Melon

Karen Pendergrass · Heavy Metal Index, Institute of Contaminant Standards

HEAVY METAL INDEX · INGREDIENT PROFILE October 2026
DOI 10.83376/hmi.ingredient.melon

CITE AS

Pendergrass, K. (2026). Melon. Heavy Metal Index. https://doi.org/10.83376/hmi.ingredient.melon

CORRESPONDENCE

Corrections are logged publicly on the article page, each with its date, the affected value, and the source that resolved it.

KEYWORDS

heavy metals, food safety, dietary exposure

PUBLICATION HISTORY

This revision 2026-10-22.

Abstract

Melon in the HMI library has 192 reported results for lead, cadmium, total arsenic, inorganic arsenic, total mercury, nickel, chromium, aluminum, tin, antimony, Co, Cu, Fe, Mn, Zn, V and B from 17 sources. WHO gems/food submissions reported lead in melon as sold from 536 results in 4 reporting regions, with subgroup medians from 1.3 to 12 µg/kg. For cadmium, GEMS/Food gave subgroup medians from 3 to 11.7 µg/kg from 587 results.

1 | Melon overview

Across 2 other studies of ordinary farms and markets, reported lead means and medians on an as-sold or fresh-weight basis ranged from 0.4 µg/kg (Ibanga et al. 2019) to 540 µg/kg (Guerra et al. 2012).[2,7] For cadmium, 2 studies on an as-sold or fresh-weight basis reported means and medians from 0.5 µg/kg (Dearing et al. 2025) to 20 µg/kg (Guerra et al. 2012).[2,8]

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

2 | What counts as melon

This page covers melon in 3 forms kept separate in every comparison: melon as sold (181 results), melon peel or outer layer (7 results) and melon oil (4 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 melon

No study in the library compared melon 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 melon as sold pools 67 subgroup units from 1 sampling family, with a median of below 5 µg/kg and a middle half spanning below 3 (lower quartile) and between 1.65 and 10 µg/kg (upper quartile).[1] for cadmium in melon as sold, the reference median was 1 µg/kg, with a middle half from between 0.5 and 0.75 to between 6 and 6.5 µg/kg across 65 units.[1,8] for total arsenic in melon as sold, the reference median was below 13.9 µg/kg, with a middle half from below 9.7 to between 13.9 and 24.1 µg/kg across 19 units.[1]

Among GEMS/Food reporting regions, melon as sold had the lowest lead subgroup median in PAHO (1.3 µg/kg) and the highest in WPRO (12 µg/kg); reporting regions are markets, not growing areas.[1] For cadmium, the lowest regional median was in WPRO (3.5 µg/kg) and the highest in EURO (11.7 µg/kg).[1] For total arsenic, the lowest regional median was in EURO (16.4 µg/kg) and the highest in EURO (19 µg/kg).[1]

5 | Processing, cooking and preparation

Processed or prepared forms were compared only with unprocessed melon in the same study and group. Melon peel or outer layer (local market) had lead lower at 275 µg/kg, against 678 µg/kg for the unprocessed form in the same group (melon as sold).[10]

Forms differ in water content, so a per-kilogram difference is not by itself a measured removal or gain of metal.

6 | Mitigation for melon

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 melon for metals

Results depend on the method and its reporting limit. Reporting limits for lead ranged from 2 µg/kg (WHO GEMS/Food) to 3,000 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 2 µg/kg (WHO GEMS/Food) to 300 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 melon

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

10 | Exposure from melon

No source in the library converted melon 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 melon was decided on its content: 17 occurrence extracted, 17 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 | Melon FAQs

The library reports lead, cadmium, total arsenic, inorganic arsenic, total mercury, nickel, chromium, aluminum, tin, antimony, Co, Cu, Fe, Mn, Zn, V and B in melon, most often lead, cadmium and total arsenic.[1,2,3,4] WHO gems/food submissions reported lead in melon as sold from 536 results in 4 reporting regions, with subgroup medians from 1.3 to 12 µg/kg.[1]

Among GEMS/Food reporting regions, melon as sold had the lowest lead subgroup median in PAHO (1.3 µg/kg) and the highest in WPRO (12 µg/kg); reporting regions are markets, not growing areas.[1] For cadmium, the lowest regional median was in WPRO (3.5 µg/kg) and the highest in EURO (11.7 µg/kg).[1]

Only comparisons between forms in the same study are available, not before-and-after measurements of the same melon.[10] melon peel or outer layer (local market) had lead lower at 275 µg/kg, against 678 µg/kg for the unprocessed form in the same group (melon as sold).[10]

Inorganic arsenic, the more toxic form, was measured in 5 results from 3 sources, far fewer than total arsenic.[1,11,12] Across 2 other studies of ordinary farms and markets, reported inorganic arsenic means and medians with the basis not stated ranged from 4 µg/kg (Centre for Food Safety FEHD HKSAR 2012) to 6.3 µg/kg (European Food Safety Authority (EFSA) 2014).[11,12]

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] 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

[3] Food survey: Levels and potential health risks of chromium, lead, zinc and copper content in fruits and vegetables consumed in Algeria
Cherfi A, Abdoun S, and Gaci O · Food and Chemical Toxicology · 2014 · doi.org/10.1016/j.fct.2014.04.044
PEER-REVIEWED

[4] Monitoring of Heavy Metal Content in Fruits and Vegetables Collected from Production and Market Sites in the Misurata Area of Libya
Elbagermi MA, Edwards HGM, and Alajtal AI · ISRN Analytical Chemistry · 2012 · doi.org/10.5402/2012/827645
PEER-REVIEWED

[5] Toxic and Essential Metals in Staple Foods Commonly Consumed by Students in Ekiti State, South West, Nigeria
Iyabo OO, Ogundiran MB, and Adebayo OL · International Journal of Chemistry · 2015 · doi.org/10.5539/ijc.v7n1p155
PEER-REVIEWED

[6] Trace and Macro Elements Concentrations in Selected Fresh Fruits, Vegetables, Herbs, and Processed Foods in North Carolina, USA
Mehari TF, Greene L, Duncan AL, and Fakayode SO · Journal of Environmental Protection, 2015, 6, 573-583 · 2015 · doi.org/10.4236/jep.2015.66052
PEER-REVIEWED

[7] Studies on chemical elements and anti-nutrients compositions of three traditional vegetable oils in Nigeria
Ibanga UI, Fakunle JO, Raji AO, and Sogunle KA · Journal of Agricultural Science and Practice 4(5), 144-150 · 2019 · doi.org/10.31248/jasp2019.155
PEER-REVIEWED

[8] Assessment of Heavy Metals in Organic and Non-Organic Vegetables Post Severe Tropical Cyclone Gabrielle: A cross-sectional comparative analysis
Dearing C, Ye Z, and Robertshaw G · F1000Research · 2025 · doi.org/10.12688/f1000research.175538.1
PEER-REVIEWED

[9] Determination of heavy metals contamination in some vegetables and fruits samples from the market of Jagdalpur, Chhattisgarh State
Salhotra P and Verma R · IOSR Journal of Applied Chemistry · 2017 · doi.org/10.9790/5736-100502110113
PEER-REVIEWED

[10] Detection of Heavy metals in Fruits and Vegetables available in the Market of Quetta city
Nisa KU, Samiullah, Khan N, and Attiq-ur-Rehman · Al-Nahrain Journal of Science 23(1):47-56 · 2020 · doi.org/10.22401/anjs.23.1.07
PEER-REVIEWED

[11] 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

[12] 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

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

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

PUBLICATION HISTORY

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

This revision 2026-10-22. The full dated record is maintained at https://heavymetalindex.com/ingredients/melon.