Overview of European Legislation on Food Contaminants

Dr Iona Pratt, Food Safety Authority of Ireland
Framework Regulation

Regulation setting maximum levels
FRAMEWORK REGULATION 315/93

Lays down Community procedures for contaminants in food

• Does not apply to contaminants which are the subject of more specific Community rules, such as pesticide residues, veterinary drug residues, …
COUNCIL REGULATION 315/93

• Food containing a contaminant in an amount unacceptable from the public health viewpoint and in particular at a toxicological level shall not be placed on the market.

• Contaminant levels shall be kept as low as can reasonably be achieved (ALARA), following recommended good working practices.

• Maximum levels must be set for certain contaminants in order to protect public health.
COUNCIL REGULATION 315/93

• sampling and analysis methods

• consultation of the European Food Safety Authority (EFSA) before maximum levels are set

• Regulatory decisions (vote) taken by the Standing Committee on the Food Chain and Animal Health

• ➔ Commission Regulations or Directives
MAXIMUM LEVELS FOR CONTAMINANTS IN FOOD

Established by Commission Regulation 1881/2006 and its amendments

Mycotoxins
Aflatoxins, Ochratoxin A, Patulin, Fusarium Toxins

Metals
Lead, Cadmium, Mercury, Tin

Dioxins
PCDD/Fs, dioxin-like PCBs

Polyaromatic Hydrocarbons
Benzo[a]pyrene etc.

Nitrate
Chloropropanols (e.g. 3-MCPD)

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SETTING OF MAXIMUM LIMITS IN FOOD

Following ALARA principle for food contaminants

• As low as reasonably achievable
• Technologically practicable
• Must be able to analyse for the contaminant in the food of interest

➤ Balance between toxicological and other factors, including social, technical and economic factors

Following Scientific Risk Assessment (EFSA/JECFA/SCF)
MYCOTOXINS

Fungal contamination of crops by *Aspergillus, Penicillium* and *Fusarium* species

Main crops affected - cereals, nuts, fruit (incl. coffee)

Aflatoxins B1, B2, G1, G2, Ochratoxin A, Patulin, Fusarium toxins

Toxicity from mild to severe
MYCOTOXIN OCCURRENCE
# OTHER CONTAMINANTS

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Category</th>
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</thead>
<tbody>
<tr>
<td>Nitrate</td>
<td>Vegetables, Infant food</td>
</tr>
<tr>
<td>Lead</td>
<td>Cereals, Dairy, Fats/Oils, Meat&amp;Offal, Fish&amp;Shellfish, Fruit/Fruit Juice, Vegetables, Infant food, Alcoholic beverages</td>
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<tr>
<td>Cadmium</td>
<td>Cereals, Meat&amp;Offal, Fish&amp;Shellfish, Vegetables</td>
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<tr>
<td>Mercury</td>
<td>Fish&amp;Shellfish</td>
</tr>
<tr>
<td>Tin</td>
<td>Infant food, Canned food/beverages</td>
</tr>
<tr>
<td>B[a]Pyrene</td>
<td>Fats/Oils, Meat&amp;Offal, Fish&amp;Shellfish, Infant food</td>
</tr>
<tr>
<td>Dioxins</td>
<td>Dairy, Eggs, Fats/Oils, Meat&amp;Offal, Fish&amp;Shellfish</td>
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<tr>
<td>3-MCPD</td>
<td>Condiments, Other</td>
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</tbody>
</table>
PAHs

• Formed during processing (direct fire-drying and heating) and domestic food preparation (smoking, drying, roasting, baking, frying or grilling)

• Large number of compounds, most studied Benzo(a)pyrene

• Carcinogenic and genotoxic
NITRATE

Occurs mainly in spinach and lettuce varieties
Glass house grown more affected
Seasonal variation
Also regulated under Food Additives Legislation as Preservative

• Nitrate induced cyanosis (blue baby syndrome in infants)
• Formation of carcinogenic Nitrosamines (in- and outside the body)
DIOXINS AND PCBS

• Formed during combustion processes and as industrial by-products

• Identified in almost all environmental compartments

• Predominantly food of animal origin (fat tissue)

• Dermal toxicity (chloracne), immunotoxicity, carcinogenicity, reproductive toxicity and possible neurobehavioral (cognitive) effects
DIOXINS AND PCBS
HEAVY METALS

• Natural components of the Earth’s crust
• Cannot be degraded or destroyed
• Occur in the entire food chain
• Bioaccumulate in biological systems
• Affect various body systems (kidneys, liver, reproductive, cardiovascular, immune, nervous, gastrointestinal systems)
TIN and 3-MCPD

Acute risk
Gastric irritation at certain concentration
Canned foods and beverages
Acidic foods, i.e. tomatoes, more likely to provoke leaching of tin

Formation during processing using acid hydrolysis of protein
Soy sauces and other sauces, acid-HVP
Non-genotoxic carcinogen
Not (yet) covered by Legislation

Non-Dioxin-like PCBs

Brominated Flame Retardants and other halogenated aromatic compounds

Arsenic (national legislation)

Acrylamide
SAMPLING

- Overall similar process for all contaminants
- Focuses on sampling at earliest possible point in the food chain
- Based on statistical principles
- Aims to capture general background levels
Sampling and Analysis

Based on statistical/scientific principles

Mainly targeted at import/wholesale level

Procedure to produce representative sample
<table>
<thead>
<tr>
<th>Sampling and Analysis</th>
</tr>
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<tbody>
<tr>
<td><strong>For dioxins</strong></td>
</tr>
<tr>
<td><strong>For nitrates</strong></td>
</tr>
<tr>
<td><strong>For metals and 3-CPD:</strong></td>
</tr>
<tr>
<td><strong>For inorganic tin</strong></td>
</tr>
<tr>
<td><strong>For PAHs</strong></td>
</tr>
<tr>
<td><strong>For aflatoxins</strong></td>
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<tr>
<td><strong>For ochratoxin A</strong></td>
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<td><strong>For patulin</strong></td>
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<td><strong>For fusarium toxins</strong></td>
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GUIDANCE ON CONTAMINANTS LEGISLATION

• FSAI guidance (published today)
  • European Commission Fact Sheet on food contaminants

• FSAI Website (www.fsa.ie)
  • European Commission Guidance Document for competent authorities for the control of compliance with the EU legislation on aflatoxins

• FSAI fact sheets
  • And many others!
FSAI GUIDANCE ON CONTAMINANTS LEGISLATION

• provides an overview of the European Union and national legislation related to chemical contaminants in food, together with guidance on its interpretation

• one for everybody in the audience!
Mycotoxins in Food

The aim of this document is to provide food business operators (FBOs), enforcement officers and other stakeholders with a concise overview of the health hazards of, and sources of dietary exposure to, mycotoxins in food. It gives information on methods of sampling and analysis for these contaminants and the legislative control measures in place to minimise their presence in food. Finally, it provides a short guidance for FBOs on the risk management measures that they should have in place to control mycotoxins in food and also a bibliography giving sources of further information. The summary below gives a short synopsis of the information, while the following pages provide more technical detail.

Dioxins and PCBs in Food

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Food Contaminants

Any food containing a contaminant in an amount which is unacceptable from the public health viewpoint and in particular, at a toxicologically significant level must not be placed on the market. Furthermore, contaminant levels shall be kept as low as can be reasonably achieved by following good practices. The general European Community procedures for contaminants in food are set down in Council Regulation No. 315/93EEC. A contaminant for the purposes of Regulation (EEC) No. 315/93 is defined as any substance not intentionally added to food which is present in such food as a result of the production, manufacture, processing, preparation, treatment, packing, packaging, transport or holding of such food or as a result of environmental contamination.


EU Legislation


Amended by

European Commission Fact Sheet on food contaminants
Managing food contaminants: how the EU ensures that our food is safe

Over to Dr Heppner to hear about the role of EFSA in the process