Course Name: Canning Technology and Value Addition in Seafood
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SOP for seafood canning -P2

Welcome back once again to the Canning Technology and Value Addition of Sea Foods. In today's session, we will be again continuing with the standard operation procedures in seafood canning industry and under this we have to discuss about different standards from national and international perspective. So, in the previous session we had discussed about good manufacturing practices and we had also seen what are the different criterias that need to be taken into consideration when we adopt, when we practice good manufacturing practices, GMPs. And next, we have to see standard operating procedures, it is otherwise called SOPs and similar to GMPs, SOPs also fall under the jurisdiction of Food and Drug Administration rule. SOPs they are plant specific, GMPs they are not plant specific, they are not process specific, but then SOPs they are plant specific. So, that means each industry they have their own SOPs.

We cannot adopt one industry's SOP for another industry. So, each industry has to design, they have to develop their own SOPs and SOPs these are designed to assure the protocols for performing a certain job during the manufacturing or processing of food. So, during the processing of food what all steps are to be adopted, what has to be done from the beginning till the end till the finished product is developed. So, all the steps this will be recorded in an SOP and this need to be followed closely and properly.

It is very important that if we have a good SOP which has to be followed stringently, religiously we have to stick to it and SOPs these are used along with the GMP. We have to identify what are GMPs and along with this GMPs, SOPs need to be adopted. Now in SOP, it is clearly defined who is going to do a particular job. If it is washing who is assigned to that particular job. Twill be given in detail and why we are doing it, what is the necessity of doing it, why we are cleaning the table, why we are cleaning the food contact surfaces, why we are maintaining a temperature, why the water is chlorinated, the reason needs to be given in the SOP and what it is, how it is done, what needs to be done that also has to be done.

Then the steps involved in completing the job, how to do it, how we chlorinate the water, how we clean the surface, how we sanitize it, what should be the amount of sanitizer, what should be the amount of water, what should be the amount of chlorine and all these things need to be taken or need to be mentioned in the SOP and what are the critical

limits. If we are saying that cooking temperature has to be 70˚C, then we have to mention the limit that it should not go above 70 ˚C, it should not come below 70 ˚C. So that critical limit of 70˚C that also need to be mentioned and also, we have to say what are the corrective actions, corrective measures that need to be taken. So, suppose we say that it is 70˚C that is the critical limit and suppose it goes above 70, it becomes 75 or 80, what is the corrective action that has to be taken to bring down the temperature to the critical limit. So, corrective actions need to be taken and it has to be monitored and verified and every job it has to be performed critically.

So, standard operation procedures, these are set of written instructions that document a routine or repetitive activity followed by the organizations. So, if the company is processing or canning the sardine in tomato sauce or canning the sardine in oils, oil or brine, then instructions need to be written in the document or it should be documented correctly what are the different steps or what are the different processes that need to be followed during the process. So, this is a repetitive action. Today you will process the same food like tomorrow also. This will be uniform for every day.

So, it is a repetitive action or the routine actions which are done by the company, by the organizations it is documented and it is written clearly with all the details, not even a single detail is missed in this SOP and it is an integral part of a successful quality system. Without this it is not possible to maintain the quality and it provides individuals with all the informations to perform job regularly and facilitates consistency in the quality and integrity of a product or end result. Suppose a person is allowed or his job is to chlorinate the water regularly and he has to see that water it is potable, it is chlorinated and one day he takes leave, the work should not stop there. Somebody should be able to replace him, that person should be able to do the job exactly like the previous person was doing. So, there should be a written document which can be adopted by the new person to do the job.

The SOP provides information to the person who is coming there. We do have people who are assigned particularly for one job but if they are not there, if for some reason, the person is on leave or something has happened then somebody should be there to replace him and he should do the work exactly like what the previous person was doing. So, that is what SOP does. It sees that throughout the processing till it reaches the finished product is developed nothing is getting interrupted and the product quality and integrity is being maintained. So, SOP sometimes it is interchangeably used as protocols or instructions, it is also called worksheets and sometimes it is called laboratory operating procedures.

Basically, it is one and same but we can use different terms for this and SOP. It aims in achieving efficiency, quality output, uniformity, again efficiency because if one person is

on leave the work should not stop, the efficiency should not come down, productivity should be there, production should continue with. There should be someone to replace him and it should work the exactly like how it was working on the previous day. There should not be any compromise with the efficiency, then quality should not be compromised, uniformity should be there. Today you have one type of product, tomorrow you cannot have a different type of product. There should be a uniformity in the performance and the product.

There should not be any miscommunication. One person says that 2 ppm chlorine and by the time it reaches to the person, another person becomes 2.5 or 3 that should not happen. There should be like exactly what is the precise amount, 2 ppm means it should be 2 ppm. So that correct things should be mentioned and SOP it prevents miscommunication and failures in the industry regulations.

Everything it complies with and compliance is very important and it complies with the regulations of the industries. And SOPs it describes both the technical and the fundamental programmatic operational elements. It includes analytical processes, it also includes maintaining processes, calibration and how to use the equipments. And SOPs they are specific to organization or facility and this is to maintain the quality to ensure that quality control and quality assurance are maintained and compliance with the governmental regulations is also ensured. This is very critical.

If SOPs are not written correctly, it is of no value. Conversely, if written properly, it becomes the best SOP. However, if not followed properly, it again holds no value. Therefore, if SOPs are written, they must be done so perfectly and adopted flawlessly. There should be no compromises with SOPs. Now, the benefits of SOP include minimizing variation and reducing product variations. It promotes quality through consistent implementation of processes and procedures within organizations. Even in the face of temporary or permanent personnel changes, such as people being on rotation, there should be no compromise with the product's quality; it should remain unchanged.

So, there should not be any change – that is the first and most important point of SOP, a benefit of SOP. Then, it indicates compliance with governmental requirements and organizational standards. It is also used as part of a personal training program and minimizes miscommunication. It addresses all safety concerns and serves as a checklist for auditing inspectors. Whenever there is an audit, SOPs are used as a checklist, reducing work effort. With documentation in place, you only need to refer to it and complete the work. This eliminates the need to discuss with many people to find out what is required and then design it again in your way. It is already documented, so look into it and perform the work. It improves comparability, credibility, and legal defensibility.

Using a correct, well-written SOP will minimize differences. These are the benefits of SOP.

SOP should be concise, step by step, with everything mentioned and written in an easy-to-read format. It should not be very complicated; jargon words should not be used. Write in simple words that everybody can understand. It should be a team effort, with experts in their own subjects contributing. When a revision is required, review and revise it as needed. Then, reapprove it; it should form a part of the checklist, as mentioned earlier. When designing an SOP, every document will have the following elements: a title page, a table of contents, procedures, quality assurance, quality control, and references. These are the five different elements that have to be in an SOP. On every page, there should be a mark in the right corner mentioning the short title or the ID, revised date, and page number. This comes in all the pages and should address all the steps from receiving, sorting, loading (pre-processing steps), and processing steps like cooking, exhausting, filling, and also the packaging steps. Everything needs to be mentioned in SOP.

This is an example of an SOP, not applicable to all industries, as it is plant-specific. It must be developed individually for each plant. The document includes SOP, page number, revision, and date on the right side of each page. The contents section outlines the scope, methodology, sample preservation, containers, handling, storage, and more. References and appendixes, containing programme charts and supportive figures, should be included.

Sanitation Standard Operating Procedures (SOP) fall under the jurisdiction of the United States Department of Agriculture (USDA) and address cleanliness and maintenance for ensuring wholesome and safe food. SOPs cover building integrity, wall and tile height, fixture and lighting specifications, equipment conditions, utensils, food contact surfaces, cleanliness, sanitizing agents, and prevention of adulteration. All aspects discussed in previous sessions under GMPs and SOPs are consolidated in SOPs.
Give emphasis to food contact surfaces, ensuring they do not harbor microbial proliferation or contribute to biofilm formation. Separate areas must be designated for storing chemicals - dry and wet chemicals should be kept apart to prevent contact with food surfaces. Additionally, they should not come into contact with water, necessitating the use of pallets or raised platforms for storing dry chemicals. An effective sanitation system requires diverse cleaning procedures tailored to the type of food soils and appropriate cleaning and sanitizing chemicals.

In general, hot water treatment or chlorinated water treatment is commonly employed. However, in industries such as milk or dairy, specific cleaning procedures must be adopted based on the nature of the food and potential impurities. Adequate pest control, proper water supply, effective drainage, and a well-functioning plumbing system are essential. Pipes should be color-coded to distinguish hot water, cold water, portable

water, and drainage systems. Proper sewage disposal is crucial, and there should be sufficient toilets for workers to avoid overcrowding and inconvenience for the entire workforce.

There should be sufficient toilets for men and women, along with separate areas for storing food. Adequate repair facilities must be available on the premises. Any required maintenance or changes should be addressed promptly. Handwashing stations, preferably foot-operated, need to be present. Waste disposal areas should be designated, and proper disposal methods must be followed. Good air quality is essential, and the premises should have insect-proof nets or other measures to maintain hygiene. Such practices need to be implemented.

Moving on to the next method, HACCP and ISO 9000 are regularly followed. HACCP, standing for Hazard Analysis Critical Control Point, is a preventive system. It ensures the safe production and processing of foods through a systematic approach. GMP, SSOPs, and SOPs are adopted to guarantee the safety of the finished product. If any issues arise, corrective actions are taken. Just as prevention is better than curing in sickness, HACCP is a preventive measure for avoiding contamination and ensuring food safety. It focuses on safety rather than quality.

ISO 9000 is an international standard organization 9000 series system. While not directly related to safety, it provides standards for maintaining quality during the production and manufacturing of food products. This ensures agreement among partners and upholds product quality in both national and international markets.

In HACCP, there are key terms such as acceptable level, control point, critical control point, critical limits, deviations, HACCP plan, and hazard. Let's delve into each term.

Acceptable level refers to the presence of a hazard that does not pose a likelihood of causing health risks. Each component has specific levels, defining the acceptable threshold below which it does not threaten human health.

The critical point in the food system or process is the point whose loss may lead to health risks, making them unacceptable. For example, during cooking, temperature and time are controlled to prevent microbial growth. Failure to maintain these conditions may lead to contamination and pose a threat.

Identifying critical points is crucial, and determining critical limits involves establishing the maximum and minimum values to control biological, chemical, or physical parameters. For cooking, the critical limits might include temperature and time.

Deviations occur when something is not in accordance with critical limits. In such cases, appropriate control measures must be adopted to address failures and maintain the safety of the food production process.

The HACCP plan is a document outlining formal procedures for following the HACCP principles. There are seven principles, and specific steps must be adhered to when applying HACCP.

Hazard refers to a chemical, biological, or physical property that poses a risk or threat to human life. Monitoring involves a planned sequence of observations to ensure that chemical critical limits are regularly checked and do not deviate. A recording system is essential for this purpose.

Preventive measures are actions taken to exclude, destroy, eliminate, or reduce hazards. For example, preventing physical hazards like jewelry falling into food products involves removing and safely storing such items. Smoking should be prohibited in the industry to prevent cigarette or matchstick contamination of food products.

Risk is an estimate of the likelihood and severity of a hazard occurrence, indicating the potential impact on human health. Sensitive ingredients are those posing biological hazards that may be harmful to humans.

Verification involves means, procedures, or tests to determine if the hazard system complies with the HACCP plan. Regular verification ensures that adopted systems align with the plan.

Today's session covered SSOP, its importance, the combination of GMPs and SOPs, and the definition of SSOPs according to US regulations. The discussion also introduced HACCP, highlighting important terms. In the next class, we will delve into the different principles and steps involved in HACCP.