

# Participant Handbook

Sector  
**Food Processing**

Sub-Sector  
**Bread and Bakery**

Occupation  
**Baking Technician/Operative**

Reference ID: **version 1.1, FIC/Q5005**  
**NSQF level 4**



**Baking Technician/  
Operative**





**Shri Narendra Modi**  
Prime Minister of India

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



## Certificate

### COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

**FOOD INDUSTRY CAPACITY AND SKILL INITIATIVE**

for

**SKILLING CONTENT : PARTICIPANT HANDBOOK**

Complying to National Occupational Standards of  
Job Role/ Qualification Pack: **'Baking Technician /Operative'** OP No. **'FIC/ Q 5005 NSQF Level 4'**

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\*Valid up to the next review date of the Qualification Pack or the  
'Valid up to' date mentioned above (whichever is earlier)

Authorised Signatory  
(CEO, FICSI )

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## About this book

This Participant Handbook is designed to enable training for the specific Qualification Pack(QP). Each National Occupational (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 by participants of the skill development course for a Baking Technician / Operative 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 Baking Technician/ Operative NSQF level 4 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).

The Baking Technician/ Operative is responsible for baking of products and maintaining their consistency and quality while meeting defined SOPs and leveraging his/ her skill to operate ovens in synchronization with proof box/ rest of the plant/ unit.

## Symbols Used



Key Learning  
Outcomes



Steps



Time



Tips



Notes



Unit  
Objectives

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## 3. Prepare for Baking Products in Oven

Unit 3.1 - Introduction to Food Microbiology

Unit 3.2 - Food Spoilage

Unit 3.3 - Food Preservation



FIC/N5018

## Key Learning Outcomes

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

- State the types of food microbes
- State the causes for food spoilage
- State the process for food spoilage
- State the criteria to check food spoilage
- State the need for food preservation
- State the different types of food preservation processes

## UNIT 3.1: Introduction to Food Microbiology

### Unit Objectives

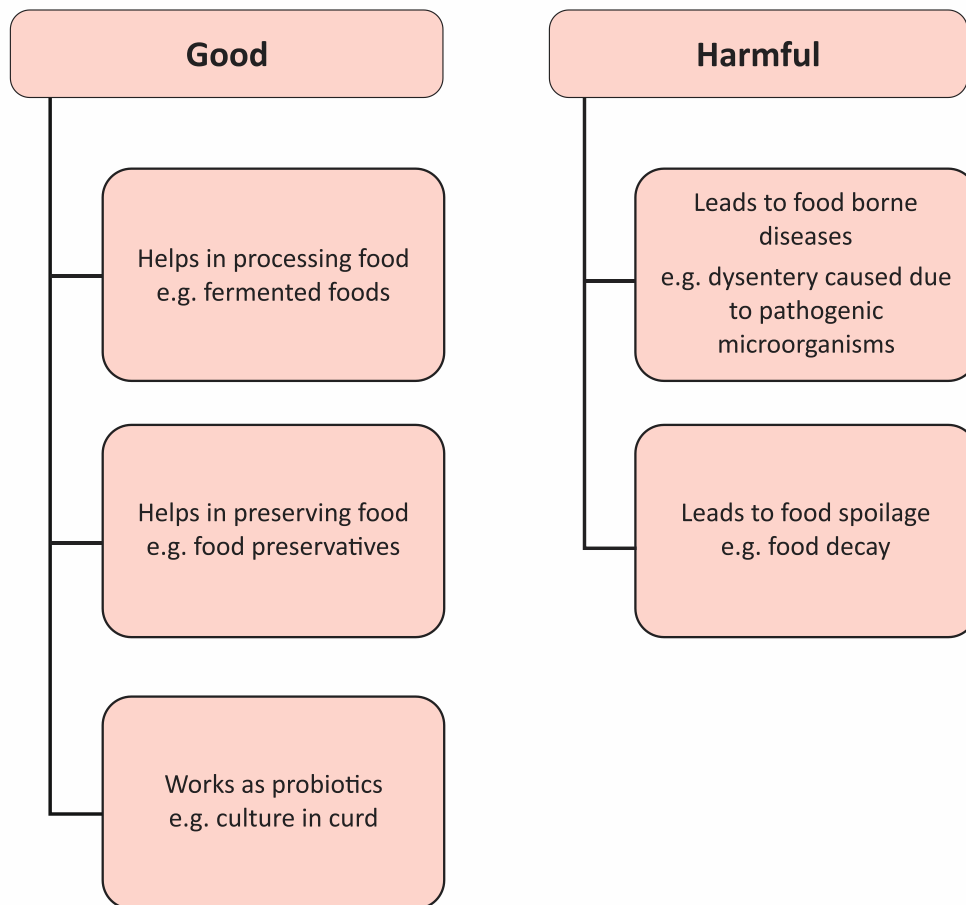
At the end of this module, you will be able to:

- State the types of food microbes
- Define food microbiology explain different causes of food spoilage

### Unit 3.1.1: What is Food Microbiology

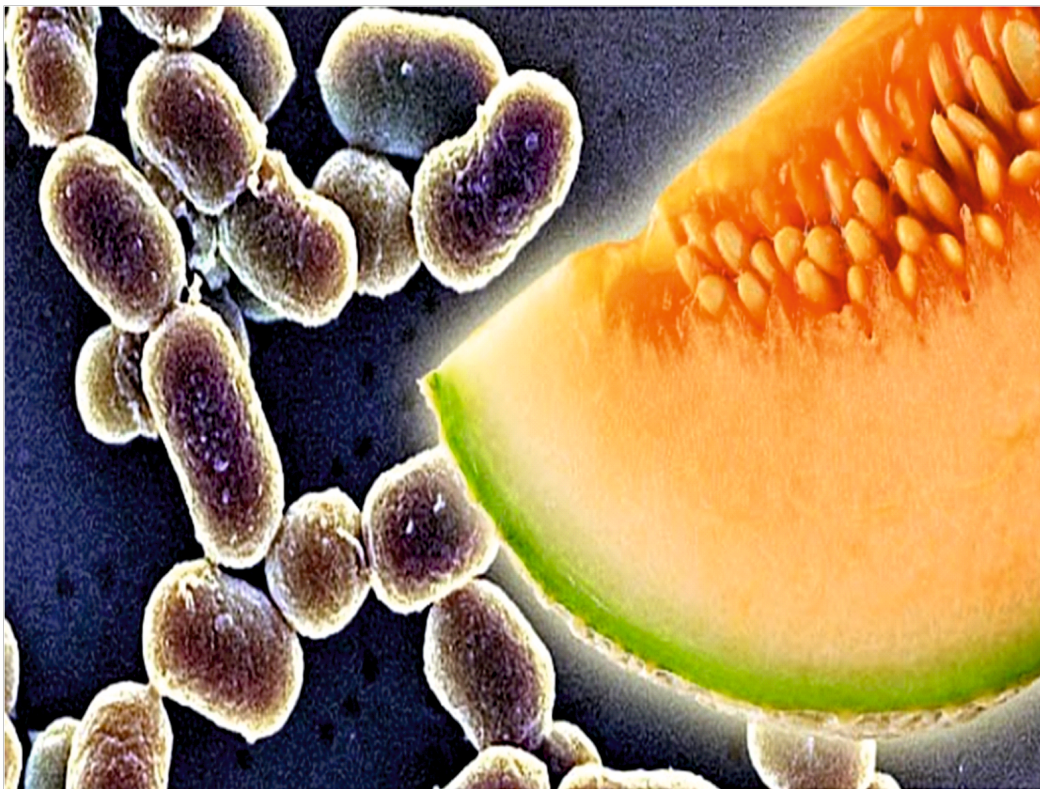
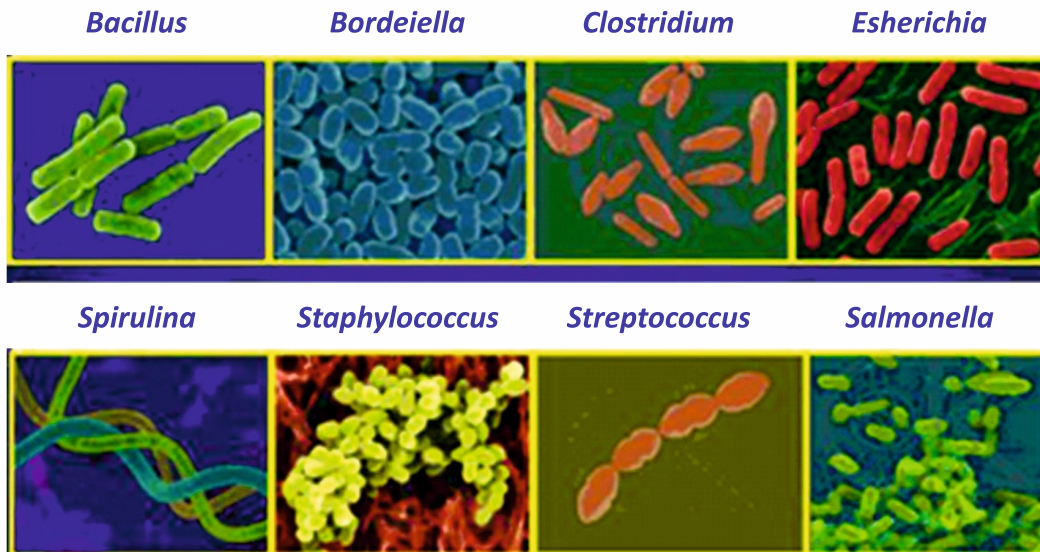
Food microbiology is the study of microorganisms found in food products. Microorganisms are classified as: (see Fig 1.26)

Fig 1.25



## Types of Food Spoilage Microorganisms

Fig 1.26



## Bakery items Spoiled by Microorganisms

Fig 1.27



## UNIT 3.2: Food Spoilage

### Unit Objectives

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

- State the causes for food spoilage
- State the process for food spoilage
- State the criteria to check food spoilage

### Unit 3.2.1: Types of Food Contaminants

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

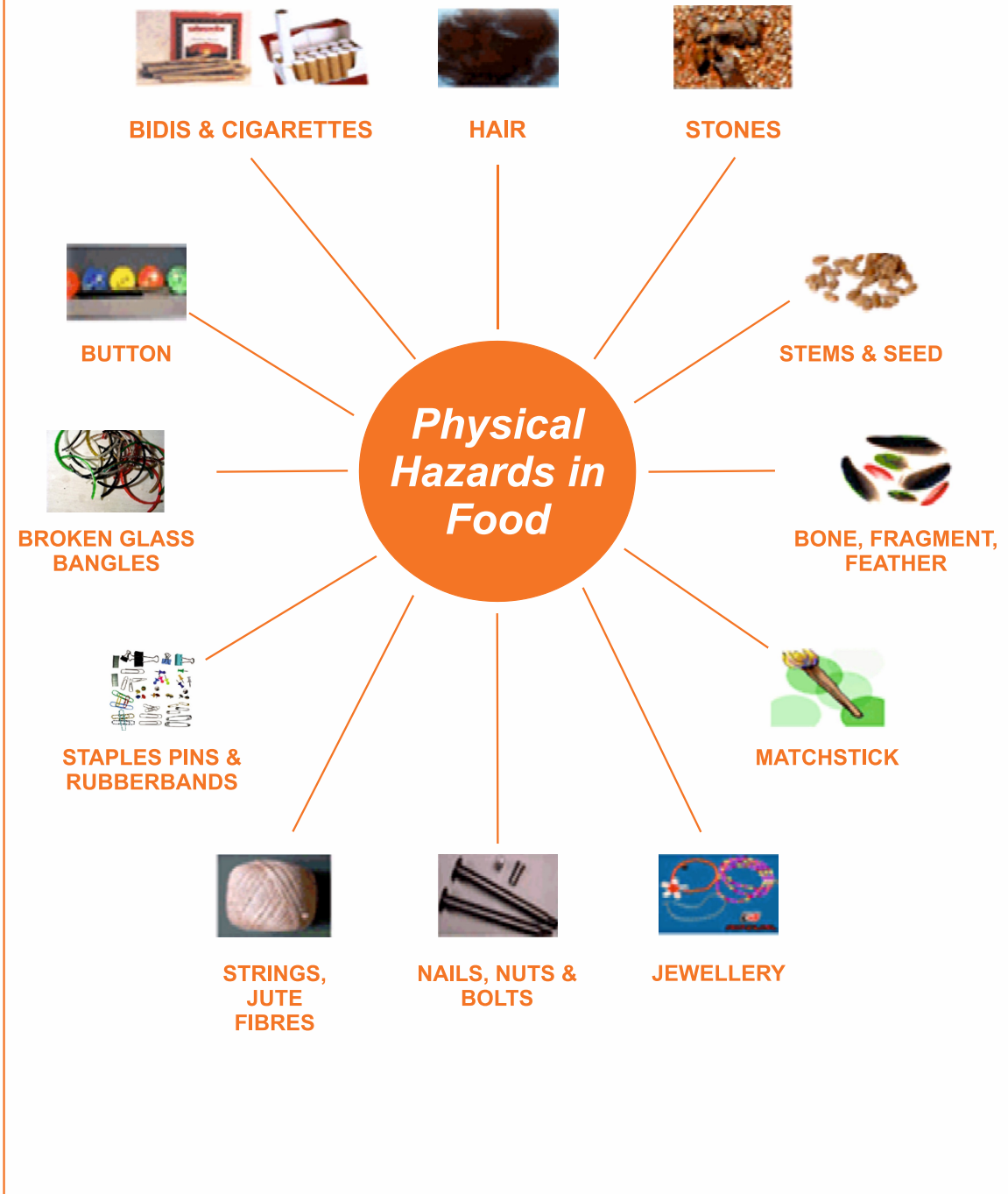
Some types of contaminants in foods are:

Table 1.8

Types of contaminant	Examples
Microbial	Bacteria, moulds, yeasts, viruses, etc.
Biological	Hair, excreta, bone splinters, etc.
Chemical	Pesticide residues, detergents, etc.
Physical	Bolts from machinery, stones, glass, etc.

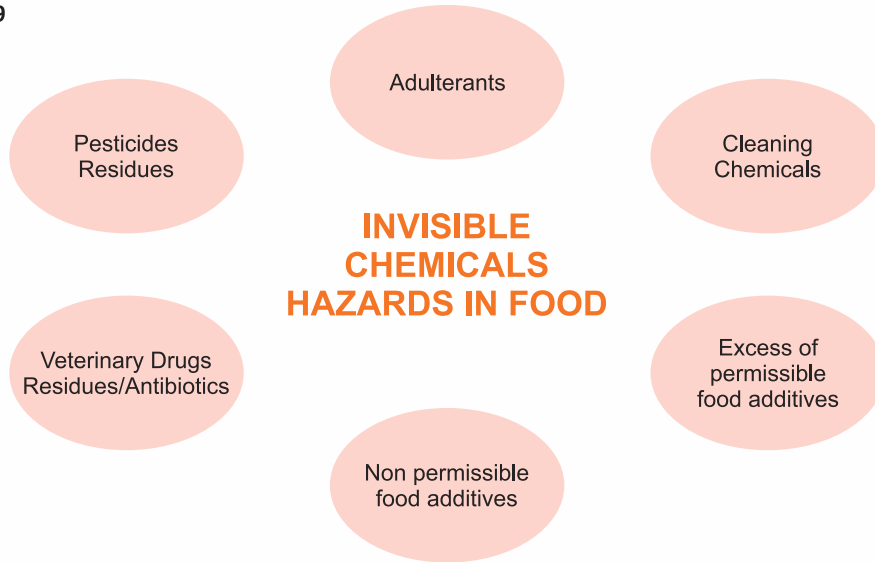
## Different Types of Physical Hazards in Food

Fig 1.28



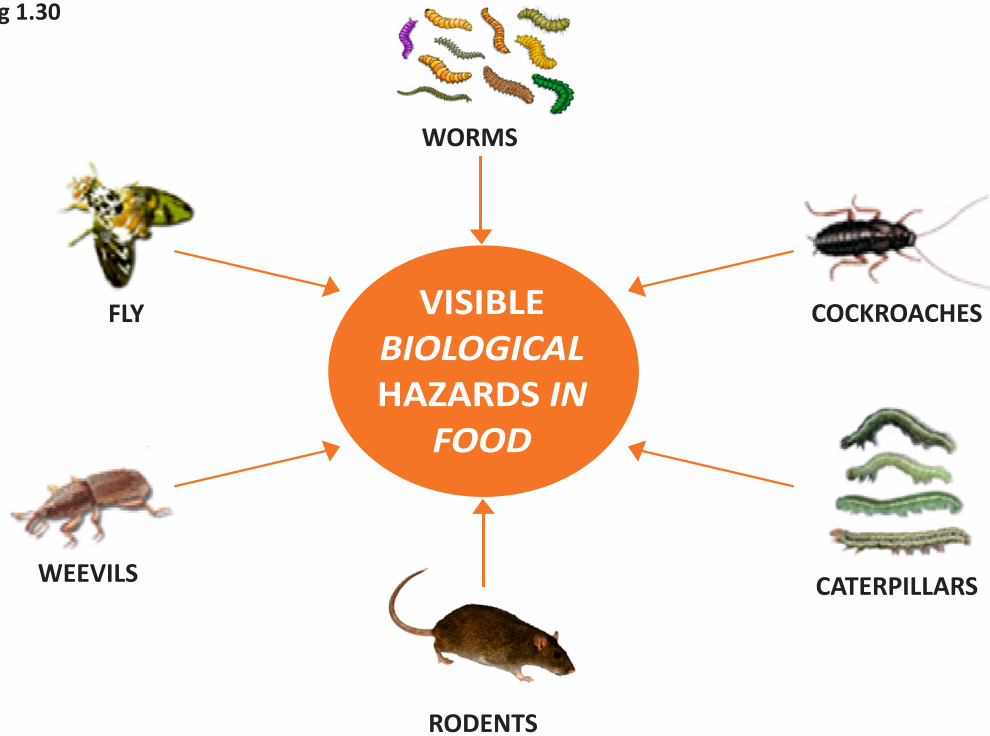
## Different Types of Chemical Hazards in Food

Fig 1.29



## Different Types of Biological Hazards in Food

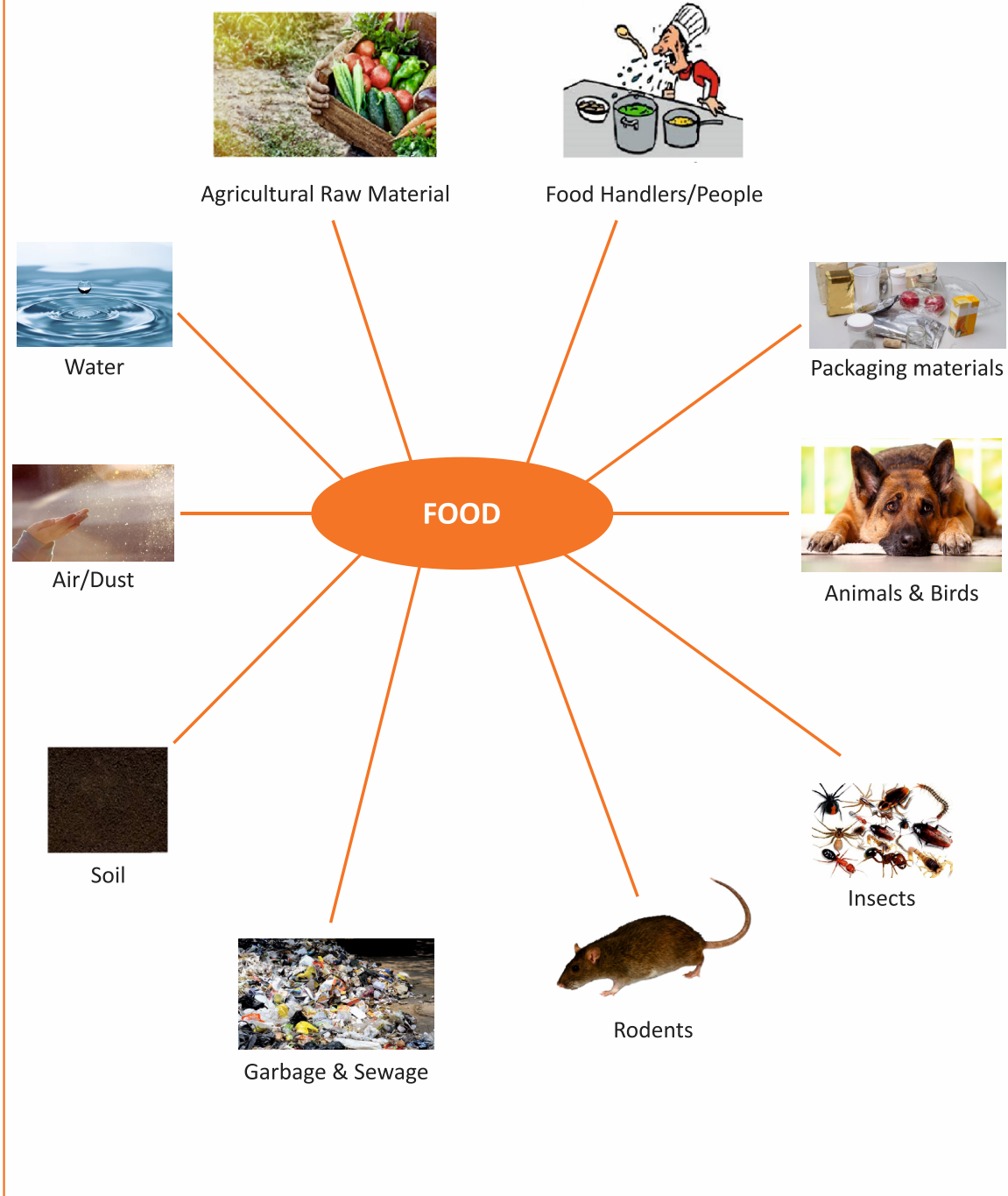
Fig 1.30





## Sources of Food Contamination

Fig 1.31

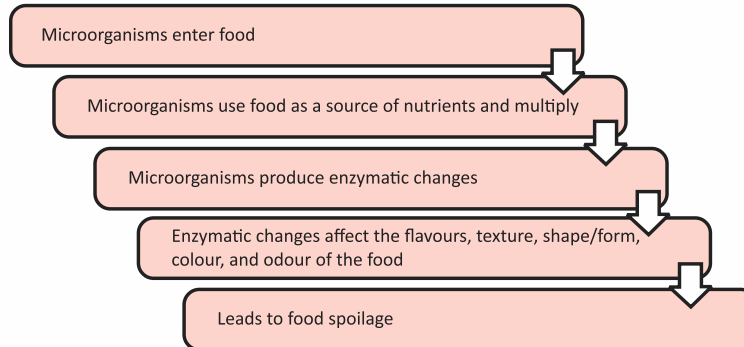


## Unit 3.2.1: Types of Food Contaminants

### 3.2.1.1 Process of Food Spoilage

The following process chart shows how food spoilage takes place:

Fig 1.32



### 3.2.1.2 Classification of Food Based on Spoilage

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

Table 1.9

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

## Unit 3.2.2: Types of Food Contaminants

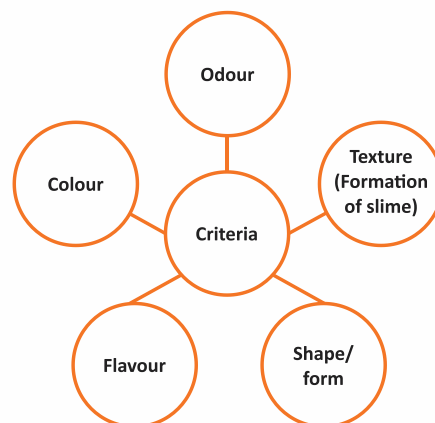
### 3.2.2.1 Criteria to Check Food Spoilage

Food Spoilage can be identified by:

1. Smell/Odour
2. Taste
3. Texture
4. Colour

The following figure summarizes the various criteria used for checking food spoilage

Fig 1.33



## UNIT 3.3: Food Preservation

### Unit Objectives

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

- State the need for food preservation
- State the different types of food preservation processes

### Unit 3.3.1: What is Food Preservation

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

- retain the original nutritive value
- retain the original colour
- retain the original flavour
- retain the original texture of the food
- extend the shelf life of the food
- ensure year-round availability
- prevent or delay spoilage

#### 3.3.1.1 Common Methods of Food Preservation

The most commonly followed methods of food preservation are:

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