

Course Name: Canning Technology and Value Addition in Seafood

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SOP for seafood canning P1

Welcome to the NPTEL course, Canning Technology and Value Addition of Seafood. In today's session, we will discuss standard operating procedures for seafood canning, focusing on national and international standards. Before delving into the details, let me briefly recap what we covered in previous sessions. We discussed various canning processes in detail, examining each step meticulously. We explored how the canning process varies across different seafood products. Additionally, we covered pre-processing machinery and tools commonly used in the seafood industry. The session concluded with a discussion on additives, their definition, significance in the seafood industry, and the various types used in the canning process.

Coming to today's session, SOP, that is standard operating procedures. In seafood processing, like any other food industry, there are strict processing and manufacturing standards that must be followed. No compromise is allowed with these rules, regulations, or protocols, as they directly impact food safety. Generally, we adhere to the HACCP rule, which stands for hazard analysis critical control point. This principle was developed in the 1990s and has been effective in maintaining food quality. All industries are directed to have a food safety plan, diligently practice it, and implement necessary developments and changes as approved and required. In the industry, we find GMP (good manufacturing practices), SSOPs (sanitary standard operating procedures), and HACCP principles. Other principles or regulations envisioning food safety are also included in this category. Anything supporting food safety or improving food quality will be adopted by the industry.

Coming to GMP, these practices or procedures are conducted by food processors to ensure the safety of food for human consumption. Most food products are aimed at human consumption, but even those for animal consumption, such as animal feed or pet foods, must follow GMPs. The emphasis is on ensuring safety, avoiding hazards or disease conditions in humans. Quality should be maintained from the beginning, from the industry's processing point, ensuring it is safe for consumption. Safety considerations encompass personnel, equipment, processes, operations, and the production environment.

All aspects relevant, directly or indirectly involved in food production, must be taken into account. GMPs are not plan or process-specific; it is an underlying statement adopted by the industry. It doesn't change with process to process or plan to plan; it is mandatory

for all companies to adopt stringently. GMP falls under the jurisdiction of the Food and Drug Administration. GMPs are listed in the Code of Federal Regulations, CFR 221 in part 110, with certain categories given. The first and most important category is personnel, because they are involved in food production. According to GMP regulations, plan management in industries should take reasonable measures and precautions to ensure certain factors, with disease control being the first. The human resource should not transfer any disease to the food or contaminate it. If there is a sick person in the industry, they should be immediately assigned to another job, avoiding direct contact with the food. Similarly, individuals with open wounds, boils, or sores should not interact with the food processing line, food contact surfaces, or food packaging section. They should either take sick leave or be assigned to another section where they won't contact food surfaces or packaging, ensuring disease transfer prevention. This is the first rule under GMP, should be monitored and maintained by every management.

The second rule is cleanliness. Proper hygiene practices during processing are crucial. Upon entering the company, the management must ensure people follow designed hygiene practices to protect the food from contamination. This includes wearing aprons; workers must change into uniforms and wear aprons, maintaining personal cleanliness. When using restrooms or toilets, they must wash and sanitize their hands as required. Workers in food lines cannot wear jewelry, grow nails, or use nail polish. These items must be removed and stored securely. Glasses and impermeable gloves are mandatory. Any tear or hole in gloves requires immediate replacement to avoid direct unnecessary hand contact. Proper tying of hair is crucial to prevent hazards; hair caps, bands, and nets are used.

Male workers in food lines must cover beards. While beards are generally not allowed, for religious reasons, beard covers can be used. Food consumption is prohibited in processing areas, ensuring no contact with food contact surfaces. Separate sections for eating, canteens, or restrooms are provided. Chewing gum, tobacco, or talking during processing is not allowed. These precautions fall under the cleanliness section, supervised to ensure proper adherence. Medications and cosmetics are not allowed in processing sections. Separate areas exist for personal belongings and medication, preventing their entry into processing lines. Education and training are crucial aspects; workers should not only be aware but also trained on the importance of maintaining cleanliness and GMP adherence.

Regular training is crucial to understand the importance of maintaining hygiene and safety in food. Training should be ongoing, ensuring workers are upgraded on hygiene practices. Educational programs on cleanliness and food safety must be intermittent but regular. There should be individuals overseeing compliance with GMP requirements,

ensuring regulations are followed. The supervisor plays a vital role in maintaining these standards.

Moving on to equipment in GMP, various tools and utensils are used in food processing. Utensils must be food-friendly, resistant to corrosion, and easy to clean. They should have smooth surfaces without dents where microbes could thrive. Easy cleaning and sanitization are essential. Equipment should not react with food components or sanitizing agents. Non-corrosive materials are preferred. Proper installation is necessary for easy cleaning, with access to water and sufficient space being key considerations. Equipment should not adulterate food; no metal fragments, lubricants, or contaminated water should enter the food. Equipment must be new, clean, and free from microorganisms. Joints or seams, if present, should be smoothly bonded without crevices or dents which will harbor the microorganisms or the contaminated water and which will in later stage will cause contamination such things should not be there if anything is there it should be on a smooth end and it should have a smooth surface

Non-food contact equipment, holdings, conveying, and manufacturing systems must maintain proper sanitary conditions. Food freezers and cold storage units should be equipped with thermometers, monitoring devices, and alarm systems these all come under GMP's though we say that freezer is working properly the temperature is coming down to minus 40 but we have to make sure that it is working properly for that we have to use thermometers and we have to check it regularly. It is essential to regularly check the freezer's temperature, either using a digital or glass thermometer, or employing alarm devices that signal temperature changes. Quantitative data should support claims of proper functioning. Compressed air and other gases used for sanitizing food contact surfaces must not contaminate food. Separate storage areas should be designated for these substances. Moving on to processing operations, every step, from receiving and sorting to pre-processing, packaging, inspecting, storing, and transferring, must be monitored. The entire process, from farm to fork, requires thorough oversight to ensure food safety.

The environment should maintain sanitary conditions and ensure that the product remains uncontaminated for safe human consumption. Immediate action is required if any issues arise during procedures, with monitoring and rectification done promptly. Emphasis should be placed on chemical parameters, microbiological organisms, and physical testing procedures to prevent food contamination. All the different types of hazards or all these different types of testing methods need to be adopted and need to be followed to ensure that food contamination is prevented. Identifying and addressing sanitation failures is crucial, and corrective actions should be implemented and regularly followed up like where it has happened, how it has happened and how it we can address. These things how we can rectify it the actions need to be taken immediately and it has to be seen that it is followed regularly even after addressing it. If it is being repeated again and again then what is the necessary action that is what is the corrective action that has to be

taken. We have to go into those details and we have to change those things and adulterated food it needs to be rejected immediately. The suppliers should be informed, and actions to treat or remove the issue must be taken immediately. These points directly relate to food. However, we also address the environment, focusing on areas around the plant, both inside and outside. The environment must be safe, free of dumps, garbage, or waste material. Waste material should not be dumped. A proper draining system is essential, and waste water treatment should prevent water coagulation, even during rainfall.

When vehicles enter from outside, there should be a dip to wash off dirt and other materials, ensuring they don't enter the plant premises. Necessary actions need to be promptly taken to maintain a clean and safe environment. All of this is intended to remove pests because waste attracts pests and rodents, posing a threat to food contamination. Therefore, maintaining proper environmental safety is crucial for ensuring safe food. Necessary actions may be taken. The plant premises are all tiled; there is no mud, making it easy to clean. Generally, it is tiled or cemented. There should be ample spaces for storing chemicals, sanitizing chemicals, raw materials, cold storage, and packaging material, as well as for storing the finished product should have ample space; there should not be any restrictions on the spaces. Sufficient space should be provided for all the equipment and other materials. We use light bulbs inside the plants, and they should be well-protected to prevent them from breaking and falling over the food. These factors need to be considered. Lighting and ventilation are crucial because people cannot work in the dark; they need proper visibility to identify any contaminants. Therefore, adequate lighting is necessary. When providing lighting directly over the table, it should be protected by nets or fixtures to prevent it from falling over the foot. These points are again part of GMPs when considering the environment. We discussed good manufacturing practices, which need to be implemented in every aspect of the industry—from the processing sector to the people involved in processing, machinery, equipment, and the use of sanitizing chemicals. The GMPs adopted should ensure that food is safe, free from contamination, and that people are not at any risk. With this, we'll conclude for today, and we'll meet again in the next session.