Herbal/botanical infusions: HMTc Standard

Karen Pendergrass · 0000-0002-2348-7259 · Heavy Metal Tested & Certified, Institute of Contaminant Standards

CITE AS

Pendergrass, K. (2026). Herbal/botanical infusions: HMTc Standard. Institute of Contaminant Standards.

© 2026 Institute of Contaminant Standards / Heavy Metal Certified. All rights reserved.

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 2026-08.

Abstract

The Heavy Metal Tested & Certified heavy-metal-safety standard for herbal/botanical infusions in Beverages, evaluated on dry botanical as sold (loose material, tea bags, sachets, pyramids), reported on the as-sold dry article; this is the lot the applicant packages and the auditor samples. 1 of 11 panel analytes publish a numeric limit taken from the strictest applicable government maximum; the remainder are held under mandatory control or a substantiated not-material determination.

1 | How every number on this standard is set

HMTc Method v2.0 (government-limit-only): the strictest applicable sovereign maximum level for this exact beverage form and analyte in the row's declared native basis, with disclosed read-across where the exact cell is unregulated, a substantiated not-material determination where a species is bounded or is a method artifact, and a control where no defensible sovereign number and no supportable near-neighbour exist. Never occurrence-derived. Ready-to-drink and dry-commodity bases are never mixed and no brewing, dilution or reconstitution factor is invented.

2 | Master limit table

All values in ppb (µg/kg), as sold basis. A brand meeting every value qualifies for the mark.

ANALYTE	HMTC LIMIT	BASIS
Lead (Pb)	2,000	read-across (Hong Kong)
Cadmium (Cd)	control	measured every lot; no human-food maximum

Total arsenic (tAs)	control	measured every lot; no human-food maximum
Inorganic arsenic (iAs)	control	measured every lot; no human-food maximum
Mercury, total (tHg)	control	measured every lot; no human-food maximum
Methylmercury (MeHg)	n/m	not material in this matrix
Nickel (Ni)	control	measured every lot; no human-food maximum
Tin (Sn)	control	measured every lot; no human-food maximum
Aluminium (Al)	control	measured every lot; no human-food maximum
Total chromium (Cr)	control	measured every lot; no human-food maximum
Hexavalent chromium (Cr-VI)	control	measured every lot; no human-food maximum

3 | Derivation — where each number comes from

Every cell traces to one named sovereign maximum level (the strictest for the nearest analog), or to an explicit control, not-material, or species-bounded determination. No occurrence statistic selects a certification value.

ANALYTE	HMTC	SOVEREIGN ANALOG / DETERMINATION
Lead (Pb)	2,000	read-across (Hong Kong); Broadleaf Holly leaves

 © All rights reserved

Cadmium (Cd)	control	No credible sovereign sets a cadmium maximum level for dried herbal or botanical infusion material. Hong Kong Cap 132V, the only credible instrument that names infusion botanicals at all, sets lead values for them but no cadmium value; EU 2023/915, Codex CXS 193, FSANZ Schedule 19 and Health Canada set no cadmium cell for herbal infusions or for tea. Two EU cells reach the nearest commodities and both were considered and rejected: the leaf-vegetable cadmium cell (100 ug/kg, eu2023_-cd_leaf_vegetables_100) and the spinaches, similar leaves, mustard seedlings and fresh herbs cell (200 ug/kg, eu2023_cd_spinach_-herbs_200), which is the closest sovereign cadmium cell to this commodity that exists. Both are fresh-weight edible-portion values for a plant eaten whole while fresh, and carrying either onto a dried botanical sold as sold would require an invented drying factor of roughly an order of magnitude; the register records both on a wet-weight basis and this row's basis guard refuses them for that reason. No near-neighbour read-across is supportable, so the fail-safe disposition is a control: cadmium testing is mandatory on every certified lot and no ceiling is invented from occurrence data.

Total arsenic (tAs)	control	No credible sovereign sets a total-arsenic maximum level for dried herbal or botanical infusion material. Regulators write beverage arsenic limits on the inorganic species (EU 2023/915 section 3.4.4 fruit juices at 20 ug/kg and section 3.4.1.6 non-alcoholic rice-based drinks at 30 ug/kg; the US FDA apple-juice action level at 10 ug/kg) and write unspeciated arsenic limits only in the packaged-water and public-water-supply schedules, which are Category 8 instruments. No sovereign writes an inorganic-arsenic cell for this commodity either, so both arsenic cells in this row are controls and the escalation rule carries the obligation. Total arsenic is therefore mandatory on every lot as the parent screen and no total-arsenic ceiling is invented.
Inorganic arsenic (iAs)	control	No credible sovereign sets an inorganic-arsenic maximum level for dried herbal or botanical infusion material. Every sovereign inorganic-arsenic cell is scoped either to rice and rice-based products, to a ready-to-drink beverage (EU fruit juices 20 ug/kg, EU non-alcoholic rice-based drinks 30 ug/kg, US FDA apple juice 10 ug/kg), to seafood, or to packaged and public drinking water. None of those is applicable to this dry commodity, and applying a ready-to-drink beverage cell to a dry leaf, bean or powder would be a basis conflation. Inorganic arsenic is a claim analyte, so it is speciated whenever the total-arsenic screen is elevated.

Mercury, total (tHg)	control	No credible sovereign sets a total-mercury maximum level for dried herbal or botanical infusion material. The sovereign mercury values in this basis family are the packaged-drinking-water quality standards (US 21 CFR 165.110 total mercury at 2 ug/kg; Hong Kong Cap 132V packaged drinking water, written for inorganic mercury at 6 ug/kg) and the fish and seafood methylmercury and total-mercury ceilings, none of which governs this product form. Mercury has no identified enrichment pathway in this supply chain, but the analyte is on the mandatory eight-total panel, so testing is mandatory and no ceiling is invented.
Methylmercury (MeHg)	n/m	Methylmercury has no formation pathway in a dried botanical infusion material: there is no marine bioaccumulation step in the supply chain and no anaerobic, sulfate-reducing methylation environment in the product or its process. Methylmercury is a component of total mercury (MeHg <= tHg) and is governed by and bounded by the total-mercury cell; no separate methylmercury ceiling is published.

 © All rights reserved

Nickel (Ni)	control	No credible sovereign sets a nickel maximum level for dried herbal or botanical infusion material. EU 2024/1987 is the only comprehensive sovereign nickel instrument; its cells cover cereals, pulses, oilseeds, tree nuts, vegetables, cocoa and chocolate, infant formula, baby food and fruit and vegetable juices, and none of them is written for dried infusion material. The two cells that come closest are named and rejected rather than passed over: the fresh-herbs cell (1200 ug/kg, eu2024_ni_fresh_herbs_-1200) and the leafy-vegetables--except-fresh-herbs cell (500 ug/kg, eu2024_ni_leafy_veg_500). Both are recorded in the register on a wet-weight basis for a plant sold fresh, and this row certifies the dried commodity as sold, so adopting either would require a drying factor that no instrument supplies; this row's basis guard refuses them on that ground. The juice and nectar cell (250 ug/kg) is written in a ready-to-drink basis and cannot be applied to a dry commodity, and the dry-commodity cells that do exist are written for other plant families. Nickel is a claim analyte on the mandatory eight-total panel.
Tin (Sn)	control	No credible sovereign sets a tin maximum level for dried herbal or botanical infusion material. The exclusion is written into the instrument itself: EU 2023/915 Annex I section 3.5 scopes its inorganic-tin maximum levels to canned beverages and canned foods and expressly excepts canned dried and canned powdered products, and the Codex, FSANZ and Hong Kong canned-food cells carry the same carve-out. There is therefore no sovereign number for a dry beverage commodity and no supportable read-across, because the canned-liquid cells are written in a ready-to-drink basis. Tin is nonetheless on the mandatory eight-total panel.

Aluminium (Al)	control	No credible sovereign sets an aluminium maximum level for dried herbal or botanical infusion material, and no near-neighbour read-across is supportable: the only sovereign aluminium values are packaged--drinking-water quality standards written in a litre-of-water basis (Category 8) and the FSANZ infant-formula limits (Category 1). Applying a water-basis value to a dry commodity would be a basis conflation of roughly three orders of magnitude. Aluminium is a live cell for this row and is not treated as a formality: several infusion botanicals are aluminium accumulators, and no credible sovereign has set a ceiling, so the analyte is reported on every certified lot and the gap is disclosed on the certificate rather than papered over with a number HMTc would have had to invent.
Total chromium (Cr)	control	No credible sovereign sets a total-chromium maximum level for dried herbal or botanical infusion material. The only sovereign chromium values reachable from this basis family are the packaged-drinking-water quality standards (US 21 CFR 165.110 at 100 ug/kg, Hong Kong Cap 132V packaged drinking water at 50 ug/kg), which govern water sold as water and are Category 8 instruments, and the public-water-system maximum contaminant levels (US EPA, Health Canada), which are water-utility instruments and not food law at all. Total chromium in this form is dominated by benign Cr(III) and is reported as a stainless-steel equipment and process-water leaching screen, not as a health limit; the health-relevant species is addressed in the Cr-VI cell.

Hexavalent chromium (Cr-VI)	control	No credible sovereign sets a hexavalent-chromium limit for any food or beverage, and the in-matrix reduction argument that supports a not-material determination in an acidic beverage is not available here: this row's certified article is a DRY botanical solid, so there is no aqueous matrix in which Cr(VI) could be reduced to Cr(III), and the acidic-beverage reduction argument is simply unavailable. Because Cr(VI) cannot be assumed to be reduced to Cr(III) in this matrix, the fail-safe disposition is a control rather than a not-material determination, and no ceiling is invented.

4 | Cite this standard

Pendergrass, K. (2026). *Herbal/botanical infusions: HMTc standard*. Institute of Contaminant Standards.

© 2026 Institute of Contaminant Standards / Heavy Metal Certified. All rights reserved.

References

[1] Hong Kong
Binds Pb. Broadleaf Holly leaves.
READ-ACROSS

STATUS AND LICENCE

A normative certification standard, editorially reviewed and version-controlled in-house; every value traces to a named sovereign maximum level, disclosed in the derivation. © 2026 Institute of Contaminant Standards / Heavy Metal Certified. All rights reserved.

COMPETING INTERESTS

This standard is published by the Heavy Metal Tested & Certified (HMTc) program, operated by the Institute of Contaminant Standards. Its statements about government regulations, toxicology, and occurrence are sourced to the cited primary and expert-body records and to the independently maintained Heavy Metal Index; the program's own certification thresholds are not used as evidence for any factual claim made here.

DATA AVAILABILITY

The works this standard draws on are listed in full in the references above and on the standard page at https://heavymetalcertified.com/standards/herbal-botanical-infusions. Primary legal instruments and expert-body assessments are named with their public identifiers; the underlying occurrence and toxicology corpus is maintained on the Heavy Metal Index.

PUBLICATION HISTORY

This revision 2026-08. The full dated record is maintained at https://heavymetalcertified.com/standards/herbal-botanical-infusions.