# Project: Technical assistance to improve implementation of food safety standards and disease crisis preparedness

## 1.2.5 (Task 4.2.2) Contribute to increased capacity of staff of the local chamber of commerce, chamber of food professionals, academy and others

## Training on Food Associated Risks

SESSION 2: **Food safety hazards and risks - General**

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# Food safety hazards and risks

## Training Objectives:

- EU legislation and standards
- The description of hazards and risks
- The identification of food safety hazards and risks
- Measurable food safety control mechanisms
- The application of good practices, like cleaning and disinfection programs

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# CONTENT

- Importance of identification of food safety hazards and risks
- EU Legislative Framework
- Definitions
- Risk analysis
- Hazards from food and food production
- Measurable food safety control mechanisms

# Importance of identification of food safety hazards and risks

- Most food is now produced by large farms, processed industrially, and sold in supermarkets.
- Modern food production has reduced the cost and increased the variety of food available.

  But this centralization of the food supply presents an opportunity for foodborne pathogens and toxins to infect and poison large numbers of consumers.
- Furthermore, the globalization of food trade means that food can become contaminated in one country and cause outbreaks of foodborne illness in another.
- Modern food production is so complex that a systematic approach is needed to identify the hazards at each point in the food chain.

# Importance of identification of food safety hazards and risks

- An important development in improving food safety has been the application of the hazard critical control point concept (HACCP), which is a systematic approach to identifying, assessing, and controlling hazards, borrowed from the aerospace industry.
- It can be applied to all sectors of the food chain from primary production through food processing, manufacture, distribution, and retailing, to the point of consumption. Its strength is that it focuses on identifying the main avenues of risk and tackling them (box).
- **Think of it as a pro-active solution instead of after- the-fact-fix**

- **Regulation (EC) No 178/2002**

- the general principles and requirements of food safety,
- establishing the European Food Safety Authority and
- laying down procedures in matters of food safety.

http://data.europa.eu/eli/reg/2002/178/oj

**Main Goals**

**This Regulation should assure:**

- A high level of protection of human life and health,
- A high level of protection consumers' interest in relation to food and
- The free movement of food and feed.

# Regulation (EC) 852/2004 and Regulation (EC) 853/2004

- Regulation (EC) 852/2004- general hygiene requirements (relevant for FBOs operating with food of animal origin and food of non-animal origin

http://data.europa.eu/eli/reg/2004/852/oj

- Regulation (EC) 853/204- specific hygiene requirements (relevant only for FBOs operating with food of animal origin)

http://data.europa.eu/eli/reg/2004/853/oj

# Definitions

- A food hazard is defined as "**a biological, chemical or physical agent** in, or condition of, food with the potential to cause an adverse health effect."
- **FOOD SAFETY HAZARDS**

**Biological:** Bacteria, Viruses, Parasites, Molds

**Chemical:** Pesticides, Processing chemicals, Drug residue, Allergens

**Physical:** Naturally Presents (bones, pits, bugs)

Handling/processing materials (glass, metal, hair)

## Definition

- Risk is defined as “a function of the probability of an adverse health effect and the severity of that effect, consequential to a hazard(s) in food.”


**Check – Clean – Seperate – Cook – Chill – Throw a way**

## Definitions

- **“Primary production" means the production, rearing or growing of primary products including harvesting, milking and farmed animal production prior to slaughter. It also includes hunting and fishing and the harvesting of wild products.**

- **“Stages of production, processing and distribution" means any stage, including import, from and including the primary production of a food, up to and including its storage, transport, sale or supply to the final consumer and, where relevant, the importation, production, manufacture, storage, transport, distribution, sale and supply of feed.**

# Ranking the risk in the Food Industry

**Risk assessment**

Each hazard is subjected to risk assessment according to the criteria specified below, ensuring that different hazards are assessed on the same basis. The accepted criteria for the severity of the hazards, the probability of impact and the impact on human health are:

***Probability :***

*1Impossible*

*2 Sparse*

*3 Periodic*

*4 Frequently*

*5 Definite*

***Severity:***

*1 Insignificant*

*2 Ordinary*

*3 Dangerous*

*4 Critical*

*5 Disasters*

| | | | | |
|---|---|---|---|---|
| 5 | 10 | 15 | 20 | 25 |
| 4 | 8 | 12 | 16 | 20 |
| 3 | 6 | 9 | 12 | 15 |
| 2 | 4 | 6 | 8 | 10 |
| 1 | 2 | 3 | 4 | 5 |

**Risk: Probability x Severity**

**Risk score 1 ≤ risk level ≤ 3**
➔No Risk No Control Measurements Needed

**Risk score 4 ≤ risk level ≤ 9**
➔ Low Risk (Control Measurements Should Be Performed When Appropriate)

**Risk score 10 ≤ risk level ≤ 12**
➔Medium Risk (Control Measures Should Be Implemented)

**Risk score 15 ≤ risk level ≤ 25**
➔ High Risk

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# Risks associated with food hazards

| Food hazards | Risk level | |
|---|---|---|
| | **Developing countries** | **Developed countries** |
| Microbiological contamination (bacteria, viruses, parasites, mould, and algal toxins) | Very High | Moderate |
| Natural occurring toxicants in food (for example, alkaloids, legume toxins, cyanogenic glycosides) | High | Low |
| Contaminants in food (heavy metals, organic chemicals) | Moderate | Low |

# Hazards from food and food production

**Livestock species are an important reservoir of:**

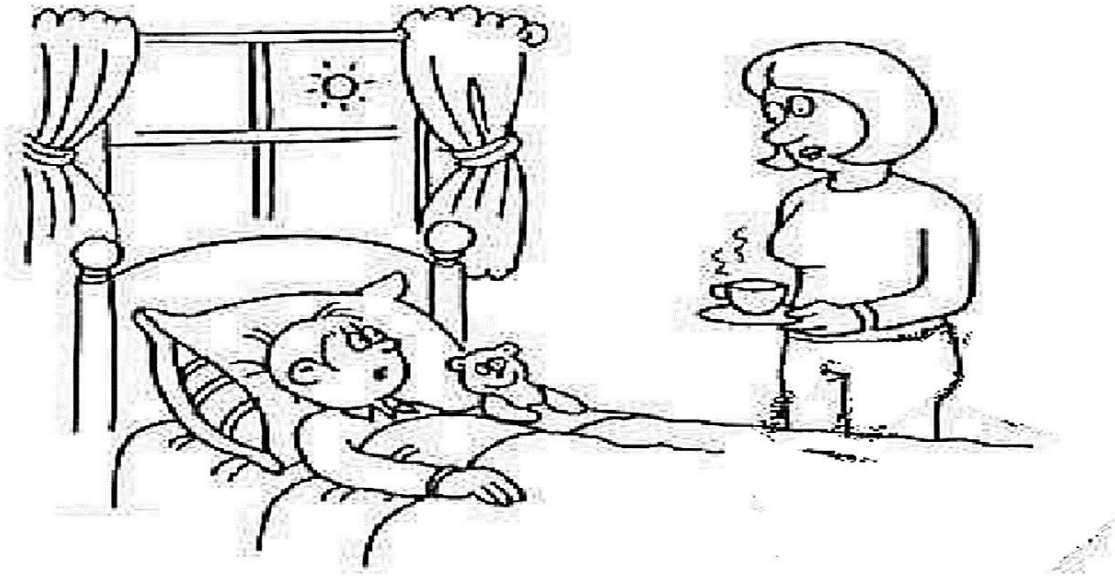
- **Campylobacter jejuni,**
- **shiga-toxin producing E. coli,**
- **L. monocytogenes, Salmonella spp.,**
- **Yersinia enterocolitica and**
- **other pathogenic bacteria.**

**These pathogens have been implicated in a number of foodborne outbreaks.**

**These pathogens have been recovered with various frequencies from dairy-cattle feces, bulk milk tanks and the dairy-farm environment, fruit, vegatables, dirty waters.**

# Hazards from food and food production

- Technological inputs (selective breeding, fertilisers, herbicides, pesticides, fungicides, etc) into farming have increased the efficiency of food production.
- However, inappropriate animal feeding practices and the use of agrochemicals may pose hazards to human health. Foodborne exposure to agricultural and environmental chemicals results in much public concern in the EU.
- Owing to exquisitely sensitive methods of detection, trace amounts of potentially harmful chemicals can be detected in many foods. However, the levels of human exposure to these chemicals are generally well below the tolerable daily intakes in the EU.
- In most developed countries the use and application of agrochemicals is carefully regulated, monitored, and reviewed. The appropriate use of agrochemicals in food production is a not a great hazard to human health.



"I feel ill Mum. I think it's the pesticides in the veges. From now on I'm going to have to eat chips,burgers and pizzas."

# Microbiological criteria

- Foodstuffs of animal and plant origin may present a microbiological risk.

- Microbiological criteria give guidance on the acceptability of foodstuffs and their manufacturing processes. Preventative actions, such as the application of Good Hygiene and Manufacturing Practices (GHP, GMP) and the Hazard Analysis Critical Control Point (HACCP) principles contribute to achieving food safety. Microbiological testing alone cannot guarantee the safety of a foodstuff tested, but these criteria provide objectives and reference points to assist food businesses and competent authorities in their activities to manage and monitor the safety of foodstuffs respectively.

# Microbiological criteria

- **Commission Regulation (EC) No 2073/2005 on microbiological criteria for foods**, lays down food safety criteria for relevant foodborne bacteria, their toxins and metabolites, such as Salmonella, Listeria monocytogenes, Enterobacter sakazakii, staphylococcal enterotoxins and histamine in specific foods.
- These criteria define the acceptability of a product or a batch of food applicable to products placed on the market. In addition, this Regulation lays down certain process hygiene criteria to indicate the correct functioning of the production process.
- The microbiological criteria have been developed in accordance with internationally recognised principles, such as those of Codex Alimentarius.
- Scientific advice on matters relating to microbiological risks in food is provided by the European Food Safety Authority (EFSA).

# Measurable food safety control mechanisms

- Good hygienic practices: All practices regarding the conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain.
- Codex HACCP system: A system which identifies, evaluates and controls hazards which are significant for food safety, described in the Annex to the Codex General Principles of Food Hygiene (FAO and WHO, 2003).
- HACCP-based system: A system that is consistent with the seven principles of HACCP but does not conform to the layout or steps of the Guidelines for the Application of the Codex HACCP system.
- Food Safety Management System: A holistic system of controls that manage food safety in a food business. Includes GHPs, the HACCP system, management policies and traceability/recall systems.

# Measurable food safety control mechanisms

- Food safety system based od HACCP principle focuses on preventing hazards in the food industry, not on catching them when it's too late.

- **Think of it as a pro-active solution** instead **of after-the-fact-fix.**

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# CONCLUSION

The globalization of food trade means that food can become contaminated in one country and cause outbreaks of foodborne illness in another.

Modern food production is so complex that a systematic approach is needed to identify the hazards at each point in the food chain.

The HACCP concept, focused on the prevention of the risk.

# Contact

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## THANK YOU FOR YOUR ATTENTION

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