Vinegar (distilled, wine, balsamic, cider, rice): HMTc Standard

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CORRESPONDENCE

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KEYWORDS

heavy metals, food safety, dietary exposure

PUBLICATION HISTORY

This revision 2026-08.

Abstract

The Heavy Metal Tested & Certified standard for Vinegar (distilled, wine, balsamic, cider, rice) (Condiments, Sauces and Dressings), stated as consumed. Each analyte carries the strictest applicable government maximum level in the product's native basis, with a disclosed read-across or a mandatory control where no government regulates the exact product.

1 | How every number on this standard is set

HMTc Method v2.0 (government-limit default; face value, no reconstitution; read-across / control / not-material for unregulated cells; no occurrence percentiles)

2 | Master limit table

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

ANALYTE	TIER	HMTC LIMIT	BASIS
Lead (Pb)	Tier 1	500	government maximum level
Cadmium (Cd)	Tier 1	100	government maximum level
Total arsenic (tAs)	Tier 2	100	government maximum level

Inorganic arsenic (iAs)	Tier 1	≤ tAs	bounded by tAs (reflex speciation)
Mercury, total (tHg)	Tier 1	50	government maximum level
Methylmercury (MeHg)	Tier 1	≤ tHg	bounded by tHg (reflex speciation)
Nickel (Ni)	Tier 2	20	human-grade read-across (European Union)
Tin (Sn)	Tier 2	100,000	human-grade read-across (European Union)
Aluminium (Al)	Tier 2	200	human-grade read-across (European Union)
Total chromium (Cr)	Tier 2	50	human-grade read-across (AU)
Hexavalent chromium (Cr-VI)	Tier 2	≤ Cr	bounded by Cr (reflex speciation)

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)	500	government maximum level
Cadmium (Cd)	100	government maximum level
Total arsenic (tAs)	100	government maximum level
Inorganic arsenic (iAs)	≤ tAs	iAs carries no product-specific sovereign cell; it is a component of and bounded by its parent total tAs (iAs <= tAs), an enforceable ceiling via reflex speciation rather than an empty cell.
Mercury, total (tHg)	50	government maximum level
Methylmercury (MeHg)	≤ tHg	MeHg carries no product-specific sovereign cell; it is a component of and bounded by its parent total tHg (MeHg <= tHg), an enforceable ceiling via reflex speciation rather than an empty cell.

Nickel (Ni)	20	European Union — human-food analog
Tin (Sn)	100,000	European Union — human-food analog
Aluminium (Al)	200	European Union — human-food analog
Total chromium (Cr)	50	AU — human-food analog
Hexavalent chromium (Cr-VI)	≤ Cr	Cr-VI carries no product-specific sovereign cell; it is a component of and bounded by its parent total Cr (Cr-VI <= Cr), an enforceable ceiling via reflex speciation rather than an empty cell.

4 | Cite this standard

Pendergrass, K. (2026). *Vinegar (distilled, wine, balsamic, cider, rice): HMTc standard* (Standard No. 10.83138/hmtc.std.32.vinegar). Institute of Contaminant Standards. https://doi.org/10.83138/hmtc.std.32.vinegar

References

[1] AU — human-food maximum levels
Binds Cr. Strictest applicable human-food sovereign maximum for the nearest analog.
MAXIMUM LEVEL

[2] European Union — human-food maximum levels
Binds Ni, Sn, Al. Strictest applicable human-food sovereign maximum for the nearest analog.
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

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DATA AVAILABILITY

The works this reference draws on are listed in full in the references above and on the briefing page at https://heavymetalcertified.com/standards/vinegar. Primary legal instruments and expert-body assessments are named

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with their public identifiers; the underlying occurrence and toxicology corpus is maintained on the Heavy Metal Index.