



They're clearly convenient but can those water bottles and baby bottles be causing cancer and behavioural problems?

Not so *fantastic* PLASTIC

WORDS JOANNA McMILLAN PRICE
PHOTOGRAPHY PHOTOLIBRARY,
ZSUZSANNA KILIÁN & BIG STOCK PHOTO

“Warning! Leaving your water bottle in the car on a hot day can give you cancer!” This was

the message of an email I, and probably you, received. The claim is that as the plastic bottle heats up, it leaches potentially carcinogenic chemicals into the water.

Public reactions to the email seem to swing from those who immediately discarded it as scare-mongering to those who believed it utterly and resolutely determined to avoid all plastics from now on, with most of us somewhere in the middle, thinking it sounded plausible, but surely if it were true the food standards people would be taking steps to warn and protect us. I made it my mission to uncover the real story.

The truth is we really don't know enough

about chemical leaching from plastics and much more research needs to be done. Plastics are ubiquitous in our society and are hard to avoid in the packaging, manufacturing, storing and reheating of food and drink. It's little wonder when you consider what incredible materials they are — pliable, lightweight, hard to break and, depending on the plastic, resistant to a range of temperatures from the freezer to the microwave. But does such versatility come at a price?

Reassuringly, there are several plastics commonly used for our foods that have no evidence of harm if used in the way they were intended. The key to knowing which ones are safe is in the recycling code on the bottom of the container. Three out of the seven codes have question marks over their safety, while the remaining four have no known risk.

PET

The single-use water bottle of the email claim falls on the safe side as these are almost always recycle number 1 (PET). However, this assumes you discard the bottle after drinking the contents. These bottles are not designed for repeated use and, although there is no strong evidence that chemicals can leach as the bottle ages, it seems prudent to play it safe and not take the chance.

BPA

The major concern is over a chemical called bisphenol-A (BPA), used to make polycarbonate plastics (identified by recycle number 7), epoxy resins and some other products. BPA was first synthesised in 1891, so it has been around for a long time, though it was not approved for use in food containers until 1963. However, in the past few decades our use of plastics has grown enormously, so we're exposed to more BPA than ever before.

On a global scale it's estimated that more than 2.5 million tonnes of BPA is produced every year. It is so widely used because of its hard-to-beat qualities for creating a hard, clear and almost unbreakable plastic. For that reason, polycarbonate plastics are used to make drink bottles, food containers and, most worryingly, babies' bottles and children's sippy cups. In food manufacturing, epoxy resins are used to line some food cans to help prevent corrosion and food contamination.

A US Centers for Disease Control and Prevention (CDC) study in 2004 found traces

10 TIPS TO REDUCE YOUR EXPOSURE TO POTENTIAL CHEMICAL LEACHING

- 1** Avoid plastics with the numbers 3, 6 and 7.
- 2** Don't reuse water bottles with the number 1. Recycle after single use. Buy a reusable stainless-steel bottle (such as a SIGG bottle) to use where possible.
- 3** Go back to using good old-fashioned glass and ceramic containers to heat foods and drinks.
- 4** Don't drink from Styrofoam cups.
- 5** Use a non-PVC clingwrap such as one made from polyethylene — it will be labelled microwave-safe. Make sure it doesn't have contact with your food when heating.
- 6** Check your children's plastic cups, drinking bottles, plates and bowls and throw away those with the recycle number 7 or with no identification.
- 7** For storing foods and drinks, use glass, ceramic or the safer plastics with numbers 2, 4 or 5.
- 8** If you have a baby, look for BPA-free bottles (MAM has one available in Australia) or use old-fashioned glass bottles. You'll find them online at most green or eco-leaning baby sites.
- 9** Put only plastics clearly labelled "dishwasher safe" in the dishwasher (because of heat).
- 10** Buy your meat and fish from the butcher and fishmonger directly to avoid plastic packaging used by the supermarkets.



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of BPA in the urine of nearly all the 2157 participants tested. Somewhat reassuringly, the levels found were some 1000 times lower than those considered safe according to the US Environmental Protection Agency and the European Food Safety Authority. However, there is no consensus on whether we have the safe levels correct, with expert panels around the world contradicting each other over whether there is a health threat.

So what could the effects on our health be? Well, BPA is what is known as an endocrine disrupter. It mimics the natural female hormone oestrogen and can therefore bind to oestrogen receptors in the body. Laboratory and animal studies have linked the chemical to breast and prostate cancer, to decreased sperm counts in rats and to altered menstrual cycles and diabetes in developing mice.

The greatest risk is undeniably to infants and young children, both because they are likely to have a higher exposure than adults, given that so many of their bottles and cups are made using BPA, and because

the dose to body size is so much greater.

Of course, we are exposed to several other oestrogen-like substances, including those found naturally in soy and soy products. There continues to be disagreement over whether those occurring naturally do us good or harm, but some (including, of course, the chemical industry) argue that BPA can have no more effect than those naturally present in our diet. I'm afraid I, for one, cannot agree with this philosophy and prefer to place my trust in nature.

Heating or placing hot food or liquids in PC plastics may increase the risk. A study released earlier this year by the University of Cincinnati showed that many polycarbonate reusable water bottles leached BPA into the water they contained at room temperature, but when exposed to hot liquids the leaching was some 55 times faster. Heating your baby's bottle in the microwave is not a good idea, then.

They also showed the leaching from the plastic lining of canned foods was far higher than from the water bottles. This is particularly worrying as at present there is no way of knowing when you buy a canned item whether or not it has a plastic lining. The only thing you can do is get to know through trial and error which cans are plastic-free — or, where possible, choose a different container for the food, such as a carton of soup, for example.

If you share the concerns over BPA you

can dramatically reduce your exposure to it simply by being careful about the plastics you use for foods and drinks. In the US, the media exposure of the potential problem has led some retailers, including the major chain Wal-Mart, to stop selling any baby products made from BPA. Several manufacturers of baby/child products and sports bottles have also announced they will stop using it. In Australia, the issue has received less attention, but BPA-free products are available.

Phthalates

The other group of chemicals of concern are phthalates (pronounced *thay-lates*), primarily used in PVC to make it soft and flexible. You'll also find them in your nail polish and even in some perfumes.








Anti-chemical lobbyists cite animal research studies showing high doses of phthalates can disrupt an animal's reproductive system and in some cases cause cancer. However, safety reviews from both the European Union and the US expert panels have so far concluded that such effects are not seen in humans, at least at the doses we may be exposed to (considerably less than in the animal studies).

Still, most of the risk may again be to our infants and young children. A study published earlier this year in the journal *Pediatrics* found measurable levels of phthalates in the urine of all babies tested. However, these were not thought to come from PVC products, but from baby shampoo, baby powder and baby lotion. It seems that it's not just food and drink receptacles that may be hazardous.

The conclusion has to be that we need not panic over every plastic container we use, but we should be careful to use plastics in the way outlined by the manufacturer. We shouldn't reuse single-use containers and we should take great care with any plastics we use for hot foods and drinks, particularly those heated in a microwave. Perhaps it's time for a return to good old-fashioned glass and ceramic bowls. ♦



Chemical leaching from plastics

RECYCLE SYMBOL NUMBER	WHAT IS IT?	COMMON USES IN FOOD CHAIN	ANY EVIDENCE FOR LEACHING CHEMICALS?
	PET or PETE (polyethylene terephthalate)	Single-use bottled beverages including water and soft drinks, peanut butter container, squeezable bottles, eg with honey	No known risk if used as intended, ie only once. Some concern over possible leaching with extended use. To reduce landfill, dispose of in recycling bin and use a refillable water bottle instead.
	HDPE (high-density polyethylene)	Milk and juice containers, yoghurt cartons, supplement bottles, margarine tubs	No known risk and recycles readily.
	PVC (polyvinyl chloride)	Clear food packaging, eg refillable rice container, lunchboxes and kids' backpacks	Increasing concern over potential leaching of phthalates — chemicals linked to child development problems. Does not recycle well. Avoid where possible.
	LDPE (low-density polyethylene)	Bread bags, frozen-food bags, squeezable bottles, eg with honey or mustard, microwave-safe clingwrap	No known risk and can be recycled.
	PP (polypropylene)	Dishwasher- and microwave-safe containers, takeaway containers, ready-to-eat fruit containers, kids' cups, sauce bottles, yoghurt cartons, margarine tubs	PP has a high melting point and therefore is considered safe for heating food in the microwave and can go in the dishwasher. No known risk of chemical leaching and can be recycled.
	PS (polystyrene)	Meat trays, cups and plates, Styrofoam cups	Concern over leaching of chemicals such as styrene, a possible carcinogen, particularly on long storage (after a year) and when used for hot liquids or foods. More difficult to recycle. Avoid where possible.
	Other — anything other than the six above and can be a combination of resins used; includes PC (polycarbonate)	Most baby bottles (unless labelled BPA-free), sippy cups, children's hard plastic plates and bowls	PC contains bisphenol-A (BPA) that has been shown to leach into contents. BPA has been linked to health problems including cancer and child development issues. While not all plastics with number 7 contain BPA, often you won't know. Best to avoid them all.