



Cooperative Extension Service  
Institute of Food and Agricultural Sciences

## Basic Elements of a Sanitation Program for Food Processing and Food Handling<sup>1</sup>

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*This document covers current definitions and practices of food handling and processing for institutions and commercial enterprises.*

### Background

**A three-word definition of Food Sanitation is protection from contamination.** With this in mind, all functions and operations must be included in a sanitation program. All food products must be protected from contamination from receiving (and before) through distribution. Sanitation is a dynamic and ongoing function and cannot be sporadic or something that can be turned on once a day, once a week, etc. Therefore, another definition could be: “sanitation is a way of life”.

### Temperature Control

The primary rule of sanitation is to pay strict attention to food temperatures.

- Avoid prolonged holding in the danger zone (from 40°F to 140°F).
- Provide functional thermometers to all food storage boxes.
- Monitor the temperature on serving lines on a regular frequency.
- Thaw frozen foods under refrigeration or under cold water.
- Do not thaw foods at room temperature.

### Hygiene and Personnel Practices

Regardless of type of processing or food handling operation, the number one consideration in food sanitation is people. It is people who set the rules, follow the rules, and also break the rules of sanitation. A sanitation program is as good as the attitude, willingness, and efforts of people. That is why the most important aspect of a sanitation program is ongoing personnel training.

It is essential that the full meaning of sanitation and its wide economic scope be accepted by everyone concerned in the food system—including management.

Personnel training should include appropriate sanitation principles and food handling practices, manufacturing controls, and personal hygiene practices.

### Sanitation Principles and Food Handling Practices

Personnel training should instill and nurture an understanding of the processing steps and technologies for each product manufactured or handled and where potential problems exist, and create a keen desire to satisfy and guard the consumers' interests.

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## **Manufacturing Controls and Essential Operations**

Production personnel must be trained in the critical elements of the operations for which they are responsible, in the importance of these operations, monitoring these operations, and in action to be taken when these operations are not controlled.

Certain industries have developed certification programs for operators of essential heat-processing equipment (e.g. milk pasteurizer or retort operators). If such programs don't exist for a given processing segment, it is important that specific training programs be developed for such personnel.

## **Hygienic Practices**

### **Communicable Diseases/Injuries**

Persons known to be suffering from, or known to be carriers of a disease likely to be transmitted through food, must be restricted from any food-handling area. Likewise, persons afflicted with infected wounds, skin infections, sores, etc., must also be restricted from these areas. Any persons with open cuts or wounds should not handle food unless the injury is completely protected by a secure, waterproof covering.

### **Hand-washing**

Facilities with hot water for hand-washing must be provided and must be convenient to food handling areas. All personnel involved in food handling must thoroughly wash hands with soap under warm-running, potable water. Hands must also be washed after handling contaminated materials and after using toilet facilities. Where required, employees must use disinfectant hand dips.

### **Personal Cleanliness and Conduct**

Personal cleanliness must be maintained while involved in food handling operations:

- Sanitary protective clothing, hair covering, and footwear must be worn and maintained in a clean, sanitary manner.
- Gloves, if worn, must be clean and sanitary.
- All food-handling personnel must remove objects (i.e. watches, jewelry) from their person which may fall into or contaminate the food product.

- Tobacco, gum, and food are not permitted in food-handling areas.

### **Traffic Control/Controlled Access**

Personnel and visitor access to specific food-product handling areas must be restricted. Personnel involved in raw product handling (e.g., farm truck drivers, etc.) must not be allowed in processing or finished product areas. Foot baths and hand dips, where required, must be properly maintained and used. Color coding of clothing, maintenance and other equipment should be used to clearly identify raw vs. processed product operations.

## **Premises and Surroundings**

### **Outside Surroundings**

Outside surroundings should be evaluated for sources of contamination such as vermin, bird harborage areas, drainage problems, odor problems, debris, refuse, and pollution—smoke, dust, other contaminants. Appropriate steps must be taken to contain and control any potential sources of contamination.

### **Buildings and Facilities**

The two most important overall elements of any food-processing and -handling facility is that it should be cleanable, and so designed and constructed that it prevents entrance or harborage of pests or other sources of contamination. Unfortunately, many existing facilities do not readily meet these essential elements.

### **Design and construction**

#### *Building Construction*

The facility should have floors, walls, and ceilings constructed of suitable, approved materials which are durable, smooth, impervious and easily cleaned. Walls should be light colored and well-joined, and floors should be adequately sloped for drainage to trapped outlets. Openings to outside and/or non-food-processing or -handling rooms or facilities must be sealed. Instrument panels should be appropriately locked and sealed to prevent harborage of insects. Windows and doors must be tight and close-fitting. And doors in food-processing areas self-closing.

### *Overhead Structures and Lighting*

Overhead structures should be situated and constructed to prevent contamination of the food products, and lighting is to be adequate with properly sealed, safety type overhead fixtures.

### *Heating, Ventilation, and Air Conditioning (HVAC)*

Systems must be designed and installed to prevent build-up of heat, steam, condensation, or dust, and to remove contaminated air. Positive air pressure is required in microbiologically sensitive areas. HVAC systems should be designed to be cleanable, and air intakes located to prevent intake of contaminated air.

### *Drainage and Sewage Systems*

Appropriate traps and vents are to be used throughout. There should be no potential of cross connections existing between human waste effluent and other wastes in the plant. Appropriate vacuum breakers or air breaks must be used.

### *Waste Facilities*

Facilities designed to prevent contamination should provide for the sanitary storage of waste and inedible material prior to their removal from plant or surroundings. Waste containers are to be clearly identified.

### **General Protection from Contamination**

In general, the facilities and various non-product contact surfaces and equipment must be evaluated to assess potential for food-product contamination. Shielding from overhead contamination should be provided as deemed necessary. Examples include: shielding over food product fillers or bottle conveyers, shielding from refrigeration unit drip in coolers, sneeze guards on food service serving lines, etc.

### **Flow-Through Pattern**

A well-designed food-processing or -handling facility is constructed to minimize traffic to prevent contamination. It is desirable to have a product flow-through that physically and operationally separates raw product functions from processing functions and finished product functions in order to avoid cross-contamination. Boiler and engineering rooms must always be separated from food-processing and -handling areas.

### **Sanitary Facilities**

#### *Washrooms, Lunchrooms, Change Rooms*

Self-closing doors must be provided for all washroom facilities. Washrooms, lunchrooms, and change rooms must be separate from—and not directly entered from—food-processing and -handling areas. Such facilities are to be properly ventilated and maintained.

#### *Hand Washing Facilities*

Sufficient numbers of handwashing sinks, with hot and cold potable water, soap, sanitary hand drying supplies or devices, must be provided in washrooms. A sufficiency of suitably located handwashing sinks are also necessary in food processing and handling areas. Hand-washing sinks should be separate from sinks used for equipment cleaning and other operations.

### **Water Quality Program**

A potable water, steam, and ice supply is imperative for sanitary food-processing and -handling. Compliance with appropriate regulations and standards must be verified through testing programs. Water treatments (such as chlorination systems, ozonation, demineralization, filtration, etc.), if applied, must be maintained. Adequate water temperatures and pressures are to be provided in processing areas.

### **Raw Material Receiving**

All elements and operations involved with receiving and storage of ingredients, packaging material, and other incoming materials must be evaluated and monitored to prevent potential contamination of the food product manufactured. Incoming materials must be received into an area which is separated from processing areas. Only safe, approved (21CFR) food-grade direct and indirect

additives and ingredients shall be used. Packaging materials used must be safe and approved (21 CFR).

## Storage

### Temperature and Humidity Controls

Where appropriate and applicable, the temperature and humidity of storage rooms for raw materials, ingredients, packaging materials, and food should be maintained and monitored.

### Returned Foods

Foods returned from retail outlets must be clearly identified and stored in a designated area for appropriate disposition. Storage conditions need be such that the safety of the returned food is not compromised.

### Non-food Chemicals

Detergents, sanitizers, or other chemicals must be properly labeled, stored and used in a manner to prevent contamination of food, packaging materials, and food contact surfaces. Chemicals must be stored in a dry, well-ventilated area which is separate from food handling areas.

## General Cleanliness and Housekeeping

All food-processing and -handling rooms and other rooms must be maintained in a clean, sanitary manner. A major source of plant contamination is from custodial personnel and equipment. All custodial brushes and equipment must be in good repair as well as being clean and sanitary.

## Equipment Construction And Maintenance

### General Sanitary Design

The overall requirement for design of equipment for food-processing and -handling operations is that it be cleanable and maintained in such a manner as to prevent contamination. Food-contact surface equipment standards—of varying thoroughness— have been developed for segments of the food industry. Some of these standards are listed here:

**3-A Sanitary Standards.** These standards, primarily for the milk and milk product industry, are highly detailed and specific. If a 3-A standard exists for a specific type of equipment, it is required in Grade A pasteurized milk plants under state and U.S. Food and Drug Admin. (FDA) regulatory programs and in manufacturing grade product plants under U.S. Dept. of Agriculture (USDA)/Agricultural Marketing Service (AMS) grading and inspection service.

### Baking Industry Sanitary Standards (BISSC).

These standards are voluntary for the baking industry.

**U. S. Dept. of Agr. (USDA).** USDA has equipment construction standards for the meat and poultry under the Food Safety and Inspection Service (FSIS), and other food industries under their AMS grading and inspection.

**National Sanitation Foundation (NSF).** The NSF seal is affixed to food service equipment which indicates that the equipment meets these very general standards.

## Equipment Installation

It does little good to have equipment which is designed to be cleanable, but which is installed in such a manner or location as to preclude its cleanability.

Adequate space must be provided within and around equipment, and equipment must be accessible for cleaning, sanitizing, maintenance, and inspection.

## Equipment Calibration and Maintenance

### Preventive Maintenance

A sanitary operations facility has a preventive maintenance program which monitors equipment maintenance procedures. Such a program specifies necessary servicing intervals, replacement parts, etc.

## Equipment Calibration

Protocols and calibration methods must be established for all equipment that could impact on food safety. These include:

- thermometers,
- pH meters,
- water activity meters,
- refrigeration controls,
- scales,
- recording thermometers,
- hygrometers, and other equipment.

All reagents used for monitoring and verification must be documented and stored properly. Appropriate monitors must be used.

## Cleaning and Sanitizing Equipment

Thoroughly evaluate the effectiveness of cleaning and sanitizing programs. Consult a reputable cleaning and sanitizing supplier and follow recommended

procedures for cleaning and sanitizing both food-product contact and non-product contact surfaces in specific operations.

## Pest Control

An adequate pest control program is necessary for sanitary operation of a food-processing or -handling facility. Effectiveness of the pest-control program should be verified on a regular frequency.

## Recall Program

An important part of food sanitation program is having a working product-recall system in place. The recall program establishes procedures to be implemented in the event of a product recall. Written recall procedures should be established and tested for validity.