

## The Chemicals in Your Mac and Cheese

By RONI CARYN RABIN

Potentially harmful chemicals that were banned from children's teething rings and rubber duck toys a decade ago may still be present in high concentrations in your child's favorite meal: macaroni and cheese mixes made with powdered cheese.

The chemicals, called phthalates, can disrupt male hormones like testosterone and have been linked to genital birth defects in infant boys and learning and behavior problems in older children. The chemicals migrate into food from packaging and equipment used in manufacturing and may pose special risks to pregnant women and young children.

The Food and Drug Administration has not banned their presence in foods, though a 2014 report to the Consumer Product Safety Commission urged federal agencies to assess risks "with a view to supporting risk management steps." The report concluded that food, drugs and beverages, and not toys, were the primary source of exposure to phthalates.

Now a new study of 30 cheese products has detected phthalates in all but one of the samples tested, with the highest concentrations found in the highly processed cheese powder in boxed mac and cheese mixes. The report, which was conducted by an independent laboratory and paid for by environmental advocacy groups, has not been published in a peer-reviewed journal.

"The phthalate concentrations in powder from mac and cheese mixes

were more than four times higher than in block cheese and other natural cheeses like shredded cheese, string cheese and cottage cheese," said Mike Belliveau, executive director of the Environmental Health Strategy Center, one of four advocacy groups that funded the report. Others were the Ecology Center, Healthy Babies Bright Futures and Safer States.

The groups tested 10 different varieties of mac and cheese, including some that were labeled organic, and found high levels of phthalates in all of them.

The tested products were purchased in the United States and shipped in the original packaging to VITO, the Flemish Institute for Technological Research in Belgium, where fat extracted from each product sample was analyzed for 13 phthalates using validated test methods, Mr. Belliveau said.

Some two million boxes of mac and cheese, a relatively inexpensive food that can be whipped up in minutes, are sold every day in the United States, according to 2013 figures from Symphony/IRI Group. Mr. Belliveau said consumers would have a hard time avoiding the chemical.

"Our belief is that it's in every mac 'n' cheese product — you can't shop your way out of the problem," said Mr. Belliveau, who is urging consumers to contact manufacturers and pressure them to investigate how phthalates are getting into their products and take steps to eliminate it. Nine of the cheese products tested were made by Kraft, which makes most of the macaroni and



VIA GETTY IMAGES

cheese products sold, though the group did not disclose the names of specific products tested.

Officials with Kraft did not respond to requests for comment on the report and its findings.

Devon Hill, a lawyer in Washington who has experience with companies that make phthalates, said many phthalates have been phased out of food processing and packaging, and that those still in use result in very low exposures. The cheese tests looked for the presence of 13 different phthalates and detected all but two, with some food items containing up to six different phthalates in a single product.

Environmental and food safety groups petitioned the F.D.A. last year to remove all phthalates from food, food packaging and food processing and manufacturing equipment, though the petition has been delayed temporarily for technical reasons, said Tom Neltner, chemicals policy director for the Environmental Defense Fund, which is coordinating the petition process for 11 advocacy groups, including the Center for Science in the Public Interest, Natural Resources Defense Council, the Environmental Working Group and others.

"A chemical is not allowed in food unless there is a reasonable certainty it will cause no harm," Mr. Neltner said, adding that because of all the evidence regarding the potential harms of phthalates, "We don't think the F.D.A. can say there is a reasonable certainty of no harm."

An F.D.A. spokeswoman said the agency regulates all substances in food contact materials that can be expected to migrate into food, including phthalates, and said there must be “sufficient scientific information to demonstrate that the use of a substance in food contact materials is safe under the intended conditions of use before it is authorized for those uses.” The spokeswoman said: “The F.D.A. continues to monitor literature and research on these compounds as it becomes available.”

Phthalates are not deliberately added to food. They are industrial chemicals used to soften plastics and are used as solvents, in adhesives and in ink on packaging.

The chemicals migrate into food from food processing equipment like plastic tubing, conveyor belts and gaskets and other plastic materials used in the manufacturing process, and can also seep in from printed labels or plastic materials in the packaging.

Since they bind with fats, they tend to build up in fatty foods, including not just cheese but baked goods, infant formula, meats, oils and fats, and fast food, studies show.

Europe has banned many phthalates from use in plastics that come into contact with fatty foods, including baby food, but the F.D.A. allows the use of many phthalates in such materials and classifies them as indirect food additives.

Although the concentration of phthalates in food may be quite low, measured in parts per billion, they are still present at higher levels than the natural hormones in the body, said Heather B. Patisaul, a professor of biological sciences at the Center for Human Health and the Environment at North Carolina State University in Raleigh.

There is strong evidence that phthalates block the production of the hormone testosterone.

“That means there is less testosterone available to the developing male fetus, and since testosterone is absolutely vital to build his reproductive organs, the worry is that you will get malformations and other kinds of problems that translate to health effects later,” Dr. Patisaul said.

## **“Our belief is that it’s in every mac ‘n’ cheese product — you can’t shop your way out of the problem.”**

Those include “infertility, low sperm counts, altered male reproductive behavior and changes in the area of the brain that are important for sex differences between men and women,” as well as a heightened risk of testicular cancer later on, she said.

“If you asked most scientists about the top 10 or 20 endocrine-disrupting chemicals they worry about, phthalates would be on that list,” Dr. Patisaul said. “We have an enormous amount of data.”

Emerging research has also suggested links between early childhood exposure to phthalates and neurodevelopmental and behavior problems in young children, including aggression, hyperactivity and possible cognitive delays, said Dr. Sheela Sathyanarayana, associate professor of pediatrics at the University of Washington in Seattle, who studies phthalates.

If you’re pregnant or planning a pregnancy, have young children or want to reduce your family’s exposure to phthalates for other reasons, here are some suggestions:

- Eat more whole fresh and frozen fruits and vegetables, and minimize the amount of processed food you eat. “Avoid anything you find in a box that could sit around for many years,” said Dr. Sathyanarayana. “There are so many steps to get to that boxed product, and every step along the way, there’s usually plastic involved.”
- Choose low-fat dairy products such as skim milk and low fat cheeses, and avoid high-fat foods such as cream, whole milk and fatty meats. “We know these more toxic phthalates accumulate in fat,” Dr. Sathyanarayana said.
- Use glass, stainless steel, ceramic or wood to hold and store food instead of plastics, Dr. Sathyanarayana suggested, and if you are using sippy cups and baby bottles made from hard polycarbonate plastics, don’t put hot liquids in them.
- Wash your hands frequently, and take your shoes off at home to avoid household dust that may be contaminated with chemical traces. Vacuum and wet dust frequently.
- Food isn’t the only source of exposure. Many fragrances contain phthalates, Dr. Patisaul said, so choose unscented personal care products, from cleansers, moisturizers and cosmetics to shampoo and detergents as well.