FICSI
Food Industry Capacity and Skill Initiative

Participant Handbook

Sector
Food Processing

Sub-Sector
Bread and Bakery

Occupation
Processing-Packaged Foods

Reference ID: **FIC/Q5007, Version 3.0**
NSQF level 3

Traditional Snack and Savoury Maker

Published by

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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

COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

FOOD INDUSTRY CAPACITY & SKILL INITIATIVE

for

SKILLING CONTENT: PARTICIPANT HANDBOOK

Complying to National Occupational Standards of

Job Role/Qualification Pack: **'Traditional Snack and Savoury Maker'**
QP Code: 'FIC/Q5007 NSQF Level 3'

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This participant handbook is dedicated to all the aspiring youth who desire to achieve special skills which would be a lifelong asset for their future endeavors and help them make a bright career in the Food Processing Sector.

FICSI is thankful to all organisations and individuals who have helped us in preparation of this participant handbook.

We also wish to extend our gratitude to all those who reviewed the content and provided valuable inputs for improving the quality, coherence, and content presentation of chapters.

About this book

This book is designed to provide skill training and/or upgrade the knowledge and basic skills to take up the job of 'Traditional Snacks and Savory Maker' in 'Food Processing' sector. All the activities carried out by a specialist are covered in this course. Upon successful completion of this course the candidate will be eligible to work as Traditional Snacks and Savory Maker in a related Unit.

This Participant Handbook is designed to enable training for the specific Qualification Pack (QP). Each National Occupational Standards (NOS) is covered across Unit/s.

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

- Prepare and maintain work area and process machineries for making snack and savoury
- Prepare for production of snack and savoury
- Prepare raw material for snack and savoury
- Prepare snack and savoury products
- Complete documentation and record keeping related to making traditional snack and savoury
- Ensure food safety hygiene and sanitation for processing food products
- DGT/VSQ/N0101: Employability Skills

Symbol Used


Key Learning Outcomes


Steps


Exercise


Tips


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Objectives

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Unit 1.5 – Workplace Ethics

FIC/N8501

Key Learning Outcomes

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

1. Explain the purpose of training;
2. Discuss the National Occupation Standards and the Qualification Pack;
3. Define food processing;
4. List the various sectors of the food processing industry;
5. Describe the various stages of food processing for converting raw materials to food products;
6. State the processes and activities of the Snack and Savoury industry;
7. State the job responsibilities and duties of a traditional snack and savoury maker;
8. State the SOP of the organisation for smooth execution of work;
9. State how to conduct yourself at a workplace;
10. Undertake a self assessment test;
11. Identify personal strengths and weaknesses.

UNIT 1.1: Introduction to the Training Programme

Unit Objectives

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

1. Explain the purpose of training;
2. Discuss the National Occupation Standards and the Qualification Pack.

1.1.1 Purpose and Benefits of the Training Programme

This training program is developed to impart specific skills to individuals who wish to work as a Traditional Snack and Savoury Maker. The training program is based upon the national occupation standards for the food processing sector. The National occupation standards have been described in the following subsection of this chapter.

The training program will enable an individual to:

- make various types of snacks and savoury products and carry out various related activities;
- select and use relevant tools and equipment for cleaning, grinding, sieving, mixing, cooking, heating, cooling, blending, packaging and storing;
- work effectively in a team to deliver desired results at the workplace;
- plan and organise production of savoury products to meet expected outcomes;
- work according to personal health, safety, and environmental protocol at the food processing site.

After successful completion of training and passing the assessment, you will be issued a certificate.

Fig. 1.1.1. Skill cards

1.1.2 Introduction to QP and NOS

This training programme is intended for imparting basic skill and knowledge relevant to the job role, required to perform at a food processing industry. This programme is based on qualification pack called Traditional Snack and Savoury Maker. The Qualification Pack Code for Traditional Snack and Savoury Maker is FIC/Q8501. This is also called a QP.

A QP consists of a set of National Occupational Standards (NOS). NOS specify the standard competency a worker must achieve when carrying out a function at the workplace.

Under Traditional Snack and Savoury Maker QP, there are six NOSs which detail the functions to be performed at work site as a Traditional Snack and Savoury Maker.

NOS Code	Major Function/Task
FIC/N8501	Prepare and maintain work area and process machineries for making snack and savoury
FIC/N8502	Prepare for production of various snack and savouries by planning production, machinery utilisation and manpower requirement, and organising raw materials, packaging materials and machineries for production
FIC/N8503	Prepare raw materials for various types of snack and savouries using various machineries as per the organisation standards and specifications
FIC/N8504	Produce various snack and savouries from different raw materials using various machineries as per the organisation standards and specifications
FIC/N8505	Documenting and maintaining records on raw materials, process and finished products, related to making of traditional snack and savoury
FIC/N9001	Ensure food safety hygiene and sanitation in work area and processing unit for processing food products

UNIT 1.2: Introduction to the Food Processing Industry

Unit Objectives

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

1. Define food processing;
2. List the various sectors of the food processing industry;
3. Describe the various stages of food processing for converting raw materials to food products.

1.2.1 Food Processing

Agriculture is the backbone of the Indian economy. The produce from various agriculture-based occupations is primarily used for consumption within the country. It is exported to different parts of the world as well. Agricultural produce is also used as raw material in the food processing industry.

Food processing is the method used to convert raw materials into food products. They could be processed foods, ready-to-eat foods, food additives or foods used to prepare other food products. Besides food processing, the food industry also relies on food preservation as an important method to store food products for longer periods.

The food processing industry in India is divided into several sub-sectors. They are:

Fig. 1.2.1. Sub-Sectors of Food Processing Industry

The Indian food industry is a star sector in India with bright prospects for growth and development. The Indian food and grocery market is the sixth-largest in the world. The food industry, particularly the food processing sector in India, has shown immense potential due to its quick-paced growth. Food processing ranks fifth in the country in terms of its production, growth, export, and consumption. One of the recent trends that is seen in this sector is ordering food online. Even though this segment is still in its early stages of development, it is growing at an increasingly fast pace.

The food industry is implementing stringent food safety and quality measures in order to attract more investors and ensure the safety of its existing consumers. All these factors will have a positive impact on the way the sector functions and also on the job market in the country.

Women have always been associated with preparing food for the family or the household, but in modern times women are breaking this stereotype and turning entrepreneurs in this sector. Women are also becoming professional chefs and bakers, and contributing to the economy and towards the sector.

1.2.2 Journey of Food from Harvest to Consumer

The following chart shows the journey food material goes through to become final, consumable product to various customers.

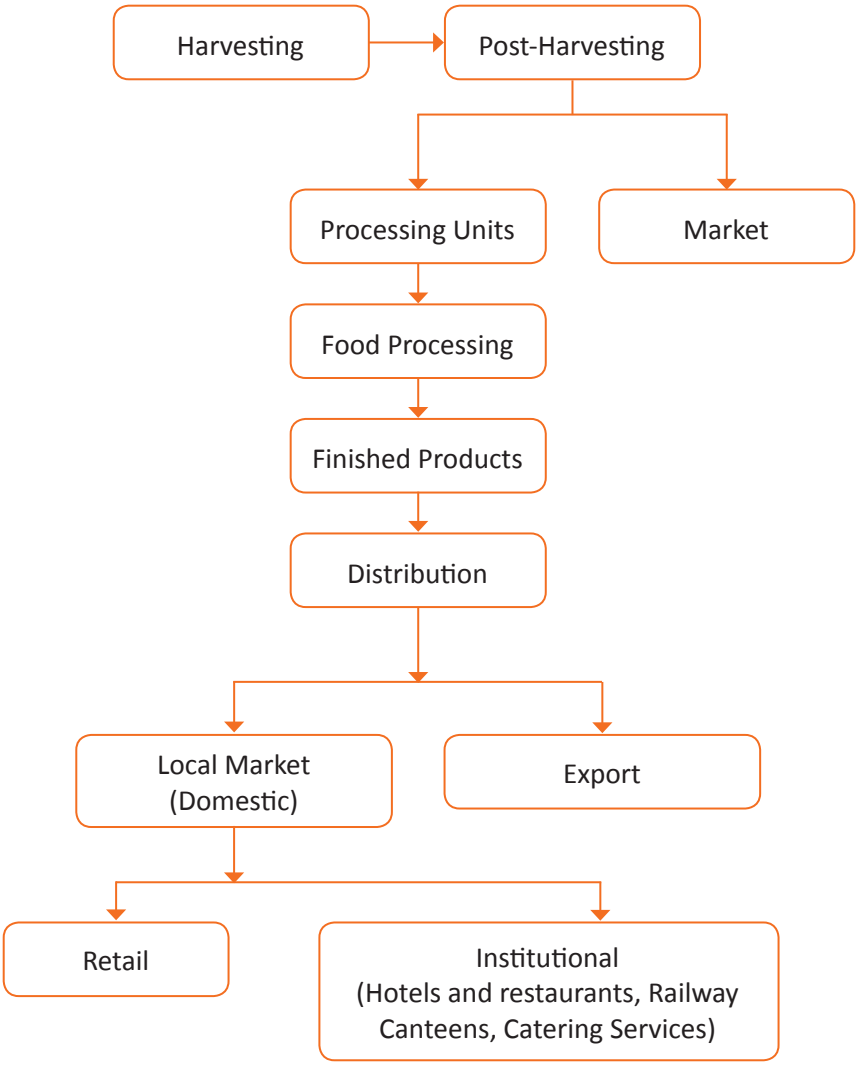

Fig. 1.2.2. Journey of harvested food

UNIT 1.3: Overview of Snacks and Savoury Industry

Unit Objectives

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

1. State the processes and activities of the Snack and Savoury industry.

1.3.1 Snack Food

- A snack is a portion of food, often smaller than a regular meal, generally eaten between meals.
- Snacks come in a variety of forms including packaged snack foods and other processed foods, as well as items made from fresh ingredients at home.
- Traditionally snacks are prepared from ingredients commonly available in the home.
- Savoury means "not sweet". "Savour" can also mean the characteristic taste of something.
- Food that is savoury does not taste sweet.
- The savoury course of a meal may have meat or fish and vegetables. This may be followed by a sweet course i.e. "pudding" or "dessert".

Examples:

Fig. 1.3.1. Burfee

Fig. 1.3.2. Kachori

Fig. 1.3.3. Murukku (Chakli)

Fig. 1.3.4. Samosa

Fig. 1.3.5. Laddu

Fig. 1.3.6. Pakora

Fig. 1.3.7. Petha

Fig. 1.3.8. Rasgulla

Fig. 1.3.9. Salted peanuts

Fig. 1.3.10. Sonpapdi

Fig. 1.3.11. Gulab-jamun

Fig. 1.3.12. Khakhra

UNIT 1.4: Attributes of a Traditional Snack and Savoury Maker

Unit Objectives

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

1. State the job responsibilities and duties of a traditional snack and savoury maker.

1.4.1 Traditional Snacks and Savoury Maker

As a traditional snacks and savoury maker, you will have to demonstrate the following roles and responsibilities at workplace:

Roles	Responsibilities
Handle raw material from the time of receipt till it reaches the process line	• Check the raw material for quality • Ensure minimum loss of raw material
Record-keeping and documentation	• Document and maintain records of raw materials, production schedule, and process • Document and maintain records of finished products
Hygiene and sanitation maintenance	• Adopt safety and sanitation-related measures • Follow food safety norms and practices
Operate processing equipment and machineries	• Optimize the use of machinery • Ensure smooth operation of machinery to complete production line
Inspect machines and troubleshoot issues	• Ensure smooth operation of machinery to complete production line • Optimize the use of machinery • Attend to minor repairs of tools and machinery when required • Ensure that safety rules and regulations are observed • Prevent accidents • Inform issues to the supervisor
Plan and execute the production process	• Examine products at different stages of production • Adhere to Good Manufacturing Practices (GMP) • Inspect intermediate as well as finished products • Ensure conformance of quality as per organisational standards
Follow storage and packaging norms	• Ensure safe and proper storage of raw material, packaging material, and finished goods
Professional Skills	• Planning and organising the work order according to situations • Utilise the time proper on work place • Use common sense and make judgments on day to day basis • Support the supervisor in scheduling tasks for helper • Identifying the problem and handling issues • Complete the assigned tasks with minimum supervision

UNIT 1.5: Workplace Ethics

Unit Objectives

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

1. State the SOP of the organisation for smooth execution of work;
2. State how to conduct yourself at a workplace.

1.5.1 What are Standard Operating Procedures?

SOP or Standard Operating Procedures is a set of written instructions that document a food manufacturer's routine or repetitive activity. Specific to food manufacturing plants, the term SOP is commonly applicable to production, manufacturing and support area processes, jobs or activities.

1.5.2 What does SOP include?

- Good Manufacturing Practices
- Label review
- Residual chemical testing
- Raw material testing
- Sanitation
- Housekeeping
- Product process design
- Rework
- Hold and release
- Recall procedures
- Storage
- Training
- Product sequencing
- Traceability
- Supplier approval

1.5.3 Benefits of SOPs

- Serve as the basis for implementing an effective program to include employee training as well as a tool for on-the-floor coaching and development
- Identify control points, as well as their limits, to control and validate the process. Corrective actions and preventive actions can be identified in order to address each
- Establish time, labour and material requirements for a job or task
- Be used as checklists by internal audit team members when auditing the plant's programs and procedures
- Ultimately, the benefits of a valid SOP are reduced work effort, along with improved comparability, credibility and legal defensibility

1.5.4 How to Conduct yourself at a Workplace?

Workplace ethics are a set of guidelines that are followed to ensure smooth and effective functioning of a workplace. Some important ones to remember are:

- Address seniors, assistants, and workers with respect
- Follow the processes laid out in the manufacturing unit
- Follow food safety norms at all times
- Do not compromise with the quality of the product at any given cost
- Perform your work with complete honesty
- Perform your roles and responsibility with integrity
- Be a team player

Fig. 1.5.1. Workers taking orders

Fig. 1.5.2. Checklist

Cleaning and Sanitising

1. Pre-cleaning - scrape and rinse to remove left over food items
2. Wash - use cleaning agent to remove stuck-on food.
3. Rinse - to remove food and cleaning agents
4. Sanitise - to kill bacteria and viruses
5. Air Dry - allow to dry

Fig. 1.5.3. Cleaning and sanitising process

Notes

Scan the QR codes or click on the link to watch the related videos

Overview of Food processing industry

https://www.youtube.com/watch?v=J-2EiMVNtpM&t=11s

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National
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Transforming the skill landscape

2. Food Safety, Hygiene and Sanitation for Processing Food Products

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FIC/N9001

Key Learning Outcomes

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

1. State the personal hygiene and sanitation guidelines;
2. State the food safety hygiene standards to follow in a work environment;
3. List the different sanitisers used in the process area;
4. Follow health and safety practices in the work area;
5. State the importance of safety, hygiene, and sanitation in the snacks and savoury industry;
6. Follow the industry standards to maintain a safe and hygienic workplace;
7. Follow HACCP principles to eliminate food safety hazards in the process and products;
8. State the types of food microbes;
9. State the causes for food spoilage;
10. State the process for food spoilage;
11. State the criteria to check food spoilage;
12. State the need for food preservation;
13. State the different types of food preservation processes.

UNIT 2.1: Sanitation and Hygiene

Unit Objectives

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

1. State the personal hygiene and sanitation guidelines;
2. State the food safety hygiene standards to follow in a work environment;
3. List the different sanitisers used in the process area.

2.1.1 Personal Sanitation

Sanitation and hygiene are the most important aspects to take care of when working in a food processing area. Some important sanitation and hygiene practices that must be followed are:

Maintain a high standard of personal cleanliness viz. have a bath every day and wear clean clothes to work.

Wear Personal Protective Equipment (PPE) such as aprons, mouth mask, head cover, face mask, hand gloves, gum boots, and beard cover mask at all times during work hours.

Always keep your finger nails trimmed.

Always keep your hair trimmed and wear a hair net while working.

Fig. 2.1.1. Personal sanitation

Fig. 2.1.2. Washing hands with soap and water

Wash your hands and feet at the designated area or wash stations provided.

Wash your hands with soap and water each time before you enter the production area.

Refrain from smoking, spitting, chewing paan, sneezing or coughing over any food when in the production area.

Do not handle food when suffering from a disease, illness, burns, injury or infection.

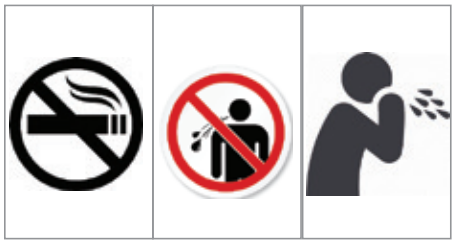


Fig. 2.1.3. Do not smoke, spit, cough

Fig. 2.1.4. Timely medical treatment

Take proper and timely medical treatment when you are ill or if you have met with an accident.

Visit a registered medical practitioner at regular intervals to keep a check on your health.

2.1.2 Sanitisers

Sanitisers are used to reduce the number of pathogens that may be found on food service equipment to safe levels. Chemical sanitisers and hot water sanitisation are both approved methods for sanitising equipment. Approved chemical sanitisers and concentrations:

- Chlorine (bleach): 50-100 ppm (200 ppm is the maximum concentration permitted; above 200 ppm is considered toxic).
- Quaternary ammonium: 200 ppm (unless otherwise specified by the manufacturer).
- Iodine: 12.5-25 ppm (Above 25 ppm is considered toxic.)
    - Minimum 10-second contact time required with chlorine sanitisers and 30 seconds for quaternary ammonia or iodine.
    - Test strips must be used to check for proper sanitiser concentrations.

For hot water sanitising, the surface of the dishes must reach 160°F. This usually means the dial must reach 180^0F.

UNIT 2.2: Safety Practises

Unit Objectives

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

1. Follow health and safety practices in the work area.

2.2.1 Symbols

There are some symbols that you must know and understand to ensure safety in case of an emergency or fire. They are:

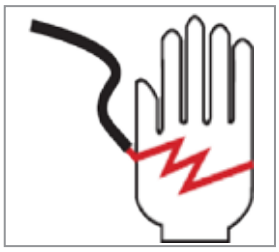
Caution

Danger Fragile Roof

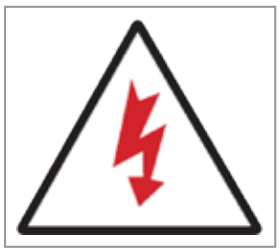
Dangerous Chemicals

Do Not Enter

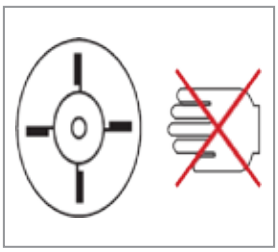
Danger Scaffolding Incomplete



Beware of Electric Shock



Electric Hazard

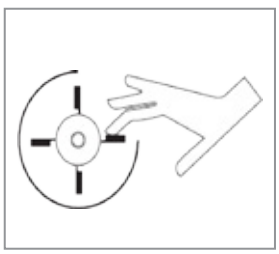


Never put your hand inside during the operation

Highly Flammable

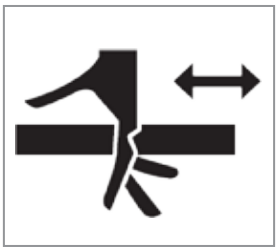
Hot surface Do Not Touch

Mind Your Head



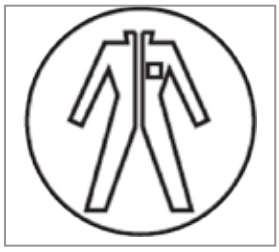
Never open the cover during the operation

Use the Dustbin



Never Touch Moving Part

Wear Eye Protection



Wear Protective Clothing

Warning Slippery Floor

This is a Tobbacco free workplace

Assembly Point

Fire Exit

Fig. 2.2.1. Safety symbols

2.2.2 Emergency Measures

During an emergency, you must follow certain measures to tackle the situation in an organised manner. These measures are:

- Do not panic
- Respond to your senior immediately or inform the matter to the concerned person
- Prepare against the emergency situation by keeping a fire bucket and a water source handy
- Evacuate the work area

After the emergency, you must:

- Report the situation to a senior or the concerned authority
- Undertake recovery measures

Fire Safety Measures

Just like emergency measures, some common fire safety measures must be followed in case of fire. They are:

- Press the closest fire alarm button (if available)
- Call the fire brigade
- Assemble at the assembly point or designated area for safety
- Evacuate the building from the closest fire exit

Types of Fire and Fire Extinguisher

Choosing the right extinguisher can preevent property damage and save lives				
Types of Fire Extinguisher → / Types of Fire ↓	Water	Foam	CO_2	Dry Chemical
A — Class A: Paper, Wood, Plastic Fabric, Rubber, Trash	✓	✓	✗	✓
B — Class B: Oil, Petrol, Some Paints and Solvents	✗	✓	✓	✓
C — Class C: Electrical Equipment, Appliances, Computers	✗	✗	✓	✓

Fig. 2.2.2. Types of Fire and Fire Extinguishers

How to use the Fire Extinguisher?

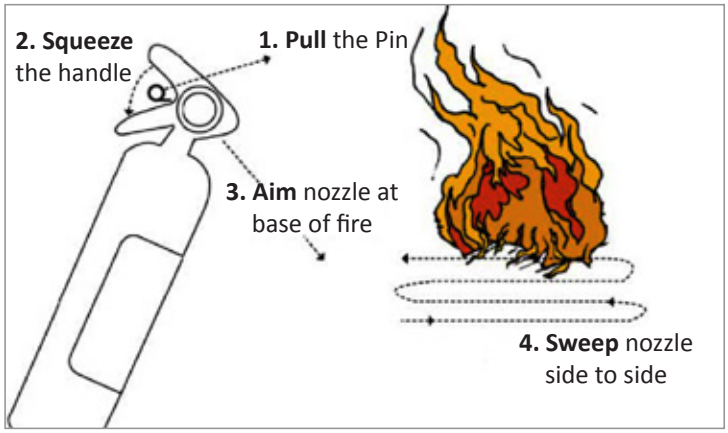


Fig. 2.2.3. Fire extinguisher

How to use the Fire Buckets?

Use the fire bucket filled with sand/water → Dump the sand/ water on the fire → Refill the fire buckets

Fig. 2.2.4. Fire bucket

UNIT 2.3: Good Manufacturing Practices

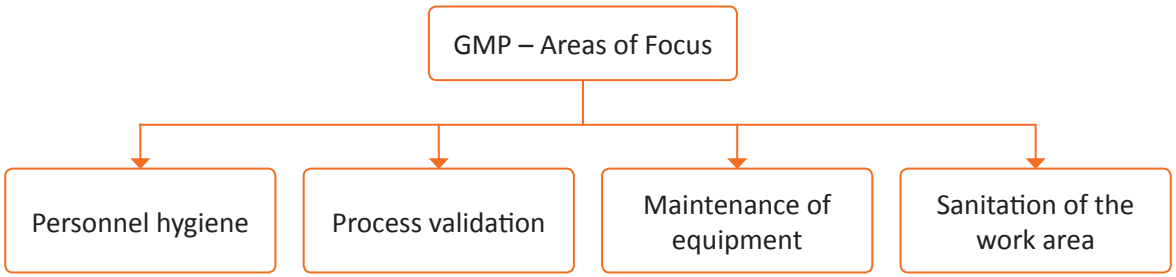
Unit Objectives

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

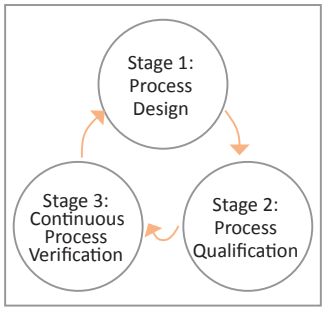
1. State the importance of safety, hygiene, and sanitation in the snacks and savoury industry;
2. Follow the industry standards to maintain a safe and hygienic workplace.

2.3.1 Good Manufacturing Practices (GMP)

GMP is a set of guidelines proposed by the Food Safety Standards Authority of India (FSSAI) to ensure the production of high quality and safe processed foods. It requires a qualitative approach towards manufacturing to reduce chances of microbial contamination, spoilage, and errors.



Area of focus	GMP
Personnel hygiene  *Fig. 2.3.1. Personnel hygiene*  *Fig. 2.3.2. Facilities for toilets*	• Your organisation follows strict hygiene and sanitation guidelines • You are provided training on Good Manufacturing Practices (GMP) • You are in a sound health condition during working hours • You follow high standards of cleanliness • Your processing unit has enough facilities for toilets and wash stations
Sanitation of the work area  *Fig. 2.3.3. Designated area for keeping utensils*  *Fig. 2.3.4. Sanitation of the work area*	• The processing unit where you work is located in a clean, pollution-free area • The entire processing unit is well ventilated and has adequate lighting • The entire work area follows high standards of cleaning and sanitisation • There is a designated area for keeping utensils and equipment. It is kept clean and pest-free at all times

Equipment maintenance  *Fig. 2.3.5. Equipment maintenance*  *Fig. 2.3.6. Monthly schedule*	• The equipment used for processing foods is protected against contamination from lubricants, metal fragments, fuel, and contaminated water • The cleaning and maintenance of tools, materials, and equipment is an easy process • The organisation follows a cleaning and sanitising drill as per daily, weekly, and monthly schedules
Process validation  *Fig. 2.3.7. Process validation*  *Fig. 2.3.8. Quality checks*	• All processes of production, like raw material procurement, execution, storage, packaging, and logistics follow strict organisational parameters • Quality checks are conducted at each step of production. This helps to ensure that food quality is maintained as per prescribed norms and standards • The stock rotation of finished product follows the FEFO and FIFO methods. This is to ensure that there is a minimum chance of food spoilage. It will also help to retain the taste of processed foods

UNIT 2.4: Hazard Analysis and Critical Control Point (HACCP)

Unit Objectives

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

1. Follow HACCP principles to eliminate food safety hazards in the process and products.

2.4.1 What is HACCP?

Hazard Analysis and Critical Control Point (HACCP) is an international food safety regulation that is followed to reduce the risk of hazards in a snack making unit. It is a system that identifies possible hazards and controls them at various points of the production process. The HACCP is based on seven principles. They are:

Conduct a hazard analysis

- Evaluate the production process and identify the points where hazards (physical, chemical, and biological) may be introduced

Identify critical control points

- Identify the critical points in the process plan where a hazard may occur
- Plan preventive measures at that critical point to control the risk

Establish critical limits

- State the boundary line between safe and unsafe processes
- State the limit until which a critical point maybe controlled

Establish a monitoring system

- State the process of monitoring critical points and critical limits

Establish corrective measures

- Specify the corrective actions that should be followed when critical limits are crossed

State verification procedures

- State the verification process to check whether HACCP principles are applied and followed
- Test the HACCP plan and ensure compliance on a regular basis
- Check whether the HACCP plan helps to prevent hazards effectively

Follow record-keeping procedures

- Keep records of all the critical points
- Maintain a log of situations when critical limits were exceeded
- State the corrective measures that were applied
- Include records of the development and maintenance of the system

Example of an HACCP Plan

Operational step	Hazard	Control measure	Critical limit	Monitoring method	Corrective action	Responsibility	Record
Procure-ment of raw material	Physical (dirt, stone particles)	Supplier guarantee specifications established by quality assurance department	As per company internal specifications	Supplier guarantee certificate is visually confirmed	Reject materials if not accompanied by supplier guarantee	Store manager	Supplier guarantee
	Chemical (toxins, pesticides from raw material)	Relative humidity of the store to be maintained					
	Microbiological (high microbiological load of raw materials, presence of pathogenic bacteria)	FIFO system should be established		Monitor temperature and humidity of storage			Store temperature logs

UNIT 2.5: Introduction to Food Microbiology

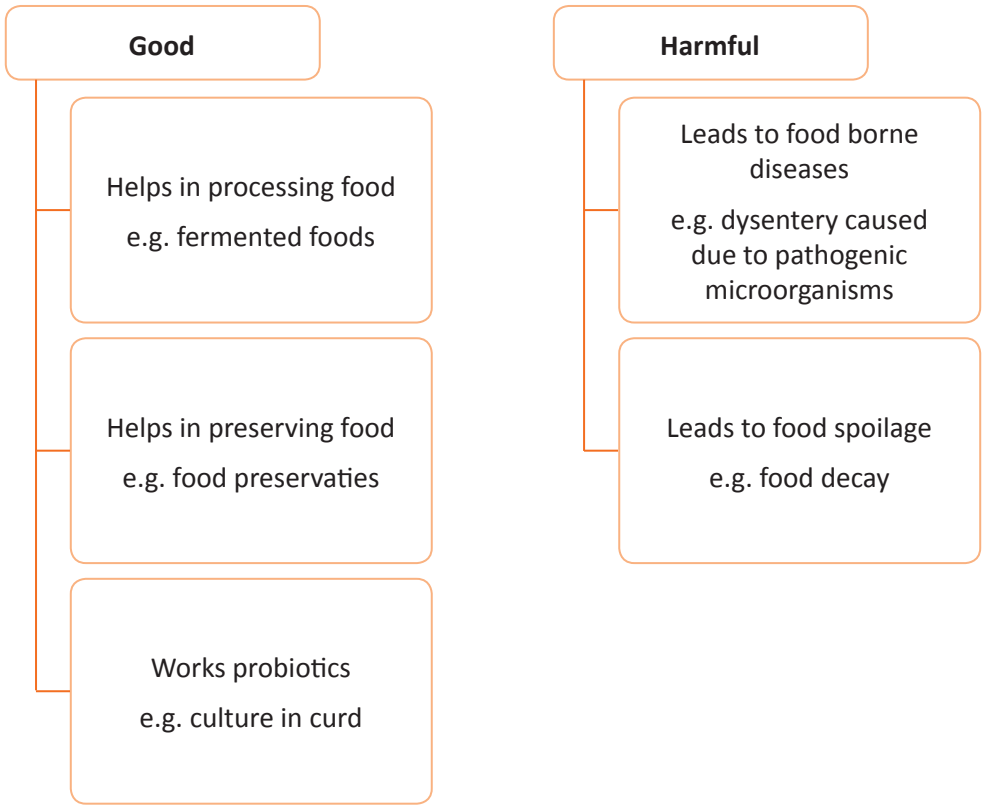
Unit Objectives

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

1. State the types of food microbes;
2. State the causes for food spoilage;
3. State the process for food spoilage;
4. State the criteria to check food spoilage;
5. State the need for food preservation;
6. State the different types of food preservation processes.

2.5.1 What is Food Microbiology?

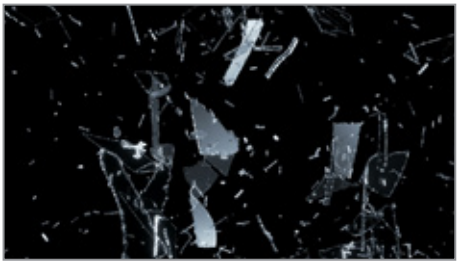
Food microbiology is the study of microorganisms found in food products. Microorganisms are classified as:



2.5.2 Types of Food Contaminants

Food spoilage is the process by which the original nutritional value, texture, flavours, and the form of food is damaged. The food then becomes harmful and unsuitable for human consumption.

Some types of contaminants in foods are:

Types of contaminants	Examples
Microbial	Bacteria, moulds, yeasts, viruses, etc.  *Fig. 2.5.1. Microbial Contaminants*  *Fig. 2.5.2. Microbial Contaminants*
Biological	Hair, excreta, bone splinters, etc.  *Fig. 2.5.3. Biological Contaminants*  *Fig. 2.5.4. Biological Contaminants*
Chemical	Pesticide residues, detergents, etc.  *Fig. 2.5.5. Chemical Contaminants*  *Fig. 2.5.6. Chemical Contaminants*
Physical	Bolts from machinery, stones, glass, etc.  *Fig. 2.5.7. Physical Contaminants*  *Fig. 2.5.8. Physical Contaminants*

Process of Food Spoilage

The following process chart shows how food spoilage takes place:

Microorganisms enter food

↓

Microorganisms use food as source of nutrients and multiply

↓

Microorganisms produce enzymatic changes

↓

Enzymatic changes affect the flavours, texture, shape/form, colour and odour of the food

↓

Leads to food spoilage

Fig. 2.5.9. Insects in grains

Fig. 2.5.10. Insects in flour

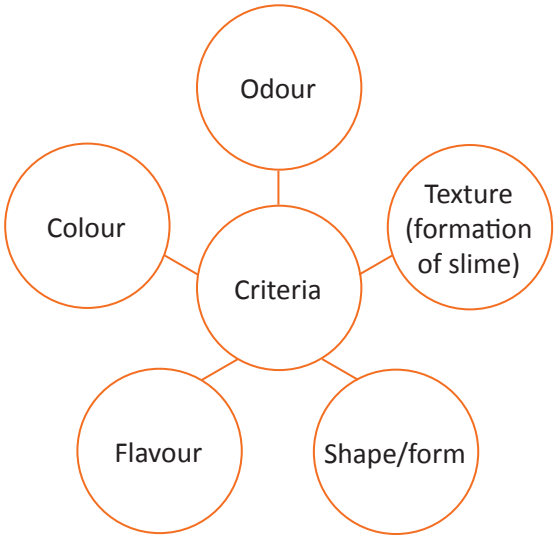
Classification of Food Based on Spoilage

The following table shows how food is classified based on spoilage:

Non-perishable foods	Semi-perishable foods	Perishable foods
Does not spoil unless handled carelessly E.g.: Sugar	Spoils only if handled carelessly or stored improperly E.g.: Potatoes	Spoils readily and needs to be stored with special preservatives/processes E.g.: Milk

Criteria to Check Food Spoilage

This chart will help you to check food spoilage based on the parameters listed below:



2.5.3 What is Food Preservation?

Food preservation is the process by which processed and unprocessed food is protected against microbes, spoiling agents, and contaminants. The objective of preserving processed food is to:

- Retain the original nutritive value
- Retain the original colour
- Retain the original flavour
- Retain the original texture of the food
- Extend the shelf life of the food
- Ensure year-round availability
- Prevent or delay spoilage

Common Methods of Food Preservation

The most commonly followed methods of food preservation are:

- Fresh storage
- Cold storage
- Freezing
- Drying/dehydration
- Concentration
- Chemical preservation
- Preservation with sugar
- Pasteurisation
- Sterilisation
- Filtration
- Irradiation
- Curing
- Fermentation
- Salting

Exercise

1. Identify the correct focus area of GMP from the list given below. Mark the correct option

GMP	Area of Focus	
a. All processes of production like raw material procurement, execution, storage, packaging, and logistics follow strict organisational parameters.	Personnel hygiene Sanitation of the work area Equipment maintenance Process validation	☐ ☐ ☐ ☐
b. The equipment used for processing foods is protected against contamination from lubricants, metal fragments, fuel, and contaminated water.	Personnel hygiene Sanitation of the work area Equipment maintenance Process validation	☐ ☐ ☐ ☐

GMP	Area of Focus	
c. Your processing unit has enough facilities for toilets and wash stations.	Personnel hygiene Sanitation of the work area Equipment maintenance Process validation	☐ ☐ ☐ ☐
d. The entire work area follows high standards of cleaning and sanitisation.	Personnel hygiene Sanitation of the work area Equipment maintenance Process validation	☐ ☐ ☐ ☐
e. The entire processing unit is well ventilated and has adequate lighting.	Personnel hygiene Sanitation of the work area Equipment maintenance Process validation	☐ ☐ ☐ ☐
f. The organisation follows a cleaning and sanitising drill as per daily, weekly, and monthly schedules.	Personnel hygiene Sanitation of the work area Equipment maintenance Process validation	☐ ☐ ☐ ☐
g. You are provided training on Good Manufacturing Practices (GMP).	Personnel hygiene Sanitation of the work area Equipment maintenance Process validation	☐ ☐ ☐ ☐
h. You are in sound health condition during working hours.	Personnel hygiene Sanitation of the work area Equipment maintenance Process validation	☐ ☐ ☐ ☐

2. Match the columns

Hazard Analysis	HACCP Principle
a. Plan preventive measures at that critical point to control the risk	i. Follow record-keeping procedures
b. State the boundary line between safe and unsafe processes	ii. State verification procedures
c. Specify the corrective actions that should be followed when critical limits are crossed	iii. Establish critical limits
d. Test the HACCP plan and ensure compliance on a regular basis	iv. Establish a monitoring system
e. Maintain a log of situations when critical limits were exceeded	v. Conduct a hazard analysis
f. Evaluate the production process and identify the points where hazards may be introduced	vi. Identify critical control points
g. State the process of monitoring critical points and critical limits	vii. Establish corrective measures

Notes

Scan the QR codes or click on the link to watch the related videos

GHP,GMP & HACCP

https://www.youtube.com/watch?v=RS4A-uczS6E&t=554s

Personnel hygiene and employee facilities

https://www.youtube.com/watch?v=daNjRoP_I0c&t=87s

Hygiene and sanitation

https://www.youtube.com/watch?v=daNjRoP_I0c&t=83s

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3. Prepare and Maintain Work Area and Process Machineries for Making Snack and Savoury

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Unit 3.1 – Equipment used in Processing Snack and Savoury

Unit 3.2 – Sanitisation of Work Area

Unit 3.3 – Cleaning Processes

FIC/N8501

Key Learning Outcomes

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

1. State the various types of machineries used in processing;
2. State the process of maintaining equipment;
3. State the materials and equipment used in cleaning and maintenance of the work area and machineries;
4. List the various cleaning chemicals required;
5. State the cleaning processes used to clean the work area and process machineries.

UNIT 3.1: Equipment used in Processing Snack and Savoury

Unit Objectives

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

1. State the various types of machineries used in processing;
2. State the process of maintaining equipment.

3.1.1 Machineries required for Preparing Snacks

Fig. 3.1.1. Peelers

Fig. 3.1.2. Visual inspection

Fig. 3.1.3. Slicers

Fig. 3.1.4. Fryer

Fig. 3.1.5. Conveyor/elevator

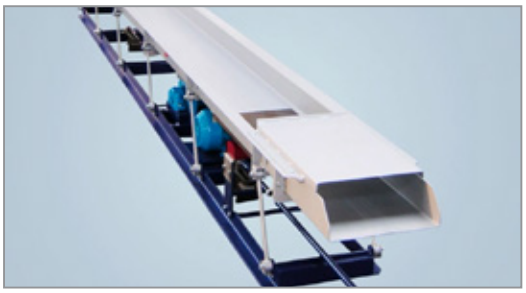


Fig. 3.1.6. Vibration conveying

Fig. 3.1.7. Colour inspection

Fig. 3.1.8. Flavour auger & drum

Fig. 3.1.9. Metal detector

Fig. 3.1.10. Checkweigher reject system

Fig. 3.1.11. Multipack/case forming

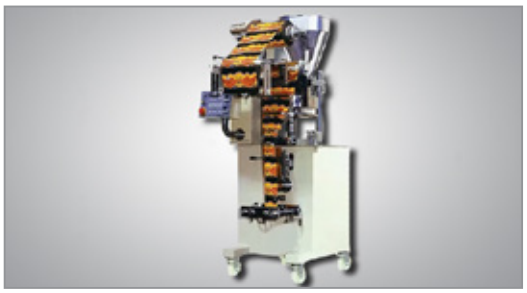


Fig. 3.1.12. Form fill seal machine

Fig. 3.1.13. Box filling & palletising

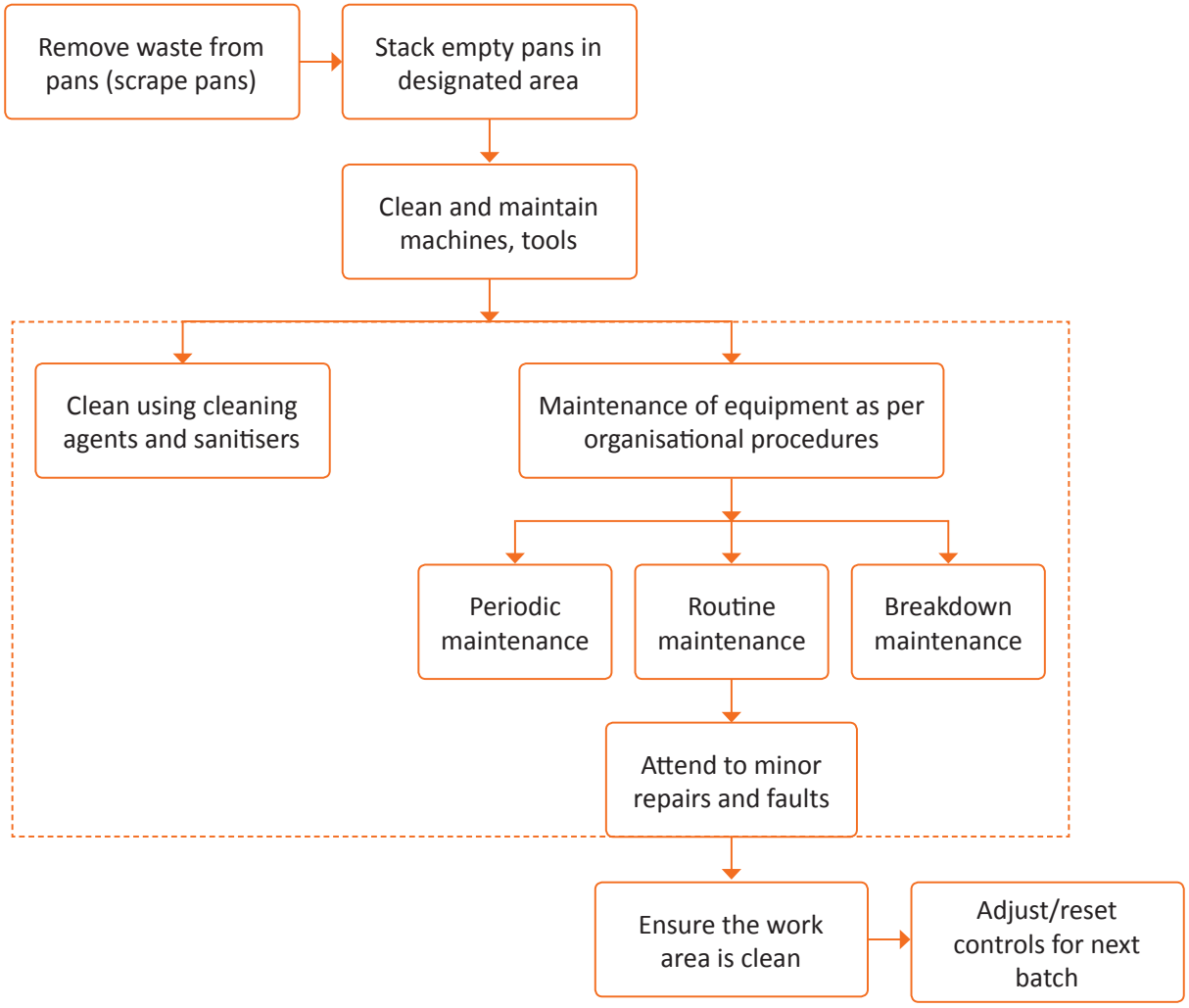
3.1.2 Types of Maintenance

The maintenance process of machineries can be classified as:

Routine maintenance	Periodic maintenance	Breakdown maintenance
It refers to checking and resolving any fault in the machinery after every batch production. It also includes regular maintenance and up-keep of the machine.	It refers to checking and resolving any fault in the machinery at scheduled intervals. These could be every day, week, month, and/or year.	It refers to checking and resolving any fault in the machinery, if they breakdown.

3.1.3 Method of Post-Production Cleaning

All food-handling equipment and tools are cleaned after the production process is over. Machines are also checked for smooth and efficient functioning. The chart below shows how to clean and maintain the work area and machineries after production. The cleaning and maintenance process has been detailed inside the dotted box.



UNIT 3.2: Sanitisation of the Work Area

Unit Objectives

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

1. State the materials and equipment used in cleaning and maintenance of the work area and machineries;
2. List the various cleaning chemicals required.

3.2.1 Cleaning and Sanitisation

Cleaning and sanitisation of the work area is extremely important for every food-handling operation. Hence, it is important to know:

- What types of materials and equipment must be used to clean the work area?
- How to use these materials and equipment?
- The method of cleaning the work area
- The frequency of cleaning the process machineries

The food processing industry follows standard procedures for cleaning the work area. This is to ensure that there is no bacterial growth due to presence of leftover food particles. For cleaning purposes, the work area is divided into two. They are:

Food contact surfaces	Non-food contact surfaces
Work tables	Overhead structures
Utensils	Walls, ceilings, and shields
Equipment	Lighting equipment
Tools like knives	Refrigeration equipment
Machines that process foods	Air conditioning, heating or ventilating systems

Fig. 3.2.1. Food contact and non-contact zones in a production area

Equipment, Chemicals, and Sanitisers Used for Cleaning

Every organisation in the food processing industry follows a cleaning schedule. For instance, a processing unit may follow a weekly, monthly or yearly cleaning schedule. To clean the processing unit, the following equipment and tools are used:

- Cleaning or washing tank
- Cleaning knives and spoons
- Cleaning or sanitising agents
- Cleaning brushes and scrubbers
- High spray nozzle jets

Fig. 3.2.2. Cleaning knives and spoons

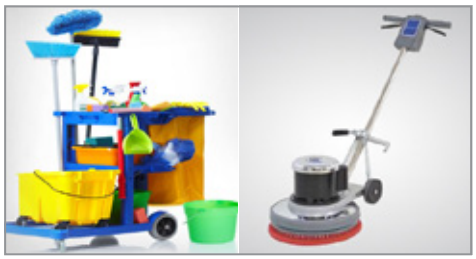


Fig. 3.2.3. Cleaning agents and equipments

Fig. 3.2.4. Cleaning in washing tanks

Fig. 3.2.5. Cleaning floors of production area

Fig. 3.2.6. Cleaning equipment parts

Some common types of cleaners and sanitising agents to clean the food contact and non-food contact surfaces are:

Cleaning agents	Used for	Risk	Safety measure
Hypochlorites like potassium hypochlorite, sodium hypochlorite, and calcium hypochlorite	Cleaning stainless steel food contact surfaces	Leads to corrosion	Ensure pH and concentration levels are maintained
Liquid chlorine	Internal cleaning of stainless steel equipment and vessels	Leads to corrosion	Ensure concentration levels are maintained
Hydrogen peroxide	Killing bacterial spores, pathogens, spoilage organisms, and other microorganisms	Has a strong odour	Use in well-ventilated and open spaces
Ozone	Cleaning food-contact and non-food-contact surfaces like equipment, walls, floors, drains, conveyors, tanks, and other containers; Killing microbes	No risk involved since it leaves no residue	Safe to use

Storage of Sanitisers and Disinfectants

Sanitisers and disinfectants are packed and labelled in a proper manner. They are kept in a safe area within the storeroom. The cleanliness of this area is maintained at all times.

UNIT 3.3: Cleaning Processes

Unit Objectives

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

1. State the cleaning processes used to clean the work area and process machineries.

3.3.1 Clean-In-Place (CIP)

CIP is a method used for internal cleaning of machineries. It is done without dismantling pipes, vessels, process equipment, filters or fittings. In this process, a sanitising agent is circulated through the entire processing unit with the help of a spray ball. The turbulence created removes soil, ensuring removal of bacteria and chemical residues.

Tips to conduct an effective CIP process:

- Use the right vessels for the right process
- Use the right cleaning and sanitising solutions
- Ensure correct flow rate
- Ensure all connections are clean
- Monitor and verify the entire process

3.3.2 Clean-Out-Of-Place (COP)

COP is conducted at a cleaning station. This method involves dismantling of the equipment. In this process, equipment and units are scrubbed with soap in COP tanks. After this, the tanks are rinsed again to remove residual detergent or chemicals. Equipment and units are reassembled and sanitised once more with heat treatment or sanitising agent.

Tips to conduct an effective COP process:

- Follow the order of tasks
- Use cleaning tanks as much as possible
- Ensure tools used in COP do not lead to contamination

Food processing equipment and units that undergo the COP process are:

- Fittings
- Gaskets
- Valves
- Tank vents
- Grinders
- Pumps
- Knives

Sterilising-In-Place (SIP)

SIP is the process by which food-processing equipment is sanitised after the CIP process. It helps to eliminate any residual microbiological contamination.

3.3.3 Sterilising-In-Place (SIP)

SIP is the process by which snack and savoury equipment is sanitised after the CIP process. It helps to eliminate any residual microbiological contamination.

SIP is a combination of three processes viz. sterilisation, disinfestation, and sanitisation.

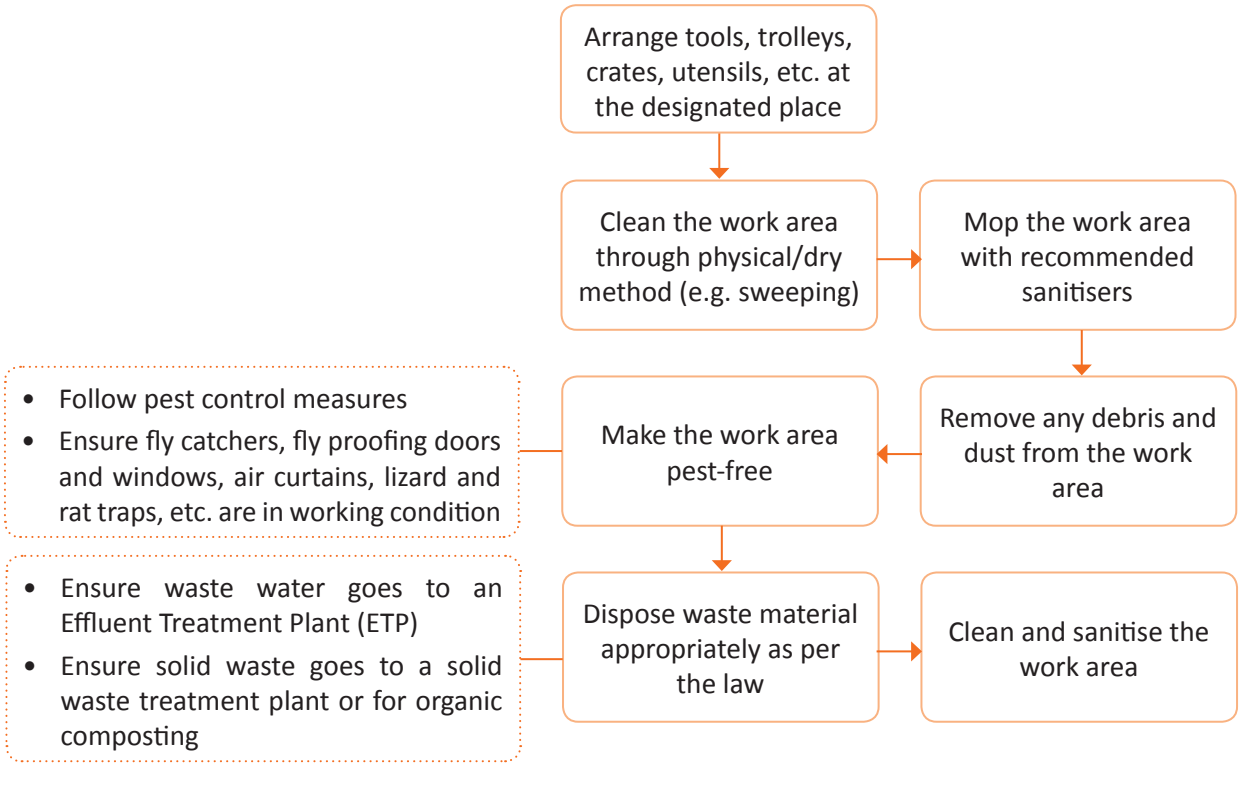
- **Sterilisation**
  - Uses steam or hot water
- **Disinfestation**
  - Uses disinfectants or chlorine solution
- **Sanitisation**
  - Uses soap solution or washing soda

3.3.4 Air-Pressure Cleaning

The snacks and savoury industry follows the air-pressure cleaning method to ensure cleanliness of regularly used equipment. The following chart explains the process in detail:

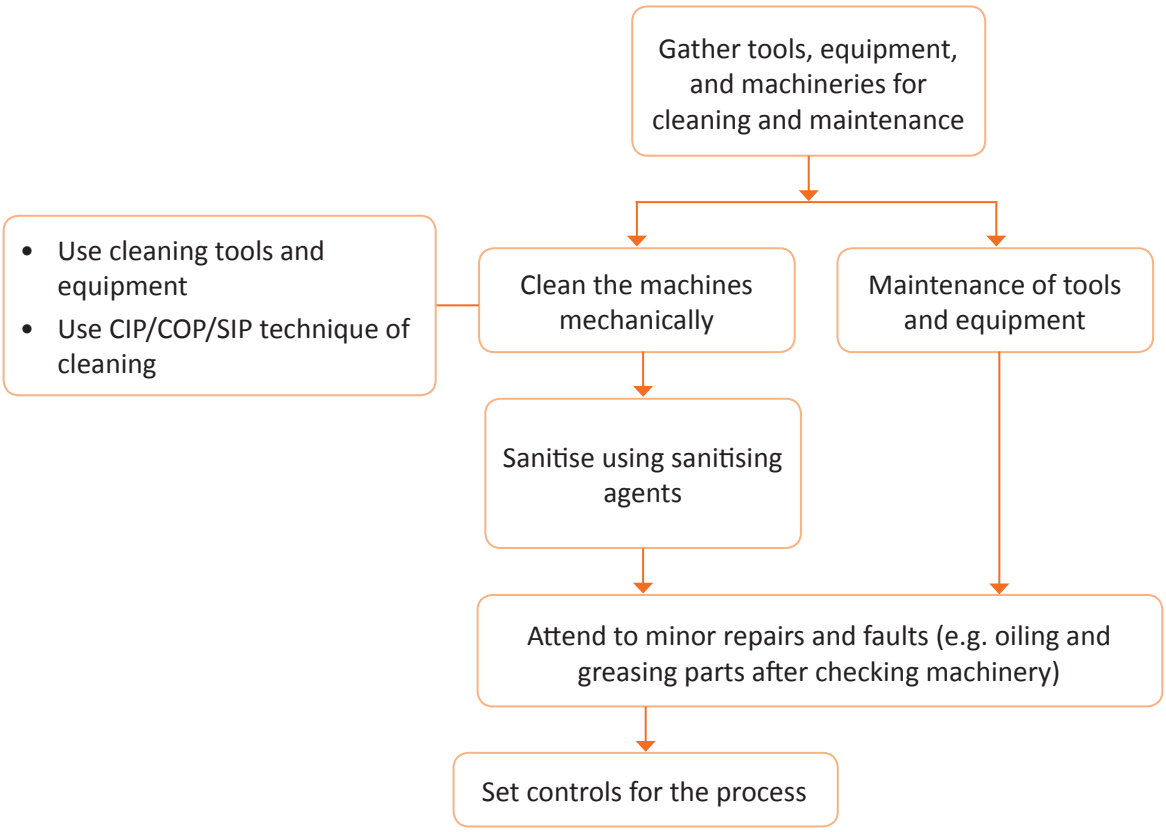
3.3.5 Process of Cleaning the Work Area

The following chart explains the process of cleaning the work area before production. The dotted boxes explain pest-control measures and methods used for waste material disposal in detail.



3.3.6 Process of Cleaning Machineries, Tools and Equipment

The chart explains cleaning of machineries, tools, and equipment used in the snack and savoury industry. The dotted chart states the techniques used for mechanical cleaning of equipment.



Exercise

1. Fill in the blanks with the correct option

a. _____ is a cleaning agent that has strong odour and kills microorganisms.

i. Ozone
ii. Hydrogen peroxide
iii. Water
iv. Salt

b. For cleaning purposes the work area is divided into _____ groups.

i. two
ii. three
iii. five
iv. nine

c. _____ is a method used for internal cleaning of equipment.

i. SOP
ii. SIP
iii. CIP
iv. PIP

d. By using _____ process snack and savoury equipment is sanitised after the Clean- In- Place process.

i. COP
ii. sanitisation
iii. PIP
iv. SIP

e. _____ method involves dismantling of the equipment.

i. COP
ii. CIP
iii. Sterlisation
iv. SIP

f. Disinfectants and chlorine solution is used for _____.

i. sanitisation
ii. disinfestation
iii. sterlisation
iv. air-pressure cleaning

g. In CIP _____ is circulated through the entire processing unit with the help of a spray ball.

i. hypochlorite
ii. sanitising agent
iii. steam or hot water
iv. high air pressure

h. Waste water in the entire process goes to _____.

i. sewage
ii. waste treatment plant
iii. Effluent Treatment Plant (ETP)
iv. water harvesting

Notes

Notes

Scan the QR codes or click on the link to watch the related videos

Packaging & Storage

https://www.youtube.com/watch?v=25zVA51CCac&list=PL_mT5DU_smK1eFsOmpTGQauReVFB72sGi&index=13

Tools & Machineries

https://www.youtube.com/watch?v=jwV94n9ROsw&list=PL_mT5DU_smK1eFsOmpTGQauReVFB72sGi&index=15

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4. Prepare for Production of Snack and Savoury

Unit 4.1 – Basic Calculations

Unit 4.2 – Production Planning

FIC/N8502

Key Learning Outcomes

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

1. Outline basic principles of mathematics;
2. Calculate the quantity of raw material required for a finished product;
3. Plan the production sequence.

UNIT 4.1: Basic Calculations

Unit Objectives

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

1. Outline basic principles of mathematics;
2. Calculate the quantity of raw material required for a finished product.

4.1.1 Measuring Units

Prefix	Symbol	Value	Meaning
kilo	**k**	1000	A thousand times bigger
deci	**d**	0.1	Ten times smaller
centi	**c**	0.01	A hundred times smaller
milli	**m**	0.001	A thousand times smaller

A table has been created by combining the three basic units for length (meter), weight (gram) and volume (liter) with the prefixes listed above. This table will help in cooking.

Unit (Symbol)	Quantity	Examples	Uses
millilitre (ml)	Smaller volumes	About the volume of a kidney bean	It is used for measuring most liquids. It is not used very often for non-liquids. For quantities larger than about 1000 ml, the liter is normally used.
litre (l)	Large volumes	Slightly more than 1 quart	It is used for measuring larger amounts of liquids or the volume of pots, mixing bowls, etc. Liters are not usually used for measuring dry ingredients. Note that one liter is the same as 1000 ml.
gram (g)	Smaller weights	About the weight of a kidney bean	It is used for measuring the majority of non-liquid ingredients, including flour, sugar, meats, cheeses, butter, etc. For quantities larger than 1000 g, the kilogram is usually used.
kilogram (kg)	Large weights	A bunch of grapes or a large loaf of bread	It is used for measuring larger quantities of non-liquid ingredients, including meats, fruits, and vegetables. Note that 1 kg is the same as 1000 g.
centimetre (cm)	Length	About the width of the nail on your little finger	Whenever a traditional recipe gives something in inches, the metric recipe will probably specify centimeters.
millimetre (mm)	Length	About the thickness of uncooked angel hair pasta	In the kitchen, millimeters are most likely to be used for measuring very small lengths. Note that 10 mm are the same as 1 cm.

4.1.2 Temperature

Temperature in the metric system is usually measured in degrees Celsius (°C). Here is a table with some common temperatures in °C.

Temperature	Description
0°C	Water freezes
21°C	Room temperature
37°C	Body temperature
100°C	Water boils
200°C	A hot oven

Calculating the cost of raw materials:

The amount of usable food after raw materials are prepared for processing is known as the 'yield' and is calculated as follows:

$$\text{Yield (\%)} = \frac{\text{weight of raw material actually used in the process x 100}}{\text{weight of raw material that is bought}}$$

The true cost of raw materials depends on the yield and can be calculated as below:

$$\text{True raw material cost} = \frac{\text{Supplier cost x 100}}{\text{\% yield}}$$

For Example,

If milk bought is 1 litre and mawa produced is 100 gram, then

$$\text{Yield (\%)} = \frac{100 \times 100}{1000} = 10\%$$

UNIT 4.2: Production Planning

Unit Objectives

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

1. Plan the production sequence.

4.2.1 Production Planning

Refer production chart	
For formulations of end products	For urgent requirements

↓

Check raw materials	
Documents received from supplier	Quality as per the organisational standards

↓

Check machineries	
Cleaning and maintenance	Changes in moulds, dyes, blades and other parts as per requirements.

↓

Calibrate machineries Weighing scales and other machines

↓

Organise	
Raw materials as per end product requirements	Work responsibilities and allot them to workers and helpers

Exercise

1. Match the columns

Weights	Measurement
millilitre (ml)	yield
kilogram (kg)	temperature
centimetre (cm)	length
degree centigrade (˚C)	most liquids in smaller volumes
percentage (%)	most solids of larger quantities

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5. Prepare Raw Material for Snack and Savoury

Unit 5.1 – Types of Raw Materials

Unit 5.2 – Quality Assessment

FIC/N8503

Key Learning Outcomes

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

1. State the various types of raw materials used for preparing snacks and savouries;
2. State the quality assessment parameters.

UNIT 5.1: Types of Raw Materials

Unit Objectives

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

1. State the various types of raw materials used for preparing snacks and savouries.

5.1.1 Raw Materials

- Most savoury snacks are made from corn.
- Sometimes other raw materials like potato powder, wheat or rice grits are used to impart an identifiable and attractive taste to the base product.
- Pulses or beans may be added to cater to distinctive local tastes.
- Similarly materials with high fibre content may be added to increase specific nutritional values.

Fig. 5.1.1. Raw materials

UNIT 5.2: Quality Assessment

Unit Objectives

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

1. State the quality assessment parameters.

5.2.1 Food Quality

- Food quality is the quality characteristics of food that is acceptable to consumers.
- Food quality is an important food manufacturing requirement, because food consumers are susceptible to any form of contamination that may occur during the manufacturing process.

The various factors contributing towards quality of snack and savoury products are:

Different types of parameters	• Appearance • Color • Taste • Odour • Nutritional value • Adulterants • Contaminants (Physical, Chemical & Microbiological)

✓ In order to ensure the right quality of various snack and savoury products, several parameters are evaluated :

Physical and Rheological Parameters		
Parameters	**Test**	**Products**
Refraction	Sieve test	Flour
Insect infestation	Visual observation	Cereals, pulses
Admixture	Visual observation	Cereals, pulses
Colour on Lovibond scale	Lovibond Tintometer	Oil, fat
Bellier turbidity temperature	Visual	Oils
Optical rotation	Polarimeter	Sugar, Syrup, Oil and fat

Chemical Parameters		
Parameters	**Test**	**Products**
Moisture	Hot air oven, Vacuum oven, Karl Fischer titer, Dean & Stark	Most of the snack and savoury products
Fat or oil	Chemical	Most of the snack and savoury products
Protein	Chemical	Most of the snack and savoury products
Starch	Chemical	Starch containing products

Packaging Materials		
Parameters	**Test**	**Products**
Tin, Chromium	AAS	Tin plate
Sulphide stain	Chemical	Food cans
Laquer	Physical Chemical	Tin cans
Migration tests	Chemical	Food grade plastics
Heavy metals like Pb, As, Cd, Se, Ba,	AAS	Coloured plastics
Water vapour permeability	Humidity chamber	Plastics

Exercise

a. State whether the following statements are true or false

a. Food quality is an important part of food production.

b. Lovibond Tintometer test is conducted on oil, fat etc.

c. Most savoury snacks are made from rice.

d. Do not compromise on the quality of the product at any given cost.

e. Potato powder, wheat or rice grits are used to impart an identifiable and attractive taste to the base product.

2. Match the columns

Physical and Chemical Parameters for Quality Test	Products
a. Refraction	i. Oil and fat
b. Insect infestation	ii. Savoury products
c. Colour on Lovibond scale	iii. Flour
d. Optical rotation	iv. Cereal and pulses
e. Moisture	v. Sugar, syrup, oil and fat

3. Fill in the blanks with the correct option

a. The Bellier turbidity temperature test done for oils is a _____ test.

i. chemical ii. visual

iii. starch iv. protein

b. Raw materials with high fibre content may be added to increase the _____ value of the snack item.

i. fat ii. commercial

iii. nutritional iv. base

c. _____ infestation in cereals and pulses are done by visual observation.

i. Insect ii. Oil

iii. Chemical iv. Starch

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6. Process, Package and Storage of Snack and Savoury Products

Unit 6.1 – Process of Producing Products

Unit 6.2 – Packaging and Storage of Finished Products

FIC/N8504

Key Learning Outcomes

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

1. State the process for producing savoury snacks;
2. State the basic categories of packing;
3. State the factors for selecting packaging materials;
4. State the storage and stock rotation norms.

UNIT 6.1: Process of Producing Products

Unit Objectives

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

1. State the process for producing savoury snacks.

6.1.1 Process of Producing Products

The most common extruded products are a wide variety of savoury, direct expanded snacks.

Process: The process can be divided into 3 stages.

- **Pre-extrusion -** Single or a homogeneous blend of various raw-materials is moisturised to a pre-determined level with water or water containing materials, prior to extrusion. The moisturisation is done either in batch mode during blending or continuously. The moisturised raw-material is still free-flowing and is metered into the extruder, sometimes together with other additives, usually with the help of volumetric screw dosing units.
- **Extrusion -** The raw-materials, being fed at a certain rate into the extruder, so long as their major component is starch or protein, are extruded (formed into a cooked dough under heat and pressure) and finally expanded into a shaped base extrudate.
- **Post-extrusion -** Though fully cooked, when it comes out of the extruder, the extrudate must be dried to reduce its moisture level to allow it to be preserved for a longer time. By the use of drum driers with infrared heating systems. After the extrudate is properly dried, it develops a crispy bite, but often still lacks an attractive taste. Hence usually a slurry of fat and seasoning is sprayed on to the product as it rolls inside and slowly moves down the coating drum. The slurry to be sprayed is prepared in a system with two heated vessels, one of which is used to vigorously mix the various components off-line and pump the slurry to the other vessel which is only a holding tank connected online. After seasoning the product is ready-to-eat. It is then either suitably stored intermediately, protected from atmospheric moisture, or immediately packed suitably.

Pre-extrusion (blending and pre-conditioning)
Mix components as per recipe (dry blending)
Moisturising raw materials to pre-determined level (in a batch mode or continuous mode)
Screw dosing of moisturised raw material with additives

↓

Extrusion (extrusion cooking and cutting into shape)
Raw material fed at a certain rate into the extruder
Extruded cooked dough is expanded into shape based extrudate

↓

Post extrusion (drying and flavour application)
Reduce moisture levels of the extruded product
Seasoning and flavouring by slurry spraying
Final Product (extruded snacks)

Fig. 6.1.1. Extruded snacks

Savoury snacks are also made using other methods like frying, baking and rolling.

Baking: Baking is cooking food by enveloping it in very hot, dry heat. Ovens are usually used for baking. The action of dry heat is modified by the steam that comes from the food during cooking. Some of the food items that can be cooked using this method include bread, pastry, pudding, vegetables and potatoes.

Frying: In this method food is entirely cooked in hot fat. This method is considered as a quick method of cooking. There are two different ways of frying food – shallow frying and deep frying.

- **Shallow-Frying:** Shallow frying is the method of frying food in very little fat. Food has to be turned over to ensure even browning or cooking. This method is usually used for pre-cooked food.
- **Deep-Frying:** Deep frying is the process of cooking food by completely immersing it in fat. Hence, a large quantity of fat is used in this method.
- **Rolling:** Rolling out process is done by flattening the dough with a rolling pin. The dough is rolled from the center to the edges to get the desired thickness and shape. Flour is sprinkled on the rolling surface before the dough is rolled out to avoid sticking. If the dough is very soft a layer of plastic wrap is placed between the dough and rolling pin. Rolling can either be done manually for small scale or by using machines for large scale production.

Fig. 6.1.2. Rolling out by machines

Fig. 6.1.3. Rolling out manually

UNIT 6.2: Packaging and Storage of Finished Products

Unit Objectives

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

1. State the basic categories of packing;
2. State the factors for selecting packaging materials;
3. State the storage and stock rotation norms.

6.2.1 Packing of Finished Products

The finished product is filled in containers meant for packaging. Depending on the demand, the market and the size of the industry packing is categorised as follows:

Order of items with the earlier date of consumption regardless of the date of entry or acquisition.

Packing

Primary packing

- It is the type of packing that comes in direct contact with food.
- E.g. Pouches, bottles, sachets, drums

Secondary packing

- It is the type of packing that comes in contact with the primary packing material.
- E.g. Cartons (filled with bottles)

Fig. 6.2.1. Primary Packaging

Fig. 6.2.2. Secondry Packaging

When selecting the packaging material to pack the finished products, one must ensure that the packaging material is:

- non-toxic and compatible with food
- offers sanitary protection
- protects the product from moisture, gas, and odour
- protects the product from light, temperature, humidity, and rain
- protects the product from insects, mites, bacteria, rodents, and birds
- is transparent and tamper-proof
- offers ease of opening, pouring, resealing, and disposing
- is compatible with the size, shape, and appearance standards set by the organisation
- is low on cost

Fig. 6.2.3. Paper and carton packaging

Fig. 6.2.4. Plastic packaging

Fig. 6.2.5. Vacuum packaging

Fig. 6.2.6. Flexible pouch packaging

6.2.2 Food Storage

When storing food, store the food in such a way that:

- It is protected from the likelihood of contamination; and
- The environmental conditions under which it is stored will not adversely affect the safety and suitability of the food.

When storing potentially hazardous food:

- Store it under temperature control and
- If it is food that is intended to be stored frozen, ensure the food remains frozen during storage.

Meaning of Stock Rotation

To rotate stock means to arrange the oldest units in inventory or storage so it gets consumed before the newer units. The reason to rotate stock is to reduce the losses from deterioration and obsolescence.

What is FIFO?

FIFO (First-IN, First-OUT) is a basic rule of product rotation that protects product quality and freshness. Rotate foods so the first products displayed (IN) are the first products sold (OUT) to minimize spoilage and waste. Every product has a code date. Do NOT use products past their code or "use-by" dates.

FIFO stock rotation in storage areas

- Find the product's code date and remove out-of-code items.
- Move previously received merchandise forward and/or to the top of the stack.
- Put new items at the back of the row and/or on the bottom of the stack.
- Always position products on the shelf/tray so the oldest products will be used first.

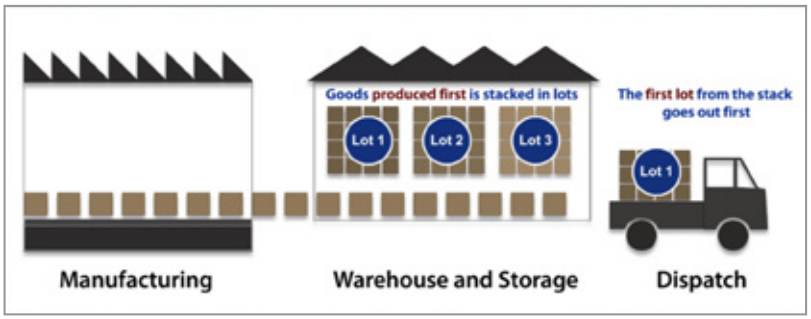

Fig. 6.2.7. FIFO stock rotation

What is FEFO?

FEFO is an acronym of the words First Expired, First Out. Material requirements are serviced in the order of items with the earlier date of consumption regardless of the date of entry or acquisition.

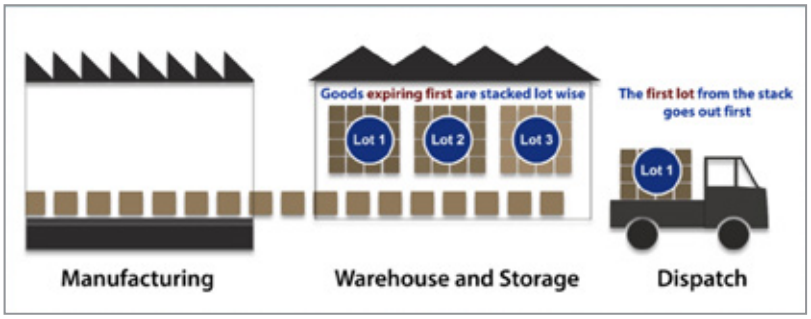

Fig. 6.2.8. FEFO stock rotation

Exercise

1. Fill in the blanks with the correct option

a. The three stages of producing the most common extruded variety of savoury are _____ , _____ and _____.

i. washing, cleaning, grinding
ii. grinding, extruding, packing
iii. pre-extrusion, extrusion, post extrusion
iv. powdering, mixing, extruding

b. When the final savoury when it comes out of the extruder must be dried to reduce its _____ level, so that it can be preserved for a longer time.

i. heat
ii. moisture
iii. salt
iv. fat

c. Drum driers with _____ heating systems are used for properly drying the savoury extrudate.

i. infrared
ii. hot water
iii. sprayer
iv. steam

d. Stock roatation method where where material requirements are serviced in the order of items with earlier date of consumption regardless of the date of entry is _____.

i. FIFO
ii. FEFO
iii. GMP
iv. HACCP

e. The method of cooking food in hot fat is called _____.

i. extrusion
ii. frying
iii. baking
iv. drying

f. In this stock rotation method the products are positioned on the shelf in such a way that oldest products will be used first _____.

i. FIFO
ii. FEFO
iii. GMP
iv. HACCP

g. Shallow frying is the method of cooking food in little _____.

i. water
ii. wine
iii. fat
iv. coal

h. Stock rotation process is done to reduce the losses from _____ and _____.

i. deterioration and obsolescence
ii. spillage and dust
iii. cold and hot
iv. water and salt

Notes

Notes

Scan the QR codes or click on the link to watch the related videos

Storage of Finished Product

https://www.youtube.com/watch?v=HcI3v1d22CM&list=PL_mT5DU_smK1eFsOmpTGQauReVFB72sGi&index=24

Overview of Controlled Atmosphere Storage

https://www.youtube.com/watch?v=WDurgHfLyiM&list=PL_mT5DU_smK2gJTTCG7kBWob3EMVEH652&index=6

Categories of Packaging

https://www.youtube.com/watch?v=bz6tskqQ_pc&list=PL_mT5DU_smK2gJTTCG7kBWob3EMVEH652&index=8

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7. Complete Documentation and Record Keeping Related to Making Traditional Snack and Savoury Products

FICSI
Food Industry Capacity and Skill Initiative

Unit 7.1 – Documentation and Record Keeping

FIC/N8505

Key Learning Outcomes

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

1. State the need for documenting and maintaining records of raw materials, process, and finished products;
2. State the method of documenting and recording the details of raw material to final finished product;
3. Observe the various facilities, machineries and drying and dehydration process in the food processing industry.

UNIT 7.1: Documentation and Record Keeping

Unit Objectives

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

1. State the need for documenting and maintaining records of raw materials, process, and finished products;
2. State the method of documenting and recording the details of raw material to final finished product.

7.1.1 Need for Documentation

Every organisation has to maintain records of ingredient procurement, production processes, and sales. This is to ensure that the business runs effectively and is profitable. Listed below are some reasons why there is a need for documentation:

- It gives detailed knowledge about running of the business
- It helps to control product quality
- It helps to keep track of the money invested in the business
- It helps to identify the separate costs of product ingredients
- It helps to identify the production cost of a particular process
- It helps to ensure that quality assurance procedures are followed
- It helps to ensure that the production unit is running smoothly/effectively
- It works as an evidence for legal procedures
- It helps to set an appropriate product price
- It helps to take corrective measures at the right time

7.1.2 How to Keep Records?

Every food processing unit follows a more or less similar way of keeping records. Production records keep a log of:

- the quantity and type of ingredients
- the processing conditions in which production took place (e.g. the temperature set or the air pressure applied)
- the product quality

Product quality can be maintained only when:

- The same quantity and quality of ingredients are mixed in every batch
- A standard formulation is used for every batch
- Standard process parameters are applied for every batch

Every batch of food is given a batch number. This number is recorded in:

- stock control books (where ingredient procurement is noted)
- processing logbooks (where production process is noted)
- product sales records (where sales and distribution is noted)

The batch number must correlate with the product code number, which is printed on labels. This helps the processor to trace any fault found in a batch back to the raw material used or the production process.

Example of a stock control book:

• Product Name			• Batch Number	
• Raw material*	• Supplier	• Results of inspection for:		
		A	B	C

Notes

Scan the QR codes or click on the link to watch the related videos

Storage of Finished Product

https://www.youtube.com/watch?v=HcI3v1d22CM&list=PL_mT5DU_smK1eFsOmpTGQauReVFB72sGi&index=24

Documentation and Record Keeping

https://www.youtube.com/watch?v=HesWbNFSQS4&list=PL_mT5DU_smK1eFsOmpTGQauReVFB72sGi&index=25

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9. Annexure

Module No.	Topic Name	Page No	Link for QR Code (s)	QR code (s)
1. Introduction (FIC/N8501)	**Overview of Food processing industry**	11	https://www.youtube.com/watch?v=J-2EiMVNtpM&t=11s	
2. Food Safety, Hygiene and Sanitation for Processing Food Products (FIC/N9001)	**GHP,GMP & HACCP**	29	https://www.youtube.com/watch?v=RS4A-uczS6E&t=554s	
	Personnel hygiene and employee facilities	29	https://www.youtube.com/watch?v=daNjRoP_I0c&t=87s	
	Hygiene and sanitation	29	https://www.youtube.com/watch?v=daNjRoP_I0c&t=83s	
3. Prepare and Maintain Work Area and Process Machineries for Making Snack and Savoury (FIC/N8501)	**Packaging & Storage**	43	https://www.youtube.com/watch?v=25zVA51CCac&list=PL_mT5DU_smK1eFsOmpTGQauReVFB72sGi&index=13	
	Tools & Machineries	43	https://www.youtube.com/watch?v=jwV94n9ROsw&list=PL_mT5DU_smK1eFsOmpTGQauReVFB72sGi&index=15	
6. Process, Package and Storage of Snack and Savoury Products (FIC/N8504)	**Storage of Finished Product**	65	https://www.youtube.com/watch?v= HcI3v1d22CM&list=PL_mT5DU_ smK1eFsOmpTGQauReVFB72sGi&index=24	
	Overview of Controlled Atmosphere Storage	65	https://www.youtube.com/watch?v=WDurgHfLyiM&list=PL_mT5DU_smK2gJTTCG7kBWob3EMVEH652&index=6	
	Categories of Packaging	65	https://www.youtube.com/watch?v= bz6tskqQ_pc&list=PL_mT5DU_smK2gJTTCG7kBWob3EMVEH652&index=8	

Module No.	Topic Name	Page No	Link for QR Code (s)	QR code (s)
7. Complete Documentation and Record Keeping Related to Making Traditional Snack and Savoury Products (FIC/ N8505)	**Storage of Finished Product**	71	https://www.youtube.com/watch?v=HcI3v1d22CM&list=PL_mT5DU_smK1eFsOmpTGQauReVFB72sGi&index=24	
	Documentation and Record Keeping	71	https://www.youtube.com/watch?v=HesWbNFSQS4&list=PL_mT5DU_smK1e FsOmpTGQauReVFB72sGi&index=25	
Employability Skills (30 Hrs)			https://www.skillindiadigital.gov.in/content/list	

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