Wholemeal bread

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Abstract

Wholemeal bread in the HMI library has 51 reported results for lead, cadmium, total arsenic, inorganic arsenic, total mercury, nickel, chromium, aluminum, tin and Cu from 2 sources. WHO GEMS/Food submissions reported lead in wholemeal bread as sold from 262 results in 3 reporting regions, with subgroup medians from 33 to 54 µg/kg. For cadmium, GEMS/Food gave subgroup medians from 7 to 20 µg/kg from 191 results.

1 | Wholemeal bread overview

Marín et al. 2018 reported lead at 30.6 µg/kg (mean), cadmium at 20.8 µg/kg (mean), total arsenic at 19.1 µg/kg (mean) and inorganic arsenic at 4.8 µg/kg (mean) in wholemeal bread as sold from Cereals.[2]

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

2 | What counts as wholemeal bread

This page covers wholemeal bread as sold (51 results).[1,2]

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 wholemeal bread

No study in the library compared wholemeal bread 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 wholemeal bread as sold pools 30 subgroup units from 1 sampling family, with a median of below 10 µg/kg and a middle half spanning below 5.2 (lower quartile) and between 3.5 and 10 µg/kg (upper quartile).[1] for cadmium in wholemeal bread as sold, the reference median was 20 µg/kg, with a middle half from 16 to 21.6 µg/kg across 33 units.[1] for total arsenic in wholemeal bread as sold, the reference median was between 6.75 and 8 µg/kg, with a middle half from below 5.56 to between 11.5 and 17.3 µg/kg across 12 units.[1]

Among GEMS/Food reporting regions, wholemeal bread as sold had the lowest cadmium subgroup median in EURO (16.2 µg/kg) and the highest in EURO (20 µg/kg); reporting regions are markets, not growing areas.[1] For total arsenic, the lowest regional median was in WPRO (6.5 µg/kg) and the highest in EURO (19.5 µg/kg).[1] For total mercury, the lowest regional median was in EURO (0.5 µg/kg) and the highest in WPRO (10 µg/kg).[1]

Targeted wholemeal bread as sold samples in EURO had lead lower at 33 µg/kg, against 54 µg/kg for EURO in the same study.[1] In another study, targeted wholemeal bread as sold samples in EURO had cadmium lower at 7 µg/kg, against 20 µg/kg for EURO in the same study.[1]

5 | Processing, cooking and preparation

No processing study for metals in this food is in the library yet.

6 | Mitigation for wholemeal bread

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 wholemeal bread for metals

Results depend on the method and its reporting limit. Reporting limits for lead ranged from 2.5 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 10 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 5 µg/kg (WHO GEMS/Food) to 99 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 wholemeal bread

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

10 | Exposure from wholemeal bread

No source in the library converted wholemeal bread 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 wholemeal bread was decided on its content: 2 occurrence extracted, 2 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 | Wholemeal bread FAQs

The library reports lead, cadmium, total arsenic, inorganic arsenic, total mercury, nickel, chromium, aluminum, tin and Cu in wholemeal bread, most often lead, cadmium and total arsenic.[1,2] WHO GEMS/Food submissions reported lead in wholemeal bread as sold from 262 results in 3 reporting regions, with subgroup medians from 33 to 54 µg/kg.[1]

Among GEMS/Food reporting regions, wholemeal bread as sold had the lowest cadmium subgroup median in EURO (16.2 µg/kg) and the highest in EURO (20 µg/kg); reporting regions are markets, not growing areas.[1] For total arsenic, the lowest regional median was in WPRO (6.5 µg/kg) and the highest in EURO (19.5 µg/kg).[1]

Inorganic arsenic, the more toxic form, was measured in 5 results from 2 sources, far fewer than total arsenic.[1,2] Marín et al. 2018 reported inorganic arsenic at 4.8 µg/kg (mean) in wholemeal bread as sold from Cereals.[2]

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] Assessment of metal levels in foodstuffs from the Region of Valencia (Spain)
Marín S, Pardo O, Sánchez A, Sanchis Y, Vélez D, Devesa V, et al. · Toxicology Reports 5 (2018) 654-670 · 2018 · doi.org/10.1016/j.toxrep.2018.05.005
PEER-REVIEWED

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

PUBLICATION HISTORY

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

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