

Evaluation of sanitary conditions in fish processing units

- Quality of the fish refers to wholesomeness of fish making it suitable for human consumption.
- Quality depends and determined by physical, chemical, organoleptic and microbiological aspects in food. Thus, the quality of a product includes factors such as intrinsic characters, nutritive value, degree of spoilage, damage to the product, deterioration during processing, storage and distribution, presence of substances hazardous to health, aesthetic aspects etc.
- Therefore, quality means all that attributes which consciously or unconsciously the consumer wants it to be present in food.
- The decision of what constitutes the quality rests ultimately with the consumers.

Hygienic practices for seafood plant employees

- The following personal hygiene practices are to be adhered by the food handlers in seafood industry.
- **Employee health:** Employees suffering from any communicable disease, carriers of any diseases, infected wound or open lesion on an exposed part of their body should be prevented from working in the processing areas.
- **Employee appearance:** All employees should have clean and tidy appearance.

- **Fingernail polish:** Employees wearing fingernail polish are not to be engaged in handling of the product
- **Jewellery:** Employees engaged in the handling of the product should avoid wearing rings, earrings, or any other jewellery.
- **Smoking/spitting/ gum or tobacco chewing:** No person is allowed to smoke, spit or chew gum or tobacco in the processing areas.

- **Hand washing:** Employees should thoroughly wash hands with warm water and soap following each absence from duty.
- **Headgear:** Employees have to wear suitable headgear covering the hair completely.
- **Bearded employees:** Male employees with beards or mustaches will have to secure them with headgear.
- **Outer garments:** Employees should wear clean uniform (coats, aprons etc) in processing area. These garments should not be worn outside the processing unit or inside toilet areas, not be placed on processing tables or equipment during break. Employees must keep their shirt, blouse and sweater sleeves rolled up past the elbow.

- **Protective hand coverings:** Gloves need to be washed and disinfected at each break and at the end of each shift.
- **Toilet area:** Employees should avoid loitering in toilet areas.
- **Personnel permitted in processing areas:** Only authorized personnel are permitted in the processing areas.
- **Foot dips:** Employees should make use of foot dips wherever required.

Fish plant sanitation

Consumers expect the foods to be pure, safe and processed, handled and served in a sanitary manner. Sanitary food is defined as one that is free of agents that cause disease or illness and free from objectionable extraneous material like insect fragments.

Therefore, sanitation is concerned with the food and also the environment and conditions under which the food is handled.

Fish plant sanitation is defined as the controlling of all conditions or practices within the plant so that the fish processed is free from disease-producing microorganisms and foreign matter.

Requirements for an effective sanitation programme

- Implementation of effective sanitation programme becomes necessary in any food processing industry. For a workable sanitation programme the following requirements have to be met. Management must be aware of the need for good sanitation.
- The processing unit should be suitably located and constructed.
- The processing unit must have required quantity of good quality water supply.
- The processing unit must have adequate washing facility for whole fish.

- The processing unit must have smooth working surfaces.
- The processing unit must have a sound clean-up policy.
- The processing unit must have adequate sanitary facilities.
- The processing unit must ensure good personal hygiene habits of employees.
- The processing unit must have effective rodent and insect control programme.

Need for hygienic practices:

- Practicing of proper hygienic practices by food handlers is of critical importance as they serve as fundamental sources of many microorganisms responsible for foodborne illnesses.
- Pathogens such as *Staphylococcus aureus* is naturally associated with humans, and will contaminate the food unless proper care is taken. Production of toxin by this organism in any food is responsible for staphylococcal food poisoning.

- The food handlers could also serve as carriers for many of the pathogenic microorganisms responsible for typhoid fever, dysenteries, salmonellosis, hepatitis etc.
- So, there is a need for acceptable hygienic practices by food handlers to prevent microbial contamination to food.
- Compliance to proper hygienic practices by the food handlers can be achieved only by educating them on the importance and need for personal hygiene practices.

Clean- up procedure

- The absolute cleanliness of personnel, equipment and premises is very important at all stages of food production.
- The main objective of cleaning is to minimize the risk of cross contamination between foods and also from waste food material left on equipment and food contact surfaces.
- The clean-up procedure in food processing industry assures; Protection of food from contamination by pathogenic microorganisms that can cause disease in consumers.
- Protection of food from spoilage organisms that can cause deterioration in the quality of food.
- Maintenance of good standards of cleanliness which helps minimizing the risk of rodent and insect infestation.

- A good clean-up procedure generally consists of initial cleaning procedure followed sanitation phase.
- **Cleaning phase**

Cleaning can be defined as the removal of all dirt, slime, blood, curry, oil, grease and any food soil from all food contact surfaces. This operation is accomplished with the aid of a detergent which when added to water helps to remove all kinds of dirt effectively. The basic steps involved in cleaning phase are initial rinsing with cold water followed by scrubbing with warm water and detergent, and final rinsing with cold water.

- **Sanitizing phase**

Sanitizing or disinfecting phase is the parts of the cleaning operation wherein surfaces and equipment are rendered microbiologically clean by using sanitizers. Sanitizing is done after cleaning phase and it involves cleaning using sanitizers followed by final rinse with cold water.

- The cleaning operation involves separation of dirt/soil from the object to be cleaned, carrying the dirt away and its suitable disposal using detergent, leaving the surface being cleaned in the desired condition and disinfection when desirable.
- Selection of a suitable cleaning solution or detergent is necessary to achieve effective cleaning as it depends on various factors such as neutralization, pH, alkalinity, buffering capacity, surface tension, wetting ability, mechanical action, emulsification, deflocculation, etc.
- Several types of mechanical aids are available for use in food industry for cleaning and sanitation purpose.

- **Guidelines for the use of sanitizers**
The following guidelines should be followed in attaining effective sanitation in a food industry. Sanitizer should never be used as a substitute for thorough cleaning.
- Sanitizers should be used as an additional safeguard to thorough cleaning.
- Should not be used where sterilization need to be achieved. Because, sterilization aims at destroying or removing all microbial life, whereas sanitization does not kill all microorganisms, but help to reduce microbial load.

- The detergents used for cleaning purpose should be inexpensive, approximately neutral (pH 6-8), biologically degradable, easy to wash away, non-toxic and approved by the appropriate regulatory body for food use.

The sanitizer used in the food industry should possess good bactericidal activity and active against a wide variety of organisms, be non-toxic or low in toxicity, not affect the colour, odour and flavour of the food, be fairly cheap, be easy to dispense and wash away, should not adversely affect the operators and food handlers and should not cause damage to surfaces being sanitized (Ex. equipments).

Common sanitizing agents

- The most commonly used sanitizing agents in food industry are chlorine, iodine and phenolic compounds. Chlorine is more commonly used than the other two in food processing plants.
- It is the least expensive and readily available in several forms. Iodine is more expensive and is not easily available, but is more effective than chlorine even in low concentrations.
- Phenolic compounds are not used in fish processing plant as their use even in very small quantities leaves a long lasting odour and bad taste.

Degree of cleanliness

- Equipment, object or any food contact surface is considered clean only when it is clean physically, chemically and microbiologically.
- The object or the surface is considered physically clean when it appears clean by sight and feel. This is easy to achieve as this can be easily tested by close observation.
- Chemical cleanliness of an object or surface refers when the object or surface is free from traces of undesirable chemicals (too small to be seen or felt, but sufficient to influence the quality of the product).
- Even traces of some chemicals can affect the taste, odour, colour or keeping quality of the food product.

- The object or surface is considered microbiologically clean when it is free from undesirable microorganisms.
- This kind of cleanliness can be tested by determining the kind and number of microorganisms left on the object cleaned, decrease or increase of bacterial load of the product at the end of the processing line, and keeping quality of the product.