Pasta

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Abstract

Pasta in the HMI library has 949 reported results for lead, cadmium, total arsenic, inorganic arsenic, dimethylarsinic acid, monomethylarsonic acid, total mercury, nickel, chromium, aluminum, tin, antimony, uranium, Co, Cu, Fe, Mn, Zn, V, Se, B, Ba, Ca, Ga, K, Mg, Mo, Na, P, Rb, S, Sr, Ti and Tl from 29 sources. WHO gems/food submissions reported lead in pasta as sold from 119 results in 3 reporting regions, with subgroup medians from 2.8 to 12.3 µg/kg. In the US Total Diet Study, cooked pasta had a median lead result below 4 µg/kg across 3 composites from 2018-2020.

1 | Pasta 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 54 µg/kg (Marín et al. 2018) to 608 µg/kg (Ihedioha et al. 2018).[3,4] For cadmium, 4 studies on an as-sold or fresh-weight basis reported means and medians from 2 µg/kg (Ihedioha et al. 2018) to 263 µg/kg (Ihedioha et al. 2018).[3] Higher results came from contaminated or exposed settings rather than ordinary supply. Pasta as sold from retail brand B had Zn higher at 5,600 µg/kg, against 900 µg/kg for retail brand A in the same study.[6]

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

2 | What counts as pasta

This page covers pasta in 3 forms kept separate in every comparison: pasta as sold (885 results), cooked pasta (48 results) canned and pasta (16 results).[1,2,3,4,5,6] Foods made from pasta that have their own pages, such as pasta sauce and whole wheat pasta, 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 pasta

The evidence on how metals reach pasta comes from studies that compared exposed and ordinary settings. Pasta as sold from retail brand B had Zn higher at 5,600 µg/kg, against 900 µg/kg for retail brand A in the same study.[6]

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 cooked hmi reference for lead in pasta pools 58 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 6.75 µg/kg (upper quartile).[1,2,9] for lead in pasta as sold, the reference median was between 12.3 and 28.1 µg/kg, with a middle half from below 3 to 300 µg/kg across 42 units.[1,5,6] for lead in pasta as sold, the reference median was below 40 µg/kg, with a middle half from below 40 to 122 µg/kg across 5 units.[7]

Among GEMS/Food reporting regions, pasta as sold had the lowest lead subgroup median in PAHO (2.8 µg/kg) and the highest in PAHO (12.3 µg/kg); reporting regions are markets, not growing areas.[1] For cadmium, the lowest regional median was in EURO (6 µg/kg) and the highest in PAHO (57.5 µg/kg).[1] For total arsenic, the lowest regional median was in EURO (10 µg/kg) and the highest in EURO (255 µg/kg).[1]

In one study, lead across 5 groups of pasta ranged from 3.6 µg/kg (Montreal 1988) to 32.9 µg/kg (Halifax 1986); the lowest is the lowest observed in that study, not an established sourcing preference.[10] In another study, cadmium across 26 groups of pasta ranged from 150 µg/kg (sample 1, US-manufactured, Las Vegas market) to 500 µg/kg (sample 32, imported from Asia, Las Vegas market); the lowest is the lowest observed in that study, not an established sourcing preference.[11]

5 | Processing, cooking and preparation

Processed or prepared forms were compared only with unprocessed pasta in the same study and group. Cooked pasta (PAHO) had lead lower at 4.63 µg/kg, against 12.3 µg/kg for the unprocessed form in the same group (pasta 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 pasta

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.[6] 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 pasta for metals

Results depend on the method and its reporting limit. Reporting limits for lead ranged from 0.2 µg/kg (Pourimani et al. 2026) to 3,000 µg/kg (WHO GEMS/Food), so a non-detect from a less sensitive method says much less.[1,5] Reporting limits for cadmium ranged from 0.15 µg/kg (WHO GEMS/Food) to 56 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 0.1 µg/kg (Pourimani et al. 2026) to 200 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 pasta

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

10 | Exposure from pasta

No source in the library converted pasta 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 pasta was decided on its content: 29 occurrence extracted, 29 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 | Pasta FAQs

The library reports lead, cadmium, total arsenic, inorganic arsenic, dimethylarsinic acid, monomethylarsonic acid, total mercury, nickel, chromium, aluminum, tin, antimony, uranium, Co, Cu, Fe, Mn, Zn, V, Se, B, Ba, Ca, Ga, K, Mg, Mo, Na, P, Rb, S, Sr, Ti and Tl in pasta, most often lead, cadmium and total arsenic.[1,2,3,4] WHO gems/food submissions reported lead in pasta as sold from 119 results in 3 reporting regions, with subgroup medians from 2.8 to 12.3 µg/kg.[1]

In the studies available, pasta from contaminated or exposed settings carried more metal than pasta from the same study's control.[6] pasta as sold from retail brand B had lead higher at 800 µg/kg, against 600 µg/kg for retail brand A in the same study.[6]

Among GEMS/Food reporting regions, pasta as sold had the lowest lead subgroup median in PAHO (2.8 µg/kg) and the highest in PAHO (12.3 µg/kg); reporting regions are markets, not growing areas.[1] For cadmium, the lowest regional median was in EURO (6 µg/kg) and the highest in PAHO (57.5 µg/kg).[1]

Only comparisons between forms in the same study are available, not before-and-after measurements of the same pasta.[1] cooked pasta (PAHO) had lead lower at 4.63 µg/kg, against 12.3 µg/kg for the unprocessed form in the same group (pasta as sold).[1]

Inorganic arsenic, the more toxic form, was measured in 15 results from 7 sources, far fewer than total arsenic.[1,4,12,13,14,15,16] Across 2 other studies of ordinary farms and markets, reported inorganic arsenic means and medians on an as-sold or fresh-weight basis ranged from 10.7 µg/kg (Marín et al. 2018) to 120 µg/kg (US Food and Drug Administration 2016).[4,12]

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STATUS AND LICENCE

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DATA AVAILABILITY

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

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.

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