Indium

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CORRESPONDENCE

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KEYWORDS

heavy metals, food safety, dietary exposure

PUBLICATION HISTORY

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Abstract

This page draws on 2 peer-reviewed studies. The complete citation list is at the bottom of the page.

1 | Overview

This page is very thin because the evidence reviewed for it is narrow. Both papers concern indium-111, a radioactive isotope used as a tracer in medical imaging, and neither measures indium in food, water, soil or people as a contaminant. One is a surgical imaging study of how well gamma signal from an indium-111 labeled tracer can be detected through tissue 1. The other is a case report in which an indium-111 labeled white blood cell scan supported a diagnosis of endocarditis 2.

2 | Toxicology

The cited evidence does not establish anything about indium toxicity. Neither paper reports adverse effects of indium or of the radiotracer.

3 | Typical exposure routes

The cited evidence does not establish dietary, drinking water, occupational or environmental exposure to indium. The only route in the papers is clinical administration of indium-111 labeled material for imaging: labeled white blood cells in one patient 2 and a dual-labeled tracer in mouse tumor models 1. Neither paper reports the administered activity or radiation dose.

4 | Food sources

The cited evidence does not establish indium concentrations in any food. No food was analyzed for indium.

5 | Regulatory limits

The cited evidence does not establish any regulatory limit or guideline value for indium. The case report notes that indium-111 white blood cell scintigraphy for suspected endocarditis receives a rating of 3, meaning rarely appropriate, under American College of Radiology appropriateness criteria 2. That rating concerns the choice of imaging test, not exposure.

6 | Testing

The cited evidence does not describe any method for measuring indium in food, water or biological samples. The imaging study measured gamma counts from indium-111 with a handheld surgical probe and found that at least 5% of the maximum signal was still detectable through up to 5 cm of tissue or gelatin, compared with about 0.5 cm for a near-infrared fluorescent dye 1. This is radiation detection for surgery, not trace element analysis.

7 | Microbiome effects

The cited evidence does not establish any effect of indium on microbiomes.

8 | Vulnerable populations

The cited evidence does not identify any population at higher risk from indium.

9 | Mitigation

The cited evidence does not establish any removal, processing or remediation method for indium.

10 | Open questions

- Toxicology: no data on indium toxicity in any species.
- Typical exposure routes: no dietary, water, occupational or environmental exposure data.
- Food sources: no measurements of indium in any food.
- Regulatory limits: no limit or guideline value for indium.
- Testing: no analytical method for indium as a trace element.
- Microbiome effects: not studied.
- Vulnerable populations: not identified.
- Mitigation: not studied.
- Radiation dose and administered activity of indium-111 in the clinical uses described.

11 | What remains uncertain

Almost everything about indium as a food or environmental contaminant remains uncertain on this evidence. The two papers treat indium only as a short-lived radioactive label in medicine, so they cannot inform questions about indium in diets, drinking water or consumer products. A useful page on indium will need occurrence, biomonitoring and toxicity studies that are not part of the evidence reviewed here.

References

[1] Detection properties of indium-111 and IRDye800CW for intraoperative molecular imaging use across tissue phantom models
Sever RE, Rosenblum LT, Stanley KC, Cortez AG, Menendez DM, Chagantipati B, et al. · Journal of Biomedical Optics 30(S1): S13705 · 2025 · doi.org/10.1117/1.jbo.30.s1.s13705
PEER-REVIEWED

[2] Edwardsiella tarda Endocarditis Confirmed by Indium-111 White Blood Cell Scan: An Unusual Pathogen and Diagnostic Modality
Litton KM and Rogers BA · Case Reports in Infectious Diseases 2016: 1082160 · 2016 · doi.org/10.1155/2016/1082160
PEER-REVIEWED

STATUS AND LICENCE

Editorially reviewed in-house; no external peer review has been completed on this reference. Published as an institutional technical report with its review state tracked on the article page. Released under CC BY 4.0.

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DATA AVAILABILITY

Every source behind this reference is listed with its own source record at https://heavymetalindex.com/metals/indium#sources.

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