

The FDA Bans Popular Food Coloring Red Dye No. 3

Analysis by [Dr. Joseph Mercola](#)

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STORY AT-A-GLANCE

- › The FDA has banned Red Dye No. 3 in food and drugs, with deadlines of January 2027 for foods and January 2028 for medications. This follows California's earlier ban in 2023
- › The ban is based on the Delaney Clause from 1960, triggered by studies showing cancer in male rats, though the FDA notes the specific mechanism doesn't affect humans
- › Research indicates Red Dye No. 3 disrupts thyroid hormone regulation, promotes thyroid tumor formation and impacts brain function through increased oxidative stress and neuroinflammation
- › Over 8,000 products contain Red Dye No. 3, including candies, sodas, baked goods and medications. The dye is also known as erythrosine, FD&C Red No. 3 or E127
- › Manufacturers are turning to alternatives like Red Dye No. 40 or natural colorings from carmine, beetroots and anthocyanins, though these changes increase production costs

Walking down the various grocery aisles, you've undoubtedly noticed bright red candies, colorful sodas and even pink-tinted medicines on store shelves for years. Many of these products owe their eye-catching color to a substance called Red Dye No. 3. It has been one of the most popular artificial colorings in the food world, often found in sugary treats and drinks. But now, it's been banned by the U.S. Food and Drug Administration (FDA).

Red Dye No. 3 Now Banned in the US

According to a Good Housekeeping report,¹ Red Dye No. 3 has played a big part in the way different foods have looked and appealed to buyers for decades. But despite its staying power, the FDA has decided that products containing this chemical will no longer be sold past the deadline they set, which is January 15, 2027, for foods, and January 18, 2028, for medicines.

This FDA ban is part of a paradigm shift in how synthetic colors are regulated. In fact, the momentum has been growing since the 1960s, when Red Dye No. 3 first went through its safety checks. In 2023, California was the first state to prohibit the sale of products containing this dye, following the standards set by the European Union and other countries such as Australia and New Zealand.²

A key part of the FDA's ban is an older legal rule known as the Delaney Clause. It was created back in 1960 to stop any additive found to cause cancer in animals or humans from ending up in the food supply. Think of it as a safety net that steps in when an ingredient crosses a specific line in lab studies. For context, here's the FDA's announcement:³

"The FDA is amending its color additive regulations to no longer allow for the use of FD&C Red No. 3 in food and ingested drugs in response to a 2022 color additive petition. The petition requested the agency review whether the Delaney Clause applied and cited, among other data and information, two studies that showed cancer in laboratory male rats exposed to high levels of FD&C Red No. 3 due to a rat-specific hormonal mechanism.

The way that FD&C Red No. 3 causes cancer in male rats does not occur in humans. Relevant exposure levels to FD&C Red No. 3 for humans are typically much lower than those that cause the effects shown in male rats. Studies in other animals and in humans did not show these effects; claims that the use of FD&C Red No. 3 in food and in ingested drugs puts people at risk are not supported by the available scientific information.

The Delaney Clause, enacted in 1960 as part of the Color Additives Amendment to the FD&C Act, prohibits FDA authorization of a food additive or color additive

if it has been found to induce cancer in humans or animals.

This is not the first time the agency revoked an authorization based on the Delaney Clause. For example, in 2018, the FDA revoked the authorization for certain synthetic flavors based on the Delaney Clause in response to a food additive petition.”⁴

Red Dye No. 3 has actually been under debate for a long time, especially because it was banned in cosmetics and topical drugs back in 1990. If this is the case, why has this chemical been used in food and drugs for two more decades? While the FDA hasn't provided any answer regarding this question, they eventually decided to bring the food and drug uses into line.⁵

What Published Research Says About Red Dye No. 3

Per the FDA's announcement, animal studies have been a main driver of the new ban. The experiments showed a link between high doses of Red Dye No. 3 and cancer in male lab rats. While the FDA's announcement didn't cite the studies they mentioned, other researchers have already compiled the research for consumers.

In a report in *The Conversation*, Lorne Hofseth, an associate dean for research at the College of Pharmacy at the University at South Carolina, noted that Red Dye No. 3 causes the following:⁶

- **Disrupts thyroid hormone regulation** — The dye inhibits your body's ability to absorb iodine, which is vital for synthesizing thyroid hormones. It also blocks an important enzyme for transforming one thyroid hormone into a new one, thus resulting in thyroid dysfunction.
- **Promotes thyroid tumor formation** — Hofseth cited animal studies showing that Red Dye No. 3 enlarged the thyroid glands, which resulted in abnormal hormone regulation.^{7,8,9,10}
- **Impacts brain function** — Exposure to Red Dye No. 3 impacts brain function in multiple ways, such as increasing oxidative stress,¹¹ thus damaging tissue. In

addition, the dye creates neuroinflammation, leading to neuronal damage.¹² It's also been shown to interact with amyloid-beta peptides, which are linked to Alzheimer's disease.¹³

Red Dye No. 3 is listed under different names, such as “erythrosine” or “FD&C Red #3.” No matter which name appears, the substance all comes from the same source. It is a synthetic dye, which means it is made from a lab – not grown like natural plant-based pigments. In fact, Red Dye No. 3 is typically made from a petroleum base, and it was developed decades ago to give foods a distinctive cherry color that catches your attention whenever you stroll down the snack aisle.

This bright color is one reason so many brands chose it to make sweets or fruit-flavored treats look more enticing to consumers. Approval processes for additives did exist back when it was first approved, but they often measured acute risks and did not look as deeply at long-term exposure in the way experts do now.

While Red Dye No. 3's cancer potential is a new development, the impact of artificial colors on humans in general has been studied as well. Take for example a 2022 meta-analysis published in Environmental Health. According to the researchers, intake of synthetic food dyes impact behavior in children:¹⁴

“We conducted a hazard characterization of the potential neurobehavioral impacts of food dye consumption. We identified 27 clinical trials of children exposed to synthetic food dyes in this review, of which 25 were challenge studies.

All studies used a cross-over design and most were double blinded and the cross-over design was randomized. Sixteen (64%) out of 25 challenge studies identified some evidence of a positive association, and in 13 (52%) the association was statistically significant.

These studies support a relationship between food dye exposure and adverse behavioral outcomes in children. Animal toxicology literature provides additional support for effects on behavior. Together, the human clinical trials

and animal toxicology literature support an association between synthetic food dyes and behavioral impacts in children.”

The Ban Impacts a Wide List of Products

If you regularly enjoy bright red treats, you have likely already seen companies start moving away from Red Dye No. 3. The new ban, however, creates an official deadline. As noted earlier, food and drug manufacturers have until January 2027 and 2028 to get rid of the dye in their products, and many are finding new colorants to replace it. But where are they found in the first place?

According to a report from Bored Panda, products such as cakes, fruit cocktails, sausages, bacon bits and strawberry-flavored desserts typically contain Red Dye No. 3.¹⁵ In addition, baking mixes, cereals, soda, cookies, biscuits, ice cream and seasoning mixes contain this toxic dye.¹⁶ If you’re looking for specific products, the table below lists some examples:^{17,18}

Pez	Ring pops
Brach’s candy corn	Safeway’s Select peppermint ice cream
Nerds Bomb Pops	Target’s Favorite Day Valentine’s Day cupcakes
Walmart’s Freshness Guaranteed heart sugar cookies	Nesquik strawberry-flavored low-fat milk
Vigo yellow rice	Jack Link’s beef and cheddar sticks
Betty Crocker pasta salads	Publix mixed fruit products
Kroger Extra Cherry canned fruit	Ensure Original Strawberry Nutrition Shake

The table above is an extremely small list of foods that contain Red Dye No. 3. In reality, there are more than 8,000 products that have it, so I can't list them all. Instead, I encourage you to visit the U.S. Department of Agriculture's (USDA) FoodData Central Food Search to get the full list.

For your convenience, [click on this link](#). I've set the search parameters to list ALL products currently sold in the U.S. and Canada. You can narrow down your search further by looking at any red-colored foods you have at home, then entering the name in the USDA's search bar.

Remember that medications are also covered under the FDA's ban to remove the dye. A pill's color helps people distinguish one drug from another, and some companies use it to create brand recognition. Examples of drugs that contain this dye include:¹⁹

- Omeprazole
- Vyvanse
- Phentermine
- Gabapentin
- Acetaminophen

Red Dye No. 40 – A Legal Replacement to Red Dye No. 3

So, what's next for companies because of the ban? Some large brands plan to use Red 40, which is another widely used artificial dye, while others are experimenting with natural food coloring compounds to get that pop of color. According to a report from CNET:²⁰

“Givaudan Sense Colour, a manufacturing company that creates natural food and drink colorings, highlighted three possible alternatives to Red No. 3. They

include carmine, which is actually made from bugs; betacyanins, found in beetroots; and anthocyanins, derived from fruits and vegetables.

As for alternative synthetic dyes, Red 40, which is not banned by the FDA, can also help achieve a bright red color, so it is also a possible alternative that manufacturers will choose.”

In addition to Red Dye No. 40, there are other food dyes that are currently approved by the FDA, including FD&C Blue No. 1, FD&C Blue No. 2, FD&C Green No. 3, Orange B, Citrus Red No. 2, FD&C Red No. 40, FD&C Yellow No. 5 and FD&C Yellow No. 6. However, while legal, you still need to watch out for them:²¹

“According to the FDA, the above dyes do not pose the same possible risks as Red No. 3, which is why they are still available for use in the US. But, some studies show possible links between certain dyes and potential health conditions. For example, some studies have linked Red 40 to hyperactivity, according to the Cleveland Clinic, but further studies are still needed to determine a direct link between the dye and the condition.”

Unsurprisingly, the ban will now shift the discussion to new questions about other artificial dyes still approved by the FDA. As noted by the CNET report, some of those dyes have their own sets of consumer concerns, which need to be looked into.

As for the manufacturers, the change will affect their production costs and consumer satisfaction. For example, a brand will worry that beet extracts will change how a candy tastes, or that it might darken a soda in an unexpected way. As a shopper, this will likely cause higher prices because natural color sources are more expensive or less stable. But if the Red Dye No. 3 ban will create safer, more transparent food labels, protecting consumer health will be worth the price adjustment.

Don't Wait for the Ban to Take Effect

While the ban will take place in 2027 and 2028, there's plenty of time for you to get a head start. One way to do this is by reading labels more carefully.

Red Dye No. 3 is often clearly listed among the ingredients, but it shows up under different names – Red #3, FD&C Red No. 3, erythrosine or E127. If you see any of those on your snacks, it's better to throw them away and look for organic alternatives from sustainable, responsible companies that greatly emphasize their consumer's health.

Ultimately, I encourage you to go for fresh, whole foods whenever possible. By doing this, you get used to flavors that do not need bright dyes or refined sugar to satiate your appetite. Over time, your taste buds will adjust, and you'll come to appreciate the wonderful flavors of a simple fruit salad or a homemade, organic smoothie, which are more satisfying than food artificially dyed red with a petroleum-based ingredient.

Sources and References

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- ^{3, 4} [FDA, January 15, 2025](#)
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