A dark side to dark chocolate? New study finds very minimal risk for kids from metals in chocolates

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Chocolate lovers may have been alarmed by a 2023 Consumer Reports finding that some dark chocolate brands could contain harmful levels of lead and cadmium.

However, a new study by Tulane University published in *Food Research International* has found that dark chocolate poses no adverse risk for adults and contains nutritionally beneficial levels of essential minerals.

The study sampled 155 dark and milk chocolates from various global brands sold in the United States and tested for the presence of 16 heavy metals ranging from the toxic (lead and cadmium) to the essential (copper, iron, zinc). The study then modeled the risk of eating one ounce of the chocolates per day which is equivalent to consuming more than two whole chocolate bars a week.

The research found that only one brand of dark chocolate exceeded the international limit for cadmium in bars containing more than 50% cacao (800 micrograms per kilogram) and only four dark chocolate bars had cadmium levels that could pose a risk to children weighing 33 pounds or less, the average weight of a 3-year-old in the U.S.

"For adults there is no adverse health risk from eating dark chocolate, and although there is a slight risk for children in four of the 155 chocolate bars sampled, it is not common to see a 3-year-old regularly consume more than two bars of chocolate per week," said lead author Tewodros Godebo, assistant professor of environmental health sciences at Tulane University School of Public Health and Tropical Medicine. "What we've found is that it's quite safe to consume dark chocolate and milk chocolates."

When tested for lead, two chocolate bars contained levels above

California's interim standards for dark chocolates, but neither was determined to pose adverse risks to children or adults.

While two previous studies in the U.S. examined the presence of lead and cadmium in chocolate, this study employed the largest sample size, expanded the scope of testing to 16 metals, and included a risk assessment of toxic metals that accounted for the nutritional contribution of essential minerals.

The dark chocolates were found to contain high levels of nutrients such as copper, iron, manganese, magnesium and zinc, and several of the chocolates sampled provided more than 50% of the daily requirement for children and adults, Godebo said.

"Not only is it packed with these essential minerals, but they can potentially reduce the absorption of toxic metals in the intestine since these metals compete for the same site," Godebo said.

The study found that much of the lead in chocolate comes from the post-harvest processing whereas cadmium comes from the soil and passes through the plant and into the cacao bean.

The researchers also sorted the chocolates geographically and found that dark chocolates from South America had higher levels of cadmium and lead than chocolates from Asia and West Africa, the latter of which is a primary source of dark chocolate for the United States.

"But even for chocolates from South America, we found there is no adverse risk in eating an ounce per day," Godebo said.

More information: Tewodros Rango Godebo et al, Occurrence of

heavy metals coupled with elevated levels of essential elements in chocolates: Health risk assessment, *Food Research International* (2024). DOI: 10.1016/j.foodres.2024.114360