



# Novel ingredients: chicory root fibre

**Chicory root fibre is a dietary fibre sourced from natural chicory roots. It contains inulin, which has significant scientifically-proven health benefits for pets, as well as people.**

## **Inulin**

Inulin (or oligofructose) is a natural fibre produced by many plants. Plants make inulin to store energy. It is also important in the plant's defence against the cold. Inulin is usually found in the roots of plants. More than 36,000 different types of plant contain inulin, including wheat, onions, bananas, garlic, asparagus, and chicory. Commercially, it is most often extracted from chicory roots.

## **Health benefits**

Inulin has functional properties that benefit the health of humans and animals. It is a carbohydrate made from many units of fructose joined together (a polysaccharide). Due to specific bonding of the fructose molecules within inulin, which the enzyme systems in our digestive tracts are not able to break

down, it acts as a dietary fibre. It boosts the fibre content of foods and promotes bowel health. With 'natural' sweetness, inulin in the form of chicory root fibre reduces the amount of processed sugar and fat needed within food products, and can help improve blood sugar management. Due to a low calorie content (half the calories of sugar), it supports weight loss and enhances the taste and texture of foods.

## **Pet food**

While many scientific studies show how inulin can benefit human health, there are fewer studies that explore effects of inulin in the diet of pets. However, the body of evidence in animals is growing. The use of chicory root fibre inulin in pet food is currently based on its proven functional benefits in humans; the evidence emerging from studies in pets indicates that these benefits also apply in animals.

# How does inulin benefit health?

### Improved digestive health

The microorganisms present in our and our pets digestive tracts affect health and well-being. Healthy gut bacteria, such as *Bifidobacteria*, contribute to good bowel movement, digestion, and overall health. Recent research indicates that gut bacteria may also affect energy regulation, immune response, and even the gut-brain interaction. Inulin stimulates the growth of beneficial bacteria and contributes to a healthy gut flora.

### Better blood sugar management

Glycaemic response is the change in blood glucose levels that happens after eating a specific food that contains sugars. Different foods create different glycaemic responses. Dietary fibres, like inulin, cause a low glycaemic response that can support better blood glucose management. Inulin does not raise blood sugar and, therefore, does not cause insulin to be secreted. Inulin is recommended for diabetics and is potentially helpful in managing metabolic syndrome risk factors.

### Cardiovascular health

Research shows that some soluble fibres, like inulin, help lower blood cholesterol and glucose levels and reduce the thickening of arteries in humans. Dietary fibre intake seems to be linked to lower blood pressure, reduced risk for hypertension, heart disease and metabolic syndrome.

### Pet food applications

Positive effects in several indicators related to overall health, obesity and well-being in pets have been found in pet foods that contain 1-4% inulin. With health and pet obesity key concerns amongst pet owners, chicory root fibre inulin could prove an interesting ingredient for pet food manufacturers. In dogs, clear effects on intestinal health and overall health promoted by composition of gut microbiota have been observed with inulin in the diet. Resultant increased short chain fatty acid (SCFA) production and reduction of ammonia provide beneficial effects, such as increased nutrient absorption, decreased intestinal pH and improved stool odour. Beneficial effects on obesity related

### Satiety

Dietary fibre satisfies the appetite and reduces blood sugar fluctuations. This can help decrease appetite and cravings, potentially helping with weight loss.

Inulin increases volume and slows the process of food emptying from the stomach. It also affects the digestive hormones that increase satiety. This may lead to less energy intake, which, in turn, may help to improve efforts to control weight.

### Fewer calories

When eaten, inulin is not broken down or absorbed in the mouth, stomach or small intestine. It arrives unchanged in the large intestine and does not contribute to calorie intake. Bacteria in the colon ferment inulin into short-chain fatty acids (SCFAs). These SCFAs are only partly absorbed by the body and contribute to a reduced calorie uptake compared to normal digestible carbohydrates.

### Sugar reduction

Sugars, including sucrose and glucose, are used in a wide range of food applications for many reasons. Adding sweetness is a key function in human food products, but sugars also play an important role in other product qualities. Inulin is a useful sugar replacer in food applications from a wide range of segments.

indicators have also been discovered.

Fewer inulin studies have, so far, focused on cats. However, despite their adaptation to a carnivorous diet, considerable microbial fermentation occurs in the hindgut of cats. Therefore, it could be logically expected that increase of healthy gut bacteria in cats would also improve general health through increased production of SCFAs.

The effects of inulin against obesity make inulin an attractive concept for cat food formulations. In addition, cats are specifically sensitive to liver and kidney problems at high age. An inulin-induced shift of nitrogen from urine to faeces could be particularly beneficial for older cats.

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## Ingredients and production



### Studies have indicated that inulin offers benefits for other companion animal species:

Animal	Beneficial effect
Chickens	<ul style="list-style-type: none"><li>• Decreased blood serum lipids.</li><li>• Increased SCFA production.</li><li>• Increased mineral absorption, improved bone quality.</li></ul>
Fish	<ul style="list-style-type: none"><li>• Higher total number and more diverse bacteria population.</li><li>• Stimulation of intestinal growth.</li></ul>
Pigs	<ul style="list-style-type: none"><li>• Reduced nitrogen excretion ('reduced pollution').</li><li>• Protection against dysentery.</li><li>• Positive change of gut microbiota.</li></ul>
Rabbits	<ul style="list-style-type: none"><li>• Improved fermentative activity.</li><li>• Higher SCFA production, lower gut pH.</li><li>• Increased protein digestibility.</li></ul>

### Clean label

As chicory root fibre inulin is a clean label ingredient, it holds even more appeal to manufacturers in developing products to satisfy growing consumer demands for healthier food. A health claim, recently approved by the European Commission, which confirms that chicory root fibre improves blood sugar management, can be used to label human food products. With several benefits for manufacturers and consumers, the use of chicory root fibre inulin in a wide range of pet food- as well as human applications is growing worldwide.

### Enormous potential

"We have seen a large increase in the demand for chicory root fibre for use in pet food products over recent years from many global players in this sector, as well as smaller companies," said Matthew de Roode, Product Developer at Sensus, one of the world's biggest chicory root fibre manufacturers.

"While chicory root fibre may currently be considered by many to be a novel food ingredient for the pet food industry, it is rapidly becoming a mainstream ingredient, also in the human food industry, as manufacturers recognise its enormous potential as a functional ingredient in healthier pet food products that match the demands of today's increasingly health-conscious pet owners." ♦



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