

Contaminated diet contributes to phthalate and bisphenol A exposure

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University of Washington pediatric environmental health specialist Dr. Sheela Sathyanarayana studies the origins and effects of phthalate and bisphenol A exposure in children. Credit: Erik Stuhaug

While water bottles may tout BPA-free labels and personal care products declare phthalates not among their ingredients, these assurances may not be enough. According to a study published February 27 in the *Nature's Journal of Exposure Science and Environmental Epidemiology*, people may be exposed to these chemicals in their diets, even if their meals are

organic and foods are prepared, cooked and stored in non-plastic containers. And children may be most vulnerable.

"Current information we give families may not be enough to reduce exposures," said Dr. Sheela Sathyanarayana, lead author on the study and an environmental health pediatrician in the University of Washington School of Public Health and at Seattle Children's Research Institute. She is an assistant professor of pediatrics at the UW School of Medicine and an attending physician at Harborview Medical Center's Pediatric Environmental Health Specialty Unit.

Phthalates and bisphenol A (BPA) are synthetic endocrine-disrupting chemicals. Previous studies have linked [prenatal exposure](#) to phthalates to abnormalities in the [male reproductive system](#). Associations have also been shown between [fetal exposure](#) to BPA and hyperactivity, anxiety, and depression in girls.

The researchers compared the chemical exposures of 10 families, half who were given written instructions on how to reduce [phthalate](#) and BPA exposures, handouts developed by the national Pediatric Environmental Health Specialty Units, a network of experts on environmentally related [health effects](#) in children. For five days the other families received a local, fresh, organic food catered diet that was not prepared, cooked or stored in [plastic containers](#)

When the researchers tested the urinary concentrations of [metabolites](#) for phthalates and BPA, they got surprising results. The researchers expected the levels of the metabolites to decrease in those adults and children eating the catered diet.

Instead, the opposite happened. The urinary concentration for phthalates were 100-fold higher than the those levels found in the majority of the general population, The comparison comes from a study conducted by

the National Health and Nutrition Examination Survey (NHANES), a program of studies managed by the Centers for Disease Control and Prevention and designed to assess the health and nutritional status of adults and children in the United States. The concentrations were also much higher for children as compared to the adults.

Then, the researchers tested the phthalate concentrations in the food ingredients used in the dietary intervention. Dairy products—butter, cream, milk, and cheese—had concentrations above 440 nanograms/gram. Ground cinnamon and cayenne pepper had concentrations above 700 ng/g, and ground coriander had concentrations of 21,400 ng/g.

"We were extremely surprised to see these results. We expected the concentrations to decrease significantly for the kids and parents in the catered diet group. Chemical contamination of foods can lead to concentrations higher than deemed safe by the U.S. Environmental Protection Agency," said Sathyanarayana.

Using the study results, the researchers estimated that the average child aged three to six years old was exposed to 183 milligrams per kilogram of their body weight per day. The U.S. Environmental Protection Agency's recommended limit is 20 mg/kg/day.

"It's difficult to control your exposure to these chemicals, even when you try," said Sathyanarayana. "We have very little control over what's in our food, including contaminants. Families can focus on buying fresh fruits and vegetables, foods that are not canned and are low in fat, but it may take new federal regulations to reduce exposures to these chemicals."

More information: The paper is titled, "Unexpected results in a randomized dietary trial to reduce phthalate and bisphenol A exposures."

Provided by University of Washington

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