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# Real Green Living

FEATURE ARTICLE - JAN/FEB 2006

REAL LIVING

## Greener Paths for Plastics

**Conventional plastics can pollute the environment and leach harmful chemicals. Here's what you need to know to stay safe.**

When plastic manufacturing took off in the early 20th century, plastic was heralded as a miraculous material—lightweight, flexible, and sturdy. Eventually, though, plastic's down sides started to emerge: Toxic chemicals such as benzene and dioxin are released into surrounding communities during the manufacture of certain types of plastic, and some types leach chemicals as we use them. A plastic bottle tossed into a landfill will take hundreds of years to break down. Plastic bags that litter the landscape will kill animals that try to eat them, and they'll harm aquatic life when dropped into bodies of water. Several studies have uncovered health risks associated with exposure to fumes from its incineration.

Plastic recycling has lightened some of the environmental burden of disposal, but the majority of plastics are landfilled or incinerated after a single use; the US plastic-bottle recycling rate is less than 25 percent, according to the American Plastics Council. Even if we raised that percentage, recycling plastic isn't an ideal solution; the plastic we recycle doesn't turn into more of the same kind plastic we tossed into the bin, but has to become lower-quality plastic that has limited applications, such as plastic lumber.

By reducing your use of plastic, choosing plastic products carefully, and using them safely, you can reduce the risks that plastics pose to the Earth and your family's health.

### Problems with Plastics 3, 6, & 7

Of most concern to your health and the environment are the types of plastic coded for recycling as #3, #6, and #7.

**#3 (Polyvinyl Chloride):** The nonprofits Center for Health, Environment & Justice (CHEJ) and Environmental Health Strategy Center have asked companies to phase out the use of polyvinyl chloride (PVC), a type of plastic widely used in construction and consumer goods, because it poses serious health threats at every stage of its life cycle. In a report entitled "PVC: Bad News Comes in 3s," the groups explain that PVC production requires highly polluting and cancer-causing chemicals that have contaminated the areas where PVC is

manufactured. They also point out that PVC is often made with plasticizers such as phthalates, which can leach out of or evaporate from the finished products and have been shown to cause developmental and reproductive damage. And, they point out that PVC incineration leads to the emission of dioxins, which are known to cause cancer, as well as reproductive, developmental, and immune problems. Landfilling PVC can cause the plastic's toxic additives to leach into groundwater. PVC is very difficult to recycle and contaminates other kinds of plastics when recycled with them.

**#6 (Polystyrene):** Polystyrene is used in foam food trays, egg cartons, carry-out containers, opaque plastic cutlery, and other disposable food service items. It's a concern because the chemical styrene can leach from it into food and beverages. According to the EPA, short-term styrene exposure at levels above the Maximum Contaminant Level (used to set drinking-water standards) can cause nervous-system effects such as loss of concentration, weakness, and nausea. Long-term exposure can cause liver and nerve damage and cancer.

**#7 (Polycarbonates and Others):** Although the #7 designation is a catchall for plastics that don't fit into one of the other categories, products marked with this number are often polycarbonates, which are used in plastic baby bottles, the plastic liners of metal food cans, sport water bottles, and other items. Bisphenol-A (BPA) is an endocrine disruptor that is used in making polycarbonates and can leach from them when they're used. A recent review of studies regarding BPA's effects (Environmental Health Perspectives, August 2005) finds that more than 80 percent of published studies assessing the effects of low-dose BPA exposure on laboratory animals found significant effects, including alterations to brain chemistry and structure, behavior, the immune system, and male and female reproductive systems.

## Be a Smart Plastic User

Here are ways to make your plastic use healthier and more environmentally friendly.

**Reduce and Reuse:** There are a few cases—such as that of medical supplies—in which it's necessary to use plastic once and then discard it, but it's often possible to find a better alternative. Avoid single-use items such as disposable bottles, plates, and cutlery. Carry a refillable bottle or mug for beverages on the go, and bring reusable cloth bags to stores. For leftovers and takeout food, reusable containers are better than foam boxes or plastic wrap and bags. If you regularly buy products that are only available in plastic packaging, buy the largest container available, rather than the multiple smaller ones, to cut down on the total amount of plastic used.

**Take precautions:** When you do use plastic, it's best to choose those labeled #1, #2, #4, and #5 and avoid those labeled #3, #6, and #7. Even if you're choosing the best plastic, though, there are still chemical leaching concerns associated with long storage or heat. The Institute for Agriculture and Trade Policy has issued a "Smart Plastics Guide" that includes the following recommendations for using any type of plastic:

- Avoid using plastic containers in the microwave. Instead, use glass or ceramic containers free of metallic paint.
- Beware of cling wraps, especially for microwave use.
- Avoid plastic bottled water, if possible.
- If you do use plastic water bottles, take precautions. If you use a polycarbonate water bottle, to reduce leaching of BPA, do not use for warm or hot liquids, and discard old or scratched water bottles. Water bottles from #1 or #2 plastics are recommended for single use only. For all types of plastic, you can reduce bacterial contamination by thoroughly washing daily. However, avoid using harsh detergents that can break down the plastic and increase chemical leaching.

**Take Care With Kids:** The rapid development and immature immune systems of fetuses and children make them particularly susceptible to damage from toxins, so pregnant women and parents should exercise extra caution with plastics. The Children's Health Environmental Coalition (CHEC) advises choosing cloth and wooden toys and avoiding plastic toys, which are often made of PVC and can leach harmful chemicals when

chewed on. Or, consult Greenpeace's Toy Report Card to learn which toy manufacturers have eliminated PVC from their products.

Plastic baby bottles are of particular concern to parents. Breastfeeding can eliminate the need for a lot of plastic, but parents may still want to use bottles for pumped breast milk or juice. CHEC recommends avoiding polycarbonate bottles, which are generally clear and rigid and bear the #7 symbol, and choosing bottles made of tempered glass or polyethylene and polypropylene (#1, #2, or #5); they note that Medela and Evenflo make bottles from safer plastics. CHEC also recommends using bottle nipples made of clear silicone rather than yellow rubber, because the silicone hides less bacteria and is heat resistant.

**Recycle Responsibly:** Recycle your plastics following the instructions given by your local recycling program. If you have a curbside program that doesn't accept certain plastics, consult [www.earth911.org](http://www.earth911.org) to find an alternative drop-off site near you. Advocate for more extensive plastic recycling collections, and purchase items made from or packaged in post-consumer content.

### **New Trend: Bioplastics**

Concerns about the rising price and supply limits of petroleum, as well as environmental factors, have spurred the use and development of bioplastics synthesized from corn, soy, sugar cane, and other crops. Toyota has started using bioplastics in some of its cars; Wild Oats, Newman's Own, and Del Monte have adopted them for deli and food packages; and even Wal-Mart has begun using a corn based packaging for cut fruit and vegetables. Most of the bioplastic packaging used in the US is polymerized lactic acid (PLA) made by NatureWorks LLC, a company owned by Cargill.

**Bioplastic's Benefits:** Unlike conventional plastics, bioplastics biodegrade relatively quickly under the right conditions, and they're made from annually renewable crops rather than petroleum. PLA can also be recycled into more of the same product repeatedly, while plastic can't.

Early reports suggest that bioplastic can be an effective substitute for petroleum-based plastic. Last July, the *Los Angeles Times* published an article about Cargill's Nebraska facility that manufactures PLA from corn. "The end products—which include T-shirts, forks and coffins—look, feel and perform like traditional polyester and plastic made from a petroleum base," the article reports. "But the manufacturing process consumes 50 percent less fossil fuel, even after accounting for the fuel needed to plant and harvest the corn."

**Concerns:** Since relatively few people in the US have access to commercial or industrial composters, which help bioplastics degrade, lots of bioplastic is ending up in landfills or recycling bins. In landfills, PLA will lack the light and heat it needs to degrade. Plastic recycling is unlikely to be adversely affected by PLA, which can't currently be processed by mainstream recyclers, until it makes up a far greater percentage of plastic than it does now. The best option would be to develop a separate recycling stream for PLA.

The Sustainable Energy & Environmental Demand (SEED) Initiative of the organization Future 500 brings together NGOs, corporations, and governments to develop markets for emerging technologies that will reduce petroleum dependence. SEED is helping NatureWorks and environmental groups work together to make PLA as eco-friendly as possible. Issues include the large amounts of energy and chemicals used to grow and process the corn, the use of GMO corn, and waste disposal. NatureWorks has already taken positive steps in these areas by purchasing green-power offsets, offering customers options to buy non-GMO-corn offsets or GMO-free PLA, and buying baled PLA back from recyclers. They continue to work with stakeholders through SEED.

One danger of increased bioplastic use is that people might end up buying a lot of it if they think it's less problematic than petroleum-based alternatives. A shift to bioplastics still needs to be accompanied by waste reduction.

**Best Uses:** When reuse isn't feasible, bioplastics can be the best alternative. For instance, our Green Festival®

events, a joint program of Green America and Global Exchange, are held in venues where vendors can't wash and reuse food service items. Instead, we use compostable plates, cups, and utensils from Biocorp and serve BIOTA water, which comes in compostable bottles. Hundreds of volunteers help attendees sort their waste into the appropriate bins, and we send the composting to a municipal composter afterwards.

Bioplastic is also a good option for collecting kitchen compost and yard trimmings destined for commercial composting, because the bags can be composted along with their contents. With a little forethought, we can all reduce our use of plastics and make the healthiest choices for our families and the planet.

—Liz Borkowski

## Biodegradable Plastics Resources

- **Biocorp** — 866/348-8348, [www.biocorpaavc.com](http://www.biocorpaavc.com).
- **Biodegradable Products Institute** — 888/274-5646, [www.bpiworld.org](http://www.bpiworld.org).
- **BIOTA** — 970/728-6132, [www.biotaspringwater.com](http://www.biotaspringwater.com).
- **Green Earth Office Supply** — 800/327-8449, [www.greenearthofficesupply.com](http://www.greenearthofficesupply.com).
- **Greener Earth Marketing** — 415/279-3221, [www.sinlessbuying.com](http://www.sinlessbuying.com)

## Types of Plastic

- **#1, PETE or PET (Polyethylene Terephthalate)** — Used for clear beverage bottles. Widely recyclable; generally considered safe, with some precautions.
- **#2, HDPE (High-Density Polyethylene)** — Used for colored or cloudy bottles and jugs, yogurt containers, and other tubs. Widely recyclable, but consumers need to verify with local recyclers whether tubs and bottles (which are made differently and can't be recycled together) need to be separated. Generally considered safe, with some precautions.
- **#3, PVC (Polyvinyl Chloride)** — Used in some cling wrap and bottles, as well as pipes and other construction materials. Not widely recyclable; recommended to avoid because it can leach toxins into food and is an environmental problem throughout its lifecycle.
- **#4, LDPE (Low-Density Polyethylene)** — Used for garbage bags, food storage bags, and some cling wrap and bottles. Not widely recyclable; generally considered safe, with some precautions.
- **#5, PP (Polypropylene)** — Used in butter tubs, some baby bottles, and other rigid containers. Not widely recycled; generally considered safe.
- **#6, PS (Polystyrene)** — Used in foam trays, takeout containers, coolers, egg cartons, and packing peanuts. Not widely recyclable, although many packing and shipping stores accept packing peanuts for reuse. Recommended to avoid because styrene may leach into food and beverages.
- **#7, Other (Includes Polycarbonate and mixed materials)** — Used in five-gallon water bottles, some baby bottles, and some liners of metal cans. Not widely recyclable; recommended to avoid because bisphenol-A can leach from polycarbonate into food and beverages.