

Why is lead limited in baby food? The certification rationale

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THE RATIONALE

CERTIFICATION RATIONALE · HEAVY METAL CERTIFIED · AUGUST 2026

HMTc limits lead because its developmental neurotoxicity in young children has no demonstrated threshold — no agency can identify an intake below which harm does not occur — so the governing question is not whether a food is under a safe dose, but how far below the strictest limit it can be pushed.

In brief

Lead is limited in food because the science leaves no safe floor. The most sensitive effect — loss of cognitive function in young children — has been measured at the lowest exposures anyone has studied, so EFSA, JECFA, the US EPA and ATSDR have each declined to set a tolerable intake. The people the exposure reaches are exactly the people who can least absorb it safely: infants, young children, and the fetus. That combination — a hazard with no threshold, an exposure that runs through ordinary foods, and a most-vulnerable population — is why a certification limit that sits at or below every applicable government ceiling is warranted, rather than a label claim that a product is simply “safe.”

The health basis for limiting lead

The hazard that anchors dietary regulation of lead is developmental neurotoxicity in young children, and it behaves unlike almost any other food contaminant: no assessment body has been able to identify a threshold below which it does no harm. In its 2010 Scientific Opinion, the EFSA CONTAM Panel selected developmental neurotoxicity as the most sensitive critical endpoint and derived a BMDL01 of 12 µg/L blood lead — a dietary intake of roughly 0.50 µg/kg body weight per day — but because measurable IQ loss was documented in cohort studies below that point, it concluded no tolerable weekly intake could be set that is health-protective. The Joint FAO/WHO Expert Committee on Food Additives reached the same conclusion at its 73rd meeting in June 2010, withdrawing the long-standing provisional tolerable weekly intake of 25 µg/kg body weight (WHO Technical Report Series 960). The US EPA's IRIS assessment derives no oral reference dose and ATSDR sets no minimal risk levels, each for the same reason.

Lead is also a carcinogen — IARC classifies inorganic lead compounds as Group 2A, probably carcinogenic to humans — but stating this precisely matters: neither EFSA's nor EPA's food limits are cancer-driven. The developmental neurotoxicity of low-dose oral exposure in children is what sets the ceilings, and a rationale that inflated the cancer basis would misrepresent the record. The full agency-by-agency assessment, with every reference point, is on [the lead analyte reference](#).

Who the exposure reaches

The reason a program certifying infant and child foods treats lead as a priority is child and prenatal physiology. Children absorb 30 to 50 percent of the lead they ingest, against 5 to 15 percent in adults, and they take it in during the developmental window for brain maturation — so an identical concentration in food delivers a far larger internal dose to the population that can least tolerate it. Lead then accumulates in bone, with a half-life of 10 to 30 years and roughly 90 percent of the adult body burden held there, and that skeletal reservoir mobilizes during pregnancy and lactation, delivering endogenous lead across the placenta and into breast milk decades after the original exposure.

The CDC's blood lead reference value of 3.5 µg/dL underscores the point. It is the 97.5th percentile of the US child distribution — a screening value that flags the most-exposed children, explicitly not a safe level — and adverse effects are established below 5 µg/dL, within the range where most US children already fall.

Where lead shows up in food

Lead in the food supply is dominated by plant matrices and the soil interface, not by the protein foods a shopper might intuitively worry about. In the US FDA Total Diet Study (FY2018–2020), the foods carrying the highest and most consistent lead are dried fruit and raisin-containing cereals, root and tuber vegetables eaten with their peel, leafy greens, and grain and baked products; fluid milk, plain meats, and most whole fruits sit at or below the reporting limit. The pattern reflects lead's route into food — it enters through roots, adheres to surfaces in contact with soil, and concentrates when a fruit is dried or a grain is milled and baked — which is why a category's lead profile tracks its ingredients and its soil and processing history far more than its label claims.

The distribution matters more than the average: the same foods that read near the reporting limit at the median produce occasional composites several times higher, so a lot that passes on average can still carry a child-relevant dose in the tail, and no reference dose makes such a lot acceptable by definition. The per-category occurrence figures and the certification derivation are on the [standards register](#); the complete occurrence corpus is on [the Heavy Metal Index](#)².

Why a certification limit is warranted

When no body will name a safe intake, the maximum levels in force are minimize-exposure ceilings — the FDA's [Closer to Zero](#) action levels of 10 ppb for fruits, most vegetables and mixtures and 20 ppb for single-ingredient root vegetables and dry infant cereals; the EU's binding 20 µg/kg for baby food and 10 µg/kg for liquid formula. These are floors that push exposure down, not certificates that a product is safe. A certification limit does something a government ceiling and a label claim cannot: it verifies, lot by lot, that a specific product sits at or below the number.

HMTc classifies lead as a priority toxic and sets its certification limit to the lower of the strictest existing government maximum level and the certified-market occurrence value — so a certified product is never passed above a limit some credible government sets, and where the market can already do better, the certificate requires it. A regulatory hard-stop blocks certification of any product that violates an actual legal lead limit regardless of HMTc status. For the foods most eaten by the population that absorbs the most and can tolerate the least, a skewed distribution with no safe floor is the entire case for testing lead lot by lot rather than trusting a category mean. How the limit is derived is set out under [how limits are derived](#).

Findings that bear on Lead

Program analyses that trace how lead enters specific foods. Each covers a finding from the independent Heavy Metal Index and applies it to the certification question; the underlying occurrence record is on the Index.

Lead in spices reaches infants

Adulterated and naturally lead-bearing spices are a concentrated route to the infant plate.

The botanical-supplement lead pathway

How root and whole-plant botanicals carry lead into supplements.

Lead and cadmium in dark chocolate

Where in the cocoa supply chain each metal enters, and why one fell under Proposition 65 pressure and the other did not.

Organ-meat cadmium and lead accumulation

Liver and kidney concentrate both metals over an animal's life.

Wastewater-irrigated crops carry multiple metals

The soil-and-water route that puts lead into staple crops.

Frequently asked questions

▼ Is there a safe level of lead in food?

No. The most sensitive effect of lead — loss of cognitive function in young children — has been observed at the lowest exposures studied, so EFSA, JECFA, the US EPA and ATSDR have each declined to set a tolerable intake or reference dose. The governing frame is to minimize exposure as far as practicable, not to certify a product below a safe dose that does not exist.

▼ Why are infants and children more affected by lead than adults?

Young children absorb 30 to 50 percent of the lead they ingest, compared with 5 to 15 percent in adults, and they are exposed during the window of brain development. Lead crosses the placenta, and lead stored in a mother's bones can mobilize during pregnancy and lactation, reaching the fetus and nursing infant.

▼ Which foods carry the most lead?

Lead concentrates in plant foods and at the soil interface: dried fruit and raisin-containing cereals, root and tuber vegetables eaten with the peel, leafy greens, and grain and baked products. Fluid milk, plain meats and most whole fruits typically sit at or below the reporting limit. A food’s lead level tracks its ingredients, soil and processing more than any label claim.

▼ What limits apply to lead in baby food?

The US FDA’s Closer to Zero action levels are 10 ppb for fruits, most vegetables and mixtures and 20 ppb for single-ingredient root vegetables and dry infant cereals; the EU sets binding maximum levels of 20 µg/kg for baby and cereal-based foods and 10 µg/kg for liquid infant formula. These are minimize-exposure ceilings rather than safe-dose thresholds.

▼ How does HMTc set its lead limit?

HMTc treats lead as a priority toxic and sets its certification limit to the lower of the strictest existing government maximum level and the certified-market occurrence value, verified by lot testing. A certified product is never passed above a limit a credible government sets, and where the market can do better the certificate requires it.

Evidence and sources

This page synthesises three surfaces that carry the underlying evidence, and links to them rather than re-hosting them:

The government and expert-body assessments, agency by agency, with the toxicological reference points — the Lead analyte reference	REFERENCE
The certification limits in force, and the Method v2.0 derivation behind each — the HMTc standards register	STANDARD
The complete peer-reviewed and regulatory literature and the occurrence corpus — Lead on the Heavy Metal Index ¹ ↗	INDEX · ONE-WAY

The Heavy Metal Index is an independent literature reference; this certification site cites it one way and applies its evidence to the certification question. The Index never cites back — that is what keeps it a disinterested source.

Cite this page

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