



## Canned Food Linked to Higher Exposure to the Chemical BPA in a First-of-its-Kind Nationally Representative Sample

### Background

The synthetic chemical used as a building block for polycarbonate plastic and epoxy resin, Bisphenol A (BPA), has in recent years become a topic of public health debate. Due to health concerns, the United States banned the use of BPA in key infant and toddler products, including baby bottles, sippy cups and ready-made infant formula cans. In addition, BPA was added to California's Proposition 65 list of chemicals known to cause reproductive toxicity, and the "BPA in Food Packaging Right to Know Act" — which would prohibit the sale of a food if the container is composed of BPA and lacks a proper warning on the label — was introduced in the U.S. Senate (March 2015). Although the United States has made progress in addressing BPA exposure in recent years, some countries have taken a stronger approach. For example, in 2015,

### About the Author

Jennifer Hartle, DrPH, MHS, CIH, performed this research as a postdoctoral researcher at the Stanford Prevention Research Center. Hartle's research concerns environmental exposures and their effects on human health, with a special focus on environmental exposures from the food system. A 2015 fellow with the Stanford Woods Institute's Rising Environmental Leadership Program and now an Assistant Professor of Environmental Health at San Jose State University, Hartle received her doctorate from Johns Hopkins University where her thesis focused on identifying dietary environmental exposures such as BPA.

the European Food Safety Authority (EFSA) reduced the Tolerable Daily Intake of BPA to 4 micrograms per kilogram of body weight per day, an amount that is twelve and a half times lower than the U.S. safety standard.



While BPA exposure has been measured in household dust and air, diet is considered a main contributor of BPA exposure. BPA is often used in food and beverage packaging. For example, in metal food cans, BPA serves as a barrier between the food and the can in order to prevent corrosion and microbes, such as botulism, from contaminating the food. Unfortunately, BPA itself can also leach into the product. In fact, previous studies indicate that around two-thirds of BPA exposure can be attributed to dietary intake.

Laboratory studies continue to suggest that canned food consumption is linked to BPA exposure, however, these studies tend to be based on the analysis of a small number of participants. New research from Stanford and Johns Hopkins University researchers utilizes a representative sample of the U.S. population to evaluate the contributions that diet — eating foods packaged in cans — has on BPA exposure levels. The researchers find

that increasing canned food consumption is associated with higher BPA concentrations (measured in urine samples), which has implications for the entire U.S. population.

## Research Findings

### Linking Canned Food to BPA Exposure

According to the study, participants that consumed one or more canned foods per day had higher BPA concentrations, compared to participants that consumed no canned food. The consumption of one type of canned food versus none was associated with 24 percent higher BPA concentrations. The consumption of two or more canned foods versus none was associated with 54 percent higher BPA concentrations. It should be noted that the researchers found that canned beverages were not associated with urinary BPA concentrations.

### Different Foods, Different Amounts of Exposure

The research highlights that specific types of canned foods are linked to higher levels of BPA.

- Concentrations of BPA in participants were 41 percent higher for consumption of canned vegetables and canned fruit, 70 percent higher for consumption of canned pasta and 229 percent higher for consumption of canned soup.
- The top three canned food groups digested by participants were canned vegetable and fruit, accounting for 50 percent of the canned food eaten, followed by canned meat and fish at 33 percent and canned pasta at 8 percent.

### Groups Affected

*Consumption:* By using a nationally representative sample, the research indicates that canned food and beverage consumption differs based on race and smoking status. According to the analysis, canned food and beverage consumption was highest in non-Hispanic Whites and the lowest among participants not exposed to secondhand smoke.



BPA is often used in food and beverage packaging such as metal food cans.

**WARNING**

Many food and beverage cans have linings containing bisphenol A (BPA), a chemical known to the State of California to cause harm to the female reproductive system. Jar lids and bottle caps may also contain BPA.

You can be exposed to BPA when you consume foods or beverages packaged in these containers.

For more information, go to:  
[www.P65Warnings.ca.gov/BPA](http://www.P65Warnings.ca.gov/BPA).

Example of a compliant BPA warning label for canned and bottled foods and beverages administered through California's Office of Environmental Health Hazard Assessment.

*Body Burden:* BPA concentrations varied among studied sub-groups, including gender, age, income, education, race and smoking status:

- The study found the higher urinary BPA concentrations in males, the youngest participants studied (6-11 year olds) and those with the lowest income and education status.
- Non-Hispanic Blacks had the highest urinary BPA concentrations compared to other races.
- Participants with secondhand smoke exposure had the highest urinary BPA concentrations.

**Considerations for Policymakers**

1. To prevent dietary exposure to BPA, canned food packaging should avoid the use of BPA.

2. Changes to current trade secret laws that allow businesses to keep the chemical components of their products hidden from the public should be considered.
3. If a canned food product contains BPA, a proper warning should be present on the label.
4. Federal regulators should expand research to include surveillance of chemicals used as BPA replacements in food packaging. In order to better understand BPA exposure in the United States, the survey used in this study, the National Health and Nutrition Examination Survey (NHANES), should include sampling for BPA replacements.

**Conclusions**

The research confirms that canned food contributes to BPA exposure in the population of the United States for both children and adults. Urinary BPA concentrations increased with the number of canned foods consumed per day, and specifically with the consumption of certain types of canned food. Most of the trends found in this study mirror findings of previous laboratory studies that have directly measured BPA concentration of canned foods, confirming the importance of removing the use of BPA from canned foods to prevent dietary exposure to BPA in the United States.

This brief is based on the paper: "[The consumption of canned food and beverages and urinary Bisphenol A concentrations in NHANES 2003–2008](#)," published in *Environmental Research*, June 2016.

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