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Acrylamide and Cancer Risk

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What is acrylamide?

Acrylamide is a chemical used in industries such as the paper and pulp, construction, foundry, oil drilling, textiles, cosmetics, food processing, plastics, mining, and agricultural industries. It is used in making paper, dyes, and plastics, and in treating drinking water and wastewater.

Acrylamide can be found in small amounts in consumer products including caulk, food packaging, and some adhesives. It is also present in cigarette smoke.

Acrylamide can form naturally from chemical reactions in certain types of starchy foods, after cooking at high temperatures. Some foods with higher levels of acrylamide include French fries, potato chips, foods made from grains (such as breakfast cereals, cookies, and toast), and coffee.

Does acrylamide cause cancer?

In general, the American Cancer Society does not determine if something causes cancer (that is, if it is a carcinogen), but we do look to other respected organizations for help with this. Based on current research, some of these organizations have made the following determinations:

- The [International Agency for Research on Cancer \(IARC\)](#)¹ classifies acrylamide as a “**probable human carcinogen.**”
- The [US National Toxicology Program \(NTP\)](#)² has classified acrylamide as “**reasonably anticipated to be a human carcinogen.**”
- The [US Environmental Protection Agency \(EPA\)](#)³ classifies acrylamide as “**likely to be carcinogenic to humans.**”

It’s important to note that these determinations are based mainly on studies in lab animals, and not on studies of people’s exposure to acrylamide from foods. Since the discovery of acrylamide in foods in 2002, the American Cancer Society, the US Food and Drug Administration (FDA), the World Health Organization (WHO), the European Food Safety Authority (EFSA), and many other organizations have recognized the need for further research on this topic. So far, reviews of studies done in groups of people (epidemiologic studies) suggest that dietary acrylamide isn’t likely to be related to risk for most common types of cancer. But ongoing studies will continue to provide new information on whether acrylamide levels in foods are linked to increased cancer risk.

To learn more about how cancer causes are studied and classified, see [Determining if Something Is a Carcinogen](#)⁴ and [Known and Probable Human Carcinogens](#)⁵.

Are acrylamide levels regulated?

In the United States, the FDA regulates the amount of residual acrylamide in a variety of materials that come in contact with food, but there are currently no regulations on the presence of acrylamide in food itself. In 2016, the FDA issued guidance to help the food industry reduce the amount of acrylamide in certain foods, but these are recommendations, not regulations.

The EPA regulates acrylamide in drinking water. The EPA has set an acceptable level of acrylamide exposure, which is low enough to account for any uncertainty in the data relating acrylamide to cancer and other health effects.

In the workplace, exposure to acrylamide is regulated by the EPA and the Occupational Safety and Health Administration (OSHA).

Can acrylamide be avoided?

For most people, the major potential sources of acrylamide exposure are in certain foods and in cigarette smoke. [Avoiding cigarette smoke](#)⁶ can lower your exposure to this and other harmful chemicals.

It's not yet clear if the levels of acrylamide in foods raise cancer risk, but if you're concerned, there are some things you can do to lower your exposure. In general, acrylamide levels rise when cooking is done for longer periods or at higher temperatures, and when certain types of cooking methods are used (such as frying or roasting). Here are some ways to reduce exposure to acrylamide in foods, according to the FDA:

- Limit foods that might be high in acrylamide, such as potato products (especially French fries and potato chips), coffee, and foods made from grains (such as breakfast cereals, cookies, and toast).
- Limit certain cooking methods, such as frying and roasting, and limit the time certain foods are cooked. Boiling and steaming do not produce acrylamide.
- Soak raw potato slices in water for 15 to 30 minutes before frying or roasting to reduce acrylamide formation during cooking. (Soaked potatoes should be drained and blotted dry before cooking to prevent splattering or fires.)
- If frying potatoes or toasting bread, cook them to a lighter color (as opposed to dark brown), which produces less acrylamide.
- Avoid storing potatoes in the refrigerator, which can result in increased acrylamide levels during cooking.

To learn more

Along with the American Cancer Society, other sources of information about acrylamide include:

Food and Drug Administration Acrylamide Questions and Answers:

www.fda.gov/Food/FoodbornIllnessContaminants/ChemicalContaminants/ucm053569.htm⁷

National Cancer Institute Acrylamide and Cancer Risk: www.cancer.gov/about-cancer/causes-prevention/risk/diet/acrylamide-fact-sheet⁸

Agency for Toxic Substances and Disease Registry ToxFAQs™ for Acrylamide: www.atsdr.cdc.gov/toxfaqs/tf.asp?id=1162&tid=236⁹

European Food Safety Authority (EFSA) EFSA explains risk assessment: Acrylamide in food: www.efsa.europa.eu/en/corporate/pub/acrylamide150604¹⁰

Hyperlinks

1. www.iarc.fr/index.php
2. ntp.niehs.nih.gov
3. www.epa.gov
4. www.cancer.org/cancer/risk-prevention/understanding-cancer-risk/determining-if-something-is-a-carcinogen.html
5. www.cancer.org/cancer/risk-prevention/understanding-cancer-risk/known-and-probable-human-carcinogens.html
6. www.cancer.org/cancer/risk-prevention/tobacco.html
7. www.fda.gov/Food/FoodborneIllnessContaminants/ChemicalContaminants/ucm053569.htm
8. www.cancer.gov/about-cancer/causes-prevention/risk/diet/acrylamide-fact-sheet
9. www.atsdr.cdc.gov/toxfaqs/faq.asp?id=1162&tid=236
10. www.efsa.europa.eu/en/corporate/pub/acrylamide150604

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International Agency for Research on Cancer. *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Volume 60: Some Industrial Chemicals*. 1994.

Accessed at <https://monographs.iarc.fr/wp-content/uploads/2018/06/mono60-16.pdf> on October 10, 2018.

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