Camel milk

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Abstract

Camel milk in the HMI library has 550 reported results for lead, cadmium, total arsenic, total mercury, nickel, chromium, aluminum, tin, antimony, Co, Cu, Fe, Mn, Zn, V, Se, Ag, B, Ba, Be, Bi, Ca, K, Li, Mg, Mo, Na, Si, Sr, Ti and Tl from 16 sources.

1 | Camel milk overview

Across 7 other studies of ordinary farms and markets, reported lead means and medians on an as-sold or fresh-weight basis ranged from 0.92 µg/kg (Parsaei et al. 2019) to 667 µg/kg (Batool et al. 2019).[3,8] For cadmium, 8 studies on an as-sold or fresh-weight basis reported means and medians from 0.14 µg/kg (Parsaei et al. 2019) to 102 µg/kg (Ahmad et al. 2017).[2,8] Higher results came from contaminated or exposed settings rather than ordinary supply. Camel milk as sold from raw camel milk samples from which E. Coli was isolated had cadmium higher at 3.2 µg/kg, against 3.1 µg/kg for raw camel milk samples from which S. Aureus was isolated in the same study.[7]

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

2 | What counts as camel milk

This page covers camel milk in 2 forms kept separate in every comparison: camel milk as sold (546 results) cooked and camel milk (4 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.

Almost every camel milk value in the library is for raw milk; a few are for shubat (fermented camel milk) or for milk boiled in one study. The library holds no metal values for pasteurized camel milk, camel milk powder, camel milk

cheese or chal. Measured regions are Pakistan, Iran, Kazakhstan, Egypt, Saudi Arabia, Xinjiang in China and Nigeria. No values are verified for the United Arab Emirates, Qatar, Kuwait, Oman, Mongolia, Somalia, Kenya, Ethiopia, Sudan, India or Algeria. Several camel milk studies are small or lack quality checks, and printed tables sometimes disagree with the same paper's text. Those values are kept as printed and flagged on their rows. Yang et al. 2025 state no quality-control data for their Tacheng samples, and the Tacheng camel milk values for beryllium, cobalt, cadmium, vanadium and antimony are about 20 to 60 times those from Altay and Ili; treat the Tacheng values as unreviewed. Soryal et al. 2026 is a preprint that has not been peer reviewed, and its table of detection limits does not line up with its own results. Abdelrahman et al. 2025 print different lead means for the same samples in Table 5 and Table 6; both are shown as printed. Their quality check used a water reference material, not a milk one. Mostafidi et al. 2016 report a chromium value for Qazvin although their conclusion says no chromium was found; Shar et al. 2021 print cadmium and lead values below their own stated detection limit; Batool et al. 2019 report lead of 0.667 to 3.17 ppm from one sample per milk type without a detection limit.

3 | How metals reach camel milk

The evidence on how metals reach camel milk comes from studies that compared exposed and ordinary settings. Camel milk as sold from raw camel milk samples from which E. Coli was isolated had cadmium higher at 3.2 µg/kg, against 3.1 µg/kg for raw camel milk samples from which S. Aureus was isolated in the same study.[7]

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

In one study, lead across 8 groups of camel milk ranged from 10 µg/kg (Zhambyl oblast, Kazakhstan) to 60 µg/kg (Almaty oblast, Kazakhstan); the lowest is the lowest observed in that study, not an established sourcing preference.[6] In another study, lead across 8 groups of camel milk ranged from 0.92 µg/kg (animals aged ≤2 years) to 14.4 µg/kg (animals aged 5 years or older); the lowest is the lowest observed in that study, not an established sourcing preference.[8]

5 | Processing, cooking and preparation

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

6 | Mitigation for camel milk

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.[7] 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 camel milk for metals

Results depend on the method and its reporting limit. Reporting limits for lead ranged from 3 µg/kg (Chen et al. 2020) to 10 µg/kg (Konuspayeva et al. 2011), so a non-detect from a less sensitive method says much less.[4,6]

Reporting limits for cadmium ranged from 0.1 µg/kg (Chen et al. 2020) to 1 µg/kg (Konuspayeva et al. 2011), so a non-detect from a less sensitive method says much less.[4,6] Reporting limits for total arsenic ranged from 0.8 µg/kg (Chen et al. 2020) to 100 µg/kg (Konuspayeva et al. 2009), so a non-detect from a less sensitive method says much less.[4,5]

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

9 | Buying and verifying camel milk

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

10 | Exposure from camel milk

No source in the library converted camel milk 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 camel milk 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 | Camel milk FAQs

The library reports lead, cadmium, total arsenic, total mercury, nickel, chromium, aluminum, tin, antimony, Co, Cu, Fe, Mn, Zn, V, Se, Ag, B, Ba, Be, Bi, Ca, K, Li, Mg, Mo, Na, Si, Sr, Ti and Tl in camel milk, most often lead, cadmium and total arsenic.[1,2,3,4]

In the studies available, camel milk from contaminated or exposed settings carried more metal than camel milk from the same study's control.[7] camel milk as sold from raw camel milk samples from which E. Coli was isolated had cadmium higher at 3.2 µg/kg, against 3.1 µg/kg for raw camel milk samples from which S. Aureus was isolated in the same study.[7]

In one study, lead across 8 groups of camel milk ranged from 10 µg/kg (Zhambyl oblast, Kazakhstan) to 60 µg/kg (Almaty oblast, Kazakhstan); the lowest is the lowest observed in that study, not an established sourcing preference.[6] In another study, lead across 8 groups of camel milk ranged from 0.92 µg/kg (animals aged ≤2 years) to 14.4 µg/kg (animals aged 5 years or older); the lowest is the lowest observed in that study, not an established sourcing preference.[8]

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STATUS AND LICENCE

COMPETING INTERESTS

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DATA AVAILABILITY

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

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