



## Antibacterial Properties of Manuka Honey

Manuka honey has long been revered as nature’s “ointment” and “superfood” for its vast array of health and wellness properties. While the mechanisms behind its therapeutic effects are still being studied, research over the years has demonstrated a direct correlation between antibacterial properties and high concentrations of methylglyoxal (MG), a naturally occurring organic compound found in Manuka honey. This article will explore Manuka honey’s unique qualities and how it may help combat bacterial growth.

### Antibacterial Properties of Manuka Honey



While traditional honey is known to have general health benefits, Manuka honey’s potent antibacterial properties can best be attributed to its active ingredient, methylglyoxal. Higher MG concentrations found in high-activity Manuka honey correlate with its bactericidal activity. Research shows that Manuka honey may help fight bacterial infections by reducing bacterial growth and biofilm formation. These effects, and others still being studied today, show Manuka honey’s potential as a natural remedy to help fight harmful bacteria. We hope this article will provide you with many answers to questions you have about Manuka honey and its significant antibacterial properties.

## What Are Bacterial Infections?



Bacteria are found everywhere, including in us and in the environment, but not all bacteria are harmful. A bacterial infection occurs when a harmful strain of bacteria proliferates on or inside the body. [Bacteria](#) can be transmitted to humans through the air we breath, the water we drink, the food we eat, and even through things like insect bites. Rapid reproduction of bacteria in the body can cause infection that may manifest in a wide range of symptoms.

## Types of Bacterial Infections



The most common bacterial infections occur on the skin, throat, and in the stomach.

There is a wide range of symptoms for a [bacterial infection](#), some of which are generalized and affect the whole body, and others that are more localized. General symptoms of a bacterial infection include fever, chills, sweats and fatigue. Localized symptoms include swelling, redness, organ dysfunction, and gastrointestinal symptoms. If you or someone you know has ever experienced food poisoning, diarrhea, strep throat, or pneumonia, bacteria was likely the culprit behind the disease. This article will focus mainly on bacterial infections of the skin, throat, and stomach - areas that Manuka honey may be helpful.

Bacterial infections can occur anywhere in the body as every organ is susceptible to bacterial infection. For example, bacterial meningitis is caused by bacteria that work their way to the meninges, while pneumonia is caused by bacteria proliferating in the lungs. Even bacteria typically found on the skin, such as *Staphylococcus aureus*, can cause a skin infection under the right circumstances and spread throughout the body via the bloodstream, causing an infection in another part of the body.



## Does Manuka Honey's Antibacterial Properties Combat Staph Infections?



A staph infection, caused by staphylococcus bacteria, is a type of infection that most commonly occurs on the skin or in the nose. Staph bacteria might enter a person's body when they pick a scab, scratch at pimples, sores or bumps on the skin, or through an open wound.

The effects of Manuka honey on wounds and antibiotic resistant strains of bacteria has been researched. A [study conducted in March 2018](#) revealed that topical applications of Manuka honey may help treat burns, ulcers and non-healing wounds. Manuka honey has also been shown to combat antibiotic-resistant strains of infections, such as MRSA (Methicillin Resistant *Staphylococcus aureus*). "Some Gram-positive organisms such as members of *Staphylococcus* genus have been known as a common leading cause of bacterial infections and can be transmitted through skin to skin contact or open wound exposure." This research demonstrated that Manuka honey of different UMF values has medicinal properties of interest and it can be beneficial when used as a combination treatment with other antimicrobial agents.

In another [study conducted in August 2020](#), researchers conducted an experiment to examine the effects of Manuka honey containing at least 550 mg/kg of Methylglyoxal on biofilm formation of hard-to-treat chronic wounds. The results indicated that, "Manuka honey is an effective inhibitor of *S. aureus* adhesion to major components of the extracellular matrix such as laminin and elastin and thus prevents the dissemination of bacterial cells and host tissue colonization." Altogether, this shows that Manuka



honey was an effective agent in healing wounds, significantly reducing wound-pH promoting fibroblast activity, inhibiting protease activity, and oxygen release, which resulted in the reduction of wound size and shortening of healing time.

### **Can Manuka Honey Eradicate Bacterial Throat Infections?**



Most people have had experience with Bacterial throat infections commonly referred to as “strep throat.” Streptococcal infections are any type of infection caused by the group of bacteria streptococcus. There are many different types of streptococci, and infections vary in severity from mild throat infections to more severe infections that can spread to the lungs causing pneumonia. Strep throat, caused by *Streptococcus pyogenes* bacteria, can spread when a person with the infection coughs, sneezes, or shares food and drinks with others.

The effects of Manuka honey against streptococcus have been researched. A study from [January 2012](#) looked at the effect of Manuka honey on *S. pyogenes* in vitro with planktonic and biofilm cultures using MIC (an antibiotic drug that prevents bacteria from growing), and MBC (the minimal bactericidal concentration), microscopy and aggregation efficiency. The results revealed that, “Manuka honey permeated 24 h established biofilms of *S. pyogenes*, resulting in significant cell death and dissociation of cells from the biofilm.” This data suggests that Manuka honey has the potential to help treat infections containing *S. pyogenes*, and could help treat strep throat.



## Can Manuka Honey's Antibacterial Properties Fight E. Coli?



*Escherichia coli*, also known as *E. coli*, is a type of bacterial infection in the gut, most commonly the intestines. Symptoms include painful stomach cramps, diarrhea, and vomiting. *E. Coli* can be found in contaminated food, such as undercooked ground beef, ready-to-eat-salads, fecal contaminated vegetables, raw cookie dough, and raw milk.

A recent study investigated Manuka honey's antibacterial properties effect on *E. Coli* bacteria. The [study, conducted in 2019](#), researched the primary effects of Manuka honey on the physiological status of *Escherichia coli* (*E.Coli*). The study exposed bacteria to Manuka honey and created Gram-positive and Gram-negative bacteria models, using flow cytometry (FC) to reveal its antibacterial action mechanisms. "Exposure of bacteria to Manuka honey resulted in physiological changes and displayed slight differences among bacteria. Manuka honey induced a remarkable metabolic disruption as it was able to block efflux pump activity in a dose-dependent fashion in the *E. coli* strain. A significant reduction of bacterial growth was observed after Manuka honey exposure." This data suggests that *E. coli* cells could not recover from the added Manuka honey and lost their ability to survive because of the physiological changes.

An additional study from [October 2009](#) researched the antibacterial effects of Manuka honey on *E. coli* cells. The results revealed that *E. coli* macroarrays were used to determine the response of bacterial cells to a sub-lethal dose of honey. "The pattern of



gene expression differed to that reported for other antimicrobial agents, indicating that honey acts in a unique and multifactorial way; 78 (2%) genes were upregulated and 46 (1%) genes were downregulated more than two-fold upon exposure to the medical-grade honey.” This data suggests that *E. coli* cell division was inhibited significantly when Manuka honey was used, and indicates that honey is an effective topical antimicrobial agent that could help reduce some of the current pressures promoting antibiotic resistance.

### **How to Make the Most of Manuka Honey’s Antibacterial Properties**



#### *Manuka Honey - Topical use*

Applying Manuka honey topically or soaking a bandage in it and then applying it to a clean wound may inhibit the growth of bacteria.

#### *Manuka Honey - Consumption*

Manuka honey may ease Strep throat symptoms, and could help combat a bacterial infection in the throat. Likewise harmful bacteria affecting the digestive tract may be reduced by consuming Manuka honey. Overall improved gut health is a commonly ascribed benefit of Manuka consumption evidenced by numerous anecdotal reports.

#### *Manuka Honey - Sinus Rinse*

Manuka honey can be diluted with a saline solution and used with a neti-pot or other sinus irrigation syringe to reduce symptoms and possibly combat upper respiratory



infections. Research<sup>1</sup> suggests this technique might be an effective prophylactic strategy for cystic fibrosis sufferers as a means of preventing the migration of bacteria from the upper airway into the lung.

## **Conclusion**



Manuka honey's potent antibacterial properties may be a powerful and all-natural path to alleviating and eradicating an array of bacterial ailments, such as infected wounds, strep throat, and more. Bees & Trees offers both high activity and medium activity jars of independently tested and New Zealand government certified Manuka honey that may help with your health needs. Our small-batch, hive-to-jar Manuka honey features independent lab reports on our product pages to ensure transparency. We hope this article is helpful, and if you do choose to try Manuka honey it is supportive of your overall health and wellness.

Disclaimer - Bees & Trees frequently shares publicly available scientific and medical research regarding Manuka Honey. We are not medical professionals and the content of our emails, articles, or website postings should not be construed as medical advice.

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<sup>1</sup> Anti-pseudomonad Activity of Manuka Honey and Antibiotics in a Specialized *ex vivo* Model Simulating Cystic Fibrosis Lung Infection





## Appendix

### Research related to Manuka Honey's Antibacterial Properties

- [1] Antibacterial activity of Manuka honey and its components: An overview  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6613335/#b27>
- [2] Manuka honey inhibits the development of *Streptococcus pyogenes* biofilms and causes reduced expression of two fibronectin binding proteins  
<https://pubmed.ncbi.nlm.nih.gov/22294681/>
- [3] Evaluation of Physiological Effects Induced by Manuka Honey Upon *Staphylococcus aureus* and *Escherichia coli*  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6722746/>
- [4] Effect of Manuka honey on biofilm-associated genes expression during methicillin-resistant *Staphylococcus aureus* biofilm formation  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7419495/>
- [5] The unusual antibacterial activity of medical-grade *Leptospermum* honey: antibacterial spectrum, resistance and transcriptome analysis  
<https://pubmed.ncbi.nlm.nih.gov/19513768/>
- [6] Bacterial Infections: Overview  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7149789/>