

Public safety is a contentious issue, particularly when it comes to food safety. **Chris Lo** examines the controversy surrounding the chemical compound bisphenol A, which has been used to package food and beverages for more than 40 years.

BPA



EXPOSED

If there is one issue that can cause an uproar in the food and packaging industries, it is public safety. Such events have the potential to spark panic among consumers and tarnish cherished brands by association. The latest public health storm is the controversy building to a boil around bisphenol A (BPA), a chemical compound used in polycarbonate plastic bottles and in the epoxy lining of canned food and beverages since the 1960s.

BPA has received sporadic attention in recent years as some organisations have begun to raise concerns about the harmful effects this compound could have if it comes into contact with humans (occurring after the substance has leached from packaging to the food or drink contained within). It is an endocrine disruptor, which means that it interferes with or mimics the body's hormones, possibly leading to health defects.

In BPA's case, this takes the form of mimicking oestrogen, which has been linked to an increased risk of heart disease, diabetes and cancer. Foetuses and neonatal infants are at particular risk, which is troubling because BPA is commonly used in baby bottles and infant food containers – on 1 March 2011, the EU placed a ban on the use of BPA in polycarbonate baby bottles from European manufacturers.

With the links made between BPA and life-threatening disorders, it would seem an open-and-shut case that the compound poses a health risk when used in food contact applications and should be banned; however, the global regulatory community is hardly in agreement on this issue.

Canadian critics

A series of scientific, governmental and independent non-academic studies into BPA raised questions about the safety of the compound. Leading the charge against BPA is the Canadian Government, which added the chemical to its list of toxic substances in October 2010, after research by Environment Canada deemed it potentially harmful to national health and the environment.

While not an outright ban, the move

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allows Canadian authorities more freedom to restrict the importation, regulation and marketing of BPA and its associated products. Rick Smith, executive director of Environmental Defence Canada, an environmental group prominent in the anti-BPA campaign, said that BPA's inclusion on the toxic list would soon herald more dramatic restrictions on the chemical.

“The risk assessment of BPA put together by our federal government is very strong in terms of its conclusions, so I think

it's a foregone conclusion that it will drive further action rather quickly,” he said. “We are literally marinating in it on a minute-by-minute basis.”

In the US, the National Toxicology Program (established by the US Department of Health and Human Services) also harbours suspicion about BPA, based on the findings of its 2008 report into the chemical's effects on humans. The organisation noted that it had “some concerns” about its effect on brain development and behaviour in foetuses, infants and children at currently accepted exposure levels. It also expressed “minimal concern” for BPA's effects on a child's developing mammary gland, as well as “negligible concern” about foetal and neonatal mortality caused by BPA exposure in pregnant women. The US Environmental Protection Agency in March 2010 placed BPA on its ‘chemicals of concern’ list, marking it out for future assessment.

Evidence and alternatives

Perhaps the most damning evidence against BPA comes from a follow-up study conducted in the aftermath of the first large survey of the chemical's effect on humans – the Lang Study, which was published in January 2010. Although scientists found no causality between high levels of BPA in urine and a higher risk of diabetes and

abnormal levels of liver enzymes, as previously suspected, the study concluded that surveyed humans with the highest concentration of BPA in their urine had a 33% higher risk of heart disease.

Industry analysts have also published material attempting to highlight the dangers of bisphenol A. In a 2009 report entitled *Seeking Safer Packaging*, Green Century Capital Management and corporate responsibility watchdog As You Sow put together a case against the chemical's use in packaging and highlighted companies deemed to be not doing enough to limit its use.

The report claimed that the chemical industry was funding research designed to create uncertainty about BPA, noting that 100% of industry-funded reports found no adverse effects in BPA, while 92% of independently funded reports found some degree of adverse effects.

The report also noted that alternatives to BPA, such as polyamide and Tritan copolyester, were available and being used in some cases, but that the industry was not moving fast enough to phase BPA from products likely to cause exposure.

The increased controversy surrounding BPA has prompted many countries, including France, Belgium, Denmark and Germany, to take a stance against the use of the chemical in infant food and baby bottle products.

Clare Dimmer, chair of charity Breast Cancer UK, explains why her organisation is against BPA: "In a woman, hormones cause action within the body at trillionths of a gram and millionths of a gram, and EFSA is saying that BPA, which has a hormonal action, is perfectly safe in the hundredths of a gram."

Dimmer and Breast Cancer UK are convinced that there is a scientific link between BPA exposure and the aggravation of breast cancer, and that it impacts the effectiveness of chemotherapy treatment. She is disappointed that the UK Government has not taken more action against the chemical.

"They [the government] really don't like to make regulations and they don't like to be seen to be clamping down on business, even if it means that public health is a major issue," she says. "As a charity, we would like to see them legislate."

BPA's defenders

The conclusions drawn about BPA following the Lang Study held little water with the European Food Safety Authority. In a report released in September 2010, EFSA issued a statement that read: "Following a detailed and comprehensive review of recent scientific literature and studies on the toxicity of bisphenol A at low doses, scientists on the European Food Safety Authority's CEF panel conclude they could not identify any new evidence that would lead them to revise the current tolerable daily intake for BPA of 0.05mg/kg body weight set by EFSA... The panel also states that the data currently available does not provide convincing evidence of neurobehavioural toxicity of BPA."

This standpoint is echoed by several studies conducted into BPA around the world, including in the UK, Netherlands and Japan. The main point in the argument against banning BPA is that a

organisation welcomes EFSA's restated stance on the safety of BPA, saying that the BPF has, "expressed its concern that interest in bisphenol A is spiralling out of control and sensationalised media reports have been the product of studies that have failed to provide reproducible results".

According to the BPF, "Plastics based on bisphenol A are perfectly safe and not only are they endorsed by the European Food Standards Agency, but also by other independent bodies including the NHS [National Health Service]... The bisphenol A issue has become highly politicised in recent years and in some countries has become divorced from the reality and nature of its use.

"BPA is one of the most widely studied compounds in the world; extensive safety research has been conducted over the past four decades providing a large database of toxicological and exposure data available to assess human health concerns."

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human would have to consume an unrealistic quantity of food with detectable levels of BPA for exposure to be considered a health risk.

A survey by Food Standards Australia New Zealand, released on 9 November 2010, found that around 30% of studied food items contained detectable levels of BPA, but still concluded the substance posed no risk to Australian consumers. This is because of the extremely low doses involved. According to Australian Associated Press medical writer Danny Rose, a three-month-old child would have to consume at least 1kg of canned custard in a single day to surpass the safe BPA limit. And that was the product that was found to have the highest concentrations of the chemical.

There are also numerous industry groups vocal in their defence of BPA as a safe component of food packaging. A spokesperson for the British Plastics Federation (BPF), notes that the

It's the thought that counts

But no matter what the scientific community decides on BPA, in the arena of consumer health, public perception is king. While debate continues to rage about whether the safe margin for BPA exposure in babies is too slim for comfort, many suspect that the public has already made up its mind about the chemical. After all, who would be willing to take chances with their child's health?

The slow, pre-emptive industry shift away from BPA is already in evidence, with Nestlé announcing that it will phase out BPA from its US products within three years and Heinz promising to remove the chemical from its baby products in the UK. In the competitive food and beverage landscape, the BPA issue has become simply another way of differentiating oneself from the competition, and there is a growing sense that the scientific evidence behind the effects of BPA is rapidly becoming immaterial. ■