

Quality control measures, Assurance and management quality of fish, HACCP, Quality Standards

Quality control measures

The product quality can be attained by adopting quality control measures. Quality control is defined as operational techniques and activities that are used to fulfill quality requirements. These include;

- Total quality management
- Sanitation control procedures
- Sanitation standard operating procedures (SSOP)
- Good Manufacturing practices (GMP)
- Hazard analysis critical control points (HACCP)

9.2.1. Total quality management (TQM)

Quality management (QM) in food industry refers to management of all technical aspects such as processing facility, process adopted, personnel involved etc , that are necessary to maintain quality in a processing company. QM is often used interchangeably with quality assurance (QA) which is defined as all activities and functions concerned with the attainment of quality.

TQC refers to food industry's management approach necessary to maintain quality and is centered on the quality based on the participation of all its members, and aimed at long term success through consumer satisfaction, and benefits to the members of the organization and society.

9.2.2. Sanitation control procedures (SCP)

The quality of food can be achieved only when it is processed and handled under good sanitary conditions. The foods processed following sanitary measures involving well established sanitary control procedures in producing good quality product which does not pose any threat to human health as they are free from disease causing agents and extraneous material.

Factors to be considered in sanitation programme

The sanitation in food processing facility should take care of factors which influence contamination of food from the environment, and handling of raw material. These include factors such as,

- Structure, cleanliness and management of processing premises and equipment.
- Cleaning and disinfection operations.
- Personal habits / actions of food handlers which may introduce microorganisms to food.

Sanitary practice

Sanitary practices helps to prevent contaminants in to the product. This can be done by systematic control of environmental conditions during transportation, storage, and processing of foods to prevent contamination by microorganisms, insects, rodents and other animal pests and chemical substances.

Personal hygiene

Personal hygiene refers to habits and actions of food handlers which may contaminate food, and also steps taken to prevent.

Food hygiene practices

Food hygiene practices include conditions and measures taken for the production, processing, storage and distribution of safe, sound and wholesome food for human consumption.

Production of good quality food can be ensured by the the food processing industry by the application of sanitation standard operating procedures (SSOP) and hazard analysis critical control points (HACCP).

9.2.3. Sanitation standard operating procedures (SSOP)

SSOPs are sanitation control procedures which are necessary for the production of quality food. Sanitation control procedures established and implemented by the the processing industries should involve documentation of sanitary programme in the form of SSOP. This contains details of in-plant procedures to be followed by a food processing firm to control, monitor and correct the key sanitation conditions and practices.

The objectives of SSOP are to,

- Describe the sanitary procedures to be used in a food processing facility.
- Provide the schedule for the sanitation procedures.
- Provide a training tool for employees.
- Identify trends and prevent re-occurring problems.
- Ensure understanding of acceptable sanitation practices by everyone involved from management to production workers.
- Provide a foundation to support a routine monitoring program.
- Encourage prior planning to implement corrections when necessary.
- Demonstrate commitment to buyers and inspectors.
- Establish improved sanitary practices and conditions in the plant.

Implementation of SSOP

The processing facilities should implement SSOP to ensure quality of food being processed. The SSOP developed should be specific to each processing unit and describe procedures associated with sanitary handling of food, cleanliness of the plant environment, and activities conducted to meet them.

Types of SSOP

The SSOP developed by the food processing facility can be of two types,

- Informal SSOP
- Formal SSOP.

Informal SSOP outlines the frequency and procedures to be followed to control, monitor and correct deficiencies for a specific task/sanitation. And the formal SSOP is a written document in a standard format containing standard information for implementation of SSOP at each stage.

Requirements of SSOP

Irrespective of the type of SSOP developed by a processing unit, it should meet two important requirements.

- It should provide enough detail for someone to carry out the task in question.
- The procedures used should accurately reflect the activities being conducted.

9.2.4. Good Manufacturing Practices (GMP)

Good manufacturing practices are mandatory operational procedures that are to be followed to ensure product of good quality. The regulatory agencies specify GMPs to be adopted in the manufacturing, processing, packing, transportation and storage of each type of food meant for human consumption. The regulations of GMPs may include sanitary aspects covering equipments and utensils, sanitary facilities and control, sanitary operations, processes and controls, and personnel.

9.2.5. Hazard Analysis and Critical Control Points (HACCP)

The foods preserved for human consumption should be free from infectious organisms.

Application of good manufacturing practices often fails to ensure zero tolerance required for many pathogenic microorganisms. The classical approach to microbiological quality control has relied heavily on determination of microbiological parameter of both raw material and product. This requires too long time for getting results, offers no control over the process and often foods fail to meet quality standards. Thus, there is a need for fool proof approaches to ensure production of safe products. The newer approach for ensuring product quality is through the adoption of HACCP concept as a method of choice for ensuring the safety of foods from farm to table.

What is HACCP?

HACCP is a statement of prevention system of controls based on hazard analysis and critical control point. HACCP involves application of more systematic rule based approach for ensuring production of microbiologically safe food.

Hazard analysis

Hazard analysis involves identification of ingredients and products which might have pronounced effect on food safety. Hazards include any biological, chemical and physical property that might cause unacceptable consumer health risk due to contaminants, toxins, microorganisms etc.

HACCP was originally developed by Pillsbury Company to produce zero defect food for astronauts of NASA in USA. Since 1973, it has been adopted in food industry to produce quality food by identifying stages of hazards and applying control points to reduce /eliminate hazards. HACCP has been recommended by Codex Alimentarius and has become international reference system for food safety assurance.

Critical control point (CCP)

Any point or procedure in a food processing system where control can be exercised and hazard can be minimized or prevented. Therefore, loss of control over processing parameters would result in unacceptable risk to consumers.

Principles of HACCP

HACCP as a natural and systematic approach to food safety is based on seven basic principles. These include,

- Conducting hazard analysis.
- Determining critical control points.
- Establishing critical limit.
- Establishing monitoring procedures.
- Establishing corrective actions.
- Establishing verification procedures.
- Establishing record keeping and documentation procedures.

Conducting hazard analysis

This involves assessing hazards and risks associated with growing, harvesting, raw material, ingredients, processing, distribution, marketing, preparation and consumption of food in question. It helps to determine hazard which could pose threat to the safety of those consuming the product. Hence, hazards must be controlled by production process.

Determining critical control points

CCPs are identified after hazards are analyzed. This involves identifying potential hazards and their occurrence in process line (where they occur), and measures to control them. CCP is defined as a location, step or procedure at which some degree of control can be exercised over a microbial hazard thereby the hazard can be prevented, eliminated or reduced to acceptable levels. Loss of control at CCP would result in an unacceptable risk to the consumer or product. Ex: Raw material as CCP - if it contains microbial hazard, subsequent processing will not guarantee its control. Procedures like cooking, chilling, freezing, cleaning, disinfection etc could be CCPs.

Establishing critical limits

A critical limit is one or more prescribed tolerances that must be met to ensure that a CCP effectively controls a microbiological hazard. The critical limits (with tolerance limits where appropriate) established should include parameters such as,

Physical parameters such as temperature, humidity, quantity of material in a package, can seam dimensions etc.

Chemical parameters such as pH in acidified foods, aw of IMF, salt concentration, available chlorine in cooling water for cans, level of preservatives etc.

Sensory information such as appearance, texture, odour etc.

Management factors such as correct labeling of product, instruction of handling and use etc.

Establishing monitoring procedures

Monitoring of CCPs involve the scheduled testing or observation of a CCP and its limits. This helps to confirm and record that the control is maintained on CCPs. But, only such parameters which are easy and quick to measure and results can be obtained immediately should be considered to monitor CCPs. Example: physical and chemical parameters such as temperature, time, pH, aw etc.

Microbiological parameters are not generally suitable as long time is required to obtain results. Proper records should be kept on the performance of CCPs. This will help in process verification, analyse trends which could lead to loss of process control and to take easy remedial measures.

Establishing corrective actions

This involves establishing corrective actions whenever deviations occur in CCP monitoring.

Actions taken must eliminate hazard created by deviation in plan/process. If product produced is unsafe due to deviation in process, such products should be removed. The actions taken varies widely depending on the product being processed, and action taken must bring the CCPs under control.

Establishing procedures for verification

This involves establishing procedures for verification that the HACCP system is working correctly. Verification consists of methods, procedures and tests used to determine that the system is in compliance with the plan. Verification confirms hazards in HACCP system whenever occurs. Verification measures include compliance with set established microbiological criteria. Verification activities generally include establishment of verification inspection schedule, review

of HACCP plan, CCP records and deviations, random sample collection and analysis etc.

Establishing effective record keeping system

Establishing effective record keeping system is necessary to document the HACCP plan. The HACCP plan must be on file at the food establishment and made available to official inspectors. For recording and documentation, standard forms may be used with necessary modification. Record keeping should provide documentation for all raw material, ingredients, processing steps, packaging, storage and distribution.

9.3. Quality Standards

Food quality standards refer to reasonably complete and widely applied set of specifications for ensuring product quality that have been agreed nationally or internationally. Food standards have been introduced by several countries to protect the health of the consumers and also to ensure fair practices in trade. Thus, it is a technical specification or a document available to the public which is prepared with the cooperation and consensus or general approval of all concerned affected by it. Establishing a quality standard is based on the consolidated results of science, technology and experience with a aim to promote optimum community benefits and approval by a body recognized on the national or international level. Thus, a document of food standards is regulatory in nature and induces technical specifications and code of practices applicable to the concerned food. The terminologies that are commonly used in food standards include regulation, technical; specification and code of practice.

Regulation

Regulation is a binding document, which contains legislative, regulatory or administrative rules that is adopted and published by an authority legally vested with the necessary powers.

Technical specification

Technical specification is a document, which lays down the characteristics of a product or a service such as levels of quality, performance, safety and dimension. It may include terminology, symbols, testing and test methods, packaging and labeling requirements.

Code of practice

Code of practice is a processing specification that applies generally to processes of a given type. Codes are guidelines drawn for a whole industry by regional, national or international agencies and are voluntary or advisory in nature with codes relating to health protection having the force of law.