Cabbage

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Abstract

Cabbage in the HMI library has 944 reported results for lead, cadmium, total arsenic, inorganic arsenic, total mercury, nickel, chromium, aluminum, tin, antimony, uranium, Co, Cu, Fe, Mn, Zn, V, Se, Ag, As, Ba, Hg, Mo, Sr, Ti and Tl from 51 sources. WHO gems/food submissions reported lead in cabbage as sold from 3,881 results in 5 reporting regions, with subgroup medians from 2.3 to 185 µg/kg. In the US Total Diet Study, cabbage as sold had a median lead result below 4 µg/kg across 27 composites from 2017-2020.

1 | Cabbage overview

Across 10 other studies of ordinary farms and markets, reported lead means and medians on an as-sold or fresh-weight basis ranged from 3 µg/kg (Antoine et al. 2017) to 1,660 µg/kg (Guerra et al. 2012).[4,8] For cadmium, 11 studies on an as-sold or fresh-weight basis reported means and medians from 3 µg/kg (Alimohammadi et al. 2018) to 350 µg/kg (authors 2021).[3,6] Higher results came from contaminated or exposed settings rather than ordinary supply. Cabbage as sold from Ruschita (mining area R) (mining-affected area) had lead higher at 900 µg/kg, against 50 µg/kg for Borlova (reference area) in the same study.[7]

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

2 | What counts as cabbage

This page covers cabbage as sold (944 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 cabbage

The evidence on how metals reach cabbage comes from studies that compared exposed and ordinary settings. Cabbage as sold from Ruschita (mining area R) (mining-affected area) had lead higher at 900 µg/kg, against 50 µg/kg for Borlova (reference area) in the same study.[7] In another study, cabbage as sold from Ruschita old mining area (R) (mining-affected area) had lead higher at 900 µg/kg, against 50 µg/kg for Borlova reference area (Ref) in the same study.[20]

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 cabbage as sold pools 26 subgroup units from 5 sampling families, with a median of between 185 and 773 µg/kg and a middle half spanning below 150 (lower quartile) and between 773 and 7,290 µg/kg (upper quartile).[1,9,14,21,22] for lead in cabbage as sold, the reference median was below 4 µg/kg, with a middle half from below 4 to below 4 µg/kg across 135 units.[1,2,23,24] for cadmium in cabbage as sold, the reference median was between 4.9 and 5.7 µg/kg, with a middle half from below 4 to 6 µg/kg across 118 units.[1,2,23,25]

Among GEMS/Food reporting regions, cabbage as sold had the lowest lead subgroup median in PAHO (2.3 µg/kg) and the highest in PAHO (185 µg/kg); reporting regions are markets, not growing areas.[1] For cadmium, the lowest regional median was in EURO (3.88 µg/kg) and the highest in EURO (195 µg/kg).[1] For total arsenic, the lowest regional median was in EURO (4.1 µg/kg) and the highest in EURO (6.9 µg/kg).[1]

Targeted cabbage as sold samples in SEARO had lead equal to at 20 µg/kg, against 20 µg/kg for SEARO in the same study.[1]

In one study, lead across 19 groups of cabbage ranged from 1,220 µg/kg (Lutendele) to 30,900 µg/kg (Cecomaf); the lowest is the lowest observed in that study, not an established sourcing preference.[21] In another study, cadmium across 8 groups of cabbage ranged from 3.88 µg/kg (EURO) to 74.5 µg/kg (WPRO); the lowest is the lowest observed in that study, not an established sourcing preference.[1]

5 | Processing, cooking and preparation

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

6 | Mitigation for cabbage

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 cabbage for metals

Results depend on the method and its reporting limit. Reporting limits for lead ranged from 0.5 µg/kg (WHO GEMS/Food) to 10,000 µg/kg (Sultana et al. 2022), so a non-detect from a less sensitive method says much less.[1,14] Reporting limits for cadmium ranged from 0.1 µg/kg (Al-Salimi et al. 2026) to 63 µg/kg (Kipelo et al. 2025), so a non-detect from a less sensitive method says much less.[21,26] Reporting limits for total arsenic ranged from 0.2 µg/kg (WHO GEMS/Food) to 600 µg/kg (WHO GEMS/Food), so a non-detect from a less sensitive method says much less.[1]

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

9 | Buying and verifying cabbage

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

10 | Exposure from cabbage

No source in the library converted cabbage 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 cabbage was decided on its content: 51 occurrence extracted, 51 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 | Cabbage FAQs

The library reports lead, cadmium, total arsenic, inorganic arsenic, total mercury, nickel, chromium, aluminum, tin, antimony, uranium, Co, Cu, Fe, Mn, Zn, V, Se, Ag, As, Ba, Hg, Mo, Sr, Ti and Tl in cabbage, most often lead, cadmium and total arsenic.[1,2,3,4] WHO gems/food submissions reported lead in cabbage as sold from 3,881 results in 5 reporting regions, with subgroup medians from 2.3 to 185 µg/kg.[1]

In the studies available, cabbage from contaminated or exposed settings carried more metal than cabbage from the same study's control.[7] cabbage as sold from Moldova Noua (mining area M) (mining-affected area) had lead higher at 250 µg/kg, against 50 µg/kg for Borlova (reference area) in the same study.[7]

Among GEMS/Food reporting regions, cabbage as sold had the lowest lead subgroup median in PAHO (2.3 µg/kg) and the highest in PAHO (185 µg/kg); reporting regions are markets, not growing areas.[1] For cadmium, the lowest regional median was in EURO (3.88 µg/kg) and the highest in EURO (195 µg/kg).[1]

Inorganic arsenic, the more toxic form, was measured in 11 results from 3 sources, far fewer than total arsenic.[1,27,28] Centre for Food Safety FEHD HKSAR 2012 reported inorganic arsenic at 2 µg/kg (mean) in cabbage as sold from all samples (4 sampling occasions, composites).[28]

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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/cabbage#sources.

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