True tea (Camellia sinensis): HMTc Standard

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CORRESPONDENCE

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Abstract

The Heavy Metal Tested & Certified heavy-metal-safety standard for true tea (Camellia sinensis) in Beverages, evaluated on dry leaf as sold (loose leaf, tea bags, pyramids, instant tea solids), 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)	5,000	government maximum level (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)	5,000	government maximum level (Hong Kong)

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Cadmium (Cd)	control	No credible sovereign sets a cadmium maximum level for tea leaf. No credible sovereign sets a cadmium maximum level for tea. Hong Kong Cap 132V names the commodity for lead but not for cadmium, and EU 2023/915, Codex CXS 193, FSANZ Schedule 19 and Health Canada set no tea cell at all. The EU leaf-vegetable cadmium cell (100 ug/kg) is a fresh-weight value for a vegetable eaten whole and cannot be carried onto a dried leaf without an invented drying factor. 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 tea leaf. 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 tea 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 tea leaf. 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 tea leaf. 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 dry tea leaf: 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.

Nickel (Ni)	control	No credible sovereign sets a nickel maximum level for tea leaf. 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 covers this commodity. 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 dry tea leaf. 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 tea leaf, 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 the single most important control in this row and is treated as such rather than as a formality: Camellia sinensis is a well-documented aluminium hyperaccumulator, mature leaf routinely carries aluminium at percent-of-milligram-per-gram scale, and a meaningful fraction is extracted into the infusion. No credible sovereign has written a ceiling. HMTc therefore mandates aluminium on every certified lot, reports it on the certificate, and states the regulatory gap plainly instead of inventing a number; the analyte is a declared Standards Ratchet surveillance priority.
Total chromium (Cr)	control	No credible sovereign sets a total-chromium maximum level for tea leaf. 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 leaf, so there is no aqueous matrix in which Cr(VI) could be reduced to Cr(III), and the acidic-beverage reduction argument is 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). *True tea (Camellia sinensis): HMTc standard*. Institute of Contaminant Standards.

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References

[1] Hong Kong
Binds Pb.
MAXIMUM LEVEL

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/true-tea-camellia-sinensis. 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/true-tea-camellia-sinensis.