# HACCP 101 and Sanitation Department Practices

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# BACTERIA 101

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Bacteria are tiny, single-celled organisms that exist everywhere in our environment. They come in different sizes and shapes, usually ranging from two to ten microns in length and about half to two microns in width. To give perspective, one micron is equal to 1/25,400 of an inch.

These organisms are living cells, meaning they can be present in food, produce waste products, multiply rapidly, and eventually die. Their method of reproduction is simple: a single cell divides into two identical cells. This process usually takes about 20 to 25 minutes and will continue as long as conditions remain favorable.

Remarkably, one bacterial cell can multiply to form as many as 281 trillion cells in just 24 hours. As they grow and multiply, some types of bacteria release harmful substances known as toxins, which can contaminate food and pose health risks.

# HACCP 101

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To control safety problems in food production, the HACCP plan is used. This system is designed to prevent hazards and place control measures at each stage of the production process. These hazards may be biological, chemical, or physical in nature.

Before implementing HACCP, Sanitation Standard Operating Procedures (SSOPs) must be in place, as they serve as important prerequisites.

**Forming a HACCP team involves five key steps:**

- Conduct a hazard analysis.
- Identify the critical control points (CCPs).
- Establish corrective actions.
- Set up proper record-keeping procedures.
- Establish verification procedures to ensure the system is working effectively.

# HACCP 101

HACCP is a preventative system rather than a reactive one. It serves as a management tool that helps protect the food supply from biological, chemical, and physical hazards. Although it is highly effective, HACCP is not a zero-risk system. Instead, it is designed to reduce and minimize the risks associated with food safety hazards.

**The seven principles of HACCP include;**

- Conduct and Hazard Analysis
- Determine the Critical Control Points
- Establish Critical Limits
- Establish Monitoring System
- Establish Corrective Action
- Establish Verification Procedure
- Establish Documentation

# Benefits of HACCP

HACCP provides businesses with a cost-effective way to control food safety. It covers the entire chain, from ingredients and production, through storage and distribution, to the final sale and service to consumers.

**The main benefits of HACCP include:**

- Helping businesses save money in the long run.
- Preventing incidents of food poisoning among consumers.
- Raising overall food safety standards.
- Ensuring compliance with legal requirements.
- Improving food quality standards.
- Streamlining processes to produce safe food.
- Organizing staff in a way that promotes teamwork and efficiency.
- Demonstrating due diligence in the workplace.

# HACCP 101

Establish likelihood of occurrence

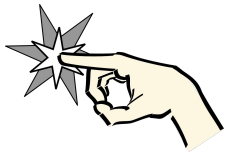
- Base your occurrence upon a combination of experience, epidemiological data and information in the technical literature.

- During evaluation of each potential hazard, the food, its method of pre operation, transportation, storage and the nature of the consumers likely to purchase the product/ consider determine each of the factors may enhance or diminish the public health.

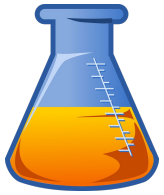
- The term must determine the influence on food safety of the manner in which the food is likely to be stored and prepared and whether the food is specifically intended for consumption.

# HACCP 101- TEAM PREVENTIVE MEASURES

**Physical Hazards:** These may include foreign objects or unsafe packaging materials that could contaminate food. Regular inspections and monitoring help prevent such risks.



**Chemical Hazards:** Proper control of chemicals is essential. This includes maintaining detailed product specifications and letters of guarantee, inspecting trucks used to transport finished products, labeling and storing all chemicals correctly, and training employees who handle chemicals to ensure safe practices.



**Biological Hazards:** Food formulations should be assessed to determine whether preservatives or additives are needed to inhibit the growth of microorganisms. It is also important to evaluate whether the type and amount of acidic ingredients influence product pH and affect microbial survival. Similarly, the water activity of the finished product should be monitored, since it plays a critical role in microbial growth. Some products may also require refrigeration during storage and transportation to reduce biological risks.

# HACCP 101- TEAM PREVENTIVE MEASURES

**Packaging Hazards:** Packaging materials must be reviewed to identify any potential chemical or physical risks. Each hazard should be described in detail, identified clearly, and assessed for its significance using available scientific and technical literature.

**Employee Practices:** Observations should be made to ensure employees do not cross-contaminate finished products by handling raw or contaminated materials with unclean hands, gloves, or equipment. Product handling after the kill step should be carefully monitored, including evaluating traffic patterns within the facility, to prevent recontamination.

**Review of Past Incidents:** Past records of physical, biological, or chemical hazards should be reviewed to understand their frequency, significance, and causes. This information helps in strengthening preventive measures.

# HACCP 101- TEAM PREVENTIVE MEASURES

**Hazard Identification and Evaluation:** Potential hazards should be identified in all ingredients and processing steps, such as those used in sauces, ranch dressings, or similar products. Each hazard must be evaluated for its likelihood of occurrence and the severity of its consequences. This assessment ensures that significant hazards are prioritized and properly controlled.

# HAZARD

**Hazard Analysis** involves carefully examining the production process to identify and control risks. The first step is to ask what could go wrong at each stage. Next, the potential hazards that may affect the product are identified. After that, the steps where these hazards are most likely to occur are pinpointed. Once this is done, it is important to decide which hazards are significant enough to require action. Finally, appropriate measures are determined and put in place to control those hazards effectively.

## Types of Hazards

- **Physical Hazards:** These are hazards that involve foreign objects or materials that can be detected through the senses, such as glass, metal, or plastic fragments.
- **Biological Hazards:** These refer to risks caused by living organisms, such as bacteria, viruses, parasites, or molds, which can contaminate food and cause illness.
- **Chemical Hazards:** These involve harmful substances or residues, such as cleaning agents, pesticides, food additives, or naturally occurring toxins, that may contaminate food during production or handling.

# HACCP 101

**Critical Control Points (CCPs)** These are the most important steps in the process where control measures must be applied to prevent, eliminate, or reduce hazards to an acceptable level.

**Critical Limits** A critical limit is the boundary that separates safe, acceptable products from unsafe ones. Common criteria used to set these limits include temperature, time, moisture level, pH (level of acidity), and water activity (Aw), which determines how much water is available to support the growth of hazards such as bacteria.

**Monitoring System** Monitoring systems are established at CCPs to confirm that the process is under control and that critical limits are not exceeded.


**Corrective Action** Corrective actions are the steps taken when a critical limit is breached. They involve immediate measures to make the food safe again and to bring the process back under control whenever it fails to meet safety standards.

# HACCP 101

**Verification** Verification ensures that the HACCP system, when followed correctly, will consistently produce safe food for consumers. It is carried out through three types of review:

- Validation: Will the HACCP plan ensure that safe food is produced?
- Verification: Is the HACCP plan working effectively to produce safe food?
- Review: Is the HACCP plan current and up to date?

# HACCP 101: Documentation

- Keep records
- Temperature charts
- Cleaning Schedule
- Pest Control Records
- Equipment Maintenance Records
- Training Records
- Delivery Check
- Non Conformance Report

# QUESTIONS?

- Food that become mishandled or contaminated can become harbroug for growth of pathogenic microorganisms?
- Are there harborough growth due to the use of chemicals in processing or packaging the ingredients?
- Is ingredient that are hazards, are they used excessively?
- If the ingredient were tampered with or left out at amounts lower than recommended, could it result in microbiological growth?
- Are there any chemical or physical hazards associated with the ingredients?
- SSOP’s is a Pre-HACCP requirement, GMP’s is a Pre-HACCP requirement?

# SANITATION

# SANITATION

**Cleaning and Rebuilding** In food operations, a combination of manual strip-down cleaning and complete rebuilding is essential. At VanLaw, manual cleaning is especially important, and close attention to detail is required to maintain high health and safety standards. Only mild chemical solutions, detergents, and disinfectants should be used to ensure both safety and effectiveness.

**Eight Essentials of Sanitation**

- A safe and adequate water supply.
- Proper condition and cleanliness of all food contact surfaces.
- Effective prevention of contamination at every stage.
- Good employee practices that promote food safety.
- Consistent hand washing and sanitizing.
- Clean and accessible toilet facilities.
- Monitoring of employee health conditions.
- Proper pest control measures.

# SANITATION

Maintaining cleanliness at every stage of the liquid and raw ingredient process is extremely important. Raw materials must be protected from contamination by pathogenic microorganisms, which can cause serious illness in consumers. They must also be safeguarded against spoilage organisms that can lower the quality of the final product. In addition, high standards of cleanliness help reduce the risk of rodent and insect infestations, which can further compromise food safety.

## Cleaning Procedure

The purpose of cleaning is to remove all undesirable materials—such as food residues, microorganisms, scales, and grease—from equipment and processing areas, leaving surfaces visibly clean, smooth to the touch, and free of cleaning agent residues.

# SANITATION

The cleaning procedure generally includes the following steps:

- Remove any remaining products and clear the area of bins or other receptacles.
- Dismantle equipment to expose all surfaces that need to be cleaned.
- Cover sensitive equipment to protect it from water damage.
- Pre-rinse by sweeping, scraping, brushing, or flushing with water to remove residues and loose materials.
- Apply cleaning agents, using mechanical energy such as pressure or brushing when necessary.
- Rinse thoroughly with water to remove all traces of cleaning agents after the recommended contact time.
- Inspect surfaces visually to confirm effective cleaning.
- Disinfect using either a suitable chemical disinfectant or heat treatment.
- Rinse again with clean water to remove disinfectant after the appropriate contact time.

# SANITATION

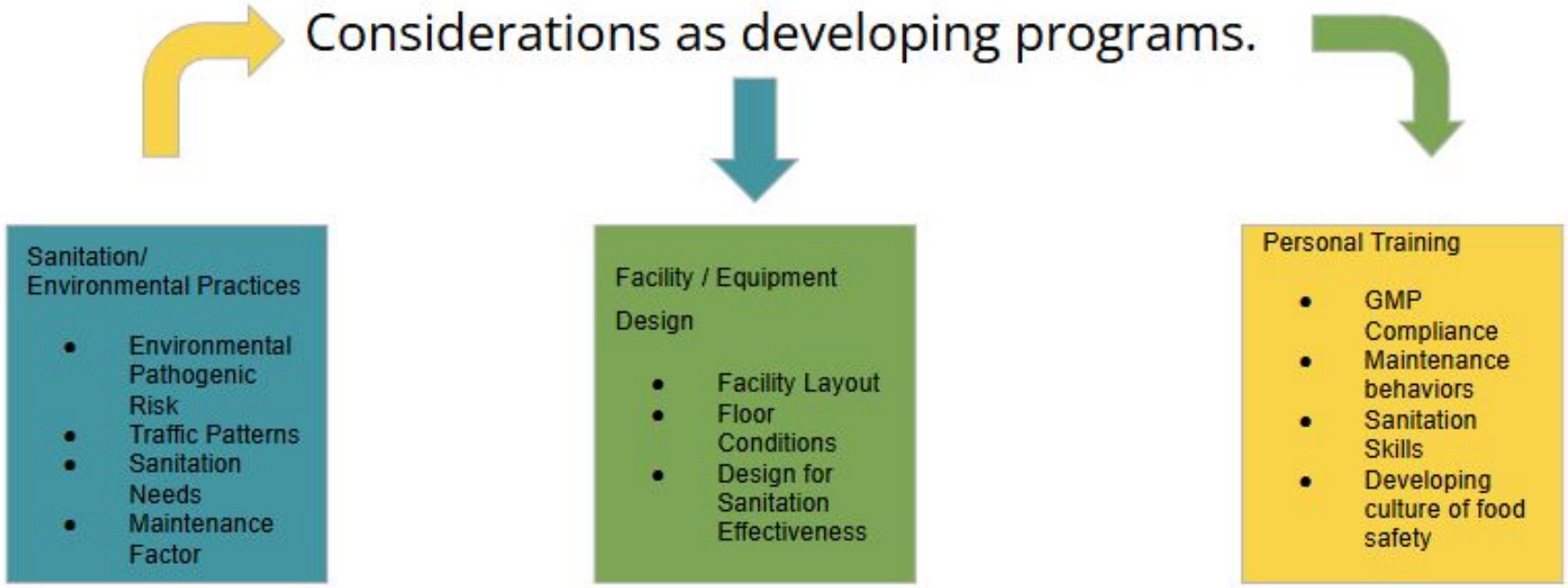
Equipment Hardware Full recovery tank systems, which include large detergent storage tanks, are multifunctional and generally cost-effective for operations. However, they must be closely monitored to prevent the build-up of soil residues in either the diluted detergent or the recovered rinse tanks.

**Process Steps**

The cleaning process typically involves the following sequence:

- Removal of gross debris (product recovery).
- Pre-rinse to wash away loose materials.
- Circulation of detergent through the system.
- An intermediate rinse to clear away detergent.
- A second detergent wash (optional, if needed).
- Another intermediate rinse.
- Disinfection to eliminate microorganisms.
- A final rinse to leave equipment clean and safe for use.

# Establishing the best program for Sanitation



# Establishing the best program for Sanitation

Developing a best-in-class sanitation program requires careful planning and consideration of several factors. Programs should be designed not only to maintain cleanliness but also to address environmental risks, equipment design, and staff training.

**Sanitation and Environmental Practices** Effective sanitation begins with understanding environmental pathogenic risks and controlling traffic patterns within the facility. Sanitation needs must be clearly defined, and maintenance practices should be factored in to prevent contamination and ensure smooth operations.

**Facility and Equipment Design** The layout of the facility plays a major role in sanitation effectiveness. Proper floor conditions and equipment design should allow for easy cleaning, minimal contamination risks, and overall efficiency. Facilities should be built or adapted with sanitation in mind.

# Establishing the best program for Sanitation

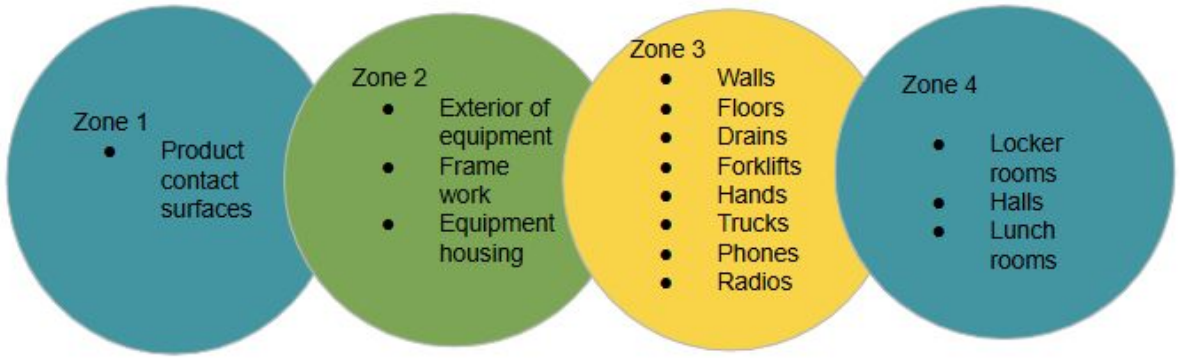
## Personal Training

Employee training is critical for the success of any sanitation program. This includes compliance with Good Manufacturing Practices (GMP), proper maintenance behaviors, and practical sanitation skills. Beyond technical training, it is equally important to foster a strong culture of food safety among all staff members.

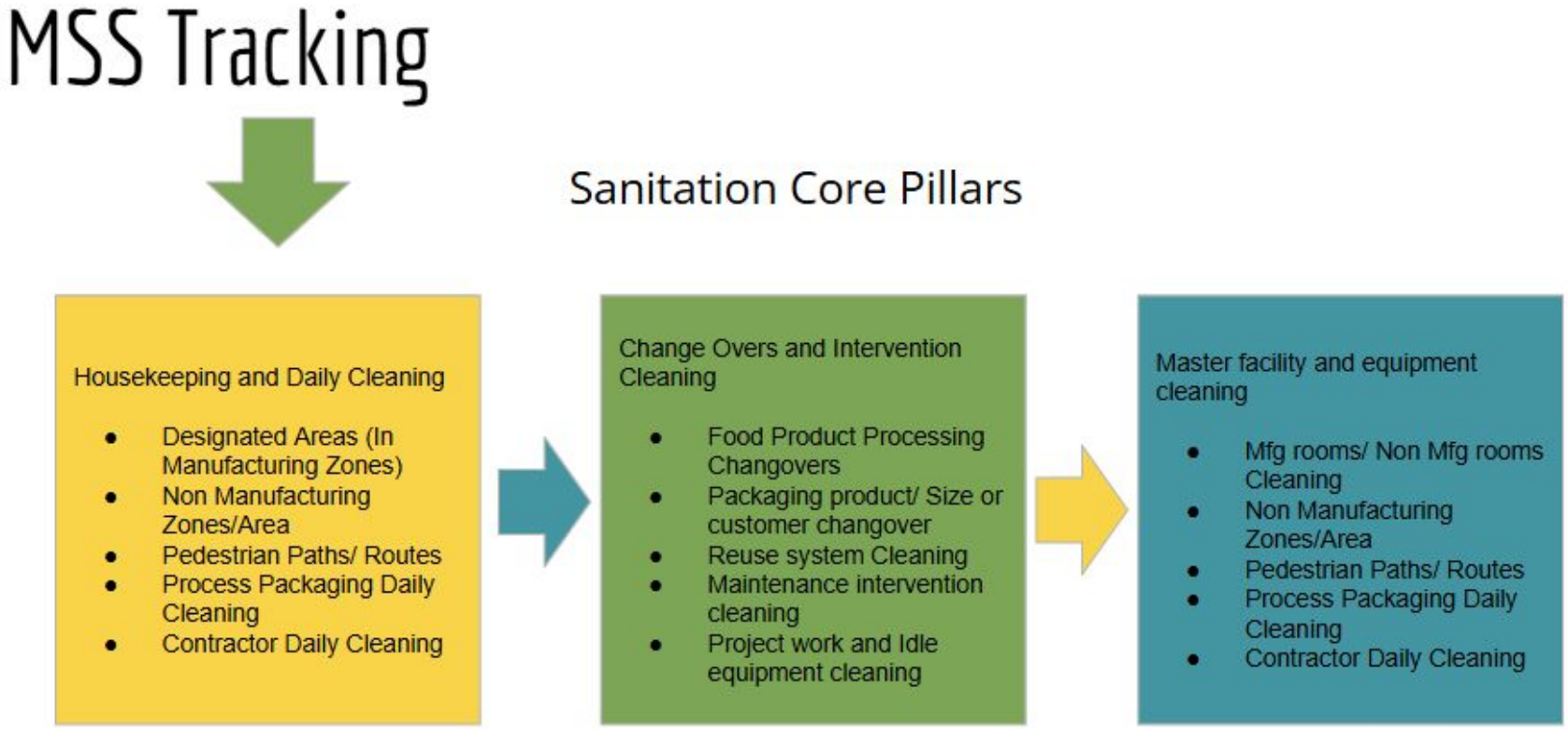
# Sanitary Zones in a Plant

To establish best-in-class sanitation programs, plants are divided into zones based on the level of risk and proximity to food products.

- **Zone 1:** Direct product contact surfaces.
- **Zone 2:** Exterior surfaces of equipment, including frameworks and equipment housings.
- **Zone 3:** Areas that are further away but still pose a risk, such as walls, floors, drains, forklifts, hands, trucks, phones, and radios.
- **Zone 4:** Non-production areas, including locker rooms, hallways, and lunchrooms.



# MSS Tracking – Sanitation Core Pillars



# MSS Tracking – Sanitation Core Pillars

**Housekeeping and Daily Cleaning** Daily cleaning plays a critical role in maintaining hygiene standards. It includes cleaning designated areas within manufacturing zones as well as non-manufacturing areas. Pedestrian paths and routes must be kept clear and sanitized. In addition, daily cleaning is required for process packaging areas and for contractors working on-site.

**Changeovers and Intervention Cleaning** Special cleaning is needed during changeovers in food processing, whether it involves a switch in product type, size, or customer specifications. Reuse systems also require cleaning before being used again. Maintenance interventions, project-related work, and idle equipment must all undergo proper sanitation before re-entering production.

**Master Facility and Equipment** Cleaning Comprehensive cleaning extends beyond daily tasks and covers both manufacturing and non-manufacturing rooms. Pedestrian paths, routes, and process packaging areas are included, along with contractor work areas. This ensures that all parts of the facility meet sanitation requirements and support food safety.

# Key Tactical Approach

To ensure effectiveness, a strong tactical approach must be applied to sanitation and utensil management.

**Sanitation Tactics** The cleaning process should be carefully tracked to confirm that procedures are being followed consistently. Best practices must be applied, whether through wet or dry sanitation methods, to achieve the highest level of effectiveness. In addition, it is important to develop subject matter experts (SMEs) who can provide guidance, oversight, and training in sanitation practices.

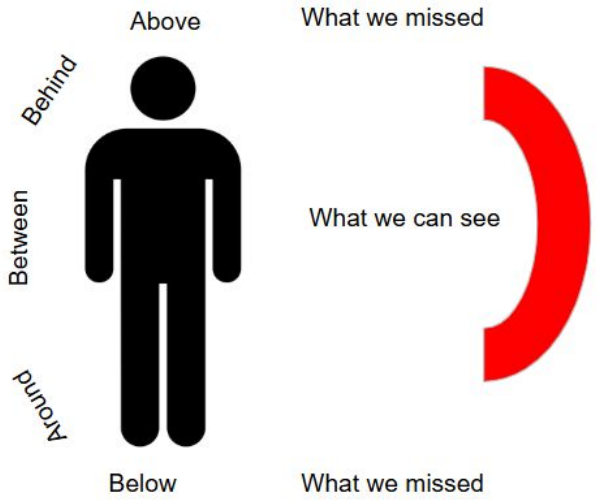
**Utensil Tactics** Utensils should have dedicated usage and proper storage to avoid cross-contamination. A clear cleaning and control plan must be in place, supported by regular monitoring. These measures help improve quality, ensure proper tracking, and maintain food safety standards.

# Cleaning Viewpoints: Line of Sight

Effective cleaning depends on what we are able to see. The principle is simple: you cannot clean what you cannot see.

When cleaning, it's important to check all viewpoints:

- Above
- Below
- Behind
- Between
- Around




Most people only clean what is directly visible, which leaves hidden areas untouched. This creates blind spots where dirt and contamination can remain. To ensure thorough cleaning, attention must be given not just to what is in sight, but also to the areas that are easy to miss.

# The Building Blocks

A strong food safety program is built step by step, just like a structure. At the foundation are pest management, equipment and maintenance, and cleaning and sanitation. These provide the base for safe and reliable operations.

On the next level, the focus shifts to incoming material and storage practices as well as exclusion and accessibility, ensuring that raw materials are handled properly and that contamination is prevented.

GMP and overall food safety, which brings all the elements together to create a complete and effective program.

# Pathogen Control

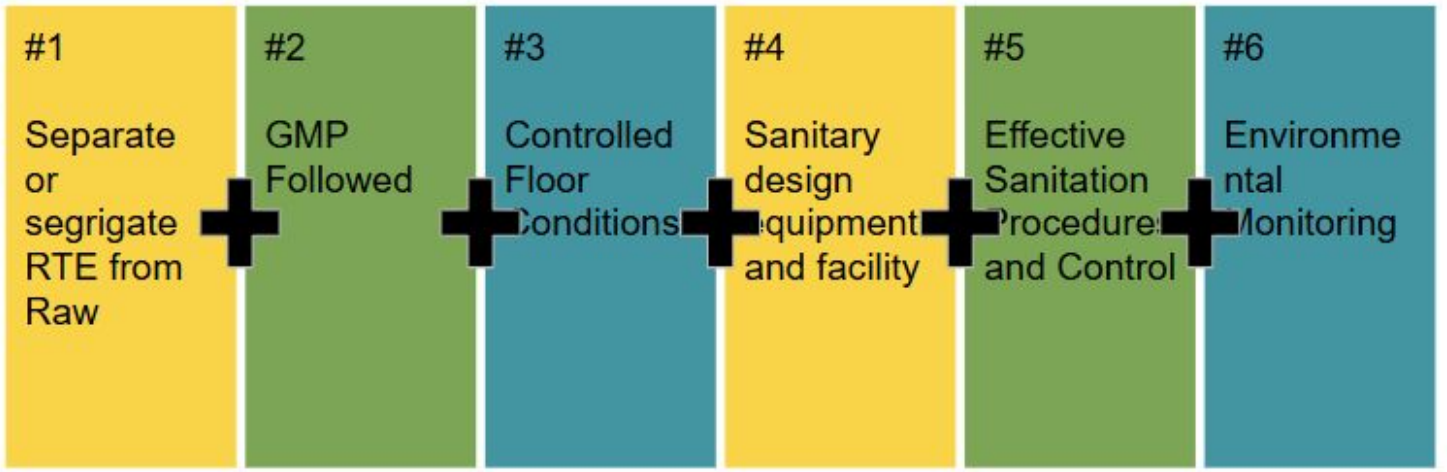
**Pathogen control is achieved through:**

- Separating or segregating Ready-to-Eat (RTE) products from raw materials.
- Following Good Manufacturing Practices (GMP).
- Maintaining controlled floor conditions.
- Using sanitary design for equipment and facilities.
- Implementing effective sanitation procedures and controls.
- Conducting environmental monitoring.

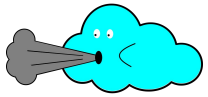
# Pathogen Control

## The pathogen control

=Equals control



# Four Major Vehicles of Contamination

- Air 
- Water 
- Surfaces 
- People 

**Program Goals:**

- To prevent growth of microorganisms such as yeast, mold, and bacteria.
- To prevent insect development.
- To protect product quality from process-related issues caused by poor sanitation practices.

# 5's Tool Organization

- Stored and sorted by function.
- Store to match label position dedicated to specific utensil.
- Store clean and ready to use
- Stored in good condition and maintained as such.

# Risk Management Strategy

**Facility Monitoring and Response** Risk management practices should be applied to regularly monitor the facility and adapt processes to improve effectiveness and success. Progress is measured through an environmental mapping program. Findings must be addressed immediately with intensive corrective actions, including identifying and eliminating the root cause of microbial harborage.

**Cleaning Utensils** A standardized set of cleaning tools must be established and maintained. Compliance is measured through audit results and self-monitoring checklists. Any non-compliance must be corrected immediately.

**Facility and Equipment Cleaning** Cleaning schedules and frequencies should be based on hard data. Practices must be adjusted as needed to improve effectiveness and outcomes. Measurement includes audit results, self-monitoring checklists, and microbial activity monitoring. Non-compliance requires immediate corrective action.

# Sanitation Evaluation

**Evaluate**

- Are floors cleaned?
- Are handrails and platforms cleaned?
- Is production equipment cleaned?
- Is the exhaust system cleaned?
- Are overhead areas cleaned?

**Create**

- Develop programs and documents to validate sanitation activities.

**Execute**

- Review SSOPs (Sanitation Standard Operating Procedures) and Master Sanitation tasks.
- Ensure all documentation is completed daily.

# Sanitation Evaluation

## Document

- Record when and where cleaning was performed.
- Provide evidence that cleaning procedures were followed.
- Confirm employee training and qualifications.
- Track and verify cleaning effectiveness.

# Fields of Application – CIP (Clean-in-Place)

CIP is widely applied in manufacturing processes, particularly in the: biotechnology, food, dairy and beverage industry.

It is primarily used for cleaning:

- Processing vessels
- Storage vessels
- Machinery
- Pipework

**Note:** All equipment to be cleaned must remain in a closed system.

Clean-in-Place (CIP) refers to the cleaning of complete plant systems or pipeline circuits without dismantling or opening the equipment, and with minimal or no manual involvement by the operator. This includes both: dedicated cleaning devices (installed permanently), and portable CIP systems (movable units that can be connected to multiple vessels).

# Benefits of CIP (Clean-in-Place)

## Improved Cleaning Results

- Ensures consistent and thorough cleaning, even in hard-to-reach areas.
- Automated systems provide guaranteed and repeatable quality assurance.
- Enables full data logging for compliance and quality tracking.

## Improved Occupational Safety

- Operators do not need to enter the plant for manual cleaning.
- Eliminates the need for handling hazardous cleaning materials directly.
- Allows the use of more aggressive cleaning agents safely.
- Reduces labor requirements through automation.

# Thank you

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