

The Child Eats the Adult's Supplement

Karen Pendergrass · ORCID 0000-0002-2348-7259 · Heavy Metal Certified · August 2026

Cite as: Heavy Metal Certified. "The Child Eats the Adult's Supplement". <https://heavymetalcertified.com/briefings/supplements-child-protective>. CC BY 4.0.

Abstract

The dose that matters is per kilogram

Toxicology does not care what a label says. It cares how much of a metal reaches a body relative to the size of that body. Lead, cadmium, and inorganic arsenic are dosed per kilogram of body weight, and the tolerable intakes the world's regulators publish are all expressed that way: micrograms per kilogram per day, or per week. A serving of a supplement delivers a fixed quantity of any contaminant it carries. That fixed quantity, divided into a fifteen-kilogram child, is four to five times the per-kilogram dose it delivers to a seventy-kilogram adult. The serving did not change. The label did not change. The exposure that the body actually experiences is several-fold higher, and it is higher precisely for the consumer whose developing nervous system is most sensitive to it.

This is not a hypothetical about misuse. It is the arithmetic of a shared bottle, and it is why, across the food side of contaminant regulation, infant and young-child categories carry the strictest limits any government sets. The child is not an edge case to be warned away from the product. On a per-kilogram basis the child is the binding safety case, and a limit that does not protect the child does not protect the household.

The floor was built for an adult

Set against that, the framework that governs supplement composition is adult all the way down. In the United States the Dietary Supplement Health and Education Act, the statute that defines the category, sets no heavy-metal maximum at all; it is a marketing-and-manufacturing framework, not a contaminant standard. The pharmacopeial reference brands actually test against, USP General Chapter 2232, sets permitted daily exposures for lead, cadmium, inorganic arsenic, and mercury, and it computes every one of them for an adult consumer: five micrograms of lead a day, five of cadmium, fifteen of inorganic arsenic, fifteen of mercury [1]. Expressed as a concentration on USP's own assumption of a ten-gram daily serving, that is a lead limit of five hundred micrograms per kilogram. The food-supplement maximum levels that a handful of governments have published run laxer still: lead permitted at one thousand micrograms per kilogram in Thailand, three thousand across the Gulf states, Israel, and Vietnam, ten thousand in the ASEAN guideline and Singapore [2][3]. None of these numbers was set with a child's body weight in the denominator, because none of these instruments was written for a product a child would take.

The one jurisdiction that has looked hardest at these metals shows the shape of the gap most clearly. California's Proposition 65 sets a developmental safe-harbour for lead of half a microgram a day, on the reproductive endpoint, a thousandfold below the observed-effect level [4]. That is the number a toxicologist reaches for when the exposed population includes the developing. It is ten times below the adult USP daily figure and it exists in the same state whose supplement aisles are stocked with products certified, if at all, against the adult one. The developmental science is already written down. It simply was never the number the supplement floor was built on.

What HMTc holds every supplement to

Faced with an adult floor and a child who eats from it, HMTc does not split the category into two tiers and certify children's products more tightly than adults'. It holds all of them to the child. For every supplement form and every ingredient class, the HMTc limit for each metal is the strictest maximum level any credible government has set for that metal in an infant-or-young-child food, converted to the supplement's own basis and applied without regard to how the product is labeled [5][6][7]. Lead is held at ten micrograms per kilogram, the strictest sovereign infant-formula lead maximum, against an adult supplement floor that begins at one thousand: a hundredfold difference. Cadmium is held at five, against an adult floor of three hundred. Inorganic arsenic is held at ten, a hundred and fifty times below the concentration USP's adult figure implies. Total mercury is held at four micrograms per kilogram, against adult supplement limits of one hundred to five hundred. The program adopts the child limit openly as a read-across and never as a government limit on the supplement itself, because no government sets an infant-food limit for an adult protein powder; HMTc chooses it, and says so.

For three of the eight metals the over-compliance is not a matter of degree but of kind, because the adult framework sets no supplement limit at all. Nickel, tin, and aluminium have no dietary-supplement maximum in any of these regimes, and USP 2232 does not cover them. A conventional certificate is simply silent on them. HMTc holds nickel to one hundred micrograms per kilogram, the strictest infant-formula nickel maximum, in a category where a child already exceeds the tolerable nickel intake European regulators have set [8]; it holds aluminium to five hundred, the only government aluminium limit for any food in the world; and it treats any measurable tin on a non-canned supplement as a packaging signal to be investigated rather than a level to be permitted. Where the adult framework says nothing, the child-food limit is the whole of the standard.

The classes where the line is hardest to hold

Some supplement classes make this posture expensive, and those are exactly the ones where it matters most. Clay, mineral, and earth-derived products, bentonite and diatomaceous earth and zeolite and shilajit, are geological materials that carry lead and arsenic at concentrations the earth put there; shilajit in particular routinely tests well above every infant-food limit for both. Greens and superfood blends combine leaf, root, algae, and cereal-grass material selected, in effect, for the plant families that draw lead, cadmium, and inorganic arsenic out of soil most efficiently. Botanicals and traditional herbal formulas have a long documented association with lead and arsenic exposure. For every one of these classes the HMTc limit is the same strict child-food number as for a vitamin tablet. The program does not compute a looser limit from what these materials typically contain, because a standard that relaxed to meet the contamination it found would certify the contamination. The line is held, and where a class cannot meet it, the honest answer is that the class is not yet clean enough to carry the mark, not that the mark should move.

The same rule, applied twice

This is the second time the program has made this structural choice, and the two together are easier to defend than either alone. Pet food is governed by feed law, whose heavy-metal limits run looser than the limits for human food; HMTc certifies pets to the stricter human-food limit anyway, the decision set out in the pet-food briefing, because the animal does not choose what is put in its bowl. Supplements are governed by an adult framework; HMTc certifies them to the stricter child-food limit, because the child eats from the same bottle as the adult. Both are one rule applied twice: certify to the level that protects the most vulnerable consumer who will realistically use the product, and disclose the looser legal floor

rather than shelter behind it. Naming the rule matters, because a certifier that keeps one protective bar across a whole category is doing something a certifier that lets its bar drift toward the least-protected buyer is not. The supplement decision is not an exception carved for one category; it is the same standard the program applies wherever the law protects the wrong person.

The tradeoff, stated plainly

Holding an adult supplement to a child's limit asks more of the brand than any government does. A protein or greens or mineral brand that has never sold a product for children, and never intends to, must nonetheless meet a bar built from infant-formula science to earn the certificate. That is a real cost and the program does not disguise it. What the brand receives for it is the only claim in the category that answers the question a parent actually has. A shelf full of supplements certified against adult limits tells a family nothing about the eight-year-old who eats the gummies. A supplement carrying the HMTc mark says that its contaminant load was measured against the level set to protect the most vulnerable person who will realistically consume it, and held there regardless of who the marketing was for. In a market where the product crosses the age line every day and the standards mostly do not, that is the difference worth certifying, and it is worth stating in exactly those terms.

References

- [1] USP General Chapter : Elemental Contaminants in Dietary Supplements. United States Pharmacopeia. Oral permitted daily exposure: lead 5 µg/day, cadmium 5 µg/day, inorganic arsenic 15 µg/day, mercury 15 µg/day (methylmercury 2 µg/day). Computed for an adult consumer; on USP's "d10 g/day serving assumption the lead limit is 500 µg/kg. Sets no limit for nickel, tin, aluminium, or chromium.
- [2] Sovereign dietary-supplement heavy-metal maximum levels (Thailand, GCC, Israel, Vietnam). Thailand MOPH Notification 414 (lead 1000 µg/kg); GSO 193:2021, Israel FCS-2016, and Vietnam QCVN 8-2:2011 (lead 3000 µg/kg). Adult food-supplement contaminant limits; none set with a child's body weight in the denominator.
- [3] ASEAN and Singapore health-supplement contaminant guidelines. ASEAN Traditional Medicines and Health Supplements Working Group and Singapore HSA: lead permitted at 10000 µg/kg (10 ppm). The laxest published supplement lead limits.
- [4] Proposition 65 Safe Harbor Levels — Maximum Allowable Dose Levels. California OEHHA. Lead oral MADL 0.5 µg/day on the reproductive/developmental endpoint, ten times below the adult USP daily figure. A warning trigger in µg/day, not a food maximum level. See also the briefing 'Named as a Hazard, Left Unlimited'. · oehha.ca.gov
- [5] Commission Regulation (EU) 2023/915 on maximum levels for certain contaminants in food. European Commission, 2023. Infant-formula maximum levels: cadmium 5 µg/kg and inorganic arsenic 10 µg/kg — the anchors HMTc reads across to supplement cadmium and inorganic arsenic. · eur-lex.europa.eu
- [6] Commission Regulation (EU) 2024/1987 amending (EU) 2023/915 as regards maximum levels of nickel in food. European Commission, 2024. Liquid infant/young-child-formula nickel maximum 100 µg/kg — the anchor HMTc reads across to supplement nickel, a metal the adult supplement framework does not limit. · eur-lex.europa.eu
- [7] Australia New Zealand Food Standards Code, Standard 1.4.1 — Contaminants and Natural Toxicants. FSANZ. Infant-formula lead maximum 10 µg/kg and non-soy infant-formula aluminium maximum 500 µg/kg — the strictest sovereign infant lead limit and the only government food aluminium limit anywhere, both read across by HMTc to supplements.
- [8] Update of the Risk Assessment of Nickel in Food and Drinking Water. EFSA CONTAM Panel, EFSA Journal 2020;18(11):6268. Chronic TDI 13 µg Ni/kg body weight/day; mean dietary exposure exceeds it, children most — the basis for treating supplement nickel as material despite the adult framework's silence.

Bibliographic record

Cite this briefing

