Plums

Karen Pendergrass · Heavy Metal Index, Institute of Contaminant Standards

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Abstract

Plums in the HMI library has 222 reported results for lead, cadmium, total arsenic, inorganic arsenic, dimethylarsinic acid, total mercury, nickel, chromium, aluminum, tin, antimony, Co, Cu, Fe, Mn, Zn, V, Se, As, Ba and Mo from 15 sources. WHO gems/food submissions reported lead in plums as sold from 70 results in 3 reporting regions, with subgroup medians from 6.95 to 37 µg/kg. For cadmium, GEMS/Food gave a subgroup median of 17 µg/kg from 53 results.

1 | Plums 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 27.2 µg/kg (Lee et al. 2023) to 140 µg/kg (Sembratowicz et al. 2010).[3,4] For cadmium, 3 studies with the basis not stated reported means and medians from 0.54 µg/kg (Dabeka et al. 1995) to 82.3 µg/kg (Akçay et al. 2023).[7,8]

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

2 | What counts as plums

This page covers plums in 3 forms kept separate in every comparison: plums as sold (124 results), dried plums (88 results) canned and plums (10 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 plums

No study in the library compared plums 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 plums as sold pools 26 subgroup units from 3 sampling families, with a median of between 8 and 15 µg/kg and a middle half spanning between 2.4 and 5.5 (lower quartile) and 110 µg/kg (upper quartile).[1,4,5] dried for lead in plums, the reference median was between 1.05 and 11.5 µg/kg, with a middle half from below 5 to between 11 and 25.5 µg/kg across 75 units.[1] for cadmium in plums as sold, the reference median was between 0.1 and 1.27 µg/kg, with a middle half from 0.1 to 10 µg/kg across 15 units.[1,4,5]

Among GEMS/Food reporting regions, plums as sold had the lowest lead subgroup median in PAHO (6.95 µg/kg) and the highest in EURO (37 µg/kg); reporting regions are markets, not growing areas.[1]

5 | Processing, cooking and preparation

Processed or prepared forms were compared only with unprocessed plums in the same study and group. Dried plums (PAHO) had lead higher at 10 µg/kg, against 6.95 µg/kg for the unprocessed form in the same group (plums as sold).[1] In another study, dried plums (5 city composites) had lead higher at 10 µg/kg, against 4.9 µg/kg for the unprocessed form in the same group (plums as sold).[7]

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

6 | Mitigation for plums

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 plums for metals

Results depend on the method and its reporting limit. Reporting limits for lead ranged from 1 µg/kg (WHO GEMS/Food) to 200 µg/kg (WHO GEMS/Food), so a non-detect from a less sensitive method says much less.[1] Reporting limits for cadmium ranged from 0.11 µg/kg (Dabeka et al. 1995) to 50 µg/kg (WHO GEMS/Food), so a non-detect from a less sensitive method says much less.[1,7] Reporting limits for total arsenic ranged from 0.9 µg/kg (WHO GEMS/Food) to 400 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 plums

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

10 | Exposure from plums

No source in the library converted plums 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 plums was decided on its content: 15 occurrence extracted, 15 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 | Plums FAQs

The library reports lead, cadmium, total arsenic, inorganic arsenic, dimethylarsinic acid, total mercury, nickel, chromium, aluminum, tin, antimony, Co, Cu, Fe, Mn, Zn, V, Se, As, Ba and Mo in plums, most often lead, cadmium and total arsenic.[1,2,3,4] WHO gems/food submissions reported lead in plums as sold from 70 results in 3 reporting regions, with subgroup medians from 6.95 to 37 µg/kg.[1]

Among GEMS/Food reporting regions, plums as sold had the lowest lead subgroup median in PAHO (6.95 µg/kg) and the highest in EURO (37 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 plums.[1] dried plums (PAHO) had lead higher at 10 µg/kg, against 6.95 µg/kg for the unprocessed form in the same group (plums as sold).[1]

Inorganic arsenic, the more toxic form, was measured in 9 results from 3 sources, far fewer than total arsenic.[1,11,12] European Food Safety Authority (EFSA) 2014 reported inorganic arsenic at 8.4 µg/kg (mean) dried in plums from European dietary-survey occurrence data.[12]

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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/plums#sources.

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