Ham

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Abstract

Ham in the HMI library has 164 reported results for lead, cadmium, total arsenic, inorganic arsenic, total mercury, methylmercury, nickel, chromium, aluminum, tin, antimony, uranium, Cu, Fe, Mn, Zn, V and CrIII from 11 sources. WHO gems/food submissions reported lead in ham as sold from 164 results in 2 reporting regions, with subgroup medians from 3.65 to 15 µg/kg. In the US Total Diet Study, ham as sold had a median lead result below 4 µg/kg across 3 composites from 2018-2020.

1 | Ham overview

Across 4 other studies of ordinary farms and markets, reported lead means and medians on an as-sold or fresh-weight basis ranged from 3.5 µg/kg (Spungen et al. 2024) to 300 µg/kg (Barone et al. 2021).[3,7] For cadmium, 3 studies on an as-sold or fresh-weight basis reported means and medians from 1.3 µg/kg (Spungen et al. 2024) to 40 µg/kg (Litrenta et al. 2025).[7,8]

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

2 | What counts as ham

This page covers ham in 3 forms kept separate in every comparison: ham as sold (107 results), cooked ham (37 results) canned and ham (20 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 ham

No study in the library compared ham 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 ham as sold pools 29 subgroup units from 2 sampling families, with a median of below 4 µg/kg and a middle half spanning below 4 (lower quartile) and below 18.6 µg/kg (upper quartile).[1,2] canned for lead in ham, the reference median was below 4 µg/kg, with a middle half from below 4 to 5.3 µg/kg across 27 units.[2] for cadmium in ham as sold, the reference median was between 1.9 and 3 µg/kg, with a middle half from below 2.4 to between 3 and 5 µg/kg across 25 units.[1,2]

Among GEMS/Food reporting regions, ham as sold had the lowest lead subgroup median in WPRO (3.65 µg/kg) and the highest in PAHO (15 µg/kg); reporting regions are markets, not growing areas.[1] For total arsenic, the lowest regional median was in EURO (7 µg/kg) and the highest in WPRO (8.5 µg/kg).[1]

Targeted ham as sold samples in WPRO had total arsenic higher at 20 µg/kg, against 8.5 µg/kg for WPRO in the same study.[1] In another study, targeted ham as sold samples in WPRO had total arsenic higher at 37.8 µg/kg, against 8.5 µg/kg for WPRO in the same study.[1]

5 | Processing, cooking and preparation

Processed or prepared forms were compared only with unprocessed ham in the same study and group. Cooked ham (retail samples, commercial centers of Apulia, South Italy) had lead lower at 220 µg/kg, against 300 µg/kg for the unprocessed form in the same group (ham as sold).[3] In another study, cooked ham (Meat and meat products group, Region of Valencia TDS 2010-2011) had lead higher at 20.2 µg/kg, against 11.9 µg/kg for the unprocessed form in the same group (ham as sold).[4]

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

6 | Mitigation for ham

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 ham for metals

Results depend on the method and its reporting limit. Reporting limits for lead ranged from 2 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 0.12 µg/kg (Barone et al. 2021) to 1,000 µg/kg (WHO GEMS/Food), so a non-detect from a less sensitive method says much less.[1,3] Reporting limits for total arsenic ranged from 2 µg/kg (WHO GEMS/Food) to 5 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 ham

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

10 | Exposure from ham

No source in the library converted ham 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 ham was decided on its content: 11 occurrence extracted, 11 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 | Ham FAQs

The library reports lead, cadmium, total arsenic, inorganic arsenic, total mercury, methylmercury, nickel, chromium, aluminum, tin, antimony, uranium, Cu, Fe, Mn, Zn, V and CrIII in ham, most often lead, cadmium and total arsenic.[1,2,3,4] WHO gems/food submissions reported lead in ham as sold from 164 results in 2 reporting regions, with subgroup medians from 3.65 to 15 µg/kg.[1]

Among GEMS/Food reporting regions, ham as sold had the lowest lead subgroup median in WPRO (3.65 µg/kg) and the highest in PAHO (15 µg/kg); reporting regions are markets, not growing areas.[1] For total arsenic, the lowest regional median was in EURO (7 µg/kg) and the highest in WPRO (8.5 µg/kg).[1]

Only comparisons between forms in the same study are available, not before-and-after measurements of the same ham.[3] cooked ham (retail samples, commercial centers of Apulia, South Italy) had lead lower at 220 µg/kg, against 300 µg/kg for the unprocessed form in the same group (ham as sold).[3]

Inorganic arsenic, the more toxic form, was measured in 8 results from 3 sources, far fewer than total arsenic.[1,4,9] Centre for Food Safety FEHD HKSAR 2012 reported inorganic arsenic at 4 µg/kg (mean) in ham as sold from all samples (4 sampling occasions, composites).[9]

References

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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/ham#sources.

PUBLICATION HISTORY

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