

Study Confirms Birds Are Breathing in Microplastics — Are You Inhaling Them Too?

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October 17, 2026

STORY AT-A-GLANCE

- › Microplastics are tiny plastic particles less than 5 millimeters in size, found everywhere in the environment, and capable of accumulating in human and animal lung tissues
- › A 2025 study found microplastic particles in every lung sample from 56 birds across 51 species, averaging about 221 particles per species. These findings suggest similar widespread contamination in humans
- › Previous research has shown that microplastics are present in human lung tissues, with particles from common plastics like polypropylene and polyethylene terephthalate (PET)
- › Microplastics and the chemicals they carry have been linked to hormone disruption, chronic inflammation, oxidative stress, and gut damage, while nanoplastics have been shown to cross the placenta and blood-brain barrier
- › To reduce your microplastic exposure, switch to reusable bags, store food in glass containers, avoid using single-use plastics, choose natural home products, and improve your indoor air quality with an air filter

Microplastics are small plastic particles that are less than 5 millimeters in size. They form when large plastic materials, such as packaging, textiles, tires, and industrial coatings, break down through heat, friction, or wear. These particles do not degrade; instead, they persist in the environment. Their size makes them especially dangerous because they're small enough to bypass your body's defenses and accumulate in your tissue.

In 2019, the world produced 460 million tons of plastic,¹ and that number is projected to triple by 2060.² So it's no surprise that microplastics are everywhere — polluting our oceans, contaminating our food, and even filling the air we breathe. One of the starkest warnings now comes from birds.

Birds are considered environmental sentinels because they show early signs of ecological damage. A study published in the Journal of Hazardous Materials³ found microplastics embedded in the lung tissue of dozens of wild bird species. The fact that plastic has accumulated inside their lungs means the same is likely happening to you.

Study Reveals Airborne Microplastics in Bird Lungs

A 2025 study published in the Journal of Hazardous Materials analyzed lung tissue from 51 different bird species living near Chengdu Tianfu International Airport in China. The goal was to see whether microplastics (tiny plastic particles between 1 micrometer and 5 millimeters) and even smaller nanoplastics (less than 1 micrometer) were present, and if so, in what quantity.⁴

- **Plastic particles were found in every single bird tested** — Across 56 birds from 51 species, the researchers found a total of 11,281 plastic particles — an average of about 221 particles per species, or roughly 416 particles per gram of lung tissue. Some birds had only a few particles, like the Little Bunting, which had 11. Others, like the Grey Heron, had over 1,400.
- **Two types of plastic showed up most often** — Out of 32 types of plastic detected, chlorinated polyethylene and butadiene rubber were the most common. These plastics are often used in packaging, cables, and tires. Most of the particles were shaped like films or small pellets and measured between 20 and 50 microns.
- **Certain types of birds had higher plastic levels** — The researchers noticed that some birds, especially those that live on land, eat other animals, or are larger in size, tended to have more plastic particles in their lungs. These differences likely

reflect how much time the birds spend in polluted areas and how their habits affect exposure.

- **Nanoplastics were found in several species** — In addition to microplastics, the team looked for even smaller particles called nanoplastics in five of the bird species. Their tests revealed nanoplastics made of materials like nylon 66, polypropylene (PP), and polyvinyl chloride (PVC), all commonly used in clothing, packaging, and building materials.
- **The study ranked plastic particles by ecological risk** — Using something called the Polymer Hazard Index, the researchers evaluated the types and amounts of plastic found to estimate their potential environmental harm. Most bird lung samples were ranked at level III or IV on this scale, meaning they carried a higher risk to wildlife.
- **Bird findings suggest shared risk for humans** — This study is the first large-scale study to confirm widespread plastic contamination across dozens of bird species. Previous research had only looked at a few species at a time. According to Shane DuBay, assistant professor of biology at the University of Texas at Arlington and part of the research team:

“Our research highlights an urgent need to address plastic pollution in our environments, as these contaminants can have far-reaching impacts on ecosystem health, as well as human health. Our findings call for further research, funding and action to mitigate the harmful effects of plastic pollution and ensure a healthier environment.”⁵

Microplastics Have Also Been Detected in Human Lung Tissue

Even in humans, microplastics have been found deep in the lungs. The researchers behind the bird study pointed to a 2022 investigation as a comparison. Published in *Science of The Total Environment*,⁶ this study analyzed lung samples from 11 patients in the U.K. who were undergoing surgery at Castle Hill Hospital. The researchers reported the following findings:

- **Microplastics showed up in almost every sample** — Out of 13 tissue samples tested, 11 contained microplastic particles. A total of 39 individual fragments were identified using a method capable of detecting plastics as small as 3 microns, which is small enough to be invisible to the eye but large enough to enter and stay in lung tissue.
- **Plastic particles were present in all areas of the lung** — Samples were taken from the upper, middle, and lower lobes, and plastic was found in each region. The lower lobes had the highest levels, with an average of 3.12 plastic particles per gram of tissue. By comparison, the upper lobes had 0.80 per gram and the middle lobes had 0.41.
- **Twelve different plastic types were identified** — The most common plastics were polypropylene (used in packaging and textiles), polyethylene terephthalate or PET (commonly found in drink bottles), and resin. Others included polystyrene, PVC, and polyurethane, all materials frequently used in construction, insulation, or consumer goods.
- **Particles came in different shapes and sizes** — The fragments varied widely, from small fibers and films to larger irregular pieces. Some were just 12 microns long, while others stretched over 2,400 microns. The largest was a PET particle measuring 2,475 microns in length and 12 microns across.

For a deeper look at how airborne microplastics affect health, check out “[Airborne Microplastics Linked to Multiple Health Problems](#).”

What Are the Other Health Problems Linked to Microplastic Exposure?

Microplastics do not just stay in the lungs. Once these particles enter your body, they interact with your cells, organs, and hormones. Here are five key areas where microplastics have been shown to interfere with human biology:

- **Disruption of hormone balance** — Plastic particles carry compounds known as endocrine-disrupting chemicals (EDCs), such as phthalates and bisphenol A (BPA). These chemicals disrupt hormonal balance by mimicking or blocking natural hormones. They bind to estrogen and androgen receptors and disrupt key functions related to metabolism, fertility, mood, and thyroid regulation.⁷⁸

In addition, when combined with natural estrogen, exposure to EDCs can lead to estrogen overload and initiates a series of harmful events. Learn more about the effects of EDCs in “[Exposing Toxic Chemicals in Consumer Products.](#)”

- **Chronic inflammation and immune activation** — Your immune system treats plastic particles as invaders. When those particles lodge in tissues, they set off an inflammatory response. Research has shown that microplastics increase immune activity and inflammatory markers. Over time, this can raise your risk for autoimmune issues, ongoing low-grade inflammation, and chronic illnesses.⁹¹⁰¹¹
- **Oxidative stress and mitochondrial dysfunction** — Microplastics are linked to increased production of reactive oxygen species (ROS), which damage DNA, proteins, and cell membranes. This oxidative stress is particularly harmful to mitochondria, which in turn impairs cellular energy production. This can compromise metabolic function, cognitive performance, and your ability to recover from stress or injury.¹²¹³¹⁴
- **Disruption of gut health and digestion** — Microplastics irritate and inflame the intestinal lining, which weakens the gut barrier and allows harmful substances to enter the bloodstream.

They also disrupt your gut microbiome by reducing beneficial bacteria and encouraging the growth of harmful strains. This imbalance affects nutrient absorption, digestion, and immune regulation, which contribute to bloating, sensitivities, and chronic gut inflammation.¹⁵¹⁶¹⁷

- **Crossing into protected areas of the body** — Nanoplastics have been shown to cross the placenta and blood-brain barrier. That means they reach fetal tissues and the central nervous system. This raises serious questions about long-term neurological and developmental effects. If you're pregnant, trying to conceive, or raising children, minimizing microplastic exposure should be a priority.¹⁸¹⁹

Read “[Microplastics Continue to Threaten Public Health](#)” for a deeper look at how these particles disrupt biological systems and impact long-term health.

5 Strategies to Reduce Your Exposure to Microplastics

Most people think of plastic pollution as an ocean problem. But the truth is, the most damaging exposure is happening inside your own home. You breathe it, eat it, sleep in it, and sit on it. If you want to lower the plastic load in your body, you need to change what's around you. These five steps target the most common sources. Here are five practical, targeted steps I recommend:

1. **Use reusable bags instead of plastic** — Every plastic bag you use contributes to long-term environmental plastic load. Reusable bags made of fabric or canvas don't shed plastic particles and don't end up breaking down in your kitchen, car, or trash bin. If you're someone who shops frequently, you'll cut down on hundreds of plastic bags a year just by making this switch.
2. **Store food in glass or stainless steel containers** — Plastic containers break down over time, especially when heated. This releases microplastic fragments and chemical residues that end up in your food and air. Use glass jars, Pyrex, stainless containers, or beeswax wraps instead. Avoid cling film or cheap plastic containers.
3. **Stop using single-use plastic items** — Straws, cutlery, and water bottles are wasteful and shed microplastics as you use them. I recommend carrying your own utensils, switching to a metal water bottle, and avoiding any plastic item designed to be thrown away after one use. If you're already minimizing single-use items, focus next on replacing plastic kitchenware like spatulas, scoops, or cutting boards.

- 4. Cut down on plastic-based products in your home** — That includes synthetic rugs, furniture with polyurethane foam, plastic-coated curtains, and plastic toothbrushes. These items slowly degrade and release airborne particles. If you're not sure where to begin, start with high-rotation items — your bedding, what you sleep on, or what you cook with. Choose natural alternatives like bamboo, wood, wool, cotton, or ceramic.
- 5. Improve indoor air quality** — Open windows regularly, vacuum and dust frequently, and use an air purifier with a HEPA filter to capture fine airborne particles, especially if you live in an urban area or spend time around synthetic fabrics and materials.

Another point I would like to emphasize is that many plastic chemicals are xenoestrogens that mimic the effects of estrogen in your body. In fact, most of the hazards associated with these chemicals stem from the stimulation of your estrogen receptors.

In cases of estrogen dominance, supplemental progesterone is helpful. Progesterone is a natural estrogen antagonist and counteracts the adverse effects of excess estrogen. In the next section, I'll go into detail about how to administer progesterone properly.

Frequently Asked Questions (FAQs) About Microplastics and Health

Q: What are microplastics, and why are they dangerous?

A: Microplastics are tiny plastic particles less than 5 millimeters in size. They come from broken-down plastic products and enter your body through the air, food, or water. Because they're so small, they bypass your body's defenses and build up in your tissues, where they have been linked to inflammation, hormone disruption, and long-term health problems.

Q: Have microplastics been found in humans?

A: Yes. Studies have found microplastics in human lungs, blood, stool, and even placenta. One 2022 study discovered plastic particles in nearly every lung tissue sample tested. These plastics come from packaging, clothing, furniture, and everyday household items.

Q: What health problems do microplastics cause?

A: Microplastics are linked to hormone imbalance, chronic inflammation, oxidative stress, digestive issues, and mitochondrial damage. They also carry chemicals that disrupt fertility, metabolism, and immune function. Some particles are small enough to reach your brain and even cross into fetal tissue.

Q: What everyday household items produce microplastics?

A: Common household items that produce microplastic particles include synthetic carpets, polyester bedding, upholstered furniture with foam cushions, plastic food containers, nonstick cookware, and clothing made from nylon, spandex, or acrylic.

Q: What's the best way to reduce microplastic exposure?

A: Small daily changes to your environment make a big difference over time. Use glass or stainless steel for food storage, stop using single-use plastics, switch to natural materials for bedding and home items, and improve your home's indoor air quality with HEPA filters.

This article is for informational purposes only and does not constitute medical advice. Consult a qualified healthcare provider before making changes to your health regimen.

How to Use Progesterone

Before you consider using progesterone, it is important to understand that it is not a magic bullet, and that you get the most benefit by implementing a Bioenergetic diet approach that allows you to effectively burn glucose as your primary fuel without backing up electrons in your mitochondria that reduces your energy production. My new book, "Your Guide to Cellular Health: Unlocking the Science of Longevity and Joy," covers this process in great detail.

Once you have dialed in your diet, an effective strategy that can help counteract estrogen excess is to take transmucosal progesterone (i.e., applied to your gums, not oral or transdermal), which is a natural estrogen antagonist. Progesterone is one of only three hormones I believe many adults can benefit from. (The other two are DHEA and pregnenolone.)

I do not recommend transdermal progesterone, as your skin expresses high levels of 5-alpha reductase enzyme, which causes a significant portion of the progesterone you're taking to be irreversibly converted primarily into allopregnanolone and cannot be converted back into progesterone.

Ideal Way to Administer Progesterone

Please note that when progesterone is used transmucosally on your gums as I advise, the FDA believes that somehow converts it into a drug and prohibits any company from advising that on its label. This is why companies promote their progesterone products as "topical."

However, please understand that it is perfectly legal for any physician to recommend an off-label indication for a drug to their patient. In this case, progesterone is a natural hormone and not a drug and is very safe even in high doses. This is unlike synthetic progesterone called progestins that are used by drug companies, but frequently, and incorrectly, referred.

Dr. Ray Peat has done the seminal work in progesterone and probably was the world's greatest expert on progesterone. He wrote his Ph.D. on estrogen in 1982 and spent most of his professional career documenting the need to counteract the dangers of excess estrogen with low LA diets and transmucosal progesterone supplementation.

He determined that most solvents do not dissolve progesterone well and discovered that vitamin E is the best solvent to optimally provide progesterone in your tissue. Vitamin E also protects you against damage from LA. You just need to be very careful about which vitamin E you use as most supplemental vitamin E on the market is worse than worthless and will cause you harm not benefit.

It is imperative to avoid using any synthetic vitamin E (alpha tocopherol acetate – the acetate indicates that it's synthetic). Natural vitamin E will be labeled "d alpha tocopherol." This is the pure D isomer, which is what your body can use.

There are also other vitamin E isomers, and you want the complete spectrum of tocopherols and tocotrienols, specifically the beta, gamma, and delta types, in the effective D isomer. As an example of an ideal vitamin E, you can look at the label on our vitamin E in our store. You can use any brand that has a similar label.

You can purchase pharmaceutical grade bioidentical progesterone as Progesterone Powder, Bioidentical Micronized Powder, 10 grams for about \$40 on many online stores like Amazon. That is nearly a year's supply, depending on the dose you choose.

However, you will need to purchase some small stainless steel measuring spoons as you will need a 1/64 tsp, which is 25 mg and a 1/32 tsp, which is 50 mg. A normal dose is typically 25 to 50 mg and is taken 30 to 60 minutes before bed, as it has an anti-cortisol function and will increase GABA levels for a good night's sleep.

If you are a menstruating woman, you should take the progesterone during the luteal phase or the last half of your cycle, which can be determined by starting 10 days after the first day of your period and stopping the progesterone when your period starts.

If you are a male or non-menstruating woman, you can take the progesterone every day for four to six months and then cycle off for one week. The best time of day to take progesterone is 30 to 60 minutes before bed as it has an anti-cortisol function and will increase GABA levels for a good night's sleep.

This is what I have been personally doing for over a year with very good results. I am a physician so do not have any problems doing this. If you aren't a physician, you should consult one before using this therapy, as transmucosal progesterone therapy requires a doctor's prescription.

Sources and References

- ¹ Lawrence Berkeley National Laboratory, Climate Impact of Primary Plastic Production, April 2024
- ² OECD Policy Highlights Global Plastics Outlook: Policy Scenarios to 2060, 2022
- ^{3, 4} Journal of Hazardous Materials Volume 487, 5 April 2025, 137274
- ⁵ Science Daily, February 27, 2025
- ⁶ Science of The Total Environment Volume 831, 20 July 2022, 154907
- ^{7, 10} Yonsei Med J. 2023 Apr 20;64(5):301–308
- ⁸ Front Endocrinol (Lausanne). 2023 Jan 16;13:1084236
- ⁹ Front Toxicol. 2022 Sep 27;4:956885
- ^{11, 12} J Transl Med. 2024 Oct 22;22:959
- ¹³ Antioxidants (Basel). 2024 May 8;13(5):579
- ¹⁴ Metabolites. 2022 Sep 23;12(10):897
- ¹⁵ Front Cell Infect Microbiol. 2024 Nov 25;14:1492759
- ¹⁶ Chemosphere. Volume 291, Part 1, March 2022, 132714
- ¹⁷ Curr Issues Mol Biol. 2024 Apr 30;46(5):4186–4202
- ¹⁸ Nanomaterials (Basel). 2023 Apr 19;13(8):1404
- ¹⁹ Toxics. 2024 Jul 30;12(8):553