Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

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Participant Handbook

Sector
Food Processing

Sub-Sector
Dairy Products

Occupation
Processing - Dairy Products

Reference ID: **FIC/Q2005, Version 2.0**
NSQF level 3

Cottage Cheese Maker

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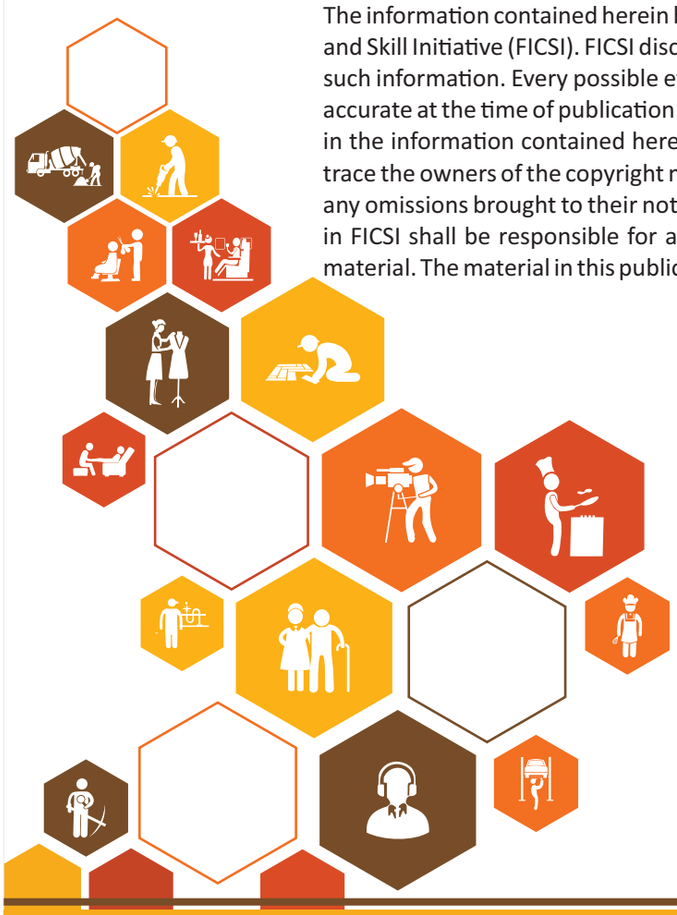

> Skilling is building a better India. If we have to move India towards development then Skill Development should be our mission.

Shri Narendra Modi
Prime Minister of India

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COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

FOOD INDUSTRY CAPACITY AND SKILL INITIATIVE (FICSI)

for

SKILLING CONTENT : PARTICIPANT HANDBOOK

Complying to National Occupational Standards of
Job Role/ Qualification Pack: **Cottage Cheese Maker** QP No. **FIC/Q2005, NSQF level 3**

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Authorised Signatory
(CEO, FICSI)

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

The preparation of this participant Handbook would not have been possible without the support of the Food Processing Industries. The Industry feedback has been extremely encouraging from inception to conclusion & it is with their inputs that we have tried to bridge the skill gaps existing today in the Industry.

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.

About this book

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

Key Learning Objectives for the specific NOS mark the beginning of the Unit/s for that NOS. The symbols used in this book are described below.

This reference book has been developed for use Participant Handbook of the skill development course for a Cottage Cheese Maker being implemented by FICSI through its affiliated training service providers. The contents of this book are completely aligned to the Qualification Pack for the role of a Cottage Cheese Maker NSQF level 3 and has been divided into Units corresponding to each NOS (National Occupational Standard). The contents of the book have been developed by NIFTEM (National Institute of Food Technology, Entrepreneurship and management, Kundli with support of MOFPI, Government of India).

Symbols Used


Key Learning Outcomes


Notes


Unit Objectives


Tips

Table of Content

Table of Content

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
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1. Introduction to the Training Program and Overview of Food Processing Industry

FICSI
Food Industry Capacity and Skill Initiative

Key Learning Outcomes

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

1. Introduce each other and build rapport with fellow participant and trainer
2. Define food processing
3. List the various sub sectors of food processing industry
4. Define Dairy Processing
5. To understand milk and the methods of testing milk for accepted quality standards
6. Introduction of coagulated product
7. Introduction of Cottage Cheese (Paneer)
8. To understand various units under dairy processing plant

Unit 1.1 Introduction to the training program

Unit Objectives

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

1. Know each other and about trainer
2. Know about the purpose of training against this Job Role
3. Know about training outcomes
4. Discuss the National Occupational Standards and the Qualification Pack

1.1.1 Purpose of training

This training programme is developed to impart specific knowledge and skills relevant to job role required to perform as a Cottage Cheese (Paneer) Maker. The training programme of Cottage Cheese (Paneer) Maker is based on the Qualification Pack (QP) code FIC/Q2005. A QP consists of a set of National Occupational Standards (NOS). A NOS specify the standard competency, a worker must possess while conducting any job/activity at the processing area. The following NOS are compulsory to QP Cottage Cheese (Paneer) Maker:

1. FIC/N2017 Preparation and maintenance of work area and machineries involved for production of cottage cheese (paneer)
2. FIC/N2018 Carry out production of cottage cheese (paneer)
3. FIC/N2019 Complete all the documents and records in continuation of the production of Cottage Cheese (Paneer) Maker.
4. FIC/N9001 Maintain safety, hygiene and sanitation in a food processing industry

Occupation Standards (OS) is the set of standards related to performance at workplace, an individual must accomplish while performing any job/activity, along with the knowledge and understanding need to achieve that standard without fail. Occupational Standards are relevant to the Indian and global contexts.

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

Fig.1.1.Skill card

1.1.2 About Skill card

Skill Card is issued to Certified Trainers and Assessors, displaying the following:

- Name
- Unique ID
- Certification Grade
- Validity of the Certification

The skill card will have a quick response (QR) code and by scanning it, an employer will know what kind of skill course a person has undergone and what type of certification he or she has been awarded. For a trained job seeker, it will lead to less hassle—he or she will not have to carry bundles of certificates.

The card may be converted into a smart card, with an embedded chip over time.

1.1.3 Training Outcomes

After completing this programme, participants will be able to:

1. Learn about Food Processing
2. Plan production sequence as per production order
3. Produce Cottage Cheese following specification and standards of the organization
4. Observe food safety and hygiene standards at work
5. Maintain documents and keep records of raw material, finished goods and process parameters

Notes

Unit 1.2 Overview of the Food Processing Industry

Unit Objectives

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

- Describe food processing
- Enlist a range of sectors present in the food processing industry
- Know the market trends of food processing industry

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.

The role of food processing is the conversion of agricultural harvest into value added food products. Food processing includes many unit operations through which raw agricultural produce can be transformed into more valued shelf stable product. The main purpose of food processing is to increase the storage life of food using preservation techniques.

Indian food processing industry is divided into numerous sub-sectors viz:

Table 1.1: Sub-Sectors of food processing industry

Sub-Sectors	Industry Scenario
Dairy	Whole milk powder, skimmed milk powder, condensed milk products, cream, butter and ghee, ice-cream, cheese, paneer, flavor milk, curd, shrikhand, etc.
Fruit and vegetable processing	Juices, slices, concentrates, pulps, frozen and dehydrated products, wafers, pickles, etc.
Grains and cereals	Flour, bakeries, cornflakes, vermicelli, malted foods, beer and malt extracts, grain-based alcohol, etc.
Fisheries	Fish oil, frozen and canned products, etc.
Meat and poultry processing	Frozen and packed meat, egg powder, etc.
Bread and bakery	Biscuits, cookies, breads, cakes, buns, confectionery, pastries, etc.
Consumer foods	Snack foods, namkeen, ready-to-eat foods, etc.

1.2.2.Opportunities in Food Processing:

Indian Economy is fastest growing economy in the world. The Indian food processing industry is actually supported by two key sectors of Indian Economy – Agriculture and Manufacturing. Food Processing Sector is rightly being phrased as Sunshine sector, as several policies are being amended to encourage the build investment ecosystem and all efforts are being made to achieve the required infrastructure.

1.2.3 Production, Processing and Wastage

India is the world's largest economy and ranked 3rd after US and China. India ranked first in production of milk, pulses, spices, fish, livestock, and plantation crops. India secured second position in Fruits and Vegetables production after China. The domestic market is growing rapidly with the increasing demand of food groceries and services.

1.2.3.1 Production Status (2017 - 2018)

- Milk: 176.3 Million MT
- Horticulture: 307.16 Million MT
- Food grains: 279.51 million MT
- Meat and poultry: 6.7 Million MT
- Marine: 11.41 million MT
- Fruits and vegetables : 314.5 MT

1.2.3.2 Processing status

In Spite of a large production ground, only a very small portion of production is processed.

- Fruits and vegetables: 2%
- Poultry: 6%
- Milk: 35%
- Marine : 8%
- Overall processing: <10%
- Meat: 1%

Table 1.2: Segment wise types of processing

Segments	Primary Processing	Secondary Processing	Tertiary Processing
Milk	Inspection, Grading and Chilling	Packaged milk, Cream, Flavored milk, Milk powder	Paneer, Cheese, Ice cream, Curd, other value added products
Fruits and Vegetables	Cleaning, Cutting, Sorting	Pulp, Slices, Flakes, Paste, Frozen, Canned	Jams, Jellies, Chips, Syrup beverages, Indian ethnic drinks
Grains and Cereals	Sorting and Grading	Rice Puff, Flour, baby food(final product/ ingredients)	Cakes, Biscuits, Breakfast cereals, breads, other bakery products, RTC/RTE products
Oilseeds	Sorting and Grading	Oil Cakes, Refined Oils	Soya Oil, Olive Oil, Mustard Oil, Fortified Oil
Meat and Poultry	Sorting and Refrigeration	Chilled/Frozen products	Ready to Eat products

1.2.3.3 Processing Advantage in India

- ✓ 3rd largest and extremely growing economy in the world
- ✓ Major producer of various agricultural commodities in the world
- ✓ Geographical advantage
- ✓ High number of skilled personnel at considerable rate
- ✓ High emphasis on the development of skill through several schemes of GOI
- ✓ Attractive incentives of GOI for the food processing industry
- ✓ High opportunity for investors in the supply chain of food commodities
- ✓ GOI investments for the development like ports, infrastructure related to transportation, supply chain and storage facilities.
- ✓ 1st in Milk Production

1.2.4 Market trends of food processing industry

Food Processing industry is an important industry of India and ranks fifth with context of production, consumption, and exports of processed food. The diverse agro-climatic conditions and availability of food infrastructure are the key factors for the growth of Indian food processing hub. Only 10% of the total food produced in India is converted into value-added products, which is very less as compare to the developed nation like United States (65%) and China (23%).

The food processing industry is expected to expand in the tune of 11.5% compound annual growth rate (CAGR) between FY 2018 and FY 2023.

National Investment Promotion & Facilitation Agency predicted the following:

1. Indian food processing along with retail market is estimated to reach 828.92 billion dollar by 2020.
2. Dairy industry of India is likely to double to 140 billion dollar by 2020.
3. The industry have the potential to attract 33 billion dollar investments by 2020 and able to generate employment for 9 million people
4. 100% FDI is permissible through the automatic route in food processing industry,
5. 100% FDI is through e-commerce platform for the food commodities produced or manufactured in India.

1.2.5 Government initiatives for food processing sector:

Several schemes and financial support were launched by the Ministry of Food Processing Industries (MOFPI), GoI. Some of them are mentioned below:

- ➢ Pradhan Mantri Kisan Sampada Yojana: focused on the development of Agro-Marine Processing and Agro-Processing hubs.
- ➢ Mega food park scheme: Sanctioned 40 Mega Food Parks (MFPs). At present, 17 Mega Food Parks are in operation.
- ➢ Scheme for creation/expansion of infrastructure for preservation or value addition units,
- ➢ Scheme for development of cold chain

Unit 1.3 Overview of Indian Dairy Industry

Unit Objectives

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

- Explain the requirement of processing milk
- List down the various sub section within a dairy processing plant

1.3.1 Need for Processing Milk

Milk is considered wholesome food mainly because of its high nutritive value. It has to be processed because:

The primary responsibilities and essential functions of extruder operator are as follows:

- It is highly perishable by nature.
- It can be used for preparing other dairy products like dahi, cheese, paneer, butter etc.
- The demand for liquid milk and value added products is continuously increasing in domestic as well as international market.

1.3.2 Dairy Industry in India

As per recent data, India leads in the milk production throughout the world. The annual production of milk reaches up to 176.3 million tonnes in year (2017-2018). The organized sector handles only 50 percent of the milk produces in country. It is estimated that domestic market annual growth for the products like ice cream, paneer, cheese, butter and milk powder is 8 to10 percent. However, only 27% of the total milk production at present is processed into value added products. Consumption patterns of liquid milk at the farm level and less infrastructure for processing is the main reason for low value addition of milk. The demand for value added products especially traditional dairy products is increasing day by day and the dairy industry of the country is trying to met the present demand.

1.3.3 Units of a Dairy Processing Plant

A dairy processing plant consists of several units as per the size and operational requirement. Some of these are:

- Milk reception section
- Process milk section
- Butter oil section
- Powder section
- Ice-cream section
- Fermented Milk product section
- Utilities for processing plant
- Stores and purchase
- ETP section
- Quality assurance section
- HACCP/ISO Section
- Paneer section
- Flavor milk section
- Pouch section
- Finished foods dispatch
- Pouch dispatch
- Administration and accounts
- Milk marketing section
- Boiler Section
- Refrigeration Section
- Compressed air section
- Cream/Butter section

1.3.4 Opportunities in Infrastructure and Technology for Dairy Processing

- ✓ New technology in dairy processing, like membrane filtration, cold centrifuge, cold concentration modified cold storage, and ice silo or ice bank tank.
- ✓ New and innovative Packaging solutions for dairy products, which attracts customers and provides easy handling along with high shelf life.
- ✓ Enhancement of shelf life for the existing products, without altering the taste and texture,
- ✓ Research infrastructure for new product development
- ✓ Energy efficient technologies
- ✓ Dedicated testing labs for nutrients and sensory parameters

1.3.5 Opportunities in Processing of dairy products

- ❖ New product development in dairy beverages viz. herbal milk, smoothies, health drinks, energy drinks, sports drinks
- ❖ New products development- products with fortification, tradition Indian food, convenience food
- ❖ Creation of Supply chain facilities – with the increasing demand of food products, there will be huge demand and potential for the creating a Supply chain facilities in food processing sector. MoFPI is also focusing in the area like mega food park, cold storage, and infrastructure related to supply chain.
- ❖ Design and development of machineries or equipment related to food processing activities like canning, innovative processing and packaging, cold plasma, non thermal and non destructive technologies.

It was 'White Revolution or Operation Flood" which has transformed India into a leading milk producer in the World. Cooperative and private dairy sector come into the existence and really helped dairy farmers to enhance their income. Top fifteen milk and milk products producing companies are as below.

1. Amul – Anand Milk Union Limited, Gujarat
2. Nandini Milk – Karnataka Milk Federation
3. Mother Dairy – Noida, Uttar Pradesh
4. Dudhsagar Dairy – Mehsana, Gujarat
5. Milma Milk – Kerala Co-operative Milk Marketing Federation
6. Aavin Milk – Tamil Nadu Co-operative Milk Producers Federation
7. Sanchi Milk – Madhya Pradesh State Cooperative Dairy Federation
8. OMFED Milk – Orissa State Cooperative Milk Producers Federation
9. Sudha Dairy – Bihar State Milk Co-operative Federation
10. Verka Milk – Punjab State Cooperative Milk Federation
11. Heritage Foods
12. Hatsun Agro Product
13. Kwality Ltd
14. Milky Mist Dairy – Erode, Tamil Nadu
15. Reliance Dairy

Unit 1.4 Introduction to Milk and testing procedure

Unit Objectives

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

- Explain milk
- State the composition of milk
- Describe milking practices
- Describe milk collection and transportation practice
- Describe the testing method for milk as per standards

1.4.1 Milk

As per FSSAI, "Milk is a whole, fresh, clean lacteal secretion obtained by complete milking of one or more healthy milch animals excluding that obtained within 15 days before calving or 5 days after calving. Market milk must possess the pre determined percentage of milk fat and SNF (Solid Not Fat)."
Milk of different classes and types must conform to the standards laid down by FSSAI. Mixed milk means a combination of the milk from cow and buffalo or any other milch animal. The combination also should at par with FSSAI standards. The following table explains the composition of milk:

Table 1.3: Nutritional values of milk

Nutritional Factor	Description	Energy Value
Protein	Milk protein is casein, a high quality protein. Allessential amino acids is present in Milk.	4.1 KC/g
Minerals	Milk contains phosphorus and calcium.	
Vitamins	Milk contains vitamins A, D, thiamine, and riboflavin.	
Fat	Milk fat is responsible of good flavor and physical properties. The fat content in cow milk is generally from 3.5 to 4.5 %	9.3 KC/g
Lactose	Lactose is the sugar component of milk and supply energy.	4.1 KC/g

1.4.1.1 Percentage of different compounds in milk

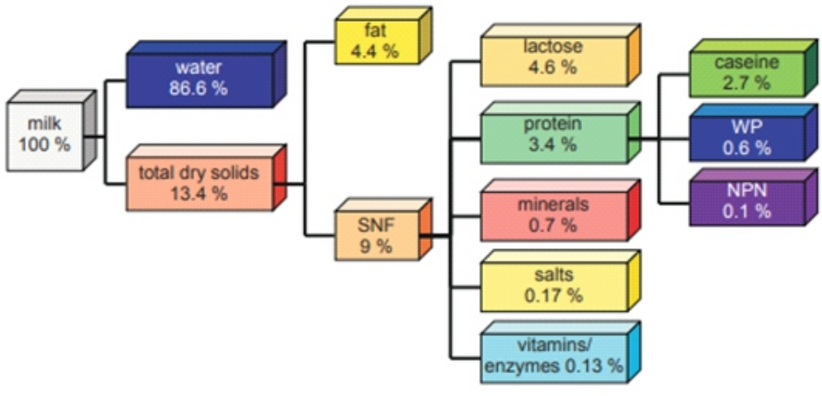


Fig.1.3: Percentage composition of milk (Source: Dairy Processing Handbook - Tetra Pak)

1.4.2 Milking Methods

Milking may be done manually or through machine. In case of manual milking, cows are milked from left side and initial strip of milk are discarded because of bacteria may accommodate themselves in the teat canal. Prior to milking, udders were cleaned with the help of clean and uncontaminated water.
In case of machine milking, all the parts were cleaned and sanitizes prior to use. Semiautomatic and fully automatic type of milking machine are available in the market.

Table 1.4: Types of milking methods

1.	**Stripping method**	
2.	**Full hand method**	
3.	**Knuckling method**	
4.	**Machine milking** **Types:** **Single bucket** **Double bucket**	
5.	**Milking Parlor**	

1.4.3 Milk Collection And Transportation Practice Available In India

The fresh milk need to be collected, tested and transported from the point of production to processing including chilling centers, processing unit and distributions points in cities.

1.4.3.1 Rural Milk Collection

It depends on the availability of milk, road
access to collection points and their distance from the site of the dairy plants.

1.4.3.2 Co-operative system

In case of co-operative society, which was generally formed by the group of villagers a collection center was establishes to receive milk twice a day. The milk were subjected to test prior to the acceptance at collection centre and paid accordingly on the basis of weight, SNF ratio or fat percentage. Further the co-operative society sells milk to nearby milk processor, (private of government dairy plant) via cans or road milk tankers (insulated).

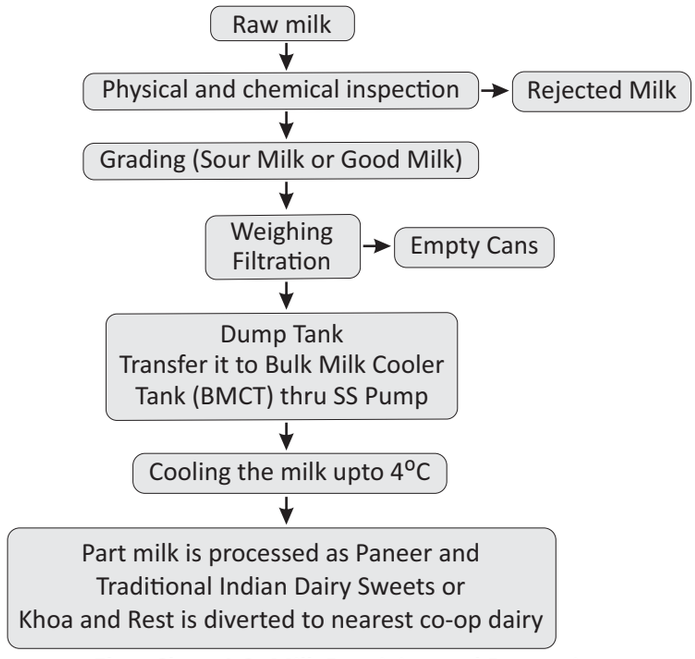
The co-operative society also provides the following services to its member of co-operative society:

1. Artificial insemination (AI)
2. Veterinary support
3. Supplies of concentrated cattle feed and fodder seeds.
4. Loan to purchase new milch animals, and small equipment.

1.4.3.3 Chilling Centre/Bulk Milk Cooling Centre

If a dairy plant is far away from the collection centre, then the collected milk is first brought to a centralized chilling centre/ bulk milk cooling unit to reduce the temperature of milk up to 4 to 5°C. Then the milk is stored in the insulated tanks of 5000-20,000 L capacity. Subsequently, the chilled milk is transported in insulated Road milk tanker to the dairy plant. The transportation of milk from the chilling centre to the processing plant usually takes place once a day.

Flow chart for Milk Receiving and Processing



Flow Chart 1.2: Milk Receiving and Processing

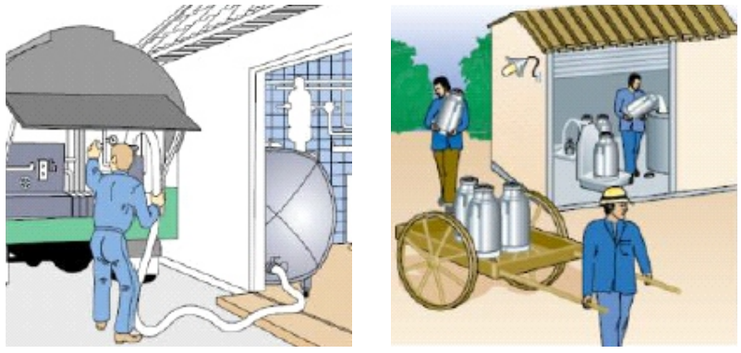


Fig. 1.5: Receiving and unloading of milk

1.4.4 Nutrients present in Milk

As per FSSAI, "Milk is a whole, fresh, clean lacteal secretion obtained by complete milking of one or more healthy milch animals excluding that obtained within 15 days before calving or 5 days after calving. Market milk must possess the pre determined percentage of milk fat and SNF (Solid Not Fat)."
Milk of different classes and types must conform to the standards laid down by FSSAI. Mixed milk means a combination of the milk from cow and buffalo. The combination also should at par with FSSAI standards. The following table explains the composition of milk are as follows:

- Protein - require for body building and repair
- Carbohydrates - provide energy
- Fats - provide energy, carries fat-soluble vitamins A, D, E and K
- Vitamins - helps in growth and shall prevents diseases
- Vitamin D - good for bones and teeth, prevents rickets
- Vitamin A - aids growth, prevents night blindness
- Riboflavin (Vitamin B2) - regulates production of energy from dietary fat, carbohydrates and protein.
- Minerals - strong bones and teeth, body regulation
- Calcium - good for bones and teeth, prevents osteoporosis
- Phosphorus - good for bones and teeth

1.4.5 Testing of Milk for quality control

It is one of the most vital component of dairy industry. The milk must be tested prior to receive from the milk producers or any middle men. Milk is prone to adulteration because of high amount of water (87%). The growth of bacteria require nutrients and water which are abundant in milk. Testing is the only method through which industry shall control the quality of milk and milk products. Storage at lower temperature (<5 deg C) helps to retain the quality of milk.
QUALITY may be check:

i) At the farm
ii) At Milk collection Centre
iii) At the Dairy Factories
iv) Within the Dairy Factory
v) During marketing of processed products

Fig. 1.6: Sampling and Testing of milk

1.4.6 Practice used for milk testing

1.4.6.1 Sampling of milk for testing

Sampling of milk sample for testing is the first most important activity after collection of milk at collection centre or at processing centre. Milk receive in the collection centre through cans while through road milk tanker at chilling/processing centre. It is advised to mix the milk with the help of plunger before the collection of sample for physical, chemical and sensory testing. All the sample must be coded and labeled with name of suppliers and date of receive. A proper records must be documented for the future use.

Fig. 1.7: Sampling device

1.4.6.2 Common test for milk sample.

1.4.6.2. 1 Organoleptic tests:

This test helps to discard the poor quality of milk at the milk reception dock itself. An experienced milk grader with effective sense of sight, smell and taste may detect any off flavor, color or smell easily. The milk may be taken into the mouth for clear opinion about the taste.

1.4.6.2. 2 Clot on Boiling (C.O.B) Test

This test is very simple and quick. Milk sample take into a test tube and heated from the bottom. If there is the formation of clot, that means milk contains acid or rennet producing microorganisms. It also confirm that such milk cannot withstand high temperature while processing and therefore be rejected. This test helps to identify the milk with low pH (<5.8) or the abnormal milk (e.g. colostral or mastitis milk).

1.4.6.2. 3 The Lactometer test

Every liquid is having a fixed value of density or specific value at a particular temperature. This value may change if the same liquid is mixed with other and this is the principle of this test. When milk is adultered with water or other materials (like, salt, urea, sugar, vegetable oil, soap solution), it's specific value get changed. The lactometer test is used to detect the change in density of such adulterated milk. Lactometer is allow to sink slowly into a specially degined measuring cylinder containing milk at temperature 20°C. One has to read and record the last Lactometer degree (°L) just above the surface of the milk. For the milk having temperature greater than the calibration temperature, a correction factor need to be added for the corrected LR. For each ˚C above the calibration temperature add 0.2°L; for each °C below calibration temperature subtract 0.2˚L from the recorded lactometer reading.

1.4.6.2. 4 Freezing Point Determination

Freezing point of milk is lower than water because of the dissolved solids. It varies between −0.53°C and −0.56°C and act as a more reliable property for the adulteration of milk. The freezing point value will change with the addition of water, salt, urea etc. and tells us about the adulteration. Cryoscope is used for the measurement of freezing point.

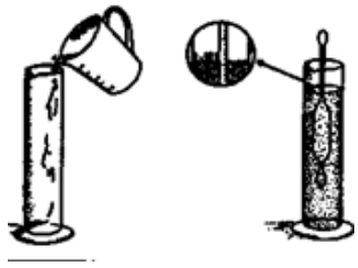
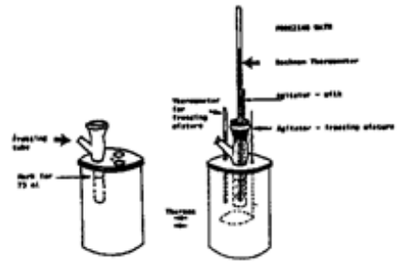
		
Clot on Boiling Test	Lactometer test	Cryoscope

Fig. 1.8: Equipment require for platform testing

Notes

Unit 1.5 Introduction to Coagulated Dairy Products

Unit Objectives

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

- Explain coagulation and their types
- Method of coagulation
- Effect of pasteurization and homogenization on coagulation process

1.5.1 Coagulation

Coagulation is a process, in which proteins presents in the milk get converted into solid form from a liquid phase. This process is not reversible, that means the protein will not converted back to liquid again. This process initiated at around 38°C and is completed between 71°C to 82°C. Coagulation process may be achieved with the help of:

- Animal or vegetable based enzymes
- acid
- heat assisted acid treatment

1.5.2 Enzyamatic Coagulation of Milk

Chymosin, or rennet, is mostly use for enzyme coagulation. The whole process is achieved in three stages described below:

(1) First Stage: In this stage, about 80% of casein present in the milk get break down into smaller casein particles with the help of enzyme at natural pH.

(2) Second Stage: The aggregation of casein particles (micelles) started in this process. All the casein micelles combined together to form a gel or clusters which traps water inside.

(3) Third stage: The ongoing development of the gel network continues in this stage. Also, the gel structure achieves firmness for further cutting or processing.

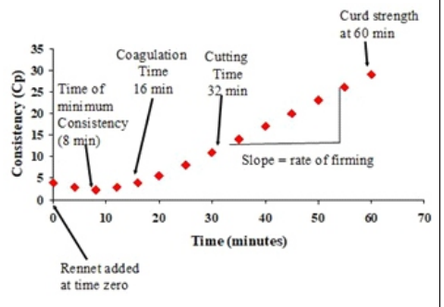


Fig. 1.9: Enzymic Coagulation of Milk (Source: University of Guelph)

1.5.3 Effects of processing parameters on enzymic coagulation

Only the first and second stages of the coagulation process is mostly affected by the addition of coagulum.

1.5.3.1 Effect of pH. The enzyme activity increases with lower pH in both primary and secondary stages of coagulation process.

1.5.3.2 Effect of Calcium content. Calcium content is a vital factor for the aggregation of the casein micelles and coagulation may be stimulate by adding adequate amount of calcium chloride.

1.5.3.3 Effect of temperature. Temperature plays an vital role in the process of coagulation. The optimum temperature for most cheese is 30-32°C. The coagulation time decrease with increasing temperature.

1.5.4 Acid Coagulation of Milk

In this process, casein micelle properties are altered by a lowering the pH of milk. With this a loosely linked aggregates was due to the denature of whey protein. The protein recovery is higher in this case.

1.5.5 Heat assisted Acid coagulation

During this process, recovery of caseins and whey proteins takes place at a same time. Whey proteins are generally acid stable but unstable with heat treatment. Ricotta cheese, Paneer and Channa, were prepared with this process. It is estimated that, bonding of whey proteins with casein micelles enhanced with the heating temperature of milk around 80 degC for at least five minutes holding.

1.6.5.1 Effects of heat treatments

1. During pasteurization, calcium and phosphate present in the milk shifted towards the insoluble form which means lesser amount of calcium is available for coagulation.
2. Addition of calcium chloride or the milk preserved at low temperature helps in the process of coagulation.
3. The time require for the formation of gel increases with the temperature greater than pasteurization temperature. A high heat treatments, casein particles absorbs whey proteins which results in the formation of weak gel.

1.5.6 Effects of Homogenization

Homogenization mainly affects the secondary stage of coagulation process. In addition, the following changes takes place:

- Aggregation of casein particles reduces but fat recovery increases
- As the size of fat globules reduces, the syneresis decrease.
- The texture of soft cheese get better and wither

Unit 1.6 Introduction to Cottage Cheese (Paneer)

Unit Objectives

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

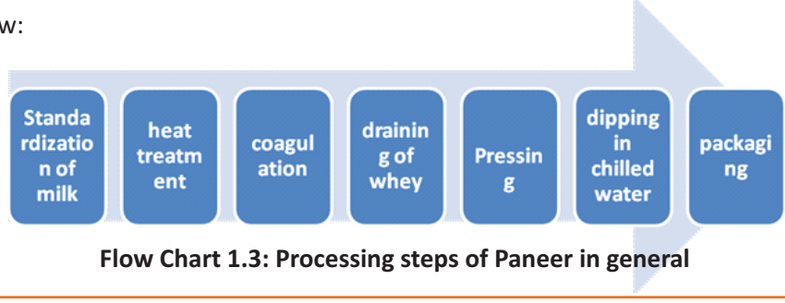
- Describe Cottage Cheese (Paneer)
- State the classification/types and composition of Cottage Cheese (Paneer)

1.6.1 Cottage Cheese (Paneer)

As per Food Safety and Standards Regulations (FSSR), 2011 Paneer is the heat assisted coagulated product resulted from the coagulation of cow or buffalo milk or a combination thereof with the help of lactic acid or citric acid. The paneer must have the moisture content less than 70 %. The fat per cent of paneer shall be greater than 50% of the dry matter. Milk powder may also be used in the preparation of paneer. The moisture and fat percent of low fat paneer shall not be more than 70 and 15% respectively on dry matter basis. According to Bureau of Indian Standards (IS 10484:1983), paneer shall contain minimum of 50% fat on dry matter basis but the moisture content shall not go beyond 60%.

1.6.2 Preparation of Paneer

Paneer may be prepared from Buffalo milk or Cow milk or their combination. The process steps are mentioned below:



Flow Chart 1.3: Processing steps of Paneer in general

1.6.3 TYPES OF PANEER

1.6.3.1 Paneer prepared from Buffalo Milk

In this process, buffalo milk with fat content 5.8 to 6.0% was heated to 90°C without holding. This milk is further cooled down to 70°C and coagulated with 1 to 1.5 % per cent citric acid solution which is also uphold at 70°C. Stirring is preferred till the separation of clear whey. Remove all the whey produce in this process and collect the coagulated mass in the hoops lined with muslin cloth. The whey temperature must be maintained above 63°C during draining. The filled hoops were further pressed (manually or pneumatically) for 10-20 minutes. After this the block of curd is removed and immersed in pasteurized chilled water maintained at 5-6°C for around 2 hours.

Dipping of paneer pieces helps to improve the body and texture of paneer along with cooling. Further, the paneer blocks/pieces were placed on the perforated tray to allow loose water to drain. The moisture per cent of final paneer also increases after dipping. Finally it is packed and stored under refrigerated environment for further sale .

1.6.3.2 Paneer from Cow Milk

Paneer may be prepared from standardized cow milk (using cream extracted from cow milk only) with a fat per cent in the range of 4.5 - 5.0% Calcium chloride is also added to this milk in the range of 0.05 to 0.10%. The milk is heated to 90°C without holding and further cooled down to 85°C. For coagulation, citric acid solution (2%), which was prepared and maintained at temperature of 85°C was mixed with the milk at this temperature only.

All others steps will remain the same as Paneer from buffalo milk.

1.6.3.3 Recombined Milk Paneer

Recombined milk means a milk which is prepared with skim milk powder, cream/butter and good quality water. This milk is standardized (fat 5.8% and SNF 9.5%) and homogenized for further process. This milk is then heated to 90°C without holding and coagulated with the help of 10% citric acid solution maintained at the same temperature.

All others steps will remain the same as Paneer from buffalo milk.

1.6.3.4 Reconstituted Milk Paneer

In this type, whole milk powder is dissolved in good quality water at 50°C and hold in a tank for 3-4 hours for proper hydration of milk components. Calcium chloride (0.1 to 0.15%) is added to the milk and the mixed milk is heated to 90°C without holding.

All others steps will remain the same as Recombined Milk Paneer.

Table 5: Composition of Paneer

Product	Moisture (%)	Fat (%)	Protein (%)	Lactose (%)	Ash (%)
Paneer made from Buffalo Milk	52.3	27.0	15.8	2.2	1.9
Paneer made from Cow Milk	52.5	25.0	17.3	2.2	2.0

Table 6: Chemical/Physical criteria

Description	Standard
Smell + taste	Fresh creamy to slightly fresh sour
Colour	White to light yellow
Fat	Solid dices or blocks
Appearance + texture	No foreign particles
Foreign particles	Minimum 50% in the DM
Moisture content	52 – 53 %
Friability	Good
Acidity	20 - 23% LA or 22 - 25,5 °N
Phosphatase test	Negative

1.6.3.5 Microbiological criteria

As per 10th Amendment Regulations, 2016, Food Safety & Standards Authority of India (FSSAI) has specified microbiological requirements for process hygiene and food safety.

Table 7: Microbiological data for paneer

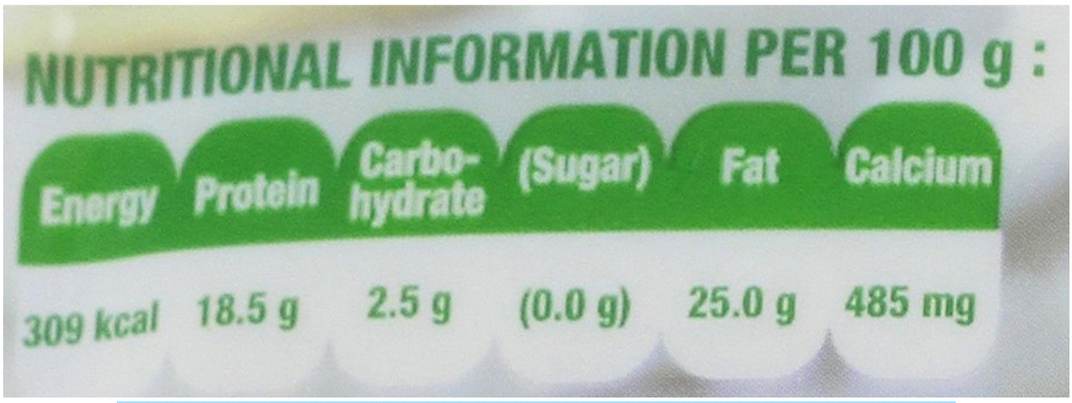
	Minimum	Maximum
TPC	150,000/gm	350,000/gm
Coliform (cfu/gm)	10/gm	100/gm
Yeast and mould (cfu/gm	50/g	150/gm
E. coli	Less than 10/gm	
S. aureus	10/gm	100/gm

1.6.4 Storage conditions

Paneer is stored in the freezer room at -20°C for maximum 1 month. In general, the shelf life is 15 days as mentioned on the paneer package if store under refrigerated condition.

1.6.5 Nutritional value of paneer

The information per 100 g of paneer of AMUL and Mother Dairy are shown below:



Product Details

Product Name	**Amul Fresh Paneer**
Description	Equivalent to Cream Cottage cheese
Packing	Block Paneer - 100g, 200g and 1kg

Product Specifications

Composition	Milk Solids, Citric acid

Nutritional Information

Nutritional Information*	
Amount per 100g	
Energy, kcal	289
Energy from FAT, kcal	225
Total FAT, g	25
Saturated FAT, g	15
Cholesterol, mg	66
Carbohydrate, g	2
Added Sugar, g	0
Protein, g	14
Calcium, mg	480
Not a significant source of Vitamin C, Iron and Dietary fibre.	

Fig 1.10: Product information printed on Paneer pouches

Unit 1.7 Equipment Used in a Dairy Processing Plant

Unit Objectives

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

- Enlist the machineries require for milk and milk products processing
- List the different types of machineries used for paneer processing

1.7.1 Raw Milk Reception Dock

Equipment Used in Dairy Processing

Described below are some of the equipment used in a dairy processing unit:

The dairy plant receives milk through cans or road milk tankers. Raw milk reception dock is the place where milk receives first. The following activities conducted in RMRD.

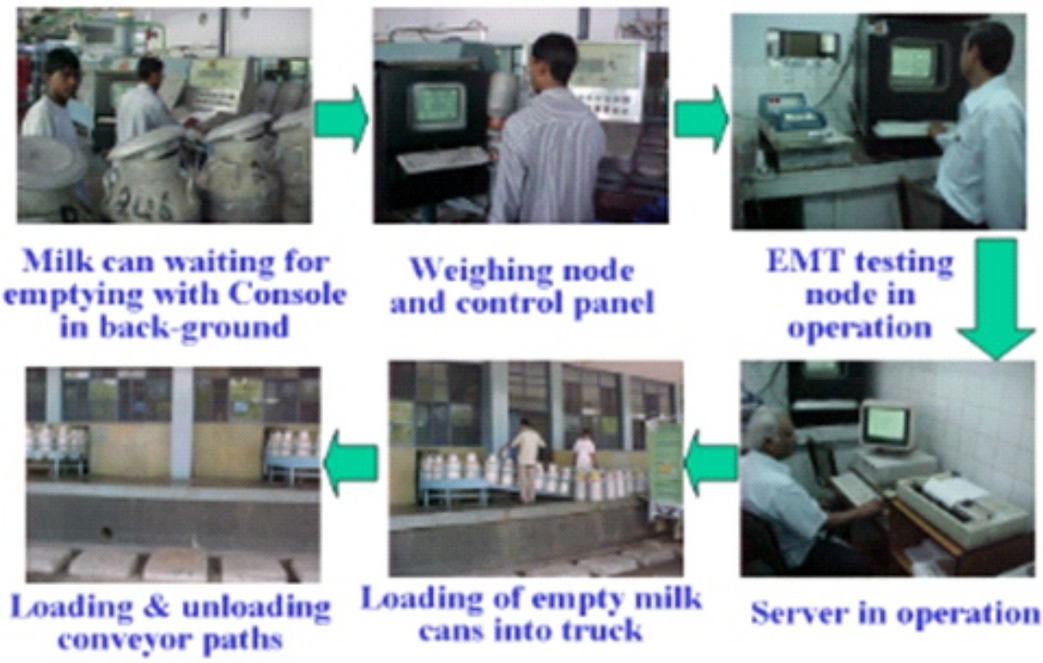


Fig. 1.11: List of activities in RMRD

The RMRD consists of the following activities in continuation i.e, sampling, testing, grading, conveying cans, dumping, unloading from road milk tank, weighing or measuring, recording, and pumping. Platform tests were conducted after the receiving of milk and depending on the quality, the milk may be accept for further processing or reject. At the end cleaning of cans and tankers were also conducted at RMRD.

1.7.1.1 Storage Tanks

The milk storage tanks are the insulated tanks in which hot or cold milk shall be store for further processing/packaging. In the dairy industry, storage tanks are classified based on structure and heat preservation capacity. Several types of storage tank are available in the dairy industry like; Horizontal milk storage tank (HMST), Vertical milk storage tank (VMST) or Silos, Flat bottom and cone bottom tanks etc. Some of them are listed below:

Horizontal milk Storage Tank

Vertical milk Storage Tank

Fig. 1.12: Milk Storage Tank

1.7.1.2 Chilling section

The milk must be immediately chilled down with the help of a milk chiller to arrest the growth of micro organisms present in the milk. Milk chiller consists of a plate pack (PHE) which chills the milk less than 5°C with the help of chilled water generated at dairy plant.

Bulk milk cooler

The farm level bulk milk chilling system consists of the following components:
a) **Bulk Milk Tank:** It is a horizontal tank of rectangular or cylindrical shape and made of AISI 304 Grade stainless steel. The tank is also fitted with accessories such as inlet and outlet connections, agitator and calibrated stick etc., all made of AISI 304 Grade stainless steel. The tank is provided with a thick insulation, generally polyurethane foam, between the inner and the outer jacket to prevent refrigeration loss.

a) Refrigeration Unit: It consists of refrigerant, compressor, air cooled condenser, condenser fan, receiver and expansion device.

Milk chiller

Bulk Milk Cooler

Fig. 1.13: Milk Chilling equipment

1.7.1.3 Milk Pasteurizer

Milk Pasteurization plant is a combination of PHE, balance tank, pumps, holding coils to achieve pasteurization. The milk goes into the pasteurization at 4°C and after pasteurization, the outlet temperature of milk is 4°C. Pasteurization is a process in which milk is heated up to 72°C and hold the same for 15 seconds in order to kill the pathogenic microorganisms.

Fig. 1.14: Pasteurization Unit

1.7.1.4 Homogenizer

Homogenization is the process used to make a uniform mix of two liquids with different densities. A homogenizer is used to reduce fat components in the milk to a uniform size and disperse them uniformly through the rest of the milk.

1.7.1.5 Separator

A cream separator is a device used to separate cream from milk. It helps in the mechanical separation of milk into cream and skimmed milk with the help of centrifugal force. Centrifugation is a process where milk is filled in the separator and is rotated at a very high speed. Due to this, the thicker liquid separates from the thinner liquid and settles at the bottom of the equipment.

The dairy industry uses two types of separators. They are:

- Hand-operated separators
- Power-driven separators

Fig. 1.15: Homogenizer

Fig. 1.16: Cream Separator

1.7.1.5 Standardization equipment for dairy products

The skim milk and cream were obtained from the process of centrifugal separator. Standardization is the process in which fat, solids non-fat and total solids were added back into that product in precise 'standardized' quantities. In other words, Standardized milk is milk in which the desired fat or SNF percentage were achieved either by adding/removing cream or by adding skim milk.

1.7.1.6 Multi-purpose Vat

For the processing of Indian traditional products like cheese, ghee, peda, paneer, ice cream etc., a multipurpose Vat is generally used. It may be rectangular or circular types. These Vat will have the provision of heating and cooling (via chilled water) and available in different materials of construction, capacity, shape and design. The vat is attached with steam or hot water for the heating application. The vat may be mounted with agitator as per product requirement.

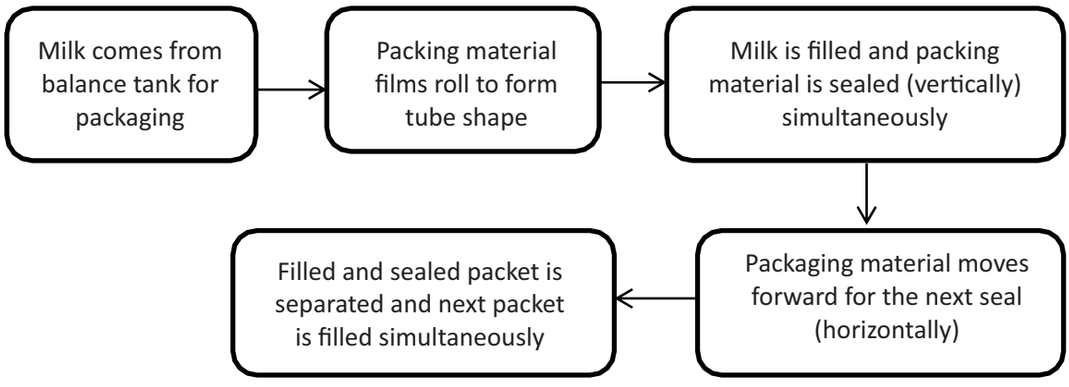
1.7.1.7 Packaging Machine

Most dairy processing plants use the Form Fill Seal (FSS) machines to package processed milk and milk products. This machine is ideal for packaging free-flowing type or granular food products.

Fig. 1.17: Multipurpose vat

Fig. 1.18: Double head Packaging Machine

Flow Chart 3: Working principle of FFS machine



1.7.1.8 Utility Section

Several types of resources or plant utilities (raw water, compressed air, refrigeration, steam and electricity, machineries and skilled/unskilled labour etc.) were required for the unit operations involved into the conversion of raw milk into value added finished products.

In addition to this a dairy plant must have ETP to treat the effluent produced in the dairy industry.

The following chart explains the process followed for packaging milk in FFS machine.

Notes

Notes

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

2. Organisational Standards and norms

Unit 2.1 - Roles and responsibilities of cottage cheese maker and workplace ethics

Unit 2.2 - Standard Operating Procedures

Unit 2.3 - Personal hygiene and sanitation guidelines

Unit 2.4 - Food safety hygiene standards to follow in a work ronment (Schedule-4)

(FIC/N2018)

Key Learning Outcomes

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

1. Roles and responsibilities of Cottage cheese maker
2. How to conduct yourself at the workplace
3. Personal hygiene and sanitation
4. Food safety hygiene standards to follow in a work environment (Schedule-4)

Unit 2.1 Roles and Responsibilities of a Cottage Cheese Maker

Unit Objectives

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

1. Understand the roles and responsibilities of a Cottage Cheese (Paneer) maker
2. State how to conduct yourself at the workplace
3. Understand the importance of disciplined behavior for the success in workplace
4. Explain the generic skills needed for one to become successful production worker
5. Explain the criteria's of a good listener
6. Explain the importance of effective communication to become a successful production worker
7. State the importance of interpersonal skills to maintain good relationships at the workplace
8. State the importance of working as a team in the workplace
9. Explain the benefits of teamwork
10. Understand common reasons for interpersonal conflicts in a workplace and how to tackle with them
11. How to escalate employee grievance to the management
12. Explain the procedure of handling grievance in an organization

2.1.1 Roles and Responsibilities of cottage cheese maker

The following table provides detailed information about the roles and responsibilities of a cottage cheese (paneer) maker:

Roles	Responsibilities	for more information refer module
Handle raw material from the time of receipt till it reaches the process line	• Check the raw material for quality (Fat, SNF, TS and Acidity %LA) • Ensure minimum loss of raw material while handling	Module 1
Record-keeping and documentation	• Documentation and maintenance of raw materials, production schedule/ process and finished products	Module 5
Hygiene and sanitation maintenance	• Adopt safety and sanitation-related measures • Follow food safety norms and practices	Module 2 Module 6
Operate dairy equipment and machineries	• Optimize the use of machinery • Ensure smooth operation of machinery to complete production line	Module 3 Module 4

Inspect machines and troubleshoot issues	• Attend to minor repairs of tools and machinery when required • Ensure that safety rules and regulations are observed • Prevent accidents	Module 3 Module 2 Module 6
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 • Achieve good quality products with the correct quantity	Module 4 Module 2 Module 3
Handle finished material from the time of production till packaging	• Check the processed material for quality (Fat, SNF, TS, Acidity %LA, Fat in Dry Matter and Coliform/g) • Ensure the products meet the quality standards set by the organization.	Module 4
Follow storage and packaging norms	• Ensure safe and proper storage of raw material, packing material, and finished goods.	Module 4

2.1.2 Workplace Ethics

Workplace ethics are, by definition, the moral principles that guide a person's actions in the workplace. Ethical standards can vary from industry to industry, and from position to position within an industry. They can also vary by specific field within a larger industry.

Some important ones to remember are:

- Address seniors, assistants, and workers with respect
- Follow the processes laid out in the manufacturing unit
- Always follow food safety norms
- 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

2.1.2.1 Disciplined behavior

Disciplined behavior is important to improve workplace performance and to provide a safe and honest working environment.

Fig 2.1. Disciplined behavior

2.1.2.2 Language skills Cottage cheese maker

To be a successful cottage cheese maker, the participant shall have the following generic skills

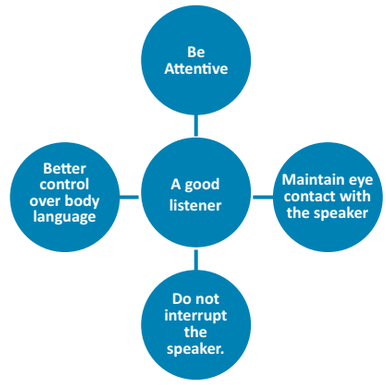
2.1.2.2.1 **Speaking:** Skills that give one the ability to communicate effectively and convey the message in a convincing manner.

2.1.2.2.2 **Reading and writing skills:** A cheese maker shall understand and interpret the process and flow chart required for producing different types of products. He is also responsible to note down the observation on day to day basis and inform the management.

2.1.2.2.3 **Listening:** Listening is a skill which allows one to understand what another person is saying.

A good listener can;

- Improve relationships in their personal and professional lives
- Avoid conflicts and misunderstandings and gain more clarity through listening well
- Higher confidence level as they have access to information
- A good source of information



2.1.2.3 Communication

Communication is the process of exchanging information by speaking, writing, or using some other medium. Effective communication is a basic prerequisite for the achievement of organizational goals.

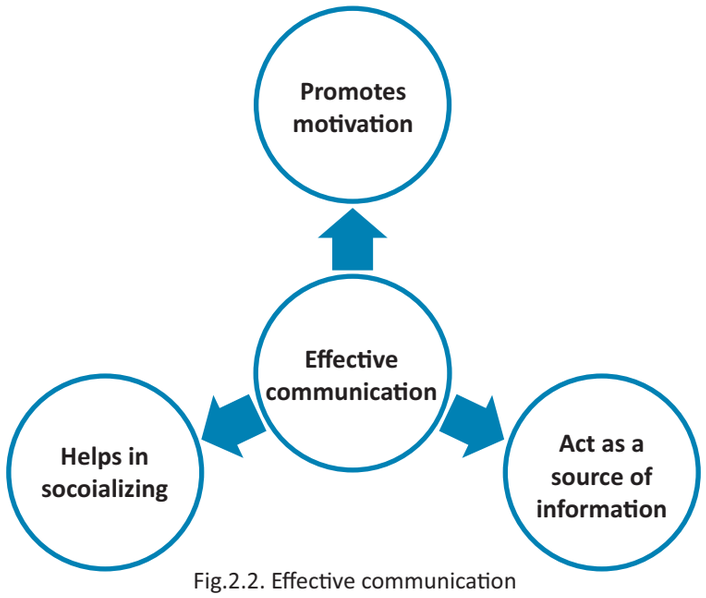
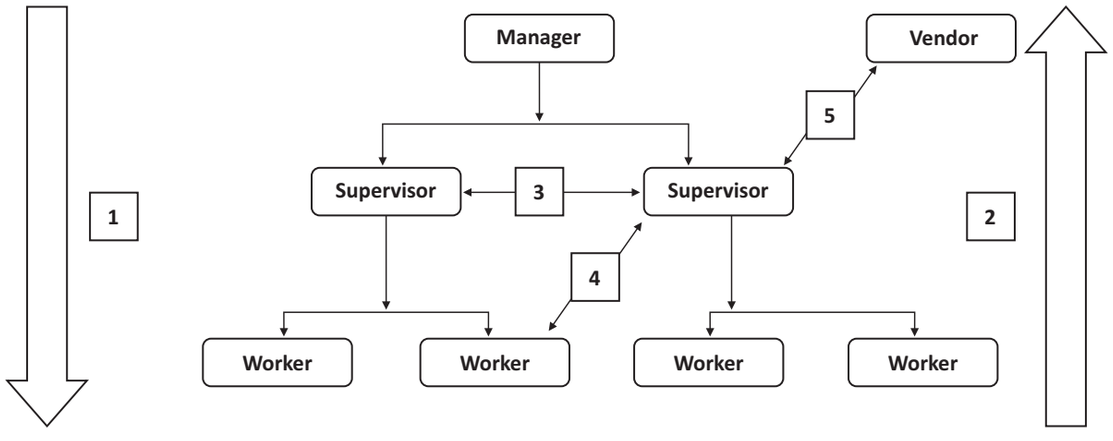


Fig.2.2. Effective communication

Communication flow in an organization

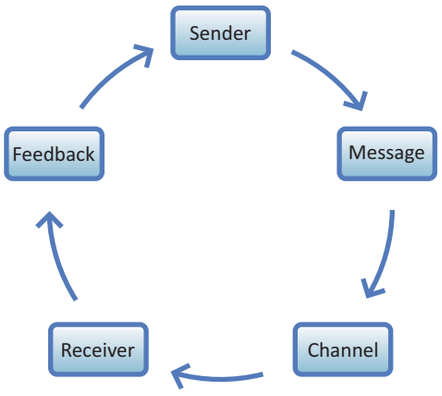
In an organization, communication flows in 5 main directions



1. **Downward:** Communication from management to subordinates is downward communication
2. **Upward:** Communication that flows to a higher level in an organization
3. **Lateral:** Communication between the same levels of hierarchy in an organization is called lateral communication
4. **Diagonal:** Communication between a supervisor-worker or worker-supervisor of other workgroups is called diagonal communication
5. **External:** Communication between a management and external groups such as - suppliers, vendors, banks, financial institutes etc.

Criteria's of a good communicator

The main components of communication process are:

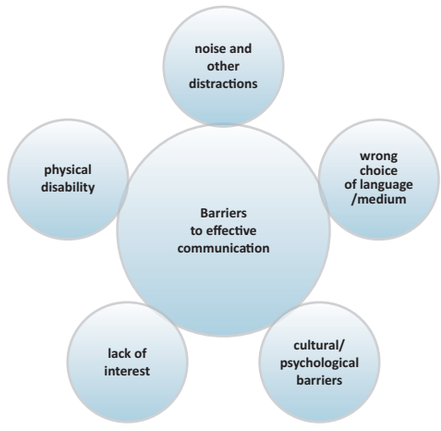
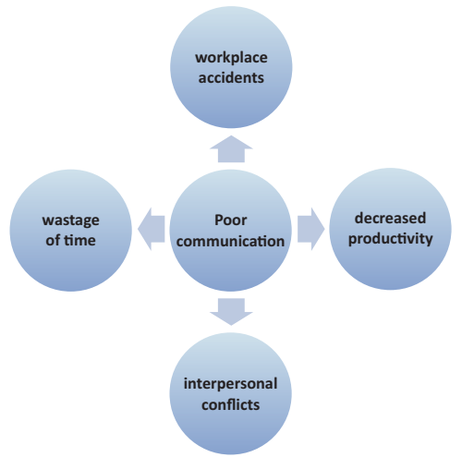


- **Context** - The context may be physical, social, chronological or cultural.
- **Sender / Encoder** - The person who sends the message.
- **Message** - The key idea that the sender wants to communicate. It is a sign that elicits the response of recipient.
- **Medium** - Medium is a means used to exchange the message.
- **Recipient / Decoder** - The person for whom the message is intended.
- **Feedback** - Feedback is the main component of communication process and it permits the sender to analyze the efficacy of the message sent.

Notes

Communication in the workplace

- ✓ Encourage two way communications in the workplace. Speak up if you are not clear about the information received.
- ✓ Provide information to others clearly which help them understand
- ✓ Provide specific and descriptive feedback
- ✓ Be a good listener

The barriers to effective communication	Effects of poor communication
	

2.1.2.4 Inter personal skills

Interpersonal skills are the ability to develop fruitful relationships with others. Knowing how to develop healthy working relationships with people at the workplace contributes significantly to your success as a cottage cheese maker

How to Develop Good Interpersonal Skills

Effective communication plays a key role in developing good interpersonal skills.

1. **Non verbal communication** which result in achieving positive interpersonal skills are:
   - Smile and eye contact
   - Correct postures and gestures
2. **Good listening skills.**
   - It conveys that "you care"
   - It enables you to understand other people's viewpoints and empathize with their situation.
3. **Verbal communication** which result in achieving positive interpersonal skills are:
   - Use of voice and intensity .

2.1.2.5 Work as a team

2.1.2.5.1 Team work

Team work promotes strong working relationships which eventually contribute higher productivity. When employees work together and succeed as a team, they are more likely to; ✓ Communicate well with others ✓ Support and get motivated ✓ Work cooperatively for the success of the organization	

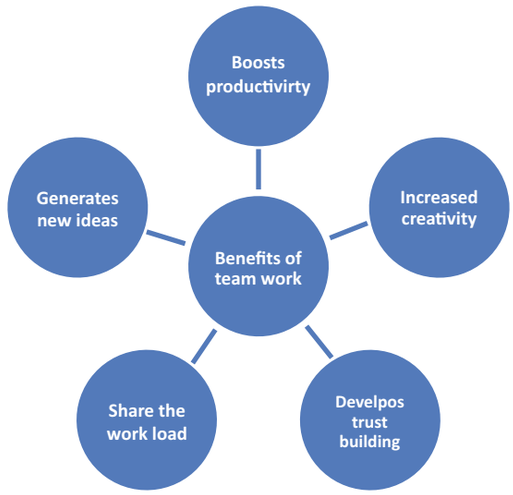


Fig.2.5. Benefits of team work

2.1.2.5.2 Conflict Resolution skills

Interpersonal conflicts: The conflict comprises a series of human affective states including anxiety, hostility, resistance, aggression, and competition. The common reasons for interpersonal conflicts in a workplace are;

- ✓ Lack of effective communication
- ✓ Individual differences on values and beliefs
- ✓ Lack of trust
- ✓ Incivility
- ✓ Stress

The conflict resolution process

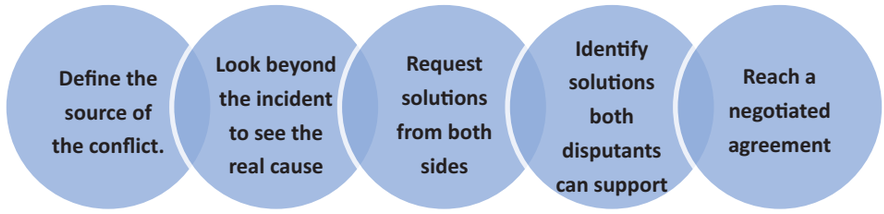


Fig.2.6. Conflict resolution process

2.1.6 Grievance management in workplace

Grievance is a concern, problem, or complaint that an employee has regarding the work/workplace, or someone they work with which made him/her feel dissatisfied.

Types of grievances in the workplace include;

- ✓ Pay and benefits.
- ✓ Bullying/ harassment.
- ✓ Work place risks and safety concerns.
- ✓ Workload.

Grievance procedure

1. The organization shall have a written grievance procedure, by which employee can escalate his/her issues
2. Investigating grievance:- the organization carryout investigation.
3. Grievance meeting: the organization holds a meeting so that the employee gets opportunity to explain the complaint.
4. Considering the evidences the organization decides whether to reject or hold the grievance.
5. The employee can go for appeal if he feels unfair to the decisions made by organization

Notes

Practical : Self quiz on work ethics

Aim: to get an understanding on how ethical person you are.

Materials required

- ✓ Stationary items, quiz format.

Name of participant:			Roll no:		
Dependability	**1. Are you reliable?**				
	Never	Seldom	Sometimes	Usually	Always
	2. Do you follow rules?				
	Never	Seldom	Sometimes	Usually	Always
Responsibility	**1. Do you honor your word?**				
	Never	Seldom	Sometimes	Usually	Always
	2. While working, do you ever do other things?				
	Never	Seldom	Sometimes	Usually	Always
	3. Do you help your co-worker at work?				
	Never	Seldom	Sometimes	Usually	Always
Honesty	**1. Are you true to the words you make?**				
	Never	Seldom	Sometimes	Usually	Always
Level of rigor	**1. Are you a hard worker?**				
	Never	Seldom	Sometimes	Usually	Always
Level of initiatives	**1. Do you perform work that is not required of you?**				
	Never	Seldom	Sometimes	Usually	Always
	2. Do you work for extra time when the organization needs you (e.g. festive season)				
	Never	Seldom	Sometimes	Usually	Always

Methodology

1. Fill the quiz format given by the trainer as honestly as possible.

Unit 2.2 Standard Operating Procedures

Unit Objectives

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

- State Standard Operating Procedures
- Implications of Food Recall
- Explain benefits of Standard Operating Procedures

2.2.1 Standard Operating Procedures

Hazard Analysis & Critical Control Points (HACCP) and Food Safety plan are core to Food Manufacturer's. These facilities require some pre-requisite program. Standard Operating Procedures run on the basis of pre-requisite program.

An SOP is defined as 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 applied to production, manufacturing and support area processes, jobs or activities. For all sanitation-related processes, jobs or activities, the term SSOP (Sanitation SOP) is held in reserve.

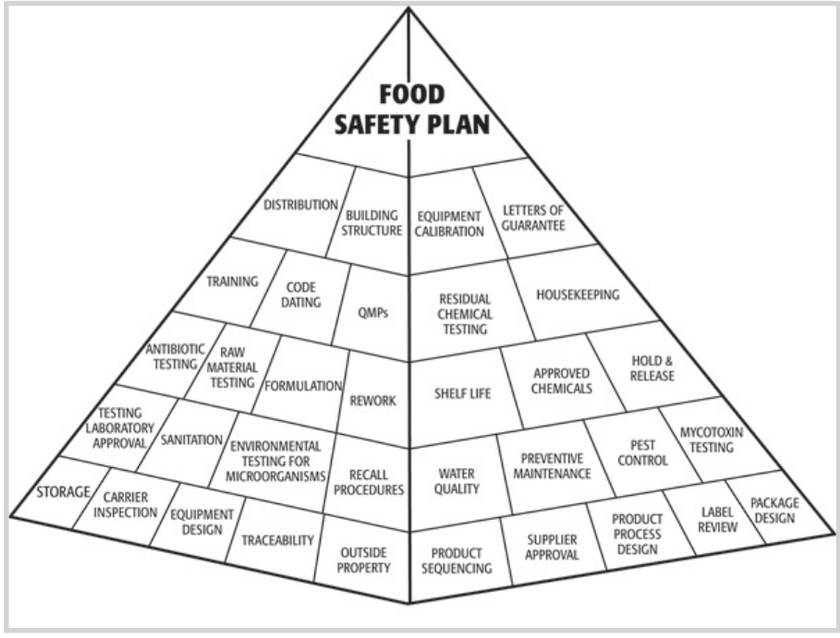


Fig 2.7 Food Safety Plant

The development and use of SOPs/SSOPs are essential parts of a successful food safety, quality and sanitation system (see Figure 2.1), as they provide all basic information to the individuals required to properly perform their jobs. Furthermore, the use of SOPs and SSOPs promotes quality through constant implementation of a process, task or job. Also, if clearly written, SOPs and SSOPs can minimize miscommunication and variation between individuals or organizations.

The term SOP may also be used synonymously with “protocol,” “job instruction” or “work instruction.”

2.2.2 Implications of a Food Recall

The significance of the development and use of food plant SOPs/SSOPs cannot be overstated. For example, according to U.S. Food and Drug Administration's Reportable Food Registry annual report (fiscal year, September 2011–August 2012), 37.9 percent of all food recalls were due to undeclared allergens. In the course of the investigations, the true cause of these recalls was traced to either an SOP/SSOP that did not exist or was insufficient, or to a non-compliance to one or more of the appropriate measures, including:

- 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

In addition to create harm and generating adverse publicity, recalls are expensive: the average cost associated with these allergen-related SOP failures has been estimated at $10 million per recall.

2.2.3 Benefits of SOPs

Besides help encouraging food safety and prevent food recalls, SOPs can do the following:

- Serve as the basis for implementing an effective program to include employee training as well as a tool for on-the-floor instruction and expansion.
- Identify control points, as well as their limits, to control and validate the process. Corrective actions and preventive actions can be identified to facilitate each process.
- Establish time, labor and material requirements for a job or task.
- Be used as checklists by internal audit team members during auditing the plant’s programs and procedures.

Finally, the benefits of a valid SOP are reduced work effort, along with improved comparability, credibility and legal defensibility.

2.2.4 Developing and Maintaining SOPs/SSOPs

SOPs and SSOPs should adhere to the following food industry best practices.

2.2.4.1 Key Sections

The SOP/SSOP must be formatted in such a way that it provides all felicitous information so that an employee with some knowledge of the area, equipments and tools can read and perform the functions of the task both safely and effectively.

2.2.4.2 Title Page

Firstly identify the procedure name, an identification number, date of issue and/or revision and the name of the applicable plant, division and department to which the SOP applies. This section also includes the signatures and signature dates of those individuals who prepared and approved the SOP. Electronic signatures are acceptable for SOPs maintained on a programmed database.

2.2.4.3 Table of Contents

A table of contents is helpful for immediate reference and location of specific information, changes or updates. It is principally significant for lengthy or detailed SOPs/SSOPs.

2.2.4.4 Introduction/Purpose

This section will illustrate the meaning for the SOP/SSOP and allows the reader to better understand not only the "how" but the "why" as well. Included here are any appropriate background information and a synopsis.

2.2.4.5 Responsibilities

This section will illustrate the list of accountabilities for all stakeholders, detailed by position.

2.2.4.6 Definitions

This section will illustrate a list of terms, phrases, words or acronyms and their applicable meanings. Since the reader will already have some knowledge of the task or equipment, only uncommon and unfamiliar terms should be defined. For example, in a testing procedure, Listeria may not need to be defined, whereas in an environmental monitoring procedure, Listeria may require definition.

2.2.4.7 Materials

This section illustrate about list of materials, equipments, checklists and supporting documents required to complete the activity or task.

2.2.4.8 Safety

This section includes a list of any personal injury or loss-of-life warnings, such as restricted space. This section will explain what will happen if the procedure is not followed or is followed incorrectly.

2.2.4.9 Procedure(s)

Each process, task or step to be taken in sequence will be listed in this section. One SOP/SSOP document may contain several procedures for multiple processes or sub processes.

2.2.4.10 Training

List the training requirements for the SOP/SSOP as well as the frequency of training (i.e., one-time or annually).

2.2.4.11 Documentation

Identify the forms to be used and reports to be written, as well as the data and record storage location and duration.

2.2.4.12 Compliance Verification and Validation

This section will describe any control steps and provisions for review and/or oversight. Verification will include a periodic review of the SOP/SSOP and corresponding actions like (Are we doing what we say we are doing?). On the other hand, validation will include a periodic review of the records, reports and other documentation. (Are the goals of the SOP being accomplished?) All deviations should be reported and trended, and a corrective action/preventive action plan developed to address each opportunity.

2.2.4.13 References

This section give information about list of all cited regulatory, company or facility references.

2.2.4.14 Document Revision History

This section give list of all reviews, updates and revisions made to the SOP/SSOP.

2.2.4.15 Content

SOPs and SSOPs should be clearly worded so as to be gladly understandable by a person knowledgeable about the general concept of the procedure. One can use diagrams, flow charts, pictures and computer screen shots to help break up long sections of text and to review a series of steps for the reader. These visual aids mainly help in delivering training of the SOP/SSOP.

One should be careful to include all necessary information without becoming too comprehensive.

2.2.5 Development Process

When developing an SOP/SSOP, a subject matter expert (SME) should prepare a written draft of the procedure. This draft is then reviewed by other plant or area experts. The purpose of this review is to solicit comments, suggestions and ideas for improvement and clarification.

Once the SOP/SSOP has been drafted, the content must then be verified. This is best accomplished by having the SME "walk" through the procedure, on the floor, taking into consideration all key parameters (e.g., time, equipment speed, sample location, etc.). Update the SOP/SSOP with all necessary changes. Pictures, diagrams, flow charts and computer screen shots should be inserted at this time.

Once the SOP/SSOP is in final draft form, an equipment or process expert, such as a training supervisor, should perform the procedure as written. If possible, to best identify any and all gaps, conduct more than one expert review. These experts will then provide the final updates and refinements required to complete the SOP/SSOP.

When finalized, the SOP/SSOP should then follow the appropriate approval process, as identified in the company's policy, and be published.

2.2.6 Revisions and Reviews

An SOP/SSOP is an changeable, "living" document. As such, in an effort to continuously improve a process or task, updates are required. Indeed, improvements should be actively required and changes often made. These must always be tracked and communicated effectively.

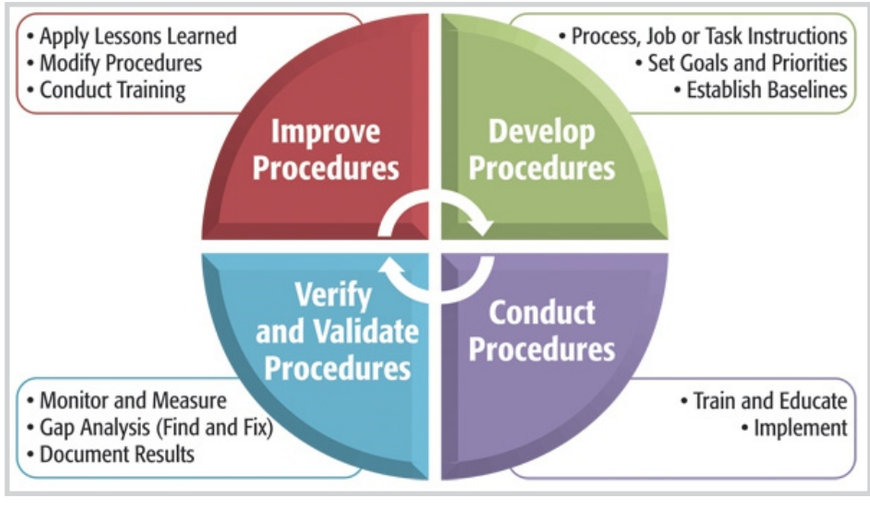


Fig.2.8 Revisions and Reviews

continuous improvement" cycle give best description by a variant of the Deming circle, also known as plan, do, check, act (PDCA).The Deming circle is an integrated, four-step method used for the control and continuous improvement of processes (Figure 2).

The PDCA steps for each consecutive Deming circle include the following four phases:

2.2.6.1 Plan (Develop Procedures)
Develop the SOPs and SSOPs, establishing the objectives and processes essential to deliver the preferred results. This will, in turn, establish objectives, priorities and baselines to achieve. Establishing these expectations makes completeness and accuracy of the SOP/SSOP a part of the targeted improvement.

2.2.6.2 Do (Perform Procedures)
Perform the SOPs/SSOPs. In other words, execute the plan, conduct the process and make the product. Collect data for charting, trending and analysis.

2.2.6.3 Check (Verify & Validate Procedures)
Verify and validate the SOPs/SSOPs by studying the actual results, as depicted in the "Do" section. Do the comparison of these results with the targets or objectives from the "Plan" section. Look for deviations between the development and the implementation of the SOP/SSOP. Making the Chart can create it much easier to see trends over several Deming cycles.

2.2.6.4 Act (Revise & Improve Procedures)
For each major difference between actual and planned results, once the root cause has been determined, develop a corrective action/preventive action (CAPA) plan. It has to be determined

where to apply changes for improvement of the process or product. If, after one or two passes through the Deming circle, the process does not improve, further refine the CAPA plan to include more detail in the next iteration of the cycle(s). Otherwise, more concentration may be required in a different stage of the process.

Category 1	This is a new/revised document. All required personnel must read this version and complete the prescribed training.
Category 2	This is a revised document in which only the area of applicability has changed. All newly impacted personnel required to follow content must read version and complete the prescribed training.
Category 3	This is a new/revised document. All personnel required to follow content must read this version.
Category 4	This is a revised document in which only the area of applicability has changed. All newly impacted personnel required to follow content must read version.
Category 5	No significant changes made to document content-no requirement to read or train.

Table 2.1 various categories of a new/revised document

SOP/SSOP revisions and updates should be categorized so that all the stakeholders understand the amount of change that has occurred as well as the degree of employee training required with the changes (Table 2.1).

2.2.7 Document Control

Document control is the process of initiating, updating, changing and "expiring" company documents. All documents and records should be maintained in either an electronic or manual system.

At a prescribed time (i.e., immediately after production, weekly, etc.), all documents and records will be collected. Once compiled, all of the documents and records will then be stored in a short- term records, in an area that will allow easy access for reference as needed.

As archived records begin to exceed the maximum length of time for short-term storage, they will be moved to a long-term storage location for a minimum of 2 years or shelf life plus 1 year, whichever is longer. Local, state and federal regulations as well as customer necessities may recommend a longer period.

Clearance of expired documents and records should be followed on a scheduled basis and in accordance with a documented policy.

2.2.8 Access

Each SOP and SSOP must be easily accessible by employees. Therefore, the most up to date version of the SOP and SSOP must be readily available. Access can be in the form of either a printed manual or electronic access. If a printed manual is used, procedures and practices must be in place that ensure the manual is controlled and the updates done are current.

For new employees or for employees working in an unfamiliar or new area, having a physical copy in hand may be especially useful. This copy can be used as quick reference for a new work assignment or for coaching activities.

Whether considered a protocol, work instruction or job instruction, SOPs and SSOPs must be integral and preliminary parts of all food manufacturing facilities' food safety program

Notes

Unit 2.3 Personal Hygiene and Sanitation Guidelines

Unit Objectives

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

- Understand the importance of personal hygiene and sanitation guidelines require to follow in a work environment

2.3.1 Personal Sanitation

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

- Maintain a high standard of personal cleanliness viz. have a bath every day and wear clean clothes to work.
- Always button up your sleeves or roll them up above the elbows. Button up your cuffs and wear a protective cap.
- 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.
- Gloves need to worn most of the time in workplace, so use suitable barrier cream to protect the skin.
- Use heat resistant gloves to prevent any types of burns.
- Wear rubber gloves when dealing with chemicals. Wear leather gloves when dealing with heavy machineries.
- Wear safety shoes always during the work.
- Take precautions, when the floor is wet or there is an obstacle in your way.
- Wear goggles or eye shield when working with chisel, grinder or a sharpening tool.
- Always keep your finger nails trimmed.
- Always keep your hair trimmed and wear hair net while working.
- 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.
- Avoid smoking, spitting, sneezing or coughing when present in the process hall or workplace.
- Do not handle food when suffering from a disease, illness, burns, injury or infection.
- 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.

Table 9: Personal Protective Equipments

 Protective Gloves	 Head Cap	 Mouth Mask	 Safety Goggles
 Aprons	 Earbuds	 Sanitizer	 Safety Boots

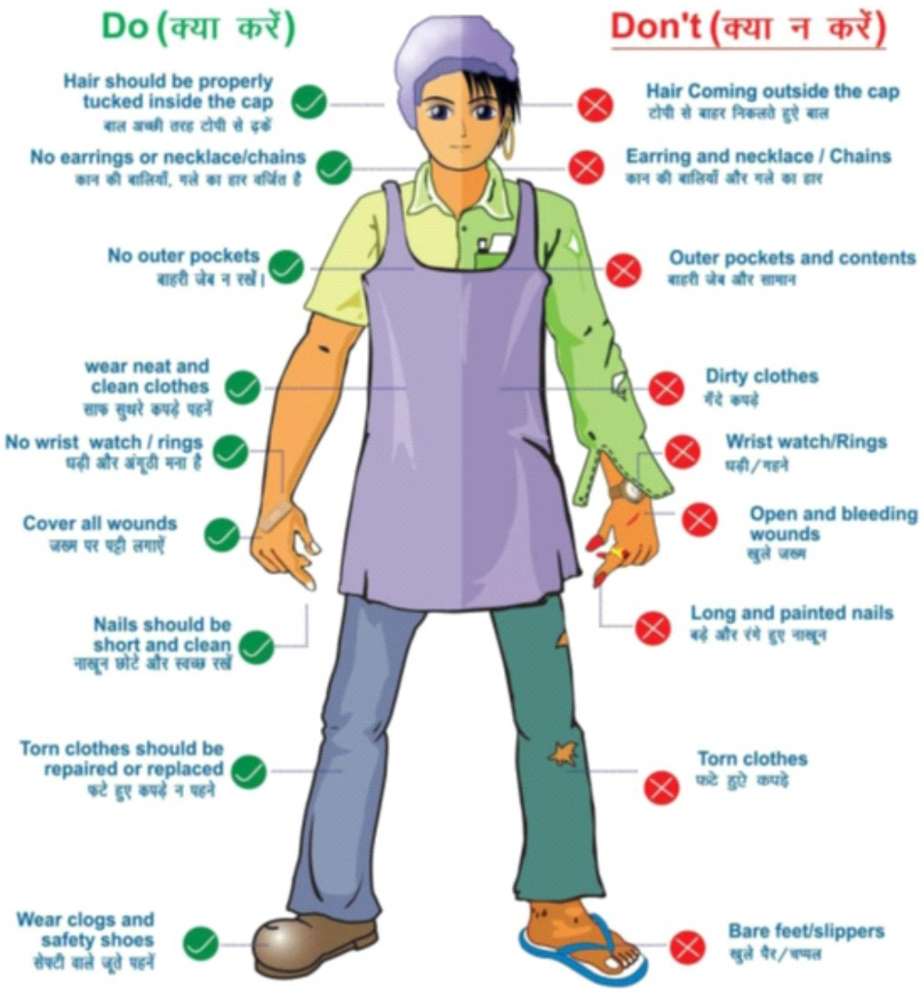


Fig.2.9 Do's and Don't in general

Fig. 2.10 Hygienic Practices

Notes

Unit 2.4 Food safety hygiene standards to follow in a work environment (Schedule-4)

Unit Objectives

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

1. Know the food safety hygiene standards to be follow in a work environment
2. Explain Schedule 4 of FSSAI and its importance
3. To introduce a single statute relating to food safety
4. List various general hygiene and sanitation practices by Food Business Operator
5. Need of Food Safety for Food Business Operator

2.4.1 General Hygienic and Sanitary practices

The Food Safety and Standards Authority of India (FSSAI), has made Schedule 4 under Food Safety and Standards (Licensing and Registration of Food Businesses) Regulation, 2011. Under these regulations, it is mandatory that every Food Business Operator has to follow hygienic and sanitary practices in the premises where food is being manufactured. Schedule 4 is a set of basic - mandatory requirements to ensure safety of the food made in any premise and Food Business Operator shall continuously try to improve hygienic conditions and sanitary practices at the premises with a aim of attaining India HACCP standards.

The Schedule 4 is divided into five parts as follows:

Part I - General Hygienic and Sanitary practices to be followed by Petty Food Business Operators applying for Registration

Part II - General Requirements on Hygienic and Sanitary Practices to be followed by all FBO applying for License

Part III- Specific Hygienic and Sanitary Practices to be followed by FBO engaged in manufacture, processing, storing and selling of Milk and Milk Products

Part IV - Specific Hygienic and Sanitary Practices to be followed by FBO engaged in manufacture, processing, storing and selling of Meat and Meat Products

Part V - Specific Hygienic and Sanitary Practices to be followed by Practices to be followed by FBO engaged in catering / food service establishments

The general sanitary and hygienic requirements are part of Good Manufacturing Practices (GMP) and Good Hygienic Practices (GHP). For food manufacturer/ processor/handler below indicated generic guidelines are provided which will give fair idea about the practices to be followed. The place where food is made, processed or handled shall comply with the below indicated general requirements:

1. The units/ premises shall be located in a sanitary place and free from filthy surroundings and shall maintain overall hygienic environment. All new units shall set up away from environmentally polluted areas.
2. The premises to conduct food business for manufacturing should have adequate space for manufacturing and storage to maintain overall hygienic environment.

3. The premises shall be clean, adequately lighted and ventilated and sufficient free space for movement.
4. Floors, Ceilings and walls must be maintained in a sound condition. They should be smooth and easy to clean with no flaking paint or plaster.
5. The floor and walls shall be washed as per condition/requirement with an effective disinfectant the premises shall be kept free from insects. Windows, doors and other openings shall be fitted with net or screen, as appropriate to make the premise insect free. No spraying shall be done during the conduct of business, but instead fly swats/ flaps should be used to kill spray flies getting into the premises. The water used in the manufacturing shall be potable and if required chemical and bacteriological examination of the water shall be done at regular intervals at any recognized laboratory.
6. Continuous supply of potable/ fresh water shall be ensured in premises. In case of intermittent water supply, sufficient storage arrangement for water used in food or washing purpose shall be made.
7. Equipment and machinery when employed shall be of such design which will permit easy cleaning. Arrangements for cleaning of containers, tables, working parts of machinery, etc. shall be provided.
8. No container or other equipment, the use of which is expected to cause metallic contamination injurious to health shall be employed in the preparation, packing or food storage.
9. All equipments shall be kept clean, washed, dried and stacked at the close of business to ensure freedom from growth of mould/ fungi and infestation.
10. All equipments shall be placed away from the walls to allow correct inspection.
11. There should be efficient drainage system and there shall be adequate provisions for disposal of refuse.
12. The workers working in processing and preparation shall use clean aprons, hand gloves, and head wears.
13. Persons suffering from communicable diseases shall not be permitted to work. Any wounds or cuts shall remain covered at all time and the person should not be allowed to come in direct contact with food.
14. All food handlers shall keep their finger nails trimmed, clean and wash their hands with soap, or detergent and water before commencing work and every time after using toilet. Scratching of body parts, hair shall be avoided during food handling processes.
15. All food handlers should keep away from wearing, false nails or other items or loose jewelery that might fall into food and avoid touching their face or hair during handling food.
16. Eating, chewing, smoking, spitting and nose blowing shall be prohibited within the premises especially while handling food.
17. All articles that are stored or are intended for sale shall be fit for consumption and have proper cover to avoid contamination.
18. The vehicles used to transport article of foods must be maintained and kept clean.
19. Foods while in transport in packaged form or in containers shall maintain the required temperature.
20. Disinfectants /Insecticides shall be kept and stored separately and `away from food manufacturing / storing/ handling areas.

Notes

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

3.Prepare and maintain work area and process machineries for production of cottage cheese

FICSI
Food Industry Capacity and Skill Initiative

(FIC/N2017)

Key Learning Outcomes

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

1. State the material and equipment used in the cleaning and maintenance of the work area
2. State the common detergents and sanitizers used in cleaning work area and machineries
3. State the methods of cleaning and sanitation
4. Perform the process of preparing the work area for scheduled production
5. Describe the functions to be carried out before starting production
6. State the different types of maintenance procedures
7. Conduct minor repairs and faults in process machineries
8. Prepare the machines and tools required for production
9. Waste Management in Dairy Industry

Unit 3.1 The materials and equipment used in the cleaning along with methods of cleaning and maintenance of the work area

Unit Objectives

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

1. Enlist the material and equipment used in the cleaning and maintenance of the work area
2. State the common detergents and sanitizers used in cleaning work area and machineries
3. State the methods of cleaning and sanitation
4. Perform the process of preparing the work area for scheduled production
5. Describe the functions to be carried out prior to production
6. State the different types of maintenance procedures
7. Conduct minor repairs and faults in process machineries
8. Prepare the machines and tools required for production

3.1.1 Materials and equipment require for the cleaning and maintenance of the work place

3.1.1.1 Manual cleaning

Industrial brushes and gloves must be available for manual cleaning. Only mild chemicals are used (pH value between 4 and 9) like Acetone pH: 7, isopropyl alcohol pH: 8, etc. It is difficult to achieve consistent results because the human factor is involved in manual cleaning. Motivation, training, supervision and education are required for efficient cleaning.

3.1.1.2 Scrubbers and polishers

Scrubbers and polishers are used for floors and the selection is mostly depends on the weight of machine so, that brushes shall rotates easily on the contact surface. Most suitable for open and large area. In case of heavy congestion on floor, manual cleaning may applied.

Fig. 3.1 Manual cleaning

Fig. 3.2 Scrubbers and polishers

Fig. 3.3 Steam cleaners

3.1.1.3 Steam cleaners

Steam cleaning is very much require because of fat, oil and greasy materials present in the food industry. Some model may have in-built steam generators for effective and easy use.

3.1.1.4 High pressure cold/hot water cleaners

High pressure (1000 to 5000 kN/m^2) water jet with a rate of 8 Lit/minute or above is used in the food industry to clean the corners, floor, equipments etc.

3.1.2 Objectives of Cleaning

The degree of cleanliness is associated with the following:

1. **Physical cleanliness** – cleaning of all visible dirt
2. **Chemical cleanliness** –cleaning of microscopic residues along visible dirt
3. **Bacteriological cleanliness** – achieve disinfection of all the equipment
4. **Sterile cleanliness** –micro organisms free environment

3.1.3 Cleaning procedures adopted in dairy industry

Dairy industry accommodates heavy equipments, hence circulatory cleaning-in-place (CIP) systems is generally adapted for cleaning and sanitization.

The CIP cycle in a dairy industry comprises the following:

- Recovery of product residues prior to cleaning: water or compressed air is used for flushing/pushing the raw/processed products available in the pipelines or processing equipment.
- Pre-rinsing with cold/hot water to eliminate dirt in loosen condition;
- Cleaning with detergent;
- Rinse with clean water;
- Disinfection by chemical agents (optional)

Each stage need certain duration of time to achieve desirable result.

3.1.4 Cleaning and Sanitization Protocols

Cleaning and sanitization are the two processes employed in the dairy industry to ensure hygiene and product safety. Cleaning refers to the soil/dirt removal from the surface of the equipment/pipelines. Sanitization is destruction of all organisms that will affect the quality of a product or raw material. Cleaning and sanitization are complementary processes.

During the course of processing, milk constituents deposit on the surface of the equipment. These deposits are typically known as “dairy soil” and consist of milk or milk product residues.

Common equipment used in a typical dairy industry for cleaning are:

- Cleaning or washing tank
- Cleaning or sanitizing agents
- Cleaning brushes and scrubbers
- High-spray nozzles

Table 10: Levels of Cleaning in a Food Processing Unit

Physical	Chemical	Microbiological
Focuses on cleaning non- food contact surfaces	Focuses on cleaning the food-contact surfaces	Focuses on cleaning all direct and indirect food-contact surfaces

3.1.5 Detergents Used for Cleaning Processes

Detergents are used for washing and cleaning. The detergents used for cleaning a dairy processing unit should be:

- Highly penetrable
- Capable of dissolving calcium deposits
- Check re-deposits
- Possess moderate foam generation capacity
- Non-corrosive
- Non-toxic

Some commonly used detergents in the dairy industry are:

- Alkaline detergents
- Water softeners
- Acid cleaners

Notes

3.1.6 Sanitizers Used for Cleaning Processes

Sanitization involves destruction of pathogens and reducing microorganisms to a level acceptable. The following table explains the classification of sanitizers:

Table 11: Levels of Cleaning in a Food Processing Unit

Thermal Sanitizers	Chemical Sanitizers
• Used to eliminate microorganisms	• Used to reduce microorganisms to a level acceptable
• Also called high temperature sanitizers	• Also called low temperature sanitizers
• E.g. Steam, hot water	• E.g. Chlorine-based sanitizers, iodine

3.1.7 Clean-In-Place (CIP)

CIP is a method used for internal cleaning of machineries. It is done without dismantling pipes, storage tanks, process equipment, filters and fittings. In this process, a sanitizing 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.

3.1.7.1 Tips to conduct an effective CIP process:

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

3.1.7.2 Cleaning sequence

Based on the availability of heated surfaces (like pasteurizers, UHT) in the dairy plant, CIP programs differ accordingly. Acid circulation is require for the heated surface to get rid off of encrusted protein and salts.

A detailed sequence for CIP cleaning is as follows:

1. Recover product residue from drainage
2. Remove non-retrievable residue with water or compressed air
3. Rinse for 10 minutes with warm water (50-60°C)
4. Circulate alkaline detergent (0.5-1.5 % solution) at 75°C for 30 minutes
5. Rinse with warm water (50°C) for 5-8 minutes
6. Circulate acidic detergent (0.5-1.0 % solution) at 75°C for 20 minutes
7. Rinse with warm water (50°C) for 5-8 minutes
8. Use thermal disinfection (90-95°C) and cooling for 10 minutes or chemical disinfection with a suitable sanitizer

3.1.7.3 Advantages of CIP

The major advantages of implementing CIP are:

- Proven and repeatable quality assurance step
- Reduction in cleaning costs by recycling cleaning solutions
- Possibility to clean inaccessible areas on the equipment
- Better safety to operators because hazardous cleaning materials are not handled
- Reduction in time between two production runs
- Safety operators are not required to enter the plant to clean it
- Reduction in labour requirements
- More effective use and control of cleaning materials
- Reduction in water consumption

3.1.8 Sterilizing-In-Place (SIP)

SIP is the process by which food processing equipment is sanitized after the CIP process. It helps to eliminate any residual microbiological contamination. SIP is a combination of three processes viz. sterilization, disinfestation, and sanitization.

Table 12: Process under Sterilizing-In-Place (SIP)

Sterilization	Chemical Sanitizers	Sanitization
➢Uses steam or hot water	➢Uses disinfectants or chlorine solution	➢Uses soap solution or washing soda

Unit 3.2 Common detergents and sanitizers used in cleaning work area and machineries

Unit Objectives

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

- List the common sanitizers and detergents used in cleaning work area and machineries
- List Pre-requisites for effective cleaning and sanitization
- Types of detergents used in cleaning
- What should be quality of water used for cleaning
- State various precautionary measures to be taken while cleaning and sanitization

3.2.1 Pre-requisites for effective cleaning and sanitization

The primary purpose of cleaning food processing equipments after each use is to remove all residues. Residues provide harborage for bacterial growth that affect product quality and shelf life and have a potential to cause disease. Secondarily, excessive soil buildup will be detrimental to those processes where heat transfer is involved.

➢ **Good Quality Water**

a) The water used at food processing plant shall specify to IS 10500.
b) Only potable water, with appropriate facilities for its storage and distribution shall be used as an ingredient in processing and cooking.
c) Water storage tanks shall be cleaned periodically and records of the same shall be maintained in a register.
d) Non potable water can be used provided it is intended only for cleaning of equipment not coming in contact with food, which does not come into contact with food steam production, fire fighting & refrigeration equipment.
e) Worker must understand potable and non portable water pipe lines.

➢ **Types of chemicals**

Chemicals used in cleaning can be simple or formulated cleaning detergents. If formulated cleaning detergents are used, supplier recommendations must be followed fully. The chemicals used depends on:

➢ **The Soil type:**

a) Chlorinated alkalis are used for cleaning protein oils
b) Chemicals with high alkalinity (NaOH, KOH) are used for removing carbohydrated soils.

Table 13: Detergent solutions are recommended by BIS

Purpose	Detergent solution	Quantity per 1000 g
For general use	sodium phosphate Wetting agent	850g/1000 g 100g/1000 g
For aluminium utensils	sodium phosphate, sodium metasilicate, Wetting Agent*	650g/1000 g 200g/1000 g 150g/1000 g
Cleaning In Place (CIP)	Caustic	1-1-2%

Wetting agent: Acinol-N, Idet-10, Teepol, or equivalent compound

Maintain strength of detergent solution between 0.8% - 1%.

➢ **Chemical concentration**

- The chemical concentration of the detergent depends on the kind of soil to be removed.
- Heated surfaces often require higher concentrations than cold ones.
- Also, when dosing equipment is used, the concentration of detergent should be adjusted so as not to interfere with the proper functioning of the machinery.
- A conductivity measurement with a guarding and recording function is sometime required.
- Semi-automatic and manual cleaning units are used in heat exchangers cleaning
- Either a dosing device should be constructed or a premix of ready to use detergents solution must be prepared in sufficient amounts(For cleaning the circuits).

➢ **Contact between the chemical and processing equipments**

- A good turbulent flow is required between the circulating liuid and inner surface of pipes. To remove sediment and trapped air.
- Due to flow restrictions and a special ''cleaning pump' may be necessary.
- A spray device is also required after every two meters in horizontal tanks.

➢ **Exposure Time**

- It is different for both, alkaline clean and acid clean surface.
- Acid clean usually takes a less time than alkaline clean.
- Pre-rinse and intermediate rinse and final rinses take about five to ten minutes.

➢ **Contact Temperature**

- The temperature of the pre rinse should be above the fat melting points, but below the denaturation temperature for proteins.
- Cleaning utilizes chemicals. All chemical reactions are very much temperature dependent.

➢ **Microbiological Load**

- Sanitizer activity depends upon the type of micro-organism present.
- Spores are more resistant than vegetative cells

3.2.2. Disinfection

Disinfection of food contact surfaces may be carried out by means of:

- Steam - Steaming should be done for 10- l5 minutes after the condensate has attained 85˚C.
- Hot water - Hot water at 80˚C (use soft water only to prevent deposition of salts) for at least 20 minutes in circulation cleaning for 15 minutes at 85˚C

Table 3.2.2: Some common types of cleaners and sanitizing agents used for 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

Yeasts, molds, fungi, and viruses have different effectiveness for sanitizers.

3.2.3 Storage of Sanitizers and Disinfectants

Sanitizers 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 time

3.2.4 Precautionary measures during Cleaning and Sanitization

The precautionary measures to be taken before cleaning of any equipment/machine are as follows;

- Obtain a Work Permit before carrying out any equipment internal cleaning activity in respective section as per SOP.
- All energy sources are de-energized before carrying out cleaning activity.
- Use appropriate PPE (Mask, gloves, goggles, safety belts, ladder, etc.) People required to enter into a vessel/equipment should wear a safety belt, mouth cover, hair-net, helmets, dedicated safety shoes or new shoe covers.
- Always clean the equipment followed by floors cleaning
- If the cleaning process requires human entry into the vessel/equipment, ensure that the Confined Space Entry permit / Cold Work permit (as the case may be) has been received and all due safety measures have been taken.
- Equipment used for handling raw and perishable food products must be cleaned and disinfected after each process.
- Equipment handling products high in fat (butter, ghee and cheese)must be cleaned after the process.
- All equipment shall be stored when not in use in a clean and dry place that prevents contamination.
- The temperature of detergent solution in manual cleaning shall be such that it does not affect the hands of user.
- Wherever manual cleaning is involved, it is recommended that the hands and eyes of the operator be adequately protected by the use of gloves, goggles, etc.

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Unit 3.3 Preparing the Work Area before Starting Production

Unit Objectives

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

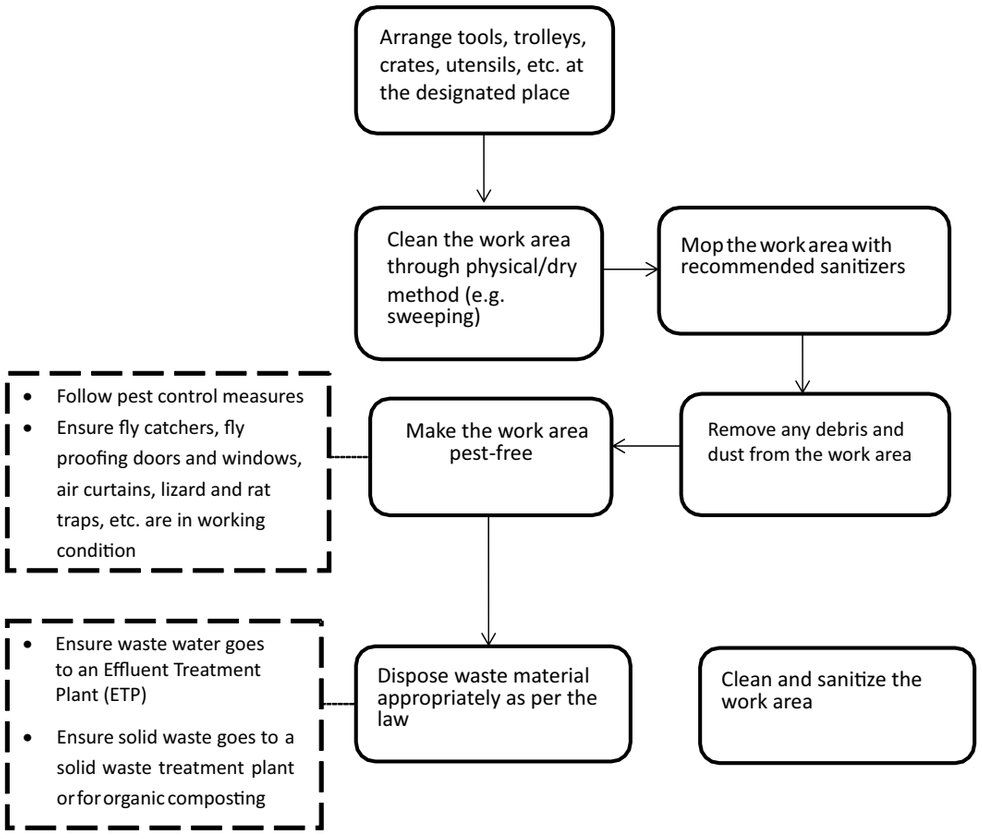
- Know the process of cleaning the Work area before starting production
- Explain pest control measures
- Explain the Process of preparing the work area for scheduled production
- Explain the Process of cleaning tools and equipments

3.3.1 Functions of preparing workplace area for Scheduled production

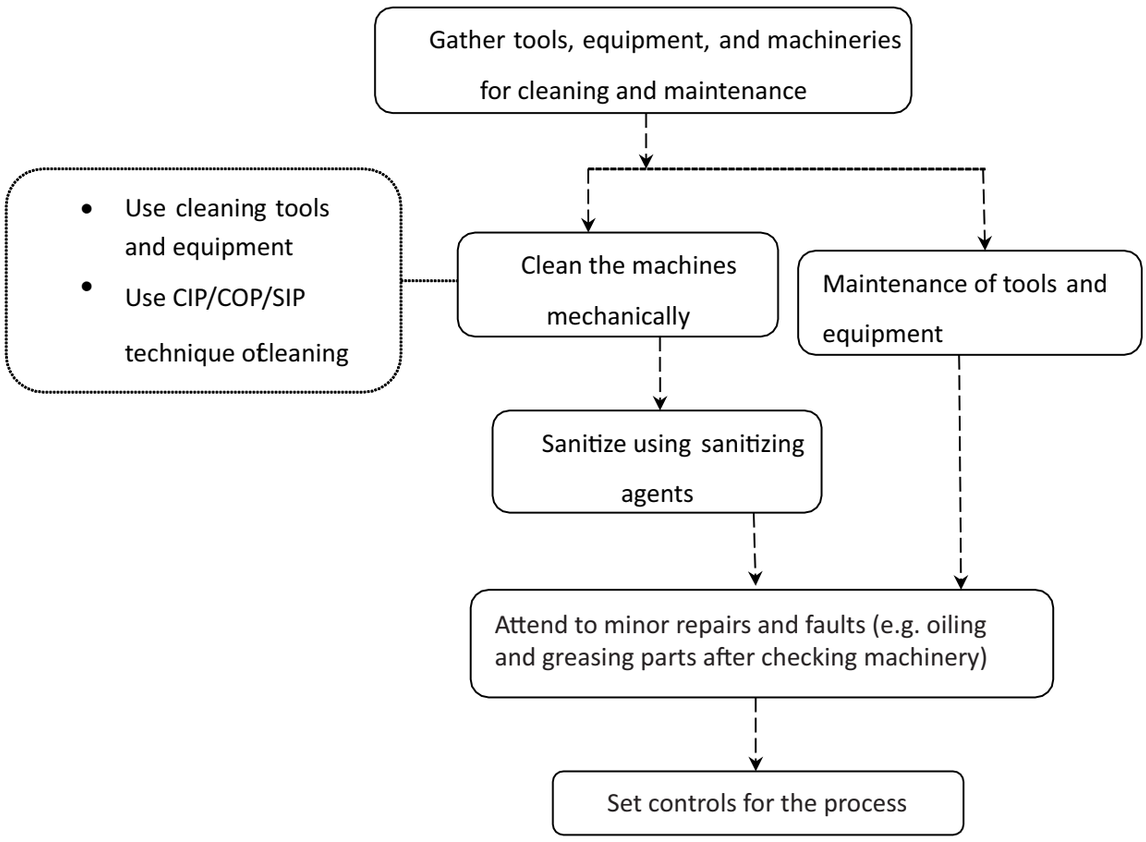
As per food safety norms, all food processing premises should follow high standards of hygiene and cleanliness in order to check contamination of products.

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.

Flow chart 4: Process of Cleaning process of cleaning work area



Flow Chart 5: Process of cleaning and maintenance for tools and equipment



3.3.2 Managing Work Place Area

- There should not be any mixing/contamination in raw and processed products.
- A separate storage facility shall be available for the raw materials, process/products ingredients, packaging materials and finished goods.
- Toilet should not be near to processing section. A separate facilities for the same is advisable.
- In food industry, there must be sufficient space for weighing, inspecting and storage of raw material. Simultaneously, there must be sufficient space for production, packing and storage of products. Space must be allocated for the maintenance and repair of equipments along with first aid box, sand buckets and fire extinguishers.

Unit 3.4 Maintenance procedures and their types

Unit Objectives

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

- Explain the various different types of maintenance procedures

3.4.1 Preventive Maintenance

In order to ensure smooth functioning of all equipment and machineries, the dairy industry follows a preventive maintenance schedule. This schedule includes four processes namely:

- Cleaning
- Inspection
- Oiling
- Retightening

3.4.1.1 Advantages of preventive maintenance are as follows:

1. Minimize production lag
2. Very less or no repairs of large volume
3. No wastage of raw and finished material
4. Operational life of equipment will increase
5. Improved spare parts control management
6. Better work safety with less manufacturing costs

3.4.2 Types of Maintenance

The maintenance procedures followed in the dairy industry are broken into four categories. The following table explains the differences:

Table 15: Type of Maintenance

Periodic maintenance	• Involves routine inspection, servicing, and cleaning for the machineries • Involves periodic replacezarts to prevent unexpected breakdown
For aluminium utensils	• Involves predicting the service life of key parts/equipment on the basis of analysis/identification • Parts/equipment are used only till their service life
Corrective maintenance	• Tack care of equipment and its parts to ensure better preventive maintenanceInvolves redesigning of equipment to improve reliability
Breakdown maintenance	• Involves repairing of equipment after breakdown • in case of equipment failure leads to the losses which is more than repair cost

Dairy plant maintenance requires a well established step by step process to get maximum output from it. Following records/schedule are required to be update time to time

1. Equipment/machineries records
2. Inspection schedules

a. On the basis of log book entries

b. Along with schedule servicing

c. For lubrication

3. Spare parts control report
4. Maintenance taken report

A sample equipment record card is presented here for an example which will have all the record related to maintenance, lubrication and change of spare parts

DESCRIPTION	(NAME OF PLANT)	MODEL	CAPACITY	SERIAL NO.	INVENTORY NO.
NAME ADDRESSES TELEPHONES TELEXES CONTACTS CONTRACTS					
MANUFACTURER			SERVICE CONTRACT COMPANIES		
DRRAWING No.		SPARE PARTS SHEET No.		SERVICING MANUAL No.	
LAYOUT DRAWING No.		MAINTEANCE INSPECTION SECHEDULE No.		LUBRICATION SCHEDULE No.	
STATUTORY INSEPECTIONES					
GOVERNMENT		INSURANCE		OTHERS	
ORDER No.		RECEIVED (DATE)	INSTALLED (DATE)	COMMISSIONED (DATE)	COST
DETAILS RELEVANT TO MAINTENANCE PROCEDURES					
MECHANICAL		ELECTRICAL		GENERAL	
DRIVES		MOTERS		SPECIAL TOOLS	
GEARS					
BELTS/CHAINS					
BEARINGS		OTHER APPLIANCES		LUBRICANTS	
RECORD ON THE REVERSE ALL CHANGES, ADDITIONS, MODIFICATIONS, MAJOR REPAIRS & OTHER RELEVANT INFORMATION					

Fig. 26 Equipment record card

Unit 3.5 Process of preparation the work area, tools and equipment prior to the production along with minor repairs

Unit Objectives

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

- State the procedure to be require to conduct prior to the production
- State the maintenance procedure to be followed for dairy processing machineries before starting production
- Explain the lubrication system followed in the dairy industry
- State the various types of maintenance procedures

3.5.1 Preparation of Machineries for Production

Before beginning with the actual production process, a cottage cheese (paneer) maker must prepare and maintain the process machineries and tools. Following is a step-by-step guide to preparing machineries for production:

1. Make sure about the safety and hygienic processing at the work area.
2. Plan, schedule, and organize machineries
3. Ensure proper installation
4. Ensure periodic inspection
5. Ensure adequate lubrication of machineries
6. Adjust machineries and instruments, if required
7. Replace worn and damaged parts

Apart from this, a paneer maker must also:

- Record and report observations, any type of repairs, and replacements
- Periodically review records on inspection, lubrication, repairs, and performance of equipment
- Keep an sufficient quantity of spare parts
- Determine maintenance costs
- Ensure regular cleanliness and painting of machineries
- Inspect and maintain all the protective types of instruments in case of any emergency
- Ensure maintenance of all the utilities as well
- Inspect the equipment for any physical damage and report the same, if necessary

- Follow manufacturers' instructions for maintaining, cleaning, repairing, lubricating, and servicing the equipment
- Ensure timely lubrication of gears, compressors,
- Look out for refrigerator gas leaks, air leaks, and milk leaks in equipment
- Maintain the oil, water, air, and lubrication levels at all times
- Balance the bowl in the separator and clean it thoroughly after each use
- Dismantle the ventilator occasionally for complete cleaning
- Maintain the product temperature and check the flow diversion valve regularly

3.5.2 Spare Parts Used in the Dairy Industry

Following is a list of spare parts used in the dairy industry:

- Pipes and gaskets
- Fittings
- Bolts
- Nuts
- Washers
- Bars
- PHE Plates and gaskets
- Electric bulbs, parts and relays
- Seal for pumps
- Springs and bearings
- Automatic switches
- Aluminium capping foils

3.5.3 Lubrication System

Insufficient lubrication while operation is the major causes of equipment breakdown in the dairy industry. Hence, it is important to follow the following:

- Lubrication chart for each machine along with schedule of lubrication
- List of places to be lubricated along with frequency of lubrication

3.5.4 Following are the mandatory requirements for starting production:

- Ensure to do careful planning, scheduling and organizing usage of equipments during production.
- Ensure that proper maintenance is performed on equipment and acting as a communications connection between the ground-level work of a company and the higher management executives.
- Ensure that workplace is up to federal labour standards and everybody is conscious about the safety training.
- Ensure Production equipments/utensils must be cleaned and sanitized after the completion of production.
- Replace brushes with loose bristles
- Check the cleanliness of product surfaces of the equipment.
- Be sure no tools and attachments are lying lose in production area.
- Availability of pests or flies, insects, mice droppings must be reported to supervisors/seniors.
- Scrappers for equipments and table-tops are not to be used on the floor.
- Repair worn and damaged parts immediately.
- Use white cloth to wipe hands regularly and use yellow clothes to clean the floor.
- No moist clothes should be left in work place area and also dispose of soiled clothes without any delay.
- Ensure proper installation of equipment and adequate lubrication of machineries
- Ensure periodic inspection of equipments.
- Adjustments of machineries and equipments, If required
- Ensure that all containers, are kept covered and designated.
- Garbage bins containers must be covered.
- Make sure the fresh ingredients were used for the production.
- Brooms and dust pans are to be placed at stations provided.
- Wipe or mop up spilled liquid milk immediately
- Monitor and maintain proper temperatures of machines.
- Ensure that no tools and hazards were present in the work area prior to the production.

Unit 3.6 Waste Management in Dairy Industry

Unit Objectives

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

- Define Waste Management
- Elaborate the method of managing and disposing waste material

3.6.1 Introduction

All food processing industries encompassing varied products generate waste in some or the other forms. The products manufactured by these industries contain huge amount of essential nutrients such as carbohydrates, protein, fats, vitamins and mineral salts which during various equipment operations enter the drainage thereby favoring the growth of anaerobic and aerobic bacteria.

3.6.2 Definition of Waste Management

Waste management may be defined as the process of collection, transportation, processing, recycling or disposal, and monitoring of waste substances. Waste materials are generally categorized as:

- Solid waste
- Liquid waste
- Oily waste
- Gaseous waste/ water vapours

3.6.3 Solid wastes

The waste attained in the solid state during operations such as processing or generated during maintenance are referred to as solid wastes.

Some of the examples are:

1. Minute dust particles in the exhaust air released from drier,
2. Solid residue from ghee in ghee section,
3. Ash from Boiler, in case of solid fuel,
4. Packaging section, where substantial packaging items may be scrapped in the form of cartons, bottles, LDPE films etc.
5. Waste generated from uncertain events. (Explosions, fire etc.).
6. Impaired or contaminated equipment and polluted soil.

Most dairy processing units have an Effluent Treatment Plant (ETP) within them to treat waste material and water before disposal. This is crucial to ensure the processing unit remains clean and hygienic. There are strict laws and norms that should be followed for running an ETP. Violating these laws will lead to severe legal consequences. It will also lead to compromised quality of treated waste.

3.6.4 Liquid wastes

The waste generated in the liquid form, during various operations performed in the processing industries such as washing, cleaning, flushing, manufacturing etc. are referred to as Liquid wastes. Operational deterioration leading to the generation of by-products, un-reacted raw materials or impurities may be include the waste obtained from processing., e.g., delayed pasteurization of milk may lead to coagulation resulting in sour taste, which makes it necessary to be drained. Clean-in-place (CIP) which involves the use of acid and lye along with water used for cleaning purposes is also considered under liquid wastes.

3.6.5 Oily wastes

The wastes which involves oil lubrication such as coolant leakage and motors, along with leakage from hydraulic machines, crankcases, compressors etc. are termed as oily wastes. Separate disposal methods are adopted for oily wastes, differentiating them from liquid wastes.

3.6.6 Gaseous wastes/water vapors

The waste released in the air either in gaseous state or in the form of volatile vapors are termed as Gaseous wastes. The odious fume from the chimney which consists of various gases like CO_2 and CO polluting the environment to a great extent, refrigerant leakage from pipe lines of the compressors are example of gaseous waste. The energy in the water vapours generated in the concentration section, increase the relative humidity of the surrounding in processing plants and are considered as the gaseous waste. Steam leakage from various points causes corrosion with time thereby decreasing the life of the tees and knobs used for regulation purpose, nuts and bolts.

3.6.7 Waste Minimization

Waste minimization being the necessity of time, can be accomplished through various waste management plans, which is a requirement as per Industrial Waste Management Policy for the premises which are subject to works approval. Hence, all the food processing industries should assess opportunities for reducing waste generated during various operations.

Several waste management measures include:

- Optimal utilization of water and its recycling
- Controlled use of chemicals and its recycling
- Recovery and reuse of raw material and products,
- off-spec material being reused/ reprocessed

3.6.8 Process Control

The waste generated in a dairy plant is basically depends on the following:

- The design parameters of the plant
- Operational factors within the plant
- Availability of adequate process monitoring, and procedure alarms.
- Degree of automation in the plant
- Training and commitment of operator
- Schedule of routine maintenance programme for equipment.

3.6.9 Avoidable losses

Some examples of avoidable losses are:

- Quantity lost may not be large by the pipelines, leaking valves, pumps or some other fittings but they may be huge source of pollutants.
- Whatever may be the cause of spills whether poor handling and malfunctioning of process or any overflows leads to pollution. Spills generally occur for a short span of time but unfortunately the volume and concentration of product lost is very high which increase environmental pollution load.
- Losses from manufacturing plants as well as the wastage during cleaning these operated plants and equipment aids to the pollution load to a great extent.
- These type of losses also includes the discharged materials which is not worth recovering like whey, spent cleaners and others
- Production of liquid milk also results in the generation of large amount of waste water and solid waste. Also it leads to generation of noise and odour.
- Fatty and viscous milk products like butter, ghee and cream also generate huge amount of waste and residues which are difficult to remove as these substances get stick to equipment very strongly. The most effective and feasible way for removing residues left during cream, ghee and butter processing is hot water treatment and the temperature of water should be less than 65°C.

3.6.10 Surface deposits

There are certain ways to prevent the buildup of surface deposits include

- Minimizing the surface area could be one way.
- Measures should be taken to prevent deposits of milk stone
- Preparation done before filling must be accurate.
- Over-working of the batches must be avoided.
- To prevent overflow all the collection or holding facilities should be large enough to accommodate the entire quantity without ant loss.

- Also have a proper and regular check on leakage.
- To reduce waste, buttermilk and solids recovered from butter wash water can be dried and used as animal feed
- Preventive measures should be taken for avoiding wastes during processing milk and milk products like cheese, milk powder, butter and others.
- Byproducts should be reused wisely.

3.6.11 Waste reduction

Different measures to achieve waste reduction are as follows:

1. To prevent curd loss during paneer preparation, avoid overfilling of vats.
2. Before rinsing of vats there must be complete removal of whey and curds from the vats.
3. The whey which is being drained from paneer must be segregated properly.
4. The small and fines particles of curd must be removed properly prior to the drainage of whey.
5. In evaporation and powder production plant, the reduction in waste may be achieved by the following:
   a. Maintaining a comparatively low level valve to stop boil-over product before spilling.
   b. Longer runs should be avoided as these results in higher pollution due to the blockage of tube. It also create problem during cleaning.
   c. To avoid carry-over of milk droplets effluent entrainment separators must be used during condensation of evaporated water.
   d. Keep recirculate the feed stock like low concentrated milk until required concentration is being achieved.
   e. Wet scrubbers or air filters must be used to reduce air emission

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4. Carry out production of cottage cheese (Paneer)

Unit 4.1	Machineries are clean and in good working conditions and Controlling Parameters
Unit 4.2	Demonstrate assembling of all components of machines, Production Sequence and conduct a pre check
Unit 4.3	State the working of machineries involved in the production
Unit 4.4	Demonstrate the entire production of Paneer
Unit 4.5	Packaging, storage of paneer and analyze the quality of finished product
Unit 4.6	Post production cleaning and maintenance

(FIC/N2018)

Key Learning Outcomes

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

1. List the different machineries involved in manufacturing of cottage cheese
2. State the working of machineries involved in the production
3. Demonstrate assembling of all components of machines
4. Perform a pre check on all machineries
5. Demonstrate the entire production of cheese
6. Analyze the quality of finished product
7. Demonstrate cleaning the machineries used with recommended sanitizers following CIP (clean-in-place) procedure
8. Demonstrate cleaning the equipment and tools used using recommended cleaning agents and sanitizers

4.1 Machineries are clean and in good working conditions and Controlling Parameters

Unit Objectives

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

1. List various machineries used for manufacturing cottage cheese
2. Know how we can check machineries are in good working condition and clean
3. State how to check the machines are clean
4. Understand importance of control parameters

4.1.1 Machineries required for cottage cheese production

List of Major Machineries Required for Production of cottage cheese

1. Plate chiller for milk
2. Raw milk silo
3. Bactofuge
4. Milk Pasteurizer
5. Cream Separator
6. Homogenizer
7. Multipurpose vat
8. Paneer Press
9. Packaging machine

(a) To check machines are in Good Working Condition, below indicated points to be followed

1. All the contact surface of food must be cleaned through approved CIP procedure.
2. The non food contact surfaces shall be kept dry.
3. There should not be any noise while operating the equipment. The difference in noise will lead to a clear idea about the state of machineries.
4. The preventive maintenance (as discussed in maintenance section) should be followed as per standard operating procedure.
5. No lubricant application over food contact surfaces.

(b) Control Parameters

The efficiency and ease of working is based on controlling all the set parameters and following the standard operating procedure.

(c) Factors Affecting Efficiency

Effective operation of a dairy plant is possible only when all factors involved work in sync. This can be achieved only by optimizing the use of available resources and facilities. Some of the factors that affect the plant operation efficiency and their corrective measure are:

Table 16: plant operation efficiency and their corrective measure

Factors	Corrective measure
Services and utilities	Uninterrupted supply of services and utilities
Supply of raw material	Adequate supply of raw material and its scheduled arrival
Quality of raw material	Quality checks for milk used for production
Work schedule	No wastage of working hours
Efficient labour	Employing skilled labour
Proper processing units	Using the floor space efficiently
Utilities	Easy availability of water, electricity, refrigeration, and steam
Stock supplies and spare parts	Adequate supply of stocks and spare parts

(d) Standard Operating Procedures (SOPs)

A dairy products processor is required to follow the Standard Operating Procedures (SOP) set by the dairy processing plant. SOPs must be followed in order to guarantee quality and safety of the processed products.

A typical dairy processing plant uses the same pipeline for carrying milk to different sections. For a dairy products processor, it is important to understand the opening and closing process of valves for specific purpose of production.

Steam and chilled water are a major part of milk product processing. It is important to understand the precaution set by the dairy industry to keep in mind while operating the steam and chilled water line.

Before starting production, both the lines must be checked properly in co-ordination with utility section (boiler and refrigeration section). The production process must be in sync with the operation of the utility section. This is necessary because if there is any change in the supply of steam or chilled water, there are chances of getting low quality product. This can also be dangerous from the safety point of view.

(e) Ingredients Required for Production

The general ingredients in a dairy plant are:

- Chemicals for testing of raw and processed products
- Milk powder
- Natural and artificial flavours
- Citric acid
- Cream
- Colour
- Butter
- Vegetable fat
- Stabilizer and emulsifiers like monoglycerides, gelatine, and alginate

Based on the product requirement and production planning, a dairy products processer is required to inform the raw material store to be ready with the raw material of the desired quantity.

Unit 4.2 Demonstrate assembling of all components of machines, Production Sequence and conduct a pre check

Unit Objectives

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

- Demonstrate assembling of all components of machines
- Explain the process of planning production sequence for maximize resource utilization

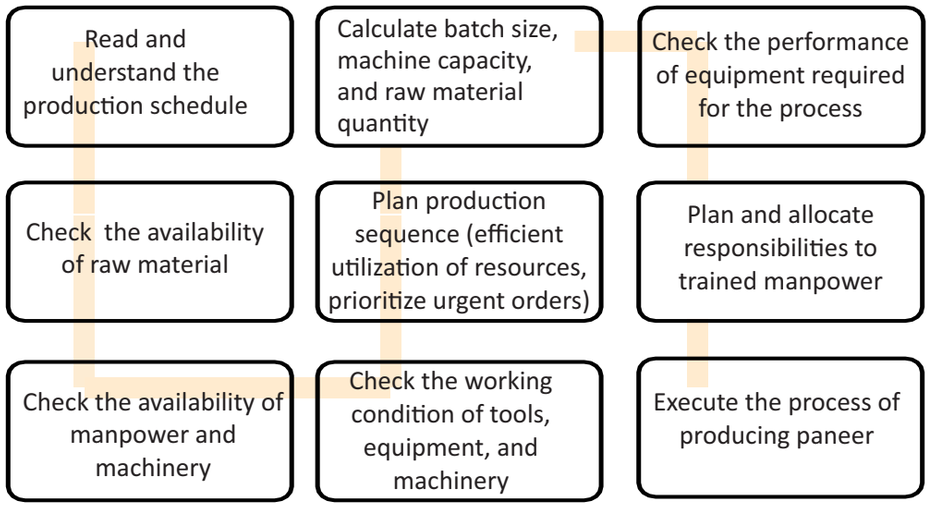
4.2.1 Assembling of all components of machines

All the machineries or equipment are require to check for the following:

1. Presence of screw, nut and bolt
2. Fully tight screw, nut and bolt
3. Leakage prior to the production
4. proper assembling of machine

4.2.2 Production Sequence

The following chart provides an overview of the production planning process:



Flow chart 6: Process sequence for maximum utilization

4.2.3 Process Loss

This is defined as the losses that occurs while converting raw material into finished product. The following may be the reason of losses:

- Quality of raw material
- Mishandling of raw material/machinery

Unit 4.3 State the working of machineries involved in the production

Unit Objectives

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

- Define pasteurization
- State the production procedure of pasteurization
- State the different types of pasteurization methods
- State the process of HTST pasteurization
- Demonstrate the process of HTST pasteurization
- State the importance of standardization process
- Explain the method for standardize milk to desired fat and SNF levels
- Explain the various calculations required for standardization of cream
- State the need of homogenization in milk
- State the method of homogenization of milk

4.3.1 Pasteurization

Louis Pasteur (French scientist) developed a process in the year 1860, through which the shelf life of wines increase after heating at high temperature. The process is termed as pasteurization after his name. Latter in 1880, Germany and Denmark dairy industries adopted this method on commercial scale. Pasteurization destroys all the pathogenic microorganisms present in milk. Heat treatment also inactivate the enzymes present in the milk.

4.3.1.1 Definition

International Dairy Federation (IDF), defined pasteurization as a process, in which a product is subjected to the heat treatment to minimize the pathogenic microorganisms along with a minimal chemical, physical and sensory changes in the product.

4.3.1.2 Importance of Pasteurization

- It destroy all the pathogenic microorganisms present in the milk.
- It helps to increase the shelf life of milk by killing spoilage organisms (about 88-99%).
- It helps to inactivate enzymes.
- It helps to eliminate some of the gaseous, tainting substances.

4.3.1.3 Drawbacks of Pasteurization

- It diminishes the cream line or cream volume.
- Renneting time may increase after pasteurization.
- bacterial toxins may not be destroyed after pasteurization.

4.3.1.4 Types of Pasteurization method

Pasteurization of milk is done by two methods:

a) Batch method known as Low Temperature Long Time (LTLT)

b) Continuous method known as High Temperature Short Time (HTST)

The following table explains the two processes in detail:

Table 17: Pasteurization process

Low Temperature Long Time (LTLT) High	Temperature Short Time (HTST)
• Heating Temperature: 63°C • Holding time: 30 minute • Outlet temperature of milk: 5°C or below • Heat transfer take place through double jacket tank via a circulation of heating/cooling media. • Mostly used for cream and ice-cream pasteurization	• Heating Temperature: 72°C • Holding time: 15 seconds • Outlet temperature of milk: 5°C or below • Heating and cooling are automated procedures • Mostly used for processing large volumes of milk

4.3.2 Pasteurizer

Pasteurizer is plate-type equipment that helps in the exchange of heat. Each plate has the corrugation to direct the milk and the heating or cooling media.

Following operations take place during pasteurization:

a) Filration and clarification

b) Separation of milk (separators)

c) Bactofugation

d) Standardization of milk

e) Homogenization of milk

f) Heat exchange

g) HTST pasteurization

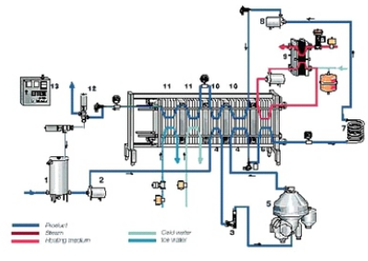


Fig. 27 Pasteurization module

4.3.3 Filtration and Clarification

Following operations take place in this process:

4.3.3.1 Pre-heating

Heating of milk before actual processing

4.3.3.2 Straining

Helps remove large, foreign material like straw, hair, insects, grass, dirt, flies, etc.

4.3.3.3 Filtration

Removes visible sediment (foreign matter) by centrifugal force

4.3.3.4 Clarification

Removes dirt and foreign matter more efficiently to improve appearance and marketability of milk

4.3.4 Working of HTST Pasteurizer

4.3.4.1 Preparing the pasteurizer for production

Before preparing the pasteurizer for production, the following steps must be followed:

1. The plant must be sterilized
2. All water remaining in the plant must be drained
3. Filter clothes should be cleaned
4. Nylon filters should be fitted in the filter

4.3.4.2 Steps for starting the pasteurizer

1. Switch on the air compressor and electrical control panel mains
2. Fill the hot water tank with water and switch on the hot water pump and inspect the tank after 2-3 minutes to check the level.
3. Open all the air vents in the pipes
4. let the milk flow towards the balance tank with float by starting milk pump
5. Close the air vents when the milk comes out from them.
6. Set the temperature controller at pasteurization temperature (minimum 71.7°C) and adjust the air reducing valve so that the supply gauge registers 1.76 kg/cm^2 pressure.
7. Turn on the steam to the hot water system via 'solenoid valve' for controlling steam passage into the heater.
8. Turn on the chilled water brine as soon as forward flow takes place.
9. Once the chilling temperature is reached, the plant will set itself to forward flow.

Note: The diluted milk that comes out first should not be collected in the balance tank.

4.3.4.3 Steps for shutting down the plant

1. The moment last drop of milk is about to leave from the balance tank, fill the balance tank with water almost equal to the capacity of pasteurizer. This will push the milk towards the outlet of the pasteurizer.
2. Shut the 3-way valve for the pasteurized milk outlet and put a hose pipe in the balance tank, so that surplus water diverted to the floor. It allows the flushing completely with the help of water.
3. Turn off the chilled water pump, milk pump, air and steam supply.

4.3.4.4 Maintenance of Milk Pasteurizers

The following guidelines should be followed for maintaining the pasteurizer:

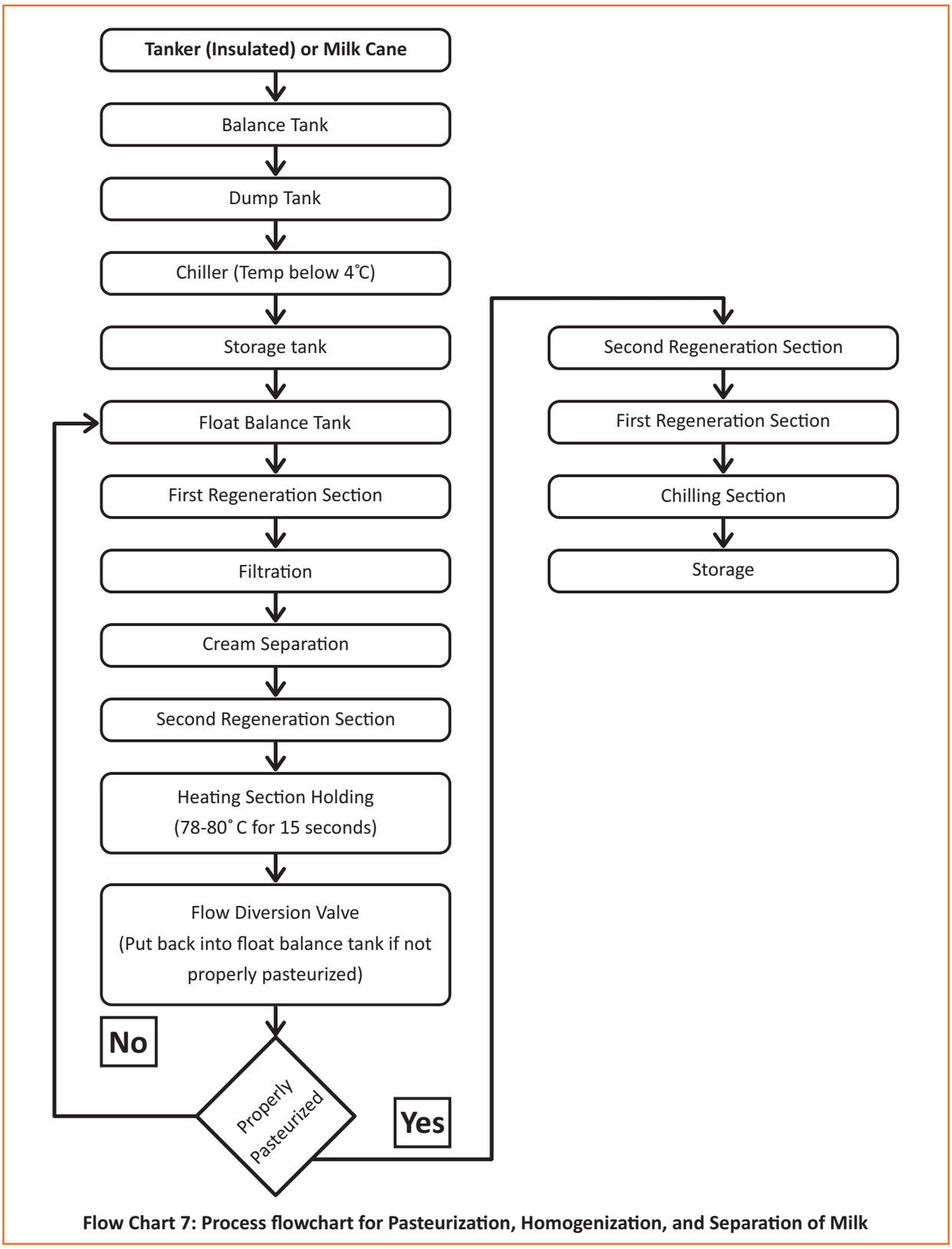
1. Pasteurizer should be inspected every day for any leakage and to ensure cleanliness.
2. The filter cloth or filter bag must be changed at regular intervals.
3. Periodical inspection of individual plate surface and gaskets must be done when the pasteurizer is dismantled for manual cleaning.
4. Any loose or broken gasket must be replaced using proper adhesive.
5. The surface of the plate bar and the tightening spindle must be coated with grease.
6. The equipment require air should be supplied with clean and dry air.
7. All recording instruments, thermometers, etc. must be checked for accuracy periodically.

4.3.5 Efficiency of Pasteurization

Alkaline phosphatase test is based on the detection of the activity of enzyme phosphatase, which is present in raw milk, but is completely inactivated at the temperature-time adopted for effictive pasteurization. Enzyme phosphatase is more resistant than most heat-tolerant vegetative pathogenic bacteria.

The alkaline phosphatase enzyme present in the raw milk release phenol with the help of disodium para-nitro phenyl phosphate and forms a yellow coloured complex at alkaline pH. The intensity of yellow colour is based on the enzyme activity and the same is measured by direct comparison with standard colour discs in a Lovibond comparator. This test is not appropriate for sour milk. For more detail refer IS:8479 (Part-1)-1977, method for determination of Phosphatase activity in milk and milk products

Notes



Flow Chart 7: Process flowchart for Pasteurization, Homogenization, and Separation of Milk

4.3.6 Standardization of Milk

Various types of milk is available in market with different per cent of fat and SNF content. The process through which fat and solids not fat (SNF) levels of milk is adjusted is known as standardization. This may be require for the manufacturing of certain milk products like paneer, cheese, ice cream etc. Standardization helps to provide uniform taste/texture throughout the product and also meet the legal requirements for any specific milk products.

The paneer may be prepared from buffalo milk or cow milk or the combination of both. The fat percentage of milk need to be standardized prior to the paneer production. The level of fat in buffalo milk should be 5.8% to 6.0% for paneer preparation, while in case of cow milk, the fat percentage in the cow milk should be 4.5% to 5.0% for paneer preparation. Adjusting fat content to a higher as well as a lower side may affect the fat loss and yield of paneer. It is advisable not to add water for the reduction of fat in final product.

Standardization shall be achieve by any of three methods discussed below:

4.3.6.1 Batch standardization

In this process, raw milk is store in a silo and its fat content is determined. Based on the final value of fat content, a portion of milk is subjected for separation into skim milk and cream. Some amount of cream is added back into the bulk milk under continuous agitation so that the final percent of milk will be higher compare to initial milk. The fat adjustments was done on the basis of calculation in a batch. The demerits of batch standardization are the time require for agitation, testing and final mixing.

4.3.6.2 Continuous standardization

An inline sampler along with a testing device is attached in a continuous standardization machine which helps to samples, measures and displays the fat content present at the outlet stream at every 20 seconds. Based on the desired level of fat content, the operator adjusts the values to combine skim milk or cream into the milk line, just before the sampling point.

4.3.6.3 Automatic standardization

In this system, separator is replaced by a microprocessor/controller unit which is actually linked to the sampler/tester system. This unit has a set value of desired fat content and flow rates of the whole and skim milk. Accordingly, It responds by opening or closing a valve, which regulates the amount of skim milk added to the whole milk. Standardization process is depends on correct sampling, accurate testing of fat content, efficient separation and the correct amount of skim milk or cream needed.

4.3.6.3.1 Tri-process Machine

Tri-process machine is similar to a cream separator but is intended to clarify, separate, standardize milk in a single unit. The needle valve in the bypass line of the tri-process machine is adjusted in such a way that the bypass cream when mixed with the skim milk would result in the desired fat % in the standardized milk.

4.3.6.4 Standardization of milk is done by the following method:

Certain mathematical calculations are used for the Standardization of milk. They are:

- Arithmetical calculations
- Pearson's Square Method

a) Arithmetic method of calculation

Example:

Example 1. To prepare 10,000 litre market milk with 4.5 % fat and to estimate required quantities of raw milk of 6.5 % fat and skim milk of 0.01 % fat.

Answer: - Assume the required quantities of raw milk be A and skim milk be B.

Fat Balance : 6.5 A + 0.01 B = 4.5 x 10,000

Mass Balance : A + B = 10,000

The following formula can be directly used to estimate required quantities of skim milk and raw milk :

Skim milk , kg = Standard milk in kg x (% fat in Raw milk - % fat in standard milk)/(% fat in Raw milk - % fat in skim milk)

Raw milk, Kg = Standard milk in kg x (% fat in standard milk - % fat in skim milk)/ (% fat in Raw milk - % fat in skim milk)

On solution : 6.5 % fat milk required A = 6147.9 kg

0.01 % skim milk required B = 352.1 kg

b) Milk Standardization Using Pearson's Square Method

Pearson's Square method is a simple mass balancing process for food standardization. A square is drawn with the final constituent content is assigned at the center (say for example, f_x).

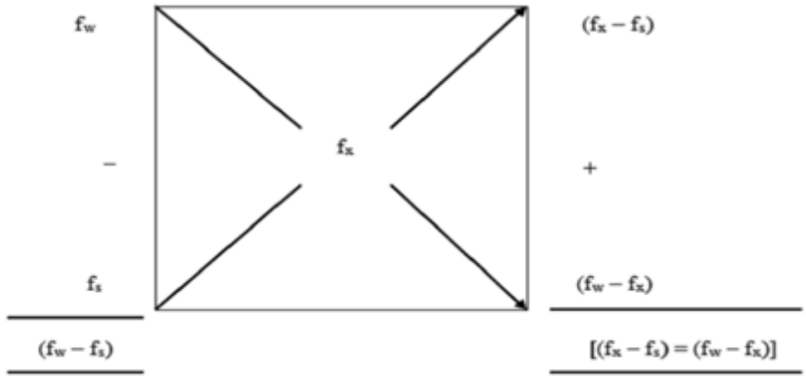


Fig. 28: Pearson's Square for Milk Standardization

Example 1

How much whole milk with 3.9% fat and skimmed milk with 0.04% fat content will require to produce 2000 kg of standardized milk with 2.5% fat?

Solution:

1. Using mass balance method:

Total Mass Balance:

Whole milk + Skim milk = 2000

Mass Balance for Fat:
0.039* Whole milk + 0.0004* Skim milk = 0.025*2000
Solving for Whole milk = 1274.6 kg and Skim milk = 725.4 kg

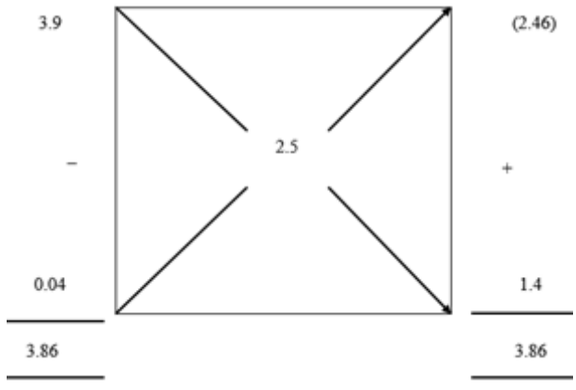
2. Using Pearson's Square method:

Proportion of the whole milk = 2.46/3.86

Amount of whole milk required =
(2.46/3.86)*2000 = 1274.6 kg

Proportion of skimmed milk = 1.4/3.86

Amount of skimmed milk required =
(1.4/3.86)*2000 = 725.4 kg (or 2000 – 1274.6)



Pearsons square for Standardising 2 fluid streams

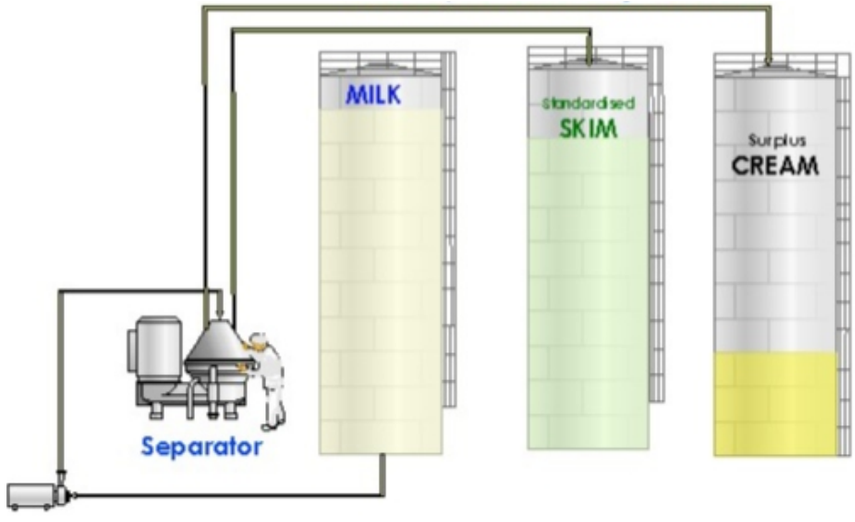


Fig. 29: Process for separating and storing cream and skim milk

The fat molecules present in the milk will rise to the surface of milk and form a thick layer of cream because of density difference. The fat globules were break down into a smaller sizes with the help of homogenizer so that of they will uniformly mixed in the milk. Homogenization generally take place after pasteurization of milk.

4.3.8 Homogenization of Milk

Homogenization implies mechanical treatment to break fat globules into smaller size of 2µm or less. The milk is forced through a narrow opening so that fat globules present in the milk shall split into smaller sizes and uniformly disperse them in milk.

4.3.8.1 Advantage of homogenization

- No cream-line formation after process
- Milk will be more whiter
- Chances of fat oxidation will be less
- Better mouth feel and flavour
- High stability or firmness of cultured milk products

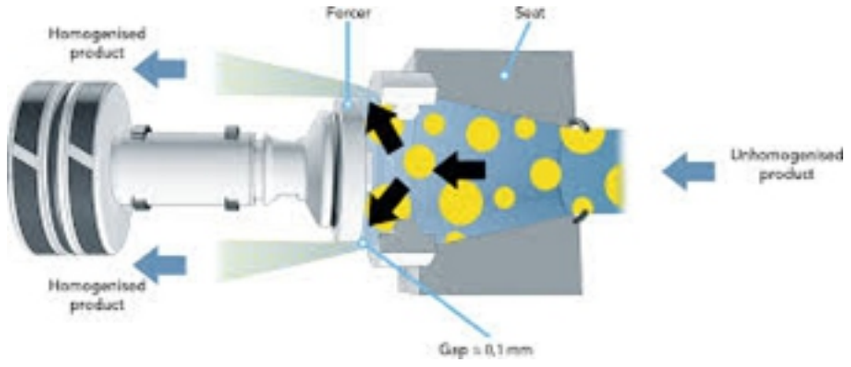


Fig. 30: Homogenization process

4.3.8.2 Disadvantage of homogenisation

- Fat may not be effectively separate from homogenised milk.
- The surface are of fat globules will be more after homogenization, which leads to high sensitivity to light may result into "Sunlight flavour"
- There will be a chance of fat clumping after single-stage homogenisation.
- The milk will not be suitable for production of semi-hard or hard cheeses.

Notes

Unit 4.4 Demonstrate the entire production of Paneer

Unit Objectives

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

- Know the process flow chart of paneer
- State the method of preparation

Unit 4.4.1 Procedure of Paneer Production

1. Take standardized milk (fat : SNF 1:1.65) in a clean and sterilised SS vat. The milk will be heated up to 82°C. Maintain the same temperature for 5 minutes and then cool the milk to 70°C.
2. 1% citric acid solution with respect to the milk is used as a coagulant. The temperature of coagulant is maintained at 70°C, which is same as the temperature of milk at the time of addition of coagulants.
3. The coagulant should be added in optimum quantity so that a clear whey separation shall be achieved. The green colour of the whey indicates proper coagulation. Stirring should not be intense otherwise this will lead to the break up the curd mass.
4. When the pH of whey reached in the range of 5.7 to 6.0, allow the curd mass to be settle for about 5 - 10 minutes. Allow the whey to be drained out through a muslin cloth and the coagulated curd remains in the vat/cloth. It is advised that the whey temperature should not fall below 63°C during the whole process.
5. The curd mass shall be filled in the SS hoops lined with muslin cloth and pressed for 15-20 min. Pressing can be achieved through a manual press or pneumatic press.
6. Immersed the pressed paneer blocks in chilled water (4- 6°C) or 5% brine solution (4- 6%) for 2 - 3 hours to achieve firmness. Further the paneer blocks were cuts and dried to remove extra free water.
7. At last the paneer slices were packed in a vacuum-package made of high density polyethylene (HDPE) and stored at 5°C - 8°C for further sales/distribution.

Good quality buffalo milk

↓

Filtration

↓

Standardization (Fat: SNF 1:1.65 using buffalo skim milk)

↓

Heating (82^0C, 5 min)

↓

Cooling (70^0C)

↓

Addition of coagulant (1 % Citric acid solution at 70^0C)

↓

Continuous stirring till clear whey separates out

↓

Settling for 10 min

↓

Draining of whey

↓

Pressing the coagulum after filling in muslin cloth lined hoops

↓

Removal of blocks and cutting into desired size

↓

Immersion of *paneer* blocks in chilled water (4^0C)

↓

Draining of water and wiping surface

↓

Packaging and storage at 4^0C

Table 18: process detail of paneer manufacturing (step wise)

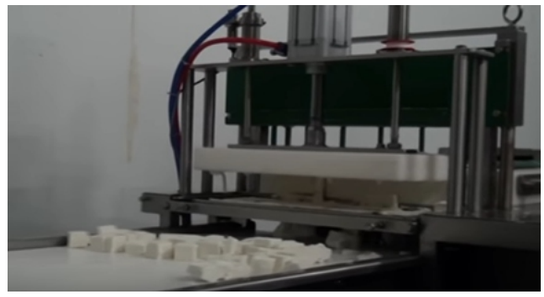
Process Detail	Pictorial depiction
Testing of raw milk sample after the receiving. The following test were carried out in general 1. COB 2. Standard Plate Count (SPC) 3. FAT 4. SNF 5. Acidity 6. Added Water and Milk Freezing Point	
Plate chiller: When the milk leaves the udder, bacteria grow well at the ambient temperature and milk starts deteriorating. Hence freshly drawn raw milk must be quickly cooled to 5°C or below and held at that temperature till it is processed. Chilled water from Ice bank tank is used for this purpose. MOC (PHE): SS316	
Raw Milk Silo: Milk stored in raw milk silo after chilling the milk at 4°C. These are insulated storage tanks. A slow speed agitator is attached at the side of the silo to prevent cream from forming. MOC: SS316 (inner) SS 304 (outer)Bactofugation	
Bactofuge are special type of separator with high separation accuracy that can remove microorganisms from milk based on their density difference (skim milk – 1.036; bacteria – 1.07 – 1.13 g/cm^3). Used for heat resistant spores like (Bacilli/Clostridia), which does not inactivated by pasteurization.	

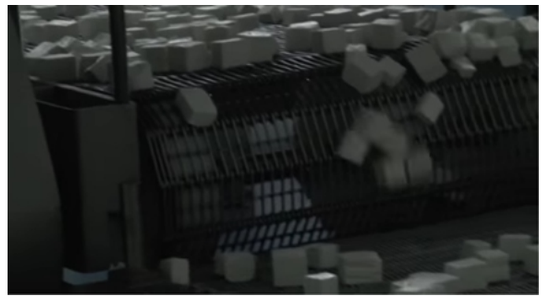
Cream Separator: the fat from the milk separates in form of cream. The working principle depends on the density difference. The effective separation take place at 40 to 45° C.	
Pasteurization: Milk will be subjected to the pasteurization in a continuous flow. The milk enters in the pasteurizer at 4 deg C and leaves at 4 deg C. Milk pasteurizer is available with 90 - 95 % regeneration efficiency.	
After pasteurization, milk stored in the pasteurized milk silo at 40C for further process. A side mounted agitator in the silo (at very low rpm) facilitates uniform temperature and product quality during storage. Pasteurized milk silo is a insulated tank	
Cleaning: prior to the start of process	

Sanitization: with the help of hot water or saturated steam	
Receiving milk in a multipurpose vat: Standardized milk	
Heating at **90°C** as per process requirement. The protein present in the milk denature at this temperature.	
Cooling at **70°C** as per process requirement for the addition of coagulant.	

Testing: Final testing of milk prior to the addition of Acid Coagulant	
Preparation of Acid Coagulation: Citric acid at 1-2 % concentration is the most widely used coagulant for paneer making. The optimum pH of coagulation suggested by researchers should be in the range of 5.3-5.35 for buffalo milk and 5.20-5.25 for cow milk paneer. With the decrease in pH, the moisture retention in paneer also decrease. This results in reduced yield and profit.	
Mixing of Acid Coagulation at **70°C**	
Formation of curd	

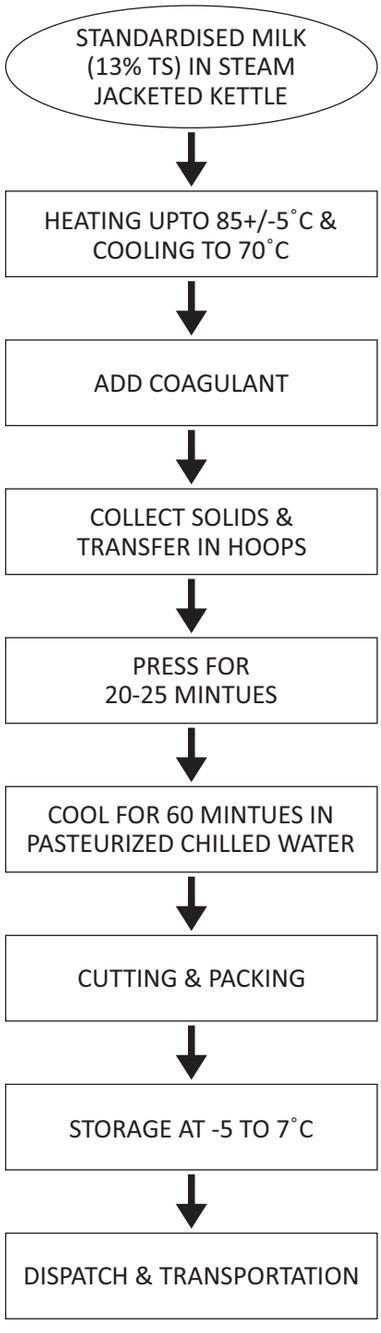
Sideline the curd for easy whey removal from the outlet	
Whey Removal: Whey may be stored for further use	
Straining with muslin cloth	
Hooping: The coagulated mass were collected from the vat and transferred manually to a hoop, lined with muslin cloth. MOC: SS304	

Pneumatic Press: The pressing of paneer mass placed in the hoops (MOC: SS) were subjected to pressing with the help of compressed air. The excess whey drained in this process and resulted compact block of paneer.	
Cooling: After pressing, the paneer blocks are immersed in the pasteurized chilled water maintained at 4-5°C for 2 hours. This process facilitates cooling of paneer blocks. It enhances the moisture content of paneer and improves the body and texture of final paneer blocks.	
Paneer Slicer: As per requirement	
Manual slicing: As per requirement	

Convening and draining of extra moisture Paneer having 51-54% moisture is expected to exhibit yield of 21-23% and 17-18% when made out of standardized buffalo and cow milk respectively.	
Printing of packaging details on the package like 1. MRP 2. Batch number 3. Manufacturing code 4. Date and time of packaging	
Packaging, weighing and vacuum sealing in 200 gms, 500gms	
Shelf life of paneer packaged in laminated pouches is 30 days under refrigeration **(6°C)**. Secondary Packaging for storage and transportation under refrigerated conditions.	

PROCESS FLOW CHART FOR PANEER MANUFACTURE (in term of utilities requirement)

Process Flow	Dairy Operations Requiring Utilities (stepwise)



Steam	**Water**	**Electrical**	Refrigeration
Heating & cleaning	Cleaning	Light	NA
Heating	NA	Light	NA
NA	NA	NA	NA
NA	Cleaning of hoops	NA	NA
NA	Cleaning	Manual pressing	NA
NA	Cleaning	NA	Chilled water
NA	Cleaning of floor	Vacuum packing m/c, air fan	NA
Cleaning	Cleaning of floor	Air blower, motors, light	Refrigerant supply to air blower unit
Cleaning of floor	Cleaning of floor	Light	NA

Unit 4.5 Packaging, storage of paneer and analyze the quality of finished product

Unit Objectives

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

- Enlist the method of packaging and storing paneer
- Understand the quality parameter for paneer

4.5.1 Packaging materials used for packing Paneer

Paneer requires protection from heat, light, O_2, microbial contamination, moisture loss, odour absorption, acid resistance, oil and grease resistance. Therefore the package should have barrier properties and possible for heat sealing.

1. Vegetable parchment: paneer can keep well 3-4 days at 21-27°C, 10 days at refrigerated storage.
2. Vegetable paper parchment treated with Na-propionate increases the keeping quality of paneer.
3. Wax/plastic coated paper: 55-60 gsm / 0.02 mm ---0.009-0.02 mm.
4. Poster paper/Al-foil/LDPE - 150 gauze.
5. MST Cellulose (300)/LDPE – 150 gauze.
6. Poster paper/Al-foil (0.02 mm)/LDPE.
7. Al-foil 0.009 mm, 4-5°C 100% RH Poster paper laminate (0.02 mm).
8. Al-foil 0.009 mm is found superior to MST-300/LDPE which has minimum keeping quality.

Vegetable parchment paper and PE bags are generally used. PE gives greater keeping quality (7 days at 5°C) than that given by vegetable parchment Paper. The Cryovac system using shrink film is being successfully used. Retortable tins are also used. Long life can be given by Metallized polyester or Nylon – PET / METPET/ PE or Aluminium foil or Nylon or LDPE/LLD. Paneer is packed in laminated tin container along with the brine. These tins are sterilized and it may be having a slight cooked flavour and maillard browning which will increase with storage period.

Notes

4.5.2 Vacuum packaging

Paneer is high in fat compare to milk and subjected to decrease in quality. The shelf life of paneer is normally 1 day in an ambient temperature but the same may be enhance significantly with the help of vacuum packaging. A laminated or co-extruded pouches along with vacuum also helps in enhancing the shelf life further. As reported in literature, the shelf life of paneer packed in a oxygen barrier film along with vacuum and heat treatment at 90 °C for one min may reaches up to 90 days under refrigeration.

4.5.2.1 Advantages

1. Extended Shelf Life - As reported in literature, the shelf-life of paneer packed in vacuum packaged may improve from 50%-400%. This type of packaging is available with the organized dairy sector throughout the world.
2. Minimized Product Loss – The moisture present in the paneer will retain with the vacuum type of packaging methods as the packaging films is not permeable for water. This will maintain the package weight throughout the storage period.
3. In case of vacuum packaging, no need of chemical preservatives for the extended shelf life.

4.5.3 Coding and Labelling of Packaging Material

As per food industrial norms, a food package must possess a label with the information as follows:

- Manufacturer's name and address
- Marketer's name and address
- Brand name of the Manufacturer (if any)
- Net quantity in weight or gram or any other unit as per market practice
- Time and date of manufacturing
- Nutritive or calorific values
- List of ingredients
- Information about the permitted color, stabilizer, emulsifier etc.
- Best before uses
- MRP for the processed food

4.5.4 Quality Analysis of Finished product

4.5.4.1 Preparation of Sample of Paneer (Ref:- IS 12758 - 1989 / I.S.O 1735-1987 Cheese and Processed Cheese products - Determination of fat content by gravimetric method - reference method. Bureau of Indian Standards, New Delhi).

Grate the paneer sample quickly through a suitable grater. Mix the grated sample thoroughly. Transfer the grated sample to an air-tight container to await analysis, which should be carried as soon as possible after grinding. Keep sample in an airtight container until the time of analysis. If delay is unavoidable, take all precautions to ensure proper preservation of the sample, and to prevent condensation of moisture on the inside surface of the container. The storage temperature should be below 10°C.

4.5.4.2 Determination of Moisture in Paneer (Ref: IS:2785:1979; Reaffirmed 1995).
The moisture content of paneer is the loss in mass, expressed as a percentage by mass when the product is heated in an air oven at 102 ± 2°C to constant mass

- **Apparatus require**

  A. Flat-bottom dishes with lid: Dishes of nickel, aluminium or of other suitable metal not affected by boiling water, 70 to 80 mm in diameter and not more than 25 mm deep, provided with short glass stirring rod having a widened flat end. The dishes shall have lids which fit well and can readily be removed.

  B. Hot air oven: Maintained at 102 ± 1°C.

  C. Desiccator: Containing an efficient desiccant.

  D. Sand: Which passes through 500 µ sieve and is retained by 180 µ sieve. It shall be prepared by digestion with concentrated HCl, followed by thorough washing with water. It shall then be dried and ignited till it is dull red.

- **Procedure**

  A. Heat the flat-bottomed metal dish containing 20 g of prepared sand and a stirring rod, in hot air oven for about 1 h. Allow to cool in an efficient desiccator for 30 to 40 min. Weigh accurately 3 g of the prepared sample of channa into a flat-bottomed dish (with a cover) previously dried and weighed containing about 20 g of prepared sand and a stirring rod.

  B. Saturate the sand by careful addition of a few drops of distilled water, and thoroughly mix the wet sand with the channa sample by stirring with the glass rod, smoothing out lumps and spreading the mixture over the bottom of the dish.

  C. Place the dish on a boiling water-bath for 20 to 30 min, then wipe the bottom of the dish. Transfer the dish containing the material, along with glass rod after uncovering in an oven maintained at 102.1°C for about 4 h.

  D. After 4 h replace the lid, transfer the covered dish to the desiccator, allow it to cool to room temperature and weigh it accurately and quickly to the nearest 0.1 mg.

  E. Heat the uncovered dish and lid in the oven at 102 ± 1°C for further 1 h, replace the lid, allow the covered dish to cool to room temperature in the desiccator and weigh it. Repeat the process of drying, cooling and weighing, until the successive weighing do not differ by more than 0.5 mg. Record the weight.

4.5.4.3 Calculation

Moisture % by mass = (M1 - M2) / (M1 - M) X 100

Where, M = mass in g, of the empty dish with containing glass rod; M_1 = Initial mass in g of the dish, lid, glass rod along with the material taken for analysis; M_2 = the final mass in g of the dish, lid, glass rod along with the material after drying.

Express the results to the nearest 0.01% (m/m). (Ref:-IS 2785 -1979 (Reaffirmed 1995). Specification for Natural cheese (Hard Variety), Processed Cheese, Processed Cheese Spread and Soft Cheese. Bureau of Indian Standards, New Delhi; IS 10484 -1983 (Reaffirmed 1999). Specification for Paneer. Bureau of Indian Standards, New Delhi).

4.5.4.3 Determination of Fat (by Acid Digestion Method) in Paneer (Ref:- IS 2785 -1979 (Reaffirmed 1995). Weigh accurately 1-2 g of prepared sample in a 100 ml beaker. Add 10 ml of conc. hydrochloric acid. Heat on a Bunsen burner, stirring continuously with a glass rod, or on a boiling water bath until all solid particles are dissolved. Cool to room temperature. Add 10 ml of ethyl alcohol first to the beaker and later transfer the contents to the Mojonnier fat extraction flask or the Rohrig tube Transfer to the Mojonnier fat extraction flask. Proceed as in determination of milk fat by acid digestion.

Notes

Unit 4.6 Post production cleaning and maintenance

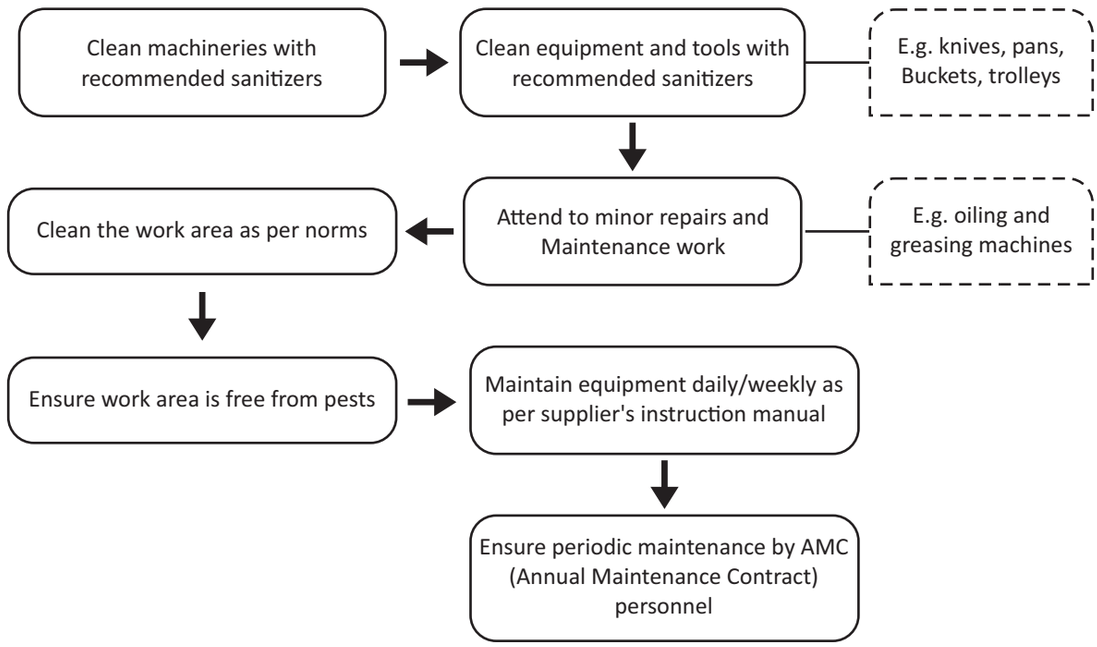
Unit Objectives

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

- Exhibit the post production cleaning methodology for work area and the machineries
- Demonstrate cleaning the machineries used with recommended cleaning agents and sanitizers

4.6.1 Post-Production Cleaning Method

This chart explains the method of cleaning the work area after production:



Flow chart :Cleaning procedure after production

Notes

Notes

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

5. Complete documentation and record keeping related to production of cottage cheese

FICSI
Food Industry Capacity and Skill Initiative

Unit 5.1 Documentation and Record-Keeping for Raw Material, and Finished Product

Unit 5.2 Process of Documenting Record for production plan, process parameters, and finished products

(FIC/N2019)

Key Learning Outcomes

At the end of this module you will be able to:

1. Documentation and Record-Keeping for Raw Material, and Finished Product
2. Process of Documenting Record for production plan, process parameters, and finished products

Unit 5.1 Documentation and Record-Keeping for Raw Material, and Finished Product

Unit Objectives

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

1. Explain the process of documenting and recording for the raw material, processed products, packaging material etc
2. Exhibit the process of documenting records related to procurement of raw material, production plan, process parameters, and processed products

5.1.1 Need for Documentation

Every organization has to maintain records of raw material 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:

1. It gives detailed knowledge about running the business.
2. It helps to control product quality.
3. It helps to keep track of the money invested in the business.
4. It helps to identify the separate costs of raw material or product ingredients.
5. It helps to identify the production cost of a particular process.
6. It helps to make sure that all the quality assurance practices were followed during the production.
7. It helps to make sure that the production equipment is running smoothly/effectively.
8. It works as an evidence for legal procedures.
9. It helps to set an appropriate product price.
10. It helps to take corrective measures at the right time.

5.1.2 How to Keep Records

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

- The quantity and type of raw materials received
- The quantity and type of ingredients used during processing
- The processing conditions in which production took place (e.g. the temperature set or the air pressure applied)
- The product quality produced

Product quality can be maintained only when:

- The same quantity and quality of ingredients and raw materials 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 raw material 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.

Notes

Paneer Preparation (Record)

Date		Batch No.	

	Parameters	Batch 1	Batch 2	Batch 3
Milk	Fat %			
	SNF %			
	Ratio of SNF to Fat			
	TS%			
	Acidity % LA (= ºN x 0.9/100)			
	Coliform count per gram			
Processing	Qty of Milk (kg)			
	Heat Treatment ºC (85 ºC)			
	Time taken for heating in minutes			
	Coagulation Temp. ºC (78-79 ºC)			
	Time taken for cooling in minutes			
	Temp of Citric Acid solution ºC (80 ºC)			
	Concentration of Coagulants (2%)			
	Qty of citric acid used per litre of milk (1.65 g/L)			
	Quantity Coagulants (82.5 ml/L milk)			
	Dipping time			
	Hooping Temp ºC			
	Load in kg of Pressing			
	Time of Pressing in min.			
	Temp of Chilled Water ºC			
	Soaking Time in min.			
	Temp of Paneer after Soaking ºC (40 ºC)			
	Drying Temp.ºC			
	Drying Time			
	Temp. After Drying in ºC			
	pH of Whey			
Paneer	Moisture %			
	Acidity % LA			
	Fat %			
	Fat on Dry matter %			
	Qty in kg			
	Yield %			
	SPC per gram			
	Coilform per gram			
	Colour			
	Texture			
	Flavour & Taste			
	Friability			
	No of 200g pack made			
	Actual yield in kg			
	Handling losses in %			

(Paneer Maker) **(General Manager)**

Unit 5.2 Process of Documenting Record for production plan, process parameters, and finished products

Unit Objectives

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

- Understand the term document,record and audit
- Understand what is meant by self-evaluation and review
- State process of documentation and record keeping.

5.2.1. Self-evaluation and review

- The FBO must undertake a self-evaluation method for the process to verify the effectiveness of the implemented food safety system through internal and external audits at least twice in a year. Necessary corrective actions related to the self-evaluation results shall be taken. Records to be maintained.
- FBO shall also undertake a complete review of the systems including self- evaluation results, customer feedback, complaints, new technologies and regulatory updates at periodic intervals, but at least once in a year for continual improvement.

5.2.2. Documentation and records

5.2.2.1 Appropriate documentation & records of processing, production and distributions must be maintained in a legible manner, retained in good condition for a period of one year or the shelf life of the product, whichever is more.

5.2.2.2 The major records that must be documented as follows:

A. Legal

i. FSSAI License and Registration of Manufacturer/Supplier/Dealers/Retailers

ii. Pollution Control Board Certificate of plant/manufacturing unit

iii. Record of Discharge Effluent & its Compliance with statutory requirements - ETP Compliance

B. Procurement/Quality

1. Raw material receiving and traceability records (including records for milk being received from Milk Collection Centre, BMCs, Chilling Centre).
2. Receiving records for raw materials and additives (other than milk)
3. Quality Control / Lab test reports records/Compositional analysis/Microbial test records – raw milk, processed milk and milk products.
4. External testing reports - Microbiological / chemical test reports pertaining to milk and milk products, water, other food ingredients, additives etc
5. Certificates of Analysis/COA
6. Internal and external audit records/ Corrective action (CAPA).
7. Records for receipt of packaging materials and COA/Supplier certification.
8. Certificate for Virgin / food grade Packing material
9. Certificate of Ink approved for use for milk and milk products packet.
10. Testing record of Packaging materials.
11. Records of samples picked up FSSAI/State FDA authorities.

C. Production/Processing

1. Daily production records
2. Raw material consumption/utilisation records
3. Process monitoring records – CCP's/OPRP's
4. Temperature records of cold room (s)/ storage tanks/silos (when in operation), pasteurizer, chillers, driers etc.
5. Consolidated daily production records.
6. Packing/Packaging records
7. Dispatch records

D. Cleaning, Sanitation and Pest Control

1. Cleaning, plant hygiene and sanitation records.
2. Pest Control and routine treatment records.
3. CIP Record - Processing Level
4. Record of Equipment Swabs for Monitoring Effectiveness of Cleaning
5. Record - Periodic Review of Residual Chemical after Cleaning
6. Records of Cleaning and Disinfection for Cold Stores/ Freezers
7. Cleaning and sanitation records – milk tankers
8. Vehicle inspection record – milk tankers, trucks – raw milk handling and material dispatch

E. HR/Manpower related

1. Training record of Food handlers
2. Health record of the employees (involved in milk handling operations)
3. Record of system to prevent entry of Person from other Department suffering from diseases/Visitor entry records
4. Record of Hygiene monitoring of operators/ Workers
5. Training Records of Officer's (new Joinees/ on job training or Identified Training)

Notes

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Notes

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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. Food Safety, Hygiene and Sanitation for Cottage Cheese

(FIC/N9001)

Key Learning Outcomes

At the end of this module you will be able to:

1. Importance of Food safety (Good Manufacturing Practices (GMP))
2. HACCP Principles
3. Safety Practices

Unit 6.1 Importance of Food safety (Good Manufacturing Practices)

Unit Objectives

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

1. Describe the significance of safety, hygiene, and sanitation in industry
2. Follow the set standards to maintain a safe and hygienic workplace

6.1.1 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. (GMPs) ensure that raw materials, ingredients, finished products and packaging materials are handled safely and that food products are processed in a appropriate environment.

In general there are ten points needed to achieve GMP

1. Writing procedures
2. Following written procedures
3. Documentation for easy traceability
4. Designing facilities and equipments
5. Maintaining facilities and equipments
6. Validating work
7. Job competence
8. Cleanliness
9. Component control
10. Auditing for compliance

GMP'S is applicable in the following area/domain:

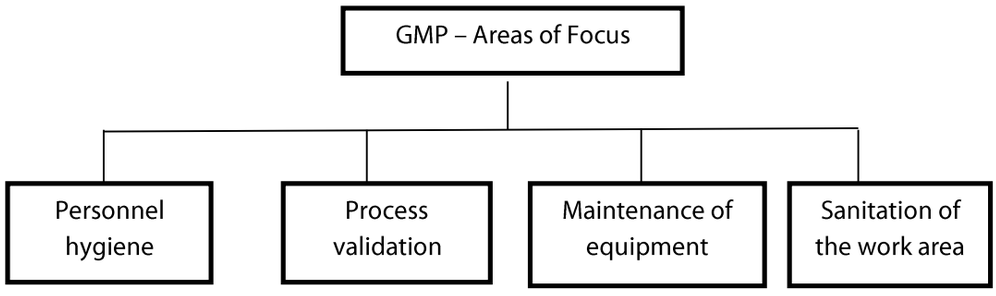
i. Personal practices in the work place

ii. Course of action for sanitary operation and production

iii. Building and services for the plant

iv. Warehouse or storage area

v. Equipment design and laws thereof



Area of focus	GMP
Personnel hygiene	• Follows strict hygiene and sanitation guidelines as per organization • Remember the training on Good Manufacturing Practices (GMP) • Ensure sound health condition during working hours • Must follow high standards of cleanliness • Ensure that the processing unit has enough facilities for toilets and wash stations
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 sanitization. • There is a designated area for keeping utensils and equipment. It is kept clean and pest-free at all times.
Equipment maintenance	• 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 organization follows a cleaning and sanitizing drill as per daily, weekly, and monthly schedules.
Process validation	• All processes of production like raw material procurement, execution, storage, packaging, and logistics follow strict organizational 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 6.2 Risk Analysis Framework

Unit Objectives

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

- Explain Risk Analysis Framework
- State what is risk assessment
- State Various terms related to Risk Assessment
- Know the procedure of Risk Assessment
- Define Food Safety Management System
- State documentation

6.3.1 Risk Analysis Framework

It is an uncomplicated part having risk assessment as a scientific component. It utilizes output of the assessment to be put in place of actions to manage hazards. Risk communication is the discussion among interested parties related to the output of Food Safety.

6.3.1.1 Risk Assessment is a scientific based process consisting of the following steps:

- Hazard identification
- Hazard characterization
- Exposure assessment and
- Risk characterization

6.3.1.2 Risk Management is the process which is distinct from risk assessment, of weighing policy alternatives in consultation with all interested parties, considering risk assessment and other factors relevant for the health protection of consumers and for the promotion of fair trade practices, and, if needed, selecting appropriate prevention and control options. It is the involvement of top management and food safety team in finding the ways through consultation for reducing the Risk level, identified during risk assessment.

6.3.1.3 Risk Assessment Framework is a simple Module in which the scientific element is risk assessment. It uses the output from the assessment to put in place actions to control hazards. Risk communication is the dialogue between interested parties regarding the outputs of the Food Safety.

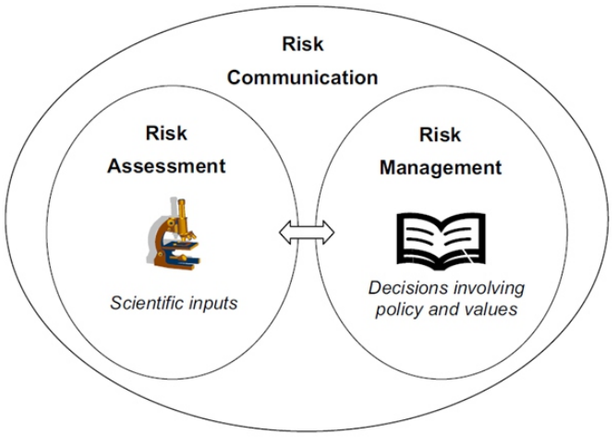


Fig. 31

6.3.1.4 Risk Assessment is the process of identifying a hazard and estimating the risk presented by that hazard. It may be quantitative or qualitative. Detailed quantitative risk analysis is not possible. Main advantage of Risk Analysis is that it takes account of various factors such as quality, acceptable risk, technical feasibility, cost along with developing more effective HACCP Plans. Risk assessment contributes to better understanding of whole food systems and changes. It is used to compare risk between foods or various hazards within the same food.

Fig. 32

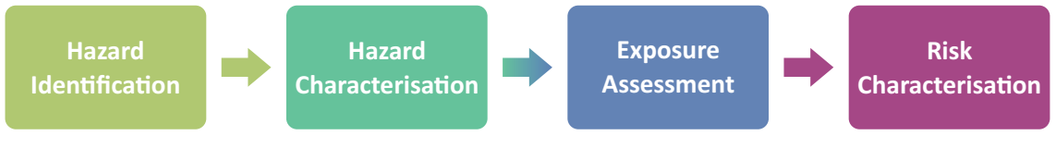
6.3.1.5 4 Steps of Risk Assessment

1. **Hazard Identification**
   - It is the identification of agents capable of causing adverse health effects
   - It Identifies micro- organism, toxin etc of concern and evaluates whether it is a hazard.

2. **Hazard Characterization**
   - It is the assessment of the nature of the adverse health effects associated with hazard.
   - It provides an estimate of the nature, severity and duration of effects. Adverse health effects depend on:
     - The agent
     - The individual/ consumer
     - The food
     - The consumption pattern
     - Dose response: Number or quantity of agent that causes adverse response
     - Range of symptoms
     - Micro- organisms (Infectious or toxicogenic)
     - Food Attributes (Food matrix or Fatty foods)

3. **Exposure Assessment**
   - It evaluates the levels of hazardous agent in food at the time of consumption.
   - This may be actual or anticipated human exposure due to consumption.
   - It is science based method directly affected by production, processing, handling, distribution, preparation, packaging, hygiene conditions, etc.

4. **Risk Characterization**
   - It is the assessment of the nature of the adverse health affects associated with a hazard which may be present in foods
   - It provide an estimate of the nature, severity and duration of the adverse effects
   - It helps to bring together data and analysis both. Example of Risk characterization is risk to public health from food borne Listeria monocytogenes among selected categories of ready to eat foods (US DHHS / USDA)



Unit 6.3 Hazard Analysis Critical Control Point (HACCP)

Unit Objectives

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

- Know the obligation of HACCP
- Follow HACCP principles in the workplace.

6.3.1 Necessity of HACCP

Food safety is very significant to us as this may leads to many hazards to human being. Several rules and regulation were formed and adopted by the food industry to protect people against foodborne diseases and food adulteration. Many more reasons are listed below:

- Food habits are also changing now's a day and high number of people are eating outside the home.
- Due to high number of vulnerable people (elderly, less-immune, undernourished) who are susceptible to various diseases.
- Foodborne diseases is becoming a threat to the modern world irrespective of the knowledge advancement in the field of food science and technologies.
- The threat of food contamination also increase because of mass production or the contamination of the environment.
- The advancement in scientific and analytical methods leads to the methods of detection of contaminants in food.
- Also, the awareness of food safety has significantly increased among the consumer.

In respect to the above reasons, the concern about food safety increases on large scale. In this situation HACCP system is consider to be a reliable, cost effective and highly recognized method for the food safety assurance method.

Notes

6.3.2 What is HACCP

HACCP is an international food safety regulation that is followed to reduce the risk of hazards in a food processing 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 hazard analysis

- Identify the production process and categorize the points where hazards (physical, chemical, and biological) maybe introduced

Identify critical control points

- Recognize the critical points in the process plan to prevent any type of hazard
- 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
- Must have the records related to the of the maintenance of the equipment

Example for HACCP plan for procurement of raw materials

Operational Step	Hazard	Control Measure	Critical Limit	Monitoring Method	Corrective Action	Responsibility	Record
Procurement of raw material	Physical (dirt, stone particles)	Supplier adhere the specifications provided by quality assurance Team	As per company internal specificati -ons	Supplier guarantee certificate is visually confirmed	Reject materials if not accomp-anied 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

6.3.3 Application of HACCP system for milk and milk products

6.3.3.1. HACCP Implementation steps

➢ **Assemble HACCP team**

The food operation shall ensure that the appropriate product specific knowledge and expertise is available for the development and implementation of an effective HACCP plan. A multi disciplinary team shall be assembled either in-house or if such expertise is not available on-site , expert advice shall be obtained from other sources, such as trade and industry associations, independent experts, regulatory authorities, HACCP plan shall be identified and shall describe which segment of the food chain is involved and the general classes of hazards to be addressed (all or selected classes).

➢ **Describe product**

A full description of the product shall be drawn up, including relevant safety information such as composition (including raw materials ingredients, allergens), origin, physical/chemical properties that impact food safety (including Aw, pH, etc.),microbial/static treatments (heat treatment, freezing, brining, smoking etc.), packing, labelling, durability and storage conditions and method of distribution. Within businesses with multiple product for example, catering operations with similar characteristics or processing steps may be grouped for the purpose of development of the HACCP plan.

- **Identify intended use**

  The intended use of the product shall be defined based on the expected uses of the product by the end user or customer. The suitability of the product for vulnerable groups of the population such as pregnant women, infants, elderly should be considered, as necessary.

- **Construct flow diagram**

  The flow diagram shall be prepared to cover all steps in the operation for each specific product or product category. When applying HACCP to a given operation, consideration shall be given to steps preceding and following the specified operation.

- **On-site confirmation of flow diagram**

  Steps shall be taken to confirm the proceeding operation against the flow diagram during all stages and hours of operation and amend the flow diagram where appropriate. The confirmation of the flow diagram should be performed by a competent person or persons. On-site verification activities shall be carried out whenever there are any changes in the process.

- **List of all potential hazards associated with each step, conduct a hazard analysis, and consider any measures to control identified hazards (SEE PRINCIPLE 1)**

  The HACCP team should list all potential hazards (physical, chemical, biological) that may be reasonably expected to occur at each step according to the scope. It should then conduct a hazard analysis to identify for the HACCP plan which hazards are of such a nature that their elimination or reduction to acceptable levels is essential to the production of safe food. In conducting the hazard analysis, the following should be included as appropriate:

  - The likely occurrence of hazard and severity of their adverse health effects;
  - The qualitative and/ or quantitative evaluation of the presence of hazards;
  - Survival or multiplication of micro-organisms of concern;
  - Production of persistence of foods of toxins, chemicals or physical agents; and
  - Conditions leading to the above. For selection of control measures, consideration shall be given to what control measures, if any, can be applied to each hazard. More than one control measure may be required to control a specific hazard and more than one hazard may be controlled by a specified control, measure. Where elimination of hazard is not practical, justification for acceptable levels of the hazard in the finished product shall be determined and documented.

- **Determine Critical Control Points (SEE PRINCIPLE 2)**

  For each hazard that requires control, control measures shall be identified. The control measures shall be reviewed to identify those that need to be addressed through the HACCP plan and for which CCPs shall be identified. There may be more than one CCP at which control is applied to address the same hazard or there may be cases where there is no CCP identified. The CCP in the HACCP system shall be determined and this may be facilitated by a logic reasoning approach such as the application of a decision tree (see dia 2). The application of a decision tree should be flexible. This example of a decision tree may not be applicable to all situations and alternative approaches may be used. If a hazard has been identified at a step where control is necessary for safety, and no control measure exists at that step, or any other, then the product or process should be modified at that step, or at any earlier or later stage, to include a control measure.

- **Establish Critical Limits for each CCP (SEEPRINCIPLE 3)**

  Critical Limits shall be specified and validated for each CCP. In some cases more than one critical limit may be elaborated at a particular step. These critical limits shall be measurable, Critical Limits based on subjective data (such as visual inspection of product, process, handling) shall be supported by instructions or specifications and / or education and training.

- **Establish a monitoring system for each CCP (SEE PRINCIPLE 4)**

  A monitoring system shall be established for each CCP to demonstrate that the CCP is under control. The monitoring shall be able to detect loss of control at the CCP and in time to make adjustments to regain control of the process and prevent violation of the critical limits. Where possible, process adjustments should be made when the results of monitoring indicate a trend towards loss of control at a CCP. The adjustment should be taken before a deviation occurs. Data derived from monitoring shall be evaluated by a designated person with knowledge and authority to carry out corrective actions when indicated. If monitoring is not continuous, then the amount or frequency of monitoring shall be sufficient to ensure that the CCP is under control. The monitoring system shall cover the following:

  a) Measurements or observations that provide results within an adequate time frame
  b) Monitoring device used
  c) Applicable calibration method
  d) Monitoring frequency
  e) Responsibility and authority related to monitoring and evaluation of monitoring results
  f) Records.

  All records and documents associated with monitoring CCPs shall be signed by the person(s) doing the monitoring and by the responsible reviewing official(s) of the company. The monitoring methods and frequency shall be capable of determining when the critical limits have been exceeded in time for the product to be isolated before it is used or consumed.

- **Establish corrective actions (SEE PRINCIPLE 5)**

  Specific planned corrective actions shall be developed for each CCP in the HACCP system in order to deal with deviations when they occur and to prevent their recurrence. This may require identification of the causes of deviation. The action shall ensure that the CCP has been brought under control. Actions taken shall also include proper disposition of the affected product. Deviation and product disposition procedures shall be documented. Records of deviations and disposition shall be maintained.

- **Establish Verification Procedures (SEE PRINCIPLE 6)**

  The verification procedures consist of two activities, verification activities and validation activities. The food business operator shall have in place a system to verify the HACCP plan at a set frequency. Procedures for verification shall be established. The frequency of verification should be sufficient to confirm that the HACCP system is working effectively. Verification should be carried out by someone other than the person who is responsible for performing the monitoring and corrective actions. Where certain verification activities cannot be performed inhouse, verification should be performed on behalf of the business by external experts or qualified third parties. The HACCP system, including the HACCP plan, shall be reviewed (atleast once in a year) and necessary changes made when any modification is made in the product, process, or any step. Verification activities shall include:

Self-evaluation;

- Review of the HACCP system and plan and its records
- Review of deviation and product dispositions
- Confirmation that CCPs are kept under control

The results of verification shall be maintained and communicated to the HACCP team/ relevant staff. The food business operator shall periodically validate the HACCP plan and necessarily before its implementation and after any changes are made. The objective of the validation process is to ensure that identified hazards are complete, correct and effectively controlled under the HACCP plan. Validation activities should include actions to confirm the efficacy of the HACCP system. Records of validation shall be maintained. An annual review of the complete HACCP system shall be carried out. Verification and validation activities are also important for maintenance of the system as well as continual improvements.

➢ **Establish Documentation and Record Keeping (SEE PRINCIPLE 7)**

HACCP procedures shall be documented. Documentation and record keeping shall be appropriate to the nature and size of the operation and sufficient to assist the business to verify that the HACCP controls are in place and being maintained.

➢ **Documentation shall include (as a minimum) the following:**

- HACCP team composition
- Product description
- Intended use
- Flow chart
- Hazard analysis
- CCP determination
- Critical limit determination
- Validation process
- HACCP plan

6.3.4 The HACCP plan shall include the following information for each identified CCP:

- Food safety hazard(s) to be controlled at the CCP
- Control measure(s)
- Critical limit(s)
- Monitoring procedure(s)
- Corrections and corrective action(s) to be taken if critical limits are exceeded
- Responsibilities and authorities for monitoring, corrective action and verification
- Record(s) of monitoring

6.3.5 Records to include

- CCP monitoring activities
- Deviations and associated corrective actions
- Disposition of non-conforming products
- Verification procedures performed
- Modifications to the HACCP plan
- Validation record
- Product release records
- Testing records

Notes

Unit 6.4 Safety Practices

Unit Objectives

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

- Follow the safety practices while working in any industry

6.4.1 Safety Signs

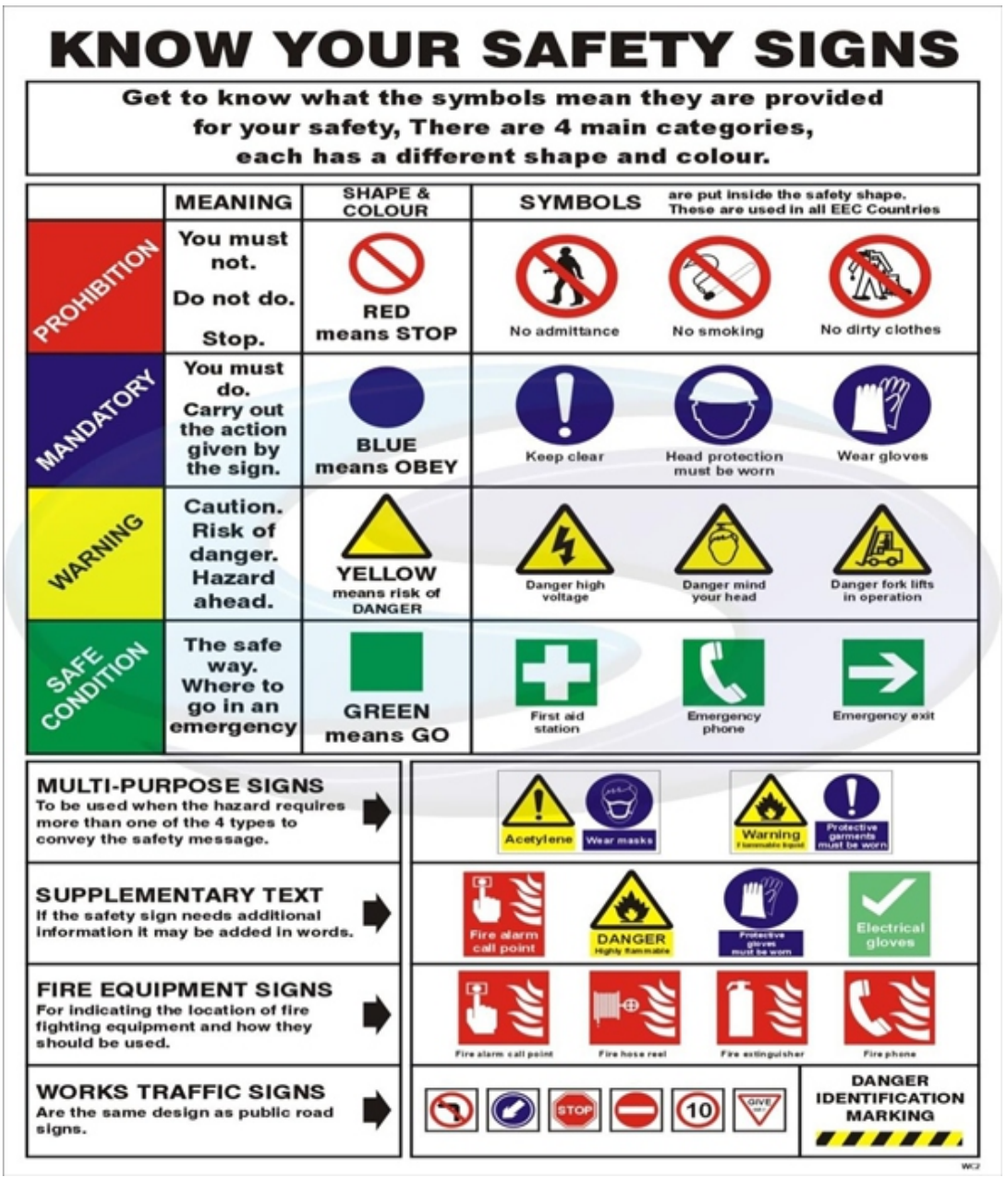


Fig. 33: Safety signs

6.4.1 Cause of fire

- **Sparks** (caused by short circuit)
- **Flames** (caused by open fires, torch, boilers, etc.)
- **Hot surfaces** (machinery, overheating, friction, etc.)
- **Radiant heat** (electric fire, open fire, etc.)

6.4.2 Fire Safety Practices

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

Fig. 34: Fire Safety Practices

6.4.3 Hazards Warning Signs

These warning signs should be displayed in the workplace.

Fig. 35: Hazards warning Signs

6.4.4 Emergency Measures

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

- Do not panic
- Report to your senior immediately or escalate 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 safely

After the emergency, you must:

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

6.4.5.Fire Safety Measures

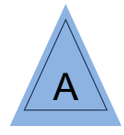
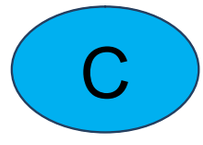
Just like emergency measures, some common fire safety measures must be followed in case of fire. They are:

- 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

6.3.5.1 Fire extinguisher

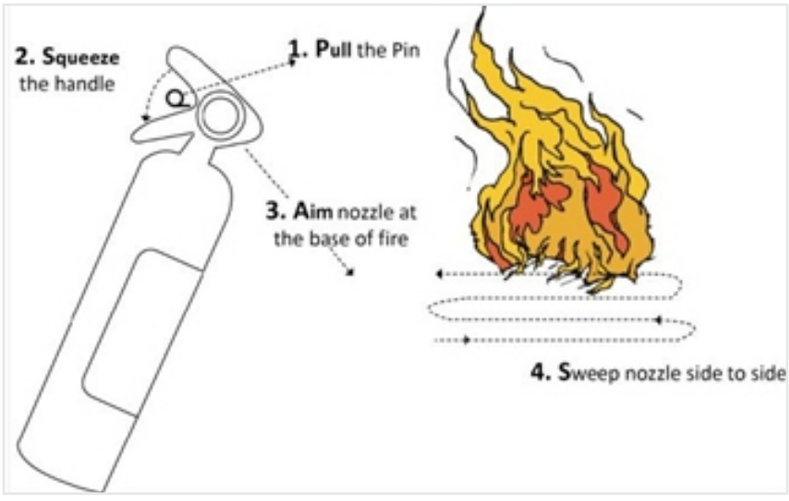
There are mainly four types of fire extinguishers used against the fire:

Type of Extinguisher	Colour of Flash
Water	Red
Foam	Cream
Carbon Dioxide	Black
Powder	Blue

TYPE	CLASS	SYMBOL
Class A fire caused by solid materials of an organic origin like wood, paper, cloth, rubber and plastics. These material will not melt with fire.		
Class B fire caused by flammable liquids like petrol, diesel, thinners, oils, paints, wax, cooking fat and plastics that can melt.		
Class C fire caused by electricity.		
Class D fires caused by flammable metals like sodium, magnesium, potassium, aluminum and titanium.		

Here is what they look like:

Steps to use fire extinguisher



Steps to Use the Fire Buckets

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

Fire bucket

Notes

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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.Professional and Core Skills

Key Learning Outcomes

At the end of this module you will be able to:

1. How to undergo a self assessment test for personal strengths and weakness identification
2. Planning and scheduling the work order and effective time management to complete the task assigned
3. Highlight the importance of decision making
4. Emphasize the importance of listening

Unit 7.1 Identification of Personal strengths and weaknesses

Unit Objectives

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

1. Identify personal strengths and weaknesses
2. Follow the set standards to maintain a safe and hygienic workplace.

7.1.1 SWOT Analysis

S---- strengths

W----- weaknesses

O------ opportunities

T------- threats

This helps the individual to asses him/her self's strength and weaknesses. The organization will be strengthen with the people working for it. After analyzing strength and weaknesses one may easily work on the opportunities and threats that will add value to them and organization. This analysis is very much important for an individual satisfaction and happiness at work place.

Fig. 36: SWOT

7.1.2 How to conduct SWOT?

Fig. 37: How to conduct SWOT

Source : https://www.thebalancesmb.com

The following question may be used to identify the strength, weaknesses, opportunities and threats:

7.1.2.1 Strengths

- What types of advantages do you have compare to your colleague?
- What is your biggest achievements?
- Which types of job, you may do better in compare to others?
- What is your personal resources that can be use by you?
- What do other people (your boss, colleague) notice as your strengths?
- What ethics/standards do you thinks, others must possess?

7.1.2.2 Weaknesses

- What types of advantages do you have compare to your colleague?
- What is your biggest achievements?
- Which types of job, you may do better in compare to others?
- What is your personal resources that can be use by you?
- What do other people (your boss, colleague) notice as your strengths?
- What ethics/standards do you thinks, others must possess?

7.1.2.3 Opportunities

- Which type of new technology/idea will help you?
- Is there any strategic contacts or colleague at your workplace supports/help you?
- What trends do you notice at yours workplace, and how the same will help you?
- Is there any chance to provide solution for your company based on the feedback received from competitors, vendors, customer?
- Is there any job at your workplace in which no one is interested?

7.1.2.4 Threats

- Which type of new technology/idea will help you?
- Is there any strategic contacts or colleague at your workplace supports/help you?
- What trends do you notice at yours workplace, and how the same will help you?
- Is there any chance to provide solution for your company based on the feedback received from competitors, vendors, customer?
- Is there any job at your workplace in which no one is interested?

Table: Mention the strengths, weakness, opportunities and threats in this table

Strengths	Weaknesses
Opportunities	**Threats**

Notes

Unit 7.2 Time Management and Production Planning

Unit Objectives

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

- Understand how to manage time effectively
- Understand how to plan and schedule work order

7.2.1 Time management objectives

a) Analyze the issues that affect your use of time.

b) Identify the significant time problems that impact your work.

c) Develop practical strategies for solving these problems.

d) Use selected time management principles to improve your effectiveness.

e) Fix priorities more wisely for you and your workplace .

Fig. : Tips for Time Management

7.2.2 Make To-Do-List

Create a To-Do list to keep track of the job received identifying the priority

Sr no	Data	Job code/ number	Task/ activities	Targetcompletion	Priority
1					
2					
3					
4					
5					
6					

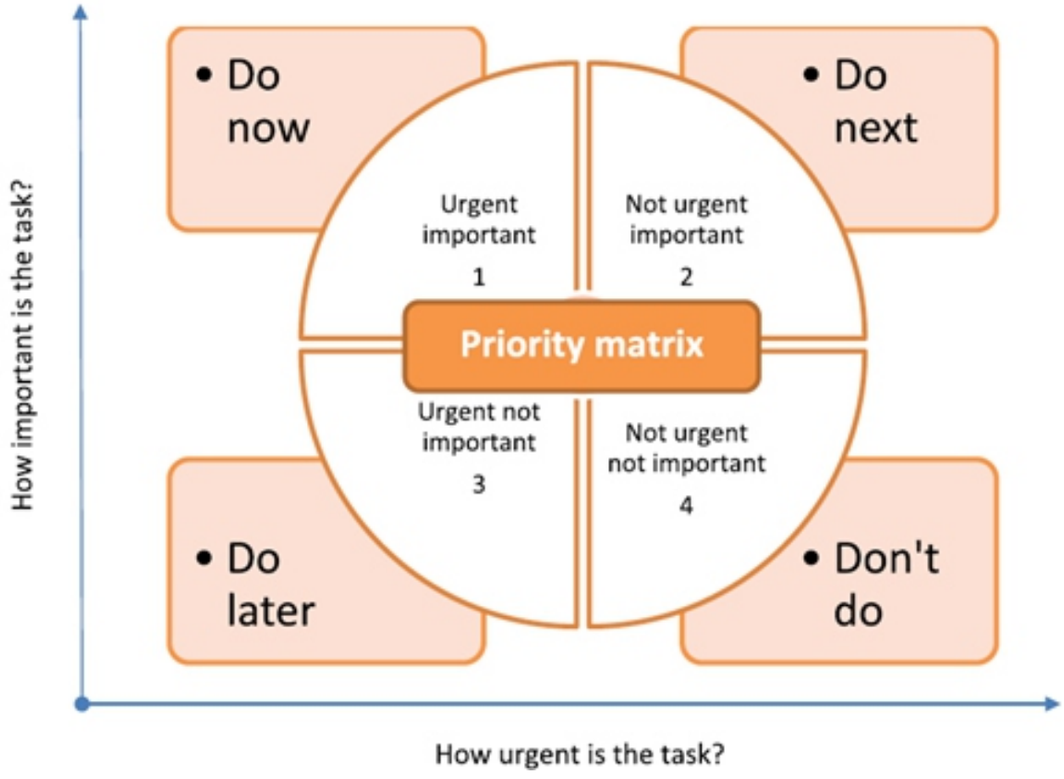


Fig. : Priority Matrix

7.2.3 Planning and scheduling the work

Organizing and planning is a process of completing a given task effectively within the time limit. Planning and organizing includes;

1. Identification of activities
2. Establishing a plan
3. Measuring actual work progress at regular intervals
4. Comparing the actual work done with the plan and identifying any gaps
5. Coordination of work among team
6. Finding the reason from deviation (if any)
7. Taking corrective measures to rectify the deviation

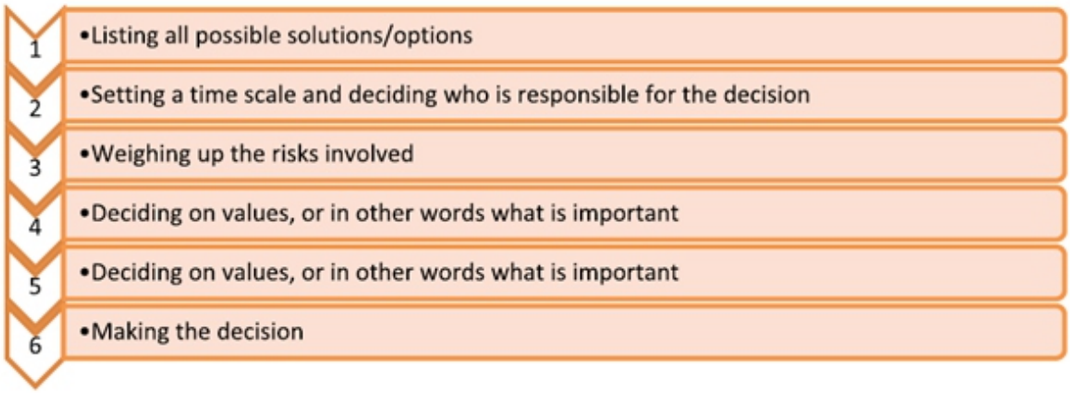
Unit 7.3 Decision Making

Unit Objectives

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

- To choose two or more courses of actions to solve problem quickly and timely
- Explain what is decision making
- List various techniques of decision making

Based on the situation/problems an act has been selected out of the several possible alternatives and this is called a decision. Decision making is a very crucial steps in any field of life or in industry. It is just a selection from the best possible solutions. The process of decision making is as follows:



7.3.1 How to develop decision making skills

- Please answer all these answers as honestly as possible
- Circle your answer for each answer
- Refer to the result table below and evaluate the results

Sl. No.	Decision making skills	Mark where you stand (circle your answer)				
		Strongly agree	agree	Somewhat agree	Somewhat disagree	Strongly disagree
1	Desire to actively participate in the process of solving/ improving a situation					
2	Too much analysis of situation results in delaying decision					
3	Respect other people's suggestion and recommendations					
4	Analyze and calculate the risk and problems which may occur after taking a decision					
5	Follow work place rules and regulations in situations involving high level of risk at work					
6	Use your job specification to take appropriate decision					
7	Do not hesitate to consult your supervisor and subordinates before arriving to a decision point					
8	Do not make workplace decision on emotions					

Result

Your Score	Evaluation	Result
1-3	You need to work hard to develop decision making quality	Need hard work
4	You possess this quality but need to enhance this for success	Keep improving
5	You possess this quality and this is your strength. Use it to make timely and effective decision	Use this strength always

Unit 7.4 Problem Solving and Importance of Listening

Unit Objectives

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

- Understand how to identify the potential problems
- Know about Problem solving Skills
- Differentiate between listening and hearing
- Understand the importance of listening

7.4.1 Potential-Problem Analysis

In this analysis, all the potential problems is recorded first and start with the serious ones first. There are 7 steps in this methods:

In this analysis, all the potential problems is recorded first and start with the serious ones first. There are 7 steps in this methods:

Step 1. Prepare a list of potential problems

Step 2. Recognize the precise nature of each problem
- What?
- Where?
- When?
- To what extent?

Step 3. Establish the amount of risk associated with each problem

Step 4. Identify the possible causes of each problem

Step 5. Estimate the probability of occurrence

Step 6. Establish resources for preventing causes or minimizing their effects

Step 7. Build contingency plans

7.4.2 Problem solving skills

Problem solving skills is the set of activities through which one may identify and analyze a problem for their prioritization and selecting best alternatives for a solution.

7 Steps for Effective Problem Solving

1) **Step 1:** Identifying the Problem. Ask yourself what the problem is
2) **Step 2:** Defining Goals
3) **Step 3:** Brainstorming.
4) **Step 4:** Assessing Alternatives.
5) **Step 5:** Choosing the Solution.
6) **Step 6:** Active Execution of the Chosen Solution.
7) **Step 7:** Evaluation.

7.4.3 Methods to improve your problem-solving skills

1) Acquire more technical knowledge relevant to your industry through additional training or practice.
2) Be a volunteer to solve problem at your workplace. Do not miss any opportunities in your current industry or outside because this will enhance your skill.
3) Practice and role-play are the useful tools for the development of problem-solving skills. Several practice books and problem-solving suggestion are available in market or online that may be helpful.
4) Try to observe your colleagues or boss, who were involved in the problem solving team.

7.4.4 Hearing and Listening

Hearing is passive and is a natural process while listening is an active process. Hearing simply happens but listening is a set of skills (what we hear, what we understand, and what we remember). In facts, effective listening leads to learning.

Listening	Hearing
1.Focused Hearing 2.With purposeful 3.Requires motivation 4.Need to pay concentration Example: understanding the meanings spoken by a speaker We have to give our attention for this type of sound.	1.Accidental response 2.No reason to respond 3.Effortless 4.Involuntary Examples: sounds of airplanes, lawn mowers, furnace blowers In general, we train ourselves to ignore this type of sound

Table : Differences between Listening and Hearing

Why Listening is so important?

Listening is very important skills in our day to day life. Some of the activities based on the listening are mentioned here:

- Decision making
- Coaching and mentoring
- Sales and negotiation
- Training and consultancy
- Dealing with complaints

7.4.5 Purpose of Effective listening

Effective listening is a key factor for any industry and shall serves the following purposes:

- It helps to focus on the messages that are being communicated in order to avoid distractions.
- It helps in reaching an accurate perceptive explained by speakers.
- To focus on non-verbal gestures for fully comprehend the message.
- To show concentration, concern and interest.
- To help the speaker to elaborate more and honest information.
- To demonstrate a selflessness approach, by listening the speaker first.
- To arrive at a conclusion.

Listening should not be taken for granted. The moment we listen someone, we use to frame question or answer in our mind (like how, why, where etc.) This leads to the destruction in effective listening. Understanding the fact expressed by the speaker is much more important than framing an answer or question.

Output Devices: Wherein the information is processed and displayed

Eg.:Printer; Monitor; Speaker etc.

Notes

Notes

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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

8. IT Orientation

Key Learning Outcomes

At the end of this module you will be able to:

1. Identify parts of the computer
2. State use the computer keyboard effectively to type
3. State use ERP effectively to record day- to-day activities
4. Explain use the word processor effectively
5. Explain use the spreadsheet application

Unit 8.1 Parts of computer and key-board

Unit Objectives

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

1. List and identify the various parts of the computer
2. State input and output devices
3. State storage devices
4. Use the computer keyboard effectively to type

8.1.1 Computer

A computer is an electronic machine that processes data. Data is the bundle of information given to the computer through the input device. Computer saves time and energy and programmed to produce output without any delay and mistakes. It can remember a lot of things. The basic parts of a computer are shown in the picture given here.

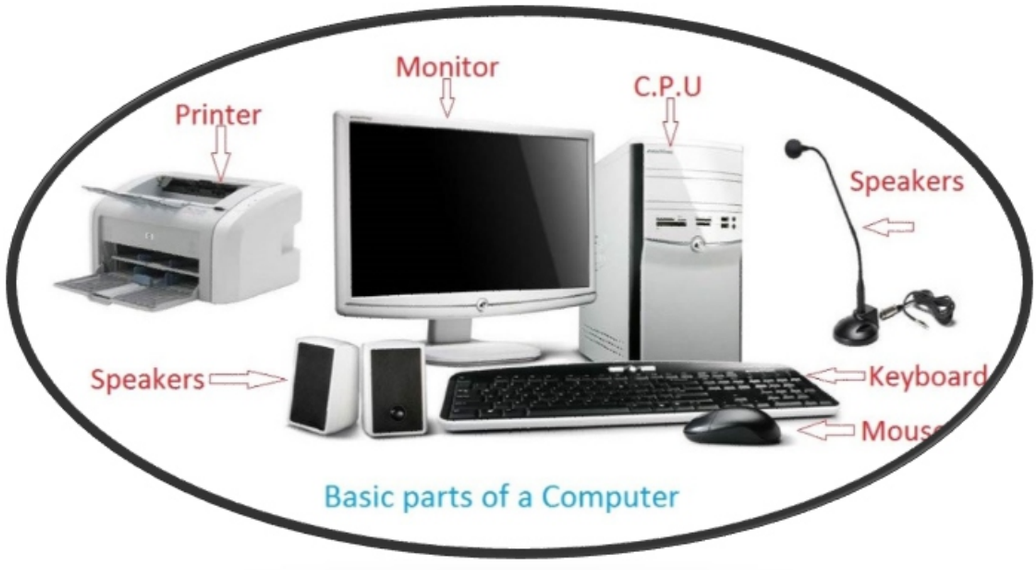


Fig 8.1 Parts of computer

8.1.2 Input Devices

The computer is embedded with an operating software which requires data for processing output. The data can be fed through the following:

Keyboard	
Mouse	
Webcam	
Joystick	
Microphone	
Scanner	

8.1.3 Processing Device

All the inputs are stored, sorted, arranged and changed by a computer. The device that helps a computer do so is called the processing device. The processing device in a computer is known as Central Processing Unit (CPU). The CPU for desktop is shown here. All the parts of the desktop like, monitor screen, keyboard, mouse, printer, scanner, webcam, microphone are attached with this CPU. This unit accommodates the following:

a) Hard Drive

b) Mother Board

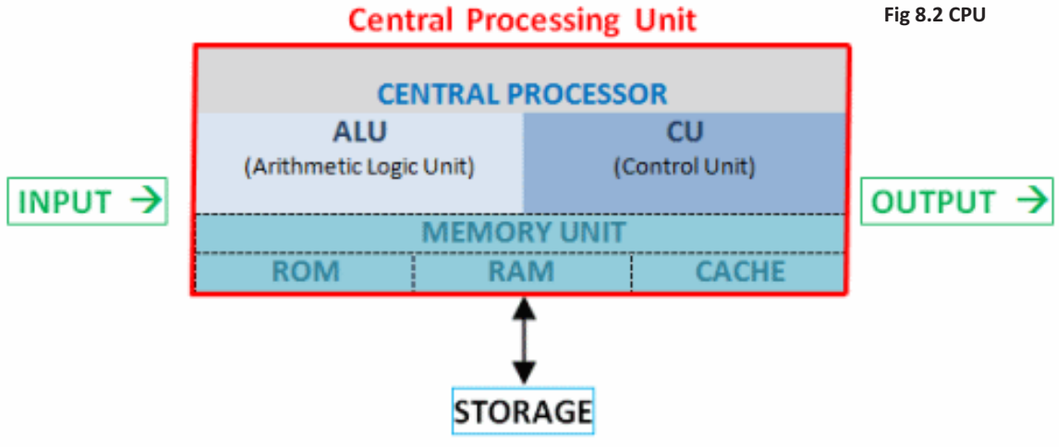
c) Random Access Memory (RAM)

d) Printed Circuit Boards,

e) Microprocessors etc.

The function of CPU is as below:

Fig 8.2 CPU



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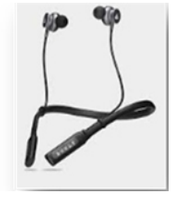
8.1.4 Output Devices

The central processing unit process the data as per the command given by the user and converted the information through an output device. Some of them are mentioned below:

Monitor	
Printer	
Speakers or headphones	 
Projector	
Plotter: use writing tools, such as pen, pencil, marker, to draw lines.	

8.1.5 Storage device

A hardware means capable of holding information/data either temporarily or permanently.

Hard drive

DVD

pen drive

SD card

Notes

Unit 8.2 Use the computer keyboard effectively to type

Unit Objectives

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

- State the use of computer keyboard effectively for typing

8.2.1 Details of Keys on keyboard

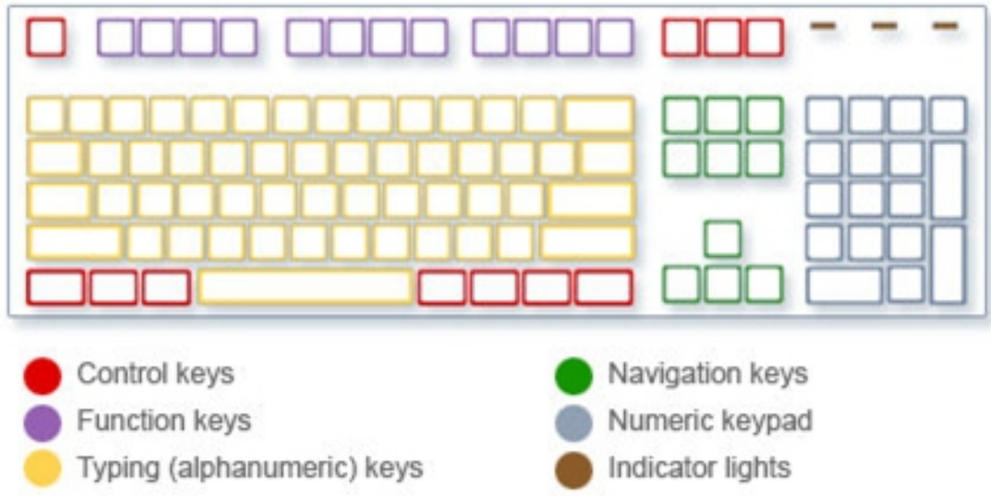


Fig. 8.3 A typical keyboard

1) **Typing (alpha-numeric) keys:** letter, number, punctuation, and symbol keys.
2) **Control keys:** are Ctrl, Alt, the Windows logo key
3) **Function keys:** as F1, F2, F3, and so on, up to F12 used to perform specific tasks.
4) **Navigation keys:** Arrow keys, Home, End, Page Up, Page Down, Delete, and Insert are used for moving around in documents or in webpages.
5) **Numeric keypad:** for entering numbers quickly.

A cursor (i.e, blinking vertical line) guide us while typing in any program like Microsoft office (word, excel, ppt), e-mail message etc. The cursor may be adjusted/moved with the help of navigation key or mouse.

Key name	How to use it
Shift	Uppercase letter: Shift + letter Symbol: Shift + key on which symbol is mentioned
Caps Lock	Press Caps Lock to ON: helps to type all letters as uppercase. Press Caps Lock again to turn off this function.
Tab	Press Tab: cursor moves several spaces forward. The same may be press to move to the next text box in a table.
Enter	Press Enter: cursor move to the beginning of the next line.
Spacebar	Press the Spacebar to move the cursor one space forward.
Backspace	Press Backspace to delete the character before the cursor, or the selected text.

8.2.2 Keyboard shortcut

A hardware means capable of holding information/data either temporarily or permanently.

Shortcuts	Descriptions
Ctrl + C	Copy
Ctrl + X	Cut
Ctrl + V	Paste
Ctrl + Z	Undo
Ctrl + S	Save
Ctrl + F	Search for word
Ctrl + A	Highlight everything
Shift + Left Arrow or Right Arrow	Highlight next letter
Ctrl + Shift + Left Arrow or Right Arrow	Highlight next word
Ctrl + Left Arrow or Right Arrow	Navigate text cursor to next word without highlight
Home	Go to beginning of line
End	Go to end of line
Page Up	Scroll up
Page Down	Scroll down
Ctrl + Tab	Switch to next tab
Ctrl + Shift + Tab	Switch to previous tab
Ctrl + T	Open new tab
Ctrl + W	Close current tab
Ctrl + Shift + T	Open previously closed tab
Ctrl + R	refresh current webpage

Ctrl + N	Open new web browser window
Backspace	Go back one page
Shift + Backspace	Go forward one page
Alt + Tab	Switch to next opened window
Alt + Shift + Tab	Switch to previous opened window
Alt + F4	Close current window

Notes

Unit 8.3 Use of ERP and Microsoft-word & Spreadsheet

Unit Objectives

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

- Apply ERP effectively for day- to-day activities
- Understand word processor
- Understand spreadsheet application

8.3.1 Enterprise Resource Planning

Enterprise Resource Planning or ERP is a tool for effective planning of all the resources in an organization. It include all the details related to corporate vision, objectives, attitudes beliefs, values, operating style and the people who works for the organization.

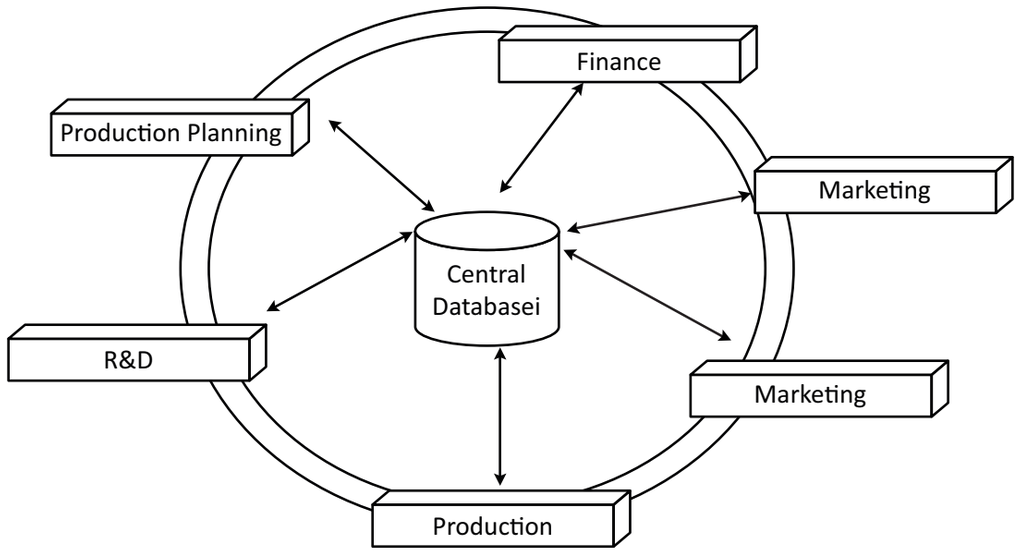


Fig 8.3 Modern Enterprise Resource Planning

8.3.2 Uses of ERP Effectively to record day to day activities

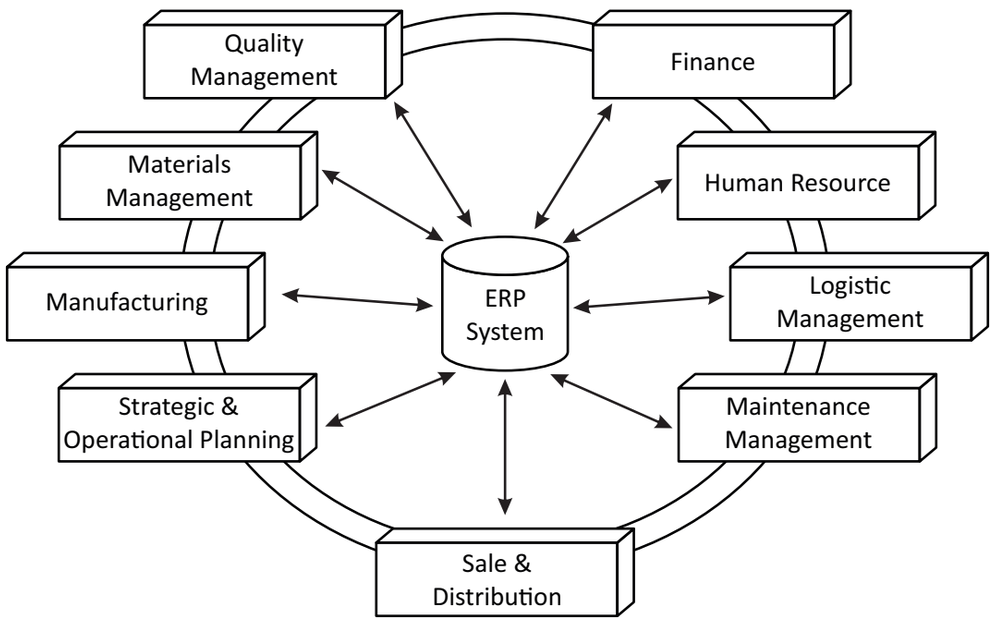


Fig 8.4 Information Integration through ERP System

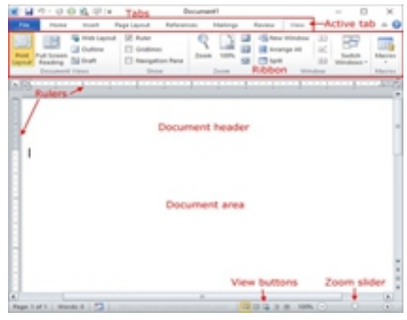
ERP system have many advantages to the industry like enhanced efficiency, information incorporation, faster response time to customer queries, etc. In addition to this ERP also brings better corporate image, improved customer goodwill, customer satisfaction, and so on.

- ERP tools help in managing accounts, inventory and employee records of the company. It would also automate the process of buying and maintaining material after analyzing the stock.
- ERP save the time and effort when compared to the paper records.
- The merger of financial and operational information allows the company to analyze the business needs and helps to predict the market trends effectively.
- By combining all the records in one whole, ERP makes the management of data easier and more productive.

8.3.4 Word processor

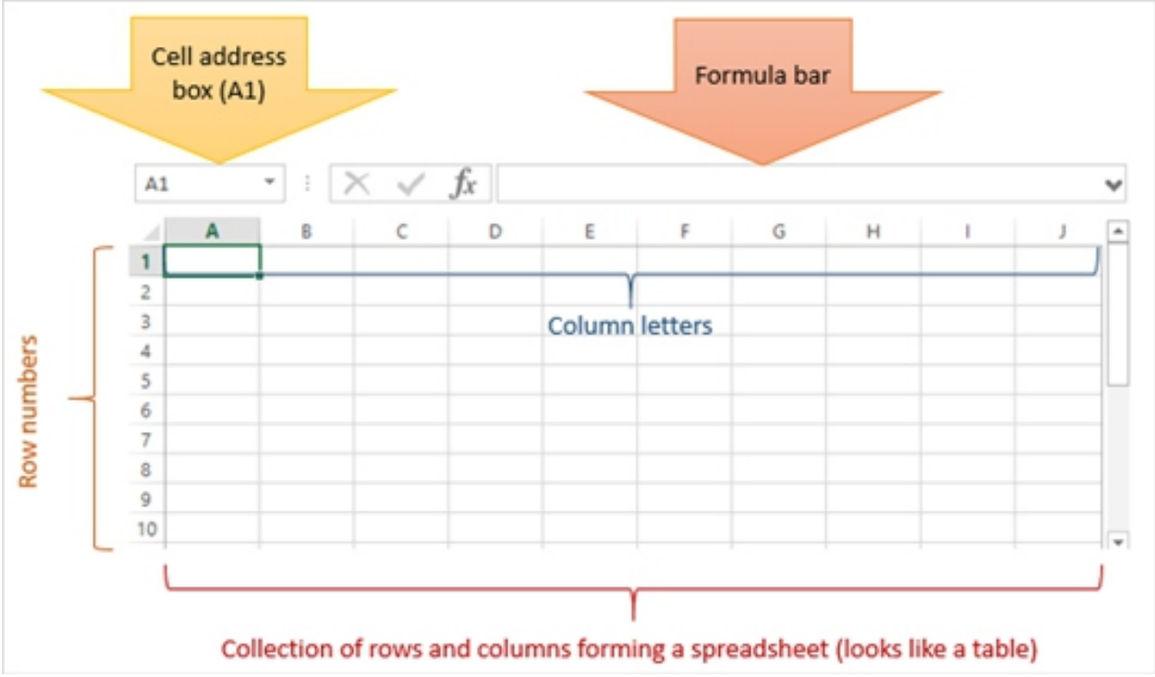
Microsoft word is designed to create professional quality documents. You may have a shortcut to word on your desktop, if so double-click the icon and the word will open. If not, follow the steps

1. Click on the start button
2. Highlight programs
3. Highlight Microsoft office
4. Click on Microsoft word



8.3.4 MS-Spreadsheet

Microsoft Excel is a spreadsheet program that is used to record and analyze numerical data. It is a collection of columns and rows that form a table. Alphabetical letters are usually assigned to columns and numbers are usually assigned to rows.



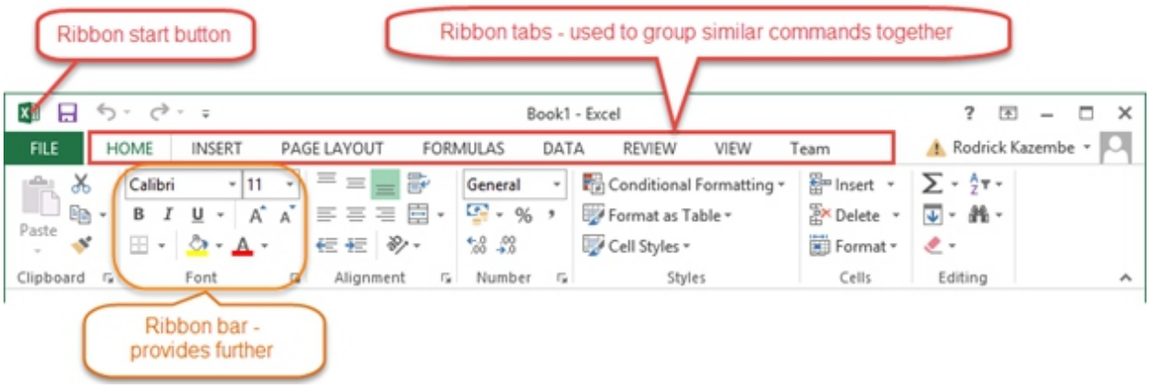
Running Excel is not different from running any other Windows program. To open MS Excel, follow the following steps.

- Click on start menu
- Point to all programs
- Point to Microsoft Excel
- Click on Microsoft Excel

Alternatively, you can also open it from the start menu if it has been added there. You can also open it from the desktop shortcut if you have created one.

8.3.4.1 Understanding the Ribbon

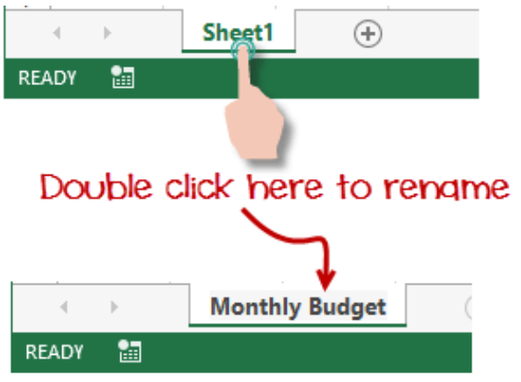
The ribbon provides shortcuts to commands in Excel. A command is an action that the user performs. An example of a command is creating a new document, printing a documenting, etc. The image below shows the ribbon used in Excel 2013.



8.3.4.2 Ribbon start button - it is used to access commands i.e. creating new documents, saving existing work, printing, accessing the options for customizing Excel, etc.

8.3.4.3 Ribbon tabs – the tabs are used to group similar commands together. The home tab is used for basic commands such as formatting the data to make it more presentable, sorting and finding specific data within the spreadsheet.

8.3.4.4 Ribbon bar – the bars are used to group similar commands together. As an example, the Alignment ribbon bar is used to group all the commands that are used to align data together.



8.3.4.5 Understanding the worksheet (Rows and Columns, Sheets, Workbooks)

A worksheet is a collection of rows and columns. When a row and a column meet, they form a cell. Cells are used to record data. Each cell is uniquely identified using a cell address. Columns are usually labeled with letters while rows are usually numbers.

A workbook is a collection of worksheets. A workbook has three cells in Excel. You can delete or add more sheets to suit your requirements. The sheets are named Sheet1, Sheet2 and so on and so forth. You can rename the sheet names to more meaningful names i.e. daily Expenses, Monthly Budget, etc.

Table : Important Excel Shortcuts

Ctrl + P	Used to open the print dialogue window
Ctrl + N	Creates a new workbook
Ctrl + S	Saves the current workbook
Ctrl + C	Copy contents of current select
Ctrl + V	Paste data from the clipboard
SHIFT + F3	Displays the function insert dialog window
SHIFT + F11	Creates a new worksheet
F2	Check formula and cell range covered

Practical Test

Subject: design a newspaper advertisement in MS word

Aim: to get hands on training on designing and creating text or image using MS word

Methodology

1. Switch on the computer
2. Open MS word
3. Design a text based document shown by the trainer; name and save the file.
4. Switch off the computer

Practical test

Subject: hands on training on MS excel

Aim: to get hands on training on using MS excel

Methodology

1. Switch on the computer
2. Open MS word
3. Feed the data given by trainer and arrange them in ascending order and find the sum of the data given using spreadsheet.
4. Save the spreadsheet and name it
5. Switch off the computer

Notes

Unit 8.4 Effective use of computer to record day-to-day activities

Unit Objectives

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

- State the use of computer applications in day to day documentation and record keeping
- Word processor and Spreadsheet can be used in day to day documentation and record keeping

8.4.1 Documentation using computer

- Daily production report can be prepared using word application.
- Any information related to procurement of raw material may be shared using word.
- Any shutdown or fault occurred during production can also be documented.
- All the policies of the organization can be documented in digital form and if required, can be printed as well.
- Any communication to the vendors, suppliers or officials can be done using word application.

8.4.2 Record keeping using computer

- Record of personal hygiene check of the workers can be recorded
- Daily production record can be maintained in digital format using spreadsheet or word application
- Process parameters during production may also be recorded in computers
- All the inventory of raw material can be maintained in computer
- The financial calculations can be done and recorded using spreadsheet application.

Notes

Notes

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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

9. Employability & Entrepreneurship Skills

Key Learning Outcomes

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

1. Explain the meaning of health
2. List common health issues
3. Discuss tips to prevent common health issues
4. Explain the meaning of hygiene
5. Understand the purpose of Swacch Bharat Abhiyan
6. Explain the meaning of habit
7. Discuss ways to set up a safe work environment
8. Discuss critical safety habits to be followed by employees
9. Explain the importance of self-analysis
10. Understand motivation with the help of Maslow's Hierarchy of Needs
11. Discuss the meaning of achievement motivation
12. List the characteristics of entrepreneurs with achievement motivation
13. List the different factors that motivate you
14. Discuss how to maintain a positive attitude
15. Discuss the role of attitude in self-analysis
16. List your strengths and weaknesses
17. Discuss the qualities of honest people
18. Describe the importance of honesty in entrepreneurs
19. Discuss the elements of a strong work ethic
20. Discuss how to foster a good work ethic
21. List the characteristics of highly creative people
22. List the characteristics of highly innovative people
23. Discuss the benefits of time management
24. List the traits of effective time managers
25. Describe effective time management technique
26. Discuss the importance of anger management
27. Describe anger management strategies
28. Discuss tips for anger management
29. Discuss the causes of stress
30. Discuss the symptoms of stress
31. Discuss tips for stress management
32. Identify the basic parts of a computer
33. Identify the basic parts of a keyboard
34. Recall basic computer terminology
35. Recall basic computer terminology

36. Recall the functions of basic computer keys
37. Discuss the main applications of MS Office
38. Discuss the benefits of Microsoft Outlook
39. Discuss the different types of e-commerce
40. List the benefits of e-commerce for retailers and customers
41. Discuss how the Digital India campaign will help boost e-commerce in India
42. Explain how you will sell a product or service on an e-commerce platform
43. Discuss the importance of saving money
44. Discuss the benefits of saving money
45. Discuss the main types of bank accounts
46. Describe the process of opening a bank account
47. Differentiate between fixed and variable costs
48. Describe the main types of investment options
49. Describe the different types of insurance products
50. Describe the different types of taxes
51. Discuss the uses of online banking
52. Discuss the main types of electronic funds transfers
53. Discuss the steps to prepare for an interview
54. Discuss the steps to create an effective Resume
55. Discuss the most frequently asked interview questions
56. Discuss how to answer the most frequently asked interview questions
57. Discuss basic workplace terminology
58. Discuss the concept of entrepreneurship
59. Discuss the importance of entrepreneurship
60. Describe the characteristics of an entrepreneur
61. Describe the different types of enterprises
62. List the qualities of an effective leader
63. Discuss the benefits of effective leadership
64. List the traits of an effective team
65. Discuss the importance of listening effectively
66. Discuss how to listen effectively
67. Discuss the importance of speaking effectively
68. Discuss how to speak effectively
69. Discuss how to solve problems
70. List important problem solving traits

71. Discuss ways to assess problem solving skills
72. Discuss the importance of negotiation
73. Discuss how to negotiate
74. Discuss how to identify new business opportUnities
75. Discuss how to identify business opportUnities within your business
76. Understand the meaning of entrepreneur
77. Describe the different types of entrepreneurs
78. List the characteristics of entrepreneurs
79. Recall entrepreneur success stories
80. Discuss the entrepreneurial process
81. Describe the entrepreneurship ecosystem
82. Discuss the government's role in the entrepreneurship ecosystem
83. Discuss the current entrepreneurship ecosystem in India
84. Understand the purpose of the Make in India campaign
85. Discuss the relationship between entrepreneurship and risk appetite
86. Discuss the relationship between entrepreneurship and resilience
87. Describe the characteristics of a resilient entrepreneur
88. Discuss how to deal with failure
89. Discuss how market research is carried out
90. Describe the 4 Ps of marketing
91. Discuss the importance of idea generation
92. Recall basic business terminology
93. Discuss the need for CRM
94. Discuss the benefits of CRM
95. Discuss the need for networking
96. Discuss the benefits of networking
97. Understand the importance of setting goals
98. Differentiate between short-term, medium-term and long-term goals
99. Discuss how to write a business plan
100. Explain the financial planning process
101. Discuss ways to manage your risk
102. Describe the procedure and formalities for applying for bank finance
103. Discuss how to manage your own enterprise
104. List important questions that every entrepreneur should ask before starting an enterprise

Unit 9.1 Personal Strengths & Value Systems

Unit Objectives

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

1. Explain the meaning of health
2. List common health issues
3. Discuss tips to prevent common health issues
4. Explain the meaning of hygiene
5. Understand the purpose of Swacch Bharat Abhiyan
6. Explain the meaning of habit
7. Discuss ways to set up a safe work environment
8. Discuss critical safety habits to be followed by employees
9. Explain the importance of self-analysis
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12. List the characteristics of entrepreneurs with achievement motivation
13. List the different factors that motivate you
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24. List the traits of effective time managers
25. Describe effective time management technique
26. Discuss the importance of anger management
27. Describe anger management strategies
28. Discuss tips for anger management
29. Discuss the causes of stress
30. Discuss the symptoms of stress
31. Discuss tips for stress management

9.1.1 Health, Habits, Hygiene: What is Health

As per the World Health Organization (WHO), health is a "State of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity." This means being healthy does not simply mean not being unhealthy – it also means you need to be at peace emotionally, and feel fit physically. For example, you cannot say you are healthy simply because you do not have any physical ailments like a cold or cough. You also need to think about whether you are feeling calm, relaxed and happy.

Common Health Issues

Some common health issues are:

- Allergies
- Asthma
- Skin Disorders
- Depression and Anxiety
- Diabetes
- Cough, Cold, Sore Throat
- Difficulty Sleeping
- Obesity

Tips to Prevent Health Issues

Taking measures to prevent ill health is always better than curing a disease or sickness. You can stay healthy by:

- Eating healthy foods like fruits, vegetables and nuts
- Cutting back on unhealthy and sugary foods
- Drinking enough water everyday
- Not smoking or drinking alcohol
- Exercising for at least 30 minutes a day, 4-5 times a week
- Taking vaccinations when required
- Practicing yoga exercises and meditation

How many of these health standards do you follow? Tick the ones that apply to you.

1. Get minimum 7-8 hours of sleep every night. ☐
2. Avoid checking email first thing in the morning and right before you go to bed at night. ☐
3. Don't skip meals – eat regular meals at correct meal times. ☐
4. Read a little bit every single day. ☐
5. Eat more home cooked food than junk food. ☐

6. Stand more than you sit. ☐
7. Drink a glass of water first thing in the morning and have at least 8 glasses of water through the day. ☐
8. Go to the doctor and dentist for regular checkups. ☐
9. Exercise for 30 minutes at least 5 days a week. ☐
10. Avoid consuming lots of aerated beverages. ☐

What is Hygiene?

As per the World Health Organization (WHO), "Hygiene refers to conditions and practices that help to maintain health and prevent the spread of diseases." In other words, hygiene means ensuring that you do whatever is required to keep your surroundings clean, so that you reduce the chances of spreading germs and diseases.

For instance, think about the kitchen in your home. Good hygiene means ensuring that the kitchen is always spick and span, the food is put away, dishes are washed and dustbins are not overflowing with garbage. Doing all this will reduce the chances of attracting pests like rats or cockroaches, and prevent the growth of fungus and other bacteria, which could spread disease.

How many of these health standards do you follow? Tick the ones that apply to you.

1. Have a bath or shower every day with soap – and wash your hair with shampoo 2-3 times a week. ☐
2. Wear a fresh pair of clean undergarments every day. ☐
3. Brush your teeth in the morning and before going to bed. ☐
4. Cut your fingernails and toenails regularly. ☐
5. Wash your hands with soap after going to the toilet. ☐
6. Use an anti-perspirant deodorant on your underarms if you sweat a lot. ☐
7. Wash your hands with soap before cooking or eating. ☐
8. Stay home when you are sick, so other people don't catch what you have. ☐
9. Wash dirty clothes with laundry soap before wearing them again. ☐
10. Cover your nose with a tissue/your hand when coughing or sneezing. ☐

See how healthy and hygienic you are, by giving yourself 1 point for every ticked statement!

Then take a look at what your score means.

Your Score

0-7/20: You need to work a lot harder to stay fit and fine! Make it a point to practice good habits daily and see how much better you feel!

7-14/20: Not bad, but there is scope for improvement! Try and add a few more good habits to your daily routine.

14-20/20: Great job! Keep up the good work! Your body and mind thank you!

Swachh Bharat Abhiyan

We have already discussed the importance of following good hygiene and health practices for ourselves. But, it is not enough for us to be healthy and hygienic. We must also extend this standard to our homes, our immediate surroundings and to our country as a whole.

The 'Swachh Bharat Abhiyan' (Clean India Mission) launched by Prime Minister Shri Narendra Modi on 2nd October 2014, believes in doing exactly this. The aim of this mission is to clean the streets and roads of India and raise the overall level of cleanliness. Currently this mission covers 4,041 cities and towns across the country. Millions of our people have taken the pledge for a clean India. You should take the pledge too, and do everything possible to keep our country clean!

What are Habits?

A habit is a behaviour that is repeated frequently. All of us have good habits and bad habits. Keep in mind the phrase by John Dryden: "We first make our habits, and then our habits make us." This is why it is so important that you make good habits a way of life, and consciously avoid practicing bad habits.

Some good habits that you should make part of your daily routine are:

- Always having a positive attitude
- Making exercise a part of your daily routine
- Reading motivational and inspirational stories
- Smiling! Make it a habit to smile as often as possible
- Making time for family and friends
- Going to bed early and waking up early

Some bad habits that you should quit immediately are:

- Skipping breakfast
- Snacking frequently even when you are not hungry
- Eating too much fattening and sugary food
- Smoking, drinking alcohol and doing drugs
- Spending more money than you can afford
- Worrying about unimportant issues
- Staying up late and waking up late

Tips

- Following healthy and hygienic practices every day will make you feel good mentally and physically.
- Hygiene is two-thirds of health – so good hygiene will help you stay strong and healthy!

9.1.2 Safety: Tips to Design a Safe Workplace

Every employer is obligated to ensure that his workplace follows the highest possible safety protocol. When setting up a business, owners must make it a point to:

- Use ergonomically designed furniture and equipment to avoid stooping and twisting
- Provide mechanical aids to avoid lifting or carrying heavy objects
- Have protective equipment on hand for hazardous jobs
- Designate emergency exits and ensure they are easily accessible
- Set down health codes and ensure they are implemented
- Follow the practice of regular safety inspections in and around the workplace
- Ensure regular building inspections are conducted
- Get expert advice on workplace safety and follow it

Non-Negotiable Employee Safety Habits

Every employer is obligated to ensure that his workplace follows the highest possible safety protocol. When setting up a business, owners must make it a point to:

- Immediately report unsafe conditions to a supervisor
- Recognize and report safety hazards that could lead to slips, trips and falls
- Report all injuries and accidents to a supervisor
- Wear the correct protective equipment when required
- Learn how to correctly use equipment provided for safety purposes
- Be aware of and avoid actions that could endanger other people
- Take rest breaks during the day and some time off from work during the week

Tips

- Be aware of what emergency number to call at the time of a workplace emergency
- Practice evacuation drills regularly to avoid chaotic evacuations

9.1.3 Self Analysis – Attitude, Achievement Motivation: What is Self-Analysis

To truly achieve your full potential, you need to take a deep look inside yourself and find out what kind of person you really are. This attempt to understand your personality is known as self-analysis. Assessing yourself in this manner will help you grow, and will also help you to identify areas within yourself that need to be further developed, changed or eliminated. You can better understand yourself by taking a deep look at what motivates you, what your attitude is like, and what your strengths and weaknesses are.

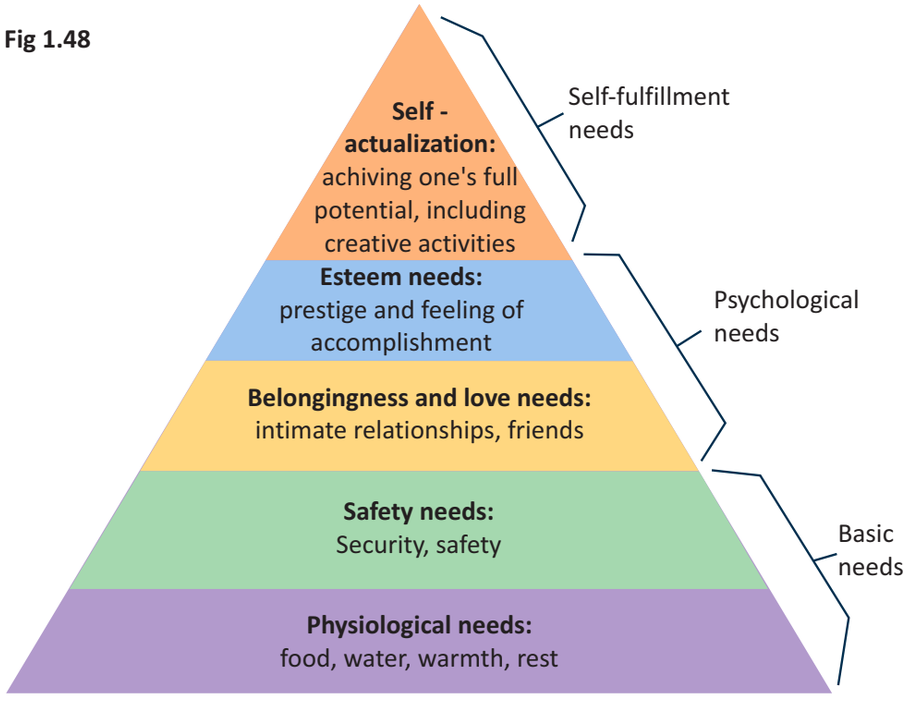
What is Motivation?

Very simply put, motivation is your reason for acting or behaving in a certain manner. It is important to understand that not everyone is motivated by the same desires – people are motivated by many, many different things. We can understand this better by looking at Maslow's Hierarchy of Needs.

Maslow's Hierarchy of Needs

Famous American psychologist Abraham Maslow wanted to understand what motivates people. He believed that people have five types of needs, ranging from very basic needs (called physiological needs) to more important needs that are required for self-growth (called self-actualization needs). Between the physiological and self-actualization needs are three other needs – safety needs, belongingness and love needs, and esteem needs. These needs are usually shown as a pyramid with five levels and are known as Maslow's Hierarchy of Needs.

Fig 1.48



As you can see from the pyramid, the lowest level depicts the most basic needs. Maslow believed that our behaviour is motivated by our basic needs, until those needs are met. Once they are fulfilled, we move to the next level and are motived by the next level of needs. Let's understand this better with an example.

Rupa comes from a very poor family. She never has enough food, water, warmth or rest. According to Maslow, until Rupa is sure that she will get these basic needs, she will not even think about the next level of needs – her safety needs. But, once Rupa is confident that her basic needs will be met, she will move to the next level, and her behaviour will then be motivated by her need for security and safety. Once these new needs are met, Rupa will once again move to the next level, and be motivated by her need for relationships and friends. Once this need is satisfied, Rupa will then focus on the fourth level of needs – her esteem needs, after which she will move up to the fifth and last level of needs – the desire to achieve her full potential.

Understanding Achievement Motivation

We now know that people are motivated by basic, psychological and self-fulfillment needs. However, certain people are also motivated by the achievement of highly challenging accomplishments. This is known as Achievement Motivation, or 'need for achievement'.

The level of motivation achievement in a person differs from individual to individual. It is important that entrepreneurs have a high level of achievement motivation – a deep desire to accomplish something important and unique. It is equally important that they hire people who are also highly motivated by challenges and success.

What Motivates You?

What are the things that really motivate you? List down five things that really motivate you.

Remember to answer honestly!

I am motivated by:

Characteristics of Entrepreneurs with Achievement Motivation

Entrepreneurs with achievement motivation can be described as follows:

- Unafraid to take risks for personal accomplishment
- Love being challenged
- Future-oriented
- Flexible and adaptive
- Value negative feedback more than positive feedback
- Very persistent when it comes to achieving goals
- Extremely courageous
- Highly creative and innovative
- Restless - constantly looking to achieve more
- Feel personally responsible for solving problems

Think about it:

- How many of these traits do you have?
- Can you think of entrepreneurs who display these traits?

How to Cultivate a Positive Attitude

The good news is attitude is a choice. So it is possible to improve, control and change our attitude, if we decide we want to! The following tips help foster a positive mindset:

- Remember that you control your attitude, not the other way around
- Devote at least 15 minutes a day towards reading, watching or listening to something positive
- Avoid negative people who only complain and stop complaining yourself
- Expand your vocabulary with positive words and delete negative phrases from your mind
- Be appreciative and focus on what's good in yourself, in your life, and in others
- Stop thinking of yourself as a victim and start being proactive
- Imagine yourself succeeding and achieving your goals

What is Attitude?

Now that we understand why motivation is so important for self-analysis, let's look at the role our attitude plays in better understanding ourselves. Attitude can be described as your tendency (positive or negative), to think and feel about someone or something. Attitude is the foundation for success in every aspect of life. Our attitude can be our best friend or our worst enemy. In other words:

"The only disability in life is a bad attitude."

When you start a business, you are sure to encounter a wide variety of emotions, from difficult times and failures to good times and successes. Your attitude is what will see you through the tough times and guide you towards success. Attitude is also infectious. It affects everyone around you, from your customers to your employees to your investors. A positive attitude helps build confidence in the workplace while a negative attitude is likely to result in the demotivation of your people.

What Are Your Strengths and Weaknesses?

Another way to analyze yourself is by honestly identifying your strengths and weaknesses. This will help you use your strengths to your best advantage and reduce your weaknesses.

Note down all your strengths and weaknesses in the two columns below. Remember to be honest with yourself!

Strengths	Weaknesses

Tips

- Achievement motivation can be learned.
- Don’t be afraid to make mistakes.
- Train yourself to finish what you start.
- Dream big.

9.1.4 Honesty & Work Ethics: What is Honesty?

Honesty is the quality of being fair and truthful. It means speaking and acting in a manner that inspires trust. A person who is described as honest is seen as truthful and sincere, and as someone who isn't deceitful or devious and doesn't steal or cheat. There are two dimensions of honesty – one is honesty in communication and the other is honesty in conduct.

Honesty is an extremely important trait because it results in peace of mind and builds relationships that are based on trust. Being dishonest, on the other hand, results in anxiety and leads to relationships full of distrust and conflict.

Qualities of Honest People

Honest individuals have certain distinct characteristics. Some common qualities among honest people are:

1. They don't worry about what others think of them. They believe in being themselves – they don't bother about whether they are liked or disliked for their personalities.
2. They stand up for their beliefs. They won't think twice about giving their honest opinion, even if they are aware that their point of view lies with the minority.
3. They are think skinned. This means they are not affected by others judging them harshly for their honest opinions.
4. They forge trusting, meaningful and healthy friendships. Honest people usually surround themselves with honest friends. They have faith that their friends will be truthful and upfront with them at all times.

They are trusted by their peers. They are seen as people who can be counted on for truthful and objective feedback and advice.

- Honesty and employees: When entrepreneurs build honest relationships with their employees, it leads to more transparency in the workplace, which results in higher work performance and better results.
- Honesty and investors: For entrepreneurs, being honest with investors means not only sharing strengths but also candidly disclosing current and potential weaknesses, problem areas and solution strategies. Keep in mind that investors have a lot of experience with startups and are aware that all new companies have problems. Claiming that everything is perfectly fine and running smoothly is a red flag for most investors.
- Honesty with oneself: The consequences of being dishonest with oneself can lead to dire results, especially in the case of entrepreneurs. For entrepreneurs to succeed, it is critical that they remain realistic about their situation at all times, and accurately judge every aspect of their enterprise for what it truly is.

Importance of Honesty in Entrepreneurs

One of the most important characteristics of entrepreneurs is honesty. When entrepreneurs are honest with their customers, employees and investors, it shows that they respect those that they work with. It is also important that entrepreneurs remain honest with themselves. Let's look at how being honest would lead to great benefits for entrepreneurs.

- Honesty and customers: When entrepreneurs are honest with their customers it leads to stronger relationships, which in turn results in business growth and a stronger customer network.

What are Work Ethics?

Being ethical in the workplace means displaying values like honesty, integrity and respect in all your decisions and communications. It means not displaying negative qualities like lying, cheating and stealing.

Workplace ethics play a big role in the profitability of a company. It is as crucial to an enterprise as high morale and teamwork. This is why most companies lay down specific workplace ethic guidelines that must compulsorily be followed by their employees. These guidelines are typically outlined in a company's employee handbook.

Elements of a Strong Work Ethic

An entrepreneur must display strong work ethics, as well as hire only those individuals who believe in and display the same level of ethical behavior in the workplace. Some elements of a strong work ethic are:

- **Professionalism**: This involves everything from how you present yourself in a corporate setting to the manner in which you treat others in the workplace.
- **Respectfulness**: This means remaining poised and diplomatic regardless of how stressful or volatile a situation is.
- **Dependability**: This means always keeping your word, whether it's arriving on time for a meeting or delivering work on time.
- **Dedication**: This means refusing to quit until the designated work is done, and completing the work at the highest possible level of excellence.
- **Determination**: This means embracing obstacles as challenges rather than letting them stop you, and pushing ahead with purpose and resilience to get the desired results.
- **Accountability**: This means taking responsibility for your actions and the consequences of your actions, and not making excuses for your mistakes.
- **Humility**: This means acknowledging everyone's efforts and had work, and sharing the credit for accomplishments.

How to Foster a Good Work Ethic

As an entrepreneur, it is important that you clearly define the kind of behaviour that you expect from each and every team member in the workplace. You should make it clear that you expect employees to display positive work ethics like:

- **Honesty**: All work assigned to a person should be done with complete honesty, without any deceit or lies.
- **Good attitude**: All team members should be optimistic, energetic, and positive.
- **Reliability**: Employees should show up where they are supposed to be, when they are supposed to be there.
- **Good work habits**: Employees should always be well groomed, never use inappropriate language, conduct themselves professionally at all times, etc.
- **Initiative**: Doing the bare minimum is not enough. Every team member needs to be proactive and show initiative.
- **Trustworthiness**: Trust is non-negotiable. If an employee cannot be trusted, it's time to let that employee go.

- **Respect**: Employees need to respect the company, the law, their work, their colleagues and themselves.
- **Integrity**: Each and every team member should be completely ethical and must display above board behaviour at all times.
- **Efficiency**: Efficient employees help a company grow while inefficient employees result in a waste of time and resources.

Tips

- Don't get angry when someone tells you the truth and you don't like what you hear.
- Always be willing to accept responsibility for your mistakes.

9.1.5 Creativity & Innovation : What is Creativity

Creativity means thinking outside the box. It means viewing things in new ways or from different perspectives, and then converting these ideas into reality. Creativity involves two parts: thinking and producing. Simply having an idea makes you imaginative, not creative. However, having an idea and acting on it makes you creative.

Characteristics of Highly Creative People

Some characteristics of creative people are:

- They are imaginative and playful
- They see issues from different angles
- They notice small details
- They have very little tolerance for boredom
- They detest rules and routine
- They love to daydream
- They are very curious

What is Innovation?

There are many different definitions of innovation. In simple terms, innovation means turning an idea into a solution that adds value. It can also mean adding value by implementing a new product, service or process, or significantly improving on an existing product, service or process.

Characteristics of Highly Innovative People

Some characteristics of highly innovative people are:

- They embrace doing things differently
- They don't believe in taking shortcuts
- They are not afraid to be unconventional
- They are highly proactive and persistent
- They are organized, cautious and risk-averse

Tips

- Take regular breaks from your creative work to recharge yourself and gain fresh perspective.
- Build prototypes frequently, test them out, get feedback, and make the required changes.

9.1.6 Time Management: What is Time Management?

Time management is the process organizing your time, and deciding how to allocate your time between different activities. Good time management is the difference between working smart (getting more done in less time) and working hard (working for more time to get more done).

Effective time management leads to an efficient work output, even when you are faced with tight deadlines and high pressure situations. On the other hand, not managing your time effectively results in inefficient output and increases stress and anxiety.

Benefits of Time Management

Time management can lead to huge benefits like:

- Greater productivity
- Better professional reputation
- Higher chances for career advancement
- Higher efficiency
- Reduced stress
- Greater opportUnities to achieve goals

Not managing time effectively can result in undesirable consequences like:

- Missing deadlines
- Substandard work quality
- Stalled career
- Inefficient work output
- Poor professional reputation
- Increase in stress and anxiety

Traits of Effective Time Managers

Some traits of effective time managers are:

- They begin projects early
- They set daily objectives
- They modify plans if required, to achieve better results
- They are flexible and open-minded
- They inform people in advance if their help will be required
- They know how to say no
- They break tasks into steps with specific deadlines
- They continually review long term goals
- They think of alternate solutions if and when required
- They ask for help when required
- They create backup plans

Effective Time Management Techniques

You can manage your time better by putting into practice certain time management techniques. Some helpful tips are:

- Plan out your day as well as plan for interruptions. Give yourself at least 30 minutes to figure out your time plan. In your plan, schedule some time for interruptions.
- Put up a “Do Not Disturb” sign when you absolutely have to complete a certain amount of work.
- Close your mind to all distractions. Train yourself to ignore ringing phones, don’t reply to chat messages and disconnect from social media sites.

- Delegate your work. This will not only help your work get done faster, but will also show you the unique skills and abilities of those around you.
- Stop procrastinating. Remind yourself that procrastination typically arises due to the fear of failure or the belief that you cannot do things as perfectly as you wish to do them.
- Prioritize. List each task to be completed in order of its urgency or importance level. Then focus on completing each task, one by one.
- Maintain a log of your work activities. Analyze the log to help you understand how efficient you are, and how much time is wasted every day.
  Create time management goals to reduce time wastage.

Tips

- Always complete the most important tasks first.
- Get at least 7 – 8 hours of sleep every day.
- Start your day early.
- Don't waste too much time on small, unimportant details.
- Set a time limit for every task that you will undertake.
- Give yourself some time to unwind between tasks.

9.1.7 Anger Management: What is Anger Management

Anger management is the process of:

1. Learning to recognize the signs that you, or someone else, is becoming angry
2. Taking the best course of action to calm down the situation in a positive way

Anger management does not mean suppressing anger.

Importance of Anger Management

Anger is a perfectly normal human emotion. In fact, when managed the right way, anger can be considered a healthy emotion. However, if it is not kept in check, anger can make us act inappropriately and can lead to us saying or doing things that we will likely later regret.
Extreme anger can:

- **Hurt you physically:** It leads to heart disease, diabetes, a weakened immune system, insomnia, and high blood pressure.
- **Hurt you mentally**: It can cloud your thinking and lead to stress, depression and mental health issues.
- **Hurt your career**: It can result in alienating your colleagues, bosses, clients and lead to the loss of respect.
- **Hurt your relationships**: It makes it hard for your family and friends to trust you, be honest with you and feel comfortable around you.
  This is why anger management, or managing anger appropriately, is so important.

Anger Management Strategies

Here are some strategies that can help you control your anger:

Strategy 1: Relaxation

Something as simple as breathing deeply and looking at relaxing images works wonders in calming down angry feelings. Try this simple breathing exercise:

1. Take a deep breath from your diaphragm (don't breathe from your chest)
2. Visualize your breath coming up from your stomach
3. Keep repeating a calming word like 'relax' or 'take it easy' (remember to keep breathing deeply while repeating the word)
4. Picture a relaxing moment (this can be from your memory or your imagination)

Follow this relaxation technique daily, especially when you realize that you're starting to feel angry.

Strategy 2: Cognitive Restructuring

Cognitive restructuring means changing the manner in which you think. Anger can make you curse, swear, exaggerate and act very dramatically. When this happens, force yourself to replace your angry thoughts with more logical ones. For instance, instead of thinking 'Everything is ruined' change your mindset and tell yourself 'It's not the end of the world and getting angry won't solve this'.

Strategy 3: Problem Solving

Getting angry about a problem that you cannot control is a perfectly natural response. Sometimes, try as you may, there may not be a solution to the difficulty you are faced with. In such cases, stop focusing on solving the problem, and instead focus on handling and facing the problem. Remind yourself that you will do your best to deal with the situation, but that you will not blame yourself if you don't get the solution you desire.

Strategy 4: Better Communication

When you're angry, it is very easy to jump to inaccurate conclusions. In this case, you need to force yourself to stop reacting, and think carefully about what you want to say, before saying it. Avoid saying the first thing that enters your head. Force yourself to listen carefully to what the other person is saying. Then think about the conversation before responding.

Strategy 5: Changing Your Environment

If you find that your environment is the cause of your anger, try and give yourself a break from your surroundings. Make an active decision to schedule some personal time for yourself, especially on days that are very hectic and stressful. Having even a brief amount of quiet or alone time is sure to help calm you down.

Tips for Anger Management

- The following tips will help you keep your anger in check:
- Take some time to collect your thoughts before you speak out in anger.
- Express the reason for your anger in an assertive, but non-confrontational manner once you have calmed down.
- Do some form of physical exercise like running or walking briskly when you feel yourself getting angry.
- Make short breaks part of your daily routine, especially during days that are stressful. Focus on how to solve a problem that's making you angry, rather than focusing on the fact that the problem is making you angry.

Tips

- Try to forgive those who anger you, rather than hold a grudge against them.
- Avoid using sarcasm and hurling insults. Instead, try and explain the reason for your frustration in a polite and mature manner.

9.1.8 Stress Management: What is Stress

We say we are 'stressed' when we feel overloaded and unsure of our ability to deal with the pressures placed on us. Anything that challenges or threatens our well-being can be defined as a stress. It is important to note that stress can be good and bad. While good stress keeps us going, negative stress undermines our mental and physical health. This is why it is so important to manage negative stress effectively.

Causes of Stress

Stress can be caused by internal and external factors.

Internal causes of stress

- Constant worry
- Rigid thinking
- Unrealistic expectations
- Pessimism
- Negative self-talk
- All in or all out attitude

External causes of stress

- Major life changes
- Difficulties with relationships
- Having too much to do
- Difficulties at work or in school
- Financial difficulties
- Worrying about one's children and/or family

Symptoms of Stress

Stress can manifest itself in numerous ways. Take a look at the cognitive, emotional, physical and behavioral symptoms of stress.

Cognitive Symptoms	Emotional Symptoms
• Memory problems	• Depression
• Concentration issues	• Agitation
• Lack of judgement	• Irritability
• Pessimism	• Loneliness
• Anxiety	• Anxiety
• Constant worrying	• Anger

Physical Symptoms	Behavioral Symptoms
• Aches and pain	• Increase or decrease in appetite
• Diarrhea or constipation	• Over sleeping or not sleeping enough
• Nausea	• Withdrawing socially
• Dizziness	• Ignoring responsibilities
• Chest pain and/or rapid heartbeat	• Consumption of alcohol or cigarettes
• Frequent cold or flu like feelings	• Nervous habits like nail biting, pacing etc.

Tips to Manage Stress

The following tips can help you manage your stress better:

- Note down the different ways in which you can handle the various sources of your stress.
- Remember that you cannot control everything, but you can control how you respond.
- Discuss your feelings, opinions and beliefs rather than reacting angrily, defensively or passively.
- Practice relaxation techniques like meditation, yoga or tai chi when you start feeling stressed.
- Devote a part of your day towards exercise.
- Eat healthy foods like fruits and vegetables. Avoid unhealthy foods especially those containing large amounts of sugar.
- Plan your day so that you can manage your time better, with less stress.
- Say no to people and things when required.
- Schedule time to pursue your hobbies and interests.
- Ensure you get at least 7-8 hours of sleep.
- Reduce your caffeine intake.
- Increase the time spent with family and friends.

Tips

- Force yourself to smile even if you feel stressed. Smiling makes us feel relaxed and happy.
- Stop yourself from feeling and thinking like a victim. Change your attiude and focus on being proactive.

Unit 9.2 Digital Literacy: A Recap

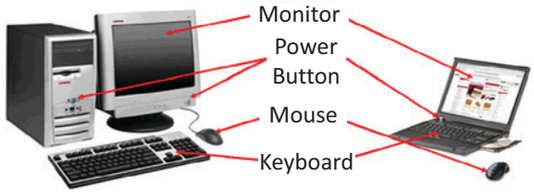
Unit Objectives

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

1. Identify the basic parts of a computer
2. Identify the basic parts of a keyboard
3. Recall basic computer terminology
4. Recall basic computer terminology
5. Recall the functions of basic computer keys
6. Discuss the main applications of MS Office
7. Discuss the benefits of Microsoft Outlook
8. Discuss the different types of e-commerce
9. List the benefits of e-commerce for retailers and customers
10. Discuss how the Digital India campaign will help boost e-commerce in India
11. Describe how you will sell a product or service on an e-commerce platform

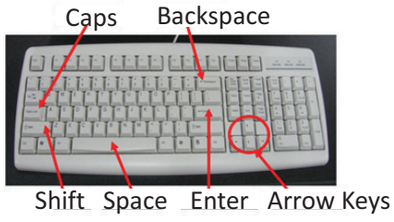
9.2.1 Computer and Internet basics: Basic Parts of a Computer

Fig 1.49



Basic Parts of a Keyboard

Fig 1.50



Basic Parts of a Computer

- **Central Processing Unit (CPU)**: The brain of the computer. It interprets and carries out program instructions.
- **Hard Drive**: A device that stores large amounts of data.
- **Monitor**: The device that contains the computer screen where the information is visually displayed.
- **Desktop**: The first screen displayed after the operating system loads.
- **Background**: The image that fills the background of the desktop.

Basic Parts of a Computer

- **Mouse**: A hand-held device used to point to items on the monitor.
- **Speakers**: Devices that enable you to hear sound from the computer.
- **Printer**: A device that converts output from a computer into printed paper documents.
- **Icon**: A small picture or image that visually represents something on your computer.
- **Cursor**: An arrow which indicates where you are positioned on the screen.
- **Program Menu**: A list of programs on your computer that can be accessed from the Start menu.
- **Taskbar**: The horizontal bar at the bottom of the computer screen that lists applications that are currently in use.
- **Recycle Bin**: A temporary storage for deleted files.

Basic Internet Terms

- **The Internet**: A vast, international collection of computer networks that transfers information.
- **The World Wide Web**: A system that lets you access information on the Internet.
- **Website**: A location on the World Wide Web (and Internet) that contains information about a specific topic.
- **Homepage**: Provides information about a website and directs you to other pages on that website.
- **Link/Hyperlink**: A highlighted or underlined icon, graphic, or text that takes you to another file or object.
- **Web Address/URL**: The address for a website.
- **Address Box**: A box in the browser window where you can type in a web address.

Basic Computer Keys

- **Arrow Keys**: Press these keys to move your cursor.
- **Space bar**: Adds a space.
- **Enter/Return**: Moves your cursor to a new line.
- **Shift**: Press this key if you want to type a capital letter or the upper symbol of a key.
- **Caps Lock**: Press this key if you want all the letters you type to be capital letters. Press it again to revert back to typing lowercase letters.
- **Backspace**: Deletes everything to the left of your cursor.

Tips

- When visiting a .com address, there no need to type http:// or even www. Just type the name of the website and then press Ctrl + Enter. (Example: Type 'apple' and press Ctrl + Enter to go to www.apple.com)
- Press the Ctrl key and press the + or - to increase and decrease the size of text.
- Press F5 or Ctrl + R to refresh or reload a web page.

9.2.2 MS Office and Email: About MS Office

MS Office or Microsoft Office is a suite of computer programs developed by Microsoft. Although meant for all users, it offers different versions that cater specifically to students, home users and business users. All the programs are compatible with both, Windows and Macintosh.

Most Popular Office Products

Some of the most popular and universally used MS Office applications are:

- **Microsoft Word**: Allows users to type text and add images to a document.
- **Microsoft Excel**: Allows users to enter data into a spreadsheet and create calculations and graphs.
- **Microsoft PowerPoint**: Allows users to add text, pictures and media and create slideshows and presentations.
- **Microsoft Outlook**: Allows users to send and receive email.
- **Microsoft OneNote**: Allows users to make drawings and notes with the feel of a pen on paper.
- **Microsoft Access**: Allows users to store data over many tables.

Why Choose Microsoft Outlook

A popular email management choice especially in the workplace, Microsoft Outlook also includes an address book, notebook, web browser and calendar. Some major benefits of this program are:

- **Integrated search function**: You can use keywords to search for data across all Outlook programs.
- **Enhanced security**: Your email is safe from hackers, junk mail and phishing website email.
- **Email syncing**: Sync your mail with your calendar, contact list, notes in One Note and…your phone!
- **Offline access to email**: No Internet? No problem! Write emails offline and send them when you're connected again.

Tips

- Press Ctrl+R as a shortcut method to reply to email.
- Set your desktop notifications only for very important emails.
- Flag messages quickly by selecting messages and hitting the Insert key.
- Save frequently sent emails as a template to reuse again and again.
- Conveniently save important emails as files.

9.2.3 E-Commerce: What is E-Commerce

E-commerce is the buying or selling of goods and services, or the transmitting of money or data, electronically on the internet. E-Commerce is the short form for "electronic commerce."

Examples of E-Commerce

Some examples of e-commerce are:

- Online shopping
- Online auctions
- Online ticketing
- Electronic payments
- Internet banking

Types of E-Commerce

E-commerce can be classified based on the types of participants in the transaction. The main types of e-commerce are:

- **Business to Business (B2B)**: Both the transacting parties are businesses.
- **Business to Consumer (B2C)**: Businesses sell electronically to end-consumers.
- **Consumer to Consumer (C2C):** Consumers come together to buy, sell or trade items to other consumers.
- **Consumer-to-Business (C2B)**: Consumers make products or services available for purchase to companies looking for exactly those services or products.
- **Business-to-Administration (B2A)**: Online transactions conducted between companies and public administration.
- **Consumer-to-Administration (C2A)**: Online transactions conducted between individuals and public administration.

Benefits of E-Commerce

The e-commerce business provides some benefits for retailers and customers.

Benefits for retailers:

- Establishes an online presence
- Reduces operational costs by removing overhead costs
- Increases brand awareness through the use of good keywords
- Increases sales by removing geographical and time constraints

Benefits for customers:

- Offers a wider range of choice than any physical store
- Enables goods and services to be purchased from remote locations
- Enables consumers to perform price comparisons

Digital India Campaign

Prime Minister Narendra Modi launched the Digital India campaign in 2015, with the objective of offering every citizen of India access to digital services, knowledge and information. The campaign aims to improve the country's online infrastructure and increase internet connectivity, thus boosting the e-commerce industry.

Currently, the majority of online transactions come from tier 2 and tier 3 cities. Once the Digital India campaign is in place, the government will deliver services through mobile connectivity, which will help deliver internet to remote corners of the country. This will help the e-commerce market to enter India's tier 4 towns and rural areas.

E-Commerce Activity

Choose a product or service that you want to sell online. Write a brief note explaining how you will use existing e-commerce platforms, or create a new e-commerce platform, to sell your product or service.

Tips

- Before launching your e-commerce platform, test everything.
- Pay close and personal attention to your social media.

Unit 9.3 Money Matters

Unit Objectives

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

1. Discuss the importance of saving money
2. Discuss the benefits of saving money
3. Discuss the main types of bank accounts
4. Describe the process of opening a bank account
5. Differentiate between fixed and variable costs
6. Describe the main types of investment options
7. Describe the different types of insurance products
8. Describe the different types of taxes
9. Discuss the uses of online banking
10. Discuss the main types of electronic funds transfers

9.3.1 Personal Finance – Why to Save: Importance of Saving

We all know that the future is unpredictable. You never know what will happen tomorrow, next week or next year. That's why saving money steadily through the years is so important. Saving money will help improve your financial situation over time. But more importantly, knowing that you have money stashed away for an emergency will give you peace of mind. Saving money also opens the door to many more options and possibilities.

Benefits of Saving

Inculcating the habit of saving leads to a vast number of benefits. Saving helps you:

- **Become financially independent**: When you have enough money saved up to feel secure you can start making your choices, from taking a vacation whenever you want, to switching careers or starting your own business.
- **Invest in yourself through education**: Through saving, you can earn enough to pay up for courses that will add to your professional experience and ultimately result in higher paying jobs.
- **Get out of debt**: Once you have saved enough as a reserve fund, you can use your savings to pay off debts like loans or bills that have accumulated over time.
- **Be prepared for surprise expenses** : Having money saved enables you to pay for unforeseen expenses like sudden car or house repairs, without feeling financially stressed.
- **Pay for emergencies**: Saving helps you deal with emergencies like sudden health issues or emergency trips without feeling financially burdened.

- **Afford large purchases and achieve major goals:** Saving diligently makes it possible to place down payments towards major purchases and goals, like buying a home or a car.
- **Retire**: The money you have saved over the years will keep you comfortable when you no longer have the income you would get from your job.

Tips

- Break your spending habit. Try not spending on one expensive item per week, and put the money that you would have spent into your savings.
- Decide that you will not buy anything on certain days or weeks and stick to your word.

9.3.2 Types of Bank Accounts, Opening a Bank Account: Types of Bank Accounts

In India, banks offer four main types of bank accounts. These are:

- Current Accounts
- Savings Accounts
- Recurring Deposit Accounts
- Fixed Deposit Accounts

Current Accounts

Current accounts offer the most liquid deposits and thus, are best suited for businessmen and companies. As these accounts are not meant for investments and savings, there is no imposed limit on the number or amount of transactions that can be made on any given day. Current account holders are not paid any interest on the amounts held in their accounts. They are charged for certain services offered on such accounts.

Savings Accounts

Savings accounts are meant to promote savings, and are therefore the number one choice for salaried individuals, pensioners and students. While there is no restriction on the number and amount of deposits made, there are usually restrictions on the number and amount of withdrawals. Savings account holders are paid interest on their savings.

Recurring Deposit Accounts

Recurring Deposit accounts, also called RD accounts, are the accounts of choice for those who want to save an amount every month, but are unable to invest a large sum at one time. Such account holders deposit a small, fixed amount every month for a pre-determined period (minimum 6 months). Defaulting on a monthly payment results in the account holder being charged a penalty amount. The total amount is repaid with interest at the end of the specified period.

Fixed Deposit Accounts

Fixed Deposit accounts, also called FD accounts, are ideal for those who wish to deposit their savings for a long term in return for a high rate of interest. The rate of interest offered depends on the amount deposited and the time period, and also differs from bank to bank. In the case of an FD, a certain amount of money is deposited by the account holder for a fixed period of time. The money can be withdrawn when the period expires. If necessary, the depositor can break the fixed deposit prematurely. However, this usually attracts a penalty amount which also differs from bank to bank.

Opening a Bank Account

Opening a bank account is quite a simple process. Take a look at the steps to open an account of your own:

Step 1: Fill in the Account Opening Form

This form requires you to provide the following information:

- Personal details (name, address, phone number, date of birth, gender, occupation, address)
- Method of receiving your account statement (hard copy/email)
- Details of your initial deposit (cash/cheque)
- Manner of operating your account (online/mobile banking/traditional via cheque, slip books)

Ensure that you sign wherever required on the form.

Step 2: Affix your Photograph

Stick a recent photograph of yourself in the allotted space on the form.

Step 3: Provide your Know Your Customer (KYC) Details

KYC is a process that helps banks verify the identity and address of their customers. To open an account, every individual needs to submit certain approved documents with respect to photo identity (ID) and address proof. Some Officially Valid Documents (OVDs) are:

- Passport
- Driving License
- Voters' Identity Card
- PAN Card
- UIDAI (Aadhaar) Card

Step 4: Submit All your Documents

Submit the completed Account Opening Form and KYC documents. Then wait until the forms are processed and your account has been opened!

Tips

- Select the right type of account.
- Fill in complete nomination details.
- Ask about fees.
- Understand the rules.
- Check for online banking – it's convenient!
- Keep an eye on your bank balance.

9.3.3 Costs: Fixed vs Variable: What are Fixed and Variable Costs

Fixed costs and variable costs together make up a company's total cost. These are the two types of costs that companies have to bear when producing goods and services.

A fixed cost does not change with the volume of goods or services a company produces. It always remains the same.

A variable cost, on the other hand, increases and decreases depending on the volume of goods and services produced. In other words, it varies with the amount produced.

Differences Between Fixed and Variable Costs

Let's take a look at some of the main differences between fixed and variable costs:

Criteria	Fixed Costs	Variable Costs
Meaning	A cost that stays the same, regardless of the output produced.	A cost that changes when the output changes.
Nature	Time related.	Volume related.
Incurred	Incurred irrespective of Units being produced.	Incurred only when Units are produced.
Unit cost	Inversely proportional to the number of Units produced.	Remains the same, per Unit.
Examples	Depreciation, rent, salary, insurance, tax etc.	Material consumed, wages, commission on sales, packing expenses, etc.

Tips

- When trying to determine whether a cost is fixed or variable, simply ask the following question: Will the particular cost change if the company stopped its production activities? If the answer is no, then it is a fixed cost. If the answer is yes, then it is probably a variable cost

9.3.4 Investment, Insurance and Taxes:

Investment

Investment means that money is spent today with the aim of reaping financial gains at a future time. The main types of investment options are as follows:

- **Bonds:** Bonds are instruments used by public and private companies to raise large sums of money – too large to be borrowed from a bank. These bonds are then issued in the public market and are bought by lenders.
- **Stocks:** Stocks or equity are shares that are issued by companies and are bought by the general public.
- **Small Savings Schemes:** Small Savings Schemes are tools meant to save money in small amounts. Some popular schemes are the Employees Provident Fund, Sukanya Samriddhi Scheme and National Pension Scheme.
- **Mutual Funds:** Mutual Funds are professionally managed financial instruments that invest money in different securities on behalf of investors.
- **Fixed Deposits:** A fixed amount of money is kept aside with a financial institution for a fixed amount of time in return for interest on the money.
- **Real Estate:** Loans are taken from banks to purchase real estate, which is then leased or sold with the aim of making a profit on the appreciated property price.
- **Hedge Funds:** Hedge funds invest in both financial derivatives and/or publicly traded securities.
- **Private Equity:** Private Equity is trading in the shares of an operating company that is not publicly listed and whose shares are not available on the stock market.
- **Venture Capital:** Venture Capital involves investing substantial capital in a budding company in return for stocks in that company.

Insurance

There are two types of insurance – Life Insurance and Non-Life or General Insurance.

Life Insurance

Life Insurance deals with all insurance covering human life.

Life Insurance Products

The main life insurance products are:

- **Term Insurance:** This is the simplest and cheapest form of insurance. It offers financial protection for a specified tenure, say 15 to 20 years. In the case of your death, your family is paid the sum assured. In the case of your surviving the term, the insurer pays nothing.
- **Endowment Policy:** This offers the dual benefit of insurance and investment. Part of the premium is allocated towards the sum assured, while the remaining premium gets invested in equity and debt. It pays a lump sum amount after the specified duration or on the death of the policyholder, whichever is earlier.
- **Unit-Linked Insurance Plan (ULIP):** Here part of the premium is spent on the life cover, while the remaining amount is invested in equity and debt. It helps develop a regular saving habit.

- **Money Back Life Insurance:**While the policyholder is alive, periodic payments of the partial survival benefits are made during the policy tenure. On the death of the insured, the insurance company pays the full sum assured along with survival benefits.
- **Whole Life Insurance:** It offers the dual benefit of insurance and investment. It offers insurance cover for the whole life of the person or up to 100 years whichever is earlier.

General Insurance

General Insurance deals with all insurance covering assets like animals, agricultural crops, goods, factories, cars and so on.

General Insurance Products

The main general insurance products are:

- **Motor Insurance:** This can be divided into Four Wheeler Insurance and Two Wheeler Insurance.
- **Health Insurance:** The main types of health insurance are individual health insurance, family floater health insurance, comprehensive health insurance and critical illness insurance.
- **Travel Insurance:** This can be categorised into Individual Travel Policy, Family Travel Policy, Student Travel Insurance and Senior Citizen Health Insurance.
- **Home Insurance:** This protects the house and its contents from risk.
- **Marine Insurance:** This insurance covers goods, freight, cargo etc. against loss or damage during transit by rail, road, sea and/or air.

Taxes

There are two types of taxes – Direct Taxes and Indirect Taxes.

Direct Tax

Direct taxes are levied directly on an entity or a person and are non-transferrable.

Some examples of Direct Taxes are:

- **Income Tax:** This tax is levied on your earning in a financial year. It is applicable to both, individuals and companies.
- **Capital Gains Tax:** This tax is payable whenever you receive a sizable amount of money. It is usually of two types – short term capital gains from investments held for less than 36 months and long term capital gains from investments held for longer than 36 months.
- **Securities Transaction Tax:** This tax is added to the price of a share. It is levied every time you buy or sell shares.
- **Perquisite Tax:** This tax is levied is on perks that have been acquired by a company or used by an employee.
- **Corporate Tax:** Corporate tax is paid by companies from the revenue they earn.

Indirect Tax

Indirect taxes are levied on goods or services.

Some examples of Indirect Taxes are:

- **Sales Tax:** Sales Tax is levied on the sale of a product.

- **Service Tax:** Service Tax is added to services provided in India.
- **Value Added Tax:** Value Added Tax is levied at the discretion of the state government. The tax is levied on goods sold in the state. The tax amount is decided by the state.
- **Customs Duty & Octroi:** Customs Duty is a charge that is applied on purchases that are imported from another country. Octroi is levied on goods that cross state borders within India.
- **Excise Duty:** Excise Duty is levied on all goods manufactured or produced in India.

Tips

- Think about how quickly you need your money back and pick an investment option accordingly.
- Ensure that you are buying the right type of insurance policy for yourself.
- Remember, not paying taxes can result in penalties ranging from fines to imprisonment.

9.3.5 Online Banking, NEFT, RTGS etc.: What is Online Banking

Internet or online banking allows account holders to access their account from a laptop at any location. In this way, instructions can be issued. To access an account, account holders simply need to use their unique customer ID number and password.

Internet banking can be used to:

- Find out an account balance
- Transfer amounts from one account to another
- Arrange for the issuance of cheques
- Instruct payments to be made
- Request for a cheque book
- Request for a statement of accounts
- Make a fixed deposit

Electronic Funds Transfers

Electronic funds transfer is a convenient way of transferring money from the comfort of one's own home, using integrated banking tools like internet and mobile banking.

Transferring funds via an electronic gateway is extremely convenient. With the help of online banking, you can choose to:

- Transfer funds into your own accounts of the same bank.
- Transfer funds into different accounts of the same bank.
- Transfer funds into accounts in different banks, using NEFT.
- Transfer funds into other bank accounts using RTGS.
- Transfer funds into various accounts using IMPS.

NEFT

NEFT stands for National Electronic Funds Transfer. This money transfer system allows you to electronically transfer funds from your respective bank accounts to any other account, either in the same bank or belonging to any other bank. NEFT can be used by individuals, firms and corporate organizations to transfer funds between accounts.

In order to transfer funds via NEFT, two things are required:

- A transferring bank
- A destination bank

Before you can transfer funds through NEFT, you will need to register the beneficiary who will be receiving the funds. In order to complete this registration, you will require the following information:

- Recipient's name
- Recipient's account number
- Recipient's bank's name
- Recipient's bank's IFSC code

RTGS

RTGS stands for Real Time Gross Settlement. This is a real time funds transfer system which enables you to transfer funds from one bank to another, in real time or on a gross basis. The transferred amount is immediately deducted from the account of one bank, and instantly credited to the other bank's account. The RTGS payment gateway is maintained by the Reserve Bank of India. The transactions between banks are made electronically.

RTGS can be used by individuals, companies and firms to transfer large sums of money. Before remitting funds through RTGS, you will need to add the beneficiary and his bank account details via your online banking account. In order to complete this registration, you will require the following information:

- Name of the beneficiary
- Beneficiary's account number
- Beneficiary's bank address
- Beneficiary's bank's IFSC code

IMPS

IMPS stands for Immediate Payment Service. This is a real-time, inter-bank, electronic funds transfer system used to transfer money instantly within banks across India. IMPS enables users to make instant electronic transfer payments using mobile phones through both, Mobile Banking and SMS. It can also be used through ATMs and online banking. IMPS is available 24 hours a day and 7 days a week. The system features a secure transfer gateway and immediately confirms orders that have been fulfilled.

To transfer money through IMPS, the you need to:

- Register for IMPS with your bank
- Receive a Mobile Money Identifier (MMID) from the bank
- Receive a MPIN from the bank

Once you have both these, you can login or make a request through SMS to transfer a particular amount to a beneficiary.

For the beneficiary to receive the transferred money, he must:

1. Link his mobile number with his respective account
2. Receive the MMID from the bank

In order to initiate a money transfer through IMPS, you will need to enter the following information:

1. The beneficiary's mobile number
2. The beneficiary's MMID
3. The transfer amount
4. Your MPIN

As soon as money has been deducted from your account and credited into the beneficiary's account, you will be sent a confirmation SMS with a transaction reference number, for future reference.

Differences Between NEFT, RTGS & IMPS

Table 1.28

Criteria	NEFT	RTGS	IMPS
Settlement	Done in batches	Real-time	Real-time
Full form	National Electronic Fund Transfer	Real Time Gross Settlement	Immediate Payment Service
Timings on Monday – Friday	8:00 am – 6:30 pm	9:00 am – 4:30 pm	24x7
Timings on Saturday	8:00 am – 1:00 pm	9:00 am – 1:30 pm	24x7
Minimum amount of money transfer limit	₹1	₹2 lacs	₹1
Maximum amount of money transfer limit	₹10 lacs	₹10 lacs per day	₹2 lacs
Maximum charges as per RBI	Upto 10,000 – ₹2.5 above 10,000 – 1 lac – ₹5 above 1 – 2 lacs – ₹15 above 2 – 5 lacs – ₹25 above 5 – 10 lacs – ₹25	above 2 – 5 lacs – ₹25 above 5 – 10 lacs – ₹50	Upto 10,000 – ₹5 above 10,000 – 1 lac – ₹5 above 1 – 2 lacs – ₹15

Tips

- Never click on any links in any e-mail message to access your online banking website.
- You will never be asked for your credit or debit card details while using online banking.
- Change your online banking password regularly.

Unit 9.4 Preparing for Employment & Self Employment

Unit Objectives

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

1. Discuss the steps to prepare for an interview
2. Discuss the steps to create an effective Resume
3. Discuss the most frequently asked interview questions
4. Discuss how to answer the most frequently asked interview questions
5. Discuss basic workplace terminology

9.4.1 Interview Preparation: How to Prepare for an Interview

The success of your getting the job that you want depends largely on how well your interview for that job goes. Therefore, before you go in for your interview, it is important that you prepare for it with a fair amount of research and planning. Take a look at the steps to follow in order to be well prepared for an interview:

1. **Research the organization that you are having the interview with.**
   - Studying the company beforehand will help you be more prepared at the time of the interview. Your knowledge of the organization will help you answer questions at the time of the interview, and will leave you looking and feeling more confident. This is sure to make you stand out from other, not as well informed, candidates.
   - Look for background information on the company. Ty and find an overview of the company and its industry profile.
   - Visit the company website to get a good idea of what the company does. A company website offers a wealth of important information. Read and understand the company's mission statement. Pay attention to the company's products/services and client list. Read through any press releases to get an idea of the company's projected growth and stability.
   - Note down any questions that you have after your research has been completed.
2. **Think about whether your skills and qualifications match the job requirements.**
   - Carefully read through and analyze the job description.
   - Make a note of the knowledge, skills and abilities required to fulfill the job requirements.
   - Take a look at the organization hierarchy. Figure out where the position you are applying for fits into this hierarchy.
3. **Go through the most typical interview questions asked, and prepare your responses.**
   - Remember, in most interviews a mix of resume-based, behavioral and case study questions are asked.
   - Think about the kind of answers you would like to provide to typical questions asked in these three areas.
   - Practice these answers until you can express them confidently and clearly.

4. **Plan your attire for the interview.**
   - It is always safest to opt for formal business attire, unless expressly informed to dress in business casual (in which case you should use your best judgement).
   - Ensure that your clothes are clean and well-ironed. Pick neutral colours – nothing too bright or flashy.
   - The shoes you wear should match your clothes, and should be clean and suitable for an interview.
   - Remember, your aim is to leave everyone you meet with the impression that you are a professional and highly efficient person.
5. **Ensure that you have packed everything that you may require during the interview.**
   - Carry a few copies of your resume. Use a good quality paper for your resume print outs.
   - Always take along a notepad and a pen.
   - Take along any information you may need to refer to, in order to fill out an application form.
   - Carry a few samples of your work, if relevant.
6. **Remember the importance of non-verbal communication.**
   - Practice projecting confidence. Remind yourself to smile and make eye contact. Practice giving a firm handshake.
   - Keep in mind the importance of posture. Practice sitting up straight. Train yourself to stop nervous gestures like fidgeting and foot-tapping.
   - Practice keeping your reactions in check. Remember, your facial expressions provide a good insight into your true feelings. Practice projecting a positive image.
7. **Make a list of questions to end the interview with.**
   - Most interviews will end with the interviewer(s) asking if you have any questions. This is your chance to show that you have done your research and are interested in learning more about the company.
   - If the interviewer does not ask you this question, you can inform him/her that you have some queries that you would like to discuss. This is the time for you to refer to the notes you made while studying the company.
   - Some good questions to ask at this point are:
     - What do you consider the most important criteria for success in this job?
     - How will my performance be evaluated?
     - What are the opportUnities for advancement?
     - What are the next steps in the hiring process?
   - Remember, never ask for information that is easily available on the company website.

Tips

- Ask insightful and probing questions.
- When communicating, use effective forms of body language like smiling, making eye contact, and actively listening and nodding. Don't slouch, play with nearby items, fidget, chew gum, or mumble.

9.4.2 Preparing an Effective Resume: How to Create an Effective Resume

A resume is a formal document that lists a candidate's work experience, education and skills. A good resume gives a potential employer enough information to believe the applicant is worth interviewing. That's why it is so important to create a résumé that is effective. Take a look at the steps to create an effective resume:

Step 1: Write the Address Section

The Address section occupies the top of your resume. It includes information like your name, address, phone number and e-mail address. Insert a bold line under the section to separate it from rest of your resume.

Example:

Jasmine Watts
Breach Candy, Mumbai – India
Contact No: +91 2223678270
Email: jasmine.watts@gmail.com

Step 2: Add the Profile Summary Section

This part of your resume should list your overall experiences, achievements, awards, certifications and strengths. You can make your summary as short as 2-3 bullet points or as long as 8-10 bullet points.

Example:

Profile Summary

- A Content Writer graduated from University of Strathclyde having 6 years of experience in writing website copy.
- Core expertise lies in content creation for e-learning courses, specifically for the K-12 segment.

Step 3: Include Your Educational Qualifications

When listing your academic records, first list your highest degree. Then add the second highest qualification under the highest one and so on. To provide a clear and accurate picture of your educational background, it is critical that include information on your position, rank, percentage or CPI for every degree or certification that you have listed.

If you have done any certifications and trainings, you can add a Trainings & Certifications section under your Educational Qualifications section.

Example:

Educational Qualifications

- Masters in International Management (2007) from Columbia University with 8.8 CPI.
- Bachelor of Management Studies (2004) from Mumbai University with 87% marks.
- 10+2 with Math, Stats (2001) from Maharashtra Board with 91% marks.
- High School (1999) from Maharashtra Board with 93% marks.

Step 4: List Your Technical Skills

When listing your technical skills, start with the skills that you are most confident about. Then add the skills that you do not have as good a command over. It is perfectly acceptable to include just one skill, if you feel that particular skill adds tremendous value to your résumé. If you do not have any technical skills, you can omit this step.

Example:

Technical Skills

- Flash
- Photoshop

Step 5: Insert Your Academic Project Experience

List down all the important projects that you have worked on. Include the following information in this section:

- Project title
- Organization
- Platform used
- Contribution
- Description

Example:

Academic Projects

Project Title: Different Communication Skills

Organization: True Blue Solutions

Platform used: Articulate

Contribution: Content writing and graphic visualization

Description: Development of storyboards for corporate induction & training programs

Step 6: List Your Strengths

This is where you list all your major strengths. This section should be in the form of a bulleted list.

Example:

Strengths

- Excellent oral, written and presentation skills
- Action-oriented and result-focused
- Great time management skills

Step 7: List Your Extracurricular Activities

It is very important to show that you have diverse interests and that your life consists of more than academics. Including your extracurricular activities can give you an added edge over other candidates who have similar academic scores and project experiences. This section should be in the form of a bulleted list.

Example:

Extracurricular Activities

- Member of the Debate Club
- Played tennis at a national level
- Won first prize in the All India Camel Contest, 2010

Step 8: Write Your Personal Details

The last section of your résumé must include the following personal information:

- Date of birth
- Nationality
- Gender & marital status
- Languages known

Example:

Personal Details

- Date of birth: 25th May, 1981
- Gender & marital status: Female, Single
- Nationality: Indian
- Languages known: English, Hindi, Tamil, French

Tips

- Keep your resume file name short, simple and informational.
- Make sure the resume is neat and free from typing errors.
- Always create your resume on plain white paper.

9.4.3 Interview FAQs

Take a look at some of the most frequently asked interview questions, and some helpful tips on how to answer them.

Q1. Can you tell me a little about yourself?

Tips to answer:

- Don't provide your full employment or personal history.
- Offer 2-3 specific experiences that you feel are most valuable and relevant.
- Conclude with how those experiences have made you perfect for this specific role.

Q2. How did you hear about the position?

Tips to answer:

- Tell the interviewer how you heard about the job – whether it was through a friend (name the friend), event or article (name them) or a job portal (say which one).
- Explain what excites you about the position and what in particular caught your eye about this role.

Q3. What do you know about the company?

Tips to answer:

- Don't recite the company's About Us page.
- Show that you understand and care about the company's goals.
- Explain why you believe in the company's mission and values.

Q4. Why do you want this job?

Tips to answer:

- Show that you are passionate about the job.
- Identify why the role is a great fit for you.
- Explain why you love the company.

Q5. Why should we hire you?

Tips to answer:

- Prove through your words that you can not only do the work, but can definitely deliver excellent results.
- Explain why you would be a great fit with the team and work culture.
- Explain why you should be chosen over any other candidate.

Q6. What are your greatest professional strengths?

Tips to answer:

- Be honest – share some of your real strengths, rather than give answers that you think sound good.
- Offer examples of specific strengths that are relevant to the position you are applying for.
- Provide examples of how you've demonstrated these strengths.

Q7. What do you consider to be your weaknesses?

Tips to answer:

- The purpose of this question is to gauge your self-awareness and honesty.

Q8. What are your salary requirements?

Tips to answer:

- Do your research beforehand and find out the typical salary range for the job you are applying for.
- Figure out where you lie on the pay scale based on your experience, education, and skills.
- Be flexible. Tell the interviewer that you know your skills are valuable, but that you want the job and are willing to negotiate.

Q9. What do you like to do outside of work?

Tips to answer:

- The purpose of this question is to see if you will fit in with the company culture.
- Be honest – open up and share activities and hobbies that interest and excite you.

Q10. If you were an animal, which one would you want to be?

Tips to answer:

- The purpose of this question is to see if you are able to think on your feet.
- There's no wrong answer – but to make a great impression try to bring out your strengths or personality traits through your answer.

Q11: What do you think we could do better or differently?

Tips to answer:

- The purpose of this question is to see if you have done your research on the company, and to test whether you can think critically and come up with new ideas.
- Suggest new ideas. Show how your interests and expertise would help you execute these ideas.

Q12: Do you have any questions for us?

Tips to answer:

- Do not ask questions to which the answers can be easily found on the company website or through a quick online search.
- Ask intelligent questions that show your ability to think critically.

Tips

- Be honest and confident while answering.
- Use examples of your past experiences wherever possible to make your answers more impactful.

9.4.4 Work Readiness – Terms & Terminologies: Basic Workplace Terminology

Every employee should be well versed in the following terms:

- **Annual leave:** Paid vacation leave given by employers to employees.
- **Background Check:** A method used by employers to verify the accuracy of the information provided by potential candidates.
- **Benefits:** A part of an employee's compensation package.
- **Breaks:** Short periods of rest taken by employees during working hours.
- **Compensation Package:** The combination of salary and benefits that an employer provides to his/her employees.
- **Compensatory Time (Comp Time):** Time off in lieu of pay.
- **Contract Employee:** An employee who works for one organization that sells said employee's services to another company, either on a project or time basis.
- **Contract of Employment:** When an employee is offered work in exchange for wages or salary, and accepts the offer made by the employer, a contract of employment exists.
- **Corporate Culture:** The beliefs and values shared by all the members of a company, and imparted from one generation of employees to another.
- **Counter Offer/Counter Proposal:** A negotiation technique used by potential candidates to increase the amount of salary offered by a company.
- **Cover Letter:** A letter that accompanies a candidate's resume. It emphasizes the important points in the candidate's resume and provides real examples that prove the candidate's ability to perform the expected job role.
- **Curriculum Vitae (CV)/Resume:** A summary of a candidate's achievements, educational background, work experience, skills and strengths.
- **Declining Letter:** A letter sent by an employee to an employer, turning down the job offer made by the employer to the employee.
- **Deductions:** Amounts subtracted from an employee's pay and listed on the employee's pay slip.
- **Discrimination:** The act of treating one person not as favourably as another person.
- **Employee:** A person who works for another person in exchange for payment.
- **Employee Training:** A workshop or in-house training that an employee is asked to attend by his or her superior, for the benefit of the employer.
- **Employment Gaps:** Periods of unemployed time between jobs.
- **Fixed-Term Contract:** A contract of employment which gets terminated on an agreed-upon date.
- **Follow-Up:** The act of contacting a potential employer after a candidate has submitted his or her resume.
- **Freelancer/Consultant/Independent Contractor:** A person who works for him or herself and pitches for temporary jobs and projects with different employers.
- **Holiday**: Paid time-off from work.
- **Hourly Rate**: The amount of salary or wages paid for 60 minutes of work.

- **Internship**: A job opportUnity offered by an employer to a potential employee, called an intern, to work at the employer's company for a fixed, limited time period.
- **Interview**: A conversation between a potential employee and a representative of an employer, in order to determine if the potential employee should be hired.
- **Job Application**: A form which asks for a candidate's information like the candidate's name, address, contact details and work experience. The purpose of a candidate submitting a job application, is to show that candidate's interest in working for a particular company.
- **Job Offer**: An offer of employment made by an employer to a potential employee.
- **Job Search Agent**: A program that enables candidates to search for employment opportUnities by selecting criteria listed in the program, for job vacancies.
- **Lay Off**: A lay off occurs when an employee is temporarily let go from his or her job, due to the employer not having any work for that employee.
- **Leave**: Formal permission given to an employee, by his or her employer, to take a leave of absence from work.
- **Letter of Acceptance**: A letter given by an employer to an employee, confirming the offer of employment made by the employer, as well as the conditions of the offer.
- **Letter of Agreement**: A letter that outlines the terms of employment.
- **Letter of Recommendation**: A letter written for the purpose of validating the work skills of a person.
- **Maternity Leave**: Leave taken from work by women who are pregnant, or who have just given birth.
- **Mentor**: A person who is employed at a higher level than you, who offers you advice and guides you in your career.
- **Minimum wage**: The minimum wage amount paid on an hourly basis.
- **Notice**: An announcement made by an employee or an employer, stating that the employment contract will end on a particular date.
- **Offer of Employment**: An offer made by an employer to a prospective employee that contains important information pertaining to the job being offered, like the starting date, salary, working conditions etc.
- **Open-Ended Contract**: A contract of employment that continues till the employer or employee terminates it.
- **Overqualified**: A person who is not suited for a particular job because he or she has too many years of work experience, or a level of education that is much higher than required for the job, or is currently or was previously too highly paid.
- **Part-Time Worker**: An employee who works for fewer hours than the standard number of hours normally worked.
- **Paternity Leave**: Leave granted to a man who has recently become a father.
- **Recruiters/Headhunters/Executive Search Firms**: Professionals who are paid by employers to search for people to fill particular positions.
- **Resigning/Resignations**: When an employee formally informs his or her employer that he or she is quitting his or her job.
- **Self-Employed**: A person who has his or her own business and does not work in the capacity of an employee.
- **Time Sheet**: A form that is submitted to an employer, by an employee, that contains the number of hours worked every day by the employee.

Unit 9.5 Understanding Entrepreneurship

Unit Objectives

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

Discuss the concept of entrepreneurship
Discuss the importance of entrepreneurship
Describe the characteristics of an entrepreneur
Describe the different types of enterprises
List the qualities of an effective leader
Discuss the benefits of effective leadership
List the traits of an effective team
Discuss the importance of listening effectively
Discuss how to listen effectively
Discuss the importance of speaking effectively
Discuss how to speak effectively
Discuss how to solve problems
List important problem solving traits
Discuss ways to assess problem solving skills
Discuss the importance of negotiation
Discuss how to negotiate
Discuss how to identify new business opportUnities
Discuss how to identify business opportUnities within your business
Understand the meaning of entrepreneur
Describe the different types of entrepreneurs
List the characteristics of entrepreneurs
Recall entrepreneur success stories
Discuss the entrepreneurial process
Describe the entrepreneurship ecosystem
Discuss the government's role in the entrepreneurship ecosystem
Discuss the current entrepreneurship ecosystem in India
Understand the purpose of the Make in India campaign
Discuss the relationship between entrepreneurship and risk appetite
Discuss the relationship between entrepreneurship and resilience
Describe the characteristics of a resilient entrepreneur
Discuss how to deal with failure

9.5.1 Concept Introduction, (Characteristic of an Entrepreneur, types of firms / types of enterprises): Entrepreneurs and Entrepreneurship

Anyone who is determined to start a business, no matter what the risk, is an entrepreneur. Entrepreneurs run their own start-up, take responsibility for the financial risks and use creativity, innovation and vast reserves of self-motivation to achieve success. They dream big and are determined to do whatever it takes to turn their idea into a viable offering. The aim of an entrepreneur is to create an enterprise. The process of creating this enterprise is known as entrepreneurship.

Importance of Entrepreneurship

Entrepreneurship is very important for the following reasons:

1. It results in the creation of new organizations
2. It brings creativity into the marketplace
3. It leads to improved standards of living
4. It helps develop the economy of a country

Characteristics of Entrepreneurs

All successful entrepreneurs have certain characteristics in common.

They are all:

- Extremely passionate about their work
- Confident in themselves
- Disciplined and dedicated
- Motivated and driven
- Highly creative
- Visionaries
- Open-minded
- Decisive

Entrepreneurs also have a tendency to:

- Have a high risk tolerance
- Thoroughly plan everything
- Manage their money wisely
- Make their customers their priority
- Understand their offering and their market in detail
- Ask for advice from experts when required
- Know when to cut their losses

Examples of Famous Entrepreneurs

Some famous entrepreneurs are:

- Bill Gates (Founder of Microsoft)
- Steve Jobs (Co-founder of Apple)
- Mark Zuckerberg (Founder of Facebook)
- Pierre Omidyar (Founder of eBay)

Types of Enterprises

As an entrepreneur in India, you can own and run any of the following types of enterprises:

Sole Proprietorship

In a sole proprietorship, a single individual owns, manages and controls the enterprise. This type of business is the easiest to form with respect to legal formalities. The business and the owner have no separate legal existence. All profit belongs to the proprietor, as do all the losses - the liability of the entrepreneur is unlimited.

Partnership

A partnership firm is formed by two or more people. The owners of the enterprise are called partners. A partnership deed must be signed by all the partners. The firm and its partners have no separate legal existence. The profits are shared by the partners. With respect to losses, the liability of the partners is unlimited. A firm has a limited life span and must be dissolved when any one of the partners dies, retires, claims bankruptcy or goes insane.

Limited Liability Partnership (LLP)

In a Limited Liability Partnership or LLP, the partners of the firm enjoy perpetual existence as well as the advantage of limited liability. Each partner's liability is limited to their agreed contribution to the LLP. The partnership and its partners have a separate legal existence.

Tips

- Learn from others' failures.
- Be certain that this is what you want.
- Search for a problem to solve, rather than look for a problem to attach to your idea.

9.5.2 Leadership & Teamwork: Leadership and Leaders

Leadership means se翩 ng an example for others to follow. Se翩 ng a good example means not asking someone to do something that you wouldn't willingly want to do yourself. Leadership is about figuring out what to do in order to win as a team, and as a company.

Leaders believe in doing the right things. They also believe in helping others to do the right things. An effective leader is someone who:

- Creates an inspiring vision of the future.
- Motivates and inspires his team to pursue that vision.

Leadership Qualities That All Entrepreneurs Need

Building a successful enterprise is only possible if the entrepreneur in charge possesses excellent leadership qualities. Some critical leadership skills that every entrepreneur must have are:

1. **Pragmatism**: This means having the ability to highlight all obstacles and challenges, in order to resolve issues and reduce risks.
2. **Humility**: This means admi翩 ng to mistakes often and early, and being quick to take responsibility for your actions. Mistakes should be viewed as challenges to overcome, not opportUnities to point blame.
3. **Flexibility**: It is critical for a good leader to be very flexible and quickly adapt to change. It is equally critical to know when to adapt and when not to.
4. **Authenticity**: This means showing both, your strengths and your weaknesses. It means being human and showing others that you are human.
5. **Reinvention**: This means refreshing or changing your leadership style when necessary. To do this, it's important to learn where your leadership gaps lie and find out what resources are required to close them.
6. **Awareness**: This means taking the time to recognize how others view you. It means understanding how your presence affects those around you.

Benefits of Effective Leadership

Effective leadership results in numerous benefits. Great leadership leads to the leader successfully:

- Gaining the loyalty and commitment of the team members
- Motivating the team to work towards achieving the company's goals and objectives
- Building morale and instilling confidence in the team members
- Fostering mutual understanding and team-spirit among team members
- Convincing team members about the need to change when a situation requires adaptability

Teamwork and Teams

Teamwork occurs when the people in a workplace combine their individual skills to pursue a common goal. Effective teams are made up of individuals who work together to achieve this common goal. A great team is one who holds themselves accountable for the end result.

Importance of Teamwork in Entrepreneurial Success

For an entrepreneurial leader, building an effective team is critical to the success of a venture. An entrepreneur must ensure that the team he builds possesses certain crucial qualities, traits and characteristics. An effective team is one which has:

1. **Unity of purpose:** All the team members should clearly understand and be equally committed to the purpose, vision and goals of the team.
2. **Great communication skills:** Team members should have the ability to express their concerns, ask questions and use diagrams, and charts to convey complex information.
3. **The ability to collaborate:** Every member should feel entitled to provide regular feedback on new ideas.
4. **Initiative:** The team should consist of proactive individuals. The members should have the enthusiasm to come up with new ideas, improve existing ideas, and conduct their own research.
5. **Visionary members:** The team should have the ability to anticipate problems and act on these potential problem before they turn into real problems.
6. **Great adaptability skills:** The team must believe that change is a positive force. Change should be seen as the chance to improve and try new things.
7. **Excellent organizational skills:** The team should have the ability to develop standard work processes, balance responsibilities, properly plan projects, and set in place methods to measure progress and ROI.

Tips

- Don't get too attached to your original idea. Allow it to evolve and change.
- Be aware of your weaknesses and build a team that will complement your shortfalls.
- Hiring the right people is not enough. You need to promote or incentivize your most talented people to keep them motivated.
- Earn your team's respect.

9.5.3 Communication Skills: Listening & Speaking: The Importance of Listening Effectively

Listening is the ability to correctly receive and understand messages during the process of communication. Listening is critical for effective communication. Without effective listening skills, messages can easily be misunderstood. This results in a communication breakdown and can lead to the sender and the receiver of the message becoming frustrated or irritated.

It's very important to note that listening is not the same as hearing. Hearing just refers to sounds that you hear. Listening is a whole lot more than that. To listen, one requires focus. It means not only paying attention to the story, but also focusing on how the story is relayed, the way language and voice is used, and even how the speaker uses their body language. The ability to listen depends on how effectively one can perceive and understand both, verbal and non-verbal cues.

How to Listen Effectively

To listen effectively you should:

- Stop talking
- Stop interrupting
- Focus completely on what is being said
- Nod and use encouraging words and gestures
- Be open-minded
- Think about the speaker's perspective
- Be very, very patient
- Pay attention to the tone that is being used
- Pay attention to the speaker's gestures, facial expressions and eye movements
- Not try and rush the person
- Not let the speaker's mannerisms or habits irritate or distract you

How to Listen Effectively

How successfully a message gets conveyed depends entirely on how effectively you are able to get it through. An effective speaker is one who enunciates properly, pronounces words correctly, chooses the right words and speaks at a pace that is easily understandable. Besides this, the words spoken out loud need to match the gestures, tone and body language used.

What you say, and the tone in which you say it, results in numerous perceptions being formed. A person who speaks hesitantly may be perceived as having low self-esteem or lacking in knowledge of the discussed topic. Those with a quiet voice may very well be labelled as shy. And those who speak in commanding tones with high levels of clarity, are usually considered to be extremely confident. This makes speaking a very critical communication skill.

How to Speak Effectively

To speak effectively you should:

- Incorporate body language in your speech like eye contact, smiling, nodding, gesturing etc.
- Build a draft of your speech before actually making your speech.
- Ensure that all your emotions and feelings are under control.
- Pronounce your words distinctly with the correct pitch and intensity. Your speech should be crystal clear at all times.
- Use a pleasant and natural tone when speaking. Your audience should not feel like you are putting on an accent or being unnatural in any way.
- Use precise and specific words to drive your message home. Ambiguity should be avoided at all costs.
- Ensure that your speech has a logical flow.
- Be brief. Don't add any unnecessary information.
- Make a conscious effort to avoid irritating mannerisms like fidgeting, twitching etc.
- Choose your words carefully and use simple words that the majority of the audience will have no difficulty understanding.
- Use visual aids like slides or a whiteboard.
- Speak slowly so that your audience can easily understand what you're saying. However, be careful not to speak too slowly because this can come across as stiff, unprepared or even condescending.
- Remember to pause at the right moments.

Tips

- If you're finding it difficult to focus on what someone is saying, try repeating their words in your head.
- Always maintain eye contact with the person that you are communicating with, when speaking as well as listening. This conveys and also encourages interest in the conversation.

9.5.4 Problem Solving & Negotiation skills: What is a Problem?

As per The Concise Oxford Dictionary (1995), a problem is, "A doubtful or difficult matter requiring a solution"

All problems contain two elements:

1. Goals 2. Obstacles

The aim of problem solving is to recognize the obstacles and remove them in order to achieve the goals.

How to Solve Problems

Solving a problem requires a level of rational thinking. Here are some logical steps to follow when faced with an issue:

Step 1: Identify the problem

Step 2: Study the problem in detail

Step 3: List all possible solutions

Step 4: Select the best solution

Step 5: Implement the chosen solution

Step 6: Check that the problem has really been solved

Important Traits for Problem Solving

Highly developed problem solving skills are critical for both, business owners and their employees. The following personality traits play a big role in how effectively problems are solved:

- Being open minded
- Being proactive
- Having a positive attitude
- Asking the right questions
- Not panicking
- Focusing on the right problem

How to Assess for Problem Solving Skills

As an entrepreneur, it would be a good idea to assess the level of problem solving skills of potential candidates before hiring them. Some ways to assess this skill are through:

1. **Application forms**: Ask for proof of the candidate's problem solving skills in the application form.
2. **Psychometric tests**: Give potential candidates logical reasoning and critical thinking tests and see how they fare.
3. **Interviews**: Create hypothetical problematic situations or raise ethical questions and see how the candidates respond.
4. **Technical questions**: Give candidates examples of real life problems and evaluate their thought process.

What is Negotiation?

Negotiation is a method used to settle differences. The aim of negotiation is to resolve differences through a compromise or agreement while avoiding disputes. Without negotiation, conflicts are likely to lead to resentment between people. Good negotiation skills help satisfy both parties and go a long way towards developing strong relationships.

Why Negotiate

Starting a business requires many, many negotiations. Some negotiations are small while others are critical enough to make or break a startup. Negotiation also plays a big role inside the workplace. As an entrepreneur, you need to know not only know how to negotiate yourself, but also how to train employees in the art of negotiation.

How to Negotiate

Take a look at some steps to help you negotiate:

Step 1: Pre-Negotiation Preparation	Agree on where to meet to discuss the problem, decide who all will be present and set a time limit for the discussion.
Step 2: Discuss the Problem	This involves asking questions, listening to the other side, putting your views forward and clarifying doubts.
Step 3: Clarify the Objective	Ensure that both parties want to solve the same problem and reach the same goal.
Step 4: Aim for a Win-Win Outcome	Try your best to be open minded when negotiating. Compromise and offer alternate solutions to reach an outcome where both parties win.
Step 5: Clearly Define the Agreement	When an agreement has been reached, the details of the agreement should be crystal clear to both sides, with no scope for misunderstandings.
Step 6: Implement the Agreed Upon Solution	Agree on a course of action to set the solution in motion

Tips

- Know exactly what you want before you work towards getting it
- Give more importance to listening and thinking, than speaking
- Focus on building a relationship rather than winning
- Remember that your people skills will affect the outcome
- Know when to walk away – sometimes reaching an agreement may not be possible

9.5.5 Business OpportUnities Identification: Entrepreneurs and OpportUnities

"The entrepreneur always searches for change, responds to it and exploits it as an opportUnity."

Peter Drucker

The ability to identify business opportUnities is an essential characteristic of an entrepreneur.

What is an OpportUnity?

The word opportUnity suggests a good chance or a favourable situation to do something offered by circumstances.

A business opportUnity means a good or favourable change available to run a specific business in a given environment, at a given point of time.

Common Questions Faced by Entrepreneurs

A critical question that all entrepreneurs face is how to go about finding the business opportUnity that is right for them.

Some common questions that entrepreneurs constantly think about are:

- Should the new enterprise introduce a new product or service based on an unmet need?
- Should the new enterprise select an existing product or service from one market and offer it in another where it may not be available?
- Should the enterprise be based on a tried and tested formula that has worked elsewhere?

It is therefore extremely important that entrepreneurs must learn how to identify new and existing business opportUnities and evaluate their chances of success.

When is an Idea an OpportUnity?

An idea is an opportUnity when:

- It creates or adds value to a customer
- It solves a significant problem, removes a pain point or meets a demand
- Has a robust market and profit margin
- Is a good fit with the founder and management team at the right time and place

Factors to Consider When Looking for OpportUnities

Consider the following when looking for business opportUnities:

- Economic trends
- Changes in funding
- Changing relationships between vendors, partners and suppliers
- Market trends
- Changes in political support
- Shift in target audience

Ways to Identify New Business OpportUnities

1. Identify Market Inefficiencies

   When looking at a market, consider what inefficiencies are present in the market. Think about ways to correct these inefficiencies.

2. Remove Key Hassles

   Rather than create a new product or service, you can innovatively improve a product, service or process.

3. Create Something New

   Think about how you can create a new experience for customers, based on existing business models.

4. Pick a Growing Sector/Industry

   Research and find out which sectors or industries are growing and think about what opportUnities you can tap in the same.

5. Think About Product Differentiation

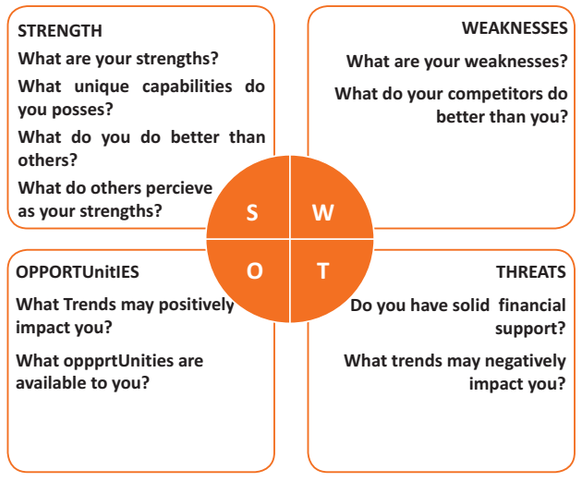
   If you already have a product in mind, think about ways to set it apart from the existing ones.

Ways to Identify Business OpportUnities Within Your Business

1. SWOT Analysis

   An excellent way to identify opportUnities inside your business is by creating a SWOT analysis. The acronym SWOT stands for strengths, weaknesses, opportUnities, and threats. SWOT analysis framework:

Fig 1.51



Consider the following when looking for business opportUnities:

By looking at yourself and your competitors using the SWOT framework, you can uncover opportUnities that you can exploit, as well as manage and eliminate threats that could derail your success.

2. Establishing Your USP

Establish your USP and position yourself as different from your competitors. Identify why customers should buy from you and promote that reason.

OpportUnity Analysis

Once you have identified an opportUnity, you need to analyze it.
To analyze an opportUnity, you must:

- Focus on the idea
- Focus on the market of the idea
- Talk to industry leaders in the same space as the idea
- Talk to players in the same space as the idea

Tips

- Remember, opportUnities are situational.
- Look for a proven track record.
- Avoid the latest craze.
- Love your idea.

9.5.6 Entrepreneurship Support Eco - System: What is an Entrepreneur?

An entrepreneur is a person who:

- Does not work for an employee
- Runs a small enterprise
- Assumes all the risks and rewards of the enterprise, idea, good or service

Types of Entrepreneurs

There are four main types of entrepreneurs:

1. **The Traditional Entrepreneur**: This type of entrepreneur usually has some kind of skill – they can be a carpenter, mechanic, cook etc. They have businesses that have been around for numerous years like restaurants, shops and carpenters. Typically, they gain plenty of experience in a particular industry before they begin their own business in a similar field.
2. **The Growth Potential Entrepreneur**: The desire of this type of entrepreneur is to start an enterprise that will grow, win many customers and make lots of money. Their ultimate aim is to eventually sell their enterprise for a nice profit. Such entrepreneurs usually have a science or technical background.
3. **The Project-Oriented Entrepreneur**: This type of entrepreneur generally has a background in the Arts or psychology. Their enterprises tend to be focus on something that they are very passionate about.
4. **The Lifestyle Entrepreneur**: This type of entrepreneur has usually worked as a teacher or a secretary. They are more interested in selling something that people will enjoy, rather than making lots of money.

Characteristics of an Entrepreneur

Successful entrepreneurs have the following characteristics:

- They are highly motivated
- They are creative and persuasive
- They are mentally prepared to handle each and every task
- They have excellent business skills – they know how to evaluate their cash flow, sales and revenue
- They are willing to take great risks
- They are very proactive – this means they are willing to do the work themselves, rather than wait for someone else to do it
- They have a vision – they are able to see the big picture
- They are flexible and open-minded
- They are good at making decisions

Entrepreneur Success Stories

Dhiru Bhai Ambani

Dhirubhai Ambani began his entrepreneurial career by selling "bhajias" to pilgrims in Mount Girnar on weekends. At 16, he moved to Yemen where he worked as a gas-station attendant, and as a clerk in an oil company. He returned to India with Rs. 50,000 and started a textile trading company. Reliance went on to become the first Indian company to raise money in global markets and the first Indian company to feature in Forbes 500 list.

Dr. Karsanbhai Patel

Karsanbhai Patel made detergent powder in the backyard of his house. He sold his product door-to-door and offered a money back guarantee with every pack that was sold. He charged Rs. 3 per kg when the cheapest detergent at that time was Rs.13 per kg. Dr. Patel eventually started Nirma which became a whole new segment in the Indian domestic detergent market.

The Entrepreneurial Process

Let's take a look at the stages of the entrepreneurial process.

Stage 1: Idea Generation. The entrepreneurial process begins with an idea that has been thought of by the entrepreneur. The idea is a problem that has the potential to be solved.

Stage 2: Germination or Recognition. In this stage a possible solution to the identified problem is thought of.

Stage 3: Preparation or Rationalization. The problem is studied further and research is done to find out how others have tried to solve the same problem.

Stage 4: Incubation or Fantasizing. This stage involves creative thinking for the purpose of coming up with more ideas. Less thought is given to the problem areas.

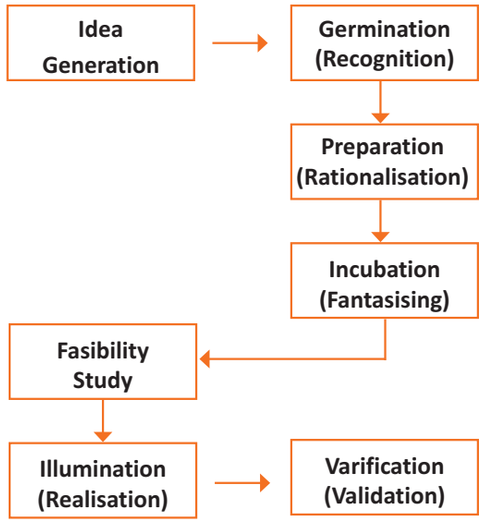
Stage 5: Feasibility Study: The next step is the creation of a feasibility study to determine if the idea will make a profit and if it should be seen through.

Stage 6: Illumination or Realization. This is when all uncertain areas suddenly become clear. The entrepreneur feels confident that his idea has merit.

Stage 7: Verification or Validation. In this final stage, the idea is verified to see if it works and if it is useful.

Take a look at the diagram below to get a better idea of this process.

Fig 1.52



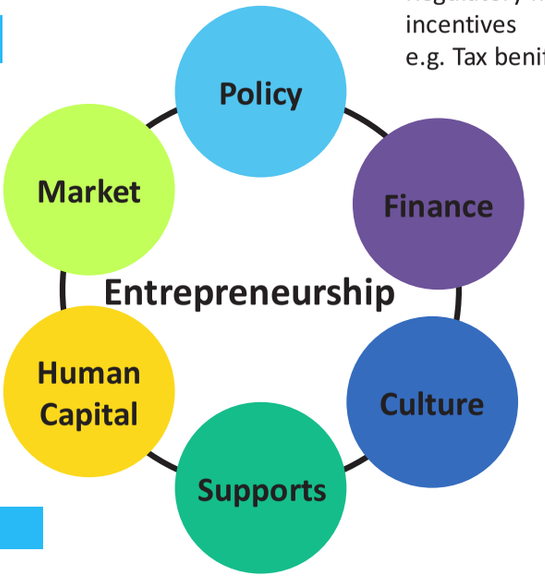
What is an Entrepreneur?

The entrepreneurship support ecosystem signifies the collective and complete nature of entrepreneurship. New companies emerge and flourish not only because of the courageous, visionary entrepreneurs who launch them, but they thrive as they are set in an environment or 'ecosystem' made of private and public participants. These players nurture and sustain the new ventures, facilitating the entrepreneurs' efforts.

An entrepreneurship ecosystem comprises of the following six domains:

1. **Favourable Culture:** This includes elements such as tolerance of risk and errors, valuable networking and positive social standing of the entrepreneur.
2. **Facilitating Policies & Leadership:** This includes regulatory framework incentives and existence of public research institutes.
3. **Financing Options:** Angel financing, venture capitalists and micro loans would be good examples of this.
4. **Human Capital:** This refers to trained and untrained labour, entrepreneurs and entrepreneurship training programmes, etc.
5. **Conducive Markets for Products & Services:** This refers to an existence or scope of existence of a market for the product/service.
6. **Institutional & Infrastructural Support:** This includes legal and financing advisers, telecommunications, digital and transportation infrastructure, and entrepreneurship networking programmes.

These domains indicate whether there is a strong entrepreneurship support ecosystem and what actions should the government put in place to further encourage this ecosystem. The six domains and their various elements have been graphically depicted.



Early Customers

- Early adopters for proof-of-concept
- Expertise in productizing
- Reference customer
- First reviews
- Distribution channels

Leadership

- Unequivocal support
- Social legitimacy
- Open door for advocate
- Entrepreneurship strategy
- urgency, crisis and challenge

Government

- Institutions
  e.g. Investment, support
- Financial support
  e.g. for R&D, jump start funds
  Regulatory framework
  incentives
  e.g. Tax benifits
- Research institutes
- Venture-friendly legislation
- e.g. Bankruptcy, contract enforcement, property rights, and labour

Networks

- Entrepreneure's networks
- Diaspora networks
- Multinational corporations

Financial Capital

- Micro-loans
- Angel investors, friends and family
- Zero-stage venture capital
- Venture capital funds
- Private equity
- Public capital markets
- Debt

Labour

- Skilled and unskilled
- Serial entrepreneures
- Later generation family

Success Stories

- Visible successes
- Wealth generation for founders
- International reputation

Educational Institutions

- General degrees (professional and academic)
- Specific entrepreneurship training

Societal norms

- Tolerance of risk, mistakes, failure
- Innovation, creativity, experimentation
- Social status of entrepreneur
- Wealth creation
- Ambition, drive, hunger

Infrastructure

- Telecommunications
- Transportation & logistics
- Energy
- Zones, incubation centers, clusters

Non-Government Institution

- Entrepreneurship promotion in non-profits
- Business plan contests
- Conferences
- Entrepreneur- friendly association

Support Professions

- Legal
- Accounting
- Investment bankers

Fig 1.53

Every entrepreneurship support ecosystem is unique and all the elements of the ecosystem are interdependent. Although every region's entrepreneurship ecosystem can be broadly described by the above features, each ecosystem is the result of the hundred elements interacting in highly complex and particular ways.

Entrepreneurship ecosystems eventually become (largely) self-sustaining. When the six domains are resilient enough, they are mutually beneficial. At this point, government involvement can and should be significantly minimized. Public leaders do not need to invest a lot to sustain the ecosystem. It is imperative that the entrepreneurship ecosystem incentives are formulated to be self-liquidating, hence focusing on sustainability of the environment.

Government's Role in the Entrepreneurship Ecosystem

Encouraging new ventures is a major focus for policymakers. Governments across the world are recognizing that new businesses flourish in distinctive types of supportive environments. Policymakers should study the scenario and take into account the following points whilst they formulate policies and regulations that enable successful entrepreneurship support ecosystems.

1. Policymakers should avoid regulations that discourage new entrants and work towards building efficient methods for business startups. Policies and regulations that favour existing, dominant firms over entrepreneurial ventures, restrict competition and obstruct entry for new companies.
2. Instead of developing policies conceptually intended to correct market failures, policymakers should interact with entrepreneurs and understand the challenges faced by them. The feedback should be used to develop policies that incite idea exploration, product development and increased rates of deal flow.
3. Entrepreneurial supporters should create a database that enables identifying who the participants in the ecosystem are and how they are connected. These ecosystem maps are useful tools in developing engagement strategies.
4. Disruptions are unavoidable in economic and social life. However, it's important to note that economic disruption gives rise to entrepreneurial opportUnities. Architects of the entrepreneurship ecosystems (entrepreneurs, mentors, policymakers and consumers,) should anticipate these dips, thus capitalizing on the opportUnities they create.

The need for effective strategies to enable local entrepreneurship support ecosystems is a practical one. Better understanding of the actual ecosystems provides a framework within which policy makers can ask relevant questions, envisage more efficient approaches, and assess ensuing outcomes.

Snapshot of the Entrepreneurship Ecosystem in India

Entrepreneurship has earned a newfound respect in India. Many Indians, with exposure to the world of business, who traditionally would have opted for a job, are setting up their own ventures. Many elements of the entrepreneurship ecosystem are beginning to come together. For example, increase in venture capitalists, government schemes and incubators, academia industry linkages, and emerging clusters and support to rural economy. All these initiatives are effective but there is a need to scale up and enrich the ecosystem further in the following ways:

1. We need to review our attitude towards failures and accept them as learning experiences.
2. We must encourage the educated to become entrepreneurs and provide students in schools and colleges with entrepreneurship skills.

3. Universities, research labs and the government need to play the role of enablers in the entrepreneurship support ecosystem.
4. Policymakers need to focus on reducing the obstacles such as corruption, red tape and bureaucracy.
5. We need to improve our legal systems and court international venture capital firms and bring them to India.
6. We must devise policies and methods to reach the secondary and tertiary towns in India, where people do not have access to the same resources available in the cities.

Today, there is a huge opportUnity in this country to introduce innovative solutions that are capable of scaling up, and collaborating within the ecosystem as well as enriching it.

Make in India Campaign

Every entrepreneur has certain needs. Some of their important needs are:

- To easily get loans
- To easily find investors
- To get tax exemptions
- To easily access resources and good infrastructure
- To enjoy a procedure that is free of hassles and is quick
- To be able to easily partner with other firms

The Make in India campaign, launched by Prime Minister Modi aims to satisfy all these needs of young, aspiring entrepreneurs. Its objective is to:

- Make investment easy
- Support new ideas
- Enhance skill development
- Safeguard the ideas of entrepreneurs
- Create state-of-the-art facilities for manufacturing goods

Tips

- Research the existing market, network with other entrepreneurs, venture capitalists, angel investors, and thoroughly review the policies in place to enable your entrepreneurship.
- Failure is a stepping stone and not the end of the road. Review yours and your peers' errors and correct them in your future venture.
- Be proactive in your ecosystem. Identify the key features of your ecosystem and enrich them to ensure self-sustainability of your entrepreneurship support ecosystem.

9.5.7 Risk Appetite & Resilience: Entrepreneurship and Risk

Entrepreneurs are inherently risk takers. They are path-makers not path-takers. Unlike a normal, cautious person, an entrepreneur would not think twice about quitting his job (his sole income) and taking a risk on himself and his idea.

An entrepreneur is aware that while pursuing his dreams, assumptions can be proven wrong and unforeseen events may arise. He knows that after dealing with numerous problems, success is still not guaranteed. Entrepreneurship is synonymous with the ability to take risks. This ability, called risk-appetite, is an entrepreneurial trait that is partly genetic and partly acquired.

What is Risk Appetite?

Risk appetite is defined as the extent to which a company is equipped to take risk, in order to achieve its objectives. Essentially, it refers to the balance, struck by the company, between possible profits and the hazards caused by changes in the environment (economic ecosystem, policies, etc.). Taking on more risk may lead to higher rewards but have a high probability of losses as well. However, being too conservative may go against the company as it can miss out on good opportUnities to grow and reach their objectives.

The levels of risk appetite can be broadly categorized as “low”, “medium” and “high.” The company’s entrepreneur(s) have to evaluate all potential alternatives and select the option most likely to succeed. Companies have varying levels of risk appetites for different objectives. The levels depend on:

- The type of industry
- Market pressures
- Company objectives

For example, a startup with a revolutionary concept will have a very high risk appetite. The startup can afford short term failures before it achieves longer term success. This type of appetite will not remain constant and will be adjusted to account for the present circumstances of the company.

Risk Appetite Statement

Companies have to define and articulate their risk appetite in sync with decisions made about their objectives and opportUnities. The point of having a risk appetite statement is to have a framework that clearly states the acceptance and management of risk in business. It sets risk taking limits within the company. The risk appetite statement should convey the following:

- The nature of risks the business faces.
- Which risks the company is comfortable taking on and which risks are unacceptable.
- How much risk to accept in all the risk categories.
- The desired tradeoff between risk and reward.
- Measures of risk and methods of examining and regulating risk exposures.

Entrepreneurship and Resilience

Entrepreneurs are characterized by a set of qualities known as resilience. These qualities play an especially large role in the early stages of developing an enterprise. Risk resilience is an extremely valuable characteristic as it is believed to protect entrepreneurs against the threat of challenges and changes in the business environment.

What is Entrepreneurial Resilience?

Resilience is used to describe individuals who have the ability to overcome setbacks related to their life and career aspirations. A resilient person is someone who is capable of easily and quickly recovering from setbacks. For the entrepreneur, resilience is a critical trait. Entrepreneurial resilience can be enhanced in the following ways:

- By developing a professional network of coaches and mentors
- By accepting that change is a part of life
- By viewing obstacles as something that can be overcome

Characteristics of a Resilient Entrepreneur

The characteristics required to make an entrepreneur resilient enough to go the whole way in their business enterprise are:

- A strong internal sense of control
- Strong social connections
- Skill to learn from setbacks
- Ability to look at the bigger picture
- Ability to diversify and expand
- Survivor attitude
- Cash-flow conscious habits
- Attention to detail

Tips

- Cultivate a great network of clients, suppliers, peers, friends and family. This will not only help you promote your business, but will also help you learn, identify new opportUnities and stay tuned to changes in the market.
- Don’t dwell on setbacks. Focus on what the you need to do next to get moving again.
- While you should try and curtail expenses, ensure that it is not at the cost of your growth.

9.5.8 Success & Failures: Understanding Successes and Failures in Entrepreneurship

Shyam is a famous entrepreneur, known for his success story. But what most people don't know, is that Shyam failed numerous times before his enterprise became a success. Read his interview to get an idea of what entrepreneurship is really about, straight from an entrepreneur who has both, failed and succeeded.

Interviewer: Shyam, I have heard that entrepreneurs are great risk-takers who are never afraid of failing. Is this true?

Shyam: Ha ha, no of course it's not true! Most people believe that entrepreneurs need to be fearlessly enthusiastic. But the truth is, fear is a very normal and valid human reaction, especially when you are planning to start your own business! In fact, my biggest fear was the fear of failing. The reality is, entrepreneurs fail as much as they succeed. The trick is to not allow the fear of failing to stop you from going ahead with your plans. Remember, failures are lessons for future success!

Interviewer: What, according to you, is the reason that entrepreneurs fail?

Shyam: Well, there is no one single reason why entrepreneurs fail. An entrepreneur can fail due to numerous reasons. You could fail because you have allowed your fear of failure to defeat you. You could fail because you are unwilling to delegate (distribute) work. As the saying goes, "You can do anything, but not everything!" You could fail because you gave up too easily – maybe you were not persistent enough. You could fail because you were focusing your energy on small, insignificant tasks and ignoring the tasks that were most important. Other reasons for failing are partnering with the wrong people, not being able to sell your product to the right customers at the right time at the right price… and many more reasons!

Interviewer: As an entrepreneur, how do you feel failure should be looked at?

Shyam: I believe we should all look at failure as an asset, rather than as something negative. The way I see it, if you have an idea, you should try to make it work, even if there is a chance that you will fail. That's because not trying is failure right there, anyway! And failure is not the worst thing that can happen. I think having regrets because of not trying, and wondering 'what if' is far worse than trying and actually failing.

Interviewer: How did you feel when you failed for the first time?

Shyam: I was completely heartbroken! It was a very painful experience. But the good news is, you do recover from the failure. And with every subsequent failure, the recovery process gets a lot easier. That's because you start to see each failure more as a lesson that will eventually help you succeed, rather than as an obstacle that you cannot overcome. You will start to realize that failure has many benefits.

Interviewer: Can you tell us about some of the benefits of failing?

Shyam: One of the benefits that I have experienced personally from failing is that the failure made me see things in a new light. It gave me answers that I didn't have before. Failure can make you a lot stronger. It also helps keep your ego in control.

Interviewer: What advice would you give entrepreneurs who are about to start their own enterprises?

Shyam: I would tell them to do their research and ensure that their product is something that is actually wanted by customers. I'd tell them to pick their partners and employees very wisely and cautiously. I'd tell them that it's very important to be aggressive – push and market your product as aggressively as possible. I would warn them that starting an enterprise is very expensive and that they should be prepared for a situation where they run out of money.

I would tell them to create long term goals and put a plan in action to achieve that goal. I would tell them to build a product that is truly unique. Be very careful and ensure that you are not copying another startup. Lastly, I'd tell them that it's very important that they find the right investors.

Interviewer: That's some really helpful advice, Shyam! I'm sure this will help all entrepreneurs to be more prepared before they begin their journey! Thank you for all your insight!

Tips

- Remember that nothing is impossible.
- Identify your mission and your purpose before you start.
- Plan your next steps – don't make decisions hastily.

Unit 9.6 Preparing to be an Entrepreneur

Unit Objectives

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

1. Discuss how market research is carried out
2. Describe the 4 Ps of marketing
3. Discuss the importance of idea generation
4. Recall basic business terminology
5. Discuss the need for CRM
6. Discuss the benefits of CRM
7. Discuss the need for networking
8. Discuss the benefits of networking
9. Understand the importance of setting goals
10. Differentiate between short-term, medium-term and long-term goals
11. Discuss how to write a business plan
12. Explain the financial planning process
13. Discuss ways to manage your risk
14. Describe the procedure and formalities for applying for bank finance
15. Discuss how to manage your own enterprise
16. List important questions that every entrepreneur should ask before starting an enterprise

9.6.1 Market Study / The 4 Ps of Marketing / Importance of an IDEA: Understanding Market Research

Market research is the process of gathering, analyzing and interpreting market information on a product or service that is being sold in that market. It also includes information on:

- Past, present and prospective customers
- Customer characteristics and spending habits
- The location and needs of the target market
- The overall industry
- Relevant competitors

Market research involves two types of data:

- Primary information. This is research collected by yourself or by someone hired by you.
- Secondary information. This is research that already exists and is out there for you to find and use.

Primary research

Primary research can be of two types:

- Exploratory: This is open-ended and usually involves detailed, unstructured interviews.
- Specific: This is precise and involves structured, formal interviews. Conducting specific research is the more expensive than conducting exploratory research.

Secondary research

Secondary research uses outside information. Some common secondary sources are:

- Public sources: These are usually free and have a lot of good information. Examples are government departments, business departments of public libraries etc.
- Commercial sources: These offer valuable information but usually require a fee to be paid. Examples are research and trade associations, banks and other financial institutions etc.
- Educational institutions: These offer a wealth of information. Examples are colleges, universities, technical institutes etc.

The 4 Ps of Marketing

The 4 Ps of marketing are Product, Price, Promotion and Place. Let's look at each of these 4 Ps in detail.

Product

A product can be:

- A tangible good
- An intangible service

Whatever your product is, it is critical that you have a clear understanding of what you are offering, and what its unique characteristics are, before you begin with the marketing process.

Some questions to ask yourself are:

- What does the customer want from the product/service?
- What needs does it satisfy?
- Are there any more features that can be added?
- Does it have any expensive and unnecessary features?
- How will customers use it?
- What should it be called?
- How is it different from similar products?
- How much will it cost to produce?
- Can it be sold at a profit?

Price

Once all the elements of Product have been established, the Price factor needs to be considered.

The Price of a Product will depend on several factors such as profit margins, supply, demand and the marketing strategy.

Some questions to ask yourself are:

- What is the value of the product/service to customers?
- Do local products/services have established price points?
- Is the customer price sensitive?
- Should discounts be offered?
- How is your price compared to that of your competitors?

Promotion

Once you are certain about your Product and your Price, the next step is to look at ways to promote it. Some key elements of promotion are advertising, public relations, social media marketing, email marketing, search engine marketing, video marketing and more.

Some questions to ask yourself are:

- Where should you promote your product or service?
- What is the best medium to use to reach your target audience?
- When would be the best time to promote your product?
- How are your competitors promoting their products?

Place

According to most marketers, the basis of marketing is about offering the right product, at the right price, at the right place, at the right time. For this reason, selecting the best possible location is critical for converting prospective clients into actual clients.

Some questions to ask yourself are:

- Will your product or service be looked for in a physical store, online or both?
- What should you do to access the most appropriate distribution channels?
- Will you require a sales force?
- Where are your competitors offering their products or services?
- Should you follow in your competitors' footsteps?
- Should you do something different from your competitors?

Importance of an IDEA

Ideas are the foundation of progress. An idea can be small or ground-breaking, easy to accomplish or extremely complicated to implement. Whatever the case, the fact that it is an idea gives it merit. Without ideas, nothing is possible. Most people are afraid to speak out their ideas, out for fear of being ridiculed. However, if are an entrepreneur and want to remain competitive and innovative, you need to bring your ideas out into the light.

Some ways to do this are by:

- Establishing a culture of brainstorming where you invite all interested parties to contribute
- Discussing ideas out loud so that people can add their ideas, views, opinions to them
- Being open minded and not limiting your ideas, even if the idea who have seems ridiculous
- Not discarding ideas that you don't work on immediately, but instead making a note of them and shelving them so they can be revisited at a later date

Tips

- Keep in mind that good ideas do not always have to be unique.
- Remember that timing plays a huge role in determining the success of your idea.
- Situations and circumstances will always change, so be flexible and adapt your idea accordingly.

9.6.2 Business Entity Concepts: Basic Business Terminology

If your aim is to start and run a business, it is crucial that you have a good understanding of basic business terms. Every entrepreneur should be well versed in the following terms:

- Accounting: A systematic method of recording and reporting financial transactions.
- Accounts payable: Money owed by a company to its creditors.
- Accounts Receivable: The amount a company is owed by its clients.
- Assets: The value of everything a company owns and uses to conduct its business.
- Balance Sheet: A snapshot of a company's assets, liabilities and owner's equity at a given moment.
- Bottom Line: The total amount a business has earned or lost at the end of a month.
- Business: An organization that operates with the aim of making a profit.
- Business to Business (B2B): A business that sells goods or services to another business.
- Business to Consumer (B2C): A business that sells goods or services directly to the end user.
- Capital: The money a business has in its accounts, assets and investments. The two main types of capital are debt and equity.
- Cash Flow: The overall movement of funds through a business each month, including income and expenses.
- Cash Flow Statement: A statement showing the money that entered and exited a business during a specific period of time.
- Contract: A formal agreement to do work for pay.
- Depreciation: The degrading value of an asset over time.
- Expense: The costs that a business incurs through its operations.
- Finance: The management and allocation of money and other assets.
- Financial Report: A comprehensive account of a business' transactions and expenses.
- Fixed Cost: A one-time expense.
- Income Statement (Profit and Loss Statement): Shows the profitability of a business during a period of time.
- Liabilities: The value of what a business owes to someone else.
- Marketing: The process of promoting, selling and distributing a product or service.
- Net Income/Profit: Revenues minus expenses.
- Net Worth: The total value of a business.
- Payback Period: The amount of time it takes to recover the initial investment of a business.
- Profit Margin: The ratio of profit, divided by revenue, displayed as a percentage.
- Return on Investment (ROI): The amount of money a business gets as return from an investment.

- Revenue: The total amount of income before expenses are subtracted.
- Sales Prospect: A potential customer.
- Supplier: A provider of supplies to a business.
- Target Market: A specific group of customers at which a company's products and services are aimed.
- Valuation: An estimate of the overall worth of the business.
- Variable Cost: Expenses that change in proportion to the activity of a business.
- Working Capital: Calculated as current assets minus current liabilities.

9.6.3 CRM & Networking: What is CRM?

CRM stands for Customer Relationship Management. Originally the expression Customer Relationship Management meant managing one's relationship with customers. However, today it refers to IT systems and software designed to help companies manage their relationships.

The Need for CRM

The better a company can manage its relationships with its customers, the higher the chances of the company's success. For any entrepreneur, the ability to successfully retain existing customers and expand the enterprise is paramount. This is why IT systems that focus on addressing the problems of dealing with customers on a daily basis are becoming more and more in demand.

Customer needs change over time, and technology can make it easier to understand what customers really want. This insight helps companies to be more responsive to the needs of their customers. It enables them to modify their business operations when required, so that their customers are always served in the best manner possible. Simply put, CRM helps companies recognize the value of their clients and enables them to capitalize on improved customer relations.

Benefits of CRM

CRM has a number of important benefits:

- It helps improve relations with existing customers which can lead to:
  - Increased sales
  - Identification of customer needs
  - Cross-selling of products
- It results in better marketing of one's products or services
- It enhances customer satisfaction and retention
- It improves profitability by identifying and focusing on the most profitable customers

9.6.4 What is Networking?

In business, networking means leveraging your business and personal connections in order to bring in a regular supply of new business. This marketing method is effective as well as low cost. It is a great way to develop sales opportUnities and contacts. Networking can be based on referrals and introductions, or can take place via phone, email, and social and business networking websites.

9.6.5 The Need for Networking

Networking is an essential personal skill for business people, but it is even more important for entrepreneurs. The process of networking has its roots in relationship building. Networking results in greater communication and a stronger presence in the entrepreneurial ecosystem. This helps build strong relationships with other entrepreneurs.

Business networking events held across the globe play a huge role in connecting like-minded entrepreneurs who share the same fundamental beliefs in communication, exchanging ideas and converting ideas into realities. Such networking events also play a crucial role in connecting entrepreneurs with potential investors. Entrepreneurs may have vastly different experiences and backgrounds but they all have a common goal in mind – they all seek connection, inspiration, advice, opportUnities and mentors. Networking offers them a platform to do just that.

Benefits of Networking

Networking offers numerous benefits for entrepreneurs. Some of the major benefits are:

- Getting high quality leads
- Increased business opportUnities
- Good source of relevant connections
- Advice from like-minded entrepreneurs
- Gaining visibility and raising your profile
- Meeting positive and enthusiastic people
- Increased self-confidence
- Satisfaction from helping others
- Building strong and lasting friendships

Tips

- Use social media interactions to identify needs and gather feedback.
- When networking, ask open-ended questions rather than yes/no type questions.

9.6.6 Business Plan: Why Set Goals

Setting goals is important because it gives you long-term vision and short-term motivation. Goals can be short term, medium term and long term.

Short-Term Goals

- These are specific goals for the immediate future.

Example: Repairing a machine that has failed.

Medium-Term Goals

- These goals are built on your short term goals.
- They do not need to be as specific as your short term goals.

Example: Arranging for a service contract to ensure that your machines don't fail again.

Long-Term Goals

These goals require time and planning.

They usually take a year or more to achieve.

Example: Planning your expenses so you can buy new machinery

Why Create a Business Plan

A business plan is a tool for understanding how your business is put together. It can be used to monitor progress, foster accountable and control the fate of the business. It usually offers a 3-5 year projection and outlines the plan that the company intends to follow to grow its revenues. A business plan is also a very important tool for getting the interest of key employees or future investors.

A business plan typically comprises of eight elements.

Elements of a Business Plan

Executive Summary

The executive summary follows the title page. The summary should clearly state your desires as the business owner in a short and businesslike way. It is an overview of your business and your plans. Ideally this should not be more than 1-2 pages.

Your Executive Summary should include:

- The Mission Statement: Explain what your business is all about.

  Example: Nike's Mission Statement

  Nike's mission statement is "To bring inspiration and innovation to every athlete in the world."
- Company Information: Provide information like when your business was formed, the names and roles of the founders, the number of employees, your business location(s) etc.
- Growth Highlights: Mention examples of company growth. Use graphs and charts where possible.
- Your Products/Services: Describe the products or services provided.
- Financial Information: Provide details on current bank and investors.
- Summarize future plans: Describe where you see your business in the future.

Business Description

The second section of your business plan needs to provide a detailed review of the different elements of your business. This will help potential investors to correctly understand your business goal and the uniqueness of your offering.

Your Business Description should include:

- A description of the nature of your business
- The market needs that you are aiming to satisfy
- The ways in which your products and services meet these needs
- The specific consumers and organizations that you intend to serve
- Your specific competitive advantages

Market Analysis

The market analysis section usually follows the business description. The aim of this section is to showcase your industry and market knowledge. This is also the section where you should lay down your research findings and conclusions.

Your Market Analysis should include:

- Your industry description and outlook
- Information on your target market
- The needs and demographics of your target audience
- The size of your target market
- The amount of market share you want to capture
- Your pricing structure
- Your competitive analysis
- Any regulatory requirements

Organization & Management

This section should come immediately after the Market Analysis.

Your Organization & Management section should include:

- Your company's organizational structure
- Details of your company's ownership
- Details of your management team
- Qualifications of your board of directors
- Detailed descriptions of each division/department and its function
- The salary and benefits package that you offer your people
- The incentives that you offer

Service or Product Line

The next section is the service or product line section. This is where you describe your service or product, and stress on their benefits to potential and current customers. Explain in detail why your product of choice will fulfill the needs of your target audience.

Your Service or Product Line section should include:

- A description of your product/service
- A description of your product or service's life cycle
- A list of any copyright or patent filings
- A description of any R&D activities that you are involved in or planning

Marketing & Sales

Once the Service or Product Line section of your plan has been completed, you should start on the description of the marketing and sales management strategy for your business.

Your Marketing section should include the following strategies:

- **Market penetration strategy**: This strategy focuses on selling your existing products or services in existing markets, in order to increase your market share.
- **Growth strategy**: This strategy focuses on increasing the amount of market share, even if it reduces earnings in the short-term.
- **Channels of distribution strategy**: These can be wholesalers, retailers, distributers and even the internet.
- **Communication strategy**: These can be written strategies (e-mail, text, chat), oral strategies (phone calls, video chats, face-to-face conversations), non-verbal strategies (body language, facial expressions, tone of voice) and visual strategies (signs, webpages, illustrations).

Your Sales section should include the following information:

- **A salesforce strategy**: This strategy focuses on increasing the revenue of the enterprise.
- **A breakdown of your sales activities**: This means detailing out how you intend to sell your products or services – will you sell it offline or online, how many Units do you intend to sell, what price do you plan to sell each Unit at, etc.

Funding Request

This section is specifically for those who require funding for their venture.

The Funding Request section should include the following information:

- How much funding you currently require.
- How much funding you will require over the next five years. This will depend on your long-term goals.
- The type of funding you want and how you plan to use it. Do you want funding that can be used only for a specific purpose, or funding that can be used for any kind of requirement?
- Strategic plans for the future. This will involve detailing out your long-term plans – what these plans are and how much money you will require to put these plans in motions.
- Historical and prospective financial information. This can be done by creating and maintaining all your financial records, right from the moment your enterprise started, to the present day. Documents required for this are your balance sheet which contains details of your company's assets and liabilities, your income statement which lists your company's revenues, expenses and net income for the year, your tax returns (usually for the last three years) and your cash flow budget which lists the cash that came in, the cash that went out and states whether you had a cash deficit (negative balance) or surplus (positive balance) at the end of each month.

Financial Planning

Before you begin building your enterprise, you need to plan your finances. Take a look at the steps for financial planning:

Step 1: Create a financial plan. This should include your goals, strategies and timelines for accomplishing these goals.

Step 2: Organize all your important financial documents. Maintain a file to hold your investment details, bank statements, tax papers, credit card bills, insurance papers and any other financial records.

Step 3: Calculate your net worth. This means figure out what you own (assets like your house, bank accounts, investments etc.), and then subtract what you owe (liabilities like loans, pending credit card amounts etc.) the amount you are left with is your net worth.

Step 4: Make a spending plan. This means write down in detail where your money will come from, and where it will go.

Step 5: Build an emergency fund. A good emergency fund contains enough money to cover at least 6 months' worth of expenses.

Step 6: Set up your insurance. Insurance provides long term financial security and protects you against risk.

Risk Management

As an entrepreneur, it is critical that you evaluate the risks involved with the type of enterprise that you want to start, before you begin setting up your company. Once you have identified potential risks, you can take steps to reduce them. Some ways to manage risks are:

- Research similar business and find out about their risks and how they were minimized.
- Evaluate current market trends and find out if similar products or services that launched a while ago are still being well received by the public.
- Think about whether you really have the required expertise to launch your product or service.
- Examine your finances and see if you have enough income to start your enterprise.
- Be aware of the current state of the economy, consider how the economy may change over time, and think about how your enterprise will be affected by any of those changes.
- Create a detailed business plan.

Tips

- Ensure all the important elements are covered in your plan.
- Scrutinize the numbers thoroughly.
- Be concise and realistic.
- Be conservative in your approach and your projections.
- Use visuals like charts, graphs and images wherever possible.

9.6.7 Procedure and Formalities for Bank Finance:

The Need for Bank Finance

For entrepreneurs, one of the most difficult challenges faced involves securing funds for startups. With numerous funding options available, entrepreneurs need to take a close look at which funding methodology works best for them. In India, banks are one of the largest funders of startups, offering funding to thousands of startups every year.

What Information Should Entrepreneurs Offer Banks for Funding?

When approaching a bank, entrepreneurs must have a clear idea of the different criteria that banks use to screen, rate and process loan applications. Entrepreneurs must also be aware of the importance of providing banks with accurate and correct information. It is now easier than ever for financial institutions to track any default behaviour of loan applicants. Entrepreneurs looking for funding from banks must provide banks with information relating to their general credentials, financial situation and guarantees or collaterals that can be offered.

General Credentials

This is where you, as an entrepreneur, provide the bank with background information on yourself. Such information includes:

- Letter(s) of Introduction: This letter should be written by a respected business person who knows you well enough to introduce you. The aim of this letter is set across your achievements and vouch for your character and integrity.
- Your Profile: This is basically your resume. You need to give the bank a good idea of your educational achievements, professional training, qualifications, employment record and achievements.
- Business Brochure: A business brochure typically provides information on company products, clients, how long the business has been running for etc.
- Bank and Other References: If you have an account with another bank, providing those bank references is a good idea.
- Proof of Company Ownership or Registration: In some cases, you may need to provide the bank with proof of company ownership and registration. A list of assets and liabilities may also be required.

Financial Situation

Banks will expect current financial information on your enterprise. The standard financial reports you should be prepared with are:

- Balance Sheet
- Cash-Flow Statement
- Business Plan
- Profit-and-Loss Account
- Projected Sales and Revenues
- Feasibility Study

Guarantees or Collaterals

Usually banks will refuse to grant you a loan without security. You can offer assets which the bank can seize and sell off if you do not repay the loan. Fixed assets like machinery, equipment, vehicles etc. are also considered to be security for loans.

The Lending Criteria of Banks

Your request for funding will have a higher chance of success if you can satisfy the following lending criteria:

- Good cash flow
- Adequate shareholders' funds
- Adequate security
- Experience in business
- Good reputation

The Procedure

To apply for funding the following procedure will need to be followed.

1. Submit your application form and all other required documents to the bank.
2. The bank will carefully assess your credit worthiness and assign ratings by analyzing your business information with respect to parameters like management, financial, operational and industry information as well as past loan performance.
3. The bank will make a decision as to whether or not you should be given funding.

Tips

- Get advice on funding options from experienced bankers.
- Be cautious and avoid borrowing more than you need, for longer than you need, at an interest rate that is higher than you are comfortable with.

9.6.8 Enterprise Management - An Overview: How to Manage Your Enterprise

To manage your enterprise effectively you need to look at many different aspects, right from managing the day-to-day activities to figuring out how to handle a large scale event. Let's take a look at some simple steps to manage your company effectively.

Step 1: Use your leadership skills and ask for advice when required.

Let's take the example of Ramu, an entrepreneur who has recently started his own enterprise. Ramu has good leadership skills – he is honest, communicates well, knows how to delegate work etc. These leadership skills definitely help Ramu in the management of his enterprise. However, sometimes Ramu comes across situations that he is unsure how to handle. What should Ramu do in this case? One solution is for him to find a more experienced manager who is willing to mentor him. Another solution is for Ramu to use his networking skills so that he can connect with managers from other organizations, who can give him advice on how to handle such situations.

Step 2: Divide your work amongst others – realize that you cannot handle everything yourself.

Even the most skilled manager in the world will not be able to manage every single task that an enterprise will demand of him. A smart manager needs to realize that the key to managing his enterprise lies in his dividing all his work between those around him. This is known as delegation. However, delegating is not enough. A manager must delegate effectively if he wants to see results. This is important because delegating, when done incorrectly, can result in you creating even more work for yourself. To delegate effectively, you can start by making two lists. One list should contain the things that you know you need to handle yourself. The second list should contain the things that you are confident can be given to others to manage and handle. Besides incorrect delegation, another issue that may arise is over-delegation. This means giving away too many of your tasks to others. The problem with this is, the more tasks you delegate, the more time you will spend tracking and monitoring the work progress of those you have handed the tasks to. This will leave you with very little time to finish your own work.

Step 3: Hire the right people for the job.

Hiring the right people goes a long way towards effectively managing your enterprise. To hire the best people suited for the job, you need to be very careful with your interview process. You should ask potential candidates the right questions and evaluate their answers carefully. Carrying out background checks is always a good practice. Running a credit check is also a good idea, especially if the people you are planning to hire will be handling your money. Create a detailed job description for each role that you want filled and ensure that all candidates have a clear and correct understanding of the job description. You should also have an employee manual in place, where you

put down every expectation that you have from your employees. All these actions will help ensure that the right people are approached for running your enterprise.

Step 4: Motivate your employees and train them well.

Your enterprise can only be managed effectively if your employees are motivated to work hard for your enterprise. Part of being motivated involves your employees believing in the vision and mission of your enterprise and genuinely wanting to make efforts towards pursuing the same. You can motivate your employees with recognition, bonuses and rewards for achievements. You can also motivate them by telling them about how their efforts have led to the company's success. This will help them feel pride and give them a sense of responsibility that will increase their motivation.

Besides motivating your people, your employees should be constantly trained in new practices and technologies. Remember, training is not a one-time effort. It is a consistent effort that needs to be carried out regularly.

Step 5: Train your people to handle your customers well.

Your employees need to be well-versed in the art of customer management. This means they should be able to understand what their customers want, and also know how to satisfy their needs. For them to truly understand this, they need to see how you deal effectively with customers. This is called leading by example. Show them how you sincerely listen to your clients and the efforts that you put into understand their requirements. Let them listen to the type of questions that you ask your clients so they understand which questions are appropriate.

Step 6: Market your enterprise effectively.

Use all your skills and the skills of your employees to market your enterprise in an effective manner. You can also hire a marketing agency if you feel you need help in this area.

Now that you know what is required to run your enterprise effectively, put these steps into play, and see how much easier managing your enterprise becomes!

Tips

- Get advice on funding options from experienced bankers.
- Be cautious and avoid borrowing more than you need, for longer than you need, at an interest rate that is higher than you are comfortable with.

9.6.9. 20 Questions to Ask Yourself Before Considering Entrepreneurship

1. Why am I starting a business?
2. What problem am I solving?
3. Have others attempted to solve this problem before? Did they succeed or fail?
4. Do I have a mentor[1] or industry expert that I can call on?
5. Who is my ideal customer[2]?
6. Who are my competitors[3]?
7. What makes my business idea different from other business ideas?
8. What are the key features of my product or service?
9. Have I done a SWOT[4] analysis?
10. What is the size of the market that will buy my product or service?
11. What would it take to build a minimum viable product[5] to test the market?
12. How much money do I need to get started?
13. Will I need to get a loan?
14. How soon will my products or services be available?
15. When will I break even[6] or make a profit?
16. How will those who invest in my idea make a profit?
17. How should I set up the legal structure[7] of my business?
18. What taxes[8] will I need to pay?
19. What kind of insurance[9] will I need?
20. Have I reached out to potential customers for feedback?

Tips

- It is very important to validate your business ideas before you invest significant time, money and resources into it.
- The more questions you ask yourself, the more prepared you will be to handle to highs and lows of starting an enterprise.

Footnotes:

1. A mentor is a trusted and experienced person who is willing to coach and guide you.
2. A customer is someone who buys goods and/or services.
3. A competitor is a person or company that sells products and/or services similar to your products and/or services.
4. SWOT stands for Strengths, Weaknesses, OpportUnities and Threats. To conduct a SWOT analysis of your company, you need to list down all the strengths and weaknesses of your company, the opportUnities that are present for your company and the threats faced by your company.

5. A minimum viable product is a product that has the fewest possible features, that can be sold to customers, for the purpose of getting feedback from customers on the product.
6. A company is said to break even when the profits of the company are equal to the costs.
7. The legal structure could be a sole proprietorship, partnership or limited liability partnership.
8. There are two types of taxes – direct taxes payable by a person or a company, or indirect taxes charged on goods and/or services.
9. There are two types of insurance – life insurance and general insurance. Life insurance covers human life while general insurance covers assets like animals, goods, cars etc.

Notes

Participant Handbook

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