

Plastics in Our Diet

By Sheldon Krimsky, environmental policy specialist

When scientists find chemicals that disrupt human systems, regulators must ban them

STUDIES HAVE SURFACED IN RECENT MONTHS THAT CERTAIN plastic products we use every day could be interfering with our hormone systems. Approximately 100,000 synthetic chemicals are approved for consumer products and industrial processes—and certain classes of them, it seems, are dangerous to our health. One compound in the news, known as BPA, is of particular concern.

Only a handful of once approved substances have ever become banned or severely restricted, such as DDT, PCBs and benzene. What about the rest? Under existing laws, drugs must be shown to be safe and effective, pesticides must be tested to demonstrate that they are safe enough in a balance between risks and benefits, and synthetic food additives must meet a standard set in 1958 by the Delaney Amendment to the Food, Drug and Cosmetic Act. But many, many other substances remain untouched by safety regulations.

According to the Delaney Amendment, if a synthetic food additive causes cancer in test animals at any dose it must be prohibited. This is a precautionary test: people are not typically exposed to the high doses given to lab rats, and if the animals get cancer that does not guarantee that humans exposed to lower doses will suffer the same fate. But society has determined that such a risk is not worth taking given that artificial food additives are not a necessity.

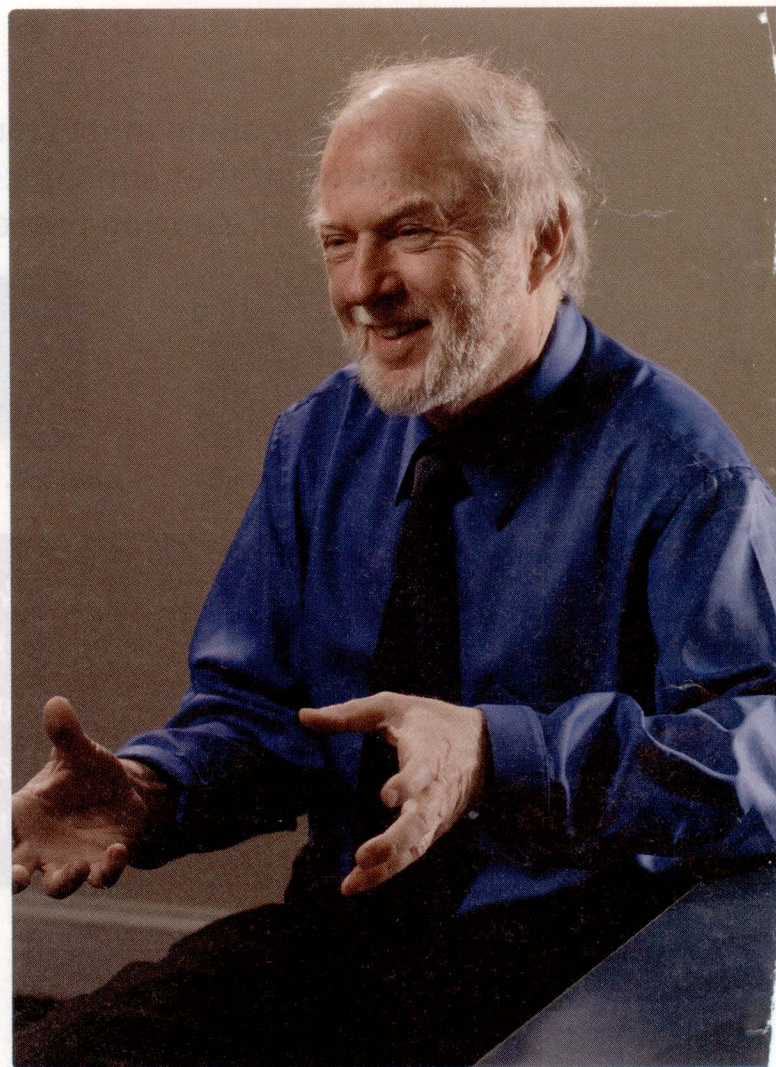
The amendment does not apply to other synthetic chemicals that find their way into our foods. Yet plastic monomers and polymers—notably bisphenol-A, phthalates and polyvinyl chloride—can leach into our food from baby bottles, plastic wraps, water bottles, soda can liners and certain plastic containers that are heated in a microwave. The few health and safety laws that are marginally pertinent to such chemicals are not nearly as precautionary. Typically the burden of proof is on the *regulators* to show that synthetic molecules are dangerous to human health or the environment. Manufacturers do not have to demonstrate that a compound is safe.

In the 1950s bisphenol-A, or BPA, became a key component in polycarbonate plastics—used in those durable plastic baby bottles, the ubiquitous Nalgene water bottles, the epoxy lining in canned food, as well as dental implants and eyeglass lenses. More than two billion pounds of BPA are produced in the U.S.

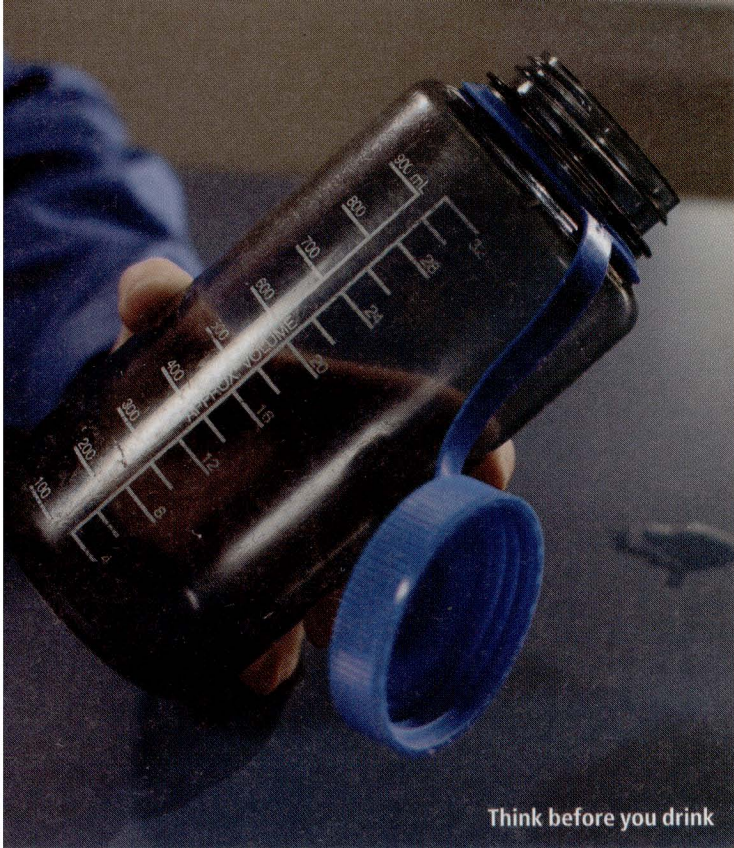
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every year. Hundreds of scientific articles published in peer-reviewed journals for decades have demonstrated that BPA can produce adverse health effects in test animals at very low doses and provided circumstantial evidence that it can harm humans. A 2007 consensus statement from a 38-member scientific panel in the journal *Reproductive Toxicology* concluded that there was “great cause for concern” about the potential for adverse effects in humans. Health Canada announced this past April

Synthetic chemicals that leach into our food from baby bottles and water bottles could harm our bodies if they are not properly tested.



BEN STECHSCHULTE/Redux Pictures



Think before you drink

that BPA is “toxic to human health.” Yet U.S. regulators have not been persuaded to ban it from consumer goods. The reason is that they maintain an unrealistically high burden of proof.

Bisphenol-A is a demonstrated endocrine disruptor: it interferes with the hormone systems of animals, including humans. Evidence dates back to the 1930s. In recent tests, when pregnant mice were exposed to very small quantities (two parts per billion), the male offspring had dramatically enlarged and hypersensitized prostates when they reached adulthood. Prenatal exposure of lab rats to extremely low doses of BPA makes them more susceptible to cancer, too. BPA can also inhibit the treatment of human prostate cancer, and babies born to women with elevated phthalate levels are demasculinized. These links have prompted scientists to hypothesize that these and other endocrine-disrupting compounds may be key factors in certain reproductive and developmental disorders, such as early onset of puberty in girls, decline in semen quality, genital abnormalities, and even neurobehavioral problems such as attention-deficit hyperactivity disorder.

As a result, Playtex Infant Care announced in April it would eliminate BPA from its line of baby bottles, and Nalgene Nunc International said it would pull its Nalgene Outdoor water bottles from stores. Chains such as Wal-Mart and Toys “R” Us said they would stop carrying certain products. Senator Charles Schumer of New York introduced a bill to ban BPA in children’s products.

People opposed to removing BPA from consumer goods argue that mice are not humans, and until we have definitive evidence (whatever that might be) that it harms humans, there is no reason to prohibit its use. Ethically, we can-

How can I limit my exposure to BPA?

On plastic products, look for the triangular recycling symbol; if it says “PC” next to the symbol, the product probably contains BPA. If “PC” is not present, but the recycling number is “7,” the product might have BPA. Other numbers are usually BPA-free.

not test humans by exposing them to BPA, and because the chemical is ubiquitous, we cannot perform a credible case-controlled study by separating people who are exposed to it from those who are not.

What we do know is that the BPA molecule attaches to a hormone receptor on cells in our body. We also know that BPA is biologically active; our bodies do not simply break it down and expel it. We are not certain what it does to our hormone receptors: Does it block them from receiving natural hormones? Does it activate a harmful DNA reaction? Does it do this only to certain people at certain ages?

Do any of these questions really matter? Is it not enough to know that the chemical disrupts our hormone system? Science cannot tell us when to begin taking action. Regulators must make a decision.

Let’s look at the problem from a different angle. Suppose we find that a commercial synthetic chemical accumulates in human fat cells. Our bodies do not get rid of it. We do not know exactly what this alien molecule is doing to us, but we do know that the more we are exposed to it the more we carry around. A reasonable person would ask, “Should my body be a waste receptacle for this substance?” When, added to that, we discover that the substance causes illness in lab animals and interferes with human systems, that chemical should be banned.

Fifty years ago a sensible Congress passed a precautionary law that was easy to understand. We need a similar standard for the tens of thousands of synthetic chemicals like BPA that have entered our world without proper testing. First, the federal government should have the National Academy of Sciences, a presidential panel or a similarly august group convene scientists and charge them with reaching a consensus about how much evidence is enough to declare, “Yes, the X group of chemicals is dangerous.” Once that is done, a screening process must be devised and the many chemicals out there in that class should undergo the test. The EPA could perform the screening.

Indeed, an EPA Endocrine Disruptor Screening and Testing Advisory Committee began this kind of work in the late 1990s, but the Bush administration showed much less interest in this area and funding dried up. The new president and the EPA administrator who take office this coming January could get a head start by reviewing the progress the old committee made.

We do not have to give up plastics. Not all synthetic chemicals are endocrine disruptors. But when we find substances that are, we have to ensure that they are kept out of our food and water.