



Health / [A Third Of Chocolate Products Are High In Heavy Metals, CR's Tests Find](#)

# A Third of Chocolate Products Are High in Heavy Metals, CR's Tests Find

Brownie mixes, chocolate chips, hot cocoa, and more contained concerning levels of lead or cadmium. Here's how to eat the treats safely.

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Photo Illustration: Chris Griggs/Consumer Reports, Getty Images

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**W**ith the holiday season approaching, many of us will be indulging in a favorite treat: chocolate. Yet despite dark chocolate's reputation as a healthier sweet, it can also be contaminated with lead and cadmium, two heavy metals linked to serious health problems, as many people learned from Consumer Reports' testing last year.

Now CR has the results of our new tests on heavy metal levels in other kinds of chocolates and foods made with it.

Hershey: Get the Lead Out of Chocolate

Our tests found several Hershey's products have concerning levels of lead. Tell the company to commit to reducing heavy metals in its products! [Read the full petition.](#)

Sign The Petition

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In chocolate products, the lead and cadmium are concentrated in the cocoa (or cacao), the ingredient that gives chocolate its distinctive flavor. Dark chocolate tends to have higher levels of cacao. But other chocolate products contain cacao, too, in varying quantities—from cocoa powder, which is essentially pure cocoa, to milk chocolate, which can have very little.

CR's experts wanted to see whether other cacao-containing foods posed a risk, so we tested 48 different products in seven categories—cocoa powder, chocolate chips, milk chocolate bars, and mixes for brownies, chocolate cake, and hot chocolate. We also added a few more dark chocolate bars to our test. Products came from big name brands such as Hershey's, Ghirardelli, and Nestlé; national retailers like Costco, Target, Trader Joe's, Walmart, and Whole Foods; and specialty makers such as Droste and Navitas.

As expected, dark chocolates tended to have higher levels of heavy metals and milk chocolate lower. "But every product we tested had detectable amounts of lead and cadmium," says James E. Rogers, PhD, director and acting head of product safety testing at CR. "Sixteen of the 48 products had amounts above CR's levels of concern for at least one of the heavy metals—in some cases more than twice our limit—but we did find safer options in each category of chocolate products."

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## Heavy Metals in Chocolate

Heavy metals can be found in many foods—such as arsenic in rice, mercury in some types of fish, cadmium in spinach, and lead in carrots and sweet potatoes. And you can also be exposed through drinking water or your environment (such as lead paint in your house). All these sources can add up, so it is important to be aware of different pathways that contribute to your overall heavy metal intake. Chocolate may just be one of a number of contributing factors to overall heavy metal levels, but it's a popular treat eaten by children and adults and not an essential part of a someone's diet. So it makes sense to try to limit the amount of heavy metals people get from chocolate.

Exposure to heavy metals is of greatest concern in children and during pregnancy, because they can damage the brain and nervous system, causing developmental delays, learning and behavior problems, and more. But adults can also experience negative effects. For example, frequent lead exposure has been linked to [immune system suppression](#), reproductive issues, kidney damage, and hypertension.

Lead and cadmium are the two heavy metals that CR's tests have found to be the most problematic in chocolate. Research indicates that [lead and cadmium get into cocoa in different ways](#). For cadmium, it appears that the cocoa plant takes it up from the soil. Lead, however, can be deposited on the cocoa beans after harvest, potentially from dust and soil as beans dry outdoors. These metals are both found in the cocoa solids—which, along with cocoa butter, make up cacao. That's why products rich in cocoa solids, such as dark chocolate and cocoa powder, tend to be higher in heavy metals.

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# How CR Tested Chocolate Products

We measured the amount of lead, cadmium, mercury, and arsenic in three samples of each food and averaged the results. None of the products posed a risk of arsenic or mercury exposure.

To assess the risk from lead and cadmium, we looked at whether a serving of each product would expose someone to California's standard maximum allowable dose levels (MADL) for lead (0.5 micrograms per day) and cadmium (4.1 mcg per day) in food. Note that as part of a settlement to a lawsuit currently in place brought by As You Sow, an organization that pushes for corporate accountability, the vast majority of chocolate products sold in the state are subject to less stringent standards, while companies work to reduce the levels of metals in their chocolate products.

CR's scientists measured heavy metal content against California's standard levels because there are no federal limits for the amount of lead and cadmium most foods can contain, and they believe that California's standard levels are the most protective available. However, our tests are not assessments of whether a product exceeds California's or any other legal standard—they are meant to indicate which products had comparatively higher levels of heavy metals.

Our results are shown by category in the charts in each section below. We list the percentages of the standard MADL levels for lead and cadmium supplied in one serving of the foods. While both heavy metals increase the risk of serious health problems, products within each category are listed in order of lead level, because that heavy metal poses particular concerns and no amount of it is considered safe.

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## Dark Chocolate

When we tested dark chocolate bars last year, we found lead or cadmium levels above CR's thresholds in 23 of 28 bars, or 82 percent of them. Our results this time were similar. Of the seven bars we tested, five, or 71 percent, were above our levels for lead, cadmium, or both.

Two bars—Divi... 70% Deliciously Smooth Dark Chocolate and Sam's Choice (Walmart) Dark Chocolate 85% Cocoa—fell below CR's levels for both lead and cadmium, based on a serving of about 1 ounce. (The following bars also came in below our thresholds when we tested them last year: Ghirardelli Intense Dark Chocolate 86% Cacao, Ghirardelli Intense Dark Chocolate Twilight Delight 72% Cacao, Mast Organic Dark Chocolate 80% Cocoa, Taza Chocolate Organic Deliciously Dark Chocolate 70% Cacao, and Valrhona Abinao Dark Chocolate 85% Cacao.)

Eating an ounce of four others would put you over our limit for lead. The Perugina Premium Dark Chocolate bars had the highest amounts. One of the four, Evolved Signature Dark 72% Cacao Chocolate Bar was high in both lead and cadmium. Another bar, Sam's Choice Dark Chocolate 72% Cocoa, was high in cadmium only.

Nestlé, which owns Perugina, told CR, "We apply strict standards to ensure our products are high quality and comply with all applicable regulatory requirements, including limits for cadmium and lead." And Rick Gusmano, co-founder of Evolved Chocolate, said the company's chocolate products fall well below levels set in the As You Sow settlement and that the company "regularly tests raw materials and finished goods to ensure compliance and, ultimately, consumer safety." Other makers of dark chocolate with high levels of lead or cadmium did not respond to a request for comment.

# Dark Chocolate Results

Based on the manufacturer's recommended serving size of about 1 ounce.  
Ordered from lower to higher lead level.

Below 100% of CR's levels

Above 100% of CR's levels

## Sam's Choice (Walmart)

Dark Chocolate 72%  
Cocoa

LEAD  
36%  
CADMIUM  
118%

## Sam's Choice (Walmart)

Dark Chocolate  
85% Cocoa

LEAD  
43%  
CADMIUM  
99%

## Divine

70% Deliciously  
Smooth Dark  
Chocolate

LEAD  
80%  
CADMIUM  
41%

## Divine

85% Exquisitely  
Smooth Dark  
Chocolate

LEAD  
120%  
CADMIUM  
56%

## Evolved

Signature Dark 72%  
Cacao Chocolate  
Bar

LEAD  
236%  
CADMIUM  
149%

## Perugina

70% Premium Dark  
Chocolate

LEAD  
314%  
CADMIUM  
82%

## Perugina

85% Premium Dark  
Chocolate

LEAD  
539%  
CADMIUM

CADMIUM  
68%

# Milk Chocolate

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Milk chocolate tends to be lower in heavy metals than dark chocolate because it has less cocoa solids. And in fact none of the five milk chocolate bars in our tests were over CR's limit for either heavy metal. Hershey's Milk Chocolate bar had the most lead, reaching 67 percent of CR's limit. Feastables Mr. Beast Bar Milk Chocolate, with 80 percent of CR's limit, had the most cadmium per serving. Lindt Classic Recipe Milk Chocolate Bar was the lowest overall, with one serving (about 1 ounce) containing 11 percent of the daily maximum amount of lead and 13 percent of the daily cadmium limit.



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# Milk Chocolate Results

Based on the manufacturer's recommended serving size of about 1 ounce.  
Ordered from lower to higher lead level.

Low 100% of CR's levels

Above 100% of CR's levels

Lindt

Classic Recipe Milk  
Chocolate Bar

LEAD

11%

CADMIUM

13%

Feastables

Mr. Beast Bar Milk  
Chocolate

LEAD

36%

CADMIUM

80%

365 Whole  
Foods Market

Organic Milk  
Chocolate

LEAD

37%

CADMIUM

40%

Chocolove

Milk Chocolate

LEAD

55%

CADMIUM

8%

Hershey's

Milk Chocolate Bar

LEAD

67%

CADMIUM

31%



# Chocolate Chips

None of these 12 products had high levels of cadmium, and only two—Hu Dark Chocolate Gems and Good & Gather (Target) Semi-Sweet Mini Chocolate Chips—were over CR’s limit for lead.

But there’s a caveat: The serving size for chocolate chips is just around ½ ounce (about 1 tablespoon)—the amount you might expect to get in a cookie or two, depending on the size of the cookie. If you’re the type that likes to eat more than a few cookies, or a handful of chips straight out of the bag, with many of these you could exceed the daily limits for both cadmium and lead by eating just two servings. Some good options for snacking that are relatively low in both heavy metals are 365 Whole Foods Market Semi-Sweet Chocolate Baking Chips, Kirkland Signature Semi-Sweet Chocolate Chips, and Nestlé Toll House Semi-Sweet Morsels.

A spokesperson for Hu told CR that our test results were in line with the company’s own testing, but added that those levels fall far below those set in the As You Sow lawsuit settlement. Target did not respond to a request for comment.

# Chocolate Chip Results

Based on the manufacturer's recommended serving size of 1 tablespoon.  
Ordered from lower to higher lead level.

Below 100% of CR's levels

Above 100% of CR's levels

## Ghirardelli

Premium Baking  
Bittersweet  
Chocolate Chips  
60% Cocoa

LEAD  
29%  
CADMIUM  
57%

## Nestlé

Toll House Semi-  
Sweet Morsels

LEAD  
36%  
CADMIUM  
37%

## 365 Whole Foods Market

Semi-Sweet  
Chocolate Baking  
Chips

LEAD  
46%  
CADMIUM  
24%

## Lily's

Semi-Sweet Style  
Baking Chips

LEAD  
46%  
CADMIUM  
45%

## Kirkland Signature (Costco)

Semi-Sweet  
Chocolate Chips

LEAD  
48%  
CADMIUM  
11%

## Enjoy Life

Semi-Sweet Mini  
Chips

LEAD  
49%  
CADMIUM  
36%

## Great Value (Walmart)

Mini Semi-Sweet  
Chocolate Chips

LEAD  
50%

## Hershey's

Special Dark  
Chocolate Chips

LEAD  
65%  
CADMIUM

# Cocoa Powder

Cocoa powder is almost all cocoa solids, so you might expect that most would be too high in lead and cadmium, even in small amounts. But none of those we tested were high in cadmium, and only two had high levels of lead.

Most of the cocoa powders in our tests were natural-style—the kind most commonly available in the U.S.—and of those, a serving (1 tablespoon) of Hershey's Cocoa Naturally Unsweetened 100% Cacao exceeded our lead limit.

Droste Cacao Powder was the only Dutch processed cocoa in our tests. This type of cocoa is alkalized to give it a less bitter taste. It was also the highest in lead of any product in our tests, supplying 324 percent of CR's limit.

The best cocoa powder overall was Navitas Organics Organic Cacao Powder, which reached 77 percent of CR's lead limit and 17 percent of the cadmium limit. Navitas has a third party test all finished products for heavy metals to ensure low levels, according to the [company website](#).

Neither Droste nor Hershey responded to a request for comment.

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# Cocoa Powder Results

Based on the manufacturer's recommended serving size of 1 tablespoon.  
Ordered from lower to higher lead level.

Low 100% of CR's levels

Above 100% of CR's levels

Novitas  
Organics  
Organic Cacao  
Powder

LEAD  
77%  
CADMIUM  
17%

Nestlé  
Toll House 100%  
Pure Cocoa

LEAD  
77%  
CADMIUM  
66%

BetterBody  
Foods  
Organic Cacao  
Powder

LEAD  
95%  
CADMIUM  
95%

365 Whole  
Foods Market  
Organic Cocoa  
Powder

LEAD  
97%  
CADMIUM  
93%

Hershey's  
Cocoa Naturally  
Unsweetened 100%  
Cacao

LEAD  
125%  
CADMIUM  
18%

Droste  
Cacao Powder

LEAD  
324%  
CADMIUM  
41%



# Hot Chocolate Mixes

These mixes contain cocoa powder plus sugar and other ingredients, so we expected that they would be relatively low in lead and cadmium. That's not what we found. Four of the six mixes we tested exceeded our lead limit: Great Value (Walmart) Milk Chocolate Flavor Hot Cocoa Mix, had the highest levels, with mixes from Trader Joe's and Nestlé (which also makes hot chocolate mix for Starbucks), above CR's cutoff.

The Nestlé spokesperson said that the company stands by the safety of its products and that it works with its "suppliers on an ongoing basis to closely monitor and minimize the presence of these substances in our foods as much as possible." Other makers of hot chocolate with high levels of lead did not respond to requests for comment.

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# Hot Chocolate Results

Based on each manufacturer's recommended serving size, which varies, as shown below.  
Ordered from lower to higher lead level.

Low 100% of CR's levels

Above 100% of CR's levels

## Ghirardelli

Premium Hot Cocoa Mix

Serving size: 3 Tbsp.

LEAD

76%

CADMIUM

17%

## Swiss Miss

Milk Chocolate Flavor Hot Cocoa

Serving size: 1 envelope

LEAD

80%

CADMIUM

13%

## Nestlé

Rich Milk Chocolate Flavor Hot Cocoa Mix

Serving size: 1 Tbsp.

LEAD

108%

CADMIUM

10%

## Trader Joe's

Organic Hot Cocoa Mix

Serving size: 1 envelope

LEAD

112%

CADMIUM

88%

## Starbucks

Hot Cocoa Classic

Serving size: 1 envelope

LEAD

159%

CADMIUM

44%

## Great Value (Walmart)

Milk Chocolate Flavor Hot Cocoa Mix

Serving size: 3 Tbsp.

LEAD

345%

CADMIUM

13%

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# Brownie and Cake Mixes

These products fared well overall in our tests. None were high in cadmium, and just one brownie mix and two cake mixes exceeded CR's lead limits—one by quite a bit. One serving of Bob's Red Mill Gluten Free Chocolate Cake Mix had 216 percent. The heavy metal levels refer to the amounts of the mix that are in one serving of the finished cake or brownie. (We list the number of servings each mix makes in the charts below.)

However, the serving sizes are small. For instance, Duncan Hines Devil's Food Cake mix makes a cake that the manufacturer says will serve 10. The company's Double Fudge Brownie mix makes 20 servings. If your cake or brownie portions are more generous, keep in mind that you'll be getting more lead and cadmium than we list here.

Bob's Red Mill, Simple Mills, and Ghirardelli did not respond to requests for comment.



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# Brownie Mix Results

Based on each manufacturer's recommended serving size, which varies. Servings per package listed below.

Ordered from lower to higher lead level.

Below 100% of CR's levels

Above 100% of CR's levels

## Betty Crocker

Fudge Brownie Mix

18 servings per box

LEAD

34%

CADMIUM

13%

## Annie's

Organic Double  
Chocolate Brownie  
Mix

16 servings per box

LEAD

47%

CADMIUM

61%

## Duncan Hines

Dark Chocolate  
Fudge Brownie Mix

20 servings per box

LEAD

70%

CADMIUM

43%

## Miss Jones Baking Co

Brownie Double  
Chocolate Baking  
Mix

16 servings per package

LEAD

76%

CADMIUM

36%

## Krusteaz

Gluten Free Double  
Chocolate Brownie  
Mix

16 servings per box

LEAD

94%

CADMIUM

24%

## Ghirardelli

Premium Brownie  
Mix Double  
Chocolate

16 servings per box

LEAD

108%

CADMIUM

37%

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# Cake Mix Results

Based on each manufacturer's recommended serving size, which varies. Servings per package listed below.

Ordered from lower to higher lead level.

Below 100% of CR's levels

Above 100% of CR's levels

Cost Value  
(Walmart)  
Devil's Food  
Chocolate Cake Mix  
10 servings per box  
LEAD  
52%  
CADMIUM  
23%

Betty Crocker  
Super Moist Triple  
Chocolate Fudge  
Cake Mix  
10 servings per box  
LEAD  
77%  
CADMIUM  
29%

Simple Mills  
Almond Flour  
Baking Mix -  
Chocolate Muffin &  
Cake  
12 servings per box  
LEAD  
127%  
CADMIUM  
34%

Pillsbury  
Devil's Food  
Premium Cake Mix  
10 servings per box  
LEAD  
58%  
CADMIUM  
28%

Duncan Hines  
Devil's Food Cake  
Mix  
10 servings per box  
LEAD  
90%  
CADMIUM  
31%

Bob's Red Mill  
Gluten Free  
Chocolate Cake Mix  
11 servings per package  
LEAD  
218%  
CADMIUM  
77%

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**Making Chocolate Safer**

Since any intake of heavy metals can be harmful over time, it's important that products contain the lowest amount possible. There are ways for manufacturers to reduce the heavy metals in their products—such as sourcing chocolate from areas that have low levels of cadmium in the soil, and making improvements in cocoa harvesting, processing, and cleaning procedures.

CR reached out to an industry trade group as well as the Food and Drug Administration for comment.

“Chocolate and cocoa are safe to eat and can be enjoyed as treats, as they have been for centuries,” says Christopher Gindlesperger, senior vice president of public affairs and communications for the National Confectioners Association, a candy industry group. “Food safety and product quality remain our highest priorities, and we remain dedicated to being transparent and socially responsible.”

The Food and Drug Administration told CR that “While the presence of cadmium and lead in chocolate has been the subject of considerable media attention, experts from around the world have found that chocolate is a minor source of exposure to these contaminants internationally.” And the agency added that “all food manufacturers and processors are responsible for ensuring the safety of their food.”

Our results, however, show that some companies may be doing a better job of keeping metals out of their products than others. That's true even for dark chocolate and cocoa powders. “In general, products with higher cocoa content tend to have higher levels of metals, but not always,” says Eric Boring, PhD, a CR chemist who oversaw our chocolate tests. “There's enough variation in the lead levels within each category of foods that it's clear factors other than cocoa content affect lead levels, and that means manufacturers have the ability to reduce the heavy metals in their products to the lowest levels possible.”

For example, if Navitas Organic Cacao can be lower in lead, Boring says, why can't Hershey's make a cocoa powder that is lower in the heavy metal, too?

Brian Ronholm, director of food policy at CR, adds that "Earlier this year, a Hershey executive stated that the company continues to look for ways to remove more of the metals through additional cleaning and alternate sourcing. We would like for them to honor that commitment."

"Since the metals occur naturally in soil, it may seem that it would be difficult to reduce contamination, but there are some steps that chocolate makers can take to make their products safer," Ronholm says. These include sourcing from areas with lower levels and mixing beans from different areas to ensure that the final product has lower levels. Producers could also test lots of cocoa to identify problem areas and reject particularly contaminated lots, he says.

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## Making Healthier Choices

- As much as possible, it makes sense to try to avoid heavy metals in your diet—but that doesn't mean you should never eat chocolate.
- Kids and pregnant people should consume dark chocolate sparingly, if at all, because heavy metals pose the highest risk to young children and developing babies. And if you do eat it, pick products that our tests showed to have lower levels of heavy metals. When consuming other cocoa-containing items—like hot chocolate or brownies—it may be best to limit these to not every day, and also choose products lower in heavy metals. And, of course, you should limit how much you eat other foods that tend to be high in heavy metals, such as rice and rice products, carrots, and sweet potatoes.
- Milk chocolate can be a fine alternative for those who want to limit heavy metal exposure, but don't treat it as a health food—it's packed with more sugar than dark chocolate, and should still be consumed in moderation.
- For other adults who want to eat dark chocolate, occasional consumption won't necessarily expose you to extremely high levels of heavy metals. But as much as

possible, try to be aware of potential metal exposure from multiple sources. For more tips, see our [previous article on metals in chocolate](#).

- When consuming hot chocolate, brownies, chocolate cake, and other cocoa-containing products, know that they can contribute to your overall heavy metal burden. As with other types of chocolate, these are best consumed in moderation.

MORE ON FOOD SAFETY

[Lead and Cadmium Could Be in Your Dark Chocolate](#)

[How Heavy Metals Get Into Dark Chocolate](#)

[CR Urges Chocolate Makers to Get the Lead and Cadmium Out](#)

[Heavy Metals in Baby Food](#)

[Your Herbs and Spices May Contain Arsenic, Cadmium, and Lead](#)