

A Lawsuit Claims Skittles Are Unfit for Consumption. Experts Weigh In.

They contain the food additive titanium dioxide, which is in thousands of food products. Here's what we learned about its safety.

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If you've been paying attention to nutrition headlines lately, you may have noticed a recent lawsuit that claimed that Skittles — the colorful candies of “taste the rainbow” fame — were “unfit for human consumption” because of the presence of a “known toxin” called titanium dioxide.

The class-action lawsuit, filed July 14 in the United States District Court for the Northern District of California, said that Mars Inc., the maker of the candies, had “long known of the health problems” the chemical compound posed, and that it had even publicly committed in 2016 to phase the substance out of its products. Yet, according to the complaint, the candy company “flouted its own promise to consumers” and continued to sell Skittles with titanium dioxide, posing a “significant health risk to unsuspecting consumers.”

But what is titanium dioxide, exactly? And should you be concerned about it in your candy — or in any other food, for that matter? Here's what we know.

What is titanium dioxide?

Titanium dioxide is a chemical compound, derived from a naturally occurring mineral, that is processed and used as a color additive, anti-caking agent and whitener, among other things, in thousands of food products across a range of categories. These include many chewing gums, baked goods, sandwich spreads, salad dressings and dairy products like cottage cheese, ice cream and coffee creamers, said Tasha Stoiber, a senior scientist at the Environmental Working Group, a nonprofit focused on consumer health and safety.

Sweet treats and candies also make up a large share of food products that contain the substance. One recent E.W.G. review concluded that “thousands of children's sweets,” including Starburst and other candies marketed to kids, contained it.

Titanium dioxide is also used in a variety of nonfood items, such as certain medications, sunscreens, cosmetics, paints and plastics.

Is it safe to eat?

It depends on whom you ask. Since 1966, the Food and Drug Administration has recognized the use of titanium dioxide in human food as safe, so long as it doesn't exceed 1 percent of the food's weight.

But despite its widespread use, studies published since the 1960s have raised questions about its safety. A 2015 review of mostly animal (but some human) studies, for instance, found that titanium dioxide did not just pass through the body, as research in the 1960s suggested. Instead, the researchers found, the additive could be absorbed into the bloodstream via the intestines and accumulate in certain organs, potentially damaging the spleen, liver and kidneys.

A subsequent animal study published in 2017 linked titanium dioxide with an increased risk of intestinal inflammation, cancer and damage to the immune system. This research was concerning enough that in 2019, the French government called for a ban of titanium dioxide by 2020.

And in 2021, another review of animal and human studies raised the possibility that titanium dioxide could play a role in inflammatory bowel diseases and colorectal cancer.

This year, after an assessment of the scientific literature by the European Food Safety Authority, the European Union decided to ban titanium dioxide in food. The agency highlighted its concern that the additive could damage DNA and lead to cancer. While more research is still needed, the agency concluded that it could not establish a safe level of titanium dioxide in food.

Britain and Canada, however, disagreed with the European Union's decision and continued to allow titanium dioxide in food.

Norbert Kaminski is a professor of pharmacology and toxicology and the director of the Center for Research on Ingredient Safety at Michigan State University whose own animal research on titanium dioxide has been partially funded by industry groups such as the Titanium Dioxide Manufacturers Association and the International Association of Color Manufacturers. He said that the studies used to

justify banning the ingredient in the European Union contained methodology flaws. He added that a 1979 study by the National Toxicology Program, part of the National Institutes of Health, found no link between titanium dioxide and cancer. In that research, mice and rats were given the chemical compound in extremely large doses — amounting to 2.5 to 5 percent of their diet — across two years.

In response to a request for comment, an F.D.A. official said that the agency has reviewed the findings of the European Union's ban and concluded that the available studies "do not demonstrate safety concerns connected to the use of titanium dioxide as a color additive."

But Pierre Herckes, a professor of chemistry at the School of Molecular Sciences at Arizona State University who was an author of a 2014 study on titanium dioxide, said that based on the current research, which is mixed, it's tricky to say whether consumers should limit their consumption of the additive. "I don't have a clear yes or no," he said.

Dr. Herckes did say, however, that given that sweet treats and candies contain some of the highest levels of titanium dioxide and are mostly consumed by children, there is reason for concern, given their smaller bodies and higher relative doses. "If there is damage to the DNA, classical carcinogenicity, that is cumulative over time. When you are exposed to that in the younger years, it can hit you in later years," he said.

What can I do if I want to avoid it?

While Mars Inc. is in the process of phasing out titanium dioxide in its products sold in Europe, the company has yet to take action in the United States, where titanium dioxide is still permitted.

In an emailed statement to The Times, Justin Comes, vice president of research and development at Mars Wrigley North America, said that the company's use of titanium dioxide "is in full compliance with government regulations. While we do not comment on pending litigation, all Mars Wrigley ingredients are safe and manufactured in compliance with strict quality and safety requirements established by food safety regulators, including the F.D.A."

Mars Inc. did not respond when asked if it planned to remove the additive from its products sold in the United States.

Jaydee Hanson, policy director for the nonprofit Center for Food Safety, said that he was baffled as to why the company wasn't removing titanium dioxide from the U.S. market. "Maybe because the F.D.A. has not told them they're going to ban it," he said.

Scott Faber, senior vice president of government affairs at the Environmental Working Group, said that steering clear of the additive could be difficult, since food companies aren't required to include it on their ingredient lists, and not all companies do. The chemical compound may be especially hard to avoid in processed foods that might simply state "color added" rather than list the specific ingredients used.

Your best bet, then, for limiting your consumption of titanium dioxide is to choose products that don't contain added coloring. Or you could stick to eating unprocessed, whole or organic foods when you can, said Marion Nestle, a professor emeritus of nutrition, food studies and public health at New York University.

Dr. Nestle noted that food additives like titanium dioxide were generally used to make "junk food look healthy and taste better." She added that "those are not foods that a nutritionist would be likely to recommend except in very small quantities."

The larger issue, though, Dr. Nestle said, is that the F.D.A. does not have the staff or the funds to do the necessary scientific review of this additive or countless others that are in our food supply.

The agency has long needed to review the thousands of food additives that it deemed safe decades ago, based on research that was typically provided by the industry or based on no research at all, Mr. Faber added.

"Titanium dioxide is really the poster child for many chemicals that were reviewed, in some cases, more than 50 years ago for safety by the F.D.A. and haven't been reviewed since," he said. "So titanium dioxide is part of a bigger story about regulatory failure."

That's why legislators have introduced bills that would require the F.D.A. to better ensure the safety of chemicals before they are added to food and to regularly assess them for safety. Barring that, it's left up to each food company to decide if it will include additives like titanium dioxide in their products, just as it's up to individual consumers to decide if they will eat them.

As for Skittles in particular, Dr. Nestle said that since there are suspicions that the additive may be carcinogenic, "Mars should take it out. They shouldn't be using it." She added, "Why take a chance?"

Should this affect your choices in the supermarket? And will this affect the outcome of the lawsuit against Mars Inc.? It seems that the jury is still out.