Vegetable juice

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Abstract

Vegetable juice in the HMI library has 108 reported results for lead, cadmium, total arsenic, inorganic arsenic, dimethylarsinic acid, total mercury, nickel, chromium, aluminum, tin, uranium and Co from 16 sources. WHO GEMS/Food submissions reported lead in vegetable juice from 869 results in 4 reporting regions, with subgroup medians from 1.15 to 6.6 µg/kg. In the US Total Diet Study, vegetable juice had a median lead result below 1 µg/kg across 3 composites from 2018-2020.

1 | Vegetable juice overview

Across 2 other studies of ordinary farms and markets, reported lead means and medians with the basis not stated ranged from 0 µg/kg (EFSA Panel on Contaminants in the Food Chain (CONTAM) 2010) to 44.4 µg/kg (Dabeka et al. 1995).[6,7] For cadmium, 3 studies on an as-sold or fresh-weight basis reported means and medians from 8.1 µg/kg (EFSA Panel on Contaminants in the Food Chain (CONTAM) 2009) to 18 µg/kg (Grochowska-Niedworok et al. 2020).[3,8]

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

2 | What counts as vegetable juice

This page covers vegetable juice (108 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 vegetable juice

No study in the library compared vegetable juice 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 vegetable juice pools 78 subgroup units from 4 sampling families, with a median of below 1.9 µg/kg and a middle half spanning below 1.6 (lower quartile) and between 1.9 and 4 µg/kg (upper quartile).[1,2,3,5] for cadmium in vegetable juice, the reference median was between 8.9 and 9 µg/kg, with a middle half from 8.9 to between 9.68 and 10.2 µg/kg across 74 units.[1,2,8] for total arsenic in vegetable juice, the reference median was below 1.3 µg/kg, with a middle half from below 1 to between 1.3 and 10 µg/kg across 50 units.[1,2]

Among GEMS/Food reporting regions, vegetable juice had the lowest lead subgroup median in PAHO (1.15 µg/kg) and the highest in WPRO (6.6 µg/kg); reporting regions are markets, not growing areas.[1] For cadmium, the lowest regional median was in EURO (7.52 µg/kg) and the highest in PAHO (11.4 µg/kg).[1]

In one study, lead across 6 groups of vegetable juice ranged from 3.7 µg/kg (Vancouver 1987) to 93.9 µg/kg (Montreal 1988); the lowest is the lowest observed in that study, not an established sourcing preference.[6]

5 | Processing, cooking and preparation

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

6 | Mitigation for vegetable juice

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 vegetable juice for metals

Results depend on the method and its reporting limit. Reporting limits for lead ranged from 1 µg/kg (WHO GEMS/Food) to 1,000 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 55.4 µg/kg (WHO GEMS/Food), so a non-detect from a less sensitive method says much less.[1,2] Reporting limits for total arsenic ranged from 1 µg/kg (FDA Total Diet Study) to 10,000 µg/kg (WHO GEMS/Food), so a non-detect from a less sensitive method says much less.[1,2]

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

9 | Buying and verifying vegetable juice

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

10 | Exposure from vegetable juice

No source in the library converted vegetable juice 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 vegetable juice was decided on its content: 16 occurrence extracted, 16 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 | Vegetable juice FAQs

The library reports lead, cadmium, total arsenic, inorganic arsenic, dimethylarsinic acid, total mercury, nickel, chromium, aluminum, tin, uranium and Co in vegetable juice, most often lead, cadmium and total arsenic.[1,2,3,4] WHO GEMS/Food submissions reported lead in vegetable juice from 869 results in 4 reporting regions, with subgroup medians from 1.15 to 6.6 µg/kg.[1]

Among GEMS/Food reporting regions, vegetable juice had the lowest lead subgroup median in PAHO (1.15 µg/kg) and the highest in WPRO (6.6 µg/kg); reporting regions are markets, not growing areas.[1] For cadmium, the lowest regional median was in EURO (7.52 µg/kg) and the highest in PAHO (11.4 µg/kg).[1]

Inorganic arsenic, the more toxic form, was measured in 9 results from 2 sources, far fewer than total arsenic.[1,9] European Food Safety Authority (EFSA) 2014 reported inorganic arsenic at 4.4 µg/kg (mean) in vegetable juice from European dietary-survey occurrence data.[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/vegetable-juice#sources.

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