Frequently Asked Questions: Heavy Metals in Spices

Are spices safe for consumers?

There is a consensus among global regulators that spices are safe for human consumption. While spices are an integral part of most people's diet, they are consumed in small amounts as ingredients in food and do not account for a large portion of each person's daily food intake, especially when compared to other food groups. In fact, the average American eats a fraction of a gram of spices per day amounting to only 0.01 percent of a person's total diet. As such, contributions by spices to heavy metal exposure, if any, would be very minor compared to consumption of other foods. Assessments which evaluate the presence of metals in spices and account for typical consumer exposure demonstrate that consuming spices is safe.

How do U.S. regulatory authorities address heavy metals in spices?

The Food and Drug Administration (FDA) has established a testing protocol and monitoring program for heavy metals, or "elements," in all foods, which includes screening imports to ensure food products entering the United States are safe. Additionally, FDA requires manufacturers to address toxic elements, such as heavy metals, in compliance with the Food Safety Modernization Act. FDA develops guidance levels for toxic elements in products determined to be the most significant for public health, but has not identified levels of concern for spices. Additionally, the FDA has not included spices as part of the agency's Closer to Zero initiative, which identifies actions the agency will take as it seeks to reduce exposure to toxic elements from foods eaten by babies and young children.

Why is ensuring the availability of spices so important to consumers?

While spices play an essential role in adding flavor to different cuisine types, importantly, they also have health benefits. The Dietary Guidelines for Americans highlight that "spices and herbs can help flavor foods when reducing added sugar, saturated fat, and sodium, and they also can add to the enjoyment of nutrient-dense foods, dishes, and meals that reflect specific cultures." Additionally, there is a growing body of research on the potential for certain spices to improve health. For example, there is interest in the impact of spice consumption on improving cardiovascular and metabolic health, providing antioxidants, and supporting the gut microbiome.

Why are trace amounts of heavy metals found in spices?

As with any food product, the concentration of heavy metals in spices naturally varies due to where and how spices are grown, environmental factors, soil conditions, and harvesting and processing methods. Spices come from dozens of crops grown in many different countries around the world. Heavy metals are naturally occurring elements in the Earth's crust, so any natural product that comes into contact with soil or groundwater has the potential to take up trace amounts of heavy metals that cannot be removed.



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How do spice companies ensure heavy metal levels in spices remain low?

The U.S. spice industry is committed to ensuring spices remain safe and that any presence of heavy metals is as low as feasible. The industry typically achieves this in several ways. Spice farmers follow Good Agricultural Practices to mitigate uptake during growing. Importers ensure compliance with quality standards and strict specifications by requiring documentation from their suppliers, including testing for heavy metals to achieve the safest supply of spices for consumers. Additionally, manufacturers use cleaning methods to minimize contributions from soil and the environment and adhere to practices that prevent the contribution of heavy metals through processing.

Are spices purchased in the U.S. safer than those bought by consumers abroad and transported back to the U.S.?

Scientific studies show that spices purchased in the U.S. are demonstrated to have notably lower heavy metal levels than those purchased in foreign markets. For instance, a 2019 study found that the average lead level was significantly higher in spices purchased outside of the U.S., and higher still from countries that have limited laboratory testing surveillance programs. This highlights the success that U.S. importers and regulators have had in implementing standards to keep heavy metal levels in spices in the U.S. market low.

Are there limits for heavy metals in spices?

A number of global regulatory authorities, most notably the European Commission, have established limits for lead in spices that are supported by available scientific evidence and enable access to a safe and reliable supply of spices for consumers. Likewise, a similar approach is under consideration by the World Health Organization's Codex Committee on Contaminants in Food. Importantly, these standards avoid a one-size-fits-all approach and, instead, differentiate by spice type and element. Due to the global nature of the supply chain for spices, discrepancies regarding maximum levels of heavy metals between regulatory bodies could potentially create significant barriers to global trade. Harmonization across international regulations fosters compliance and mitigates barriers to trade. As such, the spice industry supports FDA establishing federal toxic element action levels and has encouraged the agency to explore harmonizing levels with those established by international bodies.

What stewardship efforts are the spice industry undertaking on heavy metals?

The American Spice Trade Association publishes guidance for the spice industry on heavy metal limits and Good Agricultural Practices to educate spice producers on how to best grow crops, manage irrigation, monitor soils, and safely transport product to minimize toxic element uptake from the environment. Furthermore, the spice industry works with producers and other partners, such as the Sustainable Spice Initiative, around the world to provide training on these practices, while also investing in ongoing research on the best ways to mitigate elements in the spice supply chain.

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