

Opiates in Our Food Supply

Congress Must Act to Prevent Harm from Contaminated Poppy Seeds

Poppy seeds and heroin originate from the same plant— *Papaver somniferum*, or the opium poppy. The seeds themselves naturally contain negligible amounts of opiate alkaloids, but other parts of the plant produce substantial amounts, including morphine, codeine, and thebaine.¹ Because seeds can become contaminated with opiates from the plant's sap and dust during harvest, thorough washing and processing are needed to reduce the opiate content of the seeds to safe levels.

Opium poppy may not be legally grown in the U.S., but we import seeds from 15 countries, primarily in Europe and Asia.² When producers and importers fail to follow important steps to reduce opiate contamination, U.S. consumers can be exposed to contaminated poppy seeds, resulting in unintentional intoxication³ and false positive drug tests.⁴ People can also concentrate the opiates by mixing seeds in water to form a “tea,”⁵ which can contain sufficient opiates to cause overdose and death.⁶

Congress should address this harm by passing the Stephen Hacula Poppy Seed Safety Act, a bill that directs the Food and Drug Administration (FDA) to set maximum limits for opiate content, removing contaminated seeds from the market.

Poppy has caused dozens of overdoses and deaths in the U.S.

At least 20 non-fatal overdoses and 19 deaths from poppy in the U.S.—most involving consumption of poppy seed tea—have been reported in the medical literature and government publications, and most have occurred since 2016.⁷ These are likely underestimates, as additional deaths involving poppy have been reported in the popular media and adverse event data is typically incomplete.⁸

Poppy seeds with unsafe levels of opiates continue to be sold

Despite the documented harm caused by contaminated poppy seeds, these products remain on the market. A 2018 study analyzed the opiate content of 22 poppy products purchased online and found up to 2,788 mg morphine per kg seeds after extraction, with a median of 97.3 mg/kg morphine.⁹ For reference, a dose of 20 to 50 morphine mg equivalents per day increases the risk of overdose and death.¹⁰

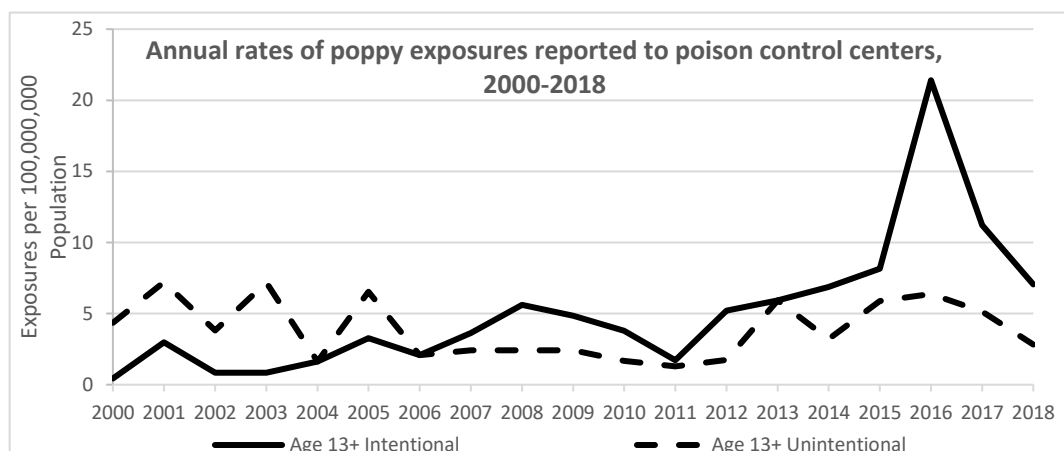


In February 2023, the Department of Defense issued a statement warning service members to avoid all poppy seeds, based on evidence that some seeds may have codeine contamination high enough to impact drug testing.¹¹ Women screened for opiates during hospital childbirths have also reportedly tested positive due to consuming contaminated poppy seeds in baked goods, leading to separation from their newborn infants and unwarranted scrutiny from child welfare officials.^{12,13,14}

In some cases, businesses may intentionally market contaminated poppy seeds, using terms like “raw” or “unwashed” to signal higher concentrations of opiates. Such sales can be substantial: owners of one Tulsa-based business are being charged with distributing controlled substances by selling contaminated poppy seeds, making almost 50,000 sales in 2020 alone.¹⁵

Adverse events from contaminated poppy may be on the rise.

A recent study by CSPI and the Connecticut Poison Control Center found that U.S. poison control centers received 392 calls regarding poppy exposure in people age 13+ between 2000 and 2018, and rates of “intentional exposures,” a category that includes use for intoxication, therapeutic purposes, or self-harm, increased during that period.¹⁶



Seventy-seven of these 392 exposures involved poppy in liquid form, suggesting the use of “poppy seed tea.” This home-brewed concoction is made by combining large amounts of poppy seeds with water, and online recipes direct users to add acidic ingredients that help extract opiates. But opiate contamination levels can vary widely between batches of seeds, putting users at risk of accidental overdose.

Contamination in poppy seeds is preventable.

The harms caused by contaminated poppy seeds are largely preventable. Cleaning processes recommended by the European Commission have proved effective at reducing morphine contamination from 50 to 220 mg/kg down to 4 mg/kg or less.¹⁷ The European Union set a legal threshold for opiate contamination in poppy seeds, and the United States must follow suit.¹⁸

The sale of opiate-contaminated poppy products is already illegal under the Controlled Substances Act, which lists “poppy straw” (defined as all parts of the poppy plant except its seeds) as a Schedule II controlled substance. But no federal agency has established a threshold for maximum contamination, making it difficult for law enforcement, importers, and retailers to clearly identify unsafe seeds.

The Stephen Hacula Poppy Seed Safety Act will protect Americans from unsafe seeds

The Stephen Hacula Poppy Seed Safety Act¹⁹ would remedy this gap in public health by prohibiting the sale of contaminated poppy seeds to consumers and directing the FDA to establish a maximum limit on the opiate content of poppy seeds, giving the agency one year to issue a proposed rule and two years to issue a final rule.

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- ² United Nations Comtrade Database. Search of 2019 data using HS code 120791- Oil seeds; poppy seeds, whether or not broken. <https://comtrade.un.org/data/>. Accessed January 22, 2021.
- ³ Sproll C, Perz RC, Lachenmeier DW. Optimized LC/MS/MS analysis of morphine and codeine in poppy seed and evaluation of their fate during food processing as a basis for risk analysis. *J Agric Food Chem.* 2006;54:5292-5298.
- ⁴ Concheiro M, et al. Morphine and Codeine in Oral Fluid after Controlled Poppy Seed Administration. *Drug Test Anal.* 2015;7(7):586–591.
- ⁵ Haber I, Pergolizzi J, LeQuang J. Poppy seed tea: a short review and case study. *Pain Ther.* 2019;8(1):151–155
- ⁶ Greenthal E, Lurie P, Doyon S. Opioid exposure associated with poppy consumption reported to poison control centers and the U.S. Food and Drug Administration. *Clin Toxicol* (Phila). 2021;59(8):746-755. doi:10.1080/15563650.2020.1866766
- ⁷ Overdoses include 18 from Greenthal et al. (2021) and two from Spyres MB, et al. Two cases of severe opiate toxicity after ingestion of poppy seed tea. *Toxicol Commun.* 2018;2(1):102-104.; deaths are all referenced in Greenthal et al. (2021)
- ⁸ Other deaths from poppy seed tea (and poppy pod tea). 2020. <http://www.poppyseedtea.com/Other%20Deaths%20Page.html>.
- ⁹ Powers (2018)
- ¹⁰ U.S. Centers for Disease Control and Prevention. Calculating total daily dose of opioids for safer dosage. https://www.cdc.gov/drugoverdose/pdf/calculating_total_daily_dose-a.pdf
- ¹¹ Warning Regarding Poppy Seed Consumption and Military Drug Testing. Department of Defense. February 17, 2023. <https://media.defense.gov/2023/Feb/21/2003164614/-1/-1/1/POPPY-SEEDS-WARNING-MEMO-SIGNED-CONTACT-REDACTED.PDF>
- ¹² Brice-Saddler M. A Mother Briefly Lost Her Newborn After Failing a Drug Test. Her Doctor Suspects Poppy Seeds. *The Washington Post*. February 3, 2020. <https://www.washingtonpost.com/health/2020/02/03/poppy-seed-drug-test/>. Accessed December 1, 2023
- ¹³ Salam E. Two US Mothers Sue Hospitals Over Drug Tests After Eating Poppy Seed Bagels. *The Guardian*. March 20, 2023. <https://www.theguardian.com/us-news/2023/mar/20/mothers-positive-drug-tests-poppy-seed-bagels>. Accessed December 1, 2023.
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- ¹⁷ Commission Recommendation of 10 September 2014 on good practices to prevent and to reduce the presence of opium alkaloids in poppy seeds and poppy seed products. Official Journal of the European Union. 2014/662/EU:96–100.
- ¹⁸ Commission Regulation (EU) 2021/2142 of 3 December 2021 amending Regulation (EC) No 1881/2006 as regards maximum levels of opium alkaloids in certain foodstuffs. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R2142>.
- Poppy seed image: <https://pxhere.com/en/photo/1521603> (labeled for reuse under Google's Create Commons)
- ¹⁹ S.3354 - Stephen Hacula Poppy Seed Safety Act. 118th Congress (2023-2024). <https://www.congress.gov/bill/118th-congress/senate-bill/3354>