

Just the Facts...

Health Safety of Plastics Used for Food and Drinking Water Packaging: Bisphenol A

Important Facts on Bisphenol A

Anecdotal stories about contaminants leaching from polycarbonate bottles and epoxy resins used in food packaging materials periodically surface, in particular, suggesting that real-life conditions of use may release harmful levels of bisphenol A (also referred to as BPA) into contained food and liquids. Due the widespread use of BPA as an ingredient in a variety of consumer products - for example, baby bottles - the Canadian Government established a deadline of June 2008 to determine whether or not materials containing BPA should be banned from use in all food-related consumer products.¹ Wal-Mart, the largest consumer product marketing company in the world, has followed suit and announced it will discontinue the sale of baby bottles containing BPA in the U.S. by 2009.^{2,3} Toys-R-Us will also phase out the sale of baby bottles and other baby-feeding products containing BPA.³ Recently, the National Toxicology Program (NTP) released a draft report affirming “some concern” for potential adverse brain and behavior-related developmental effects associated with exposures to BPA.⁴ However, NTP does acknowledge that the concerns stem from limited evidence based on laboratory animals, which demonstrates the need for additional research, especially on the long-term health effects of current exposure levels. Growing attention on BPA in the U.S. has sparked Congressional interest for further investigation⁵ and the establishment of a U.S. Food and Drug Administration (FDA) task force to review concerns and new research on BPA. The FDA Task Force is coordinating closely with the Canadian Ministries of Health and the Environment and is reviewing the concerns presented in the NTP draft report and the concerns presented in a Canadian draft risk assessment, both released in April 2008.⁶

Bisphenol A: Description and Uses

BPA is a synthetic chemical compound that is produced at an estimated 2.3 billion pounds a year in the U.S.⁴ Commercially used since the 1950s, BPA is a chemical ingredient commonly used in the production of polycarbonate plastic and epoxy resin, both of which are used for a variety of applications. Polycarbonate plastic is a hard and high-performance type plastic labeled using the resin code or container material symbol  with the number 7 inside and the letters “PC” beneath it. Epoxy resin is commonly used as a sealant or protective coating.⁷ Examples of commonly encountered uses of BPA are to produce hard plastic baby bottles, reusable beverage containers (e.g., water bottles), food storage containers and dinnerware, and protective coatings used in metal food and beverage cans, wine vats, and dental sealants.

Health Effects

The primary route of exposure to BPA is through dietary intake of food and beverages packaged in BPA-containing materials.⁴ A considerable amount of research has been conducted by both governmental and non-governmental institutions to measure levels of human exposure to BPA.⁴ BPA has been detected in urine, blood, breast milk, and tissues in several studies/evaluations from people in the U.S., Europe, and Asia. The highest daily intakes of BPA in the general population occur in infants and children because they eat, drink, and breathe more than adults on a pound for pound basis. Evidence based on animal testing suggests that adverse developmental effects related to BPA exposures occur. Some of the observed effects include neural and behavioral abnormalities in rodents. However, these effects occur at levels several thousand times higher than any child or adult would be expected to consume on a daily basis.⁴ More research is needed to determine what risks are actually associated with BPA, including those resulting from long-term, low-level exposures.

Current Federal Regulations

Food, bottled water, and associated packaging sold in and imported into the U.S. are regulated under the Federal Food, Drug, and Cosmetic Act, and enforced by the U.S. Food and Drug Administration (FDA).⁸ The FDA evaluates the potential for certain chemical constituents of food/beverage packaging (also referred to as “food contact substances”) to migrate into the contained food or liquid. All substances used to make packaging materials for food and beverages, including plastics for bottled water, must be determined by the FDA to be safe for their intended use before they can be marketed.⁸ As part of the approval process, the FDA conducts risk assessments to determine the amount (if any) and toxicity of material transfer to ensure that it does not pose a risk to human health, including the health of infants and children.

Impact on Department of Defense

The U.S. Army Veterinary Command is responsible for all matters of public health/consumer protection related to food safety and quality, including bottled water, within the Department of Defense.⁹ They maintain close relations with the FDA, the United States Department of Agriculture (USDA), and other Federal, state, and military agencies to ensure consumer protection, food quality, and product safety. They coordinate daily with Army, Navy, and Air Force public health and preventive medicine organizations on inspections of commercial food manufacturing facilities as well as inspections of military retail food operations. The U.S. Army ensures that up-to-date health advisories and related regulations established by Federal, state, or local agencies are followed.

Alternatives and Additional Sources of Information

The FDA reportedly believes that transfers of BPA from food contact products to food/beverages are within reasonable limits of health and safety for consumers, and recommends that consumers continue to consume food packaged or stored in plastics containing BPA.⁶ However, consumers may choose alternatives to products packaged in materials that contain BPA. Examples of alternatives include glass-made baby bottles, stainless steel beverage containers, and fresh foods or foods packaged in glass jars. Additional information can be obtained from the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) Water Supply Management Program, by calling commercial (410) 436-3919 or by

sending an email to: Water.Supply@amedd.army.mil. Consumers can also obtain up-to-date news on product recalls, health advisories, and research on BPA from the following websites:

U.S. Food and Drug Administration (FDA)
<http://www.fda.gov>

www.Recalls.gov (a Federal interagency website for product recalls) <http://www.recalls.gov>

National Toxicology Program (NTP)
<http://ntp-server.niehs.nih.gov/>

Health Canada
http://www.hc-sc.gc.ca/index_e.html

References

- ¹ Health Canada News Release, 18 April 2008, http://www.hc-sc.gc.ca/ahc-asc/media/nr-cp/2008/2008_59_e.html (accessed 29 April 2008).
- ² Ylan Q. Mui, “Wal-Mart to Pull Baby Bottles Made With Chemical BPA”, *The Washington Post*, 18 April 2008, <http://www.washingtonpost.com> (accessed 29 April 2008).
- ³ Liz Szabo, “More U.S. Retailers Give BPA the Boot”, 21 April 2008, http://www.usatoday.com/news/health/2008-04-21-BPA-phase-out_N.htm (accessed 29 April 2008).
- ⁴ U.S. Department of Health and Human Services (HHS), National Toxicology Program, “Draft NTP Brief on Bisphenol A”, 14 April 2008.
- ⁵ L. Schierow and S.A. Lister, “Bisphenol A (BPA) in Plastics and Possible Human Health Effects”, *Congressional Research Service (CRS) Report for Congress*, 5 May 2008.
- ⁶ U.S. Food and Drug Administration (FDA) News Release on BPA, <http://www.fda.gov> (accessed 29 April 2008).
- ⁷ Society of the Plastics Industry (SPI), “SPI Resin Identification Code: Guide to Correct Use”, <http://www.plasticsindustry.org> (accessed 6 May 2008).
- ⁸ Federal Food, Drug, and Cosmetic Act, codified in the United States Code, Title 21, Chapter 9 [*Food Additives and Food Contact Substances* regulations are described in 21 Code of Federal Regulations Parts 170-189].
- ⁹ Department of Defense (DOD) Directive 6400.4 “DoD Veterinary Services Program” 22 August 2003 (certified current 24 November 2003).