Oatmeal

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Abstract

Oatmeal in the HMI library has 67 reported results for lead, cadmium, total arsenic, inorganic arsenic, total mercury, nickel, chromium, aluminum, tin, antimony, uranium, Co and V from 9 sources. WHO gems/food submissions reported lead in oatmeal as sold from 19 results in 2 reporting regions, with subgroup medians from 4.85 to 6.14 µg/kg. In the US Total Diet Study, oatmeal flour or meal had a median lead result below 4 µg/kg across 3 composites from 2018-2020.

1 | Oatmeal overview

Across 2 other studies of ordinary farms and markets, reported lead means and medians with the basis not stated ranged from 2 µg/kg (Centre for Food Safety (Hong Kong) 2013) to 8.6 µg/kg (Dabeka et al. 1995).[5,6] Spungen et al. 2024 reported cadmium at 2.2 µg/kg (mean) in oatmeal flour or meal from all samples.[4]

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

2 | What counts as oatmeal

This page covers oatmeal in 3 forms kept separate in every comparison: oatmeal flour or meal (49 results), oatmeal as sold (16 results) cooked and oatmeal (2 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 oatmeal

No study in the library compared oatmeal from contaminated and ordinary settings, so the routes by which metals reach it are not measured here.

4 | Which forms and regions measured lower

For cadmium, the HMI cooked reference median was lowest for oatmeal (2.75 µg/kg) and highest for oatmeal flour or meal (7.8 µg/kg); forms differ in water content, so this compares foods as sold or eaten, not uptake.[1,2,3] The hmi reference for lead in oatmeal flour or meal pools 6 subgroup units from 3 sampling families, with a median of below 4 µg/kg and a middle half spanning below 3 (lower quartile) and between 2 and 4 µg/kg (upper quartile).[2,3,4] for lead in oatmeal as sold, the reference median was between 4.1 and 5.16 µg/kg, with a middle half from below 2 to between 7.2 and 8.4 µg/kg across 17 units.[1] cooked for lead in oatmeal, the reference median was below 7 µg/kg, with a middle half from below 7 to below 7 µg/kg across 17 units.[1]

Among GEMS/Food reporting regions, oatmeal as sold had the lowest lead subgroup median in PAHO (4.85 µg/kg) and the highest in PAHO (6.14 µg/kg); reporting regions are markets, not growing areas.[1] For cadmium, the lowest regional median was in PAHO (2 µg/kg) and the highest in PAHO (30 µg/kg).[1]

5 | Processing, cooking and preparation

Processed or prepared forms were compared only with unprocessed oatmeal in the same study and group. Cooked oatmeal (PAHO) had cadmium lower at 3 µg/kg, against 30 µg/kg for the unprocessed form in the same group (oatmeal 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 oatmeal

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 oatmeal for metals

Results depend on the method and its reporting limit. Reporting limits for lead ranged from 0.4 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 1 µg/kg (FDA Total Diet Study) to 2 µg/kg (Centre for Food Safety (Hong Kong) 2013), so a non-detect from a less sensitive method says much less.[2,5] Reporting limits for inorganic arsenic were 3 µg/kg where sources stated them.[7]

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

9 | Buying and verifying oatmeal

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

10 | Exposure from oatmeal

No source in the library converted oatmeal 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 oatmeal was decided on its content: 9 occurrence extracted, 9 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 | Oatmeal FAQs

The library reports lead, cadmium, total arsenic, inorganic arsenic, total mercury, nickel, chromium, aluminum, tin, antimony, uranium, Co and V in oatmeal, most often lead, cadmium and total arsenic.[1,2,3,4] WHO gems/food submissions reported lead in oatmeal as sold from 19 results in 2 reporting regions, with subgroup medians from 4.85 to 6.14 µg/kg.[1]

For cadmium, the HMI cooked reference median was lowest for oatmeal (2.75 µg/kg) and highest for oatmeal flour or meal (7.8 µg/kg); forms differ in water content, so this compares foods as sold or eaten, not uptake.[1,2,3]

Among GEMS/Food reporting regions, oatmeal as sold had the lowest lead subgroup median in PAHO (4.85 µg/kg) and the highest in PAHO (6.14 µg/kg); reporting regions are markets, not growing areas.[1] For cadmium, the lowest regional median was in PAHO (2 µg/kg) and the highest in PAHO (30 µg/kg).[1]

Only comparisons between forms in the same study are available, not before-and-after measurements of the same oatmeal.[1] cooked oatmeal (PAHO) had cadmium lower at 3 µg/kg, against 30 µg/kg for the unprocessed form in the same group (oatmeal as sold).[1]

Inorganic arsenic, the more toxic form, was measured in 3 results from 3 sources, far fewer than total arsenic.[1,3,7] WHO GEMS/Food submissions reported inorganic arsenic in oatmeal as sold from 4 results in 1 reporting region, with subgroup medians below 3 µg/kg, mostly non-detects.[1]

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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.

DATA AVAILABILITY

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