

# Lead and Other Toxic Metals Detected in Tampons

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## STORY AT-A-GLANCE

- › A 2024 study found 16 different heavy metals, including lead and arsenic, in tampons. These metals may come from agricultural or manufacturing processes and could potentially be absorbed through vaginal tissue
- › Long-term exposure to heavy metals through tampon use could potentially contribute to health issues such as increased risk of dementia, cancer, and infertility, though more research is needed
- › Experts weren't surprised by the findings, as previous studies have found harmful chemicals in various feminine hygiene products. Your vagina's structure makes it efficient at absorbing chemicals
- › Organic tampons had lower levels of lead compared to nonorganic ones. Nonorganic tampons may also contain pesticides and genetically engineered cotton, posing additional risks
- › The cost of tampons has increased significantly, leading to concerns about "period poverty." Reusable alternatives like menstrual cups and discs are becoming more popular as cost-effective and potentially safer options

Tampons are the top go-to product for menstruating women. In a 2023 survey involving more than 7,000 respondents, 47% report using regular tampons to manage their menstrual flow.<sup>1</sup> Tampons' biggest advantage is they're discreet — unlike bulky sanitary pads, they are more convenient to carry around and allow women more freedom of movement.

But tampons harbor a dirty secret — a recent study<sup>2</sup> found that every time you use one, you're potentially exposing yourself to damaging heavy metals, including lead and arsenic.

## Study Finds Over a Dozen Heavy Metals in Tampons

A 2024 study published in the journal *Environment International*<sup>3</sup> found that tampons are unknowingly exposing menstruating women to toxic heavy metals. Based on their findings, these popular hygiene products are tainted with several dangerous heavy metals — 16 different types to be exact. According to the study authors:

*"Between 52% and 86% of people who menstruate in the United States use tampons — cotton and/or rayon/viscose 'plugs' — to absorb menstrual blood in the vagina. Tampons may contain metals from agricultural or manufacturing processes, which could be absorbed by the vagina's highly absorptive tissue, resulting in systemic exposure."*<sup>4</sup>

The researchers selected a total of 30 different types of tampons from 14 brands and 18 product lines (tampons with different names but under the same brand). They included top-sellers and store-brands from large-chain retailers; the tampons were made from cotton, rayon and viscose (or a mix), and had varying absorbencies. There were also organic and nonorganic brands, as well as tampons with plastic and cardboard applicators.

Using the acid digestion method, a process used for trace metal analysis, the researchers studied the tampons for the presence of 16 different types of heavy metals, including:<sup>5</sup>

Arsenic	Barium	Calcium	Cadmium
Cobalt	Chromium	Copper	Iron
Mercury	Manganese	Nickel	Lead

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Selenium

Strontium

Vanadium

Zinc

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The results revealed "measurable concentrations" of all these heavy metals in every tampon product they tested. They also found that the concentrations of these metals differ depending on the brand and where they were sold. For example, tampons sold in the U.S. had higher concentrations of lead compared to those in the Europe.

*"To our knowledge, our study is the first to assess concentrations of metals in tampons, despite the potential for substantial vaginal absorption of metals and the widespread and frequent use of tampons among menstruators,"* the study authors said.<sup>6</sup>

## **Experts 'Not Surprised' by Study Results**

While these findings may seem alarming, some experts have said that this isn't surprising anymore, as there have been reports in the past few years pointing to the harmful chemicals in personal hygiene products.<sup>7</sup>

In an NPR article,<sup>8</sup> Consumer Reports health and science journalist Catherine Roberts says she's more surprised that the issue wasn't investigated sooner, saying, "[Tampons are] in the most sensitive part of people's bodies. It's so close to us. We use so many [tampons] over a lifetime. It's just wild to me that this is both so little researched and so little regulated."

One study, published in 2020,<sup>9</sup> reported that volatile organic compounds (VOCs) have been discovered in feminine hygiene products. Aside from tampons, sanitary napkins, feminine washes, sprays, powders and wipes were all found to contain VOCs, which are potentially carcinogenic.

For example, 62% of the products they tested contained chloroform, with the highest level found in a brand of feminine wash. Benzene, which is also carcinogenic, was detected in 83% of the products, including all feminine moisturizers, washes, sprays and powders they tested.<sup>10</sup>

Meanwhile, 1,4-dioxane was detected in 92% of the feminine washes and 75% of feminine wipes tested – 50% of the products included in the study contain this "likely carcinogenic" compound.<sup>11</sup>

Earlier this year, period underwear brand Thinx settled a class-action lawsuit after its products, which have been marketed to be a "safer, more sustainable approach to menstrual hygiene" were found to contain potentially harmful "forever chemicals."<sup>12</sup>

According to the lawsuit, which was filed in 2022,<sup>13</sup> Thinx products contain multiple polyfluoroalkyl substances (PFAS) and silver nanoparticles, which can be harmful to human health.

*"The lawsuit alleges that Thinx uses PFAS chemicals to 'enhance the performance of the underwear, including, but not limited to, its 'moisture-wicking' and 'leak-resisting' qualities.'*

*It explains that the thousands of PFAS chemicals in existence are all categorized either as 'long-chain' or 'short-chain,' based on whether they contain fewer or more than eight carbon atoms.*

*Long-chain chemicals – sometimes called 'forever chemicals' – have been known to cause negative health effects and have been phased out of use in the U.S., the suit says, adding that short-chain chemicals are being used as replacements in the apparel industry," NPR reports.<sup>14</sup>*

You can read more about this topic in [this article](#), where Mamavation conducted tests on period underwear brands for PFAS chemicals.

## **How Do Heavy Metals End Up in Your Tampons?**

The topic of heavy metals polluting consumer products isn't something new to this website; I've written many articles on how heavy metals are so pervasive in our environment and the products that we use today, and even in the food supply – they're in [fast food items](#), ["junk" school lunches](#) and even in [infant formula](#).

However, the issue of heavy metals in tampons deserves attention, as millions of women rely on them during the most sensitive days of the month. Imagine using these sanitary products for decades, not knowing that they are adding to your toxic load and putting your health at risk. As noted by Time,<sup>15</sup> "chronic metal absorption has been linked to increased risk of dementia, cancer, infertility and other health issues."

But how do these chemicals make their way into tampons in the first place? According to the featured study, the contamination may occur during agricultural and manufacturing processes.<sup>16</sup> The cotton used may have absorbed chemicals from the water, soil or air. It may also be exposed to nearby contaminants — for example, if a lead smelter is located near the cottonfield.<sup>17</sup>

During the manufacturing process, these chemicals can make their way into tampons as part of a whitener, pigment or antibacterial agent. For example, zinc and calcium, the two metals with the highest concentrations, were used in tampons for "odor control, lubrication and as antimicrobial agents."<sup>18</sup>

*"Despite this large potential for public health concern, very little research has been done to measure chemicals in tampons,"* said Jenni A. Shearston, a postdoctoral scholar at the UC Berkeley School of Public Health and the study's lead author.

*"I really hope that manufacturers are required to test their products for metals, especially for toxic metals. It would be exciting to see the public call for this, or to ask for better labeling on tampons and other menstrual products."<sup>19</sup>*

## **The Vagina's Unique Structure Makes It Absorb More Chemicals**

The study authors say that further research still needs to be done to truly determine if heavy metals can "leach out of the tampons and cross the vaginal epithelium." However, they explained that the unique biology of the vagina, particularly the vaginal lining — which is more permeable than other parts of the body — and the small folds within it, make it highly efficient at absorbing chemicals.

What's more, when heavy metals enter the body through your vagina, they are not brought to your liver to be filtered. Instead, they directly enter your bloodstream. The authors highlighted the 1980s toxic shock syndrome (TSS) outbreak as a crucial example of how substances that enter the bloodstream through the vagina can have harmful effects:<sup>20</sup>

*"In that [toxic shock syndrome] epidemic, the Rely tampon (and other superabsorbent tampons that could be worn for extended durations) interacted with menstrual blood and vaginal microbiota over time to result in overgrowth of the bacteria Staphylococcus aureus and its toxin in the vagina.*

*The toxin crossed the vaginal epithelium, entered systemic circulation, and produced a range of serious symptoms in individuals, including hypotensive shock and even death."*<sup>21</sup>

When you consider just how many tampons a menstruating woman uses in her lifetime, from the start of her period until she reaches menopause (a whopping 7,400 tampons, based on the featured study's estimates<sup>22</sup>), and how each tampon stays in the body for around four to six hours at a time, the possibility of these heavy metals leaching into the body becomes even more worrisome.

In a USA Today article,<sup>23</sup> study co-author Kathrin Schilling commented, "Although toxic metals are ubiquitous and we are exposed to low levels at any given time, our study clearly shows that metals are also present in menstrual products and that women might be at higher risk for exposure using these products."

## **Lead Puts You at Risk of Infertility**

One heavy metal that the researchers focused on is lead, which, alarmingly, has been found in all the tampon samples used in the study.<sup>24</sup> The researchers emphasized that there are no safe exposure levels for lead, and that "any proportion of [lead] that may leach out of a tampon and reach systemic circulation might contribute to negative health outcomes."

They also warned that lead can be stored in the bones, replacing calcium, and that it stays in the body for decades.<sup>25</sup> This is because lead and calcium are chemically very similar,<sup>26</sup> which is how it disrupts many different body systems. For example, in your neurological system, it disrupts neurons that use calcium to transmit information.<sup>27</sup> Lead can also cause some neurons to fire more and decrease the signals in others.

In fact, even low levels of lead in the blood can cause serious, long-lasting or permanent health effects, such as infertility. A paper published in *Lead Chemistry*<sup>28</sup> explored the link between lead and reproductive health, and found that, "With respect to the reproductive system, health damages in female have been observed even at very low levels of exposure."

However, the authors noted that lead's reproductive effects can be seen not just in women, but also in men, saying, "lead can reduce the libido and affect spermatogenesis reducing the quality of sperm. Other effects in exposed men include disturbance of prostatic function and damage in serum testosterone."<sup>29</sup>

Lead is also particularly damaging to pregnant women, as it can increase your risk of spontaneous abortion, preterm delivery, gestational diabetes, hypertension and preeclampsia.<sup>30</sup>

## **Nonorganic Tampons Also Pose Other Health Risks**

According to the featured study, though there wasn't a significant difference in the heavy metal content between organic tampons and nonorganic tampons, they did find that organic tampons had lower levels of lead.<sup>31</sup>

Another drawback of nonorganic tampons is they tend to be heavily sprayed with pesticides, which can also be absorbed through your vaginal tissues. Most are also made with genetically engineered (GE) cotton, which adds unknown risks.

Some tampons made with noncotton materials also pose certain risks. For example, rayon and viscose, which are made from wood pulp tend to have loosened fibers that can be left behind in your vagina even when the tampon is removed.

To make them appear white and sanitary, tampons made from rayon are also bleached with chlorine. Chlorine can potentially lead to the creation of substances like dioxin and disinfection-by-products (DBPs) such as trihalomethane. The U.S. Environmental Protection Agency (EPA) considers dioxin such a serious public health issue that, like lead, there is no safe level of exposure.

Yet, the government continues to turn a blind eye when it comes to feminine hygiene products, illogically concluding there's no health risk expected from dioxins in tampons and pads. Even if the product is bleached using chlorine dioxide (typically advertised as an "elemental chlorine-free" bleaching process), it can still generate dioxins.

The plastic applicators used in tampons also contain phthalates, which are endocrine disruptors linked to various health issues, such as respiratory health problems, metabolic effects, and infertility due to poor testicular and ovarian function, and preterm birth.<sup>32</sup>

## **Switch to Safer Menstrual Products**

In addition to the potential risk of heavy metal exposure, tampons and other sanitary products are burning a hole through many women's pockets, with their costs increasing faster compared to even the cost of food. Tampons now cost 36% more than they did in 2019, and there is a growing concern that this will lead to "period poverty" – the inability to access menstrual products.<sup>33</sup>

Making the switch to reusable menstrual products instead of single-use tampons and pads may be both safer and more cost-effective. An example is the menstrual cups, which are made from medical-grade silicone or latex and are inserted into the vagina to collect the blood, rather than absorb it. After several hours, you simply remove the cup, empty the blood (ideally done at least twice a day) and reinsert it after cleaning.

Menstrual cups are particularly useful when exercising, swimming or if you have heavy flow. There are numerous brands you can choose from, including Moon Cup, Keeper Cup, Lunette Menstrual Cup, DivaCup, Lena Cup and Lily Cup.



With proper care, a menstrual cup can last for several years, saving you a lot of money. A 2019 meta-analysis also notes that they post a lower risk of leakage and toxic shock syndrome (TSS) compared to tampons.<sup>34</sup>

An alternative to menstrual cups are menstrual discs. Although they are made from the same material, the menstrual discs are flat and designed to sit at the cervix, tucked behind the pubic bone. And just like menstrual cups, there are several different brands to choose from, making them a more sustainable option than tampons or sanitary pads.<sup>35</sup>

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