Green beans

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Abstract

Green beans in the HMI library has 205 reported results for lead, cadmium, total arsenic, inorganic arsenic, dimethylarsinic acid, total mercury, methylmercury, nickel, chromium, aluminum, tin, antimony, uranium, Co, Cu, Fe, Mn, Zn, V, Se, As, Ba, Hg, Sr, Ti and Tl from 19 sources. WHO GEMS/Food submissions reported lead in green beans as sold from 846 results in 4 reporting regions, with subgroup medians from 5.4 to 40 µg/kg. In the US Total Diet Study, cooked green beans had a median lead result below 4 µg/kg across 27 composites from 2017-2020.

1 | Green beans 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 2.1 µg/kg (Spungen et al. 2024) to 750 µg/kg (Guerra et al. 2012).[4,7] For cadmium, 4 studies on an as-sold or fresh-weight basis reported means and medians from 0.75 µg/kg (Dearing et al. 2025) to 70 µg/kg (Guerra et al. 2012).[4,8] Higher results came from contaminated or exposed settings rather than ordinary supply. Green beans as sold from Ruschita (mining area R) (mining-affected area) had lead higher at 350 µg/kg, against 70 µg/kg for Borlova (reference area) in the same study.[3]

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

2 | What counts as green beans

This page covers green beans in 3 forms kept separate in every comparison: green beans as sold (194 results), cooked green beans (9 results) canned and green beans (2 results).[1,2,3,4,5,6] Foods made from green beans that have their own pages, such as canned green beans, are covered there.

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 green beans

The evidence on how metals reach green beans comes from studies that compared exposed and ordinary settings. Green beans as sold from Ruschita (mining area R) (mining-affected area) had lead higher at 350 µg/kg, against 70 µg/kg for Borlova (reference area) in the same study.[3]

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 green beans as sold pools 65 subgroup units from 3 sampling families, with a median of between 0.8 and 1.35 µg/kg and a middle half spanning between 0.7 and 0.8 (lower quartile) and between 1.7 and 7 µg/kg (upper quartile).[1,5,10] cooked for lead in green beans, 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 green beans as sold, the reference median was between 0.75 and 0.825 µg/kg, with a middle half from between 0.3 and 0.675 to between 0.9 and 2.8 µg/kg across 47 units.[1,5,8,10]

Among GEMS/Food reporting regions, green beans as sold had the lowest lead subgroup median in WPRO (10 µg/kg) and the highest in SEARO (40 µg/kg); reporting regions are markets, not growing areas.[1] For inorganic arsenic, the lowest regional median was in EURO (41.5 µg/kg) and the highest in EURO (43 µg/kg).[1]

5 | Processing, cooking and preparation

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

6 | Mitigation for green beans

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.[3] 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 green beans 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 3,000 µg/kg (WHO GEMS/Food), so a non-detect from a less sensitive method says much less.[1,11] Reporting limits for cadmium ranged from 0.067 µg/kg (WHO GEMS/Food) to 1,000 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 2.1 µg/kg (Houlihan et al. 2019) to 500 µg/kg (WHO GEMS/Food), so a non-detect from a less sensitive method says much less.[1,5]

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

9 | Buying and verifying green beans

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

10 | Exposure from green beans

No source in the library converted green beans 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 green beans was decided on its content: 19 occurrence extracted, 19 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 | Green beans FAQs

The library reports lead, cadmium, total arsenic, inorganic arsenic, dimethylarsinic acid, total mercury, methylmercury, nickel, chromium, aluminum, tin, antimony, uranium, Co, Cu, Fe, Mn, Zn, V, Se, As, Ba, Hg, Sr, Ti and Tl in green beans, most often lead, cadmium and total arsenic.[1,2,3,4] WHO GEMS/Food submissions reported lead in green beans as sold from 846 results in 4 reporting regions, with subgroup medians from 5.4 to 40 µg/kg.[1]

In the studies available, green beans from contaminated or exposed settings carried more metal than green beans from the same study's control.[3] green beans as sold from Moldova Noua (mining area M) (mining-affected area) had lead higher at 190 µg/kg, against 70 µg/kg for Borlova (reference area) in the same study.[3]

Among GEMS/Food reporting regions, green beans as sold had the lowest lead subgroup median in WPRO (10 µg/kg) and the highest in SEARO (40 µg/kg); reporting regions are markets, not growing areas.[1] For inorganic arsenic, the lowest regional median was in EURO (41.5 µg/kg) and the highest in EURO (43 µg/kg).[1]

Inorganic arsenic, the more toxic form, was measured in 8 results from 3 sources, far fewer than total arsenic.[1,6,12] Marín et al. 2018 reported inorganic arsenic at 1.4 µg/kg (mean) in green beans as sold from Vegetables and fruits group, Region of Valencia TDS 2010-2011.[6]

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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/green-beans#sources.

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