

TVET CERTIFICATE IV in Culinary Arts

Hygiene and Food Safety Control

CUAFS401

Apply Hygiene and food safety control

Competence



Credits: 4

Learning hours: 40

Sector: Hospitality and Tourism

Sub-sector: Culinary Arts

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Purpose statement

This module describes the skills and knowledge required to apply hazards critical control points principles while handling food and beverage following all the stages of food preparation.

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General introduction to Hygiene and food safety

1.1 Introduction



This module will turn around the five key elements of hygiene and food safety including good personal hygiene, use safe ingredients, safe handling of food commodities, use correct temperature and cleaning promise. Food hygiene can be defined as good practices which lead to clean workplace and the safe production of food it is aimed to reduce the risks of producing harmful food and preventing infestation by pests like flies, mice for examples.

1.2 Hygiene & food Safety Terms

1. **Temperature/Food Danger Zone (TDZ):** the temperature range where bacteria can grow and reproduce rapidly; the TDZ is between +5°C and 65°C.
2. **Food borne illness/Food poisoning:** Illness transmitted to humans through food.
3. **Cross-contamination:** the transfer of a harmful substance from one food to another by direct or indirect contact.
4. **Direct cross-contamination:** Involves the transfer of a harmful agent from raw foods to cooked or ready-to-eat foods.
5. **Indirect cross-contamination:** Involves the transfer of a harmful agent to foods by hands, utensils, or equipment
6. **Clean:** free of visible soil.
7. **Sanitize:** to reduce the number of microorganisms to a safe level.
8. **Sterilize:** to make free of all microorganisms.

9. **Contamination:** the presence of harmful substance in food.
10. **Spoilage:** damage to the edible quality of a food. (Food that is unsafe to eat may not smell or taste spoiled.)
11. **Hazard:** The physical, chemical or biological agent or the condition of food which can cause adverse health effect.
12. **Potentially Hazardous Foods (PHF's):** foods that allow the rapid growth of bacteria
13. **Cross-contamination:** the transfer of a harmful substance from one food to another by direct or indirect contact.
14. **Direct cross-contamination:** involves the transfer of a harmful agent from raw foods to cooked or ready-to-eat foods.
15. **Indirect cross-contamination:** involves the transfer of a harmful agent to foods by hands, utensils, or equipment.
16. **Personal Hygiene:** health practices and habits which enable one stay physically healthy.
17. **Sanitation:** means keeping the food, equipment, utensils and work area clean.

Learning unity 1: Apply hygiene control measures when handling food

LO 1. 1 Maintain personal hygiene

● Topic 1 Body hygiene practices

❖ Personal hygiene tips

1. Do not work with food if you have any communicable disease or infection.
2. Bath or shower daily.
3. Wear clean uniforms and aprons.
4. Keep hair neat and clean.
5. Always wear a hat or hairnet.
6. Keep mustaches and beards trimmed and clean.
7. Remove all jewelry: rings, low-hanging earrings, watches, bracelets.
8. Wash hands and exposed parts of arms before work and between two different tasks
9. Cover coughs and sneezes, then wash your hands.
10. Keep your hands away from your face, eyes, hair, and arms.
11. Keep fingernails clean and short. Do not wear nail polish.
12. Do not smoke or chew gum while on duty.
13. Cover cuts or sores with clean bandages
14. Do not sit on worktables.

❖ The Benefits of Good Hygiene

1. Satisfied customers.
2. Compliance with food safety legislation.
3. Less food wastage and increased shelf life of foods.
4. Good working conditions.
5. Good reputation and increased business.
6. Reduced risk of food poisoning.
7. Instill a good work ethic.

8. Produce high quality products.
9. Produce safe products.
10. Preventing food contamination
11. Protect other people from getting sick
12. Protect your reputation in the food industry
13. Protect your business, and
14. Protect your job

● Topic 2: Work attire hygiene

❖ **Personal Protective Clothing used in the Kitchen**

1. **Hair Covering/hairnets:** Prevent hair from falling into food product.
2. **Facial Masks:** serve as barriers to airborne contamination during sneezing, coughing and talking.
3. **Aprons:** Reduce risk of contamination and help maintain cleanliness.
4. **Gloves:** Reduce risk of contamination.
5. **Footwear:** helps avoid slippage and reduce risk of contamination



LO 1.2 Use clean equipment and tools/utensils

● Topic 1: Cleaning techniques

I. Equipment to be cleaned and sanitized or disinfected

1. Eating utensils (plates, spoons, fork, glasses, cups and saucers)

2. Cooking utensils (pots, pans, kettle, casserole)
3. Cutting tools (cutlery, knives)
4. Preparing tools (chopping board, containers)
5. Garbage bins
6. Exhaust fan
7. Refrigerator
8. Sink and drains

II. Equipment and sanitation procedures

A. Dishwashing machine

1. Remove strainer pans, wash and stock outside machine until next use.
2. Scrub inside frequently with stiff brush.
3. Remove and clean the wash and rinse arms and fits daily to remove foreign particles.
4. Wash tables and top of machine
5. Clean nozzles.
6. Do a special periodic cleaning in hard water area.

B. Range

1. Remove all burnt sediments and wipe with degreaser from top of range after each use.
2. Scrape grease from curbs and openings hinges.
3. When cool, wash top of range
4. Run oiled cloth over top of range
5. Clean oven by removing grates, scraping off food deposits, washing and drying.
6. Keep burners clean. Gas burners can be soaked and scrubbed with stiff brush while electric burners should be cleaned with a brush or with a damp cloth.
7. Before replacing, rub with oil-damped cloth.

C. Slicers.

1. Clean immediately after using, especially after slicing vegetables and nuts.
2. Remove all parts to clean
3. Dry and cover knives after cleaning with oil-damped cloth.
4. Wash carriage slides thoroughly.

5. Wipe outside with cloth.
6. Clean table and pedestal under slicers.
7. Replace guard after cleaning

D. Proper dishwashing (Utensils) techniques

1. Remove large scraps with a rubber scraper.
2. Rinse or soak pans and other utensils as used.
3. Stack the dishes in the proper order namely: glassware, silverware, chinaware, and utensils.
4. Wash the glassware. Soap each piece individually and rinse in hot water.
5. Wash the silverware. Soak them in a pan and remove the dirt with a plastic scourer before soaping.
6. Soap each piece individually and rinse in hot water.
7. Wash the chinaware. Scrape and rinse each dish. Soap and rinse dishes in hot water at 66°C above.
8. Wash the utensils. Scour all pans until completely clean. Use ammonia to remove fat. Soap each piece and rinse in hot water at 66°C or above.

Manual Dishwashing

Procedures

1. Scrape and pre-rinse
2. Wash; use warm water at 110°F – 120°F and a good detergent.
3. Rinse , use clean warm water to rinse off detergent
4. Sanitize ; Place utensils in a rack and immerse in hot water at 170°F
5. Drain and air-dry, Do not towel dry the dishes.

Mechanical Dishwashing

Procedures

1. Scrape and pre-rinse
2. Rack dishes so that the dishwasher spray will strike all surfaces
3. Run machine for a full cycle

4. Set the sanitizing temperature at 180°F for machine that sanitize by heat and 140°F for machine that sanitize by chemical disinfectant.
5. Air-dry and inspect dishes. Do not touch surfaces that come in contact with food

E. Kitchen Premises

– Refrigerator

1. Wipe up spilled foods immediately
2. Wash inside shelves and trays at least twice a week with baking soda.
3. Rinse and dry thoroughly
4. Flush drains weekly

– Sink and Drains

1. Keep outlet screened at all times
2. Flush daily with 1 gal. of solution, made up of strong solution soda (4oz. to 2 gal. of water)
3. Clean and replace greased tray regularly.
4. Use force pump if drain is slow
5. Replace washers immediately on leaking faucets.

F. Tools for Cleaning

1. Brushes
2. Scouring Pads
3. Mops and Brooms
4. Buckets
5. Towels

● Topic 2: Cleaning detergents/chemicals

There are various types of chemicals to be used for cleaning, sanitizing and disinfecting cooking equipment

❖ Types of Sanitizers and Disinfectants and detergents

1. Chemical

- a. Chlorine
- b. Carbolic acid

- c. Ammonia
- d. Detergents
- e. Dishwashing liquid
- f. Timsen
- g. Soap
- h. Alcohol
- i. Boric acid

2. Physical/sterilizers

- a. Hot water
- b. Steam
- c. Dry heat
- d. UV light (ultraviolet light)
- e. Filtration

Note: Sterilizing is a process designed to destroy all microorganisms including microorganisms that have formed a protective coat (spores). The standards do not require eating and drinking utensils and food contact surfaces to be sterilized.

3. Sanitizers

Chemicals are be used to sanitize food utensils and equipment manually or in dishwashers that have been designed for use with chemical sanitizers. The chemicals used should be suitable for use with food contact surfaces and eating utensils (food grade).

❖ Traditionally used chemical sanitizers include

- 1. Chlorine-based compounds (e.g. hypochlorite or bleach)
- 2. Quaternary ammonium compounds
- 3. Alcohol
- 4. Iodophors (iodine)
- 5. organic acids (e.g. peracetic acid)
- 6. And hydrogen peroxide

❖ Sanitizing techniques



1. Sanitation of eating and drinking utensils and food contact surfaces should only be done after they have been thoroughly cleaned.
2. Sanitizing can be achieved through the use of hot water, chemicals or other processes.
3. soaking items in very hot water
4. soaking items in diluted bleach
5. saturating items with 70% alcohol
6. All surfaces to be sanitized must be clean
7. Sanitizers should be used at the correct concentration (too low or too high is not effective)
8. Some sanitizers require extended contact time to ensure pathogens are reduced to a safe level.
9. After sanitizing, utensils and surfaces should be thoroughly dried

❖ **Mixing procedures of an approved sanitizing solution**

Sanitizing reduces the number of microorganisms on surfaces to levels considered safe. Sanitizing Solution Chemicals can sanitize dishes and other food contact surfaces such as cutting boards, knives, cooking utensils, and counter tops

Things you need to mix a chlorine sanitizer solution using bleach:

1. Ordinary household bleach. Do NOT use bleach with fibre guard or fresh scent.
2. Teaspoon or tablespoon
3. Spray bottle or bucket labeled Sanitizer

Mix according to directions provided below. If you do not use household bleach, commercial chlorine solutions, quaternary ammonia solutions or iodine solutions may be used at solution strength listed below but always follow the manufacturer's instructions

| Sanitizer | How to Mix | Solution Strength |
|--|---|---|
| Chlorine Solution using household bleach | Mix ½ to one teaspoon (2 to 5 ml) bleach into 1 liter water | 100—200 ppm Note: 200 ppm may be used |

| | | |
|-------------------------------------|--|-----------------------------------|
| | Mix one to two tablespoons (½ - 1 ounce) bleach into 1 liter water | for sanitizing surfaces in-place) |
| Commercial Chlorine Solution | Follow manufacturer's instructions | |
| Quaternary Ammonia Solution (QUATS) | Follow manufacturer's instructions | 200 ppm |
| Iodine Solution | Follow manufacturer's instructions | Between 12.5ppm - 25 ppm |

Tips to Remember:

1. Do not mix bleach with soap.
2. Use test strips to check the strength of the sanitizing solution.
3. Replace sanitizing solution when solution strength is less than the required strength.
Solution strength will weaken over time

❖ Different between cleaning and sanitizing

Cleaning is the process of removing food and other types of soil from a surface such as a countertop or plate.

Cleaning Agents

- Detergents
- Solvent cleaners
- Acid cleaners
- Abrasive cleaners

Factors That Affect the Cleaning Process

- ☐ Condition of soil
- ☐ Water Hardness
- ☐ Water Temperature
- ☐ Cleaning Agent and Surface Being Cleaned
- ☐ Agitation or Pressure
- ☐ Length of Treatment

Sanitizing is the process of reducing the number of microorganisms on that surface to safe levels.

Methods for Sanitizing

Heat

- Hot water
- Steam

Chemicals

- Chlorine – 50 ppm
- Quaternary Ammonia – per manufacturer instructions
- Iodine – 12.5 -25.0 ppm

Factors Influencing the Effectiveness of Sanitizers

- ☐ **Contact Time**
- ☐ **Selectivity** (Ability to kill certain microorganisms.)
- ☐ **Temperature** (Best between 23 to 49°C.)
- ☐ **Concentration** (concentration of a sanitizing solution.)

LO 1.3 Maintain good health

● Topic 1: Personal health guidelines and procedures

Health precautions tips /Guidelines

- 1) Take a Balanced diet
- 2) Have Enough sleep
- 3) Have Periodical medical checkup
- 4) Sports
- 5) Select from the right food groups
- 6) Don't smoke
- 7) Maintain cleanliness in the room
- 8) Provide comfortable furniture for the users
- 9) Users should take regular breaks
- 10) Maintain a conducive environment (temperature between 18 and 24°C)
- 11) Do not take excessive alcohol



● Topic 2: Common contamination diseases/Food borne illness/Food poisoning

Food borne illness (FBI) is an illness from consuming food that contains a harmful substance, harmful microorganisms or their toxins.

❖ **Three kinds of microorganisms can contaminate food and cause illness:**

1. Bacteria

sporeforming bacteria

Bacillus cereus



Clostridium perfringens



Clostridium botulinum



- *Bacillus cereus*
- *Clostridium perfringens*
- *Clostridium botulinum*

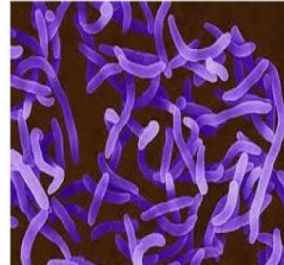
non-sporeforming bacteria

- *Campylobacter jejuni*
- *Escherichia coli* 0157: 7
- *Listeria monocytogenes*
- *Salmonella* spp.
- *Shigella* spp.
- *Staphylococcus aureus*
- *Vibrio* spp

Salmonella spp.



Vibrio spp.



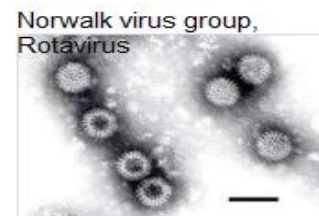
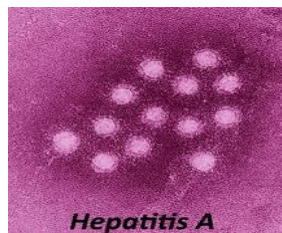
Shigella spp.



2. Viruses

Three viruses that are of primary importance to food establishment which are;

- Hepatitis A
- Norwalk
- Rotavirus

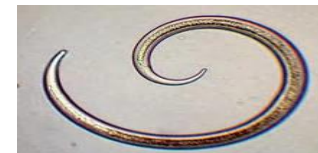


3. Parasites

An animal or plant that lives in or on another from whose body it obtains nourishments.

Types of parasites such as;

- *Anisakis* Spp.
- *Cryptosporidium Parvum*, *Giardia Lamblia*
- *Trichinella Spiralis*



❖ The table below describe most common food borne illness

| S/N | Illness | Symptoms | Foods Involved |
|-----|----------------------|--|--|
| 1 | Salmonellosis | Cramps, nausea, headache, fever, diarrhea, vomiting. | Poultry, eggs, meat, fish, dairy products, protein foods, fresh produce. |
| 2 | Campylobacter | Nausea, vomiting, fever, | Meats and poultry, unpasteurized |

| | | | |
|-----------|--------------------|--|--|
| | Jejuni | diarrhea, abdominal pain, headache, and muscle pain | milk and dairy products |
| 3 | Hepatitis A | Fatigue, discomfort, fever, headache, nausea, loss of appetite, vomiting, jaundice | Water, ice, salads, cold cuts, sandwiches, shellfish, fruit, fruit juices, milk and milk products, vegetables |
| 4 | Norwalk | Cramps, nausea, headache, fever, vomiting | Water, raw vegetables, fresh fruit, salads, shellfish |
| 5 | Trichinosis | Abdominal pain, nausea, diarrhea, fever, swelling around eyes, thirst, sweating, chills, fatigue, hemorrhaging | Pork, non pork sausages, wild game |
| 6 | Shigellosis | Abdominal pain, diarrhea, vomiting, fever, dehydration | Protein salads, lettuce, raw vegetables, poultry, shrimp, milk and milk products |
| 7 | Rotavirus | Abdominal pain, diarrhea, vomiting, mild fever | Water, ice, salads, fruit, hors d'oeuvres |
| 8 | Anisakiasis | Tingling in throat, abdominal pain, coughing up worms, cramping, vomiting, nausea | Fish, seafood |
| 9 | Giardiasis | Cramps, nausea, intestinal gas, fatigue, loss of weight | Water, ice, salads |
| 10 | Botulism | Constipation and diarrhea, vomiting, fatigue, vertigo, double vision, dry mouth, paralysis, death | Underprocessed foods, canned low-acid foods, sauteed onions in butter sauce, baked potatoes, untreated garlic and oil products |
| 11 | E. Coli | Severe abdominal cramps, | Raw ground beef, undercooked |

| | | | |
|----|------------------------------|--|--|
| | | diarrhea, vomiting, mild fever, kidney failure | meat, unpasteurized milk and apple cider or juice, mayonnaise, lettuce, melons, fish from contaminated water |
| 12 | Staphylococcus aureus | Nausea, vomiting, stomach cramps, diarrhea | Handmade items that do not require cooking. |

Learning unit 2: Apply HACCP

LO 2.1 Identify HACCP

● Topic 1: Principles of Hazard Analysis Critical Control Point (HACCP)

Each head steward in food service industry must take in mind the following key terms of HACCP Hazard, Critical control point, Critical limit, Monitoring, Corrective action plan, Documentation, Verification.

They are seven principles of HACCP

1. Conduct a hazard analysis in each process
2. Determine the Critical Control Points (CCP's)
3. Establish Critical Limit for each Critical Control Points
4. Establish a system to monitor control of the CCP
5. Establish corrective action to be take when monitoring indicates a particular CCP is not under control
6. Establish documentation concerning all procedures and records appropriate to these principles and their application
7. Establish procedures for verification to confirm that the HACCP system is working effectively

● Topic 2: Food Safety Management System (FSMS)

It means the adoption Good Manufacturing Practices, Good Hygienic Practices, Hazard Analysis and Critical Control Point and such other practices as may be specified by regulation, for the food business

The Food Safety Management System is a continual process and every Food Business Operator should aim for improvement and take higher Food Safety objectives for consumer safety.

House rules

Those are set procedures to assure food hygiene and food safety, they are aimed to prevent food contamination and food borne illness

a) Cross contamination prevention house rules

Personnel

- Maintain good personal hygiene at all times
- Wash hands regularly; between two tasks

Delivery vehicles

- Raw and cooked/ready-to-eat foods must be kept separate during delivery

Storage

- Use separate refrigerators for raw meat and cooked/ready-to-eat foods where possible..
- Wrap adequately all food before putting them in freezers

Defrosting and cooling

- Raw meat requires to be defrosted must stored in bottom shelves of refrigerator
- All foods in the process of being cooled require to be kept separate from raw food

Equipment and utensils

- Separate all equipment designed for raw meat from those ones designed for ready to eat food
- Probe thermometer must be cleaned and sanitized after use
- Separate thermometer designed for raw and cooked food
- Higher leaned areas are cleaned before low risk area
- Use color coded cutting board

Safe preparation

- Don't reuse foil, cling film or freezer bags.
- Keep foods that are cooling, in clean containers
- Separate work surfaces for food preparation should ideally be used.

b) Stock control house rules

- Stock control is a term used to describe the measures taken to ensure that food is not kept beyond its shelf life.
- Food with damaged packaging should not be accepted
- Expired food does not accepted in stock
- Damaged item should be removed from the stock
- Stock rotation should be respected on first in first out and last in first out basis
- Dried food should be stored in large waterproof containers
- Keep food that can cause allergic reaction separate from other foods

c) Personal hygiene house rules

Personal Cleanliness

- Hands are to be washed thoroughly between two tasks
- Hair should be tied back and covered
- Food handlers should not spit, sneeze or cough over food
- Food handlers should not smoke in a food preparation area
- Cuts and sores should be covered with a waterproof dressing
- Jewellery should be kept to a minimum when preparing and handling food
- Care Staff to assist Service Users in washing of their hands prior to dining.

Clothing

- All staff working in the food preparation area should wear suitable, clean clothing
- Clothing must be kept clean and should be changed and laundered regularly

d) Temperature control house rules

Temperature control is important because harmful bacteria are a hazard present in many of the foods handled in catering businesses. We can destroy harmful bacteria, or reduce their numbers, by cooking, reheating or cold.

Deliveries

- Accept chilled food at the specified temperature of 8°C or below
- Accept frozen food at the specified temperature of –18°C or below

Storage

- Store chilled food at the specified temperature of 8°C or below
- Accept frozen food at the specified temperature of –18°C or below

Preparation

- Keep cooked/ready-to-eat food within the chill or refrigerator until it is required
- Thoroughly defrost all frozen foods in a refrigerator
- Thoroughly defrost all frozen foods prior to cooking

Cooking

- When cooking poultry, rolled meat joints, stews, casseroles, minced meats and meat products, ensure the centre reaches a suitably high temperature is 75°C or above

Hot holding

- All foods which are to be held hot prior to serving must be kept at above 63°C.
- These foods should be placed in appropriate equipment, a pre-heated bain-marie/hot cabinet.

Cooling

- Hot food should be cooled as quickly as possible and then refrigerated
- This should be achieved within 90 minutes
- If possible, cool food in small portions or in shallow containers
- Avoid placing “hot” food in refrigerators

Reheating

- Reheat food thoroughly until the core temperature is not less than 82°C.
- Reheat the finished dish only once

e) Pest control house rules

- Elimination of building cracks and crevices
- Covers on all external drains
- The use of mesh fly-screens on windows and doors in specified areas

- The use of self-closing exterior doors
- Proper food storage

Revision questionnaire

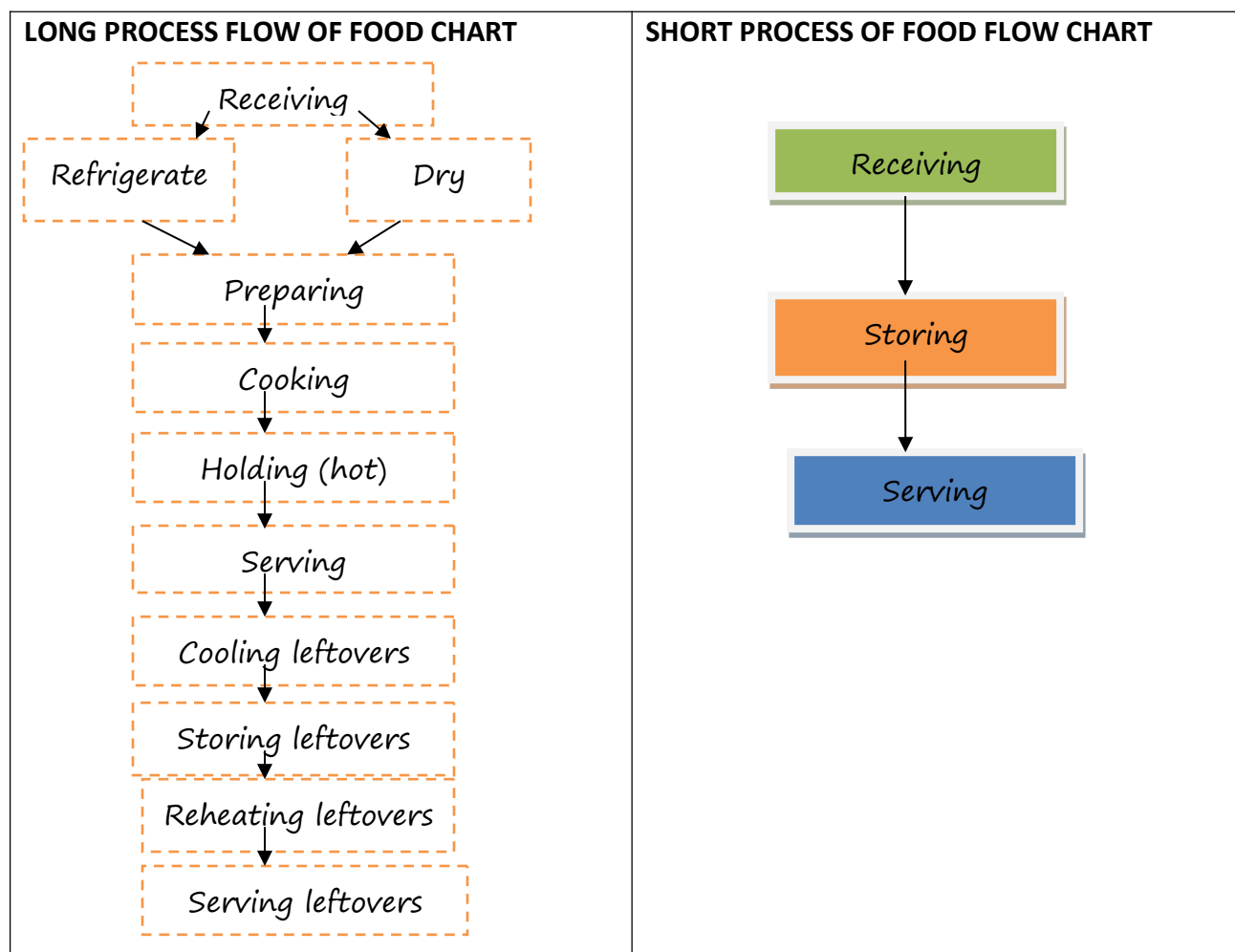
1. Define HACCP in food service industry
2. Discuss 7 principles of HACCP
3. What do you understand by Food safety Management in food service industry
4. Explain pest control in food service industry
5. Illustrate temperature management in food service industry to assure food safety
6. Develop a Food safety management System in Kitchen

LO 2.2 Apply HACCP Principles in floor of food

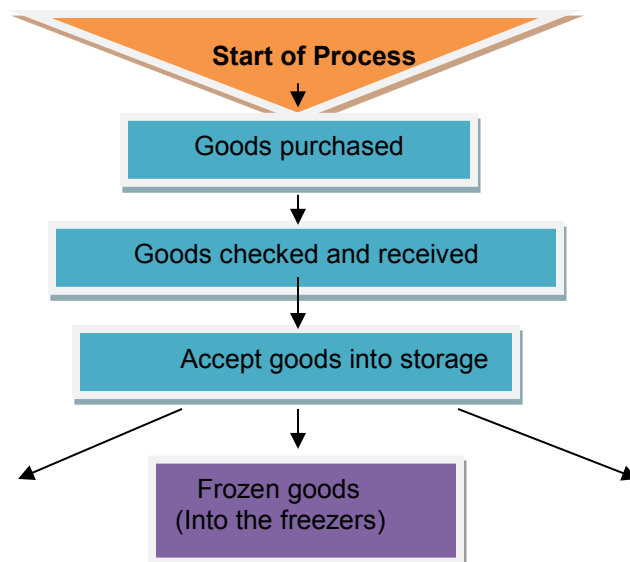
● Topic 1: Application of HACCP principles Food flow

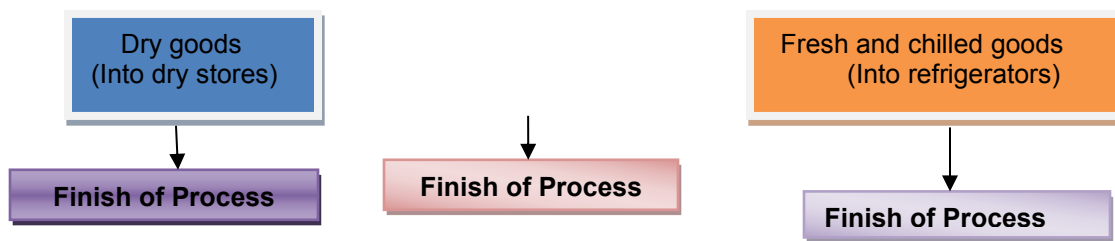
HACCP begins with a concept called the flow of food. This term refers to the movement of food through a food service operation, from receiving through storage, preparation, and service, until it gets to the final consumer.

The flow of food is different for each item being prepared. Some menu items involve many steps others few



This diagram bellow indicates the passage of all goods once food orders have been placed, delivery notes or receipt vouchers have been signed, and the goods formally accepted. It will remain in the responsibility of Store keeper and the store keeper will transfer the food to hands of chef de cuisine until the point of consumption or disposal.





LO 2.3 Apply HACCP in food storage areas

● Topic 1: Strategies for Distribution System Monitoring, Hazard Assessment and Control

The following three tables indicate all possible checking points by applying HACCP principles in three food storage areas (frozen, chilled and dry) and they are indicated in diagram above.

1) Goods Purchased, Checked And Receipted

| Hazard at critical control point (s) What can go wrong? | Control Measures and Critical Limit (s) What action has to be taken to effectively reduce or get rid of the hazard? What are the critical limits? | Monitoring & Recording How are the control measures checked and recorded? | Corrective Action What should be done if the control measure fails and / or the critical limits are not met? |
|--|--|--|---|
| Presence and growth of harmful bacteria | Purchase from nominated/reputable suppliers at a temperature that will discourage the growth of harmful bacteria | Monitor temperature of food on arrival to ensure it complies with recommended temperatures – Chilled food +8°C or below Frozen food -18°C or below Visual check on “use by” and “best before” dates | If above temperature, decide if food should be rejected or is safe to use Review suppliers Reject food beyond “use by” or best before” date and review supplier |

| | | | |
|--|--|---|---|
| | What needs to be done | What needs to be done : | What needs to be done : |
| | Keep to the temperature controls and stock control House Rules | Complete Goods Inward Inspection record in the Food Safety Records Book | Refer to the temperature controls and stock control House Rules |
| Cross contamination - from raw to cooked / ready to eat foods | Keep raw and cooked / ready to eat foods separate | Ensure separation is practiced | Reject food which may be contaminated |
| | Use safe handling practices | Ensure safe handling practices are followed | Review delivery methods Review staff training |
| | What needs to be done | What needs to be done : | What needs to be done |
| | Keep to the cross contamination prevention House Rules | Complete Goods Inward Inspection record in the Food Safety Records Book | Refer to the training and cross contamination prevention House rules |
| Physical contamination | Make sure that food is protected and / or covered | Visually check all goods to identify any damage to packaging and that food is protected | Reject food which may be contaminated Review delivery methods Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cross contamination prevention House Rules | Complete Goods Inward Inspection record in the Food Safety Records Book | Refer to the training and cross contamination prevention House rules |
| Chemical contamination | Separate storage area for chemicals Chemicals returned to | Clean up chemical spillages immediately | Reject food which may be contaminated Review staff training |

| | | | |
|--|---|---|---|
| | storage area after use. Spillages cleaned up immediately | | |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cleaning House Rules in the Cleaning Manual | Complete cleaning schedules in Food Safety Records Book | Refer to training and stock control House Rules and Cleaning manual |

2) Goods Into Refrigerated/Chilled Storage

| Hazard at critical control point (s) | Control Measures and Critical Limit (s) | Monitoring & Recording | Corrective Action |
|---|--|--|--|
| What can go wrong? | What action has to be taken to effectively reduce or get rid of the hazard? What are the critical limits? | How are the control measures checked and recorded? | What should be done if the control measure fails and / or the critical limits are not met? |
| Presence and growth of harmful bacteria | Store food at the correct temperature of +8°C or below Make sure that all food is within its appropriate "use by" date" | Check refrigerator temperature daily Visual check on "use by" and "best before" dates | Re-check temperature and consider if food should be rejected or is safe to use Dispose of food beyond "use by" Maintenance to check / repair equipment |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the temperature controls | Complete refrigerator temperature record in | Refer to the temperature controls |

| | | | |
|---|--|---|--|
| | and stock control House Rules | the Food Safety Records Book | and stock control House Rules |
| Cross contamination - from raw to cooked / ready to eat foods | Keep raw and cooked / ready to eat foods separate Use safe handling practices | Ensure separation is practiced Ensure safe handling practices are followed | Dispose of food which may be contaminated Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cross contamination prevention House Rules | Keep to the cross contamination prevention House Rules | Refer to the training and cross contamination prevention House rules |
| Physical contamination | Make sure that food is protected and / or covered Keep the refrigerator(s) clean | Check protection of food Check cleaning of refrigerator(s) | Dispose of food which may be contaminated Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cross contamination prevention House Rules | Complete cleaning schedules in the Food Safety Records Book | Refer to the training and cross contamination prevention House rules |
| Chemical contamination | Separate storage area for chemicals Chemicals returned to storage area after use. Spillages cleaned up immediately | Clean up chemical spillages immediately | Reject food which may be contaminated Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cleaning | Complete cleaning | Refer to training and |

| | | | |
|--|------------------------------------|---------------------------------------|---|
| | House Rules in the Cleaning Manual | schedules in Food Safety Records Book | stock control House Rules and Cleaning manual |
|--|------------------------------------|---------------------------------------|---|

3) Goods Into Freezer/Refrigerator Storage

| Hazard at critical control point (s) What can go wrong? | Control Measures and Critical Limit (s) What action has to be taken to effectively reduce or get rid of the hazard? What are the critical limits? | Monitoring & Recording How are the control measures checked and recorded? | Corrective Action What should be done if the control measure fails and / or the critical limits are not met? |
|--|--|---|--|
| Presence and growth of harmful bacteria | Store food at the correct temperature of -18°C or below Make sure that all food is within its appropriate "use by" date | Check freezer temperature daily Visual check on "use by" and "best before" dates | Re-check temperature and consider if food should be rejected or is safe to use Dispose of food beyond "use by" Maintenance to check / repair equipment |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the temperature controls and stock control House Rules | Complete refrigerator temperature record in the Food Safety Records Book | Refer to the temperature controls and stock control House Rules |

| | | | |
|--|--|---|--|
| Cross contamination - from raw to cooked / ready to eat foods | Keep raw and cooked / ready to eat foods separate Use safe handling practices | Ensure separation is practiced Ensure safe handling practices are followed | Dispose of food which may be contaminated Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cross contamination prevention House Rules | Keep to the cross contamination prevention House Rules | Refer to the training and cross contamination prevention House rules |
| Physical contamination | Make sure that food is protected and / or covered Keep the refrigerator(s) clean | Check protection of food Check cleaning of refrigerator(s) | Dispose of food which may be contaminated Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cross contamination prevention House Rules | Complete cleaning schedules in the Food Safety Records Book | Refer to the training and cross contamination prevention House rules |
| Chemical contamination | Separate storage area for chemicals Chemicals returned to storage area after use. Spillages cleaned up immediately | Clean up chemical spillages immediately | Reject food which may be contaminated Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cleaning | Complete cleaning | Refer to training and |

| | | | |
|--|------------------------------------|---------------------------------------|---|
| | House Rules in the Cleaning Manual | schedules in Food Safety Records Book | stock control House Rules and Cleaning manual |
|--|------------------------------------|---------------------------------------|---|

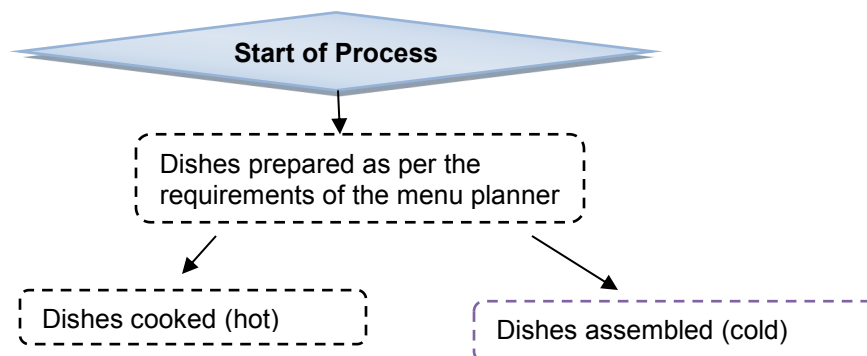
4) Goods Into Dry Storage Area

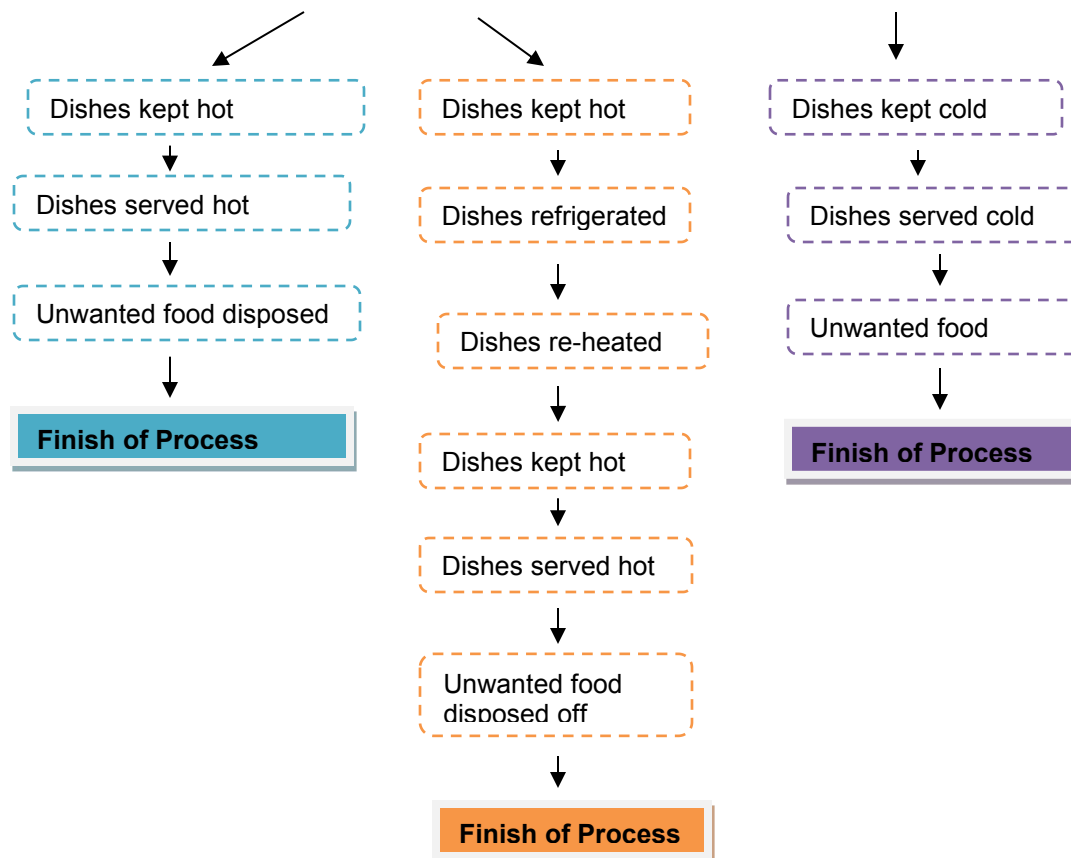
| Hazard at critical control point (s) What can go wrong? | Control Measures and Critical Limit (s) What action has to be taken to effectively reduce or get rid of the hazard? What are the critical limits? | Monitoring & Recording How are the control measures checked and recorded? | Corrective Action What should be done if the control measure fails and / or the critical limits are not met? |
|---|---|---|--|
| Contamination | Keep storage area's clean Make sure that food is protected and / or covered | Check cleaning Check protection of food | Dispose of food which may be contaminated |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cleaning and stock control House Rules | Complete cleaning schedules in the Food Safety Records Book | Refer to the training, cleaning and cross contamination prevention House rules |
| Contamination from pests | Implement pest control measures Prevent pests entering | Check storage area's for signs of pests Check food and | Dispose of food which may be contaminated Notify the Registered Manager for immediate |

| | | | |
|------------------------|--|---|---|
| | the premises | packaging for signs of pests Check the condition of the premises | investigation Ensure repairs to premises are carried out |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the pest control House Rules | Complete cleaning schedules in the Food Safety Records Book | Refer to the pest control House rules |
| Chemical contamination | Separate storage area for chemicals Chemicals returned to storage area after use. Spillages cleaned up immediately | Clean up chemical spillages immediately | Reject food which may be contaminated Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cleaning House Rules in the Cleaning Manual | Complete cleaning schedules in Food Safety Records Book | Refer to training and stock control House Rules and Cleaning manual |

● **Topic 2: Application HACCP principles in preparation, cooking, serving & re-heating food**

This diagram below indicates the passage of all food items once they have been removed from storage for immediate preparation and service, or returned to temperature-controlled storage until required for use.





1) Preparation

| Hazard at critical control point (s) | Control Measures and Critical Limit (s) | Monitoring & Recording | Corrective Action |
|---|---|--|--|
| What can go wrong? | What action has to be taken to effectively reduce or get rid of the hazard? What are the critical limits? | How are the control measures checked and recorded? | What should be done if the control measure fails and / or the critical limits are not met? |
| Presence and growth of harmful bacteria | Minimize the time food is out of the refrigerator | Ensure preparation practices are followed | Consider if the food is safe to use Dispose of unsafe food |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the | Complete weekly record | Refer to the |

| | | | |
|---|---|--|---|
| | temperature controls House Rules | in the Food Safety Records Book | temperature controls House Rules |
| Cross contamination - from raw to cooked / ready to eat foods | Keep raw and cooked / ready to eat foods separate Use safe handling practices Wash salad ingredients | Ensure separation practiced Ensure safe handling practices are followed Ensure salad washing practices are followed | Dispose of food which may be contaminated Review practices Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cross contamination prevention House Rules | Complete weekly record in the Food Safety Records Book | Refer to the training and cross contamination prevention House rules |
| | | | |
| Physical contamination | Use good personal hygiene practices Make sure that equipment and utensils are clean Make sure that equipment and utensils are in a good state of repair | Ensure personal hygiene practices are followed Check cleaning Check the condition of equipment and utensils | Dispose of food which may be contaminated Review staff training Dispose of defective equipment / utensils |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the personal hygiene and the cleaning House Rules in | Complete weekly record and cleaning schedules in the Food Safety | Refer to the personal hygiene, training and the cleaning House Rules in |
| | | | |

| | | | |
|------------------------|---|---|---|
| | the Cleaning Manual | Records Book | the Cleaning Manual |
| Chemical contamination | <p>Separate storage area for chemicals</p> <p>Chemicals returned to storage area after use.</p> <p>Spillages cleaned up immediately</p> | Clean up chemical spillages immediately | <p>Reject food which may be contaminated</p> <p>Review staff training</p> |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cleaning House Rules in the Cleaning Manual | Complete cleaning schedules in Food Safety Records Book | Refer to training and stock control House Rules and Cleaning manual |

2) Preparation – defrosting food

| Hazard at critical control point (s) | Control Measures and Critical Limit (s) | Monitoring & Recording | Corrective Action |
|--------------------------------------|---|--|--|
| What can go wrong? | What action has to be taken to effectively reduce or get rid of the hazard? What are the critical limits? | How are the control measures checked and recorded? | What should be done if the control measure fails and / or the critical limits are not met? |
| Presence and growth of harmful | Defrost in a refrigerator which complies with the | Check refrigerator is below +8°C Ensure the time that | Adjust refrigerator setting and consider if the food is safe to use |

| | | | |
|---|--|---|---|
| bacteria | House rules | the food is at room temperature is kept to a minimum | once defrosted Dispose of unsafe food |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the temperature controls House Rules | Complete weekly record in the Food Safety Records Book | Refer to the temperature controls House Rules |
| Cross contamination - from raw to cooked / ready to eat foods | Keep raw and cooked / ready to eat foods separate | Ensure separation is practiced | Dispose of food which may be contaminated |
| | Use safe handling practices | Ensure safe handling practices are followed | Review practices Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cross contamination prevention House Rules | Complete weekly record in the Food Safety Records Book | Refer to the training and cross contamination prevention House rules |
| Physical contamination | Keep surfaces and equipment clean | Check cleaning | Dispose of food which may be contaminated |
| | Prevent pests coming into your premises | Observe the condition of the premises | Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the personal hygiene and the cleaning House Rules in the Cleaning Manual | Complete weekly record and cleaning schedules in the Food Safety Records Book | Refer to the personal hygiene, training and the cleaning House Rules in the Cleaning Manual |
| Chemical contamination | Separate storage area for chemicals | Clean up chemical spillages immediately | Reject food which may be contaminated |

| | | | |
|--|---|---|---|
| | Chemicals returned to storage area after use. Spillages cleaned up immediately | | Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cleaning House Rules in the Cleaning Manual | Complete cleaning schedules in Food Safety Records Book | Refer to training and stock control House Rules and Cleaning manual |

3) Cooking

| Hazard at critical control point (s) What can go wrong? | Control Measures and Critical Limit (s) What action has to be taken to effectively reduce or get rid of the hazard? What are the critical limits? | Monitoring & Recording How are the control measures checked and recorded? | Corrective Action What should be done if the control measure fails and / or the critical limits are not met? |
|---|---|---|--|
| Survival of harmful bacteria | Cook the food to a temperature of at least 75°C for 30 seconds to destroy harmful bacteria | Check that the specified cooking temperature is reached | Continue cooking until the specified temperature is reached |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the temperature controls House Rules | Complete food temperatures in the Food Safety Records Book | Refer to the temperature controls House Rules |

4) Hot holding

| Hazard at critical control point (s) What can go wrong? | Control Measures and Critical Limit (s) What action has to be taken to effectively reduce or get rid of the hazard? What are the critical limits? | Monitoring & Recording How are the control measures checked and recorded? | Corrective Action What should be done if the control measure fails and / or the critical limits are not met? |
|--|--|--|---|
| Growth of harmful bacteria | Hot hold food at 63°C or above for no more than one hour | Check that specified hot holding temperature is maintained | Consider if food is safe to use Dispose of unsafe food Maintenance to / check / repair equipment |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the temperature controls House Rules | Complete weekly record in the Food Safety Records Book | Refer to the temperature controls House Rules |
| Physical contamination | Make sure equipment and utensils are clean Make sure that food is protected and / or covered | Check cleaning Check food if is protected | Dispose of food which may be contaminated Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cleaning and stock control | Complete weekly record and cleaning schedules in | Refer to the cleaning, stock control and training |

| | | | |
|------------------------|--|---|---|
| | House Rules | the Food Safety Records Book | House rules |
| Chemical contamination | Separate storage area for chemicals Chemicals returned to storage area after use. Spillages cleaned up immediately | Clean up chemical spillages immediately | Reject food which may be contaminated Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cleaning House Rules in the Cleaning Manual | Complete cleaning schedules in Food Safety Records Book | Refer to training and stock control House Rules and Cleaning manual |

5) Cooling

| Hazard at critical control point (s) What can go wrong? | Control Measures and Critical Limit (s) What action has to be taken to effectively reduce or get rid of the hazard? What are the critical limits? | Monitoring & Recording How are the control measures checked and recorded? | Corrective Action What should be done if the control measure fails and / or the critical limits are not met? |
|--|--|---|---|
| Growth of harmful bacteria / Surviving spores | Cool hot food which has just been cooked as quickly as possible , then refrigerate This should be achieved within 90 minutes | Check that food cools for no longer than 90 minutes Use timer or similar to keep check on time | Consider if the food is safe to use Dispose of food which has not cooled within 90 minutes |

| | | | |
|---|--|---|---|
| | Place in smaller, unheated containers to cool | | Revise cooling procedure |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the temperature controls House Rules | Complete temperature records in the Food Safety Records Book | Refer to the temperature controls House Rules |
| Cross contamination - from raw to cooked / ready to eat foods | Keep raw and cooked / ready to eat foods separate | Ensure separation is practiced | Dispose of food which may be contaminated |
| | Use safe handling practices | Ensure safe handling practices are followed | Review practices Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cross contamination prevention House Rules | Complete weekly record in the Food Safety Records Book | Refer to the training and cross contamination prevention House rules |
| Physical contamination | Keep surfaces and equipment clean | Check cleaning | Dispose of food which may be contaminated |
| | Prevent pests coming into your premises | Observe the condition of the premises | Review staff training |
| | Make sure that food is protected and / or covered | Check food is protected | Ensure repairs to premises are carried out |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the personal hygiene and the cleaning House Rules in the Cleaning Manual | Complete weekly record and cleaning schedules in the Food Safety Records Book | Refer to the personal hygiene, training and the cleaning House Rules in the Cleaning Manual |
| Chemical contamination | Separate storage area for chemicals | Clean up chemical spillages immediately | Reject food which may be contaminated |

| | | | |
|--|---|---|---|
| | Chemicals returned to storage area after use. Spillages cleaned up immediately | | Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cleaning House Rules in the Cleaning Manual | Complete cleaning schedules in Food Safety Records Book | Refer to training and stock control House Rules and Cleaning manual |

6) Serving food

| Hazard at critical control point (s) What can go wrong? | Control Measures and Critical Limit (s) What action has to be taken to effectively reduce or get rid of the hazard? What are the critical limits? | Monitoring & Recording How are the control measures checked and recorded? | Corrective Action What should be done if the control measure fails and / or the critical limits are not met? |
|---|---|---|--|
| Growth of harmful bacteria | Serve food immediately | Ensure safe serving practices | Consider if the food is safe to use Dispose of unsafe food |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the temperature controls House Rules | Complete temperature records in the Food Safety Records Book | Refer to the temperature controls House Rules |
| Physical contamination | Use good personal hygiene practices Make sure equipment | Check personal hygiene practices Check cleaning | Dispose of food which may be contaminated Review staff training |

| | | | |
|------------------------|--|---|---|
| | and utensils are clean Make sure that food is protected and / or covered | Check food is protected | |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the personal hygiene and the cleaning House Rules in the Cleaning Manual | Complete weekly record and cleaning schedules in the Food Safety Records Book | Refer to the personal hygiene, training and the cleaning House Rules in the Cleaning Manual |
| Chemical contamination | Separate storage area for chemicals Chemicals returned to storage area after use. Spillages cleaned up immediately | Clean up chemical spillages immediately | Reject food which may be contaminated Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cleaning House Rules in the Cleaning Manual | Complete cleaning schedules in Food Safety Records Book | Refer to training and stock control House Rules and Cleaning manual |

7) Reheating

| Hazard at critical control point (s) | Control Measures and Critical Limit (s) | Monitoring & Recording | Corrective Action |
|--------------------------------------|--|--|--|
| What can go wrong? | What action has to be taken to effectively reduce or get rid of the hazard? What are the | How are the control measures checked and | What should be done if the control measure fails and / or the critical |

| | critical limits? | recorded? | limits are not met? |
|------------------------------|---|--|--|
| Survival of harmful bacteria | Reheat food to a temperature of 82°C Reheat only once | Check that specified reheating temperature is reached | Continue heating until the specified reheating temperature is reached Review staff training |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the temperature controls House Rules | Complete temperature records in the Food Safety Records Book | Refer to the temperature and training controls House Rules |
| Physical contamination | Keep surfaces and equipment clean Prevent pests coming into your premises Make sure that food is protected and / or covered | Check cleaning Observe the condition of the premises Check food is protected | Dispose of food which may be contaminated Review staff training Notify the Registered Manager for immediate investigation of any pest control issues Ensure repairs to premises are carried out |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the personal hygiene and the cleaning House Rules in the Cleaning Manual | Complete weekly record and cleaning schedules in the Food Safety Records Book | Refer to the personal hygiene, training and the cleaning House Rules in the Cleaning Manual |
| Chemical contamination | Separate storage area for chemicals Chemicals returned to storage area after use. Spillages cleaned up | Clean up chemical spillages immediately | Reject food which may be contaminated Review staff training |

| | | | |
|--|---|---|---|
| | immediately. | | |
| | What needs to be done | What needs to be done | What needs to be done |
| | Keep to the cleaning House Rules in the Cleaning Manual | Complete cleaning schedules in Food Safety Records Book | Refer to training and stock control House Rules and Cleaning manual |

● **Topic 3: Benefits of and Barriers/ Challenges to Implementing HACCP**

a) Benefits

There are clear benefits of implementing HACCP for all sectors: government, food industry and consumers alike. The following benefits should encourage businesses and governments to implement HACCP:

Benefits to consumers

- Reduced risk of food borne disease
- Increased awareness of basic hygiene
- Increased confidence in the food supply and
- Improved quality of life (health and socio-economic)

Benefits to industry

- Increased consumer and/or government confidence;
- Reduced legal and insurance costs;
- Increased market access
- Reduction in production costs (reduced recall \ wastage of food)
- Improved product consistency
- Improved staff-management commitment to food safety; and
- Decreased business risk.

Benefits to governments

- Improved public health
- More efficient and targeted food control
- Reduced public health costs
- Trade facilitation;

- Increased confidence of the community in the food supply

b) Challenges/Barriers of implementing HACCP

The barriers may include:

- ❖ Lack of government commitment
- ❖ Lack of customer and business demand
- ❖ Absence of legal requirements;
- ❖ Financial constraints;
- ❖ Human resource constraints;
- ❖ Lack of expertise and/or technical support
- ❖ Inadequate infrastructure and facilities
- ❖ Inadequate communications
- ❖ Complexity (Large range of products)
- ❖ Lack of time
- ❖ Staff turnover
- ❖ Lack of employee motivation
- ❖ A lack of understanding of HACCP role in food service industry
- ❖ Lack of knowledge about HACCP and other food safety programs
- ❖ Lack of prerequisite programs
- ❖ Lack of HACCP personnel training
- ❖ Lack of information necessary in implementing HACCP system
- Unaware of the impact of HACCP system deviation

c) Overcoming Barriers (Promoting/ distribute strategies of Implementing HACCP)

The following issues may need to be considered in any strategy to promote HACCP implementation in food service industry

❖ Government Commitment

Government awareness and commitment can be influenced by:

- Epidemiological data on food borne diseases and food contamination
- Consumer awareness and concerns
- The need for food safety and HACCP for export of foods to other countries

- Advocacy by international organizations, e.g. Codex Alimentary Commission, WHO, FAO and the World Trade Organization (WTO).

Note: To promote HACCP and secure the commitment of enterprises, governments may need to draw the attention of food enterprises to the following:

- Benefits achieved in rationalization of food safety management
- Risks inherent in certain foodstuffs or production processes
- Costs, including compensation costs resulting from production failure
- Value of HACCP in safeguarding the enterprise's image from any associated outbreaks and/or product recalls.

❖ **Customer and Business Demand**

Food service industry makers should ensure that they purchase food from appropriate suppliers, transporters and retailers who, in turn, implement food safety management systems. This should, in conjunction with better-informed consumers, create a demand for improvements in food safety

The role of such associations may include:

- Communication of information pertinent to implementation of HACCP
- Collection of data on products, hazards and risks
- Development of product specifications
- Information on generic HACCP plans
- Training, material, advice and central expertise
- Working with and representing the sector in the mass media and governments

❖ **Legal Requirements**

To this end, when appropriate, governments may need to consider the necessity of mandatory measures. Whether HACCP is implemented under voluntary or mandatory schemes

Thus governments could:

- ❖ Prioritize the industry sectors for which implementation of HACCP is more important
- ❖ Consider establishing HACCP implementation committees
- ❖ Organize media campaigns on HACCP
- ❖ Develop guidance materials and generic models
- ❖ Train regulatory authorities in HACCP

- ❖ Fund initiatives to accelerate the implementation of HACCP in high-risk sectors
- ❖ Develop schemes that recognize HACCP systems
- ❖ When necessary, review food laws to shift from end-point testing to a safety management system approach.

❖ **Cost Considerations**

Mostly financial issues come at first agenda of private sector meeting to implementing HACCP for both governments and industry; implementation capacity is completely reduced of HACCP in private sector. Government should establish long term saving that could accrue to public health. Those saving should be:

- ✓ Reduced public health costs due to reduced food borne disease;
- ✓ Reduced litigation due to reduced food safety failures;
- ✓ Reduced spoilage due to improved handling, storage, and processing of food; and
- ✓ Reduced labor disputes due to improved management / staff commitment.

❖ **Human Resource Constraints**

One of the major human resource barriers is the lack of management commitment and understanding of HACCP; adequate training is important for overcoming barriers related to human resources Government and private sector should organize:

Training guidelines to promote understanding of HACCP role.

❖ **Technical Support**

The type of technical support that could be offered by governments or industry/trade associations may include:




- Providing relevant, technical training with consideration given to the level of education
- Facilitating the availability of appropriate, current, scientific support;
- Facilitating access to low cost analytical services;

❖ **Infrastructure and Facilities**

Implementation of HACCP may require improvements in the infrastructure and facilities, both within the community and the business itself. In this regard both governments and businesses have certain responsibilities:

a) Governments have set infrastructure electricity, roads, safe water supply, sewage facilities



b) Businesses should ensure that:

-  Premises, work surfaces and equipment are well designed and constructed;
-  Setting facilities to encourage personal hygiene
-  Adequate, standardized monitoring equipment is available and used correctly

❖ Communications

Government and businesses should set communication strategies of HACCP initiative.

Communication strategies should include:

-  Information on the need for change and the benefits of HACCP
-  Education of consumers regarding the importance of food safety for health

● Topic 4: HACCP approach documentation and record keeping

a) Food Safety Management System (FSMS) plan format sample

| Operational Step | Hazard | Control Measure | Critical Limit | Monitoring Method | Corrective Action | Responsibility | Record |
|------------------|--------|-----------------|----------------|-------------------|-------------------|----------------|--------|
| 1. | | | | | | | |
| 2. | | | | | | | |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |

✓ Example of Food Safety Management System plan for Food Service Units

| Operational Step | Hazard | Control Measure | Critical Limit | Monitoring Method | Corrective Action | Responsibility | Record |
|------------------|------------------|-------------------------------|----------------|------------------------|-------------------|------------------|-------------------------------|
| 1.Receiving | Microbial Growth | Receive below the danger zone | 4°C | Incoming Receipt Check | Reject Lot | Purchase Manager | Incoming Material Receipt Log |
| 2.Storage | Microbial | Store below | Fish 4°C | Daily | Inform Chef, | Sanitation | Refrigerator, |

| | | | | | | | |
|---------------|-------------------------|--------------------------------------|---|--------------------------------------|--|--------------------|-----------------------------|
| | Growth | the danger zone | | Monitoring of Freezer Temperature | and re-adjust freezer temperature | Officer | Freezer Temp Log |
| 3.Preparation | Microbial Contamination | Restrict ill employees | Nil Nil | Thrice a day checks | Inform Chef, reject lot if contamination | Sanitation Officer | Food Area Checklist |
| 4.Cooking | Bacterial, Parasitic, | Cook to Product Internal Temperature | Product core temperature 75°C for 60 secs | Chef to control Time and temperature | reheat till requirements satisfied | Chef | Cooked Food Preparation Log |
| 5.Cooling | Microbial Growth | Quick chilling to below danger zone | Cool food from 75°C to 5°C within 2 hours | Chef to control Time and temperature | reject lot | Chef | Raw Foods Preparation Log |
| 6.Reheating | Microbial Growth, | Bring and hold to Safe zone | Reheat to 75°C for 60 sec | Chef to control Time and temperature | reject lot | Chef | Cooked Food Preparation Log |
| 7.Holding | Microbial Growth during | Hold below danger zone | 5°C or below and use | Chef to control Time and | reject lot | Chef | Raw Foods Preparation Log |

| | | | | | | | |
|--|---------------|--|-------------------|-----------------|--|--|--|
| | Holding of | | within 4 hours | temperatu re | | | |
|--|---------------|--|-------------------|-----------------|--|--|--|

1. Food safety checklist

Date_____

Observer_____

Directions: Use this checklist daily. Determine areas in your operations requiring corrective action. Record corrective action taken and keep completed records in a notebook for future Reference

| PERSONAL HYGIENE | Yes | No | If “No” Corrective action |
|---|-----|----|---------------------------|
| Employees wear clean and proper uniform including shoes. | | | |
| Effective hair restraints are properly worn. | | | |
| Fingernails are short, unpolished, and clean (no artificial nails). | | | |
| Jewelry is limited to a plain ring | | | |
| Hands are washed properly, frequently, and at appropriate times. | | | |
| Burns, wounds, sores or scabs, or splints and water-proof bandages on hands are bandaged and completely covered with a foodservice glove while handling food | | | |
| Eating, drinking, chewing gum, smoking, or using tobacco | | | |

| | | | |
|---|------------|-----------|----------------------------------|
| are allowed only in designated areas away from preparation, service, storage, and ware washing areas | | | |
| Employees use disposable tissues when coughing or sneezing and then immediately wash hands. | | | |
| Employees appear in good health | | | |
| Hand sinks are unobstructed, operational, and clean | | | |
| Hand sinks are stocked with soap, disposable towels, and warm water | | | |
| A hand washing reminder sign is posted | | | |
| Employee restrooms are operational and clean | | | |
| FOOD PREPARATION | Yes | No | If "No" Corrective action |
| All food stored or prepared in facility is from approved sources | | | |
| Food equipment utensils, and food contact surfaces are properly washed, rinsed, and sanitized before every use | | | |
| Frozen food is thawed under refrigeration, cooked to proper temperature from frozen state, or in cold running water | | | |
| Thawed food is not refrozen | | | |
| Preparation is planned so ingredients are kept out of the temperature danger zone to the extent possible | | | |
| Food is tasted using the proper procedure | | | |
| Procedures are in place to prevent cross-contamination | | | |
| Food is handled with suitable utensils, such as single use gloves or tongs | | | |
| Food is prepared in small batches to limit the time it is in the temperature danger zone | | | |
| Clean reusable towels are used only for sanitizing | | | |

| | | | |
|---|--|--|--|
| equipment and surfaces and not for drying hands, utensils, or floor | | | |
| Food is cooked to the required safe internal temperature for the appropriate time. | | | |
| he internal temperature of food being cooked is monitored and documented | | | |

| HOT HOLDING | Yes | No | If “No” Corrective action |
|--|------------|-----------|----------------------------------|
| Hot holding unit is clean | | | |
| Food is heated to the required safe internal temperature before placing in hot holding. | | | |
| Hot holding units are not used to reheat potentially hazardous foods | | | |
| Hot holding unit is pre-heated before hot food is placed in unit. | | | |
| Temperature of hot food being held is at or above 135 °F | | | |
| Food is protected from contamination | | | |
| COLD HOLDING | Yes | No | If “No” Corrective action |
| Refrigerators are kept clean and organized | | | |
| Temperature of cold food being held is at or below 41 °F | | | |
| Food is protected from contamination | | | |
| REFRIGERATOR, FREEZER, AND MILK COOLER | Yes | No | If “No” Corrective action |
| Thermometers are available and accurate | | | |
| Temperature is appropriate for pieces of equipment | | | |
| Food is stored 6 inches off floor or in walk-in cooling equipment | | | |
| Refrigerator and freezer units are clean and neat | | | |
| Proper chilling procedures are used | | | |

| | | | |
|---|------------|-----------|----------------------------------|
| All food is properly wrapped, labeled, and dated | | | |
| The FIFO (First In, First Out) method of inventory management is used. | | | |
| Ambient air temperature of all refrigerators and freezers is monitored and documented at the beginning and end of each shift. | | | |
| FOOD STORAGE AND DRY STORAGE | Yes | No | If “No” Corrective action |
| Three-compartment sink is properly set up for ware washing | | | |
| Dishwashing machine is working properly | | | |
| Water is clean and free of grease and food particles | | | |
| Water temperatures are correct for wash and rinse | | | |
| If heat sanitizing, the utensils are allowed to remain immersed in 171 °F water for 30 seconds | | | |
| If using a chemical sanitizer, it is mixed correctly and a sanitizerstrip is used to test chemical concentration | | | |
| Small ware and utensils are allowed to air dry | | | |
| Wiping cloths are stored in sanitizing solution while in use | | | |
| UTENSILS AND EQUIPMENT | Yes | No | If “No” Corrective action |
| All small equipment and utensils are cleaned and sanitized between uses | | | |
| Small equipment and utensils are washed, sanitized, and air-dried | | | |
| Work surfaces are cleaned and sanitized between uses | | | |
| Thermometers are cleaned and sanitized after each use | | | |
| Thermometers are calibrated on a routine basis | | | |
| Can opener is clean. | | | |
| Drawers and racks are clean | | | |

| | | | |
|---|--|--|--|
| Clean utensils are handled in a manner to prevent contamination of areas that will be in direct contact with food or a person's mouth | | | |
|---|--|--|--|

| LARGE EQUIPMENT | Yes | No | If "No" Corrective action |
|---|------------|-----------|----------------------------------|
| Food slicer is clean | | | |
| Food slicer is broken down, cleaned, and sanitized before and after every use | | | |
| Boxes, containers, and recyclables are removed from site | | | |
| Loading dock and area around dumpsters are clean and odor-free | | | |
| Exhaust hood and filters are clean | | | |
| GARBAGE STORAGE AND DISPOSAL | Yes | No | If "No" Corrective action |
| Kitchen garbage cans are clean and kept covered | | | |
| Garbage cans are emptied as necessary | | | |
| Boxes and containers are removed from site | | | |
| Loading dock and area around dumpster are clean | | | |
| Dumpsters are clean | Yes | No | If "No" Corrective action |
| PEST CONTROL | | | |
| Outside doors have screens, are well-sealed, and are equipped with a self-closing device. | | | |
| No evidence of pests is present | | | |
| There is a regular schedule of pest control by a licensed pest control operator | | | |

Name:.....**Position:**.....**Signed:**..... **Date:**...../...../.....

Note: The above form is Simple checks of the premises which should be carried out by the Manager or Supervisor regularly

2. Refrigeration / Freezer log

| Refrigeration / Freezer log | | | | | | |
|-------------------------------|------|------|-------------|----------------------|----------------------------|----------------------------|
| Location/ Unit Description | Date | Time | Temperature | Corrective Action | Food Worker Initials | Manager Initials / Date |
| | | | | | | |
| | | | | | | |

Instructions: This log should be maintained for a minimum of 90 days after the food has been consume

3. Corrective Action Log

| Corrective action log | |
|--|-------------------------|
| Product: | Lot ID: |
| Date / Time: | Designated Food Worker: |
| Deviation: | |
| Cause of Deviation | |
| Cause of Deviation Eliminated By: | |
| CCP Under Control After Corrective Actions Taken: | |
| Preventative Measures: | |
| Product Disposition | |

Verification (Records Review) by and Date: _____

4. Receiving Log

| Receiving Log (Transporting) | | | | | | | |
|------------------------------|------|----------|-----------------|-------------|----------------------|---------------|--------------------------|
| Date | Time | Supplier | Product Name | Temperature | Corrective Action | Initials/Date | Manager Initials/Date |
| | | | | | | | |

| | | | | | | | |
|--|--|--|--|--|--|--|--|
| | | | | | | | |
| | | | | | | | |

Instructions: This form is completed by food worker and Verified by supervisor.

The Receiving log should be maintained for a minimum of 90 days after the food has been consumed.

5. Damaged or Discarded Product Log

| Damaged or Discarded Product Log | | | | | | | |
|----------------------------------|------|----------|--------------|-------------|-------------------|---------------|-----------------------|
| Date | Time | Supplier | Product Name | Temperature | Corrective Action | Initials/Date | Manager Initials/Date |
| | | | | | | | |
| | | | | | | | |

Instructions: This form is completed by food worker and Verified by supervisor. The Receiving log should be maintained for a minimum of 90 days after the food has been

6. Food Preparation Log

| Food Preparation Log | | | | | | | | | |
|----------------------|------------|--------------|---------|---------|-----------------|--------------------|----------|----------------|---------------|
| Date | Start Time | Product Name | Temp #1 | Temp #2 | Amount Prepared | Corrective Actions | End Time | Initial Worker | Verified Date |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Instructions: This form is completed by food worker and Verified by supervisor if the procedure is respected. This log should be maintained for a minimum of 90 days after the food has been consumed.

7. Cooking & Reheating Temperature Log

| Cooking & Reheating Temperature Log | | | | | | | |
|-------------------------------------|------|-----------|---------------------------|---------------------------|-------------------------|-----------------|---------------|
| Date | Time | Food Item | Internal Temperature Time | Internal Temperature Time | Corrective Action Taken | Initials Worker | Verified Date |
| | | | | | | | |
| | | | | | | | |

Instructions: This form is completed by food worker and Verified by supervisor if the procedure is respected. This log should be maintained for a minimum of 90 days after the food has been consumed.

8. Cooling Temperature Log

| Cooling Temperature Log | | | | | | | | | | |
|-------------------------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------------------|----------|--------------------|
| Date | Food Item | Time Temp #1 | Time Temp #2 | Time Temp #3 | Time Temp #4 | Time Temp #5 | Time Temp #6 | Corrective Actions Taken | Initials | Verified By / Date |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Instructions: This form is completed by food worker and Verified by supervisor if the procedure is respected. The Cooling Log should be kept for a minimum of 1 year.

9. Holding Times & Temperatures

| Holding Times & Temperatures | | | | | | | | |
|------------------------------|-----------|---|------|----------|--|------|----------|-------------------|
| Date | Food Item | 1 st Measurement (e.g. enter holding) | | | 2 nd Measurement (e.g. exit holding) | | | Corrective Action |
| | | Time | Temp | Initials | Time | Temp | Initials | |
| | | | | | | | | |
| | | | | | | | | |

Supervisory Employee's Initials and Date: _____

Instructions: Take and record the temperature of the food when placed in holding units and when removed from holding units. If pans are moved directly from ovens to holding units, simply record the end cooking temperature on this form.

10. Thermometer Calibration Log

| Thermometer Calibration Log | | | | | | | |
|-----------------------------|------|----------------------|-------------------------------|--------------------------|---------------------------------|-------------------|----------|
| Date | Time | Test Thermometer ID# | Reference Thermometer Reading | Test Thermometer Reading | Adjustments Required (Yes / No) | Corrective Action | Initials |
| | | | | | | | |

| | | | | | | | |
|--|--|--|--|--|--|--|--|
| | | | | | | | |
| | | | | | | | |

Verification (Records Review) by and Date: _____

Instructions: This form is completed by food worker and observed and verified by supervisor if the procedure is well respected. This log should be maintained for a minimum of 90 days after the food has been consumed.

Thermometers intended for measuring hot temperature items, such as cooked product, will be calibrated in hot water, while those used for taking lower temperatures will be calibrated in ice water. All thermometers will be calibrated within + or – 18°C

Learning unity 3: Prevent food contamination and poisoning

LO 3.1: Select required temperature for food

● **Topic 1: Causes of food poisoning**

It is also called food borne illness is illness caused by eating contaminated food.

Causes may include

- ✓ Toxin formation when bacterial growth is at high rate
- ✓ Accidentally eating contaminated and toxic foods
- ✓ Incorrect storage and food handling procedures

Types of food poisoning

1. Staphylococcus Aureus
2. Clostridium Perfringens
3. Salmonella
4. Listeria
5. Clostridium Botulinum
6. Camphylobacteria



● **Topic 2: Symptoms of food poisoning**

1. Nausea
2. Vomiting
3. Stomach cramps
4. Diarrhea

5. Gastro-enteritis
6. Dehydration

a. The cause/source of food contamination

Foods can become contaminated by any of the following mean

- 1) Hands
- 2) Air
- 3) Coughs and sneezes
- 4) Water
- 5) Other foods
- 6) Insects
- 7) Pests
- 8) Equipment and utensils
- 9) Rats and mice



● **Topic 3: Conditions that is conducive to bacteria growth**

There are 6 factors influence the growth of bacteria

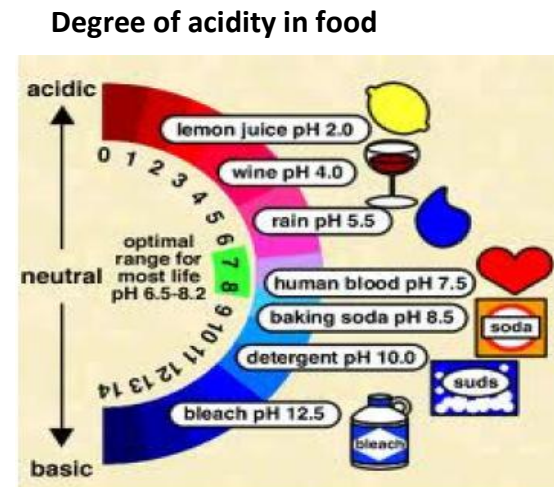
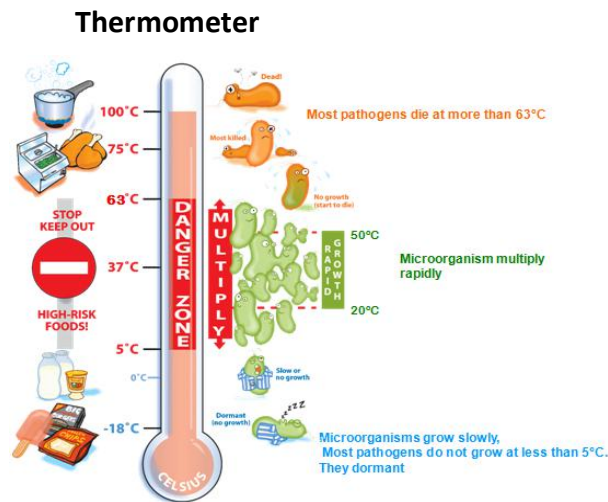
1. **Food:** High protein
2. **Acid:** Foods with pH 4.6 or higher
3. **Temperature:** 5°C-63°C (Temperature Danger Zone)
4. **Time:** About 3 million for 5 hours in ideal condition
5. **Oxygen:** Aerobic, Anaerobic, Facultative.
6. **Moisture:** Water activity greater than 0.85

This is acronym **F. A. T. T. O. M.** of those factors said in above table

The following pictures describe effect of Temperature and acid on microorganism

- More temperature becomes high than 63°C; it kills microorganism,
- More temperature becomes less than 5°C microorganisms dormant
- More acid becomes high than 4.6 (0 1 2 3 4 as it is indicated in Degree of acidity in food scheme) Microorganisms do not appeal in food

- Most foods are in the acidic range, or less than 7.0 pH. Bacteria grow best in an environment that is neutral or slightly acidic.



● Topic 3: Temperature and time control procedures while storing, cooling and reheating food

a) FIFO rules applied to all types of foods

- **Fresh foods:** are best used the day of purchase or within several days, like potato, carrots, which can be kept longer if stored properly

Different requirements in the storage of fresh products items

- Peaches, plums and nectarines, can be left at room temperature while ripe, are refrigerated until ready to use
- Tomatoes should never be refrigerated, because cold damages texture and ultimately taste.
- **Frozen foods:** should be stored at 0°F or less. The maximum length of storage for frozen items varies, but for most fruits and vegetables, a good rule is six months.
- **Canned foods:** have a shelf life of about two years. If they are stored at a constant temperature of about 75°F, and as long as the can is not leaking or bulging. Check canned foods periodically rotate stock using the FIFO rule and discard any leaking, bulging dented cans (dent - depression in a surface made by pressure or below)
- **Dried foods** should be stored in cool, dark areas. Storing in airtight containers in the refrigerator is a great option. Recommended storage times for dried foods range from 4

months to 1 year. Because food quality is affected by heat, the storage temperature helps determine the length of storage. The higher the temperature, the shorter the storage time.

b) Cooling food

There are two acceptable methods of cooling food

- ❖ **One-stage (four hour) method:** Cool hot cooked food from 57° Celsius to 5° Celsius within four hours
- ❖ **Two-stage method:** Cool hot cooked food from 57° Celsius to 21° Celsius or lower within two hours, and then cool down to 5° Celsius or lower within an additional four hours

Procedures for cooling foods:

- ✓ Reduce the quantity of the food being cooled
- ✓ Use ice-water baths
- ✓ Add ice or water as an ingredient
- ✓ Stir food to cool faster and more evenly

c) Reheating food

All food should be reheated to an internal temperature of 74° Celsius and held at least 15 seconds to assure the safety of food

Procedure

- ☐ Remove leftover food from the freezer/refrigerator.
- ☐ Reheat the food product to 74° Celsius for 15 seconds using an oven, stove, or steamer.
- ☐ Serve the food immediately, or place the food in a steam table

Notice: Food which is between 5-63°C should be removed from the reheating list

d) Guidelines for keeping food at proper temperature

- 1) Use the proper storage method for purchased food.
- 2) Keep hot food above 63°C until served.
- 3) Keep cold food below 5°C until served.
- 4) After serving, refrigerate food immediately
- 5) Do not keep stuffed uncooked meat, poultry, or fish in the refrigerator

Cross Contamination

It is the term used to indicate as to how bacteria are spread from one food product to another

Food contamination prevention measures

1. Protect food from contamination.
2. Prevent bacteria within food from multiplying.
3. Destroy the contaminated bacteria within food.
4. Store food at right temperature
5. Cook food appropriately
6. Maintain hot cooked food at right temperature.
7. When reheating cooked food, reheat at right temperature
8. Apply personal hygiene effectively

LO 3.2 Apply hygiene and food safety rules in storage areas

❖ **Food storing:** is process consisting of well keeping food in proper condition to assure their freshness by extending its living time.

❖ **Objectives of storing food**

- ☐ Assure food freshness
- ☐ Extending food living time
- ☐ Using them in future time

● Topic 1: Food storage areas hygiene and food safety practices

I. Dry Storage Practices

- Store dry foods in a well-ventilated room, at least six inches off the floor and away from the walls.
- The temperature of the dry storage area should be maintained between 10°C and 21°C
- Use FIFO (First In, First Out).
- Avoid storing food under exposed waste or sewer lines.
- Store opened packages in closed, sturdy, labeled containers.
- Store chemicals, cleaners, and pesticides away from food products.
- Keep the shelving and floor clean.

II. Frozen Storage Practices

- Store foods between -18°C and -12°C.

- Use FIFO (First In, First Out).
- Properly wrap food to prevent freezer burn.
- Defrost the freezer as needed.
- Keep the shelving and floor clean.

III. Refrigerated Storage Practices

- Store foods at 5°C or below.
- Store raw meat on the bottom shelf in a leak-proof dish away from other foods.
- Store dairy products away from strong odor foods, if possible.
- Use FIFO (First In, First Out).
- Store foods to allow cool air circulation on all surfaces.
- Prevent condensation from dripping on food.
- Check and record temperatures frequently.
- Keep refrigerator and freezer doors closed.
- Keep the shelving and floor clean.

LO 3.3 Apply the storage procedures

● **Topic 1: Storage of foods according to their needs**

Tips for proper food storage

Proper food storage includes maintaining proper food temperature and storing food in such a way as to keep it clean and safe prior to the time it is served to the customer

- Keep cold foods cold and hot foods hot.
 - ☐ Keep hot food above 63°C and cold foods below 5°C
 - ☐ Don't let foods stand at room temperature
- Do not thaw frozen meats at room temperature
 - ☐ Thaw foods in refrigerator; in a micro wave; under a steady stream of cold, running water or through cooking
- Store all bulk foods in a clean, dry storage area.
 - ☐ Once opened, bulk foods should be transferred to clean, labeled containers with tight fitting lids.
- Wash, rinse, and sanitize all dishes

- ☐ All dishes, glasses, and utensils should be sanitized in chlorine, iodine, and quaternary ammonium solutions.

E. Keep kitchen, dining rooms and storage rooms free from rats, mice and insects.

- ☐ Maintain a vigorous program to prevent the entry of vermin

Food storage procedure/ methods

- ❖ FIFO system
- ❖ LIFO method
- ❖ Labeling
- ❖ Stocktaking
- ❖ Packaging
- ❖ Cooling
- ❖ Clean and sanitize storage areas
- ❖ Close the doors of chiller, fridge or freezer

Food storage temperature and procedures

| Food | Storage Temperature | Storing procedures |
|-----------------------------|---------------------|--|
| Meat | 5°C | Tightly wrap or place it in a deep container |
| Poultry | 5°C | Store ice-packed poultry in self-draining containers. Change ice often and sanitize the container regularly. |
| Fish | 5°C | Tightly wrap or store in original packaging. Before shipping, |
| Shellfish | 7°C | Store alive in the original container |
| Shell eggs | 5°C | Use within 4-5 weeks of the packing date. |
| Dairy | 5°C | Discard if past the use-by or expiration date. |
| Ice cream and frozen yogurt | -14°C -12°C | Discard if past the use-by or expiration date |
| Canned/ dry food | 10°C-21°C | If removed from its original packaging, store in airtight, clearly labeled containers. |
| Perishables | 8°C or below | Wrap each type in airtight container |
| Fruits | 7-10°C | Wrap each type in airtight container |

LO 3.4 Apply pests control measures to avoid to avoid food contamination and poisoning

● **Topic 1: Pests control procedures**

Pest is any creature that lives on, or in, human food causing damage or contamination or both

Food Pests: Food pests include rodents, insects or birds that cause damage to, or contamination of, food products.

Food pest include

- Rodents
- Ants and flying insects
- Birds
- Feral cats and foxes

a) The importance of pest control

1. Pests are a hazard to public health
2. They carry disease Pests damage and waste food
3. Pests damage property
4. Pests contaminate water storage tanks

b) Signs(evidences) of the pest

i. Signs of rodent activity – e.g. mice

Droppings, nibbled food packages, gnaw marks and holes, greasy smears on pipes and walls, paw marks in dust, shredded scraps of paper used for nesting.

ii. Signs of insect activity – e.g. cockroach

1. Moulded skins - cockroaches
2. Larvae/eggs – bluebottles
3. Webbing - mites & moths

c) The best method of preventing pest

1. Eliminate their food and shelter
2. Rodent proof the building

3. Set traps or lay bait (umutego wimbaba)
4. Insect proof the building
5. Insecticides and insect killers
6. Ultra violet insect killers
7. Elimination of building cracks and crevices
8. Covers on all external drains
9. The use of mesh fly-screens on windows and doors in specified areas
10. The use of self-closing exterior door
11. Proper food storage

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