



EUROPEAN COMMISSION  
DIRECTORATE-GENERAL FOR HEALTH AND FOOD SAFETY

Food Safety, Sustainability, and Innovation  
**Food Processing Technologies and Novel Foods**  
**Pesticides and biocides**

**Guidelines for harmonised risk management approaches and enforcement action**  
**in cases of incidents involving food products containing genotoxic carcinogens**

*This document has been conceived as a technical guideline of the Commission Services and has not been adopted by the European Commission. Any views expressed may therefore not be regarded as stating an official position of the Commission. It does not intend to produce legally binding effects.*

## **Endorsement**

These Guidelines for harmonised risk management approaches/enforcement action in cases of incidents involving food products containing genotoxic carcinogens have been endorsed by the respective sections of the Standing Committee on Plants, Animals, Food and Feed (SCoPAFF), sections Phytopharmaceuticals -Pesticides Residues and section Novel Food and Toxicological Safety, on 18-19 September 2023 and 22 September 2023 respectively.

While general principles for a harmonised approach have been agreed, discrepancies in views of Member States still remain on whether or not measurement uncertainty (MU) should be taken into account when making compliance decisions for genotoxic carcinogens. While some Member States are in favour of considering MU when making compliance decisions for genotoxic carcinogens (in the same way as for any other substance), in line with the Commission's views, other Member States are of the view that the MU should not be applied. Further efforts are needed by Member States to support the Commission's intention to ensure a harmonised approach on this point.

## **Introduction**

Recent alerts notified by Member States in the Rapid Alert System for Food and Feed (RASFF) regularly indicate findings in food of certain genotoxic carcinogens (e.g., aflatoxin B1, ethylene oxide), or substances that are suspected to be genotoxic carcinogens (e.g., the metabolite aniline is a carcinogen for which a genotoxic mechanism cannot be excluded). The findings of such substances which are regulated by different sector specific legislation (e.g., contaminants, additives, pesticides) are assessed and followed up by enforcement authorities in Member States. This is done according to the sector specific regulations and under the framework of the General Food Law (GFL<sup>1</sup>), which defines, in Article 14, when food is considered unsafe, with the result that Food Business Operators need to withdraw or recall such food (Article 19 GFL).

In accordance with Article 14(7) of the GFL “food that complies with specific Community provisions governing food safety shall be deemed to be safe insofar as the aspects covered by the specific Community provisions are concerned.”

Recent experience of incidents needing coordination at EU level (e.g., the incidents of ethylene oxide findings in various foodstuffs) has demonstrated that uniform enforcement action is crucial, and that Member States need harmonised guidance in the case of findings of genotoxic carcinogens, or suspected genotoxic carcinogens, in food to avoid internal market distortions. This guidance should be applied for any new incident arising to ensure that rapid and uniform action is taken by Member States, without needing to perform a detailed risk assessment for each finding (for example using the Margin of Exposure approach) which would lead to divergences between Member States as the consumption figures differ. Such guidance should not be determined by how past incidents were handled, but rather draw on the experience gained from these precedents.

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<sup>1</sup> Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety, OJ L 31, 1.2.2002, p. 1

The purpose of this paper is thus to define the main principles of an EU-level harmonised risk management approach/enforcement action in cases of EU-wide incidents<sup>2</sup> involving food products containing substances such as genotoxic carcinogens or suspected genotoxic carcinogens that do not have Health Based Guidance Values (HBGV). The approach applies also to contaminants in case the contamination has been intentional and could have been avoided. At the onset of an incident a Crisis Coordinators' meeting would be convened with technical experts of the Member States invited as necessary. The specific details of the incident would be discussed then including possible consultation of EFSA and/or the EU Reference Laboratories. Necessary case-by-case decisions will be taken, including on a harmonised LOQ to be applied and on the intention and consequently the avoidability of the contamination in case it concerns a contaminant. However, with the main principles already agreed in this paper, such discussion would be more efficient and lead more quickly to harmonised action.

It is to note that the approach set out in this paper is meant for incidents requiring EU-wide action. While Member States can decide to apply the principles of the approach in their day-to-day management of findings, it is not the purpose of this paper to define specifics for this, e.g., on how to notify in the Rapid Alert System for Food and Feed (RASFF) - for that purpose, further work on the Work Instructions of RASFF would be needed.

## Scope

It is not possible to draw up an exhaustive list of all substances that would fall under the approach, which would quickly become outdated. Each case may be specific and deserves detailed examination. Therefore, at the beginning of an incident, there is a need to check and confirm that the substance is a genotoxic carcinogen, or a suspected one, and that EU coordination is needed. The Commission will ensure that such a coordination takes place with all Member States and that EFSA is consulted as necessary.

The following sources and criteria could be used to identify whether a substance would be covered by the approach laid down in this paper, in this order:

1. CLP classification (Regulation 1272/2008<sup>3</sup> on Classification, Labelling and Packaging.) Annex VI for harmonised classifications – searching for Muta 1A, 1B or 2 or Carc 1A, 1B or 2 (substances that are mutagenic and not carcinogenic should also be included in this first search):  
<https://echa.europa.eu/information-on-chemicals/annex-vi-to-clp>
2. Opinions of the RAC (Committee for Risk Assessment), for substances that have not yet been included in Annex VI of the CLP Regulation, but that have already been identified as genotoxic carcinogens by the RAC:  
<https://echa.europa.eu/opinions-of-the-committee-for-risk-assessment-on-proposals-for-harmonised-classification-and-labelling>  
<https://echa.europa.eu/registry-of-clh-intentions-until-outcome/>
3. EFSA Open Food Tox database:  
<https://zenodo.org/record/5076033#.Y9k-jHDMJhF>, filtering for:

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<sup>2</sup> The definitions of an “incident” and of situations requiring enhanced coordination at Union level are included in the Commission Implementing Decision (EU) 2019/300 of 19 February 2019 establishing a general plan for crisis management in the field of the safety of food and feed, in particular Articles 4 and 10.

<sup>3</sup> Regulation (EC) No. 1272/2008 of the European Parliament and the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006, OJ L 353 31.12.2008, p. 1

- a. Genotoxicity: download, filter by “author” – select “EFSA”, “PPR” or “CONTAM”, and filter by “genotoxicity” - select “positive” or “ambiguous”. – link for 2022:  
[https://zenodo.org/record/5076033/files/Genotoxicity\\_KJ\\_2022.xlsx?download=1](https://zenodo.org/record/5076033/files/Genotoxicity_KJ_2022.xlsx?download=1)
  - b. TTC Class III: download, filter by “author” – select “EFSA”, “PPR” or “CONTAM”, and filter by “Assessment” - select “TTC Class III” – link for 2022:  
[https://zenodo.org/record/5076033/files/ReferenceValues\\_KJ\\_2022.xlsx?download=1](https://zenodo.org/record/5076033/files/ReferenceValues_KJ_2022.xlsx?download=1)
  - c. Carcinogenicity: download, filter by “author” – select “EFSA”, “PPR” or “CONTAM”, and filter by “effect” - select “histopathology neoplastic” – link for 2022:  
[https://zenodo.org/record/5076033/files/ReferencePoints\\_KJ\\_2022.xlsx?download=1](https://zenodo.org/record/5076033/files/ReferencePoints_KJ_2022.xlsx?download=1)
4. For refinement: a substance falls under the approach covered by this discussion paper only if there is a non-threshold mechanism, which is to be confirmed by checking the respective risk assessments. Sometimes, even though there is harmonised classification, a threshold applies and in these cases the substance does not fall under the scope of this paper, e.g., carbendazim, thiophanate-methyl. Carbendazim has a harmonised classification as mutagen 1B (M1B), but not as a carcinogen. However, since carbendazim is an aneugen (genotoxic compound for which a threshold can in principle be set), reference values can be established. Thiophanate-methyl is classified as Carcinogen Cat. 2 and Mutagen Cat. 2. However, in a recent re-evaluation<sup>4</sup> it was concluded that “*that there is direct evidence in vitro that thiophanate-methyl is not clastogenic but aneugenic*” and “*indirect evidence in vivo that thiophanate-methyl is not clastogenic but aneugenic*”, allowing to set and reference values.

Where such substances are regulated under the Regulation on Maximum Residue Levels for pesticides<sup>5</sup> (MRL-R), MRLs are set at the Limit of Quantification (LOQ) of the analytical method for the specific food matrix. The contaminants’ Regulation (CONT-R)<sup>6</sup> establishes Maximum Levels (MLs) for such substances which may be higher than the analytical LOQ due to their unintentional and unavoidable presence in food as the consequence of production, processing and/or their presence in the environment.

The question has arisen on how to appropriately handle EU-wide incidents involving findings of such substances, where they are contained in food that is further processed or is part of composite products, and where rapid EU coordination is needed.

The approach laid down in this paper does not apply to feed, for which a specific approach had been agreed earlier<sup>7</sup>.

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<sup>4</sup> EFSA, Reasoned opinion on the toxicological properties and maximum residue levels (MRLs) for the benzimidazole substances carbendazim and thiophanate-methyl, EFSA Journal 2021;19(7):6773, <https://doi.org/10.2903/j.efsa.2021.6773>

<sup>5</sup> Regulation (EC) No 396/2005 of the European Parliament and of the Council of 23 February 2005 on maximum residue levels of pesticides in or on food and feed of plant and animal origin and amending Council Directive 91/414/EEC, OJ L 70, 16.3.2005, p. 1

<sup>6</sup> Commission Regulation (EU) 2023/915 of 25 April 2023 on maximum levels for certain contaminants in food and repealing Regulation (EC) No 1881/2006, OJ L 119, 5.5.2023, p. 103

<sup>7</sup> [https://food.ec.europa.eu/system/files/2021-12/rasff\\_ethylene-oxide-incident\\_e410\\_crisis-coord\\_20211004\\_sum.pdf](https://food.ec.europa.eu/system/files/2021-12/rasff_ethylene-oxide-incident_e410_crisis-coord_20211004_sum.pdf) and [https://food.ec.europa.eu/system/files/2022-02/rasff\\_ethylene-oxide-incident\\_e410\\_crisis-coord\\_20220120\\_sum.pdf](https://food.ec.europa.eu/system/files/2022-02/rasff_ethylene-oxide-incident_e410_crisis-coord_20220120_sum.pdf)

## Approaches for Enforcement Decisions

Two legally sound approaches are available to risk managers to handle food safety incidents related to genotoxic carcinogens, which can be summarised as an approach based on quantification (residues/contaminants above the (composite) LOQ) on the one hand and an approach based on traceability on the other hand. Both approaches are not applicable for genotoxic carcinogenic contaminants for which MLs are established in certain food commodities above the LOQ or for non-regulated genotoxic carcinogenic contaminants, the presence of which in food is unavoidable.

**For contaminants for which the presence in food is – to a certain extent – unavoidable:** For some of these substances, maximum levels (MLs) are established in certain foods at higher levels than the LOQ to take unavoidable levels into account. In such cases the approach is based on the specific ML established in the CONT-R and on the basis of Article 3 of Regulation 2023/915 (for processed/compound/composite food) or in case of unavoidable contaminants for which no ML has been established, based on the level that is considered to be unavoidably present. An example in the area of contaminants are aflatoxins (with maximum levels in some food), one of the most potent genotoxic carcinogens known. A guidance on actions to be undertaken as regards compound food in which a non-compliant ingredient because of the presence of aflatoxins has been used is in detail described in a guidance document on aflatoxin control (point - II.26.4. Finding of non-compliance in food ingredient – Action as regards compound food – it is also mentioned that though the guidance is about aflatoxins, it is also applicable to other contaminants regulated by Commission Regulation (EU) 2023/915 - the guidance is available at [https://food.ec.europa.eu/system/files/2016-10/cs\\_contaminants\\_sampling\\_analysis-guidance-2010\\_en.pdf](https://food.ec.europa.eu/system/files/2016-10/cs_contaminants_sampling_analysis-guidance-2010_en.pdf)).

**(I) Approach based on quantification, i.e., residues/contaminants above the (composite) LOQ<sup>8</sup>:** For pesticides residues and for contaminants of which the presence in food is avoidable, this approach relies on whether the levels of the respective substance in a food ingredient or in a composite/compound final food incorporating this ingredient are quantified above the (composite) LOQ. If in the final food there are no levels above the (composite) LOQ, no withdrawals/recalls are needed.

It is based in principle on the approach for processed/composite/compound foods laid down in Article 20 of the MRL-R or in Article 3 of the CONT-R. According to Article 20 of the MRL-R and Article 3 of the CONT-R processed/composite/compound products are compliant if they are not found to contain a substance at levels above a “composite LOQ<sup>9</sup>” calculated on the basis of the LOQs applicable to the ingredients of the processed/composite/compound food<sup>10</sup> or the relevant processing factor.

For processed/composite/compound food products, in most cases the first step should be a calculation to evaluate the level of residue expected in the product and a decision on whether the product should be analysed for the substance, which could be the case if the expected level is close to the LOQ. If the calculation demonstrates a level far below the LOQ no analysis is needed, and the product can remain on the market. If the calculation demonstrates a level

<sup>8</sup> In case of pesticide residues, the LOQ is the MRL, established at the LOQ.

<sup>9</sup> In case of pesticide residues, the “composite LOQ” is the “composite MRL” based on the MRLs of the ingredients, each of them established at the LOQ.

<sup>10</sup> MRLs for specific composite products are as such not established in the MRL-R which only lists raw products and their MRLs. However, Article 20 of the MRL-R allows the calculation of a LOQ for a composite product composed of the LOQs for the single ingredients (raw products) and their ratio (percentage) in the final food. **Example:** the calculated LOQ in a composite food X composed of two compounds Y (40%) and Z (60%), with the LOQ for Y at 0.05 mg/kg, the LOQ for Z at the default of 0.01 mg/kg, is  $0.05*40\% + 0.01*60\% = 0.026^* \text{ mg/kg}$ .

significantly above the LOQ no analysis is needed, and the product should be withdrawn/recalled. For all other cases laboratory analysis of the final food is necessary.

Difficulties in the application of this approach can arise where no validated analytical method is available for use by official control laboratories or where there is insufficient laboratory capacity that is able to quantify the respective substance in the processed/composite/compound food.

- a) **For pesticides residues**, quantified levels in the final processed/composite/compound food are established if the residues of that substance are above the “composite LOQ” for that food (as calculated according to Article 20 of the MRL-R.). Since for most genotoxic carcinogens there are no safe threshold values, any non-compliance with the MRL (set at the LOQ) should be considered as a potential risk for consumers by precaution and the enforcement authorities should notify such cases in the RASFF and withdraw products from the market / recall products from consumers. MRLs for pesticides residues that are genotoxic carcinogens established in Regulation (EC) No 396/2005 should be regularly reviewed and lowered to the lowest LOQs analytically achievable, where necessary.
- b) **For contaminants for which the presence in food is avoidable, i.e., the contamination was intentional and therefore avoidable**, the situation is similar as described for pesticide residues. Quantified levels in processed food or in composite/compound food are established if above the “composite LOQ” value and the enforcement actions are the same as in point a).

**(II) Approach based on traceability:** This approach relies on the knowledge of the presence of a substance in an ingredient that was used to produce a composite/compound food or of a substance in a food (e.g., raw material) that was used to produce a processed/derived food.

For a processed/composite/compound food product, a traceability approach can be used if there is knowledge ex-post that an ingredient/raw material containing substances that have genotoxic and carcinogenic properties, had been used by the Food Business Operator (FBO) at some stage during the food manufacturing process based on his traceability records. In such a case the processed/derived/composite/compound food would be declared as ‘not safe’, notified as an alert notification to the RASFF and withdrawn from the market/recalled from consumers by the Member States’ enforcement authorities. However, the traceability approach may become disproportionate to the risk, e.g., in reported real cases (example in the footnote<sup>11</sup>). It may therefore be necessary to agree on criteria to be used by Member States to decide about withdrawals/recalls of final processed/derived/composite/compound products. Such criteria would be a risk management decision.

Additionally, with regards to imports, the General Food Law (Regulation (EC) No 178/2002) sets out a general traceability requirement for food safety purposes (‘one step back – one step forward’). As further clarified in the SANTE guidance document on the implementation of the General Food Law, the general traceability requirement for safety purposes has no extraterritorial effects. Therefore, it does not apply to third country food business operators; it rather covers all stages of production, processing and distribution in the EU, namely from the EU importer up to retail level in the EU (excluding however supply to the final consumer). As

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<sup>11</sup> A substance X found in a spice, used in a sauce, used for a composite product that is added to a dish - leads to withdrawal/recall of the dish (in a concrete case the calculated level of substance X in the composite food was 5000 times lower than the LOQ, which is impossible to be analytically detected even by making use of the most sophisticated equipment).

further elaborated in the above-mentioned SANTE guidance document, exporters in trading partner countries cannot be legally required to fulfil the traceability requirement imposed within the EU (unless there are special bilateral agreements for certain sensitive sectors or where there are specific Union legal requirements, for example in the veterinary sector). However, there may be additional requirements for traceability that go beyond the legal provisions (e.g., between EU importers and food business operators in third countries) in food business' contractual arrangements. Given these legal constraints as regards the traceability requirement for imported products, Member States must rely on the approach based on absence of residues/contaminants.

### **Situations in which the approaches (I) and (II) should be used and legal considerations**

Recent experience, such as the ethylene oxide incidents, have demonstrated the important role that an approach based on traceability can play in the management of a newly emerging incident.

There are however limitations and drawbacks to the approach based on traceability as it does not ensure a level playing field between imported and domestically produced food. In the starting phase of a new emerging food incident, if there is limited knowledge/data and lack of validated analytical methods with sufficient sensitivity and lack of sufficient laboratory capacity, an approach based on quantification could not be used and the traceability approach would be the only choice to protect consumers. The situation would however be expected to evolve over time: with efforts made by the EU Reference Laboratories to provide the necessary analytical methods, a gradually better understanding of the substance's properties and its way of entry into the food chain, moving to an approach based on quantification should then be considered in the second phase of incident management as a more proportionate risk management option. In cases where analytical methods, data and knowledge are available at the EU level right from the start of a crisis, an approach based on quantification would be the most proportionate option by default.

Both approaches ensure a high level of consumer protection.

### **Way forward**

The following way forward is agreed by Member States:

- use by default the approach based on quantification (residues/contaminants above the LOQ) for single food ingredients/raw materials and above the composite LOQ in processed/composite/compound food for which sufficiently robust analytical methods and knowledge and laboratory capacity exist;
- the above-mentioned approach can be combined with a calculation approach. Consequently, analyses are only carried out for food items where the calculated level is close to the (composite) LOQ for the processed/composite/compound food.
- consider on a case-by-case basis the use of a traceability approach in very exceptional circumstances and only where the use of the approach based on absence of quantified residues/contaminants is hampered, e.g., by lack of knowledge/data and/or analytical methods with sufficient sensitivity, preventing establishment of a (composite) LOQ in the final food;

- allow for rapid transition from the traceability towards an approach based on quantification in one and the same incident when the situation evolves and knowledge/analytical methods and laboratory capacity become available over time. The moment of transition would need to be discussed and agreed with the Member States competent authorities in each specific case and the transition should be as fast as possible.
- for pesticide residues, ensure that MRLs for genotoxic carcinogens are established in the EU MRL Regulation at the lowest LOQs analytically achievable as advised by the EU RLs.