NCVET
कौशल गुणवत्ता प्रगति

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

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National
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FICSI
Food Industry Capacity and Skill Initiative

Participant Handbook

Sector
Food Processing

Sub-Sector
Generic

Occupation
Quality Analysis/Assurance

Reference ID: **FIC/Q7604, Version-1.0**
NSQF Level: 5

Food Safety Team Leader

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> Skilling is building a better India. If we have to move India towards development then Skill Development should be our mission.

Shri Narendra Modi
Prime Minister of India

Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

FOOD INDUSTRY CAPACITY AND SKILL INITIATIVE

for the

SKILLING CONTENT: PARTICIPANT HANDBOOK

Complying to National Occupational Standards of
Job Role/ Qualification Pack: '**FOOD SAFETY TEAM LEADER**' QP No. '**FIC/Q7604 NSQF LEVEL 5**'

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Authorized Signatory
(Food Industry Capacity and Skill Initiative)

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The preparation of this participant Handbook would not have been possible without the support of the Food Processing Industries. The Industry feedback has been highly encouraging from inception to conclusion & it is with their input we have tried to bridge the skill gaps existing today in the Industry. This participant handbook is dedicated to all aspiring youth who desire to achieve special skills which would be a lifelong asset for their future endeavours and help them make a bright career in the Food Processing Sector.

About this book

This Participant handbook is designed to enable training for the Qualification Pack (QP) for the

Food safety team leader with Reference ID: FIC/Q7604 published by Food Industry Capacity Industry and Skill Iniave (FICSI).

This course encompasses all National Occupational Standards (NOS) of the Qualification Pack, Food safety team leader, Reference ID: FIC/Q7604. Each NOS is covered across one unit/s. This book is designed to upgrade the knowledge and skills for working as a 'Food safety team leader in the Food Processing Industry. This book will provide the necessary knowledge and skill inputs for a Food safety team leader to work in an organized and disciplined manner and following safe working practices, effective communication, documentation, and work ethics as well as production work, ensuring preparation and maintenance of work area along with the required machinery. Upon successful completion of this course, the participant will be able to:

Key Learning Objectives for the specific NOS mark the beginning of the Unit/s for that NOS

FIC/N7613: Design, develop and implement Food Safety Management System (FSMS)

FIC/N7614 : Conduct food safety audits and handle customer complaints

FIC/N9903: Ensure workplace health and safety

FIC/N9904: Ensure food safety at the workplace

FIC/N9902: Work effectively in an organization

SGJ/N1702: Optimize resource utilization at workplace

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1. Module 1

FICSI
Food Industry Capacity and Skill Initiative

Unit 1.1 Introduction to Food Processing Industry

Unit 1.2 The Importance of Continuous Food Safety Training for Food Safety Team Leaders

Unit 1.3 Roles and Responsibilities of Food Safety Team Leader

Key Learning Outcomes

At the end of this module, the trainees will be able to:

1. State the importance of the training program for a Food Safety Team Leader
2. Discuss the food processing industry and generic sub-sector in brief
3. Discuss the career opportunities available to a Food Safety Team Leader in the food processing industry
4. Explain the terminologies used while conducting audits in the food processing facility
5. Elaborate on standard business etiquette in the food processing industry
6. Discuss the workflow and departmental organisation in the quality analysis and assurance sector

Unit 1.1 Introduction to Food Processing Industry

Unit Objectives

At the end of this unit, participant will be able to:

1. Discuss the size and scope of the food processing industry in brief
2. Discuss the future trends and career growth opportunities available for Sanitation workers in the food processing industry.

1.1.1 Food Processing

Agriculture is India's mainstay industry. Most of the products from various agricultural occupations are consumed within the country and exported to different countries worldwide. Agriculture produce is also a raw material in the food processing industry. Food processing is the process of transforming raw materials into finished goods. They could be processed foods, ready-to-eat foods, food additives, or ingredients used to make other foods. The following figure explains the different levels of food processing.

Primary Food Processing

- Primary Processing relates to theconversionof rawagricultural produce, milk, meat, and fishinto a commoditythat isfit for human consumption
- Itinvolves stepssuch ascleaning, grading,sorting, packing, etc.

Secondary Processing

- Secondaryfoodprocessing is theconversionof ingredients into edibleproducts -
- This involves combining foods in a particular way to change properties. E.g.- Preparing oforange juices fromoranges

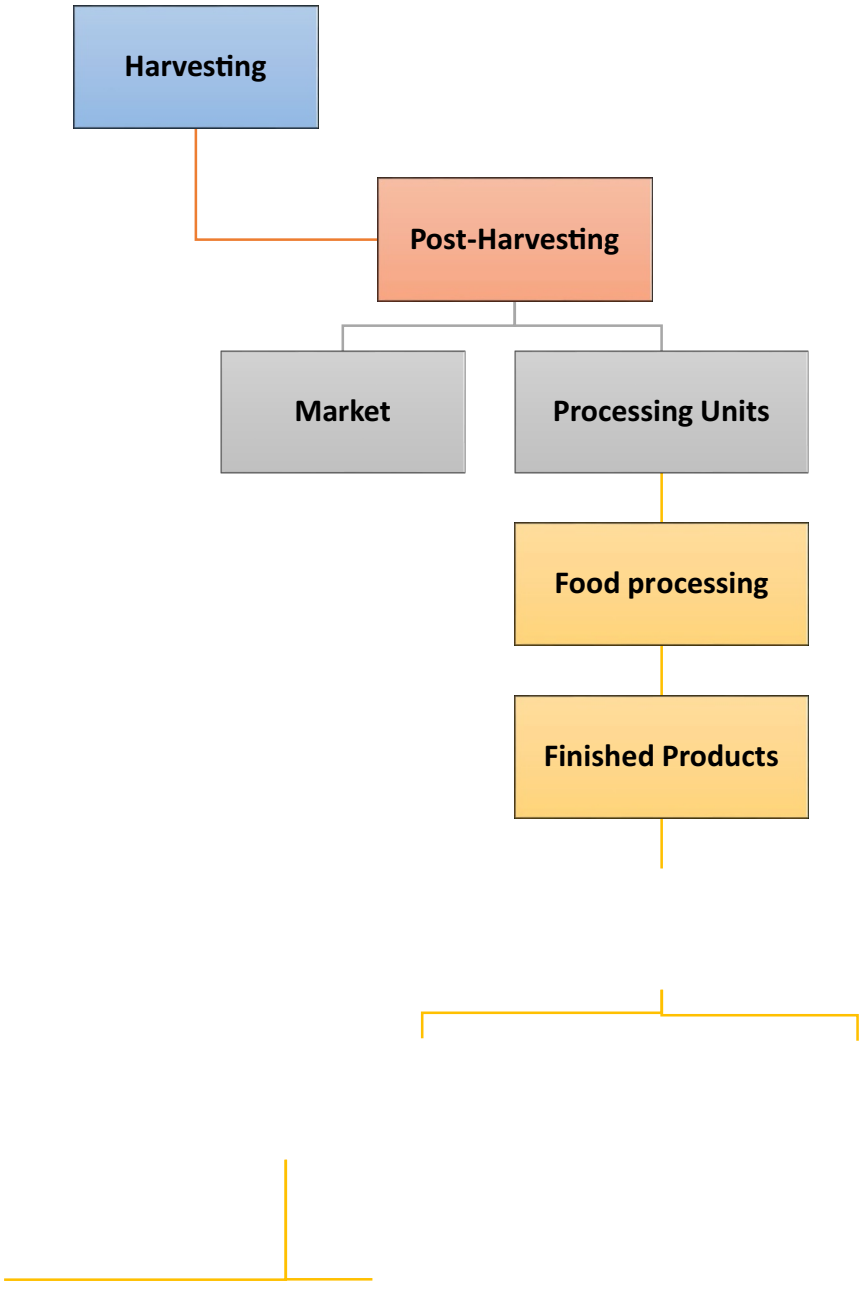
Tertiary Food Processing

- Tertiary food processing is the commercial production of what is commonly called processedfood
- These are ready-to-eat (RTE) or heat-and-servefoods .

Fig 1.1 Level of Food Processing

1.1.2 Journey of food from Harvest to Consumer

The flowchart below explains how food material becomes a final, consumable product for various customers



1.1.3 India's Food Processing Industry

- The major segments in the Food Processing sector comprise Fruits and Vegetables, Dairy, Edible Oils, Meat and Poultry, Non-alcoholic beverages, Grain-based products, Marine products, Sugar and sugar-based products, Alcoholic beverages, Pulses, Aerated beverages, Malted beverages, Spices, and Salt.

- In India, the food processing industry is divided into several sub-sectors.

Dairy	•Wholemilk powder, skimmed milk powder, condensed milk, ice-cream, butter and ghee, cheese etc.
Fruit and Vegetable Processing	•Beverages, juices, concentrates, pulps, slices, frozen and dehydrated products, potato wafers, pickles and pastes etc.
Grains and Cereals	•Flour, bakeries, starch glucose, cornflakes, malted foods, vermicelli, beer and malt extracts, grain-based alcohol etc.
Fisheries	•Fish oil, frozen and canned products
Meat and Poultry Processing	•Frozen and packed meat,egg powder, etc.
Bread and Bakery	•Biscuits, breads, buns, cakes, confectionery, pastries, cookies, etc.
Consumer Foods	•Snack foods,namkeen, biscuits, ready-to-eatfoods, alcoholic and non-alcoholic beverages

Fig.1.3 Sub-Sectors of the Food Processing Industry

Food processing is simply the method by which agricultural products are transformed into consumable food products. It entails various processing methods, such as grinding grain into raw flour, home cooking, and industrial methods for producing convenience foods, such as noodles, pasta, and chips. Due to the variety of food products that India harvests and processes for human consumption, the food processing industry is a significant contributor to India's economy. India is the world's leading producer of milk, bananas, mangoes, guavas, papaya, ginger, and okra; the second-leading producer of wheat, rice, fruits, vegetables, tea, sugarcane, and cashew nuts; and the third-leading producer of cereals, coconut, lettuce, chicory, nutmeg, mace, cardamom, and pepper. Rising incomes and growing demand for healthy packaged foods make it unlikely that this industry will ever experience a recession. Therefore, the government is also increasing its support for the industry.

Market Stats

- The food processing industry in India is one of the largest in the world, with an expected output of $535 billion by 2025-26.

- By 2024, this sector is projected to generate 9 million jobs.
- The food processing sector accounts for 32% of the Indian food industry, expanding at a CAGR of 11%.
- Between April 2014 and March 2020, the food industry in India attracted $4.18 billion in foreign direct investment.
- By 2030, India's annual household consumption is projected to have tripled, making it the world's fifth-largest consumer.

Key Growth Drivers & Trends

- The organised food retail sector is expanding, and urbanisation is rising.
- MSMEs play a vital role in India's food processing chain due to advancements in skills and technology.
- The online food ordering industry in India is expanding exponentially.
- There is a shift in emphasis from loose to branded packaging.
- There is a high demand for packaged, healthy, immunity-boosting snacks like roasted nuts, popcorn, and roasted pulses.
- The government's "Atmanirbhar Bharat" initiative prioritises this sector and provides support through several policies.

Recent Government Initiatives

In its "Make in India" initiative, the Indian government has prioritised the food processing industry and encourages investment in the sector. In addition, the government has developed the food processing supply chain by establishing 18 mega food parks and 134 cold chain projects. These initiatives will likely benefit food processing businesses. In addition, recent government initiatives, such as Mrs Nirmala Sitharaman's Rs. 10,000 crores ($1.35 billion) scheme to support this industry, have placed the food processing sector on a high growth trajectory.

Launch of GIS One District One Product (ODOP) Digital Map of India:

The Ministry of Food Processing launched, on November 18, 2020, the capacity-building component of the Pradhan Mantri Formalisation of Micro Food Processing Enterprises Scheme (PM-FME Scheme) and the GIS One District One Product (ODOP) Digital Map of India, which provides detailed information on ODOP products to all stakeholders. The objective of the ODOP programme was to upgrade SMEs on specific products (within a district) by providing a credit-linked subsidy of 35% of the eligible project cost, up to a maximum of Rs. 10 lakh (US$ 13,52 thousand).

Mr Narendra Singh Tomar, Minister for Food Processing Industries, emphasised the formation/creation of a local value chain and training of food processing entrepreneurs through the PM-FME Scheme. These training sessions will be conducted via online lectures and demonstrations and will benefit 8 lakh SME beneficiaries. In addition, on November 21 2020, the government approved a grant of Rs. 107.42 crores ($14.52 million) for implementing 28 food processing projects.

New Cold Chain Initiatives to Decrease Food Waste and Increase Exports:

The Ministry of Food Processing Industries (MOFPI) approved 28 new local cold chain infrastructure

projects in September 2020 to increase the export potential of the local agri-food industry and decrease food waste. These 28 projects fall under the "Pradhan Mantri Kisan SAMPADA Yojana" (PMKSY) programme, which the central government funds with Rs. 2,08 billion (US$ 28 million).

MOFPI also highlighted the benefits of these cold chain projects, which will contribute to India's independence. These integrated cold chain projects will be implemented in eleven states by either central or state-owned enterprises or other government-approved entities.

Mr Harsimrat Kaur Badal, Minister of Food Processing, stated that these projects would not only boost the food processing sector but also streamline the agricultural supply chain, generate employment, offer farmers and end-users better prices, and benefit allied sectors. In addition, the Federation of All India Vyapar Mandal (FAIVM), the local trade and retail body for FMCG products, applauded this initiative. It stated that it would prevent agri-food waste caused by a lack of temperature-controlled warehouses.

Other Food Processing Initiatives:

The government approved seven food processing projects totalling>Rs. 234 crore (US$ 31.63 million) in Meghalaya, Gujarat, Madhya Pradesh, Karnataka, and Maharashtra on November 25, 2020, including a grant-in-aid of Rs. 60.87 crores (US$ 8.23 million). MOFPI stated that these projects will leverage Rs. 173.81 crores ($23.49 million) in private investments and are anticipated to generate 7,750 jobs.

Recent State Measures in Kerala

Mr C Anandha Ramakrishnan, Director of the Indian Institute of Food Processing in Tanjore, emphasised India's enormous potential to become a global food factory, given the country's enormous food and grocery market share. During a webinar hosted by Kerala Agricultural University (KAU), he discussed the PM-FME scheme's new opportunities in the food processing industry.

Mr Ramakrishnan hypothesised that Kerala would benefit from food customisation and the promotion of convenient and ethnic food chains under the ODOP concept. Officials from KAU and the State Industries Department have collaborated to implement the ODOP concept to encourage SME concentration on local production. Under this initiative, various products, including mussels, tapioca, coconut oil, and spices, are considered for various districts.

Telangana

On November 2, 2020, tribal women in Untnoor, Telangana, established a food processing unit for the first time. Tribal Cooperative Finance Corporation Limited (TRICOR), Tribal Welfare Department of Telangana, the Government of India's Ministry of Tribal Affairs, and ICRISAT's Agribusiness and Innovation Platform collaborated to establish this unit (AIP). In addition to improving the economic conditions of tribal communities, this project aims to localise production and address malnutrition. Komaram Bheem Peanut Chikki Industries unit will supply its products with government nutrition programmes and anganwadis in the tribal region.

Chandigarh

The Punjab government established the Punjab Food Processing Advisory Committee in September 2020 to encourage investment in the food processing sector. Mr Om Prakash Soni, Minister of Food

Processing for the state of Punjab, assured that this move would increase the farmers' faith in the system because they can realise reasonable crop prices. Captain Amarinder Singh, the chief minister of Punjab, called for special attention to the state's food processing industry, as it will boost farmer incomes and the state's economy. In addition, Mr Joginder Singh Mann, chairman of Punjab Agro Industries Corporation, praised the survey conducted by the food processing department in Chandigarh under the ODOP scheme.

International – Coca-Cola, Pepsi, Unilever, Mars, Mondelez (Kraft Foods), Kellogg's, Del Monte, Cargill, Ferrero, Nestle, Danone, McCain, Hershey, and Perfetti Van Melle National – Kissan, Amul, Godrej Industries, Parle Agro, ITC Ltd., Agro Tech Foods, Dabur India Ltd., Britannia Industries Ltd., Sunfeast,

Road ahead

Several factors, including a rise in health concerns, the ongoing COVID-19 pandemic, busy lifestyles, and an increase in food adulteration, have led to a shift in consumer purchasing habits, including an increase in demand for ready-to-cook, ready-to-eat meals and healthy, immunity-boosting snacks. In addition, during the COVID-19 outbreak, safe and processed food categories such as cookies and snacks have experienced growth.

In an interview with Economic Times, Mr Anand Ramanathan, Partner at Deloitte India, stated that the Indian food processing industry has yet to capitalise on its opportunities. He stated that India ranks far below the global average in the sector and has only a 10% market share among Asian nations. The food processing sector in India is 1.5 times the size of the agricultural sector. At the same time, it is 4-5 times larger in developed nations. In India, the ratio of food retail sales to agricultural GDP is relatively low compared to other developed nations, indicating an opportunity to expand the food processing industry. Currently, India processes 10% of its agricultural output; therefore, there are enormous opportunities to increase processing levels and attract investments in this sector.

Mr Ramanathan added that the growth of the food processing sector would be driven by retail demand and the increasing number of health-conscious consumers who prefer safe, branded food. In addition, he described COVID-19's role in promoting agriculture and horticulture. Currently, the Indian food processing industry comprises a diverse assortment of MSMEs. In addition, he stated that a robust crop value chain with adequate funding and technological applications would boost the food processing industry through the SME sector.

1.1.1 Food Processing

The fruit and vegetable processing sub-sector deals with processed, semi-processed, and packaged foods made from fruits and vegetables. These includes:

Fig.1.4 Various Processed and Semi-Processed Food Products

Specific parameters are essential when selecting a fruit/vegetable for processing. They are:

1. **Demand for processed food made from that vegetable/fruit**
2. **High-quality produce**
3. **Continuous supply**

These parameters are critical for ensuring that raw materials can withstand the processing and preservation processes.

1.1.1 Food Processing

The following are some standard methods of processing fruits and vegetables:

Unit 1.2 The Importance of Continuous Food Safety Training for Food Safety Team Leaders

Unit Objectives

At the end of this unit, participant will be able to:

1. State the importance of the training program for a Food Safety Team Leader.

Importance of Food Safety Training

According to analyses of foodborne diseases from around the world, most food-associated diseases are caused by mistakes in food preparation. For this reason, food industry workers must undergo training and education in proper food handling, which must also cover proper hygiene practices. According to the Centers for Disease Control and Prevention (CDC), improper food handling practices in restaurants and other food businesses primarily contribute to spreading foodborne illnesses. Examples of improper food handling practices include the following:

- Contamination of uncooked and cooked food by cross-contamination
- Inadequately prepared food
- Storage at inappropriate temperatures

Additionally, the FSSAI has suggested that all licenced food businesses have at least one trained and certified Food Safety Supervisor under FoSTaC for every 25 food handlers working within each premise. This recommendation was made in response to a previous directive from the FDA. In addition, 17 distinct types of competency-based certification programmes are made available by FSSAI through FoSTaC. Each class lasts anywhere from eight to twelve hours and lasts over one to two days. Subject matter experts have designed courses, and FSSAI's expert committee has attended and reviewed them. The general hygiene or manufacturing practices detailed under schedule 4 of the FSS Regulation are the foundation for the training manuals. The courses have been organised into the following three levels.

FSSAI could also offer additional training courses, including customised courses that could be introduced in due course as the need arises. Currently, courses are being offered in face-to-face mode. While this would be continued, but subject to the availability of credible training partners, some of the courses could be allowed through online mode as well. FSSAI has created training content for the above courses. The same is available in English and translated into Hindi and ten regional languages.

Training is more beneficial when an effective follow-up requires monitoring and mentoring in the food premises. This is because of the need for these activities. At this point, it is necessary to have a supervisor who has received training to ensure that employees handling food are using their knowledge appropriately. Food handlers are better prepared to follow safe food handling practices if they receive training in addition to mentoring. Simply having theoretical knowledge is insufficient to maintain the behavioural change and good practices they have started.

During their training, those who handle food should be made aware of the conditions that require them to rest at home. For example, food service employees suffering from throwing up or diarrhoea must remain at home in the current scenario. COVID-19 symptoms include things like fever and coughing. Food handlers need to be aware that any carelessness in this regard could lead to the transmission of diseases to others either directly or indirectly through surfaces such as doorknobs, menus, sink taps or even through the food they handle while they are ill. Therefore, continuous training in food safety is necessary to prevent the spread of diseases. Food workers in various settings are responsible for spreading foodborne illnesses; as a result, training and preventative measures should be implemented.

Food handlers can be asymptomatic disease carriers, and if they follow poor hygiene practices, they also can be a potential source of contamination for the food they handle. However, it is possible to improve food handling methods by receiving sufficient training and then applying that training to effect positive behavioural change. Studies conducted in research suggest that ongoing training in food handling, such as refresher courses or courses of shorter duration, can improve food safety practices. According to several studies, food handlers show improved food safety behaviour after receiving training tailored to address a need in their work area.

Food handlers can gain the knowledge they need to make safe and informed decisions about their food handling practices by participating in training programmes focusing on good food safety practices. When employees are given adequate training, there is less likelihood that food will be lost, contaminated, or wasted due to poor handling. Continuous training and the diligent application of food safety principles in daily life will make safe food handling behaviours second nature. Refresher courses serve as a gentle nudge to remind participants of the importance of maintaining high food safety standards. They gain the direction and knowledge they need through training courses to adhere to food safety standards. In addition, they are provided with the most recent information on proper food handling. They are aware of food inspectors' criteria when conducting their inspections.

A food Safety Team Leader's Training Must include the following aspects:

- Introduction to Food Safety Culture
- Overview of GMP-Based Codex and Terms
- The Basic Conditions to Achieve Food Safety - PRP
- HACCP System -In general
- Food Safety Hazards
- Role of Allergens in Food Safety
- Allergen Management and Control
- Food Defense - An Overview
- Food Fraud, TACCP and VACCP
- Food Safety Culture
- Cleaning and Sanitisation Practices
- Food Safety Management System Documentation
- Personal Hygiene

Unit 1.3 Roles and Responsibilities of Food Safety Team Leader

Unit Objectives

At the end of this unit, participant will be able to:

- Summarise the key roles and responsibilities of Food Safety Team Leader
- List the various terminologies used in audits
- Discuss the standards for handling hazards and ensuring a clean work area.

1.3.1 Roles and responsibilities of Food Safety Team Leader

The operators of food businesses are required by law to ensure that their employees receive the appropriate instruction in food handling. Furthermore, the individual responsible for maintaining food safety measures within the business must have had the appropriate training.

This indicates that senior staff members, such as middle and upper management, food hygiene trainers, and head chefs, should participate in the appropriate safety training to guarantee that they pass on the appropriate training to all their staff members who handle food.

Food safety team leader summary of functions

The Food Safety Team Leader is in charge of the organisation's Food Safety Management System (FSMS), which they manage. This includes supervising food safety processes such as audits, corrective actions, and recalls, as well as keeping the organisation informed about issues related to food safety. Additionally, it is the responsibility of the Food Safety Team Leader to organise the Food Safety Team following the requirements outlined in the standard. The Food Safety Team Leader ensures that the team possesses the appropriate expertise, time, training, and experience for the assigned tasks. e assigned.

The Food Safety Team Leader is going to be in charge of leading this team. The F team Leader will lead this team. The Food Safety Team Leader will be responsible for scheduling meetings, preparing agendas, and collecting information to bring to the meetings. o the meetings. o the meetings. o the meetings. o the meetings. o the meetings. o the meetings. o the meetings. o the meetings. o the meetings. o the meetings. o the meetings. o the

Food Safety Team Leader Essential Duties And Responsibilities

- In order to ensure that all food safety procedures and instructions are up to date, they should be reviewed regularly.
- Examine requests to amend FSMS-related processes and work instructions, and guide the Food Safety Team through such examinations of the requests.
- Manage the Food Safety Team and make sure that all of the necessary processes for the Food Safety Management System (FSMS) are established, put into place, and kept up to date.

- Make a report on the performance of the FSMS and any areas that may need improvement to the President and high management.
- Make sure that everyone in the organisation knows customers' food safety needs, and do your best to promote that awareness.
- Create the required programmes for the company, ensure they are executed, monitored, and reported to the appropriate parties, and perform periodic reviews of the PRPs.
- When necessary, put together Food Safety Teams.
- Construct a Flow Diagram for each product or process category covered by the Food Safety Management System. Then, check to ensure that the diagrams are accurate.
- Carry out the necessary risk assessments.
- Check to see that the purchase orders reflect the necessary inspection requirements.
- Evaluate the food safety management systems of suppliers and vendors; continuously monitor and report on the performance of suppliers concerning food safety.
- Examine all of the items that the Food Inspector rejected.
- Review the changes made to the manufacturing methods to ensure that any possible threats to food safety have been effectively handled.
- Confirmation of the non-conformity and determination of the disposition of the materials that do not conform
- Maintained oversight of the internal food safety audit programme, including selecting internal audit employees, assessing food safety audit results, verifying that corrective actions are comprehended, and supervising corrective actions.
- Providing a report on the alterations and modifications that were made during Management Review meetings
- Collect, examine, and make public measurement data to establish the underlying cause of food safety issues in the manufacturing process and the finished product and to make recommendations for how these issues might be resolved.
- Recall products and supervise their return to stores to guarantee their successful deployment and operation.
- Supervise hazard analyses, communicate the results of analyses to top management, and conduct periodic reviews of food safety-related activities to ensure that all dangers are accounted for and controlled.

The leader of the food safety team is accountable for the following: In the course of carrying out an analysis of the organisational demands placed upon the food safety programme, The determination of any potential or existing risks to food safety, as well as the identification of any organisation-specific requirements, such as the impact that an existing organisation policy has on food safety, existing policies and procedures, food handling operations, production processes, and the identification of any organisation-specific requirements. In addition, some dangers must be considered, as well as the current product requirements that must be provided to suppliers, the determination of quality assurance parameters for the final product that must be offered, and an appraisal of the need for change.

The leader of the food safety team is responsible for the identification of food safety management system requirements such as product description, determining the scope and requirements of the food safety system based on regulatory guidelines and customer expectations, forming a team, identifying goals, clearly communicating food safety responsibilities, obligations, and roles to stakeholders, reviewing flowcharts of processes, and implementing changes as necessary are some of the r Food safety team leaders is responsible for the identification of food safety management system requirements such as product description, determining the scope and requirements

A food safety team leader is responsible for carrying out the pre-HACC Steps to get the process of constructing a food safety management system off the ground. The first step is to form a body of individuals who will be held accountable for ensuring food safety. At least one representative from each division should be incorporated into this committee. This ought to be a priority. A member of the group who took on the role of a representative was responsible for ensuring that everyone's obligations and responsibilities were pretty distributed. Next, you will need to supply the food safety team members with a product description. This description should include the product's name, category, minimum retail price, maximum shelf life, regulatory requirements for manufacturing, label claims, nutritional information, storage and distribution information, and other pertinent particulars. The following phase is to become familiar with the product's constituents and determine the standards the product must meet to satisfy the target market's requirements.

Developing process flowcharts according to Good Manufacturing Practices, Good Laboratory Practices, and regulatory requirements for all of the processes included in the final product's production is the responsibility of the leader of the food safety team. Developing process flowcharts includes the following steps: Good Manufacturing Practices, Good Laboratory Practices, and regulatory requirements. For instance, in the biscuit industry, there are cleaning processes, the receiving of ingredients, quality inspection premixing, sugar grinding, the preparation of invert syrup, the flour sieving process, the mixing of ingredients, the moulding/cutting of dough, baking, cooling of biscuits, packing, the use of re-work, and the process of waste disposal. These are just some of the many processes that are involved.

The leader of the food safety team is responsible for verifying the existing process flowcharts and looking for any holes in those flowcharts, determining whether there were any violations of the food safety protocols, and finding a solution to any problems that were discovered after the flowcharts were inspected. The following step is to ascertain the training requirements of the staff and the team members and then to develop relevant training programmes.

It is the responsibility of the head of the food safety team to conduct a hazard analysis in order to identify the different categories of hazards and compile a list of food safety dangers that are most likely to result in food safety problems. Next, identify the elements that may influence the chance of the hazard occurring and its severity by classifying the food safety dangers as either physical, chemical, biological, or allergic. This will allow you to determine the factors that may have an effect.

The leader of the food safety team is accountable for determining where the critical control points (CCPs) are located in the process. These are the points in the procedure at which risks can be removed entirely, reduced to a tolerable level, or avoided altogether. Next, determine the critical control limits that can be exceeded for each critical control point. These outlines ought to be able to be scrutinised and evaluated quantitatively. [This is a prime example] Establish the monitoring strategy and delegate

particular responsibilities to each staff member working on it. Recording observations or measurements to assess on a predetermined schedule whether or not the CCP is being satisfied should be one of these jobs. The schedule should be determined in advance. The monitoring has shown that the critical thresholds are not being kept at the correct levels. In such a circumstance, you will need to take the proper steps to regain control of the process for it to be carried out effectively and successfully. Imagine for a moment that the requirements set forth for the CCP are not being met. In a situation like this, the proper remedial actions must be carried out using various approaches, like decision trees.

Creating verification mechanisms to determine whether the HACCP plan is valid is vital. During the process, you must ensure that all prospective threats are unearthed and managed using essential control points and constraints. You need to develop a strategy, a procedure, and pre-operational checklists before you can conduct audits successfully. Record-keeping and documentation processes that are both efficient and effective need to be put into place in order for the food safety management system to work as it was designed to and for appropriate oversight to be exercised. Make a timetable for the ongoing quality control and risk assessment that will be done on the system, and follow it. All staff must be familiar with the food safety management system, including its rules, procedures, and product requirements.

In addition, make sure that there is sufficient signage and you can get to the information being displayed. In conclusion, to successfully implement the plan, it is required first to determine the training requirements of the human resources and then to conduct the appropriate training to meet those requirements. Lastly, confirm that the critical control limits and CCPs can be measured with the assistance of the appropriate technology, such as a dependable database management system. This should be a priority for you.

The leader of the food safety team is accountable for the following: Monitoring operational activities, which may include pre-requisite programmes, standard operating procedures, critical control points, traceability, and critical limits, among other activities. This is one technique to ensure that the food safety management system is as solid as possible. After the root cause of the system's non-compliance has been identified and addressed, the system will again comply with the applicable regulatory standards. Take the product off the market if it does not conform to the specifications. Start the appropriate corrective processes, such as removing it from circulation if necessary. When you have received clearance for the food safety management system, you should immediately begin implementing any extra corrective and preventative activities required to keep the system working without a hitch. You can determine whether or not the HACCP plan contains any inaccuracies by reviewing the supporting documentation and policies, such as flowcharts, procedures, product specifications, monitoring systems, and corrective measures. This will help you determine whether or not the plan contains any errors. Make adjustments to the procedures that were one of the factors that led to the breach in food safety, document those adjustments, and then communicate them to the team along with an implementation strategy. Maintain food safety management systems continuously updated by the regulations and seek authorisation from the competent authority.

The leader of the food safety team is responsible for setting the scope of both the audit and the inquiry to determine the extent to which both will be conducted. First, deciding the required evidence to address the audit scope and criteria is necessary. Next, it is necessary to determine the collection methods that are the most suitable. Finally, it is necessary to ascertain each employee's roles and responsibilities during the audit. In addition, prior to moving forward with the audit, it is essential to

secure the management team's cooperation. Following this, you should devise a plan for the audit and make it available to the public. In the end, you need to plan, organise, and prepare the relevant resources and needs for the audit, as well as the closure of any non-conformances discovered while doing the audit.

It is the responsibility of the leader of the food safety team to communicate information regarding the audit scope. In order to evaluate whether or not the food safety management system is compliant, the audit checklist needs to be checked. Find any inconsistencies or departures from the predetermined processes and policies, note them, and proceed with the proper course of action. Collect evidence that can be used to prove that there were deviations from the system, as well as conformities and non-conformities, concerning the audit checklist, procedures, and processes. The food safety team members will investigate each technique and location during the inspection. After that, they will wrap up the review with a procedure consistent with auditing standards. After you have prepared audit reports that meet the requirements of the audit scope, you should transmit them to the appropriate people. Please analyse audit findings to ensure that evidence corresponds with the standards stated by the approved food safety management System, report any non-conformities with the requirements of the food safety system, etc. Finally, it is necessary to conduct research and a review of the audit evidence in order to locate any sections of the food safety management system or the regulations that are not being complied with.

The leader of the food safety team is responsible for compiling a list of the non-conformances discovered by the auditors and conducting an investigation into their root cause, in addition to reviewing any preventative measures and corrective actions that the auditee may have proposed. It is of the utmost importance to investigate the particulars and ensure that corrective and preventative measures have been carried out effectively. After the corrective action taken in response to nonconformances has been implemented, please continue to keep a close eye on it over the next few days. Please verify that the appropriate steps have been taken to close it out. If there is a deviation, you need to take the necessary actions. Auditing programmes should be evaluated and improved whenever the need arises, and new opportunities present themselves. The HACCP plan or the audit report must be updated to consider any necessary revisions. Pay attention to the issues voiced by customers about the quality of the food being served and act accordingly. Please find out the underlying problem that led to the complaint, and then start to work on fixing it as quickly as possible so that it does not occur again. If it turns out to be necessary, you should go ahead and cancel the order for the product. To be following the food safety system, one must first establish the processes that will be used to deal with non-compliance. If incidents of non-compliance occur, you are obligated to report them to the regulatory authorities as soon as possible.

1.3.2 Various Terminologies used in Food Processing Facility Audits

1. Acceptable Level - Organization's end-product food safety hazard level.
2. Accreditation - Accreditation confirms a certification body's management systems and competence to certify against a standard.
3. Action Criterion - Measurable or observable specification for monitoring an ISO 22000 OPRP. An action criterion determines whether an OPRP retains control. When the action measure is met,

the OPRP is in control. The Hazard Control Plan (HACCP/OPRP Plan) should be followed if it is not.

4. Adulteration - Undeclared ingredients added to food for profit.
5. Agent - A company that facilitates trade between an organisation and its raw material or packaging suppliers but never owns the goods.
6. Airlock - A space that allows people and materials to pass between two areas with two doors that do not open simultaneously, minimising the transfer of pests, dust, odours, or air.
7. Allergen - Food ingredient that causes immunological reactions (e.g. nuts and others identified in legislation about the country of production or sale).
8. Ambient High Care - Ambient area, designed, maintained, and operating to a high hygienic standard, where employees, ingredients, equipment, packaging, and environment aim to minimise product adulteration by pathogenic microorganisms.
9. Announced Audit - The organisation/site and certification body agree on the audit date.
10. Approved Supplier(s) - Risk-assessed suppliers who can meet the site's food safety requirements for materials and services.
11. Assessor (for Accreditation Bodies) - The person assigned by an Accreditation Body to assess a Certification Body.
12. Assured Status - Products produced in accordance with a recognised product certification scheme, the status of which needs to be preserved through the production facility
13. Products are certified by a recognised scheme, whose status must be maintained by the production facility (An example scheme would be GlobalGAP or “Organic Certification” such as Soil Association Certification).
14. ATP Bioluminescence Techniques - ATP (adenosine triphosphate), a substance used in cell energy transfer, detects biological material on surfaces. A short analysis can define acceptable surface levels. Test Based on firefly ATP luminescence. Surface-collected ATP reacts with Luciferin/Luciferase to create bioluminescence. Luminometer measures bioluminescence light in RLUs (RLU).
15. Audit - Systematic, autonomous, and documented process for gaining and evaluating audit evidence to determine if audit criteria are met. An audit can be internal (first-party), external (second-party or third-party), or combined (combining two or more disciplines).
16. A systematic examination to measure compliance with a predetermined system and whether it is implemented effectively and suitable to achieve goals.
17. A qualified food safety auditor systematically and independently examines a site's food safety system to determine if food safety, systems, hygiene, and management activities comply with the food safety standard.
18. Audit Checklist - A list of requirements available for use by an auditor when conducting an audit.
19. Auditor - A licenced certification body's employee or contractor who audits a site's food safety management system.
20. Auditor Authenticity - A person possessing the appropriate competence and skills to conduct an audit.
21. Calibration - Calibration compares a device's measurements to a known-accurate standard. Calibration of customer instruments against primary standards provides traceability. Set of

operations that create, under specified conditions, the relationship between measured quantities, material measures, or reference materials, and traditional values.

22. CCP – Critical Control Point - A step where control can be applied to prevent, eliminate, or reduce a food safety hazard.
23. Central Site - A certified site where activities are planned to control and manage sub-sites in a multi-site programme.
24. Certificate - A licenced certification body issues a site certificate after a food safety certification and re-certification audit.
25. Certificate Suspension - Revocation of certification for a given period, pending remedial action on the company's part.
26. Certificate Withdrawal - Regaining certification after revocation requires an audit.
27. Certification - Certification by a licenced body that a site's food safety management system complies with the relevant standard/scheme.
28. Certification Audit - An audit of an uncertified site's food safety management system, including a desk audit.
29. Certification Body - Entity licenced by the Food Safety Management Standard/Scheme to certify a site's food safety management system according to the Standard/Certification Scheme's Body Criteria.
30. Certification Cycle - Annual interval between certification/re-certification audits.
31. Certification Number - A unique number provided by the Food Safety Management Standard/Scheme Owner and included in a certified site's certificate.
32. Clause -A certification requirement or statement of intent.
33. Compliance - Meeting the regulatory or customer requirements concerning product safety and legality.
34. Conformity - Fulfillment of a requirement.
35. Consultant - A registered expert who can help develop, validate, verify, implement, and maintain a food safety management system for a client site in the food industry categories appropriate to their registration.
36. Contaminant - Any substance not deliberately added to food due to production, manufacture, processing, preparation, treatment, packaging, packaging, transport, holding, or environmental contamination.
37. Contamination - Unwanted organism, taint, or substance in packaging, food, or food environment. Physical, chemical, biological, and allergen contamination exist. Contamination also means package correlation.
38. Continual Improvement - Routine activity to enhance performance.
39. Control -- To maintain an operation's compliance with established criteria and the state of following correct procedures and meeting criteria.
40. Control Measure -Any action that can prevent, eliminate, or reduce a food safety hazard. Necessary action to prevent or reduce a food safety hazard.
41. Controlled document - An identifiable document for which revisions and removal from use can

be tracked. The document is issued to identified individuals, and their receipt is recorded.

42. Correction - Elimination of nonconformities or deviations. Remove a non-conformity. Corrective action can include handling potentially unsafe products. Reprocessing, further processing, or eliminating non-negative conformity effects are examples of corrections (such as disposal for other use or specific labelling).
43. Corrective Action - Any action when CCP monitoring indicates a loss of control. Action to eliminate non-conformity and prevent a recurrence. Corrections involve cause analysis. Remedy for non-conformity or other problems. Corrective action includes determining and documenting immediate action. Problem-solving. Evaluating cause-related action. Determine if the problem is system-wide and take action. Recording actions and results. Objectively reviewing, verifying, and documenting action effectiveness. Remedy for a detected non-conformity, deviation, or other problem.
44. Crisis Management - A site manages an event (e.g. flood, fire) that affects its ability to provide safe food and requires a crisis management plan.
45. Critical Control Point (CCP) - Control measures are applied to prevent or reduce a significant food safety hazard to an acceptable level, and critical limits and measurements enable corrections.
46. Critical Limit - A measure of acceptability. Critical limits determine a CCP's control. Products are affected if a critical limit is exceeded or not met.
47. Cross-docking - Material is unloaded at circulation premises and handled but not formally put into storage.
48. Desk Audit - A licenced certification body reviews a site's documentation as part of the certification audit to ensure it meets the Food Safety Management Standard/Scheme.
49. Deviation - Failure to meet a critical limit.
50. Documented Information - Organisational information and its medium. Information can be in any format, media, or source. For example, documented information can refer to the management system, documentation, or results (records).
51. Environmental Monitoring Program (EMP) - A programme that includes pathogen or indicator swabbing to detect risks in processing environment sanitation. Verify a facility's high-risk pathogen controls.
52. Exempt - A term that is applied to aspects of the Food Safety Management Standard or Food Safety Management Scheme that the site does not wish to be included in the certification audit, and the site has submitted a written request to the certification body to exclude, prior to the beginning of any scheduled audit activity.
53. Exposure Assessment - If relevant, evaluate biological, chemical, and physical agent intake via food and other sources.
54. Facility - Site's address. The area where a product is produced, processed, packaged, and stored, including processes, equipment, environment, materials, and personnel. The same operational management must oversee the facility. Site audits examine the facility.
55. Factory Inspection (versus Internal Audits) - Any appropriate person inspects factories for hygiene, pest control, product control, fabrication, and foreign material hazards.
56. Food Additive - A substance not generally consumed as a food by itself and not commonly used as a typical food ingredient is added to food to improve its technological (including organoleptic)

properties. For example, food additives preserve flavour or improve taste, appearance, or other qualities. The term does not include nutritional supplements.

57. Food Authenticity - A substance not generally consumed as a food by itself and not generally used as a typical food ingredient, added to food to improve its technological (including organoleptic) properties. For example, food additives preserve flavour or improve taste, appearance, or other qualities. The term does not include nutritional supplements.
58. Food Defence - Procedures protect materials and products from malicious contamination or theft.
59. Food Defense - Food supply protection from contamination or tampering. Food defence protects food products from contamination or adulteration intended to harm public health or the economy.
60. Food Fraud - Fraudulent and intentional substitution, dilution, addition, or misrepresentation of a product or raw material to increase its apparent value or reduce its production cost.
61. Food Handler - Anyone who handles or prepares food.
62. Food Safety - A guarantee that the food, when prepared and consumed following its intended purpose, will not harm the person who consumes it.
63. Food Safety Hazard - An agent in food that can cause adverse health effects.
64. Food Safety Objective (FSO) - Maximum frequency and concentration of a hazard in a food at consumption that provides adequate protection (ALOP).
65. Food Safety Plan - A plan developed based on the CODEX HACCP method, which includes process controls at control points in production to monitor product safety, identify deviations from control parameters, and define necessary corrections to keep the process under control.
66. Food Sector Category (FSC) - A specific sector of the food or feed industry or the provision of related food safety services.
67. Formula - A detailed description of the quantity and quality of raw materials to process the products, as required in customer specifications.
68. Genetically Modified Organism (GMO) - A mutated organism whose DNA contains genes not ordinarily present.
69. GMO - An organism, except for humans, in which the genetic material has been modified otherwise than natural multiplication or recombination.
70. Good Agricultural Practices (GAPs) - Farm practices define best production practices, incorporating integrated crop management, pest management, and hygienic agricultural practices.
71. Good Aquaculture Practices (GAPs) - Methods used in aquaculture farms and wild catch fisheries are considered the most effective production methods. These methods include integrated water quality management, veterinary and growth practices, and handling and hygienic methods.
72. Good Hygiene Practice - Conditions and measures are necessary to ensure food safety and suitability at all stages of the food chain. Usually connected to a combination of operation, process, personnel and service control procedures intended to ensure that products and services consistently achieve appropriate levels of hygiene.
73. Good Manufacturing Practices (GMPs) - Combining best management and manufacturing

practices ensures food products meet legislative and customer specifications.

74. Hazard Analysis Critical Control Point (HACCP - A system which identifies, evaluates, and controls hazards which are significant for food safety.
75. HACCP Method - Implementing food hygiene programmes and applying HACCP principles in the logical sequence of the twelve steps described in the current CODEX Alimentarius Commission Guidelines: HACCP Application Guidelines.
76. HACCP Plan - Document prepared by CODEX HACCP principles to control food safety hazards in the relevant food chain segment.
77. Hazard - Biological, chemical, physical or radiological agents in food or conditions can cause adverse health effects.
78. Hazard Analysis - The process of collecting and evaluating information on food safety hazards and conditions to determine which should be addressed in the HACCP plan.
79. Hazard Analysis and Critical Control Point (HACCP) - A system that identifies, evaluates and controls hazards which are significant for food safety.
80. Hazard Characterization - Evaluation of biological, chemical, and physical agents in food that may cause adverse health effects.
81. Hazard Identification - Identifying biological, chemical, and physical agents that may cause health problems in a food or food group.
82. Hazardous Chemicals and Toxic Substances - Solids, liquids, or gases that are radioactive, flammable, explosive, corrosive, oxidising, asphyxiating, or pathogenic, including detergents, sanitisers, pest control chemicals, lubricants, paints, processing aids, biochemical additives, that if used or mismanaged or in high doses may harm the handler and consumer.
83. High-Risk Food - Food or food products that are known to have microbiological growth, physical or chemical contamination, or that, due to the type of processing used, have the potential to allow pathogenic microbial flora or other contamination to survive and contribute to consumer illness. Food has been deemed high risk due to a customer complaint, food regulation, or an outbreak of foodborne illness.
84. High-Risk Food Process(es) - Good hygienic practices relating to personnel, ingredients, equipment, packaging, and environment to prevent food contamination from pathogens.
85. High-Care Area - An area designed to a high hygiene standard and equipped with good hygienic practices concerning its personnel, ingredients, equipment, packaging, and environment to prevent product contamination by pathogenic microorganisms.
86. High-Care Product - An area that is physically separated from other areas and is designed with a high standard of hygiene. In this area, good hygienic practices regarding personnel, ingredients, equipment, packaging, and the environment are in place to prevent product contamination by pathogenic microorganisms.
87. High-Risk Area - An area that is physically separated from other areas and is designed with a high standard of hygiene. In this area, good hygienic practices regarding personnel, ingredients, equipment, packaging, and the environment are in place to prevent product contamination by pathogenic microorganisms.
88. High-Risk Product - A chilled, ready-to-eat, ready-to-heat product or food with a high risk of developing pathogenic microorganisms. Also known as “chilled ready-to-eat or ready-to-heat.”

89. Highly Perishable Products - Products that, from a microbiological point of view, after a short period are likely to constitute an immediate danger to the health of humans.
90. Incident - An occurrence that has taken place and has the potential to result in the production or supply of products that are unsafe, illegal, or do not conform.
91. Industry Code of Practice - To provide helpful, industry-specific guidelines for good practice in the context of conforming to regulations while also satisfying the needs of the industry, industry groups may establish industry norms, rules, or protocols. These initiatives aim to satisfy industry needs while also conforming to regulations.
92. Initial Audit - An audit at a company/site which does not have a valid certificate.
93. Inspection Area - A station ordinarily situated near the processing area and has been expressly designed to monitor food safety and quality attributes and parameters.
94. Internal Audit - The overall auditing procedure is performed on all company activities. Carried out by the company itself or on its behalf for use within the organisation. The purpose of internal auditing is to add value to an organisation's operations and make them more efficient by using an independent, objective assurance and consulting activity. It does this by bringing a methodical, disciplined approach to evaluating and improving the efficacy of risk management, control, and governance processes. This assists an organisation in accomplishing the goals it has set for itself.
95. Legality - Following the national, federal, state, and local regulations that are in effect at the production location and in the nations where the product (or products) is/are intended to be sold.
96. Licensed Certification Body (LCB) - An organisation that has been granted permission by the Food Safety Management Standard or Scheme to manage the auditing and certification of the site's food safety management system as a result of having entered into a licence agreement with the standard or scheme.
97. Lot - A defined quantity of a product that was produced, processed, and packaged under the same conditions as other terms, such as lot, can be described using the term “batch,” which is one of the terms that can be used to describe such a quantity.
98. Low-Risk Food - Foods that have been subjected to a thorough cooking process before being consumed; these foods have a high acid content and are not known to support the growth of pathogens.
99. Low-Risk Area - A location where the processing or handling of foods poses the lowest possible risk of product contamination or the growth of microorganisms or in which the subsequent processing or preparation of the product will guarantee the product's safety.
100. Management System - A set of elements of an organisation that are interconnected or interact with one another to establish policies and goals and the processes to accomplish those goals. The organisation's structure, roles, responsibilities, and planning and operation are considered system components.
101. Mandatory Elements - A mandatory requirement of a Food Safety Management Standard/Scheme must be established by an organisation to receive certification.
102. Maximum Limit for Pesticide Residues (MRL) - The highest pesticide residue, measured in milligrammes per kilogramme, that the Codex Alimentarius Commission believes should be allowed to remain on or in food products or animal feeds. MRLs are determined using GAP data. The intention is that foods derived from commodities that comply with their respective

MRLs will be acceptable from a toxicological standpoint.

103. Maximum Residue Limits (MRLs) - In most cases, maximum allowable trace levels of agricultural and veterinary chemicals in agricultural produce, mainly produce entering the food chain, are determined by local regulation or the CODEX Alimentarius Commission. These levels are considered safe for human consumption.

104. May - Identifies a requirement or text intended to provide direction but not required to demonstrate compliance with the Food Safety Management Standard or Scheme.

105. Measurement - The process of determining a value.

106. Monitoring - The carrying out a predetermined series of measurements or observations of control parameters to determine whether or not a CCP is under control. The process of determining the current status of a device, a procedure, or an undertaking. It is possible that checking, supervising, or closely observing the situation will be required to determine the status. Monitoring is conducting a planned sequence of observations or measurements to assess whether a process operates as intended. Monitoring is applied during activity and provides information for action within a specified time frame. Monitoring refers to conducting such an evaluation to ensure food safety.

107. MSDS (Material Safety Data Sheet) - Users are provided with pertinent information in the material safety data sheet, which enables them to take the necessary precautions for the protection of food safety and the protection of health, safety, and the environment at their place of employment.

108. Multi-site Certification - A multi-site certification requires the designation and certification of a central site (into which a network of certified sub-sites all feed) and the individual certification of each sub-sites. In most cases, the leading site and the sub-sites are located in the same nation. They must comply with the same regulations regarding food safety.

109. Multi-site Programme - A multi-site programme consists of a leading certified site, under which activities are planned to manage and control the food safety management systems of a network of subsites connected by a legal or contractual link. These subsites are part of a more extensive programme that is referred to as a multi-site programme.

110. Multi-site Sampling Program - A programme of sub-site audits that are defined by the certification programme owner but will be determined by the certification body based upon specified criteria is referred to as a sub-site audit programme in the Global Food Safety Initiative Requirements Document.

111. N/A - When an element does not apply at the time of the audit, the auditor may report that it is “not applicable,” which stands for the phrase “not applicable.”

112. Non-conformity - Failure to satisfy a pre-requisite condition. The failure to fulfil a specified requirement for the product's legality, quality, or safety, as well as a specified requirement for the system. Categories of Nonconformity Regarding Certification Audits An omission or deficiency in the site's food safety management system that produces unsatisfactory conditions and, if not addressed, may lead to a risk to food safety is considered a minor non-conformity. This type of non-conformity is classified as a minor non-conformity. An omission or deficiency in the site's food safety management system that results in unsatisfactory conditions and threatens the quality and safety of the food is considered a major non-conformity. A critical non-conformity is a failure in the site's food safety management system

that is deemed likely to cause a significant risk to public health and occurs when the product is contaminated. This failure must also be present for the non-conformity to be considered critical.

113. Open Product Area - An area in which the product is open to the environment, such as not fully enclosed in packaging or not enclosed within filling equipment, tanks or pipes.

115. Operational Pre-requisite Programme (OPRP) - A control measure or combination of control measures implemented to eliminate or reduce a significant food safety hazard to an acceptable level. Action criterion and measurement or observation enable effective control of the process and product.

116. Performance Criterion (PC) - The effect on the frequency and concentration of a hazard in food must be achieved by applying one or more control measures to provide or contribute to a PO or an FSO. This effect can either be a reduction in the frequency or a reduction in the concentration of the hazard.

117. Performance Indicators - Summaries of quantified data that provide information on the level of compliance against agreed-upon targets, such as customer complaint levels, the degree of product conformity, or the degree of audit compliance, are all examples of such targets.

118. Pesticide - Substances used to prevent, destroy, attract, repel, or control pests, including unwanted plants or animals, during food production, storage, transport, distribution, and processing or to control ectoparasites in animals. Fertilisers, plant and animal nutrients, food additives, and animal drugs are omitted.

119. Pesticide Residue - Any specified substance in food, agricultural commodities, or animal feed resulting from pesticide use. The term includes pesticide derivatives, such as conversion products, metabolites, reaction products, and impurities considered toxicological significance.

120. Pests - Vermin, including birds, rodents, insects, or other unwanted species, can carry disease and pose a risk to packaging, feed or food.

121. Policy - Intentions and direction of an organisation as formally expressed by its senior management.

122. Pre-requisite Programme (PRP) - To maintain food safety, primary conditions and activities are necessary within and throughout the food chain. Therefore, the PRPs needed to depend on the segment of the food chain in which the organisation operates and the type of organisation. Examples of equivalent terms are good agricultural practice (GAP), good veterinary practice (GVP), good manufacturing practice (GMP), good hygiene practice (GHP), sound production practice (GPP), good distribution practice (GDP) and good trading practice (GTP).

123. Preventive Action - Action to eliminate a non-root conformity's cause and prevent a recurrence.

124. Primary Producer or Producer - A single entity responsible for pre-farm gate food production, field packing, storage, and supply.

125. Procedure - Detailed instructions, process description, or flow chart showing how to carry out an activity or process.

126. Process - Set of interrelated or interacting activities which transform inputs to outputs.

127. Quality - Exceeding customer or corporate expectations and being defect- and variation-free.

128. Quantity Check (Mass Balance) - Reconciliation of incoming raw material, including packaging,

against the amount used in finished products, including waste and re-work.

129. Quantity Control - Check the amount of product in the pack. It can be related to weight, volume, number of pieces, size, etc.
130. Quarantine - Material or product set aside and isolated while awaiting approval for use or sale.
131. Re-certification - A re-certification audit re-certifies a site's food safety management system.
132. Recoup - Unprocessed, intact product repackaged for distribution.
133. Reference Sample - Representative products or components are saved for future use.
134. Reviewer - The person in charge of evaluating audit reports before a certification decision.
135. Re-work - Food, materials, and ingredients, including work-in-progress, have left the normal product flow and need action before they can be released and reused.
136. Risk - Uncertainty's effect. Effects are positive or negative deviations from expectations. Uncertainty is a lack of information about an event, its consequence, or its likelihood. According to the Codex Procedural Manual, food safety risk is a function of the probability and severity of adverse health effects from food hazards. The danger of a hazard
137. Risk Analysis - Risk assessment, management, and communication make up the process.
138. Risk Assessment - Risk identification, evaluation, and estimation to determine an appropriate control process. A scientific process that identifies, characterises, assesses, and characterises risks.
139. Risk Characterisation - Based on hazard identification, characterisation, and exposure assessment, qualitative and quantitative estimation of the probability and severity of known or potential adverse health effects in a given population. These estimates are based on the likelihood and severity of adverse health effects.
140. Risk Estimate - The qualitative and quantitative risk estimation resulted from risk characterisation.
141. Risk Management - The process, which is distinct from risk assessment, of weighing policy alternatives, in consultation with all interested parties, taking risk assessment and other relevant factors into consideration to protect the health of consumers and promote fair trade practices, and, if necessary, selecting appropriate prevention and control options. This process occurs because risk assessment is one of the factors considered.
142. Risk Profile - The description of the food safety problem and its context.
143. Root Cause - The underlying cause of a problem, which, if adequately addressed, will prevent a recurrence of that problem.
144. Sampling Plan - A documented plan defines the number of selected samples and the acceptance or rejection criteria.
145. Satellite Depot - A warehouse or distribution centre that only receives products from other warehouses or distribution centres owned by the same company.
146. Schedule - A statement in the form of a table that provides specifics of actions and timings.
147. Scope of Certification - The certificate categories and products.
148. Shall - A requirement to comply with.
149. Should - Compliance with the requirement is expected.

150. Significant Food Safety Hazard - Control measures must control food safety hazards identified through the hazard assessment.
151. Site -Any food business that produces, manufactures, processes, transports, stores, distributes, or sells food, beverages, packaging, animal feed, or pet food, or provides support services to the food sector, and has or agrees to have a licenced certification body audit and certify its food safety management system.
152. Site Audit - An audit that reviews the site's products and processes on-site to determine the effective implementation of the site's documented food safety management system (including certification audits).
153. Specification - An explicit or detailed description of a material, product or service.
154. Specifier - A company or person requesting the product or service.
155. Surveillance Audit - A routine audit of a certified system.
156. Suspension - When a company's certification is revoked pending remedial action.
157. System - Interconnected elements. The system is a planned, sustainable structure. Complexity-based documentation is advised. Documentation, procedure description, control/monitoring, corrective action, and site plan are included.
158. Technical Expert - A person with high expertise and technical competence in the food sector understands HACCP.
159. Threat - An identified risk can, if not controlled, affect the product.
160. Traceability - Trace raw materials (including packaging), components, and products through receipt, production, processing, and customer distribution.
161. Validation - Proving that a control measure (or combination of controls) can effectively control the food safety hazard. When a control measure combination is designed or changed, validation is performed.
162. Verification - Methods, procedures, tests, evaluations, and monitoring to determine HACCP compliance. Objective evidence that requirements are met.
163. Verification Schedule - A schedule outlining the frequency and responsibility for performing additional methods, procedures, or tests to ensure the HACCP study was completed correctly and the food safety management system complies with the food safety plan and remains effective.
164. Workwear - Authorised clothing designed to prevent product contamination.

1.2.4 Standard Practices for Handling Hazards and Cleaning Work Area

Every employee is concerned about their health and safety. As a result, following safety guidelines is required to avoid hazards and accidents. Similarly, sanitisation and hygiene are the most critical factors when working in the food processing industry. The figure below depicts the standard practices for dealing with hazards, risks, and cleaning work areas:

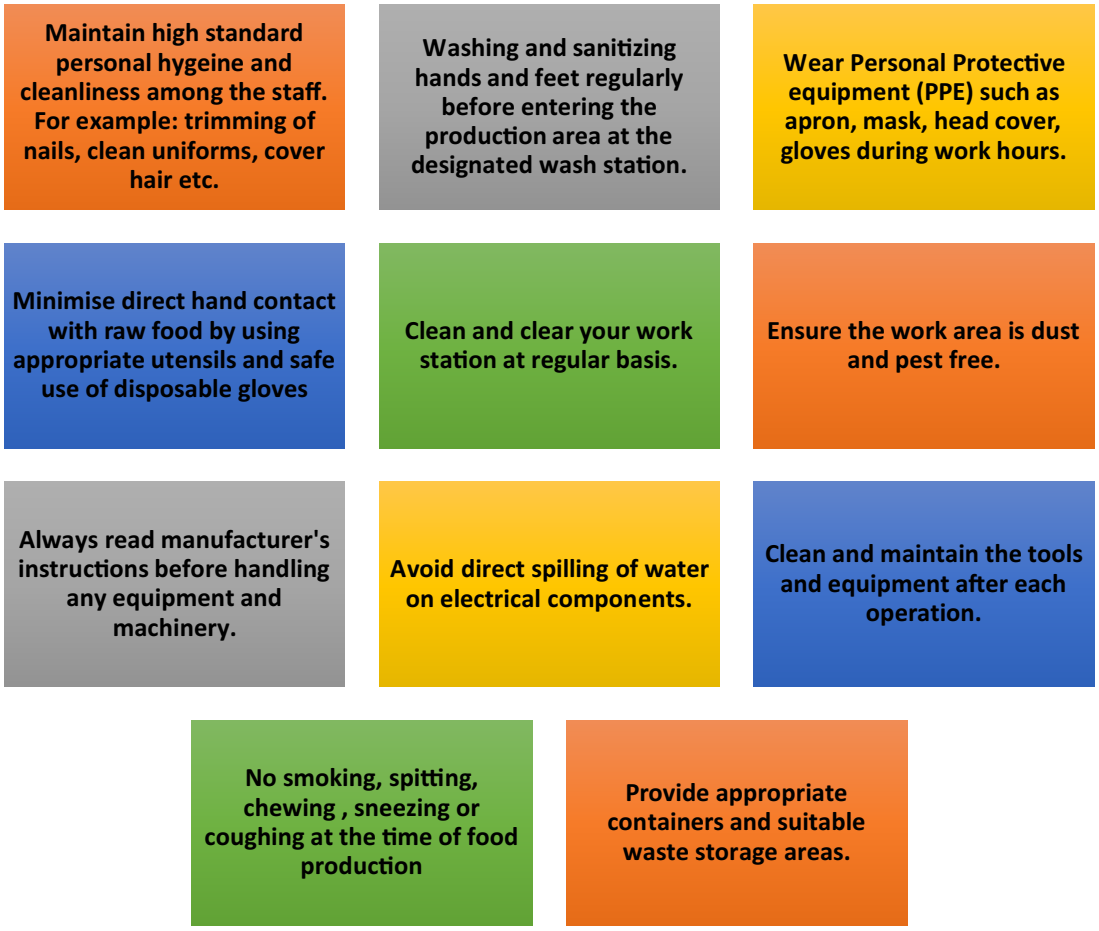


Fig.1.6 Standard Practices for Handling Hazards and Cleanliness

1.2.5 Cleaning and Sanitation

Professional etiquette is an unwritten business code of conduct. All involved feel more comfortable, and things flow more smoothly when proper professional etiquette is used. Professional etiquette makes a lasting first impression. Proper etiquette can give a competitive edge in professional situations. Conversely, improper etiquette can lead to missed job opportunities or other losses. E-mails, phone calls, and business meetings all require professional etiquette.

This tutorial covers American professional etiquette. However, suppose you are meeting a business contact from another culture or making contacts while travelling abroad. In that case, should research proper etiquette in that culture. For example, dining styles, greetings, body language perceptions, etc., vary globally. Knowing these differences could prevent offending someone or squandering an opportunity.

E-mail etiquette

- A professional e-mail differs from a personal one. When e-mailing businesses, potential employers, teachers, or strangers, consider these tips:

- Use professional e-mail. s will not be taken seriously if they use foxymama@email.com. Instead, consider a team leader's e-mail address. First and last names are safer.
- Topical. Include a short, precise e-topic subject line. “Hello” serves no use in e-mail subject lines.
- Manners! e-mail: please and thanks. Otherwise, it seems unpleasant.
- Address properly. Business e-mails need names. Unless prompted, use Mr., Mrs., Ms., or Dr. Unless told otherwise, use Ms.
- Tone counts. Personalise e-mails. s should avoid impolite, harsh, or demanding business e-mails. Instead, send angry or irritating e-mails. All caps yell. The Lowercase is incorrect.
- Focus. E-mails should be succinct and accurate. Repeat yourself or ramble, but do not be disrespectful. But friendly. Answer e-mails to save time and avoid follow-ups.
- Eliminate emojis, abbreviations, and formatting. E-mail emoticons lack professionalism. Standard abbreviations (LOL, TTYL, “U” for “ ”) look unprofessional and may be misunderstood. Fancy fonts and layouts might be distracting when drafting a business e-mail.
- Correct spelling, grammar, and punctuation. Unprofessionalism includes misspellings and poor grammar. Sending a message without a spellcheck is risky.
- Have a sign an e-mail. Then, who sent the e-mail will be known. Signatures should include addresses and phone numbers.
- Quick! 24 hours for e-mails. Immediately answer their e-mail if possible. If a needs more than 24 hours to react, indicate they are gathering information.
- No jokes, chain letters, etc. Not professional. Wastes time and inbox space. No offensive, obscene, or defamatory e-mails.
- Maintain confidentiality. E-mail is not always private. Personally deliver critical information.

When placing telephone calls:

- Time matters. Know someone's business hours before calling. Call after closing. Never call someone's number before 8 a.m. or after 9 p.m.
- Always be polite. Be polite to administrative secretaries and other call-takers. It is unprofessional and will tarnish the impression of the person trying to reach (professor, employer, etc.).
- Self-identify. Tell the caller's name and why she is calling.
- When should we talk? Ask the person a called if now is a good time to talk. This is especially important if a call will be extended. If you know a call will be long, schedule it.
- When leaving a voicemail message, use a pleasant tone, be concise, and include the name, phone number, date, and reason for calling. Speak clearly and slowly so the listener does not need to replay the message.

When answering calls:

- Friendly. s are friendly. Smile on the phone to sound happier.
- Clarify. Eating or chewing gum amplifies phone sounds. s should hold the phone two fingers

from their mouths to avoid muffling. Listen and watch.

- Ask before using speakerphone or holding. Then, use these features as needed.
- End calls courteously. Thanks, and good morning.
- If one misses a business call, ensure their voicemail is professional. Name the. In outgoing texts, avoid humour and slang. Return calls quickly.

Cell phones:

- Discourage cell phone use. Before meeting a professional, keep the phone silent or turn it off to avoid interruptions. In meetings or conversations, do not check missed calls or messages. A wants to meet participants to know they have a 's full attention.
- Always be aware of your surroundings when making business calls. Cell phones pick up background noise, so move to a quiet area before making or receiving business calls. This is done out of respect for others who may be nearby and do not want to hear a call. Also, ensure a has good reception to avoid dropped calls.

Introductions and first impressions:

- A only gets one chance to make a good impression on professors, mentors, and employers. Appropriate attire, physical appearance, verbal and nonverbal communication skills, and manners and business etiquette help achieve this impression.

Physical appearance:

- Attending a professional event or meeting a professional:
- Dress well. Overdressing trumps underdressing. Do not wear wrinkled, dirty, stained, or faded clothes. Avoid hats, shorts, jeans, sweats, t-shirts, flip-flops, and athletic shoes. Never wear tight, low-cut, or revealing clothing. Clean, conservative, scuff-free, and good-condition shoes are required.
- Simple jewellery is best. Non-ear piercings should be removed.
- Cover tattoos. If you have tattoos, do not risk being judged by them. Safety first!
- Men should groom. Men should be clean-shaven or well-groomed. Keep hairstyles simple. Trim or file fingernails cleanly. Keep make-up simple and fresh. Shave in private.
- Be careful with fragrances. Some people are sensitive to smells, so limit or avoid perfume and cologne.

Introductions:

- Introduce a self by name.
- Wear on the right at a nametag event. This makes a nametag visible when shaking hands.
- Right hand for shaking. If not already, stand during an introduction. Always shake with a 's right hand. When they shake hands, a web should touch theirs. Firmly but comfortably hold their hand. Handshakes should last 3 seconds and include three up-and-down motions.

- Maintain eye contact with the person introduced to or being introduced to. Smile!
- End conversation with "It was a nice meeting." Never leave mid-introduction.

Conversing:

- Grammar and vocabulary matter. In a professional setting, use correct grammar, avoid slang, and never swear.
- Listen with interest and respect. Give full attention to the speaker. Non-interrupt. Listen to the speaker. When it is, turn, comment, or ask questions. This shows that he was listening.
- Avoid controversy. A professional meeting is not the place to debate controversial issues. Religion, politics, money, and illegal activities should be avoided with business contacts. Keep romantic and health-related details tasteful.
- Small talk with professionals should be safe. Safe topics include a meeting or event, current events, and industry-related books and articles.
- Body language matters. In a conversation, ensure that non-verbal communication matches what is said verbally. For example, good posture, head nodding, eye contact, and smiling are positive. Conversely, crossed arms, fidgeting, slumping, leaning on objects, and looking away are opposing (and appear uncomfortable or disinterested.)

Business Meeting Etiquette:

- When meeting a professional contact in person, following a few rules to respect his or her time is essential. This will help make a good impression and make the meeting easier for everyone.
- Please confirm ASAP. If you cannot make it at the agreed-upon time, tell the other person(s) and apologise for any inconvenience.
- Punctual Lateness makes a terrible first impression. Arriving early allows for last-minute preparations.
- Ready? Know what to discuss, and write down any questions or ideas. When needed, bring a pen and notepad to the meeting. Bring any required extras.
- Knock before entering someone's office. Sit only when invited.
- Turn off or silence the phone. Before the meeting, do this. Check phone and messages after the meeting.
- Question and comment during the meeting. Avoid interrupting others or being negative. Keep on-topic.
- Thanks for meeting others.

Dining Etiquette Basics:

1. One may dine with a business contact. Restaurants host job interviews. Dining etiquette makes a positive impression.
2. Be kind to waitstaff. Diners will notice manners and behaviour.
3. Silence cellphones. They should be hidden during the meal.
4. Seated: Be seated. Place purses, bags, and briefcases beside or under the seat. Put these

away.

5. Do not take a menu till a host does. s host. Choose awkward or messy meals. s should consume according to their knowledge. s should avoid pricey dishes. Do not drink.
6. Place a napkin on their lap. Crumple napkins. s should dab their mouths with a napkin. If a leaves the table during a meal, place a napkin on their chair. No picking up napkins. Another? Return a napkin when everyone leaves (to the left of the plate, if the plate is still there).
7. Lift your arms. Stand firm. BAREFOOT Utensils: Formals have utensils on both sides. Plates may have dessert utensils. Left: forks, right: spoons and knives. Plates have utensils on the sides for each course. Utensils are brought closer as courses are served. Use the host's cutlery. Top knife, side forks and spoons. Replace dropped utensils. When an is done eating, set their fork and knife between 4 and 11 o'clock. Allow a host to eat or drink first.
    - Instead of leaning in, bring food to your mouth.
    - Never speak with food in your mouth.
    - Never extraordinary food with breath.
    - Do not eat with your fingers unless it is a sandwich.
    - Eat as quickly as your tablemate.
    - Never “double dip” appetisers or dishes.
    - No silverware scraping!
8. Use a spoon to lift soup by dipping it in the opposite direction (instead of shovelling it towards). Gently move the bottom of the spoon against the bowl's inner rim to remove drips before sipping. Tilt the bowl away when getting the last bit of soup onto a spoon. Never drink from the bowl.
9. Remove food from teeth, take medication or groom in the restroom. Never do these at the table.
10. If a guest is being treated to a meal, do not make a big deal if the server accidentally places the bill in front of an. Wait until notice and pays. If they do not pay, offer to split it. Even if one is being treated, always be able to pay.
11. Thank the host for the meal and time!

Notes

Scan the QR Codes to Watch the related Videos

Cleaning and Sanitation

General Requirement on Hygiene and sanitation Practices for all FBOs Applying for Licenses

Overview of Food Processing Industry

NCVET
कौशल गुणवत्ता प्रगति

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

2. Design, develop and implement Food Safety Management System (FSMS)

FICSI
Food Industry Capacity and Skill Initiative

(FIC/N7603)

Key Learning Outcomes

By the end of this unit, the participant will be able to:

1. Explain the Fundamentals of GMP/GHP Criteria for Food
2. Describe the Process of Manufacturing various Food Products
3. State Overview on FSSAI schedule IV – Catering/Meat/Dairy Industry
4. Understand the requirements of FSTL, laid in various GFSI approved standards.
5. List the Seven Steps of the HACCP plan and the essential five prerequisites of the HACCP plan.
6. Define PRP, OPRP & CCP based on CODEX HACCP principles and relevant decision trees to evaluate the implementation of the control points.
7. Explain the Personnel and Surrounding Hygiene.
8. Understand the Documentation of the HACCP Plan and its Methods.
9. Describe the Job Responsibilities of the Food Safety Team Leader and Quality Assurance Manager.

UNIT 2.1: Fundamentals of GMP/GHP Criteria for Food

Unit Objectives

At the end of this unit, you will be able to understand

1. Explain the importance of Good Manufacturing Practices in the food industry
2. Describe the Good Hygiene Practices in the food industry.
3. Introduce the Five Main Components of Good Manufacturing Practices.

2.1.1 Importance of Good Manufacturing Practices in the Food Industry

Consumers have much faith in the companies that make the thingsthey use daily, such as pharmaceuticals, car components, cosmetics, and food. However, when items are recalled, it can cause consumers to lose faith in them, so prevention is vital.Fig. 1.1.1: GMP in Food IndustrManufacturers need to do everything they can to foster their trust and take the necessary steps to keep it. One way to do that is by implementing Good Manufacturing Practices (GMP).

GMP stands for Good Manufacturing Practices. It is a system that assures that commodities produced by multiple manufacturing facilities are consistently produced and controlled according to quality standards. There are GMP systems for everything from cosmetics to pharmaceutical products to, of course, food.

Fig. 2.1.1: GMP in Food Industry

GMP examines every step of the manufacturing process for potential risks that could jeopardise the quality of the final product. Cross-contamination, mislabeling, and adulteration are just a few of the things GMP aims to prevent.

Good Manufacturing Practices are a critical system that all manufacturing facilities should implement. They help guarantee that industrial processes and facilities are appropriately designed, monitored, and controlled. Companies that follow these guidelines contribute to the products' uniqueness, strength, and quality. When properly implemented, GMP may assist reduce facility losses and waste while also protecting the company, its customers, and the environment.

Sound Manufacturing Systems are one of the key PRP's for any food manufacturing System. The importance of GMP lies in creating and maintaining a manufacturing system that can produce,

control and sustain a hygienic environment, which ensures that a food product is safe to consume and shall not pose any severe health risk to the consumers.

There are several things in the GMP of food industries and manufacturing industries in general.

1. Quality Management:Quality management is a concept that ensures that manufactured goods are suitable for their intended usage.
2. Sanitation and Hygiene: In terms of Good Manufacturing Practices, there is nothing more vital than sanitation and hygiene, particularly for drug, cosmetic, and food manufacturers. This includes anything that could get contaminated if adequate hygiene and sanitation are not followed.
3. Suitable Facility Locations:Manufacturing facilities should be located in a suitable place free of contamination risk. Additionally, the facility should be designed to help minimize the risk of potential errors in operations and be easy to clean and maintain.
4. Equipment: Similar to the location requirements, any equipment within the facility should be designed, located, and maintained to function as intended. All equipment should be cleaned and kept regularly and should be removed if it is determined to be damaged or malfunctioning.
5. Raw Materials:All the raw materials entering a food system shall be purchased from an approved vendor and comply with the FSSAI. Once purchased, the goods shall always be stored in a dedicated warehouse that meets the material storage conditions. There must be dedicated storage areas like QC Passed/ Hold/ Quarantine/ Fail to ensure goods are placed as per the requirement. Indeed, an inventory management system will help maintain the stock of the goods as per FIFO/FEFO norms. All the RM shall be documented to ensure proper forward and backward traceability.
6. Personnel:GMP compliance is, of course, mainly reliant on facility employees. Everyone who works at the facility should be well-trained and qualified to perform their duties. They should have a clear awareness of the various GMP principles and receive continual training always to be up-to-date with their job skills.
7. Validation and Qualification: The critical phases in the manufacturing process should be evaluated to ensure that they comply with GMP certification standards. Regular assessments of this process will also aid in maintaining high and consistent product quality.
8. Handle Complaints: Another critical factor of Good Manufacturing Practices includes handling complaints. Every company and facility should have a GMP-compliant complaint repeat handling mechanism. The optimal complaint system should have ready-to-use remedies for all situations within the facility.
9. Documentation and Recordkeeping: Keeping thorough records is essential for any company and, therefore, a critical part of the GMP. Everything concerning the facility should be written down legibly and unambiguously.
10. Inspections and Quality Audits:Inspections and quality audits are other stages in implementing good manufacturing practices. Facilities can guarantee compliance with GMPs by conducting frequent inspections and audits. These checks will also prevent the

facility from forgetting to obey the rules; otherwise, harsh repercussions will be imposed.

GMP is an essential aspect of running a high-quality manufacturing plant, regardless of the type of facility. Facilities that follow GMPs make a concerted effort to provide a safe, high-quality, and hygienic environment to produce safe and high-quality products for consumers.

2.1.2 Components of Good Manufacturing Practices

GMPs in food industry establishments should focus on the five main categories below.

- **People:** People are at the heart of any successful GMP programme. Individuals on the factory floor (as well as those in administrative positions) cannot be expected to implement processes and procedures efficiently unless they have been adequately taught. Therefore, food companies must invest in training to know GMP quality control standards and how to carry them out. It cannot be a "one and done" activity. However, training methods should be assessed and reassessed regularly.

Fig. 2.1.2: GMP Main Components

- **Premises:** In the food industry, where products come into touch with surfaces regularly, a clean, safe environment is critical. The environment should be built to facilitate cleaning and decrease the danger of cross-contamination.
    - In the food industry, "premises" also refers to equipment. All machines should be validated and calibrated, and there should be procedures, schedules, and records for cleaning and maintenance.

- **Processes/Paperwork:** The documentation that proves procedures are followed is GMP processes. Auditors will use this paperwork to inspect facilities and ensure that GMP protocols are followed correctly. As a result, detailed documentation might benefit food manufacturers, albeit this does not necessarily imply collecting binders, notebooks, or other handwritten material. Digitizing your GMPs with plant management software can simplify your approach by ensuring all employees have access to pre-op and sanitation programs at their fingertips. In addition, record signoffs can be completed quickly on one convenient platform, and food safety checks can be carried out and reviewed for thorough recordkeeping.

- **Products & Primary Materials:** Products and primary materials are two of the most significant parts of food processing. End goods offered to customers, such as merchants and restaurants, eventually reach the consumer and are referred to as products. Raw or

semi-processed substances, on the other hand, are primary materials. If primary materials are not adequately inspected before entering production, dangerous products could wind up on the market. Therefore, GMPs must incorporate quality tactics to monitor and address deviations in incoming materials.

- **Procedures:** Procedures must be thoroughly examined, regularly updated, and properly applied. They must also be well-documented so that if a problem occurs, it can be quickly and easily traced to the course through measures such as root cause analysis.

Examples of Good Manufacturing:

Every company, and possibly even separate plant sites, may have a distinct approach to GMP implementation. With that in mind, here are several GMPs in food industry facilities that you might want to consider installing at your facility.

- An effective hygiene programme that detects and eliminates potential contamination sources
- A detailed equipment and facility maintenance programme, including preventative maintenance activities
- Detailed job descriptions that clearly define employees' roles
- A system for investigating and addressing complaints and following through to resolution
- A clear documentation strategy might include best practices such as:
    - Documents should not be handwritten
    - Documents must be routinely reviewed and updated
    - Documents must be approved, signed, and dated by the appropriate party
    - Any modifications or corrections to documents must be signed and dated
    - Whenever possible, photographs should accompany documents indicating an observed issue
- Inspections that are performed routinely to monitor GMP effectiveness
- Audit checklists that can outline GMP guidelines

Pest Management

1. The facility must either hire a qualified pest management vendor or obtain certification for frequent inspection and treatment of the site to prevent and eliminate infestations.
2. The frequency of inspections must be decided and documented based on the risk assessment.
3. Where the services of a pest control contractor are employed, the service contract shall be clearly defined and reflect the site's activities.
4. Bait stations shall be robust, of tamper-resistance construction, secure in place, and appropriately located to prevent contamination risk to the product.
5. In infestation or evidence of pest activity, immediate action shall be taken to eliminate

the hazard. Any potentially affected products shall be subject to the food safety incidents procedure.

6. Records of pest control inspections, pest-proofing, hygiene recommendations, and actions taken shall be maintained. It shall be the company's responsibility to ensure that all relevant recommendations made by their contractor or in-house expert are carried out promptly.
7. An in-depth, documented pest control survey shall be undertaken based on risk, but typically quarterly, by a pest control expert to review the pest control measures in place.

Fig. 2.1.3: GMP Guidelines

8. The timing of the survey shall be such as to allow access to equipment for inspection where the risk of stored product insect infestation exists.
9. An annual review of the program is required to evaluate its effectiveness in the pest control program.
10. Results of pest control inspections shall be assessed and analysed for trends regularly. The analysis shall be used to improve the pest control procedures.
11. A site management representative shall be designated to oversee internal and external (contracted the third party) IPM services for the facility. The site Pest Control Operator shall be certified in pesticide application by the appropriate governing body of the state or region in which the facility is located. The site representative shall be responsible for identifying pest control program needs, implementing the program, scheduling pest control work, record keeping, and program maintenance through timely audits

2.1.3 Personal Hygiene and Good Hygiene Practices

Personal hygiene is a crucial component of food safety compliance. To guarantee a healthy working environment, proper food handling techniques are necessary. The implications of poor food hygiene range from the spread of foodborne illness to avoidable compliance infractions.Fig. 1.1.4 Hand washingBy acting as a good role model and reinforcing the need to adhere to a food safety compliance routine, management has the chance to promote personal hygiene advice. Emphasize the importance of personal cleanliness regularly, assuring employees that they will not lose their jobs if they report sickness or infectious disease.

Fig. 2.1.4 Hand washing

Provide employees with clear instructions and the necessary sanitary equipment to sustain their hygienecorrectly. In addition, adequate supervision and reoccurring training will help employees follow protocol and business to continue running safely and smoothly.

The Importance of Personal Hygiene for Food Handlers:

Anyone who directly or indirectly touches food (cooking, serving, or packaging food) is considered a food handler (storing, delivering, or transporting food). Additionally, workers who come into contact with preparation surfaces, including cutlery, benches, or kitchen utensils, are considered food handlers and must adhere to the same strict handling practices as workers who directly handle food.

Fig. 2.1.5: Food Handlers Personal Hygiene

Proper food handling procedures should be communicated prior to employment and regularly reiterated during employment through training programmes. Regardless of your employees' language, they need access to thorough translated food safety practices and procedure training.

Food industry experts may consider using signage that visually communicates health and safety requirements as a food hygiene reinforcement approach. These signs should be easily accessible, prominently displayed in appropriate locations, and multilingual. Unless food industry employees understand and adhere to safe handling practices, they may unintentionally violate food safety protocol, putting your customers and business at risk.

Below are personal hygiene tips to optimize food handling practices, including-

Washing your hands frequently and adequately - use the following six steps to wash hands properly-

Other tips include-

1. Wash and store garments properly to avoid the spread of hazardous microorganisms.
2. Always use a high-quality cleaning product and keep clean clothes in a dry, clean location.
3. Discard single-use safety equipment such as gloves or hairnets.

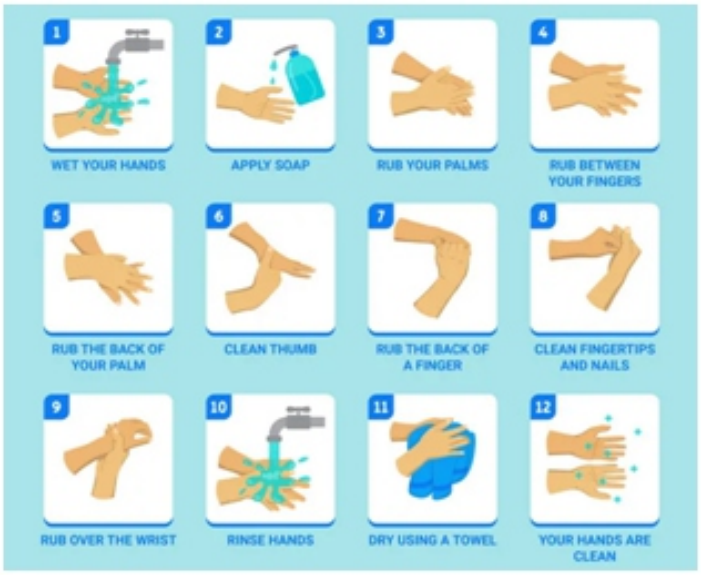


Fig. 2.1.6 Food Handlers' Hygiene

4. When shifting preparation sites, replace any protective apparel.
5. Use a hairnet.
6. Never touch your face, hair, jewellery, or clothing while preparing food.
7. Do not smoke. If you do, do away from food prep areas.
8. Wipe perspiration from your face with a cloth or paper towel, then thoroughly wash your hands.
9. Avoid chewing gum while preparing food.
10. Avoid all unnecessary contact with RTE (ready to eat) foods.
11. Avoid cross-contamination between RTE and raw meals, especially raw meat.
12. Never taste food with fingers or utensils returned to the food.
13. When coughing or sneezing into your hands, ensure thorough hand washing
14. Notify your supervisor of any suspected illness, wound, or infections.
15. Do not come to work if you are ill or suspect you may be ill.

There shall be a proper health declaration format for Visitors and Contractors to ensure that the food manufacturing system under controlled GMP conditions is not jeopardized.

Exercise

Q. 1. Which of these is a Prerequisite programme?

(A). Validation
(B). GMP & GHP
(C). Codex
(D). Both A & B

Q. 2. Which of these is a safety gear?

(A). Gloves
(B). Apron
(C). Safety shoes
(D). All of the above

Q. 3. The efficacy of the HACCP system relies on?

(A). The degree of achieving its objectives
(B). Achieving its certification only
(C). The degree of technical know-how only among team members
(D). The degree of spontaneity and response time

Q. 4. Mention 3 personal hygiene tips to optimize food handling practices.

Q. 5. What are the five main components of GMP?

UNIT 2.2: Process of Manufacturing of various Food Products

Unit Objectives

At the end of this module, you will be able to understand

1. Explain the Process of Manufacturing various Food Products
2. Describe the Food Industries, their Raw Materials and Processes

2.1.1 Process of Manufacturing of Various Food Products

Any procedure for converting fresh foods into food items is called food processing. Food processing includes washing, cutting, pasteurizing, freezing, fermenting, packaging, cooking, and other operations. Adding substances to food, for example, to improve shelf-life, is part of food processing.

Fig. 2.2.1: Food Processing

Traditional and modern food processing methods include heat treatment, fermentation, pickling, smoking, drying, and curing (pasteurization, ultra-heat treatment, high-pressure processing, or modified atmosphere packaging). Some of the standard methods are described below:

1. **Peeling** - The objective of peeling is to remove unwanted or inedible material from vegetable raw materials. This improves the appearance and taste of the final product. During peeling, peeling losses need to be minimised by removing as little of the underlying food as possible but still achieving a clean peeled surface.
2. **Grinding (Milling)** - Grinding (milling) is used for the size reduction of solid dry material. It may also improve the eating quality and suitability of the material for further processing.
3. **Crushing** - Crushing covers, for instance, breaking the skin of berries and then crushing the berries to liberate the must. This process is necessary to facilitate the yeasts' multiplication and conduct traditional macerations before pressing.
4. **Chopping or slicing** - Slicing is the cutting of food into thin, relatively broad slices. Slices may be used as they are or processed further to produce other speciality cuts such as chiffonade, rondelles, diagonals, oblique or roll cuts, and lozenges. Slicing may be accomplished by hand or machine.
5. **Mincing** - Mincing is a food preparation technique in which food ingredients are finely divided into uniform pieces. Minced food is in smaller pieces than diced or chopped foods and is often prepared with a chef's knife or food processor.
6. **Fermentation** - In food processing, fermentation converts carbohydrates to alcohol or organic acids using microorganisms—yeasts or bacteria—under anaerobic (oxygen-free) conditions. Fermentation usually implies that the action of microorganisms is desired. The science of

fermentation is known as zymology or zymurgy.

7. Emulsification disperses two or more immiscible liquids together to form a semistable mixture. In food applications, these two liquids generally consist of an organic (oil) phase and an aqueous (water) phase that is stabilized by the addition of a food-grade emulsifier (surfactant).
8. **Cooking** - Cooking produces safe and edible food by preparing and combining ingredients and (in most cases) applying heat. In addition, cooking is a means of processing food, without which many foods would be unfit for human consumption.
9. **Mixing** - Mixing is fundamental to food processing operations, such as in the preparation of ingredients, the addition of solids to liquids and the development of structure and incorporation of air in the dough mixing process.
10. **Proofing** - In cooking, proofing (also called proving) is a step in preparing yeast bread and other baked goods. The dough is allowed to rest and rise a final time before baking. During this rest period, yeast ferments the dough and produces gases, thereby leavening the dough.
11. **Spray drying** - Spray drying is the process where a mixture of compounds is made in its liquid or slurry form that is finally converted into dry powder form. This drying technique emerged way back in the 1860s and was used during World War II. It helped to make easy shipment of larger quantities of food within a limited storage area.
12. **Pasteurization** - Pasteurization is a food processing method. Mild heat treatment is applied to food to kill harmful bacteria (pathogens) and extend shelf life (Jay, Loessner, and Golden 2005). It is one of the most common food processing methods and has been used for hundreds of years!

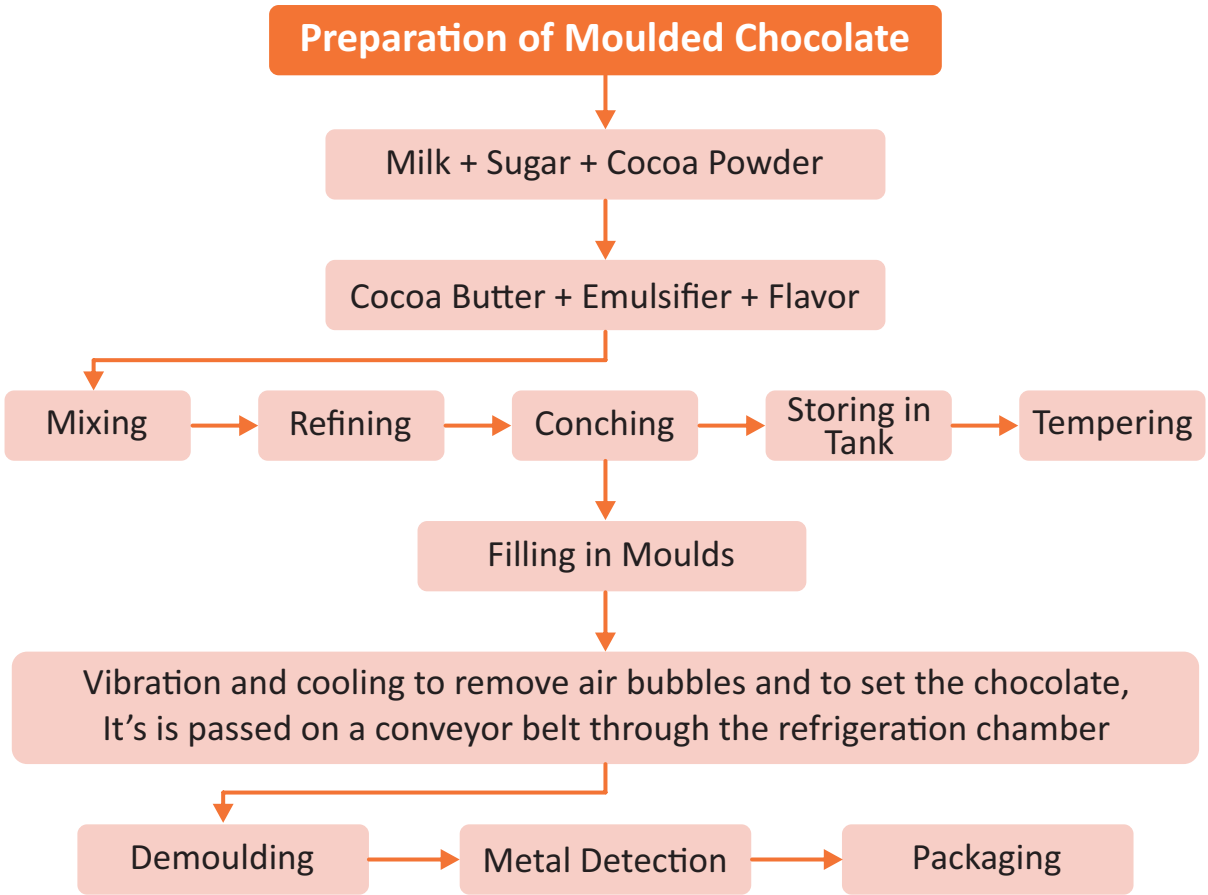


Fig. 2.2.2: Preparation of Moulded Chocolate

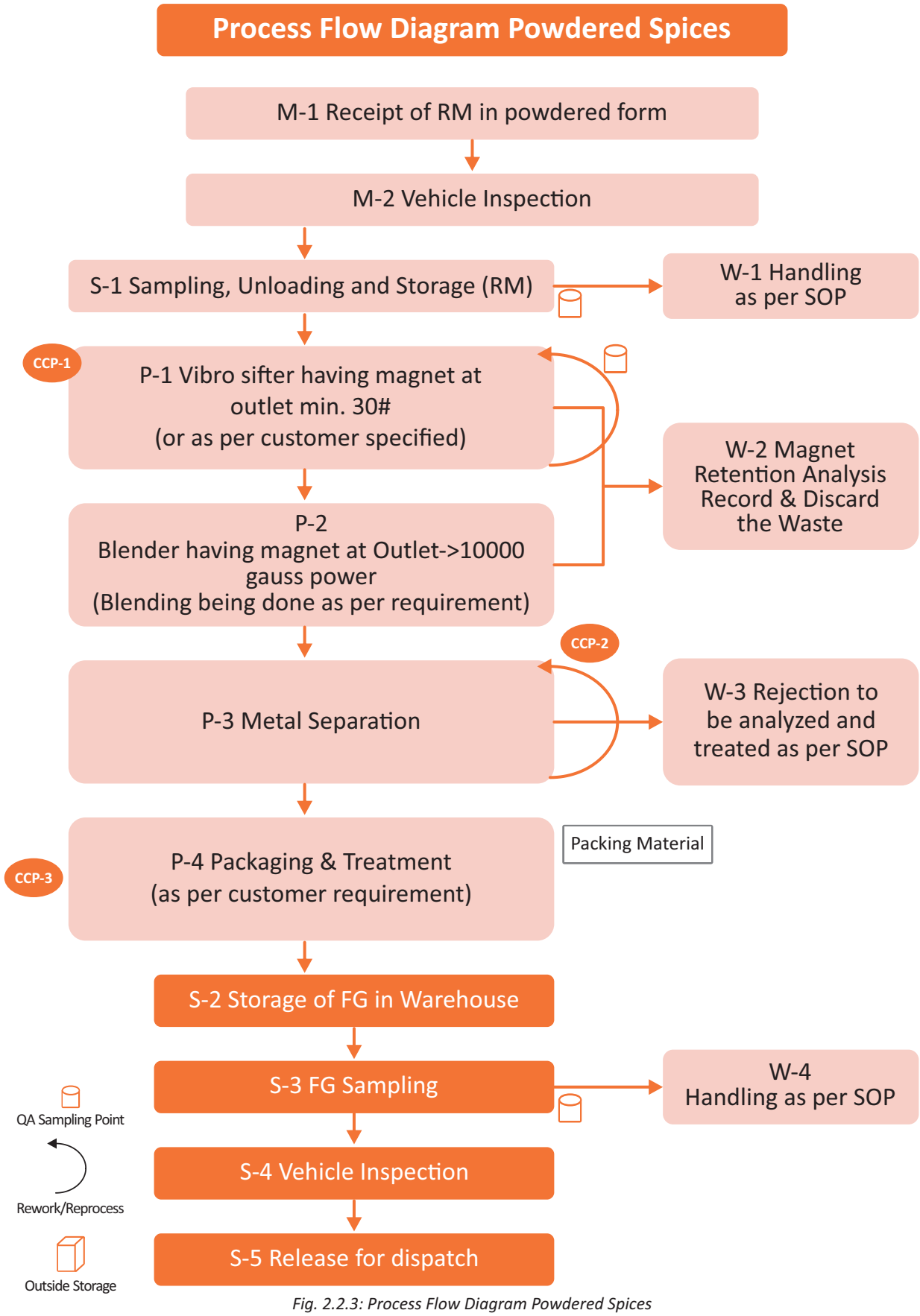


Fig. 2.2.3: Process Flow Diagram Powdered Spices

Process Flow Chart of Maida, Atta, Suji, Bran Wheat Cleaning System for Mill

Wheat Cleaning System for Mill

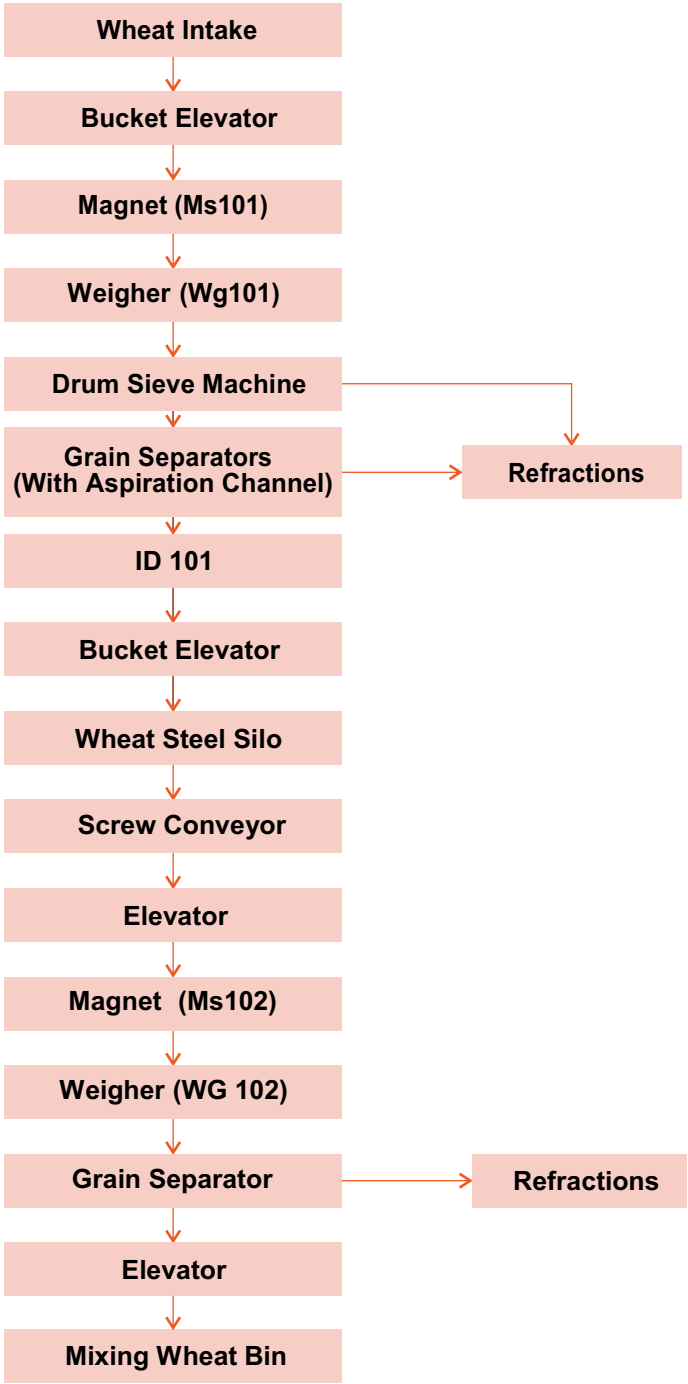


Fig. 2.2.4: Process Flow Chart of Wheat Cleaning System for Mill

Wheat Cleaning System for Fines Mill

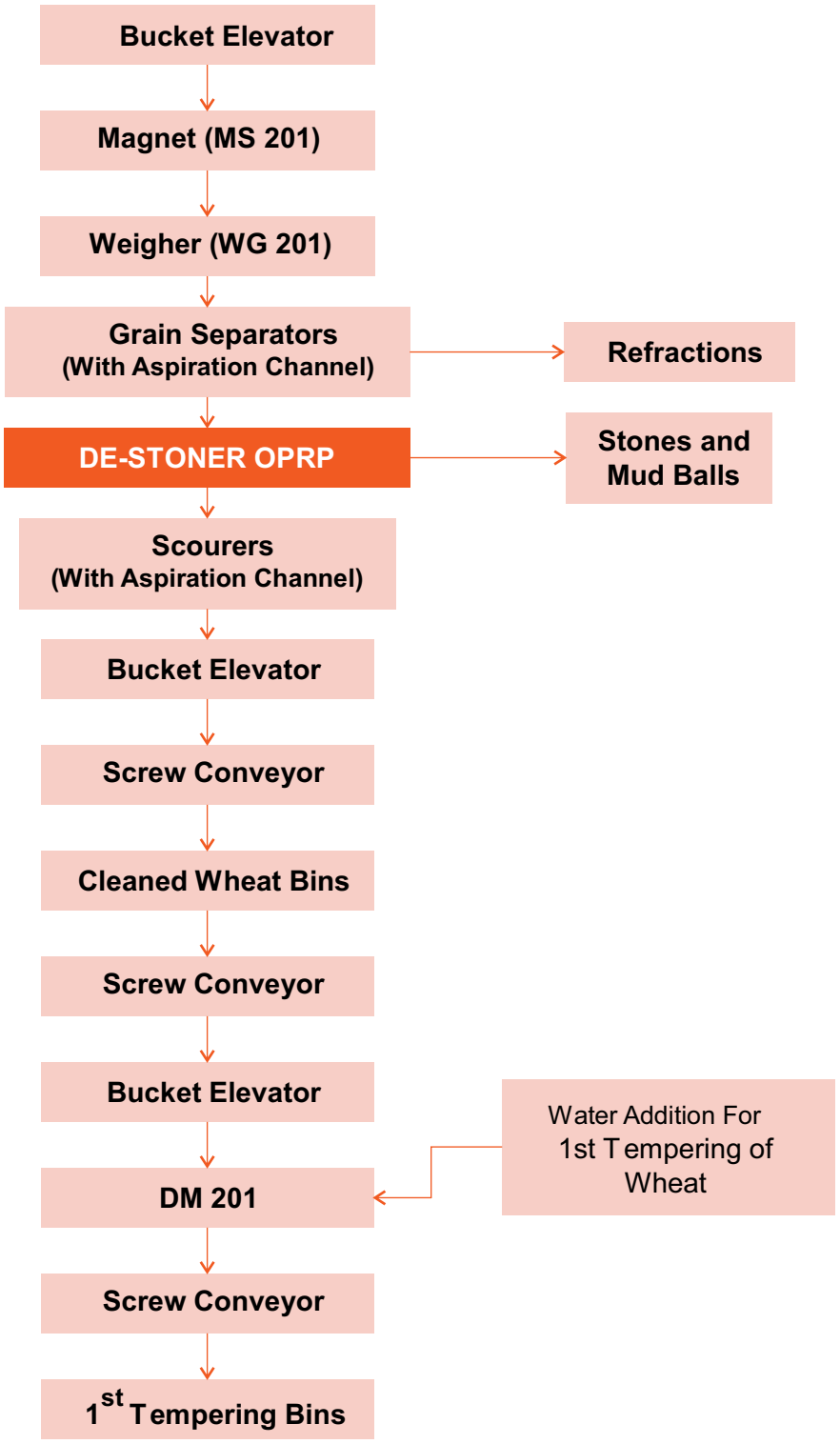


Fig. 2.2.5: Process Flow Chart of Wheat Cleaning System for Fines Mill

Wheat Cleaning System for Fines Mill

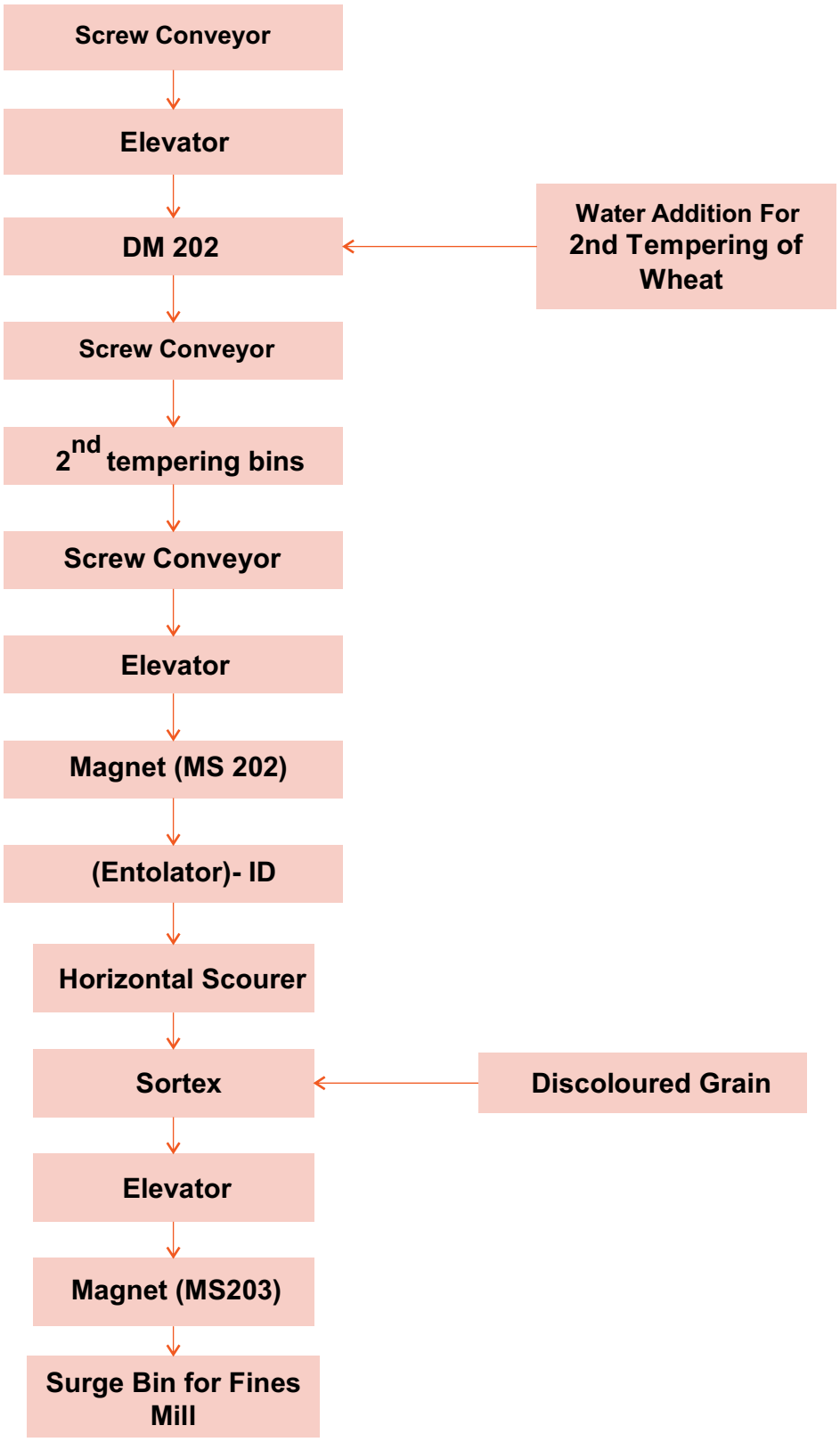


Fig. 2.2.6: Process Flow Chart of Wheat Cleaning System for Fines Mill

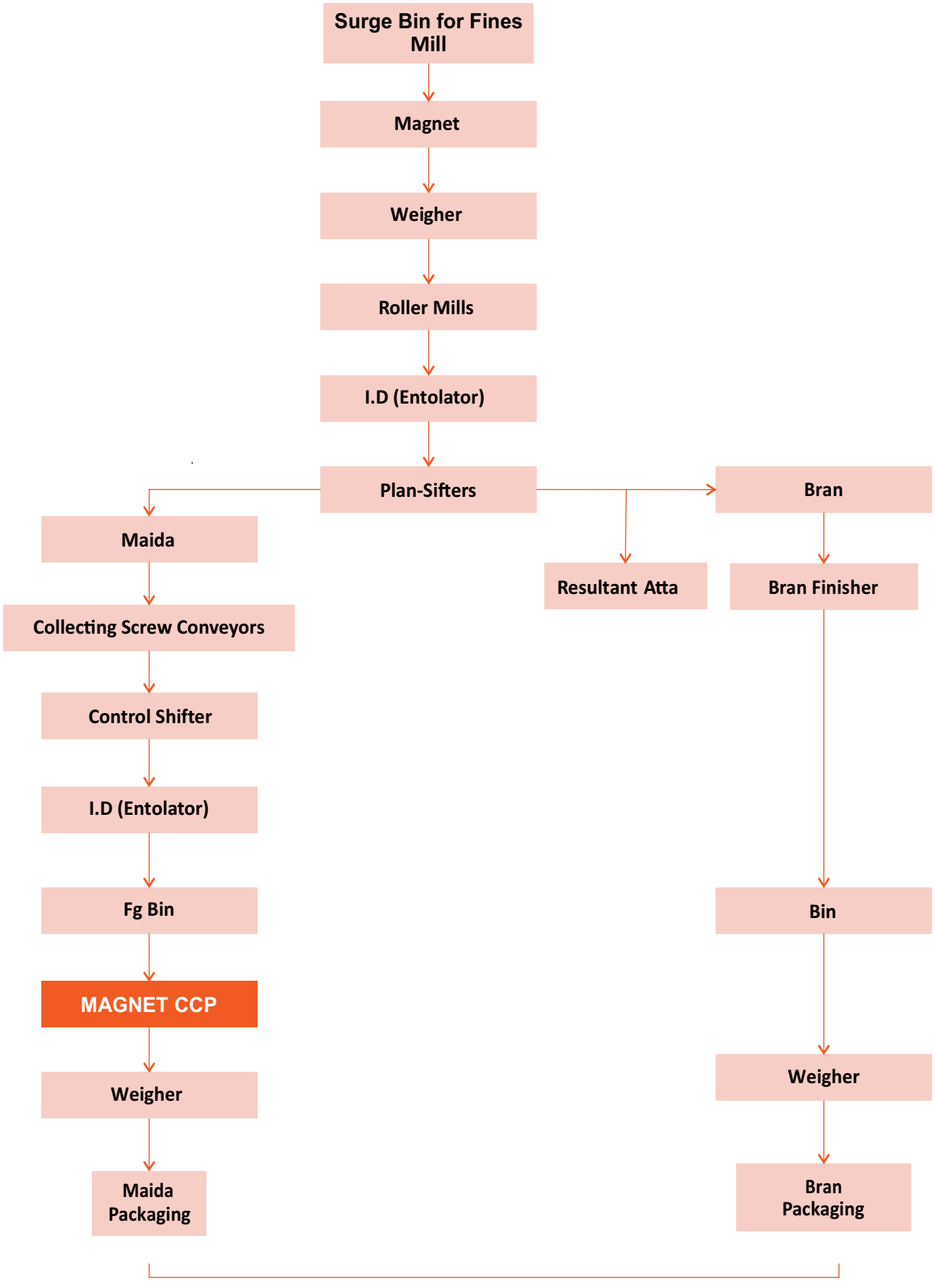
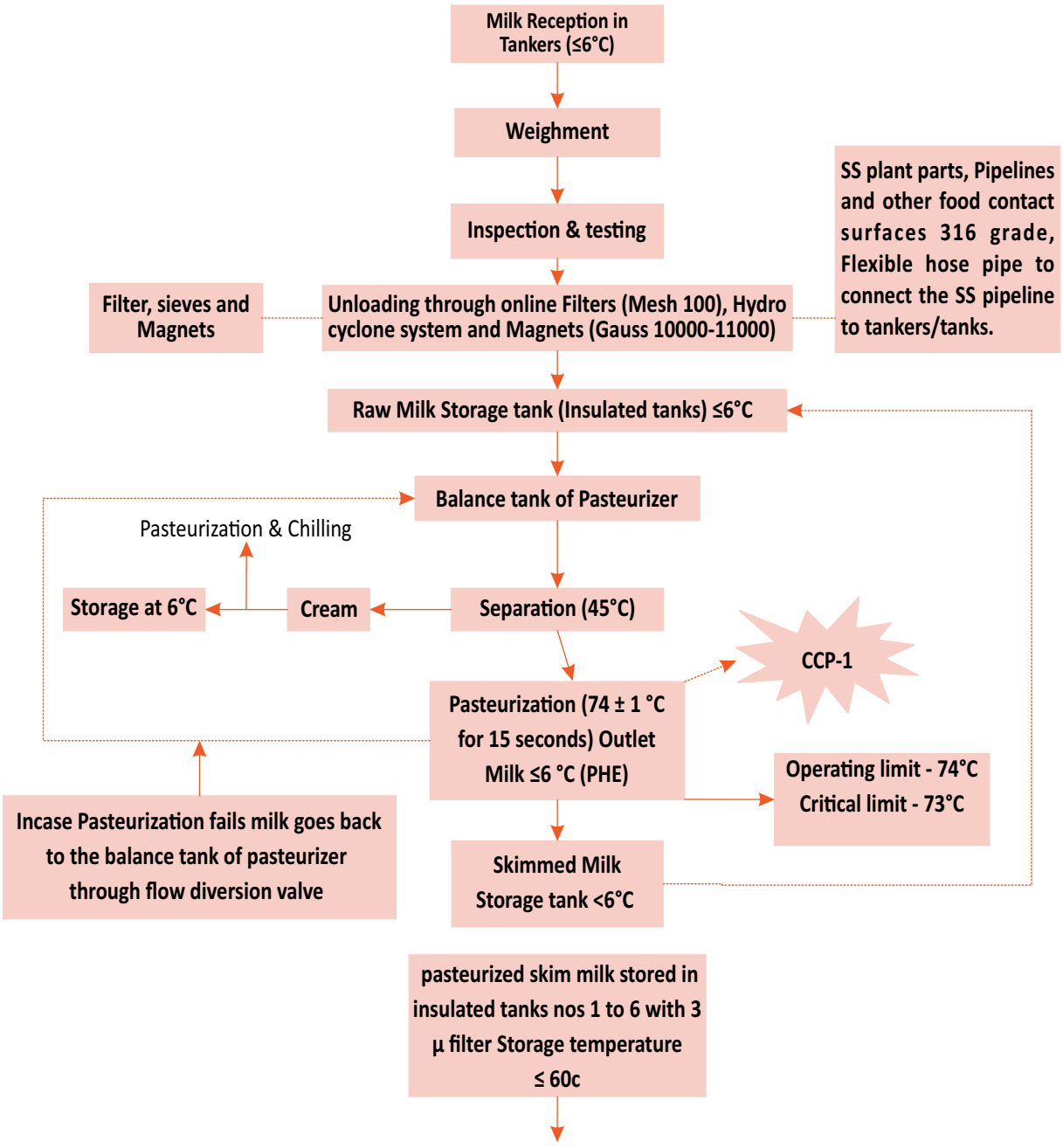


Fig. 2.2.6: Process Flow Chart of Wheat Cleaning System for Fines Mill

Process Flow Diagram Of Skimmed Milk Powder



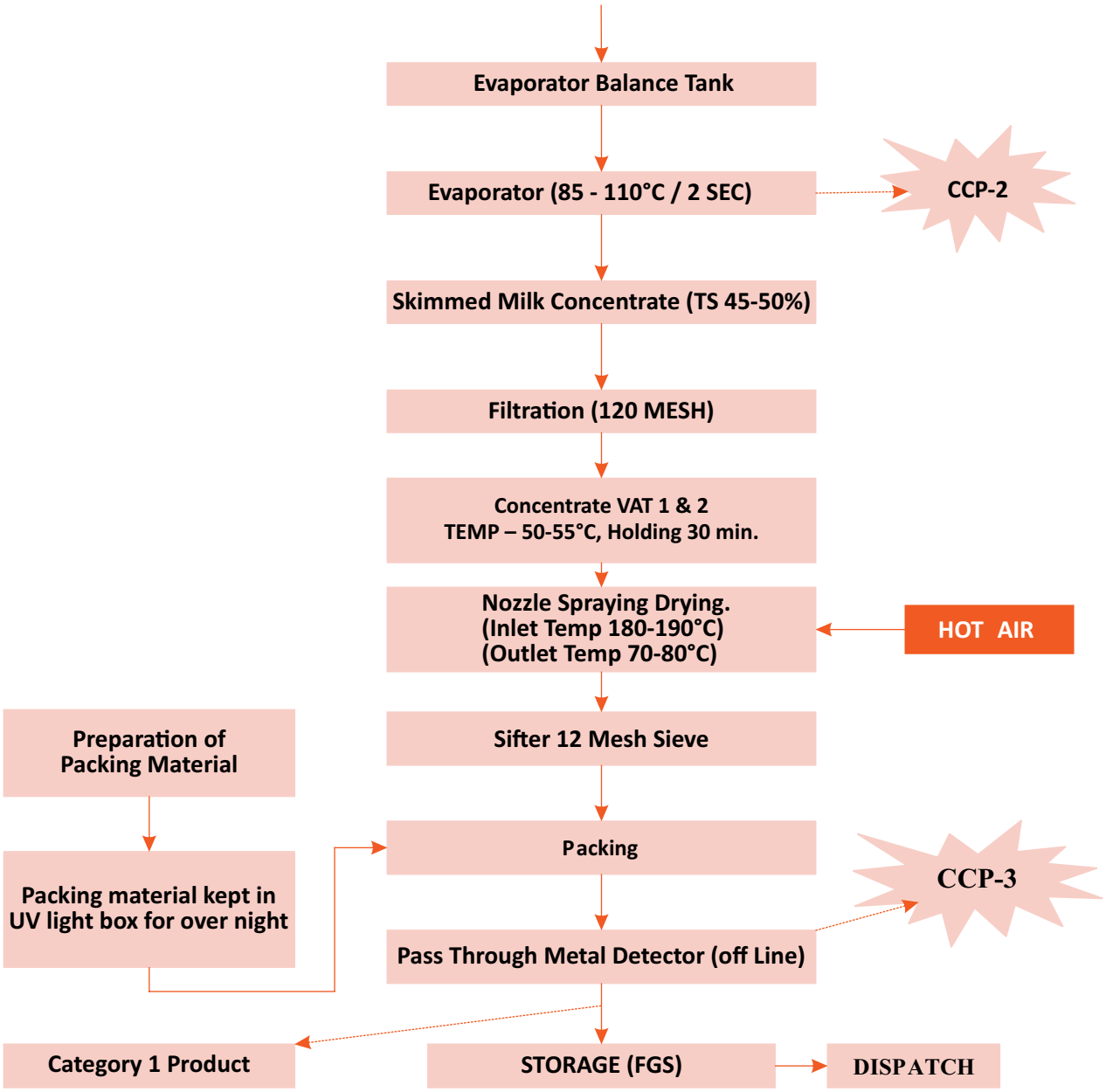


Fig. 2.2.7: Process Flow Diagram of Skimmed Milk Powder

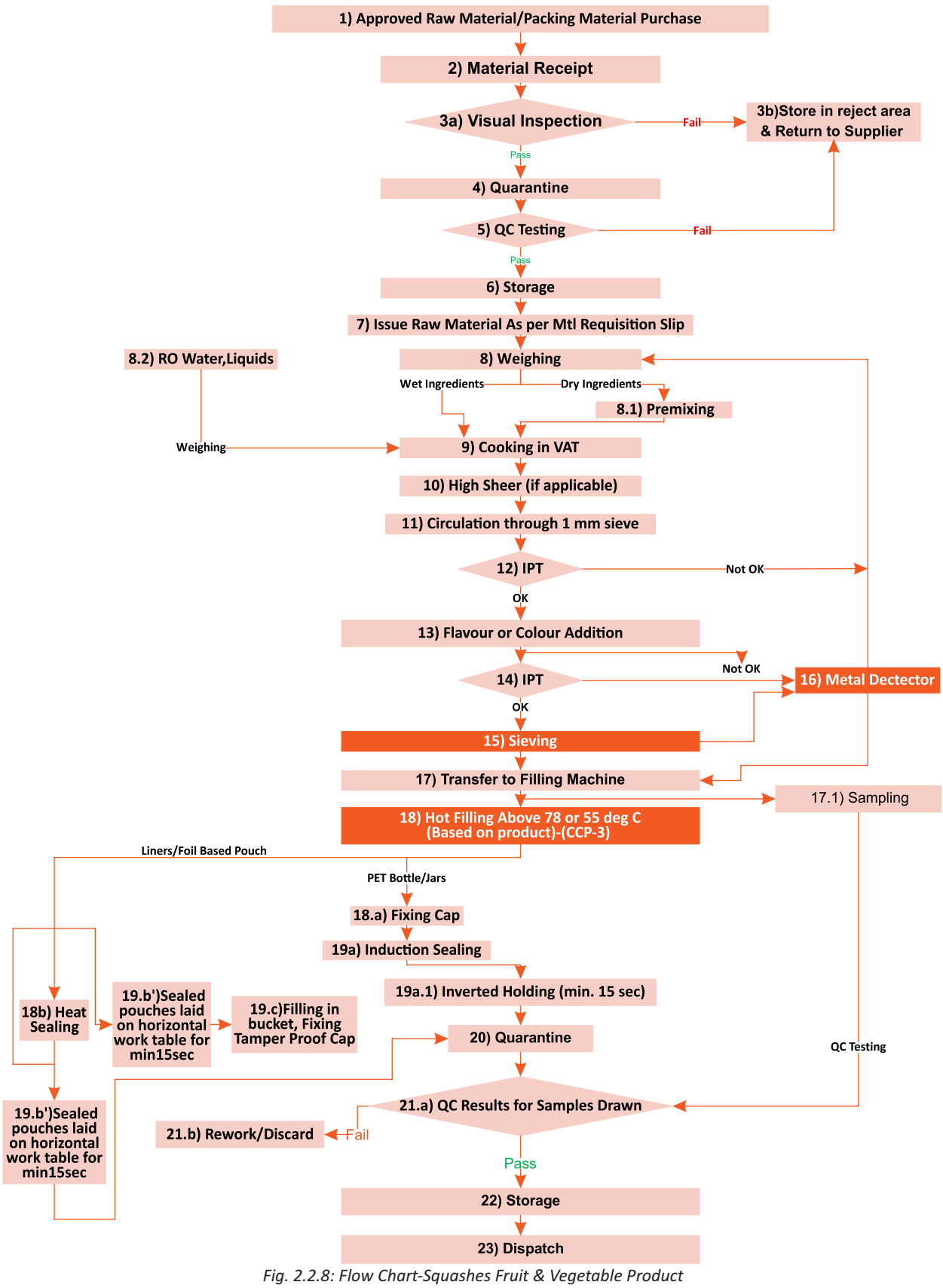


Fig. 2.2.8: Flow Chart-Squashes Fruit & Vegetable Product

Biscuit Processing Flow Chart

- **Food Preservation Methods**
  - **Canning:** The dish has been cooked at a high temperature. Pasteurization is the term for this process. Then, the food is packaged and stored in an air-tight can.
  - **Fermentation:** Under anaerobic circumstances, bacteria, yeasts, and other microorganisms break down carbohydrates. This implies that no oxygen is required for the process (apart from oxygen present in sugar). Fermentation is notably used in producing alcoholic beverages such as wine, beer, and cider, preserving foods such as sauerkraut, dry sausages, and yoghurt, and raising dough in bread production.

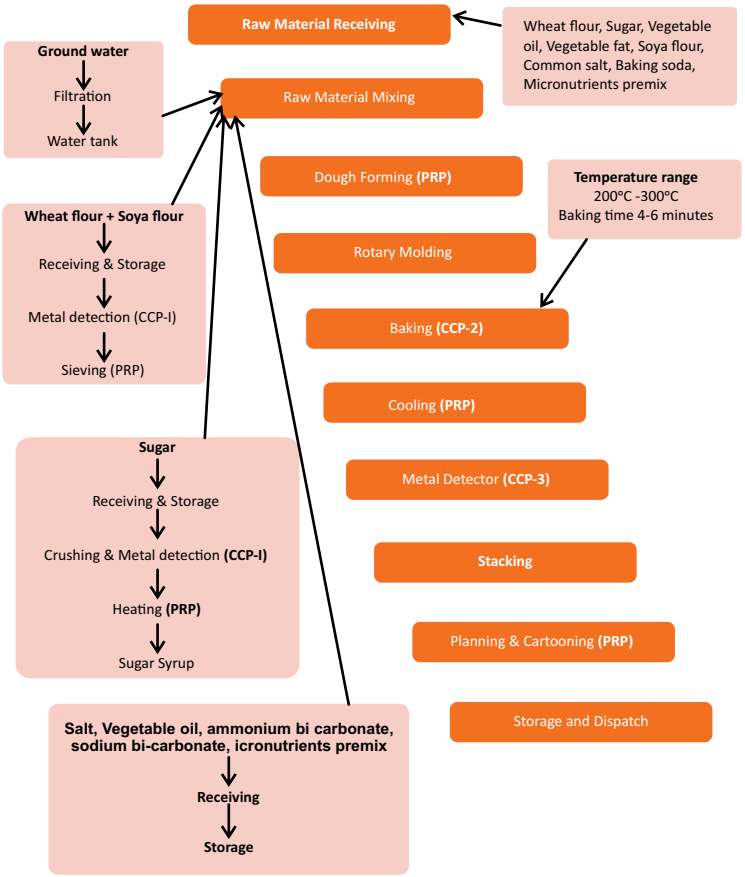


Fig. 2.2.9

- **Freezing:** To minimise the activity of dangerous bacteria, food temperatures are decreased to below 0°C. The process can be used to preserve most foods, including fruits, vegetables, meat, fish, and ready meals.
- **Modified atmosphere packaging:** A protective gas mix, often comprising oxygen, carbon dioxide, and nitrogen - gases found in the air humans breathe – replaces the air within a package. They help extend the shelf life of fresh food products - usually fruits, vegetables, meat and meat products, and seafood.
- **Pasteurization:** To kill microbes, food is heated and then immediately chilled. Raw milk, for example, could contain hazardous bacteria that cause food poisoning. Therefore, boiling it (at home) or pasteurising it (on a large scale) is crucial to ensure it is safe to consume. Apart from dairy products, pasteurisation is widely used to preserve canned foods, juices and alcoholic beverages.
- **Smoking:** A method of treating food with heat and chemicals to help preserve it by exposing it to smoke from burning materials like wood. Smoked foods usually include types of meat, sausages, fish or cheese.
- **Addition of Additives:** The freshness, safety, flavour, appearance, and texture of processed meals are all enhanced by using food additives. Food additives are used for specific goals, such as ensuring food safety or maintaining food quality during a product's shelf life. For example, antioxidants prevent fats and oils from becoming rancid. In contrast, preservatives prevent or reduce the growth of microbes (e.g. mould on bread). Emulsifiers are used to improve the

texture of mayonnaise or stop salad dressings from separating into oil and water.

Benefits of Food Processing

- **Makes food edible:** Wheat and corn are examples of grain crops that are not edible in their natural state. Processing procedures such as milling and grinding, on the other hand, turn them into flour, which may then be used to make bread, cereals, pasta, and other edible grain-based items.
- **Safety, shelf life, and preservation:** Processing improves food safety by removingharmful microorganisms. Pasteurization, airtight packing, and the application of preservatives are the most common ways.
- **Nutritional Values:** Food processing can affect the nutritional quality of foods in both ways: it can enhance it, for instance, by adding components that were not present, like vitamin D (through 'fortification'), or by lowering fat, salt or sugar. Excessive refining, heating, or freezing can also result in the loss of specificfibre, vitamins, and minerals.
- **Convenience:** Processing and packaging technologies help meet modern-day time restrictions by providing a variety of quick-to-prepare foods such as ready meals, packaged salads, and sliced and canned fruits and vegetables that may be eaten "on the go."

Convenience Food Can Be Classified Into The Following Categories

- Shelf-stable convenience food
    1. Ready-to-Eat (RTE) and Ready-To-Serve (RTS) food
    2. Ready-to-Cook (RTC)
- Frozen convenience food

Ready-to-Eat (RTE) foods are normally consumed within a short time. However, with appropriate processing and packaging, the shelf life can be extended up to years. Ready-to-eat food product does not require any extensive processing or cooking procedures. The pack is opened in an appetizing form. RTE snacks such as idlis, dosa and pav bhaji have a short shelf life. Hence, they have been packaged into injection moulded plastic containers with low water vapour, oxygen permeability and good barrier strength.

RTE foods such as upma, curry rice and vegetable biriyani are processed by retort for longer shelf life. In retort processing, low acid foods with medium to large particle sizes are preferred and used because it is easier to remove the oxygen from the headspace by gas flushing.

Retort pouches are a special flexible laminate that can withstand thermal processing up to 121°C as it combines the advantages of metal can and boil in bag functionality preserving food by physical and chemical means. Retort pouches provide good barrier strength, puncture resistance and toughness, which can withstand abuse in handling and distribution. Retort pouches are a good substitute for cans as it eliminates the additions of brine or sugar syrup. To sum, retort pouches' demand grows as they get accepted equally with glass or metal containers.

Retort pouches are made of a three-ply laminate consisting of PET/Al Foil/PP, ethylene vinyl alcohol (EVOH), and polyvinylidene chloride (PVDC) silica-coated nylon providing a shelf life of up to one year.

Ready-to-Cook (RTC) Foods are classified as low moisture food, medium moisture, and high moisture foods. Low moisture food (1 to 5% moisture) tends to absorb moisture from the environment and

become soggy. The packaging materials' moisture vapour transmission rate (MVTR) is less than 1 gm / m2 per 24 hours. On the other hand, the barrier property (MVTR) requirement in medium moisture foods (6 to 20% moisture) is less stringent and useful for long shelf life. Typical examples of foods used in this method are Indian savoury snacks and sweetmeats. However, the use of preservatives is required for long shelf life.

High moisture foods have a moisture content between 20 to 60%. This segment makes freshly baked products such as cake, chapatis, pickles, and chutneys. Medium and high moisture foods are susceptible to biological spoilage and need additional preservation methods before packaging.

RTC foods can be divided into four groups based on the ingredients used in ready-to-cry mixes. The first category is cereal-based, consisting of batter mix for idli, and dosa, which is very sensitive to moisture. These ingredients become soft and unacceptable at about 8 to 13% moisture content. Therefore, Polyolefin plastic pouches (37 to 75µ) thickness are used for packaging cereal-based ingredients with 3-4 months of shelf-life.

Secondly, Legume or pulses based mixes for vadaand bonda have requirements similar to cereal-based mixes. However, they are less permissible to moisture. Therefore, this goods segment needs materials with water vapour impermeability, such as LDPE and PP providing between 3 to 6 months of shelf life based on temperature/RH storage conditions.

Thirdly, mixes of Jamun, doughnut and cake have high-fat content and milk solids which are prone to rancidity and exchanges with oxygen and water vapour. Therefore, CPP pouches, printed polyester with LDPE or HD-LDPE co-extruded films, are used for products in this category for a different protection point and attractive appearance.

Finally, Spice mixes, rasam, sambar, and soup are highly susceptible to aroma loss and oxidative changes,deteriorating the final product. Functional packaging based on metallised PET/PE and films with polyamide core layer provides a longer shelf-life for products in this category. In addition, HD-LDPE coextruded film provides good heat sealability.

Exercise

Q. 1. Which of the following is at the lowest risk of foodborne illness?

(A). Adolescents
(B). Alcoholics
(C). Elderly people
(D). Pregnant Women

Q. 2. How long can you leave food unrefrigerated?

(A). There is no safe time for foods to be left out
(B). More than four hours
(C). No more than two hours
(D). As long as you want as they are covered

Q. 3. Food Safety Management System consists of:

(A). Pre-requisite program
(B). HACCP Principles
(C). FSMS Standards element
(D). All of above

Q. 4. What do you understand by Shelf-life?

Q. 5. What are the processing and preserving techniques for the processing industry of Milk & Milk Products?

UNIT 2.3: Overview of FSSAI Schedule IV

Unit Objectives

At the end of this module, you will be able to understand

1. Explain the FSSAI schedule IV
2. Describe the FSSAI schedule IV for the Catering/Meat/Dairy Industry

2.3.1 FSSAI schedule IV

FoSTaC

Food Safety Training & Certification(FoSTaC) is a large scale training and certification ecosystem for Food Businesses across the food value chain. Persons successfully trained & certified under FoSTaC will be termed Food Safety Supervisors (FSS). In turn, these Food Safety Supervisors will train other food handlers in their premises to create an ecosystem of trained persons.

FSSAI has designed FoSTaC to fulfil its mandate Section 16(3) h of the Food Safety and Standards Act 2006. Under FoSTaC, the curriculum and content for 16 courses for different kinds of food businesses on three competency levels,i.e. Basic, Advanced & Special, have been created centrally by domain experts. Training is to be delivered through Training Partners, including Large Food Businesses, Academic and Vocational Institutions, Training Agencies approved under Skill Development Councils and Missions, Industry, Scientific and Technology Associations and Civil Society Organisations

FSSAI recommends that all licensed food businesses have at least one trained and certified Food Safety Supervisor under FoSTaC for every 25 food handlers on each premise. To get detailed information on FoSTaC.

Every food business operator (FBO) applying for licensing must have a documented FSMS strategy and conform with schedule 4 of the FSS (Licensing & Registration of Food Businesses) Regulations 2011.Fig. 1.3.2: FBO Schedule 4 introduces the concept of FSMS based on the implementation of Good Manufacturing Practices (GMP) and Good Hygiene Practices (GHP) by food businesses and is divided into five parts:

Fig. 2.3.1: Catering Industry

Catering Industry:

Catering is a service that offers food to an occasion or a specific place. The person frequently sells catering services. Businesses in the catering sector supply food, beverages, and other services to a

wide range of clientele, usually for special events. A caterer can work for a restaurant or run their own business. Caterers might use independent contractors for some aspects of their catering service.

Fig. 2.3.2: FBO

2.3.3 FSSAI Guidance Documentson FSMS:

Fig. 2.3.3: FSMS Regulations

A set of sector-specific Food Safety Management System (FSMS) Guidance Documents has been developed to provide implementation guidance to food businesses (tiny and medium businesses) involved in manufacturing, packing, storage, and transportation to ensure critical food safety-related aspects are addressed throughout the supply chain.Fig. 1.3.4: FSSAI Guidance on FSMSThese documents are based on Schedule 4 of Food Safety & Standards (Licensing & Registration of Food Businesses) Regulation, 2011 and lay down general requirements on good hygienic practices to be followed by Food Business Operators & indicate practical approaches that a business should adopt to ensure food safety. The documents are recommendatory and provide the basic knowledge and criteria for implementingthe food businesses' Hazard Analysis and Critical Control Point (HACCP) system. Sample HACCP Plans have been taken from some established practising industries. These plans could be used as a reference by the industry and modified or altered based on their operations.

Scan/Click the QR codes to access the formats and guidance documents

Food industry guide to implement GMP GHP requirements

Food industry Guide to Implement GMP GHP

Food Safety Management System

Format for sending the comments and suggestions

FSMS guidance documents for Food Grain Warehouse Flour milling Catering Sector

Implementation of Revised Food Safety Inspection checklists

These publications also offer inspection checklists to assess their facility and operations for food business operators. Based on the indicative scoring, FBOs can assess themselves. Also, these documents provide basic templates and forms to facilitate the FBOs to maintain the records. These include mandatory forms as prescribed by FSSAI &a few templates for maintaining records of processes critical for food safety.

Date		FBO Name	
Food Safety Officer		FBO's representative	
FBO License No.		Address	

Table 2.3.1

Indicate the following – Compliance (C), Noncompliance (NC), Partial Compliance (PC) or Not Applicable (NA)

Total points ..... / 114

Asterisk mark (*) questions may significantly impact food safety &, therefore, must be addressed as a priority. Failure in any of the asterisk mark questions will lead to Non-compliance.

Grading Parameters			
	A+	100 - 114	Compliance – Exemplar
	A	91 - 99	Compliance/Satisfactory
	B	77 - 90	Needs Improvement
	No Grade	<77	Non-Compliance

Table 2.3.2

Milk & Milk Product Industry:

Fig. 2.3.4: Milk Industry

A dairy farm produces milk, which is then processed into a range of dairy products by a dairy factory. These businesses make up the worldwide dairy industry, part of the food industry. Dairy products, milk, and milk-based foods such as butter, cheese, ice cream, yoghurt, and condensed and dried milk are all examples.

For decades, India has been a significant producer and consumer of dairy products worldwide. The Indian dairy business has strong development potential, with over 300 million cows producing over 198 million tonnes of milk in 2019-20.

Date		FBO Name	
Food Safety Officer		FBO's representative	
FBO License No.		Address	

Table 2.3.3

Indicate the following – Compliance (C), Noncompliance (NC), Partial Compliance (PC) or Not Applicable (NA)

Total points ..... / 106

Asterisk mark (*) questions may significantly impact food safety &, therefore, must be addressed as a priority. Failure in any of the asterisk mark questions will lead to Non-compliance.

Grading Parameters			
	A+	95 – 106	Compliance – Exemplar
	A	83 – 94	Compliance/Satisfactory
	B	53 – 84	Needs Improvement
	No Grade	<53	Non-Compliance

Table 2.3.4

Meat Industry:

Fig. 2.3.5: Meat Industry

The meat processing business is an essential aspect of India's agricultural landscape. According to studies, India's yearly meat production is predicted to be 6.3 million tonnes, placing it fifth in the world in terms of volume. India produces 3% of the world's total meat production. With 515 million people, the country possesses the world's most significant livestock population.

The meat processing industry has grown at a steady pace. It is well-known for providing producers with

decent returns. Beef and pork are valuable nutrient-dense foods in India, and they are also relatively inexpensive. Non-vegetarians account for over 70% of the Indian population. The per capita meat consumption in India every year is around 5.2kg. Chicken and fish have the highest consumption rate. The consumption of poultry meat in India will be over 3.9 million metric tons in 2020.

Date		FBO Name	
Food Safety Officer		FBO's representative	
FBO License No.		Address	

Table 2.3.5

Asterisk mark (*) questions may significantly impact food safety &, therefore, must be addressed as a priority. Failure in any of the asterisk mark questions will lead to Non-compliance.

Grading Parameters			
	A+	90 – 100	Compliance – Exemplar
	A	80 - 89	Compliance/Satisfactory
	B	50 – 79	Needs Improvement
	No Grade	<50	Non-Compliance

Table 2.3.6

Exercise

Q. 1. The Food Safety and Standards Authority of India (FSSAI) has issued a set of guidelines regarding the recall of _____ from the market?

(A). unsafe drinking water
(B). unsafe food products
(C). unsafe labelling
(D). unsafe packaging

Q. 2. FSSAI has issued an advisory banning the use of which material for wrapping and packaging food items?

(A). Newspaper
(B). Plastic
(C). Polythene
(D). None of the above

Q. 3. Which of these are responsible for the implementation of FSSAI?

(A). Ministry of Health & Family Welfare
(B). Ministry of Food Processing Industries
(C). Department of Agriculture & Cooperation
(D). Directorate General of Health Services

Q. 4. What is Schedule IV FSSAI?

Q. 5. What is FSSAI's role?

UNIT 2.4: Seven Steps of the HACCP plan

Unit Objectives

At the end of this module, you will be able to understand

1. Explain the Importance of HACCP plans
2. Describe the Steps of HACCP in Food Safety

2.4.1 HACCP and Its 7 Steps

'HACCP' stands for Hazard Analysis Critical Control Points.

Hazard Analysis Critical Control Points/ HACCP is a tool, a systematic approach only by which any organization can identify all the possible risks and factors which might happen at all the levels of a food manufacturing company, right from the receiving of raw material, packaging materials to the final production and storage, which shall cover essential aspects like processing aids, manual/automation of

Fig. 2.4.1: HACCP

the process and all the factors which might impact the safety, quality and legality of a finished product.

HACCP concepts are now used as the foundation for food safety plans worldwide. HACCP is applied to processes throughout every stage of the food supply chain, including production, preparation, packaging and distribution, and manages food safety across many types of food businesses.

Steps

Preliminary Steps of HACCP Implementation (5 Basic Steps):

Before successfully implementing a HACCP-based approach in any food manufacturing process, it is

essential to understand the basic five steps and work as a foundation to ensure that the results are more accurate and precise when the HACCP toll is practically implemented.

i. Assemble a HACCP team and train the team.

- A company must establish a set of people who must be cross-functional and work as a HACCP Team. They must be trained and lead the team under the HACCP Coordinator/ Food Safety Team leader. This team will be responsible for carrying out all HACCP related jobs, attending HACCP audits, timely monitoring of control points, operational prerequisite programs (OPRP), validation of measuring and monitoring equipment, document keeping etc.

ii. Describe the product and processes.

- This Shall include-
  - Characteristics of raw materials, ingredients, and product contact materials
  - Characteristics of end products
  - Packaging, storage, and distribution requirements
  - Important labelling requirements

iii. Identify the intended use of the product.

- The intended use, including reasonably expected handling of the end product and any unintended use but reasonably common mishandling and misuse of the end product, shall be considered and maintained as documented information to the extent needed to conduct the hazard analysis.
- Where appropriate, groups of consumers/users shall be identified for each product. Groups of consumers/users known to be especially vulnerable to specific food safety hazards shall be identified.

iv. Develop a process flow chart.

- The HACCP team shall complete a detailed process flow chart, taking inputs from the sections of the cross-function team, to create the flow chart traceable to the actual process line.
- Flow diagrams shall be clear, accurate and sufficiently detailed to the extent needed to conduct the hazard analysis. Flow diagrams shall, as appropriate, include the following:

  a) the sequence and interaction of the steps in operation.
  b) any outsourced processes.
  c) where raw materials, ingredients, processing aids, packaging materials, utilities and intermediate products enter the flow.
  d) where reworking and recycling take place.

e) where end products, intermediate products, by-products, and waste are released or removed. Carry the on-site verification of the process flow chart.

Seven Principles of HACCP:

Think of HACCP principles as the steps you need to take to manage and control food safety risks in your business.

The seven principles of HACCP are:

i. Conduct a Hazard Analysis
ii. Identify Critical Control Points
iii. Establish Critical Limits
iv. Monitor Critical Control Points
v. Establish Corrective Actions
vi. Establish Verification Procedures
vii. Establish Record-Keeping Procedures

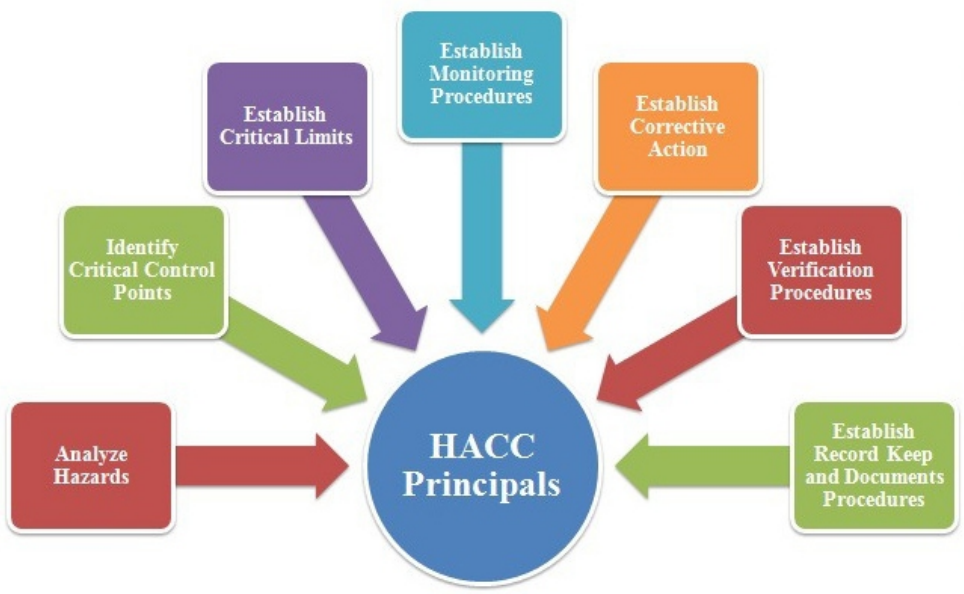


Fig. 2.4.2: HACCP Principles

1. Conduct a hazard analysis

The first stage in any Food Safety Plan (also known as a HACCP Plan) is to identify all potential food safety hazards in your firm. First, consider your processes. These might include:

- receiving goods
- cooking food
- serving food

- waste disposal

Next, think about the food safety risks that could arise throughout each step. Anything that can contaminate food is considered a food safety issue (harmful or unsafe). There are four types of food contamination:

- biological contamination (e.g. bacteria, viruses)
- physical contamination (e.g. pieces of broken glass, metal staples)
- chemical contamination (e.g. detergent, sanitiser)
- Allergen contamination (e.g. Milk, Soya, Eggs, Fish, Nuts, Cereals containing gluten, peanuts and crustaceans/molluscs).

Once you have identified all the potential hazards in your business, categorize them as biological, physical or chemical and allergens.

2. Identify critical control points (CCPs)

After identifying all of your food safety hazards, you must now identify essential control points. CCPs are the steps in your process where a control measure is used to prevent, eliminate, or minimize a hazard or hazards to an acceptable level.Fig. 1.4.3: CCPsCritical control points are located at any step where hazards can be prevented, eliminated, or reduced to acceptable levels. CCPs may include thermal processing, chilling, testing ingredients for chemical residues, product formulation control, and testing product for metal contaminants.

Fig. 2.4.3: CCPs

To Identify a Critical Control Point (CCP), the organization follows a risk-based matrix, including the following to an extent where the CCPs will be identified and implemented.

1. Listing all kinds of hazards and developing a risk matrix, where the likelihood of occurrence of the hazard and its severity shall be calculated.
2. Once the severity matrix tells the data, the team must analyze whether the identified risks are significant or non-significant.
3. If the risks identified are non-significant, then the risks must be controlled by PRPs. This systemis a day-to-day activity that prevents that hazard from being non-significant to significant. Ex- Daily cleaning, Pest control, loading and unloading of goods, storage practices, daily weight verification of weighing balances, record keeping etc.
4. In case the risk becomes significant, then a method needs to be approached (either a decision tree developed by CODEX or taking an approach from ISO 22000:2018, Clause 8.5.2.3, which enables any organization to understand if that risk can be controlled by any Operational prerequisite programs (OPRP) or Critical Control Points (CCP).

Some examples of CCPs could be:

- checking the temperature of food before serving
- cooking food to a specific temperature to achieve the microbial kill step
- Passing products through a final point metal detection, like a Metal detector or X-Ray

3. Establish critical limits

A critical limit is a maximum or minimum value. A biological, chemical, or physical threat to food safety must be regulated to prevent, eliminate, or reduce the hazard to an acceptable level. For each danger, each CCP must have one or more critical limits.

Critical limits are generally concerned with parameters that are measurable with equipment or can be answered with a yes or no answer, such as:

- time
- temperature
- acidity
- best before or expiry dates

Critical limits must be given a numerical value (for example, high-risk items must be cooked to an internal temperature of 74°C/165°F*). However, because there are numerous risks, each with its own set of permissible values, finding or assigning actual numbers to critical limits can be difficult.

To get the information you need, you may need to conduct tests or obtain information from outside sources (e.g. regulatory guidelines, expert opinions). If information is not available, make a judgement call — be sure to err on the side of caution, and keep your reasons for making the decision and any reference materials you used in your Food Safety Plan.

4. Monitor critical control points (CCPs)

Food must be monitored to stay within the critical limitations set at each key control point. Put simply, and monitoring means checking that food is safe.

Monitoring techniques can be broken down into four different categories:

- observation monitoring (e.g., checking cleaning schedules, monitoring delivery checklists)
- sensory monitoring (using taste, smell, touch and sight to check whether food is within critical limits)

Fig. 2.4.4: Sensory Monitoring

- chemical monitoring (e.g. checking acidity levels, conducting a nutritional analysis)
- biological monitoring (e.g. checking food temperature, pressure, weight, etc.)

Using checklists and other paperwork to record outcomes is the best way to ensure (and verify) that monitoring is done regularly.

5. Establish corrective actions

Corrective actions are the steps that must be followed Whenever any deviation is observed from the predetermined levels". CCP limits are permanently fixed, and CCPs are regularly and continuously monitored

Immediate corrective action is stopping a breach that is happening now. For example:

- Throwing out contaminated food
- Rejecting a food delivery with signs of pest infestation
- Refrigerating food to keep it out of the Temperature Danger Zone (4°C–60°C/40°F–140°F*)
- The goal of preventative, corrective action is to avoid a breach in the future. For example:
- Performing routine maintenance on equipment
- Changing work procedures
- Training staff to follow food safety best practices

If corrective action must be taken, remember to record and communicate it to the appropriate person (or people) in the business.

6. Establish verification procedures

The verification activities shall confirm that:

a) The PRP(s) are implemented and effective
b) The hazard control plan is implemented and effective
c) Hazard levels are within identified acceptable levels
d) Input to the hazard analysis is updated

The manufacturing firm/company/organization shall ensure that verification activities are not carried out by the person responsible.

- For monitoring the same activities.
- Verification results shall be retained as documented information and shall be communicated.

7. Establish record-keeping procedures

Record keeping is critical to the successful operation of your Food Safety Plan. It must include an up-to-date hazard analysis and information on any remedial actions implemented in your food establishment.There are many day-to-day records associated with your Food Safety Plan. For example:

Fig. 2.4.5: Food Safety

- Delivery Checklists
- Signed-Off Cleaning Schedules
- Temperature Recordings
- Pest Inspection Results
- Staff Training Records

All staff should know where the Food Safety Plan is kept, what they are responsible for (e.g., updating cleaning schedules, filling out temperature logs), when they must complete it, and to whom they should report any problems.

If you responded yes to any of these questions, your food safety plan must be updated.

Hazard Analysis Critical Control Point (HACCP) is essential to identify the weakness of the production line and suggest critical limits in compliance with legislation and, therefore, the preventive and corrective measures.

Though the HACCP system was designed to aim for zero defect products, it is not feasible to achieve 100% defect-free products. However, it aims to minimize the associated risks during production and reduce unacceptable unsafe products. Therefore, during the implementation of HACCP, it is imperative to set controls at each point of the production line at which safety problems (physical, chemical and microbiological) are likely to occur.

A HACCP plan must be in place before initiating the HACCP system. A HACCP plan consists of **5 initial steps and seven major HACCP principles**.

The requirements for Sanitation Standard Operating Procedures (SSOPs), Good Manufacturing Practices (GMPs), & Good Hygiene Practices should be considered PreRequisite for HACCP.

Risk assessment is a critical step in a HACCP plan. Below is a template to determine what severity and probability a processing step is involved with and, therefore, what level of criticality is held in the processing line.

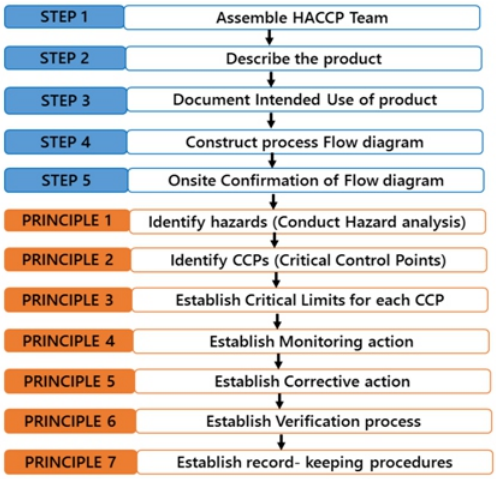


Fig. 2.4.6: HACCP Steps & Principles

Probability/ Likelihood — What's the chance of the risk occuring?	Consequence/ Severity — How severe could the outcome be if the risk event occurs?				
	Severe	Major	Significant	Minor	Insignificant
Frequent	Extreme	Extreme	Very High	High	Medium
Likely	Extreme	Very High	High	Medium	Medium
Occasional	Very High	High	Medium	Medium	Low
Seldom	High	Medium	Medium	Low	Very Low
Unlikely	Medium	Medium	Low	Very Low	Very Low

Fig. 2.4.7: HACCP Steps & Principles

Introduction to Decision Tree

Hazard Analysis and Critical Control Point (HACCP) decision trees can help you decide whether a hazard control point is a critical control point (CCP) or not. A CCP is a step at which control can be applied. However, it is not always possible to eliminate or prevent a food safety hazard, allowing you to reduce it to an acceptable level. A decision tree aims to support the team's judgment and help you confirm whether the hazard needs more food safety controls. Decision trees are not mandatory elements of HACCP, but they can help you determine whether a particular step is a CCP.

You must determine the correct CCPs to ensure that food is managed effectively and safely. The number of CCPs in a process will depend on how complex the process is and how many hazards are present.

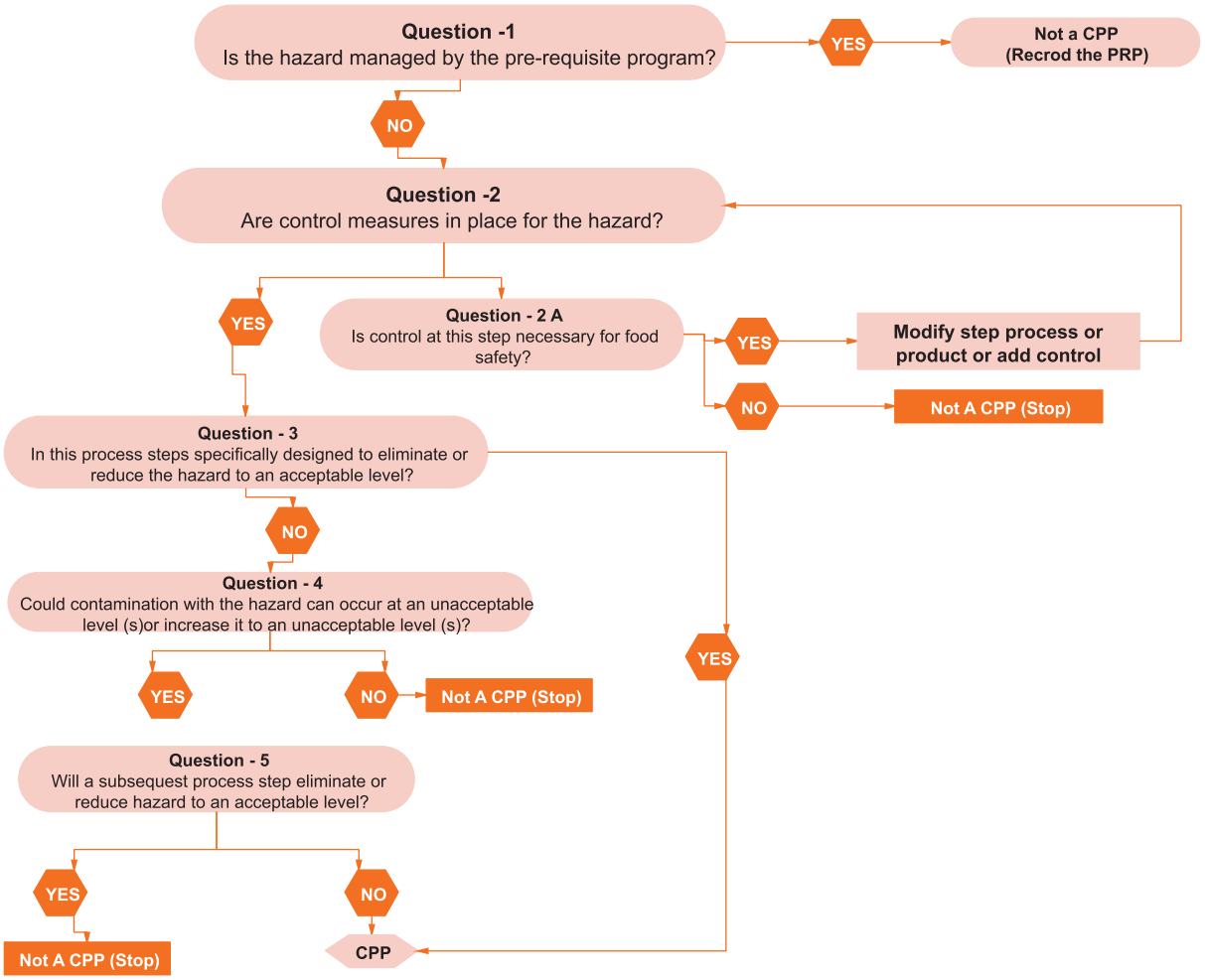


Fig. 2.4.8: HACCP Decision Tree

Exercise

Q. 1. What is the third step of HAACP?

(A). Establishing Hazard Analysis
(B). Establishing Critical Control Limits
(C). Establishing Critical control points
(D). Verifying

Q. 2. Recording temperatures from the oven every hour follows which HAACP plan?

(A). Record Keeping
(B). Monitoring
(C). Verifying
(D). All of the above

Q. 3. What is the goal of HACCP?

(A). Keep the establishment pest-free
(B). To raise money in fees for the federal govt.
(C). To establish awareness of the safety rules for employees
(D). Identify and control possible hazards throughout the flow of food

Q. 4. What are the steps of HACCP?

Q. 5. Which step is essential in the success of any HACCP?

UNIT 2.5: Overview of PRP, OPRP & CCP

Unit Objectives

At the end of this module, you will be able to understand

1. Explain the Importance of HACCP plans
2. Describe the Steps of HACCP in Food Safety
3. Difference between HACCP and HARPC

2.5.1. Overview of PRP, OPRP & CCP

Many food safety practitioners find' PRP', 'OPRP', and 'CCP' confusing because of their similarities.

Control measures are divided into PRP, OPRP, and CCP. According to the International Standards Organisation (ISO), a control measure is an action or activity that can prevent or eliminate a food safety danger or decrease it to an acceptable level in food safety.

PRP	oPRP	CCP
Horizontal; applies to all operations	Applies to a specific hazard and a specific product and process	Applies to a specific hazard and a specific product and process
May contribute to the reduction of a hazard but may not be essential for control	Is essential for the reduction of the hazard, but may work in the hazard conjunction with other controls	Provides absolute control over
Failure does not necessarily mean product is unsafe	Failure does not necessarily mean product is unsafe	Failure indicates product is unsafe
Is not measureable in real time	May or may not be measurable in real time— critical limits may be established	Measurable in real time with critical limits established

Fig. 2..5.1: PRP, OPRP & CCP

Critical Control Point (CCP)

A Critical Control Point, as defined by ISO, is a phase in the process when control can be applied and is necessary to prevent, eliminate, or reduce a food safety hazard to an acceptable level.

The phrase "a step in the process" distinguishes a CCP from a general control measure. It refers to a specific process step rather than a broad activity or action.

A CCP must be designed to apply control. Else cannot be referred to as a CCP.

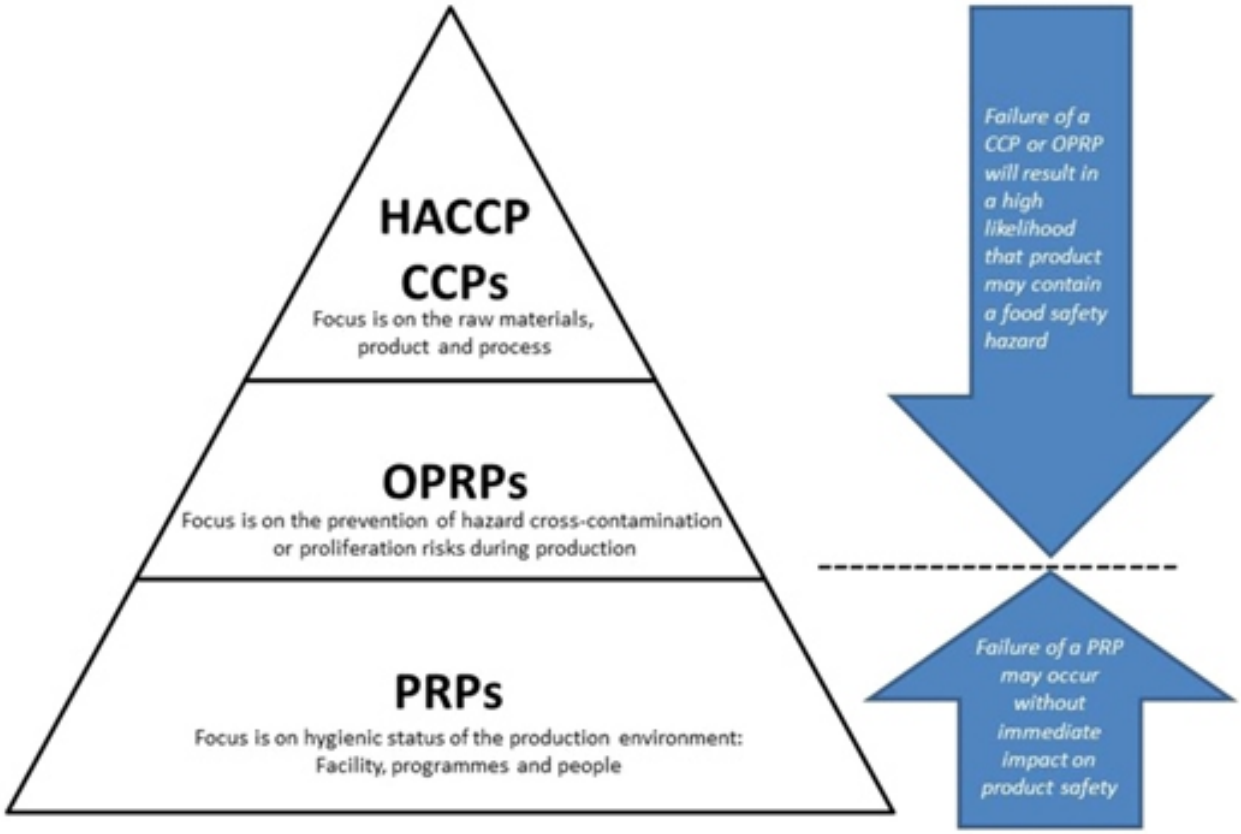


Fig. 2.5.2: PRP, OPRP & CCP

Prerequisite Program (PRP)

PRPs, as defined by ISO, are the primary conditions and activities required to maintain a sanitary environment adequate for the production, handling, and provision of safe end products and safe foods for human consumption across the food chain.

PRPs are of different varieties depending on the particular product and process.

The following are examples of PRP in a food manufacturing environment:

- Construction And Layout Of Buildings
- Layout Of Premises, Including Workspace And Employee Facilities
- Supplies Of Air, Water, Energy And Other Utilities
- Supporting Services, Including Waste And Sewage Disposal
- The Suitability Of The Equipment And Its Accessibility For Cleaning And Maintenance
- Management Of Raw Materials, Supplies, Disposals And Handling Of Products
- Measures For Preventing Cross-Contamination
- Cleaning And Sanitizing
- Control Of Pests
- Hygiene Of Personnel Etc.

It should be emphasized that PRPs are usually broad in scope and not specific to any one phase in the process.

Their failure does not always imply an immediate risk to food safety. However, as they fail over time, a fundamental alteration occurs, potentially posing a food safety risk.

Operational Prerequisite Program (PRP)

OPRP is defined by ISO 22000 as a control measure identified by the hazard analysis as necessary to prevent the introduction of food safety hazards and the contamination or proliferation of food safety hazards in the product(s) or processing environment.

OPRPs are process-specific measures vital for food safety and critical for lowering the likelihood of specific hazards.

OPRP is not an essential stage in the process; it can be eliminated. However, a company can still create relatively safe products.

Understanding these differences assists in the easy implementation, monitoring and management of the food safety management system.

Exercise

Q. 1. What does 'CCP' stands for?

(A). Critical Centre Point
(B). Critical Cut-off Point
(C). Critical Control Point
(D). Critical Control Plan

Q. 2. Which of these is true?

(A). Critical Control Point need to be monitored
(B). A critical limit is set for CCP to keep in check
(C). Corrective action to be taken at the time of any non-conformance
(D). All of the above

Q. 3. CCP helps to control?

(A). Hazard risk
(B). New product development
(C). Quality checklist
(D). Quality assurance

Q.4. What are the PRP elements in food safety?

Q. 5. What is the difference between PRP and OPRP?

UNIT 2.6: Personnel and Surrounding Hygiene

Unit Objectives

At the end of this module, you will be able to understand

1. Explain the high standard of personal cleanliness
2. Describe the ways to ensure food safety

Personal Hygiene and Workplace Hygiene

Good personal hygiene can prevent food poisoning.

Food poisoning bacteria can be found in anyone - including healthy people. If you touch your nose, lips, hair, or clothes, then food, you can spread bacteria from yourself to the meal.

It is also good business sense to maintain proper personal hygiene. Customers appreciate seeing food-handling employees concerned about hygiene and practising safe food handling.

Fig. 2.6.1: Hygiene at Workplace

Food handlers – personal hygiene tips

To prevent food poisoning using good personal hygiene, follow these tips:

- wash and dry your hands thoroughly before handling food, and wash and dry them again frequently during work
- dry your hands with a clean towel, disposable paper towel or under an air dryer
- never smoke, chew gum, spit, change a baby's nappy or eat in a food handling or food storage area
- never cough or sneeze over food or where food is being prepared or stored
- wear clean protective clothing, such as an apron
- keep your spare clothes and other personal items (including mobile phones) away from where food is stored and prepared
- tie back or cover long hair
- keep fingernails short, so they are easy to clean and do not wear nail polish because it can chip into the food
- avoid wearing jewellery, or only wear plain-banded rings and sleeper earrings
- completely cover all cuts and wounds with a wound strip or bandage (brightly coloured waterproof bandages are recommended)

- wear disposable gloves over the top of the wound strip if you have wounds on your hands
- change disposable gloves regularly
- advise your supervisor if you feel unwell and do not handle food.

Food handlers – handwashing

1. Handwashing thoroughly minimises the risk of contaminating food with microorganisms from your own body.
2. Hands should be washed with soap and warm water, and the backs of your hands, wrists between your fingers, and under your fingernails should all be washed.
3. After you have washed your hands, make sure they are dehydrated. Always use a clean towel, disposable paper towel, or an air dryer to dry your hands.

Food handler health and working

Because food handlers have the potential to contaminate food, companies and employees must ensure that no illness is spread among individuals in the sector.

If you are vomiting or have diarrhoea, you should not work. Return to work only once your symptoms have subsided for at least 48 hours. If you are unsure, you should get guidance from your doctor.

If you are sick with an ailment that is likely to be transmitted through food, do not go to work.

You must advise your supervisor if you feel unwell, including when suffering from a cold, flu, sties and other eye infections.

Fig. 2.6.2 Medical fitness certificate Profarma

There is a separate requirement forthe food handler's annual medical check-up mentioned in FSSAI, condition of licensing and as compliant with Schedule-IV (See Para No. 10.1.2., Part-II, Schedule-IV of FSS Regulations, 2011). Therefore, Arrangements shall be made to get the food handlers/employees of the establishment medically examined once a year to ensure that they are free from any infectious, contagious and other communicable diseases. A record of these examinations signed by a registered

medical practitioner shall be maintained.

PERFORMA FOR MEDICAL FITNESS CERTIFICATE FOR FOOD HANDLERS

(FOR THE YEAR .....)

(See Para No. 10.1.2, Part- II, Schedule - 4 of FSS Regulation, 2011)

It is certified that Shri/Smt./Miss..... employed with M/s....., coming in direct contact with food items has been carefully examined* by me on date ..... Based on the medical examination conducted, he/she is found free from any infectious or communicable diseases and the person is fit to work in the above mentioned food establishment.

Scan/Click the code to access the decumbent (ANNEXURE 1 Page No. 72)

Name and Signature with Seal
of Registered Medical Practitioner / Civil Surgeon

***Medical Examination to be conducted:**

1. Physical Examination
2. Eye Test
3. Skin Examination
4. Compliance with schedule of Vaccine to be inoculated against enteric group of diseases
5. Any test required to confirm any communicable or infectious disease which the person suspected to be suffering from on clinical examination.

Food handlers – skills and knowledge

Food handlers must be aware of how their activities may affect the food's safety.

Food handlers need to know:

- How to locate and follow workplace information
- About their food handling operations
- How to identify and correct (or report) situations or procedures that do not meet the business' food safety obligations
- Whom to report food safety issues to within the business

- Their responsibilities concern health and hygiene requirements.

Behaviour in the workplace

Our kitchen behaviour can also be a source of food contamination. Some things you do without thinking can be hazardous.

When moving around the workplace, try the following tips:

- Avoid all unnecessary contact with ready to eat foods such as salads, cooked meat or fruit. This has been proven to reduce the risk of food contamination significantly.
- If you cough or sneeze into your hands, always ensure you wash your hands thoroughly and replace any gloves.
- Never touch your face, hair, jewellery or clothing while preparing food.
- Do not taste food with your fingers or with utensils returned to the food.

Fig. 2.6.3 Kitchen Hygiene

- Do not smoke. If you need to smoke, always ensure it is done well away from all food preparation areas. Also, ensure your hands and face are washed thoroughly afterwards.
- Wipe the sweat from your face away using a cloth or paper towel, then wash your hands thoroughly.
- Avoid chewing gum while preparing food.
- Replace any protective clothing such as aprons and gloves when moving from onekitchen area to another.
- Always know your company policies regarding moving between workstations.

Exercise

Q. 1. Cleanliness, physical exercise, rest and sleep are a part of _____.

(A). Hygiene
(B). Social hygiene
(C). Personal hygiene
(D). None of the above

Q. 2. Which of the following factors is necessary for a healthy person?

(A). Vaccination
(B). Balanced diet
(C). Personal hygiene
(D). All of the above

Q. 3. Spreading bacteria to clean food from contaminated work surfaces, hands, utensils, or food is called:

(A). Botulism
(B). Cross-contamination
(C). Hygiene
(D). Food-borne illness

Q. 4. Why are personnel appearance and personal hygiene important in the foodservice industry?

Q.5. What are the personal hygiene practices to be followed by food handlers?

UNIT 2.7: Documentation of HACCP Plan and its Methods

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the Steps To Develop A HACCP Plan
2. Describe the importance of documentation and record-keeping

2.7.1. Establish Documentation and Record-Keeping

Suppose a food safety problem occurs as a result of your products. In that case, you may be required to establish that you took all reasonable efforts to make food safe. In the event of legal action, demonstrating that the HACCP principles have been correctly applied as required by law and that documentation and records have been retained may give evidence of due diligence.

Fig. 2.7.1: Critical Elements

Documentation and record-keeping should be:

- 1. Appropriate to the operation's nature and size,
2. Sufficient to assist the business in verifying that the HACCP controls are in place and maintained.

What to consider regarding documentation

- What records need to be kept?
- How are they to be stored – e.g. hard copy, electronic?
- Where are the documents to be stored?
- How long are the records to be retained? (what is an appropriate time, think about the shelf-life of the product and possibly how the product may be misused)
- Who is responsible for the records?
- Who needs frequent access to the records?

Examples of records

- CCP monitoring activities
- Deviations and associated corrective actions
- Verification procedures performed
- Modification to the HACCP plan
- Training undertaken
- Daily records (glass and brittle plastic check)

- Visual inspection reports
- Team meeting records

Fig. 2.7.2: Analysis

- Processing records

Examples of documentation

- The HACCP plan
- List of hazards and details of the hazard analysis
- CCP Validation, Determination and Verification (CCP Validation Documents in the form of DQ, IQ, OQ, PQ, i.e. Design Qualification (DQ), Installation Qualification (IQ), Operational Qualification (OQ) and Performance Qualification (PQ).
- Critical limit determination
- Training needs analysis
- Procedures – e.g. standard operating procedures, the corrective action procedure
- Work Instructions

Review

If any has inside the company, a review of this concept should be scheduled and initiated (see Principle 6).

During a review, you may wish to consider the following:

- Does the documentation cover all of the HACCP system operations?
- How is the document controlled with regards to updates and issues etc.?
- Are all documents accurate and current?
- Are verification procedures documented?
- How are change and version control managed?

2.7.2 Completing Your HACCP Plan: a Step-by-Step Guide

The Hazard Analysis and Critical Control Point (HACCP) system is a systematic, internationally recognized approach to decreasing food safety concerns.

Control potential biological, physical, chemical and allergenic hazardsthat threaten the integrity of each of your food products using a HACCP system. HACCP plans are required for each of your goods or processes.

Below, we will walk you through the steps of designing and filling out a HACCP plan template.

Complete Your Relevant Prerequisite Programs:

Before working on the HACCP system, you must first finish several pre-condition programmes.

These programs vary according to the type and way you process food. They usually include items such as:

- Water and ice safety
- Food-contact surface cleanliness and conditions
- Preventing cross-contamination
- Maintaining hygiene facilities (handwashing, toilet facilities, etc.)
- Labelling and storage programs
- Pest prevention
- Allergen management
- Training
- Waste disposal
- Temperature control

Fig. 2.7.3: Pest Prevention

These programs form the foundation of your HACCP plan.

Nominate Your HACCP Team

The HACCP system is a collaborative effort, and the strength of your HACCP plan is only as good as your team.

Each HACCP team member should come from a different department to provide a well-rounded perspective.

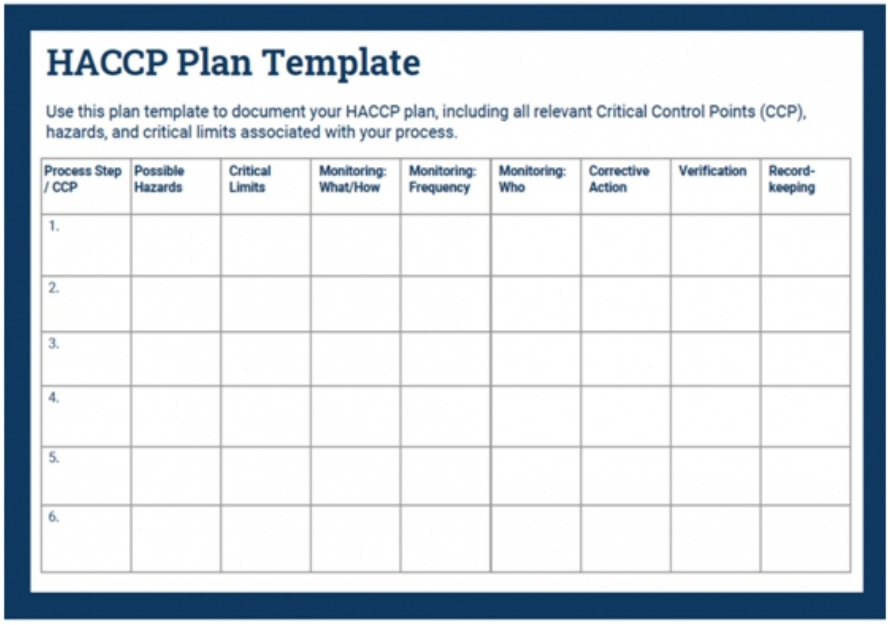
Members Personnel from the operation room should also be included. They provide practical insight into the process and aid in detecting any flaws. Involving these team members also gives the HACCP process a sense of ownership, making its implementation more likely to succeed.

Fig. 2.7.4: HACCP Team Members

Complete Your Plan Template

You are ready to begin working on your HACCP plan template with your team in place.

Complete your HACCP plan step by step using the following guide.



HACCP Plan Template

Use this plan template to document your HACCP plan, including all relevant Critical Control Points (CCP), hazards, and critical limits associated with your process.

Process Step / CCP	Possible Hazards	Critical Limits	Monitoring: What/How	Monitoring: Frequency	Monitoring: Who	Corrective Action	Verification	Record-keeping
1.								
2.								
3.								
4.								
5.								
6.								

Fig. 2.7.5 HACCP Plan Template

Tips for Writing HACCP Plan

Keep descriptions precise but brief when writing your HACCP strategy. Make use of simple, no-nonsense terminology. Your strategy should be simple to comprehend and implement.

After you have finished your first draught, go over it again and remove everything that is not necessary.

Write Your Product Description

Every team's first task is to write a product description.

HACCP Plan: Product Description

Orange Juice Company (OJC)

OJC Tan-Orange Juice

Our product is a 100% tangerine and orange juice blend.

Commonly known as fresh-squeezed or not-from-concentrate, our product is used by consumers in the general population for refreshment and as a part of a healthy diet.

Our product is produced in house using the cold press method. It is not pasteurized. It requires immediate refrigeration and refrigeration throughout its distribution and shelf stocking.

The product is packaged in BPA free plastic bottles provided in 8 and 16 oz. by Bottling Co. Its shelf life is 28 days at constant refrigeration.

Our product will be sold wholesale to regional grocers, coffee shops, and restaurants, which will then sell it direct-to-consumer.

Labeling to include lot coding, safe consumption guidelines (within 4 days /keep refrigerated).

By: Jane Jackobs, Product Manager, OJC

Date: January 2020

Orange Juice Company | 333 OJC Rd. | Pasadena, CA

Fig. 2.7.6: Product Description

The description should be general and include shelf life and physical and chemical parameters that impact food safety:

- The food
- Ingredients
- Processing methods
- Packaging
- Storage
- Distribution procedures (frozen, refrigerated, ambient temperature, etc.)
- Example of the label and labelling information

Describe Your Intended Use and Primary Market

Who buys the food, and why do they do so? This component of your product description will come in handy later on when establishing critical limits.

Many dishes can be classified as catering to the general public, as they are purchased for cooking at home. However, if you make a specialised product, like dairy-based baby formula, you will need to target them directly.

For example, suppose you are writing a description of baby formula. In that case, you may mention that it is meant to be blended with water.

Process Flow Chart

The second step of your template requires identifying the scope and the process or commodity flow.

The HACCP team uses the product description, intended use, and primary market to create a detailed description of the entire manufacturing process from beginning to end.Fig. 1.7.8: Commodity Flow ChartThe commodity flow diagram, or flowchart, simplifies the process steps. It does not need to include fine details at this point in the diagram — that comes later.

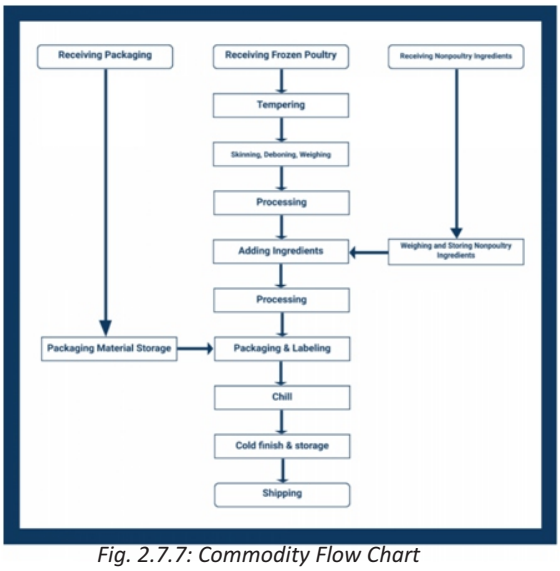


Fig. 2.7.7: Commodity Flow Chart

However, there are some common oversights. Make sure that your list of process steps also includes:

- Any inputs
- Intended delays
- Procedures that vary by shift
- Return of product to the process
- Any outputs from the product

Verify the Flow Chart

The next step is to double-check the flow diagram you just made. Then, your team should go over it again: you should go to the location where the system is used and walk through each step on the chart as if it were a production process (i.e., walk the line).

Your verification phase guarantees that the flow chart contains all the process's procedures and materials, allowing you to identify every single important control point in the next step.

If the process varies from shift to shift or season to season, your HACCP team should visit at least once throughout each version. Multiple visits aid in the creation of more detailed flow diagrams.

If your commodity flow diagram is incorrect, your HACCP plan will be ineffective.So take the time to verify and get it right the first time.

Run a Hazard Analysis

After completing the process flowchart, you will need to assess it for any dangers. First, look for biological, chemical, physical, allergen and environmental threats in each step you identified in your flowchart.

The hazard analysis will assist you in determining which steps in your commodity flow are essential for consumer protection. (See Principle 1 for more information.)

Flowchart/ Process Step	Hazard Type (Biological, Chemical, Environmental)	Hazard Description	Potential Impact (See Risk Matrix)	Control Methods	Hazard Alleviated by Controls? (Y/N)	Monitoring Methods	Conclusion: CP or CCP?
1. Transfer via loading dock	Biological	Growth of pathogenic bacteria	High	Temperature control to FDA and scientific standards	Y	Recording and limiting tie outside of refrigeration	CCP

Fig. 2.7.8: Hazard Analysis

Document hazard type, "Likelihood of occurrence of hazard X Severity of the hazard if exist", and control methods on a hazard analysis worksheet. Be sure to note whether or not you have legal requirements for controlling each of the hazards you identified.

Use a second tool — the CCP decision tree — to help you identify the relevant CCPs.

Risk assessment

Risk assessment is a critical step in a HACCP plan. Risk is the combination of the likelihood (probability) of Occurrence & Consequence(s) (sometimes referred to as severity) of a specified hazardous event occurring.

So the risk is defined as: RISK= OCCURRENCE * CONSEQUENCE

The following scales can measure the likelihood of Occurrence & the consequences, hence the risk.

Criteria forLikelihoodof Occurrence				
Likelihood ofOccurrence	Criteria			Rating
	Frequencyofoccurringat least once in		Description	
	Routine job	***Irregularjob***		
Very High	Daily	Five batches	Persistent willoccur ifnot attended to	**5**
High	Fortnightly	50 batches	Frequentchance of occurrence	**4**
Moderate	Monthly	100 batches	Occasionallycouldoccur	**3**
Low	Yearly	1000 batches	Relativelysomechance ofoccurrence	**2**
Remote	**In 5 years**	**5000 batches**	**Unlikelytooccur**	**1**

Table 2.7.1: Criteria for Likelihood of Occurence

Consequence (Severity)		
Rating	**Severity**	**Effect**
5	Very High (Catastrophic)	Death
4	High (Critical)	Serious Illness
3	Moderate	Illness/Injuries
2	Low	Un-comfort
1	Remote	No injuries

Table 2.7.2: Consequence (Severity)

Nature of Control over Risk

Rank ofRisk	Risk IndexValue	Level of Control	Significant
R1	16-25	Avoidance/Special Process	**Significant Hazard**
R2	15-Sep	Physical Control/Monitoring	**Significant Hazard**
R3	8-May	Formal Control	**Non-Significant Hazard**
R4	0-4	Informal Control / Training	**Non-Significant Hazard**

Table 2.7.3: Nature of Control Over Risk

The level of risk could help to identify the level of control as per the following:-

R1: Avoidance:	Precluding the possibility of a given hazard, it may be the modification of the process if necessary.
R2: Physical Control:	Continuous control & monitoring of the actual physical process.
R3: Formal Control:	It is the management of the conditions of an operation to maintain compliance with documented criteria.
R4: Informal Control	It is the monitoring/check of the process without formal recording.
Training:	It is the teaching of the staff responsible for the process of what is to be done to prevent the hazard.

Table 2.7.4: Level of Control

Identify Critical Control Points

You are ready to use a CCP Decision Tree to find the critical control points (CCPs) for each step now that your process flow has been confirmed and risks have been identified. Again, principle 2 explains this in detail.

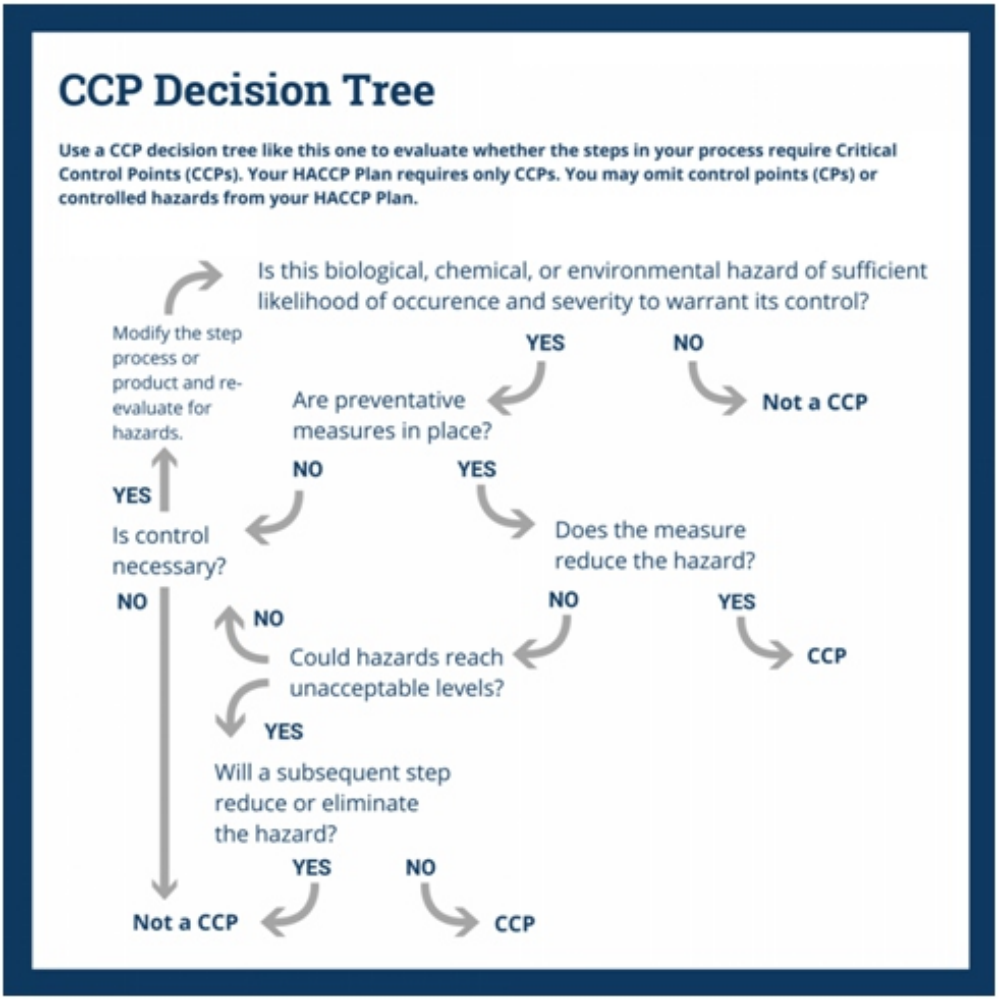


Fig. 2.7.9: CCP Decision Tree

A CCP is a point where you must intervene to remove, mitigate, or prevent a hazard from becoming unacceptable.It is vital to note that a single CCP can control several hazards. Conversely, multiple CCPs may be required to manage a single hazard.

In your HACCP template, fill in the first column with your CCPs. Then, place them in consecutive order.

Next, fill in the second column with the identified hazards in your analysis.

Process Step / CCP	Possible Hazards	Critical Limits	Monitoring: What/How	Monitoring: Frequency	Monitoring: Who	Corrective Action	Verification	Record-keeping
1. Receiving	Shellfish may contain marine biotoxins, pathogens, and/or toxic chemicals if harvested improperly							
2. Points of Transfer: Loading Dock	Pathogenic bacterial growth							
3. Storage	Pathogenic bacterial growth							

Fig. 2.7.10: CCP Template

Set Critical Limits for Each CCP

The critical limit (see Principle 3) is the greatest or lowest value that can be tolerated for food safety.

If the values you are monitoring are not within the crucial range, you are putting your customers' health in danger. Therefore, each critical limit should be as strict as any legal limits that apply to your processes, if not more so.

Process Step / CCP	Possible Hazards	Critical Limits	Monitoring: What/How	Monitoring: Frequency	Monitoring: Who	Corrective Action	Verification	Record-keeping
1. Points of Transfer: Loading Dock	Bacterial growth	Once under temperature control, shellstock is not permitted to remain outside of refrigeration for more than 2 hours						

Fig. 2.7.11: CCP Template

In your HACCP plan, fill in the critical limits column with measurable controls.

You will also need to validate your critical limits and monitor corrective actions after completing your HACCP plan and if the HACCP plan remains in place.

Identify Monitoring Procedures for Each CCP

HACCP Principle 4 covers the establishment of monitoring procedures for CCPs.

Monitoring is a series of measures and observations used to see if the CCP is still under control. It is also crucial for record-keeping and verification in the future.

Your monitoring technique aids in the detection of tendencies toward loss of control, allowing you to

use the next step (corrective actions) to stay inside the critical limit.

When you identify the monitoring procedures, you must:

- Nominate a person to conduct the monitoring (must be a specific individual)
- Determine what to monitor
- Identify the process for monitoring
- Create a process timeline (when it will be monitored, frequency, etc.)

Nominate a person to audit the monitoring system

It would be best to examine factors such as the number of essential control points involved, the preventive measures to be implemented, and the complexity of the monitoring as you design the processes.

Document all of the above in the monitoring columns of your HACCP plan.

Process Step / CCP	Possible Hazards	Critical Limits	Monitoring: What/How	Monitoring: Frequency	Monitoring: Who	Corrective Action	Verification	Record-keeping
1. Points of Transfer: Loading Dock	Bacterial growth	Once under temperature control, shellstock is not permitted to remain outside of refrigeration for more than 2 hours	Time out of refriger-ration (Record duration)	Starting with arrival of every lot or pallet	Plant Personnel as assigned			

Fig. 2.7.12: CCP Template

Keep in mind that responsible staff needs to be trained in the monitoring technique and have a keen understanding of the purpose of the process.

Ideally, they will be able to provide unbiased reporting to ensure accuracy. However, staff should never check their work.

Define Corrective Actions for Each CCP

Principle 5 compels you to determine the best course of action for any issues that arise in each circumstance.

Corrective actions do three things:

- Restore control

- Deal with products impacted by the loss of control
- Investigate the cause of the loss of control

In addition to determining your corrective actions, you also need to identify and note:

- Who is responsible for what corrective action?
- What information must be recorded, where to record it, and who should record it
- Who will audit the corrective action and double-check the data recorded

For example, suppose you work in meat production. In that case, legislation is likely to require items like only admitting clean and healthy animals for slaughter and dressing.

Use the Corrective Action column in your HACCP plan to document critical procedures for controlling breaches.

Process Step / CCP	Possible Hazards	Critical Limits	Monitoring: What/How	Monitoring: Frequency	Monitoring: Who	Corrective Action	Verification	Record-keeping
1. Points of Transfer: Loading Dock	Bacterial growth	Once under temperature control, shellstock is not permitted to remain outside of refrigeration for more than 2 hours	Time out of refriger-ration (Record duration)	Starting with arrival of every lot or pallet	Plant Personnel as assigned	If shellstock are out of Temperatur control for greater than 2 hours, check internal temperature If temperature exceeds 50°F, product must be iced or chilled rapidly to bring internal temperature to 50° F. (Record corrective action)		

Fig. 2.7.13: CCP Template

Validate and Verify

Before certifying that any of the designs generated at your company are ready for usage on the floor, they must be verified and validated. Principle 6 explains how to do this.

It is divided into two parts. You must first ensure that the HACCP plan will function as intended. This necessitates on-site labour.

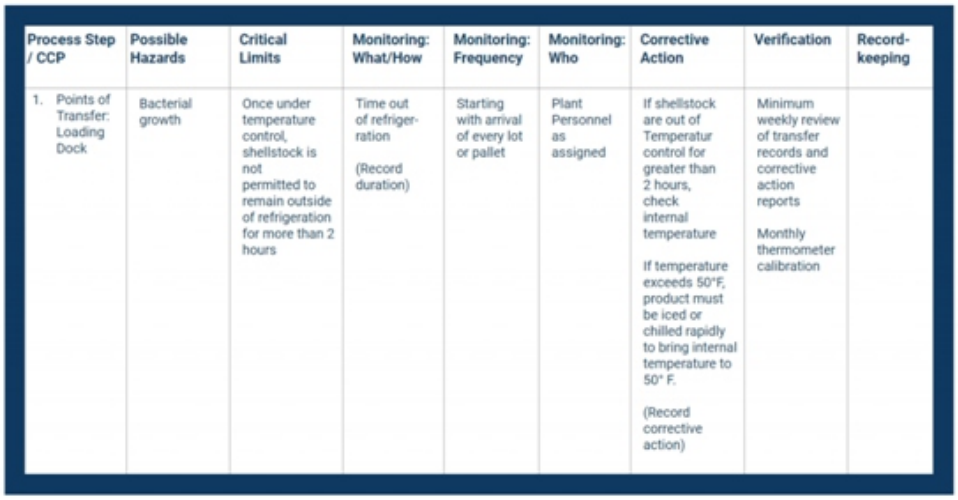
Second, validation uses scientific and technical principles to identify whether the HACCP plan offers the control needed for identified hazards.

The same criterion applies to monitoring: validation and verification should be performed by outside persons or team members who will not be involved in daily data collecting or monitoring.

However, the initial validation step is only the beginning.

Future verification and validation points should be identified in your HACCP plan. The frequency, as well as the manner, should be included in the strategy.

In the verification column, record how you will stay on top of your processes and records.



Process Step / CCP	Possible Hazards	Critical Limits	Monitoring: What/How	Monitoring: Frequency	Monitoring: Who	Corrective Action	Verification	Record-keeping
1. Points of Transfer: Loading Dock	Bacterial growth	Once under temperature control, shellstock is not permitted to remain outside of refrigeration for more than 2 hours	Time out of refriger-ration (Record duration)	Starting with arrival of every lot or pallet	Plant Personnel as assigned	If shellstock are out of Temperatur control for greater than 2 hours, check internal temperature If temperature exceeds 50°F, product must be iced or chilled rapidly to bring internal temperature to 50° F. (Record corrective action)	Minimum weekly review of transfer records and corrective action reports Monthly thermometer calibration	

Figure 2.1.14 Dust is an essentialissue in a unit

Verification usually includes addressing these items at a minimum:

- Pre-requisite programs
- CCPs
- Calibration
- The HACCP Plan

Validation should occur at least once a year, and it may include items such as:

- Hazard analysis justification
- Support of critical limits
- Support for monitoring activities
- Support for hazard identification
- Support for CCP location

Identify Logs and Records

Finally, identify the required records and create systems that keep them up to date (Principle 7). Again, both your team and regulators require this.

You will need to carefully record the critical activities associated with your HACCP plan, including:

- Critical limit monitoring logs
- Testing and calibration logs
- Corrective action log
- Verification logs

Place all necessary recordkeeping activities in the final column of your HACCP plan.

Process Step / CCP	Possible Hazards	Critical Limits	Monitoring: What/How	Monitoring: Frequency	Monitoring: Who	Corrective Action	Verification	Record-keeping
1. Points of Transfer: Loading Dock	Bacterial growth	Once under temperature control, shellstock is not permitted to remain outside of refrigeration for more than 2 hours	Time out of refriger-ration (Record duration)	Starting with arrival of every lot or pallet	Plant Personnel as assigned	If shellstock are out of Temperatur control for greater than 2 hours, check internal temperature If temperature exceeds 50°F, product must be iced or chilled rapidly to bring internal temperature to 50° F. (Record corrective action)	Minimum weekly review of transfer records and corrective action reports Monthly thermometer calibration	Shellstock temperature control record Thermometer calibration record Corrective action record

Fig. 2.7.15: CCP Template

Train your team to document and store their HACCP-related activities.

You lose vital information about your product if you do not keep consistent paper or digital logs. If a variation results in consequences, you could face penalties.

Double-Check Your Documentation

To finish, group your HACCP plan template with the additional documents that pertain to your system:

HACCP plan documents (HACCP team, plan template, product description, and product flowchart)

- Hazard analysis
- Explanatory notes
- Monitoring arrangements
- Validation and verification arrangements
- Policy documents (hygiene, monitoring, corrective action)

It is helpful to keep paperwork simple. Then, it will be easy to read, complete, and keep updated. Each record should also identify the person in charge of that record.

Become a HACCP Master

Finally, your HACCP plan is complete — but its success depends on how well you implement it. Your HACCP system aids in the monitoring of essential control points in order to avoid a chaotic situation.

It is critical not to overlook the importance of verification and validation throughout the procedure and your papers. Regulatory compliance and certification are essential. Nevertheless, more importantly, they assist you in ensuring that your system functions properly.

Exercise

Q. 1. Steps at which control can be applied and are essential to prevent or eliminate a food safety hazard or reduce it to an acceptable level are:

(A). Critical Control Points

(B). Control Points

(C). Critical Limits

(D). Hazard Analysis

Q. 2. The process of collecting and evaluating the information on hazards associated with the food under consideration to decide which are significant and must be addressed in the HACCP plan is:

(A). Critical control point

(B). Hazard analysis

(C). Record keeping

(D). Validation

Q 3. A measure such as time, temperature, water activity, pH, weight or some other measure that is based on scientific literature or regulatory standards:

(A). Conduct a Hazard Analysis

(B). Identify the CCPs

(C). Establish Critical Limits

(D). Monitor CCPs

Q. 4. What are the methods of the HACCP system?

Q. 5. What documents would you find in HACCP?

Notes

Scan the QR Codes to Watch the related Videos

M-30.Good Manufacturing Practices (GMP)

Food Safety and Standards Act (FSS Act)

Good Hygienic Practices (GHP)

NCVET
कौशल गुणवत्ता प्रगति

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

FICSI
Food Industry Capacity and Skill Initiative

3. Conduct Audits and Handle Customer Complaints

Unit 3.1 Food Safety and Standards Act'2006 (FSSA) and Its Regulations

Unit 3.2 Critical Limits of Possible Risks

Unit 3.3 Documents and Records necessary to Conduct Audits

Unit 3.4 Concept of Root Cause Analysis (RCA), Corrective Actions and Preventive Actions

Unit 3.5 Protocols of a Food Safety Auditor and necessary Tools

Unit 3.6 Customer Complaint Log

Unit 3.7 Procedure of Product Recall, Mock Recall, Forward and Backward Traceability

(FIC/N7614)

Key Learning Outcomes

At the end of this module, you will be able to understand

1. Discuss the significance and procedure to establish the scope and extent of the audit and the evidence required to address the audit scope and responsibilities of the team during the audit.
2. Recall the protocols of a food safety auditor.
3. List necessary tools used by an auditor during the audit.
4. Discuss the significance of preparing the employees for an audit process.
5. Please elaborate on conducting audits and preparation for their relevant documents.
6. Describe the methods to monitor the effectiveness of the food safety management system, identify various NC (Non-Conformance) from the result of the audit and work upon the corrective actions.
7. Elaborate ways to analyse the audit evidence for identifying areas of non-compliance with legislation and the food safety management system.
8. Discuss the root cause analysis (RCA) process and various ways to take corrective and preventive actions.
9. Elaborate ways to analyse the implementation of corrective and preventive actions.
10. Discuss the documents and records needed to be prepared and maintained related to the audit.
11. Describe regulatory requirements of products and organisational standards for products.
12. Describe the customer complaint logging system of the organisation and how to log the complaints accurately in it.
13. Discuss the procedure to handle complaints regarding food quality.
14. Discuss the nature of complaints coming from the customers
15. Discuss the root cause analysis of customer complaints and various ways to take corrective and preventive actions.
16. Discuss the procedure of product recall, mock recall, and forward and backward traceability.
17. Describe various ways to deal with non-conformance of the food quality.

UNIT 3.1: Food Safety and Standards Act'2006 (FSSA) and Its Regulations

Unit Objectives

At the end of this unit, you will be able to understand

1. Explain the Food Safety and Standards Act'2006 (FSSA) and its regulations
2. Describe the objectives of the food laws and Regulations Act 2006

3.1.1 All about Food Safety and Standards Act (FSS Act)

Since the food industry has become one of the most in-demand sectors of the economy, food adulteration and the mixing of additives in food has been a severe problem. As a result, the government's role in regulating and inspecting the food on the market becomes critical. On the 23rd of August, 2006, the government took action and introduced the Food Safety and Standards Act. However, there were many rules and regulations to oversee safe food practices in the country prior to the passage and implementation of the Food Safety and Standards Act.

Food Acts before FSS Act, 2006:

The Food Safety and Standards Act was promulgated by the Parliament and notified in the Gazette of India on 24th August 2006. The main objectives of the Act were to integrate various food laws that existed in the country to ensure safe and wholesome food for its countryman.

Fig. 3.1.1: FSS Act

Prior to the enactment of this Act, there were many food laws, such as

1. Prevention of Food Adulteration (PFA) Act, 1954
2. Prevention of Food Adulteration Rules, 1955 made there
3. Essential Commodities (EC) Act, 1955
4. Fruit Products Order 1955
5. Meat & Meat Products Order 1973,
6. Milk & Milk Products Orders 1992,
7. Vegetable Oil Products (Control) Order 1973
8. Edible Oil Packaging (Regulations) Order 1998

Various Ministries and Departments enforced the above Acts and Control Orders. Multiple regulations and control created confusion in addressing food safety & quality issues and hassles in the food business. After FSS Act and the Regulations made thereunder came into existence, the above Acts and Orders have been repealed. As provided under the Act, Food Safety and Standards Authority (FSSAI) was established in 2008 to implement and enforce the Act and Regulations. FSSAI is an autonomous

statutory body under the Ministry of Health and Family Welfare.

FSS Act and FSSAI

This new FSS act has changed how the country monitors food safety and food handling manufacturing processes. The Food Safety and Standards Authority of India, established under the FSS Act, is a body corporate that sets standards for food articles and safe methods for handling the food articles created and delivered. FSSAI, the governing body, has set the standards based on thorough scientific research to help regulate the manufacturing, storage, distribution, sale, and import-export of all types of food articles being made available to the general population. Remember, to do import-export business in India, and you must acquire an Import Export License.

So, in a nutshell, the FSS is an Act to consolidate the laws relating to food and to establish the Food Safety and Standards Authority of India for laying down science-based standards for articles of food and regulating their manufacture, storage, distribution, sale and import, to ensure availability of safe and wholesome food for human consumption.

FSSAI License

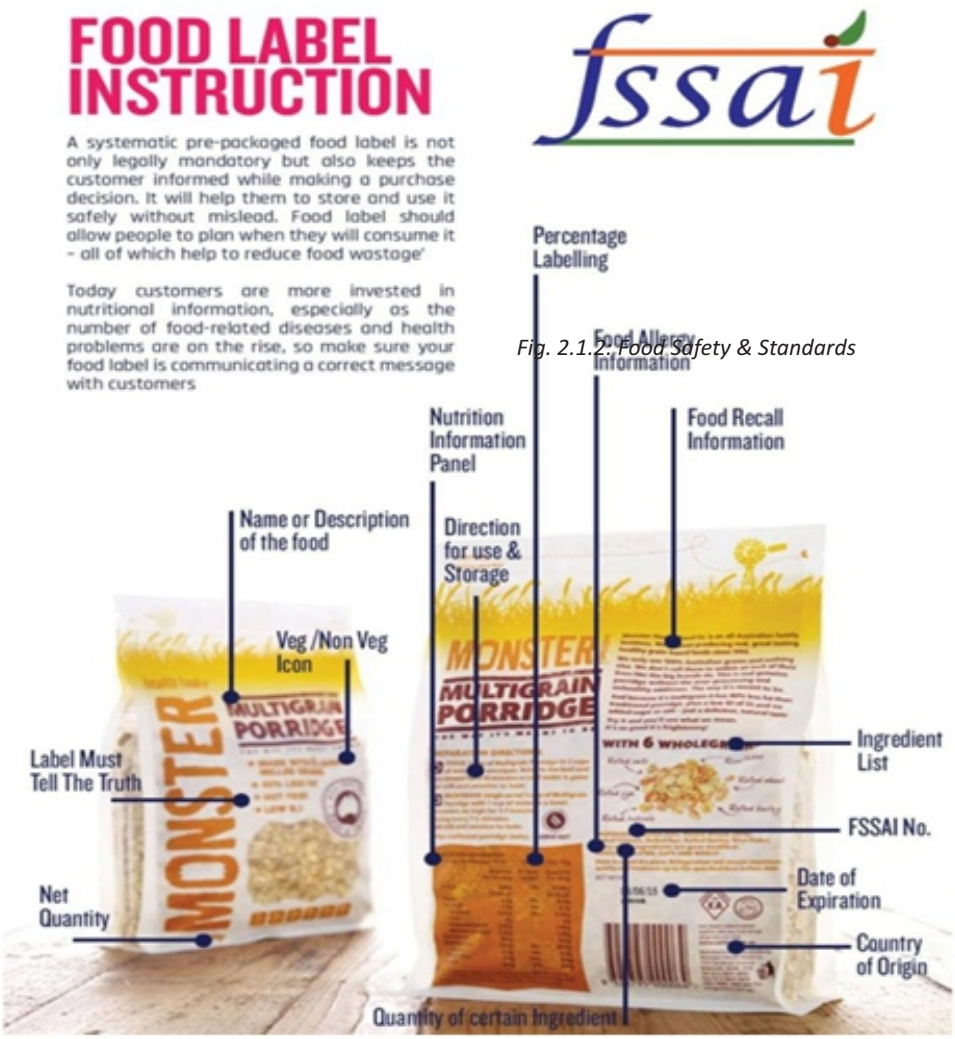
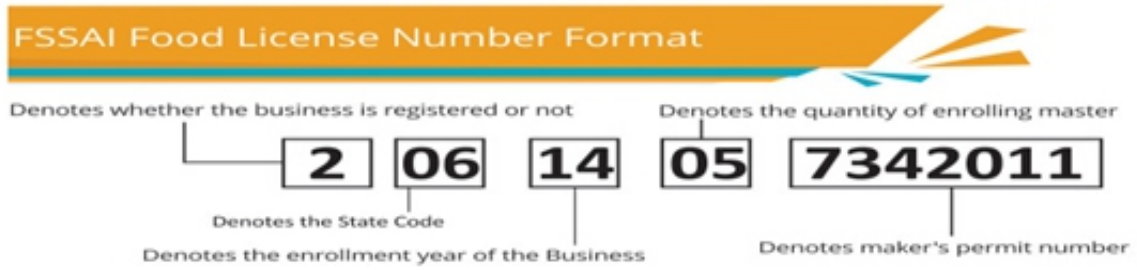


Fig. 2.1.2: Food Safety & Standards

Fig. 3.1.2: Food Label Instruction

This Food Safety and Standards Act empowers the FSSAI to grant FSSAI Licenses for all food products. The FSSAI License is a 14-digit number engraved/printed on food goods beside the FSSAI emblem to ensure the safety of the food products delivered to customers. The FSSAI seal also assures buyers that the food is free of pollutants and substances that could compromise the product's quality.

As per FOOD SAFETY AND STANDARDS (PACKAGING AND LABELLING) REGULATIONS, 2011, the license number shall be displayed as perthe below format-



7. [1][License number shall be displayed on the principal display panel in the following format, namely:-

Provided that the existing products of a unit shall comply with the requirement of this clause on and after the six months of commencement of the Food Safety and Standards (packaging and labeling) Ammendment Regulation ,2013.]

Fig. 3.1.3: FSSAI Food License Number Format

Chapters of the Food Safety and Standards Act

The Food Safety and Standards Act, which the Indian government enacted, is divided into 12 chapters, each of which discusses the impact, restrictions, and authority that the Act entails in ensuring the safety of food products. The Chapters of the Food Standards and Safety Act are as follows.

Chapter I: Preliminary

The preliminary presents the Act, what it stands for, and what the act's definitions are. It also declares that the Union is taking control of the food business in the public interest. This chapter also declared that the applicability of the FSS Act would be throughout India.

(i) **Adulterant**: Any material that could be employed to make a portion of food unsafe or sub-standard or misbranded, or contain extraneous matter.

(ii) **Contaminant**: Any substance whether or not added to food but present in food due to production, manufacture, processing, preparation, treatment, packaging, packing, transport

or holding of such food or as a result of environmental contamination.

(iii) **Extraneous matter**: Means any matter contained in an article of food that may be carried from raw materials, packaging materials or process systems used for its manufacture or which is added to it, but such matter does not render an article of food unsafe .

(iv) **Food additive**: Any substance not generally consumed as food by itself or used as a typical ingredient of food added to food for a technological purpose in manufacturing, processing, preparation, packaging, transport, or holding of such food.

(v) **Food safety**: Means assurance that food is acceptable for human consumption according to its intended use.

(vi) **Food Safety Management System**: This means the adoption of Good Manufacturing Practices, Good Hygienic Practices, Hazard Analysis, Critical Control points and such other practices as may be specified by regulations for the food business.

(vii) **Hazards**: This means a biological, chemical or physical agent in or condition of food with the potential to cause an adverse health effect.

(viii) **Risk analysis**: This means a process consisting of three components, i.e. Risk assessment, Risk management and Risk communication.

(ix) **Sub-standard**: This means an article of food is deemed sub-standard if it does not meet the specified standards but does not render the article of food unsafe.

(x) **Unsafe food**: Means any article of food whose nature, substance or quality is so affected as to render it injurious to health. An article of food may be unsafe for various reasons as stipulated under clause (zz) of Section 3 of the Act.

Chapter II: FSSAI

Deals with modalities of establishing the Food Safety and Standards Authority of India(FSSAI) and its composition, role and functions of FSSAI, Chairperson and Chief Executive Officer, the constitution of Central Advisory Committee, Scientific Panels and Scientific ScientificScientific Committee.

Food Authority, i.e. FSSAI, comprises Chairperson and 22 members from different Central Ministries and State Governments, representatives from industry, consumers' organizations, retailers & farmer organizations and eminent food scientists. Out of 22 members, one third shall be women. The role of FSSAI is to frame rules & regulations, procedures and guidelines for risk assessment, render scientific advice to Central Government and State Governments in framing policy, capacity building for enforcement officials and general awareness on food safety.

A Central Advisory Committee has a Chief Executive Officer, FSSAI as its Chairman and Commissioners of Food Safety of all States/UTs. Representatives from industry, agriculture, consumer organization, research bodies and laboratories are its members. In addition, there are eight Scientific Panels to advise and recommend science-based standards and Scientific Committee to deal with the matter not covered by Scientific Panels. The eight Scientific Panels are for

1. Food additives, flavouring substances, processing aids and materials in contact with food
2. Pesticide and antibiotic residues
3. Genetically modified organisms and foods

4. Functional foods, nutraceuticals, dietetics and other similar products
5. Biological hazards
6. Contaminants in the food chain
7. Labelling and Claims/Advertisements
8. Method of sampling and analysis Subsequently, some more Panels have been constituted to address issues related to other specific areas.

In addition, the FSSAI's headquarters will be in New Delhi, the nation's capital. In addition, there are six other regional offices based on the various zones that the act's jurisdiction has been divided into.

- **Headquarter Address**: FDA Bhawan near Bal Bhavan, Kotla Road, New Delhi
- **North Region Address**: First Floor, NBCC Place, BhishamPitamah Marg, PragatiVihar, New Delhi
- **South Region Address**:
  - 02nd Floor, Central Documentation Complex (South Wing), Chennai Port Trust, RajajiSalai Chennai
  - First Floor, Marine Building Malabar Road, North End, Willington Island, Cochin, Kerala
- **East Region Address**: Benfish Tower, 6th floor, 31 G N Block, Sector-V, Salt Lake, Kolkata
- **West Region Address**: 902, Hallmark Business Plaza, Opp. Guru Nanak Hospital, Bandra (E), Mumbai
- **North Eastern Region**: 6th Mile, Milan Path, JuriPur, Panjabari Road Guwahati-781037 Assam

Chapter III: General Principles of Food Safety

The Food Safety and Standards Work, Chapter 3, focuses on food safety, the purpose for which they act, and the organisation that oversees them, the Food Safety and Standards Authority of India (FSSAI). The basic principles of food safety outlined in the FSS act are as follows.

- Strive for an acceptable level of human life, health protection and customer interests' protection, including fair practises in all types of food commerce regarding food safety standards and procedures.
- Carry out risk management, considering the results of risk assessments and other elements that assist regulatory agencies.
- The likelihood of adverse health effects has been discovered in specified conditions based on a review of existing information. Still, scientific uncertainty persists, and provisional risk management measures for appropriate safety should be deployed until concrete scientific evidence, and proper risk assessment is not conducted.
- In cases where there are reasonable grounds to believe that a portion of food may pose a risk to human health, the Food Authority and the Commissioner of Food Safety shall,

Fig. 3.1.4: Food Safety

depending on the nature, seriousness, and extent of the risk, take appropriate steps to inform the general public of the nature of the risk to health, identifying to the fullest extent possible the food or type of food, the risk that it may pose, and the measures that are taken or about to be taken, the Food Authority and the Commissioner of Food Safety shall take appropriate.

- Suppose any food fails to meet food safety requirements and is part of a batch, lot, or consignment of food of the same class or description. In that case, it is presumed that all of the food in that batch, lot, or consignment fails to meet those requirements until the opposite is proven.

Chapter IV: General Provisions as to Articles of Food

- Use of Food Additive or Processing Aid
  - No food additive or processing aid shall be used in any article of food unless it complies with the provisions of this Act and the regulations promulgated thereunder.
- Contaminants, Toxic Substances, Heavy Metals
  - No contaminant, naturally occurring harmful compounds or toxins, hormones, or heavy metals shall be present in amounts more significant than those specified by rules in any article of food.
- Pesticides, Veterinary Drugs, Antibiotic Residue, Microbiological Counts
  - No food item shall contain insecticides or pesticide residues, veterinary medications, antibiotics, solvent residues, pharmacologically active compounds, or microbiological counts above the tolerance limit set by laws.
- Genetically Modified Foods, Organic Foods, Functional Foods, Proprietary Foods
  - No one may make, distribute, sell, or import any novel food, genetically modified food, irradiated food, organic food, foods for specific dietary reasons, functional foods, nutraceuticals, health supplements, proprietary foods, or other foods that the Central Government may notify.
- Packaging and Labelling of Foods
  - Every food business operator must ensure that the labelling and presentation of food, including their shape, appearance, or packaging, the packaging materials used, how they are arranged and presented, and the information made accessible about them via any channel, do not mislead consumers.
  - No person shall manufacture, distribute, sell, expose for sale, dispatch, or deliver to any agent or broker any packaged food goods not marked and labelled in the manner authorised by rules.

Fig. 3.1.5: Label Packaging

Restrictions on Advertisement and Prohibition as to unfair trade practices

- No food shall be advertised misleadingly or deceptively or in a manner that violates the requirements of this Act or the rules and regulations promulgated thereunder.
- No one shall engage in any unfair trade practice to promote the sale, supply, use, and consumption of articles of food, or adopt any unfair or deceptive practice, such as making any statement, whether orally, in writing, or by visible representation, falsely representing that the foods are of a particular standard, quality, quantity, or grade-composition, or making a false or misleading representation concerning the need for, or the usefulness of, the foods.

Chapter V: Provisions Related to Import

- No person shall import into India any unsafe, misbranded, or substandard food, or food containing foreign matter, or any article of food for which a licence is required under any Act, rules, or regulations unless the licence conditions are followed or any article of food in violation of any other provision of this Act, any rule or regulation made thereunder, or any other Act, or any article of food in violation of any other provision of this Act, any rule or regulation made thereunder, or any other Act.
- The Central Government shall, while prohibiting, restricting or otherwise regulating the import of article of food under the Foreign Trade (Development and Regulation) Act, 1992 (22 of 1992), follow the standards laid down by the Food Authority under the provisions of this Act and the Rules and regulations made thereunder.

Chapter VI: Special Responsibility to Food Safety

The Food Safety and Standards Act, Chapter VI, outlines the obligations of those working in the food industry and how this translates into guaranteeing a safe food supply to customers. These are divided into three broad categories in the FSS Act. These are as follows:

- Responsibilities of the Food Business Operator
- Liability of Manufacturers, packers, wholesalers, distributors, and sellers
- Food Recall Procedures

Chapter VII: Enforcement of the Act

The powers, efficient enforcement, and compliance with the safety requirements for food goods made available to the general public are covered in detail in Chapter 7. It also outlines the authorities and officers enforcing the Food Safety and Standards Act terms. The enforcement of the act via regulatory bodies and officers allocated towards food safety has been divided up by the central government.

- Authorities responsible for enforcement of the Act
- Commissioner of Food Safety of the State
- Licensing and Registration of Food Business
- Improvement Notices
- Emergency Prohibition Notice and Orders
- Notification of Food Poisoning

- Designated Officers
- Food Safety Officer
- Powers of the Food Safety Officer
- Liability of the Food Safet Officer
- Food Analysis from Purchaser
- Power of search, seizure, investigation, prosecution and procedure thereof
- Procedure for launching Prosecution

Chapter VIII: Analysis of Food

The Food Safety and Standards Act's chapter 8 on food analysis lays out the methods and complexities of inspecting and analysing food products that have been delivered for mass consumption. The detailed procedure for the analysis of food has the following provisions:

- Recognition and accreditation of laboratories, research institutions as well as referral food laboratory
- Recognition of Organisation or agency of food safety audit
- Food Analysts
- Functions of Food Analyst
- Sampling and Analysis

Food Testing and analysis is an essential part of the food safety ecosystem to assure that the food is safe to consume. For the same, FSSAI recognises and notifies NABL accredited food laboratories under Section 43 of the FSS Act, 2006. FSSAI also recognises foreign laboratories to reduce the time to clearance food consignments at ports. FSSAI approved notified laboratories as National Reference Laboratories (NRLs) and as ancillary facilities of NRLs (ANRLs) for a specific purpose. Lists of all these laboratories are given below-

1. Primary food laboratories - The Food Authority notifies food laboratories and research institutions accredited by the National Accreditation Board for Testing and Calibration Laboratories or any other accreditation agency to analyse samples by the Food Analysts.
2. Referral food laboratories - The Food Authority recognises referral food laboratories to analyse appeal samples. Presently there are 19 referral food laboratories.
3. National Reference Laboratories - SSAI has recognised the National Reference Laboratory (NRL) to set up a countrywide standard for routine procedures, validate such standard procedure/testing methods, develop new methods, and ensure proficiency in testing across the food laboratories with particular reference to the risks or food categories. A primary food laboratory or a referral food laboratory can be considered for declaration as an NRL. Presently there are 12 NRLs and 2 ANRLs.

Chapter IX: Offences and Penalties

The foundation for and provisions for non-compliance by food businesses to offer safe food to consumers are laid out in Chapter 9 of the Food Safety and Standards Act, which includes a complete list

of offences, and fines levied on those who break the rules. The offences and penalties under the act are classified under the following provisions.

- General Provisions relating to offences
- General Provisions relating to Penalties
- The penalty for selling food, not of nature or substance or quality demanded
- Penalty for sub-standard food.
- Penalty for misbranded food.
- Penalty for misleading advertisement
- Penalty for food containing extraneous matter
- Penalty for failure to comply with the directions of the Food Safety Officer
- Penalty for unhygienic or unsanitary processing or manufacturing of food
- Penalty for possessing adulterant
- Penalty for contraventions for which no specific penalty is provided
- Punishment for unsafe food
- Punishment for interfering with seized items.
- Punishment for false information
- Punishment for obstructing or impersonating a Food Safety Officer
- Penalty for contravention of provisions of this Act in case of import of articles of food to be in addition to penalties provided under any other Act
- Offences by companies
- Compensation in case of injury or death of consumer
- Punishment for carrying out a business without a license
- Punishment for subsequent offences.

Exercise

Q. 1. Section 18 of The Food Safety and Standards Act 2006 provides ____?

(A). General principles to be followed in the administration of Ac

(B). Packaging and labelling of foods

(C). Notification of food poisoning

(D). Food Analysts

Q. 2. When did The Food Safety and Standards Act 2006 come into force?

a. 01 April 2006

b. 01 March 2006

c. 01 May 2007

d. 23 August 2006

Q. 3. Explain:

- Primary food laboratories?
- Referral food laboratories
- National Reference Laboratories

Q. 4. What is the main aim of the Food Safety Act?

Q. 5. Prior to the FSS Act 2006, many food laws were repealed. Explain about them?

UNIT 3.2: Critical Limits of Possible Risks

Unit Objectives

At the end of this module, you will be able to understand

1. Explain the CCP in Food Safety
2. Describe the Hazard Analysis of Critical Control Points Principles

3.2.1 All About Critical Control Points and Identifying Potential Hazards

Any phase where dangers can be avoided, eliminated, or lowered to tolerable levels has a critical control point. Thermal processing, chilling, testing materials for chemical residues, product formulation control, and metal contamination testing are all examples of CCPs.

Fig. 3.2.1: CCPs and Hazards

A. Ingredients

a. Does the meal contain any sensitive elements that could pose microbiological, chemical, or physical dangers (e.g., aflatoxin, antibiotic, pesticide residues, stones, glass, metal)?

b. Portable water, ice and steam used in formulating or handling the food?

c. What are the sources (e.g., geographical region, specific supplier)?

B. Intrinsic Factors

The food's physical characteristics and composition (e.g., pH, type of acidulants, fermentable carbohydrate, water activity, preservatives) during and after processing.

a. What dangers might arise if the food composition is not carefully monitored?

b. Does the food allow microorganisms to survive or multiply, as well as toxin development, during processing?

c. Will the food allow pathogens to survive or multiply and the development of toxins throughout the following steps in the food chain?

d. Are there other similar products in the marketplace? What has been the safety record for these products? What hazards have been associated with the products?

C. Procedures used for processing

a. Is there a controllable pathogen-destroying processing stage in the process? Which

pathogens, if any, are you talking about? Take into account both vegetative cells and spores.

b. If the product is subject to recontamination between processing (e.g., cooking, pasteurizing) and packaging, which biological, chemical or physical hazards are likely to occur?

D. The microbial content of the food

a. What is the regular microbial content of the food?

b. Does the microbial population change throughout the storage time before eating the food?

c. Does the resulting change in microbial population affect the food's safety?

d. Do the answers to the above questions indicate a high likelihood of specific biological hazards?

E. Facility design

a. If food safety is a concern, does the facility's layout adequately separate raw materials from ready-to-eat (RTE) foods? If not, what threats should be evaluated as potential RTE product contaminants?

b. Is positive air pressure maintained in product packaging areas? Is this essential for product safety?

c. Is the traffic pattern for people and moving equipment a significant source of contamination?

Fig. 3.2.2: Ready-to-eat (RTE)

F. Equipment design and use

a. Will the equipment provide the time-temperature control that is necessary for safe food?

b. Is the equipment adequately sized for the volume of food processing?

c. Can the equipment be managed to the point where the variance in performance is within the tolerances needed to produce a portion of safe food?

d. Is the equipment reliable, or is it prone to frequent breakdowns?

e. Is the equipment designed so that it can be easily cleaned and sanitized?

f. Is there a chance for product contamination with hazardous substances, e.g., glass?

g. What are product safety devices used to enhance consumer safety?

1. Metal detectors
2. Magnets
3. Sifters
4. Filters
5. Screens

6. Thermometers
7. Bone removal devices
8. Dud detectors

h. How does standard equipment wear influence the likelihood of physical danger (such as metal) in the product?

i. Are our allergen protocols needed in using equipment for different products?

G. Packaging

a. Does the packaging method affect microbial pathogen proliferation and the synthesis of toxins?

b. Is the package clearly labelled "Keep Refrigerated" if this is required for safety?

c. Does the package include instructions for the safe handling and preparation of the food by the end-user?

d. Is the packaging material resistant to damage, thereby preventing the entrance of microbial contamination?

e. Are tamper-evident packaging features used?

f. Is each package and case legibly and accurately coded?

g. Does each package contain the proper label?

h. Are potential allergens included in the list of ingredients on the label?

H. Sanitation

a. Does sanitation affect the safety of the food that is being processed?

b. Is it possible to clean and sterilise the facility and equipment quickly enough to handle food safely?

c. Is it possible to consistently provide sanitary conditions to ensure safe foods?

I. Employee health, hygiene and education

a. Do employee health or personal hygiene practices have an impact on food safety?

b. Do the employees understand the process and the factors they must control to ensure safe foods?

c. Will the employees inform management of a problem that could impact food safety?

Fig. 3.2.3: Safe Food Handling

J. Conditions of storage between packaging and the end-user

a. How likely is the food to be poorly stored at an incorrect temperature?

b. Would an error in improper storage lead to microbiologically unsafe food?

K. Intended use

a. Will the consumer heat the food?

L. Intended consumer

a. Is the food intended for the general public?

b. Is the food meant for a group that is more susceptible to sickness (e.g., newborns, the elderly, the infirmed, and immune-compromised people)?

c. Is the food to be used for institutional feeding or the home?

3.2.2 Critical Control Point examples for HACCP system

In brief, here are the eight recommended critical control points you need to manage in your HACCP system.

Raw material Purchasing

This includes information on food suppliers and the types of foods purchased. The following are some examples of critical control points for food purchases:.

Fig. 3.2.4: Food Purchasing

- **Checking suppliers** – look at their food production, sourcing and traceability, etc. Also, look at their ability to maintain acceptable HACCP practices.
- **Listcreation** – go right back down the chain to the original food producers and suppliers,
- **Packaged and frozen foods** – put processes in place for adequately managing labelling, storage and temperature control.

Delivery and Receipt

This refers to your procedures for managing food deliveries. You should take into account:

- **Transfer to storage** – do this as soon as possible to control food temperatures.

Food Storage

This guarantees that food is stored correctly and following the manufacturer's instructions. These methods also ensure no cross-contamination, that bacteria do not develop to unsafe levels, that allergens are managed, and that the temperature is maintained.

- Containers – keep them clean, covered, and dated, and not overload them.
- Shelving storage –keep foods inappropriate storage facilities with an appropriate wall or floor clearance and anti-pest control,

- Hot, cold and dry storage – segregate these into controlled environments.

Fig. 3.2.5: Food Storage

Food Production

This concerns the handling and preparation of food. Critical control point examples for food production might be:

- **Cross-contamination and segregation** – have separate areas for preparing foods that should not be cross-contaminated. For example, foods containing allergens, raw and cooked foods, and meats.
- **Allergen Management** – is more than just segregating foods; it requires separate procedures to be put into place. Allergens can cause severe harm in anaphylaxis and pose a significant risk that needs to be controlled.
- **Cooking, reheating and thawing** – You should detail your specific procedures, mainly where temperatures, checks and equipment are concerned.

Service/Display of Food

Critical control point examples for managing the service of your food and any display areas are as follows:

- **Displays** – Appropriate, clean facilities should be provided to protect display food. Hot, cold, and frozen displays have specific requirements detailed in your food safety manual. Each should be segregated and regulated.

Cleaning and Maintenance

This considers the cleanliness of your food preparation rooms, storage, general premises, and the cleaning chemicals and equipment you employ. It also covers waste management and pest control.

- **Cleaning procedures** – Follow a 6 step cleaning procedure to ensure thorough premises and food preparation areas.

  6 step cleaning procedure

  1. Pre-Clean
  2. Main Clean
  3. Rinse
  4. Disinfection
  5. Final Rinse
  6. Drying

- **Cleaning substances and equipment** –Follow procedures and risk management and keep all substances away from foods.
- **Premises maintenance** – maintain premises to a safe and clean standard.
- **Waste management and pest control** – Do not dispose of foods down drains; dispose of used oils according to the procedure. In addition, there are specific procedures for managing pest control.

Personal Standards and Hygiene/Staff Training

This considers worker competency in handling food safely and hygienically and food safety and hygiene awareness training.PRP – Pre-Requisite Program – Access the document by scanning/clicking the QR Code.

PRP – Pre-Requisite Program Document

Fig. 3.2.6: Food Hygiene

Exercise

Q. 1. Who is the person MOST likely to takecorrective action?

(A). An auditee
(B). Food safety team leader
(C). Front line food employee
(D). Designated food employee

Q. 2. It is observed that the food product being cooked has not reached the proper temperature within the proper time; the next step required is to:

(A). Create a flow diagram to see where the process went wrong
(B). Conduct a hazard analysis of the food product
(C). Implement the corrective action specified in the approved HACCP plan
(D). Raw food does not cause any health issues; hence ignore it

Q. 3. The first line of food defence is:

(A). The food employee
(B). A pre-written plan
(C). Conducting background checks
(D). The management staff

Q. 4. What are critical limits in food?

Q. 5. What are the four hazards that need to be controlled within the food industry?

Q. 6. What are the three main risks of flood hazards?

Q. 7. What is the correct example of critical limits and targets?

UNIT 3.3: Documents and Records necessary to Conduct Audits

Unit Objectives

At the end of this module, you will be able to understand

1. Explain the Importance of Audit, Documentation and Record-Keeping
2. Describe the FSMS Related Document & Record Templates

3.3.1 Audit, Documentation and Record-Keeping

Self-Evaluation and Review:

- A periodic audit of the entire system shall be performed following the FBO's stated SOP to identify/gaps for future improvement in the GMP&GHP system.
- At least once a year, the FBO shall conduct a self-evaluation process to assess the effectiveness of the implemented food safety system through internal and external audits or other mechanisms.

Fig. 3.3.1: Record Keeping

- The FBO shall analyse the results of verification activities, including internal and external audits, take necessary actions, and provide evidence that any corrections and corrective actions taken are effective.

Documentation and Records:

- Food business operators must develop a documented food safety plan that describes the dangers identified during the hazard analysis process and the control measures applied to address each hazard.
- Proper records of spice processing/production, storage, distribution, food quality, laboratory test findings, cleanliness and sanitation, pest management, and product recall must be kept.
- Records must be kept in good shape for at least one year of the product's shelf life.

1.1 Medical Fitness Certificate for Food handlers (Template):

MEDICAL FITNESS CERTIFICATE FOR FOOD HANDLERS

PERFORMA FOR MEDICAL FITNESS CERTIFICATE FOR FOOD HANDLERS

(FOR THE YEAR .....)

(See Para No. 10.1.2, Part- II, Schedule - 4 of FSS Regulation, 2011)

It is certified that Shri/Smt./Miss..... employed with M/s....., coming in direct contact with food items has been carefully examined* by me on date ..... Based on the medical examination conducted, he/she is found free from any infectious or communicable diseases and the person is fit to work in the above mentioned food establishment.

Name and Signature with Seal
of Registered Medical Practitioner /
Civil Surgeon

***Medical Examination to be conducted:**

1. Physical Examination
2. Eye Test
3. Skin Examination
4. Compliance with schedule of Vaccine to be inoculated against enteric group of diseases
5. Any test required to confirm any communicable or infectious disease which the person suspected to be suffering from on clinical examination.

***Medical Examination to be conducted:**

1. Physical Examination
2. Eye Test
3. Skin Examination
4. Compliance with the schedule of Vaccine to be inoculated against an enteric group of diseases
5. On clinical examination, any test is required to confirm any communicable or infectious disease that the person is suspected of suffering from .

1.2 FORM E

FORM E
Form of Guarantee
(Refer Regulation 2.1.14(2))

Invoice No. _____

Place:_____
Date:_____

From: _____

To: _____

Date of sale	Nature and quality of article/brand name, if any	Batch No or Code No.	Quantity	Price
1	2	3	4	5

I/We hereby certify that food/foods mentioned in this invoice is/are warranted to be of the nature and quality which it/these purports/purported to be.

Signature of the manufacturer/Distributor/Dealer

Name and address of
Manufacturer/Packer
(in case of packed article)
License No. (wherever applicable)

2. Recommendatory Performa's

2.1 Utensil Monitoring record (Template)

S. No.	Item number	Item placed at	Condition (OK/Not OK)	Correction done	Remarks

Table. 3.3.1: Utensil Monitoring Record (Template)

2.2 Approved Supplier List (Template)

S. No.	Item/Material Name	Location of Use	Primary Approved Supplier(Name &complete address)					Secondary Approved Supplier (Name &complete				
			Complete Address	*Contact Person*	*Contact No.*	*Email id*	*Fax*	*Complete Address*	*Contact Person*	*Contact No.*	*Email id*	*Fax*

Table. 3.3.2: Approved Supplier List (Template)

2.3 Incoming Material Inspection Template

Includes all type: *Raw materials, Ingredients, Food additives, Processing aids, Packaging materials ,Cleaning and sanitation chemicles,etc.*		
Material Name:		
Supplier Name:		
Identification/Location of Supplier:		
Quantity received:		
Pack size received:		
Material Receipt Date:		
Transport Mode:		
Rejected(Yes/No):		
Reason for Rejection:		
PARAMETER EVALUATED	**STATUS/RESULTS**	**Signature**
Temperature (Degree Celsius)		
Visual Inspection Condition(OK/Not OK)		
Packaging &Labelling Condition(OK/Not OK)		
Production Date/Shelf Life Date/Expiry Date		
Vehicle Inspection Condition (OK/Not OK)		
Quality Lab Results (Ifapplicable)		
Certificate Of Analysis(COA) received (Yes/No)		
Remarks		
ClearanceDate		
Authorized Signatory		

Table. 3.3.3: Incoming Material Inspection Template

2.4 Incoming Vehicle Inspection Record (Template)

Date of Incoming Vehicle: **Vehicle Type:** **Material in Vehicle received:** **Number of Persons accompanying Driver:**	
PARAMETEREVALUATED	**REMARKS**
Security lock	
Type of carrier (full covered/Open Roof)	
Mode of covering products(in case of Open Roof)	
Overall Hygiene in the interior	
Overall Hygiene on the exterior	
Any	
Any pests detected	
Any grease/oil detected	
Authorized Signature	

Table. 3.3.4: Incoming Vehicle Inspection Record (Template)

2.5 Product Release Record (Template)

Name of Product:	
Date of Manufacturing:	
Time of Manufacturing:	
Batch/Lot No.:	
Best Before/ Expiry Date:	
Quality Acceptance	
Analytical	
Microbiological	
Sensory	
Others, if any	
Quality Lab signature	

Table. 3.3.5: Product Release Record (Template)

2.6 Non-conforming Material/Product (Template)

HOLD: ☐ **REJECT:** ☐

Material Type:

Finished Product — Raw Material

In-Process Product — Packaging Material

Material Name:
Date of Manufacturing/Receipt:
Quantity of Manufacturing/Receipt:
Lot/Batch No.
Quantity used:
Lot/Batch No.
Quantity Hold:
Lot/Batch No.
Quantity Rejected:
Lot/Batch No.

Reason for Hold:
Reason for Rejection:

Rectification Measure:
Preventive Action:

Remarks:

Signature:
QC Executive — *Quality Manager Mfg/ProductionManager*

Table. 3.3.6: Non-conforming Material/Product (Template)

2.7 Outgoing Vehicle Inspection Record (Template)

Date of Outgoing Vehicle:
Vehicle Type:
Material in Vehicle to be dispatched:
Date of Manufacturing: Time of Manufacturing:
Batch/Lot No.:
Number of Persons accompanying Driver:

PARAMETEREVALUATED	REMARKS
Security lock	
Type of carrier (full covered/Open Roof)	
Mode of covering products(in case of Open Roof)	
Overall Hygiene in the interior	
Overall Hygiene on the exterior	
Any sharp edges /points in the interior of vehicle	
Any pests detected	
Any grease/oil detected	

Authorized Signature

Table. 3.3.7: Outgoing Vehicle Inspection Record (Template)

2.8 Product Recall record (Template)

S. No.	Date of Complaint	Nature of Complaint	Results of Investigation	Product/ Batches& Quantity recalled	Mode of Disposal

Table. 3.3.8: Product Recall Record (Template)

2.9 Product Identification & Traceability (Template)

Traceability Detail Format

Product Description

Plant Name: Manufacturing Date:
Product Name: Manufacturing Time:
Pack Size: Batch/Lot no.:

Traceability Details

Investigation Date: Investigation Time End:
Investigation Time Start: Total Time Taken:

A. Cleaning Details

EquipmentName	Date	Time	Person responsible	Remarks

B. Raw Material Details

Material Description		Remarks
Name	Batch/Lot No.	

C. Utility Details

Chemical/Material Description		Remarks
Name	Batch/Lot No.	

D. Primary Packaging

Material Description		Remarks
Name	Batch/Lot No.	

E.ManufacturingDetails

Date	Shift	Cases Manufactured	Compliance	Remarks

F.QC Details

Date	Shift	QC compliance	Product blocked, if any	Remarks

G. Dispatch Details

Invoice No.	Date of Dispatch	Quanity Dispatched= Total produced-(Rejected+ Control samples+ Warehouse retained)	Dispatch Destination	Remarks

Table. 3.3.9: Product Identification & Traceability (Template)

2.10List of Monitoring & Measuring Devices and Records of Calibration (Template)

S. No.	Name of Equipment	ID. No.	Location	Range	Least Count	Frequency of Calibration	In house calibration Done On	In house calibration Due On	Remarks	Sign

Table. 3.3.10: List of Monitoring & Measuring Devices and Records of Calibration (Template)

2.11 Equipment Breakdown Maintenance report (Template)

Date:			Period of Report:				
S. No.	Name/Code No. of the Machine/ Equipment	Location	Nature of Breakdown	Details of repairs carried out	Breakdown Period	Work Done by	Remarks

Table. 3.3.11: Equipment Breakdown Maintenance report (Template)

2.12 Preventive Maintenance Schedule (Template)

LIST OF MACHINERY AND EQUIPMENT FOR MAINTENANCE										
S. No.	Name of Machine/ Equipment	Code/ Identification No.	Specification /Supplier	Location of place of the Machine/ Equipment	Frequency of check					Remarks
					Daily	Weekly	Monthly	Half Yearly	Yearly	

Table. 3.3.12: Preventive Maintenance Schedule (Template)

2.13 Pest Management Plan (Template)

Type of Pest	Mode of Control	Station (locations) monitored	Number designated	Frequency of Monitoring	Remarks

Table. 3.3.13: Pest Management Plan (Template)

2.14 Pest Monitoring record (Template)

Date	Type of Pest	Mode of Control	Station (locations) monitored	Number designated	Frequency of Monitoring	Clean (ok/Not ok)	Remarks	Sign

Table. 3.3.14: Pest Monitoring record (Template)

2.15 Waste Disposal Record (Template)

S. No.	Amount of waste						Daily disposal (Yes/No)
	Chemical/ Hazardous waste	Food material waste	Package material waste	Other waste (Dry)	Other waste (Wet)	%of total waste	

Table. 3.3.15: Waste Disposal Record (Template)

2.16 Pre-employment medical record (Template)

Name of Candidate: **Father's name:** **Address:** **Date of Birth:** **Designation applied For:** **Age:** **Name of hospital/laboratory tested:** **Medical Examination**	
Heart : Chest : Abdomen: Blood Pressure: Eye Sight : C.N.S. :	Blood Group : Blood Sugar : Haemoglobin : T.L.C. : D.L.C.: P L M E
X.Ray Chest: E.C.G.:	Urine Examination: Stool:
Final Medical Report: **Signature of Candidate** **Signature of Medical Examiner:** **Reg. No .of the Medical Examiner:**	

Table. 3.3.16: Pre-employment medical record (Template)

2.17 Regular Medical Checkup record (Template)

Name of employee:	
Date of medical test conducted:	
Next Medical test due on:	
Name of hospital/laboratory tested:	
Tests done for:	
Status of acceptance (Yes/No):	

Table. 3.3.17: Regular Medical Checkup Record (Template)

2.18 Monitoring of Personnel hygiene (Template)

Date:															
S. No.	Employee Code	Employee name	Area of work	Hand wash, sanitize (and Gloves where necessary)	Clean &trimmed Nails	No open Wounds	No Jewellery	Covered Hair	Clean outer garments / protective clothing	Clean Shoes/ shoe covers	Infectious Disease /Skin infection / Allergy, if any	No Tobacco/ Smoking / Chewing	Overall Hygiene Status upon examination(Yes/No)	Action needed on non-compliance	Re-examination status (Yes/No)
1															
2															
3															
4															
12															
13															
14															
Jewellery *wristwatches, cufflinks, earrings, glass bangles, stickbindis*															

Table. 3.3.18: Monitoring of Personnel Hygiene (Template)

2.19 Visitor Record (Template)

Date of visit:	
Time of entry:	
Time of exit:	
Name of visitor:	
From(location):	
Whom to meet:	
Purpose of visit:	
Type of visitor:	*Please Tick:* *Type I(Critical areas: Internal processing areas)* *Type II(Outside processing areas)* *Type III(Office areas)*
Any Allergy/Infectious disease declaration:	
Belongings description:	
Signature of visitor:	
Signature of Security in-charge:	
Signature of person visited:	
NB: Pls adhere to all the food safety and quality; and company policies and rules during your visit	

Table. 3.3.19: Visitor Record (Template)

2.20 Product Information (Template)

S. No.	Description	Specifications
1	Product Category/Name	
2	Composition (Raw materials, Ingredients, etc.)	
3	General &Specific product specification	
4	Legislative requirements, Customer requirements	
5	Storage	
6	Labeling	
7	Transportation	
8	Product Shelf-life	
9	Packaging material	
10	Hazardous for any group of customers	
11	Food Category	
12	INTENDEDUSE	

Table. 3.3.20: Product Information (Template)

2.21 Customer/Consumer Complaint Log (Template)

Complaint Number:_____

Date: _____ **Time recorded:** _____ ☐ **am** ☐ **pm**
Quality related: ☐ **Food safety related:** ☐

Customer Details
Customer Name:
Phone:
Address: City:_____ Zip code:
State/Province: _____
Email:

Product Consumed
Product name:
Batch Code/Lot no.:
Package size:
Location of purchased:
Date of purchase: Date consumed:_____
How was the product stored? _____

Nature of Complaint
Foreign object ☐ Off/Unsatisfactory Flavor ☐ Allergic ☐
Packaging ☐ Illness ☐ Others ☐

How many people consumed? _____ **Ages?** _____
Symptoms/Additional Problem Information:
_____

Has the Customer
Seen a Doctor? Gone to Hospital?
Spoken to a public health? Contacted Regulatory Agency?

Comments & follow up action
_____

Feedback from client- Status or date finalized

Table. 3.3.21: Customer/Consumer Complaint Log (Template)

2.22 Determination of Customer Satisfaction (Template)

We would like to know how well we are succeeding in meeting your needs. Following is the questionnaire about what you wanted from us. Answers will be treated with complete confidentiality. Please answer the questions using the scale (Please TICK that you choose).

('1' being the worst score;'5' being th ebest score)

S.No	QUESTIONS	SCORE				
1	How well do we communicate with you?	1	2	3	4	5
2	Do we give you the information you need?	1	2	3	4	5
3	Do we answer your queries promptly?	1	2	3	4	5
4	Do we respond positively to your problems &suggestions?	1	2	3	4	5
5	Do you feel we have a concern for quality &food safety?	1	2	3	4	5
6	Do we deliver quality &safe products consistently and on time?	1	2	3	4	5
7	Do we anticipate your needs?	1	2	3	4	5
8	Have we increased your understanding of quality &food safety?	1	2	3	4	5
9	Do we work with you as a team?	1	2	3	4	5

Any other comments?

Name and Address

Table. 3.3.22: Determination of Customer Satisfaction (Template)

2.23 Training Need Identification (Template)

Name of employee: **Date of Joining:**

Qualification:

Designation: **Department:**

Key Responsibilities:

Training(s) Required

1	Managerial	
2	Technical	
3	On the Job	
4	General/Others	

Suggested Training institutions(applicable for external trainings):

Any other suggestions:

Signature of Dept. Head:

Below topics of training to be determined, but not limited to:

1 Food safety policy

2 Food safety objective and targets

3 Actual or potential significant environmental impacts and unacceptable risks of the work activities

4 Food Safety and hygiene related issues

5 Compliance to legal requirements

6 Roles and responsibilities of employees to ensure effective implementation of food safety

7 Operational Control procedures

8 Emergency Preparedness and response requirements

9 Potential effects of deviation from documented procedures

Table. 3.3.23: Training Need Identification (Template)

2.24 Training Record (Template)

Date of Training:
Conducted By:
Subject of Training:
Brief summary of the subject:
Duration of Training:

S.No.	Name of person trained	Functional area	Remarks	Signature
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Table. 3.3.24: Training Record (Template)

2.25 Training Effectiveness record (Template)

Date of Training:
Subject of Training:
Brief summary of the subject:

S. No.	Name of person trained	Functional area	Pre-evaluation result	Post-evaluation result	Effectiveness status (Yes/No)	Comment on effectiveness	Signature of trainee
1							
2							
3							
4							
5							
6							

Effectivess can be based on: Improvement in quality of work , Improvement in work output ,Behavioural change, Overall usefulness of training, etc.

Table. 3.3.25: Training Effectiveness Record (Template)

2.26 Training Calendar (Template)

S. No.	Topic of training	Month/Year:_____											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1													
2													
3													
4													
5													
6													

Table. 3.3.26: Training Calendar (Template)

2.27 Internal Audit Schedule (Template)

Date of Audit: Standard of Audit:					
S. No.	Process Area	Auditee(s)& Functional Department	Auditor(s)& Functional Department	Date	Time
1	Store areas-Raw material, ingredients, chemicals, finished product				
2	Production/Manufacturing Area				
3	Housekeeping, Cleaning& Personal Hygiene				
4	Preventive Maintenance				
5	Internal Laboratory				
6	Management functions				
7	Packaging &Dispatch area				
8	Documentation				
9	Human Resource& Training				
10	Others				

Table. 3.3.27: Internal Audit Schedule (Template)

2.28 Internal Audit Observation & Non- conformance report (Template)

Name of Manufacturing plant:
Date of Internal Audit:
Process Area Audited:
Auditor(s):
Auditee(s):

Areas Covered:

S .No.	Observation area	Compliance checkpoint	Status (Yes/No)	Non-Compliance details (if any in this area)	Corrective action planned	Responsibility	Target date of completion	Actual completed on

Table. 3.3.28: Internal Audit Observation & Non- conformance report (Template)

2.29 Internal Audit Plan (Template)

S. No	Process Area	Month/Year:_____											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Store areas-Raw material, ingredients, chemicals, finished product												
2	Process Area												
3	Housekeeping, Cleaning &Personal Hygiene												
4	Preventive Maintenance												
5	Internal Laboratory												
6	Management functions												
7	Packaging &Dispatch area												
8	Documentation												
9	Human Resource &Training												
10	Others												

Table. 3.3.29: Internal Audit Plan (Template)

The three elements of the audit system:

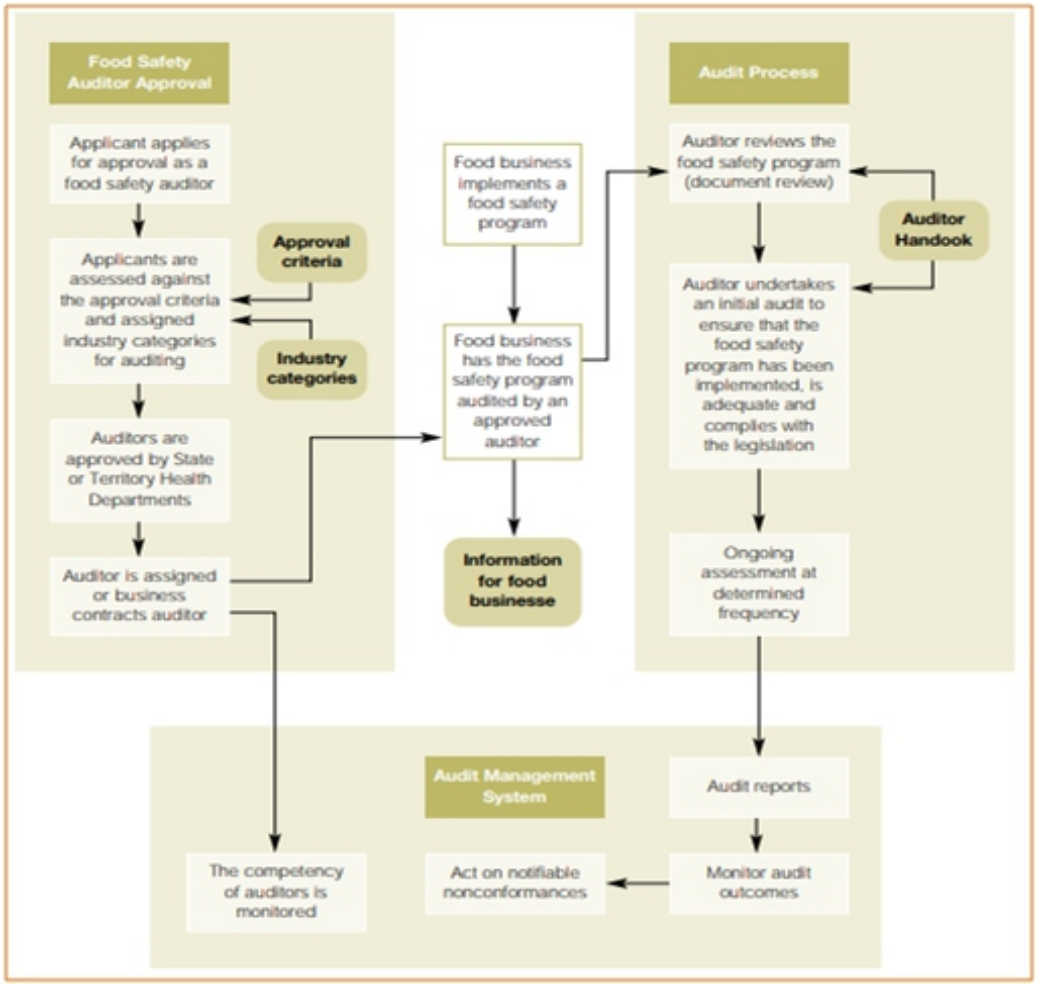


Fig. 3.3.2: Audit System

Scan/click the QR code to access the Recommendatory Performas Page No. 66-85)

Exercise

Q. 1. As per Section 3 of the Food Safety & Standards Act 2006, if food article sold in the market contains any inferior or cheaper substances, whether wholly or partly which is injurious to health, then such products can be called:

(A). Sub-standard

(B). Unsafe

(C). Misbranded

(D). Partly sub-standard

Q. 2. Which of the following can be used instead of Expiry-date on packages?

(A). Best-before date

(B). Use-by date

(C). Marketable-by date

(D). Marketable-before date

Q. 3. What records must all food businesses keep?

Q. 4. Why is documentation essential in the food industry?

Q. 5. What is an audit in the food industry? in the food industry?

UNIT 3.4:Concept of Root Cause Analysis (RCA), Corrective Actions and Preventive Actions

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the Importance of Audit, Documentation and Record-Keeping
2. Describe the FSMS Related Document & Record Templates

3.4.1 Root Cause Analysis (RCA)

Root Cause Analysis (RCA) is a broad word that refers to a set of problem-solving techniques for determining the root cause of a non-conformance or quality issue. Defining, understanding, and solving a problem is known as root cause analysis. The root reason for a non-conformance, defect, or failure is the underlying or fundamental cause. The term "root cause" can also indicate the exact point in the causal chain where a remedial action or intervention will prevent non-conformance.

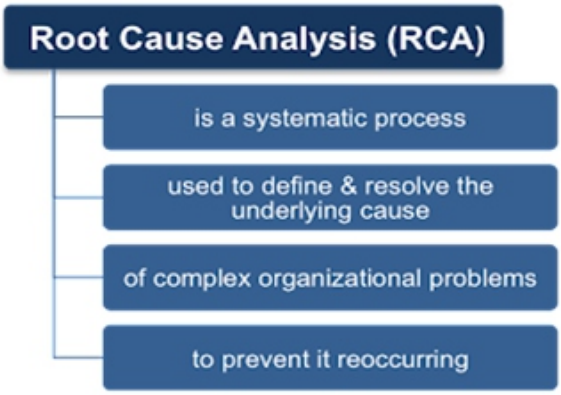


Fig. 3.4.1: Root Cause Analysis

Why Perform Root Cause Analysis (RCA)

In the food processing industry, repeat problems are a wasteof resources. Machine downtime, product rework, increased scrap, and the time and money spent "solving" the problem are all examples of waste. We may assume that the problem has been fixed when, in fact, we have just addressed a symptom of the problem rather than the fundamental cause. When done correctly, a Root Cause Analysis can reveal weaknesses in your processes or systems that contributed to the non-conformance and help you figure out how to avoid it in the future. An RCA is performed to identify what happened and why and determine what improvements or changes are required. Through the proper application of RCA, repeat problems can be eliminated.

How to Perform Root Cause Analysis (RCA)

Root Cause Analysis (RCA) is frequently used in a more extensive problem-solving process. During a Root Cause Analysis, a variety of tools can be used. Some of them can be done by a single individual. However, in most circumstances, a Cross-Functional Team (CFT) approach will yield the best results and enhance the likelihood of locating the underlying "root cause."

Several problem-solving methodologies, such as the Eight Disciplines of Problem Solving (8D), Six Sigma / DMAIC, or Kaizen, use Root Cause Analysis. In each of these cases, the RCA is a crucial step.

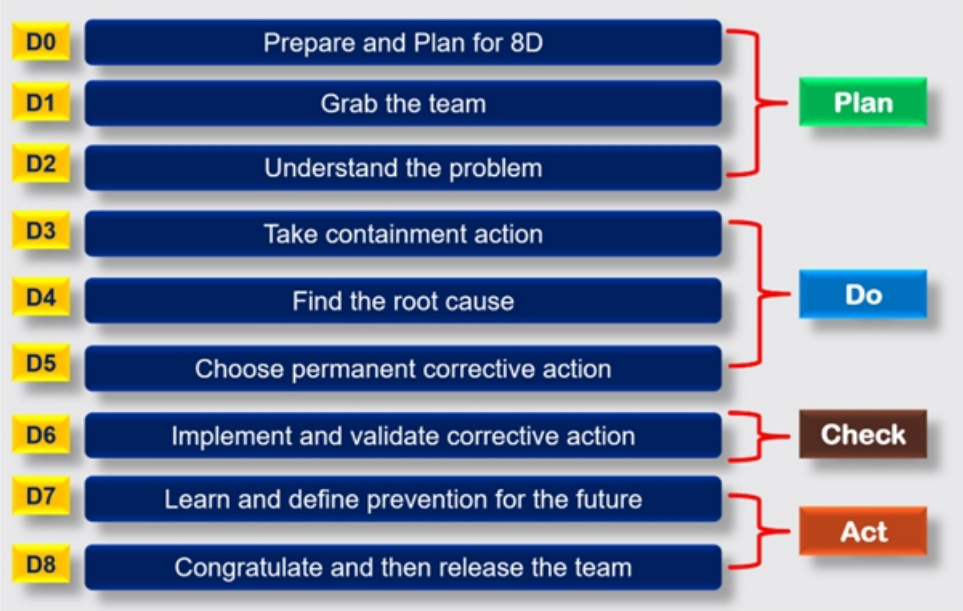


Fig. 3.4.2: How to Perform Root Cause Analysis

- **D0:** Plan - Plan for solving the problem and determine the prerequisites.
- **D1:** Use a team - Select and establish a team of people with product/process knowledge.
- **D2:** Define and describe the problem - Specify the problem by identifying in quantifiable terms the who, what, where, when, why, how, and how many (5W2H) for the problem.
- **D3:** Develop interim containment plan; implement and verify interim actions - Define and implement containment actions to isolate the problem from any customer.
- **D4:** Determine, identify, and verify root causes and escape points - Identify all applicable causes that could explain why the problem occurred. Also, identify why the problem was not noticed when it occurred. All causes shall be verified or proved, not determined by fuzzy brainstorming. One can use 5 Whys and cause and effect diagrams to map causes against the effect or problem identified.
- **D5:** Choose and verify permanent corrections (PCs) for problem/nonconformity. Through preproduction programs, quantitatively confirm that the selected correction will resolve the problem for the customer.
- **D6:** Implement and validate corrective actions - Define and implement the best corrective actions (CA).
- **D7:** Take preventive measures - Modify the management systems, operation systems, practices, and procedures to prevent the recurrence of this and all similar problems.
- **D8:** Congratulate your team - Recognize the collective efforts of the team. The team needs to be formally thanked by the organization.

Six Sigma is a method that provides organizations tools to improve the capability of their business processes. This increase in performance and decrease in process variation helps reduce defects and improve profits, employee morale, and quality of products or services.

Fig. 3.4.3: Six sigma parameters

DMAIC is a data-driven improvement cycle or framework that breaks down problem-solving into five steps, as shown below. Each step has key activities and tools/templates used to set up and execute a problem-solving activity.

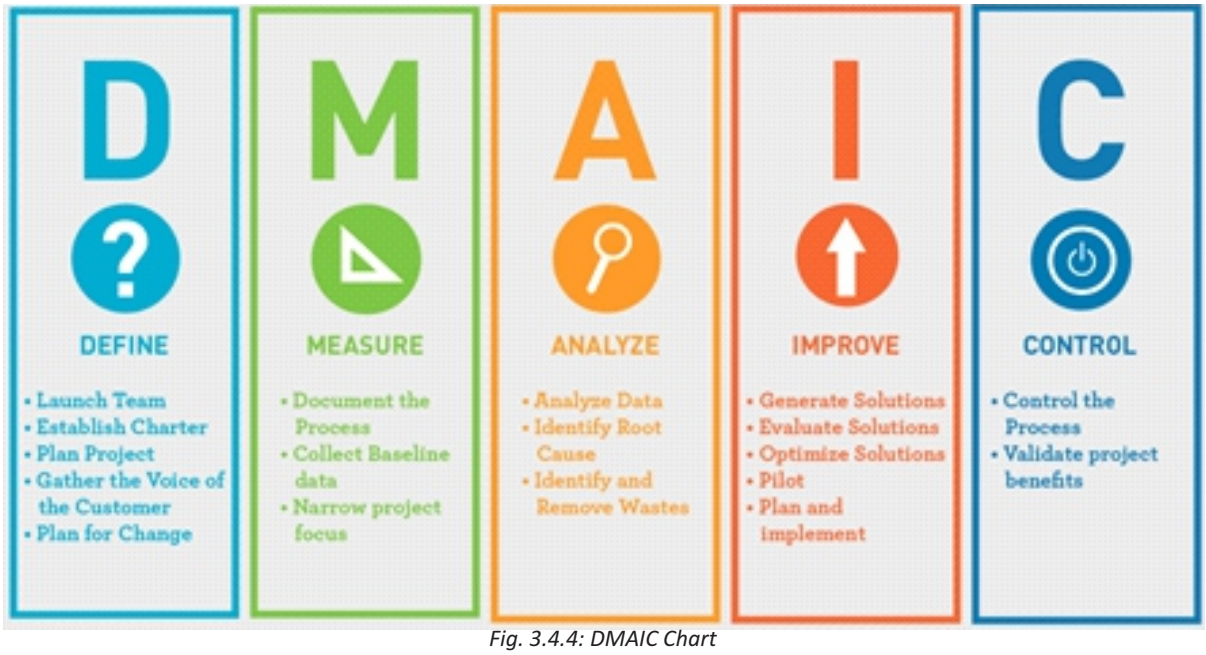


Fig. 3.4.4: DMAIC Chart

Tools of Root Cause Analysis (RCA)

During a Root Cause Analysis, various tools can be used. This section will go over some of the tools and when and how they can help with the analysis. The first stage uses the Is/Is Not analysis to establish what is not included in the problem investigation.

Is / Is Not

The "Is/Is Not" analysis can be applied at many stages of the RCA. It can be used to decide what is in scope and will be considered during the analysis and what is out of scope and will not be addressed while defining the problem. It can also be utilised to assist the team in deciding what to include and exclude when developing a solution. The Is-Is Not analysis allows the team to think about the problem and the boundaries of what it is or is not. The tool helps the team maintain their focus. If the boundary of the problem is not clearly defined, the team may stray off the initial path and work on solving minor problems.

Document what “Is” and “Is Not” part of or a characteristic of the problem. The process works by asking the team various questions such as:

- Who is impacted by this problem?
- Does the team have the authority to resolve this issue?
- What do we already know about the problem?
- Is this something that will impact the customer?
- Will we do something about this?

		IS	IS NOT	SO	THEN
	Specific Questions	*Performance Deviation*	*Closest Logical Comparison*	*What is distinctive about ….*	*Does this suggest a change?*
Identity **WHAT?**	What is the unit with the problem? What is the problem?				
Location **WHERE?**	Where is the problem observed? (geographically) Where is the problem observed on the unit?				
Timing **WHEN?**	When was the problem first observed? When has it been observed since? When in the operating cycle of the unit is the problem observed?				
Magnitude **HOW MUCH?**	What is the extent of the problem? How many units are affected? (scope of effect) How much of any one unit affected?				

Fig. 3.4.5: Is/Is Not

Ask the team enough questions until there is a clear definition of the problem/scope of the problem-solving process.

Ishikawa Diagram

The Ishikawa Diagram, often known as the Fishbone Diagram, is a helpful tool for discovering the most likely causes (MLCs) of a quality issue. Because it resembles the skeleton of a fish, the design is sometimes referred to as a Fishbone Diagram, with the effect or problem indicated in a box at the end. The 6Ms (Man, Material, Method, Machine, Measurement, and Mother Nature) are addressed in the central portions of the diagram (Environment). The diagrams usually workright to the left. Each large "bone" of the fish branch out to include smaller bones with additional details. It is essential not to limit the team brainstorming ideas here. If an idea is in a different diagram section, simply list it in the appropriate section and go back to it later. Once the team has brainstormed all the possible causes of the problem, the team should rate the potential causes according to their level of importance and likelihood of contributing to the failure and develop a hierarchy. From the hierarchy, the team should select which causes to investigate further.

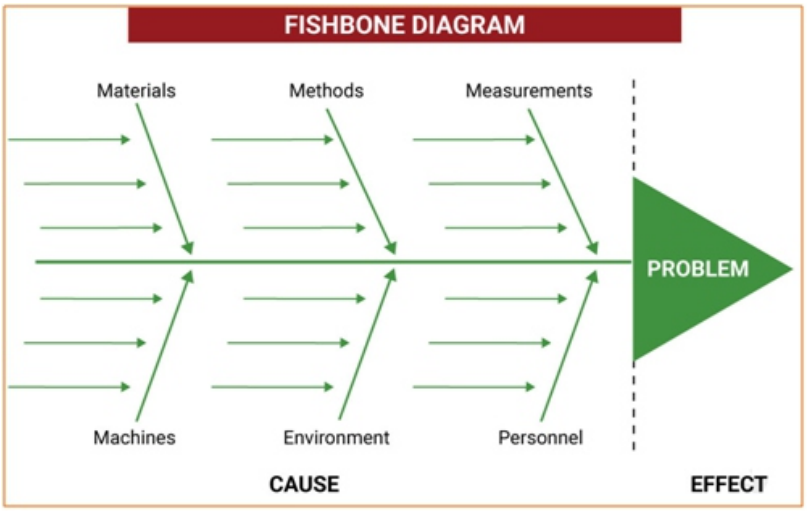


Fig. 3.4.6: Fishbone Diagram

5 Whys

The 5 Why approach entails repeatedly asking "Why" until you have exhausted all of a problem's symptoms and reached the fundamental cause. During problem-solving exercises, the 5 Whys is frequently employed. It can be used in conjunction with other analysis tools, such as the Cause and Effect Diagram, or it can be used independently. The 5 Whys works best when the responses come from those who have firsthand experience with the problem. To discover the root cause of a problem, keep asking "why". By repeating "why", you can drive down to the root cause of the problem. A general rule of thumb is that you should reach the 3rd to fifth "why", or you may address a symptom of the problem and not the actual root cause. The 5 Why Form can sometimes have three separate areas (or "legs") to address the 5 Whys: Why it occurred, Why it was not detected and Why our systems failed. Each area should be explored, and you may have more than one causal progression for each area.

Fig. 3.4.7: 5 Whys

FMEA

FMEA is for Failure Modes and Effects Analysis. It is a well-defined tool for identifying various failure modes inside a system or process. When a significant problem is discovered in a process or product, many firms require the team to analyse any current FMEAs related to the problem. So first, the team should examine whether the failure's problem or consequence was identified in the FMEA. If so, how properly the risk was assessed. If the problem is not included in the FMEA, the team should add any known information and then complete the following steps:

- List the current problem as a failure mode of the design or process
- Identify the impact of the failure

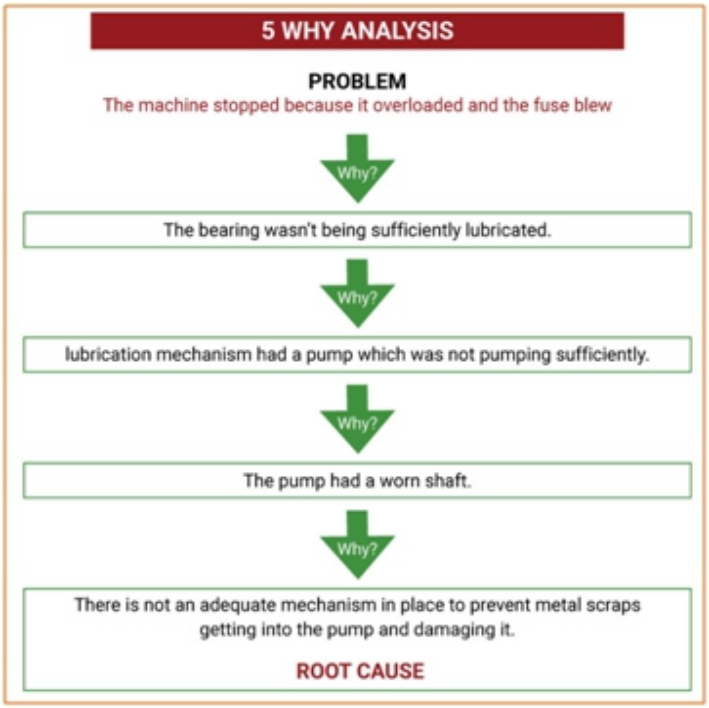


Fig. 3.4.8: 5 Whys' with Root Cause

by defining the severity of the problem or effect of failure

- List all probable causes and how many times they occur
- When reviewing a process FMEA, review the process flow or process diagram to help locate the root cause
- Next, identify the Escape Point, which is the closest point in the process where the root cause could have been detected but was not
- Document any controls in place designed to prevent or detect the problem
- List any additional actions that could be implemented to prevent this problem from occurring again and assign an owner and a due date for each recommended action
- Carry any identified actions over to the counter-measure activity of the RCA

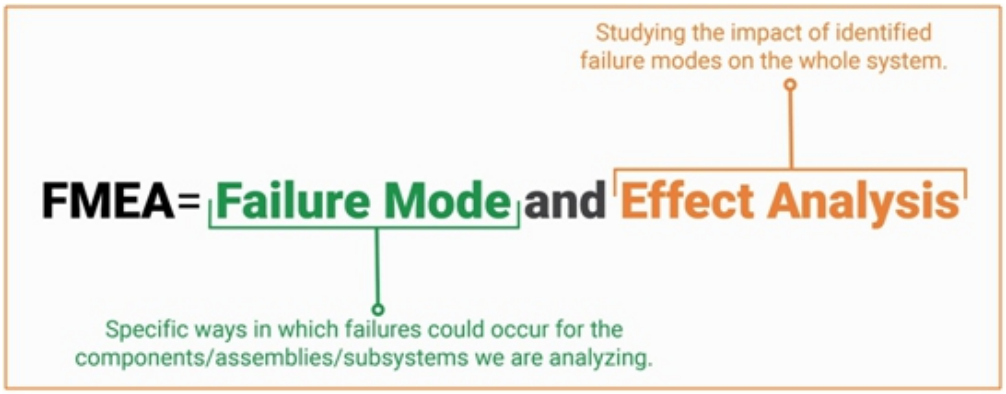


Fig. 3.4.9: About FMEA

Fig. 3.4.10: FMEA Process

Action Plan

The team must then develop appropriate counter-measures or corrective activities after determining the root cause using any methods outlined above. In addition, the team should develop an action plan to implement the counter-measures.

The counter-measures are usually divided into two categories:

- Short-term or immediate counter-measures – generally accomplishable in less than one week. If not, it should be designated as a "Long-term" counter-measure.

- Long-term or permanent counter-measures – are usually more complex and may require additional resources to complete. All "Long-term" counter-measures should be able to complete in less than one month. If not, they should be forwarded to the Continuous Improvement (CI) team for evaluation as part of a Kaizen or Black Belt project.

The corrective action must be well-defined and attainable by the team member in charge of the assignment. The action plan should also include expected due dates for each corrective measure. Corrective activities that do not have an owner or a deadline are much less likely to be performed. Occasionally, the countermeasures necessitate the completion of duties by more than one team member simultaneously or in a specific order. The action plan should be used to track the progress of individual action items needed to complete the countermeasures' implementation.

Verification Plan

The team should also establish a Verification (or Validation) Plan. This is used to offer a documented performance evaluation of the effectiveness of the countermeasures. This could include keeping track of data or auditing any particular controls devised and put in place during the RCA exercise. Evidence should be collected to verify the success of the countermeasures or corrective actions. In addition, it is good practice to re-assemble the team approximately 30 days after the permanent counter-measures are in place. The team should review the effectiveness of the counter-measures and determine if the problem has occurred since the implementation of the counter-measures. The team should also review the process (if applicable) to assure all counter-measures are being followed.Fig. 2.4.8: Symptoms and Root CauseBy discovering the underlying cause and taking action to prevent it from reoccurring, establishing a comprehensive, well-planned Root Cause Analysis (RCA) methodology can benefit the firm. Many lessons learnt during a successful RCA can be applied to similar designs or processes. This should initiate a problem solving continuous improvement mindset to spread throughout the company.

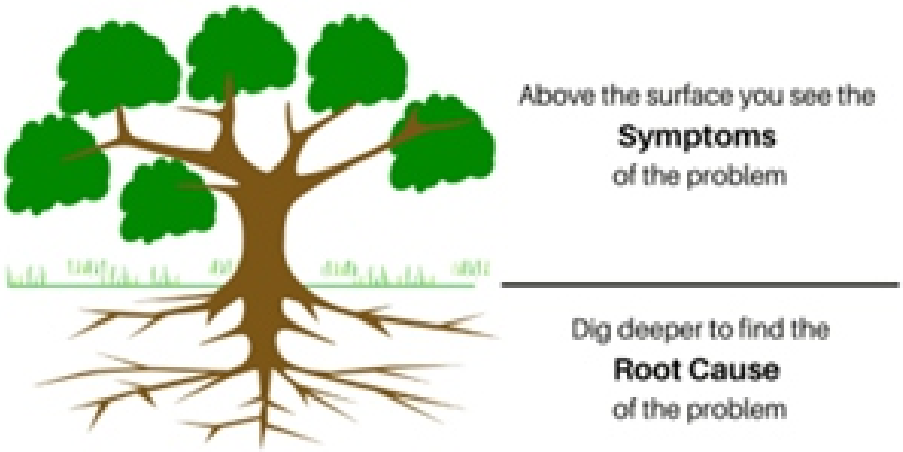


Fig. 3.4.11: Symptoms and Root Cause

Exercise

Q. 1. As per Section 3 of the Food Safety & Standards Act 2006, if food article sold in the market contains any inferior or cheaper substances, whether wholly or partly, which are injurious to health, then such products can be called as:

(A). Sub-standard

(B). Unsafe

(C). Misbranded

(D). Partly sub-standard

Q. 2. What is a Cause and Effect Diagram?

(A). Activity Diagram

(B). Interaction Overview Diagram

(C). Fishbone Diagram

(D). Use Case Diagram

Q.3. What are the 5 Whys of root cause analysis?

Q. 4. What are the six steps of RCA?

Q. 5. What is RCA in the food industry?

UNIT 3.5: Protocols of a Food Safety Auditor and necessary Tools

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the Protocols of a Food Safety Auditor
2. Describe the necessary tools required for Food Safety Auditing

3.5.1 Terms related to Audit:

- **Auditee:** The business or organization being audited
- **Auditor:** A person with the competence to conduct an audit
- **Audit findings:** The results of the evaluation of the collected audit evidence against the audit criteria
- **Audit conclusion:** The overall outcome of an audit provided by the auditor or team after consideration of the audit objectives and all audit findings
- **Audit scope:** The extent and boundaries of the audit, including location, business units, processes, period, etc.
- **Audit agenda:** The time-table for the actual audit

3.5.2 Auditing Skills

In addition to personal qualities, the auditor must have a set of practical abilities that aid in the performance of a successful and valuable audit.

These include the ability to:

- Observe
- Question
- Listen
- Record

Fig. 3.5.1: Audit in Food Premises

Skill 1 - Observing

An essential audit skill is observation. It is the ability to look at things and link them to the standard's specific needs. It is crucial to pay attention to details and keep an eye out for problems in a food processing facility. Observation has been the skill associated with a 'traditional' inspection and is ordinarily applicable to PRP, including:

- Premises - adequacy, maintenance, clearing
- Plant or equipment
- People - facilities, practices, hygiene
- Pests'

The recent modifications to GFSI (Global Food Safety Initiative) guidelines have given the food safety audit's observation or plant inspection component a renewed focus. The plant audit is now virtually as important as the paper or desk audit.

Skill 2 - Questioning

The ability to ask a question is vital in the audit process. Without this skill, there can be no communication. For example, the following saying underscores the point: Why?, What?, Where?, When?, How?, Who?Fig. 2.5.2: Audit on Food Production

The auditor may ask either closed or open-ended questions. Which one is employed is determined by the auditor's objectives. Closed questions can only be answered with a Yes or No. When the auditor wants to determine compliance without explanation or qualification, they usually employ them. An example of a closed question is “Do you check temperatures?” Open questions where the auditor is seeking more information or insight into an area of nonconformance, exceptionally where the root cause of an issue may be relevant to the overall audit finding. Examples of open questions are “How do you check temperatures?” and “Why do you not check the temperature?”

Fig. 3.5.2: Audit on Food Production

Skill 3 - Listening

Listening is often thought to be more important than talking about ineffective communication. This is also true when it comes to food safety auditing. For example, when you pose a question, pay attention to the answer! It is not only respectful but also professional auditing because the information provided will enable you to finish your task and generate a better audit report. When listening, there are certain things you should do to let the person know you are engaged:

- Looking receptive
- Making encouraging sounds or gestures
- Checking to understand - if you are unclear about some information, ask for it to be clarified
- Summarise clearly what you have heard in order to show the person that you have been listening

As far as possible, do not engage in the following activities which might discourage the auditee and convey the wrong message:

- Orient yourself away from the auditee

- Take lengthy notes
- Fidget
- Lose eye contact
- Look at the clock
- Interrupt whilst auditee is explaining

Skill 4 - Recording

The recording is an essential part of gathering objective evidence. All notes and records should be clear, succinct, and purposeful during the audit. Any non-conformances should be documented in as much detail as possible to ensure a fair and accurate portrayal. Examples of sound recording include:

- The bait point number, e.g. 'Bait point number 15 in the finished product store, is missing.'
- The calibration data and the identity of the thermometer
- The staff record with names and details
- The product and time of dispatch and receipts
- Where possible, agree with the evidence at the time with the auditee

3.5.3 Duties of Auditors

- Observe the organization's food preparation, handling, storage, and transportation processes
- Interview food preparation, handling, etc., personnel within the scope of the organization's FSMS
- Review the organization's food safety-related records and documents (e.g., receiving records, HACCP plan)
- Issue a formal audit report to the organization and certification body, as well as issue the quality and safety Certificate

Fig. 3.5.3: Auditors' Duties

3.5.4 Types of Audits:

The nature of the relationship between the auditor and the person or entity being audited can be used to define audits. These are:

- **First Party Audit:** This is where a company or organization performs an audit on itself. This is often referred to as an internal audit.
- **Second Party Audit:** This is where a company or an organization performs an audit on another company or organization. An example of this would be where the food company performs an audit directly on one of its suppliers. Another example would be an audit conducted by a retailer on the food business.

- **Third-Party Audit:** This is where an organization, body or agency performs an audit on a food business on behalf of another organisation or scheme. The organization has no direct commercial relationship with the food company in these cases. Examples of these types of audits would include certification audits under the GFSI.

Fig. 3.5.4: Principles of Auditing

Five Principles of Auditing:

There are a few basic rules that must be followed in order to ensure effective and repeatable audits. These principles enable auditing results that are relevant and sufficient and allow auditors to work independently to obtain similar conclusions in similar situations.

There are five principles in total:

- Ethical conduct
- Fair presentation
- Due professional care
- Independence
- Evidence-based approach

Steps

Regardless of their type, food safety audits are usually conducted following the under-mentioned steps:

(1) Planning.
(2) Execution.
(3) Corrective and preventive action.
(4) Verification.
(5) Audit evaluation

Step 1. Planning

A food safety audit design should begin with a specific goal in mind. The primary goal of a food safety audit, for example, could be to assess the management system. It could also focus on a single product or product range that a customer has requested. Increasing efficiency and continuous improvement and promoting a sense of ownership and participation throughout the business maybe further aims.

Another critical aspect of preparation is determining the scope of your food safety audit - what areas will be examined? This might be based on criteria such as a standard's requirements or physical boundaries such as a specific procedure or the entire business. Based on your objective and scope, there are three

types of food safety audits:

- **Focused:** this type of audit targets a specific area and maybe conducted in response to a specific customer request, in response to an incident at another facility, or to conduct a pre-assessment of particular parts of the management system
- **Random Sample:** this type of audit lends itself mainly to spot checks or follow-up verifications of corrective action. It provides support to a problem or high-risk areas.
- **Process/Department:** these audits provide greater depth and aid in identifying trends and root cause analysis. Root cause analysis helps you identify risks at the source and understand how they proliferate throughout a process or facility. A deep understanding of risks requires the evaluation of all the various inter-linkages within your system and the collection and analysis of food safety audit data. It is essential to achieve long-term corrective action.

Step 2. Execution

Audits give you a real-time picture of how your business and quality management system is doing. Food safety audits look at problems that are now festering rather than looking at safety records and past statistics - they might be preventive rather than reactive. In addition to reporting findings, looking for places where you may implement preventative tactics can provide value by increasing productivity and preventing future problems.

Food safety audits are also an excellent opportunity to improve internal communication. In addition, interviewing employees provides a variety of perspectives and an opportunity to foster a sense of ownership and buy-in within the company – all of which can help build a solid food safety culture.

It is critical to develop and use audit tools such as turtle diagrams, cross-reference matrices, and process needs matrices during execution to ensure a systematic and thorough food safety audit.

Step 3. Corrective and Preventative Action

Building a formal process where responsibility is assigned and procedures are clearly defined. Proper documentation and problem descriptions capture informationand allow meaningful replies and quick remedial action. Root cause analysis, in which data is collected over time to uncover trends and permit long-term remedies rather than a "quick fix" approach, allows for more in-depth analyses. What is the underlying issue, you could wonder?

Corrective Action vs. Preventive Action

	Corrective Action	Preventive Action
When it is used	After a problem happens in a process	Before a problem happens, when a risk is identified
Role in ISO 9001, ISO 14001, ISO 22301, ISO 27001, ISO 45001, etc. (the majority of ISO management system standards)	Includes assessment of root cause and a plan to prevent recurrence	Replaced by risk-based thinking and improvement, rather than a formal process
Role in ISO 13485, IATF 16949	Includes assessment of root cause and a plan to prevent recurrence	Includes assessment of root cause and a plan to prevent occurrence
Type of activity	Reactive activity – Happens after the fact	Proactive activity – Takes action when a risk is identified

Fig. 3.5.5: Corrective versus Preventive Actions

Everyone participating in the process should be informed, and they should be aware of their responsibilities for remedial action. Again, an opportunity exists to enhance buy-in and ownership among employees. Detailed documentation and supporting follow-up monitoring data should be routinely captured to assess the success of corrective and preventive action.

Step 4. Verification

This audit section looks at how well corrective and preventive activities operate and whether they accomplish the goals outlined in the management strategy. The individual who does the food safety audit should not be the same person who came up with the corrective action to offer an extra level of impartiality and a fresh perspective. Reviewing all of the collective outputs of a specific activity and doing mini-audits and follow-up interviews can help you increase the depth of your verification.

Step 5. Audit Evaluation

Auditing your audit process is not a waste of time; it is one of the most critical aspects. Are you following the objectives and the food safety audit schedule, are resources being used effectively, and is management committed to pushing for the implementation of corrective and preventative actions? The food safety auditing process should be evaluated regularly to verify that audits add value. How can we make our audits more effective? It is a question that should always be posted. This continuous circle of feedback strengthens your food safety audits and, as a result, your entire organisation.

Fig. 3.5.6: Actions and Defect Repair

Exercise

Q. 1. State three sources of chemical hazards.

(A). Raw ingredients, Cleaners, Pest control operations, Vets, Industry pollutants/emissions and Equipment (grease),

(B). Raw ingredients, Buildings, Equipment, Notice boards, Maintenance operatives, Food handlers, Cleaning activities, Pests and Visitors

(C). Bones, Glass, Wood, Plastic, String, Nails/screws/bolts/nuts, Buttons, Pen-tops, Jewellery, Fingernails, Wire, Cigarette ends, Swarf, Dressings, Pest & pest debris, Scorching food or water

(D). All of the above

Q. 2. State vulnerable groups of people are most at risk from food poisoning.

(A). The elderly

(B). Very young

(C). Pregnant women

(D). All of the above

Q.3. Where do food safety auditors work?

Q. 4. Who audits food safety?

Q. 5. What is an R638 certificate?

UNIT 3.6: Customer Complaint Log

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the Customer Complaint Log
2. Describe the Customer Complaint Management Systems (CCMS) in a food processing industry

3.6.1 Food Safety Complaints

Food safety refers to how food is handled to avoid foodborne illness. Food safety is a worldwide concern. We have all seen news reports about a live insect in the dish and how people sued the business. We have also witnessed instances where someone ordered vegetarian cuisine and received chicken instead.Fig.

Fig. 3.6.1: Food Safety Complaints

It is vital to remember that packaged items with the FSSAI seal are generally safer than those without. There has also been a boomin ordering food online, leading to many food delivery apps coming to the market for food delivery, namely Zomato, Swiggy, Uber Eats, Foodpanda etc. People these days generally prefer to order their food online rather than dining out in a restaurant.

Fig. 3.6.2: Food Delivery Apps

Commonly Reported Food Safety Complaints in India

According to a recent survey, over 10% of individuals were dissatisfied with the meals provided through these online dining platforms. The most common food complaints include:

- Wrong product delivered
- Stale food delivered
- Less quantity
- Issues with the quality

- Adulteration
- Foreign material in food (insect in food, plastic in the food item, metalpin in food item etc.)
- Refund not provided
- No customer support etc.

How to resolve Food Safety Complaints in India?

1. **Contact Food Aggregator**

   First and foremost, we should strive to contact the customer service departments of these web portals as soon as possible. They will endeavour to handle the problem as soon as possible because they value customer feedback. For the same, several apps include automated chatbots.

2. **Report to FSSAI**

   It has been observed that even these reputable organisations will sometimes close a customer's complaint without offering a viable solution. So what can be done if their customer support is not providing any solution? First, go to FSSAI and file a complaint.

   Updated Link for lodging consumer complaint (grievance and redressal)-

   https://foscos.fssai.gov.in/consumergrievance

   This is the FSSAI website, which is designed to assist those who are dealing with food-related issues. Your complaint will be delivered to the Food Safety Officer, who will handle it after you have filed it and attached all supporting documentation. The customer care number of FSSAI is 1800112100. You can even share your concern here.

3. **File a Consumer Forum Case**

   Finally, if you have not received a satisfactory response, you can file a complaint with your local consumer forum. You do not need to pay a lawyer to submit a case there. You can do it in as little as 2-3 hours. At Voxya, help consumers take legal action against food delivery apps by sending a legal notice and preparing the case documents to file a case in consumer court. So, if you are frustrated, File a complaint today!

Most Common Issue Reported for Food Safety Complaints

1. Nonveg delivered in place of veg
2. Item not delivered
3. Less quantity
4. Wrong item received
5. Items were missing
6. Stale food delivered
7. Bad packing
8. Payment deducted but no delivery
9. Delay in delivery
10. Credits and coupons not working

11. Refund not received
12. No Customer support
13. Charged twice
14. Dust particles Hair in food

Customer Complaint Log:

A Customer Complaint Form should include the following:

The customer should enter their details, such as their name, phone number, address, and email. Information about the product that is the subject of the complaint. Enter the invoice or receipt number, product article, and description.

Customer Complaint Register

Format No.:

Sr. No.	Customer Complaint Ref. No.	Nature of Complain	Root Cause	Corrective Action

Fig. 3.6.3: Customer Complaint Register

Fig. 3.6.4: Customer Feedback

Record all consumer complaints as set out in the Customer Service RIGs

	Complaints concerning connections **quotations** or pre-quotation enquiries (including supply upgrades and service alterations)*	Complaints concerning the **delivery** of connections services (including supply upgrades and service alterations)**	Complaints concerning loss of supply (planned and unplanned) and emergency situations	All other complaints ***
Number of telephone complaints received				
Number of written complaints received (including letters, emails, texts)				
Total complaints received	0	0	0	0
Number of complaints resolved by the end of the first working day after which the complaint was received (day+1)				
Percentage of complaints outstanding after day+1	0.00%	0.00%	0.00%	0.00%
Number of complaints resolved between day+2 and 31 calendar days				
Percentage of complaints outstanding after 31 calendar days	0.00%	0.00%	0.00%	0.00%
Number of repeated complaints				
Percentage of repeated complaints	0.00%	0.00%	0.00%	0.00%
Total number of deadlock letters issued by the DNO to the complainant on or before 8 weeks				

Fig. 3.6.5: Records of Complaints

Exercise

Q. 1. _____states that a consumer should know the reliefs available to him in case of product or service falls short of his expectations.

(A). Right to Safety

(B). Right to Seek Redressal

(C). Right to be informed

(D). Right to Consumer Education

Q 2. The Consumer Protection Act provides relief to customers by replacing the product, removinga defect in the product, and compensation for any loss or injury suffered by the consumer. For example, which consumer right has been highlighted in this statement.

(A). Right to Safety

(B). Right to Seek Redressal

(C). Right to be informed

(D). Right to Consumer Education

Q. 3. _____States that, the consumer has a right to file a complaint and to be heard in case of dissatisfaction with a product.

(A). Right to heard

(B). Right to Seek Redressal

(C). Right to be informed

(D). Right to Consumer Education

Q. 4. What is the five food safety?

Q. 5. What are the four principles of food safety?

Q. 6. What are ten food safety rules?

Q. 7. What are the six principles of food safety?

UNIT 3.7:Procedure of Product Recall, Mock Recall, Forward and Backward Traceability

Unit Objectives

At the end of this module, you will be able to understand

1. Explain the concept of traceability and recall
2. Describe the Customer Complaint Management Systems (CCMS) in a food processing industry

3.7.1 Traceability and Recall

You are responsible for the quality and safety of the food you process as a manufacturer. Suppose there is any concern about the safety of your products. In that case, you must be able to rapidly and effectively remove potentially unsafe products from the market. This is referred to as a recall. When a recall is required, acting swiftly and adequately will aid in the protection of consumers and your company's reputation.

Fig. 3.7.1: Traceability for Food

The procedures outlined here are:

- Traceability
- Preparing for the possibility of a recall
- Actions to take during a recall

Many situations can trigger a recall. Examples include:

- The contamination of a product with a biological, chemical or physical contaminant
- Notification from a supplier that a lot or batch of ingredient was contaminated
- The mislabelling of a product that contains allergens
- The results from regulatory sampling and testing programs or inspections
- The result from your sampling and testing programs or inspections
- Complaints from distributors or retailers
- Complaint from consumers
- Product tampering (actual or threatened)

A solid traceability system that allows you to track products and their ingredients backwards and forward across the agri-food chain is required to recall a product correctly. Your production records

must be detailed and accurate enough to link a specific lot of products to a specific ingredient or addition. Similarly, records must be able to track all of the goods created with a specific ingredient from a specific lot.

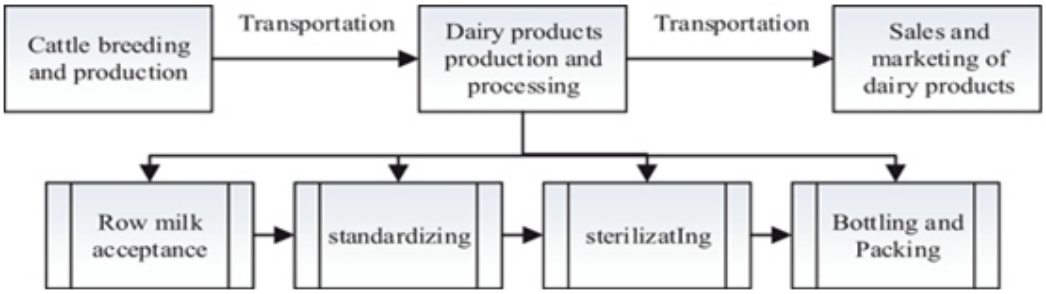


Fig. 3.7.2: Recall Process

In dairy processing, traceability requires collecting, filing and sharing information about:

- Product ingredients
- Processing
- Packaging
- Labelling
- Storage
- Distribution

To effectively recall a product, you must also have a recall plan that lays out all the steps. A recall can be a distressing and perplexing experience. However, having procedures that are well thought out, documented and tested will minimize the impact a recall may have on your clients and business.

Procedures: Traceability

The basis of an efficient recall programmeis to trace each ingredient you use back to its source and track your products once they leave the plant.

Ingredient requirements

- All ingredients should have a clear identifying lot or batch number on them.
- Record this lot or batch number on a "make sheet." Also, record the amount of the ingredient you used. Have a separate make sheet for every formulated product.
- If you rework material from other production runs into a product, note the rework material's lot or batch number on the make sheet.

Finished product requirements

- The finished product should have a different lot/code/batch number or "best before" date that indicates when it was manufactured. For example, suppose your chocolate milk has a shelf life of 26 days. In that case, all the cartons packaged on September 1st should have a "best before" date of SE27, informing the consumers that they should not be consumed after September 27.
- Keep meticulous records of production, inventory, and distribution to quickly and precisely pinpoint the location of each final product unit. This means:

- keeping a record of each customer: their names, addresses, contact information, the amount and lot/code of any products delivered or sold to them and when the product was shipped (most plants already track this information for billing purposes)
- if you use a coding system, document it so that anyone can decipher exactly what a particular code means
- including the name of the product and where it was made on all product packaging and lot/batch coding
- if you use case coding, make sure it is linked to the codes on the containers inside

Retail labelling requirements

- Retail sales refer to direct sales of products to consumers at food premises such as grocery stores, convenience stores, restaurants, delis and cafes.
- The finished product in retail-sized containers must be labelled with the company name, product name and a lot/code/batch number or "best before" date.
- Suppose you repackage a milk product made by a different business (for example, cutting and wrapping cheese made by another company into consumer-sized packages). The repackaged product must be labelled and identified with eitherthe original manufacturer's information (processor name, packing date, batch number), your business name, address or code, and repackaging date or "best before" date. ("Best before" dates do not apply to some aged cheeses.) In this case, you must keep records that identify the original processor, packing date and batch number of the milk product.
- Refer to Regulation 753 under the Milk Act and Regulation 493/17 under the Health Protection and Promotion Act for additional labelling requirements for fluid and milk products.
- For more information on your role and responsibilities for labelling, see FSSAI's Food Labelling and Advertising page.

Fig. 3.7.3: Retail Labelling Requirements

Procedures: Preparing for the Possibility of a Recall

It is critical to react swiftly in a recall situation. It is critical to start thinking about how you will respond if your plant ever has to recall a product. Preparation involves five steps:

- Establish a recall team
- Develop a written recall plan and traceability system
- Train staff
- Conduct a mock recall
- Use the mock recall experience to improve your plan

Establish a recall team

Determine the roles and duties of each team member. A recall team leader and at least one senior company representative should be on the recall team. The size of your business will determine the number of team members you choose. Consider including someone from each of the following departments:

- production
- shipping
- maintenance
- sales
- distribution
- quality control
- Identify a backup for each person.

Develop a written recall plan and traceability system

Develop a written recall plan and traceability system: The recall plan should be developed with input from the recall team members. Consider the following questions:

- What could trigger a recall?
- How will you determine the extent of the problem? For example, does it affect just one lot or many lots?
- How will you determine how much product needs to be recalled? For example, how much product is in the marketplace and how many distributors and locations are involved?
- How will you communicate information about the recall to your employees, distributors and retailers, regulatory officials, media and consumers (if needed)?
- Who will develop the communications materials and deliver the message?
- How will you remove the product from the market, find the cause, and take steps to stop the problem from happening again?

The plan should:

1. **Identify the records needed:** Determine whether records are required to keep track of the components, packaging materials, and processing aids utilised in the final product. Identify records (such as shipping receipts) that will allow you to monitor the finished product as it leaves your facility and where it travels. It can take a long time to gather this information. To prevent unsafe products from reaching customers during a recall, the recall team must produce documents as promptly as feasible. They will be able to reply faster and more efficiently if they have a complete list of records.

2. **Document the recall team's actions to prepare for the possibility of a recall and** follow up after a recall happens. This includes:

    - Meetings - record key decisions about how you would handle a recall

- Training - preparing staff for the possibility of a recall
- Exercises - practising recall procedures, staging a mock recall
- Follow-up - determining the cause of a recall and preventing it from happening again

3. **Develop a communications plan.** Specify who needs to be contacted in case of a recall. This could include:

   - employees
   - distributors
   - retailers
   - regulatory agencies
   - media
   - consumers

   Determine the exact information that each audience will require and how to reach them. Then, create a recall notice template that can be quickly filled up and sent to your distributors and retailers in the event of a recall to safeguard consumers from harm.

4. **Create a list of people in the company** who should be notified in a recall situation. This list should include:

   - The recall team plus any additional people in the company who need to be aware of the recall
   - The roles and responsibilities of each person
   - The phone number and e-mail address of each person
   - Emergency contact information where they can be reached when they are not at work
   - Alternate people in the company to contact if any member of the recall team cannot be reached

   Review the list regularly and update it whenever there are staff changes.

5. **Create a list of the people external to the company** that need to be contacted, including:

   - your product distributors and retailers, and
   - regulatory authorities such as the FSSAI Area Recall Coordinator, Dairy Plant Specialist or the Dairy Food Safety Advisor, and your local Public Health Unit

   Include all contact information. Review the list regularly and update it when necessary.

   In the event of a recall, be aware of the information and actions that local, provincial, and federal inspection agencies would require. Sharing the pertinent information with product distributors, merchants, and authorities as soon as possible can help eliminate the source of public risk immediately.

6. **Develop a training plan.** The recall plan should be communicated to all employees, who should

know how it may affect them and their jobs. (Because a prompt response is crucial in the event of a recall, all employees should be aware of the situation.) Recall procedures should be taught to your recall team to respond promptly and effectively if a recall is required. A mock recall should be included in the training.

Procedures: Actions to Take During a Recall

In the event of a recall, take the following steps. First, remember that speed is essential. The better the affected product can be isolated and removed from the marketplace.

1. **Assemble your recall team**

   Inform them of the situation and start putting your recall plan into action.

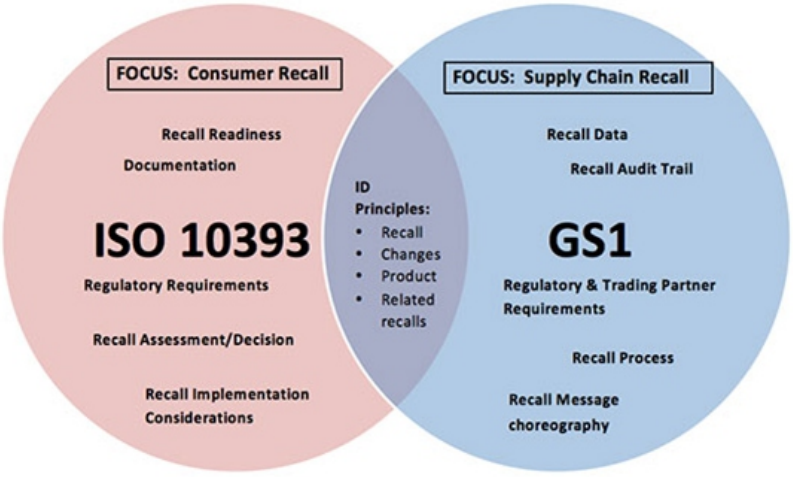


Fig. 3.7.4: Recall

2. **Identify the nature of the recall**

   To do this:

   - document the source of the information that triggered the recall (the trigger)
   - document the type of hazard (biological, chemical or physical)
   - identify the level of risk (actual or potential) based on the type of hazard and the type of product involved
   - document any illness associated with the product
   - review your production records and laboratory test results to determine the extent of the problem

3. **Notify the appropriate regulatory authorities immediately**

   This includes:

   - your nearest FSSAI inspector or the FSSAIArea Recall Coordinator (the FSSAIcoordinates food emergency responses across India)
   - Dairy Plant Specialist or Food Safety Advisor

- Your local Public Health Unit

4. FSSAI will classify the recall

Recalls can be classified as Class I, II or III based on the level of risk. To do this, FSSAI may complete a health risk assessment. According to FSSAI:

- A recall is classified as "Class I" (high risk) if there is a reasonable probability that using the violative product or being exposed to it will cause serious health problems or death. The FSSAI issued a public warning for all Class I recalls when the product is available for sale or could be in consumers' homes.
- A recall is classified as "Class II" (moderate risk). Therefore, using the violative product or being exposed to it may cause temporary health problems, or the probability of serious health problems is remote.
- A recall is classified as "Class III" (low or no risk) if using the violative product or being exposed to it is not likely to cause any health problems.

5. Identify and locate the affected product

Work with FSSAI to determine how much product is affected by the recall and to contain it. The extent of the recall will depend on many factors. For example:

- The recall could involve all products of a particular code or "best before" date associated with an illness for disease-causing micro-organisms.
- The recall could involve all products manufactured on a particular line for foreign material. (This may involve multiple codes or "best before" dates.)
- The recall could involve all the products made with that ingredient for an ingredient hazard. To figure out how much product or ingredient is involved, you may need to calculate how much-finished product corresponds to the number of raw materials used, taking yield and product losses into account.

Investigate whether the recall may affect other products (for example, a product made before or after an affected lot).

Immediately stop distributing any product that may be affected. Isolate any recalled product still under your control.

6. Start a logbook

Use this logbook to record all the steps taken during the recall and the information gathered. This includes documenting:

- the triggers for the recall, including consumer complaints (if applicable)
- the extent of the recall
- all communications to retailers, distributors, the general public, government and media
- the product you isolate in your plant and the product you retrieve from the marketplace

- the efficiency of the recall (how much of the affected product you could account for and how much you recovered)
- how you disposed of the product (including government approvals, if necessary)
- how do you track down the problem that led to the recall
- an in-depth analysis to determine the root cause of the problem
- what steps you will take now and in the long term to prevent the problem from happening again
- the debrief, including identifying areas of the recall process that could be improved in the future

7. Write and distribute communications materials

- Fill out previously developed templates for each audience: employees, distributors, retailers, regulatory agencies, media and consumers.
- Produce accurate and detailed information to ensure that all affected products can be quickly identified and removed from the marketplace. If possible, provide complete manufacturing and distribution details for every lot.
- Follow up to make sure communications have been received and understood.

8. Retrieve affected products from the marketplace

- Use your distribution records to track all of the products in each lot. This includes parts of a lot on hand, on hold or reworked.
- Create a list of distributors and retailers that received affected products. This list should include product codes and lot codes. If the distribution list is not specific, be prepared to do a broader recall to bring back all products that may be affected.
- Contact all distributors and retail customers to make sure your communications are working. Find out:
  - Whether they received your notification
  - Whether the product is still available for sale, and if so, why
- Have a plan to recover the affected product.
- Identify any returns to the plant and store them until you can dispose of them in a way that will not contaminate the plant or other products.

9. Dispose of the affected product

Create a plan for disposing of the affected product and documenting that disposal. Next, send this plan for approval. Then, follow instructions for disposing of the affected product.

Training

Train all employees on:

- How a recall could affect their work

- When and how to communicate with media, regulatory authorities, employees and customers in the event of a recall

The recall team requires specific training on your plant's recall procedures. They need to know:

- what could trigger a recall
- the various classifications of recalls
- what problems require a recall rather than a market withdrawal
- what actions to take during a recall

Specify:

- who has authority to speak with outside contacts such as media or customers
- what messaging statements the company has prepared in case of a recall

Conduct a mock recall:

Perform a mock recall at least once a year or whenever your procedures change significantly. A mock recall is an excellent tool for training employees and monitoring how well your system works.

Monitoring and Follow-up

In any recall - mock or natural - the key things to monitor are:

- how effectively do you communicate with each retailer and distributor
- whether every unit of the product being recalled could be tracked down

Ask your distributors and retailers to confirm how many units they had on hand when receiving the recall notice. Compare these numbers with your production figures and the inventory you still have on hand. In an actual recall, notify FSSAI if the retailers sold any recalled product or you cannot account for all of the recalled product. Depending on the seriousness of the risk to consumers, FSSAI may issue a "Health Alert" or some other form of public announcement.

Fig. 3.7.5: Monitoring & Follow-up

- How efficiently this was done
- How much product was recovered from the marketplace (%)
- How quickly the product was recovered

Continue to work with your recall team immediately after the recall event is over to determine:

- the root cause of the problem was that made a recall necessary
- what corrective measures must be taken to prevent this problem from happening again
- how effective was your recall was
- how your recall program could be improved

Implement the corrective measures and update the recall plan as needed.

Exercise

Q. 1. Which of the following is a performance parameter for the food industry?

(A). Hygiene

(B). Labour Used

(C). Hygiene &Labour Used

(D). None of the above

Q. 2. Is food processing the transformation of agricultural products?

(A). Grains

(B). Food

(C). Both A and B

(D). Flour

Q. 3. Commercial food processing uses control systems such as _____ to reduce the risk of harm.

(A). FMEA

(B). FCEA

(C). GREA

(D). HACCP

Q. 4. What is the difference between mock recall and traceability?

Q. 5. What is traceability in food safety?

Notes

Scan the QR Codes to Watch the related Videos

HACCP - Hazard analysis and critical control points

Basics of GMP: Deviations, Root Cause Analysis (RCA) Tools and Corrective and Preventive Action

NCVET
कौशल गुणवत्ता प्रगति

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

FICSI
Food Industry Capacity and Skill Initiative

4. Ensuring Food Safety and Personal Hygiene

Unit 4.1 - Introduction to Food Safety
Unit 4.2 - Schedule IV requirements of FSSAI
Unit 4.3 - Personal Hygiene
Unit 4.4 - Health Safety

FIC/N9901

Key Learning Outcomes

By the end of this module, the participants will be able to:

1. Identify the hazards, types of hazards (Physical, chemical, biological and Allergenic) and risks at workplace
2. HACCP, TACCP, VACCP, Control measures, CCP, Critical limit
3. Explain the preventions of product contamination
4. Discuss the factors affecting food spoilage and food storage techniques
5. Describe Schedule IV requirements of FSSAI
6. Discuss cleaning and sanitization process, needs and importance and storage of sanitizing materials
7. Discuss health and safety policies and procedures
8. Discuss Employee health do's and don'ts, Food borne illness and preventive health checkups

UNIT 4.1: Introduction to Food Safety

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify types of hazards and risks at work place

4.1.1 Food Safety

Food safety refers to routines in the preparation, handling and storage of food meant to prevent food borne illness and making food safe for human consumption. Safe food handling practices and procedures are thus implemented at every stage of the food production life cycle in order to curb these risks and prevent harm to consumers.

4.1.2 Food Safety Hazard and Risk

Hazard is a factor or agent which may lead to undesirable effects like illness or injury in the absence of its control, whereas, risk refers to the probability that the effect will occur.

Hazard is that part of food which somehow entered in the food and which is non-consumable.

Types of hazards and risks at work place

There are two types of hazards: one is food safety hazard and second is health safety hazards.

Food Safety Hazard

There are four major hazards that may be introduced into the food supply any time during harvesting, processing, transporting, preparing, storing and serving food. These hazards may be microbiological, chemical, physical and allergens.

Microbiological hazards

When harmful microorganisms are found or grown on food it is called microbiological hazards. Food which contains harmful or pathogenic bacteria when eaten can make people ill.

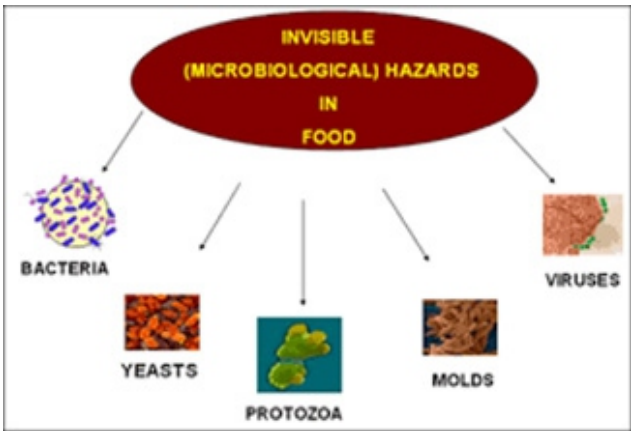


Fig. 4.1.1: Microbiological Hazards

Food spoilage and deterioration is no accident. It is a naturally occurring process. To understand how to maintain the quality of food and prevent spoilage, we need to know what can cause it.

Food spoilage: The microorganisms that can cause food-borne illness are called pathogenic microorganisms. These microorganisms grow best at room temperatures (25-30°C), but most do not grow well at refrigerator or freezer temperatures. Pathogenic microorganisms may grow in foods without any noticeable change in odor, appearance or taste. Spoilage microorganisms, including some kinds of bacteria, yeasts and molds, can grow well at temperatures as low as 4°C. When spoilage microorganisms are present, the food usually looks and/or smells awful.

Fig. 4.1.2: Food Spoilage

FAT TOM- This is a term used commonly in food industry to describe the six favorable conditions required for the growth of the food borne pathogens/micro-organisms.

Fig. 4.1.3: FATTOM Food Safety

Physical Hazards

These include any foreign material, which you would not expect to find in your food. Hair, finger nails, pieces of wood, metal, plastic, glass and insect debris are examples of what can find their way into food as foreign matters.

Fig. 4.1.4: Physical Hazards

Chemical Hazards

Chemical hazards include, food contact materials, cleaning agents, pest control substances, contaminants (environmental, agricultural and process e.g. acrylamide), pesticides, biocides and food additives. They are naturally occurring, intentionally added or unintentionally added.

- Preservatives
- Colours and dyes
- Flavour enhancers
- Water additives
- Packaging materials
- Processing aids

Allergen

An allergen is any protein that is capable of producing an abnormal immune response in sensitive segments of the population.

A known component of food which causes physiological reactions due to an immunological response (e.g.- nuts, gluten, egg, ,milk etc, identified in legislation relevant to country of production or sale)

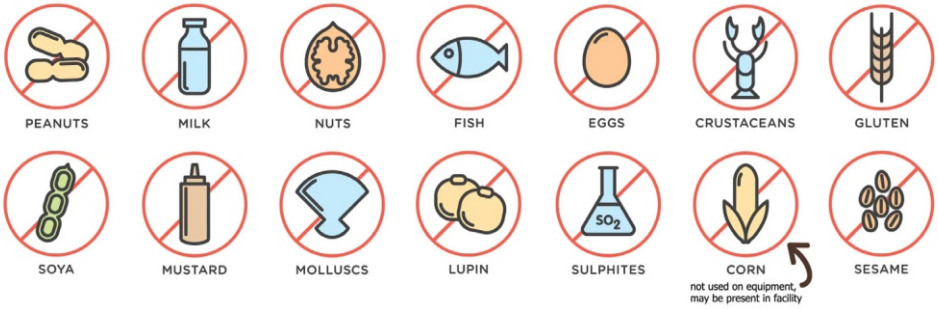


Fig. 4.1.5: Allergens

It is important to be aware of food allergens in food industry as this is the risk associated with the unintended presence of allergen due to cross contamination and should take this a matter of serious concern. Food allergies can cause serious and even deadly reactions.

What Are the Most Common Food Allergens?

There appears to be eight common allergens accounting for most food allergic reactions. They stand to be- milk, eggs, peanuts, soya, wheat, tree nuts (like walnuts and cashews), fish and shelfish (such as shrimp).

What Are the Signs & Symptoms of a Food Allergy?

The common sign and symptoms are: trouble breathing; coughing; hoarseness; throat tightness' belly pain' vomiting' diarrhe' itchy, wateru, or swollen eyes; red spots; swelling, a dropi in blood pressure and is capable of happening because a person can't digest a substance, such as lactose.

Handling of Allergenic Foods:

The common sign and symptoms are: trouble breathing; coughing; hoarseness; throat tightness' belly pain' vomiting' diarrhe' itchy, wateru, or swollen eyes; red spots; swelling, a dropi in blood pressure and is capable of happening because a person can't digest a substance, such as lactose.

4.1.3 Contamination, Cross Contamination and Prevention

Contamination: The presence of unwanted materials such as dust and particles during the manufacturing and transportation time is called contamination. The term contaminants include any unwanted matter that is found in the product. These contaminants affect the quality of the product or the process.

The most common types of contaminant include:

- Physical contaminant Examples: fiber material, particles, chips from your pill press tooling.
- Chemical contaminant. Examples: vapor, pesticides, grease. detergents, and so on.
- Biological contaminant Examples: fungus, bacteria, virus.

Cross contamination is possible when the unwanted matter is introduced or brought from one process to the next during manufacturing.

A leak in the holding containment would contaminate the product inside it; this would be an example of physical contamination.

Certain metals standing to be more advantageous to health, like iron, appearing to be globally added to some foods, involving infant formulas as well as breakfast cereals, to highlight their dietary advantages.

For biological contamination, bacteria may thrive if the container is not properly cleaned and dried. The contaminated container will then affect the product and microbes may thus be introduced to the batch.

Prevention of Contamination:

- Determine the cause of the contamination
- Anticipate the effect
- Eliminate the source material

- To remove the contaminant carrier:
  - Reduce human involvement
  - Regulate the use of the equipment
  - Regulate the use of air
  - Regulate the use of water
- To reduce human carrier risk:
  - Ensure that proper attire is worn when coming and going from the production area
  - People frequently touch their eyes, nose, and mouth without even realizing it. Germs can get into the food through their contaminated unwashed hands.
- To reduce water as carrier:
  - As water is the number one source for cross contamination, it is important to reduce and prevent water contamination
  - Water borne contaminants: particulates (such as minerals) and pathogens (e. coli, salmonella, etc.)
  - Use of preventive measure such as filtration devices, distillation or reverse osmosis, UV treatments
- To reduce air as carrier:
  - Control air flow through AHUs (Air Handling Unit)
  - Use of air locks
  - Installation of HEPA (High Efficiency Particulate Absorbing Filters) filters
  - Ultra-Low Particulate Air

4.1.4 Storage (Importance of Storing Food at Specified Temperature)

Storage temperature is one of the most important factors in the preservation of food because microorganisms have been found to grow in almost all temperature.

Food storage is a major issue when keeping food safe. Food which is not correctly stored can spoil or become contaminated, which can make people sick. There are very specific rules regarding the temperatures that food must be stored at, cooked to and reheated to and if not followed, the risk of becoming ill as a result of contamination increases.

Room Temperature Food Storage

Keep dry storage areas clean with good ventilation to control humidity and prevent the growth of mold and bacteria. 21°C is adequate for dry storage of most products. One of the first things to check regarding food which has been stored in the 'use-by' or 'best-before' dates printed on the packaging.

These dates will give you the most accurate indication of a food's shelf life, however, when a packet or can is opened, the expiry date almost always changes.

Refrigerating and Freezing Food

To reduce the risk of bacterial contamination, many foods must be stored in the refrigerator and thus kept below 5°C. These foods are often classified as 'high-risk foods' and include – meat, poultry, dairy,

seafood, eggs, small goods and cooked rice and pasta. This also refers to ready-to-eat foods that have high-risk foods as ingredients and include – casseroles, quiche, pasta salad, pizza, sandwiches and many cakes.

By keeping these high-risk foods under 5°C it stops them from entering the 'danger-zone' – temperatures between 5°C and 60°C. The danger-zone is the temperature zone which provides bacteria with the perfect environment to rapidly grow and multiply to numbers that cause food poisoning.

By freezing food its longevity is increased because the water content of the food freezes – this prevents bacteria from multiplying and food spoiling. Food should be kept frozen at –18°C; when thawing, it should be stored in a refrigerator that reaches no more than 5°C until it is ready to be prepared.

4.1.5 Transportation

Selling fresh and high-quality produce is essential in groceries and retail food businesses. That's why the transport and storage of foods is so important, and refrigerated transport is essential to achieve this.

Refrigerated Transportation

Refrigerated transportation is a shipping cargo with advanced temperature adjustment features. It is built and designed mainly for climate-sensitive goods such as vegetables, fruits, meat, all-prep meals, bread, etc. in which the freight is loaded with ice and salt to maintain the food's quality at a particular temperature.

Fig. 4.1.6: Refrigerated Transportation

Ambient Temperature for Shipping

When it comes to cold chain logistics, maintaining ambient temperature tends to mean maintaining a temperature between 15°C to 25°C or 59°F to 77°F. These temperatures fall in the range of comfortable room temperature instead of being on one extreme and of temperature ranges.

4.1.6 HACCP, TACCP, VACCP, control measures, critical control point, critical limit

HACCP (Hazard Analysis Critical control point): It is a systematic approach in identification, evaluation and control of food safety hazards and it's written documented plan based on HACCP principles known as HACCP Plan. It has 12 steps and 7 principles as:-

- Assembly of HACCP Team
- Describe Product
- Identify indent use
- Draw Flowchart / Diagram
- Verify Flowchart/ Diagram
- Conduct a hazard analysis (Principle 1)
- Determine critical control points (CCPs) (Principle 2)
- Establish critical limits (Principle 3)
- Establish monitoring procedures (Principle 4)
- Establish corrective actions (Principle 5)
- Establish verification procedures (Principle 6)
- Establish record-keeping and documentation procedures (Principle 7)

VACCP (Vulnerability Analysis Critical control points):

It focuses on food fraud as well, and widens the scope to include systematic prevention of any potential adulteration of food, whether intentional or not, by identifying the vulnerable points in a supply chain. It is especially concerned with economically motivated adulteration (EMA). Examples include product substitutions, unapproved product enhancements, counterfeiting, stolen goods and others.

TACCP (Threat Analysis Critical control points): generally requires a wider range of employee involvement than HACCP, as it covers issues such as manufacturing plant and transportation security, IT security, and employee background checks. Some points will overlap with HACCP, such as tamper-proof seals and various quality control checks.

Reduce the likelihood (chance) and consequence (impact) of a deliberate attack;

Protect organizational reputation;

Reassure customers and the public that proportionate steps are in place to protect food;

Demonstrate that reasonable precautions are taken and due diligence is exercised in protecting food.

Control: It is means to prevent, eliminate, or reduce hazard.

Control measures: It is means of any action or activity that is used to prevent, reduce to acceptable levels, or eliminate a hazard.

Critical limit: it is means a point, step, or procedure in a food process at which a control measure can be applied and at which control is essential to prevent, reduce to an acceptable level, or eliminate an identified food hazard.

UNIT 4.2: Schedule IV requirements of FSSAI

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify requirements in Schedule IV in FSSAI

4.2.1 Schedule IV Requirements of FSSAI

To provide assurance of food safety, Food businesses must implement an effective Food Safety Management System (FSMS) based on Hazard Analysis and Critical Control Point (HACCP) and suitable pre- requisite programmes by actively controlling hazards throughout the food chain starting from food production till final consumption.

As per the condition of license under FSS (Licensing & Registration of Food Businesses) Regulations 2011, every food business operator (FBO) applying for licensing must have a documented FSMS plan and comply with schedule 4 of this regulation. Schedule 4 introduces the concept of FSMS based on implementation of Good Manufacturing Practices (GMP) and Good Hygiene Practices (GHP) by food businesses and is divided into five parts as under:.

Schedule 4	General Requirements
Part 1	General hygienic and sanitary practices to be followed by food business operators applying for registration - Petty food operators and Street food vendors
Part 2	General hygienic and sanitary practices to be followed by food business operators applying for license- Manufacturing/ processing/ packaging/storage/distribution
Part 3	General hygienic and sanitary practices to be followed by food business operators applying for license- Milk and milk products
Part 4	General hygienic and sanitary practices to be followed by food business operators applying for license- Slaughter house and meat processing
Part 5	General hygienic and sanitary practices to be followed by food business operators applying for license- Catering

Table 1.2.1: Five Parts of Good Manufacturing Practices (GMP) and Good Hygiene Practices (GHP)

Part II: General hygienic and sanitary practices to be followed by food business operators applying for license- Manufacturing/ processing/ packaging/storage/distribution

- **Location and Surroundings**
- Location shall be:
  - away from environmentally polluted areas
  - away from industrial activities which produce:
  - Disagreeable or obnoxious odor,
  - Fumes
  - Excessive Soot
  - Dust

Well Guarded Entrance of the Plant

Demarcation of the area

Fig. 4.2.1: Location and Surrounding factors

- Smoke
- Chemical or biological emissions
- Pollutants
- Layout and Design of Food Establishment Premises

Facility in good condition leads to clean, pest free environment	• Repaired or replaces holes, broken tiles missing ceiling panel etc. • Sealed/ grated sewer grids less than ¼ inch
Hole free exterior walls	• Louvers in exterior wall fans that close tightly when turned off • Screened pipes & windows • Sealed outside pipe
Striped or sealed gaps around all doors	• Use of screen door, air curtains & other mechanisms • Sealed cracks to prevent insect harborage

Fig. 4.2.2: Layout and Design factors

- **Equipment and Containers**
  - made up of non-corrosive / rust free material
  - smooth, free from any grooves
  - easy to clean and maintain
  - non-toxic and non-reactive
  - of food grade quality

Fig. 4.2.3: Equipment and Container factors

- **Facilities**
  - **Water supply**
    - Only potable water meeting BIS (Bureau of Indian Standards) standards
    - Appropriate facilities for storage and distribution of water
    - Periodic cleaning of storage tanks and its record
    - Non-potable water, if used, only for cooling of equipment, steam production, fire fighting
    - Distinguished non-potable water pipes

Colour coding of water pipes to avoid contamination

Fig. 4.2.4: Water Supply

- Drainage and waste disposal
  - Disposal of sewage and effluent in conformance with the requirements of Factory
  - Designed and constructed to reduce risk of contamination to food and potable water
  - Separate waste storage area
  - Covered containers for waste storage
  - No accumulated waste in food handling, food storage or other working areas
  - Periodic disposal of waste/refuse
  - Pedal operated adequate size bins for waste collection
  - Waste bins emptied and washed daily with a disinfectant and dried before next use

Sr. No.	Material	Dustbin Colour	SYMBOL
1	Oily Cotton Waste	Red	
2	Paper	Green	
3	Plastic Jars, Sampling Bottles	Blue	
4	Plastic Bags	Yellow	
5	Polish Filter	Grey	
6	Food Waste	Orange	
7	Glass Bottles	Black	

Fig. 4.2.5: Waste Disposal

Fig. 4.2.6: Drainage System

- Personnel facilities and toilets
  - Facilities for washing and drying hands
  - Supply of hot and cold water
  - Separate lavatories of appropriate hygiene design for males and females separately
  - Suitably located Changing facilities for personnel
  - No direct opening of such facilities in food processing, service or storage area

Fig. 4.2.7: Personal facilities

- **Ventilation and Lighting**
  - Air quality and ventilation:
    - Natural / mechanical ventilation system including air filters, exhaust fans
    - Designed and constructed as such air does not flow from contaminated areas to clean areas
  - Lighting
    - Adequate Natural /artificial lighting
    - Protected lightings to avoid contamination by breakages

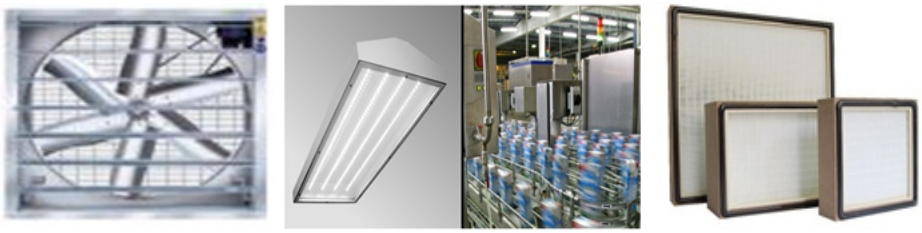


Fig. 4.2.8: Ventilation and Lighting

- **Food Operations And Controls**
  - **Procurement of raw materials**
    - Quality raw materials (free of parasites, micro-organisms, pesticides etc.)
    - Raw material conforming to the regulations under the act
    - Records of raw material as source of procurement

Fig. 4.2.9: Procurement of raw materials

  - **Storage of raw materials and food**
    - Adequate food storage facilities to protect food from contamination
    - Cold storage facilities according to requirement
    - Segregation of storage area for raw and processed food, recalled materials, packaging materials, stationary, cleaning materials/ chemicals
    - Separate cold storage of raw food like meat/poultry/seafood product away from the area of WIP (Work in Progress), processed, cooked and packaged products.
    - Monitoring of temperature and humidity
    - FIFO First received (In) materials must move out first
    - Non –toxic containers for food storage
    - Stored on racks or pallets well above the floor and away from the wall

Fig. 4.2.10: Storage of raw materials and food

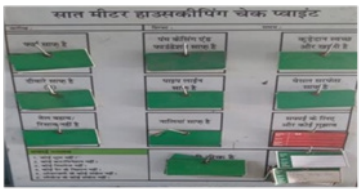
Review Of Product Label /Packaging Usage And Control

Labels should be reviewed allergens are mentioned don it prior to their receipt for their accuracy. Line Personnel should be trained to ensure labelling is changing when a changeover takes place.

Food Processing / Preparation, Packaging and Distribution / Service

- **Storing at appropriate temperature:** The Food Business shall develop and maintain the systems to ensure that time and temperatures are controlled effectively where it is critical to the safety and suitability of food. Such control shall include time and temperature of receiving, processing, cooking, cooling, storage, packaging, distribution and food service till it reaches the consumer, as applicable.
- **Food Packaging:** Packaging materials shall provide protection for all food products to prevent contamination, damage and shall accommodate required labelling as laid down under the FSS Act & the Regulations there under.
- **Transportation:** All critical links in the supply chain need to be identified and provided for to minimize food spoilage during transportation. Processed / packaged and / or ready-to-eat food shall be protected as per the required storage conditions during transportation and / or service.
- **Management and Supervision**
  - Provision of resources to implement & maintain Food Safety
  - Developing SOPs for processing, packing, dispatch & storage of food
  - Competent Technical Managers & Supervisors:
    - having skills on food hygiene principles & practice
    - taking appropriate preventive & corrective action
    - ensure effective monitoring and supervision.
- **Maintaining Process related records (e.g. production records)**
- **Sanitation And Maintenance of Establishment Premises**
  - Facilities should permit effective cleaning.
- **Cleaning Program**
  - areas to be cleaned,
  - cleaning frequency,
  - procedure,
  - equipment,
  - cleaning material and method

Visualizing for HK material


Kamishibai Board for maintaining HK


Hanging of Flexible pipes for ease of cleaning

Fig. 4.2.11: Cleaning Program

- **Maintenance**
  - Preventive and Corrective Maintenance
  - Lubricants and heat transfer fluids shall be food compatible Procedure for releasing maintained equipment back to production
  - Maintenance personnel shall be trained in the product hazards associated with their activities

Fig. 4.2.12: Maintenance

- **Pest Control Systems**
  - Report pest infestations immediately.
  - Do not use pesticides/insecticides in food processing area.

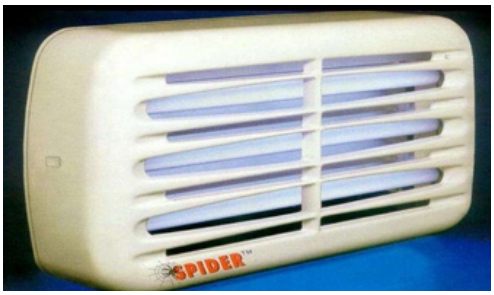


Fig. 4.2.13: Fly Catcher and Rodent Traps

- **Personal Hygiene**
  - Health Status
    - Personnel suffering from disease or illness shall not be allowed to enter in food handling area
    - System to report illness or symptoms of illness to management
    - Medical examination of food handlers/ employees once in a year
    - Records of medical examination
    - Factory shall be compulsorily inoculated against the entire group of diseases and recorded
    - In case of epidemic, all workers to be vaccinated irrespective of the yearly vaccination.
  - **Personal Cleanliness**
    - High degree of personal cleanliness by food handlers
    - Food business shall provide to all food handlers;
    - Protective clothing
    - Head covering
    - Face mask
    - Gloves
    - Foot wear

Fig. 4.2.14: Personal Cleanliness

- **Visitors Generally**
  - Generally visitors should be discouraged to go inside the food handling areas
  - The food business shall ensure visitors to its food manufacturing/ handling areas shall;
  - Wear protective clothing
  - Footwear
  - Adhere to personal hygiene provisions envisaged in the respective section
- **Product Information And Consumer Awareness**
  - Batch Identification
    - Identifies producer
    - Product recall
    - Effective stock rotation - FIFO
  - Product Information
    - Adequate information & enables other person in food chain to handle, display, store, prepare & use the product safely & correctly
  - Labeling
    - Should confirm to Legal Requirements
- **Consumer Education**
- **Training**
  - Awareness & responsibilities
  - Training Programmes
    - Nature of food
    - Control Spoilage
    - Handling of food
    - Storage
  - Training Records
  - Instruction & supervision
    - Periodic assessment of training & effectiveness
  - Refresher training
- **Good Manufacturing Practices For Whole Premise**

  Good Manufacturing Practices* (GMPs) are the basic operational and environmental conditions required to produce safe foods. They ensure that ingredients, products and packaging materials are handled safely and that food products are processed in a suitable environment.

  GMPs address the hazards associated with personnel and environment during food production. They provide a foundation for any food safety system. Once GMPs are in place, processors can implement a Hazard Analysis Critical Control Point (HACCP) system to control hazards that may affect the ingredients and packaging material during food processing.

GMPs Address:

Fig. 4.2.15: GMPs Address

- **Environmental control (premises):** Location, design and construction of the building and its interior, equipment, water supply.
- **Personnel practices:** Personal hygiene, hand washing, clothing/footwear/headwear, injuries and wounds, evidence of illness, access and traffic patterns, chemical use.
- **Shipping, receiving, handling, storage:** Inspection procedures for transport vehicles; loading, unloading and storage practices; inspection procedures for incoming products; shipping conditions; returned and defective products; allergen control; chemical storage; waste management.
- **Pest control:** Monitoring procedures for the exterior and interior of the building (ex: surveillance, fumigation) and the use of pesticides.
- **Sanitation:** Cleaning and sanitizing procedures and pre-operational assessment.
- **Equipment maintenance:** Procedures describing preventive maintenance and calibration of all the equipment and instruments that can affect food safety (ex: thermometers, thermocouples, metal detectors, scales, pH meters)
- **Recall and traceability:** Procedures that ensure final products are coded and labeled properly; incoming materials; in-process and outgoing materials are traceable; recall system is in place and tested for effectiveness (ex: procedures for mock recalls).
- **Water safety:** Water safety monitoring procedures for water, ice and steam, and water treatment procedures that ensure it is potable for use in food processing

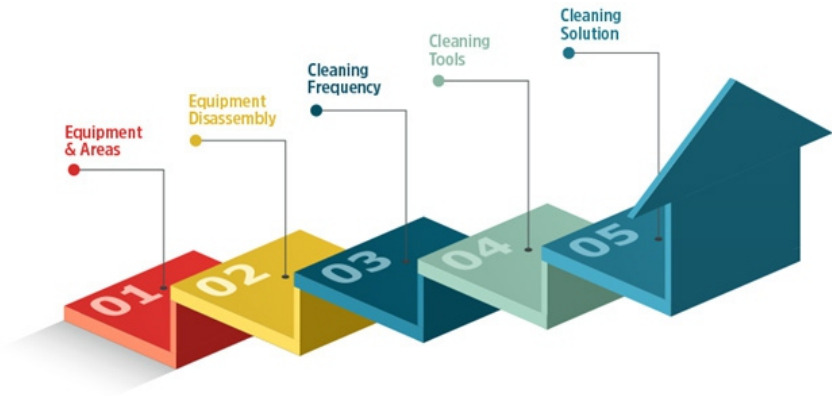


Fig. 4.2.16: Storage of sanitizing materials

Where and How to Store Your Cleaning Supplies

- **Clean, Cool, Dry:** Store your cleaning supplies in an area that is clean and free of debris. Make sure that there aren't any temperature extremes in the area where your cleaning supplies are stored. Another thing to make sure of is that the area is dry.
- **Original Containers:** Keep cleaning supplies in their original containers. If you mix your own cleaners, make sure you use new clean bottles and label them to avoid a mixup.
- **Safe Storage:** Be sure to keep your cleaning supplies stored in places where your children and/or pets will not be able to get to them. Consider higher storage or locked storage options to protect small children and pets.

Cleaning and Sanitization Process, Need and Importance

Workplace Sanitation: Maintaining a clean work environment is critical in preventing foodborne illness. Bacteria can grow on unsanitary surfaces and then contaminate food. Just because a work surface looks clean does not mean that it is sanitary. Always ensure that you clean and sanitize a work area before starting to prepare food.

Cleaning Procedures and Schedules: Cleaning with soap and other detergents is just one step of the cleaning procedure. It is also necessary to sanitize. Cleaning will remove any dirt or grease, but will not necessarily kill any bacteria or other pathogens. Only a sanitizer will kill bacteria and ensure the area is safe for food preparation. Leading sanitizers used in the food service industry are chlorine solutions (bleach), quaternary solutions (quarts), and iodine. Use these materials according to the manufacturer's instructions that accompany the product and that are found on the material safety data sheet (MSDS) using the appropriate personal protective equipment.

A sanitation plan is important in any food service preparation area. It ensures that all surfaces are cleaned on a regular basis and reduces the risks of transferring bacteria or other pathogens from an unclean surface to clean equipment such as cutting boards or tools. A sanitation plan has two components:

- A list of cleaning and sanitizing agents or supplies with instructions on their safe use and storage
- A cleaning schedule, outlining how each item needs to be cleaned, who is responsible, and how frequently it happens

Routine Equipment Maintenance

Refer to the manufacturer's instructions and training provided by your employer or instructor on how to do this safely. Some equipment is intended to be cleaned in place. This should be identified in your sanitation plan and cleaning schedule.

All equipment must be routinely cleaned and inspected. Older equipment may have nooks and crannies where dirt and bacteria can hide, which can be difficult to clean effectively. Proper cleaning procedures must be established and followed at all times with regular review to ensure that procedures are working. If equipment is replaced or cleaning materials change, the process may have to be adjusted. If you notice any safety concerns with the equipment while cleaning it, such as a frayed cord, missing guard or loose parts, let your supervisor know immediately.

- **Good Food Hygiene Practices**
  - Cleaning
    - Food areas and equipment between different tasks, especially after handling raw food shall be cleaned.
    - The surface shall be thoroughly cleaned in case if somebody spills food / water / drink.
  - Raw materials
    - Raw materials shall be purchased from reliable and known dealers and checked for visible deterioration & off-odour, physical hazards and foreign body contamination.

Fig. 4.2.17: 8 Principles based on eight quality management principles

- Cooking
  - The preparation/ processing/ cooking should be adequate to eliminate and reduce hazards to an acceptable level which might have been introduced at the raw food level.
  - The preparation/ processing/ cooking methods should ensure that the foods are not re-contaminated.
  - The preparation/ processing/ cooking of veg. & non-veg. products should be segregated.
  - Whenever cooking or reheating of food is done, it should be hot all the way through, it is especially important to make sure that food is cooked thoroughly.
  - Re-use of cooking oil should be avoided.
  - In case of reheating of oil use maximum three times to avoid the formation of Trans fat. It is ideal to use once if possible.
- Chilling
  - Semi cooked or cooked dishes and other ready-to-eat foods such as prepared salads and desserts having short shelf life should not be left standing at room temperature.
  - Chilled food intended for consumption should be cold enough.
  - Food items that need to be chilled should be put straight away into the fridge.
  - Cooked food should be cooled as quickly as possible and then put it in the fridge.
  - Chilled food should be processed in the shortest time possible.
  - Fridge and display units should be cold enough and as per requirement. In practice, fridge should be set at 5°C to make sure that food is kept in chilled condition. Also, fridge and display units should be maintained in good working condition to avoid food spoilage and contamination.
- Cross-contamination

  Following should be done to avoid cross-contamination.
  - Separation of each crop/species and also processed and unprocessed foods.
  - Hands should be thoroughly washed after touching.
  - Work surfaces, chopping boards and equipment should be thoroughly cleaned before the preparing of food starts and after it has been used.

- Personal Hygiene
  - High standards of personal hygiene should be maintained.
  - All employees handling food should wash their hands properly:
    - before preparing food
    - after touching raw food or materials, specially meat/poultry or eggs
    - after breaks
    - after using the toilet after cleaning the raw materials or utensils / equipments
  - Street shoes inside the food preparation area should not be worn while handling & preparing food.
  - Food handlers should ensure careful food handling & protect food from environmental exposure.
- Transportation and Handling Of Food
  - Food shall be adequately covered during transportation to assure food safety.
  - Transportation vehicles
    - Vehicle inspection
    - Shall not contaminate foods & packaging
    - Should be easy to clean and maintain

- Provide effective protection from dust & dirt
- If required maintain temperature, humidity, atmosphere
- If required allow monitoring of temperature, humidity, etc.
- Should be used only for carrying food.
- Regular maintenance of vehicles is required.
- Appropriate supply chain to minimize food spoilage
- Non-toxic, clean, well maintained food containers during transportation
- Temperature and humidity control during transportation
- Dedicated vehicles for food transportation
- Effective cleaning and sanitation of vehicles between loads carrying high risk foods as fish, meat poultry to avoid cross contamination

Fig. 4.2.18: Transportation and handling of food

- Storage
  - It is very important to store food properly for the purpose of food safety. Following things must be ensured:
    - Raw meat/poultry should be stored separately from other foods
    - Storage temperature of frozen food should be -18°C or below.
    - Storage instructions over food packaging should be followed.
    - Dried foods (such as grains and pulses) should be stored off the floor, ideally in sealable containers, to allow proper cleaning and protection from pests.
    - Store commercial ice cream at temperatures below 0°F.
    - Store biscuit, brownie, and muffin mixes at room temperature.

Stock rotation

The rule for stock rotation is FIFO (first in, first out) to make sure that older food is used first. This will help to prevent wastage. Older product will have nearer shelf life expiry, so older product should be moved out first, but new products will have time to move out since expiry is so far. That's why a rule of FEFO does also exist which means First Expiry First Out. It is called Good Distribution Practice.

UNIT 4.3: Personal Hygiene

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify types of health and safety policies and procedures

4.3.1 Personal Hygiene

The expression "food hygiene" is often associated to personal hygiene. The concept of food hygiene really refers to the general cleanliness state of the food handlers' body and clothes. Microorganisms can easily pass to food and reach the consumer if the handler comes into contact with any pathogenic microorganism by their clothes, hands, hair, nails, rings and then sets out to prepare food. As so, the personal hygiene of whoever contacts with food, as well as behaviors they assume during its processing, constitute an important preoccupation in the food business. The set of rules, conditions and practices that assure adequate personal hygiene make up the good practices for personal hygiene.

4.3.2 Importance of Personal Hygiene

It is imperative for safe food-handling outcomes for all workers to be familiar with standard sanitation and hygiene practices. Fig. 1.3.1 shows the cycles of transmission of micro-organisms. One of the basic principles is to break the cycle by avoiding cross-contamination, which can be achieved by ensuring personal hygiene practices are followed.

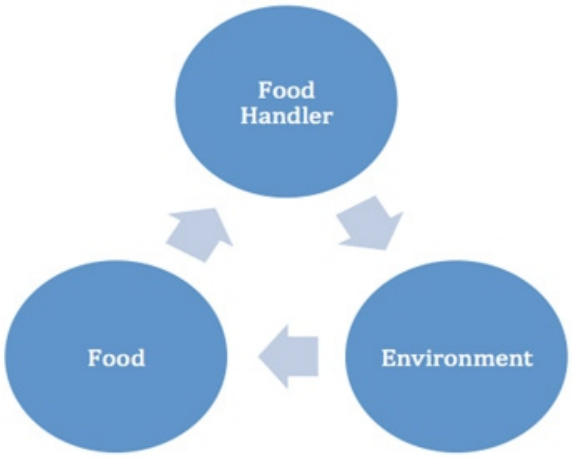


Fig. 4.3.1: Importance of Personal Hygiene

Proper personal hygiene is critical in any food service premise. Personal hygiene includes:

- Showering and bathing regularly
- Keeping hair clean hair and covered or tied back
- Keeping clean clothing and footwear that is used only at work
- Hand washing regularly

Fig. 4.3.2: Personal hygiene

4.3.3 Hand Washing

Proper and regular hand washing is a critical part of any food safety system.

Fig. 4.3.3: Methods of washing hand

How to Use Sanitizer?

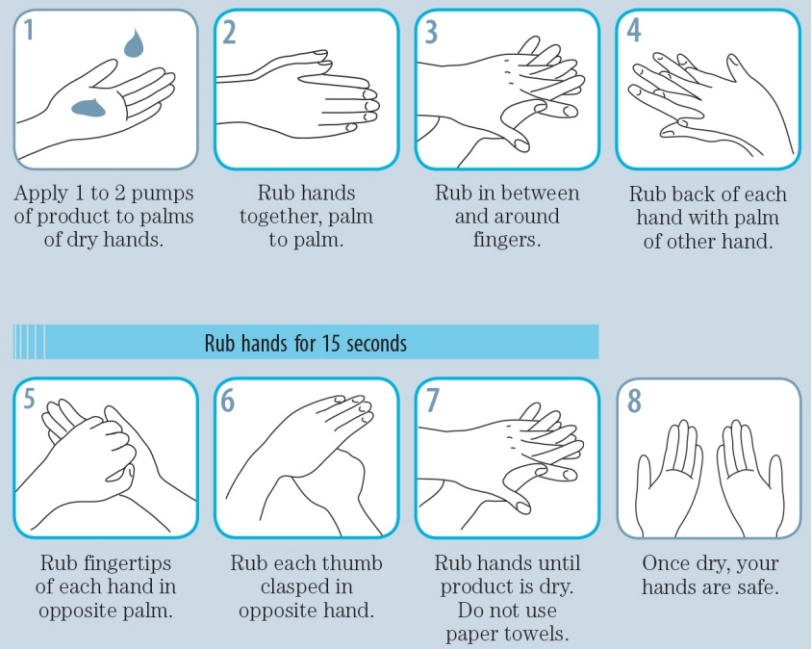


Fig. 4.3.4: Usage of Sanitizer

When to Wash and Sanitize Hand?

Fig. 4.3.5: Times to wash and sanitize hand

We need to stop the spread of COVID-19 in food industry by washing hands regularly with soap and water for 20 seconds – especially after going to the bathroom, before eating, and after coughing, sneezing, or blowing our nose.

4.3.4 Good personal hygiene can prevent food poisoning.

Bacteria that cause food poisoning can be on everyone – even healthy people. You can spread bacteria from yourself to the food if you touch your nose, mouth, hair or your clothes, and then food.

Good personal hygiene also makes good business sense. Customers like to see food-handling staff who take hygiene seriously and practice safe food handling.

- Personal hygiene is important to prevent food poisoning.
- When handling food, wash your hands thoroughly and often.
- If you are sick, do not go to work, because you can contaminate food more easily.
- Food handlers should be properly trained in safe food handling.

Food handling businesses ensure the following factors are considered to ensure personal hygiene:

- **Hand Washing —** ensure effective hand washing techniques are followed at appropriate times
- **Minimise hand contact with food —** try to minimise direct hand contact with raw food by using appropriate utensils and safe use of disposable gloves
- **Personal cleanliness —** cover hair; do not sneeze or cough over food; cover cuts and sores; and do not wear jewellery
- **Wear protective clothing —** wear suitable clean protective clothing and handle appropriately to prevent cross contamination
- **Exclude ill staff —** staff must report illnesses; exclude staff with vomiting or diarrhoea

UNIT 4.4: Health Safety

Unit Objectives

By the end of this unit, the participants will be able to:

1. Illustrate the concept of health safety
2. Understand the hazards of health safety
3. Explain the health and safety policies and procedures
4. Describe the personal protective equipment
5. Discuss the types of personal protective equipment

4.4.1 Health Safety

The term Health and Safety is generally used to describe Occupational Health and Safety, and relates to the prevention of accidents and ill health to employees and those who may be affected by their work.

4.4.2 Health Safety Hazards

Safety hazards exist in every workplace, but how do you know which ones have the most potential to harm workers? By identifying hazards at your workplace, you will be better prepared to control or eliminate them and prevent accidents, injuries, property damage, and downtime.

First of all, a key step in any safety protocol is to conduct a thorough safety hazard assessment of all work environments and equipment

In a safety hazard assessment, it is important to be as thorough as possible because after all, you can't protect your workers against hazards you are unaware of and unprepared for. Avoid blind spots in your workplace safety procedures by taking into consideration these 3 types of workplace hazards:

- **Safety hazards**

  Safety hazards are number one on the list of 3 types of workplace hazards. These hazards play an effect on employees who work directly with machinery or in construction sites. Safety hazards are unsafe working conditions that that can cause injury, illness, or death.

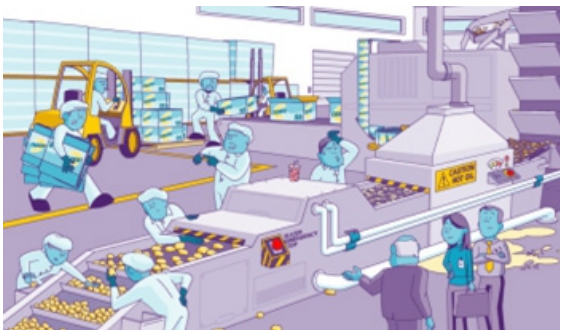
  

  Fig. 4.4.1: Safety hazards

  Safety hazards are the most common workplace risks. They include:

  - Anything that can cause spills or trips such as cords running across the floor or ice
  - Anything that can cause falls such as working from heights, including ladders, scaffolds, roofs, or any elevated work area.
  - Unguarded and moving machinery parts that a worker can accidentally touch.
  - Electrical hazards like frayed cords, missing ground pins and improper wiring
  - Confined spaces

- **Ergonomic hazards**

  Ergonomic safety hazards occur when the type of work, body positions, and working conditions put a strain on your body.

  Ergonomic Hazards include:

  - Improperly adjusted workstations and chairs
  - Frequent lifting
  - Poor posture
  - Awkward movements, especially if they are repetitive
  - Having to use too much force, especially if you have to do it frequently
  - Excessive vibration

Fig. 4.4.2: Ergonomic Hazards

- **Work organization hazards**

Safety hazards or stressors that cause stress (short-term effects) and strain (long-term effects). These are hazards associated with workplace issues such as workload, lack of control and/or respect, etc.

Examples include:

- Workload demands
- Workplace violence
- High intensity and/or pace
- Respect (or lack thereof)
- Flexibility
- Control or say about things
- Social support or relations
- Sexual harassment

4.4.3 Health and Safety Policies and Procedures

Overview

The law says that every business must have a policy for managing health and safety.

A health and safety policy sets out your general approach to health and safety. It explains how you, as an employer, will manage health and safety in your business. It should clearly say who does what, when and how.

4.4.4 What is Personal Protective Equipment?

Personal protective equipment, commonly referred to as "PPE", is equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses. These injuries and illnesses may result from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. Personal protective equipment may include items such as gloves, safety glasses and shoes, earplugs or muffs, hard hats, respirators, or coveralls, vests and full body suits.

Employers are also required to train each worker required to use personal protective equipment to know:

- When it is necessary
- What kind is necessary
- How to properly put it on, adjust, wear and take it off
- The limitations of the equipment
- Proper care, maintenance, useful life, and disposal of the equipment

If PPE is to be used, a PPE program should be implemented. This program should address the hazards present; the selection, maintenance, and use of PPE; the training of employees; and monitoring of the program to ensure its ongoing effectiveness.

4.4.5 Types of PPE

Head protection

Examples of head protection equipment:

- Helmets;
- Hard hats;
- Hair nets

Hand protection

Examples of hand protection equipment:

- Work gloves and gauntlets;
- Wrist cuff arm nets.

Eye and face protection

- Safety glasses and goggles;
- Eye and face shields;

Fig. 4.4.3: Eye and face protection

Respiratory Protection

This type of PPE must be present when being in contact with large amounts of gases, powders, dust and vapors.

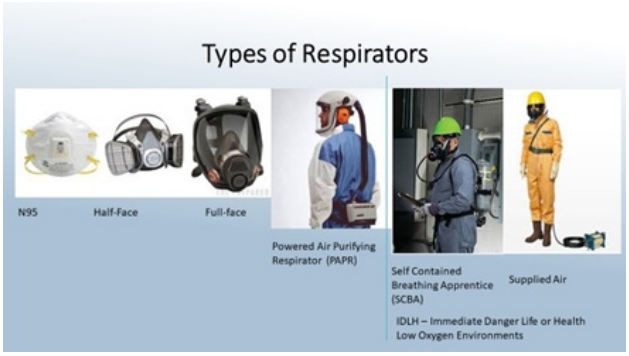


Fig. 4.4.4: Types of Respirators

Hearing protection

Examples of hearing protection equipment:

- Earplugs and defenders;
- Noise meters;
- Communications sets;
- Acoustic foam.

Foot protection

As examples of foot protection equipment can be pointed out the following ones:

- Safety boots and shoes;
- Anti-static and conductive footwear.

Height and access protection

As examples of height and access protection equipment can be mentioned in the following ones:

- Fall-arrest systems;
- Body harnesses;
- Lowering harnesses;
- Rescue lifting;
- Energy absorbers and others

Fig. 4.4.5: FSSAI dos and don'ts for food handlers

First aid kit

The kit should be kept in an accessible location and /or close to areas where there is a higher risk of injury or illness. The first aid kit should provide basic equipment for administering first aid.

Pictograms

Not only is preparing your workshop for accidents a smart thing to do, it is even smarter to organize your workshop in such a way that no serious accidents can take place. A simple way to make your workshop safer is to use pictograms: indicating flammable materials, the necessary use of hearing protection, indicating emergency exits.

Health and Safety Policy

FBO is committed to the goal of providing and maintaining a healthy and safe working environment, with a view to continuous improvement. This goal is only achievable by adherence to established objectives striving to exceed all obligations under applicable legislation, and by fostering an enthusiastic commitment to health, safety and the environment.

In particular:

Management, working in cooperation with the Joint Health and Safety Committee, will strive to take all reasonable steps to reduce workplace hazards to as low as reasonably achievable.

Supervisors and managers are held accountable for the health and safety of all employees under their supervision. This includes responsibility for applicable training and instruction, appropriate followup on reported health and safety concerns, and implementation of recommended corrective action.

FBO is committed to providing all necessary training and instruction to ensure that appropriate work practices are followed on the job, and to promote their use off the job.

Health, safety, the environment and loss control in the workplace are everyone's responsibility. Company expects that everyone will join in our efforts to provide a healthy and safe working environment on a continuous day to day basis.

Importance of Preventive Health Checkups

No matter what age group you are a part of, regular preventive health tests are essential for each one of us.

Whether one is feeling fit from within or is still in his early years of life, a preventive health checkup is an important practice that one must inculcate in his or her daily life.

- It can detect developing disease and prevent them
- Increase better chances for treatment and cure
- Can identify health issues early and prevent them
- It helps to improve lifestyle and increase productivity at work.

FSSAI Format for health check up

PERFORMA FOR MEDICAL FITNESS CERTIFICATE FOR FOOD HANDLERS

(FOR THE YEAR .....)

(See Para No. 10.1.2, Part- II, Schedule - 4 of FSS Regulation, 2011)

It is certified that Shri/Smt./Miss..... employed with M/s....., coming in direct contact with food items has been carefully examined* by me on date ..... Based on the medical examination conducted, he/she is found free from any infectious or communicable diseases and the person is fit to work in the above mentioned food establishment.

Name and Signature with Seal
of Registered Medical Practitioner /
Civil Surgeon

***Medical Examination to be conducted:**

1. Physical Examination
2. Eye Test
3. Skin Examination
4. Compliance with schedule of Vaccine to be inoculated against enteric group of diseases
5. Any test required to confirm any communicable or infectious disease which the person suspected to be suffering from on clinical examination.

Fig. 1.4.6: Format for health check up

Medical examination to be concluded –

1. Physical examination
2. Eye Test
3. Skin examination
4. *Compliance with schedule of vaccine to be inoculated against enteric group of diseases
5. Any test required to confirm any communicable or infectious disease which the person suspected to be suffering from on clinical examination

* Vaccine to be inoculated against enteric group of diseases shall be decided by the medical practitioners in accord to remove the ping to the list as declared by the municipal corporation of that area.

Summary

- Food safety refers to routines in the preparation, handling and storage of food meant to prevent food borne illness and making food safe for human consumption. Safe food handling practices and procedures are thus implemented at every stage of the food production life cycle in order to curb these risks and prevent harm to consumers.
- It is important to be aware of food allergens in food industry as this is the risk associated with the unintended presence of allergen due to cross contamination and should take this a matter of serious concern. Food allergies can cause serious and even deadly reactions.
- The presence of unwanted materials such as dust and particles during the manufacturing and transportation time is called contamination. The term contaminants include any unwanted matter that is found in the product. These contaminants affect the quality of the product or the process.
- Refrigerated transportation is a shipping cargo with advanced temperature adjustment features. It is built and designed mainly for climate-sensitive goods such as vegetables, fruits, meat, all-prep meals, bread, etc. in which the freight is loaded with ice and salt to maintain the food's quality at a particular temperature.
- The retail food industry plays a significant role in assuring a safe food supply for its consumers. At the retail level, activities to control food safety risks can be divided into four key areas: the supplier and source of foods and food ingredients; in-store practices and procedures; education and training of employees and food handlers; and consumer engagement.
- Good Manufacturing Practices (GMPs) are the basic operational and environmental conditions required to produce safe foods. They ensure that ingredients, products and packaging materials are handled safely and that food products are processed in a suitable environment.
- Maintaining a clean work environment is critical in preventing foodborne illness. Bacteria can grow on unsanitary surfaces and then contaminate food. Just because a work surface looks clean does not mean that it is sanitary. Always ensure that you clean and sanitize a work area before starting to prepare food.
- The rule for stock rotation is FIFO (first in, first out) to make sure that older food is used first. This will help to prevent wastage. Older product will have nearer shelf life expiry, so older product should be moved out first, but new products will have time to move out since expiry is so far. That's why a rule of FEFO does also exist which means First Expiry First Out. It is called Good Distribution Practice.
- The expression "food hygiene" is often associated to personal hygiene, being many times limited to the care of washing hands. The concept of food hygiene really refers to the general cleanliness state of the food handlers' body and clothes.
- Health and Safety is a term that generally covers the legal requirements that fall under the Health and Safety at Work Act etc. 1974. The term Health and Safety is generally used to describe Occupational Health and Safety, and relates to the prevention of accidents and ill health to employees and those who may be affected by their work.

Exercise

A. Answer the following questions briefly.

1. _____ refers to routines in the preparation, handling and storage of food meant to prevent food borne illness and making food safe for human consumption.
   a. Food Safety
   b. Fire Safety
2. _____ is a factor or agent which may lead to undesirable effects like illness or injury in the absence of its control, whereas, risk refers to the probability that the effect will occur.
   a. Threat
   b. Hazard
3. The presence of _____ materials such as dust and particles during the manufacturing and transportation time is called contamination.
   a. wanted
   b. unwanted
4. _____ is one of the most important factors in the preservation of food because microorganisms have been found to grow in almost all temperature.
   a. Storage temperature
   b. Hazard temperature
5. Selling fresh and _____ produce is essential in groceries and retail food businesses.
   a. low-quality
   b. high- quality

B. Answer the following questions by choosing the correct option:

1. What are the most common types of contaminant?
2. Outline the layout and design of food establishment premises.
3. Explain VACCP
4. What are the facilities provided by water supply?
5. What are the two components of the sanitation plan?

Notes

_____

_____

_____

Scan the QR Codes to Watch the related Videos

Introduction to Schedule IV

NCVET
कौशल गुणवत्ता प्रगति

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

FICSI
Food Industry Capacity and Skill Initiative

5. Managing Accidents and Emergencies

FIC/N9901

Key Learning Outcomes

By the end of this module, the participants will be able to:

1. Recognize the types of hazards, risks as well as accidents
2. Categorize the standard precautions and practices
3. Examine the utilization of the electrical equipment
4. Explore the usage of personal protective equipment
5. Recognize the organizational protocols
6. Monitor the ways to handle the toxics
7. Identify fire prevention and fire extinguisher
8. Evaluate CPR as well as the artificial respiration
9. Discuss the evacuation and rescue
10. Catalogue the first aids
11. Understand the ill health as well as potential injuries
12. Demonstrate the precautions in mobility
13. Discuss the significance of various types of hazard and safety signs

UNIT 5.1: Hazard, Risk and Accidents

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify the types of hazards, risks as well as accidents

5.1.1 Types of hazards, risks and accidents

Hazard is considered a sort of incident or source that can fundamentally harm something, whether in a living or non-living state. It states to be significant to identify the hazard and the amount of risk or impact it would create on its surroundings. Thus, an individual must be prepared from the initial stages to manage such occurrences.

It is important to control workplace hazards by eliminating and identifying the capable risks. This is required as it is capable of causing accidents or hazards, along with finding the access based on the ways to isolate the risk which can lead to the hazard.

To ensure the safety of an individual and the workplace surrounding, an individual requires to regularly participating in the safety drill, which is conducted at their specific times.

Types of Hazards:

- **Safety Hazard:** A safety hazard is among the most common dangers found in every workplace. A safety hazard is capable of causing specific serious injuries or damage to the industrial workers. The safety hazards perform a practical part on the employees who have regularly contacted the heavy equipment or machinery throughout their working hours.

  Some of the safety hazards which lead to accidents in the workplace tend to include:

  - Anything capable of causing a fall, such as floor holes or opening walls, slippery surfaces, unprotected edges, and ladders which is unsafely situated.
  - Heavy-duty mechanisms, which is seen to be usually present in every industry, such as construction, manufacturing, mining and so on, can sometimes be the cause behind the accident. It is due to loose machinery parts, sharp edges, hot surfaces causing severe cuts, burns and wounds.
- **Chemical Hazards:** Chemical substances are seen to include but are also not restricted to acidic substances, petroleum products, reagents, acids, flammable liquids and many more.
  - Acidic substances are firmly alkaline in their state as they tend to possess properties to damage the accidental arrival in contact with the other substances by forming a chemical reaction.
  - The petroleum products generate gasoline such as Butane, Propane, Kerosene, and LPG as they are incredibly flammable hazards and can damage on a larger scale.
  - Acids occur to be more hazardous, relying on their corrosive materials. The common acid includes Hydrochloric Acid, Sulphuric Acid, and Nitric Acid.
- **Biological Hazards:** Biological hazard is also known as the biohazard and is connected to the biological substances that lead to sickness and illness in humans during its occurrence in direct contact.

  Sources through which the biological hazard might include are:

  - Bacteria, viruses, insects, plants and humans are capable of being the hazard carrier that adversely impacts their health, causing skin irritation and can also lead to serious infections, like Tuberculosis, AIDS, and carcinogenic infection.

- Toxins from biological sources stand to be extensively poisonous in their state as they are manufactured by harmful animals and plants, such as snake venom toxins and botulinum toxins.
- The most recent example of the biological hazard is the outbreak of Covid-19.

- **Physical Hazard:** A physical hazard is the least common hazard at the workplace and is not limited only to physical presence. Extreme weather conditions or unfavourable working environments are the major causes of physical hazards.

  Physical hazard has a prolonging effect on the health of the workers. These types of hazards are generally unrecognizable, like:

  - The temperature can also be a cause of danger for the workers who attempt to work indoor as well as outdoors, having the factors such as overexposure to heat and cold leading to some serious illness like heat stroke, sweaty palm increasing the risk of accident, frostbit hypothermia which can eventually lead to death also.
  - Harmful radiation like micro-waves, radio-waves, electro-magnetic waves, and so on.

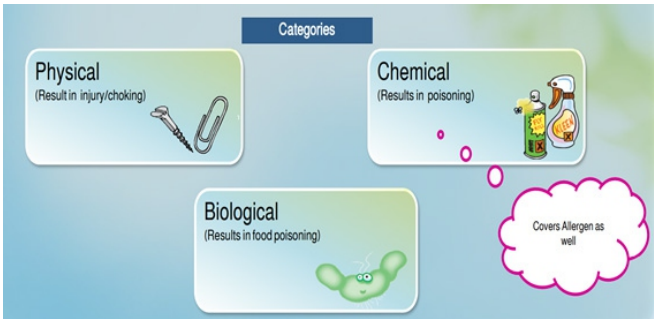


Fig. 5.1.1: Examples of physical, Chemical, Biological hazards

- **Ergonomic Hazard:** An ergonomic hazard is a type of hazard that adversely affects the workers' physical health, having continuous work leading to lower back pain, joint pains, muscles ache, and ligaments pain.

  Ergonomic hazards may include:

  - Poor sitting or standing postures.
  - Improperly adjusted chairs and workstation height.
  - Too much vibration or loud noise in the workplace.
  - Frequent lifting of heavyweights.
  - Prolong working conditions demanding physical force

- **Work Organization Hazard:** Work organization hazard usually defines the issues related to the workplace such as;
  - Excessive workload
  - Inappropriate behaviour of peers
  - Bullying
  - Lack of mental support
  - Work-related stress

Fig. 5.1.2: Sources of different types of hazards

5.1.2 Hazard Identification and Risk assessment

Risk Assessment (RA) and environment review (ER) were done for hazard and environmental impact. It is done from different stages, from evaluating a new operation, modification to the existing facilities, maintenance work and others.

RA identify all safety and health hazards – Including Operational, mechanical, electrical, chemical, biological and ergonomic for ER indicate the environmental aspects and impacts taken into consideration.

Review and update of R.A and ER to be done under following circumstances: -

- Amendments/addition in legal, corporate and other voluntary requirements.
- Change in process or product handled or new developments/ modifications in activities/ products/ services.
- Occurrence of the accident, emergency
- While initiating any corrective and preventive actions
- While purchasing and erecting any new equipment/ machinery/ building

UNIT 5.2: Standard Practices and Precautions

Unit Objectives

By the end of this unit, the participants will be able to:

1. Categorize the standard precautions and practices

5.2.2 Standard Practices and Precautions

- Hand hygiene- Physical, Chemical or Biological hazard
- Usage of personal protective equipment- Safety hazard
- Respiratory hygiene/ Cough Etiquette- Biological hazard
- Sharp Safety- Safety hazard
- Safe injection practices- Biological or Physical hazard
- Sterile instruments and Devices- Biological or Physical hazard
- Avoiding ergonomic hazard

- **Hand hygiene:** Washing hands regularly is a significant step towards cleanliness, protecting us from various diseases and infections. Washing hands can keep us healthy well as it protects us from viruses capable of travelling from one person to another person. Germs and bacteria are the only host which comes from touching the nose, eyes with dirty hands, or eating/cooking food with smeary hands.
- **Usage of Personal Protective Equipment**
  - Personal protective equipment, or PPE, protects its user against any physical harm or hazards that the workplace environment may present. It is important because it exists as a preventative measure for industries that are known to be more hazardous, like manufacturing and mining. Some of the personal protective equipment are: gloves, masks and eyewear.
- **Respiratory Hygiene / Cough Etiquette:** One should follow the below guidelines to maintain respiratory hygiene.
  - Covering the mouth and nose with a cloth or elbow while coughing or sneezing.
  - Throw the used tissues in a separate bin.
  - Washing of the hands or sanitizing before touching the nose or mouth
- **Sharp Safety:** Sharp objects such as needles, lancets, and surgical knives must be handled with utmost care to prevent injury or spread of infection.
- **Avoiding ergonomic hazard:** Headsets, monitor stands, and adjustable chairs are just some devices that can be easily integrated into a workspace to diminish the risk of injury from repetitive motions. Awkward locating refers to positions in the body when a person deviates significantly from a neutral position while performing tasks.

UNIT 5.3: Uses of Electrical Equipment

Unit Objectives

By the end of this unit, the participants will be able to:

1. Examine the utilization of the electrical equipment

5.3.1 The Utilization of the Electrical Equipment

Electrical equipment is generally that equipment that requires electrical supplies for their operations. It generally consists of several small components in an enclosed form and is controlled by a power switch. It tends to include:

- Electric switchboard
- Distribution board
- Circuit breakers and disconnects
- Electricity meter
- Transformer

Fig. 5.3.1: Different type of electrical equipment's

Hazards Related to Electrical Equipment's

The five hazards described here are very common and easily preventable.

- Working on live circuits
- Skipping Lockout/Tagout. It is also known as LOTO, which disconnects electricity and avoids electrical hazards.
- Forgetting PPE.
- Improper grounding.
- Damaged extension cords.

Fig. 5.3.2: Electrical hazard symbols

UNIT 5.4: Usage of Personal Protective Equipment

Unit Objectives

By the end of this unit, the participants will be able to:

1. Explore the usage of personal protective equipment

5.4.1 The Usage of Personal Protective Equipment

Personal protective equipment is majorly used to protect oneself from serious accidents or illnesses originating from the workplace's physical, biological, chemical, and mechanical hazards.

Personal protective equipment includes:

Fig. 5.4.1: The usage of personal protective equipment

Importance of PPE in Food Industry

Protective Clothing Reduces Injury and Contamination Risks. In the food manufacturing units, workers are at a surprising risk of exposure to harsh and toxic chemicals, which can cause further contamination of the food product. Also, PPE importance can be identified during working at height to avoid slip, trip and fall.

UNIT 5.5: Organisational Protocols

Unit Objectives

By the end of this unit, the participants will be able to:

1. Recognizing the organizational protocols

5.5.1 The Organizational Protocols

Accidents are unplanned experiences resulting in injuries, illness, death, and loss of property and/or production. While there is no way to avoid accidents, some actions, plans, and preparations are capable of being taken to diminish them.

Knowledge of the Hazards

- Be aware of the environment. Look around and recognize workplace risks that are capable of causing harm.
- Look for manners to diminish or eliminate hazards and implement them.
- Report unsafe areas or practices.
- Dress for the weather.
- Use the EHS (Environmental Health & Safety) Job Hazard Analysis devices to recognize hazards linked with job sorts.

Originate a Safe Work Sector

- Keep an orderly job place. Poor housekeeping is capable of causing safety hazards and serious health. The workplace's layout requires to have accurate egress routes as well as be debris' free.
- Take breaks as well as mobilize around regularly all through the day. Short breaks (moving around and standing up) can make a big distinction in combating the threats of residing in a static position all day long.
- Pay attention to workstation ergonomics.

Use Safe Lifting Techniques

- Follow the following safe lifting practices:
    - Lift from a position of power
    - Keep the load close
    - Use a staggered stance
    - Cable/Rope/Slings in good repair
    - Hoist chain/Rope free of kinks and twist
    - Hooks not deformed or damaged and safety latches intact
    - Display of testing date, capacity and safe working load
    - Do not attempt to twist while lifting
- Training in body mechanics can reduce strain injuries and keep employees safe during moving and lifting.
- Regular Interaction
    - Notify supervisors regarding the safety hazards
    - Speaking up as well as being included in safety strategizing.
    - Constantly cultivate a safety level
- Training as well as Education
    - Make sure for everyone who possesses the appropriate safety training linking to the job's

threats.

- Take benefit of Environmental Safety and Health online training events.
- Each employee's responsibility is to take an active role in maintaining safety.

Emergency Preparedness Plan

Nowadays, many organizations, including the food industry, also implement their emergency preparedness plan, which includes hazards identified during their past years of operation; possible weather or climatic condition; spillages during operational activities, etc. Hazards can be classified as low, moderate and significant impact on the organization based on the geolocation of the unit.

Incident Reporting and Investigation

Incident

It is an event that causes damage to equipment material or other property. It may or may not be accompanied by human injury. It can be categorized as: -

- **No Injury Incident / Dangerous Occurrences**

  Fire– An incident in which a fire broke out which has the potential of causing burn injury to humans or damage to property.

  Near Miss– An incident that has the potential for causing an injury to humans or damage to property but narrowly escapes
- **Industrial / Injury incident:** An incident is a sudden and unforeseen event, attributable to any cause, which happens to the person, arising out of or in this course of his or her work and resulting in an employment injury to that person.
- **Major Incident** An incident results in a human fatality, permanent disability or extensive loss of equipment or materials.
- **Lost Time Incident**- Human injury incident prevents the person from doing his work for more than 48 Hrs.
- **Minor Incident–** An incident that causes minor injury to a human which may prevent him from undertaking his work up to 48 Hrs.
- **First Aid Case–** An injury incident that requires a person to go to a dispensary for a one-time treatment and/or any follow-up visit for observation of minor scratches, cuts, burn, splinters or other minor industrial injuries which do not ordinarily require medical care.
- **Unsafe Act:** The violation of a commonly accepted safe procedure or practice which resulted in the incident or was against the safety guidelines. Examples are operating without authority, operating at an unsafe speed, making safety devices inoperative, posture or unsafe position, failure to use personal protective equipment. Etc
- **Unsafe condition:** The condition which has the potential to cause injury/harm & damage to property material/ environment or process, improper guarding, defective tools/ equipment, hazardous arrangement or process, Improper ventilation, high temperature/dust Noise.

Incident Investigation

- Persons investigating any incident should collect all information, evidence regarding the situation under which the incident; this shall also include the condition of the persons, physical and mental conditions.
- The investigation should be based on fact-finding, and immediate causes of incidents are listed in two groups (Unsafe Condition and Unsafe Act). The investigating team shall find out and note down. The investigation team shall attempt to list all unsafe conditions and all unsafe behaviours on personnel.

UNIT 5.6: Dealing with Toxics

Unit Objectives

By the end of this unit, the participants will be able to:

1. Monitor the ways to handle the toxics

5.6.1 The Ways to Handle the Toxics

Toxics are chemical substances that can cause serious harm to the person if he/she comes directly in its contact. One should be extra careful while handling such substances and an organisation must have clear labelling, separate storage rooms and proper guidelines for its usage.

- **Exposure hazards:**
  - **Contact or Absorption:** It can cause when a person comes in direct contact with toxic substances. It can result in drying or defatting of skin, skin irritation, or redness.
  - **Inhalation** occurs when a person inhales the fumes or vapour of toxic substances. It can cause shortness of breath, sore throat, coughing, an effect on the nervous system, and irritation during the breath.
  - **Ingestion:** It occurs when people accidentally consume toxic material. It can result in diarrhoea, vomiting, indigestion, effect on the functioning of the liver and kidney.

- **Storage requirement:**
  - Toxic substances must be stored in designated storage compartments only.
  - It should be stored under the optimum condition as prescribed. Always take the material in desired quantity and never put the used or remaining material in the original container.
  - One should always look for an alternative before using the toxic agent.
  - Only authorised
  - Personnel should be given access to the storage compartment.

- **Labelling requirement:**
  - Toxic substances or materials should be labelled in clear and readable format and proper usage instructions.
  - Work areas should be labelled properly where toxic substances are used regularly or excessively.
  - Always label the emergency contact number near the storage and the work area.

- **Spill and accident procedures:**
  - In case of a spill or accident, immediately alert the people in that area and inform the supervisors.
  - Evacuate the area and seize the entry.
  - Inform the relevant authority in case of leakage or spillage in larger quantities.
  - The trained professional of designated staff should only perform cleaning of toxic spillage.
  - Usage of absorbent while cleaning the corrosive or other harmful liquid.
  - Usage of neutralizing agent while cleaning the acidic, toxic substances.
  - Never touch the toxic substance with naked hands.

- **Waste management:**
  - Toxic waste must be segregated separately in accordance with its nature.
  - It should be managed separately from other wastes.
  - Flammable chemicals, acids should be disposed of carefully and separately in order to prevent any type of accident or injury.
  - Never dispose of the toxic substance in an open area.
  - It should always be disposed of in a leak-proof and airtight container.

Fig. 5.6.1: Waste disposal process for a different type of waste

UNIT 5.7: Fire Prevention and Fire Extinguishers

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify fire prevention and fire extinguisher

5.7.1 Fire Prevention and Fire Extinguisher

Prevention from fire is necessary to avoid excessive damage. Their major goal remains to educate the workers on the ways to prevent the environment from fire.

To prevent the workplace from fire, we must enforce the following measures:

- Workers should be highly trained for the mock drill.
- No smoking signs around the highly flammable liquid and gases.

Causes of fire

- **Flammable and combustible liquids:** This requires proper storage and handling in order to prevent the occurrence of fire which must be stored under a well labelled and closed container to avoid any accident.
- **Liquified Petroleum Gases:** LPG gas has a low density and is heavier than air. It usually accumulates in low lying areas so that the workers are warned if they tend to find any leakage or hole in the cylinders. Moreover, they must not use fire; instead of that, they are capable of utilizing soapy water and finding out the bubbles.

Prevention of the Casualties from Fire

- **Fire Alarm Devices:** These are the devices used to warn people during fire and smoke or any other types of fire emergencies. These alarms are automatically activated once smoke and heat are detected. It should be installed on the telephone desk and the employer's entrance in order to evacuate promptly.
- **Fire Extinguisher:** It is a lifesaver device that is used to control small fires as well as in emergency situations. It should not be used in indented fire issues if it is reached to the walls, ceiling or where there is no route for escape.

  Placement of fire extinguishers at workplace or organization must include.

  - The fire extinguisher should always be placed or mounted on a wall and should be properly marked.
  - Employees should be well trained with PASS methods or firefighting.
  - The fire extinguisher should always be kept at the ease of location to all employees.
  - Vehicles should also carry out one ABC rated extinguisher in case of emergency.
  - All extinguishers should be well marked and labelled and should be clearly visible.
  - All extinguishers should be inspected on a monthly basis, and their place it has not tampered with.
  - For the point of safety, all extinguishers should be examined yearly or required to be refilled in order to ensure operability.
  - A tag should also be attached to ensure its maintenance or refilling date and the signature of the authorized person.

- **Fire Extinguisher Classes:** There are four types/classes of fire extinguishers, which are most common, i.e., A, B, C and D, where every class is capable of putting out a varied sort of fire.
  - Class A extinguishers would be capable of putting out fires in ordinary combustibles such as wood and paper.
  - Class B extinguishers are utilized for flammable liquids like grease, gasoline and oil.
  - Class C extinguishers are used only for electrically energized fires.
  - Class D extinguishers are used on flammable metals.

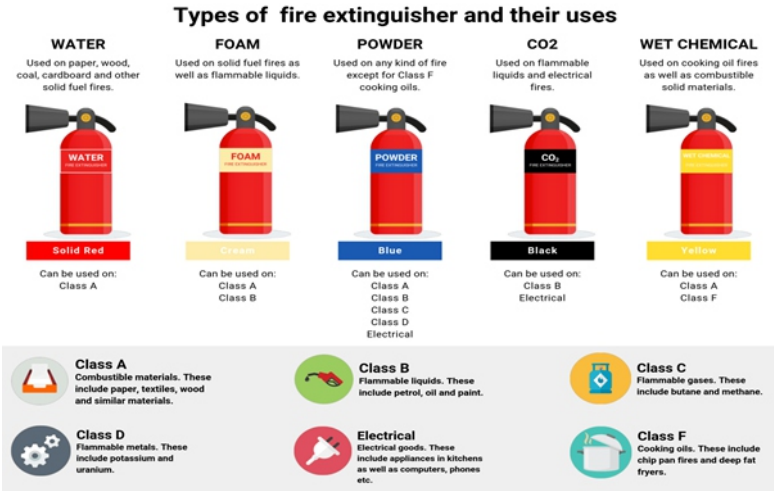


Fig. 5.7.1: Types of fire extinguishers

Uses of Fire Extinguishers

Once it is installed in the workplace or industry, it is important for every employee to get familiar with the usage and the direction of fire extinguishers so as to be well prepared for the sudden occurrence of any hazardous incidents and accidents. Fire extinguishers are relatively easy to use in case of small fires by using some simple technique called PASS.

Fig. 5.7.2: Pass technique for Fire Extinguisher use

Fire Hydrant/ Fire Hydrant Pump

Fire hydrant consists of a system of pipework connected directly to the water supply mainly to water to every hydrant outlet as well as is attempted to present water for the firemen in order to fight a fire. The water is seen to be discharged into the fire engine, from which it is then pumped and sprayed over the fire. Where the water supply is not inadequate or reliable, hydrant pumps requires to be presented to pressurize the mains of the fire.

UNIT 5.8: Artificial Respiration and CPR

Unit Objectives

By the end of this unit, the participants will be able to:

1. Evaluate CPR as well as the artificial respiration

5.8.1 CPR As Well As the Artificial Respiration

Artificial respiration and CPR is an act (or) technique used for stimulating respiration when there is a sudden stoppage of breathing or lung functioning.

Techniques used to provide artificial respiration are:

- Mouth-to-mouth breathing
- Prone-pressure method
- Cardiopulmonary resuscitation (CPR) or external chest compression

There are two types of ways to provide Artificial respiration. They are:

- Manual and,
- Mechanical

Manual ways consist of:

- Mouth-to-mouth breathing
- Prone Pressure Method
- Back Pressure Arm-Lift

Mouth-To-Mouth Breathing

The steps to perform in this specific process are:

		
Position your hand	Interlock fingers	Give chest compressions

		
Open the airway	Give rescue breaths	Watch chest fall
		
Repeat chest compressions and rescue breaths		

Table 5.8.1: CPR steps

Prone Pressure Method

This method, additionally known as the Schafer method, stands to be a type of artificial respiration which is used for a patient in case of drowning. In this, the patient is placed in a prone or placed in a face-down position allowing rhythmically pressure with the help of hand on the thorax by means of which the water present would get expelled from the lungs allowing air to enter by clearing the passage in order to breath.

Back Pressure Arm-Lift

This particular method is used as an alternative when other methods are not possible or are not working out.

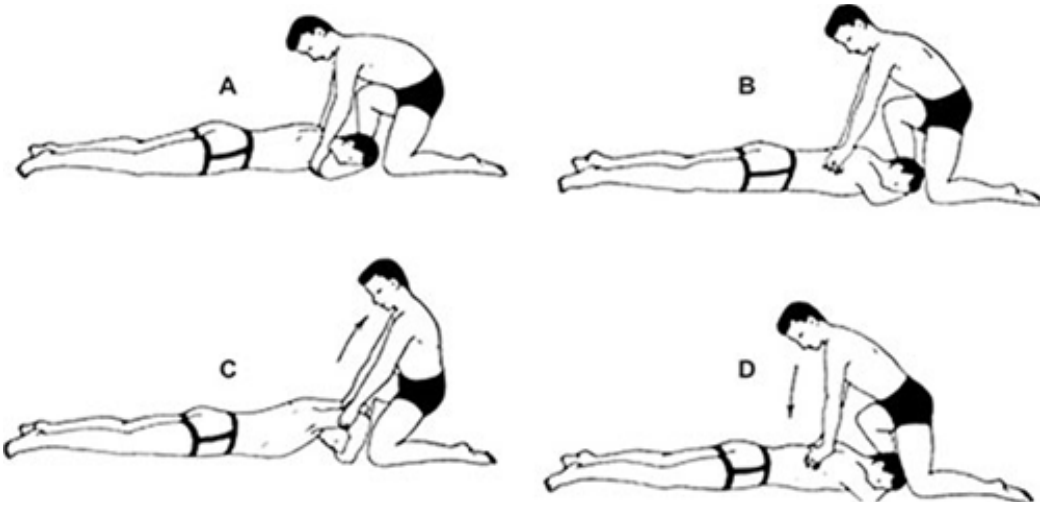


Fig. 5.8.1: Back Pressure Arm-Lift

A Mechanical Method of Artificial Respiration

These types of artificial respiration methods are generally performed by highly trained professionals such as a doctor, nurses, and paramedic forces. The mechanical method often uses machine-like ventilators. Another device that is used in the mechanical method is a bag valve mask. It has the self-inflate and deflates mechanism as well as has an air supply that is controlled by the valve.

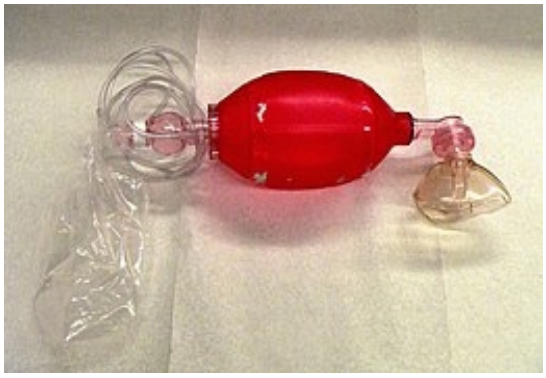


Fig. 5.8.2: Big Valve mask

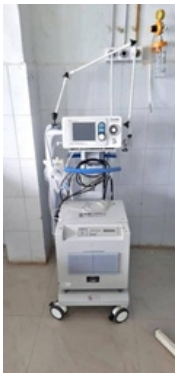


Fig. 5.8.3: Ventilator

UNIT 5.9: Rescue and Evacuation In Case Of Fire

Unit Objectives

By the end of this unit, the participants will be able to:

1. Discuss the evacuation and rescue during a fire incident

5.9.1 The Evacuation and Rescue during a Fire Incident

A "Fire Emergency Evacuation Plan (FEEP)" stands a scripted document that involves the activity to be adapted by all staff in the event of a fire and the sequences for calling the fire brigade.

Staff Fire Notice High fire threats or extensive premises that would be required a more illustrated emergency evacuation strategy which takes account of the findings of the assessment of fire risk, e.g. the staff importantly at threat and their spots. In addition, notices providing transparent and concise routine's instructions to be followed in the instance of fire that requires to be appropriately showcased.

In some instances, the inidviduals requires to be nominated inidviduals in order to conducr the fire action plan as well as provide them enough training in firefighting as well as procedures for evacuation. The following items require to be taken into consideration where appropriate:

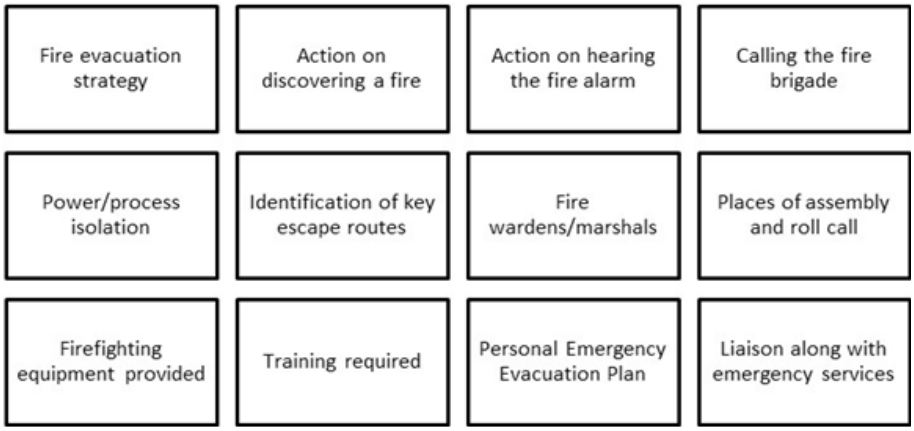


Fig. 5.9.1: Staff Fire Notice

Fire Evacuation Plan

You require taking into consideration of how you would tend to arrange the premises' evacuation in the light of your risk evaluation as well as the other fire precautions that the individuals possesses or intended to put in spot.

Simultaneous Evacuation

In most premises, the evacuation in the instance of fire would easily be by means of each one responsing to the warning signal given when a fire is discovered, then making their way, by regards of escape, to a spot of safety away from the boundaries. This is referred as a simultaneous evacuation and would generally be initiated by the sounding of the normal alarm over the system of fire warning.

Vertical Phased Evacuation

In certain larger complex premises, the emergency arrangements are designed to allow people who are not at immediate risk from fire to delay initiating their evacuation. It might be accurate to start the evacuation by initially performing the evacuation by only the sector closest to the fire as well as warning other individuals to stand by. This is generally done by suddenly evacuating the floor where the fire is spotted as well as the floor located above. The other floors are then evacuated among the individuals to neglect congestion on the escape paths. The rest of the indivdiuals are then evacuated if it is important to do so. The fire warning system requires to be capable of providing two distinctly different signals (warning and evacuation) or giving accurate voice messages. Horizontal phased evacuation in hospitals as well as care homes: the floor may be divided into a number of fires resisting compartments, and the occupants are moved from the compartment involved in the fire to the adjacent compartment as well as, if required, moved again. Depending on the fire situation, it might eventually be significant to take into consideration vertical evacuation.

Other Fire Precautions

- systems of voice alarm
- fire control points
- compartmentation of the premises using fire-resisting construction
- sprinklers in buildings where the top floor is 30 meters or more above ground standards

Staff Alarm Evacuation (Silent Alarm)

In certain instances, it might not be accurate for a normal alarm to start immediate evacuation (Cinemas and Theatres). This could be as of the number of members of the public provided and the requirement for the staff in order to put pre-arranged strategies for the safe evacuation of the premises into action. In the mentioned situations, a staff alarm is capable of being provided (by fire records, personal pagers, discreet sounders, or a coded phrase on a public address system etc.). Following the staff alarm, a more normal alarm signal is capable of being provided, as well as a phased or simultaneous evacuation initiated. The general alarm might be activated automatically if manual initiation has not taken place within a pre-determined time.

Defend in Place

This strategy might be taken into consideration in blocks of flats where each flat is a minimum 60-minute fire-resisting compartment. It might additionally be considered in hospitals or nursing homes where patients are connected to life-supporting equipment as well as is not capable of being moved. The concept authorises the occupants to stay put as well as authorise the fire facility to extinguish the fire. If the fire spreads as well as it is not capable of being controlled, then they would tend to initiate an entire evacuation. In the instance of patients connected to life-supporting equipment, a decision has to be made which choice stands to be the best, stay or move; in either manner, the patient would be at grave threat.

You should only strategise in order to utilise defend-in-place, phased evacuation schemes or a alarm system for the staff if the individuals have sought the suggestion of a competent individual as well as the fire and rescue service.

Action on Hearing the Fire Alarm

On discovering a fire, it is the duty of every person to sound the nearest fire alarm immediately. The plan should include the method of raising the alarm in the case of fire.

People, on hearing the alarm, should proceed to pre-determined positions to assist members of the public and staff in leaving the building by the nearest safe route.

Lifts and escalators should not be used due to possible electrical failure unless they are part of a Personal Emergency Evacuation Plan.

Calling the fire brigade

The Fire Service should also be informed to combat from fire.

Power/Process Isolation

Close Down Procedure – Adopt your own 'Close Down' procedure as appropriate.

Fig. 5.9.2: Fire evacuation process

UNIT 5.10: First Aid

Unit Objectives

By the end of this unit, the participants will be able to:

1. Cataloguing the first aids

5.10.1 First Aids

First aid, as the name suggests, stands to be the first and immediate care or assistance provided to the person in case of either minor, serious injury or illness. First-aid provided on time can save the life in case of life and death kind of situation as well as additionally assists to control the condition from worsening further.

First aid is often controlled by the 3 P's principle:

- Prevent further injury
- Preserve life
- Promote recovery

It is necessary that each floor or manager should have the first aid box handy with them and can be easily accessed by the employees in case of emergency or need.

Fig. 5.10.1: First Aid Kit

UNIT 5.11: Potential Injuries and Ill Health

Unit Objectives

By the end of this unit, the participants will be able to:

1. Understanding the ill health as well as potential injuries

5.11.1 The Ill Health As Well As Potential Injuries

The major role of work is based on enhancing self-esteem, wellbeing and social mobility. However, work-related accidents or illnesses can impact the employees' health in longer or shorter terms and may result in economic as well as social repercussions for the employer.

It is mandatory for an employer to have precautionary measures in place to avoid such incidents. A few common work-related injuries and illnesses are:

- **Slips, trips and falls:** One of the most common causes of injury are slippery surface, fall from ladder or height. It can be avoided through a safety grill or safety bars.
- **Muscle strains:** Muscle strain occurs at the workplace due to lifting heavy items regularly and long-standing or sitting hours. This can be prevented easily through exercise, training and guidance.
- **Being hit by falling objects:** Employees working in warehouses often encounter injuries caused by fall-ing objects. It can be controlled by providing adequate storage and encouraging staff to store the item safely.
- **Cuts and lacerations:** It generally occurs by inappropriately handling sharp objects and is capable of being controlled by delivering the proper training to the staff, wearing proper protection and providing safety equipment to the workers.
- **Inhaling toxic fumes:** Workers who are dealing with chemicals are more likely to become a victim of an injury caused by toxic materials like inhaling dangerous gases or fumes. It is mandatory for the em-ployer to provide adequate safety gear to its worker who regularly meets such kinds of substances.
- **Crashes and collisions:** It can happen in warehouses and construction sites due to vehicle movement, and prevention can be done through necessary safety measures such as PPE, sufficient light, safety alert etc.
- **Exposure to loud noise:** Industrial deafness can occur to employees working in loud noise areas, and it can be avoided by wearing earplugs or earmuffs.
- **Fights at work:** Disagreement or tension may lead to fighting at work. It is a must to have an employee grievance department in order to deal with such cases.

UNIT 5.12: Precautions in Mobility

Unit Objectives

By the end of this unit, the participants will be able to:

1. Demonstration of the precautions in mobility

5.12.1 The Precautions in Mobility

For the safety of the workers or employees at the workplace or any industry, one should always take the necessary precautions.

All manufacturing owners need to comply with the legal requirements to order to ensure that their industry and workplace is safe to work for everyone, from the customers to employees, suppliers, visitors, contractors and others.

In order to provide better productivity for a workplace, the management of the organization:

- Should minimize illness and injury of employees.
- Should reduce the risk of accidents.
- Should maximize productivity.
- Should reduce the cost of injuries and workers compensation.
- Should meet their legal requirements and responsibilities.
- Should retain their staff for better performance.

Precautions at the workplace may include.

- Keep every corner organised, clean and clutter-free
- Usage of mats on slippery floors
- Properly stored combustible material
- Ensure proper training while handling equipment and machinery

It is very important to have medical facilities and proper first aid for the employees working with heavy equipment and machinery.

1. **Clothes for each different appropriate task:** The people who are working with tools or with machinery must have proper clothing while operating the machinery. They must wear the right size of gloves according to the type of work and must wear safety shoes as well as all protective equipment while handling the tools, machinery and chemicals.

   Different industries have different types of personal protective equipment based on their mode of work. Those are:

   - **The food processing industry:** In this particular industry, they do not require special types of uniforms unless they require antibacterial head caps, clothing or aprons in order to prevent bacterial contamination.
2. **Implementation of emergency procedures:** This procedure usually contains emergencies that do not announce themselves, and there can be the expectation of fire and accidents. For this, there is a need to be prepared beforehand for such emergencies in order to ensure the safety of the employees, workers, visitors as well for business.

3. **Reduce workplace stress:** The common cause of stress during work is working for long hours, insecurity of job and conflicts between employees, which can sometimes lead to depression, difficulties during work and affects the concentration of the employees. Employers must avoid excessive workload on their employees as it may lead to employee's frustration which will provide a direct impact on employee productivity.

In order to promote a healthy and stress-free environment at the workplace, it is the employers' duty to take care of both the physical and emotional well-being of its employees by conducting regular training on time management, outdoor activities, small group discussion and many more.

UNIT 5.13: Significance of various types of hazard and safety signs

Unit Objectives

By the end of this unit, the participants will be able to:

1. Understanding the impact of various types of hazard and safety signs

5.13.1 The Impact of Various Types of Hazard and Safety Signs

Safety Hazard Significance

A hazard is a process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation. Hazards may be natural, anthropogenic or socio-natural in origin.

Safety hazards are number one on the list of 6 types of workplace hazards. These hazards play an effect on employees who work directly with machinery or on construction sites. Safety hazards are the most common workplace risks. They include:

- Anything that can cause spills or trips such as cords running across the floor or ice
- Anything that can cause falls, such as working from heights, including ladders, scaffolds, roofs, or any elevated work area.
- Unguarded and moving machinery parts that a worker can accidentally touch.
- Electrical hazards like frayed cords, missing ground pins, and improper wiring
- Confined spaces.

Safety Hazards Symbol

Safety symbols, hazard symbols or safety labels are meaningful and recognizable graphical symbols that warn of or identify hazards associated with the location or item.

Fig. 5.13.1: Role of hazard in Risk assessment

Chemical Hazard Significance

A chemical hazard is a (non-biological) substance that has the potential to cause harm to life or health. Chemicals are widely used in the home and in many other places.[1] Exposure to chemicals can cause acute or long-term detrimental health effects. In the workplace, exposure to chemical hazards is a type of occupational hazard. The use of personal protective equipment (PPE) may substantially reduce the risk of damage from contact with hazardous materials.

Chemical Hazards Symbol

Hazard pictographs are a type of labelling system that alerts people at a glance that there are hazardous chemicals present. The symbols help identify whether the chemicals that are going to be in use may potentially cause physical harm or harm to the environment.

These pictographs are also subdivided into classes and categories for each classification. The assignment for each chemical depends on its type and severity.

Fig. 5.13.2: Chemical hazard safety signs

Biological Hazard Significance

Biological health hazards include bacteria, viruses, parasites and moulds or fungi. They can pose a threat to human health when they are inhaled, eaten or come in contact with skin.

Fig. 5.13.3: Biological hazard safety signs

Biological Hazards Symbol

The biohazard symbol is used or displayed only to signify the actual or potential presence of a biological hazard. Appropriate wording may be used in association with the symbol to indicate the nature or identity of the hazard, the name of the individual responsible for its control, precautionary information, etc., but never should this information be superimposed on the symbol.

Ergonomic Hazard Significance

Poor ergonomics contributes to muscle strain, muscle imbalances, and fatigue. Many muscle strains result from performing the same motion over and over again. These become repetitive stress injuries, which are some of the most common workplace injuries.

Ergonomics alone won't eliminate this type of injury. However, proper ergonomics will significantly reduce fatigue and strain.

Ergonomic Hazard Symptoms

Signs and symptoms of ergonomic injuries include pain which may be dull and aching, sharp and stabbing or a burning sensation—tingling or numbness; swelling, inflammation, stiffness. Muscle weakness or discomfort; extremities are turning white or cold.

Work Organization Hazard Significance

A few examples of work organization hazards and it is effective they are defined below.

- Falls and Falling Objects- It can result in serious injury or fatality
- Fire Hazards- It can result in loss, serious injury or fatality
- Electrical Hazards- It can result in loss, serious injury or fatality

Work Organization Hazard Symbol

There are multiple signs or symbols used in an organization to alert the people in their workstations.

Fig. 5.13.4: Work organization related hazard safety signs

Summary

- Hazard can be identified as an extended-term as it is capable of causing severe disruption to the environment or surroundings.
- Risk Assessment (RA) and environment review (ER) were done for hazard and environmental impact. It is done from different stages, from evaluating a new operation, modification to the existing facilities, maintenance work and others.
- Electrical equipment is generally that equipment that requires electrical supplies for their operations.
- Personal protective equipment is majorly used to protect oneself from serious accidents or illnesses originating from the workplace's physical, biological, chemical, and mechanical hazards.
- Accidents are unplanned experiences resulting in injuries, illness, death, and loss of property and/or production. While there is no way to avoid accidents, some actions, plans, and preparations are capable of being taken to diminish them.
- The "Occupational Safety and Health Administration (OSHA)" needs to implement the organization with a fire prevention event in order to prevent injuries and accidents from the occurrence of fire in the workplace. Prevention from fire is necessary to avoid excessive damage.
- Fire hydrant consists of a system of pipework connected directly to the water supply mainly to water to every hydrant outlet as well as is attempted to present water for the firemen in order to fight a fire. The water is seen to be discharged into the fire engine, from which it is then pumped and sprayed over the fire.
- Artificial respiration and CPR is an act (or) technique used for stimulating respiration when there is a sudden stoppage of breathing or lung functioning. It requires metabolic processes to exchange the gases which tend to be present in the body by external or pulmonary ventilation.
- Fire drills can be initiated with a defined frequency in a surprising manner to ensure employees are well aware of the fire evacuation process. Attendance can be taken in assembly points, and briefing also can be arranged to further train the staff.
- First aid, as the name suggests, stands to be the first and immediate care or assistance provided to the person in case of either minor, serious injury or illness. First-aid provided on time can save the life in case of life and death kind of situation as well as additionally assists to control the condition from worsening further.
- The major role of work is based on enhancing self-esteem, wellbeing and social mobility. However, work-related accidents or illnesses can impact the employees' health in longer or shorter terms and may result in economic as well as social repercussions for the employer.
- A hazard is a process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation. Hazards may be natural, anthropogenic or socio-natural in origin.
- Poor ergonomics contributes to muscle strain, muscle imbalances, and fatigue. Many muscle strains result from performing the same motion over and over again. These become repetitive stress injuries, which are some of the most common workplace injuries.

Exercise

A. Answer the following questions briefly.

1. Is Covid -19 a biological hazard?
   A True B False
2. Which of the following is included in Personal Protective equipment?
   A Spectacles or clear goggles B Earmuffs
   C Hard hat D All of them.
3. Can toxic substances spillage be wiped off with a normal cloth and with bare hands?
   A True B No
4. A simple technique for using fire extinguisher_____.
   A. PASS method B Installation on telephonic desk
5. Which is not a part of potential injury at the workplace?
   A Muscle strain B Cuts
   C Slip or fall D Drowning

B. Answer the following questions by choosing the correct option:

1. Explain the golden rule of “First Aid”.
2. Why is Organisational Protocol necessary for an organisation?
3. Describe any two types of electrical equipment?
4. Explain why hand hygiene is necessary for oneself.
5. Describe the various types of hazards involved while handling or dealing with toxic?

Notes

NCVET
कौशल गुणवत्ता प्रगति

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

FICSI
Food Industry Capacity and Skill Initiative

6. Working Effectively in an Organization

FIC/N9902

Key Learning Outcomes

By the end of this module, the participants will be able to:

1. Categorize the organizational policies
2. Catalogue the Legislations, standards, policies, and procedures
3. Analyse the reporting structure
4. List the inter-dependent functions
5. Discuss the impact of harassment and discrimination
6. Monitor the ways of prioritising the task
7. Record the types of communication skills
8. Evaluate the ways of carrying out teamwork
9. Highlight the ethics and discipline
10. Illustration of the grievance's solution
11. Recognize the interpersonal conflicts
12. Identify the disabilities and challenges
13. Outline the gender sensitivity and discrimination
14. Discuss the applicable legislations, grievance redressal mechanisms
15. Analyse the process of transacting with others without personal bias

UNIT 6.1: Organizational Policies

Unit Objectives

By the end of this unit, the participants will be able to:

1. Categorize the organizational policies

6.1.1 The Organizational Policies

Organizational policy or work place policy is a type of statement which provides the outlining of any organization that practices out the procedures. This eventually leads to its business which covers and everything, starting from the operations to concerns and compliances along with the employee's legislation. It also protects the organization from risks and hazards. It consists of a group of statements that could showcase the purpose for one or more guidelines and actions that are required to be taken against it in order to achieve the goals. The statements are required to be written in simple formats for providing efficiency, depending on the type of issues in which the length of policy is stated.

Benefits of Organizational Policies:

- It stands to be in line with organizational values
- It tends to have the list of complaints with the employment and associated legal requirement
- It provides proper clarity on the roles and responsibilities
- It ensures that an organization operates efficiently and in the specified business manner
- It helps in strengthening the staff position during or in the legal situation
- It enforces consistency and uniformity in the operational procedure and in the processes of decision making
- It saves time for the employees while the problems can be resolved rapidly and effectively through the existing policy

Types of organizational or workplace policies:

- Workplace health and safety policy
- Non-discrimination and anti-harassment policies
- Equal opportunity policy
- Employee code of conduct policy
- Leave policy
- Employee time-stamping policy
- Employee disciplinary and termination policy
- Employee grievance policy
- Social media policy
- E-mail policy
- Mobile phone policy
- Temporary policy

1. **Workplace health and safety policy:** It is very essential for a recruiter to provide safe and healthy work environments to their employees since the hazards might arrive without alarming anybody about the risks.
2. **Non-discrimination and Anti-harassment policy:** The principle behind this policy highlights its providing of guarantees in which human rights are exercised without any discrimination. These discriminations stand to be against individuals on the basis of their race, colour, gender, age, language, national origin, religion, gender identity, sexual orientation, property, marital status, family status, and citizenship. The proposal of this policy is mainly to inhibit any kind of harassment, whether it could be verbal or nonverbal and any kind of physical conduct which is designed to threaten the co-workers and to intimidate the employees or any person working on behalf.
3. **Equal opportunity policy:** This policy ensures that the employees are hired irrespective of their gender, religion, colour, age, caste, marital status, or physical ability.
4. **Employee code of conduct policy:** The policy sets the guidelines for all the employees and various stakeholders in which they are expected to follow in their professional and personal behaviour at the workplace.
5. **Leave policy:** This policy recognises that employees require time off from their works in order to maintain the work-life balance. It also understands the various other needs, like personal commitment, medical exigencies, relaxes time and so on of the employees.
6. **Employee time-stamping policy:** This policy describes the rules and regulations related to the working hours of an employee. It additionally assists the guidelines related to their reporting time, work duration/hours and breaks time.
7. **Employee disciplinary and termination policy:** The major objective of the mentioned policy is to define the procedures and protocols in case of any breach of the company's policy, employee misconduct or any in-disciplinary behaviour.
8. **Employee grievance policy:** The aim of this policy is to make sure that every employee has a formal way to raise their concern or complaint to their senior management. It has a clear structure and point of contact details in a case in which the employee wants to raise a concern.
9. **Social media policy:** It is expected from every employee who is engaged or involved in social media sites, like Facebook, Instagram, and Twitter, LinkedIn and several other similar platforms, to understand and follow the guidelines of the company's social media policy. This mainly stands to be the concern for the company if their action or engagement involves the company name. Failing to do so can put their employment with the company at risk.
10. **E-mail policy:** This policy describes the guidelines and uses of corporate e-mails to meet business requirements. One should follow the corporate standards, including copyrights, logos and signatures, while sending the e-mail within or outside the organization.
11. **Mobile phone policy:** This policy implies restrictions or limitations on the usage of mobile phones at the workplace.
12. **Temporary Policies:** These policies are added to the main body of company's policy guides and could be changed or removed as needed example during the COVID-19 pandemic organization implemented policy to handle social distancing, masking, disinfecting and other safety procedures for keeping employee's and workplace safe for smooth running of organization or business.

UNIT 6.2: Legislations, standard, policies, and procedures

Unit Objectives

By the end of this unit, the participants will be able to:

1. Catalogue the Legislations, standards, policies, and procedures

6.2.1 The Legislations, Standards, Policies, and Procedures

It is the legal requirement of an organisation to comply with the local laws as well as regulations and keep them updated time-to-time. The HR department is mainly responsible for continuously updating the regulations and making sure that it is communicated across the organisation. It also states that the laws and regulations of local authorities take over the organisational policy when required.

Standard practices at a workplace must have:

- Employers to define clear expectations from their employees.
- Provide a chance to utilise one's skills to perform a task.
- Support one's employees
- Motivate employees to collaborate and participate in decision making
- Welcoming nature for the feedback from the organization's employees.
- Investment in the employees learning and development process.
- Feedback received from employees and attempts to make a great workplace.

Policies and procedures at the workplace:

A policy is a general set of guidelines that are designed in line with the company's objective for dealing with an issue. Policies communicate the connection between the organization's vision and values.

A procedure sets out the specific task or action plan for implementing or carrying out a policy. Procedure tells employee's how to deal with a situation and when.

Importance of Policies and Procedure:

- It makes sure of the smooth functioning of the business and its day-to-day tasks.
- It clearly sets out the instruction for the employees which is expected from them.
- Having policy and procedure in place become handy at times while dealing with any kind of issue.
- It improves the overall image of an organisation in the market.
- It sends out a clear message to its external stakeholders and helps the organisation to build trust among its stakeholders.
- It enhances the goodwill of an organisation and, in turn, increases the market value.

The difference between policy and procedure is described below:

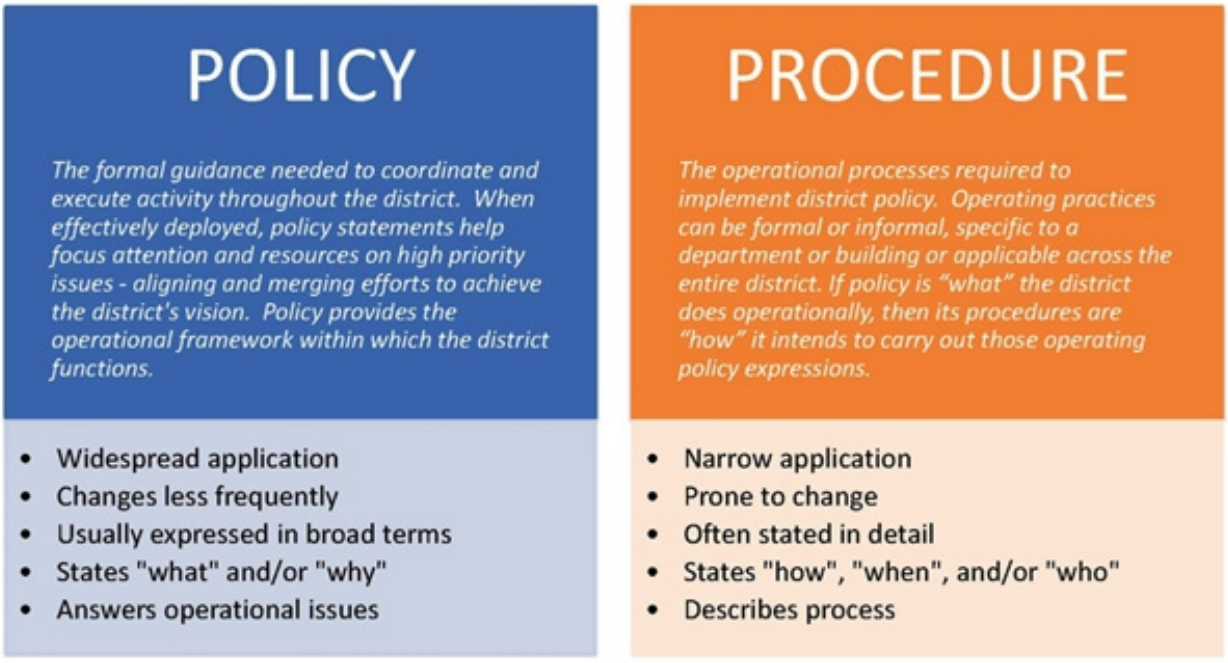


Fig. 6.2.1: Difference between Policy and Procedure

UNIT 6.3: Reporting Structure

Unit Objectives

By the end of this unit, the participants will be able to:

1. Analyse the reporting structure

6.3.1 The Reporting Structure

Reporting structure refers to the relationship between the employees' position in terms of authority –"who reports to whom". The reporting structure acts as a command it is hierarchal within every employee report to another employee who resides to be one level higher in their authority or position within the organisation including communication and decision channels.

Types of Reporting Structure

- **Vertical Structure:** The vertical organizational structure is a pyramid like top-down management structure. It creates a powerful hierarchical structure that emerges from top highest level of leadership CEO/owner followed by middle management then regular employees at bottom. Every employee has the authority to do their individual task or jobs. Every employee has to report to their supervisors in case of any issue. Here decision making often work from top to bottom, but work approval will work from bottom to top.
- **Horizontal Structure:** The flat structure or horizontal structure is an organizational structure having only a few layers of management into which the managers have a very wide span to control with one or more subordinates as it does not have many chains of command. The top layer of the structure is the owner of the business, whereas the second layer contains team leaders or managers who will report to the business owner. The third layer of team members is supervised by the team leaders or the managers of the second layer.

The company's reporting structure is generally prepared to keep the company's strategic goals and missions in mind. The authorities and work are delegated among the employees of the various departments according to various business functions.

Fig. 6.3.1: Company's Reporting Structure

UNIT 6.4: Inter-Dependent Functions

Unit Objectives

By the end of this unit, the participants will be able to:

1. List the inter-dependent functions

6.4.1 The Inter-Dependent Functions

Interdependence stands to be the key aspect of creating a healthy work environment and a sense of unity among the workers in order to achieve a common organizational goal. Teams of employees working together in hierarchy of organizational structure tend to demonstrate high chances of success rather than working individually. It also ensures the everyone is in line with the company's overall progress and are working towards the same objective.

The two main components of Inter-dependence are:

1. Collaboration
2. Delegation

Types of Inter-dependence:

- **Pooled inter-dependence:** In an organisation, each vertical or or horizontal department may not directly interact and do not directly depend on each other and perform completely separate functions having their own set of tasks, which stands to be different from each other, but they offer a contribution to the overall goal of an organisation as well. This type of inter-dependence is known as pooled inter-dependence. It means if any department fails to achieve its objective, the entire project or goal will collapse.
- **Sequential inter-dependence:** Sequential interdependence is a kind of inter-dependence when one department is witnessed to depend upon the functioning of the other department. As an instance, the procurement department must purchase the raw materials in order to ensure the proper functioning of the production department.
- **Reciprocal inter-dependence:** Similar to Sequential inter-dependence, Reciprocal inter-dependence also defines output of one department becomes input of other department in order to efficiently complete the task or project.

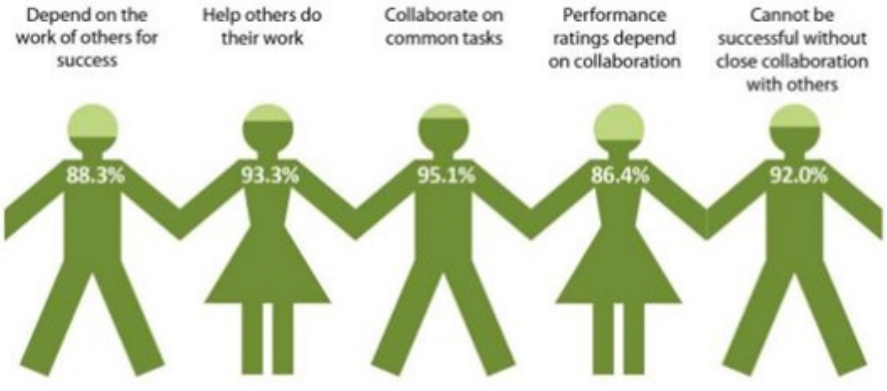


Fig. 6.4.1: Process of the concept of Inter-dependence

UNIT 6.5: Harassment and Discrimination

Unit Objectives

By the end of this unit, the participants will be able to:

1. Discuss the impact of harassment and discrimination

6.5.1 The Impact of Harassment and Discrimination

Any objectionable behaviour of someone towards an individual during professional or personal communication, whether on verbal or non-verbal terms, is referred to as harassment.

Harassment can include behaviours, such as:

- Telling abusive jokes about a particular group of members.
- Forwarding obvious or sexually suggestive emails or texts.
- Making disrespectful comments or taunts about a person's appearance and disability.
- Asking unwanted questions about someone's life.
- Displaying ethnic offensive screen savers.

Discrimination refers to a treatment when one person or a group of members are treated unfairly based on the factors such as race, colour, gender, sexual orientation, age, religion, and disability.

Discrimination that occurs in the workplace is of different types:

It occurs when an individual is discriminated against a number of factors. In addition to the reasons, job applicants and workers are also discriminated against because of their relationship with any other person.

The different types of workplace discrimination are.

- Gender Discrimination
- Age Discrimination
- Race Discrimination
- Skin colour Discrimination
- Mental and physical disability
- Genetic information
- Religion Discrimination

Pregnancy and parenthood: Harassment and Discrimination at workplace is illegal and unethical. It is not only treating your employee's equally the right thing to do but also avoiding any type of harassment and discrimination can also improve company's reputation and will also improve working environment in organization.

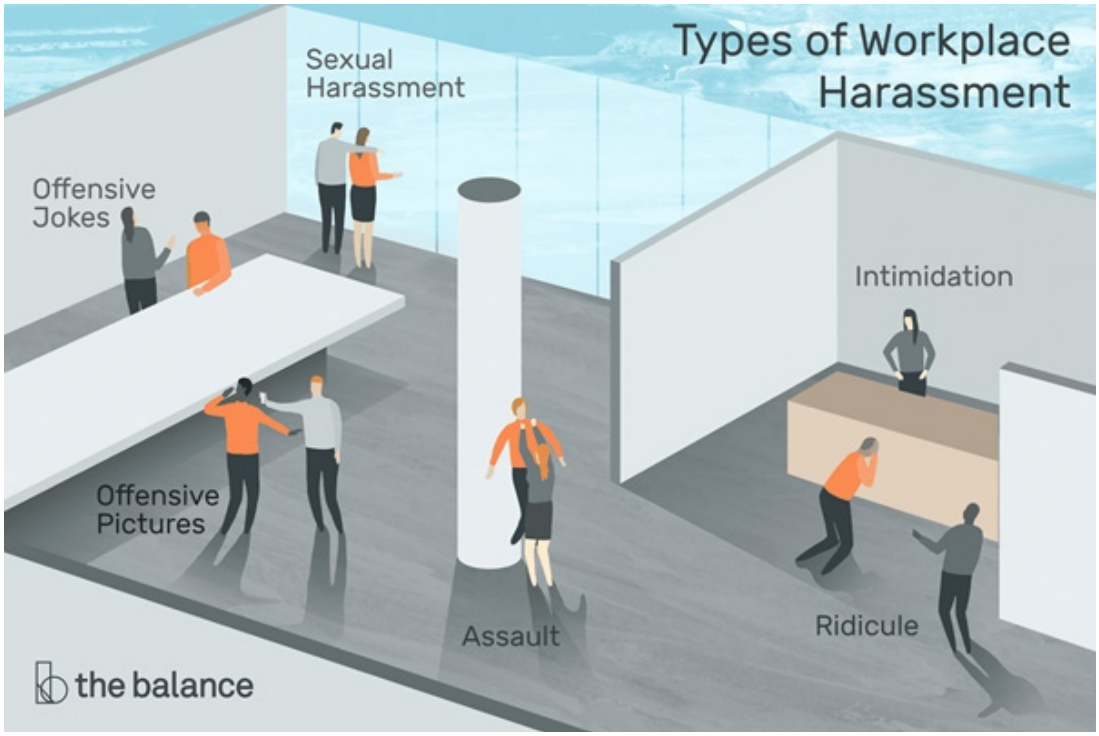


Fig. 6.5.1: Types of Workplace Harassment

UNIT 6.6: Prioritising Tasks

Unit Objectives

By the end of this unit, the participants will be able to:

1. Monitor the ways of prioritising the task

6.6.1 The Ways of Prioritising the Task

Prioritizing a task or work is a process of having an understanding of which task requires to be achieved first by determining the level of importance and urgency of task, thing or event. However, each task or work appears to be equally vital. Prioritization also helps the employees to attain more work or tasks in a less amount of time. It is very important for the employees and workers to prioritize their work in order to be productive rather than being reactive, which will indirectly decrease their efficiency of providing productive work.

How to Prioritize Task on Workplace When Everything's Important?

Seven strategies for prioritizing tasks at the workplace:

- Having a list that contains all tasks or works in one place
- Identify what's important
- Highlight what is necessary
- Prioritize based on importance
- Avoid competing with priorities
- Consideration of the efforts made in the tasks
- Constantly reviewing task and be realistic

UNIT 6.7: Communication Skills

Unit Objectives

By the end of this unit, the participants will be able to:

1. Record the types of communication skills

6.7.1 The Types of Communication Skills

Communication skill mainly addresses to the ability of the ways in order to communicate effectively with managers, colleagues and staff. It is an essential part for every industry. Communication is the act of transferring information from one place to another. It may be vocally (using voice), written (using printed or digital media such as books, magazines, websites or emails, visually (using logos, maps, chats or graphs), nonverbally (using body language, gestures, tone and pitch of voice). In practice it is often a combination of several of these. Productive communication skills in the workplace can reduce conflicts, lower the risk of projects indirectly and thus would make the work more agreeable.

In today's scenario having technical skills is not only enough to get the work done in the workplace. Completing the task must require the support of the whole team, and without proper communication, things will remain stringent in order to get better communication in the workplace. Communication skills are absolutely necessary for successful communication both in the workplace and in private life.

Fig. 6.7.1: Essential Communication Skills

- **Body Language (non-verbal):** When there is a discussion about body language, it refers to the ways by an individual presents themselves while interacting with someone. It includes body posture, hand movements or gestures, the type of eye contact that is made, and the voice tone.
- **Listening:** Communication in the workplace is not entirely about speaking; it mainly represents atwo-way channel. Onehas to pay close attention while talking, as this allows the team members to ask and clarify their doubts as well asinquiries to ensure that they are on the same page or track.

Fig. 6.7.2: 7 Key Active Listening Skills

- **Clarity and Conciseness:** One of the major ingredients for effective communication in the workplace is clarity, which mainly stands to be responsible to expresses the attempt of conveying an individual's message in the simple way possible. Before you start a conversation, type an email or being a discussion, have in mind what the purpose of the communication is and what information you hope to obtain as a result.
- **Friendliness:** In order to engage with the team members in an open or honest discussion, a person needs a friendly tone, a personal question, or simply a smile. It is important because the team members would not hesitate to contact the individual as they would be easily approachable for the conversation.

- **Empathy:** Showing compassion or empathy even when the individual disagrees with an employer, co-worker, or employee state to be very important as it helps in understanding their point of view and also respects their decision.
- **Confidence:** It is an important step to be confident when an individual tends to interact with others. As in all interactions, confidence (but not overconfidence) is crucial part. Conveying with confidence will give you peoples, faith in your abilities and will take you seriously.
- **Respect:** The employee must respect their co-workers' roles, skill set and ideas in order to meet the company's overall goal as a team.

  The team must communicate with each other in a respectful manner every time. Conveying them with respect through email by taking the time in order to edit their message is also required. If the individual would send them a sloppy written, confusing email, the recipient will think them to be disrespectful and also encourage them to think through the person's communication.

Summarizing the concept:

Effective and clear communication at the workplace ensures that the healthy work environment supports the overall team development, engagement of employees, innovative idea, which in turn help the overall company's growth, enhancing the goodwill and trust of its customers.

UNIT 6.8: Teamwork

Unit Objectives

By the end of this unit, the participants will be able to:

1. Evaluate the ways of carrying out a teamwork

6.8.1 The Ways of Carrying Out Teamwork

Teamwork is a cumulative effort done by a team or a group of members in order to acquire a common goal or to complete a given work or task in the most effective and powerful way. Good teamwork helps in building a strong relationship as well as provides morale in the workplace, which makes the workers more productive, leading to an increased profit.

Tips to improve teamwork in the organization:

- **Encourage informal social events:** In an informal environment, employees feel free to communicate with each other, and they also try to understand the personal behaviour of everyone.
- **Clarify Roles:** In order to work efficiently at the workplace, every employee should have a proper understanding of their roles and responsibilities according to their work demand.
- **Specify long-term as well short-term goals:** Specifying goals help in streamlining the communication and makes the teamwork more purposeful.
- **Reward and recognition:** It is necessary for an employer to recognise the best performing employees as it will keep them motivated and also provide a sense of accomplishment.
- **Avoid micro-management:** One of the significant drawbacks of micromanagement is that the employee tends to focus on the small or less relevant thing which they think is required to please the immediate supervisor.
- **Establish Effective Communications:** It is not necessary that an employee needs to be friends with all the co-workers, but the thing which is necessary states the establishing and practising of effective/good communication.
- **Respect Individuality:** Every individual has their own personality, skill and preferential ways of working, which is a necessity of the employer in order to recognise these.
- **Seek feedback:** Seek feedback not only from the managerial staff but also from the ground level staff in order to gain the proper insights and scopes of improvement.

UNIT 6.9: Ethics and Discipline

Unit Objectives

By the end of this unit, the participants will be able to:

1. Highlight the ethics and discipline

6.9.1 The Ethics and Discipline

Work ethics refers to the ways by which the employees govern themselves and their attitude towards their work. It also refers to morality in the workplace.

A person having a good work ethic tends to create a healthy workplace environment for him/her as well as for their fellow co-workers.

It is mandatory for an employer to develop strong work ethics among the employees. It can be done in various ways.

- Setting clear goals and objectives
- Mentoring
- Set example
- Need of right work environment
- Encourage professionalism
- Discipline
- Listen to your employees
- Feedback
- Rewards and recognition
- Remove obstacles
- Discipline at Workplace

UNIT 6.10: Grievances Solution

Unit Objectives

By the end of this unit, the participants will be able to:

1. Illustration of the grievance's solution

6.10.1 The Grievance's Solution

Grievance's Solutions

A grievance can prove to be quite harmful if not dealt with in time. It may lead to frustration among the employees, and they can start losing their trust from the employers.

Work-related grievances and complaints from staff need to be tackledwith proper care and are also known to be a time taking procedure.

It is the liability of the HR department that employee grievances are addressed quickly and in an effective manner.

There are five ways in order to address the grievances effectively:

- **Prompt and timely Action:** The staff or department expert in handling the grievances must be highly trained in managing the employee grievances effectively and in a time-bound manner.
- **Grievance acceptance:** The supervisor or expert must accept the employee grievance and also should respect their genuine feelings.
- **Collect information:** Management should not wait for the grievances to be reported. Instead, it should take preventive steps in order to avoid it. In order to curb it, the management must discuss, collect information, communicate regarding various issues at the workplace.
- **Cross verify the grievance cause:** Once the information and cause of grievance are collected about the reported incident, the information must be cross-checked from various other sources.
- **Decision making:** On successful identification of the causes, the management must develop a series of steps in order to resolve it along with the next course of action.
- **Review and implement:** The management should not wait for a longer time once they have a rational and effective resolution. It is necessary to involve the concerning employee(s) in confidence before implementing the decision.

UNIT 6.11: Interpersonal Conflicts

Unit Objectives

By the end of this unit, the participants will be able to:

1. Recognize the interpersonal conflicts

6.11.1 The Interpersonal Conflicts

Interpersonal Conflicts

Interpersonal conflicts refer to any type of conflict among two or more people. The idea mainly refers to the situation when a person or group of employees try to interfere in some other employee's work.

Ways to Resolve Conflict at the Workplace

- Communicate
- Listen carefully
- Show empathy
- Never hold back any grudges
- Effective communication skill

UNIT 6.12: Disabilities and Challenges

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify the disabilities and challenges

6.12.1 The Disabilities and Challenges

People with disabilities are far more impacted by personal and environmental barriers than normal people. By the end of this module, you will be able to get clarity on the rights of disabled people in the workplace.

These challenges to employment can range from a variety of physical and social ones. These can include:

- Physical barriers
- Nature of co-workers and stereotyping
- Communication barriers
- Policy barriers

Physical Barriers

They can take the form of structural issues in an environment that retrogrades the basic functioning of disabled people. As an instance, the lack of a wheelchair ramp or an elevator can hamper basic tasks for disabled people or not allow them access to modern equipment that would authorizethem to perform tasks.

Nature of Co-Workers and Stereotyping

Judgements and assumptions against people with disabilities are pretty much the norms of our present-day society. They tend to prevent disabled people from getting hired or having a positive experience in the workplace. For example, a person might be denied useful resources because their employer believes that they don't tend to possess a learning ability. This is common for people suffering from autism, ADHD or several other 'invisible' disabilities.

Communication Barriers

Communication barriers can create an inefficacy to effectively write, speak, read or understand the necessary requirements for a job. Some examples would involve the inability to use a phone due to hearing disability, lack of braille prints for blind people, and usage of languages that are too technical for people with cognitive impairments.

Policy Barriers

Policy barriers can also be a defining factor for the challenged people to get a job in a cooperative workplace. These include giving people not enough time to complete their tasks.

UNIT 6.13: Gender Sensitivity and Discrimination

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify the disabilities and challenges

6.13.1 The Disabilities and Challenges

Gender sensitivity has also been an ongoing dialogue inside the workplace. The workplace has frequantly been referred to as an "inhospitable place" for women due to the multiple decisions taken by the HRs (i.e., policies, decisions and their enactment, training, wage).

Ways to Build Gender Sensitivity and Eliminate Discrimination

- Recognizing the workplace's "Gender Equality Maker (GEM)."
- By being open and informative about it
- Altering existing policies to make room for gender diversity and equality
- Strict implementation of the policies

Recognize the Workplace's Gender Equality Maker

Being gender-sensitive is just one of the many necessary steps to be taken in order to have a gender-fluid workplace. Recognizing your company's current status in its diversity can be helpful and would point you in the right direction.

By Being Open and Informative About It

An open atmosphere in a workplace would help a company and its employees to excel in all directions. Understanding their needs and fulfilling them accordingly would help the employers and workers in a similar manner to achieve a gender-balanced environment.

For example, having group discussions with men, women, and LGBTQ+ would help people to understand their needs and concerns.

Altering Existing Policies to Make Room for Gender Diversity and Equality

The "Equal Remuneration Act of 1976" of India has prohibited differential pay to men and women employees for conducting the same work or work of the same nature.

Strict Implementation

Rules and regulations are only followed up with when implemented strictly. There are lots of rules and policies that can be put in place in order to check inequality and help a workplace to go from being gender-sensitive to gender transformative. One example which can be taken under consideration is the ensuring of nearly everyone to be confident and open to a leadership role if offered, while the otherscould portray equal pay amongst colleagues in the same position. Lastly, for sexual harassment, implementing strict rules against this kind of behaviour is paramount and shows that a corporation is heading in the right direction. Companies must realise that employees are working in a safe environment and do not need to be anxious about a harassment encounter.

UNIT 6.14: Applicable Legislation, Grievance Redressal Mechanisms

Unit Objectives

By the end of this unit, the participants will be able to:

1. Discuss the applicable legislations, grievance redressal mechanisms

6.14.1 The Applicable Legislations, Grievance Redressal Mechanisms

The Indian Constitution guarantees equality and prohibits discrimination on the grounds of religion, race, caste, sex, birthplace, and residence.

Discrimination against or profiling individuals can occur at two stages – pre-recruitment and post-recruitment. The former entails rejecting potential candidates on the basis of their gender, religion, caste, marital status, pregnancy etc. Post-recruitment discrimination manifests in lesser pay, fewer benefits and/or leave or even termination, based on the same grounds.

The Constitution guarantees equality of opportunity for every citizen in matters relating to employment or appointment to any office under the state.

“Equal Remuneration Act, 1976” needs the employers to pay equal remuneration to the employees for the same task or work of a similar nature without having any discrimination on the basis of sex.

Grievance Redressal Mechanism

A transparent, quick, robust and confidential grievance redressal system can effectively help in order to handle conflicts in the workplace and potentially go a long way in bringing harmony to the workplace. Some of the better places to work are identified to have an efficient worker-based grievance redressal mechanism.

In India, certain central and state-specific labour laws require the employer to adopt certain grievance redressal mechanisms at the workplace.

- **Internal Commite for Complaints:** According to the sexual harassment of women at workplace "(Prevention, Prohibition and Redressal) Act, 2013" of India (POSH Act), each workplace possessing at least ten employees is required to constitute an Internal Complaints Committee (IC). The IC is required to investigate complaints of sexual harassment of women at the workplace and also provide recommendations to the employers.
- **Grievance Redressal Committee:** According to section 9C of the Industrial Disputes Act, 1947 of India (IDA), each employer recruiting at least twenty workmen, is needed to structure a Grievance Redressal Committee (GRC) for resolution of the conflicts arising out of grievances of the people.
- **Works Committee:** The labour authorities might, under section 3 of the IDA, order an initiation possessing at least one hundred workmen to set up a Works Committee (WC).
- **Committee for Employee's Health and Safety:** Certain states in Indian like Maharashtra need employers to employ at least one hundred workers to structure a Health, Safety and Welfare Committee (HSW Committee). The responsibility of the HSW Committee includes surveying and identifying any accident-prone, hazardous objects or spots in the boundaries, rectifying such spots, conducting healthcare camps once a year.

UNIT 6.15: Transacting With Others without Personal Bias

Unit Objectives

By the end of this unit, the participants will be able to:

1. To administer with others without personal bias

6.15.1 Personal Bias

When it arrives at making choices at work, it's important to know they are not based on bias. It is essential for organizations to have concrete processes and procedures in place to curb unconscious bias. Nevertheless, there are many stages that can be adopted to check the biases and to create an inclusive environment for the team.

Recognizing an Individual's Own Biases

Recruitment is known to be an area where unconscious bias may come into play as it has been seen that people may unwittingly tend to favour applicants from their own familiar backgrounds.

Focusing on People

Many organizations are so focused on their processes that they lose sight of their own people. Of course, there is a requirement to find time, for example, to write reports, define job descriptions, and set up performance appraisals, but it's important that there is also the establishment of expectations communicate plans, and givingas well asreceiving feedback from everyone involved in the team.

Increasing Exposure to Biases

Many organizations assume that their policies on avoiding discrimination are robust and work well, so perhaps they fail to weed out some subtle biases. Declaration of the intentions about valuing a diverse workforce is extensively required. Saying words out loud, or writing them down, sends a clear message to everyone with whom an individual is working, as well as is involved inone's own subconsciousness.

Summary

- Organizational policy or work place policy is a type of statement which provides the outlining of any organization that practices out the procedures. This eventually leads to its business which covers and everything, starting from the operations to concerns and compliances along with the employee's legislation.
- It is the legal requirement of an organisation to comply with the local laws as well as regulations and keep them updated time-to-time. The HR department is mainly responsible for continuously updating the regulations and making sure that it is communicated across the organisation.
- Policies communicate the connection between the organization's vision and values.
- The reporting structure acts as a command it is hierarchal within every employee report to another employee who resides to be one level higher in their authority or position within the organisation including communication and decision channels.
- Teams of employees working together in hierarchy of organizational structure tend to demonstrate high chances of success rather than working individually.
- Prioritizing a task or work is a process of having an understanding of which task requires to be achieved first by determining the level of importance and urgency of task, thing or event.
- Effective and clear communication at the workplace ensures that the healthy work environment supports the overall team development, engagement of employees, innovative idea, which in turn help the overall company's growth, enhancing the goodwill and trust of its customers.
- Discipline at the workplace lays a strong foundation of trust between the employer and its employees. It includes reporting on time, maintaining decorum during working hours and at the workplace, appropriate dressing, proper communication, etc.
- A grievance can prove to be quite harmful if not dealt with in time. It may lead to frustration among the employees, and they can start losing their trust from the employers. In order to handle grievances properly, one should have an adequate set of procedures that lays out a clear step by step process in order to deal with the grievances.
- Women have been witnessed to have fought for their rights and for their place in this world for hundreds of years. However, it's not just women now, and the LGBTQ+ communities are also fighting for their rights and their voices in order to be heard.
- The Indian Constitution guarantees equality and prohibits discrimination on the grounds of religion, race, caste, sex, birthplace, and residence.
- A transparent, quick, robust and confidential grievance redressal system can effectively help in order to handle conflicts in the workplace and potentially go a long way in bringing harmony to the workplace.
- Recruitment is known to be an area where unconscious bias may come into play as it has been seen that people may unwittingly tend to favour applicants from their own familiar backgrounds. But a person can take practical steps in order to reduce this bias.

Exercise

A. Answer the following questions briefly.

1. Which policy stands to be the workplace or organizational policy?
   A. Social Media Policy B. Environment Protection Policy
2. _____ at workplace lays a strong foundation of trust between the employer and its employees/
   A. Communication B. Discipline
3. _____ can prove to be quite harmful if not dealt in time.
   A. Actions B. Grievance
4. The employment barriers might include:

A. Communication barriers B. Disciplinary barriers

5. _____ requires employers to pay equal remuneration to the workers.

A. Equal Remuneration Act, 1976 B. Republic Act No. 9710

B. Answer the following questions by choosing the correct option:

1. List down the importance of having the company policies in force.
2. State the differences between policies and procedures.
3. What do you understand by communication skills?
4. What are policy barriers?
5. What are some of the central and state-specific labour laws in India for focusing on the grievance redressal mechanism?

Notes

NCVET
कौशल गुणवत्ता प्रगति

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

FICSI
Food Industry Capacity and Skill Initiative

7. Material Conservation

SGJ/N1702

Key Learning Outcomes

By the end of this module, the participants will be able to:

1. Identify the ways to handle materials.
2. Categorize the workstation layouts, electrical and thermal equipment.
3. List the organizational procedures for minimising waste.
4. Analyse the practices of efficient and inefficient management.
5. Discuss the material and water usage.

UNIT 7.1: Material Handling

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify the ways to handle materials

7.1.1 The ways to handle materials

Material handling

Material handling is also known as the integrated system, which involves such activities of the movement, storage, protection and control of types of materials and products throughout the manufacturing, distribution, consumption and disposal. The major function involves the focus on methods, mechanical equipment, and related control systems to achieve the mentioned functions.

The fundamental objective of using material handling is to ensure that the material is in the right amount and is safely delivered to the desired place at the right time, along with minimum production cost. The cost of material handling has an estimated 20-25% of total manufacturing labour cost.

Principles of Material Handling

- **Planning:** The planning requires to be done in order to achieve the approach of the team with the input of consultants, suppliers and the end-users, from the management, engineering, operations, finance, sales and operations.
- **Standardization:** All the material handling equipment, methods, controls, and software requires to be standardized in such a way that it would be able to perform a wide range of tasks in a broad range of operations.
- **Work:** In material handling, the process requires to be clarified by reducing, shortening and eliminating in order to remove the unnecessary movement that would impact productivity.
- **Ergonomics:** Work and work-related conditions are being adapted to support the ability of a worker, which reduces the repetitive and difficult manual labour as well as safety.
- **Unit Load:** Due to the less use of effort and work required to move several individual items together as a single load (e.g., moving of many items one at a time), a unit load such as containers or pallets is required to be used.
- **Space Utilization:** In order to maximize the effective use of space within a facility, it is extensively crucial to keep the working stations organized and clutter-free to increase the density and availability of the storage area. 5S principle can be implemented for space utilization 5S stands for the 5 steps of this methodology: Sort, Set in Order, Shine, Standardize, Sustain.
- **System:** In material handling, the movement and the storage are required to be coordinated throughout the process in order to form or receive the inspection, storage, packaging, order selection, production, and shipping, return handling, as well as transportation.
- **Environment:** Energy, which is used in potential environmental impact, have been considered in designing the system with recycling and reusability processes implemented whenever possible, as well as for the establishment of practices for safe handling of hazardous materials.
- **Automation:** To develop operational efficiency and consistency, the automated material handling technologies need to be positioned whenever possible.

- **Life Cycle Cost:** For all the equipment used in material handling for a specified system, the analysis of a life cycle cost is required to be conducted. The areas of considerations require possessing the installations, programming, training, operation, maintenance and also repairing.

Material Handling Equipment

The simplest shelf to the most complex light out facilities, warehouse mechanization, is capable of being operated in the dark as it uses a lot of material handling equipment.

There are different kinds of material handling equipment, and they fall under four broad types. Material handling is the unloading and loading or movement of goods within a warehouse, especially with the help of mechanical devices. Thus, material handling equipment refers to the devices that are used in a warehouse's operation by storing and moving the goods.

Type 1: Storage and Handling Equipment

This stands to be usually the simplest type of material handling equipment which includes shelves and racks where an individual is capable of storing their material in the middle of shipping and receiving it. Drawers, bins, flow racks, cantilever racks and stacking frames are additionally included in this category.

Type 2: Bulk Material Handling Equipment

It is the process of storing, transportation and control of materials in loose bulk form. For instance, a silo, a large cylinder that is capable of holding stuff like grain. Other examples include:

- Reclaimers and Stackers:
- Hoppers
- Conveyor Belt
- Grain Elevators
- Dump Trucks
- Rotary Car Dumper
- Screw Conveyor
- Bucket Elevators
- Vacuum lifter

Type 3: Industrial Truck

These are the type of equipment or vehicles that is used to move materials. Sometimes it is run by workers, and sometimes they are automated. "Automated Guided Vehicles (AGVs)" fall under both industrial trucks and engineered systems. Other examples include:

- Forklifts
- Order Pickers
- Hand Trucks
- Pallet Trucks

Type 4: Engineered System

It is the type of material handling equipment that stands to be a more complicated system with multiple components, which are usually automatic. They include AGVs, conveyor belt or robotic delivery system that comes in different sizes and shapes or automated storage systems.

7.1.2 Hazards, Risks and Threats Associated with Handling Different Materials

There are multiple hazards, risks and threats can be identified during receiving, loading & unloading, storage, and transportation for handling different types of materials.

Receiving

Hazards, risks and threats can be identified during receiving of the material. Inspect incoming materials as soon as they are received to ensure established specifications such as product temperature, packaging conditions, etc. are met. A designated employee should verify and document:

- Incoming raw materials – Quality and other kinds of defects can occur during receiving of incoming materials. So, all kind of material should be from an approved supplier. Approved supplier can be verified through supplier visit, document verification and certification from legal bodies.
- Cleanliness of the truck – Foreign body, pest can be identified as a hazard. So, we must ensure that no foreign material, dirt, odours, rodents, insects or other pests are there in the vehicle.
- Temperature of the truck – Every different material requires different type of temperature requirements such as ambient (Normal temperature- 20-25°C), chilled (0-5°C), frozen (-16°C to -23°C) and dry items. Any deviation of temperature requirements can be considered as a hazard. Proper temperature needs to maintain for products according to specifications.
- Condition of door seals – Improper door closing, or door gaps of the vehicle can be one of the risk factors of material. So, it needs to ensure that close-fitting doors with no spaces at sides or bottom.
- General truck conditions or Material handling equipment's – Truck or material handling equipment's can be cause damage of product, infrastructure damage and injury of the person or even fatality.

Loading and Unloading

Loading and unloading process can be considered as hazard due to the potential risk involved to the product, property and person.

- Product damage and spillage can happen during loading and unloading process and it can be considered as a risk.
- Human error during loading or unloading process can cause damage to product, property or the employees. Employees responsible for loading and unloading materials should follow company standards for hygiene and sanitation practices.
- Proper product temperature must be maintained during loading and unloading as well. Movers should be aware of the product temperature requirements. Any kind of deviation regarding temperature can cause product damage. Document verification plays an important part for tracing shipments in case of a recall and should include: Time of receipt, type of product, ingredient and product packaging, labelling, lot number, pallet tag, quantity, size and weight.

Storage

Products should be stored adequately to maintain package/pallet integrity:

- Allow maximum air circulation and stock rotation. Air circulation is important to maintain the temperature, humidity inside the warehouse. Also, HEPA (High efficiency particulate air) filter can be installed to avoid biological hazard.
- Assign different storage areas for different products (ingredients, raw materials, finished products) to avoid cross contamination.

- Material should be used within the manufacturer's specified time period to maintain shelf-life requirements. Appropriate rotation of food and packing materials -- first in, first out (FIFO) -- helps minimize product contamination, damage and spoilage. Allergen control precautions need to establish for food industry regarding raw materials purchasing, transportation and storage Ensure suppliers have documented and implemented an allergen control plan. Check labels on incoming ingredients to ensure supplier has not sent the wrong product, a substitute product or used the wrong label. Ensure vehicles and shipping containers are cleaned before shipping. Clearly label raw materials to indicate they contain food allergens (ex: color-coded containers, tags).
- Pallet used to store materials can cause different hazards. For example- Damage pallets can result into product damage or fall down of the product; Protruded nails can product damage or injury.
- Loading strength and design should be based on Health and safety risk assessment. Major accidents can happen due to excessive product storage on each rack or improper design of racking system.

Transportation

Vehicles and containers that transport materials should be used only for the intended purpose and should have both sanitary design and pest control procedures in place. (Ex: truck's doors should be sealed to prevent entry of pests.) Refrigeration equipment in vehicles and temperature measuring devices should be calibrated and in good working order. Mechanical refrigeration should be provided for perishable food products such as meat, fish, poultry, milk and eggs.

Inspection of vehicles

Designated employees should evaluate and document the condition of trucks, containers and carriers of finished products before loading. The following should be verified before loading:

- Cleanliness of the truck should be maintained to avoid any physical, chemical or biological hazards.
- No odours or obvious dirt or debris.
- No evidence of chemical contamination such as fluids, powders, chemical residues
- Correct temperature in the truck.
- Temperature measuring devices will work properly during transportation. Documentation and maintain a log to verify inspection and cleaning tasks. Indicate type of loads, cleaning and sanitation procedures, inspections, etc.

UNIT 7.2: Workstation Layout, Electrical and Thermal Equipment

Unit Objectives

By the end of this unit, the participants will be able to:

1. Categorize the workstation layouts, electrical and thermal equipment

7.2.1 The Workstation Layouts, Electrical and Thermal Equipment

Workstation Layout

Workstation or workplace is also known as the floor space occupied by the workers, as well as by the machines or a group of machines. An ergonomic workplace is a scientific discipline that is concerned with improving the productivity, health, comfort and safety of people in order to promote effective interactions among people, the environment and technology.

During the design of the workstation layout, the following space requirements are taken into considerations:

- Requires having spaces for racks, bins and conveyor stations that either contain the under processed work or receive the work after it has been completed by the machine.
- There should be a rectangular space occupied by the length and width of the machine or group of machines. They need to include the space for the travel of moving parts as well as the projected parts of machines which include shafts, levers, pulleys, handles and wheels.
- There requires being a proper workspace for the workers in order to efficiently complete their tasks.
- Requires having clearance space for feeding the work on and off the machine.
- There needs to be a space for tool racks, workbenches, etc., required by the individual machine, if any.
- There needs to be proper floor space for the power source, or if in case of any electric motor, it has to be placed on the floor or within the working area.

Storage Space Requirement

In any plant layout, the space for workstations allocation requires to be made for the storage of material and space essentially required inside the plants. Every department and area need to be designed in such a way so that they are capable of providing waiting, processing and moving facilities.

The storage space requirement depends on various factors such as:

- Quantitative use of raw material per hour
- Movement of semi-built parts between two machines depending upon the weight and volume.
- Movement of parts between the departments, depending upon the weight and volume.
- The dependence upon the scrap weight and volume
- Vertical heights of the building plants.
- Production capacity of the assembly.

- Floor load-bearing capacity.
- Storage practices.

Once the space requirement for all machines has been estimated, the employer needs to have the provision for the basic amenities like canteen, drinking water, first aid, restrooms, sales department, changing room (for factory worker like machine operators), refreshment place, etc.

Workplace Layout Design:

Employee productivity stands to be directly in proportion to workplace conditions. A good and comfortable workplace always results in high productivity per employee.

Some important aspects which need to be considered while designing the workplace are:

- Cleanliness
- Proper lighting
- Noise
- Too ls and Material positioning
- Chairs and Workbench
- Machine design

Electrical and Thermal Equipment

In order to build an efficient workplace layout, one needs to consider the electrical and thermal requirements of the workers. Workstations that are well equipped with electrical supply takes care of the power source needs of employees in order to operate the required equipment and tools.

The following points require to be considered while designing an electrical workstation.

- Placement of electricity outlet or strips
- Power/voltage requirement of different equipment
- The number of power outlets required
- Alternative or emergency power source outlets

UNIT 7.3: Organisational Procedures for Minimising Waste

Unit Objectives

By the end of this unit, the participants will be able to:

1. List the organizational procedures for minimising waste.

7.3.1 The Organizational Procedures for Minimising Waste

Types of organisational waste and ways to minimise them:

- **Transportation:** Transportation waste refers to the movement of tools, equipment, inventory, raw material, people etc., more than the actual requirement or consumption. Unnecessary or excessive movement of resources leads to unnecessary work, increased wear and tear, increased damaged and defects.

  In order to curb this type of waste, the department which works closely needs to be designated next to each other. The materials required for production has to be placed in easy to reach locations as well as the multiple handling of material needs to be avoided.

- **Inventory:** Inventory is often considered as an asset to any organisation; however, storing inventory stands to be more than the required leads to unnecessary damage, defects and increased lead time during the production process. The main cause of this is over-purchasing of raw material, increased WIP (work in progress) and over-production in comparison to the actual customer needs.

  Measure to be taken in order to reduce such kind of waste involves the purchase of raw material as per the demand, avoid overproduction and reduce the work in progress.

- **Motion:** This includes unnecessary movement of tools or equipment, machinery or people. It also includes repetitive movement that doesn't add value to the work or customer, reaching for raw material, unnecessary walking to fetch tools or equipment and readjusting of installed machinery.

  Measures to be taken in order to reduce such kind of waste include a well-designed workplace, easy to reach location for tools or equipment, and efficient one-time installation of machinery.

- **Waiting:** It includes equipment or machinery which are kept idle and also the workers waiting for material or equipment. It is majorly caused by unevenness among the various production lines.

  This type of waste is capable of being curbed by streamlining the process for continuous workflow as well as training the workers on multiple skills set who are capable of easily adapting to the changing work demands and standardized workflow.

- **Overproduction:** Overproduction means manufacturing a product or material in excessive quantity than the actual demand.

  Measures to be taken in order to reduce such kind of waste include, even manufacturing rate between the station or production units and also manufacturing small batch size.

Fig. 7.3.1: Overproduction

- **Defects:** A defect usually refers to a specific product that is of no use. This results in either discarding the product or reworking on them and is capable of incurring the additional operational cost.

Tips

- For having an effective system of food processing implementation of automated statistical process control systems are extensively required
- Maintaining a high level of supply chain visibility is also considered to be important for efficient food processing

UNIT 7.4: Practices of Efficient and Inefficient Management

Unit Objectives

By the end of this unit, the participants will be able to:

1. Analyse the practices of efficient and inefficient management

7.4.1 The Practices of Efficient and Inefficient Management

Inefficient Management Practices

Inefficiency at the workplace often refers to low productive and poor confidence. Inefficiency directly impacts the cost incurred by any organisation.

Following are the key indicators of inefficient management:

- Uneven prioritization of work
- Non-essential work
- Lack of resource planning
- Improper justification of resources
- Inefficient productivity management
- Lack of fruitful collaboration

An efficient manager must answer the below questions in order to identify the inefficient management practices.

1. Who is working on what?
2. Are they working on the highest priority projects?
3. Do they have the resources they need?
4. Do they have the information they need?
5. How is work coming along?
6. Will work be done on time?

Efficient Management Practices

An efficient management practice refers to those practices which can perform the task with minimal wastage of resources. It also refers to the appropriate utilisation of resources leading to profit maximisation. The basic rules of effective management are:

- Consistency
- Goal setting
- Delegation
- Task prioritization
- Effective communication
- Rewards and Recognition
- Training and development
- Management Commitment

UNIT 7.5: Material and Water Usage

Unit Objectives

By the end of this unit, the participants will be able to:

1. Discuss the material and water usage.

7.5.1 The Material and Water Usage

Material Usage

Material refers to those components or raw goods which are used in producing hard goods like machines and equipment for another industry or end consumer as well as soft goods like food items, chemicals, medicines, apparel, etc.

Water Usage

In manufacturing units, water is used for various purposes like fabrication and processing of various materials, cleaning, diluting or as a coolant.

The need and demand for industrial water vary upon the product which is being manufactured. The other factors which need to be taken into consideration are water quality in the region, type of treatment required in order to make water usable.

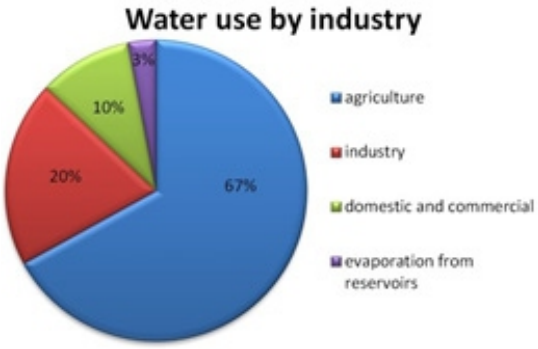


Fig. 7.5.1: Industry-wise water consumption

Industrial usage of water:

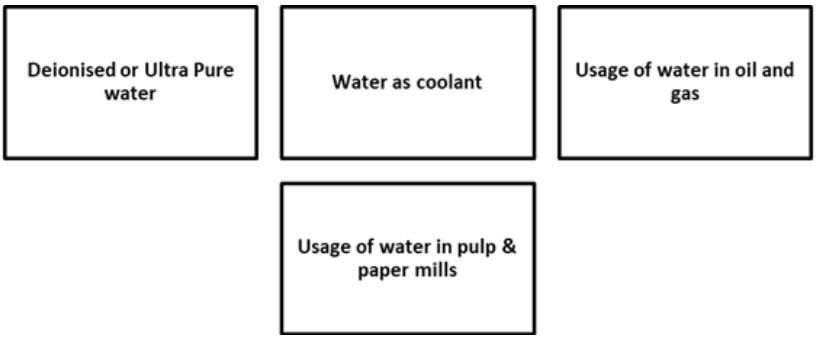


Fig. 7.5.2: Industrial wastage of water

Summary

- Material handling is also known as the integrated system, which involves such activities of the movement, storage, protection and control of types of materials and products throughout the manufacturing, distribution, consumption and disposal.
- Workstation or workplace is also known as the floor space occupied by the workers, as well as by the machines or a group of machines.
- Employee productivity stands to be directly in proportion to workplace conditions.
- An efficient management practice refers to those practices which can perform the task with minimal wastage of resources.

Exercise

A. Answer the following questions briefly.

1. What is the manufacturing labour cost for material handling?

A. 20- 23% B. 20- 25% C. 20- 30% D. 20- 35%

2. What stands to be the full form of AGV?

A. Automated Guided Vehicle

B. Activated Guided Vehicle

C. Accurately Guided Vehicle

D. Action Guided Vehicle

3. _____ is the major component for manufacturing semiconductors and chips, which are widely used in mobile phones, computers and various other electronic goods.

A. Nitrogen B. Silicon C. Hydrogen D. Lithium

4. _____ directly affects the efficiency of the workers.

A. Proper lighting B. Noise C. Cleanliness D. Machine design

5. The appropriate temperature at the workplace usually requires being at _____ degrees Celsius.

A. 22

B. 30

C. 18

D. 16

B. Answer the following questions by choosing the correct option:

1. What are the key indicators of inefficient management?
2. What are the four ways to control the defects types of waste?
3. What are the points required to consider while designing an electrical workstation?
4. What are the important aspects which need to be considered while designing the workplace?
5. What are the requirements for a storage space?

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8. Energy and Electricity Conservation

SGJ/N1702

Key Learning Outcomes

By the end of this module, the participants will be able to:

1. Define electricity
2. State the basics of electricity
3. Identify the energy-efficient devices
4. Explain the standard practices to be followed for conserving electricity
5. Illustrate electrical equipment and appliances

UNIT 8.1: Define Electricity

Unit Objectives

By the end of this unit, the participants will be able to:

1. Define electricity

8.1.1 Definition of Electricity

Electricity stands to be a general form of energy observable in a positive and negative form that takes place naturally (as in lightning) or is generated (as in a generator), as well as that is expressed in terms of movement and interaction of electrons.

The existence of an electric charge, which is capable of being either positive or negative, creates an electric field. The movement of electric charges leads to an electric current which further generates a magnetic field.

It is at the heart of many of our present era technologies, being utilized for:

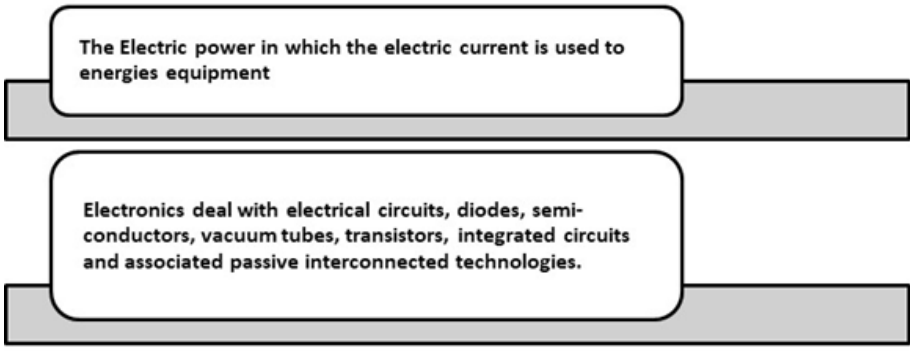

Fig. 8.1.1: Electricity utilization

UNIT 8.2: Basics of electricity

Unit Objectives

By the end of this unit, the participants will be able to:

1. State the basics of electricity

8.2.1 The Basics of Electricity

Electricity is easily put in the flow of electrons in a conductor. Electric current flows in the form of free electrons; thus, the greater the number of free electrons in a material, the better would stand to be its conductivity. On the basis of conductivity, these 'materials' can be classified into three categories:

- **Conductors –** Materials whose conductivity lies between 104 to 107-ohm m. For example, Iron, Copper, etc.
- **Semi-conductors –** Materials whose conductivity lies between 10-6 to 104-ohm m. For example, Graphite, Silicon, etc.
- **Insulators –** Materials whose conductivity lies between 10-20-to-10-10-ohm m. For example, Paper, Glass, etc.

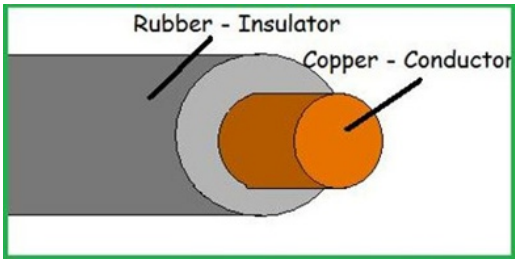

Fig. 8.2.1: Conductor of Electricity

There are three primary electrical parameters:

- Volt
- Ampere
- Ohm

Volt: The amount of external force exerted on free electrons is known as "Electromotive Force (EMF)". Volt is the amount of EMF needed to push a current of one ampere through a conductor with the resistance of one ohm.

Ampere: Ampere defines the rate of flow of electric current. For example, when one coulomb of charge flows through a given point on a conductor in a second, it is defined as a current of one ampere.

Ohm: Ohm is the unit of resistivity of a conductor. Three factors determine the resistivity of a conductor:

- Size of conductor
- Composition of conductor
- Temperature of conductor

UNIT 8.3: Energy efficient devices

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify the energy-efficient devices

8.3.1 Energy-Efficient Devices

The use of energy– efficient devices has proved to be an effective strategy for the economics and planet as a whole, as it cuts down on unnecessary power consumption while also being cost-effective.

From the viewpoint of an energy consumer, the main motivation for saving energy is frequently and simply saving money by decreasing the cost of purchasing energy. From an energy policy viewpoint, there has been a long trend in wider recognition of efficient energy as "first fuel" (meaning the ability to avoid consumption of fossil fuels for energy production).

Fig. 8.3.1: Energy-efficient devices

Energy-Efficient Devices

Devices like LED bulbs, fluorescent lighting or natural skylights reduce the amount of energy required to attain the same amount of illumination compared to using traditional incandescent light bulbs. Modern appliances such as freezers, dishwashers, ovens, stoves, dryers use significantly less energy than their previous generation models and line-ups. For example, modern energy-efficient refrigerators use 40% less energy than their conventional models did in 2001.

Energy Conservation

Energy conservation is broader in comparison to energy efficiency in including active efforts to decrease energy consumption. For example, through behavioural change it has an addition to using energy effectively. Energy conservation is a challenge requiring stringent policy programmers, technological development and behaviour change to go hand in hand. Many energies intermediary organizations, government, non-government, regional, local or at the national level, are working in order to meet this challenge.

8.3.2 Common Ways to Identify Electrical Problems

Electricity appears to be something most of us understand it for granted. When the individuals need it, you turn to the nearest switch or outlet, and there it is, ready to serve you 24/7.

Yet that electric energy faithfully facilitating us is additionally a potential destruction's source.

Several electrical fire dangers are hidden within the walls of your house or offices or other workplaces. Nevertheless, if the indivdiuals have the knowledge the ways to point the warning signs, the individuals are capable of making proactive — and less expensive — repairs that will also help protect your home in the long run. Here are certain manners to spot common issues and what to do about them.

- **Unknown odour:** When you detect an odd smell arriving from an electrical store, unplug anything linked to it, as well as don't utilise it again until a qualified electrician has tended to check it. In addition to this, if the individual's breaker panel or fuse box is emitting an odd odour, call an electrician immediately.
- **ARC faults:** Arc faults tend to take place when an electrical circuit veers off its intended path, frequently via a breach in the wiring. Arc faults stand to be preventable via the installation of a tool referred as an arc-fault circuit interrupter (AFCI).
- **Sparking or warm switches and outlets:** If the individual's light switches stand to be warm to the touch or an store is sparking, call a expertised the electrician immediately to see if your wiring needs repairs or the fixture should be replaced.
- **Buzzing sounds:** If you hear any buzzing, cracking or sizzling sounds when you flip a switch or plug into an outlet, turn off the power to that fixture immediately and consult a professional electrician.
- **Flickering lights:** Flickering lights usually indicate a power surge. These power surges don't necessarily have to come from a catastrophic event — more than likely, your appliances are making demands on the electrical system that it cannot handle.
- **Broken light switches and loose outlets:** If switches or outlets stop working or work only intermittently, it could be a sign of loose wiring — and another potential fire hazard. Loose outlets also create a potential for electrical shock.
- **Hot ceiling fixtures:** Occasionally check the area around your ceiling fixtures for warmth that could indicate a lack of sufficient insulation. Also, exceeding recommended bulb wattages can cause overheating. Either issue poses a potential fire hazard. Consider switching to compact fluorescent light (CFL) or light-emitting diode (LED) bulbs as these don’t produce as much heat as incandescent bulbs.
- **Circuit breaker problems:** Circuit breakers are designed to trip when a circuit is overloaded. Tripping prevents overheating and eliminates fire hazards. Occasional tripping probably indicates a simple overload, but if it occurs repeatedly, you need to call in an electrician and have them evaluate your entire electrical system.

UNIT 8.4: Standard Practices for Conserving Electricity

Unit Objectives

By the end of this unit, the participants will be able to:

1. Explain the standard practices for conserving electricity

8.4.1 Standard Practices for Conserving Electricity

Renewable energy sources have received plenty of attention in recent years, but the conservation of electricity is also important for sustainability. Nevertheless, the best results are acquired when clean power is combined with energy conservation, reducing the pressure to invest in newer infrastructure.

Environmental Reasons to Conserve Electricity

All systems of power generation have an environmental influence that must be taken into consideration before an investment decision. This is evident while dealing with fossil fuels since their combustion emits a constant stream of greenhouse gases in the atmosphere. The process of construction also has an environmental impact. Some waste materials are unavoidable, heavy machinery releases emissions and the ecosystem is seen to be disrupted.

Practices for Saving Electricity

For an average consumer, saving electricity can be good for the pocket and in turn, it reduces the increasing stress on the environment. Those savings can be diverted to alternative sources of energy like solar panel arrays, especially in a tropical country like India, where seasons are relatively moderate and 'timed'. Some practices and habits changes which would help in saving electricity are:

- Turning down the refrigerator
- Usage of energy-efficient LED bulbs
- Air drying the dishes and clothes
- Cooking under the right-sized burner
- Washing clothes with cold water
- Using window shades to alter sun rays entering the house
- Turning off electrical appliances, fans, lights when not in use
- Using low flow faucets and showerheads

Summary

- Electricity is a basic form of energy observable in a positive and negative form
- The main motivation for saving energy is frequently and simply saving money by decreasing the cost of purchasing energy.
- Energy conservation is broader in comparison to energy efficiency in including active efforts to decrease energy consumption.
- Renewable energy sources have received plenty of attention in recent years, but the conservation of electricity is also important for sustainability.
- All systems of power generation have an environmental influence that must be taken into consideration before an investment decision.
- Electrical equipment involves any machine powered by electricity.

Exercise

A. Answer the following questions briefly.

1. On the basis of conductivity, conductors possess:

   A. Materials whose conductivity lies between 10-6 to 104-ohm m

   B. Materials whose conductivity lies between 104 to 107-ohm m

   C. Materials whose conductivity lies between 10-20-to-10-10-ohm m

   D. None of the above

2. What is the full form of EMF?

   A. Electromotive Force

   B. Electromagnetic Force

   C. Electro mobile Force

   D. Electro massive Force

3. _____ energy sources have received plenty of attention in recent years, but the conservation of electricity is also important for sustainability.

   A. Renewable

   B. Non- renewable

   C. Sustainable

   D. Non-sustainable

4. Energy _____ is broader in comparison to energy efficiency in including active efforts to decrease energy consumption.

   A. Release

   B. Emission

   C. Conservation

   D. Deletion

5. Modern energy efficiency refrigerators use _____ less energy than their conventional models did in 2001.

   a. 50%

   b. 40%

   c. 60%

   d. 90%

B. Answer the following questions by choosing the correct option:

1. What are the classifications for the materials of electricity?
2. What are the three primary electrical parameters?
3. What are the components of electrical equipment?
4. What are the categories of appliances?

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9. Waste Management and Recycling

Unit 9.1 - Types of waste

Unit 9.2 - Waste Management and Disposal Solutions

Unit 9.3 - Pollution and Remedies

SGJ/N1702

Key Learning Outcomes

By the end of this module, the participants will be able to:

1. List the types of wastes
2. Describe waste management and disposal solutions
3. Explain pollution and its remedies

UNIT 9.1: Types of waste

Unit Objectives

By the end of this unit, the participants will be able to:

1. List the different types of waste

9.1.1 The Different Types of Wastes

Unwanted, trash, rubbish, excess, superfluous, scrap, extra, rework, unused- there are so many synonyms for waste.

There are different types of waste which are recyclable or non-recyclable. Recycling of waste depends on the scientific progression as well knowledge about different kind of waste handling. Below are lists of different type of waste.

Recyclable waste	Non-recyclable waste
1. Concrete 2. Steel 3. Aluminium 4. Plastic (PET) 5. Newspapers 6. Corrugated Cardboard 7. Plastics (HDPE) 8. Glass 9. Mixed Papers 10. Used Motor Oil 11. Used oil from food industry	1. Garbage. Mixture of different of garbage makes it hard to recycle. 2. Food-tainted items (such as: used paper plates or boxes, paper towels, or paper napkins) 3. Ceramics and kitchenware. 4. Windows and mirrors. 5. Plastic wrap. 6. Packing peanuts and bubble wrap. 7. Wax boxes. 8. Photographs 9. Medical waste 10. Polystyrene or Styrofoam 11. Hazardous chemicals and chemical containers 12. Plastic toys or sporting goods equipment 13. Foam egg cartons 14. Wood 15. Light bulbs 16. Yard waste or garden tools

Table 9.1.1: Lists of different types of waste

'Waste' is any unwanted material. These are objects that have been discarded, either because they do not function as intended or are simply not required anymore. Waste can come in many forms: solid, liquid or even gaseous (although it's mostly solid). There are many types of waste, but the two general ones are:

- Municipal Waste
- Hazardous Waste

Municipal Waste

It consists of everyday items discarded by the population. It includes clothes, wires, glass, unwanted food and a multitude of other things. It is further sub-divided into household, commercial and demolition waste.

- Household Waste – Materials like unused food, unwanted paper, empty batteries come under this category.
- Commercial Waste – Waste collected from establishments like businesses, trading factories, schools, etc., comes under this category.
- Demolition Waste – Evident from its name, this type of waste comes from the destruction of buildings or any structure made of concrete, bricks, wood, etc.

Hazardous Waste

It refers to solid, liquid or gaseous waste that has the properties of corrosiveness, ignitability, reactivity and toxicity. Proper disposal and treatment of this waste are necessary as it is unsafe for the well-being and the environment at large. It is further sub-divided into industrial and biomedical waste.

Fig. 9.1.1: Hazardous wastes

- Industrial Waste – Waste produced by industries such as chemicals, pigments, ashes, metals, etc., come under this category.
- Also cafeteria garbage, dirt and gravel, masonry and concrete, scrap metals, trash, oil, solvents.
- Biomedical Waste – Waste coming from medical facilities such as hospitals, medical colleges, research centres etc., come under this category.

  PPE kits also consider as biochemical waste (specially now a days)

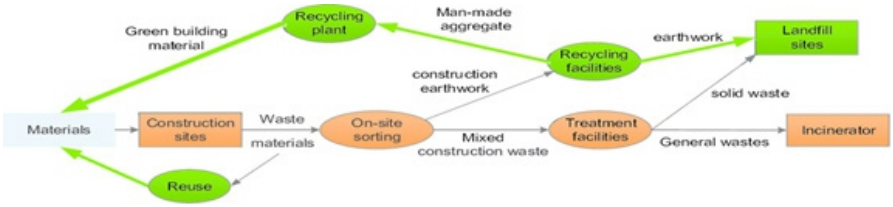

Fig. 9.1.2: Ways to process industrial and biomedical wastes

Significance of Different Coloured Dustbins

Colour coding of waste bin help us to understand which waste can be reuse or recycle and which waste need to dump. It also eliminates the amount waste through segregation process. Disposition process of waste can be defined based on different type of waste. Some waste can be dumped to land fill as it will not impact the soil quality such as food waste (onion, potato skin) as it act as fertilizer whereas industrial waste such as oil, batteries, chemical can't be dumped in land fill as it is hazardous to the soil property. It means if the wastes were separated in the 1st place then it will prevent or reduce any kind of negative impact to the environment due to waste disposition process.

Ideally every place where we discard waste should have three bins.

GREEN – for wet waste, which comes from the kitchen/cooking/food, goes to one bin.

BLUE – Dry recyclable waste such as newspapers, cardboard, packing plastics, bottles, cans, etc., should go to a different bin.

RED – Reject waste, which does not belong to the above two categories, including biowaste like diapers and bandages should go into a third bin.

All over the world, three-way segregation of waste is followed, and it is primarily instituted with some form of colour coding. It works just like the way traffic lights are coded in people's minds.

Govt authorised vendor details for different waste disposal solution-

There are many industries those are known for waste collection and disposal process approved by Indian govt. through registration process.

S No.	Registered PRO	Issued PRO Certificate
1	M/s. Attero Recycling Private Limited, H-59, Sector 63, Noida, UP-201301	11.10.2018
2	M/s. Auctus E Recycling Solutions Pvt. Ltd. A-58, Udyog Kendra-1, Ecotech-III, Village Habibpur, Noida-Dadri Road, Surajpur, Greater Noida (UP) 201306	12.11.2018
3	M/s Earth Sense Recycle Pvt. Ltd., Plot No:37, TSIIC Industrial Park, Mankhal, Maheshwaram Mandal, Rangareddy Dist., Telangana-501359	11.10.2018
4	M/s EPR Compliance Pvt. Ltd., 422, The Summit Business Bay, Andheri Kurla Road, Near WEH Metro Station, Andheri (East), Mumbai-93	12.11.2018
5	M/s Hulladek Recycling Pvt. Ltd., 4 D.L. Khan Road, Block B, Flat-401, 4th Floor, Kolkata-700025	12.11.2018
6	M/s Karo Sambhav Private Limited, 408-409, Fourth Floor, Suncity Business Tower, Sector-54, Golf Course Road, Gurugram-122002, Haryana	29.08.2018
7	M/s Mahalaxmi Metalloys India Private Limited, Plot No. 87, 91/92, Sikhera Road Industrial Area, Modinagar, Dist. Ghaziabad (U.P.)201204	23.10.2018
8	M/s Pegasus Support System Pvt. Ltd, F- 6, 1st Floor, 4648/1, 21, Ansari Road, Daryaganj, New Delhi 110002	14.09.2018
9	M/s Pro Connect, G-7, New Market, Near Khasa Kothi Circle, Jaipur-302016 Rajasthan	12.11.2018
10	M/s R2 PRO Pvt. Ltd., B03-Jain Height-Altura, Kalkondrahalli, Sarjapur Road, Banglore-560102	23.10.2018

Fig. 9.1.3 : Examples of waste collecting vendors

UNIT 9.2: Waste Management and Disposal Solutions

Unit Objectives

By the end of this unit, the participants will be able to:

1. Describe waste management and disposal solutions

9.2.1 Waste Management and Disposal Solutions

Waste management includes the activities as well as actions required to manage waste from its inception to its end disposal. This involves the disposal, collection, transport, and treatment of waste, together with regulation and monitoring of the waste management procedure and waste-related laws, technologies, as well as economic mechanisms.

Proper management of waste is significant for building sustainable and liveable cities, yet it remains a challenge for many developing countries and cities. A large portion of the practices of waste management deal with municipal solid waste, which stands to be the bulk of the waste that is produced by household, industrial, and commercial activity.

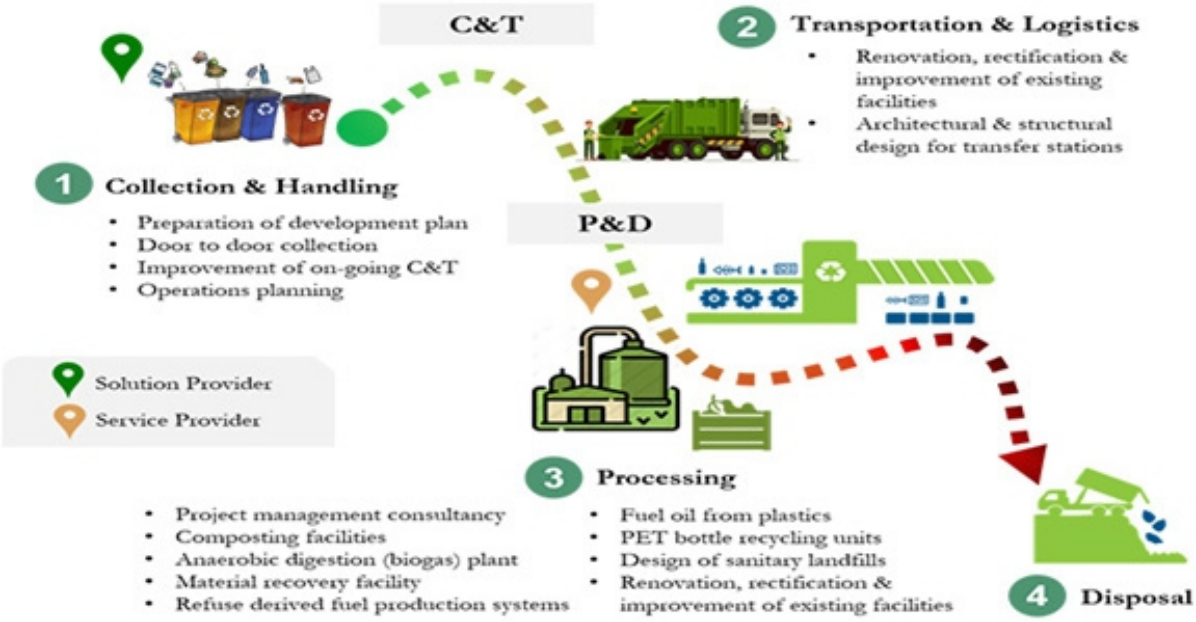

Fig. 9.2.1: Waste management and disposal solutions

Turn Away from Single-Use Plastics

A few instances of these include plastic straws, sanitary napkins, take-out containers etc. There are plenty of reusable alternatives to them, like glass and metal straws.

One good manner of doing this is by shopping at bulk stores and zero-waste stores that provide products without packaging. A good practice is to carry around a reusable bag, metal straw and a stainless steel bottle to cut the dependencies on polluting stuff.

Fig. 9.2.2: Waste Management Hierarchy

Conventional Technologies

It is apparent that certain technologies are no longer applicable to modern waste reduction as well as recycling, but some organizations continue to rely on them because they appear to be cheap. However, more technologies are evolving or being created to solve waste management problems. These technologies can be used to recycle or up cycle waste, creates alternatives from products that normally produce more waste, or find a way to address the ever-growing problem of waste management.

There is seen to be plenty of this technology, including plastic-free shampoo pods and toothpaste pills, machines that sustainably remove waste from bodies of water.

UNIT 9.3: Pollution and Remedies

Unit Objectives

By the end of this unit, the participants will be able to:

1. Explain pollution and its remedies

9.3.1 Pollution and Its Remedies

Today, the air is becoming foul, water is no longer clean, and forests are being cut down unscrupulously. Pollution in and of itself is difficult to define. The term is derived from the Latin word "polluere", which means 'to contaminate any feature of the environment. It may be broadly said to be 'adding to the environment a capably hazardous source or substance of energy faster than the environment can accommodate in it.

Methods to Counteract Pollution

Pollution prevention is considered as any action that reduces the number of contaminants released into the environment. Implementation of such processes reduces the severity and/or a number of hazards posed to both public health and the environment. If companies produce less waste, they do not have to worry about proper disposal. Some common methods for controlling pollution are:

- Reducing, Reusing, Recycling and Mitigating.
- Water pollution is capable of being controlled by using non-toxic soaps, detergents and cleaning products.
- Limiting the use of artificial fertilizers and pesticides helps in controlling soil and water pollution.
- Promoting and enforcing the use of biological methods for pest control.
- Chimneys should be longer in length so that polluting air is released high up in the atmosphere where it would not harm the surrounding environment.
- Automobiles should be installed with emission and pollution control systems.
- The timely servicing of automobiles also checks for air pollution.
- Carpooling and public transportation should be encouraged.
- Alternative sources of energy like wind, sun, water, geothermal should be harnessed and put to use.

Summary

- 'Waste' is any unwanted or un-useful material.
- Municipal wastes consist of everyday items discarded by the population.
- Hazardous waste refers to solid, liquid or gaseous waste that has the properties of corrosiveness, ignitability, reactivity and toxicity.
- Waste management includes the activities as well as actions required to manage waste from its in-ception to its end disposal.
- Proper management of waste is significant for building sustainable and liveable cities, yet it re-mains a challenge for many developing countries and cities.
- The biosphere and ecosystem are self-sustaining, and nature maintains a balance between the land, water, air and living organisms.
- The term "pollution" is derived from the Latin word "polluere", which means 'to contaminate any feature of the environment.
- Pollution prevention is considered as any action that reduces the number of contaminants re-leased into the environment.

Exercise

A. Answer the following questions briefly.

1. Which one stands to be a general type of waste?
   A. Commercial waste
   B. Hazardous waste
   C. Household waste
   D. Demolition waste

2. Which one is the type of hydrocarbon-eating bacteria that feed on oil?
   A. Alcanivorax borkumensis
   B. Bacillus
   C. Spirillum
   D. Vibrio

3. _____, reusing, recycling and mitigating helps in pollution reduction.
   A. Reducing
   B. Reinstalling
   C. Redeeming
   D. Reinvolving

4. The Latin term for pollution is _____
   A. pollueme
   B. polluese
   C. polluere
   D. polluete

5. _____ waste comes from medical facilities.
   A. Municipal
   B. Biomedical
   C. Industrial
   D. Commercial

B. Answer the following questions by choosing the correct option:

1. What are the differences between recyclable waste and non- recyclable waste?
2. What are two general types of wastes?
3. What stand to be the significance of the different colored dustbins?
4. Outline the responsible waste management hierarchy.
5. What are the methods for controlling pollution?

Notes

Annexure - I

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Chapter – 2 Design, develop and implement Food Safety Management System (FSMS)	Unit 2.1 Fundamentals of GMP/GHP Criteria for Food	2.1.1 Importance of Good Manufacturing Prac	101	M-30.Good Manufacturing Practices (GMP)
Chapter – 2 Design, develop and implement Food Safety Management System (FSMS)	UNIT 2.1: Fundamentals of GMP/GHP Criteria for Food	2.1.1 Importance of Good Manufacturing Prac_ces in the Food Industry	101	Food Safety and Standards Act (FSS Act)
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