

Why is arsenic limited in food? The certification rationale

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THE RATIONALE

CERTIFICATION RATIONALE · HEAVY METAL CERTIFIED · AUGUST 2026

HMTc limits inorganic arsenic because it is an IARC Group 1 human carcinogen for which the assessment bodies have set no safe intake threshold, and ordinary dietary exposure already sits at or above the reference point EFSA uses to anchor the cancer risk — so there is no headroom to give away.

In brief

Inorganic arsenic is limited in food because it is a genotoxic human carcinogen with no threshold below which the risk is nil, and because typical diets already reach the exposure the cancer assessment is built on. It is only the inorganic fraction that carries this risk, so the metal is measured as total arsenic and speciated to inorganic when a food form warrants it. Rice takes up arsenic more efficiently than other staples and is a first food for infants, which puts the highest exposure per unit of body weight on the youngest eaters. With no safe floor and exposure already at the reference point, a certification limit that holds a product to the strictest verified number is the mechanism that matters.

The health basis for limiting arsenic

Inorganic arsenic is an IARC Group 1 human carcinogen, with the strongest dose-response evidence for skin, lung and bladder cancer, and it is genotoxic — the mechanism that leads assessment bodies not to set a safe threshold. In its 2024 reassessment, EFSA concluded inorganic arsenic is a genotoxic carcinogen and, rather than deriving a tolerable intake, selected a Reference Point of BMDL05 = 0.06 µg inorganic arsenic per kg body weight per day for skin cancer — and reported that dietary exposure across Europe already sits at or above that point. The Joint FAO/WHO Expert Committee on Food Additives had already withdrawn the earlier provisional tolerable weekly intake of 15 µg/kg body weight at its 73rd meeting in June 2010 (WHO Technical Report Series 960), on the finding that arsenic causes cancer at exposures below it.

Because only the inorganic fraction carries this risk, the analyte is measured as total arsenic and speciated to inorganic where a food form warrants it — organoarsenicals in seafood are largely inert. The full agency record, including the US EPA IRIS reassessment and the ATSDR profile, is on [the arsenic analyte reference](#).

Who the exposure reaches

The population most exposed to inorganic arsenic per unit of body weight is infants and young children, and the route is rice. Rice takes up arsenic from soil and water far more efficiently than other cereal staples, and rice-based cereal is a conventional first solid food, so a small body eats a comparatively arsenic-dense food at the age of greatest per-kilogram intake. Because the endpoint is lifetime cancer risk with no threshold, an exposure that begins in infancy and continues through a rice-inclusive diet is exactly the pattern a certification program is positioned to interrupt.

Where arsenic shows up in food

Inorganic arsenic concentrates in rice and rice products — including rice cereal, rice cakes, rice milk and rice-based snacks — and in some seaweeds; it also appears in certain fruit juices and follows drinking-water contamination into prepared foods. The signal is dominated by the rice matrix, which is why the certification standard treats rice-based categories distinctly from other grains.

The per-category occurrence figures and the derivation behind each limit are on the [standards register](#); the complete occurrence corpus, and the speciation evidence separating inorganic from organic arsenic, are on [the Heavy Metal Index](#)^[7].

Why a certification limit is warranted

When the assessment bodies decline to name a safe intake and current exposure already reaches the cancer reference point, there is no margin to certify against — the objective is to hold the number as low as the supply chain can reach. Governments have moved: the EU and Codex set maximum levels for inorganic arsenic in rice and rice destined for infant food, and the FDA has proposed action levels for infant rice cereal. These are ceilings; they do not verify a given lot.

HMTc classifies inorganic arsenic as a priority toxic, applies its speciation reflex where total arsenic could otherwise overstate the inorganic load, and sets its certification limit to the lower of the strictest existing government maximum level and the certified-market occurrence value, checked lot by lot. A regulatory hard-stop blocks certification of any product over an applicable legal limit. How the limit is derived is set out under [how limits are derived](#).

Findings that bear on Inorganic arsenic

Program analyses that trace how inorganic arsenic 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.

The organoarsenical inertness assumption

Why total arsenic must be speciated before it can be read as a toxicity signal.

Cadmium and arsenic in seaweed

Some seaweeds carry inorganic arsenic well above the foods they substitute for.

Metal amplification in infant formula

How a reconstituted powder can concentrate the metals in its ingredients and water.

Combined exposure is under-protected

Single-metal limits miss the additive load a real diet delivers.

Frequently asked questions

▼ Is arsenic in food a real health risk?

The inorganic form is. Inorganic arsenic is an IARC Group 1 human carcinogen linked to skin, lung and bladder cancer, and because it is genotoxic the assessment bodies set no safe threshold. EFSA reported in 2024 that dietary exposure in Europe already reaches the reference point it uses to anchor the cancer risk.

▼ What is the difference between total and inorganic arsenic?

Total arsenic includes both the toxic inorganic forms and largely inert organic forms found in seafood. Only inorganic arsenic carries the carcinogenic risk, so a total-arsenic number can overstate the hazard. HMTc measures total arsenic and speciates to inorganic where the food form warrants it.

▼ Why is arsenic a particular concern in rice and baby food?

Rice takes up arsenic from soil and water more efficiently than other staple grains, and rice cereal is a common first food for infants. That puts the highest exposure per unit of body weight on the youngest eaters, at an age when a lifetime of cancer risk is just beginning to accrue.

▼ Is there a safe level of inorganic arsenic?

No safe intake has been set. EFSA and JECFA both declined to establish a tolerable intake because inorganic arsenic causes cancer at low exposures with no demonstrated threshold; JECFA withdrew its earlier provisional tolerable weekly intake in 2010. The frame is to minimize exposure, not to stay below a safe dose.

▼ How does HMTc set its arsenic limit?

HMTc treats inorganic arsenic as a priority toxic, speciates total arsenic to inorganic where needed, 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.

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 Inorganic arsenic 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 — [Inorganic arsenic on the Heavy Metal Index](#)¹²

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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