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Our December 2025 Newsletter for Healthy Living

Pitch Pesticides and Go Organic

Pesticides are marketed as precision tools, designed to eliminate weeds, insects, or fungi while leaving everything else untouched. But that narrative falls apart when you realize what happens after they enter your body. Long after the crops are harvested, trace levels of these chemicals remain in your food, drinking water, and even household dust. Once inside, they don't just pass through. They interact with your gut microbes in ways that set off a chain reaction of immune stress, metabolic disruption, and inflammation.

Your gut isn't just processing calories. It's interpreting chemical messages, regulating immune function, and maintaining your body's inflammatory balance. When that system gets corrupted — even subtly — it affects far more than digestion. People

with autoimmune disorders, neuroinflammation, or persistent fatigue often have one thing in common: a disrupted gut microbiome with damaged communication lines.

What's often missing from the conversation is the upstream trigger — chemicals that alter how your microbes behave and what they produce. Mounting scientific evidence shows that pesticide exposure reshapes your microbiome in measurable, disease-linked ways. Even low-dose, everyday exposure has consequences, especially if your gut barrier is already compromised or your immune system is hyperreactive. To understand how this disruption unfolds, the latest research uncovers exactly which bacteria are affected, which metabolic pathways get hijacked, and what that means for your long-term health.

A 2025 study in Nature Communications looked at how common pesticides affect the behavior — not just the survival — of your gut bacteria. Instead of only measuring which strains lived or died, researchers examined how 306 different pesticide-bacteria combinations changed the bacteria's internal chemistry, or "metabolic fingerprint." What they found shows just how deeply pesticides interfere with your gut's ability to keep you healthy.

"Mounting scientific evidence shows that pesticide exposure reshapes your microbiome."

Most gut bacteria stopped working the way they should; in many cases, the bacteria weren't killed off, but their metabolism changed in harmful ways. For example, Bacteroides ovatus and Clostridium symbiosum, two key species that normally help calm inflammation by making short-chain fatty acids (SCFAs), were thrown off track after exposure to a pesticide called DDE. That means they could no longer help your immune system or protect your gut lining, even though they were still alive.

Some bacteria actually absorbed the pesticide and stored it. Instead of breaking down or flushing out the toxins, certain bacteria took them in and held onto them like little toxin reservoirs. Fat-loving pesticides like DDE tend to stick around in the body, especially in tissues, and gut bacteria carrying those toxins keep triggering problems over time.

Pesticide-altered bacteria affect your brain, immune system, and metabolism. When researchers gave mice bacteria that had been exposed to pesticides, the animals' gut and brain chemistry changed. Their fat-processing signals were altered, and their immune system fired up inflammation pathways known to play a role in autoimmune and metabolic disease. This shows that the damage isn't just in your intestines — it spreads to other systems.

Pesticides disrupt how bacteria process tryptophan, an amino acid you need for calm and focus. Normally, healthy bacteria turn tryptophan into anti-inflammatory compounds that protect your gut and calm your immune system. But under pesticide stress, those pathways broke down. Instead of making beneficial indoles, the bacteria made compounds that drive inflammation and oxidative stress, which wear down your body over time.

More than 40 key bacterial processes were thrown off. The study found widespread disruptions in how bacteria process amino acids, fats, bile, and other nutrients. These changes followed predictable patterns, showing that pesticides interfere with gut health in a targeted and harmful way, not by accident.

A 2024 review published in Metabolites explored how pesticides damage your gut by interfering with the natural chemistry that keeps your immune system in check. Instead of just shifting which bacteria are present,

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"The real fix isn't just avoiding chemicals — it's helping to stop their use altogether. ."

these chemicals block your gut's ability to produce protective compounds that normally reduce inflammation and support digestion.

Pesticides interfere with your gut's ability to make anti-inflammatory compounds. The review found that pesticides like glyphosate, chlorpyrifos, and carbamates reduce the production of SCFAs, which are powerful healing compounds made by your gut bacteria when they break down fiber. SCFAs like butyrate and acetate are essential for keeping your gut lining strong and helping your immune system stay calm. Without enough of them, you're more likely to develop leaky gut, food sensitivities, and autoimmune symptoms. Under pesticide stress, multiple gut pathways break down at once, not just one.

Pesticides don't just damage a single function. This review showed they mess with many gut-related pathways at the same time, including how bacteria process tryptophan (an amino acid needed for mood balance), recycle bile acids (important for fat digestion), and make vitamins. When these pathways are off, you might notice fatigue, mood swings, blood sugar problems, or recurring digestive issues, all signs that your gut chemistry is out of sync. Even your "good" bacteria stop working the way they should.

Beneficial microbes under pesticide stress may reduce or stop producing key metabolites like butyrate and B vitamins, weakening your immune defenses even if those bacteria remain present. Pesticide exposure doesn't just shift your gut bacteria — it rewires what they do, leaving you more vulnerable to inflammation, illness, and long-term immune dysfunction. A report from the Global Autoimmune Institute explains how regular exposure to pesticides seriously damage the gut, setting the stage for autoimmune conditions like lupus, multiple sclerosis, rheumatoid arthritis, and inflammatory bowel disease.

It's not just about the chemicals themselves — it's about how they interfere with your gut bacteria, throwing your immune system out of balance. If your gut bacteria get damaged, your immune system can turn against you. Pesticides change the balance of bacteria in your gut, a condition called dysbiosis. When this happens, your immune system stops getting the signals it needs to stay calm. Instead of defending you from real threats, it starts attacking your own tissues, causing chronic pain, fatigue, skin problems, or digestive issues.

` Living near farms or using pesticides increases your risk. People who work in agriculture or live near areas where pesticides are used are hit the hardest. The article points to research showing that farmworkers and others regularly exposed to pesticides are more likely to develop autoimmune diseases. These chemicals have been shown to damage DNA, create oxidative stress, and confuse your immune system's ability to tell the difference between your own body and invaders.

Pesticides weaken your gut lining and let toxins leak into your bloodstream. One of the ways pesticides hurt your health is by damaging the lining of your intestines. When this lining breaks down, harmful bacterial fragments known as LPS (lipopolysaccharides) leak into your bloodstream. These fragments light up your immune system like an alarm — causing full-body inflammation and triggering flare-ups in autoimmune conditions.

If you're dealing with unexplained fatigue, skin flareups, stubborn gut issues, or autoimmune symptoms that seem to come out of nowhere, you could be overlooking one of the biggest culprits hiding in plain sight: pesticides. These chemicals lodge in tissues, disrupt your microbes, and stir up immune dysfunction. But there's a clear path forward if you're ready to make a few changes.

The following suggestions may help you eliminate the source of the problem and actively restore your body's natural defenses. Whether you live in the city, work on a farm, or are somewhere in between, this plan puts the power back in your hands:

Eliminate pesticide exposure from your diet and environment — Buy organic whenever possible — especially high-residue items like berries, leafy greens, and apples. Swap out conventionally raised meat and dairy for grass fed, pasture-raised options to avoid chemical residues stored in fat. If you're a gardener or live near agriculture, ditch chemical sprays in favor of natural pest control options like neem, beneficial insects, or crop rotation. Every small step reduces the chemical burden on your microbiome.

Sweat it out with regular exercise or sauna sessions — One way to move pesticides out of your body is through sweat. Activities like interval walking training and sauna t help your body excrete these toxins through your skin. This isn't just a detox trick — it's a foundational health habit. Exercise also reduces inflammation, supports metabolic health, and boosts microbial diversity. If you're struggling to get started, aim for 20 minutes of movement a day and build from there.

Filter your water to stop drinking pesticide residues — If you're drinking tap water, especially near golf courses, agricultural zones, or parks, you're likely ingesting glyphosate and other chemical residues daily. Choose a high-quality water filtration system that removes pesticides, fluoride, chlorine, and heavy metals. It's one of the simplest changes that protects your gut and your long-term immune health.

Choose metabolically supportive foods, not prebiotic hype — Damaged guts don't need more fiber — they need metabolic stability. Focus on fruit and white rice to start. These nourish your gut lining without feeding endotoxin-producing bacteria. Skip high-fiber foods if they leave you bloated or foggy; introduce them only after your gut is healed. The goal is to support your terrain, not overwhelm it.

Support organic farming with your wallet — The real fix isn't just avoiding chemicals — it's helping stop their use altogether. Organic agriculture replaces pesticides with nature-based practices that enrich soil, protect water, and restore biodiversity. These farms use cover crops, no-till methods, and livestock integration to build real health from the ground up. When you buy organic, you vote for a food system that protects your gut and the planet.

The more consistently you take these steps, the more resilient your gut becomes — and the less power pesticides have over your health. You're not stuck. Your body is constantly trying to recover. You just need to give it the right environment to do it.

Reference: *Nature Communications* May 10, 2025. *Metabolites* March7, 2024, 7;14(3):155. Global Autoimmune Institute July 21, 2023. : *Arthritis Care* February, 2011; 63(2):184-94. *Biomedical Research International* October 5, 2016; 63(2):162643.

Ginger as Medicine

> ***"Ginger's active ingredients have the ability to regulate several signaling pathways.… leading to an anti-tumor effect"***

Medicinal plants are becoming more widely appreciated for their ability to protect and even help treat diseases, and one of the most popular ones is ginger (Zingiber officinale). Traditionally used to help reduce inflammation and relieve pain, ginger is now recognized for its protective effects against cancer. With more than 2 million cancer cases expected to arise in the U.S. this year, it is important to find alternative therapies that are helpful against this disease.

There were more than 1.9 million new diagnoses and 935,000 deaths associated with colorectal cancer worldwide in 2020, making it the cancer with the highest incidence rate and second-highest mortality rate. Many recent studies have found that ginger has therapeutic actions against this type of cancer, mainly due to its anti-inflammatory, antioxidant and immunoregulatory effects. One study notes: *"Indisputable evidence show that among all natural products, ginger (Zingiber officinale), which is extensively used in foods and beverages as a spice worldwide, is a unique source of bioactive compounds that can show both chemo-preventive and chemotherapeutic effect against different types of cancers and has attracted the interest of medical scientists recently."*

A 2024 review published in the Journal of Ethnopharmacology highlighted ginger's ability to help inhibit and treat colorectal cancer by inhibiting cancer cell proliferation, inducing cell cycle blockage, promoting apoptosis (programmed cell death) and suppressing cancer cell invasion and migration. The review, which looked at clinical studies and animal and in vitro experiments, also noted that ginger helps enhance the anticancer effects of chemotherapy drugs.

An animal study that explored ginger's effects on colorectal cancer was also published in 2022 in the journal Anti-Cancer Agents in Medicinal Chemistry. The researchers induced colorectal cancer in rats using dimethylhydrazine, a cancer-causing chemical. They then divided the test subjects into those given the cancer drug cisplatin and those treated with ethanolic ginger extract. Remarkably, after 21 weeks of treatment, they found not only did ginger extract work better than cisplatin, but it also didn't damage the kidneys or liver, indicating its safety. *"This study proved that the antitumor activity of GE against the DMH induced-CRC is superior to cisplatin. GE was also safer than cisplatin and did not elicit hepatotoxicity or nephrotoxicity. GE induced apoptosis and has carcinostatic activity,"* the study authors concluded.

Ginger's unique and multifaceted composition is responsible for its benefits against cancer. This root crop contains more than 60 active compounds with strong biological activity and pharmacological properties, such as antioxidant, antibacterial and anti-inflammatory, which all contribute to its ability to help suppress tumor formation. A 2023 study published in the World Journal of Gastrointestinal Oncology investigated the components of ginger that give it its antitumor effects against cancers of the digestive tract, including gastric, liver, laryngeal, colorectal and pancreatic cancers. These beneficial components include:

Gingerol — A specific type of gingerol called 6-gingerol was found to slow down the growth of colon cancer cells by counteracting the effects of a substance called phorbol 12-myristate 13-acetate (PMA). PMA activates proteins that allow cancer cells to survive and thrive. When scientists added 6-gingerol to PMA-induced colon cancer cells, it interfered with the cellular pathways activated by PMA. 6-gingerol also activates caspases, which are protease enzymes essential in apoptosis.

Shogaol — 6-shogaol also activates caspases, helping eliminate tumor cells. In addition, it was found to kill tough Mahlavu cells — a type of liver cancer cell that's very resistant to treatment — by causing oxidative stress.

Zingerone — According to the researchers, this compound has significant pharmacological effects. Higher amounts of zingerone are found in dried or cooked ginger, as opposed to raw ginger. Zingerone creates an unpleasant, stressful environment for colon cancer cells. When scientists treated HCT116 colon cancer cells with this compound, it produced more reactive oxygen species (ROS) that damage their mitochondria and decrease the cells' natural defenses, causing them to die.

Paradol — Found in dried ginger, paradol has antitumor and anti-proliferative effects. It fights pancreatic cancer by reducing the amount of epidermal growth factor receptor (EGFR), which triggers cancer cell growth. Paradol also slows down PI3K/AKT signaling, which are cellular communication pathways in cancer cells that instruct them to grow and resist death. According to the study authors, extracting these active components will help develop more efficient modern treatments for gastrointestinal tumors. *"Ginger's active ingredients have the ability to regulate several signaling pathways such as PI3K/Akt/mTOR, Wnt/β-catenin, EGFR and NF-κB. This regulation is achieved through components such as 6-gingerol, 6-shogaol, zingerone and others that can directly or indirectly act on signal targets, leading to an antitumor effect,"* they concluded.

Beyond its uses to help protect against cancer and support healthy aging, ginger offers a host of other whole-body benefits, which include: **Reducing inflammation** and pain associated with conditions like dysmenorrhea and osteoarthritis; **Stimulating fat breakdown** to aid in weight management; **Promoting vasodilation** to help manage blood pressure levels; **Supporting cardiovascular health, and Reducing blood sugar levels** to protect against diabetes, and alleviating motion sickness, nausea and headache.

Ginger is a culinary treasure; when cooked and added to your favorite dishes, it provides a delicious yet mild spiciness and fragrance. There's no reason not to add more of it to your daily meals, and if you need a few tips, here are some ideas to help you out: put a few pieces of fresh ginger in a mug and add hot water to make fragrant ginger tea; add fresh ginger, grated or finely chopped, or powdered ginger to curry or stir-fry, or add a small amount of fresh ginger to your morning smoothie.

Reference: NIH, *Cancer Statistics. Journal of Ethnopharmacology*, April 24, 2024; 324:117733. *Archives of Pharmacy Practice* 2020; 11:3. *Anti-Cancer Agents in Medicinal Chemistry* 2022, 22; 8:1601-10. *International Journal of Molecular Science* 2021, 22(12): 6509. *World Journal of Gastrointestinal Oncology* November 15, 2023; 15(11): 1835-51. WHO March, 2024. *PLOS One S*eptember 10, 2015. *Oxidative Medicine and Cellular Longevity* May 9, 2022, Ginger. *Nutrition Reviews* 2023, 81(9): 1213-24.