

Why is aluminium limited in food? The certification rationale

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THE RATIONALE

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HMTc limits aluminium because it accumulates against a low tolerable weekly intake derived from neurotoxic, reproductive and developmental endpoints — a limit that high-consuming infants can approach or exceed — and because human disease is documented where the kidney cannot clear it, in dialysis patients.

In brief

Aluminium is limited in food because a small absorbed fraction still matters against a low tolerable intake. It is poorly absorbed from the diet, but it is also slowly excreted, and the tolerable weekly intake set from neurotoxic, reproductive and developmental endpoints is low enough that high-consuming infants can approach or exceed it. The clearest human evidence comes from people whose kidneys could not clear aluminium — dialysis patients, who developed encephalopathy and bone disease from contaminated dialysate — which flags the infant, with immature renal clearance, as the sensitive dietary case. Because much of the dietary load is from additives and processing, a certification limit that adopts the strictest government ceiling gives a controllable lever.

The health basis for limiting aluminium

Aluminium's dietary regulation rests on accumulation against a low tolerable intake rather than a single dramatic effect. EFSA established a tolerable weekly intake of 1 mg aluminium/kg body weight in 2008, integrating neurotoxic, reproductive and developmental effects seen in animal studies; JECFA set a group provisional tolerable weekly intake of 2 mg aluminium/kg body weight at its 74th meeting in 2011 (WHO Technical Report Series 966), derived from a no-observed-adverse-effect level of 30 mg/kg body weight per day with a hundredfold uncertainty factor. The two bodies read the same evidence to values that differ by a factor of two, but both are low relative to what a high-consuming diet delivers.

The clearest human disease is documented in the renally impaired: ATSDR traces dialysis encephalopathy — a progressive dementia — and dialysis osteomalacia to aluminium-contaminated dialysate water in patients whose kidneys could not clear the metal. That is the toxicological warning that points to the infant as the

sensitive dietary case. The full agency record is on [the aluminium analyte reference](#).

Who the exposure reaches

The sensitive dietary population is the infant, for a reason the dialysis evidence makes explicit: aluminium's safety depends on renal clearance, and an infant's kidneys are immature. Combined with a high food intake per unit of body weight, that puts high-consuming infants closest to — and in surveys of some infant foods, over — the tolerable weekly intake. Adults with normal kidney function clear aluminium efficiently and sit well within the guidance value; the case for a tight limit is strongest precisely for the foods a young child eats most.

Where aluminium shows up in food

Aluminium in food comes partly from the crop and partly from processing. Naturally, it appears across many plant foods at low levels; the additions that push intake up are aluminium-containing food additives — certain raising agents, colours and anticaking agents — and leaching from aluminium cookware, foil and packaging, which increases with acidity and heat. Surveys of commercial infant foods have found intakes reaching a large fraction of, and in some products exceeding, the tolerable weekly intake.

The per-category occurrence figures and the derivation behind each limit are on the [standards register](#); the complete occurrence corpus is on [the Heavy Metal Index](#)².

Why a certification limit is warranted

Because a meaningful share of the dietary load is added during processing rather than inherent to the crop, aluminium is controllable — reformulating additives and controlling contact materials moves the number. Where a government sets a maximum level, that ceiling is the reference; where it does not, occurrence data carry the determination.

HMTc treats aluminium as a claim analyte and adopts the strictest existing government maximum level directly, computing an occurrence value only where no government regulates the cell. Every claim analyte is equal at the gate; a product is certified only at or below its published limit, and above it, on any metal, it is not certified and carries no mark. A regulatory hard-stop blocks certification of any product over an applicable legal limit. For infant foods, where intake sits closest to the tolerable value, verifying the number lot by lot is the point of a certificate. How the limit is derived is set out under [how limits are derived](#).

Findings that bear on Aluminium

Program analyses that trace how aluminium 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.

Metal amplification in infant formula

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

Metal leaching from cookware and utensils

Aluminium cookware and foil add to a food's load, more so with acid and heat.

Frequently asked questions

▼ Why is aluminium limited in food if little is absorbed?

Because it is also slowly excreted, and the tolerable weekly intake set from neurotoxic, reproductive and developmental endpoints is low. EFSA's tolerable weekly intake is 1 mg/kg body weight and JECFA's provisional value is 2 mg/kg body weight — low enough that high-consuming infants can approach or exceed the guidance value.

▼ Who is most at risk from dietary aluminium?

Infants, because aluminium's safety depends on renal clearance and an infant's kidneys are immature, and because their food intake per unit of body weight is high. The clearest human disease appeared in dialysis patients whose kidneys could not clear aluminium, which flags impaired or immature clearance as the sensitive condition.

▼ Which foods and sources add the most aluminium?

Aluminium-containing food additives — certain raising agents, colours and anticaking agents — and leaching from aluminium cookware, foil and packaging, which increases with acidity and heat. Many plant foods carry low natural levels; the additions are what push intake toward the tolerable value.

▼ What is the tolerable intake for aluminium?

EFSA set a tolerable weekly intake of 1 mg aluminium/kg body weight in 2008; JECFA set a group provisional tolerable weekly intake of 2 mg/kg body weight at its 74th meeting in 2011. The two bodies read the same evidence to values a factor of two apart, but both are low relative to a high-consuming diet.

▼ How does HMTc set its aluminium limit?

HMTc treats aluminium as a claim analyte and adopts the strictest existing government maximum level directly, computing an occurrence value only where no government regulates the cell. Every claim analyte is equal at the gate; a product is certified only at or below its published limit. A regulatory hard-stop blocks any product over an applicable legal limit.

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 Aluminium analyte reference	REFERENCE
The certification limits in force, and the Method v2.0 derivation behind each — the HMTc standards register	STANDARD

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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