be freeze-dried in capsules and consumed as supplements. Prebiotics like chicory inulin and oligofructose have the advantage that they can be added under all conditions to a wide variety of food and drinks. Prebiotics and probiotics may

be combined in one product, as the prebiotic may support the storage life of the probiotic microbe and enhance the health benefits. This combination makes a 'synbiotic', which is defined as 'a mixture

comprising live microorganisms and substrate(s) selectively utilized by host microorganisms that confers a health benefit on the host'<sup>10</sup>.

### Difference between prebiotics, probiotics and synbiotics



## 6. Sensus chicory inulin

Inulin and oligofructose are dietary fibers which are naturally present in many vegetables and fruits such as onions, garlic and banana. Sensus extracts the fibers inulin and oligofructose from one of the richest sources, the chicory root. Frutaft® inulin and Frutalose® oligofructose are dietary fibers that selectively increase the number of bifidobacteria in the gastrointestinal tract and have scientifically

proven health benefits on the digestive system<sup>6</sup>. Health claims for the bifidogenic effect and even for a prebiotic effect may be made on foods in many countries with conditions depending on the regulatory body. Moreover, there is increasing evidence for other benefits such as supporting weight management and a good immune system<sup>7,8,11</sup>.

## 7. Conclusion

Dietary fibers from plant food sources cannot be digested in the small intestine and so reach the colon where they are fermented by the intestinal microbes. Some dietary fibers, like Frutafit® inulin and Frutalose® oligofructose from chicory roots are selectively fermented by the beneficial bifidobacteria leading to health benefits, and thus are also prebiotics. Frutafit® inulin and Frutalose® oligofructose are the only plant-based prebiotic ingredients, officially recognized by ISAPP, that are available on the market.

The mechanism by which the prebiotic effect occurs can be explained by the fermentation of chicory root fibers by bifidobacteria in the gut with consequent production of SCFAs. Everybody can benefit from the prebiotic effects of chicory root fiber, as there are numerous studies demonstrating the bifidobacterial effect in infants to elderly, which strongly underlies a healthy gut and well-being.

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