Oilseeds

Karen Pendergrass · Heavy Metal Index, Institute of Contaminant Standards

HEAVY METAL INDEX · INGREDIENT PROFILE October 2026

DOI 10.83376/hmi.ingredient.oilseeds

CITE AS

Pendergrass, K. (2026). Oilseeds. Heavy Metal Index. https://doi.org/10.83376/hmi.ingredient.oilseeds

CORRESPONDENCE

Corrections are logged publicly on the article page, each with its date, the affected value, and the source that resolved it.

KEYWORDS

heavy metals, food safety, dietary exposure

PUBLICATION HISTORY

This revision 2026-10-22.

Abstract

Oilseeds in the HMI library has 241 reported results for lead, cadmium, total arsenic, inorganic arsenic, total mercury, nickel, chromium, aluminum, tin, Cu, Fe, Mn and Zn from 12 sources. WHO gems/food submissions reported lead in oilseeds as sold from 2,636 results in 4 reporting regions, with subgroup medians from 10 to 440 µg/kg. For cadmium, GEMS/Food gave subgroup medians from 6 to 1,100 µg/kg from 4,275 results.

1 | Oilseeds 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 1,430 µg/kg (authors 2016).[4,5] For cadmium, 3 studies with the basis not stated reported means and medians from 108 µg/kg (Joint FAO/WHO Expert Committee on Food Additives 2022) to 501 µg/kg (Joint FAO/WHO Expert Committee on Food Additives 2022).[7] Higher results came from contaminated or exposed settings rather than ordinary supply. Oilseeds as sold from granulate IV (50% sludge, 20% ash), dose 3 (60 g/pot) (experiment) had nickel higher at 690 µg/kg, against 210 µg/kg for control (unamended soil, no granulate) in the same study.[3]

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

2 | What counts as oilseeds

This page covers oilseeds as sold (241 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 oilseeds

The evidence on how metals reach oilseeds comes from studies that compared exposed and ordinary settings. Oilseeds as sold from granulate IV (50% sludge, 20% ash), dose 3 (60 g/pot) (experiment) had nickel higher at 690 µg/kg, against 210 µg/kg for control (unamended soil, no granulate) in the same study.[3]

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 hmi reference for lead in oilseeds as sold pools 106 subgroup units from 1 sampling family, with a median of below 47.7 µg/kg and a middle half spanning below 17 (lower quartile) and between 23 and 50 µg/kg (upper quartile).[1] for cadmium in oilseeds as sold, the reference median was between 57 and 58.5 µg/kg, with a middle half from between 9.68 and 13.5 to 303 µg/kg across 100 units.[1] for total arsenic in oilseeds as sold, the reference median was between 7 and 29.5 µg/kg, with a middle half from below 20 to between 20 and 46.1 µg/kg across 66 units.[1]

Among GEMS/Food reporting regions, oilseeds as sold had the lowest lead subgroup median in PAHO (10 µg/kg) and the highest in WPRO (98 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 EURO (1,100 µg/kg).[1] For total arsenic, the lowest regional median was in EURO (24.2 µg/kg) and the highest in EURO (70 µg/kg).[1]

Targeted oilseeds as sold samples in EURO had cadmium lower at 22 µg/kg, against 31.7 µg/kg for EURO in the same study.[1] In another study, targeted oilseeds as sold samples in EURO had cadmium higher at 85 µg/kg, against 31.7 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 oilseeds

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.[3] 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 oilseeds 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 200 µg/kg (WHO GEMS/Food), so a non-detect from a less sensitive method says much less.[1] Reporting limits for cadmium ranged from 0.4 µg/kg (WHO GEMS/Food) to 500 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 600 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 oilseeds

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

10 | Exposure from oilseeds

No source in the library converted oilseeds 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 oilseeds was decided on its content: 12 occurrence extracted, 12 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 | Oilseeds FAQs

The library reports lead, cadmium, total arsenic, inorganic arsenic, total mercury, nickel, chromium, aluminum, tin, Cu, Fe, Mn and Zn in oilseeds, most often lead, cadmium and total arsenic.[1,2,3,4] WHO gems/food submissions reported lead in oilseeds as sold from 2,636 results in 4 reporting regions, with subgroup medians from 10 to 440 µg/kg.[1]

In the studies available, oilseeds from contaminated or exposed settings carried more metal than oilseeds from the same study's control.[3] oilseeds as sold from granulate I (experiment) had lead higher at 620 µg/kg, against 390 µg/kg for control (unamended soil, no granulate) in the same study.[3]

Among GEMS/Food reporting regions, oilseeds as sold had the lowest lead subgroup median in PAHO (10 µg/kg) and the highest in WPRO (98 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 EURO (1,100 µg/kg).[1]

Inorganic arsenic, the more toxic form, was measured in 7 results from 2 sources, far fewer than total arsenic.[1,8] European Food Safety Authority (EFSA) 2014 reported inorganic arsenic at 24.3 µg/kg (mean) in oilseeds as sold from European dietary-survey occurrence data.[8]

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] Essential and toxic elements in plant-based dairy alternatives: implications for vegan diets
Ondřej Zvěřina, Pavlína Kosečková, Pavel Coufalík, Dominika Michaličková, and Eva Duborská · European Food Research and Technology · 2025 · doi.org/10.1007/s00217-025-04775-1
PEER-REVIEWED

[3] The Effect of Sludge-Ash Granulates on the Content and Uptake of Heavy Metals by Winter Rape Seeds and Triticale
Ewa Mozdzer and Renata Gamrat · Applied Sciences · 2023 · doi.org/10.3390/app13052863
PEER-REVIEWED

[4] A comparative study of the content of heavy metals in oils:
Unknown authors · Peer-reviewed article · 2016 · doi.org/10.1515/aep-2016-0029
PEER-REVIEWED

[5] Scientific Opinion on Lead in Food
EFSA Panel on Contaminants in the Food Chain (CONTAM) · EFSA Journal 2010;8(4):1570 · 2010 · doi.org/10.2903/j.efsa.2010.1570
GOVERNMENT

[6] Cadmium dietary exposure in the European population
European Food Safety Authority · EFSA Journal 2012;10(1):2551 · 2012 · doi.org/10.2903/j.efsa.2012.2551
GOVERNMENT

[7] Cadmium: dietary exposure assessment
Joint FAO/WHO Expert Committee on Food Additives · WHO Food Additives Series, No. 82 (Safety evaluation of certain contaminants in food, prepared by the 91st meeting of JECFA) · 2022 · www.who.int
GOVERNMENT

[8] Dietary exposure to inorganic arsenic in the European population
European Food Safety Authority (EFSA) · EFSA Journal 2014;12(3):3597 · 2014 · doi.org/10.2903/j.efsa.2014.3597
GOVERNMENT

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.

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/oilseeds#sources.

PUBLICATION HISTORY

This revision 2026-10-22. The full dated record is maintained at https://heavymetalindex.com/ingredients/oilseeds.