

8. EUROPEAN LIMITS AND OFFICIAL CONTROLS

The presence of dioxins, furans and polychlorinated biphenyls (PCBs) in food is not left to producers' discretion. In the European Union, legislation sets maximum concentrations for various food categories, sampling criteria and analytical-method requirements. These provisions have a practical purpose: to prevent non-compliant foods from being marketed and progressively reduce population exposure. They do not, however, mean that every compliant food is completely free from contaminants.

RULES FOR PERSISTENT SUBSTANCES

The main reference for maximum levels in food is Regulation (EU) 2023/915, Annex I, Section 4.1, which should be consulted in the consolidated version applicable at the time of inspection. Depending on the food, the regulation covers three distinct parameters: the sum of dioxins and furans (PCDD/Fs); the sum of dioxins, furans and dioxin-like PCBs; and the sum of six indicator non-dioxin-like PCBs (PCB 28, 52, 101, 138, 153 and 180, known as ICES-6). These are different parameters and must not be confused.

For the first two parameters, the value is expressed as toxic equivalents (WHO-TEQ), taking account of congeners' different potencies through toxic equivalency factors (TEFs). For indicator non-dioxin-like PCBs, a sum of mass concentrations, generally expressed in nanograms, is used instead. Regulatory values use the TEFs specified by the relevant legislation; it is not appropriate simply to replace them with those used in EFSA's latest toxicological assessment.

WHY LIMITS DIFFER BETWEEN FOODS

There is no single limit applicable to every product. Categories include meat from different species, liver, milk and dairy products, eggs, fish and fishery products, oils and fats, as well as certain special categories. The rules account for differences between matrices and, where specified, express values on a fat or fresh-weight basis. A number without its unit and reference category cannot therefore establish compliance.

An example that can be checked in Annex I, Section 4.1 concerns meat from cattle, sheep and goats, for which maximum levels are 2.5 pg WHO-PCDD/F-TEQ per gram of fat for dioxins and furans alone and 4.0 pg WHO-PCDD/F-PCB-TEQ per gram of fat for dioxins, furans and dioxin-like PCBs combined. The limit for ICES-6 is 40 ng per gram of fat. These three numbers have different definitions and units; they are not interchangeable measures of the same contamination. Specific conversion rules apply to products with a very low fat content.

The examples help explain the system but do not replace consultation of the legislation in force: amendments and transitional provisions may affect particular categories.

MAXIMUM LEVELS AND ACTION LEVELS: TWO DIFFERENT TOOLS

A maximum level is a legal requirement for marketing: food exceeding it, under the applicable compliance-assessment rules, cannot be placed on the market as compliant food. The action levels in Recommendation 2013/711/EU instead have a preventive role: they identify situations in which it is appropriate to investigate the contamination source and take action to reduce it, even before a maximum level is exceeded. They are not, for that reason alone, additional legal limits equivalent to maximum levels.

This distinction highlights an important aspect of protection policy: checking whether a batch is lawful and investigating environmental sources are complementary, but different, activities.

TWO TOOLS, TWO FUNCTIONS

Maximum content and level of action do not mean the same thing

MAXIMUM CONTENT

Legal limit applicable to the marketing of the food

LEVEL OF ACTION

Signal to investigate the sources and take action to reduce contamination

The comparison depends on the matrix, parameter, unit and correct method.

HOW A REPRESENTATIVE SAMPLE IS OBTAINED

A laboratory-measured concentration also depends on how the sample was collected. Regulation (EU) 2017/644 lays down sampling and analysis methods for these substances in specified foods. It provides procedures for forming aggregate samples representative of lots and sublots. An occasional sample taken without an appropriate plan may provide useful preliminary information, but is not necessarily equivalent to representative official sampling.

Precautions are also required to prevent accidental contamination, ensure traceability and preserve samples correctly. Uneven distribution of a contaminant makes it essential

to define the sampling strategy in advance. The final interpretation concerns the lot sampled under the defined conditions, not all similar products on the market.

SCREENING AND CONFIRMATORY METHODS

Controls may use screening techniques to identify samples requiring further investigation and confirmatory methods to provide adequately documented analytical findings. Legislation imposes specific method-performance requirements, including quality, recovery and selectivity checks. Laboratories must also account for congeners that cannot be quantified: for maximum levels, the regulation uses the 'upper-bound' approach, assigning values below the limit of quantification the corresponding LOQ.

This precautionary approach means that part of the overall value may be calculated from analytical thresholds rather than concentrations actually measured. Method sensitivity, quantification limits and presentation of results are therefore essential elements of a test report.

MEASUREMENT UNCERTAINTY IN COMPLIANCE ASSESSMENT

An analytical result is not a perfectly exact quantity. Measurement uncertainty quantifies the range within which the value may reasonably lie according to the method used. For official decisions on non-compliance, Regulation 2017/644 requires this uncertainty to be taken into account so that an exceedance is established under the prescribed conditions. A numerical result just above the limit is not, by itself and without the other required elements, sufficient to characterise the outcome of an official control correctly.

WHO CHECKS COMPLIANCE, AND WHAT HAPPENS IF A PROBLEM IS FOUND?

Primary responsibility for placing safe, compliant food on the market lies with food business operators. Competent authorities check compliance through risk-based official controls, inspections, sampling and analysis under the general framework of Regulation (EU) 2017/625. Where non-compliance is found, measures depend on the circumstances and may include further investigation, withdrawal or recall, action on products and enquiries along the supply chain. For persistent contaminants, tracing possible environmental or feed sources is particularly important.

Surveillance does not mean analysing every unit sold. It is a system of selective checks and monitoring programmes: valuable for identifying problems and improving safety, but unable to guarantee the absolute absence of every contaminant in each package. Feed monitoring is also relevant to these substances and is subject to specific rules, including Directive 2002/32/EC on undesirable substances in animal feed.

THE MEANING AND LIMITATIONS OF COMPLIANCE

Compliance with a maximum level relates to the product, parameter and category covered by the regulation. It does not demonstrate that a consumer's total exposure falls below the tolerable weekly intake established through risk assessment. That intake relates to total consumption from multiple foods over time, whereas a maximum level is set for a specific matrix and supports risk management along the supply chain.

Limits therefore provide real protection, but they are not biological dividing lines between harmlessness and harm. They become more effective when checks on individual foods are accompanied by emission reductions, environmental surveillance and action on contamination sources. The next chapter examines how analytical results should be read and which choices can help reduce exposure.

SCIENTIFIC AND REGULATORY REFERENCES

- [Regulation \(EU\) 2023/915, consolidated text as at 19 August 2026 — Annex I, Section 4.1.](#)
- [Regulation \(EU\) 2017/644 — sampling and analysis of dioxins and PCBs in food.](#)
- [Recommendation 2013/711/EU — reduction of dioxins, furans and PCBs in food and feed.](#)
- [Regulation \(EU\) 2017/625 — official controls in the agri-food chain.](#)
- [Directive 2002/32/EC — undesirable substances in animal feed.](#)