



## NEWS

# Food contact chemicals among 921 substances tied to breast cancer risk

Researchers expand list of known substances with characteristics linked to breast cancer by more than four-fold; many are in standard consumer products, including 189 in food contact according to FPF's database on migrating and extractable food contact chemicals (FCCmigex); authors call for improved hazard identification methods, advocate for more comprehensive chemical testing, especially focusing on the mammary gland and broader range of chemicals

🕒 February 1, 2024 👤 Lindsey Parkinson ⌚ 4 minutes

In an [article](#) published on January 10, 2024, in *Environmental Health Perspectives*, Jennifer E. Kay and co-authors from the *Silent Spring Institute* and the *University of California, Berkeley* published a list they developed of over 900 chemicals with evidence that they may increase breast cancer risk.

The researchers reviewed information from "authoritative databases," including *International Agency for Research on Cancer (IARC) Monographs* and the *US Environmental Protection Agency's (EPA) ToxCast* to find which chemicals have been found to induce mammary tumors in rodents. Then they looked at multiple aspects of endocrine activity and genotoxicity of these chemicals to assess the [key characteristics](#) of rodent mammary carcinogens, and to identify other chemicals that exhibit these effects and may, therefore, increase breast cancer risk (FPF [reported](#) also [here](#)).

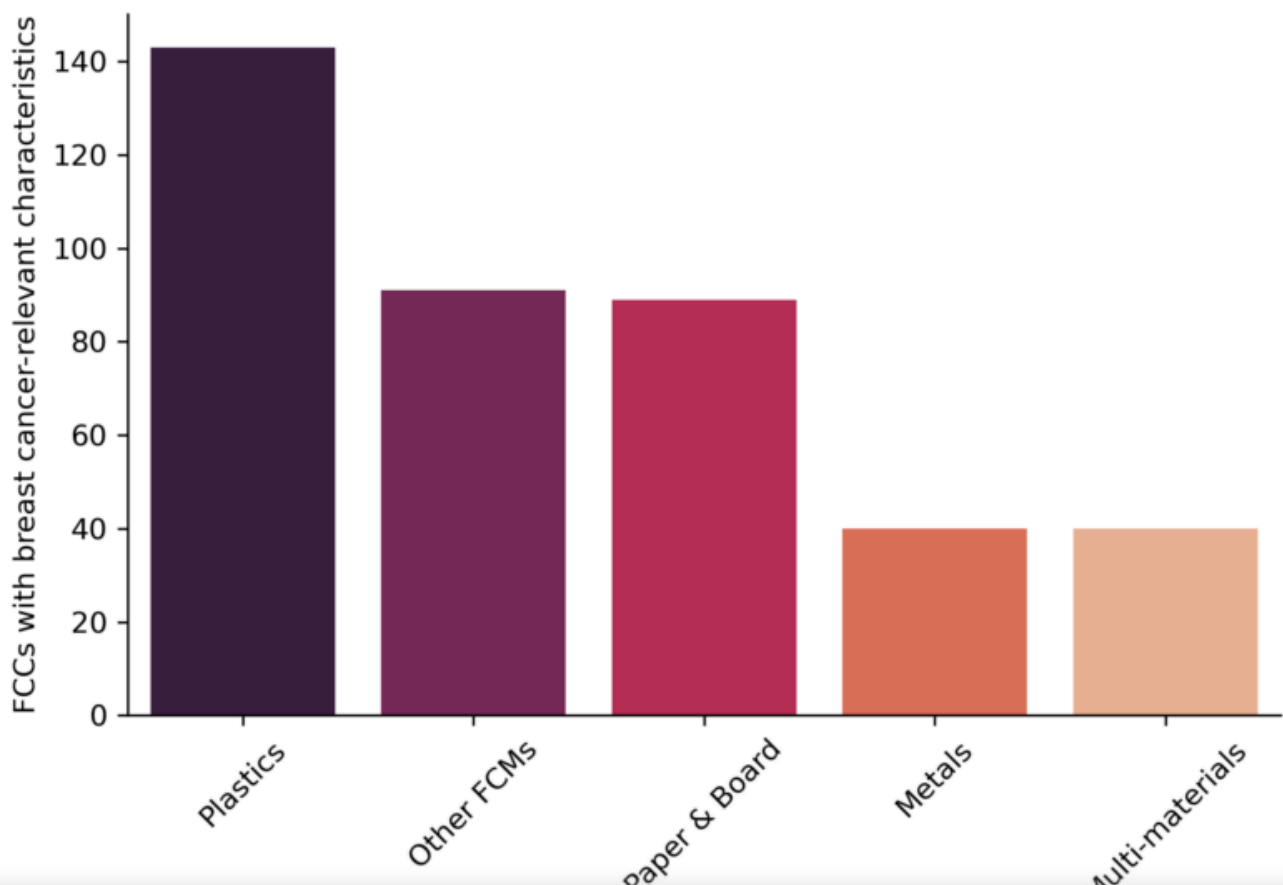
This site uses cookies, including third-party cookies. By accepting, you agree to our use of cookies. [Read More](#)

Settings

Accept All

Of the 921 breast cancer-relevant chemicals found by Kay and co-authors, 189 have been measured in food contact articles according to the *Food Packaging Forum's* database on migrating and extractable food contact chemicals ([FCCmigex](#)). Migration experiments more closely resemble real-use situations but even when limiting FCCmigex results to migration, 121 breast cancer relevant chemicals have still been detected.

Three-quarters of the breast cancer relevant food contact chemicals (FCCs) were detected in food contact articles made with plastic, but all material groups except glass\* contained some of the chemicals (see Figure 1. \*note: some of these chemicals may be in metal closures of glass containers).



This site uses cookies, including third-party cookies. By accepting, you agree to our use of cookies. [Read More](#)

[Settings](#)

[Accept All](#)

assessments focusing on the effects of these compounds on the mammary gland, the development of assays for a broader range of chemicals, and a more comprehensive approach to chemical testing.

*FPF's Chief Scientific Officer, Jane Muncke, together with 20 other scientists recently published a vision for safer food contact materials that discusses some of the same concerns (FPF [reported](#)). Muncke et al. developed the six clusters of disease concept, which highlights prevalent and increasingly concerning non-communicable diseases linked to chemical exposures: cancers, cardiovascular diseases, as well as reproductive, brain-related, immunological, and metabolic disorders. The vision proposes a novel approach for testing FCCs that includes assessing the health impacts of FCCs and real-life mixtures with respect to the most prevalent non-communicable diseases in the human population.*

The ten most-often-detected breast cancer relevant chemicals in food contact articles are (see also Figure 2):

- Di(2-ethylhexyl) phthalate (CAS 117-81-7)
- Dibutyl phthalate (CAS 84-74-2)
- Bisphenol A (CAS 80-05-7)
- Diisobutyl phthalate (CAS 84-69-5)
- Benzophenone (CAS 119-61-9)
- Diethyl phthalate (CAS 84-66-2)
- Benzyl butyl phthalate (CAS 85-68-7)
- Styrene (CAS 100-42-5)
- Dimethyl phthalate (CAS 131-11-3)
- Irganox 1010 (CAS 6683-19-8)

This site uses cookies, including third-party cookies. By accepting, you agree to our use of cookies.  
[Read More](#)

[Settings](#)

[Accept All](#)

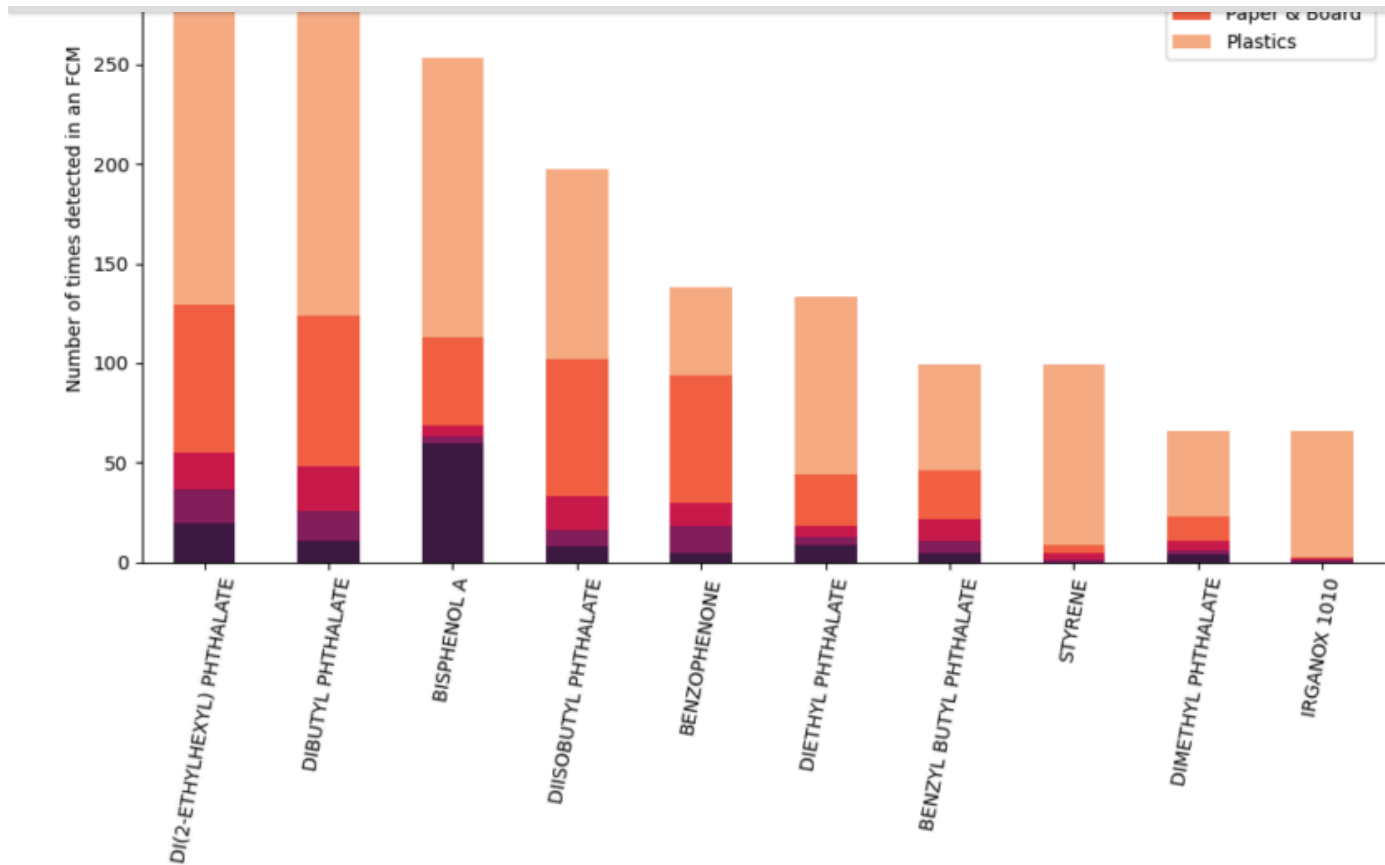


Figure 2. The ten most studied food contact chemicals included in Kay et al.'s list of breast cancer relevant substances. Bars represent the number of times it has been detected in migration or extraction experiments from a food contact article, color represents the material of the article.

Many of these breast cancer-relevant FCCs have been under scrutiny at multiple regulatory jurisdictions in recent months and years. The *European Food Safety Authority* (EFSA) in 2023 lowered the tolerable daily intake for [bisphenol A](#) (BPA) by a factor of 20,000 (FPF [reported](#)). The US *Food and Drug Administration* is expected to make a decision on BPA this year (FPF [reported](#)) while Washington State banned bisphenol-based can liners entirely and has a plan to reduce citizen exposure to [phthalates](#) (FPF [reported](#)). The *European Chemicals Agency* recently expanded its substances of very high concern

This site uses cookies, including third-party cookies. By accepting, you agree to our use of cookies. [Read More](#)

[Settings](#) [Accept All](#)

This concern for chemical testing and regulation is reflected by Kay et al. who “argue that many of these [chemicals] should not be considered low hazard without investigating their ability to affect the breast, and chemicals with the strongest evidence can be targeted for exposure reduction.”

### Reference




Kay, Jennifer E., et al. (2024). “[Application of the key characteristics framework to identify potential breast carcinogens using publicly available \*in vivo\*, \*in vitro\*, and \*in silico\* data.](#)” *Environmental Health Perspectives*. DOI 10.1289/EHP13233

### Read more

Jones, R.R. and A.J. White. (2024). “[New Motivations and Future Directions for Investigating Environmental Risk Factors for Breast Cancer.](#)” *Environmental Health Perspectives*. DOI: 10.1289/EHP13777

Liza Gross (January 10, 2024). “[More Than 900 Widely Used Chemicals May Increase Breast Cancer Risk.](#)” *Inside Climate News*.


### Related articles

-  344 volatile organic compounds in paperboard, new study
-  A novel concept for improved safety assessment of FCMs guided by public health concerns
-  FPF Workshop 2020: Work of IARC explained

This site uses cookies, including third-party cookies. By accepting, you agree to our use of cookies.  
[Read More](#)

[Settings](#)

[Accept All](#)

 *Minderoo Foundation* systematically maps human health effects from plastic-associated chemicals

## Search news articles



## Topics

active packaging   biocides   biomonitoring   bioplastics   bisphenol A   bisphenol S  
chemical analytics   chemicals strategy   china   chronic disease   circular economy  
development   DG SANTE   ECHA   EFSA   endocrine disruptor   EPA  
epidemiology   EU   European Commission   European Parliament   events  
exposure   FDA   fluorinated substances   food   food packaging   glass  
green chemistry   human health   JRC   lead   low dose   metabolic disruptor  
microplastics   migration   mineral oils   mixture toxicity   nanomaterials  
NIAS   non-monotonic dose-response   obesity   paper & board   PET   PFAS  
phthalates   plastics   pollution   prenatal   REACH   recycling  
regulation   reuse   risk assessment   substitution   SVHC  
toxicity testing   TSCA   US   workshop

## ABOUT US

This site uses cookies, including third-party cookies. By accepting, you agree to our use of cookies.  
[Read More](#)

[Settings](#)[Accept All](#)

## ADDRESS

Staffelstrasse 10  
CH-8045 Zurich  
Switzerland

 +41 44 515 52 55

 [info@fp-forum.org](mailto:info@fp-forum.org)



## NEWSLETTER

Receive a monthly summary of the latest news and stay up to date with developments in the field.

Subscribe

## SUPPORT US

to keep Food Packaging Forum's work going

Donate

© 2025 Food Packaging Forum. All rights reserved.

This site uses cookies, including third-party cookies. By accepting, you agree to our use of cookies.  
[Read More](#)

[Settings](#)

[Accept All](#)