What's the Latest Research on Synthetic Microfiber Pollution from Fashion?

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Forget straws. There's another plastic scourge in the ocean that everyone is talking about. In the U.S., it's a bigger and scarier problem than plastic fishing nets, bottle tops, or any of the common plastic debris you see on the beach. Yet most of the time, it's invisible to the naked eye. And we aren't quite sure what to do about it.

Usually, when you hear "microfiber" you think of super-absorbent and soft cleaning cloths. But in this context, microfibers are the microscopic threads that shed from synthetic textiles. They are even smaller than plastic microbeads, those offensive additions to face scrubs and other beauty products that were swiftly banned in 2015, and also much, much more numerous in our coastal waters and lakes.

How Bad Is the Problem of Microfibers?

It's somewhat difficult to separate the microfiber pollution problem from the larger microplastics problem, in which large plastic products break down into tiny particles. But some research has made the distinction. In one year-long study sampling from Florida's coastline, microfibers made up 82% of the plastic found. According to a 2017 International Union for Conservation of Nature and Natural Resources (UICN) report, between 15% to 31% of marine plastic pollution could be from tiny particles released by household and industrial products, rather than larger plastic items that degrade once they reach the sea, and 35% of this microplastic pollution comes from washing synthetic textiles. 2020 research estimates that globally, "176,500 metric tons of synthetic microfibers — chiefly polyester and nylon — are released every year."

This is also an air quality issue: Microplastics are even snowing down in the Pyrenees, the supposedly pristine wilderness area in Europe.

Are Microfibers Damaging Our Health?

The answer is "probably," but we're still at the beginning stages of research.

But let's look at some clues. Microplastics end up in the stomachs of sea life, including oysters. (Not oysters! They're so tasty and eco-friendly!) In a small 2015 study out of California, 25% of the fish and 33% of the shellfish sampled had manmade debris in their gut, and 80% of that debris was made up of tiny threads. These microfibers can attract carcinogenic toxins in the water. When fish eat them, they get lodged in the stomach and intestine and the toxins sit inside the marine life. For example, a study showed that crabs who ingested synthetic fibers ate less and had less energy for growing.

We humans are also eating, breathing, and drinking microplastics, which — along with our seafood — are in our tap water, 90% of our sea salt, beer and as a result, our poop. It's estimated we ingest a credit card's worth of microplastic every week, which can then lodge in our gut.

Where Do Microfibers Come From?

How did this happen? Well, Microfibers are so tiny (you can't usually see them with the naked eye) and they can go right through typical filters and wastewater plants and into the ocean. While microfiber concentration is highest near industrial textile production areas and areas where people illegally dump fabric, the 2011 research that discovered the microfiber pollution showed that they were also entering the water via municipal wastewater flowing from home washing machines. A 2016 study estimated that wastewater treatment facilities release 56 million microplastic particles, nearly all microfibers, into the San Francisco Bay each day. (Not surprising given San Fran's affinity for fleece.) 2019 research estimated that

across California's natural environment, 4,000 metric tons (13.3 quadrillion fibers) were released that year. That's for waterways, but new research posits that even more are shedding from our clothing during normal, everyday wear into the air.

It's important to note that not all synthetic fabrics shed at the same rate. "I think there are some nuances here that are really important," Peter Ross, VP at the non-profit Ocean Wise, told WBUR in 2019. "Some polyester textiles shed a great deal and others do not. We know that polyester fleece sweaters can shed millions of fibers in a single load of laundry whereas some performance gear that is tightly woven, but it's equally made up of 100 percent polyester, might not shed much at all." A polyester fleece jacket can shed 100,000 fibers, or 1.7 grams, in a normal wash.

Are There Any Solutions to Microfibers?

Yes. Although we are in the early stages of studying this problem, there are some proven solutions. I spoke to Dr. Joanne Brasch, a textile scientist and Special Projects Manager at The California Product Stewardship Council. Here's what she said needs to happen:

1. **Require all commercial laundries to have filters.** Commercial laundries are factories that provide a crucial part of the garment-making process, putting dyes, finishes, and washes on clothing and textiles. There are a lot of them in California and especially around Los Angeles, a fashion manufacturing hub, and a bill (AB 802) would address this. But they should also be required in other fashion production hubs, in the U.S. and abroad.
2. **Require all new washing machines to have filters.** "We know they are capable of including them. We used to have filters on our home washing machines up until the 70s and 80s," says Brasch. (This I did not know!) "The problem is maintenance. If you don't maintain the filter, it can lead to problems." So they took them off. But another California bill (AB 622) aims to get this them back in place by 2024.
3. **Make the brands responsible for microfiber pollution.** This is called Extended Producer Responsibility, and it means that brands need to design products that shed little and pay for the cleanup of microfibers, instead of relying on the government and consumers to fix the problem. "Designing for prevention and paying for mitigation is where the industry needs to be held responsible," says Brasch. "Fixing washing machines and regulating commercial laundry is just small steps until we hold brands accountable for transparency."

Here are the steps you can take before the legislation arrives:

1. **Only buy synthetic when necessary.** Polyester is in a lot of what we wear — athletic clothes, stretchy jeans, bathing suits, stockings — giving them stretch. It's the lightweight technical fabric in your fancy outdoor gear. It's more affordable than 100% natural fibers, and so will continue to be used and bought by brands and consumers until there is a good alternative in price and performance. But if you personally want to avoid microfiber pollution, then it's actually fairly easy to avoid floofy synthetic fabrics like fleece, synthetic blankets, teddy bear coats, etc. Trade in your fleece for merino wool or alpaca alternatives, buy vintage fur instead of fake fur, and only buy blankets and rugs in natural fibers.
2. **Buy a special filter for your washing machine.** The Filtrol that we've linked to was shown to filter 89% of fibers by weight, much better than the Cora Ball at 25%. And ask your apartment building or laundromat to get them for all their machines, too.
3. **Wash to minimize shedding.** If you can't buy a filter for your machine, only wash clothes that are actually dirty or smelly. Avoid powder detergents, particularly cleaners with stain removers like bleach or other oxidizing agents. Wash in a short cycle in cold water. We used to recommend the GUPPYFRIEND laundry bag, but EcoCult commenters tell us it breaks fairly easily. So if you want to buy it, I would save it to use only with any fluffy synthetic items you have.
4. **Donate** to the California Product Stewardship Council, Ocean Conservancy, Plastic Soup, or 5Gyres, who are all working on this problem.