

# Study: Preservative used in pop-tarts and hundreds of popular foods may harm the immune system

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A food preservative used to prolong the shelf life of Pop-Tarts, Rice Krispies Treats, Cheez-Its and [almost 1,250](#) other popular processed foods may harm the immune system, according to a new peer-reviewed study by Environmental Working Group.

For the study, published this week in the *International Journal of*

*Environmental Research and Public Health*, EWG researchers used data from the Environmental Protection Agency's Toxicity Forecaster, or ToxCast, to assess the [health hazards](#) of the most common chemicals added to [food](#), as well as the "forever chemicals" known as PFAS, which can migrate to food from packaging.

EWG's analysis of ToxCast data showed that the preservative tert-butylhydroquinone, or TBHQ, has been found to harm the immune system both in both [animal tests](#) and in non-animal tests known as high-throughput in vitro toxicology testing. This finding is of particular concern during the coronavirus pandemic.

"The pandemic has focused public and scientific attention on environmental factors that can impact the immune system," said Olga Naidenko, Ph.D., EWG vice president for science investigations and lead author of the new study. "Before the pandemic, chemicals that may harm the immune system's defense against infection or cancer did not receive sufficient attention from [public health](#) agencies. To protect public health, this must change."

## **TBHQ**

TBHQ is a preservative that is pervasive in processed foods. It has been used in foods for many decades and serves no function besides increasing a product's shelf life. Using new non-animal test results from ToxCast, EWG found that TBHQ affected immune cell proteins at doses similar to those that cause harm in traditional studies. Earlier studies have found that TBHQ might influence [how well flu vaccines work](#) and may be linked to a rise in food allergies.

## **PFAS**

Using ToxCast, EWG analyzed all publicly available studies that show how PFAS migrate to food from packaging materials or processing equipment. This is the first known compilation of available research on PFAS migration from packaging to food. In 2017, nationwide tests showed that many fast-food chains used food wrappers, bags and boxes coated with highly fluorinated chemicals.

Human epidemiological studies show that PFAS suppresses immune function and decreases vaccine efficacy. Recently published [research](#) has also found a link between high levels of PFAS in the blood and the severity of Covid-19.

Surprisingly, for most PFAS, the ToxCast results did not match previous animal and human test data. This illustrates the limitations of this new chemical testing method. More research is needed to understand how PFAS harm the immune system.

## **Food Chemicals Regulation**

The Food and Drug Administration's approach to the regulation of food additives does not consider the latest science on the health harms of additives that may be legally added to processed foods manufactured in the U.S. Last year, EWG published Food Additives State of the Science, which highlighted additives known to increase the risk of cancer, harm the nervous system and disrupt the body's hormonal balance.

Chemicals linked to health harms can be legally added to packaged foods because the FDA frequently allows food manufacturers to determine which chemicals are safe. Additives like TBHQ were approved by the FDA decades ago, and the agency does not consider new science to reassess the safety of food chemicals.

"Food manufacturers have no incentive to change their formulas," said

Scott Faber, senior vice president for government affairs at EWG. "Too often, the FDA allows the food and [chemical](#) industry to determine which ingredients are safe for consumption. Our research shows how important it is that the FDA take a second look at these ingredients and test all food chemicals for safety."

## Less Toxic Food Preservatives

Processed foods can be made without these potentially harmful ingredients, so shoppers should read labels carefully. TBHQ is often, though not always, listed on the ingredient label. It will be listed if it has been added to the product during manufacturing. But it can also be used in food packaging, particularly plastic packaging, in which case it may migrate to food.

EWG's Food Scores database helps consumers find products made with healthier alternatives, and our Healthy Living app allows shoppers to scan products while in stores to choose a better option.

EWG recommends that immunotoxicity testing be prioritized for chemicals in food and food contact materials in order to protect public health from their potential harm to the [immune system](#).

EWG also calls on the FDA to close the regulatory loophole that allows potentially unsafe food additives to remain on the market. The FDA should also promptly review additives like TBHQ to reflect new science.

**More information:** Olga V. Naidenko et al. Investigating Molecular Mechanisms of Immunotoxicity and the Utility of ToxCast for Immunotoxicity Screening of Chemicals Added to Food, *International Journal of Environmental Research and Public Health* (2021). [DOI: 10.3390/ijerph18073332](https://doi.org/10.3390/ijerph18073332)

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