Zucchini

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Abstract

Zucchini in the HMI library has 149 reported results for lead, cadmium, total arsenic, inorganic arsenic, total mercury, nickel, chromium, aluminum, tin, antimony, uranium, Co, Cu, Fe, Mn, Zn, V, Ag, As, B, Ba, Ga and Mo from 14 sources. WHO gems/food submissions reported lead in zucchini as sold from 799 results in 4 reporting regions, with subgroup medians from 2 to 6 µg/kg. In the US Total Diet Study, cooked zucchini had a median lead result below 4 µg/kg across 27 composites from 2017-2020.

1 | Zucchini overview

Across 3 other studies of ordinary farms and markets, reported lead means and medians on an as-sold or fresh-weight basis ranged from 2.5 µg/kg (Spungen et al. 2024) to 590 µg/kg (Guerra et al. 2012).[4,7] For cadmium, 3 studies on an as-sold or fresh-weight basis reported means and medians from 7.1 µg/kg (Spungen et al. 2024) to 40 µg/kg (Guerra et al. 2012).[4,7]

For a buyer the practical points are the form bought, the basis a result is reported on, where the zucchini came from and the laboratory's reporting limit. Testing finds contamination but does not remove it.

2 | What counts as zucchini

This page covers zucchini in 2 forms kept separate in every comparison: zucchini as sold (140 results) cooked and zucchini (9 results).[1,2,3,4,5,6]

Results stay on the basis each source reports: as sold or fresh weight, dry weight, or unstated. Dry-weight, as-sold and unstated results are never pooled, and no moisture conversion is applied.

3 | How metals reach zucchini

No study in the library compared zucchini from contaminated and ordinary settings, so the routes by which metals reach it are not measured here.

4 | Which forms and regions measured lower

The hmi reference for lead in zucchini as sold pools 39 subgroup units from 1 sampling family, with a median of below 9.5 µg/kg and a middle half spanning below 5 (lower quartile) and between 2 and 18 µg/kg (upper quartile).[1] cooked for lead in zucchini, the reference median was below 4 µg/kg, with a middle half from below 4 to below 4 µg/kg across 27 units.[2] for cadmium in zucchini as sold, the reference median was below 2 µg/kg, with a middle half from below 1.3 to between 0.57 and 3 µg/kg across 35 units.[1]

Among GEMS/Food reporting regions, zucchini as sold had the lowest lead subgroup median in SEARO (2 µg/kg) and the highest in WPRO (6 µg/kg); reporting regions are markets, not growing areas.[1] For inorganic arsenic, the lowest regional median was in EURO (0.45 µg/kg) and the highest in EURO (93.9 µg/kg).[1]

In one study, lead across 4 groups of zucchini ranged from 20.6 µg/kg (vegetable and fruit market; washed with 10% acetic acid vinegar) to 28.6 µg/kg (amateur farmers; washed with 5% acetic acid vinegar); the lowest is the lowest observed in that study, not an established sourcing preference.[3]

5 | Processing, cooking and preparation

No processing study for metals in this food is in the library yet.

6 | Mitigation for zucchini

Lot testing against the applicable limit is the check that can be verified.

7 | Trade-offs and limits of controls

Metals do not move together, so a lot that passes a lead limit says little about cadmium, arsenic or nickel unless those are tested as well.

8 | Testing zucchini for metals

Results depend on the method and its reporting limit. Reporting limits for lead ranged from 2 µg/kg (WHO GEMS/Food) to 200 µg/kg (WHO GEMS/Food), so a non-detect from a less sensitive method says much less.[1] Reporting limits for cadmium ranged from 0.5 µg/kg (WHO GEMS/Food) to 50 µg/kg (WHO GEMS/Food), so a non-detect from a less sensitive method says much less.[1] Reporting limits for total arsenic ranged from 3 µg/kg (FDA Total Diet Study) to 500 µg/kg (WHO GEMS/Food), so a non-detect from a less sensitive method says much less.[1,2]

A useful lot result names the form, the basis and a quantification limit well below the limit that applies.

9 | Buying and verifying zucchini

No maximum level for metals in zucchini was verified from primary text for this page; buyers should confirm the limit that applies in the destination market.

10 | Exposure from zucchini

No source in the library converted zucchini concentrations into a verified estimate of intake for a defined population. Concentrations describe the food, not individual risk.

11 | Evidence review and remaining gaps

Every source record that names zucchini was decided on its content: 14 occurrence extracted, 14 records in all. The occurrence table renders every extracted result; held values remain visible with their reason.

References identify the sources used in these answers. The Sources index preserves additional discovery links; inclusion there does not mean a source has been reviewed for this assessment. Corrections, completed searches, new direct evidence and changes in requirements should reopen the relevant answer.

12 | Zucchini FAQs

The library reports lead, cadmium, total arsenic, inorganic arsenic, total mercury, nickel, chromium, aluminum, tin, antimony, uranium, Co, Cu, Fe, Mn, Zn, V, Ag, As, B, Ba, Ga and Mo in zucchini, most often lead, cadmium and total arsenic.[1,2,3,4] WHO gems/food submissions reported lead in zucchini as sold from 799 results in 4 reporting regions, with subgroup medians from 2 to 6 µg/kg.[1]

Among GEMS/Food reporting regions, zucchini as sold had the lowest lead subgroup median in SEARO (2 µg/kg) and the highest in WPRO (6 µg/kg); reporting regions are markets, not growing areas.[1] For inorganic arsenic, the lowest regional median was in EURO (0.45 µg/kg) and the highest in EURO (93.9 µg/kg).[1]

Inorganic arsenic, the more toxic form, was measured in 5 results from 3 sources, far fewer than total arsenic.[1,8,9] European Food Safety Authority (EFSA) 2014 reported inorganic arsenic at 4.9 µg/kg (mean) in zucchini as sold from European dietary-survey occurrence data.[9]

References

[1] GEMS/Food Contaminants database heavy-metal exports
World Health Organization · GEMS/Food Contamination Monitoring and Assessment Programme · 2026 · extranet.who.int
DATASET

[2] FY2018-FY2020 TDS Elements Analytical Results
U.S. Food and Drug Administration · FDA Total Diet Study · 2022 · www.fda.gov
DATASET

[3] Quantification and Reduction in Heavy Metal Residues in Some Fruits and Vegetables: A Case Study Galați County, Romania
Bora FD, Bunea A, Pop SR, Banita SI, Dusa DS, Chira A, et al. · Horticulturae · 2022 · doi.org/10.3390/horticulturae8111034
PEER-REVIEWED

[4] Heavy metals in vegetables and potential risk for human health
Guerra F, Trevizam AR, Muraoka T, Marcante NC, and Canniatti-Brazaca SG · Scientia Agricola 69(1):54-60 · 2012 · doi.org/10.1590/s0103-90162012000100008
PEER-REVIEWED

[5] Lead Contamination in Selected Foods from Riyadh City Market and Estimation of the Daily Intake
Al Othman ZA · Molecules 2010, 15, 7482-7497 · 2010 · doi.org/10.3390/molecules15107482
PEER-REVIEWED

[6] Is it healthy urban agriculture? Human exposure to potentially toxic elements in urban gardens from Andalusia, Spain
Rossini-Oliva S and López Nuñez R · Environmental Science and Pollution Research · 2024 · doi.org/10.1007/s11356-024-33500-w
PEER-REVIEWED

[7] Infants' and young children's dietary exposures to lead and cadmium: FDA total diet study 2018-2020
Spungen JH and et al. · Food Additives & Contaminants: Part A · 2024 · doi.org/10.1080/19440049.2024.2396910
PEER-REVIEWED

[8] The First Hong Kong Total Diet Study: Inorganic Arsenic
Centre for Food Safety FEHD HKSAR · Centre for Food Safety, Food and Environmental Hygiene Department, Government of the Hong Kong Special Administrative Region · 2012 · www.cfs.gov.hk
GOVERNMENT

[9] Dietary exposure to inorganic arsenic in the European population
European Food Safety Authority (EFSA) · EFSA Journal 2014;12(3):3597 · 2014 · doi.org/10.2903/j.efsa.2014.3597
GOVERNMENT

STATUS AND LICENCE

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COMPETING INTERESTS

The Heavy Metal Index reports what the peer-reviewed and regulatory literature supports. It is operated separately from any certification program, does not evaluate or endorse brands, and does not use certification thresholds as evidence for the statements made here.

DATA AVAILABILITY

Every source behind this ingredient profile is listed with its own source record at https://heavymetalindex.com/ingredients/zucchini#sources.

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