INDIAN INSTITUTE OF PUBLIC HEALTH HYDERABAD

fssai

FACILITATOR GUIDE FOR ESSENTIALS OF FOOD HYGIENE – II & III

LEVEL II & III – MANUFACTURING

RSPH
ROYAL SOCIETY FOR PUBLIC HEALTH
VISION, VOICE AND PRACTICE

FACILITATOR GUIDE – LEVEL II & III
For Manufacturing Sector – Staff and Supervisors

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INTRODUCTION

This guide has been developed for use along with the books “Essentials of Food Hygiene – II” and “Essentials of Food Hygiene – III”. It meets the requirements of the Food Safety & Standards Authority of India’s (FSSAI) “Level 2” and “Level 3” training for staff and supervisors in the manufacturing sector. It aims to raise and test awareness of the principles of food safety, the hazards associated with handling and processing food for human consumption and how these hazards can be controlled.

This facilitator guide is part of an integrated training package including the books titled “Essentials of Food Hygiene – II and “Essentials of Food Hygiene - III” and several posters as well as hand outs to be used as power point presentations. There are 14 sections in this guide which match corresponding sections of the 2 books. Participants are not expected to have any previous knowledge of the subject, but must complete all sections of the programme to complete the level 2 or 3 training.

Posters and hand outs for each section are provided at the end, and these can be used as training aids. Training can be led through discussion of these aids and the guide clearly shows which poster is under consideration during each section. To accommodate different teaching styles, there are suggestions for points at which facilitators could display the poster during discussion periods. Facilitators must keep up to date with current developments to enhance their presentation. Also included in this guide are specimen assessments. This can be used for revision purposes.

The central theme is to promote a participative approach to learning. Facilitators should draw on the knowledge and often considerable experience of participants. They should remind participants of the need to apply food safety principles in their work place - knowledge is the key, but application of knowledge is vital.

PLANNING AND PROCEDURES

This programme is divided into ten or 14 sections. It is designed to be flexible and can be delivered in 7.5 hours for the level 2 trainees and 13 hours for the level 3 trainees. There is sufficient material in the guide to extend the time if a longer programme would be more appropriate. However, it could be also shortened depending on the target group of participants and their competence levels. Facilitators can select from the given content to suit the groups training needs.

Practice exercises are included in this guide. They should be used as opportunities to identify participants who may require extra help.

Preparing for the training programme

The preparation time required for teaching this programme may range from at least a day for an experienced trainer to several days for a beginner. The following points should be considered by the facilitator while preparing for the training programme:

1. **Trainee profile**: Information about the participants will be helpful so that the training can be organized well.
   - The group composition will affect its dynamics - e.g. the proportion of men to women, young to old, novices to experienced participants etc.
   - Existing skills and capabilities should be assessed, especially language and literacy levels as the training is carried out through discussions and demonstrations using posters.
   - Work experience and job responsibilities of the participants should be considered in order to make full use of their knowledge and skills.
   - Ideally, people learn best in small groups of 10-20. Larger groups may require more trainers.

2. **Facilitator profile**: Facilitators can be qualified personnel as identified by the FSSAI. They can be teachers in schools and colleges, in-house trainers in manufacturing organizations, managers within the food industry or independent trainers.

3. **Venue of the training**: It is important to check the venue of the training programme. The training venue should comply with all necessary safety standards and sufficient space should be available for all participants and for any demonstrations. The following are basic requirements that should be available at the venue:;
   - A large sink suitable for food preparation and washing up, dish cloths, scrubs, sponge, soap, detergent;

- A separate sink for hand washing - this could be situated in a nearby toilet – with hot/cold running water, soap, sanitizer and clean towels;
- Stainless steel or plastic laminate type of work surfaces or tables for food preparation which are in a reasonable condition, i.e. not chipped, cracked or badly scored, buckets, mops, disinfectant, cleaning cloths, brooms etc.;
- Cooking equipment – utensils, bowls and pans;
- A refrigerator with freezer, thermometer to measure/demonstrate temperatures;
- Garbage/Waste containers, washable protective clothing.

This is not a comprehensive list, and is just a guide which cannot cover every need or eventuality and sessions may need to be adjusted slightly to suit different situations or participants.

The following points should be kept in mind while checking the venue:

- Is it accessible for all those who wish to come?
- Is there enough space, for group work?
- Are there enough chairs?
- Is there a blackboard or a flipchart?
- Are the walls suitable to fix papers/posters?
- Are there young women participating with small children? If yes, is there a room which can accommodate them?
- Should somebody be organized who would help to look after the children?
- Does food, water, coffee/tea have to be organized? If yes, this may have to be done before the training.

SCHEDULE OVERVIEW

LEVEL 2
Total Duration: 7.5 Hours

CONTENT	TIME
Welcome, Registration and Introduction	**30 minutes**
Section 1: Food Poisoning and its causes	**1 hour**
Section 2: Hygiene control in Factories	**45 minutes**
Section 3: Personal Hygiene	**45 minutes**
Section 4: Pest control	**20 minutes**
Section 5: Temperature control	**45 minutes**
Section 6: Cleaning and disinfection	**30 minutes**
Section 7: Packaging, Labelling and Transportation	**30 minutes**
Section 8: Factory Design and Layout	**20 minutes**
Section 9: High Risk Foods & Storage Of Food	**30 minutes**
Section 10: Food Hygiene and The Law	**30 minutes**
Assessment and Evaluation	**30 minutes**
Conclusion and Certification	**25 minutes**

LEVEL 3

Duration: 13 hours

Content	Time
Welcome , Registration And Introduction	**45 minutes**
Section 1: Food Poisoning and its Causes	**30 minutes**
Section 2: Bacteria	**45 minutes**
Section 3: Food Preservation	**45 minutes**
Section 4:Hygiene Control in Factories	**60 minutes**
Section 5: Pest Control	**30 minutes**
Section 6: Personal Hygiene	**45 minutes**
Section 7: Factory Design and Layout	**60 minutes**
Section 8: Cleaning and Disinfection	**45 minutes**
Section 9: Packaging, Transportation and Labeling	**45 minutes**
Section 10: Food Safety Management System	**120 minutes**
Section 11: High Risk Foods and Storage of Food	**60 minutes**
Section 12: Supervision of Staff	**30 minutes**
Section 13: Food Hygiene and the Law	**45 minutes**
Evaluation	**45 minutes**
Valedictory function & Certificate distribution	**30 minutes**

WELCOME, REGISTRATION AND INTRODUCTION

Time: 30 - 45 minutes

A registration table should be set up at the arrival location. Participants should sign registration forms which are provided at the table. A sample registration form is included in the Appendix.

Objective:

- To introduce the programme and its structure, facilitators and participants to one another.
- To demonstrate an understanding of the need for food hygiene and food safety and the importance of reducing risks.
- To understand prior knowledge of food safety among participants.

1. Programme

It is important to begin the programme with a warm welcome and brief introduction Welcome all participants and introduce yourself, the programme and all the people involved in it. Tell participants that there are 10/14 sections in the course and the names of each of them, the objectives of the program and what is expected of them. It may also be necessary to ensure that everyone is familiar with issues such as programme schedule and timings, refreshments, location of toilets, and any other logistic arrangements.

Ask participants to give their name, place of employment and to briefly state their reasons for attending the programme. If you can identify the type of employment that the participants have then appropriate examples should be chosen to illustrate points that are made throughout the programme. Participants should be encouraged to think of ways of applying the information from the programme both at home and at work.

ICEBREAKER ACTIVITY

This is an optional introductory exercise that can be used if time permits.

Activity 1:

Participants will come up with ideas which facilitators can use to build on the participants' knowledge. They can work in small groups and compile a short list of food safety issues that have hit the headlines in the last few years. Facilitator then asks for feedback from the groups and discussion takes place of the items. This can be an opportunity to introduce topics that will be covered during the programme, such as bacteria, contamination, and temperature control.

Topics which may be discussed by participants are:

- physical contamination - examples such as a cockroach found in cooked rice, staple pins found in dal etc,
- pest infestation of food premises
- references to television programmes
- Consumption of decomposed meat, rancid biscuits,
- Cooking in tin vessels

Activity 2:
Facilitators may wish to collect press cuttings to illustrate current issues or request participants to bring such information along with them to the first session. This exercise can be concluded by pointing out that all the examples raised by the group are relevant to the need for good standards in food hygiene to ensure that food is fit for human consumption. These examples are usually caused by human error and/or because food handlers fail to observe basic hygiene rules. A further link can be made to the undoubted relevance of the topics in the rest of the programme.

The icebreaker activity allows the trainer to identify topics that may need additional emphasis or, in many cases, those that require less classroom time during the programme.

Section 1: FOOD POISONING AND ITS CAUSES AND BACTERIA

Time: 1 – 1.15 hours

Learning outcomes for Level 2:
By the end of this section, participants should be able to:

- Explain relevant terminology including: food hygiene, food poisoning, 'at risk' groups, allergic reactions.
- State the principle causes and symptoms of food poisoning
- Describe the nature and growth of bacteria & how they cause illness.
- Demonstrate an awareness of the sources of bacteria.

Learning outcomes for Level 3:

- Understand the importance of preventing food poisoning for the health of consumers.
- Describe the nature of bacteria, viruses, fungi and moulds & how they cause food poisoning
- Understand the implication of food poisoning for the business.

Methodology:

- Lecture and discussion using posters 1, 2, 3, 4 and 5 or handouts from sections 1 and 2.
- Group discussion with a case study.

This part relates to section 1 of the book "Essentials of Food Hygiene – II" for staff and sections 1 and 2 of the book "Essentials of Food Hygiene – III" for supervisors in the manufacturing sector.The main priority on this programme is to consider ways of preventing food poisoning. It explains the hazards to the population of eating food that has become contaminated, often by low standards of hygiene and poor practices.

WHAT IS FOOD SAFETY AND HYGIENE?

Discussion Question: Ask participants to create their own definitions or to identify key ideas that are important to food safety and hygiene such as cleanliness, keeping raw and cooked food apart, controlling pests, preventing food poisoning etc. The main priority on this programme is to consider ways of preventing food poisoning by giving participants the information they need to be safe food handlers.

Introduce the meaning of the terms food safety and hygiene:

"Food safety is the assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use".

"Food hygiene is the action taken to ensure that food is handled, stored, prepared and served in such a way, and under such conditions, as to prevent as far as possible - the contamination of food."

FOOD POISONING

Discussion Question: Ask questions to develop discussions around issues like:

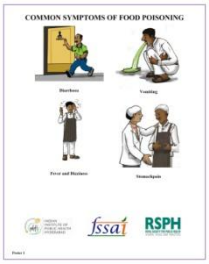
- If any participants (or their family and friends) had food poisoning and to describe how soon the symptoms started after eating contaminated food (usually 1-36 hours), how it made them feel and how long the symptoms persisted. A clear picture will emerge about of the symptoms of food poisoning.

- Who is most at risk from food poisoning and why they are more vulnerable?
  (Answer: Infants, pregnant women, elderly people and people with weak immune systems are more vulnerable and are known as 'at risk' groups)

- Have those who suffered food poisoning reported it to the doctor?

- What should a food handler do if he/she suffers from symptoms of food poisoning?

(Answer: Inform the supervisor who may require the food handler to be excluded from working with food until free from vomiting and diarrhoea for 48 hours).



Poster 1: Symptoms of food poisoning
Display poster 1 and talk through it.

Discussion Question: Ask participants why they think there has been an increase in the cases of food poisoning more recently. Interesting discussion should ensue. Some contributory factors include:

- Greater availability of ready-to-eat foods.
- More eating out – for example, ask how many of them have recently bought a take-away meal?
- Less care in storage/preparation of food.
- More pesticides used.

Accurate statistics of the total number of cases of food poisoning are not available. There are a number of reasons for this, including the fact that many people do not contact a doctor when ill. Also, not all cases are notified by doctors and are therefore not recorded. Many

people with symptoms do not have laboratory investigations to make a definite diagnosis and not all cases of vomiting and diarrhoea are caused by contaminated food.

Poster 2: Physical, Chemical and Biological Contaminants
Display poster 2 and talk through it.

Work through the poster and comment on each point. Discuss how food can be contaminated by biological (microbiological), physical and chemical hazards.

The following are examples of these hazards:

- Chemical – chemical poisons like insecticide and some poisonous mushrooms.
- Physical – undesirable substances such as fragments of glass, hair, stones and pieces of metal.
- Biological – bacteria and their toxins and viruses.

Discussion Question: Ask if participants or anyone they know, are allergic to certain foods. What symptoms they suffer? Explain that allergic reactions are not food poisoning, but can give rise to symptoms similar to food poisoning. Allergic reactions are not caused by the food being contaminated.

In order to understand why food handlers should follow certain procedures, participants will have the opportunity to learn where bacteria are found, how they grow and how they can be passed to food.

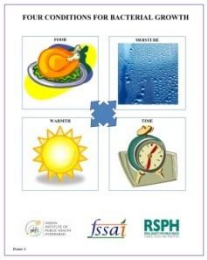
BACTERIA

"Bacteria are tiny living organisms often known as 'germs'. They are so small that it is impossible to see them without a microscope. Bacteria are usually round or rod-shaped."

Cover the following points:

- Bacteria are living cells found everywhere.
- Bacteria are everywhere: in soil, dust, water, the air around us and on our bodies.
- Variations of bacteria: harmless, beneficial, food poisoning, food spoilage and spores.
- Some bacteria can produce toxins in food.

Participants may be interested to know that the word bacteria is plural and that one cell is referred to as a bacterium.



Poster 3: Four conditions for bacterial growth
Display poster 3 and talk through it.

Bacteria are *living* organisms and in order to live and grow must have the following FOUR CONDITIONS: food, moisture, warmth and time.

Bacterial growth may also be affected by the presence or absence of oxygen and the extent to which the food concerned is acidic (pH level).

Work through the conditions for growth with discussion where possible.

1. Food (Nutrition)
Certain foods - mostly those with high protein content – are particularly rich in nutrients and contain moisture. When kept in warm conditions these foods provide a perfect environment for bacterial growth. Examples of such foods are cooked rice, meat, sea food, milk, eggs, and their products.

Foods containing sugar, salt or acid - such as jam or pickles - discourage the growth of bacteria. Some foods have preservatives (chemical substances) added to them to restrict the growth of bacteria. Facilitators can use this as a link to the next condition for growth.

2. Moisture
Bacteria need moisture to grow, and this can be found in many foods.

One of the reasons why sugar and salt discourage the growth of bacteria is that they take up the moisture that is then not available to the bacteria. Similarly, when food is frozen its moisture turns into ice and is not available to the bacteria.

3. Warmth
Bacteria that cause food poisoning will grow at temperatures between 5°C and 63° C; they grow most quickly at a temperature of around 37°C, which is the normal temperature of the human body.

Temperature Control
This topic is especially important in preventing food related illnesses. Thus facilitators must ensure that all participants fully understand the implications of this aspect of the subject.

Poster 4: Temperature Danger Zone
Display poster 4 and talk through it.

Discussion Question: Ask participants how they can prevent bacterial growth through controlling temperature?

Some examples include:

- The method of packaging of processing.
- How the product is intended to be used, e. g: further cooking/processing or ready to eat.
- Nature of the food, eg: its moisture content, pH, likely initial conten and types of microorganisms.

Many participants may have difficulty grasping what the different temperature figures really mean - try asking a question like "what is the temperature today?" Give examples such as room temperature, body temperature etc.
It is essential to explain that temperature is most important with foods like cooked meat, sea food, eggs, milk, cooked rice as nutrient (protein) and moisture are present in the food.

Other points to mention briefly are:

- killing bacteria by heat.
- Pasteurisation.
- Toxins.
- The effect of cold conditions on bacteria (i.e. refrigeration and freezing).

4. Time

Explain how bacteria grow and note multiplication rates. Include the following information:

- When provided with conditions for growth the bacterial cells multiply by splitting in two - this can happen within only 20 minutes.
- One cell can multiply into 7,000 million bacteria in 24 hours!
- Remember - food poisoning usually occurs when large numbers of bacteria are present in the food, but some food-related diseases can occur even after only low doses of bacteria have been consumed.

- The nature of food poisoning bacteria means that they cannot be detected in food: they do not affect the smell, taste, appearance or texture – i.e. food which is contaminated with food poisoning bacteria looks, smells and tastes normal.

Ask how participants could tell if food was contaminated with large numbers of disease causing bacteria – and make the point that you cannot rely on your senses to detect them in food.

Bacteria and food poisoning

Explain that a large number of bacteria are usually needed to produce food poisoning symptoms and that bacteria cause illness in one of these ways:

- Bacteria which grow throughout the food in large numbers so that when we eat the food we eat the bacteria too, for example, Salmonella species.
- Spore forming bacteria that are difficult to kill with heat, for example, *Clostridium perfringens.*
- Bacteria that release their toxins (poisons) which are heat resistant into the food before the food is eaten, for example, *Staphylococcus aureus.*
- Bacteria which are present in food in relatively small numbers and do not grow on food but multiply in the intestine, for example, Campylobacter.

As food poisoning (pathogenic) bacteria do not usually cause any change to the appearance, smell or taste of food, participants should recognise that this means food handlers must practice very high standards of food hygiene to ensure that food does not become contaminated.

Sources of bacteria

Poster 5: Ways in which bacteria enter food
Display poster 5 and talk through it.

The sources of bacteria covered in this section are:

- Raw foods
- Water/Ice
- People
- Places (e.g. equipment and surfaces)
- Other sources like pests, pets, waste food and rubbish

Discuss each of these sources.

Case study: Twenty eight school children and seven adults visited a raw milk processing plant, where they were given ice cream and raw milk. Two to five days later, nine children and three adults developed gastroenteritis. The only foods eaten by all these children (ill and well) were in the school-provided lunches. No one else in the school became sick. Stool cultures showed one bacterium in common to 9 of the ill children and not present in samples from 9 well children.

1. Identify the etiologic agent of this outbreak of food poisoning?
2. Was it food infection or intoxication?
3. How did the food get contaminated, and what item was contaminated?
4. What could be done to prevent this type of outbreak?
5. Briefly explain how you arrived at your conclusions?

Answer Hints:
Source of Infection: Raw milk
Bacteria: *Campylobacter*
Prevention: Pasteurization

Briefly reinforce the main points of this unit.

Section 2: HYGIENE CONTROL IN FACTORIES

Time: 45 – 60 minutes

Learning outcomes for level 2:
By the end of this section, participants should be able to:

- Describe hygiene control and identify risk to the consumer.
- Demonstrate an understanding of the point at which the intervention of prevention of bacteria can take place.
- Give examples of action which should be taken to prevent the contamination of food by micro-organisms.

Learning outcomes for level 3:

- Know the sources of contamination
- Identify risks to food safety from microbial, physical, chemical and allergenic hazards.
- Know how to prevent food contamination.

Methodology:

- Discussion with posters 6 and 7 or power point presentation for Section 4.
- Group Exercise

Inform participants that this section sets out the good practices they must adopt to avoid food becoming contaminated in the factory.

WHAT IS HYGIENE CONTROL?
Discussion Question: Ask participants what is meant by *hygiene control* and compare with a definition such as: "Hygiene control in factories which manufacture or process food is the adoption of practices which will reduce the risk of clean food becoming contaminated".

Food handlers have a responsibility to prevent contamination.

Cross contamination occurs through the transfer of food poisoning bacteria from a contaminated source to an uncontaminated (clean) food.

Discussion Question: How does food become contaminated?

Poster 6: Cross Contamination
Display poster 6 and talk through it.

Clean food can be contaminated in a factory:

- Due to damage to buildings and wear and tear;
- Through dirty processing and storage areas, floors, walls, ceilings and drains;
- By unclean and worn out machinery and equipment;
- By food handlers; and
- By improper manufacturing operations like handling and storage of products.
- By poor preservation processes

Give examples of how contamination occurs and ask participants how it could be prevented in each example.

Specific issues to be introduced should be related to:

- Factory environment
- Structure and maintenance of buildings
- Processing and storage areas
- Plant and equipment – portable and fixed
- Barrier hygiene practices
- Handling and storage of products
- Waste control and disposal
- Food packaging

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Ensure that participants understand that food poisoning bacteria do not travel to food by themselves, they are transferred by vehicles of contamination: especially hands, as well as equipment or cloths.

Colour coding is often used as a system to reduce mistakes related to food safety. Different colours can be used to identify different areas of the facility. Colour coding can be applied to clothing (e.g., uniforms, aprons, caps, shoes), cleaning supplies (e.g., brushes, brooms, pails), gaskets, forklifts, and any other equipment. Supervisors may have little time to train workers in food safety procedures. Colour coding can help to reduce some of this training time

Food handlers should regard raw meat, raw poultry and seafood as infected with food poisoning bacteria. Facilitators should remind participants that many outbreaks of food poisoning have occurred when good practice has not been rigorously observed.

Exercise: Hygiene Control

Working in pairs or small groups, ask participants to suggest ways in which the risk of contamination could be reduced or eliminated. Examples of risks and action required are given here for the facilitator's reference. Participants can also give suggestions of procedures and good practices from their own workplace

A sample exercise on Hygiene control is provided in Appendix (This exercise could be done individually by participants or in groups).

THE ROLE OF SUPERVISOR IN PREVENTING CONTAMINATION

Discussion question: Ask participants how they as supervisors can prevent contamination at their work place.

Possible answers:

- Implement the food hygiene policies and procedures designed to protect food from contamination.
- Ensuring barrier hygiene practices
- Train, instruct, supervise and monitor food handlers in practices designed to prevent contamination of foods.

Briefly reinforce the main points of this section.

Section 3: PERSONAL HYGIENE

Time: 45 minutes

Learning outcomes for level 2:
By the end of this section, participants should be able to:

- Explain the reasons for high standards of personal hygiene.
- Demonstrate proper hand washing techniques and their importance

Learning outcomes for level 3
By the end of this section participants should be able to:

- Ensure that sufficient facilities are available for employees to maintain good standards of food hygiene
- Ensure that high standards of personal hygiene can be maintained by staff.

Methodology:

- Demonstration (hand washing).
- Presentation and discussion with posters 8 and 9 or using handouts from section 6
- Group/ Individual Exercise.

Tell participants that this section is about personal responsibility to maintain high standards of personal hygiene.

Hand Hygiene

The human body has many bacteria on the outside and inside. The most common method of spreading bacteria is through the hands. Consequently hand hygiene is an important part of personal hygiene.

It is important for the food handler to **always wash hands thoroughly** using water and soap (preferably liquid soap). All parts of the hands and wrists must be washed under running water. It is just as important to dry hands thoroughly. Note thus, that the requirements for washing hands are:

- wash basin (wherever possible);
- hot and cold running water;
- soap;
- means of drying hands.

Note: Though it is ideal to wash hands with soap and water, several people do not have access to soap or even detergent. In their absence, it is acceptable to use coal ash as a substitute for soap to wash hands.

Poster 8: Steps involved in hand washing.
Display poster 8 and talk through.

It is important for the food handler to **always wash hands thoroughly** using hot water and soap (preferably liquid soap). All parts of the hands and wrists must be washed under running water. It is just as important to dry hands thoroughly.

Demonstration:
The facilitator can demonstrate the six steps of hand washing, and then ask a few participants to demonstrate them.

Discussion Question: Ask participants for when hands must be washed.
Discussion should also include points such as:

- someone touching their face
- someone coughing (and/or blowing nose)
- handling rubbish or closing dustbin
- smoking when on a break
- after touching any surface in public area

Poster 9: When to wash hands
Display poster 9 and talk through it.

This poster raises some points for discussion about when hands must be washed.

Emphasize on other good practice relating to face and head, such as:

- avoid coughing or sneezing in a food room
- avoid touching face and head particularly mouth, nose and ears
- keep hair covered with a net or hat
- wash hair regularly
- wear clean and protective clothing
- cover wounds and cuts with Band-Aid

- NEVER comb hair in a food area or while wearing protective clothing
- Report illnesses to supervisor.

Remind participants that hand hygiene is vital even if they are wearing gloves and that the gloves themselves can become contaminated.

REPORTING ILLNESS

Ensure participants are aware of their responsibilities to report illness such as stomach disorder, cold or cough, eye or ear discharge to the supervisor.

Exercise

Working in groups, participants should come up with a list of key points that relate personal hygiene to food safety. Level 3 trainees can list the rules they would expect a food business to have to ensure there is no risk to food from the food handlers and prepare a checklist for staff to follow good hygiene habits.

A few questions to facilitate the discussion are provided in the appendix.

THE ROLE OF A SUPERVISOR IN PERSONAL HYGIENE

Discussion Question: Ask participants how they will ensure that food handlers under their supervision are following good hygiene practices.

- Essential supervision is required to make sure that high standards of personal hygiene are maintained. The supervisors should set examples, by following all standards of personal hygiene for example, hand washing and wearing protective clothing.
- The staff should be persistently encouraged by the supervisors to maintain highest standards.
- Supervisors should ensure that proper facilities are provided for maintaining personal hygiene.
- They should provide clear instruction and training of staff including induction training and refresher courses.
- Posters and notice should be provided to remind food handlers of their personal hygiene responsibilities.
- When supervisors interview credible food handlers, they should make sure that the candidates are clean, free of skin infections and have no health problems. They should also demonstrate a good attitude towards hygiene.
- Supervisors should routinely ask food handlers to demonstrate personal hygiene rules like correct hand washing techniques.

Briefly reinforce the main points of this section.

Section 4: PEST CONTROL

Time: 20 - 30 minutes

Learning outcomes for level 2:
By the end of this section, participants should be able to:

- Recognise the signs of pest infestation and know what action to take.

Learning outcomes for level 3:
By the end of this section, participants should be able to:

- Ensure that sufficient facilities are available for hygienic and legal disposal of waste.
- Ensure that effective measures are in place for management of pests.

Methodology:

- Presentation with poster 9 or handouts of section 5.
- Discussions on own experiences.
- Group exercise

Tell participants that this section explains how to recognize pests, get rid of them and discusses the importance of denying favourable conditions and access to them.

Pests and Food

Poster 10: Pests and Food
Display poster 10 and talk through it.

Participants should know how they can help to control pests in their work premises.

Discussion Question: Ask participants to talk about the pests that are commonly found in places where food is prepared or stored and in the surrounding environment. Review characteristics and habits of each pest shown on the poster and discuss how to deal with the problems created by them.

Facilitators should use their discretion, but participants could be asked to tell of their own experiences of problems with pests.

Prevent access

Discussion Question: How to prevent pests from entering kitchen premises?

- Keep doors and windows closed as far as possible;
- Use fly screens on windows;
- Inspect the delivery bags, boxes, cartons for signs of pest;
- Find the routes by which pests gain access.

Denying Pests Favourable Conditions

Discussion Question: How can we deny pests favourable conditions for growth?

Compare students' ideas with the following suggested practices.

- Food particles and spillages should promptly be removed from work surfaces and floors;
- Unclean equipment should not be left lying around;
- A high standard of general cleanliness should be maintained;
- Any food that requires being left to 'stand out' should be covered;
- Food should not be left out overnight;
- Dried foods should be stored in containers with tight lids (this will also prevent moisture entering the food);
- All food storage areas should be regularly checked;

Signs of pests

Discussion Question: What are the signs of pests being present?

The following signs should be looked for in a food premises: Droppings, greasy trails at the base of walls and around equipment, marks on food or small mounds of food debris, nibbled wrappings, holes in cardboard containers, pest carcasses, unusual smells and noises, damage to woodwork (mice and rats nibble).

Discussion Question: what is the 3-point strategy for pest control?

- Prevent access
- Deny pests favourable conditions
- Report signs of pests

The food handler starting work early in the morning should be particularly vigilant in looking for the tell-tale signs - many pests do their work at night. If signs of pests are found or suspicion raised that the workplace is infested the supervisor must immediately be informed.

Getting rid of pests

Integrated pest management, i.e. a control programme involving a series of integrated measures to control pests that are carried out in different places should be discussed.

Group Exercise: Pest control

The participants will form small groups of 3-4 members. Each group will be given a blank form to be filled up. Each group should have a discussion on the different types of pests that are seen in a factory premises and the signs each of these pests leave behind. After that each group will list down their key points into the form provided.
An example of the form is provided in the appendix.

In a similar manner, ask the participants to mention the methods they have used to prevent and eliminate pest infestation.

THE ROLE OF THE SUPERVISOR IN PEST CONTROL:

- The supervisors and their staff should be able to recognise signs of pest's infestation.
- Supervisor should be aware of the actions needed in the event of infestation and be able to identify contamination of food products by pests.
- Signs of infestation should be reported to supervisor straight away and any contaminated food should be discarded.

Briefly reinforce main points of this section.

Section 5: TEMPERATURE CONTROL/ FOOD PRESERVATION

Time: 45 minutes

Learning outcomes for level 2:
By the end of this section, participants should be able to:

- Recognize the correct temperatures for cooking and storing food.
- Ensure temperature control systems are adhered to and equipment is used correctly.
- Describe suitable methods for storage of perishable foods.

Learning outcomes for level 3:
By the end of this section participants should be able to:

- Ensure that appropriate facilities are available to enable correct temperature maintenance at all process stages.

Methodology:

- Presentation and discussion using poster 11 and 15 and hand outs for section 3.
- Exercise

This topic is especially important in preventing food borne illnesses, thus facilitators must ensure that all participants fully understand the implications of this aspect of the programme. Ensure that participants are familiar with temperatures on the Celsius scale and that they understand important temperatures in relation to food safety.

Poster 11: Temperature Control
Display poster 11 and use as a starting point for a discussion.

Discussion Question: What are the safe methods of storing perishable foods?

- **Refrigeration:**
  Reinforce the point that placing food in a refrigerator does not kill the bacteria that the food carries but the low temperature means that *warmth* - one of the requirements for bacterial growth - is not present. The bacteria simply become dormant. If the food is removed from the refrigerator into room temperature the bacteria will begin to grow again. Foods should be refrigerated for only short periods of time, the duration varying from food to food.

Discussion Question: Give examples of food which should always be refrigerated?

Give examples of refrigerated storage periods, including the importance of following date-marks on foods.

Discuss guidelines for using refrigerators. Participants may come up with their own suggestions.

- **Freezing:**

Discussion Question: How will you store food in the freezer?

Suggested answers should include:

- All food should be wrapped, labelled and dated;
- Food should be stored neatly within the freezer and not overloaded;
- Old stock should be used before new - maximum storage periods should be known. Ingredients, processed/cooked or packaged food products shall be subject to FIFO (First In First Out), FEFO (First Expiry First Out) stock rotation system.

Freezing denies bacteria the warmth they need to grow. The coldness also turns any moisture in the food into ice - water in a form that bacteria cannot use. The length of time food can be stored in a frozen state depends on the type of food and the rating of the freezing unit. Although frozen food may not become contaminated it may deteriorate in flavour and character if stored too long.

- Food should not be crowded into the refrigerator - Enough room should be allowed for cold air to circulate (When packing refrigerated display units or freezers, care should be taken not to fill above the relevant 'load line' or obstruct air inlets).
- The temperature of the refrigerator should be checked regularly to see that it is between **1°C** and **4°C** (See Record Chart below).
- Refrigerator doors should be opened as infrequently as possible and quickly closed.
- The refrigerator should be defrosted regularly to prevent the build-up of ice. Frost free refrigerators should be used wherever possible.

- **Storage of food**

Points to mention include:

- Dry foods should be stored in cool, dry, clean and ventilated stores
- checking of deliveries to prevent any dampness or contamination from pests
- stock rotation and date-marking
- suitable storage containers and shelving
- food should be stored off the floor

The "Three C's of Food Storage": keep food Clean, Covered, and (temperature) Controlled or Clean, Cool and Covered.
This is a suitable point for discussion of safe use of tinned foods. Relevant points to raise include:

- storage conditions
- date-marking
- do not use damaged, rusty or blown cans
- do not store open tins in the fridge, transfer the food to covered containers

Exercise: Recording temperatures

Record the temperature of the refrigerator in the kitchen at the beginning of this session and at the end of it. This can be done on at least two separate occasions.

Date	Temperature before starting	Temperature when finished

If temperature was not between 1-4^{0}C discuss possible reasons, why it was not.
E.g. Door being left open for too long, very hot food being put into it, refrigerator overloaded etc.

Discussion question: What is the purpose of food preservation and what methods do you use to process food in your operations?

FOOD PRESERVATION - Participants should be aware that natural enzymes present in the food can also bring about their destruction, while chemical reactions decompose some foods. However, the main cause of food spoilage is due to contamination by microorganisms such as moulds, yeasts and bacteria.

Food preservation is the treatment of food to prevent or delay spoilage and inhibit growth of microorganisms which would make the food unfit.

It involves:

- use of low or high temperatures;
- controlling water in foods;
- use of chemicals;
- acid fermentation;
- controlled atmospheres and restriction of oxygen (vacuum packing);
- smoking; and
- irradiation.

The discussion should focus on the process involved in different types of food preservation, advantages and disadvantages of each. Failitators should also be aware of latest technologies and issues related to preservation techniques.

The role of supervisor

- The supervisor should be well versed with the policies and procedures regarding storage and temperature control.
- The food safety management process should be implemented by the supervisor.
- Proper communication to the staff about correct procedures such as reporting problems like refrigeration or removing out of date foods from display or sale should be conveyed.
- Monitoring of mandatory documentation such as temperature chart and delivery records should be done by supervisor.
- The overall responsibility of cold storage maintenance and its proper functioning rests with supervisor.
- The supervisor should ensure that procedures such as stock rotation and stock control should be implemented correctly.

Briefly reinforce the main points of this section.

Section 6: CLEANING AND DISINFECTION

Time: 30 - 45 minutes

Learning outcomes for level 2:
By the end of this section participants should be able to:

- Have an appreciation of cleaning procedures for premises, equipment and utensils.
- Maintain the premises in a clean and hygienic condition.

Learning outcomes for level 3:
By the end of this section participants should:

- Ensure all cleaning procedures are being followed.
- Ensure that appropriate facilities are available to enable safe and effective cleaning.

Methodology:

- Discussion with poster 12 and handouts of section 8
- Demonstration

The participants should understand that apart from keeping themselves clean, it is equally important to consider ways of keeping the work environment clean.

Cleaning the workplace

Discussion Question: Ask participants if they know the term '*clean-as-you-go'* and ask for examples of such tasks which they are responsible for at work.

Discussion Question: Ask if anyone is aware of a cleaning schedule at work, what tasks are included and whose responsibility they are?

Cleaning of the work-place can be divided into two broad categories:
'clean-as-you-go' and 'scheduled cleaning'

Clean-as-you-go applies to cleaning that must be done very quickly after the soiling occurs. The aim is to prevent cross-contamination, or injury to staff, or simply to keep working areas clean and tidy.

Examples of this type of cleaning are:

- Cleaning up a floor spillage just after it has happened.

Scheduled cleaning refers to cleaning tasks carried out at regular intervals. Food businesses often have a timetable which specifies all the details for each item to be cleaned. Examples of scheduled cleaning duties are:

- cleaning the store floor (DAILY)
- cleaning shelves in the dry store (WEEKLY)

Poster 12: Cleaning and disinfection chemicals
Display poster 12 and talk through it.

Discussion Question: Describe the function of each chemical

Stress the importance of adopting a thorough overall approach to cleanliness and the value of the old-fashioned hot water and elbow grease.

Remind participants that these chemicals can be dangerous and recommend they always follow the manufacturer's instructions.

Discussion: discuss some of the following points:

- Cleaning-Out of-Place (COP);
- Cleaning-In-Place (CIP);
- Cleaning and Disinfection chemicals; and
- Cleaning implements and portable equipment.

Demonstration:
The facilitator demonstrates correct techniques of how to:

- Clear the Counter.
- Wash the equipment with warm water and detergent.
- Mop the floor with water and disinfectant.
- Wipe the place with a dry cloth.

THE ROLE OF THE SUPERVISOR IN CLEANING

- Guarantee sufficient cleaning materials and suitable facilities are available and staff is given clear instructions;
- Ensure that the appropriate cleaning/ disinfecting chemical, concentration and procedure is used;
- Check that the cleaning equipment is stored properly;

- Replace broken or spoilt equipment;
- Encourage staff for high standards; and
- Audit premises and equipment for cleanliness regularly

.

Exercise: Make a cleaning schedule for the staff. A sample schedule is provided in the appendix

Briefly reinforce the main points of this section.

Section 7: PACKAGING, TRANSPORTATION AND LABELING

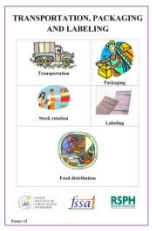
Time: 30 – 45 minutes

Learning outcomes for level 2 and level 3:
By the end of this section participants should be able to:

- Describe the importance and measures of safe packaging, transportation and labeling.

Methodology:

- Discussion with poster no. 16 and handouts from section 9



Poster 16: Packaging, transportation and labelling.
Display poster 16 and talk through it.

Stress the importance of correct packaging techniques to prevent any contamination in transportation and storage.

- **Food packaging** is the enclosing of food to protect it from damage, contamination, spoilage, pest attacks, and tampering during transport, storage, and sale. It is an integral part of food processing. It has two main functions: to advertise foods at the point of sale, and to protect foods to a pre-determined degree for the expected shelf life.
- Materials used for wrapping are not to be a source of contamination; they must be stored in such a manner that they are not exposed to a risk of contamination.
- As far as possible all unpacking and packing should be carried out in areas separate from food production or preparation to prevent contamination of open food.

Discussion Question: What are some of the key aspects which should be considered when packaging food?

- Reusable wrapping and packaging material are easy to clean and where necessary to disinfect.
- Food may be delivered in various containers including paper sacks, cardboard boxes and polythene bags.
- String removed from sacks and ties removed from bags should be immediately placed in suitable containers provided specifically for the purpose.

- Paper sacks should be cut open, although care should be taken to ensure paper do not finish up in the food.
- Special care is needed to ensure that staples, which tend to fly considerable distances when boxes are opened, do not contaminate food.
- Suppliers should be requested to use adhesive tape to fasten boxes, instead of staples.

Discussion Question: Discuss the important aspects of stock rotation system?
(Answers:

- Daily checks should be made for out-of-date- stock.
- First in First Out and First Expire First Out stock rotation system should be applied to release the food products from the store.

Packaging and rotation of food:

- Refrigerators should not be overloaded and they need packing in a manner which allows good air circulation.
- Good stock rotation is essential.

LABELLING

Food labelling is a means of communication between the producer and seller of food on one hand, and the purchaser and consumer of the other. It can be a written, electronic, or graphic communication on the packaging or on a separate but related label.

Discussion Question: What are the advantages of labeling a food product?

(**Answer Hint**:

- It helps to ensure adequate and accessible information availability to the next person in the food chain.
- Enable them to handle, store, process, prepare and display the food products safely and correctly.
- Batch can be easily traced and recalled if necessary.)

The details that need to be filled in a label include the following:

- a list of ingredients and quantities
- allergens (products which may cause allergies)
- the minimum durability date
- conditions for storage
- A batch, code or lot number which is a mark of identification by which the food can be traced in manufacture and identified in distribution

Discussion Question : what are the basic standards required during transportation of food?

(Answer:

- Vehicles used to transport foods must be maintained in good repair and kept clean.
- The temperature of food when transported in containers should be maintained at the required temperature.
- For bulk transport, containers and conveyances shall be designated and marked for food use only and be used only for that purpose.
- Conveyances and containers for transporting food shall be kept in an appropriate state of cleanliness, repair and condition.
- The vehicle used for transport shall not carry animals, toxic substances or contaminating materials along with the prepared food.
- Food shall be adequately protected during transport.)

Note on Traceability:

All food products placed in the market must be adequately labelled or identified to enable full traceability. Food businesses have a legal duty to withdraw products from the market that they identify as unsafe and carry out a full recall of these products.

Briefly reinforce the main points of this section.

Section 8: FACTORY DESIGN AND LAYOUT

Time: 20 - 60 minutes

Learning outcomes for level 2:
By the end of this section participants should be able to:

- Understand how good design and layout of a kitchen improve food safety.

Learning outcomes for level 3:

- Chooses the appropriate design, layout and equipment of food premises to minimize potential food safety hazard.

Methodology:

- Discussion with handouts of section 7.
- Group exercise.
- Demonstration.

Discussion Question: What are the important guidelines that need to be followed to keep a factory hygienic?

A hygienic layout is one that allows plenty of space for work and storage, and provides separate working areas for each of the food categories - raw, high risk, vegetables and other.

- Work surfaces should be strong, durable, easy to clean and made of smooth non-absorbant materials.
- Food should be kept away from the walls and not be stored directly on the floor.
- Walls should have glazed tiles in areas where walls are likely to be stained with food
- The ceiling should be water resistant and finished so as to minimize collection of dirt and shedding of particles.
- Effective ventilation system is required; ventilation systems should ensure that air does not flow from unclean to clean areas of the premise.
- Factory should be well lit, either with natural or artificial light.
- Waste bins should be stored away from food areas; bin should be covered with a lid.
- Toilets should be situated away from food area. Hand wash basins should have running water and supplied with materials for cleaning and drying hands.

Exercise: Factory Layout

Ask participants to form groups. Each group after discussion among themselves will have to draw an outline of a manufacturing factory.
This exercise can be used as a starting point for discussion on work flow.
Discuss procedures and answers.

- Participants should understand the importance of the separation of 'clean' and 'dirty' areas, using a clearly identified area for each separate procedure
- The exact work flow will depend upon the size of the manufacturing unit as well as on the type of food products it prepares, but the work should flow smoothly, giving consideration to:

Delivery➔ Storage➔ Preparation➔ Service

(Answer hint: Things that need to be taken into consideration for a proper layout of a manufacturing unit are work surface, floor, walls, ceilings, ventilation, lighting, drainage system, waste disposal area.)

What is Effluent Treatment?

The content and quality of the liquid wastes (effluents) that flow out of a food factory are dependent on the process taking place. In some cases objectionable smells can arise, for example, from the effluents of milk factories and confectionery factories. The aim of effluent treatment is to remove, as far as possible, any nuisance or potential damage to the environment. Some factories ship out effluent or it enters the local sewerage system to be handled by the local water authority.

Discussion Question: What are the advantages of an effluent treatment in factories?

(Answer: The advantages are:

- avoids the nuisance of odour to the factory and local residents,
- avoids the possibility of contaminating the factory with fine sprays (known as aerosols) containing microorganisms and effluent solids.)

Briefly reinforce the main points of this section.

Section 9: HIGH RISK FOODS & STORAGE OF FOOD

Time: 30 -1 hour minutes

Learning outcomes for level 2:
By the end of this section, participants should be able to:

- Properly handle high risk foods by taking necessary steps during storage.

Learning outcomes for level 3:
By the end of this section, participants should be:

- To enable staff to identify high risk foods
- To instruct staff to segregate high risk food from low risk and direct them in storing high risk food in appropriate conditions

Methodology:

- Discussion with posters 14 and 15 and handouts related to section 11.
- Exercise.

Group Exercise: High risk and low risk foods
The participants can be divided into groups and each group can be given a bag of food items or images of these foods (both high and low risk foods). The members of each team need to separate the foods based on whether they are high and low risk.

Discussion Question: List the high risk foods and the reasons for being so?

Poster 14: High Risk Food
Display poster 14 and talk through it.

High-risk foods are ready to eat foods that under unfavourable conditions support the multiplication of harmful bacteria and intended for consumption without treatment which would destroy such organisms. High risk foods are most likely to be involved in cases of food poisoning.

According to the Food Safety and Standards Authority of India, the High risk foods include the following:

- Cut fruits/ salads, fresh juices and beverages;
- Confectionary products;
- Meat, poultry and fish products;
- Milk and dairy products;
- Water based chutneys, sauces etc;
- Food transported to point of sale from point of cooking;
- Food with gravy;
- Fried foods;
- Post cooked mixing; and
- Thawing of frozen products.

Facilitators may consider it appropriate to discuss **Guidance for Handling Eggs** at this point (especially in relation to vulnerable consumers):

- wash your hands before and after handling eggs
- do not store or use cracked eggs
- store eggs in cool dry conditions, for preference in the fridge
- avoid cross contamination: raw egg can contaminate other food or be contaminated by other food
- avoid using raw shell egg in recipes where no cooking, or only light cooking is involved – discuss availability of pasteurised eggs
- cook eggs adequately
- eat egg dishes as soon as possible after preparation or keep refrigerated

Low-Risk Foods

These foods are rarely implicated in food poisoning and may be stored, suitably packaged, at ambient temperatures. They do not support multiplication of food poisoning bacteria.
Some examples include:

- Preserved food such as jam;
- Dried foods or food with little moisture, such as flour, rice bread or biscuits. But once liquid has been added to powered food, such as milk, the food becomes high risk;
- Acid foods such as vinegar or products stored in vinegar;
- Fermented products;
- Foods with high fat/sugar content, such as chocolate; and
- Canned foods, whilst unopened.

Storage of food:

Discussion question: How should different kinds of food be stored?

Storage of the following foods should be discussed:

- Raw meat and poultry
- Eggs
- Fruits and vegetables
- Milk and cream
- Ice cream
- Cereals and Flour

Exercise: Supervisors should develop effective checklists/documentation systems for delivery and unloading of raw material.

Precautions about unfit or damaged stock/food should be emphasized.

Briefly reinforce the main points of this section.

Section 10: FOOD HYGIENE AND THE LAW

Time: 30 - 45 minutes

Learning outcomes for level 2:
By the end of this section participants should be able to:

- Know the requirements of relevant food safety legislations.
- Know the possible enforcement activities and penalties.
- Ensure that activities within their department comply with legal requirements.

Learning outcomes for level 3:

- Explain food business operator and staff responsibilities with regard to food safety legislation.
- Ensure that food business complies with all relevant food safety legislation.

Methodology:

- Lecture with relevant handouts.

Everyone working with and handling food needs to understand the law as it relates to their business and themselves. More information is available from the Food Safety and Standards Authority of India website *http://fssai.gov.in.*

Talk about the general requirements needed to be followed by a catering company in order to maintain food safety.

Discussion Question: Briefly discuss with participants the evolution of the Food Safety and Standards Act.

(**Answer:** The FSS Act consolidates the earlier laws relating to food. As part of the process of consolidation, the eight earlier food laws in the country have been repealed since this Act came into being on August 5th, 2011. It lays more emphasis on science based and participatory decisions in both standard setting and implementation. The Act enables unidirectional compliance and addresses the need for a single regulatory body.

FSSAI and the State Food Safety Authorities enforce various provisions of the FSS Act. The Ministry of Health & Family Welfare, Government of India is the Administrative Ministry for the implementation of FSSAI.

The Act aims to achieve an appropriate level of protection of human life and health and the protection of consumer's interests, including fair practices in all kinds of food trade with reference to food safety standards and practices. Food business operators should thus ensure that the articles of food satisfy the requirements of this Act, at all stages of production, processing, import, distribution and sale within their business.)

PREVENTION OF CONTAMINATION OF FOOD BY FOOD HANDLERS

All food handlers have responsibilities to keep food safe, but the major legal responsibilities relate to actions that should be implemented by management. However, participants should be aware of the important role they can play in preventing food related illnesses. Ask participants if they can identify some of their own responsibilities as food handlers and supervisors.

Ask participants to suggest consequences of POOR hygiene in food premises. Discuss their ideas and consider points such as:

- dissatisfied customers
- illness (even death) of customers
- loss of firm's reputation
- bad publicity
- increase in food waste
- unpleasant working environment for staff
- conditions which may lead to pest infestation
- prosecution, disqualification or closure

EXTRA SECTIONS IN LEVEL 3

Section 11: FOOD SAFETY MANAGEMENT SYSTEM

Time: 2 hours

Learning outcomes:
By the end of this section participants should be:

- Ensure that the staff is complying with good hygiene practices (GHP) including HACCP
- Ensures that there is an effective FSMP.

Methodology:

- Lecture using poster 13 and 17 and relevant handouts

FOOD SAFETY MANAGEMENT PROCESS:
The Regulations establish that the implementation of adequate food safety operations is a voluntary effort by food businesses. To do this, food business operations that serve, process or sell food must have a food safety management system in place that guarantees safe food. Such a system is based on HACCP or Hazard Analysis Critical Control Point system principles i.e. established principles of hygiene management.

Food safety management is defined as the application of food policies, systems and processes in a food operation in order to prevent foodborne illnesses and protect consumer health

Although the concept of food safety management and HACCP is simply based on *prevention*, experience has shown that students can find the terminology confusing, especially if they are not familiar with such systems in their workplaces. Tutors must use their professional judgement as to how much information is appropriate for their students. However, students must be made aware of their own responsibilities as food handlers within their businesses' food safety management systems. This may include responsibilities for monitoring, recording and reporting actual and potential food safety hazards.

However this is approached, the central objective is PREVENTION - action taken to prevent a problem arising rather than action to deal with a problem that has happened. Start the topic with an initial exploration of the participants' existing knowledge and experience of Risk Assessment and of Hazard Analysis Critical Control Point System (HACCP). Risk assessment and hazard analysis throughout preparation/production of food reduces the importance of end point inspection of a product.

Cover points in the lecture relevant to the interests and needs of the participants, such as:

- all food businesses must have a food safety management system based on HACCP principles
- food handlers must receive training, instruction or supervision to a level appropriate to their job
- individuals responsible for the food safety management system must receive appropriate training in HACCP
- food premises must be registered with the local authority

HACCP (Hazard Analysis Critical Control Point System)

HACCP was developed in the USA to ensure safe foods to astronauts. Essentially HACCP is concerned with identifying possible hazards associated with a food product and its catering process. A HACCP system is most suited to food production and manufacturing businesses, but the principles can be applied even to small catering enterprises.

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Poster 17: Seven principles of HACCP.
Display poster 17 and talk through it.

THE SEVEN PRINCIPLES OF HACCP

1. Conduct a hazard analysis
2. Identify critical control points
3. Establish critical limits for each critical control point
4. *Establish critical control point monitoring requirements*
5. Establish corrective actions
6. Establish record keeping procedures
7. Establish procedures for verifying the HACCP system is working as intended

Monitoring, Recording and Reporting

Sometimes the hazard can only be reduced to an acceptable level. Whether a hazard can be reduced or eliminated, a process of monitoring each CCP is established to confirm that the required target is achieved. From this you will understand that continuous supervision of the system is needed, records must be kept and any faults must be reported.

Keeping a regular, written record of what is controlled or checked and the results of those checks helps establish that the methods in place for controlling a hazard are working and makes it easy to identify when something goes wrong or something different happens. Notes can then be kept of what happened and what was done to put it right. This might include notes of other actions taken to ensure food is safe to eat and could be a valuable part of due diligence defense.

Most food safety management systems used in the workplace will require the monitoring, recording and reporting of food safety hazards and critical control points. For example the temperature of refrigerators, freezers, chillers and hot-holding cabinets should be monitored and recorded and any of these that are too high or too low should be reported to a supervisor or line manager.

Ask participants for examples of what they might monitor in their place of work, and discuss what they would report to their line managers (this discussion could be used to introduce the idea of critical limits: a refrigerator with a temperature of 6°C might not be reported, but a refrigerator at 9°C should be). A selection of different record sheets could be displayed to stimulate discussion of what information should be recorded.

ADVANTAGES OF HACCP

Instead of waiting for a problem to arise and then take action, HACCP seeks to determine what problems might arise and to prevent them from happening in the first place. This is logical and sensible and reduces the need for time-consuming inspection of the finished food item.

Section 13: SUPERVISION OF STAFF

Time: 1 hour

Learning outcomes:
By the end of this section participants should be:

- Monitor and supervise the staff to ensure that they comply with food safety management process.
- Initiate and establish protocols to ensure staff have adequate training to ensure production of safe food.

Methodology:

- Lecture using relevant handouts
- Group discussion, Role play

Exercise

Participants can, think about typical supervision situations they had. They must identify their strengths and weaknesses as a supervisor in that situation and share this with others.
The group should also brainstorm about ideal environment for effective supervision.
(The knowledge, skills and attitude that a supervisor needs should come out in this discussion)

Participants may also discuss about different styles of leadership and which styles are better.
A role play can be developed from the typical situation and participants asked to enact that.

Reinforce the main points of this section.

Monitoring, Recording and Reporting

Sometimes the hazard can only be reduced to an acceptable level. Whether a hazard can be reduced or eliminated, a process of monitoring each CCP is established to confirm that the required target is achieved. From this you will understand that continuous supervision of the system is needed, records must be kept and any faults must be reported.

Keeping a regular, written record of what is controlled or checked and the results of those checks helps establish that the methods in place for controlling a hazard are working and makes it easy to identify when something goes wrong or something different happens. Notes can then be kept of what happened and what was done to put it right. This might include notes of other actions taken to ensure food is safe to eat and could be a valuable part of due diligence defense.

ADVANTAGES OF HACCP

Instead of waiting for a problem to arise and then take action, HACCP seeks to determine what problems might arise and to prevent them from happening in the first place. This is logical and sensible and reduces the need for time-consuming inspection of the finished food item.

THE SEVEN PRINCIPLES OF HACCP

8. Conduct a hazard analysis
9. Identify critical control points
10. Establish critical limits for each critical control point
11. *Establish critical control point monitoring requirements*
12. Establish corrective actions
13. Establish record keeping procedures
14. Establish procedures for verifying the HACCP system is working as intended

Briefly reinforce the main points of this section.

EVALUATION/ ASSESSMENT

Time: 30 minutes

The facilitator could use one or more of the assessment types given below depending on the available time as well as level of food handlers. Participants can be asked to note their responses on the given assessment sheet. In case of participants who are not able to write responses, oral answers can be noted by the facilitator.

Assessment Sample 1: Group Exercise

Write down **THREE** important things food handlers in manufacturing sector should DO to keep food safe to eat and to prevent hazards in food reaching consumers.

1.

2.

3.

Assessment Sample 2: Reducing Risk of Contamination

What can you do to reduce or eliminate the risk to the consumer?

Sr. No.	Risk to consumer	Action required
1.	Juices from raw meat and poultry drip onto cooked foods in the fridge	
2.	Raw and cooked foods prepared on the same work surface	
3.	Bacteria spread by dirty wiping cloths	
4.	Raw and cooked foods prepared using the same equipment and utensils	
5.	Handling raw foods and cooked foods	
6.	Frozen foods thawed on work surfaces	
7.	Evidence of pest infestation	
8.	Traces of left-over food on a chopping board	
9.	Waste food left in an open bucket by the kitchen door	

Assessment Sample 3 – True/False

Are these statements TRUE or FALSE? Delete as appropriate

1. Bus drivers are most at risk of a serious outcome if they suffer from food poisoning **TRUE/FALSE**

2. Bacteria in food is the most common cause of food poisoning **TRUE/FALSE**

3. A jar of pickled onions is a *high risk* food **TRUE/FALSE**

4. Bacteria will grow on cooked chicken at 37°C **TRUE/FALSE**

5. An elderly person is not at risk from food poisoning **TRUE/FALSE**

6. Bacteria grows easily on cold meat if left overnight in a warm kitchen **TRUE/FALSE**

7. Bacteria can be spread by dirty wiping cloths **TRUE/FALSE**

8. A cut on your hand should be covered with antiseptic cream to protect food from contamination **TRUE/FALSE**

9. Raw and cooked meats should be prepared and stored separately **TRUE/FALSE**

10. Food handlers should wash their hands after handling waste food and rubbish **TRUE/FALSE**

11. Bacteria are not often found on people **TRUE/FALSE**

12. Modern refrigerators can now kill bacteria **TRUE/FALSE**

13. If you thaw a frozen chicken completely it will not contain any bacteria **TRUE/FALSE**

14. If you find a dead mouse in your workplace you must tell your supervisor T**RUE/FALSE**

15. A stone in a fruit cake is defined as an accidental hazard **TRUE/FALSE**

16. A detergent kills all bacteria **TRUE/FALSE**

17. Food law requires you to report to your supervisor if you are suffering from vomiting and diarrhoea **TRUE/FALSE**

18. The *Temperature Danger Zone* is 1°C – 4°C **TRUE/FALSE**

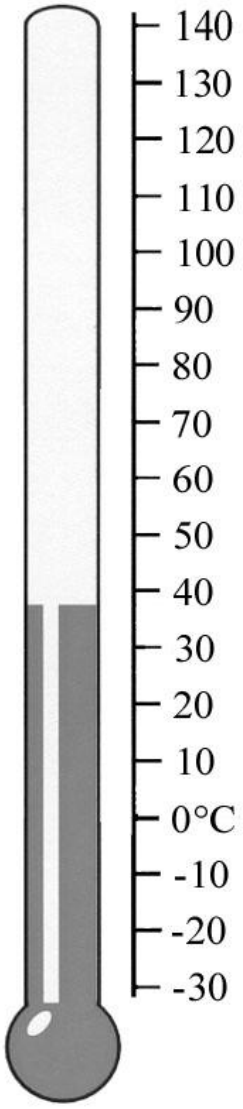
The answers are:

a) false	b) true	c) false	d) true	e) true	f) false	g) true	h) true
i) false	j) false	k) false	l) false	m) true	n) false	o) false	p) true

Temperature Control: Worksheet

Fill in the correct temperatures on the thermometer below:

- recommended temperature range for a refrigerator
- recommended temperature range for a freezer
- range of the Temperature Danger Zone
- temperature at which most bacteria can grow very quickly
- temperature which is needed to kill spores
- temperature required to ensure thorough cooking of food



CONCLUSION

Time: 10 minutes
Objective:

- To have an over view of the course, conclusions/ corrective actions if necessary

Conclude the course with an evaluation/ assessment/ test and distribution of certificates.

APPENDICES

This Certificate of completion

is hereby given to: _____

_____

For successfully completing the

Essentials of Food Hygiene – II

for Manufacturing Sector – Staff Training Programme

Organized under:

Food Safety and Standards Authority of India

_____

INDIAN INSTITUTE OF PUBLIC HEALTH HYDERABAD

fssai

RSPH
ROYAL SOCIETY FOR PUBLIC HEALTH
VISION, VOICE AND PRACTICE

EXERCISES

REGISTRATION FORM

Sl. No.	Name	Organisation/ Profession	Contact details	Signature

Exercise 2: Hygiene Control

What can you do to reduce or eliminate the risk to the consumer?

Sr. No.	Risk to consumer	Action required
1.	Materials and equipment which are stored outside, such as pallets and cleaning chemical bulk containers for long period of time accumulate leaves, other wastes and provide shelter to pests	Roadways and pathways must be kept free for access and they must also be maintained and kept clean to prevent dirt being spread around the factory site and carried into buildings.
2.	cracked walls and chipping of paint from ceiling	Any signs of damage and disrepair, whether inside or outside should be reported to the management.
3.	Accumulation of waste materials and food deposits in the drainage	Keep drains clean in food processing areas; drains should be capped when not in use.
4.	plant and equipment used and left standing for long period of time with traces of food on it.	Clean and disinfect after every use
5.	Food handler wearing same dirty apron every time while handling food	Keep clean; follow restrictions placed on their movements by company rules which aim to ensure that the food produced is safe.
6.	Evidence of pest infestation	Inform the supervisor and take corrective measures
7.	Waste food left in an open waste bin by the factory exist	Food should be covered; report sighting of pests; keep food areas free from infestation.
8.	Damaged food product delivered to the plant	Deliveries of food packaging should be inspected on receipt to ensure freedom from contamination, pest infestation and damage which might place food products and factory hygiene at risk.

Read the following statements about Food Hygiene carefully and then select TRUE or FALSE:

a) It is best to use clean wiping cloths	**TRUE/FALSE**
c) A red colour code is best for items used for raw meat	**TRUE/FALSE**
d) The main aim of hygiene control is to prevent contamination	**TRUE/FALSE**
e) It is best to store raw poultry on the shelf in the fridge above vegetables	**TRUE/FALSE**
f) If a cake is filled with fresh cream it is not necessary to store it in a refrigerator	**TRUE/FALSE**
g) It is wise to think of all raw meat and all raw poultry as contaminated with food poisoning bacteria	**TRUE/FALSE**
h) You can safely prepare raw and cooked foods on the same work surface	**TRUE/FALSE**
i) You can reduce the risk of cross contamination by keeping raw foods away from other foods	**TRUE/FALSE**
j) You can only cause cross contamination by smoking in the workplace	**TRUE/FALSE**
k) Equipment which has been used to prepare raw meat and poultry must be thoroughly cleaned as soon as the job is finished	**TRUE/FALSE**
l) The same cloth can safely be used for washing up and cleaning areas, which was previously used to prepare raw and cooked foods, as long as it is changed every day	**TRUE/FALSE**
m) You cannot spread bacteria from yourself to food	**TRUE/FALSE**
n) As long as the temperature is low, food stored in a fridge cannot become contaminated	**TRUE/FALSE**

SECTION 3: DISCUSSION QUESTION: Personal Hygiene

When must food handlers wash their hands?

What actions should the food handler take to avoid contaminating food?

Why shouldn't the food handler wear jewellery at work?

What should the food handler do to prevent hazards from wounds on hands?

Why and when should the food handler wear protective clothing?

Exercise: Pest control

Type of Premises: _____

No.	Pest	Signs of Infestation	Preventive method used	Elimination method used

OPENING AND CLOSING CHECKS

It is essential that you and your staff do certain checks every time you open and close. This helps you maintain the basic standards you need to make sure that your business manages food safety.

OPENING CHECKS								
You should do these checks at the beginning of the day. You can also add your own checks to the list.								
No	**Checks**	**Monday**	**Tuesday**	**Wednesda**	**Thursday**	**Friday**	**Saturday**	**Sunday**
1	Your chilled display equipment, fridges and freezers are working properly.							
2	Staffs are fit for work and wearing clean work clothes.							
3	There are plenty of hand washing and cleaning materials (soap, paper towels, cloths etc.)							
4	Check for signs of pests.							
5	Surfaces are clean (counter tops, floors, equipment etc.)							
6	The shop is ‘fit to trade’, i.e. clean and tidy, shelves stocked up etc.							

CLOSING CHECKS								
You should do these checks at the end of the day. You can also add your own checks to the list.								
No	**Checks**	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
1	Foods that have passed their 'use by' date, or any damaged or unfit (e.g. mouldy) foods, have been removed from sale.							
2	Foods removed from sale have been disposed of correctly or placed in a special area if being returned to a supplier.							
3	No unwrapped food is left out.							
4	The shop is 'fit to trade', i.e. clean and tidy, shelves stocked up etc.							

EXTRA CHECKS

Carrying out extra checks regularly helps you make sure your safe methods are being followed.

In the table below there are examples of some extra checks. Write down the details of extra checks that you do and how often you do them. You can add other checks below.

What to do?		Details of check	How often?
Deep clean(example)	Clean behind equipment, dry goods shelving, walls, ceilings, vents, outside waste areas etc.	Deep clean display and storage areas and outside waste areas, including walls, ceilings, and vents.	Every 6 weeks usually on a Thursday
Deep clean	Clean behind equipment, dry goods shelving, walls, ceilings, vents, outside waste areas etc.		
Maintenance	e.g. freezers defrosted		
Temperature probe	If you use a probe, check regularly that it is accurate.		
Date checks and stock rotation for best before' coded products	e.g. check tins, jars, boxes etc. Remember, eggs must be sold seven days before the 'best before' date.		
Pest control check	e.g. look for signs of damage to walls, doors etc. that could let in pests, and signs of pests.		

HANDOUTS FOR LEVEL 3 TRAINING

Section 1 & 2

FOOD POISONING, ITS CAUSES & BACTERIA

Symptoms of Food Poisoning

- Nausea
- Vomiting
- Diarrhoea
- Stomach pain
- Dehydration

'At risk' groups

We are all 'at risk' of food poisoning
BUT
some groups are more vulnerable and could suffer serious outcomes.

- infants
- pregnant women
- elderly people
- people with weakened immune systems

Contamination of Food - Hazards to Consumers

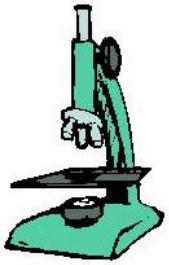
- **Chemical**
  - *Chemical poisons like insecticide*
  - *Poisonous plants like some mushrooms*

- **Physical**
  - *Undesirable substances in food like fragments of glass, nails, stones, Band-Aids, hair, shards of metal*
- **Allergenic**
  - *Food allergies, example: groundnut and other nut allergies*

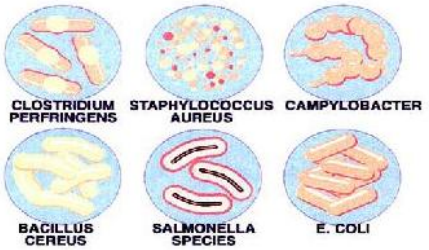
- **Biological**
  - *Bacteria and their toxins, viruses, moulds, yeasts and protozoa*

Names of Common Food Poisoning Bacteria

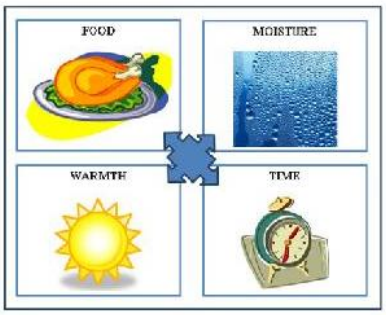
- *Salmonella*
- *Clostridium perfringens*
- *Staphylococcus aureus*
- *Bacillus cereus*
- *Campylobacter*
- *Listeria monocytogenes*
- *E.coli*



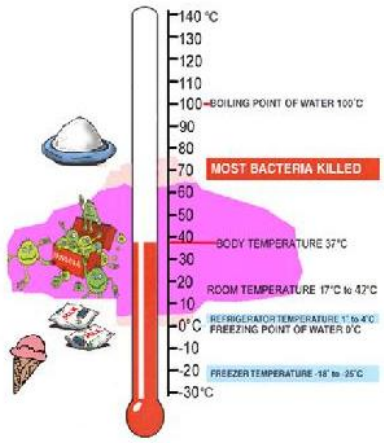
Food Poisoning Bacteria As Seen Through a Microscope



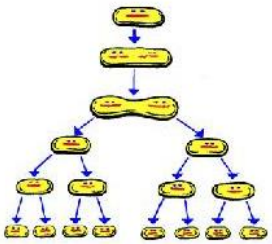
Conditions for Bacterial Growth



Temperatures & Bacterial Growth



Binary Fission



Under the right conditions, each bacterial cell can multiply as quickly as once every 10-20 minutes

Sources of Food Poisoning Bacteria

Ways in which *Salmonella* gets into food…

- from food handlers due to handling food after using the toilet, without washing hands

or

- from handling cooked food without washing hands after preparing raw food

Cost and benefits of hygiene and food poisoning

- The costs of poor hygiene:
  - The costs for the employers include reduction in sales, loss of working days and inefficiency from staff, fines and costs of legal action taken due to breach of legislation, loss of business and reputation, food losses, low employee morale, greater risk of pest infestation.
  - For employees, this would include losing their jobs or bonuses
- The benefits of good hygiene:
  - Content customers, better standards of food safety, better status and improved business, improved brand value, less food wastage and longer shelf life, good working conditions, more productivity;
  - Decreased possibility of food poisoning and food complaints.

Summary Of Section 1

- 'At risk' groups include infants, pregnant women, elderly people and people with reduced immunity
- Food can be contaminated by biological, physical and chemical hazards
- The main cause of food poisoning is bacterial contamination

Summary of Section 2

- Each bacterium is a single cell which can multiply and grow
- There are different types of bacteria, for example: harmless, spoilage and pathogenic
- Some can turn into heat resistant forms called spores
- Bacteria need food, moisture, warmth and time to grow
- High-risk foods provide nutrition and moisture for bacterial growth
- Bacteria grow best in the temperature danger zone 5°C - 63°C
- Bacteria grow more quickly around 37°C (human body temperature)
- Bacteria multiply by splitting into two (*binary fission*)
- Your senses (sight, taste, smell) cannot tell if food is contaminated by food poisoning bacteria.

Section 3

Food Preservation

Preservation methods

- Food preservation is the treatment of food to prevent or delay spoilage and inhibit growth of microorganisms which would make the food unfit.
- Preservation may involve:
  - use of low or high temperatures;
  - controlling water in foods;
  - use of chemicals;
  - acid fermentation;
  - controlled atmospheres and restriction of oxygen (vacuum packing); and
  - smoking.

Preservation by use of low or high temperatures

- Chilling and refrigeration
- Freezing of food
- Cook-chill and cook-freeze
- Heat treatment

Refrigeration

- Store raw and cooked foods in separate units or raw foods *below* cooked foods
- No hot food in the fridge - cool it quickly within 90 minutes
- Cover all food
- Don't overload the fridge
- Temperature of fridge should be between1°C and 4°C
- keep the door closed as much as possible
- keep the fridge clean and defrosted

Freezing

- Keep food at a temperature -18°C to -25°C
- Length of time food to be stored in frozen state depends on type of food and rating of the freezing unit.
- All food should be wrapped, labelled and dated
- Food should be stored neatly and not overloaded within the freezer
- Old stock should be used before new (FIFO – First In First Out & FEFO – First Expiry First Out)

Cook-chill and cook-freeze

- ***Cook-chill*** - Immediately following thorough cooking, the food is rapidly *chilled* and then stored at a low temperature.
- Refrigerators and freezers are NOT suitable for chilling.
- Only purpose-built chilling equipment, for example a blast-chiller
- ***Cook- Freeze*** - following cooking, the food is rapidly *frozen* and then stored in freezers where it can remain for 2 and 12 months

Heat Treatment

- Uses high temperatures for a short amount of time.
  - Blanching
  - canning
  - Pasteurizing
  - Cooking
  - UHT Treatment

Controlling water in foods

- Drying
  - Spray driers
  - Fluidised bed driers
  - Rotary driers
  - Vacuum band driers.
  - Belt driers

Other methods

- Chemical preservation
- Fermentation
- Smoking of food

Storage of Food

- Storage areas should be cool, dry, clean and ventilated
- Check deliveries on arrival
- Store food off the floor
- Follow date-marks and rotate stock: first in, first out (FIFO)
- Keep food covered
- Do not use damaged tins
- Dispose of unfit food safely
- Check storage areas regularly

The Role of Supervisor

- Be well versed with the policies and procedures regarding storage and temperature control.
- Develop standard operating procedures to ensure proper storage and control
- Implement food safety management process.
- Proper communication to the staff about correct procedures.
- Monitor mandatory documentation.
- Ensure procedures such as stock rotation and stock control.

Section 4

HYGIENE CONTROL IN FACTORIES

Contamination

- Direct contamination – when high risk food has close contact with contaminated source.
- Indirect contamination – When bacteria are transferred indirectly through, for example hands, equipment, and work surfaces.
- Cross-contamination - The transfer of bacteria from a contaminated source to an uncontaminated (clean) food.
- Hygiene control is the adoption of practices which will reduce the risk of clean food becoming contaminated.

Factors contributing to Hygiene control

Critical issues to consider for hygiene control

- Factory environment
- Buildings – structure and maintenance
- Processing and storage areas
- Plant and equipment
- Movement of people and barrier hygiene practices
- Handling and storage of products
- Waste control
- Food packaging
- Changes in food production

COLOUR CODING

Cross contamination can be prevented by using a colour coding system.

COLOUR	Colour coding for cleaning equipment
RED	Food processing area
GREEN	Delivery and pick up area
YELLOW	Washrooms
BLUE	Canteen

The role of the supervisor in preventing contamination

- Implement the food hygiene policies and procedures designed to protect food from contamination
- Train, instruct, supervise and monitor food handlers in practices designed to prevent contamination of foods.

Checklist for contamination control

- Purchase Food and raw materials from a well-known, clean and reliable supplier.
- Accept deliveries only when transported in a clean and properly equipped vehicle.
- Inspect deliveries immediately on arrival.
- Shift delivered goods to appropriate storage, refrigerator/cold store, once check is complete.
- Store high risk foods away from raw foods at all times.
- Handle food as little as possible, maintaining thorough personal hygiene at all times.
- Keep food covered or protected at all times unless it is being prepared or processed.
- Premises, equipment and utensils should always be kept clean and in good condition.
- Clean and disinfect all empty containers before filling with food.
- Keep cleaning materials away from food.
- Remove waste food and refuse from food areas as soon as possible.
- Sustain an active pest control programme.
- Control movement of visitors and maintenance workers in high risk areas.
- Examine food areas and processes regularly, and take action on any defects or unhygienic practices.
- Ensure sufficient thawing of foods, away from other foods.
- Make proper provisions for cooling food prior to refrigeration.

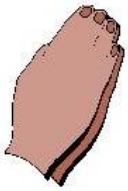
Summary of Section

- Many raw foods can carry bacteria.
- Food can get contaminated with bacteria by raw foods, equipment, water, pests and by food handlers - so clean well and clean often.
- Colour-coding helps to keep food safe.
- Maintain a high standard of personal hygiene.
- Maintain high standards of environmental hygiene.

Section 5

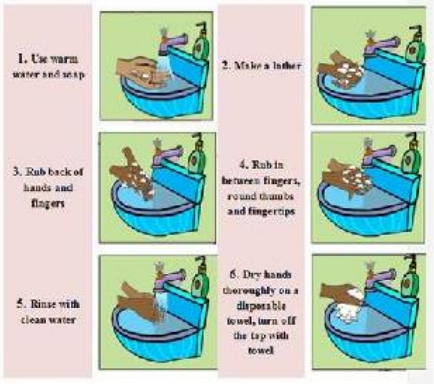
PERSONAL HYGIENE

Bacteria spread through hands of food handlers



Wash hands, wash well

Steps involved in washing hands

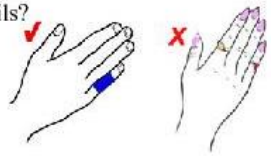


Hands must be washed:

- Before
  - handling food
- During
  - Food preparation as often as necessary
- After
  - handling raw foods
  - using the toilet or touching any surface in a public place
  - blowing nose or coughing/sneezing into hands
  - handling waste or cleaning
  - changing a baby's nappy
  - playing with pets
  - a break
  - smoking or eating

Safe Hands or Hazardous Hands?

- What are your opinions on:
  - dirty hands?
  - long nails?
  - nail polish and false nails?
  - jewellery?
  - cuts and wounds?



Good Hygiene Practice - Protective Clothing

Hair should be suitably covered to prevent it from falling into food.

Clean clothing/over-clothing should be worn.

'Barrier hygiene' should be followed about entry into areas.

The Role of the Supervisor

- Should be able to recognise signs of pest infestation.
- Should be aware of the actions needed in the event of infestation and be able to identify contamination of food products by pests.
- Should give instructions to staff concerning signs of pest infestation and importance of good housekeeping.
- Should contact pest control contractor as soon as they are aware of this problem.
- Report to senior manager issues such as ineffective pest contractor, structural defects, conditions that allow pest incursion or inadequate control procedures.

Summary of Section 5

- Three point strategy for pest control: prevent access - deny pests favourable conditions - report signs of pests.
- Pests seek food, warmth and shelter - take steps to keep them out.
- Domestic pets should be kept out the food area.
- Report problems, get rid of any contaminated food and store food safely.
- Do not allow the outside environment to become attractive to pests.

Section 6

PEST CONTROL

Have you seen any of these where you work?

Birds

Flies

Cockroaches

Rats

Mice

Pest Control

3-point strategy

- Prevent access
- Deny pests favourable conditions
- Report signs of pests

Preventing Access

- Keep doors and windows closed
- Use fly screens on windows
- Check deliveries for pests
- Find the ways by which pests gain access then prevent entry

Finding Pests

Always look for the following *signs*:

- droppings and greasy trails
- marks on food
- small mounds of food debris
- nibbled wrappings, holes in cardboard containers or pecked milk tops
- pest carcasses
- unusual smells and noises
- damage to woodwork - mice and rats nibble marks

Denying Pests Favourable Conditions

- Clean-as-you-go
- Keep utensils and equipment clean
- Cover any food that needs to 'stand out'
- Store foods properly
- Regularly check all food storage areas
- Regularly empty waste bins

GETTING RID OF PESTS

- Use integrated pest management
- Deny
  - Food
  - shelter
  - a nesting place
  - warmth
  - security

The Role of the Supervisor

- Should be able to recognise signs of pest infestation.
- Should be aware of the actions needed in the event of infestation and be able to identify contamination of food products by pests.
- Should give instructions to staff concerning signs of pest infestation and importance of good housekeeping.
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- Three point strategy for pest control: prevent access - deny pests favourable conditions - report signs of pests.
- Pests seek food, warmth and shelter - take steps to keep them out.
- Domestic pets should be kept out the food area.
- Report problems, get rid of any contaminated food and store food safely.
- Do not allow the outside environment to become attractive to pests.

Section 7

FACTORY DESIGN AND LAYOUT

HYGIENIC PREMISES

A Factory layout should have:

- clean and movable work surfaces
- durable floors
- Smooth and crack free walls
- Smooth and light coloured ceiling
- Effective ventilation system
- Good lighting systems
- Wash Sinks
- Proper waste disposal
- Clean toilet and washing facilities
- Effluent treatment
- Material and product flow

WORK FLOW

- Design and layout of the factory and equipment must ensure smooth work flow.

DELIVERY → STORAGE → SERVICE

- **A food business must not be carried on in insanitary premises**
  - Large fines and even imprisonment for breaking the law
- **Supervisors must ensure that premises are:**
  - registered with the local authority
  - properly maintained
  - adequately supplied with clean water
  - well lit and well ventilated
  - provided with suitable facilities for washing utensils, equipment and food
  - supplied with suitable facilities for personal hygiene
  - equipped with first aid materials

Summary of Section 7

- Separate 'clean' from 'dirty' areas.
- Workflow: Delivery ⇨ Storage ⇨ Preparation ⇨ Service.
- Surfaces must be clean and durable (avoid using wood).
- Good lighting and ventilation with plenty of space to work efficiently are desirable.
- Ensure safe waste disposal.

Section 8

CLEANING AND DISINFECTION

Types of Cleaning

Clean-as-you-go

Scheduled cleaning

Cleaning-out-of place

Cleaning-in-place

Clean-as-you-go

- Cleaning is an important part of any food handler's work
- Work surfaces and equipment must be thoroughly and regularly cleaned to avoid contamination
- Waste, Food debris and garbage should be removed regularly

Scheduled Cleaning

Scheduled Cleaning refers to tasks carried out at regular intervals.

- Examples -
  - cleaning the store floor (DAILY)
  - cleaning shelves in the dry store (WEEKLY)

C.O.P and C.I.P

- CLEANING-OUT-OF-PLACE (C.O.P)

  Cleaning practice used when equipment are removed from their place or point of use to be cleaned in another location.

- CLEANING-IN-PLACE (C.I.P.)

  Used when equipment cannot be removed for cleaning elsewhere because it is either too big or because reassembly would present unacceptable hygiene risks.

Cleaning and Disinfection Chemicals

- Detergents
- Disinfectants
- Sterilisers
- Sanitizers

Rules for Using Cleaning Chemicals

- Follow the manufacturer's instructions
- Use fresh, hot solutions
- Wear protective clothing if necessary
- Store chemicals safely
- NEVER mix chemicals

Steps for dish washing

- Wear rubber gloves
- Remove left over food
- Wash in hot water and detergent
- Rinse in very hot water
- Dry

Steps for Cleaning equipment

- Disconnect the machinery from any power source before commencing cleaning;
- Remove all waste foods;
- Thoroughly wash and disinfect all parts;
- Re-assemble the machine taking care if there is a moving part that could fly off if not properly refitted;
- Disinfect all parts of the machine that will come into contact with food again; and
- Take care to see that all guards have been refitted.

Cleaning Schedules

- Cleaning schedules will help ensure that all aspects of an operation are covered by:
  - Allocating specific tasks to staff;
  - Specifying what cleaning materials should be used and the method;
  - Specifying how often items/areas should be cleaned;
  - Specifying any safety precautions for staff.
  - Recording whether activities were carried out.

Cleaning Schedule

Daily Cleaning Schedule — Week Commencing .....

Item to be Cleaned	Frequency of Cleaning	Method of Cleaning	Who by	Mon	Tue	Wed	Thu	Fri	Sat	Sun
				sign	sign	sign	sign	sign	sign	sign

Checked By ..... Name..... Position ..... Date.....

11

Role of the Supervisor

- Guarantee sufficient cleaning materials and suitable facilities are available and staff is given clear instructions.
- Ensure that appropriate cleaning/disinfecting chemical, concentration and procedure is used.
- Check that the cleaning equipment is stored properly
- Replace equipment that is spoiled.
- Encourage staff to maintain high standards.
- Implement a cleaning schedule to ensure that cleaning is conducted on a regular basis (including hard to reach places).
- Conduct regular audits of the cleanliness of premises and equipment to verify that cleaning has been effective.

Summary of Section 8

- Choose the correct type of cleaning for the task
- Use the correct chemicals for the cleaning involved
- Remove rubbish regularly
- Develop, implement and ensure safe and efficient cleaning procedures

Section 9

PACKAGING, TRANSPORTATION AND LABELLING

Functions of Food Packaging

- For containment
- Protection
- Communication
- Environmental issues
- Package safety
- Product access

Packaging types

- Flexible and rigid
- Primary, secondary and tertiary

Packaging type	Type of container	Examples of food packaged
Plastic trays	Primary	Portion of fish
Bags	Primary	Potato chips
Boxes	Secondary	Box of soft drink bottles
Cartons	Secondary	Carton of eggs
Pallets	Tertiary	A series of boxes on a single pallet, to transport packaged food from the manufacturing plant to a distribution centre.

Vacuum Packaging and cling film

- Vacuum packaging reduces the amount of air from a package and seals the package so that a near-perfect vacuum remains inside.
- Avoid puncturing packs
- Discard umarked packs without 'use-by 'dates.
- Cling film is useful for stopping food drying out and protecting it against contamination.

- Packaging materials should not contaminate food and should be stored such that they are not exposed to contamination.
- Reusable packaging material is easy to clean and where necessary to disinfect.
- Unpacking and packing areas should be separate from food preparation areas.
- String and ties removed from bags should be immediately placed in suitable containers.
- Paper sacks should be cut open, and paper should not get in the food.
- Staples should not contaminate food and adhesive tape can be used to fasten boxes.
- Packaging materials and gases should be non-toxic.

Labelling

Food labelling is a means of communication between the producer and seller of food on one hand, and the purchaser and consumer on the other.

TRANSPORTATION OF FOOD

- Vehicles, conveyances and containers must be clean and maintained in good repair and should not carry animals or toxic substances along with prepared food.
- The temperature of food when transported in containers should be maintained at required temperature
- For bulk transport, containers conveyances shall be designated marked for food use only.
- Food should be adequately protected during transport.

TRACEABILITY

- **Traceability** is the ability to trace the history, application, or location of an item or activity with the help of documentation.
- Food should be traced throughout all stages of production, processing and distribution.
- Effective traceability is dependent on issues like:
  - Epidemiology – detection of the food or element to be traced
  - Availability of data through the traceability systems
  - Supply chain system

Section 10

FOOD SAFETY MANAGEMENT PROCESS

Food Preparation Processes

Process 1: Food Preparation with No Cook Step
Example flow: Receive - Store - Prepare - Hold – Serve

Process 2: Preparation for Same Day Service
Example flow: Receive - Store - Prepare - Cook - Hold – Serve

Process 3: Complex Food Preparation
Example flow: Receive - Store - Prepare - Cook - Cool - Reheat - Hot Hold - Serve

Process flow

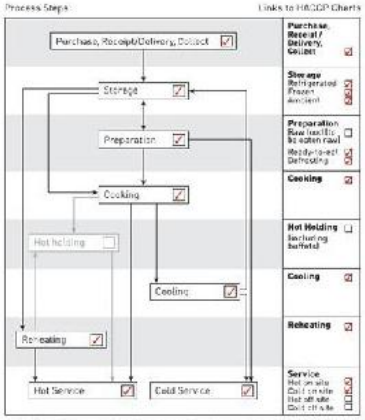


Diagram adapted from http://coolsafe.durngal.gov.uk/manual/2.flow_diagramn/2.1.htm

Introduction to Food Safety Management Process

- It is the management's responsibility to introduce a WRITTEN food safety management system, but *all* food handlers must follow the procedures to prevent hazards from reaching consumers.
- Systems may be based on HACCP principles
- A management tool used to protect the food supply against biological, chemical and physical hazards.

Good manufacturing practice (GMP) is a process of food control whereby the requirements for maintaining the quality and safety of products are written down in a GMP manual which becomes the key reference for the operation of a food manufacturing business.

HACCP may form part of the GMP requirements but, whereas HACCP focuses on products and their manufacturing processes, GMP takes a wider perspective and covers all aspects of the business which may impinge on food quality and safety.

Seven Principles of HACCP

Section 11

HIGH RISK FOODS & STORAGE OF FOOD

Food categories – levels of risk

- Low risk foods - are rarely implicated in food poisoning and may be stored and suitably packaged, at ambient temperatures.
  - Low in moisture, low in protein
- High risk foods – are ready to eat foods that under unfavourable conditions support the multiplication of pathogenic bacteria and are intended for consumption without further treatment that would destroy such organisms.

Low Risk Foods

Preserved food: Honey, Jam

Dried food: red chilies

High fat/sugar content food: chocolates and sweets

Acid foods: Vinegar

Canned and bottled foods: Tomato sauce

Fermented products: Pickles

Examples of High Risk Foods

Cut fruits/ salads, fresh juices and beverages

Confectionary products

Cooked meat and poultry; cooked meat products; seafood/ fish products gravy, soup and stock

Cooked rice

High risk foods

- high in protein;
- high in moisture;
- not subject to further treatment which would destroy organisms, for example, by cooking - 'ready to eat foods';

- bacteria can grow on them easily;
- implicated in most cases of food poisoning, so these are the foods that require special care and strict temperature control.

Delivery and Unloading of Raw Material

- Effective documentation checking system for selecting suppliers and dealing with deliveries.
- Check deliveries before storage.
- All outer packaging should be in good condition.
- Food should be labelled and date coded.
- Food should have sufficient shelf life to enable it to be used.
- Chilled food is delivered below 5^0C and frozen food at or below -18^0C.
- Delivery area should be kept clean and staff should always be available to accept deliveries.

Section 12

SUPERVISION OF STAFF

FUNCTIONS OF A SUPERVISOR

1. Guide and train the staff
2. Assist with logistics and resources.
3. Support and encourage the staff.
4. Facilitate teamwork and address interpersonal conflicts
5. Give sanctions when necessary
6. Delegate tasks and responsibilities

RESPONSIBILITIES OF A SUPERVISOR:

1. Communicate and clarify major job duties, priorities, and expectations.
2. Establish and communicate performance standards.
3. Monitor employees' performance.
4. Document good and unacceptable performance.
5. Provide continuous coaching and constructive feedback in a timely manner.
6. Hold performance discussions (at least annually).
7. Correct poor performance and reinforce good performance.
8. Help employees to develop skills and abilities for improved performance.
9. Provide necessary information, resources, and opportunities to help accomplish key objectives

PERFORMANCE PROBLEMS

The reasons why employees don't perform well:

- Lack of skills
- Lack of Information
- Motivational Issues
- Personal Issues
- Environmental Issues

IMPROVING STAFF PERFORMANCE

- Identify the performance problems.
- Deal with these problems. Begin by talking with the relevant staff.
- Manage the conflict. The ultimate goal is to come up with "win-win" situation
- Address staff motivation.
- Provide effective feedback.

USE A SUPERVISORY CHECKLIST

- It's a means to ensure a systematic approach to supervision by reminding to focus on the knowledge, skill, major activities, plans and performance of the worker
- No checklist format ideal for all situations. It has to be developed to suit his/her specific needs
- It should have two essential parts:
  - List of activities and skills to be supervised.
  - Space for the supervisor to make notes on his observations, assessment, recommendations, or actions taken.

Section 13

FOOD HYGIENE AND THE LAW

The Food Safety and Standards Act, 2006

An Act to consolidate the laws relating to food and to establish the Food Safety and Standards Authority of India for laying down science based standards for articles of food and to regulate their manufacture, storage, distribution, sale and import, to ensure availability of safe and wholesome food for human consumption and for matters connected therewith or incidental thereto.

RESPONSIBILTIES OF FOOD BUSINESS OPERATOR

Ensures that the articles of food satisfy the requirements of the FSS Act 2006 and the rules and regulations made thereunder at all stages of production, processing, import, distribution and sale within the businesses under his control.

No food business operator shall himself or by any person on his behalf manufacture, store, sell or distribute any article of food –

- which is unsafe; or
- which is misbranded or sub-standard or contains extraneous matter; or
- for which a license is required, except in accordance with the conditions of the license; or
- which is for the time being prohibited by the Food Authority or the Central Government or the State Government in the interest of public health; or
- in contravention of any other provision of this Act or of any rule or regulation made thereunder.

FOOD RECALL PROCEDURES

If a food business operator considers or has reasons to believe that a food which he has processed, manufactured or distributed is not in compliance with this Act, or the rules or regulations, made thereunder, he shall immediately initiate procedures to withdraw the food in question from the market and consumers indicating reasons for its withdrawal and inform the competent authorities thereof.

Food premises must be:

- Registered with the competent authority (usually the local authority) before the business can open or before starting to use new premises.
- maintained in good condition, kept clean and free from accumulation of waste and refuse
- Adequately supplied with clean water, proper drainage well lit and well ventilated.
- Lavatories must have sufficient ventilation and must not lead directly into food rooms, designed and maintained to prevent access by pests

Penalties

- For selling food not of the nature or substance or quality demanded
- Sub-standard food
- Mis-branded food
- Misleading advertisement
- Food containing extraneous matter
- Failure to comply with the directions of food safety officer
- Unhygienic or unsanitary processing or manufacturing of food
- Possessing adulterant
- Contraventions for which no specific penalty is provided

Punishments

- For unsafe food
- For interfering with seized items
- For false information
- For obstructing or impersonating a food safety officer
- For carrying out a business without license
- For subsequent offences

POSTERS

COMMON SYMPTOMS OF FOOD POISONING

Diarrhoea

Vomiting

Fever and Dizziness

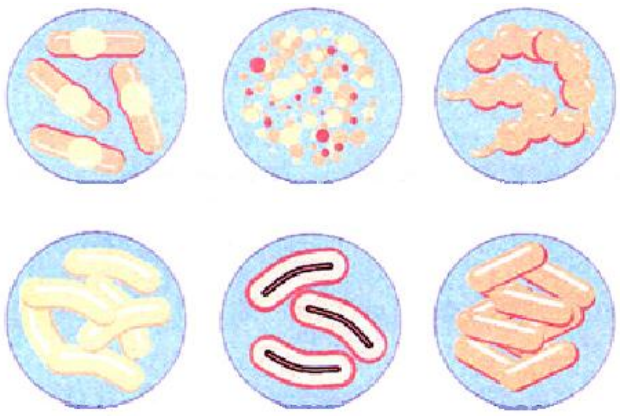
Stomachpain

Poster 1

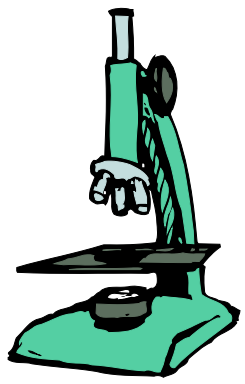
CONTAMINATION OF FOOD – HAZARDS TO CONSUMERS

PHYSICAL

CHEMICAL



Food poisoning bacteria as seen through a microscope



Microscope

BIOLOGICAL

Poster 2

FOUR CONDITIONS FOR BACTERIAL GROWTH

FOOD

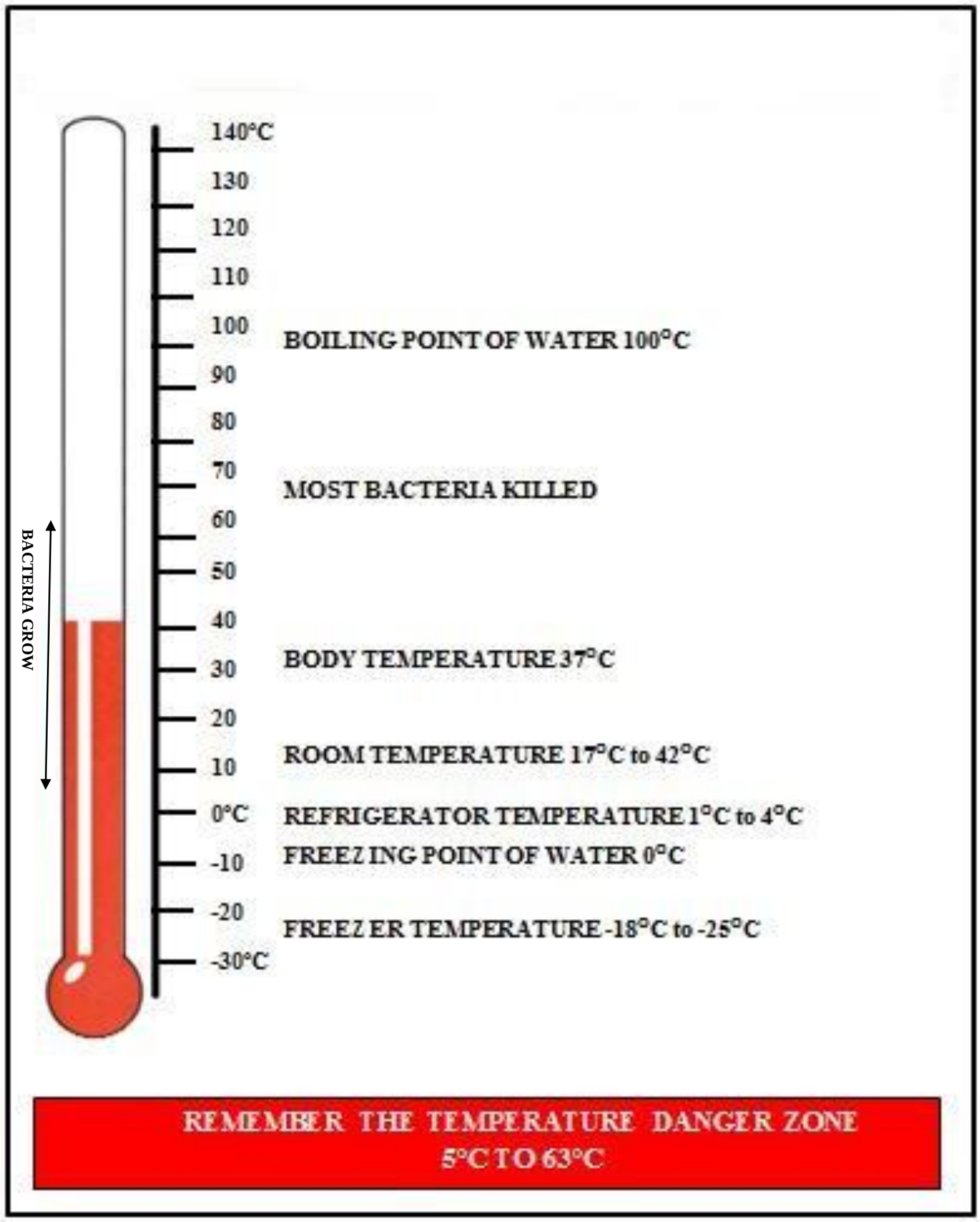
MOISTURE

WARMTH

TIME

Poster 3

TEMPERATURES AND BACTERIAL GROWTH



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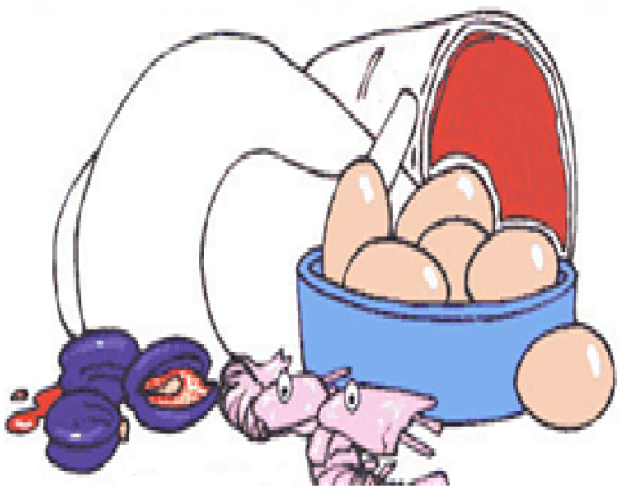
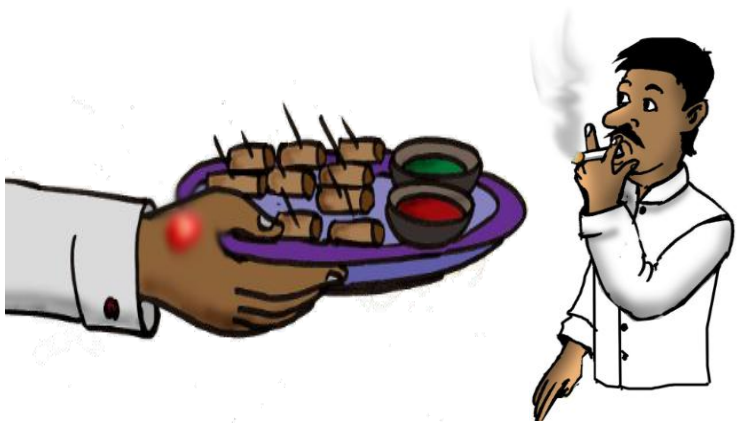
Poster 4

WAYS IN WHICH BACTERIA ENTER FOOD

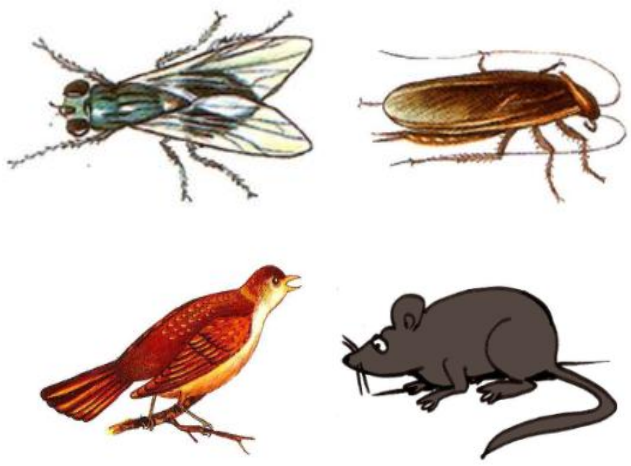


Raw foods

Water/Ice

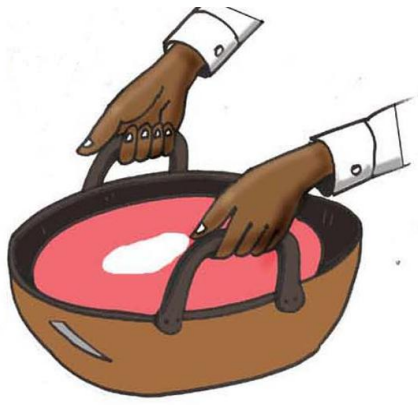


Human handlers



Pests and pets

Waste foods and rubbish



Utensils, equipmentand work surfaces

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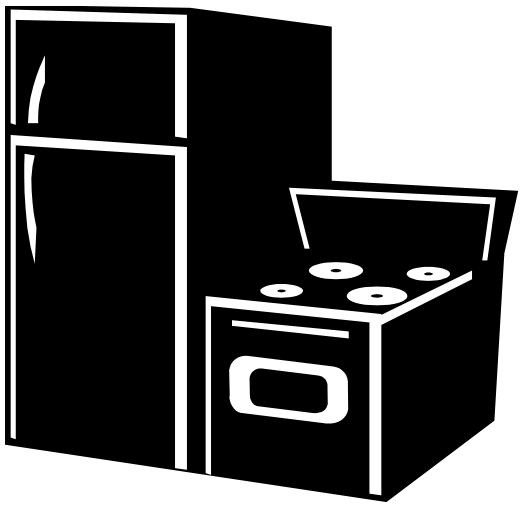
VISION, VOICE AND PRACTICE

Poster 5

CONTAMINATION

Damage or wear and tear of factory

Processing areas, floors, walls, drains



Worn out and unclean equipment

Food Handler

Improper manufacturing operations: Handling and storage of products.

Poster 6

COLOUR CODING SYSTEM

COLOUR	Colour coding for cleaning equipment
RED	Food processing area
BLUE	Delivery and pick up area
YELLOW	Washrooms
GREEN	Canteen
ORANGE	Packing and distribution

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Poster 7

STEPS INVOLVED IN HAND WASHING

1. Use warm water and soap

2. Make a lather

3. Rub back of hands and fingers

4. Rub in between fingers, around thumbs and fingertips

5. Rinse with clean water

6. Dry hands thoroughly on a disposable towel, turn off the tap with towel

Poster 8

WHEN TO WASH HANDS

BEFORE:

Before touching ready-to-eat foods

AFTER:

After using toilet

After Eating

After handling raw food

After touching a cut or changing a dressing

After handling garbage

After cleaning

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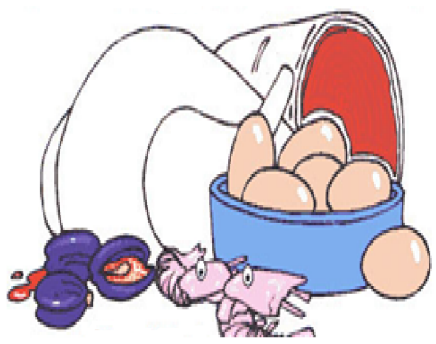
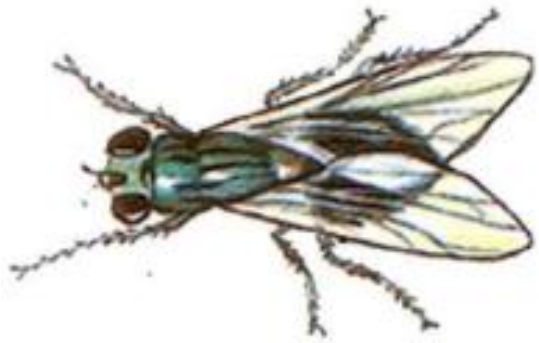
Poster 9

COMMON PESTS AND FOOD

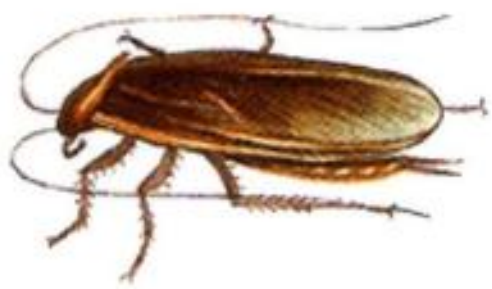


Raw meat, poultry, eggs and seafood



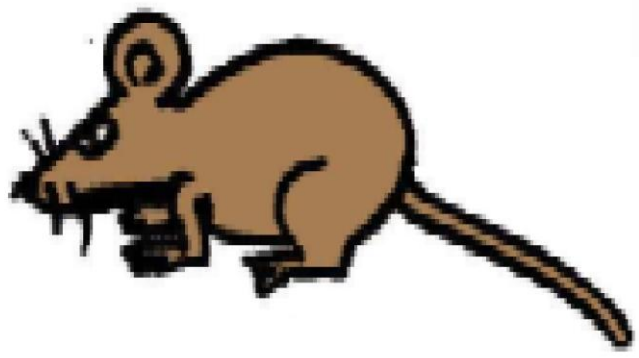
Flies

Birds



Cockroaches

Rats



Mice

Waste food and dirt

Poster 10

TEMPERATURE CONTROL

Refrigerator

Cooked Food

TEMPERATURE RECORD SHEET

Refrigerator No. _____

Temperature range 1°C - 4°C

Date	Time	°C	Comments	Signature

Temperature Record Sheet

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Poster 11

CLEANING AND DISINFECTION CHEMICALS

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Poster 12

FOOD SAFETY MANAGEMENT SYSTEM

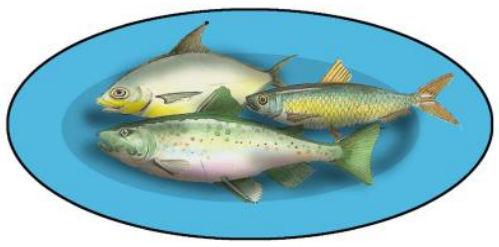
Monitoring

Recording

Reporting

Poster 13

HIGH RISK FOODS

Cooked meat and poultry; cooked meat products; gravy, soup and stock	
  	Milk and eggs and products made from them
Seafood	
	Cooked rice

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Poster 14

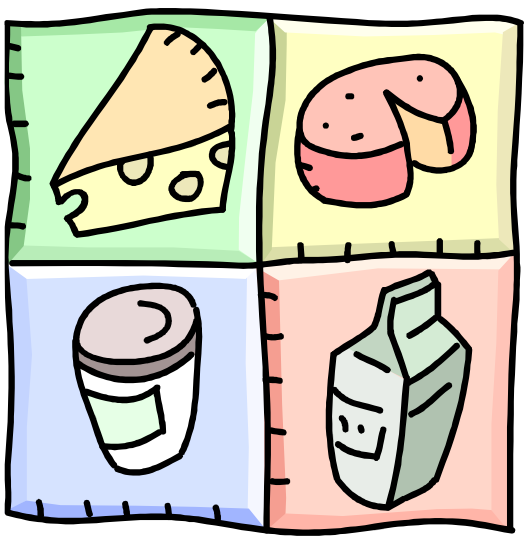
DIFFERENT TYPES OF FOOD PRESERVATION

Honey, Jam

Dried red chilies

Soft drinks

Tinned Fish



Milk Products

Pickles

Poster 15

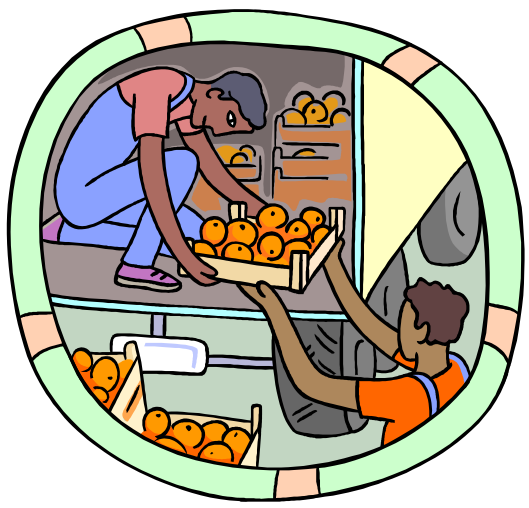
TRANSPORTATION, PACKAGING AND LABELING

Transportation

Packaging

Stock rotation

Labeling



Food distribution

Poster 16

Seven Principles of HACCP

Principle 1: Conduct a Hazard Analysis

Principle 2: Determine Critical Control Points

Principle 3: Establish Critical Limits

Principle 4: Establish Monitoring Procedures

Principle 5: Establish Corrective Actions

Principle 6: Establish Verification Procedures

Principle 7: Establish Documentation and Record

Benefits

A company may also benefit if they implement an effective HACCP system. Some benefits are:

- Enhance food safety
- Increase market access
- Improve operational activities
- Reduce costly recall and wastage
- Increase consumer confidence

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