

EUROPEAN LEGISLATION, CONTROLS AND FOOD SAFETY

BTEX compounds – benzene, toluene, ethylbenzene and xylenes – may occur in the environment and, in certain circumstances, reach food and beverages. Correct interpretation involves more than asking whether a substance is hazardous: it requires identifying the rules applying to the product, the measured concentration and the information needed to assess exposure. European legislation does not establish one universal limit for all BTEX in every food.

THE DIFFERENCE BETWEEN LEGAL LIMITS AND RISK ASSESSMENT

A statutory maximum level is a binding requirement for a specified substance and product category. A toxicological guideline value is instead intended for health assessment and is not necessarily a marketing limit. The limit of quantification (LOQ) is different again: it is the minimum concentration that a method can measure with adequate performance, not a safety threshold.

General food safety provisions continue to apply even where no specific numerical limit has been set. A substance cannot therefore be assumed to be permitted in unlimited quantities merely because it is absent from a table of maximum levels.

GENERAL FOOD LEGISLATION

Regulation (EC) No 178/2002 establishes the general principles of food law. Article 14 prohibits placing unsafe food on the market. Assessment considers, among other factors, normal conditions of use, information provided to consumers and immediate, short-term and long-term effects on health.

Regulation (EEC) No 315/93 concerns Community procedures for contaminants in food and calls for their levels to be kept as low as reasonably achievable through good practices. Regulation (EU) 2023/915 sets maximum levels for particular contaminant–matrix combinations listed in Annex I. In the consolidated version consulted (19 August 2026), it does not provide a general table of benzene, toluene, ethylbenzene and xylene limits for ordinary foods. It would therefore be inappropriate to apply a figure specified for another contaminant by analogy.



DRINKING WATER: A CASE WITH A SPECIFIC NUMERICAL VALUE

Directive (EU) 2020/2184 on the quality of water intended for human consumption specifies, in Annex I, Part B, a benzene parametric value of 1.0 µg/L. It applies to water falling within the Directive's scope. Exceedance requires the checks and measures prescribed by drinking-water legislation; it does not mean that the same figure can automatically be applied to fruit juice, soft drinks, oils or other foods.

This framework must also be distinguished from specific rules governing, for example, natural mineral waters. The commercial term 'beverage' is insufficient to identify the applicable legislation: the product's legal classification is decisive.

EXTRACTION SOLVENTS: LIMITS RELATED TO TECHNOLOGICAL USE

Directive 2009/32/EC governs solvents permitted for extraction during the manufacture of food and ingredients. It lists authorised substances, conditions of use and, where applicable, maximum residual quantities. For example, Annex I, Part II specifies a maximum of 1 mg/kg for hexane in fat, oil or cocoa butter where used in the production or fractionation of fats and oils or manufacture of cocoa butter. Other uses are subject to different conditions and concentrations.

Hexane is not a BTEX compound: the example illustrates how specific solvent rules are. These quantities are not general limits for aromatic hydrocarbons and should not be applied to environmental contamination without checking the provision's scope. Lists of authorised uses and amendments must always be checked against the current law.

PACKAGING AND FOOD-CONTACT MATERIALS

Materials and articles intended to contact food are subject to Regulation (EC) No 1935/2004. Under normal or foreseeable conditions of use, they must not transfer constituents to food in quantities that endanger human health, bring about an unacceptable change in food composition or deteriorate its organoleptic properties. Regulation (EC) No 2023/2006 also lays down good manufacturing practice for relevant materials and articles.

Specific requirements for plastics are set out in Regulation (EU) No 10/2011, while recycled plastics intended for food contact are governed by Regulation (EU) 2022/1616. Assessing migration therefore requires knowledge of the material, substance, contact conditions and specific legislation. General material rules do not establish a single universal BTEX limit.

OFFICIAL CONTROLS AND FOOD BUSINESS OPERATORS' RESPONSIBILITIES

Regulation (EU) 2017/625 sets the framework for official controls throughout the agri-food chain. Competent authorities use risk-based checks where appropriate, including inspections, sampling and laboratory analysis. The existence of official controls does not mean every batch of every food is routinely tested for the complete BTEX group.

Food business operators remain responsible for the safety of products they place on the market. Preventive hazard management, good practices and, where relevant, HACCP-based procedures under Regulation (EC) No 853/2004 should identify realistic contamination sources: water, raw materials, processes, production premises, packaging and transport.

HOW TO INTERPRET AN ANALYTICAL RESULT

Assessing a test report for benzene or other volatile compounds first requires identifying the food tested, measurement units, sampling procedure and storage conditions. Because of volatility, losses during collection, transfer and sample preparation must be minimised.

'Below the LOQ' does not demonstrate absolute absence: the compound was not reliably quantified at the level stated for the method. Conversely, measurable occurrence

does not in itself prove that food is unsafe. Compliance with an applicable rule must be distinguished from risk assessment based on toxicity, amount consumed, frequency and duration of exposure.

Even without a specific maximum level, analytical findings warrant technical judgement: comparison with pertinent scientific evidence, investigation of contamination sources and, where justified, health assessment. A product cannot be described as 'compliant with the European BTEX limit' if no such limit exists for it.

PREVENTION AND TRANSPARENCY

The strongest ways of reducing volatile contaminants in food act at the source: protecting water supplies, selecting and checking raw materials, properly managing solvents and chemicals, ensuring suitable production and storage, and verifying food-contact material suitability. Finished-product testing can supplement, but not replace, these measures.

Useful communication to consumers specifies the substance tested, the method, LOQ and any applicable rule. It distinguishes what was actually measured from what was not tested. Food safety does not mean promising the impossible absolute absence of every molecule; it means preventive systems, reliable controls and interpretation proportionate to the evidence.

CONCLUSIONS

The European framework provides different, complementary tools: general food safety principles, maximum levels for particular contaminants, drinking-water parameters, solvent and food-contact material rules, operator responsibilities and official controls. The main interpretative precaution is not to confuse their respective scopes. Where specific numerical values for BTEX in food are absent, protection of health still applies and requires credible analytical data, investigation of contamination origins and assessment of actual exposure.

SCIENTIFIC AND REGULATORY REFERENCES

- Regulation (EC) No 178/2002 – general principles and requirements of food law
[Official source](#)
- Regulation (EEC) No 315/93 – Community procedures for contaminants in food
[Official source](#)

- Regulation (EU) 2023/915 – maximum levels for certain contaminants, consolidated version of 19 August 2026 [Official source](#)
- Directive (EU) 2020/2184 – quality of water intended for human consumption [Official source](#)
- Directive 2009/32/EC – extraction solvents used in food production [Official source](#)
- Regulation (EC) No 1935/2004 – food-contact materials and articles [Official source](#)
- Regulation (EC) No 2023/2006 – good manufacturing practice for food-contact materials [Official source](#)
- Regulation (EU) No 10/2011 – plastic materials and articles intended to come into contact with food [Official source](#)
- Regulation (EU) 2022/1616 – recycled plastic materials and articles intended to come into contact with food [Official source](#)
- Regulation (EU) 2017/625 – official controls [Official source](#)
- Regulation (EC) No 853/2004 – hygiene of foodstuffs [Official source](#)