2014/08/18

science 2.0

Meet BPA-Free,
The New BPA Free, The New BPA altenatives to avoid risks

http://www.science20.com/steve_hentges/meet_bpafree_the_new_bpa-142600

Steve Hentges

More Articles

Are You Exposed To BPA, And Does It Matter?

Does BPA Make You Fat?

All Articles

There's an emerging trend, of late, in the seemingly endless saga of the chemical bisphenol A (BPA), which is most commonly used to make polycarbonate plastic and epoxy resins. Although the BPA saga has not yet become completely passé, much of the attention that had been given to BPA is now focused on alternatives to BPA. Indeed, it seems that BPA-Free is becoming the new BPA.

For what seemed an eternity, BPA had been at the center of a perfect storm comprised of scientists, regulators, legislators, environmental activists and the media. Their collective fascination with BPA struck many as bordering on obsession.

Over the last decade, thousands of studies on BPA have been published by scientists around the world and, in response to the flood of scientific data, regulatory agencies conducted numerous safety/risk assessments. Attracted to the controversy and spurred on by environmental activists, legislators proposed to ban products containing BPA. On all fronts, media coverage has both reported on and promoted the controversy.

The scientific process may not be speedy, but we must trust that science will eventually cut through the controversy and resolve uncertainties about the safety of BPA. Thanks in large part to a remarkable research program designed and conducted over the last several years by the U.S. Food and Drug Administration (FDA) in conjunction with the U.S. National Toxicology Program (NTP), that's exactly what is happening. With extensive results from that program now available, FDA recently answered the question "Is BPA safe?" with the most straightforward answer possible – "Yes."

In spite of continued safety assurances from government agencies, BPA is no longer used in a few markets. For example, it's well known that baby bottles and most sports bottles are no longer made from polycarbonate plastic. But with controversy about the safety of BPA now in decline, the BPA-Free alternatives are coming under attack from some of the same players who previously had targeted BPA.

This shouldn't really be a surprise and, in fact, it was predicted 4 years ago in a prescient commentary published by Judy LaKind and Linda Birnbaum in the Journal of Exposure Science and Environmental Epidemiology:

"There are too many examples of chemicals taken off the market only to be replaced with chemicals that, in time, come to be considered 'of concern.' We may be at such a juncture with replacement chemicals for bisphenol A (BPA) and PFOS. BPA, used mainly in the production of polycarbonates, has been measured in >90% of the general US population, prompting calls for bans, which have been enacted for certain uses in some parts of the United States and proposed in other countries.

This has in turn resulted in a demand for alternatives to polycarbonate bottles, including glass and metal bottles and those made from a copolyester (C&EN News, 2009), which is marketed to both adults and children. Our literature search on some of the replacement copolyester chemicals revealed no exposure information. Years from now, will we be seeing exposure studies describing certain BPA alternatives as emerging chemicals of concern?"

With BPA so well-studied over so many years, it should be no surprise that BPA-Free alternatives are not nearly as well studied. That's doesn't by itself mean anything. But the difference in available data for BPA and BPA-Free alternatives is now becoming very apparent and is attracting scientists like bees to honey.

Some researchers are studying plastics, including the copolyester mentioned above that is an alternative to polycarbonate, and report that "[e]strogenic chemicals often leach from BPA-free plastic products that are replacements for BPA-containing polycarbonate products." The researchers also appropriately note that their data "can only describe the existence of a possible hazard for consumption of chemicals with EA [estrogenic activity] leaching from plastic products, not what risk that consumption might have to human health," which suggests that more research may follow.

Other researchers are studying BPA analogues (i.e., chemicals with similar structures that might be used in place of BPA to make plastics or resins), in particular bisphenol S (BPS), which is currently used as an alternative to BPA in thermal receipt paper. As predicted 4 years ago, recent exposure

studies report human exposure to BPS and the presence of BPA analogues in various environmental compartments including food, paper products, indoor dust, and freshwater sediment.

With limited data available, studies relevant to potential human and environmental health effects from BPS and other analogues are also starting to appear. Very reminiscent of many earlier studies on BPA, some researchers are announcing their findings both in the form of a scientific paper and a press release to attract further attention.

But just like the early days with BPA, these new research results are difficult to interpret with respect to the safety of the BPA-Free alternatives as they are being used. As is often stated at the end of these papers, more research is needed and, almost certainly, more research will be done.

Beyond the few studies cited here, the number of studies focused on alternatives to BPA is clearly on an upward trend. As stated by NTP, "[t]here is a considerable amount of data available on BPA toxicities; however, very little is known about the potential replacement chemicals." In particular, "there is insufficient in vivo toxicological data to adequately characterize the possible human health effects of BPS" and, for that reason, NTP is currently considering a comprehensive research concept on BPS.

With new research results and controversy expanding to BPA-Free alternatives, it's not just scientists who are taking an interest. Government agencies have also taken an interest, initially focused on alternatives to BPA in thermal receipt paper. Already assessments have been conducted by the U.S. Environmental Protection Agency (EPA), the Danish Ministry of the Environment, and the State of Minnesota. As concluded by EPA, with similar conclusions from the others, "[n]o clearly safer alternatives to BPA were identified in this report…". Further such analyses are anticipated.
As scientists and government agencies turn their attention to BPA-Free alternatives, environmental activists and the media will not be far behind. With headlines like "The Scary New Evidence on BPA-Free Plastics" and "BPA-Free Plastic Containers May Be Just as Hazardous," the media barrage may be just beginning. For a while, it may have seemed that BPA-Free product labels would be a good selling point, but now the labels may become a target.

Labels proclaiming that a product is free of something are not unique to BPA. In general, though, such labels are not very informative. The right question to ask is not what a product is free of, but what is the product made from and what is known about its safety? Further discussion on this topic may be the focus of a future article.

SH