



Overview of June 2011 Study on Human BPA Exposure

“24-Hour Human Urine and Serum Profiles of Bisphenol A During High Dietary Exposure”

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Why Is This Study So Important?

This study was designed to address definitively whether dietary exposures to bisphenol A (BPA) could cause adverse health effects in humans. It is the most sophisticated analysis to date of human internal exposure, or how the human body processes BPA. This research is critical to understanding the metabolic processing of BPA in people to assess effectively whether the often-referenced animal studies actually are relevant to human exposure and human health.

How Was the Study Designed?

It was a human clinical study designed to assess blood and tissue concentrations of BPA in healthy adults. The human volunteers were admitted to the hospital where their diet was controlled. The study included hourly internal exposure measurements of BPA in human volunteers who ingested BPA by eating and drinking large amounts of canned food and beverage products. Because consumption of canned food and beverage products has been highlighted as a potentially significant source of BPA exposure, the study called for human volunteers to be fed three meals in a day that consisted primarily of canned foods and beverages. The amount of BPA exposure from this study would be considered “worst case” because, as noted by the study authors, the levels met or exceeded the high end of BPA exposure seen in humans, based on data collected by the Centers for Disease Control and Prevention (CDC).

Blood and urine samples were collected from each participant hourly during the day of the study. The blood samples were analyzed for both free BPA and total BPA. Previous studies have concluded that when ingested, BPA is rapidly metabolized into a conjugated form of BPA that is biologically inactive. In this study, the researchers tested for both unconjugated BPA (free BPA) and the combined total of the conjugated and unconjugated forms of BPA. Urine samples were analyzed for total BPA because previous data have shown that free BPA is not commonly found in urine. All measurements were made using a sensitive analytical method capable of measuring very small amounts of BPA.

Who Funded and Conducted the Study?

The study was funded entirely by the U.S. Environmental Protection Agency. It was conducted by researchers from Pacific Northwest National Laboratory (a U.S. government national

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laboratory), CDC, and the U.S. Food and Drug Administration.

What Does the Study Show?

The work of Teeguarden *et. al.* demonstrates in a large clinical study that because of the way BPA is processed in the human body, the biologically active form of BPA (free BPA) could not be measured in the blood and tissue samples. The study concluded that because of the extremely low levels of BPA that humans are exposed to, it is very unlikely that BPA could ever cause health effects in humans.

This study also pointed out the flaws of many other studies that have tried to look for internal doses of BPA and determined that many of those studies showed false results due to inadequate sample handling and laboratory contamination issues.

Even with the exaggerated diet consisting of mostly canned food and beverages, the BPA exposures seen in this study are still 1 to 3 orders of magnitude below levels that have shown adverse health effects in the most sensitive animal tests.

In addition, the study confirms that because of the way humans process BPA in the body, any BPA that enters the body is quickly metabolized and excreted. This is critical for human health assessment because a chemical cannot elicit a harmful effect if it does not exist in the body long enough to reach potential target organs.

The study can be found at <http://www.ncbi.nlm.nih.gov/pubmed/21705716>.

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