

Polystyrene Foam

Polystyrene Foam, Disposable Food Containers, and Contaminated Food

Polystyrene foam, often called styrofoam, is used to make inexpensive disposable food containers like plates, cups, and school lunch trays. Many of these containers can be identified easily because they are labeled with the #6 recycle logo.

These products are cheap and convenient but are controversial because exposure to styrene, the building block from which polystyrene is made, has well documented hazards including cancer and disruption of thyroid hormones.

In addition, styrene moves into food from polystyrene food containers when they are used. This contamination has been documented by both government and academic researchers.

While the focus of this factsheet is on polystyrene foam, the information here also applies to rigid polystyrene food containers.

Polystyrene foam is a plastic material frequently used to make food containers because it is cheap and can be used to hold both hot and cold food and beverages. Most people call this material styrofoam.

Polystyrene is made by joining together large numbers of styrene molecules. Typically, some unbound styrene remains in polystyrene foam and can move from the foam into food. This is a concern because styrene exposure causes a variety of health problems.

Styrene Hazards

The World Health Organization, the National Institutes of Health, and California all identify styrene as a cancer causing chemical.¹⁻³ The World Health Organization evaluation is the most current, completed in 2018.

Styrene can also disrupt the normal activity of our hormones. According to a database from the National Institute for Occupational Safety and Health, styrene damages a gland called the adrenal cortex where stress and sex hormones are produced. It also causes changes in several other hormones, including luteinizing hormone which is important in menstrual cycles and sperm production.⁴

The National Institute for Occupational Safety and Health also identified 36 studies conducted between 1978 and 2009 showing that styrene causes genetic damage. Twelve of these studies were done using humans or human cells. Twelve other studies found that styrene caused problems related to pregnancy, including sperm damage, reduced fertility, miscarriages, stillbirth, and birth defects.⁴

Styrene in Polystyrene Foam

Styrene is frequently found in polystyrene food containers because not all styrene is formed into polystyrene during the manufacturing process. A 2014 study by the U.S. Food and Drug Administration found styrene in all 24 polystyrene products tested.⁵ CEH's 2019 testing has consistently found styrene in polystyrene foam lunch trays.



Styrene Contamination of Food

The free styrene in polystyrene containers can contaminate food stored in the containers. The U.S. Food and Drug Administration study mentioned in the previous paragraph measured styrene contamination in eight foods stored in polystyrene, including yogurt, soup, and cookies. All of the foods tested were contaminated with styrene.⁵

Environmental Harm

Estimated use of polystyrene in food containers in the U.S. is 2600 million pounds per year.⁵ Less than 40 million pounds of this is recycled,⁶ meaning that billions of pounds are discarded. This staggering amount of polystyrene ends up in landfills, dumps, or in soil and water, and takes up to thousands of years to break down.⁷

Conclusion

Based on the studies summarized above, polystyrene foam is not a healthy material to use in food containers. The presence of unbound styrene in the containers, the ability of this styrene to contaminate food, and the documented hazards of styrene provide compelling reasons to use other materials.

References

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