PLASTICS IN THE FOOD SYSTEM

THE PLASTIC PROBLEM

Since the 1950s manufacturers have produced around 460 million tons of plastic.[1] In the United States, around 9% of plastic has been recycled and 12% incinerated, while 79% of all plastics ever made have been discarded, leaked into the environment or buried in landfills.[2] Plastic never truly disappears but breaks down into smaller and smaller particles that persist as microplastics in our soil, waterways, and oceans.

While plastic in oceans and packaging has received a lot of attention, plastic pollution also infiltrates the very systems that grow, harvest, and process our food. From agricultural soil to seafood and packaged food, plastics have become a part of the food system itself.

HOW PLASTIC CONTAMINATES FOOD PRODUCTION

Agriculture and Soil

Plastic is pervasive in food production because it's cheap, convenient, and readily available, but plastic's ecosystem and health implications run deep. From fertilizers coated in plastic and plastic "mulch" to plastic containers used for seedlings and plastic irrigation systems — plastic breaks down over time, releasing micro- and nanoplastics into the soil, which ultimately ends up in our crops and food.

The most common forms of plastic in agricultural soil are pellets, films, and fragments. Plants absorb small microplastic particles in the soil, first through their roots and then up through their tissues — much as they absorb nutrients, as well as other contaminants.

Up to 50% of plastic particles absorbed by roots can reach edible parts of the plant, raising concerns about the level of plastic contamination in our fruits and vegetables.[3] The toxic additives reduce soil fertility and water retention, decreasing growth in crops by 14%.[4] For staple crops such as wheat, rice, and corn, these numbers represent staggering losses and could lead to increased global food insecurity.

Fisheries and Aquaculture

Plastic use is extensive throughout the fishing industry. Fishing nets, aquaculture cages, feed bags, and containers used to store and transport seafood all use plastic. An estimated 12 million tons of plastic enter the ocean every year, and roughly 20% to 30%[5] of that comes from fisheries, aquaculture, vessel waste, and lost shipping cargo.

Discarded fishing gear, or "ghost gear," is a leading contributor. Lost or abandoned nets and traps continue to catch, injure, and kill sea life long after use, damaging ecosystems and reducing harvests. A 2024 U.S. Department of Commerce Report[6] to Congress estimates some U.S. fisheries lose as much as 30% of their harvest due to ghost gear, making plastic not just an environmental problem, but an economic and food security problem as well.

Aquaculture is a rising contributor to plastic contamination in food systems. One aquaculture study tested 26 fishmeal products from 11 countries and found that all but one (from Antarctica) had plastics in them.[7] Animals exposed to plastic-contaminated feed have higher concentrations of plastic in their bodies, and so do the humans who eat them. Today we unknowingly ingest tens

of thousands of microplastics per year simply by consuming meat, seafood, and plant-based proteins.

Processing and Packaging

Beyond farms and fisheries, plastics contaminate food during processing, transport and packaging. Food-contact materials — from gloves to bottles to single-use clamshell containers — can shed particles and leach plastic chemicals.

Plastic packaging has become one of the biggest sources of plastic pollution in the food system. Studies consistently show chemicals and polymers migrate from plastic packaging into food. Nonetheless, single-use plastics remain popular in food production because of cost and convenience.

CONSEQUENCES FOR THE ENVIRONMENT

Plastic particles accumulate in soil, air and water, disrupting ecosystems and threatening all living things, from microorganisms to mammals. Plastic can entangle and suffocate wildlife and cause starvation, intestinal blockages and even death after ingestion. Plastics are also composed of thousands of toxic chemicals that leach into and harm every level of the food chain. In aquatic systems, plastics contribute to habitat degradation and biodiversity loss, while ghost gear continues to trap and kill marine life.

RISKS TO HUMAN HEALTH

Plastic enters the human body in many ways: through seafood, meat, processed food, packaging, and even plant-based food. The plastics we are ingesting have been linked to endocrine disruption, reproductive issues, and increased cancer risk in 8 of 12 major human organs.[8]

Studies have reported a correlation between plastic exposure and inflammation, oxidative stress, and metabolic disorders. People who consume large amounts of highly processed meat and seafood may be at greater risk of exposure and harm.

The evidence is still emerging, but one thing is clear: Plastic pollution is not only an environmental issue but a food-safety and public-health crisis.

THREE PILLARS OF CHANGE: PERSONAL ACTION, POLICY, PUBLIC EDUCATION

Addressing plastic contamination in food production requires systemic change. There are concrete actions we can take to advocate for and build a safer, more sustainable food system:

Personal Action

- Forgo plastic mulch, netting, and containers and opt for natural materials like wood mulch, hemp, jute or organic cotton.
- Avoid food and agricultural items with unnecessary plastic packaging.
- Replace disposable, single-use food-contact plastics with reusable alternatives.

Policy

- Expand extended producer responsibility laws and regulations to require plastic manufacturers in the food system to pay for the collection, recycling (where safe and possible), disposal and pollution costs of their products.
- Shift government subsidies from plastic-intensive industrial farming practices toward sustainable, low-plastic practices, including nontoxic reuse systems.
- Eliminate chemicals and plastic polymers of concern across the plastics lifecycle and tightly regulate food-contact plastic.
- Pass laws to substantially reduce and ultimately phase out plastic production in the food and agricultural system.
- Require improved design and management of fishing gear, including switching to on-demand fishing gear to reduce entanglements in pot and trap fisheries and better tracking, collection and retrieval programs for other fishing gear to reduce ghost gear in our oceans.

Public Education and Plastic Alternatives

- Require companies to disclose the use of chemicals of concern in plastic food-contact materials.
- Launch public outreach and education campaigns to teach consumers about food and agricultural contamination risks from plastic products and how to make safer choices.
- Invest in the infrastructure needed to support safe, nontoxic, and accessible food system reusable packaging, including warewashing (cleaning and sanitizing) facilities for reusable packaging distributors.

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