

HOW TO INTERPRET RESULTS AND REDUCE EXPOSURE

A number on a certificate of analysis does not, on its own, describe the health-related quality of a food. To understand it, one must know which substances were tested, how the result was calculated, which unit was used and which comparison criterion is appropriate. These precautions are particularly important for dioxins, furans and PCBs: they comprise numerous molecules with different toxicological properties, capable of persisting in the environment and contributing to cumulative exposure over a lifetime.

AN ANALYTICAL RESULT IS NOT AN AUTOMATIC SAFETY VERDICT

For dioxins and furans (PCDD/Fs) and dioxin-like PCBs (DL-PCBs), laboratories measure individual congeners and may express the combined result as toxic equivalents (TEQ), using toxic equivalency factors (TEFs). Non-dioxin-like PCBs (NDL-PCBs), by contrast, are generally reported as the sum of specified indicator congeners in mass units, without using TEQ. These two results are not interchangeable.

Before comparing a number with a limit, at least four elements should be checked: the food category, the part of the food analysed, the basis on which the result is expressed (per gram of product or gram of fat) and the TEF system used. Even a numerically identical value may have different meanings in different matrices. European rules set specific criteria for individual food categories; there is no single threshold applicable indiscriminately to all products.

WHAT DOES 'NOT DETECTED' MEAN?

A result below the limit of quantification (LOQ) does not prove the absolute absence of a contaminant. It means that, under the conditions of the method used, it cannot be quantified below that level with the required reliability. Method sensitivity, the number of congeners investigated and the treatment of results below LOQ therefore affect interpretation.

In analyses of dioxins and dioxin-like PCBs, lower-bound, middle-bound and upper-bound estimates may be used. In the first, non-quantified congeners contribute zero; in the last, they contribute their respective LOQs. The upper-bound approach is a precautionary convention also used for comparison with regulatory maximum levels. A higher upper-bound result may be partly due to analytical limits rather than a greater quantity actually present.

READ THE CORRECT RESULT

First of all, compare the number with the reference value

1. Matrix and analysed part

Whole egg, yolk, fillet, liver...

2. Parameters and congeners

PCDD/F, DL-PCB, PCB6

3. Unit of measurement

For grams of product or fat

4. TEF system and bound

TEF version, LOQ, upper/lower bound

LEGAL COMPLIANCE AND EXPOSURE ARE DIFFERENT QUESTIONS

The first question is whether the sample meets the maximum levels applicable to its food category under Regulation (EU) 2023/915, as amended. The second is how much consuming it contributes to personal exposure. A compliant food may contain measurable amounts of contaminants; compliance does not mean a zero concentration. Equally, exceeding a legal limit has consequences for marketing, but does not, without further information, predict a health effect in someone who has already eaten a portion.

Exposure assessment considers concentration, portion size, frequency of consumption and body weight. For persistent substances, past exposure and slow elimination from the body also make it inadequate to assess risk on the basis of a single meal. A toxicological guidance value is not a contamination limit for an individual food.

WHAT THE 2026 EFSA ASSESSMENT TELLS US

In June 2026 EFSA updated its assessment of risks from dioxins and dioxin-like PCBs, establishing a tolerable weekly intake (TWI) of 0.6 picograms TEQ per kilogram of body weight per week, expressed using WHO 2022 TEFs. Estimated dietary exposure exceeds this reference in all European age groups considered. Such exceedances are a public-health concern and justify policies to reduce exposure; they are not a diagnosis of harm in every individual.

It is essential not to compare TEQ values expressed using the WHO 2022 TEFs in EFSA's assessment mechanically with values calculated using the factors prescribed for European legal limits. Non-dioxin-like PCBs also require a separate assessment. Without information about an individual's complete diet and exposure characteristics, available evidence does not allow a single test report to be turned into a reliable estimate of personal risk.

REDUCING EXPOSURE WITHOUT IMPOVERISHING THE DIET

The most reasonable individual measure is to maintain a varied, balanced diet rather than relying almost exclusively on a few foods or sources. Dioxins and many PCBs tend to concentrate in fatty components of animal-derived foods: farming practices, feed, the environment of origin, fish species and supply-chain characteristics can all influence observed levels. It would nevertheless be wrong to conclude automatically that an entire category — for example, all fish or all dairy products — should be avoided.

For fish, assessments must consider both contaminant exposure and nutritional benefits. Advice concerning particular species, fishing grounds or vulnerable groups should be followed when issued by competent authorities. Indiscriminately replacing fish and other nutritious foods could bring unjustified disadvantages. EFSA has announced a specific benefit–risk assessment of fish consumption, expected by 2027; its results should not be anticipated before that work is complete.

Removing skin or fatty parts and certain preparation techniques may, in some circumstances, reduce the amount of lipophilic contaminants in a portion, but the effect depends on the product and preparation method. Ordinary washing does not remove substances already present within tissues, and cooking is not a reliable means of destroying dioxins and PCBs. Advice promising to ‘decontaminate’ a polluted food through simple domestic measures is therefore unjustified.

THE MOST EFFECTIVE PREVENTION BEGINS BEFORE THE CONSUMER

Because exposure also reflects long-standing environmental contamination, prevention cannot be left exclusively to individual choices. Reducing emissions, managing contaminated sites and materials, monitoring animal feed, ensuring supply-chain traceability and targeted food testing are especially important. Reductions observed over time in Europe demonstrate that regulation and source-control measures can produce tangible results, even though historical contamination cannot be removed quickly.

Testing an individual batch supplies useful, verifiable information about that batch, but does not describe all future batches or replace continuing surveillance. Conversely, general compliance across a supply chain does not automatically reveal the

concentration in any individual product. These are different levels of information, both important.

HOW TO READ A CERTIFICATE RESPONSIBLY

Careful reading should check sample identification and representativeness, the sampling date, the laboratory and method, the list of analytes, units, LOQs, calculation approach and any measurement uncertainty. The legal criterion used to declare compliance should also be explicit, including the relevant edition of the rules and the food category.

A low result is favourable information, but its meaning depends on analytical sensitivity and context. A measurable result does not, by itself, imply a concrete danger. The best data are not those accompanied by a reassuring or alarming label: they are those that can be traced and compared correctly.

CONCLUSION: FROM COMPLIANCE TO KNOWLEDGE

Dioxins, furans and PCBs illustrate particularly clearly the difference between regulatory compliance, analytical concentration and total exposure. European limits and official controls are essential protective measures; compliance with them does not, however, remove the need to continue reducing population exposure to persistent contaminants. The most useful response combines environmental prevention, supply-chain monitoring, reliable analytical methods and cautious interpretation of results.

FROM COMPLIANCE TO KNOWLEDGE

Two complementary questions on food safety

COMPLIANCE

Does the batch comply with the applicable maximum levels?

EXPOSURE

How much does it contribute to the intake dose over time?

Concentration, portion size, frequency and dietary context are needed.

SCIENTIFIC AND REGULATORY REFERENCES

[EFSA CONTAM Panel \(2026\). Update of the risk assessment on dioxins and dioxin-like PCBs in feed and food. EFSA Journal, 24\(6\), e10103.](#)

[EFSA \(10 June 2026\). EFSA confirms health concerns linked to dietary exposure to dioxins and dioxin-like PCBs in Europe.](#)

[EFSA \(2026\). Dioxins and PCBs — updated topic page.](#)

[European Commission. Regulation \(EU\) 2023/915 on maximum levels for certain contaminants in food \(consult the current consolidated version\).](#)

[European Commission. Regulation \(EU\) 2017/644: methods of sampling and analysis for the control of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in food.](#)

[European Commission. Recommendation 2013/711/EU on reducing the presence of dioxins, furans and PCBs in food and feed.](#)