



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 1: General Definitions for Food Safety

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- General definitions
- Hygiene and sanitation
- The importance of hygiene and sanitation in food sector
- Food safety
- Contamination
- Sterilization and disinfection
- What are sources of food contamination
- Hygiene and sanitation before production
- Precautions to be taken during the production
- Precautions to be taken after the production
- Pest control of food industry
- Personnel hygiene
- Standard sanitation operation procedures
- Food Safety Management Systems (GMP, HACCP and other)
- Biosecurity



- **CLEANLINESS**

Cleanliness is to purify from the visible dirt in the production area by using water, air and various chemical materials in the food sector.

- **HYGIENE**

Hygiene is the process of cleaning an environment from all sickness factors which may cause health problem. Hygiene process involves all the precautions to be taken in order to reduce microorganisms.

Hygiene = Cleaning + Disinfection

- **SANITATION**

Sanitation is the creation of a clean and hygienic environment and making it sustainable.



- Hygiene and sanitation process can't be divided each other in the food sector. Hygiene is the purification of the environment from microorganisms causing diseases, on the other hand sanitation is the measure taken for cleaning and hygiene.
- Sanitation is the purification of foreign substances, microorganisms, drugs, cleaning agents and all visible sources of pollution from the production environment.



All kinds of food must be purified from any:

- physical pollution such as glass, metal pieces, stone, sand,
- chemical pollution such as liquid fuels, detergents and residual of drug,
- biological pollution sources such as bacteria and mildew to good quality, healthy and safety.

Contaminated food can cause quality problem and health problems can be observed, as well.

Hygiene and sanitation should be effectively applied and controlled at every step during manufacturing processes.



If quality control processes are not applied effectively during manufacturing, the following problems listed below can be observed:

- Decreasing number of sales and consumption
- Exposure to legal proceedings
- Loss of prestige
- Production lag
- Lack of motivation in the company
- Food poisoning or nutritional diseases
- Claim for damage



- Food safety is protection to consumer from risk of food poisoning. Food safety covers all methods for destroying physical, chemical and biological of hazards. Food borne disease can cause a health problem for kids, pregnant and elderly consumers. Food borne disease may ends up with death.
- There are 3 sources of contamination in food sector: Physical, Chemical and Biological. Allergen hazards are very important.
- There are a number of precautions to destroy physical, chemical and biological damages in foodstuffs, when must be taken before production, during production and at the end of production. These precautions must be carry out during manufacturing, otherwise hygienic product can't be achievement.



- Food contamination refers to the presence in food of harmful chemicals and microorganisms which can cause consumer illness. Contamination can occur directly with chemical, physical and biological agents, or indirectly through cross contamination.
- Cross contamination is the indirect transmission of harmful agents to foods. For example, if you use the same knife for cutting a bread and a watermelon, this situation can lead to cross contamination.



- Sterilization refers to any process that eliminates, removes, kills, or deactivates all forms of life and other biological agents present in a specified region, such as a surface, a volume of fluid, medication, or in a compound such as biological culture media. The purpose of sterilization is effacing all microorganisms.
- Disinfection is the process of purifying foodstuffs and surfaces that are contacted with foodstuffs from microorganisms except spores that can cause disease by various methods. It is made by chemical substances or heat. The chemicals used for disinfection are called "disinfectants".

What are sources of food contamination ?



Sources of food contamination: raw materials, transport, processing, storing and all kinds of physical, chemical and biological unwanted contamination, including food.

Pollution sources that cause undesirable deterioration in food:

- Soil-borne contamination passes through the raw material.
- Contaminated water used
- Incompatible tools and surface contamination
- Negative information, attitudes and behaviors of producers and consumers about hygiene
- Pesticides and chemical contamination
- Contamination from microorganisms
- Inadequate personnel hygiene contamination caused by foodborne patient and carrier subjects
- Contamination due to inadequate production, processing and storage areas
- Contamination from sources such as instruments, equipment, packaging and ventilation systems used



- There is a need for a structure which is free from physical, chemical and biological pollution sources, provided hygienic production conditions and has a suitable technological infrastructure in order to produce reliable and quality food.
- Before the manufacturing process get started, all stuff which are used for manufacturing process and manufacturing yard must be cleaned periodically.
- All "food contact surface areas" including the floor in the environment where foodstuffs are processed, the processing channels, the walls, all kinds of tools, machinery and equipment that come into contact with foodstuffs must be thoroughly cleaned regularly before starting daily work to protect food from contamination.
- The cleanliness of the ambient air should also be controlled in the workplace where microbiological contamination is important.



- The person working in the food processing area must take care of personal hygiene while working - nails should be cut short, hands should be kept clean and without open wounds. Appropriate protective clothes including headgear, gloves and footwear should be worn during work. These garments should be easy to clean and kept clean.
- Water must be safe and hygienic for washing boiled product.

Precautions to be taken after the production



Preventive actions should be identified for critical production steps that will not cause any contamination in the final product. Where there is a risk of contamination, the presence or level of contamination with appropriate chemical, microbial, physical analysis should be measured by the responsible person and should be applied. A documentation system should be established for all these steps, including records and applied transactions.

All food production processes must be carried out under conditions and under the necessary controls to reduce the risk of microorganism contamination and development. For this, temperature, time, humidity, water activity, pH, physical parameters and freezing, drying, heat treatment, acidification and cooling should be monitored continuously. Raw materials, additives and rejected materials should not be stored in the loading and transport areas of the final product in order to prevent recontamination of the finished products by contact with raw materials and additives.

Precautions to be taken after the production



- All materials which had been used during manufacturing process must be cleaned and disinfected in periodically to make sure there is no any particular nor microorganism from the last process for purifying new product from the source of dirtiness.
- Cleaning is the prevention of tools, equipment and various surface dirt and food debris that come into contact with food and turn them into growth area for microorganisms. Cleaning is the reduction of visible dirt and debris as well as all of the invisible microorganisms to the point where they are not killed or harmful.



Precautions to be taken after the production

- The role of cleaning and disinfection is great in preventing contamination (spreading) of microorganisms and preventing their negative effects.





One of preventive measures is pest control. Many pest species cause the disease to spread to humans in a variety of ways, leading to the emergence of important diseases and also to the loss and degradation of economic values of food.

In general, the following measures must be taken in the fight against pests:

- All doors and openings to outside need to be closed to prevent entry of harmful substances.
- Mechanically or adhesive mouse traps should be placed at appropriate intervals in the production area, traps should be checked regularly.
- Effective fight must be carried out and a pest control program must be prepared.
- There should be a periodical spraying or a support by a sprayer.

<https://www.youtube.com/watch?v=iq8jOuZ5k6k> (7 min)



- The most important factor in ensuring sanitation in a food operation is the hygienic condition of the personnel involved. Because one of the most important contamination sources in food enterprises is the person working in production. Personnel can carry a number and variety of microorganisms that can directly infect food during preparation, processing, packaging and transport phases. Staff's breathing, saliva, and wounds can be the source of the infection in addition to many external factors such as hands, clothes, hair, mustache, accessories.
- In general, humans are the first source of contamination for foods.



- Personnel has very important responsibilities in terms of human health. The most important factor that may cause disease and food contamination is the staff. From the acceptance of the raw material to the transportation, the staff is responsible for all stages of the production, as well as for cleaning, disinfection, control, conservation and own health. The employer has to inform the staff with the appropriate training programs for the responsibilities that the staff must bear. These responsibilities include:
 - rules for the personnel and
 - employer responsibilities.



- Water properties (chemical, physical and microbiological) – water should be completely clean, free from any odor, odorless, colorless, harmful substances and no pathogenic substances in it.



Standard Sanitation Operation Procedures are written procedures for defining sanitary conditions in food enterprises and as well as for defining sanitary conditions to ensure a safety product.

Sanitation checks can be done in 2 ways:

1. Internal audit: Sanitation should be included in the quality assurance program and explain to audit how could be. When an inspection program is being carried out, areas and storages should be included in this program. In the audit, each section should be handled separately and the status of before and after sanitation must be specified separately on the report.
2. External audit: When the operation is audited by an external auditor or expert, a good review should be made in terms of sanitation.



The areas covered by the audit are:

- Control of the operation environment
- Control of food processing departments
- Warehouse control
- Locations outside the producing areas
- Basement and roof
- Control of personnel and facilities
- Sanitation applications control



- Biosecurity was originally defined by Koblenz (2010) as "a set of preventative measures designed to reduce the risk of transmission of infectious diseases."

- "Food biosecurity" is the concept of food protection from biological hazards.
- Food security deals with the proactive precautionary measures against deliberate or accidental contamination of food that can cause harm and disruption.
- Eventually, it may lead to severe health care issues and to an economic outcry.





- Biosecurity measures prevent or limit the introduction, circulation and persistence of contaminants in a production unit, as well as their dissemination to other sites.
- The management of these measures is based on a strategic and integrated approach aimed at analysing and managing all the possible risks.
- They are typically split into external biosecurity for all the factors outside the unit, and internal biosecurity for everything inside the barn or house in direct contact with the animals.



The purpose of internal biosecurity is to limit the spread and reduce the infection pressure of any pathogenic agents already present on the farm/FBOs.

There are three main principles in establishing an internal biosecurity program:

1. Zoning
2. Isolation and sectorization
3. Cleaning and disinfection



- **GOOD MANUFACTURING PRACTICES - GMP**

Good manufacturing practices in food industry are a quality control system that supervises the processes of production, storage, distribution and consumption of products.

GMP contains:

1. Hygiene in Production
2. Quality Management
3. Suitable Facilities and Suitable Personnel
4. Traceability
5. Complaints and Recall



- It is necessary to establish systems related to hygiene, sanitation and preventive maintenance in order to ensure health safety in food industry. Sanitation can be considered as part of quality control. Sanitation programs must be put in place to ensure cleanliness of the installation, microbiological quality of the raw material, health and reliability of the products, as sanitation has an important role in the formation of quality.
- Various programs are being implemented to ensure quality, especially in terms of microbiological safety of food. The most common are HACCP, GMP and ISO 9000, 22000 series.



- HACCP (Hazard Analysis Critical Control Point)

Hazard Analysis and Critical Control Points define as a system that identifies, evaluates, and controls the hazards that are important to food safety.

- The basic aim of ISO 22000 Food Safety Management System to determine the sources of risk that cannot be removed from the production process errors for ensuring product quality and consumer health. Basically, ISO 22000 not only provides food safety, but also sensory and nutritious quality enhancement and production, as well as quality assurance in service and service applications.



Contaminated food can cause quality problem and on the other hand health problems can be observed.

Hygiene and sanitation should be effectively applied and controlled at every step before, during and after manufacturing processes.

Importance of personnel hygiene.

Standard Sanitation Operation Procedures are written procedures for defining sanitary conditions in food enterprises .

In the Food Safety Management System, everybody is given responsibility after production and more motivation is provided with more participation.



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THANK YOU FOR YOUR ATTENTION



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