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# Sanitation and Safety in Seafood Processing, English

**Developed by**
NC State Seafood Laboratory
NC Cooperative Extension Farmworker Health & Safety Education Program

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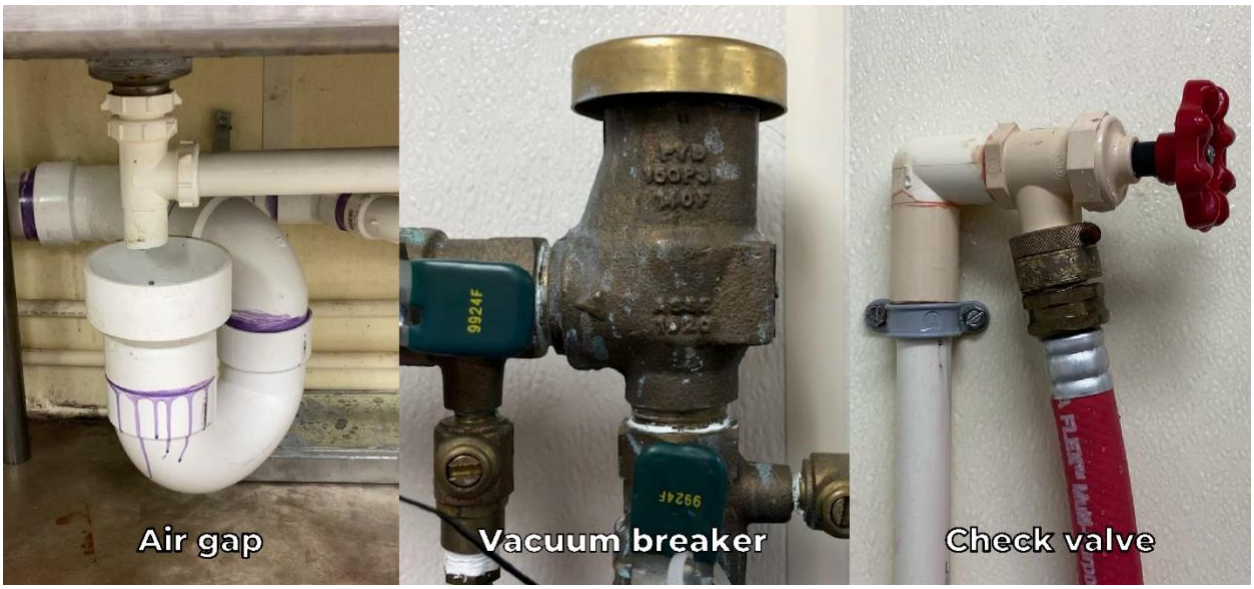
## Sanitation Condition #1: Safety of Water

- Water supply in a food processing plant shall be sufficient for the operations intended and shall be derived from an adequate source; and any water that contacts food or food-contact surfaces shall be safe and of adequate sanitary quality.

- In-plant water contamination can be caused by cross-connections and backflow. To control backflow, you can implement an air gap, vacuum breaker, or check valve.




- A monthly check for the presence of cross-connections in the hard plumbing should be done, as well as a daily check for potential back siphonage conditions, especially those related to hoses.

- Periodic monitoring should be conducted for the safety of the ice made from the water supply. Ice and its storage and handling conditions can be responsible for spreading problematic bacteria. This situation usually results from contamination of the ice as a result of unsanitary storage, conveying, shoveling, or contact with floors.

- When monitoring detects a problem with the processing water source, the processor must evaluate the situation and, if necessary, discontinue use of water from that source until the problem is solved and retesting confirms that it no longer exists.

## Sanitation Condition #2: Condition and Cleanliness of Food Contact Surfaces

- Food contact surfaces are those surfaces that contact human food and those surfaces from which drainage onto the food or onto surfaces that contact the food ordinarily occurs during the normal course of operations. Typical food contact surfaces include utensils, knives, tables, cutting boards, conveyor belts, ice makers, ice storage bins, gloves, and aprons.

- Clean, sanitary food contact surfaces are fundamental to the control of pathogenic microorganisms. The contamination of seafood through either direct or indirect contact with unsanitary surfaces potentially compromises the safety of that product for consumption.

- Cleaning and sanitizing typically involves five steps: dry clean, brief pre-rinse, detergent application which may include scrubbing, post-rinse, and sanitizer application.

***Dry clean***

***Pre-rinse***

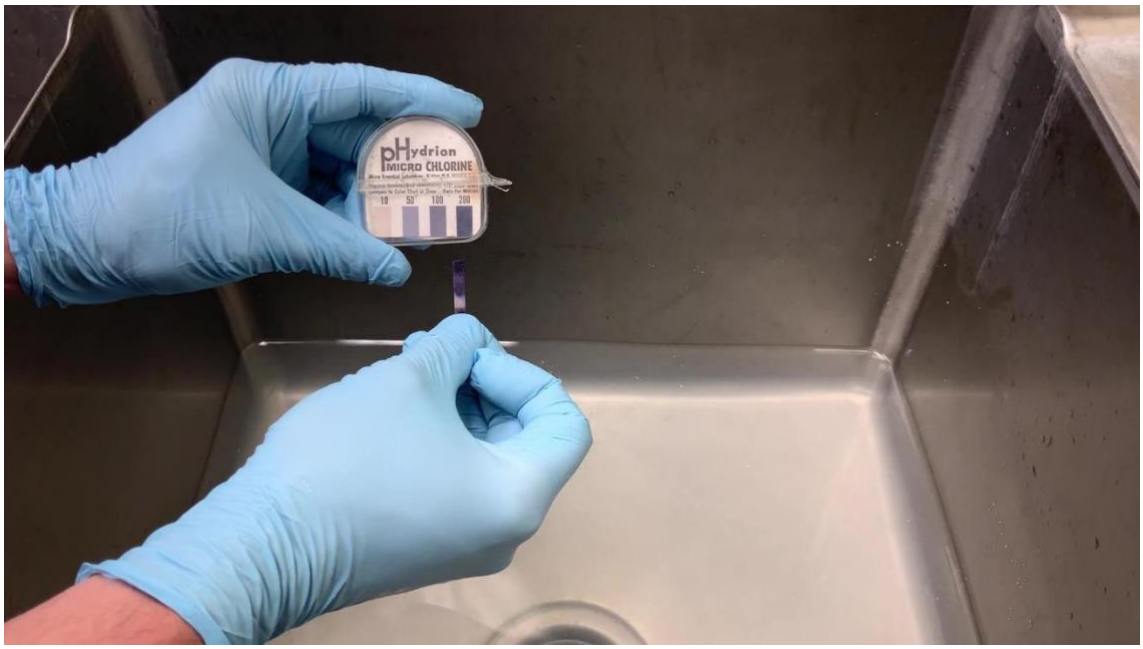
***Detergent application***

***Post-rinse***

***Sanitizer application***

- The monitoring of food contact surfaces typically involves a combination of visual checks and chemical testing of sanitizers. Visual checks includes confirmation that surfaces are in good condition so that they can be properly cleaned and sanitized. Also, gloves and outer garments must be clean and in good repair.

- When sanitizers are used in footbaths, dips or as an applied sanitizing solution the concentration is confirmed at least every four hours using test strips. Proper concentrations need to be 100 to 200 ppm for chlorine-based sanitizers, 12.5 to 25 ppm for iodine-based sanitizers, and 400 to 800 ppm for quaternary ammonium-based sanitizers.



## Sanitation Condition #3: Prevention of Cross-Contamination

- Cross-contamination is the transfer of biological or chemical contaminants to food products from raw foods, food handlers, or the food handling environment. The type of cross-contamination most frequently implicated in foodborne illness occurs when pathogenic bacteria or viruses are transferred to ready-to-eat foods.

- People who work in food handling operations can harbor pathogens on their skin and hands, and in their digestive system or respiratory tract. Hands, gloves, outer garments, utensils, food contact surfaces of equipment that come in contact with waste, the floor, or other unsanitary objects can contribute to product contamination.

- By far the easiest area of cross-contamination to identify is personnel practices. The methods for maintaining cleanliness include, but are not limited to: (1) Washing hands thoroughly, (2) Removing all unsecured jewelry, (3) Wearing effective hair covers, (4) utilizing footbaths containing sanitizers, (5) abstaining from eating food, chewing gum, drinking beverages, or using tobacco in processing areas, and (6) Protecting against contamination of food, food-contact surfaces, or food-packaging materials with microorganisms or foreign substances.

- Generally, the first step for manual hand washing is to thoroughly wet exposed arms and hands, including the back of the hands, with warm water having a temperature of at least 43°C. Introduce ample soap and vigorously rub hands together to produce an abundant lather. Remember, lathering and rubbing for 20 seconds followed by a thorough rinsing in clean water is a minimum.

- Hands should be dipped in a sanitizing solution to destroy any remaining microorganisms. Arms and hands should be washed: after touching bare human body parts other than clean hands and clean exposed portions of arms, after using the toilet room, after coughing, sneezing, using a handkerchief or disposable tissue, using tobacco, eating, or drinking, after handling soiled equipment or utensils, and during food preparation.

## Sanitation Condition #4: Maintenance of Hand Washing, Hand Sanitizing, and Toilet Facilities

- The availability and maintenance of toilet and hand washing facilities are essential parts of the hand washing program in order to prevent the spread of filth and pathogenic organisms throughout the plant.

- Hand washing facilities should be dedicated solely for that purpose. They should never be used to wash dishes, utensils or other items that may soil or contaminate the area. Hand washing should never be conducted in sinks used for food preparation or in sinks used for cleaning and sanitizing the plant.

- Each hand washing facility should provide the following at all times: (1) Clean at all times, (2) Strategically located as per regulations, near bathrooms and entrances to the processing area, (3) Dedicated to hand washing only, (4) Liquid soap in dispenser, (5) Trash receptacle, (6) Hot water at least 43 °C, (7) Use of disposable paper towels or air blowers, and (8) Adjacent hand sanitizing facilities.

- Hand sanitizing facilities should be frequently monitored and changed to maintain proper sanitizer concentrations, and conveniently located to encourage employee use, but to avoid contact with foods. Also, hand sanitizing hand dips should be changed frequently to ensure that they are clean and maintained at the proper strength.

- Hand washing, hand sanitizing, and toilet facilities should be checked to ensure that they are clean, functioning properly, and have the necessary supplies including hot water, soap, disposable paper towels, and a trash receptacle. More than one daily check may be required for certain food operations. The type and frequency of the periodic checks would depend on the food products and processing methods. Toilet facilities must always be in proper working order and cleaned routinely to avoid serious contamination.

## Sanitation Condition #5: Protection from Adulterants

- Food, food packaging materials, and food contact surfaces be considered 'adulterated' if they become contaminated by substances such as lubricants, fuel, pesticides, cleaning compounds, sanitizing agents, condensate, floor splash, and other chemical, physical, and biological contaminants.


- Foods processed in unsanitary conditions can be considered adulterated even without any evidence or measures of a contaminant.

- Protection from adulteration can be considered a 3-step process – before, during, and after processing.

- Protection from adulteration before processing is best accomplished with a written Sanitation Standard Operating Procedure, SSOP, plan. Any possible adulterant that could contaminate the food or food contact surfaces should be monitored, including potential toxic compounds and unsanitary water. A recommended monitoring frequency is at pre-op and at least every four hours thereafter. You should be aware of the potential for product adulteration during the entire day's operation from pre-op through processing and sanitation activities. Monitoring should include loading docks and receiving areas, storage areas and coolers, as well as food-handling and production areas.

- Some possible corrections to inappropriate activities are: (1) Remove condensate from unsanitary surfaces, (2) Correct air flow and room temperatures to reduce condensation, (3) Install covers to prevent condensation from falling on food, packaging materials or food contact surfaces, (4) Squeegee floor to remove standing water, (5) Direct foot or vehicle traffic around pools of standing water, (6) Wash food contact surfaces inadvertently exposed to chemical adulterants, (7) Erect screens to protect product when working with a toxic compound in a non-product area, (8), Evaluate impact of improper use of toxic compounds to assess whether or not food has been contaminated, (9) Reinforce training of employees to correct inappropriate activities, and (10) Responsibly discard unlabeled chemicals.

## Sanitation Condition #6: Proper Labeling, Storage, and Use of Toxic Compounds

- Chemicals used in most food processing plants include compounds such as cleaners, sanitizers, rodenticides, insecticides, machine lubricants and some food additives. They must be used according to manufacturer's instructions, have proper labeling, and be stored in a safe manner; otherwise, they will pose a risk of contamination of the food products that the establishment is handling or manufacturing.

- The original containers for all chemicals must be labeled to show the name of the manufacturer, instructions for use, and the appropriate approvals. Often, it is necessary to take portions of the compound from the original container for use in the facility. Therefore, the working containers used for storing or using compounds such as cleaners and sanitizers which are routinely taken from the bulk supplies must also be clearly and individually identified with the common name of the material.


It is not stored correctly (insecticide stored with gloves and hand sanitizer )


Stored correctly

- Chemicals used in cleaning and sanitizing treatments, as well as pesticides and rodenticides, must be properly stored in an area of limited access away from food handling or manufacturing. Usually this means in a locked room or cage, with the keys or combinations given only to necessary personnel.

- Cleaning chemicals should be segregated from insecticides and rodenticides to prevent accidental mixing or misuse. Likewise, food-grade chemicals should be stored away from nonfood-grade compounds.

- Some possible corrections to inappropriate activities are: (1) Move incorrectly stored toxic compounds to proper storage location, (2) Return compounds with inadequate labeling back to supplier, (3) Relabel working containers which incorrectly identify compounds contained within, (4) Destroy or discard inappropriate or damaged working containers, (5) Evaluate impact of improper use of toxic compounds to assess whether or not food has been contaminated, and (6) Reinforce training of employees to correct inappropriate activities.

## Sanitation Condition #7: Control of Employee Health Conditions

- This sanitation condition relates to persons who appear to have an illness, wound, or other affliction that could be a source of microbial contamination of the food. Disease producing organisms can be spread by careless workers handling the food products. Individuals may be a carrier, which means the individual transmits the organism without actually exhibiting symptoms of the disease.

- Unless good hygienic habits are practiced, food handled by such a person can, in turn, transmit the disease to consumers. Some pathogens are frequently transmitted by food contaminated by infected persons. The failure of food-handlers to wash hands, wear clean gloves, or use clean utensils is responsible for the foodborne transmission of these pathogens. Non-foodborne routes of transmission, such as from one person to another, are also major contributors in the spread of these pathogens.

- The presence of any one of the following signs or symptoms in persons who handle food may indicate infection by a pathogen that could be transmitted to others through handling of the food supply: diarrhea, vomiting, open skin sores, boils, fever, dark urine, or jaundice.


- The food handler should assure personal hygiene by: (1) Reporting any illness to your supervisor before you undertake work with food so that work adjustments can be made to protect the public from the food handler's illness, (2) Keeping in a good state of health by the use of proper rest, nutrition, exercise, and physical cleanliness, (3) Being health conscious and conscientious in the protection of your health, (4) Practicing good personal hygiene through daily bathing; use of appropriate deodorants; and proper hair cover and care, (5) Preventing hair from contaminating food by wearing appropriate hair covers, (6) Keeping nails clean and trimmed, (7) Avoiding practices such as sneezing and coughing that could contaminate food, and (8) Observing the no smoking, no eating and drinking rules in food preparation and service areas.

- The health of processing employees should be recorded daily on an appropriate section of a daily sanitation control before the start of production. All unsatisfactory conditions must be recorded with an accompanying correction taken to reduce or eliminate the problem.

## Sanitation Condition #8: Exclusion of Pests

- This chapter relates to the presence of pests, such as rodents, birds, dogs, cats, raccoons, and insects. The presence of rodents, birds, insects, or other pests in the processing plant is unacceptable. Even if pest control is contracted to an outside company, it is still the processor's responsibility to make sure that there are no pests in the facility. The presence of pests in a food plant can result in illness to consumers through microbial contamination.

- Generally, pest control is a three-phase procedure: elimination of shelter and attractants, exclusion of pests from the food plant, and extermination of those pests that gain entry.

- In establishing an exclusionary program for pest control in a food processing facility, there are a number of areas of concern. Some of these are, but are not limited to: plant and grounds; structure and layout; plant machinery; equipment and utensils; housekeeping; waste disposal; and the use of pesticides and other control measures.

- Thorough and efficient housekeeping practices can significantly reduce pest problems. If proper housekeeping standards are not maintained, the resulting buildup of trash, debris, and clutter is likely to attract rodents and other pests. These pests may actually take up residence among the trash, debris and clutter. In addition, personnel lockers or breakrooms that are not well maintained will likely attract a variety of pests. Any spills or overflows should be cleaned up as soon as possible. To prevent cross-contamination of food products and to minimize the potential attraction and support of rodents and other pests, storage areas for waste materials require nearly as much attention to detail when cleaning and sanitizing as do processing areas. In addition to the storage area, waste bins, tubs and dumpsters used in the collection, holding and storage of waste materials require proper cleaning and sanitizing to minimize the potential attraction and support of food pests.

- Required monitoring involves a visual inspection for both the presence of pests and for current or recent evidence of pests, such as droppings, gnaw marks and nesting material. Typically, monitoring includes observations in the processing, packing and storage areas. Monitoring frequency will vary depending on what is monitored. Inspection of the physical facility for possible entry points may be a periodic function, perhaps weekly or even monthly. The monitoring for direct evidence of pests in the plant is to be performed daily.

Rodent Trap