Inflammation, Your Diet and You

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If you've suffered arthritis, irritable bowel syndrome, eczema, hay fever or chronic pain you will know all too well how harmful inflammation can be. Inflammation causes much undue suffering to those affected by it. Inflammation causes our body's soft tissues to swell up with blood and water, stretching them to a point where they are uncomfortable, or even break. This swelling and breakage is very painful, and might do further damage to your body, causing even more inflammation.

Most of us will experience inflammation a few times a year, maybe up to once a month. But many people are more affected by inflammation every day. Those most at risk are older people, young babies, people with immune system conditions, people undergoing chemotherapy, and people who are exposed to many bacterial and viral threats daily. These people go through a lot of pain and difficulty when they suffer inflammation, as it takes longer to recover, but also are more likely to suffer inflammation in the first place. Often when we're suffering from inflammation we turn to medication which reduces the swelling, alleviates the chronic pain, or does both. However, there are also ways of fighting inflammation at its roots, and whether it's chronic pain, irritable bowel, or one of the best ways to do this is to start with diet.

What Is Inflammation?

Inflammation is when any part of our body swells up with blood or water. The most common and obvious symptoms of inflammation are joint pain and stiffness, redness, skin tightness, and a swollen joint or area. But inflammation is more than skin-deep! Other symptoms of inflammation include: chills, fatigue, fever, gastrointestinal discomfort, headaches, muscle stiffness, and no appetite. Any part of your body can become inflamed and any type of inflammation can cause pain and suffering, although different body parts will react differently.

Inflammation of a wound causes redness, soreness, and may even tear the wound open repeatedly and leak clear or cloudy fluids.

Inflammation of the joints will result in redness and swelling, a slow breakdown of the soft, cushioning tissue between the bones, and a possible overgrowth of bone, eventually causing arthritis.

Inflammation in the gut will cause cramping, strong wind that doesn't change smell no matter what you eat, and even blood in the stool.

Inflammation of the heart causes all round fluid retention, chest pains, shortness of breath and difficulty performing everyday activities.

Inflammation of the lungs causes shortness of breath and may even trigger asthma in vulnerable people.

Inflammation of the kidneys causes high blood pressure, frequent urination, migraines, and eventually results in kidney failure.

Inflammation of other soft tissues will cause pain when moving or performing basic tasks. For example, inflammation of the urethra may cause pain when urinating, or inflammation of the mouth may cause pain when eating or talking.

As you can see, inflammation can affect your entire body. And most of the time, this isn't a bad thing!

How And Why Does Inflammation Develop?

Inflammation is a bit like the army: when it does its job, we barely notice it's there; it works hard to keep our bodies safe; it doesn't actually know what the big picture is, and it trusts the orders it's given; we love it when it's needed but get angry at it when its job is done; it gets a bad rap most of the time, but we would all be very sorry if it disappeared overnight.

Inflammation is the body's response to a microscopic threat. Our five senses and our skin are our barriers to bigger threats, like bears, flying objects, sharp items, or cars. But the world around us is packed full of microscopic enemies: bacteria and viruses. These enemies are usually kept at bay by our skin and mucous membranes. Our skin is a water-tight barrier built of dead, dry cells, keeping all our fluids inside us and, just as importantly, keeping bacteria and viruses out of our fluids! Microscopic threats may land on our skin, but they can't get in and attack our living tissue, which is just as good. We all know what happens when we leave a piece of raw meat out in the open a day or two. Without our skin, we would be at risk of that. But our bodies *do* have openings: our eyes, nose, mouth, and other orifices all need to be wide open to work. And that's where mucous membranes come into play. Our mouths, for example, may look bare and open, but they're actually sealed by a very fine layer of dead tissues and mucus. Mucus is a combination of protein and water that traps microscopic threats and washes them down into our stomach acid, or sends them out of our bodies, for example when we blow our noses.

These external barriers do a great job of keeping most microscopic threats off and out of our bodies. The next line of defense becomes active when the barriers fail. Naturally there are so many bacteria and viruses in the air around us, the foods we eat, the water we wash in, and every single thing we touch, that we can't actually stop every single one from reaching our bodies. Some of these microscopic threats will even digest our skin if they stay on us long enough, defeating our barriers! So, what do our bodies do? They fight fire with fire. If our skin and mucus are barriers, our friendly bacteria are our foot soldiers.

When microscopic threats land on our skin or get into our bodies, our friendly bacteria will kill off enough of the threatening bacteria or viruses to keep us healthy and safe. But these bacteria can't always do their job. Sometimes the threat comes in through a wound. This might be a wound from something else, like cutting our finger by accident, but it can also be a wound caused by the threat themselves: when we don't have enough friendly bacteria to defend us, the enemy bacteria will digest our skin and mucus and this will create a wound where the microscopic threats can enter our bodies.

Our last line of defense is the one that plays a huge part in inflammation: our immune system. These are the heavy cannons, or our bombs in the war against microscopic threats. We don't like deploying them because they are expensive, awkward, and deal a lot of damage to our own bodies. But when push comes to shove and an enemy is in our bodies, we will use our immune system to fight off the threat. Our bodies are full of cells and all these cells are very good communicators. When a part of us is injured, the living cells in the area send signals saying they are in danger. White blood cells pick up on these signals and start to gather around the damaged area. Sometimes they will even pile on top of it, completely covering the wound! White blood cells release chemicals that attack the threats. Some of these chemicals directly digest the threats, others make our bodies warm

up so that the heat kills the threat, and others call reinforcements in, resulting in a lot more blood in the area. But, much like bombing, these chemicals don't only hurt the threat. The soreness we feel is sometimes our own bodies being hurt by the attack, a sort of collateral damage. And sometimes there is a buildup of pus or clear fluid as a result of the attack. And because our bodies are basically a battle ground, all these activities will affect our nerve endings, making us feel pain.

If the threat has managed to settle in, then we might experience the more flu-like symptoms. If our white blood cells are not able to control the threat by warming up just the damaged area, they will instead warm up the whole body. This results in a fever, which will kill a lot of the threat, but which also affects us internally. Fevers use a lot of our energy, and being warm triggers an instinct to rest, so we end up feeling lethargic. Fevers also use a lot of fluids, so we may feel dehydrated, resulting in a headache, a bad temper, a dry mouth, and itchy skin. Finally, only the white blood cells near the damage know what it is they're attacking. The rest of our body only knows it is under attack, so, a bit like a game of Chinese whispers, every part of our body acts like it has been attacked, improving our chances of recovery. This can cause nausea, vomiting, loss of appetite, stomach cramps, and diarrhea, as our digestive systems protect themselves; soreness and muscle stiffness as our muscles guard against invasion, and chills, sweating, and increased urination as our liver, kidneys, and blood try and keep clear of enemies. Our whole body goes into lockdown and purges until the threat is gone. This is why untreated infections can be such a nightmare!

Most of the time inflammation is just a one-off event. A little cut, or a bump, or we eat something bad for us. So, we feel a bit bad for a day or two, or really bad for a week, and then we're all better and it's fine. But what happens when the inflammation isn't just once, but frequent, maybe even an everyday thing, or a constant situation for your body? Well then, we are handling chronic inflammation and, as you can probably guess, having our bodies going into lockdown every day is bad news.

Understanding Chronic Inflammation

Inflammation that happens once in response to a threat and then goes away is called acute, whereas inflammation that doesn't go away on time is considered chronic. There are some key differences between the two.

Acute inflammation is just reacting to a one-off threat, which it gets rid of quickly. Acute inflammation lasts no longer than a few days. Chronic inflammation doesn't go away, lasting anywhere from months, to life. This could be because the threat is too strong for the immune system to defeat, because the threat is a virus that has taken full control of the body, because there are many dangerous foreign bodies that can't be got rid of, or because the immune system is making a mistake and attacking normal or healthy cells (known as an auto-immune condition).

Acute inflammation calls in a wide variety of specialized cells, some lighter ones, some heavy-hitters, and wipes out the attack. Acute inflammation has three potential results. It can resolve the condition, and everything goes back to normal except for maybe a bit of scar tissue. It can kill all infected and damaged tissue, but also the infection, resulting in an abscess. The abscess may collect pus and become secondarily infected, but if treated well it may heal over. Or, finally, acute inflammation can keep on going and turn into chronic inflammation.

Chronic inflammation almost exclusively calls in the heavy-hitters of the white blood cells, and almost always after acute inflammation has failed to resolve the problem. The results of chronic inflammation are always harmful. They will destroy tissue, resulting in an abscess or ulcer which will not heal, as the new, healthy cells keep getting attacked. Chronic inflammation will also cause fibrosis and necrosis, killing healthy tissue until it begins to scar and rot inside the body, slowly stopping your organs from functioning.

For this reason, even though inflammation is our friend, if we suffer inflammation that lasts over a few days, we need to fight it. This is even if the causes of inflammation are different! If you have an inflamed cut that lasts three days, and an inflamed gut two days in that lasts five days, this does just as much harm to our bodies as if we had suffered eight straight days of either. This means that even if your inflammation is because of multiple small events, you still need to address it.

Chronic Inflammation Increases Health Risks

Why should we be worried about chronic inflammation? As we have seen above, it directly causes many conditions. But it also increases your risk of others, and makes some ailments worse when you already have them.

Chronic inflammation causes fibrosis. Fibrosis is where connective tissue starts growing excessively, invading other tissues in your body. Normally this is a healthy mechanism, like scarring after an injury. But when inflammation causes many tears in tissue and our bodies start scarring too much internally, this can stop our organs and muscles from working properly.

Chronic inflammation causes necrosis. Necrosis is where perfectly healthy cells start spontaneously dying en-masse, resulting in large amounts of dead tissue inside your body. When enzymes or bacteria reach this dead tissue, you can even start rotting from the inside out, which is why necrosis in the digestive tract is particularly dangerous.

Chronic inflammation increases your risk of cancer by promotion rapid cell proliferation. When your cells are inflamed and multiply quickly, there is greater chance of a mutated cell being formed. And when your immune system is taxed, this mutated cell may be allowed to multiply out of control, resulting in cancer.

Chronic inflammation increases your risk of heart disease. All this swelling hardens your blood vessels and pumps up your heart, increasing blood pressure and limiting your ability to increase your heart rate. The two together put you at risk of a heart attack, even if you are slim and otherwise healthy!

Chronic inflammation increases your risk of diabetes. Inflammation affects your body's insulin production, resulting in hypersensitivity or insensitivity to glucose, raised blood sugar, and a high predisposition to diabetes.

Chronic inflammation increases your risk of Alzheimer's. Not only do raised blood pressure, a weak immune system, and a predisposition to diabetes put you at risk for dementia, but inflammation around the brain increases the risk of plaques forming in the brain, which is a key cause of Alzheimer's.

Chronic inflammation makes obesity worse. When you are obese, every bit of movement you can get improves your health. So naturally when your organs are taxed, your joints are

sore, your blood pressure is up and you're storing water weight, you will suffer the effects of obesity even more. This can create a cycle of ill health, as obesity also causes inflammation.

Chronic inflammation makes insomnia worse. If you suffer insomnia, inflammation will make you sleep poorly. People who sleep 7-8 hours a night, which is the healthiest amount, have less inflammation than people who sleep more or less than that. Poor sleep is not just a sign of ill health, but causes other complications.

Chronic inflammation makes osteoporosis worse. It won't give you osteoporosis, but too much swelling stops your body from repairing bones properly, resulting in less robust bones. If your bones are brittle from osteoporosis already, then inflammation may make them even more likely to break.

Inflammation Troubleshooting: Getting Down To The Root Cause

When you suffer chronic inflammation, especially if you have suffered it for years, it can be hard to work out exactly where it has come from. But usually there is one key thing that started it all, or that is keeping the inflammation going. You need to check your symptoms and work out what is the driver of your inflammation if you want to treat it properly.

Arthritis is a common type of inflammation in people over the age of fifty and in people who practice a lot of sport. With arthritis, the soft cushioning tissues between our joints starts to wear down, until eventually our joints are bare bone rubbing on bare bone. If you've ever rubbed two sticks together, you'll have noticed how eventually they warm up, start splintering, wear down, or even crack. This is what happens when we lose the cushioning in our joints. As our bodies are injured, our immune system starts inflammation to defend us. Even if an injury is internal and there are no bacteria in it, we will still get inflamed!

Autoimmune conditions are one of the most inconvenient forms of inflammation, quite simply because you can't actually stop them. This is when your body thinks your own cells are invaders and will send white blood cells to attack them. When attacked, these wounded cells send out signals saying an enemy is there, so more white blood cells are sent. It's a sort of friendly fire where you end up ill for no reason at all.

Candida yeasts live all over and inside our bodies, but when we eat too much sugar they overgrow. Too much yeast kills off our friendly bacteria, resulting in soreness and infection, which leads to inflammation.

Celiac and Crohn's Disease are when our guts are especially sensitive to certain plant proteins, most famously gluten, although in the case of Crohn's Disease other foods may be harming you too. As our bodies are so sensitive to these proteins, we perceive them as a threat, and will attack them like they were a bacteria or poison, causing inflammation.

Eczema can cause the skin to become inflamed, sometimes even extending to the inside of the mouth, nose, and ears. This inflammation is self-feeding, and without steroidal creams many people with eczema will suffer chronic inflammation.

Fluid retention can keep inflammation going longer than it needs to. This can also be confused for inflammation, but it has some similar effects, so it's worth noting. Fluid retention results in our body fat becoming softer than usual and bloating up.

Gout is when we eat too many rich foods and our kidneys can't get rid of the toxins from them fast enough. The uric acid, which normally passes in our urine, builds up in our joints and causes a sort of arthritis.

Hay fever and other environmental allergies cause inflammation because our body is reacting to harmless foreign bodies as though they were dangerous. Food allergies are simpler to avoid, but allergies to pollen, animal fur, or dust mites can be impossible to prevent, resulting in itchy skin, congestion, and inflammation. Anti-inflammatory steroidal treatments and anti-histamine treatments can address hay fever.

Heart disease can cause inflammation when our blood vessels become too weak to keep circulation going. Like with fluid retention, this isn't always a normal inflammation response, but if our blood vessels become particularly damaged immune-system based inflammation can occur too.

IBS stands for “irritable bowel syndrome”. This is when your gut bacteria live in a very delicate balance and a wide variety of foods can cause this balance to be disrupted. When the balance is disrupted bad bacteria take over your gut, harming it and causing inflammation.

Impact injuries and cuts will naturally swell up, even if they aren't exposed to the air. This is because not only does your body need to get rid of invading threats, but of dead cells which may rot and cause further damage.

Immobility promotes inflammation, especially water retention. If you already have something that is causing you to develop inflammation, not getting enough exercise will make it worse.

Lactose Intolerance can cause inflammation. If your body doesn't produce enough lactase to digest the sugars in dairy, these sugars can irritate your gut, and even feed candida yeasts, causing damage and inflammation.

Pregnancy and Menopause act on two fronts, suppressing your immune system so that it overreacts to every minor threat, and causing water retention. The two together result in chronic inflammation.

Viral attacks on the immune system are also a common cause of inflammation. A virus itself won't always cause inflammation, but when it takes hold it weakens the body so that other threats take hold. This is why people who have HIV, for example, are so vulnerable to illness and inflammation.

As you can see, there are a wide range of causes for inflammation. And even though many of them can't be solved or prevented, some can be worked with to reduce inflammation and improve your quality of life.

Inflammation and The Immune System

As we have seen, chronic inflammation is related to immunity. This is because illness is a key cause of healthy inflammation. When a bacteria or a virus gets into our bodies, inflammation is there to keep it at bay and, ideally, kill it. This means that if your immune system malfunctions, you may suffer unnecessary chronic inflammation.

If your immune system is weak, the problem may just be that you can't get inflamed enough to kill the threat. In this sense, boosting your immune system could result in less inflammation, because you are able to quickly defeat the illness, making inflammation unnecessary.

But if you suffer an auto-immune condition or an allergy, the inflammation may be an overreaction to a perfectly normal thing. In some cases, avoiding this thing is easy and you can avoid inflammation. But in other cases, you can't avoid the “danger”, so the next best thing is to curb your own immune system. By taking medication that suppresses our immune system we also suppress its overreactions to perfectly normal substances.

Food Allergy And Intolerance

Food allergy and food intolerance are very common sources of unnecessary inflammation. The first major way food acts on our body is through our digestive tract. Many food allergies involve trouble digesting certain foods. For example, a gluten allergy may result in bloating, cramping, and bleeding from the intestine, or a milk protein allergy may result in vomiting. But allergies also affect us beyond our digestive tract.

You see, an allergy is where our immune system overreacts to a perfectly safe thing, as though it were poisonous or a dangerous bacterial threat. It starts attacking this “enemy” and any cell related to it with our heaviest weaponry, damaging our own body whilst fighting... absolutely nothing. And naturally this reaction isn't limited to where the food is. Anywhere where a food particle may reach could have the reaction, and it could even extend to parts of our body that are unaffected.

The most common and most dangerous non-digestive allergic reaction is anaphylaxis, where within minutes of being exposed to a harmful food our airways begin to swell, eventually limiting breathing and causing asphyxiation. But there are other ways an allergy can cause inflammation. Some allergies cause the development of rashes and hives hours or days after eating the substance. Some allergies cause bloating and discomfort for days too. Other allergies can cause an elevated heart rate or blood pressure due to swelling in the kidneys or cardiovascular system. In short: an allergy almost always causes inflammation.

Food intolerances are different. When you have a food intolerance you don't have a system-wide inflammation response and a spike in white blood cells. But you don't feel good either. Your body doesn't think that this food is an enormous threat, but it still thinks it's dangerous, so you will experience low-level inflammation, mostly concentrated around your digestive tract. The problem is, when there is enough inflammation around the gut, we will experience chronic health complaints and inflammation around our bodies eventually, as our gut is directly linked to our immune systems.

And what makes us allergic or intolerant to certain foods? Well, we're not sure. There seems to be a genetic component, which means that if your parents or grandparents had an allergy or intolerance you may too. But it also means that your wider ethnic profile might also reveal your predisposition to certain intolerances. After all, if none of your ancestors ever ate potatoes until your parents or you, there hasn't been a lot of time to build a tolerance to the toxins in them.

There also seems to be an environmental component, in that being exposed to certain foods when we are ill, when they are badly combined with other foods, or when we are the

wrong age makes us more likely to develop an allergy or intolerance to them. So far there is no exact understanding of what causes each individual case of food allergy or intolerance, but a combination of genetic and environmental factors is probably involved.

The Elimination Diet

Not sure whether or not you are suffering a food allergy or intolerance? Thankfully there are many ways of telling! Remember how I said that your recent ancestors' diets might have laid the blueprint for your body? Not everyone has a problem with these foods, but many people have a problem with one or two. This is because it's only recently in human history that someone from Italy can eat tamarinds, or someone from China can eat eggplants. But it isn't as simple as doing a DNA test, finding where your people come from, and eating their diet. Your most recent ancestors' diet might be the foundation of a healthy diet for you, but we are all individuals. Which raises complications.

Firstly, the same way that in our recent history we have exchanged foods all over the world, we have also exchanged genes and bacteria all over the world. Your family might have lived in the same village for tens of thousands of years, but around three to four hundred years ago people started travelling more, spreading their bacteria, settling, passing on their genes, and completely changing our bodies forever. The same diet your ancestors ate a thousand years ago might not be right for you simply because you have new genes and new gut bacteria they didn't have!

And secondly, individual variation happens anyway. Just because you are Taiwanese doesn't mean you are guaranteed to be lactose-intolerant, the same way that being

Hungarian doesn't guarantee that you will be lactose-tolerant. There are little differences from person to person in all populations. The same diet your parents eat might have foods that are harmful to you, or might be excluding foods that you're absolutely fine with.

The first step is to rule out allergies. Most of these are easy to tell. Your reaction will be severe, immediate, and probably cause markers and specialist white blood cells to be released into your body. If eating this food doesn't cause an obvious allergic reaction, a blood test can tell you whether or not you have a minor allergy. If you have had a blood test done and no allergy markers have shown up, that doesn't mean your body isn't hurt by certain foods, just that your immune system isn't attacking them directly. So how do we tell if our gut bacteria, yeast balance, or other cells from our own bodies are being affected by foods we're eating? Simple: we try an elimination diet.

There are many elimination diets available to try, but the best ones take a while, so you're going to have to stick at it. In an elimination diet, we quit eating all foods that are common irritants, or in our case, common inflammatory agents.

Foods That Cause Inflammation.

Even if you have no food allergies at all, some foods cause and prevent inflammation in all of us. If you want to stay as healthy as possible and keep inflammation down, consider eliminating these foods from your daily diet:

Sugar

If we eat too many foods containing simple sugars like glucose, sucrose, or even fruit sugars like fructose, our body suffers inflammation. Most of this inflammation is internal, so

you won't notice any swelling on the outside unless you were already suffering from external inflammation! But your blood will show inflammation markers, and if you have arthritis, eczema, or any other superficial inflammation, you will notice it get worse the more simple sugars you eat. What's more, simple sugars also harm our white blood cells, so not only are we suffering inflammation, but our healthy inflammation is less able to fight threats! This is in part why diabetics in a state of hyperglycemia are at risk of losing body parts when they get a sore or an injury.

Refined carbohydrates

Yep, and for the same reason as sugars. Refined flour, oats, or mashed potatoes, for example, are all very simple carbohydrates. They might be a starch on your plate, but in your mouth and stomach they quickly become simple sugars again, so you may as well be eating candy. For this reason, many researchers have suggested not just eliminating sugar from our diets, but monitoring the Glycemic Index or Glycemic Load of our foods if we want to control how much sugar we're getting. The Glycemic Index tells you how long it takes for the sugars in a food to reach your bloodstream, whereas the Glycemic Load assesses how much sugar is in your blood based on the Glycemic Index of the food multiplied by the grams of carbohydrate it has. Both are good ways of avoiding inflammation. Checking the Glycemic Index will tell you which foods are dangerously sugary, and checking the Glycemic Load will tell you whether you have eaten too many carbohydrates, even if all of them are low on the Glycemic Index.

Sweeteners

Sorry, but we're having to take this one away too! A study has found that giving humans artificial sweeteners can cause glucose intolerance and promote type 2 diabetes. This reaction is also responsible for the production of cytokines, which cause heavy inflammation all through our bodies. Not only that, but they attack our good gut bacteria, causing inflammation and pain through our lower digestive tract. So most sweet things are completely out the window. If it's any comfort, combining honey with a fatty food to produce a low-GI meal can make a wonderful anti-inflammatory pudding.

Salt

Salt affects inflammation in two ways. Firstly, it promotes high blood pressure, which can cause or worsen inflammation. And secondly, the fluid retention it causes worsens inflammation you already have. Although a small amount of salt for a healthy person is no problem at all, any salt can be bad news for someone who already suffers inflammation, and too much salt can cause inflammation in even the healthiest of people. And some salts, like nitrates, can cause inflammation all on their own.

Refined oils

Plant oils aren't necessarily bad for you. In fact, many minimally processed oils from seeds (like sunflowers), nuts (like walnuts) and fatty fruit (like olives) are actually good for you, providing a healthy dose of essential fatty acids (EFAs). However, researchers have found that processed oils, like vegetable oils, or corn oil, and many other seed oils, are rich in omega 6 EFAs. Normally this is fine, but if you have too much omega 6 and too little omega 3 and omega 9 you can suffer inflammation. This isn't anything to do with the EFA, but with the ratio! You should ideally eat a 1:1:1 ratio of omegas 3, 6, and 9. That means that for every gram you have of one, you should have a gram of the other two. Any

imbalance causes inflammation. So, don't chug omega 3 and cut out your plant fats entirely, because studies have recently shown that people who have many omega 3 supplements and avoid omega 6 also end up with inflammation!

Grain-fed animal fats

Although saturated fat has recently been found to not cause heart disease in healthy people, that doesn't mean you should be eating all the fat off your ham and frying everything in butter. You need to know where these animal fats have come from. Grain-fed animals produce saturated fat that has been proven to cause as much inflammation as vegetable oils. If you want to be healthy, stick to the natural stuff.

Well-cooked meats

Short but sweet: all well cooked meats, but especially BBQ meats and processed red meats, are chock full of advanced glycation end products, an inflammatory compound that happens when you cook protein too long and too hot.

Grains

Many more people than we previously thought are turning out to have an intolerance to gluten. Although gluten sensitivity is a myth, gluten allergies are very real and cause severe and painful inflammation and bleeding in sufferers. But what if you feel unwell after eating bread, but aren't allergic to gluten? Until very recently we used to make breads with complex yeasts almost always. These yeasts would pre-digest our grains, breaking down the gluten and other complex, gut-irritating proteins. Therefore, even if you are gluten-tolerant or eating a gluten-free grain like corn, you may find your body has an inflammation reaction to the unprocessed proteins in the loaf! If you're gluten-tolerant, strive to eat yeast-risen breads and sourdoughs.

Dairy

It is estimated that one in four adults have been confirmed to suffer some sort of difficulty digesting any sort of milk, either lactose, casein, or whey. It is also considered possible that half the human population or more has difficulty digesting cow's milk specifically. These irritants cause inflammatory reactions akin to an allergy. There is typically swelling in the intestine, so if you bloat after eating dairy, you may have difficulty digesting it. It's thought that most people who have trouble with cow's dairy can digest goat's dairy products just fine though. Which is good news because the probiotic anti-inflammatory benefits of fermented dairy are actually many.

Nightshades

Nightshades describe all plants from the same family as the deadly nightshade. And it may surprise you, but we eat a lot of them! Potatoes, tomatoes, peppers of all varieties, zucchini, eggplants... a whole array of foods belong to the nightshade family. And, annoyingly, they do still contain some of the same toxins! That's why potato greens, for example, are poisonous. The amount in the parts we eat is a very low dose, which is good news. It's like the fact that there is cyanide in apple pips, but we don't worry about swallowing one because we'd need to eat a plateful to feel any effect. But the bad news is that some of us are more sensitive to nightshade toxins than others. Whereas many of us can chow down on tomatoes as much as we like, some of us may have a minor allergic

reaction to all nightshades, resulting in inflammation.

Alcohol

Although like with all fermented foods a little bit of alcohol a couple of times a week keeps our gut bacteria healthy and strong, drinking daily has the opposite effect. As we turn alcohol into sugars, our pancreas produces enzymes to digest the alcohol, our liver filters out toxic byproducts and passes them on to the kidneys to excrete. If we have too much alcohol, one of these organs is eventually going to have too much work on its hands, resulting in a buildup of toxins that will cause inflammation.

Plastic-sealed foods

You know how nobody wants plastic Tupperware, cutlery, or plates unless they're certified BPA-free? Do you remember why that was? BPA is a phthalate type compound that breaks down when heated and leaves toxic particles in your food. Well there are loads of different phthalates that are used in the packaging of plastic-sealed foods all the time, and they're just as dangerous. And how do they get the plastic on? With heat, of course! Meaning that even if it's all removed before the food is cooked, it's too late: the phthalates are already in your food. Fast food restaurants typically transport their pre-prepared ingredients in these plastics, and many of your favorite store-bought processed foods come in them, from microwave meals to pates. Ouch.

A whole range of artificial additives

In this case when we say “artificial” we mean something that would not be found, in that state, in nature. In much the same way steel might occur naturally, but we make stainless steel ourselves, these additives may resemble natural things, but are heavily altered. Many different artificial colors and flavors have been found to disrupt our natural hormones and trigger histamine release. As our bodies don't make any sense of these products, we start the inflammation response and try and get rid of these strange invaders as soon as possible. Furthermore, many emulsifiers inhibit our natural digestion of fats, upsetting our gut balance and causing inflammation.

So those are the foods you absolutely, positively want to avoid if you don't want to suffer inflammation. So, the question is: what *can* we eat when we're prone to chronic inflammation?

Types Of Foods That Reduce Inflammation And What They Contain

Some foods, as mentioned, also reduce inflammation. They can be divided into two camps. The first camp contains all foods that reduce irritation and speed up healing. You can eat as much of these as you like, as their anti-inflammatory properties are based on treating the root cause of your inflammation. The second camp are foods that reduce swelling on its own. You need to treat these foods as medicinal, because they will reduce inflammation *even if the inflammation is actually helping*. They won't get rid of the root cause, but having too much of them can take away the protective properties of inflammation and open you up to more harm. Don't overeat them, don't mix them with anti-inflammatory medications, and when in doubt, ask your doctor.

Camp One Foods: Eat these abundantly

Beetroot

The humble beet is an amazing source of phytochemicals, which give it it's bold, stain-prone color. Betaine, one of the most powerful, is very anti-inflammatory. It improves metabolism, reduces the impact of glucose excesses in the blood, elevates your mood, and encourages fat burning. Eating beets regularly is great for you. For best effects, eat a combination of raw and cooked beets, each one once a week. Some elements of them are healthier raw, and others when cooked, so mixing and matching is perfect. For your cooked beets, try some hearty beetroot soup, Eastern European style, as borscht. And for your raw ones, grate or chop finely into salad.

Dark chocolate

Cocoa is loaded with antioxidants which prevent weight gain, water retention, and inflammation. Bacteria in our guts ferment chocolate's fats into amazing compounds that reduce insulin resistance and cut down on inflammation. But reach for dark chocolate with a cocoa content of 75% or above, as both milk and sugar are inflammatory. For best effects, have pure cocoa powder in a drink like a coffee, or have 99% cocoa chocolate with some fibrous fruits, to promote healthy fermentation.

Chia seeds

Almost all seeds are amazing for you, so don't take this entry to mean that you need to stop eating sunflower, pumpkin, or flax seeds. But if you aren't already eating them, chia seeds are a great addition to your diet. They stabilize blood sugar, help you lose weight, balance blood pressure, and reduce salt absorption, making sure that your inflammation stays within healthy boundaries and helping it to clear up after its job is done. For best effects, eat them whole and raw on top of cereal, crush into a butter for your bread, or soak them and blend them into a smoothie.

Apples

Probiotic foods are essential to gut health, but less known are prebiotics. Where a probiotic food adds healthy bacteria to your gut, a prebiotic feeds these bacteria. Apples are naturally rich in starches and fiber, making them a great prebiotic. But they are also full of pectin and antioxidants, mostly contained in their skins, which directly attack

inflammation. But be careful, as apples can be very high in sugar, and not all varieties have as much antioxidant content as others. For best effects, choose slightly bitter apples, like granny smiths or russets. If you can stomach them, Crabapples and Braeburns are the very best!

Berries

Berries are nature's very own anti-ageing medicine. They're chock full of anthocyanins and flavonoids that assist in digestion and reverse the process of inflammation. They have actually been shown to turn off the genes responsible for inflammation and auto-immune reactions, making them great for people with common allergies and auto-immune conditions! And their high content of vitamin C and resveratrol helps remove free radicals, which also reduces inflammation. For best effects, choose berries with dusty-looking skins and eat a cup of them fresh every day.

Tuna

White tuna, or skipjack tuna, is very high in omega 3. If you're on a budget and can digest fish, this may be the best and healthiest way of increasing your omega 3 intake. And as it has a natural omega oils balance it's perfect for supplementing. To get the most benefits, choose fresh tuna and have it lightly cooked, or raw if you can source sushi-grade tuna. But if your budget doesn't stretch that far, simple tuna in olive oil is a perfect oil supplement.

Nuts

Nuts are a great source of all omegas, and contain them in a very healthy balance. They're also your best plant-based source of omega 3. Not only that, but they're rich in Vitamin E and oleic acid, which both reduce inflammation. The best ones are walnuts, hazelnuts, and brazil nuts. Make sure to eat raw, unsalted nuts for the highest benefits, and don't fall for peanuts: they're actually a legume and are actually mildly inflammatory.

Spinach

Unfortunately, spinach's fame as an iron-rich superfood is a myth caused by a printing error. But the good news is that it is absolutely loaded with all sorts of other micronutrients, all of which help in decreasing harmful inflammation. Carotenoids and Vitamin C, Vitamin E, as well as Vitamin K are abundant in spinach, and help fight inflammation, especially in your internal organs. For a healthier, less inflamed heart, liver, and kidneys, eat ten cups of raw or lightly steamed spinach a week. But if you want to eat more, feel free to eat as much as you like.

Green tea

Green tea has been a popular drink for older people and ill people across the East for millennia. And for good reason! It is chock full of micronutrients which reduce the effects of ageing and fight inflammation on a natural level, by strengthening our immune systems to reduce the amount of time it takes for inflammation to do its job. This makes it perfect for inflammation caused by a weak immune system and chronic illness. For best effects, steep green tea in water just below boiling temperature (if you can hold your hand over it, but not put it in, it's perfect), and drink three mugs a day, before meals if possible.

Broccoli

Pretty much all the brassicas are full of glucosinolate, but not only is broccoli rich in this inflammation-fighting compound, but it is accessible and mild tasting compared to its brothers: kale and Brussel sprouts. It's also rich in vitamin K, which regulates how much inflammation you suffer, ensuring your inflammation levels are healthy. But beware: as it's a flower it could trigger a pollen allergy. Cook this vegetable well before serving.

Wild salmon

Wild salmon is an amazing food, simply because of its rich omega 3 content. As we've mentioned, chowing down on omega 3 supplements could have the opposite of the desired effect when we're trying to have a healthy balance of omegas 3, 6, and 9, skewing the ratio the other way and promoting inflammation. By eating our omega oils in foods, as opposed to in pure oil form, we make sure we have a healthy balance. For best results, eat your salmon lightly steamed, or buy sushi-grade salmon and eat it raw, preserving all the oils in the fish.

Pineapple

This tropical fruit is an amazing source of bromelain. Bromelain is actually the reason pineapple and meat pair so well, as this enzyme helps to pre-digest meat for you. But it's also a powerful anti-inflammatory agent! It doesn't act on inflammation itself, meaning it is safe for people whose inflammation is benefiting them. Instead, it fights pro-inflammatory metabolites and helps to clear salt-based water retention. This takes the edge off unhealthy chronic inflammation and speeds up recovery if you've had a hard day at the gym, but doesn't stop our natural, healing inflammation. For best results, have thinly sliced raw pineapple with pork, or some chunks in a salad. But don't eat too much if your diet is rich in other sugar sources!

Olive oil

Another great source of omega oils, as well as of oleic acid. Extra virgin olive oil has countless individual properties as well, such as containing oleocanthal, which enhance its immune-system strengthening abilities. It prevents the production of inflammatory enzymes, regulates our immune system and, just as importantly, stops us from using inflammation-causing oils and fats like vegetable oil or common lard. However, beware: it has a very low smoke point, so for best results you need to use this oil for low temperature cooking, as an addition to soups, and cold on salads and bread.

Coconut oil

So, what happens if you want to fry something properly? Fear not, you don't need to turn to inflammation-promoting oils. Coconut oil is full of anti-inflammatory properties that help reduce the inflammation associated with injuries and infections, but doesn't target chronic inflammation. But reducing acute inflammation helps prevent develop chronic inflammation, which is definitely a plus. And coconut oil has a very high smoke point, meaning you can fry things in it at a very high temperature without creating dangerous trans fats.

Bones

It may seem like a hipster foodie fad, but bone broth is really great for your immune system. The cooking process extracts collagen and glucosamine, which help in recovery and boost your immune system, reducing the need for natural inflammation by healing damage quickly. It also contains some advanced glycation end products, though, from the extended cooking. However, research seems to indicate that the benefits outweigh the problems. For the greatest benefits, have a cup of bone broth with herbs in it every day.

Camp Two Foods: Treat these as complementary medicine

Raw ginger

Research has found that raw ginger has many compounds called gingerols which are simply amazing. They're antioxidants, anti-inflammatory, antibacterial, and help fight disease. They block many genes and enzymes that are causes of inflammation. A small dose is wonderful for people with swelling in their joints and muscles. But you can't just chow down on raw ginger daily: their effect is so powerful that a heavy dose will reduce healthy inflammation as well, making illness last longer and leaving weak joints unprotected. For best effects, have 10ml of extracted ginger juices, or 20g of grated fresh ginger in a smoothie or salad dressing. But if you're a true ginger lover, feel free to indulge in as much cooked ginger as you like: the cooking process breaks down the antioxidants and enzymes, making it ineffective, but also harmless.

Garlic

You know how garlic makes colds and flus feel so much easier? That's because they are a powerful anti-inflammatory food. They are loaded with allicin, a common compound in all alliums (onions, garlic, spring onion, leeks...) but especially abundant in garlic. Aged garlic provides the best effects, but the next best thing is raw garlic. For best effects, mix raw minced garlic with a little olive oil and vinegar and use to dress a salad or season cooked, chilled meats and starches. A chicken salad with a raw garlic dressing could do you wonders. But don't make this an everyday thing, especially if you already take anti-inflammatory medicines, as the compound effect might be too powerful and reduce healthy inflammation. And beware garlic if you are over fifty, as if you are one of many people who develop a sensitivity to alliums as you age, it can disrupt your gut balance, provoking inflammation and undoing all your hard work.

Coffee

Coffee, unsurprisingly, boosts your metabolism. Actually surprisingly, it's full of antioxidants that reduce inflammation and promote a healthy immune system. But it is a very strong anti-inflammatory food too, and also a strong stimulant. This means that it can increase blood flow, attack healthy inflammation, and raise your blood pressure. So, talk to your doctor before using coffee as a supplement. One cup of strong coffee a day is more than most people need to feel the benefits.

Rosemary

This traditional cooking herb has a very high concentration of anti-inflammatory antioxidants. It also contains carnosic acid and canosol, compounds which inhibit the production of cytokines. This herb is great cooked or raw, and will help keep your heart,

liver, and kidneys healthy. But be careful with it. It's highly effective, so much so that rosemary extract can act as a preservative! So, consult with your doctor, and only use it sparingly for a bit of anti-inflammatory help.
Turmeric.

This traditional Asian spice is rich in curcumin, which gives it its amazing color and a whole host of anti-inflammatory properties. It directly inhibits inflammation pathways from operating by attacking the enzymes that drive them. It thins our blood, helps keep our liver healthy, and even reduces insulin sensitivity, promoting healthy blood glucose and mental functions. That said, its effects are very powerful and may completely eliminate healthy inflammation. What is more, if any of your medications thin your blood, adding turmeric to the mix puts you at risk of suffering a heart attack. Consult with your doctor before taking this spice!

Honey

Although it is also a sugar, honey has many anti-inflammatory properties as well. This is because it contains proteolytic enzymes. These enzymes control your body's natural anti-inflammatory responses, activating them and shutting down unnecessary inflammation. It relieves problems such as IBS, and the symptoms of food intolerance pains. It is also, unlike other sugars, full of antioxidants, carotenoids, polyphenols, and vitamins. But it is still a rich source of sugar, so limit your consumption to a teaspoon or two a day.

Miso and tempeh

Being fermented soya products, miso and tempeh lack the pro-inflammatory, phyto-estrogenic properties of raw soy and lightly cooked soy. But like all soy, these estrogenic compounds still have anti-inflammatory properties, despite not acting on your hormones as much. This means you get all the benefits of isoflavones and fermentation, with none of the downsides of everyday soya. However, its effects can be very powerful, and eating too much of either of them can disrupt your digestion. Besides that, soya is a common intolerance food, so beware eating it if you may be sensitive!

Anti-Inflammatory Meal Plan

Following these guidelines, we can construct a meal plan to prevent inflammation. Naturally, if your inflammation may be caused by diet or lifestyle, it is possible that this meal plan will completely relieve you of your symptoms and that you will no longer require medication as long as you continue to eat this way. On the other hand, if your inflammation has another problem as it's root cause, you may need to continue taking your medication, but may find you need less of it, or that you no longer require painkillers. Discuss all improvements with your doctor and don't change your medication intake without talking to a professional first.

These recommendations assume you are following an ideal diet for yourself and that you will make whatever swaps you need to keep yourself eating healthy. So, for example, if you need to lower your cholesterol, if eggs upset your digestion, or if you are following the elimination diet, you may swap eggs for another lean protein source. Or if you are lactose intolerant you may consider vegan dairy alternatives such as soya or nut-based drinks. Don't follow these examples exactly! Always use your best judgement and adjust the diet plan to suit you.

What makes a good anti-inflammatory breakfast?

Early in the day is when you give yourself the strength you will need to keep you going all day long. Many people make the mistake of skipping breakfast altogether, feeling better because of it. And why do some people with chronic inflammation feel better without breakfast? Well, let's look at some typical breakfast foods:

- Milk, yoghurt, butter, all common intolerance foods.
- Eggs, a common intolerance food.
- Cured meats, full of salt.
- Cereals, full of sugar.
- Wheat, oats, barley, corn, all common intolerance foods.
- Fruit, full of sugar, especially dried fruit and fruit juice.
- Jam, full of sugar.
- Peanut butter, a common intolerance food and often full of salts *and* sugars.

No wonder many people with inflammation skip breakfast! Our fastest, easiest breakfasts are highly inflammatory foods. But eating breakfast has been shown to lower cholesterol, help us keep weight off, and *reduce* inflammation. Which means we shouldn't be skipping our first meal of the day, but instead we should be skipping our usual breakfast foods. Instead, have a high-calorie, low-sugar, anti-inflammatory breakfast.

Consider:

- A plain cereal that you can digest well, paired with some chopped nuts and a dairy, or dairy substitute you can digest well.
- Unsalted meats and vegetables, grilled or lightly cooked in olive oil on a low heat.
- Avocado on a toast (made from a cereal you digest well).
- A smoothie that is 1/3 sweet fruit, 1/3 non-sweet fruit (fatty like avocado, or low calorie like tomato), and 1/3 low calorie squash, ice, or tea.

What makes a good anti-inflammatory lunch?

Lunch time you will want to eat a lighter meal. If you're like many of us and enjoy a hearty dinner, or eating out with friends, make your lunch the lightest meal of the day. Choose a salad packed with antioxidant-rich greens and non-sweet fruits and berries. Skip the carbs and meats at lunchtime, as you get plenty of protein and carbs at dinner. Consider this your break from sugars! A good anti-inflammatory lunch may have:

- A salad based on flavorful greens like spinach or rocket.
- A salad with berries in it.
- A dressing with garlic, ginger, or another powerful anti-inflammatory food.
- A dressing based on olive oil or coconut oil.

What makes a good anti-inflammatory dinner?

The best dinner to have is actually a lighter one, but our lifestyles mean we often benefit from very light lunches, so our dinner will be between breakfast and lunch in terms of calories. Now is a good time to get plenty of extra protein and some carbs, although not many and definitely no sweet, sugary things at this time of day! This is also the perfect time for hot or warm foods. For a great anti-inflammatory dinner, you may want to consider:

- A bone broth based stew or soup.
- Lightly cooked salmon or tuna.
- A richly herby, spicy sauce.
- Chia seeds as an alternative to a normal carbohydrate on the side.

What makes a good anti-inflammatory snack?

Snacking is usually the time when we turn to sugary sweet things, so it can be hard to snack when you don't want to be inflamed! There are three approaches you can take to snacking if you want to fight inflammation:

1. Skip solid snacks entirely. Go without, or swap them for a plain coffee, green tea, or water.
2. Have an antioxidant-rich fruit like apple, berries, or pineapple.
3. Have a non-sugary snack, like plain nuts, or tuna, or vegetable sticks.

A final important take-home message regarding your meals is that unless you are following an elimination diet, you should eat the widest variety of foods available to you, including a rich selection of herbs and spices. Every food has its own balance of micronutrients, and these micronutrients will contribute to a stronger, healthier immune system, and then to lessened inflammation. By eating a variety of foods, you ensure you are getting plenty of all micronutrients and, just as importantly, not too much of any specific one! This trick will keep your immune system doing the very best job that it can.

And how do we apply all this information? The theory is fine, but often we need a few examples to put theory into perspective. The following tables illustrate a week for three different anti-inflammatory diets, adapted to different personal circumstances.

Person A: Inflammation of the digestive tract and skin caused by poor diet, cow milk protein allergy, no other diseases.

	MON	TUE	WED	THU	FRI	SAT	SUN
Breakfast	Oats and nuts.	Oats and nuts.	Oats and nuts.	Oats and nuts.	Oats and nuts.	Bacon and eggs.	Bacon and eggs.
Snack	Coffee.	Coffee.	Coffee.	Coffee.	Coffee.	Coffee.	Coffee.
Lunch	Spinach salad.	Shredded cabbage salad.	Waldorf salad.	Chicken salad.	Spinach salad.	Mixed salad.	Tuna salad.
Snack	Blueberries.	Apple.	Pineapple.	Currants.	Apple.	Pineapple.	Grapes.
Dinner	Tuna salad.	Chia seeds and chicken.	Salmon and eggs.	Bone broth soup.	Chicken salad.	Beetroot soup.	Chia seeds and salmon.

Person B: Arthritis caused by old age, overweight, and old injuries accumulated through a youth playing sports. Minor secondary inflammation from rich diet and excess sodium.

	MON	TUE	WED	THU	FRI	SAT	SUN
Breakfast	Plain bacon and eggs.	Fruit salad.	Oats.	Green tea.	Fruit salad.	Green smoothie.	Plain bacon and eggs.
Snack	Berry smoothie.	Green tea.	Coffee.	Berry smoothie.	Green tea.	Coffee.	Berry smoothie.
Lunch	Spinach salad.	Cabbage salad.	Beetroot salad.	Potato salad.	Gherkin noodle salad.	Carrot salad.	Rocket salad.
Snack	Green smoothie.	Green smoothie.	Green smoothie.	Green smoothie.	Green smoothie.	Green smoothie.	Green smoothie.
Dinner	Chicken stir fry.	Sardines and eggs.	Salmon and chia seeds.	Chicken and sweet potato.	Tuna and cabbage stir fry.	Turkey stir fry.	Sausage casserole.

Person C: All round inflammation caused by an auto-immune condition. Many dietary sensitivities. Following an elimination diet.

	MON	TUE	WED	THU	FRI	SAT	SUN
Breakfast	Plain bacon and eggs.	Oranges and avocado.	Omelet.	Grapefruit.	Sausage and eggs.	Plain bacon.	Plain bacon, eggs, and sausage.
Snack	Orange.	Grapefruit.	Avocado.	Banana.	Green smoothie.	Almond butter and celery sticks.	Cashews.
Lunch	Turkey salad.	Sweet potato salad.	Chicken and zucchini.	Sausages and sweet potato.	Spinach salad.	Pork loin and salad.	Sweet potato and chicken.
Snack	Avocado.	Almond butter and celery sticks.	Banana.	Orange.	Grapefruit.	Cashews.	Green smoothie.
Dinner	Kale and pork soup.	Salmon and eggs.	Beef stew.	Lemon and garlic chicken.	Butternut squash and beef.	Sardines and salad.	Roast chicken dinner.

Once more: these plans are not designed to be followed closely by anyone. They are more to provide an overview of what an anti-inflammatory diet may look like for different people. Your diet will be similar, but the exact foods you are eating could be very different depending on your health, tastes, and lifestyle.

Of course, as we have already discussed not all inflammation is bad. Localized swelling around a bee sting helps to keep out bacteria. A swollen bruise helps keep blood around

your injured tissues, speeding up how quickly you heal. This is why it is so crucial to identify the root cause of your inflammation. Although it is perfectly possible to have inflammation for no reason at all, meaning that completely eliminating it is the best possible solution, it is more likely that the cause of your inflammation is a genuine health concern. Removing the inflammation from a genuinely damaged body part will restrict your healing ability and make you more ill in the long run. But if you identify the source of your inflammation accurately, then perhaps you can treat your condition and remove the inflammation naturally and safely once your health is under control.