

# Hay fever could be linked to our gut and nose bacteria, and probiotics may help symptoms

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Credit: AI-generated image ([disclaimer](#))

For many people, spring has brought with it the dreaded symptoms of [hay fever](#), such as itchy eyes, sneezing and a stuffy nose. Hay fever is common, affecting [up to 42%](#) of people. It occurs when the immune system overreacts to allergens including pollen.

Research suggests there could be a link between [hay fever and the microbiome](#), the collection of microorganisms that live in and on our bodies. Specifically, the composition of a person's [gut](#) and [nasal microbiomes](#) may play a role in the development of [hay fever](#) symptoms.

By exploring this connection, we can identify potential alternative treatments that may help reduce the effects of hay [fever](#) on people's daily lives.

## Hay fever and the microbiome

Studies have shown that people with hay fever often have [a less diverse gut microbiome](#) compared to those without the condition. Reduced diversity of gut bacteria can lead to an imbalance in the [microbiome](#), and result in higher levels of inflammation (the body's immune response to irritants, such as an allergens).

So the fact that reduced diversity of gut bacteria can lead to an increased risk of hay fever makes sense since the gut microbiome plays a key role in [regulating the immune system](#), and we know the [immune system](#) influences allergies.

The gut microbiome is thought to affect immune system function in several ways, including through the production of [short-chain fatty acids](#). These are produced by gut bacteria during the fermentation of dietary fiber (a part of normal digestion).

Short-chain [fatty acids](#) are known to have anti-inflammatory properties. Research has shown that lower levels of two [bacterial strains](#) which produce short-chain fatty acids—Bifidobacterium and Lactobacillus—are associated with [an increased risk of hay fever](#).

In addition to the gut microbiome, hay fever also seems to be linked to

the [nasal microbiome](#), the community of microorganisms that inhabit the nasal passages.

The nasal microbiome plays an important role in regulating the immune system and protecting against harmful pathogens that enter our bodies through the nose. Imbalance and reduced diversity of the nasal microbiome can lead to an [increased risk of respiratory infections](#) and [exacerbation of hay fever symptoms](#).

Studies have shown that people with hay fever often have a different [composition of their nasal microbiome](#) compared to those without the condition, with more of certain bacteria such as [Staphylococcus aureus](#). This imbalance in the nasal microbiome can lead to increased inflammation and a higher risk of certain hay fever symptoms.

## **The potential role of probiotics and prebiotics**

Probiotics are [live microorganisms](#) which enhance the composition of "good" bacteria in the body. Prebiotics, meanwhile, are fibers that stimulate beneficial bacteria in the gut. Essentially, good bacteria [feed on prebiotics](#). Both are important for maintaining a healthy [gut microbiome](#), which plays a crucial role in our overall health.

Several strains of [probiotic bacteria](#) have been studied in connection to hay fever.

One strain of interest is Lactobacillus acidophilus, which has been found to [reduce hay fever symptoms](#) such as congestion, itching and sneezing. Another is Lactobacillus rhamnosus GG, which has shown potential in preventing hay fever development in infants.

Other [strains](#) such as [Bifidobacterium lactis](#), Bifidobacterium bifidum and Lactobacillus casei have also shown some promise in reducing hay

fever symptoms. But further research is needed.

## How does this work?

Probiotics appear to modulate the immune response and in particular, decrease the production of inflammatory cytokines. These are signaling molecules produced by cells of the immune system that promote inflammation.

For example, *Lactobacillus acidophilus* can [decrease the expression of](#) inflammatory cytokines associated with allergic inflammation in the mucous membranes in the nasal cavity.

Similarly, [Lactobacillus rhamnosus GG](#) has been shown to reduce airway hyperresponsiveness (where the airways narrow excessively in response to stimuli), decrease inflammatory cells in the lungs, and reduce inflammatory cytokines.

Prebiotics, such as fructo-oligosaccharides, have also been studied for their [potential in hay fever prevention](#). They've been found to increase beneficial gut bacteria such as [Bifidobacterium and Lactobacillus](#). One study showed that fructo-oligosaccharides supplementation in infants [decreased their risk](#) of developing hay fever.

## Incorporating probiotics and prebiotics

If you suffer from hay fever, you may want to consider incorporating probiotics and prebiotics into your routine.

Probiotic supplements are widely available in various forms, including capsules, tablets, powders and drinks. It's important to choose a supplement that contains the specific strains of probiotic [bacteria](#) that

have been studied in relation to hay fever. These include *Lactobacillus acidophilus*, *Lactobacillus rhamnosus* GG, *Bifidobacterium lactis*, *Bifidobacterium bifidum* and *Lactobacillus casei*.

You can also incorporate [probiotic-rich foods](#) into your diet. These include fermented foods such as yogurt, kefir, sauerkraut, kimchi and kombucha.

As for prebiotics, fructo-oligosaccharides are [commonly found in certain foods](#) such as bananas, onions, garlic, asparagus, artichokes and whole grains. Supplements are also available in various forms, including powders and capsules.

Sometimes, taking probiotics and prebiotics may have [side effects](#), including digestive discomfort such as gas, bloating and diarrhea. To minimize these risks, it's recommended you start with a low dose and gradually increase this over time. It's also worth consulting a healthcare provider before taking these supplements, especially if you have a medical condition or are on medications.

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