Unit – IV: Sanitation and Quality Control

4.1 Sanitation in Processing Plants

Environmental Hygiene in Processing Plants

Environmental hygiene refers to maintaining cleanliness and sanitary conditions in all areas of the fish processing plant to ensure the production of safe and high-quality products. The surroundings of the processing unit should be free from dust, stagnant water, waste materials, and pests. The building should be constructed with washable floors and walls made of non-absorbent materials. Proper drainage facilities must be provided to remove waste water and maintain a dry environment. Regular cleaning and disinfection of equipment, working tables, conveyors, and utensils are essential to prevent microbial contamination. The use of approved cleaning agents and sanitizers ensures effective removal of dirt, grease, and microorganisms. Ventilation and lighting should be adequate to maintain suitable temperature and working conditions. Waste bins must be covered and emptied frequently to avoid the attraction of insects and rodents. Proper maintenance of refrigeration systems, cold rooms, and storage areas is also necessary to prevent spoilage. A well-designed layout separating raw material handling and finished product areas helps to avoid cross-contamination. Overall, maintaining strict environmental hygiene in the processing plant guarantees safe and hygienic fish products.

Personal Hygiene in Processing Plants

Personal hygiene of workers plays a vital role in maintaining the safety and quality of fishery products. Every worker in the processing plant should maintain a high standard of cleanliness and follow proper hygienic practices. Workers must wear clean uniforms, caps, gloves, masks, and footwear during processing. They should wash and sanitize their hands before starting work, after using toilets, and after handling contaminated materials. Nails must be kept short and clean, and no jewelry or ornaments should be worn while working. Persons suffering from infectious diseases, wounds, or skin infections should not be allowed to handle fish. Training programs should be conducted regularly to educate workers about hygiene and sanitation. Facilities such as clean toilets, hand-washing stations, and changing rooms must be provided and maintained in a hygienic

condition. Smoking, chewing tobacco, or eating food in the processing area should be strictly prohibited. Supervisors should monitor personal hygiene practices to ensure compliance. By following these personal hygiene measures, contamination risks are minimized, and product quality and safety are ensured throughout processing.

4.2 Quality Control of Fish and Fishery Products

Pre-processing Control

Pre-processing control involves ensuring the quality of raw materials before processing begins. The freshness of fish is the most critical factor influencing the final product quality. Fish should be received from reliable sources and inspected for odor, texture, color, and signs of spoilage. Temperature control is essential from the moment of capture to prevent bacterial growth and enzymatic deterioration. Ice should be used in sufficient quantity during transportation and storage. Clean and sanitized containers must be used to avoid contamination. Sorting, washing, and grading should be done under hygienic conditions. The quality of water used in washing must meet potable standards. The pre-processing area should be separated from the main processing zone to prevent contamination. Raw materials showing signs of decomposition should be rejected immediately. Proper documentation of the source, date of catch, and handling methods ensures traceability and quality assurance. Thus, maintaining high-quality raw materials during pre-processing forms the foundation for safe and acceptable fish products.

ControlDuringProcessing

Control during processing refers to maintaining hygienic conditions and monitoring critical parameters while handling, cutting, cooking, freezing, or packaging fish. The processing area should be kept clean, and equipment should be sanitized before and after each batch. Temperature control during cooking, chilling, or freezing must be maintained as per product requirements to prevent spoilage and bacterial contamination. The use of clean water and ice is mandatory at all stages. Cross-contamination between raw and cooked products should be strictly avoided by using separate utensils and work areas. Processing parameters such as time, temperature, pH, and moisture content should be regularly monitored and recorded. Workers should adhere to good manufacturing practices (GMP) and standard operating procedures (SOPs). Proper packaging materials

must be used to prevent contamination and oxidation. Regular inspection of processing equipment ensures consistent performance. Quality control officers should perform random sampling to test microbial load, chemical residues, and sensory attributes. Maintaining strict control during processing ensures that the final product meets both domestic and export quality standards.

Control After Processing

Control after processing includes measures taken to preserve the quality of fish products during storage, transportation, and marketing. The processed products should be rapidly cooled or frozen immediately after packing to prevent bacterial growth. Cold storage rooms must maintain recommended temperatures, and regular checks should be conducted to ensure efficiency. Packaging should be airtight and resistant to moisture and oxygen to avoid rancidity and contamination. During transportation, insulated vehicles or refrigerated containers must be used to maintain the cold chain. Proper labeling with production date, expiry date, batch number, and storage conditions helps in traceability and consumer confidence. Periodic inspection and quality testing of stored products are necessary to detect spoilage or quality loss. Finished products should comply with national and international standards such as those set by FSSAI, EIC, and HACCP. Proper documentation and record keeping help in certification and export approval. By implementing effective post-processing control, the shelf life and safety of fish and fishery products are greatly enhanced.