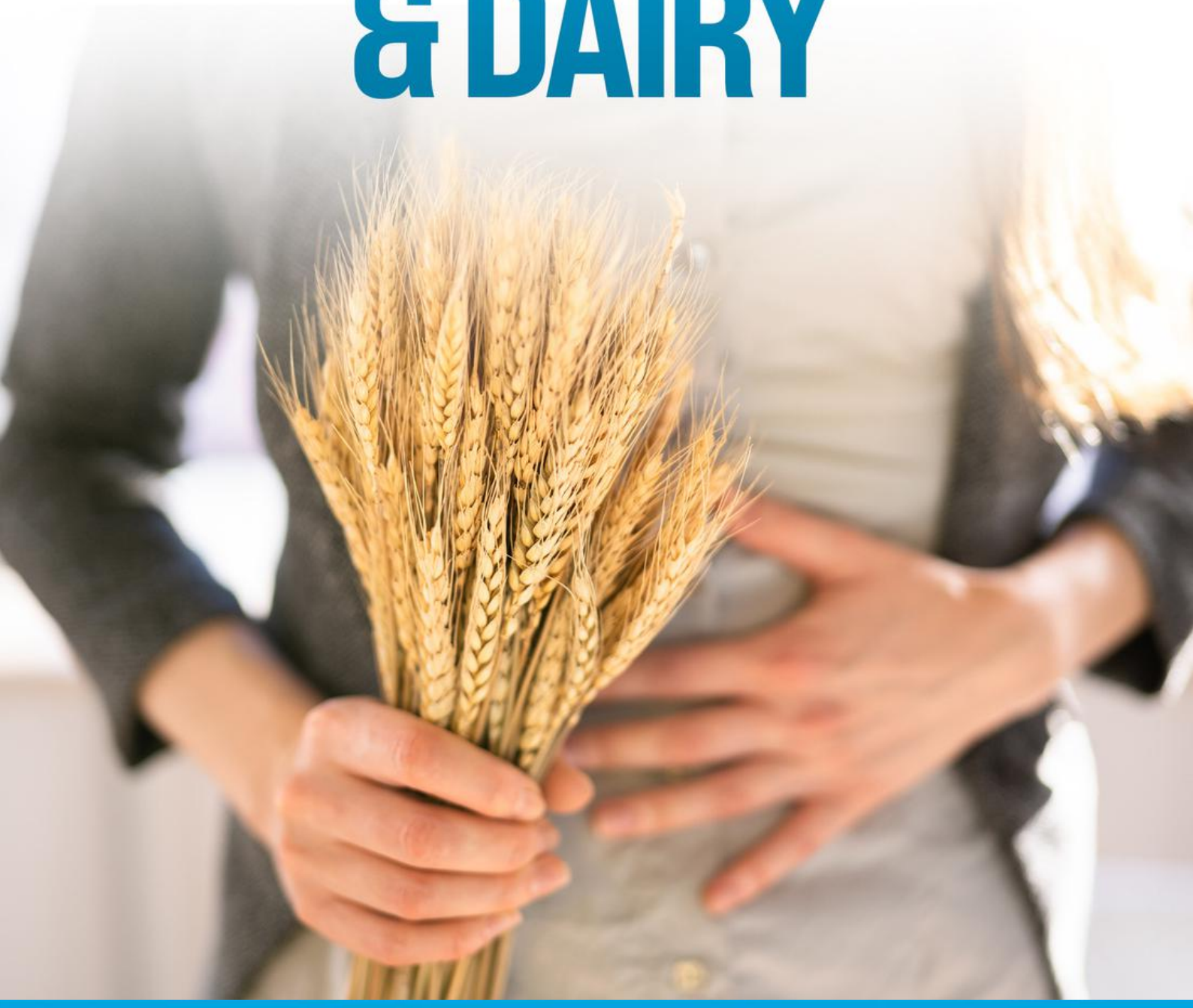
THE INFLAMMATORY EFFECTS OF GRAINS, GLUTEN, & DAIRY



WELCOME

Welcome to the Inflammatory Effects of Grains, Gluten, & Dairy guide. In this guide, we are going to discuss how specific foods can trigger inflammation in the body. This inflammation, when left unchecked, can cause unwanted symptoms and health conditions. You'll also learn more about the top nutrients which can help calm inflammation. Get started on reducing inflammation in the body by following the content within this eBook.

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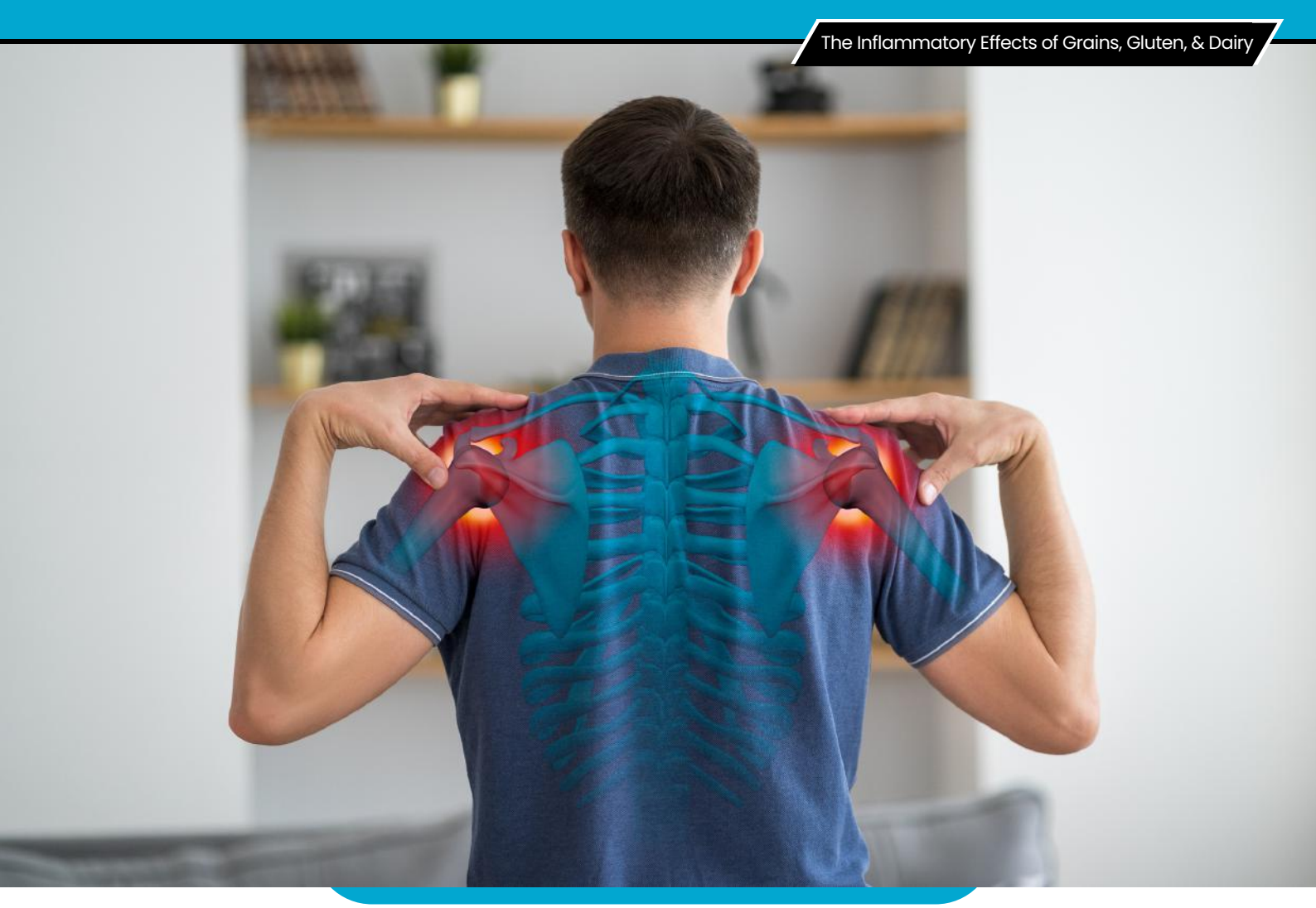
This guide does not provide medical nutrition therapy recommendations. Before starting on any diet, exercise, or supplement program, you should consult with your physician.

TABLE of Contents



Inflammation has a very important job in your body. It's designed to tell you when something is wrong. In most cases, inflammation is obvious. But sometimes inflammation is silent and that makes it hard to detect. If you listen closely, you can hear your body talking to you and telling you that there is something wrong. For example, do you have trouble sleeping at night and feel tired during the day? Do you get headaches or have consistent bloating that's embarrassing to deal with? How about sore, achy muscles when you first wake up? Do you find that your mood fluctuates or that it's difficult to concentrate at times? It could be due to inflammation.

For most people, there is no greater source of inflammation than the foods they put directly in their body. Luckily, eating anti-inflammatory foods can help reduce all of these symptoms to leave you feeling your best. This book is designed to teach you how inflammation causes damage to your health.

PART ONE

INFLAMMATION

Most of us are familiar with the redness, swelling, and pain associated with inflammation, but what really happens during the inflammatory process? In short, inflammation is what happens when your body responds to a stressor. It can be something you can touch or see, like a hot pan on the stove, or something you can't see or touch, such as stress at work or in your home life. Chronic inflammation occurs when you're exposed to these stressors on a daily basis for several weeks or months, such as a habitually bad diet and inactive lifestyle. It could build up inside your body without you even knowing about it. Eventually, this leads to disruption of your immune and digestive systems, which can cause serious disorders. Part one of this book describes the inflammatory process and how it affects your health.

What is Inflammation?

Inflammation can be a tricky thing. Most of the time, you can see it, such as when you fall down and scrape your knee. After a few days, your knee might become red and swollen. In this case, it's easy to detect inflammation. But what about the inflammation that's embedded deep in your tissues and organs that you can't necessarily see? This type of inflammation may be hard to detect because it's not visible to the naked eye. But if you pay close enough attention to your body, it will tell you when there is something wrong. For example, do you get headaches, brain fog or indigestion after eating certain foods? That could be your body's way of telling you that there is inflammation in your gut. Do you have skin problems, such as rashes, dry skin or acne? It could be due to an underlying inflammatory skin disorder. What about your hormone levels? Do you feel moody, fatigued, or have problems with your weight? The culprit might be inflammation in your thyroid gland. The symptoms of inflammation aren't always as clear as a swollen knee, but they are very real and can lead to serious health problems if ignored.

Acute vs. Chronic Inflammation

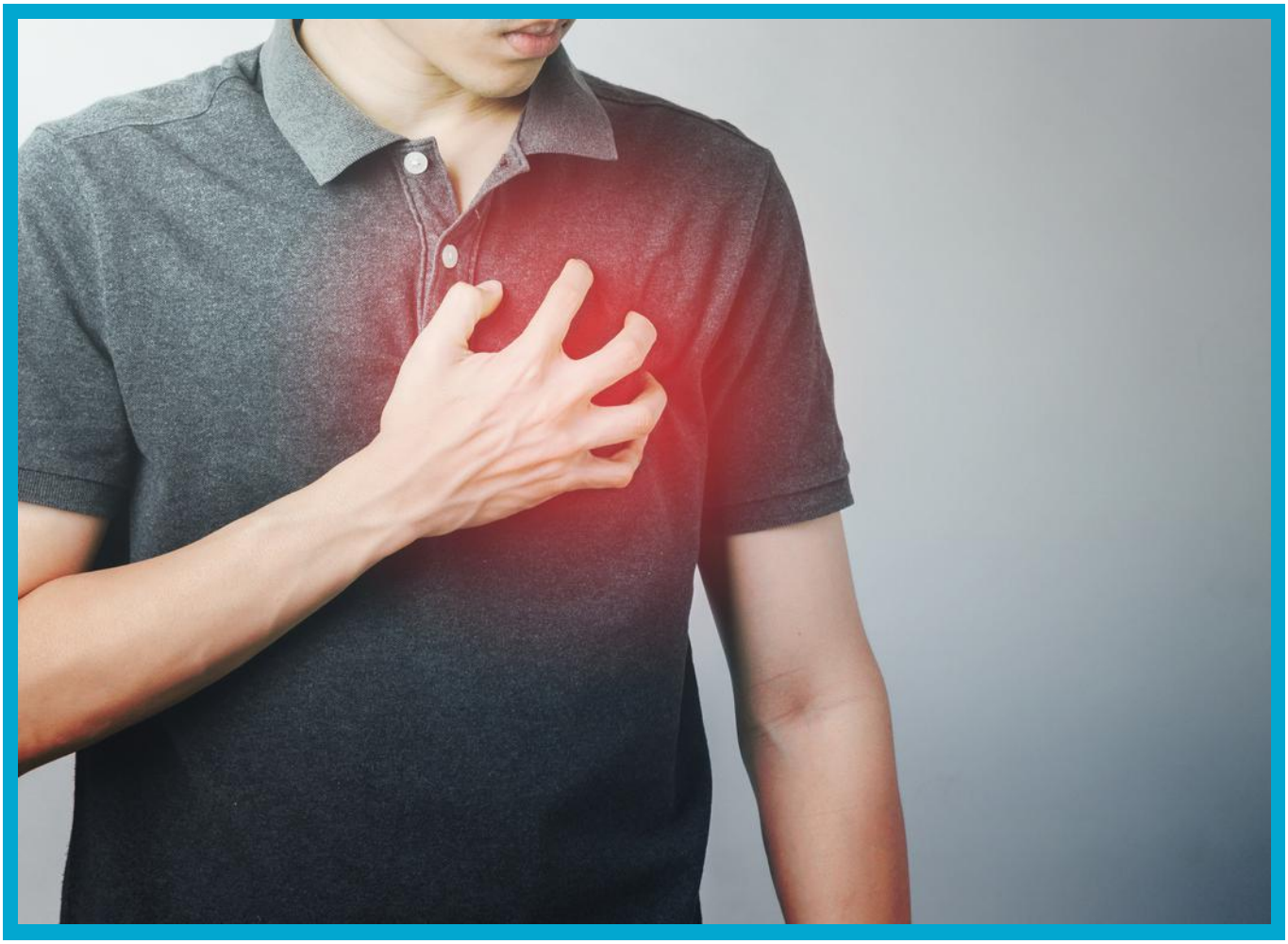
There are two primary types of inflammation: acute and chronic inflammation. Acute inflammation is short-term and occurs when you hurt yourself or catch a cold. Examples include falling and getting a cut or scrape, a sprained ankle, an infected ingrown nail or even a sore throat. Generally, the inflammation only lasts a few days and goes away on its own. Acute inflammation is the body's way of trying to heal itself naturally, so many people think of it as the "good" kind. On the other hand, chronic inflammation can be thought of as "bad" because it occurs in a wear and tear type of manner. Examples of conditions that result from chronic inflammation include Crohn's disease, rheumatoid arthritis, asthma, allergies, lupus, osteoarthritis, and other autoimmune conditions. Unlike acute inflammation, chronic inflammation is caused by prolonged stress on the body, such as in the form of unhealthy lifestyle habits, a poor diet, a lack of physical exercise, not getting enough sleep, prolonged toxin exposure or drinking too much alcohol. This type of inflammation doesn't go away on its own. In fact, it gets worse over time and increases your risk of more severe conditions, including diabetes, obesity, and cancer.

Chronic inflammation can build up in your body over the course of weeks, months and even years before you feel any symptoms. It's sort of like a silent killer that sneaks up on you. It happens when the immune system sends an inflammatory response to an area of the body that is considered a threat but doesn't really require an inflammatory response. White blood cells, which are immune system cells that are designed to protect you from foreign invaders and pathogens, are released. But the problem is that they have nowhere to go and no real inflammation to fight. More problems arise when these white blood cells begin to attack the body's own tissues and organs, such as in the case of autoimmunity. Autoimmune conditions are hard to treat sometimes because we can't figure out the underlying cause of what triggers them, but we know it has something to do with the inflammatory response. Other times there is a real threat in the body that requires white blood cells, but we do not always feel the response and the inflammation can seemingly last forever. Persistent inflammation does not always have symptoms, but doctors can sometimes use a test for it by measuring your C-reactive protein levels (CRP), which is a general indication of how inflamed the body is. They also can test for various auto-immune lab markers which would also indicate inflammation if the lab test comes back positive.

If left untreated, chronic inflammation can develop into a wide range of scary health problems. That's because inflammation creates an environment that makes it ideal for diseases to thrive. Here are some of the known health risks associated with chronic inflammation:

1. Heart disease

Research shows that inflammation plays a vital role in the development and progression of several cardiovascular conditions, such as congestive heart failure and coronary atherosclerosis (1). It occurs when cholesterol starts to build up in the lining of blood vessels and blocks blood flow. When too much cholesterol begins to accumulate, the immune system recognizes the cholesterol as a threat, and it tries to stop it by sending out inflammatory mediators (cytokines) as part of the inflammatory response. These cytokines are found in the bloodstream, which is the perfect place to cause further inflammation by causing blood clots and blood flow blockages that may lead to a heart attack. The more strain that is put on your heart, the greater your risk of heart- related complications. Remember that your blood is responsible for delivering oxygen and other important nutrients throughout the body, so a blockage may also increase the risk of stroke.



2. Diabetes

According to research from a 2009 article that was published in the journal Gerontology, the cytokines that are produced by the immune system during chronic inflammation can interfere with your insulin response (2). This causes your blood sugar levels to spike. It also results in increased insulin resistance, which means that the disease will worsen over time if the inflammation persists.

Essentially, insulin is a fat-storing hormone. It sends glucose from your bloodstream to your cells where it is used as energy. When you have too much sugar in your diet, your pancreas cannot keep up with the demand for insulin. It enhances the amount of "energy" that is stored later for use as fat by sending it directly to your fatty tissues. When your pancreas becomes overworked, it begins to shut down, and you become insulin resistant. Your cells stop responding to insulin altogether, which means that the glucose in your blood has nowhere to go. Under normal conditions, insulin has an anti-inflammatory like effect. But when you eat too many processed carbohydrates and create a state of chronic inflammation in the body, your insulin levels no longer work with you but against you.

3. Weight Loss

The primary source of pro-inflammatory cytokines is in your adipose or fatty tissue. This means that the more fatty tissue you have, the more inflammation you have as well. Eating an anti-inflammatory diet helps remove these pro-inflammatory cytokines from your tissues. You can also reduce these pro-inflammatory cytokines by losing fatty tissue in the form of weight loss. Both methods will help you reduce inflammation, but if you don't change your diet and lose the weight using some other manner, you'll still have pro-inflammatory mediators lingering in your tissues just waiting to cause weight gain. Eventually, whatever you're doing to lose weight won't be enough until you change your diet. For example, if you restrict your calories and exercise profusely, you might lose weight. But your body will still be inflamed until you remove the food causing it. Crash dieting doesn't address the source of your obesity, and you'll be more likely to gain the weight back (and then some) until you change your habits.

4. Pain

Even though you can't see it, chronic inflammation can be very painful. This is because inflammation tends to occur in very sensitive areas of your body, such as in your tissues, joints and bones. Once inflammation develops, it has a snowball effect that activates a bunch of chemical reactions that cause the nervous system to feel pain. Additionally, chronic inflammation causes changes in your nervous system so that the pain feels worse over time. For example, inflamed tissue in your knee, such as in the case of arthritis, may feel very tender. Over time, it may hurt when you lightly touch it.

5. Digestion

If there's one part of your body you want to work at its best all the time, it's your digestive system. Think about it. This is the area of your body where nutrients are absorbed into the bloodstream and sent throughout the body. It's also the area responsible for housing most of your immune system. And because your digestive system is in constant communication with your brain, it also affects your mood. The reality is that there isn't a part of your body that does not depend on the maintenance and health of your digestive system. When you accumulate inflammation in your gut due to a poor diet, chronic stress, and lack of exercise, it can be felt all over your body.

6. Hormones

The internet is booming with supplements and remedies to balance hormone levels in both men and women, and it's not hard to see why. Hormone imbalances are common, especially among aging adults. That's because your hormone levels naturally decline with age, but inflammation is also a major disruptor. Hormone imbalances bring about symptoms that make everyday tasks difficult, such as extreme fatigue, moodiness, cognitive impairments, difficulty concentrating, weight gain, infertility, hot flashes, irregular periods in women, low libido, and erectile dysfunction in men.

7. Bone health

Research from a 2009 article published in the Journal of Endocrinology stated that chronic inflammation might result in a lack of bone growth as well as increased bone loss (3). The authors of the article found that the cytokines that are released during the inflammatory response interfere with bone restructuring, which is a process that involves replacing old damaged pieces of bone with new ones. Additionally, gut inflammation can significantly lower the amount of calcium and vitamin D that you absorb. This can impact your bone health because calcium and vitamin D are needed for strong bones.

8. Depression

According to a 2015 study, people with depression had 30 percent more inflammation in their brain than subjects who weren't depressed(4). Study authors indicated that although the process of inflammation can help the brain protect itself, too much can be damaging. Inflammation in the brain has also been linked to mood disorders, sleep problems, and loss of appetite. As we will discuss later in the book, inflammation in the gut can also affect your mood. This is because the gut and the brain are in constant communication with each other. If your gut is inflamed, it sends distress signals to your brain and that causes your mood to become depressed, anxious, or distressed.

For example, one study found that people with intermittent explosive disorder (IED), which is characterized by anger and aggression, had higher amounts of C-reactive protein in their blood (5). According to the researchers, people with IED overreact to situations that are stressful by exhibiting uncontrollable rage and anger. The condition affects the person's social and professional lives and also puts them at an increased risk of developing anxiety or alcohol abuse and depression. They're also more likely to develop serious medical problems, such as stroke, diabetes, and heart disease. The researchers don't know if the inflammation triggers the anger or vice versa, but they don't recommend trying to take an aspirin to control the anger. The inflammation runs deeper than taking anti-inflammatory medication.

9. Cancer

Cancer is a tricky topic among health experts. For liability reasons, many doctors can't tell you that chronic inflammation caused your cancer diagnosis, but research is now showing this is a potential theory in cancer development. According to one study, inflammation is a critical factor in the progression of tumors. Many cancers arise from sites of chronic inflammation, irritation, and infection. It's clear that tumors are primarily orchestrated by inflammatory cells. The chronic inflammatory response triggers the destruction of proteins that are needed to repair DNA. This can lead to gene mutations, and eventually, cancer(7). Additionally, immune cells tend to attack tumors during the normal inflammatory response, but this method backfires when it comes to reducing the size of the tumor. Instead of killing the tumor, the immune cells get inside the tumor, and the tumor uses the nutrients and oxygen from inside the cells to help it grow.

While it might be hard to detect chronic inflammation, the best thing to do is to pay attention to your body and the way you feel. You might not always be able to see the effects of chronic inflammation, but you sure can feel them. Keep in mind that chronic inflammation is the starting point for most diseases. If you pay attention to the signs, you don't need a test to tell you that it's time to make some lifestyle changes. If you get headaches all the time, have trouble sleeping, suffer from digestive issues, can't seem to stop gaining weight(especially in your abdominal area), have bad breath, or experience achy muscles or joints, then you could have chronic inflammation lingering in your body already.

Inflammation and Gut Health

When integrative health experts talk about inflammation in the body, they usually are referring to leaky gut as the underlying issue. Even if your symptoms don't feel gut related at all, it's very likely that all inflammation starts in the gut. The reason is that your gut houses approximately 70 to 80 percent of your immune system, which is responsible for the inflammatory response. Given the importance of keeping your immune system healthy, it's no wonder that your gut plays such a large role in chronic inflammation. In fact, your gut has such an enormous influence on the rest of your body that it's known as the second brain. It contains approximately 100 million neurons, which is more than both the spinal cord and peripheral nervous system (8), which makes your gut highly sensitive to your internal and external environment.

Leaky Gut

Serious problems arise when chronic inflammation sets up shop in your gut. Leaky gut syndrome or increased intestinal permeability is a condition that occurs when chronic inflammation affects the lining of the intestinal wall. To understand why this is dangerous, it's important to know what the intestinal wall does. Inside our intestines, we have an extensive lining that spans across more than 4,000 feet of surface area. When it works correctly, and there is no inflammation present, the intestinal wall forms a tight barrier that controls what foods and substances you absorb through the small intestine and into the bloodstream. When you have chronic inflammation, it causes the intestinal wall to get large cracks or holes in it. This allows toxins, partially undigested foods, and pathogens to penetrate through the wall. In other words, it becomes hyper permeable and becomes unable to protect you from harmful substances.

Once your immune system senses that there are potentially dangerous molecules leaking from your gut, it sends out an inflammatory response, which further provokes the condition and establishes a vicious cycle of inflammation. Your gut takes the hit. It becomes inflamed and swollen. You might start to notice that you have abdominal pain, bloating or gas when you eat, or you might even feel symptoms that are completely unrelated to your gut, or so you think. For example, leaky gut may cause fatigue, skin problems, headaches, trouble sleeping, hormonal imbalances, and weight gain. Because your digestive system is no longer working properly, it opens the door for more serious conditions. You might become malnourished because nutrition is not being absorbed into your bloodstream. You may even start to notice that it's harder to concentrate or function at work.

To a certain extent, everyone has some degree of leaky gut because the intestinal barrier is not completely impervious. But don't worry because it's not supposed to be! Research shows that modern life is the primary driver of gut inflammation. This includes how well you treat yourself. A poor diet that's high in the wrong foods coupled with an inactive lifestyle and lots of stress can make your leaky gut worse. According to a Harvard publication, the standard American diet, which is low in fiber and high in sugar, may initiate the process of inflammation and leaky gut. Heavy alcohol use may also play a role (9). Leaky gut may eventually lead to more serious gastrointestinal conditions, such as Crohn's disease and ulcerative colitis (10). Both conditions are autoimmune diseases, which, as stated in the first section of this book, occur when the body attacks itself. But it doesn't stop there. Research shows that leaky gut may also contribute to other conditions, such as:

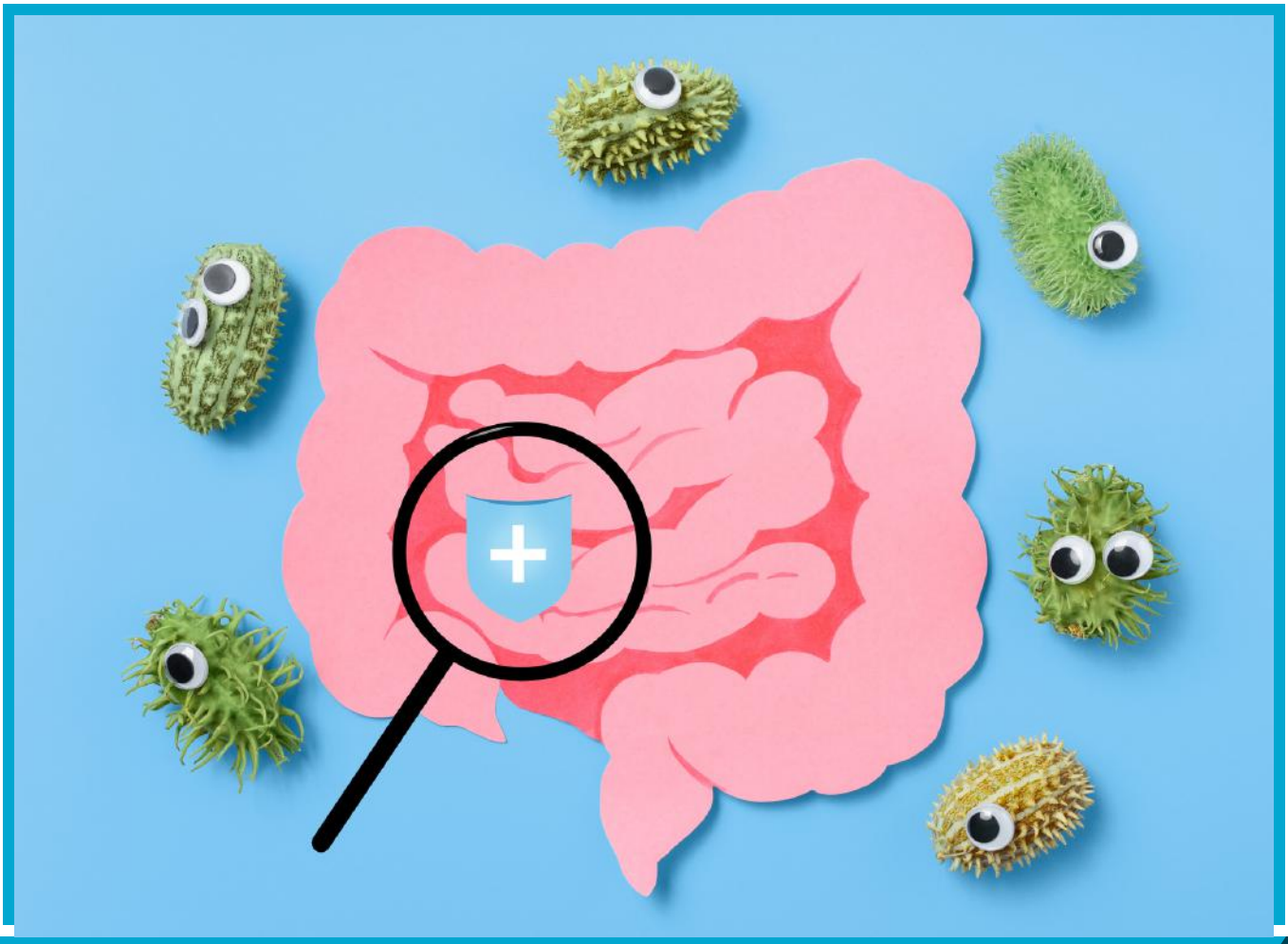
- Lupus
- Arthritis
- Allergies
- Asthma
- Acne
- Obesity
- Mental illness
- Type 1 diabetes
- Multiple sclerosis
- Fibromyalgia
- Chronic fatigue syndrome
- And much more....

This is because when the gut becomes compromised, so does the immune system. It can no longer protect you from developing more serious conditions because it's too busy fighting a war that it will never win in your gut.

While a leaky gut might not always be clear, you can decide whether or not you have it by taking a good look at your waist size. According to one study, leaky gut is linked to visceral fat, which is the type of fat that surrounds your belly (11). The study found that increased belly fat as opposed to fat in other areas of your body (such as in your glutes) was strongly related to leaky gut as well as insulin resistance and inflammation. The study authors suggested that this is because the abdominal fat impairs the gut barrier function and increases the leakage of gut-derived antigens. Results found that normal to overweight women had a positive correlation between their waist circumference and leaky gut pro-inflammatory mediators. Luckily, treating leaky gut can help you kill two birds with one stone. By reducing chronic inflammation that causes leaky gut, you also reduce abdominal fat and drop your waist circumference. Your food becomes digested easier, and eating becomes enjoyable again. You just have to know the right foods to eat.

The Microbiome

One of the primary reasons why inflammation contributes to leaky gut is because it changes the environment of your microbiome. Your gut contains billions of bacteria that are collectively known as your microbiome. This collection of bacteria is what makes you unique from everyone else. It protects you from pathogens and even influences your DNA. But your microbiome is highly sensitive, and it can be positively or negatively influenced, depending on how you treat it. It's especially prone to dietary interventions. So if you eat a diet that's high in processed sugars and ingredients, it causes inflammation that reduces the number of "good" bacteria that you have and increases the "bad" bacteria. A few bad meals here and there won't hurt you as long as the majority of your diet comes from anti-inflammatory foods. But persistent, long-term poor dietary choices cause the bad bacteria in your gut to take over. When it does, you lose the innate protection that the microbiome has over your body. Diseases thrive in these types of environments because you have basically stripped your body of its natural defenses. The best way to get it back is to stop putting inflammatory ingredients in your body and start refueling with foods that fight inflammation.



Anti-Inflammatory Eating Tips

There isn't a person on the planet who can't benefit from eating a diet high in anti-inflammatory foods, which is why many health experts urge their patients to use it as a way to heal from chronic inflammation. Research shows that this way of eating slows down the aging process and protects against many diseases (12). It also does wonders for your gut, which, as we learned earlier, is where inflammation usually begins in the first place.

Anti-Inflammatory Eating Tips

1. Aim for 25 grams of fiber each day

One of the reasons why anti-inflammatory eating works so well is because it restores the health of the digestive tract and improves your microbiome. In turn, this improves your immune system and often helps to start reducing inflammation. One of the first elements to start on is eating foods high in fiber. Eating lots of fiber helps move fecal matter through the digestive tract. It also helps feed the good bacteria in your gut. The longer matter sits in there, the longer you'll be exposed to toxins. So moving it out quickly is important for health. A fiber-rich diet also helps keep you full. Aim for at least 25 grams a day. You can reach this number by incorporating lots of fruits and vegetables in your diet. One banana has three grams of fiber. Try adding one to your morning smoothie with a cup of spinach and a handful of berries. Enjoy a big salad at lunch and steam a cup or two of broccoli for dinner.

2. Focus on fruits and vegetables

Fruits and vegetables are the bread and butter of anti-inflammatory eating. In addition to containing lots of fiber, they have phytonutrients or plant chemicals such as antioxidants and flavonoids that bind to toxins and move them out of the body. This is important because too many toxins accumulate in your tissues and wreak havoc by causing inflammation and disrupting enzymatic processes. Aim for at least nine servings of fruits and dark green, leafy vegetables a day.

3. Eat fish three times a week

Fish is a great source of omega three fatty acids ,which have been shown to suppress inflammatory mediators that cause autoimmunity, major depression, coronary heart disease, Crohn's disease and ulcerative colitis (13). They have even been used to reduce over-the-counter anti- inflammatory medications. Make sure your fish is wild-caught as farm-raised tends to be high in additives and food colorings. It may also help to take a high-quality omega three supplement.

4. Avoid processed foods

Following an anti-inflammatory plan is not just about the foods you eat. It's also important to eliminate the foods that cause inflammation. While eating more fruits and vegetables is a good place to start, you'll also want to avoid all processed foods because they work against the good foods you're eating. As a general rule of thumb, avoid any store-bought packaged foods, such as bread, energy bars, cereals, sweets, baked goods, and sweetened beverages. Even some so-called healthy foods contain sources of hidden sugar. Condiments such as salad dressings are a big offender. In place of store-bought dressing, prepare a salad with olive oil and raw, fermented apple cider vinegar. Spices are a great way to add flavor and anti-inflammatory power to your favorite dishes. Also be sure to drink lots of water to help flush toxins and improve the digestive process.

PART TWO

WHAT FOODS TRIGGER INFLAMMATION?

There are several factors in your external environment that can trigger inflammation, such as work, family stress or physical inactivity. But of all the possible causes, your diet is one of the most influential. Luckily, it's also one of the most controllable aspects of your life. You might not be able to leave a job that's making you unhappy or find time to fit in an hour of exercise at the gym every day, but you have complete control over what you eat for lunch. Unfortunately, many people eat foods that they think are healthy only to find that they're not healthy at all. Do you drink milk or eat cheese every day? Have a sandwich at lunch with white bread? Do you like to have a serving of pasta or rice at dinnertime? All of these foods could be triggering inflammation in your body.

Food Allergies vs. Food Sensitivities

If you've ever had an allergic reaction to something such as a bee sting or a certain medication, then you know it can be pretty serious. Your body can react similarly when you feed it something that it's allergic to. The only difference is that the majority of your symptoms happen inside the body, so you can't necessarily see them. There is a huge increase in food allergies present today that weren't around decades ago which is leaving many health experts wondering what happened. Have people become weaker when it comes to how we process food or is it the food that has changed and is making us sick? While it might be wishful thinking to hope that neither is true, the fact is that food is now making more people sick than it ever has before. For some people, a single bite of the wrong food can result in an allergic reaction that takes them to the hospital. For others, allergenic foods can bog down your day with symptoms of headaches, fatigue and general pain.

Food Allergy

Once again, inflammation is mostly to blame for the way you respond to certain foods. It's your body's way of telling you, "No, don't eat that." A food allergy might not present itself the first time you eat a certain food. But after several exposures, the body responds by releasing antibodies and histamine to combat the inflammation. Antibodies are large proteins produced by the immune system that fight food invaders. They work by binding to the protein that's causing you harm to prevent any further heightening of the

symptoms. Histamine is a chemical that acts as a neurotransmitter to send messages to your brain. When you experience a food allergy, histamine causes your blood vessels to dilate or swell so that your white blood cells can get through them quickly and fight the area of your body where the food allergy is detected. Because histamine travels through the bloodstream, it can affect your brain, skin, lungs, and heart. Food allergies are most commonly associated with anaphylactic shock.

Food Sensitivity

Long-term exposure to a food that you are sensitive to can cause further inflammation. Food sensitivities or intolerances occur when you are unable to fully digest specific parts of a food, such as certain proteins. The symptoms of food sensitivities are hard to detect because they can be very mild and depend on the amount you ate. They can also come on hours after you ate the food, which makes it hard to pinpoint which food caused the reaction. Food sensitivities trigger the immune system differently than a food allergy, but they both involve inflammation. For example, if you're intolerant to a food, then your body releases white blood cells and proteins such as macrophages and granulocytes to kill the toxin that initiated the inflammatory response. This is meant to protect you from any real harm. You can see how repeated exposure to either response would cause chronic inflammation.

Some common examples of foods that cause allergies or sensitivities include:

- Dairy
- Wheat (gluten)
- Grains
- Corn
- Nitrates
- Artificial sweeteners
- Soy
- Yeast
- Nuts/peanuts
- Shellfish
- Sugar
- Egg whites
- Mono-sodium glutamate
- Sulfites
- Caffeine
- Food dyes
- Nightshade vegetables (tomatoes, eggplant, potatoes, peppers)

As explained by a 2015 study on children and food allergies, most people can develop a tolerance to specific antigens that the body produces (14). But for some reason, certain people react to food and particular proteins as if they were pathogens. This causes chronic inflammation in the gut mucosa, which is located on the lining of the gut wall and is responsible for keeping harmful agents from getting through to your bloodstream. Food sensitivities may cause vomiting, diarrhea, bloody stool, developmental problems in children, eczema, and lots of other symptoms. On the other hand, a food allergy causes an immediate action. You may experience a rash or hives, sneezing, itching, coughing, watery eyes, nausea, diarrhea, stomach pain, shortness of breath,

chest pain, or even the inability to breathe due to swelling of the airways to the lungs. During both conditions, body is telling you that you ate an 'allergen/other word' and it's trying to get it out as quickly as possible.

Auto-Immune Food Triggers

Sometimes, specific food triggers can cause or worsen various diseases. For example, celiac disease occurs as a result of eating wheat or gluten. Many people who suffer from Crohn's disease or ulcerative colitis find that dairy and grains are off limits to them, and refined sugar or processed foods may worsen the symptoms of multiple sclerosis.

One study even found that food allergies and autoimmunity are related. Researchers at the National Institutes of Health determined that a gene called BACH2 is responsible for the development of both autoimmunity and food allergies (15). Results showed that people with the BACH2 gene often develop a food allergy or an autoimmune disease and that the gene is a common factor among people with compromised immune systems. Researchers stated that excessive inflammation is one of the hallmarks of uncontrolled immune responses. The BACH2 gene affected the switch between inflammatory and regulatory cells in mice, meaning that it provoked an inflammatory response in an otherwise non-inflammatory situation. What that means for people with food allergies is that removing the allergen or cause of inflammation is key to controlling the condition. The same goes for autoimmune disorders and any other disease that is provoked by inflammation. When you remove the threat, you restore your health. And it starts by eating an anti-inflammatory diet.

The Link Between Gluten and Inflammation

A few years back, the gluten-free diet seemed to take over the world, and it did so by surprise. All of a sudden supermarkets were stocking their shelves full of gluten-free alternatives for bread and other staples, and people were dropping gluten from their diet left and right even if they weren't allergic to it. People who went gluten-free claimed that they immediately felt better when they stopped eating it. So why was gluten all of a sudden targeted as being a food that you should avoid? The answer has to do with inflammation and the way your body reacts to the proteins found in products that contain gluten.

By definition, gluten is a general term used to describe certain proteins that are found in wheat, rye, barley and triticale products, which is a cross between rye and wheat. Gluten is used to help maintain the shape of certain foods. In other words, it's like the glue that holds a food together. The two primary types of proteins found in foods that contain gluten are called gliadin and glutenin. Of the two, gliadin is responsible for causing the most negative symptoms in people who eat it. You can find gluten in the following foods:

- Baked goods
- Bread
- Pasta
- Cereal
- Sauces
- Malt
- Beer
- Brewer's yeast
- Some oats
- Some soups, sauces and salad dressings (used as a thickening agent)

When it comes to gluten intolerance, most people think of celiac disease, which is an autoimmune disorder that causes symptoms such as bloating, abdominal pain, diarrhea, constipation, fatigue, headaches, skin rashes, and weight loss when you eat gluten. This is because people with celiac disease have an immune system that considers gluten and the proteins in gluten to be foreign invaders. So every time it's ingested, the immune system attacks by sending out an inflammatory response to try to get rid of the threat. Most people with celiac disease can control the disease by avoiding gluten. But since gluten likes to hide in lots of unsuspecting places, this is easier said than done. Additionally, celiac disease is tough to diagnose. Research shows that as many as 80 percent of people have the condition and don't even know it (16) (17).

Doctors diagnose celiac disease by testing for a type of antibody produced by the immune system called tissue-transglutaminase. They do so by taking a biopsy of the small intestine after a person has eaten gluten. If the person has celiac disease, then doctors will usually see that the finger-like villi that are located on the intestinal wall will be destroyed or utterly flattened. This is because gluten induces an inflammatory response in the bowel that changes the health of your microbiome and leads to leaky gut (18).

So what happens if you were tested for Celiac disease and the results came back negative? The problem is that many people today who don't have celiac disease can experience similar inflammatory reactions to gluten, even if they are not diagnosed as Celiac. They are most commonly referred to as Non-Celiac Gluten Sensitive. They can experience abdominal pain, bloating, gas, and other symptoms. This is why so many people avoid gluten even if they aren't allergic to it. NCGS or Non-Celiac Gluten Sensitivity is a real thing. It has taken decades for the medical community to finally embrace the idea that gluten sensitivity is a real thing.

Lab Testing for Leaky Gut

Whether you are diagnosed with Celiac disease or are gluten intolerant, there is a new and exciting lab test that shows whether your intestinal tract is letting gluten proteins through. Since gluten is highly inflammatory, it makes it a perfect food to fuel leaky gut. Specifically, research shows that gluten triggers a protein called zonulin that is responsible for regulating the tight junctions in the small intestine. These tight junctions are tasked with making sure nothing harmful passes through the gut. But when zonulin is released into the digestive system, it causes the tight junctions to open and allows large particles to pass through the intestinal wall, including food particles, toxins, and other harmful molecules. Studies show that gluten activates the release of zonulin and leads to leaky gut or intestinal permeability (19) (20).In other words, eating gluten enables a type of protein that causes your gut to leak food through. Once this happens, your immune system tries to remove the threat by attacking it. It leads to one big cycle of inflammation and needs to be prevented by eliminating gluten from your diet in the first place.

While intestinal permeability is worse among people with celiac disease and other autoimmune conditions, you should avoid gluten if you start to feel symptoms. Gluten is one of many highly inflammatory foods that cause problems when you eat too many of them. Other examples include processed sugar, dairy, and refined carbohydrates. You might be able to get by eating gluten every once in a while, but chronic exposure to a food that causes problems will eventually catch up to you. After a while, your inflammation levels will spike due to the body's repeated attempts to remove the threat, which means that you'll be more likely to develop other problems as well, such as other autoimmune conditions, obesity, diabetes or heart problems.

How Inflammatory Is Dairy?

For many people, the body responds to dairy much as it reacts to gluten- with an inflammatory reaction that screams, "Get out of here and don't come back!" Dairy is one of the most inflammatory foods in our diet, second only to gluten. Many foods in today's society pair these two highly inflammatory ingredients together for a disastrous response in the gut. Think about sandwiches, pizza, tortillas and wraps. They all tend to have dairy and gluten paired together. While these can be tempting meals, it's best to stay far away from them and make healthier choices.

The Difference between Lactose Intolerance, Dairy Allergies and Dairy Sensitivities

People are often confused about the differences between lactose intolerance, dairy allergies, and dairy sensitivities. These terms are often used interchangeably, but they shouldn't be. Of the three conditions, only a dairy allergy produces a true IgE reaction, which occurs when the body suffers an allergic reaction to dairy. IgE is short for immunoglobulin E. They are a type of antibody that is produced by the immune system when you eat dairy. In other words, your immune system overreacts to dairy when you eat it, and it sends out IgE antibodies that travel to your cells and release chemicals that cause an allergic reaction. An IgE mediated reaction usually occurs immediately after eating the food that you're allergic to whereas symptoms from an intolerance or sensitivity may occur hours later. A dairy allergy could cause anaphylactic shock or trouble breathing.

A dairy sensitivity is similar to a dairy allergy, but it doesn't cause an immediate IgE reaction. Dairy sensitivities cause an IgG reaction which cause delayed symptoms such as headaches, bloating, gas, fatigue and more. These types of reactions are generally mild and can occur even up to 1-2 days after exposure to the food. There are two proteins found in milk that people with dairy sensitivities respond poorly to, which are whey and casein. Research shows that casein has a similar molecular structure to gluten, which is why so many people who are gluten intolerant are also sensitive to casein. In addition to these hard to digest proteins, milk is high in sugar, which also makes it highly inflammatory and hard to digest for anyone with a sensitive system.

Some people might just have something called lactose intolerance which is caused by a reduced ability to digest the milk sugar lactose. People with lactose intolerance don't produce enough of an enzyme that helps them break down the sugar in milk. Unlike a dairy allergy, which may cause symptoms in the gastrointestinal tract, skin, and respiratory system, lactose intolerance only produces symptoms in the digestive tract, such as intestinal pain, gas, bloating, or diarrhea. Lactose intolerance doesn't require any testing to diagnose the condition whereas a food allergy can easily be detected by an allergy test. Most of the time, your doctor or nutritionist will have you keep a food diary of the foods you eat, what time you eat them, what kinds of symptoms you have, and when the symptoms occur to detect which food is causing you problems. He or she may even have you do an elimination diet to purge any suspecting foods and then monitor you as you gradually reintroduce them into your diet.

The Truth about Dairy

One problem with dairy that people tend to overlook is that it's acid-forming. Contrary to popular belief, drinking milk does the opposite of keeping your bones healthy. In fact, it pulls nutrients from them to combat the acidity of the milk. This is because your body likes to maintain a neutral or balanced pH level. In other words, it doesn't want to be too acidic, and it doesn't want to be too alkaline. When you consume dairy, your body tries to compensate for the enhanced acidity to restore your pH levels by pulling minerals from its reserves.

Alkaline minerals include calcium, potassium, and magnesium. These are stored in your bones. While they aren't necessarily "reserves" because your bones need them to become strong, your body must use what it can to return your blood pH levels back to normal. So what does it do? It takes these minerals from your bone and leaves them prone to breaks and fractures. Most people in Westernized countries are shocked to learn this because we've been told to drink milk since we were babies. But research shows that countries with the highest consumption of dairy also have the highest risk of developing osteoporosis.

On top of being acid-forming, most conventionally raised milk is full of hormones, antibiotics, and growth stimulants to keep the cows "healthy" and increase their milk supply. In fact, cows that are treated with hormones produce up to 25 percent more milk. You can see why this is appealing to farmers. But keep in mind that farmers and the food industry don't always have your best interest in mind. Research shows that a single glass of milk can contain up to 20 different chemicals(21), including painkillers, anti-malaria drugs, anti-fungal drugs, and sex hormones. Additionally, milk obtained from conventionally raised cows contains a hormone called IGF-1, which has been linked to tumor production and may contribute to cancer. No one wants to drink that.

The pesticides found in milk have even been linked to the development of Parkinson's disease, which is a neurodegenerative disease that is triggered by inflammation in the brain(22). According to a 2014 study, there is a clear-cut association between milk intake and the incidence of Parkinson's disease (23). Although the association seems to be unclear, some research shows that it's because of the lactose in dairy. Additional research shows that milk consumption is associated with mood alterations, and studies show that people who consume dairy products are more likely to become depressed (24). Depression has long been established as an inflammatory disorder. It's very likely that dairy and milk drive inflammation in the brain to cause negative changes. Even if you don't experience depression, Parkinson's disease or mood changes, you can still

suffer from a lack of mental clarity, brain fog, and impaired memory, which are all induced by the inflammatory process. During a 2014 study, milk intake was even linked to an increased risk of mortality (25). The study focused on older adult men and women who drank milk supposedly in an attempt to get stronger bones. The researchers followed up with the female subjects after approximately 20 years. They found that 15,541 women died and 17,252 had a fracture. Of this number, approximately 4259 women had a hip fracture. The researchers followed up with the men after 11.2 years and found that 10,112 men died and 5066 had a fracture with 1166 of the fractures being in the hip. Results showed that the adjusted mortality hazard ratio for women who drank three or more glasses of milk a day was 1.93 or 95 percent. For every glass of milk, the risk of death was 1.15 in women and 1.03 in men. Additionally, women who drank milk had no reduction in fracture risk for any fracture. Finally, the milk intake was linked to an increased biomarker of oxidative stress and inflammation.

Staying away from dairy can be trickier than you think. Just like gluten, dairy and milk can hide in unsuspecting places, such as crackers, chips, instant potatoes, broth, deli meat, and granola. Many food manufacturers are aware that people are starting to avoid dairy products because it causes inflammation and is hard to digest. Because of this, they are coming out with dairy-free alternatives or even lactose-free dairy products to try to get people to buy their products. But just like with gluten-free options, some of these options aren't healthier and can even be worse for you than the real thing. If you're looking for dairy alternatives, try coconut, almond or pea based products.

How Sugar Leads To Inflammation and Disease

If you were to guess that refined sugar is the single most dangerous and inflammatory ingredient on the planet, then you would probably be right. Unlike gluten and dairy, which affects people with intolerances the most, sugar affects everyone the same. It's extremely inflammatory and every time you eat it, you're feeding the chronic inflammation inside your body. The bad news is that sugar hides in all sorts of foods. It's probably even in some foods you thought were healthy. And don't think you can get away with eating sugar-free foods either. Sugar substitutes are just as inflammatory.

The Science of Sugar

Sugar is a simple carbohydrate that comes in many forms. Chemically speaking, sucrose, or table sugar, is made up of a combination of glucose and fructose. The base units of sugar are known as saccharides. There are three main types of sugar: monosaccharides, disaccharides, and polysaccharides. Monosaccharides are the smallest base unit because they only contain one sugar molecule. Examples of these include glucose, fructose, and galactose. Glucose is well known for fueling the body, but too much of it is linked to diabetes and obesity (26). Galactose is a sugar found in milk while fructose can be found in fruits.

Disaccharides are formed when two or more monosaccharide sugar molecules are combined. For example, sucrose (table sugar) is made up of a combination of glucose and fructose. Lactose, which is the sugar found in milk, is made of glucose and galactose while maltose is made of two glucose molecules. Finally, polysaccharides are made of three chains of sugar molecules. Their job is to store energy in your body, which is otherwise known as fat. Examples of polysaccharides include starchy foods, such as wheat, cereal grains, and potatoes.

Bad Sugar vs. Good Sugar

When people talk about refined sugar, they are usually referring to sucrose or table sugar. The types of sugar are confusing because sugar that is added to food is bad for you while the naturally occurring sugar in fruit is metabolized differently in the body and is actually good for you (33). When it comes to measuring your sugar intake, natural is always best. The sugar that has been added to foods, such as those in soda, candy, sweets, and fast foods, is the stuff you need to watch out for.

Unlike the naturally occurring sugar found in fruit that enters your bloodstream slowly after being adequately digested, processed or refined sugar enters your blood quickly. This is bad for several reasons.

- First, it causes a spike in your insulin levels, which is the hormone that is needed to transport all of this sugar to your body's cells. Unless you were to burn your sugar supplies immediately, your excess sugar is stored for later as energy. Essentially, insulin is a fat-storing hormone, and the more sugar you eat, the more of it your body produces.
- Next, excess sugar and carbohydrates form advanced glycation end products (AGEs) when they combine with fat or protein in your blood. Research shows that too many AGEs leads to oxidative stress and inflammation (27).

Most importantly, sugar is bad for your gut. It damages your intestinal wall and leads to leaky gut. Research shows that sugar causes bacterial changes that are harmful to your digestive health (28). Additionally, the toxins and bacteria that manage to leak through to your bloodstream are sent all over your body where they can reach other organs and cause widespread inflammation. This leads to weight gain and insulin resistance, or type 2 Diabetes(29).

The Truth on Sugar Substitutes

If you think you can skate by the refined sugar and use sugar substitutes in your favorite foods, think again. Sugar substitutes such as sucralose and aspartame are just as inflammatory as the real thing, so your best bet is to avoid both entirely. An artificial sweetener is a food additive that replicates the taste and texture of sugar, but without the calories. In animal studies, research shows that they have been linked to bladder cancer, brain tumors, and weight gain (30). But perhaps what is more disturbing is what they do in your gut.

Research shows that artificial sweeteners change the health of your gut bacteria. One study found that artificial sweeteners including aspartame, saccharin, and acesulfame potassium reduced the number of beneficial bacteria in the gut (31). Additionally, artificial sweeteners have been shown to worsen inflammatory disorders, such as Crohn's disease and ulcerative colitis, due to its gut microbial changing properties(32). They also stimulate appetite and promote weight gain (33). Some research shows that artificial sweeteners may also impact your blood sugar levels, which further encourages weight gain and prevents you from losing weight. And since obesity is already considered an inflammatory disease (41), imagine what other illnesses you're at risk for by eating foods that affect your gut microbiota.

Natural Sugars

Luckily, not all sugars are created equally. At least, the sugars you naturally find in fruits and vegetables aren't. Eating an anti-inflammatory diet is the best way to reverse the damage of chronic inflammation. Even if you've been eating processed sugars and foods your entire life, it's never too late to incorporate anti-inflammatory foods into your diet. Your body will respond quickly. The Anti-InflammX Diet includes lots of whole, plant-based foods that contain fiber, antioxidants, vitamins and minerals to reduce inflammation, restore the health of your digestive system, and increase beneficial gut bacteria. As a general rule of thumb, you'll want to eliminate any processed and refined sugar from your diet. This includes candy, packaged sweets, cookies, juice, soda, and baked goods. Even so-called healthy foods, such as crackers, canned goods, tomato paste, energy bars and granola bars have processed sugar and need to be eliminated from your diet. Essentially, all of your calories will come from fruits, vegetables, meats, nuts, fish, and eggs, and the only sugar allowed is that sugar that you naturally find in these foods.

One of the reasons why the sugar found in fruits and vegetables is not bad for you is because it comes with fiber. Fiber naturally slows down the rate at which sugar travels through your bloodstream and induces the release of insulin. It provides your body with a steady flow of energy all day long. Additionally, it also improves your immune health and makes digestion easier. You'll want to watch out for dried foods as many of these have sugar added to them, even if they are a form of fruit or vegetable.

Here are some examples of foods that contain sugar that you can eat on the Anti-Inflammatory Diet:

- Apples
- Bananas
- Mangos
- Pears
- Berries (raspberries, strawberries, blackberries, and blueberries)
- Oranges and citrus fruits
- Pineapple
- Papaya
- Kiwi
- Melon
- Grapes
- Cherries
- Carrots
- Squash
- Peppers
- Cucumbers
- Green, leafy vegetables (kale, spinach, romaine lettuce, etc.)
- Cruciferous vegetables (broccoli, cabbage, and cauliflower)
- Artichoke
- Peas
- Avocado
- Asparagus

These foods are high in anti-inflammatory plant chemicals such as antioxidants that eliminate free radical toxins to reduce inflammation. They do not spike your blood sugar levels the same way a candy bar would. In fact, research shows that they help protect you from blood sugar spikes. One study found that people who ate equal amounts of strawberries, bilberries, cranberries, and blackcurrants reduced their postprandial glucose and insulin responses after eating a piece of bread (34).The study authors concluded that berries could be used to reduce insulin spikes caused by white bread, which is a processed food high in inflammatory ingredients.

When picking out foods on the Anti-Inflammatory diet, look at the ingredients. If it contains sugar, don't buy it. If it doesn't even have an ingredients label, such as in the case of fresh fruits and vegetables, it's OK to fill your cart with these. You'll also want to check your meats and animal products for hidden sugar as this tends to be a good place to hide it. All other sugars should be avoided.

The Inflammatory Effects of Grains

In an attempt to reduce their exposure to gluten, many people turn to gluten-free alternative products to help get by. But while these products don't contain gluten, they still contain other hard to digest ingredients such as legumes, beans and grains that cause just as many problems as gluten. That's because there are chemical properties in these foods that trigger inflammatory processes by binding to your intestinal wall and causing inflammation. They even impair your ability to absorb other nutrients when eaten in excess.

Non-Gluten Grains

By definition, non-gluten grains are grains that don't contain gluten. Typical examples include quinoa, corn, rice, oats, millet, teff, amaranth, and buckwheat. You might see these grains in a lot of non-gluten containing breads and other alternatives to gluten-based products. On the other hand, grains that contain gluten include wheat, rye, barley, spelt and bulgur.

The problem with these foods is that they contain specific elements that trigger inflammation and put you at an increased risk of developing an autoimmune reaction. Additionally, many of these foods are genetically modified and aren't recognizable by our bodies. Genetically modified grains have been chemically modified using DNA technology. In short, this causes the plant to express a gene that is not naturally occurring(35). What happens when you eat something your body doesn't know how to process? It responds by inducing an inflammatory reaction. If you keep eating this way, the inflammation gets worse until eventually, your immune system turns on you.

Lectins

Lectins are a type of protein that binds to carbohydrates within the food that it is present in. They are also known as anti-nutrients because they impair the body's ability to absorb some nutrients. Humans have a difficult time digesting lectins, which is one of the many reasons why you want to avoid them. When you consume them, they travel through your gut undigested and bind to the intestinal wall where they communicate with other cells and cause inflammation (36). Research shows that they also change the length and function of your entire digestive tract (37). This can produce an autoimmune reaction(37).

Legumes and grains such as red kidney beans, soybeans, and peanuts contain the highest sources of lectins. There are a few different types of lectins, and not all of them are bad for you. The two main types to be aware of are prolamins and agglutinins. Prolamins are proteins that are required for seed growth, so you'll also find a lot of them in a lot of gluten-containing grains, such as wheat. In fact, prolamins are part of the problem when it comes to adverse reactions to the proteins in gluten-containing food. Ironically, a lot of non-gluten grains such as oats and rice contain the same protein, which is why some people still experience a reaction even though they aren't eating gluten. Agglutinins, especially genetically modified agglutinins, are just as bad for you. They are proteins that have been engineered to produce an insecticidal effect, which may help with the growth of the crop, but it wreaks havoc on your immune system.

Phytic Acid

Phytic acid is a naturally occurring substance found in plant seeds. It acts as the seeds primary storage of phosphorus. Sounds pretty harmless, right? Not so much. Just like lectins, phytic acid is an anti-nutrient. Specifically, it promotes mineral deficiencies by binding to your gut wall and impairing your absorption of calcium, zinc, and iron (38). You can find them in all legumes and grains, as well as other sources like seeds, tubers, and nuts, but GMO foods contain higher amounts of phytic acid.

Saponins

Saponins are the third and final inflammatory plant chemical you should be aware of. You can find them in all sorts of legumes and grains, but quinoa is the most common source. They're similar to lectins in that they were created as a natural protection against pests to help sustain the plant's crop growth, but again, this doesn't always play out well for human consumption. Although saponins have lots of good things going for

them, such as possible antioxidant and cholesterol-lowering properties, they bind to your intestinal wall and promote inflammation (just like phytic acid and lectins) when you eat more than a little bit of it. This is especially problematic if you have digestive issues. If you don't have any yet, then you may start to notice some symptoms popping up if you add a lot of legumes or grains to your diet.

To recap, one of the most significant problems linked to eating foods that contain lectins, saponins, and phytic acid is that they get in the way of the digestive process. Not only that, but they can enter the bloodstream if you eat too many of them and cause inflammation that can be spread throughout your entire body, which increases your risk of all sorts of diseases. Luckily, there are ways to work around the inflammatory response of these so-called healthy foods.

How to Cook with Them

Research shows that you can cook, soak, sprout or ferment foods that are high in these inflammatory triggers to reduce their amounts. For example, you could boil your legumes and grains to inactivate them, but be aware that dry heat won't do the trick. You can also sprout your foods. The longer you sprout them, the more deactivated the triggers will become. Fermenting is another good way to reduce these harmful chemicals as it allows helpful bacteria to grow in the food and eat away at the bad stuff. You'll also get added benefits from eating probiotic-rich foods, such as better immune and digestive system functioning. Finally, make sure you choose organic, non-GMO grains and legumes whenever possible as this reduces your exposure to inflammatory triggers.

PART THREE

REVERSING INFLAMMATION WITH NUTRITION

Inflammation affects every aspect of your health from your digestion to blood sugar and mood and everything in between. It can be painful and affect your joints or increase your risk of a heart attack by putting additional stress on your heart. Inflammation can also make it hard to perform everyday tasks, such as getting dressed, feeding yourself, or exercising. Luckily, you're in control of the foods you eat and there is nothing more powerful than diet when it comes to your wellbeing. Take control of your health and reduce inflammation by choosing the right foods to eat and you'll feel like a new person. There are many well researched nutrients that have been shown to help reduce inflammation. Make sure you include these healing foods into your diet to get optimal results.

Turmeric

Turmeric is one of the best anti-inflammatory nutrients in existence. It has been researched extensively and listed time and time again as a powerful yet natural way to combat inflammation. The best part is that it's safer to take than most prescription drugs because you don't have to worry about the adverse side effects. Turmeric comes from a plant called the Curcuma longa plant. It grows in the areas of Southeast Asia and India. Most of the time, the plant is utilized by taking the dried root and grinding it into a yellowish orange power. From here, it can be used as a spice to flavor dishes, or it can be taken as a powdered supplement.

The plant itself contains several compounds known as curcuminoids that make it such a potent anti-inflammatory agent. The primary active ingredient in turmeric is called curcumin. One of the reasons why curcumin is such an excellent anti-inflammatory agent is because it's high in antioxidants and can help prevent many chronic conditions by fighting free radicals. Research shows that curcumin also relieves inflammation by blocking several enzymes that are known for causing inflammation. One study found that when compared to the popular over- the-counter anti-inflammatory drugs aspirin and ibuprofen, curcumin was more effective at relieving inflammation (39). Plus, it was safer with fewer side effects reported. Many people take advantage of curcumin's

natural anti-inflammatory abilities to combat joint or muscle pain associated with diabetes or arthritis. It also works well with conditions that involve nerve pain.

Turmeric and curcumin are also hugely successful in treating inflammatory conditions that affect your mood. Since anxiety and depression are both linked to inflammation, you can use turmeric as a natural mood enhancer. According to a 2017 review that compiled data from six different studies, curcumin successfully reduced the symptoms of both anxiety and depression with hardly any side effects(40). One study even found that turmeric was more effective than the prescription drug Prozac at treating depression (41). Most people find that taking around 800 mg of turmeric a day works well for them.

Keep in mind that you can use the plant as a spice or flavoring agent for your foods, but it works best when you take it in supplement form to ensure that you're getting higher amounts. When you're picking out a turmeric supplement to take, it's important to find one that contains at least 95 percent curcuminoids in the form of curcumin to make sure you're getting the medicinal qualities of the plant. Otherwise, you won't see much benefit from just taking turmeric alone.

You'll also want to make sure you take your turmeric supplement with black pepper as it aids in absorption. In fact, research shows that black pepper can help you absorb turmeric 2000 percent better than if you were to take it on its own (42).

Pineapple (Bromelain)

Bromelain might just be one of the most delicious anti-inflammatory foods on this list. You can get it by taking it in supplement form just like turmeric, or you can get your bromelain fix by eating lots of pineapples. Bromelain is an enzyme found in the tropical fruit pineapple that is made up of many different plant compounds, such as phosphatase, peroxidase, cellulase, glucosidase, escharase and protease inhibitors. It has been used as a remedy to treat lots of different conditions that range from allergies to indigestion. In addition to being high in bromelain, pineapple also contains other beneficial phytonutrients such as vitamins C and B1, manganese and potassium that make it a highly effective anti-inflammatory food. So even if you take bromelain in supplement form, you may still want to enjoy pineapple daily.

Bromelain is especially helpful if you suffer from an inflammatory bowel disorder, such as Crohn's disease or ulcerative colitis. As an enzyme, one of bromelain's duties is to assist with the digestion of protein and help you absorb more nutrients, which can help alleviate some of the symptoms associated with digestive disorders. Research shows that bromelain also helps reduce inflammation in the colon and inhibits the production of pro-inflammatory compounds known as cytokines that would otherwise damage the lining of the gut (43). In other words, bromelain helps restore digestive health by repairing tissues that are located in the gastrointestinal tract. You can use bromelain to help treat heartburn, indigestion, diarrhea, constipation, inflammatory bowel disease, and dyspepsia or peptic ulcers that are caused by a helicobacter pylori infection. Due to its ability to improve gut health, bromelain can also be used to calm the symptoms of just about any autoimmune disease as most of the immune system resides in the gut.

Along with being a powerful anti-inflammatory agent, research shows that bromelain has antithrombotic, antiedematous and fibrinolytic properties (44), which means that it can help prevent swelling, edema and blood clots. You can also take it to help you recover from post-surgery pain. One study found that about 80 percent of people who took bromelain after having surgery for an impacted third molar healed their wounds faster and decreased the total amount of swelling and pain that they felt when compared to people who did not take bromelain(45). This makes bromelain a great all around supplement to take to improve many different aspects of your health. You can find it in supplement form at any health store.

Ginger

Ginger is a flowering plant that belongs to the same family as turmeric. Along with turmeric, it shares some incredible antioxidant and anti- inflammatory benefits. The part of the ginger plant that is used for its medicinal properties is the ginger root or the underground stem. You can use ginger in fresh form by adding it to your favorite dishes, or you can take it in capsule form as part of your supplement regimen. Some people even use ginger essential oil. In addition to being high in many vitamins and minerals, ginger contains a compound known as gingerol, which is the active ingredient that gives the plant its anti- inflammatory and antioxidant benefits. Research shows that ginger also contains antifungal properties to help fight off yeast infections. Finally, you'll find potassium, copper, manganese, magnesium, vitamin C, vitamin B6, niacin, iron and phosphorous in ginger. It's virtually packed with nutrition and protective plant chemicals to keep you healthy.

Most people know ginger as the spice or herb that helps prevent pregnant women from experiencing morning sickness, but it does so much more than that. For example, one study found that ginger helped reduce nausea in patients who were being treated with chemotherapy (46). You can also use ginger to help heal the lining of the stomach to prevent symptoms such as heartburn, fatigue, indigestion, and abdominal pain. Many studies have shown that ginger can help prevent painful stomach ulcers that are often brought on by stress. According to a 2011 study, ginger powder protected against

stomach ulcers that were induced by taking too much aspirin. Researchers of the study concluded that the ginger powder worked because it decreased the number of inflammatory proteins found in the area. It also blocked the activity of specific enzymes that are responsible for forming ulcers (47). Another study found that ginger was just as effective at treating menstrual pain as the over-the-counter medications mefenamic acid and ibuprofen (48).

Although the main ingredient in ginger that is given credit for its anti-inflammatory and antioxidant properties is gingerol, research shows that there are additional compounds in ginger that help out, too. Some examples include shogaol, paradol, and zingerone. Research indicates that these properties can be used to combat inflammation that would otherwise lead to heart disease, obesity, and diabetes if left untreated. Finally, you can use ginger to help treat digestive disorders such as dyspepsia, which occurs when you have impaired digestion that leads to discomfort, pain, and heartburn. One study found that ginger helped improve digestion by speeding up the emptying process in the stomach by 25 percent(49). Other studies have shown that taking ginger supplements along with a meal doubled the speed of stomach emptying. This helps alleviate heartburn by allowing food to move down the digestive tract as it is supposed to instead of trying to re-enter the esophagus. If taking ginger capsules isn't your thing, you can easily get your ginger fix in by adding ginger to smoothies or juices.

Probiotics

Probiotics are the ultimate anti-inflammatory supplement because they target inflammation in your digestive tract, which is pretty much the control tower for the inflammation in the rest of your body. Your digestive system houses anywhere from 70 to 80 percent of your immune system, so when this part of your body becomes inflamed, it affects every aspect of your health. You become unable to fight infections, absorb nutrients, and even concentrate. Probiotics are a great way to heal the gut by restoring the health of your gut bacteria, which in turn tells the rest of your body that there is no need to overreact by sending out chronic inflammatory signals.

Probiotics are live microorganisms that live in your digestive tract. They are made of mostly bacteria, but some types of yeast can also function like a probiotic. It might be odd to think about bacteria in the gut as good for you, but like everything, there are good and bad types of bacteria that can exist in your gut. Probiotics are the "good" bacteria in your gut that fight off the "bad" bacteria, such as viruses, pathogens, and other harmful threats. There are dozens of different types of probiotic strains, but the two most common are called Lactobacillus and Bifidobacterium. If you were to look on the back of a probiotic supplement label, you'd probably find some form of at least one of these strains.

Most of your good bacteria live in your large intestine. Here, it has many essential jobs such as manufacturing some types of vitamins including vitamin K as well as some of the B vitamins, turning fibers into short-chain fatty acids to perform metabolic functions and provide nourishment to your gut walls, and for the stimulation of the immune system. Bacteria also help regulate the health of the gut wall. In other words, when your bacteria is healthy, it prevents anything bad from leaking through the gut and causing inflammation. But when you have inflammation or damage to the tissues in the gut, it lets harmful things enter through the gut wall and into your bloodstream where they are distributed throughout the body.

Research shows that probiotics are incredibly effective at reducing digestive ailments, especially diarrhea, gas, bloating, and other symptoms. Inflammation in your gut also affects your energy levels because it prevents you from being able to absorb the nutrients you need to stay healthy. One study found that patients with ulcerative colitis and chronic fatigue syndrome who took a probiotic supplement for eight weeks had reduced markers of inflammation when compared to those who didn't take probiotics (50). Another study found that probiotics can be used to treat chronic diseases thanks to their anti-inflammatory and immune system modulation abilities. The study also indicated that probiotic supplements were well tolerated, safe, and effective among people with irritable bowel disease who took them (51).

When looking for a probiotic strain, diversity is key. You want to aim for as many different strains as you can. This is because different strains have different capabilities in the body. Also, no two people respond to the same strain the same, so you want a variety to make sure you're covered. You can also eat fermented foods that are naturally high in probiotics, such as sauerkraut, kefir, and no-sugar added yogurt.

Boswellia

Boswellia is not as popular as turmeric or even ginger, but it contains potent anti-inflammatory properties that can be used against inflammatory disorders such as osteoarthritis, inflammatory bowel disease, asthma, and rheumatoid arthritis. Because of its anti-inflammatory abilities, boswellia can also be used as a natural painkiller. Research shows that it may even prevent the loss of cartilage to alleviate joint, nerve and muscle pain. So where does it come from? Boswellia is also known as Indian frankincense. It's an herbal extract that is derived from a tree called the Boswellia serrata tree. You can take it in resin, pill or cream form.

Research shows that Boswellia works by preventing the formation of leukotrienes in the body, which are known for causing inflammation.

They have also been shown to trigger asthma. Therefore, many people use Boswellia as a natural treatment for their asthma, too. There are four primary compounds in Boswellia that help reduce inflammation. These acids are responsible for inhibiting an enzyme that produces leukotriene known as 5-lipoxygenase (5-LO). The most potent anti-inflammatory compound in Boswellia is called Acetyl-11-keto-β-boswellic acid (AKBA). A good Boswellia supplement will contain high levels of AKBA, but it should also include other boswellic acids as they are highly anti-inflammatory, too.

Boswellia is also high in terpenes, which are chemicals with a strong smell that have antioxidant abilities. Terpenes use their strong smell to protect the plant against insects and other predators, but they also stimulate many critical chemical processes. Terpenes do the same thing in humans. They use their antioxidant abilities to fight free radical damage, move toxins out of the body, restore body tissues, and prevent cellular damage. Additionally, Boswellia contains a compound known as incensole acetate that eliminates inflammation in the brain that causes cognitive decline. Research shows that incensole acetate is especially protective over neurons, which can help alleviate anxiety and depression.

Boswellia prevents inflammation by inhibiting specific pro-inflammatory mediators and compounds that destroy healthy cells, feed tumor cells and cause damage to DNA. It also boosts the immune system so that you'll be better prepared to handle higher levels of inflammation and prevent it from making you sick. For example, one study found that Boswellia does the following(52): delays responses to inflammatory sensors or sensitivities, interferes with the pro-inflammatory mediators interferon gamma, interleukin-4 and tumor necrosis factor-alpha, delays the response of white blood cell and T-cell interactions, helps regulate immunoglobulin G (IgG) antibodies to protect the

body against inflammation and threats from viruses and infections, and adjusts the production of immunoglobulin M (IgM) antibodies, which help keep the lymph and blood fluids healthy.

That's a lot of action for one little herb, but what does it mean? In short, Boswellia reduces inflammation that is linked to autoimmune conditions by preventing the body tissues from experiencing injuries, irritation, infections or any other loss of the immune function. The best way to take Boswellia is in supplement form.

Omega 3 Fatty Acids

Omega 3 fatty acids are a type of polyunsaturated fatty acids that are otherwise known as being "good" fats. Unlike trans fats, which are man-made and full of chemicals, omega 3 fats contain powerful anti-inflammatory properties that have been shown to help prevent many chronic diseases, such as heart disease, depression, and even inflammatory bowel disorder. Although there are 11 different types of omega 3 fatty acids, the three most important ones are ALA, DHA, and EPA. ALA is mostly found in plant sources such as flaxseeds and chia seeds while EPA and DHA are mostly found in animal products such as salmon. Omega 3's are pretty easy to get by using diet alone, but it's a good idea to supplement with high-quality sources of fish oil to ensure you're getting enough.

Although researchers aren't exactly sure how omega 3's reduce inflammation, they think it has something to do with how the macrophages react in the body. Macrophages are immune cells that can be found in all organs and tissues. Their job is to stimulate inflammatory reactions and monitor everything that goes on in the tissues. Macrophages observe and convert the information they "see" by using receptors or sensors on their surface. These control the secretion of hormone-like signals that are in charge of controlling all aspects of inflammation. A macrophage can either be calm or hyperactive depending on the type of process inside of the macrophage. This process is known as autophagy, which is a word that means "self-eating." Autophagy is constantly present inside cells that are being starved or injured, such as in the case of inflammation. Researchers believe that omega 3 fatty acids reduce the inflammatory response by adjusting a cells autophagy reaction (53). In other words, omega 3's affect the signaling that goes on in the macrophage to stimulate a "calm" response instead of a hyperactive one.

According to one study, omega 3 fatty acids have the most potent immunomodulatory activities among all the polyunsaturated fatty acids. Specifically, those that are from fish oil based EPA and DHA are the best for controlling inflammation. The study indicated that omega 3's work by inhibiting the amount and types of eicosanoids that are made, which are responsible for assisting in the signaling process (54). Additionally, omega 3 fatty acids inhibit a pro-inflammatory mediator known as interleukin 1 (IL-1), which is found in many autoimmune diseases as well as aging, depression, and cancer. Researchers of the study found that supplementing with fish oil appears to reduce the inflammation associated with these conditions.

When picking out a fish oil, it's important to get one that comes from a clean source. Look for one that is derived from wild fish, such as salmon or cod. Conventionally raised fish tends to contain antibiotics, preservatives, food dyes and other additives that aren't good for you. Beware that unless your fish oil product specifically says that it's from wild fish, you're probably getting a less than stellar product. You can also get your omega 3 fix in by eating more flaxseeds, walnuts, and chia seeds.

Quercetin

Quercetin is a type of flavonoid found in plants that contains antioxidant powers. Technically, quercetin is a plant-pigment, which means that it's responsible for giving certain plants their unique colors. Research shows that quercetin is one of the most abundant antioxidants out there, and it plays an integral part in reducing inflammation by fighting free radicals. You can usually get an adequate supply of quercetin by eating a lot of anti-inflammatory foods such as fruits and vegetables, but some people choose to supplement with it, too.

In addition to fighting free radicals, research shows that quercetin and other flavonoids have anti-allergic, anti-viral and anti-microbial agents. They can express themselves in different cells among both plants and animals. Flavonoids are needed to help suppress inflammatory operations that are caused by leukocytes and other signals that take place between cells. Specifically, quercetin regulates the way the immune system responds to outside stressors. You can use quercetin and other flavonoids to fight inflammatory conditions such as heart disease, allergies, infections, inflammatory bowel disease, autoimmune disorders and chronic fatigue.

One study indicated that subjects who supplemented with quercetin could reduce their oxidative stress and reduce the inflammatory factors IL-6 and CRP (55). This reduction in inflammatory mediators leads to improved endurance and muscle strength during exercise.

It also boosts the immune system so that you can fight off disease, infection, and other inflammatory disorders. Quercetin also contains natural anti-histamine properties, which makes it a great supplement to take to reduce allergies. Research shows that it works by preventing the release of histamine from immune cells, which occurs when the body senses a threat and causes swollen lips or tongue, hives, watery eyes, a runny nose or a cough. In fact, one study found that quercetin is just as good at fighting allergies as some prescription medications without the side effects(56).

Because of its ability to reduce inflammation, you can also use quercetin as a natural pain remedy in place of over-the-counter medications. Most people get adequate amounts of quercetin by eating an anti-inflammatory diet high in fruits and vegetables, but the best sources include onions, apples, citrus fruits, peppers, red wine, blueberries, tomatoes, cherries, grapes, cruciferous vegetables, olive oil, herbs, black and green teas, asparagus, capers, cranberries, and cocoa. Research shows that most people get between 40 and 50 milligrams of quercetin a day just from eating plant-based foods. Increase your intake of fruits and vegetables and you can get as much as 500 mg per day, according to WebMD.

Green Tea

Green tea is well known for its ability to help you lose weight, but most people forget that weight gain is often due to inflammation. And when you reduce inflammation, you also lose weight. Green tea is one of the healthiest things you can drink. It also contains a decent amount of caffeine, which makes it an excellent choice if you need a bit of a pick-me-up. Research shows that green tea contains antioxidants and unique phytonutrients that help you live longer by reducing your risk of stroke, depression, and diabetes. It also helps improve your blood pressure, triglyceride levels, cholesterol, blood sugar, and cholesterol (57). With these things considered, you might want to switch your morning cup of coffee to a cup of green tea.

We know that antioxidants are needed to help fight inflammation, but the ones in green tea are special because they are especially potent. In fact, some research indicates that the antioxidants in green tea are more powerful than vitamin C. There are six main catechins or polyphenols found in green tea: catechin, epigallocatechin, gallocatechin, epicatechin, epicatechin gallate, and the most popular, epigallocatechin gallate (EGCG). Green tea also contains alkaloids, which are also plant chemicals with protective compounds that have a stimulative effect, in the form of caffeine, theophylline, and theobromine. Finally, green tea contains an amino acid called l-theanine that has a unique presence in the body. Its job is to calm down the immune system by binding to receptors in the brain so that you feel in control and focused instead of jittery(like coffee).

According to a 2017 study, green tea polyphenols contain potent antioxidants with essential roles that regulate cell signaling pathways(58). In other words, they reduce the surge of inflammatory markers like cytokines that are caused by eating an unhealthy diet, leading a sedentary lifestyle, and not dealing with stress correctly. The study indicated that green tea extracts are also high in vitamins C and B as well as minerals, tannins, volatiles, and caffeic acid. Although polyphenols play a role in determining the color of a plant, its primary job is to protect it from invaders. Polyphenols do the same thing when humans ingest them. They have been shown to fight oxidative stress in response to fungal and other infectious attacks on the body. They also fight free radicals and reactive oxygen species (ROS), which both cause inflammation.

Cayenne Pepper

Cayenne pepper is more than just a spice that you use in your favorite hot dishes. It's also one of the best anti-inflammatory herbs available. Cayenne pepper comes from a shrub that is located in South and Central America, but it also grows in tropical and subtropical regions. It has a hollow fruit that grows into long pods, which change color to yellow, red or orange when they become ripe. They belong to the Capsicum genus, which is an herb. The part of the plant that is needed to make medicine is the fruit. In addition to being high in antioxidant and flavonoid anti-inflammatory properties, cayenne pepper is also high in vitamins A, B6, C, and E, as well as potassium, and manganese.

Research shows that there are 22 proven benefits of cayenne pepper and they all have to do with inflammation in some way. For example, one of the spice's most significant benefits happens in your gut, which is responsible for controlling inflammation everywhere else in your body. So just by reducing the inflammation and irritation in your gut, you're cutting your total body inflammation. Cayenne pepper helps stimulate the production of saliva, which might not seem like a big deal, but it's vital to kick-start the digestive process. Additionally, cayenne pepper stimulates the process of enzyme production, which is needed to break down foods in the gut. It also tells your stomach to produce gastric acid so that you can metabolize your food better (59). Here's a fun fact: you can also use cayenne pepper to get rid of bad breath.

You may have noticed that some detox drinks contain cayenne pepper. That's because Cayenne quite literally heats up your metabolism to help you lose weight. Thanks to its antioxidant profile, cayenne pepper also naturally detoxes the body by getting rid of free radical toxins that cause inflammation. Despite seeming like a spice that would irritate the body because of its heat, cayenne pepper has the opposite effect. It has been shown to soothe the body and have a calming effect on ulcers and diarrhea. This is because Cayenne pepper's active ingredient, which is known as capsaicin, inhibits the production of acid secretion and stimulates mucus secretions such as gastricmucosal blood flow to help heal and soothe ulcers, according to one study (60).

Another surprising benefit of cayenne pepper is that it reduces pain. This is because cayenne pepper minimizes the amount of a chemical that sends pain signals to the brain called substance P. And the less substance P you have, the less pain you feel. One study found that cayenne pepper helped reduce the pain of patients who had surgery. It also reduces nerve damage pain in the legs and feet due to diabetes, neuropathy, low back injuries, rheumatoid arthritis, muscle pain, fibromyalgia and osteoarthritis (61). Because it's almost impossible to get the amount of cayenne pepper you'd need to reap the benefits of its anti- inflammatory and antioxidant potential by diet alone, most people take cayenne pepper in the form of a supplement.

Rutin

Rutin is another plant pigment that helps gives fruits and vegetables their unique colors. Since it's also a flavonoid, rutin has powerful antioxidant properties that help reduce inflammation by eliminating free radical damage. It also helps your body utilize vitamin C, which is a potent antioxidant itself. Finally, rutin helps the body produce collagen, which is a protein that is needed to make your skin elastic and younger looking. Research shows that rutin is currently used in over 130 different registered medicinal preparations due to its pharmaceutical capabilities (62). The best part is that rutin is generally safer and gentler than most drugs that the doctor gives you.

One of the best reasons to use rutin is to help improve blood circulation and decrease the risk of blood clots, which keeps your heart healthy and reduces the risk of a heart attack or stroke. Research shows that rutin helps create flexible and robust blood vessels, such as your capillaries and arteries. When your blood vessels are strong, it can help reduce your risk of bruising or getting spider and varicose veins. Some research shows that rutin can also treat hemorrhoids that are caused by swollen veins due to its ability to increase blood flow. Many people take rutin after hemorrhoid surgery to help them recover. According to one study, rutin can prevent the formation of blood clots in animals, which is promising for human use as well (63). By preventing a blood clot, you can avoid developing conditions such as pulmonary embolism, deep vein thrombosis, heart attack and stroke.

Another way rutin can help improve heart health is by lowering cholesterol. Researchers from one study took people with a history of hypertension and gave them 500 mg of rutin once a day. Results showed that the people who took rutin decreased their blood LDL cholesterol levels, thanks to rutin's antioxidant abilities (64). Additionally, rutin can be used to reduce pain due to inflammatory disorders, such as irritable bowel disease, arthritis, osteoporosis, and more. One study determined that rutin helped suppress oxidative damage in people who had arthritis, which helped them lower their pain levels (65). This is again because of rutin's high antioxidant levels.

Rutin is pretty easy to get naturally from your diet. It's found in foods such as apples (as long as the skin is intact), figs, asparagus, black and green teas, and elderflower tea. Some people take rutin supplements to get in their desired amount but remember that if you eat a diet high in fruits and vegetables, you shouldn't need to supplement with rutin too much. If you're new to an anti- inflammatory diet and want to kick start your results, then you may want to use a high-quality supplement that contains rutin as well as other flavonoids to help enhance the detox process so that you start to feel better sooner. To get as many flavonoids as you can into your diet, make sure you eat a wide variety of fruits and vegetables. You can also pair your foods together so that you're getting more than one source.

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