CCLAC 23rd Meeting : Keynote

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Prevention and Reduction of Contaminants in Food
Prevention and Reduction of Contaminants in Food

1. Prevention
In order to prevent, it is necessary to know the contaminants that could be present in food and their risk.

2. Reduction
In order to reduce it is essential to have suitable process guidelines and to know the appropriate methods to reduce/remove contaminants in food.

3. Stakeholder Coordination and Synergy
To establish a Plan for Surveillance and Control of Contaminants in Food and to strengthen the relationship between Control Agencies, Producers/Industry, Consumers, and the Academy.

Contaminant: "Any substance not intentionally added to food, which is present in that food as a result of production. This term does not include insect fragments, rodent hair and other foreign matter" (FAO, WHO, 2018). However, it is important to consider that the definition of contaminant may vary in its specifications depending on the scope of the Codex committee that defines it.

Codex Alimentarius Committee on Contaminants (CCCF).
1. Prevention

- Identify contaminants and their risk
- Implement appropriate analytical methods
- Contribute to the baseline from research.
Prevention and Reduction of Contaminants in Food

1. **Prevention**

Identify contaminants and their risk.

- Microplastics
- NPs: Nanoparticles
- SCCP: Short-chain chlorinated kerosenes
- BFR: Brominated flame retardants
- PBFR: Non-brominated flame retardants
- PFAS: Per- and polyfluorinated compounds
- MOSH: Saturated mineral oil hydrocarbons
- MOAH: Aromatic mineral oil hydrocarbons
- Toxins: Naturals

**Contaminants**:
- Pesticides
- Arsenic
- Lead
- Chromium
- Mercury
- Mycotoxins
- Medicines
- Dioxins
- PCBs

NPs: Nanoparticles; PCBs: Polychlorinated biphenyls; SCCP: Short-chain chlorinated kerosenes; BFR/NBFR: Brominated and non-brominated flame retardants; PFAS/PFOS: Per- and polyfluorinated compounds; MOSH/MOAH: Saturated and aromatic mineral oil hydrocarbons.
1. Prevention

Implement appropriate analytical methods.

- Costly
- Highly Selective
- Non-Targeted

Costly
Highly Selective
Targeted

Low Cost
Broad Spectrum

Screening
Confirmation LMR
Unknown/Prohibited

HRMS
MS/MS
LC, GC/MS
HPLC-UV

Microbiological
Immunoassays

Prevention and Reduction of Contaminants in Food
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1. Prevention
   - Implement appropriate analytical methods.

**Targeted**
- UPLC/MS/MS Mass Spectrometer

**Non-Targeted**
- Linear Ion Trap MS

**Rapid Diagnostics**

![Imazalil (ppm)](image)
Prevention and Reduction of Contaminants in Food

1. Prevention

Contribute to the baseline from research.

Scientific Articles: Global

41,103 documents found

Scientific articles: CCLAC

2,804 documents found
Prevention and Reduction of Contaminants in Food

1. **Prevention**

Contribute to the baseline from research.

Micro and Nanoplastics

- Soft drinks
- Beer
- Leche
- Miel

PFAS

Scientific reports

MOSH/MOAH

Figure: Microplastics in food from Ecuador. Milene F. Díaz-Basantes et al., 2020a, 2020b

Figure: MOSH and MOAH in paste.
2. Reduction

- Codex and Control Organization Standards.
- Research in Pollutant Reduction/Elimination Methods
- Surveillance and Control of Adulterated Products
### Prevention and Reduction of Contaminants in Food

2. **Reduction**

Codex and Control Organization Standards.

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<tr>
<th>Referencia</th>
<th>Título</th>
<th>Comité</th>
<th>Última modificación</th>
<th>EN</th>
<th>FR</th>
<th>ES</th>
<th>AR</th>
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<tr>
<td>CXC 45-1997</td>
<td>Código de prácticas para reducir la Aflatoxina B1 presente en las materias primas y los piensos suplementarios para animales productores de leche</td>
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<td>CXS 193-1995</td>
<td>Norma general para los contaminantes y las toxinas presentes en los alimentos y piensos</td>
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<td>Código de prácticas para la prevención y reducción de la contaminación por arsénico en el arroz</td>
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Scientific articles: Global
- Search within: Article title, Abstract, Keywords
- Search documents: food AND contaminants AND treatment
- 1,895 documents found

Scientific articles: CCLAC
- Search within: Article title, Abstract, Keywords
- Search documents: food AND contaminants AND treatment
- 174 documents found

Methods
- Chemicals
- Time
- Temperature
- Drying
- MP Foods
- Water and ice
- Packages

Design Barriers
- Temperature
- Air Flow
- Aw

Figure: Some food contamination pathways
Journal of Food Protection 86 (2023) 100184
Antibiotic removal treatment

Fig. Removal of a) Amoxicillin and b) Penicillin G from water by gamma ray and TiO2 treatment.

Autores: William Villacis, Paúl Vargas-Jentzsch, Roque Santos, María Natalia Piol y Cristina Vázquez, EPN (ECU) y UBA (ARG), 2024.
Prevention and Reduction of Contaminants in Food

2. Reduction ★ Surveillance and Control of Adulterated Products.
Prevention and Reduction of Contaminants in Food

1. **Prevention**
   In order to prevent, it is necessary to know the contaminants that could be present in food and their risk.

2. **Reduction**
   In order to reduce it is essential to have suitable process guidelines and to know the appropriate methods to reduce/remove contaminants in food.

3. **Stakeholder Coordination and Synergy**
   To establish a Plan for Surveillance and Control of Contaminants in Food and to strengthen the relationship between Control Agencies, Producers/Industry, Consumers and the Academy.
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3. Coordination and Synergy

1. Policy Establishment
2. System Design
3. Implementation
4. System verification and evaluation
5. Continuous improvement

- Good Practices and Certifications
- National Contaminant Surveillance and Control Plan
- Socialization and Training

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2 Codex Alimentarius, CACL GL 82-2013, Principles and Guidelines for National Food Control Systems.
Prevention and Reduction of Contaminants in Food

3. Coordination and Synergy
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3. Coordination and Synergy

Government → [Surveillance/Control Information]

Consumers

Academy

Baseline
New Risks

Industry

Data Solutions

Harmless Products
Conclusions:

There is a need to expand the analytical capacity installed for the detection of emerging contaminants in the region.

Promote the guided participation of the Academy in food contaminant surveillance and control plans.

Information from Codex Standards and Scientific Papers are a valuable tool to prevent and reduce contaminants in food.

To keep food safe, Industry, Academia, Government and Consumers must share information and work together.
Thank you very much

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