Fresh Herbs

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Abstract

Fresh herbs in the HMI library has 674 reported results for lead, cadmium, total arsenic, inorganic arsenic, dimethylarsinic acid, total mercury, methylmercury, nickel, chromium, aluminum, tin, Co, Cu, Fe, Mn, Zn, V, Se, As, Ba, Hg, Sr and Ti from 37 sources. WHO GEMS/Food submissions reported lead in fresh herbs as sold from 3,007 results in 5 reporting regions, with subgroup medians from 2.6 to 1,300 µg/kg. For cadmium, GEMS/Food gave subgroup medians from 3 to 226 µg/kg from 1,028 results.

1 | Fresh herbs overview

Across 5 other studies of ordinary farms and markets, reported lead means and medians on an as-sold or fresh-weight basis ranged from 7.05 µg/kg (S-T et al. 2024) to 475 µg/kg (Tinggi et al. 2025).[8,9] For cadmium, 3 studies on an as-sold or fresh-weight basis reported means and medians from 0.081 µg/kg (S-T et al. 2024) to 49 µg/kg (Pan et al. 2023).[8,10] Higher results came from contaminated or exposed settings rather than ordinary supply. Fresh herbs as sold from leaf, western Anatolia had Zn higher at 83,700 µg/kg, against 11,200 µg/kg for leaf, western Anatolia in the same study.[7]

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

2 | What counts as fresh herbs

This page covers fresh herbs in 4 forms kept separate in every comparison: fresh herbs as sold (608 results), fresh herbs powder or ground (25 results), fresh herbs oil (24 results) dried and fresh herbs (17 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 fresh herbs

The evidence on how metals reach fresh herbs comes from studies that compared exposed and ordinary settings. Fresh herbs as sold from leaf, western Anatolia had Zn higher at 83,700 µg/kg, against 11,200 µg/kg for leaf, western Anatolia in the same study.[7]

These are observational comparisons from single studies; the size of the difference depends on the site, metal and distance.

4 | Which forms and regions measured lower

The HMI reference for lead in fresh herbs as sold pools 32 subgroup units from 4 sampling families, with a median of between 42.2 and 1,610 µg/kg and a middle half spanning below 42.2 (lower quartile) and between 1,610 and 5,960 µg/kg (upper quartile).[1,11,13,14] for lead in fresh herbs as sold, the reference median was between 28 and 31.7 µg/kg, with a middle half from 28 to 1,600 µg/kg across 186 units.[1,3,15] for cadmium in fresh herbs as sold, the reference median was below 20 µg/kg, with a middle half from below 20 to 543 µg/kg across 19 units.[1,11,13,14,16,17]

Among GEMS/Food reporting regions, fresh herbs as sold had the lowest lead subgroup median in PAHO (2.6 µg/kg) and the highest in PAHO (1,300 µg/kg); reporting regions are markets, not growing areas.[1] For cadmium, the lowest regional median was in EURO (12.5 µg/kg) and the highest in EURO (138 µg/kg).[1] For total arsenic, the lowest regional median was in WPRO (110 µg/kg) and the highest in EURO (232 µg/kg).[1]

Targeted fresh herbs as sold samples in EURO had lead higher at 215 µg/kg, against 155 µg/kg for EURO in the same study.[1] In another study, targeted fresh herbs as sold samples in EURO had lead lower at 150 µg/kg, against 155 µg/kg for EURO in the same study.[1]

In one study, lead across 23 groups of fresh herbs ranged from 2.6 µg/kg (PAHO) to 725 µg/kg (EURO); the lowest is the lowest observed in that study, not an established sourcing preference.[1] In another study, lead across 8 groups of fresh herbs ranged from 80 µg/kg (AG2, packaged/purchased sample) to 2,030 µg/kg (OB4, wild-collected (spontaneous flora, Galati County)); the lowest is the lowest observed in that study, not an established sourcing preference.[18]

5 | Processing, cooking and preparation

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

6 | Mitigation for fresh herbs

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

7 | Trade-offs and limits of controls

Avoiding exposed growing areas lowered the metal measured in the studies available, but no study measured the cost or supply effect of doing so.[7] 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 fresh herbs for metals

Results depend on the method and its reporting limit. Reporting limits for lead ranged from 0.83 µg/kg (Altıkulaç e t al. 2025) to 10,000 µg/kg (Sultana et al. 2022), so a non-detect from a less sensitive method says much l ess.[11,14] Reporting limits for cadmium ranged from 0.2 µg/kg (Winiarska-Mieczan et al. 2023) to 200 µg/kg (WHO GEMS/Food), so a non-detect from a less sensitive method says much less.[1,15] Reporting limits for total arsenic ranged from 2.79 µg/kg (Altıkulaç et al. 2025) to 2,510 µg/kg (WHO GEMS/Food), so a non-detect from a less s ensitive method says much less.[1,14]

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

9 | Buying and verifying fresh herbs

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

10 | Exposure from fresh herbs

No source in the library converted fresh herbs 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 fresh herbs was decided on its content: 37 occurrence extracted, 37 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 | Fresh herbs FAQs

The library reports lead, cadmium, total arsenic, inorganic arsenic, dimethylarsinic acid, total mercury, methylmercury, nickel, chromium, aluminum, tin, Co, Cu, Fe, Mn, Zn, V, Se, As, Ba, Hg, Sr and Ti in fresh herbs, most often lead, cadmium and total arsenic.[1,2,3,4] WHO GEMS/Food submissions reported lead in fresh herbs as sold from 3,007 results in 5 reporting regions, with subgroup medians from 2.6 to 1,300 µg/kg.[1]

In the studies available, fresh herbs from contaminated or exposed settings carried more metal than fresh herbs from the same study's control.[7] fresh herbs as sold from leaf, western Anatolia had cadmium higher at 1,700 µg/kg, against 500 µg/kg for leaf, western Anatolia in the same study.[7]

Among GEMS/Food reporting regions, fresh herbs as sold had the lowest lead subgroup median in PAHO (2.6 µg/kg) and the highest in PAHO (1,300 µg/kg); reporting regions are markets, not growing areas.[1] For cadmium, the lowest regional median was in EURO (12.5 µg/kg) and the highest in EURO (138 µg/kg).[1]

Inorganic arsenic, the more toxic form, was measured in 8 results from 1 source, far fewer than total arsenic.[1] WHO GEMS/Food submissions reported inorganic arsenic in fresh herbs as sold from 54 results in 2 reporting regions, with subgroup medians from 39.5 to 200 µg/kg.[1]

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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/fresh-herbs#sources.

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