Olives

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Abstract

Olives in the HMI library has 204 reported results for lead, cadmium, total arsenic, total mercury, nickel, chromium, aluminum, tin, antimony, uranium, Co, Cu, Fe, Mn, Zn, V, Se, Ba, I, Mo and Sr from 14 sources. WHO gems/food submissions reported lead in olives as sold from 285 results in 4 reporting regions, with subgroup medians from 1.5 to 365 µg/kg. In the US Total Diet Study, olives as sold had a median lead result below 4 µg/kg across 3 composites from 2018-2020.

1 | Olives 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 24 µg/kg (Fechner et al. 2022) to 250 µg/kg (Acar 2012).[3,4] For cadmium, 2 studies on an as-sold or fresh-weight basis reported means and medians from 5 µg/kg (Shavali-gilani et al. 2025) to 88 µg/kg (Acar 2012).[3,7]

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

2 | What counts as olives

This page covers olives in 5 forms kept separate in every comparison: olives as sold (177 results), peeled or flesh olives (9 results), canned olives (8 results), olives oil (8 results) cooked and olives (2 results).[1,2,3,4,5,6] Foods made from olives that have their own pages, such as olive oil, 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 olives

No study in the library compared olives 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 olives as sold pools 63 subgroup units from 3 sampling families, with a median of below 4 µg/kg and a middle half spanning below 4 (lower quartile) and below 7 µg/kg (upper quartile).[1,2,6] for lead in olives as sold, the reference median was 27,100 µg/kg, with a middle half from 335 to 53,800 µg/kg across 4 units.[1,9] for cadmium in olives as sold, the reference median was below 1 µg/kg, with a middle half from below 1 to below 2 µg/kg across 51 units.[1,2,6]

Among GEMS/Food reporting regions, olives as sold had the lowest lead subgroup median in PAHO (1.5 µg/kg) and the highest in WPRO (365 µg/kg); reporting regions are markets, not growing areas.[1]

In one study, cadmium across 7 groups of olives ranged from 1,200 µg/kg (Carolea cultivar, skin, Malta local cultivator) to 1,800 µg/kg (Cipressina cultivar, skin, Malta local cultivator); the lowest is the lowest observed in that study, not an established sourcing preference.[8]

5 | Processing, cooking and preparation

Processed or prepared forms were compared only with unprocessed olives in the same study and group. Cooked olives (PAHO) had lead lower at 6.4 µg/kg, against 10 µg/kg for the unprocessed form in the same group (olives as sold).[1]

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

6 | Mitigation for olives

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 olives for metals

Results depend on the method and its reporting limit. Reporting limits for lead ranged from 1 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 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 0.8 µg/kg (Shavali-gilani et al. 2025) to 50 µg/kg (WHO GEMS/Food), so a non-detect from a less sensitive method says much less.[1,7]

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

9 | Buying and verifying olives

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

10 | Exposure from olives

No source in the library converted olives 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 olives 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 | Olives FAQs

The library reports lead, cadmium, total arsenic, total mercury, nickel, chromium, aluminum, tin, antimony, uranium, Co, Cu, Fe, Mn, Zn, V, Se, Ba, I, Mo and Sr in olives, most often lead, cadmium and total arsenic.[1,2,3,4] WHO gems/food submissions reported lead in olives as sold from 285 results in 4 reporting regions, with subgroup medians from 1.5 to 365 µg/kg.[1]

Among GEMS/Food reporting regions, olives as sold had the lowest lead subgroup median in PAHO (1.5 µg/kg) and the highest in WPRO (365 µg/kg); reporting regions are markets, not growing areas.[1]

Only comparisons between forms in the same study are available, not before-and-after measurements of the same olives.[1] cooked olives (PAHO) had lead lower at 6.4 µg/kg, against 10 µg/kg for the unprocessed form in the same group (olives as sold).[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/olives#sources.

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