Pots, Pans, and Plastics: A Shopper's Guide to Food Safety

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Our food, it seems, is always touching plastic. Plastics play a part in every phase of food production and preparation. Food gets processed on plastic equipment, and packaged and shipped in plastic-lined boxes and cans. At home, we store and reheat the leftovers in plastic containers.

As for that strange plastic taste in last week's lo mein -- that's just the aftertaste of convenience. It couldn't possibly be harmful, right?

Recent health controversies have spawned new discussions about the safety of plastics in the food industry. In particular, research that's found potential health risks from bisphenol A (BPA), a common chemical in food packaging, has many concerned.

"For many years, the plastics incorporating BPA were believed to be safe," says Anila Jacob, MD, senior scientist with the Environmental Working Group, a nonprofit advocacy organization. Now that there are many questions about BPA, "that does raise broader questions about the safety of plastics in general," Jacob tells WebMD.

Plastics make getting, eating, and storing food more efficient. But are they also making us sick?

Plastic in Food: Inevitable Transfer

It's long been known that infinitesimal bits of plastic get into our food from containers. The process is called "leaching" or "migration." The chemical industry acknowledges that you can't avoid this transfer, noting on its web site that "[v]irtually all food packaging materials contain substances that can migrate into the food they contact."

The amounts are small, says Laura Vandenberg, PhD, postdoctoral fellow in biology at Tufts University in Boston. "But almost any plastic container can be expected to leach trace amounts of plastics into food," she says.

Heating food in plastic seems to increase the amount that's transferred to food. Migration also increases when plastic touches fatty, salty, or acidic foods. How much actually gets into our bodies? Vandenberg says that to her knowledge, there's no research that can answer that question.

Although most of the chemicals making the culinary crossing are considered "safe," Jacob tells WebMD that's generally not because they've been proved safe, but rather they haven't been proven to be *un*safe.

"There is very little published research on the potential adverse health effects of chemicals that leach from plastic food containers, so it's difficult to say they're safe with any degree of certainty, especially with long-term use," says Jacob.

Two suspects are under active investigation: bisphenol A and a class of chemicals called phthalates.

Plastics and the BPA Story

Bisphenol A is a material used in hard, lightweight plastics called polycarbonates. Some baby bottles and water bottles are made from bisphenol A. Enormous amounts of BPA are produced each year -- about 6 billion pounds.

Although bisphenol A came to fame on the nightly news as a potential poison in our water bottles, our main exposure comes from the linings of canned foods, according to Vandenberg, who studies BPA.

Plastics and the BPA Story continued...

"Over a dozen studies clearly show that BPA is not only leaching from cans, but it reaches the food stored inside," says Vandenberg.

The BPA we ingest gets into our bloodstream. Regular monitoring by the CDC shows that more than 90% of us have detectable levels of bisphenol A in our bodies.

Among all the other plastic substances that get into our food, BPA stands out, according to Vandenberg, for its ability to disrupt the functions of hormones -- especially estrogen.

Hundreds of studies show that high doses of BPA disrupt reproductive development and function in laboratory animals. Levels in humans were thought to be too low to be of concern, but more recent research has challenged that perception, Vandenberg

tells WebMD.

"Several animal studies suggest that BPA has effects at much lower doses than previously believed," says Vandenberg. "The levels of BPA in people frequently exceed the levels shown to have effects in rodents in these studies," she adds.

Chemical industry sources are quick to point out that this "low-dose hypothesis" has not yet been proven. They cite studies that have *not* shown harm from BPA at low doses in rodents. However, a new study in a prestigious journal also shows the low-dose BPA effect not just in rats but in monkeys, whose systems are more like humans.

One large, well-conducted study in humans showed that people who had high levels of BPA in the urine had a higher rate of diabetes, heart disease, and liver toxicity.

Altogether, Vandenberg believes a "fragile consensus" exists among scientists that BPA might be harmful. "Looking at the data we have, there is no reason to conclude we are all safe from BPA's effects," she tells WebMD.

The FDA recently repeated its previous statements that current BPA exposures are safe. However, the National Institutes of Health's latest review voiced "some concern" about BPA's effects.

If you want to reduce your exposure to BPA, there are some steps you can take:

- Eat less canned food, and more frozen or fresh food. In addition to avoiding BPA, you'll also get more nutrients and less sodium -- both steps toward a healthier diet.
- Breastfeed your baby, or use powdered formula instead of cans.
- Avoid bottles and plastic containers that are made from polycarbonate (usually marked with a number 7 or the letters PC) and if you want to reduce exposure to phthalates, avoid polyvinyl chloride (marked with a number 3 or PVC).

Phthalates: Is Your Food Plasticized?

Phthalates are a group of chemical "plasticizers" that are used in a huge variety of consumer products, from PVC pipes to perfume. With billions of pounds produced annually, phthalates ("THAL-ates") are everywhere. They're even in the indoor dust we breathe. Random sampling by the CDC shows most people in the U.S. have detectable levels of phthalates in their bodies. Phthalates have been banned in the European Union since 2005. Nine other countries, including Japan, Mexico and Argentina, have also outlawed the chemicals.

Phthalates: Is Your Food Plasticized? continued...

Researchers believe most of the phthalates in our bodies come from food. But they don't know exactly how and in what amounts. According to studies cited by the Department of Health and Human Services, phthalates on crops might accumulate in the livestock we eat. Or, phthalates in plastic packaging could leach into the food inside.

Like BPA, phthalates disrupt hormones -- in this case, testosterone. "Phthalates are thought to block the action of testosterone in the body, with significant effects on the male reproductive tract and other organs" in high-dose animal studies, Vandenberg tells WebMD.

People are exposed to much lower levels, and government and industry have considered phthalates to be safe. A 2000 NIH panel concluded that food exposures of phthalates pose "minimal concern" for most people, including children and developing fetuses.

But a handful of well-conducted studies have questioned phthalates' safety. Higher levels of phthalates in the body have been linked to low sperm count and quality in adult men. In one highly publicized study, pregnant women with higher levels of phthalates were more likely to bear baby boys with subtle genital changes -- namely, a slightly shorter distance between the anus and scrotum.

Avoiding phthalates is tricky, because they're so widespread and it's unclear where the greatest exposure comes from. You can reduce phthalate exposure from plastics by following the tips in the next section.

Pots, Pans, and Plastic: Sticky Questions

Teflon and related nonstick coatings on pots and pans aren't widely suspected of being toxic if swallowed. However, Teflon and all nonstick cookware can release toxic chemicals during manufacture and disposal, as well as during use at very high temperatures -- temperatures over 500 degrees.

The same chemical used in nonstick cookware is also used in the linings of nonstick packaging like that used for microwave popcorn and some fast-food containers.

You can avoid any exposure to these chemicals by following these tips:

- Never preheat your nonstick cookware on high. Empty pans can reach high temperatures very quickly. Stick to as low a temperature as possible to safely cook the food.
- Don't put nonstick cookware in an oven over 500 degrees.
- Run an exhaust fan over the stove while using nonstick cookware.
- Never cook on Teflon or other nonstick cookware with a pet bird in the kitchen. The fumes from an overheated pan can kill

a bird in seconds.

Opt for cookware that is made from safer materials like cast iron.

Reduce your consumption of microwave popcorn and fast foods.

To reduce your exposure to the chemicals in plastic, use these strategies:

Use a paper towel instead of plastic wrap in the microwave.

Don't microwave food in plastic containers (put food on a plate instead).

Use safer dishware made from materials like glass or stainless steel.

Avoid use of plastic containers with the number 3 or 7 on them. Plastics with the number 1 (typically used for water and soda bottles) are single use only. Recycle after use.

Use tempered glass baby bottles instead of plastic. If you use plastic bottles, don't heat them.

Store food in glass or Pyrex containers, rather than plastic.

Discard scratched or worn plastic containers.

Hand wash plastics to reduce wear and tear.

View Article Sources

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My Notes: