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## **Information sheet 3**

### **on the correct preparation of the technical dossier for the substantive assessment of food safety for novel foods**

Status: January 2026

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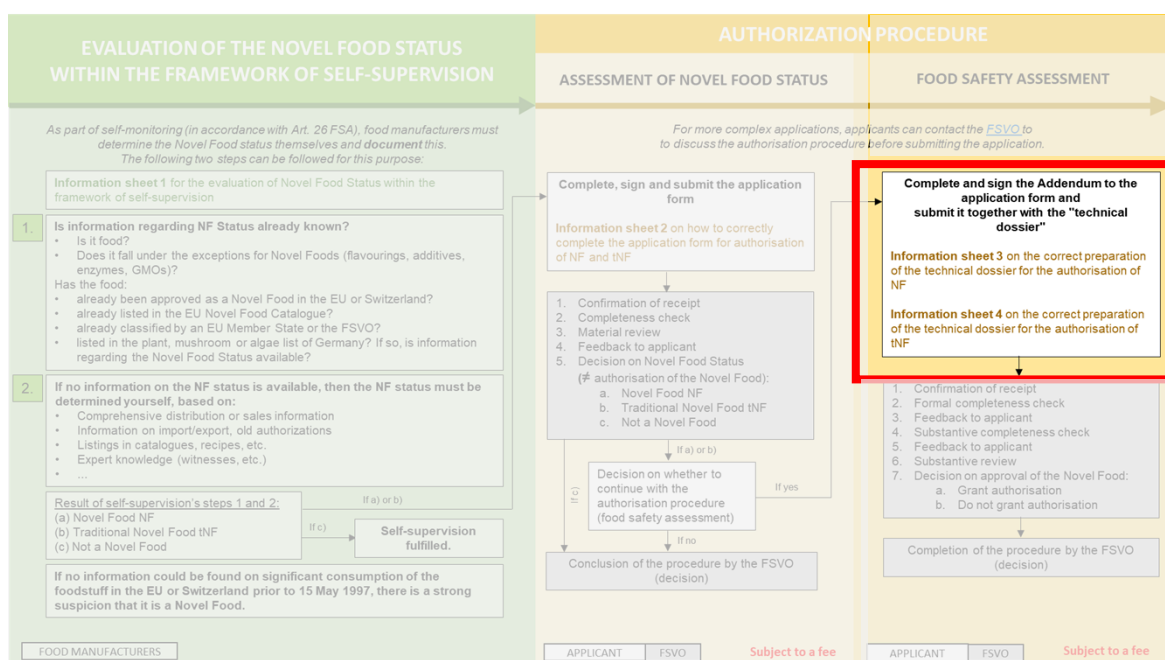
At the latest when the FSVO has assessed the novel food (NF) status, food safety must be assessed as part of the authorisation procedure (see Figure 1).

This information sheet assists applicants in preparing a complete and structured technical dossier for the authorisation of **novel foods** in Switzerland. It is based on the guidelines of the European Food Safety Authority (EFSA) and the requirements of the Federal Food Safety and Veterinary Office (FSVO). The dossier must contain scientific evidence demonstrating the safety of the product under the intended conditions of use.

The technical dossier must be structured in accordance with the requirements of the EFSA guidance document (" [Guidance on the scientific requirements for an application for authorisation of a novel food in the context of Regulation \(EU\) 2015/2283](#) "). **All** relevant chapters must be covered in full. If certain chapters or subchapters are not relevant from the applicant's point of view, their content does not need to be explained – but an explanation must be provided as to why they are considered irrelevant.

This document is intended to facilitate navigation of this guidance and shows the general structure of a correctly structured dossier; the more detailed requirements for the completeness of the respective chapters can be found in the EFSA guidance.

If necessary, the FSVO recommends contacting them at an early stage to clarify any questions regarding the preparation of the technical dossier in a physical or virtual meeting. This can be done by emailing [ime@blv.admin.ch](mailto:ime@blv.admin.ch) .



**Figure 1** Process for the authorisation of novel foods in accordance with the 'Diagram of the authorisation procedure for novel foods' ([link](#)). This information sheet serves as a guide to the correct preparation of the technical dossier for the substantive assessment of food safety for novel foods.

## General principles

### Scientific safety assessment:

The applicant must provide an overall assessment of how the data submitted (e.g. toxicological studies, nutritional analyses, allergenicity assessments) demonstrate the food safety of the novel food. This includes, among other things:

- A critical assessment of the risks (e.g. acute/chronic toxicity, genotoxicity).
- An exposure assessment based on the intended consumption levels and target groups (e.g. children, pregnant women).
- The transferability of the results to the Swiss population, taking into account local consumption habits.

### Structure and content of the dossier:

The structure of the dossier must follow the sections specified in this information sheet (1. Identity, 2. Production process, 3. Characterisation, 4. Specifications, etc.). The sections correspond to the structure of the EFSA guidelines<sup>1</sup>. Ideally, a separate document should be created for each section. Important: the document must be dated so that the latest version can always be used. If, for example, a chapter is resubmitted, this must be highlighted by the date so that the old version can be replaced.

**All** chapters must be addressed in the technical dossier. If certain sections or requirements do not apply to an NF to be approved, the reasons why these sections do not apply must still be explained.

All documents must be explained in **continuous text** in order to clearly present the logic of the safety argumentation. Dossier containing only keywords (lab journal style) will not be accepted. Appendices must be clearly numbered and named so that they can be clearly referenced in the technical dossier (in the text). Navigation within the dossier must be intuitive and clear.

Incomplete or formally incorrect dossiers (e.g. missing documents, missing signatures) will not be processed.

Please note that the risk assessment must be carried out by the company: the FSVO only checks the plausibility of the submitted risk assessment.

### Documentation of data:

The scientific data must be included in full in the technical dossier.

- Complete study reports (including raw data and methods) in accordance with international standards (e.g. OECD, ICH).
- Systematic literature search with details of the search strategy (databases, search terms, time period).

The dossier must contain all relevant data on the safety of the novel food, including negative findings. Deviations from EFSA or FSVO requirements (e.g. missing studies) must be scientifically justified.

### Special features for authorisations in Switzerland:

Despite being based on the scientific requirements of the EFSA guidelines, Swiss law takes precedence. The dossier must therefore take Swiss legislation into account, e.g.

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<sup>1</sup> [Guidance on the scientific requirements for an application for authorisation of a novel food in the context of Regulation \(EU\) 2015/2283](#)

- maximum levels for contaminants<sup>2</sup>
- Maximum levels model for vitamins and minerals<sup>3</sup>

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<sup>2</sup> FDHA Ordinance on the Maximum Levels for Contaminants (Contaminants Ordinance, [ContO](#))

<sup>3</sup> [Maximum level model](#)

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## Sections for the structure and preparation of the technical dossier

The following sections were created using AI based on the EFSA guidance document ("[Guidance on the scientific requirements for an application for authorisation of a novel food in the context of Regulation \(EU\) 2015/2283](#)"). This is intended to make the EFSA guidance documents, which are only available in English, more accessible. The content has been reviewed by the FSVO.

### 1. Identity of the novel food

Information on the identity of the novel food must be provided in accordance with the requirements set out in the relevant subsection of the guidance. In some cases, two or more subsections may be relevant to a novel food. In such cases, the relevant information should be provided for all relevant subsections. These subsections are to be distinguished from the categories under Article 15 of the Food and Consumer Goods Ordinance, to which the novel food must be assigned when submitting the application dossier.

The novel food undergoing risk assessment should be the product resulting from the production process, without the addition of ingredients/processing aids used to formulate the final marketed product. Although information on the use of non-novel compounds must be provided in the description of the production process, non-novel compounds should not be taken into account for the identity of the novel food, the compositional analyses and the proposed specifications, unless they are essential to obtain specific properties of the novel food, e.g. stability or physical form. In this context, compounds used solely to standardise the composition of the novel food should not be considered part of the novel food.

The name of the novel food in the submitted dossier must reflect its characteristic elements, e.g. its source, the main components of the organisms used, its form(s) (e.g. dried, frozen, powder), specific elements of the production process. Scientific names according to the latest taxonomy or scientific nomenclature should be included; trade names, including trademarks, should be avoided.

### 2. Production process

The methods used to produce the novel food (e.g. chemical synthesis, enzyme catalysis, fermentation or isolation from a natural source) should be described in detail. The description of the production process must be detailed enough to ensure understanding of the critical parameters and steps and to identify all potential food safety hazards. This information forms the basis for the assessment of the composition, specifications, bioavailability, nutritional value and safety of the novel food.

The following subchapters describe only the general requirements for the technical dossier; the exact requirements vary depending on the food and can be found in the [EFSA guidance](#).

#### 2.1 General provisions

Information on all input materials used in the manufacturing process of the novel food, including their functional role and regulatory status in the EU, must be provided. In addition, information on the specification and quality of the starting materials/raw materials and fermentation aids must be provided. For each material that comes into contact with food during the production process (e.g. plastic containers), a declaration of compliance in accordance with Regulation (EC) No 1935/2004 and other relevant EU regulations must be submitted. Taking into account all steps during the production process, the production yield, i.e. the resulting quantity of a novel food from its raw materials, should be calculated and, where applicable, the "processing factors" should be specified.

With regard to safety, the description must contain information on potential by-products, impurities or contaminants. The formation of processing contaminants should also be taken into account on the

basis of the processes used, and a description of the parameters that can lead to the formation of a particular processing contaminant should be included.

Food safety management systems (based on HACCP principles in accordance with the EDI Ordinance on Hygiene in the Handling of Foodstuffs) must be implemented for the production of novel foods. These include:

- Specification of operating limits and key parameters of the production process,
- Description of quality controls (e.g. HACCP, GMP, ISO),
- Creation of a production flow chart with security controls.

For applications with confidentiality claims (in accordance with EU Regulation 178/2002 and EFSA transparency rules), a non-confidential process summary with safety-related parameters must be submitted.

The exact requirements – for example, regarding critical control points, analysis methods or standardisation criteria – are described in the [EFSA Guidance](#).

## **2.2 Considerations for specific production process steps**

Depending on the product, the applicant must also submit detailed information on specific production steps. This applies, for example, to (non-exhaustive list):

- Plants and fungi: information on cultivation, harvesting (wild vs. cultivated, fertilisers, harvest time)
- Aquaculture: water quality, husbandry conditions,
- Livestock: feeding, husbandry, use of veterinary medicines,
- Microorganisms: cultivation conditions, methods for removing/inactivating cells or proof of safety in the case of viable microorganisms.
- Cell or tissue cultures: raw materials and biological risks (e.g. viruses, bacteria), characterisation of cell lines (e.g. origin, genetic stability) and compliance with quality standards (e.g. Good Cell Culture Practices).
- Chemical synthesis: reaction conditions, purification methods and use of solvents in accordance with applicable guidelines.

In addition, the use of food enzymes as processing aids must be documented. For enzymes, their safety must be demonstrated in accordance with Swiss food law (e.g. Foodstuffs and Utensils Ordinance, Art. 11), including proof of inactivation/removal or residual activity in at least three batches. Food additives may only be used if they are approved in the Swiss positive list (in accordance with the Additives Ordinance, Art. 8). For foods of plant origin, relevant processes after harvesting must also be documented (transport, drying, storage).

The exact requirements, in particular regarding biological risks, pesticides, enzymes, hormones or antimicrobial agents, are described in detail in the [EFSA Guidance](#).

## **2.3 Additional conditions**

In the case of novel foods produced by several manufacturers or with varying production steps, the safety and equivalence of all batches must be demonstrated. Applicants must document any differences in the processes, demonstrate the consistent quality of the products and present appropriate safety measures (e.g. HACCP systems). Any changes in the production process during the procedure must be reported to the FSVO.

The exact requirements for substantiating equivalence, analysing raw materials and other details are described in the [EFSA guidance](#).

### 3. Information on the composition of the food

For the authorisation of novel foods, compositional data are essential for characterising the product chemically, physically, microbiologically and nutritionally. These include qualitative and quantitative information on the composition, including variability between batches, to ensure the reproducibility and safety of the product. Specific requirements apply depending on the product type (single substance, complex mixture or whole food); section 3.1 of the guidance outlines the general requirements, sections 3.2-3.3 explain the specific requirements according to product category, and section 3.4 deals with the topic of stability testing.

Key aspects:

- Analysis of batch variability
- Determination of specification parameters for safety,
- Linking the data to the production process and raw materials.

The detailed requirements are described in the [EFSA Guidance](#).

#### 3.1 General provisions

##### 3.1.1 Analytical methods

Validated methods must be used for the analysis of composition, preferably in accordance with nationally/internationally recognised standards (e.g. AOAC, ISO). The limits of detection (*LOD*) and quantification (*LOQ*) must be specified. Validation data must be provided for in-house methods. Analyses should be carried out in accredited laboratories; any deviations must be justified. Laboratory certificates and an overview table of the analysis methods (including technique, reference, *LOD/LOQ*) are required.

The exact requirements – for example, regarding method validation or documentation structure – are set out in the [EFSA Guidance](#).

##### 3.1.2 Consideration of compositional variability

For novel foods, compositional data from at least five representative batches (produced independently) must be submitted in order to capture batch-to-batch variability. This data is used to establish specifications and for safety assessment. Important aspects:

- Representativeness: Batches should be produced under industrial conditions and cover seasonal/raw material-specific variations.
- Variability analysis: Consideration of process parameters (e.g. temperature, solvent quantity) and different product forms (e.g. powder, frozen).
- Justification requirement: Deviations from the minimum number of batches or analysis methods must be justified.
- Use of published data: Possible, provided that methods, laboratories and representativeness of samples are transparently documented.
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The exact requirements – for example, for sampling, data interpretation or integration of external studies – are described in detail in the [EFSA guidance](#).

##### 3.1.3 Representative sampling

Representative sampling procedures are crucial for the authorisation of novel foods in order to ensure the quality and safety of the product.

Key requirements:

- Representativeness: Sampling must be carried out in accordance with recognised principles (e.g. sample size, selection of containers, storage conditions).

- Justification: The chosen sampling plan must be conclusively justified.
- Standard protocols: Existing legal or standardised sampling procedures must be taken into account.
- Documentation: Each certificate of analysis must contain the batch name as well as production and analysis data.

Deviations from these requirements (e.g. in the case of non-standardised procedures) must be justified.

The exact details – such as the selection of samples or the integration of existing protocols – are described in the [EFSA guidance](#).

### 3.1.4 Characterisation of ingredients and contaminants

For novel foods, detailed information on ingredients, contaminants and risk substances is required. This includes:

- Identification and quantification of residues (e.g. pesticides, heavy metals, solvents), by-products (e.g. from chemical synthesis) and microbiological contaminants (e.g. pathogens).
- Protein analyses: calculation of protein content (using nitrogen factor 6.25) and, where applicable, amino acid profile, especially for protein-rich products.
- Nanomaterials: Characterisation in accordance with EFSA guidance if the nanomaterials are specifically manufactured. For other products, it must be demonstrated that no nano-specific risk assessment is necessary (e.g. for natural particles).

**Exceptions:** Certain categories (e.g. microorganisms, unmodified proteins, whole foods) are exempt from nanoparticle analysis provided that the manufacturing process does not promote particle formation.

Key aspects:

- Selection of analytes based on raw materials, manufacturing process and regulatory requirements
- Documentation of purity and safety (e.g. allergenicity in proteins),
- Application of nanoparticle-specific assessments only when necessary.

The exact requirements – for example, regarding analysis methods, nanoparticle detection or exemptions – are described in the [EFSA guidance](#).

### 3.2 Characterisation of single substances and simple mixtures

For novel foods defined as single substances or simple mixtures, applicants must provide the following information:

- Complete chemical characterisation of all components (identity, proportions),
- Mass balance: proof of composition and purity,
- Identity-relevant data in accordance with section 1.1 of the guidance.

When genetically modified micro-organisms (GMMs) are used, the EFSA requirements for GMM category 1 (EFSA GMO Panel, 2011) also apply.

The exact specifications – for example, on mass balance or GMM conformity – are described in the [EFSA Guidance](#).

### 3.3 Characterisation of complex mixtures and whole foods

Specific requirements apply to novel foods in the form of complex mixtures (e.g. extracts, biomass) or whole foods (e.g. milk, insects, fruit), as not all components can be fully characterised.

Key requirements:

- Basic analyses: Proximate data (moisture, protein, fat, carbohydrates, ash) and mass balances to determine the composition.
- Hazardous substances: Identification and quantification of toxic, allergenic or health-threatening substances (e.g. heavy metals, mycotoxins).
- Literature research: Systematic evaluation of existing data on raw materials and manufacturing processes in accordance with EFSA methodology.
- Special cases:
  - Genetically modified microorganisms (GMM): Compliance with Category 2 requirements (EFSA GMO Panel, 2011).
  - Insects: Consideration of species-specific risks (e.g. substrates, rearing methods).
  - Active substances: Specification of the proportion of viable cells.
- Comparative analysis: If necessary, comparison with conventional foods for safety assessment.

The exact requirements – for example, regarding analysis methods, mass balances or special cases – are described in detail in the [EFSA guidance](#).

### **3.4 Stability testing**

#### **3.4.1 Stability testing of the novel food**

For the authorisation of novel foods, a stability assessment is required to demonstrate the safety-relevant composition and integrity during storage and transport.

Key requirements:

- Test parameters: Chemical, physical and microbiological stability under the intended storage conditions (temperature, light, humidity).
- Batches: Tests on at least five independently produced batches; deviations must be scientifically justified.
- Storage period: Verification over the entire planned shelf life, with interim analyses if necessary.
- Accelerated tests: Only permitted for chemical parameters, provided that transferability to real conditions has been proven.
- Stabilisers: Documentation of additives that contribute to shelf life.

Key aspects:

- Proof that the product remains in accordance with specifications over its shelf life,
- Consideration of packaging influences and environmental parameters.
- Scientific justification for reduced batch numbers or deviating test methods.

The exact specifications – for example, regarding test intervals, validation of accelerated conditions or analysis methods – are described in detail in the [EFSA guidance](#).

#### **3.4.2 Influence of processing on novel foods**

When novel foods are used as ingredients in further processed products (e.g. heated foods), the influence of processing on safety and composition must be investigated.

Key requirements:

- Model systems: simulation of the planned conditions of use (e.g. maximum temperature, pH extremes) to analyse interactions, contaminant formation or degradation processes.
- Controls: Comparison with products without the novel food.
- Non-conventional processing: Identification of potential risks associated with non-standard manufacturing methods.

Key aspects:

- Proof that the novel food remains stable and safe under **real processing conditions**.
- Documentation of interactions with other ingredients.
- Consideration of **the limits of use** defined in Section 6.2 (e.g. thermal stress).

The exact specifications – for example, on modelling approaches, validation of extreme conditions or risk assessment – are described in detail in the [EFSA guidance](#).

## 4. Specifications

Specifications are required for novel foods to ensure identity, safety and quality through defined chemical, physical and microbiological parameters.

Key requirements:

- Parameters: Tabular listing of minimum/maximum values for:
  - Basic composition (protein, fat, carbohydrates, ash, moisture),
  - Characteristic components (e.g. carotenoids, fibre, micronutrients),
  - Safety-relevant substances (e.g. toxins, heavy metals, pathogens),
  - Stability indicators (e.g. lipid oxidation, water activity).
- Justification: Scientific basis for the specified limits (e.g. based on batch analyses, stability tests).
- Health-related values: Consideration of toxicological limit values (*HBGV*) and nutritional reference values (*UL/DRV*).
- Special cases:
  - Nanomaterials: Compliance with EFSA requirements for nano-specific specifications,
  - Small particles: Application of EFSA guidelines for conventional materials with particle content.

Key aspects:

- Limit values for undesirable substances must be as low as possible.
- Proof of analytical verifiability (methods in accordance with section 3),
- Clear documentation for substitute products (e.g. minimum nutrient content).

The exact specifications – for example, regarding table structure, nanomaterials or EU regulations – are described in detail in the [EFSA guidance](#).

## 5. History of use of the novel food and/or its source

### 5.1 History of use of the source

When assessing novel foods, data on related products from the same source (e.g. raw materials, precursor products) can provide relevant information.

Key aspects:

- Risk identification: Critical substances (e.g. toxins) or instructions for use (e.g. heating before consumption) from the source must be taken into account.
- Plant-based foods: The *EFSA Compendium on Botanicals* provides information on naturally occurring risk substances.
- Empirical values: Production and usage experience with the source helps to derive safety measures.

The exact requirements – for example, for the integration of external data sources or botanical risks – are described in the [EFSA Guidance](#).

## 5.2 History of use of the novel food

When assessing the safety of novel foods, data from non-EU countries (e.g. consumption levels, preparation methods) and non-food applications can provide relevant insights.

Key aspects:

- Usage data: Information on consumption levels (average, high, maximum), target groups, preparation (e.g. cooking) and storage.
- Literature search: Systematic evaluation of human studies on safety parameters, including search strategy (databases, search terms, time periods).
- Extended search: Consideration of studies on safety-relevant components of the product or similar foods (e.g. related species).

Key requirements:

- Documentation of the research methodology (e.g. sources used, filter criteria)
- Inclusion of empirical values from other countries, if available,
- Critical assessment of the transferability of international data to Swiss consumption habits.

The exact specifications – for example, on systematic literature evaluation or data integration – are described in the [EFSA Guidance](#).

## 6. Intended uses and expected intake

For the safety assessment of novel foods, estimates of consumption levels by the target population are required in order to evaluate nutritional and toxicological risks.

Key aspects:

- Intake estimation: Based on the proposed uses and consumption levels as well as existing consumption data for the EU population.
- Target groups: Clear definition of the target population (e.g. adults, children, special groups) and any restrictions on use.
- Safety measures:
  - Adjustment of conditions of use if health risks have been identified.
  - Inclusion of safety margins ("uncertainty factors") in accordance with EFSA recommendations.
- Micronutrients: Specific EFSA guidelines on bioavailability and safety apply to novel sources of vitamins/minerals.

Special requirements:

- Documentation of nutritional relevance (e.g. for substitute products or food supplements),
- Consideration of cumulative exposure (e.g. when added to several foods).

The exact specifications – for example, for calculating intake, defining target groups or applying safety factors – are described in detail in the [EFSA guidance](#).

## 6.1 Target population

For novel foods, the target population must be clearly defined in order to ensure safe use.

Key requirements:

- Clear specification of the target population:
  - Examples: general population, adults, adolescents, special groups (e.g. infants, people with dietary requirements).
  - For food supplements or special foods: Explicit age specifications (e.g. "from 10 years of age") in accordance with EU Regulation 609/2013.
- Safety data:
  - Must cover all potential consumer groups, even if the product is primarily intended for a specific group (e.g. ingredients in foods that could be consumed by other groups).
- Special cases:
  - Infant formula: Clearly define the target group in accordance with EU Regulation (e.g. "0–12 months").
  - Balanced diets: Compliance with EU requirements for adults or specific age groups.

Key aspects:

- Documentation of the scientific rationale for the target group selection,
- Consideration of unintended consumption by other groups (e.g. children in the case of food additives),
- Reference to the EFSA database on consumption habits for age-specific definitions.

The exact requirements – such as the definition of age groups or the integration of safety data – are described in the [EFSA guidance](#).

## 6.2 Intended uses

For the authorisation of novel foods, applicants must define specific uses and maximum amounts based on the planned applications (e.g. as an ingredient, food supplement or whole food).

Key requirements:

- Categorisation:
  - For ingredients: specification of food categories in accordance with EFSA tools (FAIM or DietEx) and maximum quantities (e.g. mg/kg) in ready-to-eat products.
  - For whole foods: comparison with foods commonly consumed in the EU in order to reflect consumption habits.
- Food supplements/special foods:
  - Specify the maximum daily intake (mg/day) for target groups (e.g. adults, adolescents).
  - Special diet products (e.g. balanced diets): Compliance with Regulation (EU) No 609/2013.
- Multiple forms: Separate information for different product forms (e.g. powder, frozen) and their combinations.

Key aspects:

- Clear documentation of food categories and maximum amounts for exposure estimation,
- Avoidance of duplication in FAIM/DietEx categories for food supplements or special foods,
- Scientific justification for comparisons with EU foods.

The exact specifications – for example, on the use of EFSA tools, categorisation or daily intake – are described in detail in the [EFSA guidance](#).

### 6.3 Estimation of expected intake

Estimating the expected intake of the novel food is central to the safety assessment. It is based on the proposed uses, maximum levels and existing consumption data for the EU population.

Key aspects:

1. Exposure calculation:
  - Use of EFSA tools (FAIM/DietEx) to estimate daily intake in different population groups.
  - Consideration of cumulative exposures (e.g. when used in several food categories).
2. Safety margins:
  - Inclusion of *uncertainty factors* to safeguard against risks.
  - Adjustment of conditions of use if estimated intake exceeds toxicological limits.
3. Special cases:
  - Food supplements: Specification of the maximum daily dose per target group (e.g. adults, adolescents).
  - Infant food or diet products: Compliance with EU Regulation 609/2013 for vulnerable groups.

Key requirements:

- Clear documentation of the basis for calculation (e.g. consumption data used, assumptions).
- Scientific justification for deviations from standard methods,
- Proof that intake is within safe limits.

The exact specifications – for example, on the use of population data integration or the application of safety factors – are described in detail in the [EFSA guidance](#).

### 6.4 Combined intake from different sources

The safety assessment must take into account the cumulative exposure to the novel food or its main components from other sources (e.g. existing foods, the environment).

Key requirements:

1. Total exposure:
  - Calculation of total intake (new + existing sources) for relevant population groups.
  - Consideration of main components (e.g. vitamins, minerals, bioactive substances) that are already present in other foods.
2. Risk assessment:
  - Comparison of total exposure with health-based reference values (e.g. *tolerable upper intake levels* – ULs).
  - Adjustment of conditions of use if limit values are exceeded.
3. Data sources:
  - Use of EU consumption databases (e.g. EFSA Comprehensive European Food Consumption Database).
  - Inclusion of studies on background exposures (e.g. environmental contaminants).

Key aspects:

- Scientific justification if certain sources are excluded (e.g. due to lack of relevance).
- Transparent documentation of all assumptions and uncertainties in exposure estimation.

The exact methods – for example, for data extraction, modelling or risk characterisation – are described in the [EFSA Guidance](#).

### **6.5 Estimation of exposure to safety-relevant substances**

This chapter requires a quantitative estimate of exposure to substances in the novel food that pose potential health risks (e.g. toxins, heavy metals, residues from the manufacturing process).

Key requirements:

1. Identification of critical substances:
  - Focus on ingredients with known or suspected toxicological risks (e.g. mycotoxins, pesticide residues).
  - Consideration of by-products or degradation products from the manufacturing process.
2. Exposure estimation:
  - Calculation of daily intake by the target population (based on intended uses, maximum quantities and consumption data).
  - Comparison of exposure with health-based guidelines (e.g. *Tolerable Daily Intake* – TDI).
3. Data basis:
  - Use of EFSA tools (e.g. FAIM/DietEx) for exposure modelling.
  - Integration of batch analyses, stability data and literature on background exposure.

Key aspects:

- Scientific justification if certain substances are not taken into account (e.g. due to lack of relevance).
- Transparent presentation of uncertainties (e.g. data gaps, model assumptions).

The exact methods – for example, for selecting critical substances, modelling or risk characterisation – are described in detail in the [EFSA guidance](#).

### **6.6 Precautionary measures and restrictions on use**

When establishing precautionary measures and restrictions on use for novel foods, all available safety data must be taken into account.

Key requirements:

- Target group restrictions:
  - Explicit indication of the population groups that should avoid consumption (e.g. pregnant women, persons with certain physiological conditions).
  - Scientific justification for these restrictions (e.g. toxicological risks, allergenicity).

Key aspects:

- Clear documentation of instructions for use (e.g. preparation methods),
- Ensuring that restrictions are risk-based and evidence-based.

The exact specifications for deriving precautionary measures are described in the [EFSA Guidance](#).

## 7. Absorption, distribution, metabolism and excretion

### 7.1 General aspects of ADME studies

This chapter deals with the assessment of absorption, distribution, metabolism and excretion (ADME) of novel foods in order to ensure their nutritional and toxicological safety.

Key requirements:

1. ADME studies:
  - Required for novel foods containing new individual substances or toxicologically relevant components in mixtures.
  - Consideration of matrix effects (e.g. influence of the food matrix on bioavailability).
2. Exceptions:
  - No ADME studies are necessary if substances are naturally present in the body/in the diet.
  - For polymers > 1000 Da that are not broken down in the gastrointestinal tract, the requirement does not apply.
3. Special cases:
  - Nanomaterials: Compliance with EFSA guidelines for *engineered nanomaterials* (EFSA Scientific Committee, 2021b).
  - Proteins: Conduct digestion studies to assess allergenicity and toxicity.
  - Nutrients: Quantification of (relative) bioavailability for new nutrient sources.

Key aspects:

- Literature review: Critical evaluation of existing ADME data prior to study planning.
- Animal-human differences: Consideration in the interpretation of animal studies.

The exact specifications – for example, on study design, nanomaterials or bioavailability testing – are described in detail in the [EFSA guidance](#).

### 7.2 Tiered approach for ADME studies

ADME studies must be conducted according to a tiered approach.

Key requirements:

1. Tiered approach:
  - Tier 1: Basic data in accordance with OECD Guideline TG 417 (in vivo studies on animals).
  - Tier 2+: Higher tiers if necessary (e.g. unclear toxicity or bioavailability).
  - Triggers for higher tiers: Insufficient data or safety concerns.
2. Exceptions:
  - ADME studies may be waived if scientifically justified (e.g. sufficient preliminary studies or literature data).

The exact specifications – e.g. on level criteria, triggers for higher animal levels or justification requirements – are described in the [EFSA Guidance](#).

### 7.3 Special requirements for novel nutrient sources

For novel foods that serve as new nutrient sources, the bioavailability of the nutrients they contain must be demonstrated.

Key requirements:

1. Micronutrients (vitamins, minerals):
  - Relative bioavailability must be quantified in accordance with the EFSA guideline (EFSA NDA Panel, 2024b).
2. Other nutrients (e.g. macronutrients):
  - Bioavailability must be demonstrated but not quantified.

The exact specifications – for example, for the quantification of micronutrients or detection methods for macronutrients – are described in detail in the [EFSA guidance](#).

## 8. Toxicological information

### 8.1 General requirements for toxicological studies

This chapter redefines the basis for toxicological studies to identify hazards and establish safe intake levels for novel foods.

Key requirements:

1. Preliminary studies:
  - Consideration of composition data (Chapter 3) and literature research on toxicological properties.
  - Development of a testing strategy based on the manufacturing process, ADME data, existing studies (in silico/in vitro/in vivo) and non-food-related safety data.
2. Study implementation:
  - Use of representative test materials (in accordance with the production process and specifications).
  - In cases of low test sensitivity (e.g. whole foods): use of concentrated fractions with scientific justification.
  - Compliance with international guidelines (OECD, GLP) and special rules for nanomaterials (EFSA Scientific Committee, 2021b).
3. Special cases:
  - Read-across approach: use of toxicological data from structurally similar substances (especially for defined chemicals).
  - TTC approach: Evaluation of low-exposure substances without toxicity data (EFSA Scientific Committee, 2019b).
  - Microorganisms: Toxicological studies only required for QPS compliance and specific safety concerns.

Key aspects:

- Scientific justification for test material deviations or data gap filling,
- Transparent documentation of all test conditions and methods.

The exact specifications – for example, on study design, read-across or QPS criteria – are described in detail in the [EFSA Guidance](#).

### 8.2 Tiered approach for toxicological studies

This chapter describes a tiered approach to toxicological studies, in particular on genotoxicity and repeated dose toxicity, in order to assess the safety of novel foods.

Key requirements:

1. Tiered testing strategy:
  - **Tier I:** Basic studies (e.g. genotoxicity, subchronic toxicity). No further testing required if data are sufficient and there are no risk signals.
  - **Tier II/III:** Higher tiers if necessary (e.g. reproductive/developmental toxicity, chronic studies), triggered by abnormalities in Tier I or literature data.
2. Flexibility in repeated dose toxicity:
  - Study planning depending on data availability (e.g. intake level, preliminary toxicological information).

- **Efficiency:** Tier III studies (e.g. EOGRTS) can replace Tier I + II to reduce animal numbers and time.

Key aspects:

- Triggers for higher levels: Unclear safety data, indications of chronic toxicity/carcinogenicity.
- Study design: Based on international standards (e.g. OECD) and EFSA guidelines for nanomaterials.

The exact specifications – e.g. on tier criteria, study design or triggers for Tier III – are described in detail in the [EFSA guidance](#).

### 8.3 Genotoxicity assessment

Genotoxicity assessment serves to identify the potential of novel foods to cause genetic damage.

Core requirements:

1. Tiered approach:
  - **Tier I:** Basic *in vitro* tests (e.g. bacterial mutagenicity and micronucleus tests).
  - **Tier II:** *In vivo* follow-up studies in case of positive/unclear Tier I results.
  - **Tier III:** No further testing necessary if *in vivo* studies are positive (substance is considered genotoxic).
2. Special cases:
  - Mixtures: Guidance based on the EFSA guidance on the genotoxicity of chemical mixtures.
  - Nanomaterials/small particles: Application of nano-specific EFSA guidelines.
  - Microorganisms: Testing of cell lysate and supernatant (at least 3 batches).
  - Genetically modified microorganisms (GMM): Case-by-case assessment, as no general testing strategy exists.

Important notes:

- If *in vitro* results are positive (e.g. micronucleus test), further analyses (e.g. kinetochore staining) are required.
- Adapted test methods may be necessary for proteins/peptides or nanomaterials.

The exact specifications – for example, on test designs, evaluation criteria or special cases – are described in detail in the [EFSA guidance](#).

### 8.4 Repeated toxicity studies

Repeated toxicity studies are used to assess the long-term health risks of novel foods and follow a tiered approach (Tier I–III).

Core requirements:

1. Tier I (basic studies):
  - **Subacute toxicity (14 days):** dose determination for follow-up studies.
  - **Subchronic toxicity (90 days):** Identification of NOAEL/BMDL values for risk characterisation (in accordance with OECD TG 408).
  - **Exceptions:** No studies necessary if safety data are sufficient or scientifically justified.
2. Tier II (in-depth studies):
  - **Reproductive/developmental toxicity:** If there are indications of hormonal or reproductive risks (e.g. OECD TG 414, 416).
  - **Other endpoints:** Neurotoxicity/immunotoxicity, cardiovascular effects, if triggered by Animal I or literature.

3. Tier III (complex long-term studies):
  - EOGRTS (Extended One-Generation Study): Assessment of pre-/postnatal effects (OECD TG 443).
  - Chronic toxicity/carcinogenicity: Only in exceptional cases (e.g. in the case of hyperplasia or accumulation).

Special notes:

- Test materials: Representative of the novel food, concentrated fractions if low sensitivity.
- Nanomaterials/small particles: Adaptation in accordance with EFSA guidelines (EFSA Scientific Committee, 2021a).
- Documentation: Complete study reports, statistical evaluations and historical control data.

The exact methods, study designs and triggers for Tier II/III are described in detail in the [EFSA Guidance](#).

### 8.5 Human data for safety assessment

Human data are an essential part of the safety assessment of novel foods, especially in cases of specific risks or unclear results from animal studies.

Core requirements:

1. Study types:
  - Intervention studies: Provision of all available studies, even if safety was not the main objective (e.g. blood values, side effects).
  - Observational studies: Use of data on tolerability or long-term effects.
2. Mandatory human data:
  - If there are indications of adverse effects from animal studies (e.g. CLA-rich oils).
  - For effects that cannot be tested in animal models (e.g. psychological effects).
3. Special cases:
  - Infant formula (under 16 weeks): Compliance with EFSA guidelines (EFSA Scientific Committee, 2017a/b).
  - New sources of micronutrients: Human studies on safety and bioavailability required (EFSA NDA Panel, 2024b).

Important notes:

- Study design: Representative target population, meaningful sample size and relevant safety endpoints.
- Data hierarchy: Strength of evidence varies depending on study type (intervention > observation).

The exact specifications – for example, on study design, endpoint selection or data interpretation – are described in detail in the [EFSA guidance](#).

## 9. Nutrition-related assessment

This chapter requires an assessment of whether the novel food could have adverse effects on the nutrition of consumers under the proposed conditions of use.

Key requirements:

1. General assessment:

- Assessment of whether the product leads to excessive intake of nutrients (e.g. sugar, salt) (Section 9.1).
  - Ensure that it does not increase the risk of inadequate nutrient intake (Section 9.2).
2. Special cases:
- New sources of micronutrients (vitamins/minerals): proof of safety and bioavailability.
  - New protein sources: Assessment of nutritional quality and digestibility.

**Important notes:**

- Use of the assessment framework described in the EFSA Guidance (e.g. Figure 3 on nutritional impact).
- Consideration of the target group and the intended consumption levels.

The exact methods – for example, for calculating nutrient surpluses, assessing the risk of inadequate intake or performing special analyses for proteins – are described in detail in the [EFSA guidance](#).

**9.1 Excessive nutrient intake**

It must be assessed whether a novel food could lead to excessive nutrient intake, which poses health risks.

**Key requirements:**

1. Comparison with health reference values:
  - The intake of the nutrient from the novel food must be compared with upper levels (UL) or other health-based limits (*HBGV*, e.g. ADI for copper).
  - Consideration of cumulative intake from the novel food and background nutrition (e.g. if there is a narrow safety margin between the UL and usual intake).
2. Estimation methods:
  - Calculation of maximum intake for target groups based on maximum levels in specifications (Section 4) and proposed conditions of use (Section 6.2).
  - Inclusion of background data on nutrient intake from other sources.
3. Missing *HBGV*:
  - Discussion of the relative increase in nutrient intake compared to the usual diet if no *HBGV* exist.

**Important notes:**

- Example reference: EFSA evaluation of vitamin D2 mushroom powder (EFSA NDA Panel, 2022c).
- Target groups: Focus on vulnerable groups (e.g. children, pregnant women).

The exact methods – for example, for exposure estimation, data source integration or risk assessment – are described in detail in the [EFSA guidance](#).

**9.2 Inadequate nutrient intake**

Similarly, it must be assessed whether a novel food increases the risk of inadequate nutrient intake and could thus worsen the nutritional situation.

**Key requirements:**

1. Antinutrients:

- Identification and comparison: Specification of the content of antinutrients (e.g. phytic acid, oxalates) in the novel food and comparison with conventional foods (e.g. hydrolysed barley protein).
  - Effects: Examination of whether antinutrients inhibit the absorption of essential nutrients (e.g. iron, zinc).
2. Replacement of conventional foods:
- Nutrient comparison: Proof that the novel food (e.g. UV-treated milk) is not less nutritious than the product it replaces.
  - Significant nutrient sources: Focus on nutrients that provide  $\geq 15\%$  of the reference intake per 100 g (7.5% for beverages) in the comparison group.

Important notes:

- Priority nutrients: Special attention to nutrients that are often deficient in European populations (e.g. vitamin D, iron).
- Manufacturing process: Consideration of processes that alter the nutrient composition (e.g. heating, fermentation).

The exact specifications – for example, for the analysis of antinutrients or nutrient comparisons – are described in detail in the [EFSA guidance](#).

### 9.5 Additional requirements

In individual cases, supplementary studies (e.g. *in vitro*, *in silico*, animal models or human data) may be necessary to assess interactions between the novel food and the diet or nutrients.

Key points:

- Triggers for studies:
  - Anomalies in the manufacturing process, composition or available data (e.g. ADME results, toxicological findings).
  - Experience from use in non-EU countries (e.g. preparation, handling).
- Types of studies:
  - Mechanistic, pharmacological or nutritional studies, depending on the risk profile.

Important:

- Scientific justification for the selection of studies is required.
- Studies must be representative of the planned conditions of use.

The exact requirements – for example, regarding study design selection or data interpretation – are described in detail in the [EFSA guidance](#).

## 10. Allergenicity

The last section of the dossier covers the assessment of the **allergenic potential** of novel foods to support regulatory decisions (e.g. labelling). Data requirements vary depending on origin, manufacturing process and allergen status in accordance with EU Regulation 1169/2011.

### 10.1 No proteins in the production process

- No allergenicity testing is necessary if the novel food does not contain proteins/glycoproteins (e.g. chemically synthesised substances or minerals).
- Examples: High-purity chemicals without protein content.

### 10.2 From sources subject to allergen labelling requirements

- Automatic labelling requirement if the product originates from allergenic sources listed in Annex II of the EU (e.g. peanuts, milk).

- Additional check: If it contains proteins from sources not subject to labelling requirements, the requirements in 10.3/10.4 apply.

### 10.3 From allergenic sources not subject to labelling requirements

- Applies to sources with known allergenicity that are not listed in Annex II (e.g. kiwi, apple).
- Evidence required:
  1. Prevalence/severity of allergy to the source,
  2. Minimum triggering dose (protein quantity),
  3. Evidence of known allergens in the product (immunological/proteomic methods, at least 3 batches).

### 10.4 Unknown allergenic potential

- Focus on cross-reactivity with known allergens.
- Requirements:
  - Literature search for allergy information (including *in silico/vitro/vivo* studies),
  - consideration of protein stability/digestibility (chapters 7.1/9.4),
  - Cross-reactivity tests only in connection with severe allergens (e.g. anaphylaxis).

The exact requirements – for example, regarding study design selection or data interpretation – are described in detail in the [EFSA guidance](#).

## 11. Conclusions and overall assessment

The applicant must integrate and interpret all data collected on the safety of the novel food and submit a final risk assessment.

Key requirements:

1. Overall presentation of the evidence:
  - Summary of toxicological, nutritional and human-relevant data.
  - Discussion of identified health risks in relation to estimated intake and target groups.
2. Key points:
  - Relevant components: Assessment of contaminants, residues or nutrients in the context of their intake and health guidelines (e.g. HBGV).
  - Study results: Highlighting the main findings from toxicity studies (including reference points such as NOAEL/BMDL).
  - Human studies: Interpretation of side effects or safety concerns from intervention studies.
  - Uncertainties: Transparent presentation of data gaps or methodological limitations.
3. Special cases:
  - Nutrient sources: conclusions on the safety *and* bioavailability of the nutrient.
  - Mechanisms: Relevance of animal study results for humans (e.g. transferability of observed effects).

Important:

- Clear risk characterisation: Sufficient safety margin between estimated intake and toxicological limits.
- Labelling recommendations: In case of remaining uncertainties or allergenicity.

The exact requirements – for example, for data interpretation or risk communication – are described in detail in the [EFSA guidance](#).