

# Histamine Intolerance: The Complete Beginner's Guide

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Histamine intolerance is poorly understood in the medical world.

Most health professional are not knowledgeable on the topic, diagnosis is flaky at best, and the condition itself is difficult to treat.

That's why I've created this guide. It's a comprehensive, research-driven review of histamine intolerance, with a particular emphasis on diet and treatment.

## What You'll Learn:

- What is histamine and histamine intolerance?
- Signs and symptoms of histamine intolerance
- [High histamine foods to limit or avoid](#)
- How much histamine is safe for those who are sensitive?
- [A low histamine diet plan and considerations](#)
- [Will any supplements or probiotics help?](#)

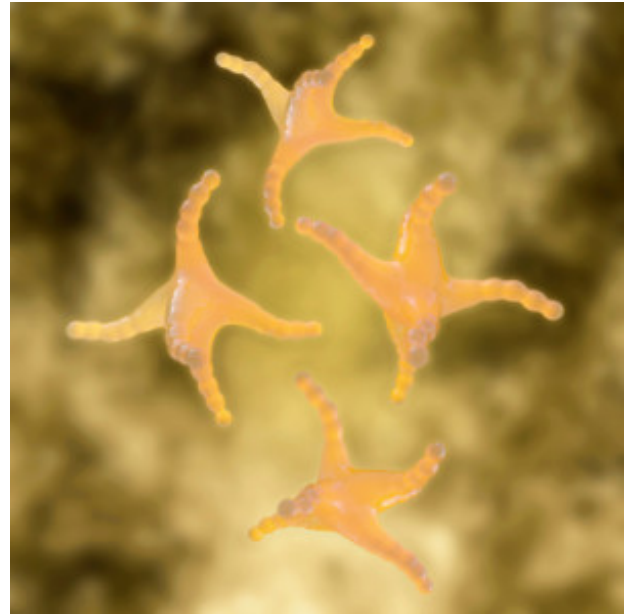
## What is histamine? A simple definition

**Histamine** is a chemical that is both made by the body and found naturally in certain foods.

In the body it's produced by **mast cells** (a type of white blood cell) and has a crucial role in our immune system. It's actually the key mediator in causing the symptoms of allergy, which is why we take **antihistamines** for allergy relief.

Histamine also occurs in our food as a by-product of the fermentation of **Histidine**, which is a form of protein. In this context it's part of a family of chemicals known as **Biogenic Amines**, which are produced by bacteria during fermentation, storage or decay (1, 2).

While high levels of biogenic amines (such as histamine) can make you feel unwell, the majority of people tolerate the amounts found in a regular diet.



**Summary:** Histamine is a chemical that has a crucial role in our immune system. It is produced by the body and also found in certain foods.

## What is histamine intolerance?

Approximately 1% of the population experience adverse reactions to what is considered a “normal” level of histamine in food (3).

This increased sensitivity to histamine is called a **Histamine Intolerance**.

It develops through both increased availability of histamine in the body, and decreased activity of the enzymes that break down histamine and remove it from your system. This “defect” is primarily thought to be caused by previous gastrointestinal disease and/or genetics.

The main histamine enzyme in the gut is Diamine Oxidase (DAO), while other areas like the skin, spinal cord, lungs and other organs rely on an enzyme called Histamine N-Methyltransferase (HNMT) (3).

So an individual with a histamine intolerance will have low levels of DAO or HNMT (or both), which can lead to a build up of excess histamine in their blood plasma.

It's not unlike those with a **FODMAPs intolerance**, or those **intolerant to caffeine** or lactose. These conditions are also the result of enzyme problems.

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## Histamine levels and testing

Normal levels of plasma histamine range from 0.3–1.0 ng/mL, but anything above this causes problems. For example, a level of 1–2 ng/mL can increase stomach acid secretion and heart rate, while levels of 3–5 ng/mL can cause flushing and headaches (4).

An individual that is histamine-sensitive and then consumes a high histamine meal is likely to get high plasma histamine levels. Unfortunately, there are no common tests to diagnose it, and the skin prick test is fairly new (5).

Therefore it's important an experienced clinician rules out **food allergies** before tweaking your diet for histamine intolerance.

**Summary:** *An increased sensitivity to histamine is called a histamine intolerance. It develops through both increased availability of histamine in the body, and decreased activity of the enzymes that break it down. There are no common tests to diagnose this condition.*

## Signs and symptoms of histamine intolerance

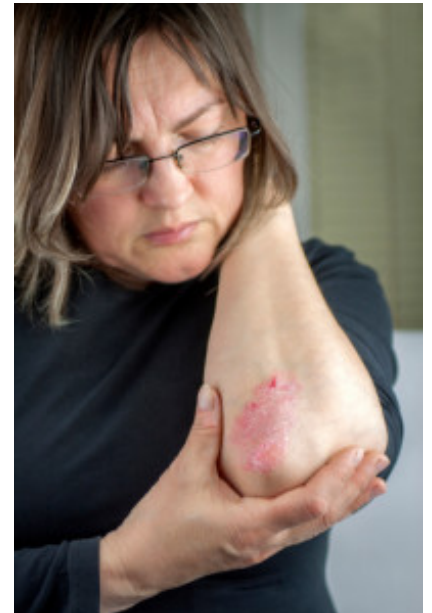
While symptoms appear allergy-like, they do not involve an [IgE-mediated response](#) and therefore are not allergic reactions (hence the term intolerance).

Of course, there is no way to know this until you have ruled out allergy through tests.

The onset and severity of histamine intolerance symptoms vary greatly between individuals, but common complaints are:

- Flushing and headaches
- Respiratory problems including asthma, runny or blocked nose
- Skin conditions like rashes, dermatitis, hives or eczema
- Gastro problems such as nausea, reflux, vomiting, abdominal pain, diarrhoea
- Dizziness, low blood pressure and irregular heartbeat.

Also note that antihistamines may help to relieve symptoms, but only if you do not already follow a low histamine diet (3).



**Summary:** *Symptoms appear allergy-like, but they do not involve IgE antibodies. The only way to be sure is to get tested for allergies.*

## High histamine foods to limit or avoid

If you are histamine intolerant then it makes sense to reduce the amount of histamine you consume.

Unfortunately, it's difficult to quantify the amount of histamine found in different foods. It varies greatly according to the type of bacteria, food composition, length of time unrefrigerated and conditions for fermentation (6).

As a general rule, high concentrations of histamine are typically found in fermented foods such as bread (effects of yeast), sauerkraut, wine, beer, processed meat and aged cheese.

In addition to histamine-rich food, there is a theory (untested) that several foods have the capacity to release histamine directly from our [white blood cells](#) (7).

This means they could contribute to increased histamine levels, even if that food itself is low histamine.

## High histamine foods

There is a lot of conflicting information online and I found many authoritative sites did not provide very comprehensive lists. I've summed up the foods that most experts recommend be avoided:

- Fermented dairy products such as aged cheese, yoghurt and quark
- Fermented or pickled vegetables
- Tinned/canned, cured and processed meats
- Fermented soya products including miso, tempeh and soy sauce
- Green tea, matcha tea, coffee, cocoa, chocolate
- All legumes (includes peanuts), and tree nuts (regular nuts)
- Citrus fruits, raspberries, strawberries, bananas, pineapple, grapes, pears and fruit juice
- Avocado, eggplant, spinach, olives, tomato and tomato products (ketchup, tomato juice)
- Vinegar, bouillon and broth
- Any alcohol
- Junk foods or drinks that contain artificial colours or flavours.

I strongly recommend you also check out this [Histamine Compatibility list \(PDF\)](#) by the *Swiss Interest Group Histamine Intolerance (SIGHI)*. It ranks the likelihood of foods to cause symptoms on a scale of 0 to 3 as well as other important tips.

**Summary:** Foods to look out for are either high in histamine, or have the capacity to release histamine from our white blood cells. But as a general rule, fermented foods are the most histamine-rich and should be avoided.

## How much histamine is safe for those who are sensitive?

Defining a safe threshold level for those with a histamine intolerance is incredibly difficult (8).

Firstly, sensitivity to bioactive amines varies greatly between individuals. Unlike food allergies, which are triggered at





first exposure, it's the cumulative amount of histamine that causes symptoms. What may trigger headaches in one person may have no effect on the other.

Secondly, certain pharmaceutical drugs inhibit the enzyme DAO from breaking down histamine in the body. This can lead to increased histamine levels over time, especially if they are long-term medications (9).

Some of the more common drugs include alprenolol (for blood pressure) and many forms of antibiotics.

These factors must be accounted for when deciding on individualised dietary changes and how strict they should be. As a general guideline, a limit of 100 mg histamine per kg in foods and of 2 mg histamine per litre in alcoholic beverages has been suggested, although these are likely too generous (10).

**Summary:** Individual sensitivity to histamine, as well as the impact of certain pharmaceutical drugs can seriously affect plasma histamine levels. Therefore defining a safe threshold is very difficult.

## A low histamine diet

A low histamine diet is a structured programme that is best done under the supervision of a dietitian specialising in food intolerance.

Once food allergy has been ruled out, the *elimination phase* involves strictly limiting the amount of histamine you consume for 2-4 weeks. Diet and symptoms must be recorded in your own food diary, which is proven useful in tracking significant improvements and relapses.

The *reintroduction phase* is next, where you gradually reintroduce histamine-containing foods to determine your tolerance and threshold. It doesn't need to be done in a particular order, and I generally advise you reintroduce the foods you miss the most first.

Some pointers to keep top of mind:

- Try to cook most of your own meals during the elimination phase
- Avoid or limit eating canned foods and ready meals
- Avoid junk foods- food dyes/artificial colours can be big triggers
- Keep your kitchen clean
- Refrigerate vigilantly as histamine forms on food as they spoil.



## A low histamine diet plan

Just to give you an idea of what a realistic low histamine day would look like:

**Breakfast:** Cereal + milk

**Lunch:** [Fresh Spring \(Rice-Paper\) Rolls](#). Avoid using meat or veggies on the high histamine list.

**Dinner:** Pan-seared chicken breast (fresh or thawed rapidly) + roast potato and vegetables (not those on high histamine list)

**Snacks:** 1 apple or peach; cucumber or carrot sticks + cottage cheese

**Drinks:** Water, coffee, herbal tea

***Summary:** A low histamine diet requires you to follow a 2-4 week elimination period, followed by a reintroduction period to determine your histamine threshold. A diet and symptom diary is necessary, and it's strongly recommended you see a specialist dietitian during this entire plan.*

## Important considerations before you trial a low histamine diet

Significant dietary restrictions can affect nutritional status at any age ( [11](#)).

Therefore, the risk–benefit ratio must be considered first when contemplating any form of elimination diet. Much like a low FODMAP diet, a low histamine diet excludes multiple nutrient-dense foods that provide health benefits.

This is why it's recommended you follow a low histamine diet under the supervision of a dietitian specialised in food intolerance.

### Not appropriate for young children

Low chemical diets are becoming increasingly popular for young children despite the lack of evidence they help.

A 2013 case-study review of 74 children placed on an elimination diet (for salicylates) found that almost half experienced harmful side-effects, including nutritional deficiencies, food aversion and eating disorders ( [12](#)).

Growth rate is highest within the first years of life and a failure to meet this potential can have a long-lasting impact on development and later health ( [13](#)).

Therefore chemical elimination diets are only warranted for young children if there is clear-cut evidence it is helping with symptoms.

***Summary:** A low histamine diet can be quite restrictive even though it is temporary, so consider your nutrition status before you start. It's not appropriate for young children.*

## Supplements for histamine intolerance

There is basically one supplement available marketed specifically for histamine intolerance.

It contains DAO isolated from pig kidneys and is designed to supplement the sub-optimal DAO levels of patients with histamine intolerance.

There was one clinical trial that found DAO supplementation helped to reduce the duration of histamine-induced migraines by 30%, but not the intensity nor how often they occur (14). It was reportedly a small study though, and ideally it would be nice to see if the results can be replicated.

The reviews of this particular supplement are interesting, and you can [buy it on Amazon here](#) if you want to give it a try (full disclosure: this is an affiliate link). Note that the capsules are labelled vegetarian (as you would expect), but the DAO inside is sourced from pork. Highly misleading labelling.



And as always, please consult with your personal doctor before you decide to try any new supplements.

## Vitamin C and vitamin B6

Some researchers believe both vitamin C and vitamin B6 supplementation can be beneficial too.

Both nutrients are required (cofactors) for DAO activity, so in theory they act as antihistamines by supporting the breakdown of histamine (15, 16).

One trial found that 5 mg of vitamin B6 supplementation daily significantly increased DAO activity in pregnant teenagers, but only those deficient in vitamin B6. It didn't benefit anyone else (17).

That's the only scientific proof I could find, and study after study shows that [vitamin supplements are basically useless](#) unless you have a clinical deficiency. Your money is better spent on foods naturally rich in [vitamin B6](#) and [vitamin C](#).

Note that if you want to give vitamin C supplements a try then it's best to avoid the form called ascorbic acid. It is typically derived from fermented corn and/or citrus, both not appropriate for histamine intolerance.

**Summary:** DAO supplementation was shown in one clinical trial to reduce the duration of migraines, but had no effect on frequency or severity of symptoms. In theory a vitamin C and/or vitamin B6 supplement may help too, but this is not supported by any strong evidence.

## Probiotics for histamine intolerance

[Probiotics](#) are microscopic bacteria that we get from fermented foods.

They help to restore and maintain the balance of bacteria in the gut, which is linked to varying aspects of health... even [weight loss](#).

Fermented foods are not an option for someone with a histamine intolerance, which leaves us with probiotic supplementation. Unfortunately the research is thin.

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One study found oral intake of two *Bifidobacterium* strains suppressed factors involved in histamine signalling and production, at least in rats ([18](#)).

Another study looked at the effects of several probiotic strains on human mast cells in a laboratory setting. Researchers were able to “turn down the dial” on the immune response and minimise histamine release, especially with two strains of *Lactobacillus rhamnosus* ([19](#)).

It seems that if probiotics were to help, they would be most useful in preventing allergic reactions rather than treating symptoms of histamine intolerance. Nevertheless, if you want to try some just be careful about what strains you use. Some strains of *Lactobacillus* have been shown to increase histamine content, while other strains decrease it ([20](#), [21](#)).

I suggest [this probiotic](#) (*Lactobacillus rhamnosus*) or [this probiotic](#) (*Bifidobacterium* strains) (full disclosure: these are Amazon affiliate links).

Just note that we don’t know the optimal dosage for this condition, nor the long-term side effects (if any), so always consult with your doctor first.



***Summary:** Early studies on rodents and in test-tubes have shown that certain probiotic strains may help minimise histamine release. The most effective strains are likely to be *Lactobacillus rhamnosus* or several *Bifidobacterium* strains, but there is no guarantee they will help.*

## This is only a guide...

There are a lot of aspects to consider when treating histamine intolerance, particularly when it comes to diet and nutrition.

While I’m a qualified dietitian, this general advice is **no substitute for your personal medical professional** that knows your medical history.

That being said, if food allergy has been ruled out, avoiding histamine-rich foods as part of a low histamine diet is the next logical step. Some supplements and probiotics may help, but I would not expect any miracles.

*What has been your experience with histamine intolerance? I’d love to hear about it in the comments section below.*

*[Last Updated: January 26, 2016]*