Barium

How You Can be Exposed

Many industries use barium in products such as paints, bricks, tiles, glass, rubber, ceramics, and rat or insect poisons. The amount of barium found in food and water is typically not enough to raise concern, making exposure for workers who interact with barium the most prominent route of exposure.

- **Water** – groundwater can contain barium when water moves through rocks, however the amount in water is usually minimal as barium doesn't mix well with water. The federal drinking water standard for barium is 2 mg/L to protect against health effects from long-term exposure. Public water systems must meet this standard. If you use a private well, consider testing your water for barium.
- **Food** – small amounts of barium can be present in food because plants may absorb it from soil. For most people, the levels found in food are not high enough to cause concern.
- **Air** – barium may be present in air near industries such as mining, metal processing, rubber production, paper manufacturing, or coal burning. Workers or people who live near these industries have a higher risk of exposure from air.
- **Soil and dust** – barium occurs naturally in soil. Higher levels may be found near hazardous waste sites, mining areas, or certain geologic regions. Exposure can occur when soil or dust is accidentally swallowed, especially by children playing outdoors.
- **Workplace exposure** – people who work in industries that use barium (such as mining, paper manufacturing, sugar refining, or rubber production) are at the highest risk of exposure.

Health Effects

Most barium that enters the body leaves within one to two weeks through feces or urine. A small amount may remain in the body and can be stored in bones and teeth. Swallowing high levels of barium can lead to vomiting, abdominal cramps, diarrhea, difficulty breathing, increased or decreased blood pressure, numbness around the face, and muscle weakness. Research has supported that barium is unlikely to cause cancer or negative reproductive effects at typical environmental exposure levels.

How to Limit Exposure

The population that is most at risk for exposure to barium are workers who interact with the metal. Workers can reduce exposure by wearing protective equipment such as respirators or special clothing. Engineering controls such as exhaust ventilators should be implemented to minimize the risk of inhaling barium. If you are exposed to barium on the job, let your supervisor know and thoroughly wash yourself if the exposure was via the skin.

The amount of barium in food and water is typically not high enough to be of concern. However, areas such as the San Luis Valley can potentially have elevated levels of barium in soil and water (if using well water) due to rock formations. For elevated concentrations of barium in water, you can install a home water treatment system that uses reverse osmosis or ion exchange technology to reduce exposure via water. To reduce exposure to barium from soil, avoid direct contact by wearing gloves when working outside and wash hands thoroughly after any contact. Contaminated soil can also be covered with clean topsoil or grass to reduce exposure.

Sources

Agency for Toxic Substances and Disease Registry. (2007). *Toxicological profile for barium and barium compounds* (TP-24). U.S. Department of Health and Human Services, Public Health Service. https://www.atsdr.cdc.gov/toxprofiles/tp24.pdf