UNIT OF COMPETENCY : PRACTICE FOOD SAFETY, SANITATION AND HYGIENE

MODULE TITLE : PRACTICING FOOD SAFETY, SANITATION AND HYGIENE

MODULE DESCRIPTOR : This module deals with the knowledge, skills and attitudes in practicing food safety, sanitation and hygiene procedures

NOMINAL DURATION : 6 hours

SUMMARY OF LEARNING OUTCOMES:

Upon completion of the module the student trainees must be able to:

LO1. Observe prevention measures for food-borne diseases

LO2. Prevent cross contamination

LO3. Observe food hygiene procedures

LO4. Practice Personal hygiene and grooming

LO1. OBSERVE PREVENTION MEASURES FOR FOOD-BORNE DISEASES

ASSESSMENT CRITERIA:

0. Causes and prevention of *food borne disease* and food hazards are identified
1. HACCP (Hazard Analysis Critical Control Point) / Food Safety Management System is applied
2. Specific temperature of foods are checked according to *cooking methods*
3. Principles of receiving food provisions are applied
4. Principles and approved method of storing foods are applied to refrigerated and dry food items
5. Approved method of thawing are applied
6. *Favorable conditions that support bacteria growth* are checked and controlled/ eliminated
7. *Galley* tools and equipment are cleaned and sanitized following established procedures
8. *Cleaning and sanitizing tools and agents are maintained* in accordance with ship's procedure
10. Appropriate cleaning and sanitizing tools and agents are identified and handled based on cleaning requirements and manufacturer's instructions
11. Tasks are recorded in accordance with ship's procedures

CONTENTS:

- Causes and prevention of food borne disease and food hazards
- Specific temperature of foods
- Principles of receiving food provisions
- Principles in re-heating and serving of leftover food
- Principles and approved method of storing foods (refrigerated and dry)
- Approved method of thawing
- Favorable conditions that support bacteria growth
- Galley tools and equipments cleaning and sanitizing methods and procedures
- Good personal hygiene
- HACCP (Hazard Analysis Critical Control Point) /Food Safety Management System
- Records keeping

CONDITIONS:

The following resources should be provided:

- Access to relevant workplace where assessment can take place
- Tools, equipment and materials/supplies relevant to the activity or task

METHODOLOGIES:

- Self-paced Hand-outs/ Module
- Video showing
- Lecturette
- Discussion on Queries
- Simulation
- Practical exercises

ASSESSMENT METHODS:

- Written Examination
- Oral Questioning
- Portfolio

Food safety is a serious concern for all establishments engaged in food production. As consumer safety cannot be compromised; adherence to sanitation guidelines of food handlers is vital.

By employing proper sanitation procedures throughout the entire operation, the integrity of food is preserved and incidences of food-borne illness are reduced. Thus, consumers are assured of safe and wholesome food. Poor sanitation practices resulting in unsafe food not only cause illness but could also ruin the business' reputation. Loss of customers' goodwill in addition to exorbitant legal fees and loss of revenues may result huge losses which may be difficult to recover.

Since food is a potential vehicle for food-borne illnesses, it is every food handler's responsibility to prepare food the proper way. This could only be assured through adequate education and training of food handlers on sanitation standards and guidelines and a commitment from managers in ensuring food and consumer safety.

FOOD-BORNE ILLNESS

Food-borne illnesses usually result in intestinal upset and fever. Symptoms may begin several hours after the meal or as late as a couple of days afterward, the severity of which will depend on the microorganisms causing the illness.

Susceptibility to food borne illnesses would depend upon the individual's age and health condition. Children, the elderly pregnant women, and the immune-compromised are those considered as highly susceptible to such illnesses.

THE TWO TYPES OF FOOD-BORNE ILLNESSES

FOOD INFECTION

Food infection occurs when pathogens enter the body through ingestion of contaminated food. Examples of bacteria that cause food infection are Salmonella spp. and Escherichia coli.

FOOD INTOXICATION

Food intoxication is a food-borne illness caused by toxins formed in the food by toxin-producing pathogens. Clostridium botulinum and Staphylococcus aurerus are two types of bacteria that cause food intoxication.

TYPES OF MICROORGANISIM

Bene Beneficial microorganisms are those used in food production. Examples of beneficial microorganisms are thos used for making bread, beer, yoghurt, and cheese.

Harmful microorganisms are those that spoil food or cause disease (pathogens). Examples are Salmonella, Clostridium and Staphylococcus.

Microbial Forms

Bacteria

Bacteria are single-celled microorganisms that can cause food-borne illnesses and spoilage. Some bacteria can form spores at adverse conditions making them more resistant than other types of microorganisms.

Fungi

a. Molds

Molds are multicellular, filamentous fungi which is characterized by cottony appearance. They vary in appearance – some may be fluffy while others may be compact.

b. Yeasts

Unlike molds, yeasts are not filamentous but are usually ovoid, spheroid unicellular. Yeast contamination may be indicated by slime formation and bubbles

Virus

While viruses do not reproduce in food, they can survive and cause illness to anyone who consumes the food.

Parasites

This type of organism requires a host in order for it to survive. Poor personal hygiene is usually the culprit of a parasite contamination. Examples are ascaris and hookworm.

NEED OF MICROORGANISMS

Food / Nutrients

As in all forms of life, microorganisms need food to grow and reproduce. High-protein foods have a high risk of contamination.

pH Requirement

The acidity or alkalinity of food may be expressed in terms of its pH. Like water activity, pH requirements vary among microorganisms. Pathogenic bacteria thrive in neutral pH which is near 7.0 while most bacterial growth is inhibited at acidic environment or at pH below 4.6 The optimum pH for yeasts is from 4.5-6.0 while molds require a pH of 3.5-4.0.

Temperature

Microorganisms can be classified according to their temperature or oxygen requirement. Molds and yeasts usually grow within the temperature range of 25-30°C while bacteria normally survive at 35°C.

The optimum temperature for microbial growth and reproduction is between 40°F to 140°F. This is the range where microbial growth and reproduction is at its peak.

Classification of microorganisms according to temperature

Thermophiles – heat loving microorganisms, thrive at 40-90°F

Mesophiles – survives at intermediate temperature levels, 5-47°C

Psychrophiles – cold-temperature loving microorganisms, -5 to 35°

Time

Microorganisms reproduce logarithmically. Under optimum conditions, each cell divides into two every 20 to 30 minutes. In three hours, from one cell alone, the number of bacterial cells in a contaminated food would increase to 64. In only 10 hours, that one cell would have increased to 1,048,576. In 24 hours, the number of cells would be more than a billion times greater than its original number, enough to cause illness to anyone who consumes the food.

Oxygen

Oxygen requirements of bacteria vary. Some may or may notrequire oxygen. Others may require only a little of it.

Classification of microorganisms according to oxygen requirement

1. Obligate aerobes are those that require oxygen to survive.

2. Obligate anaerobes require the absence of oxygen. Clostridium botulinum, which survives on sealed cans, is an example of this.

3. Facultative anaerobes are microorganisms that grow either in the presence or absence of oxygen

4. Microaerophilic microorganisms require minimal quantities of oxygen.

Water Activity

Microorganisms' need for water vary. The water requirement of microorganisms can be expressed in terms of their water activity (Aw) requirements. Water activity is the water available in food for microorganisms to grow. Different types of microorganisms have different Aw requirements. Molds require foods with low Aw. Bacteria, on the other hand, require a high a Aw for their growth and survival.

Potentially hazardous food

Any type of food runs the risk of being hazardous when exposed to optimum conditions however it is the moist, high-protein food with moderate pH which is considered to be potentially hazardous. Meats, tofu, egg-based products such as custards and mayonnaise belong to this category.

Spore formation

The ability to form spores is a defense mechanism of some bacteria against adverse conditions. It is at this stage that bacteria become inactive. Spore formers return to their vegetative state when conditions become optimum for their growth.

LO2. PREVENT CROSS CONTAMINATION

ASSESSMENT CRITERIA:

0. Sources of cross contamination are identified
1. HACCP (Hazard Analysis Critical Control Point) / Food Safety Management System is observed
2. Specific temperature of foods are checked according to approved cooking methods
3. Principles of receiving food provisions are applied
4. Principles and approved method of storing foods are applied to refrigerated and dry food items
5. Approved method of thawing are applied
6. Favorable conditions that support bacteria growth is checked and controlled/ eliminated
7. Good personal hygiene practice is applied
8. Galley tools and equipments cleaning and sanitizing methods and procedures are applied in accordance with the international standard
9. Task are recorded as per meal basis
10. International Rules and regulations is applied
11. Cleaning and sanitizing methods and are applied in accordance with ship's procedure

CONTENTS:

- Causes and prevention of food borne disease and food hazards
- HACCP (Hazard Analysis Critical Control Point) / Safety Management System
- Specific temperature of foods
- Principles of receiving food provisions
- Principles and approved method of storing foods to refrigerated and dry food items
- Approved method of thawing
- Favorable conditions that support bacteria growth
- Galley tools and equipments cleaning and sanitizing methods and procedures
- Good personal hygiene
- International Rules and regulations
- Records keeping

CONDITIONS:

The following resources should be provided:

- Access to relevant workplace where assessment can take place
- Tools, equipment and materials/supplies relevant to the activity or task

METHODOLOGIES:

- Self-paced Hand-outs/ Module
- Video showing
- Focus group discussion
- Simulation
- Practical exercises

ASSESSMENT METHODS:

- Written Examination
- Oral Questioning
- Portfolio

CROSS-CONTAMINATION

Cross contamination is the transfer of disease-causing microorganisms from one contaminated food contact surface to another. Food contact surfaces are surfaces are chopping boards, tables, countertops, plates, and bowls.

Types of hazards to food safety

Biological hazards

Biological hazards include spoilage microorganism and pathogens or disease-causing microorganisms, parasites, and fungi. Plants and animal products that carry naturally-occurring toxins also belong to this category.

Chemical hazards

Chemical hazards include detergents, sanitizers, food preservatives, and additives that may find their way into food.

Physical hazards

Physical hazards are materials from the immediate surroundings that could get into food. Examples are glass shards, staple wire, wood chips, hair strands, and pieces of jewerly.

PREVENTING CROSS-CONTAMINATION

Unsanitary practices during preparation and storage can introduce a high initial microbial load which may not be entirely destroyed during the cooking process. In the same manner, improper handling of food after cooking can also reintroduce microbial contaminants which can render the food unsafe for consumption.

To prevent this from occurring, proper control measures such as observance of proper sanitation and hygiene and controlling temperature and time should be observed in all steps of food production.

LO3. OBSERVE FOOD HYGIENE PROCEDURES

ASSESSMENT CRITERIA:

1. HACCP (Hazard Analysis Critical Control Point) /Food Safety Management System is observed
2. Specific temperature of foods are checked according to cooking methods
3. Principles of receiving food provisions are applied
4. Principles and approved method of storing foods are applied to refrigerated and dry food items
5. Approved method of thawing are applied
6. Favorable conditions that support bacteria growth is checked and controlled/ eliminated
7. Good personal hygiene practice is applied
8. Galley tools and equipment's cleaning and sanitizing methods and procedures are applied in accordance with the international standard
9. Task are recorded as per meal basis
10. International Rules and regulations is applied
11. Cleaning and sanitizing methods and are applied in accordance with ship's procedure

CONTENTS:

- Causes and prevention of food borne disease and food hazards
- HACCP (Hazard Analysis Critical Control Point) / Food Safety Management System
- Specific temperature of foods
- Principles of receiving food provisions
- Principles and approved method of storing foods wet and dry
- Approved method of thawing
- Favorable conditions that support bacteria growth
- Galley tools and equipment's cleaning and sanitizing methods and procedures
- Good personal hygiene
- Records keeping
- International rules and regulations

CONDITIONS:

The following resources should be provided:

- Access to relevant workplace where assessment can take place
- Tools, equipment and materials/supplies relevant to the activity or task

METHODOLOGIES:

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ASSESSMENT METHODS:

- Written Examination
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KITCHEN HYGIENE

Design and Construction

The construction and design of the kitchen should ensure safety and quality. It should be designed to facilitate hygienic kitchen operations such that food contamination is avoided. The design should also result in a workflow pattern that is smooth and efficient. Doors should be self-closing tight-fitting and must not allow the entry of insects, pests and other animals. Windows must be screened for the same reason.

Storage areas

Separate areas for storage of food and non-food ingredients must be provided for chemicals such as sanitizers and detergents should always be stored separately from food products to prevent contamination. Shelves should be at least 6 inches off the floor.

Restrooms

restrooms should be constructed away from the food preparation area.

Handwashing facilities like liquid soap and toilet paper as well as other facilities like a trash bin with receptacle should be provided for.

Flooring

The tiles used as flooring should be smooth and flat, cleanable, non-porous and of light color to easily reveal dirt and soil. Floors should be without crevices, cracks or rough spots as these are difficult to clean and could therefore pose as possible contaminants.

Wall and ceilings

Walls should be sloping or coved to facilitate cleaning. Walls and ceilings should be cleanable and of light color to easily reveal dirt.

EQUIPMENT AND UTENSILS

Food contact surfaces

Food contact surfaces should be non-porous, non-corrosive, smooth, flat, continuous, and without cracks that could accumulate dirt and encourage bacterial growth. Stainless steel is the best material used as counter top, sink, table, or shelf

Chopping boards

Chopping boards should be classified and differentiated according to use.

Separate chopping boards should be used for meat and vegetables, and for raw and cooked food. The color coding method is one way of classifying colored chopping boards according to use.

The more commonly used type of chopping boards are the food-grade acrylic blocks which are easier to clean sanitize than wooden boards.

Use of wooden chopping boards is not advisable since wood, being porous and biodegradable, is conducive to microbial growth and could thus be a source of contamination. Wooden boards also increase the possibility of a physical hazard since chips of wood could get into food.

Equipment

Equipment should be self-draining and should be designed such that injury could be prevented. For some equipment, the manufacturer's instructions should be followed. It is important to thoroughly clean the equipment of all visible dirt and food particles by removing detachable parts, washing, sanitizing, and air-drying them.

Other utensils

Kitchen utensils such as graters and peelers must be thoroughly cleaned and washed. A small, clean kitchen brush can be used for removing food particles and visible dirt that may otherwise be difficult to remove.

SANITARY PRACTICES DURING PREPARATION AND PRODUCTION

Storage

Cold storage

To keep food safe during storage, it must be kept out of the temperature danger zone which is from 40-140°F. Within this range, food becomes more susceptible to contamination. Cold storage by refrigeration does not inhibit but only retards microbial growth and reproduction.

Regular monitoring of the temperature of the refrigerator unit should be done to check whether it is still within the safe range. A thermometer is an

indispensable tool for monitoring the temperature. Generally, refrigerator units should have a temperature of 4.4°C (40°F) or below. Freezer units should have a temperature of 0°F (-18°C) or below. Always practice the First-in, First-out (FIFO) Foods system to minimize spoilage. This system requires old food items to be used ahead of newly-purchased or prepared food items. Stored items should be labelled with the name and date of preparation or purchase. All food items should be covered during storage to prevent contamination as well as to avoid absorption of odors from other foods, Overstocking must be avoided for proper air circulation. Discard food that exceeds beyond its expiration date.

To reduce the risk contamination, raw meat items like poultry, fish, beef and pork should be stored below, not above cooked food as they could drip or splatter and cause contamination. Vegetables and fruits should be also be stored above meat items.

Dry storage

Dry storage is meant for foods with low perishability such as canned goods and grains such as rice, spices, and cereals. Some dry goods such as flour, however, are better stored in the freezer to prevent weevil infestation. Other dry goods such as nuts should also be frozen as these contain oils that could turn rancid.

Dry storage areas must be kept clean and pest-free. Over stacking should be avoided for proper ventilation. Shelves should be slatted for the same reason. Food should not be stored on floors but on shelves at least six inches above the ground, away from the wall, in a cool, dry place away from pipes, condensation lines, and refrigerator units.

Chemicals such as sanitizers and other non-food materials should be stored in a separate area, away from food products. As with all types of storage the FIFO system must be strictly observed. All stored items should be labelled with the name and date of storage.

Preparation

Refrigeration before the preparation of foods is necessary to keep the food internal temperature within the safe range. There should be separate areas for raw and cooked food or for meat and vegetables/fruits. Likewise, separate chopping boards must be used for raw and cooked food.

Sanitized utensils and cutting boards should always be used to avoid cross-contamination.

Cooking

Cook food to a temperature higher then the minimum safe internal temperature to ensure food safety. Overloading of ovens should be avoided to prevent dropping of temperature. Allow the cooking temperature to return to the required temperature between batches to ensure that food is cooked to this safe internal temperature.

Cooling

During cooling, it is necessary to monitor and control time and temperature.

Food must not be allowed to stay within the temperature danger zone of 40-140°F for more than two hours. If it does, discard it.

To rapidly cool liquid mixtures to a safe range, an ice bath can be used.

Frequent stirring of the mixture should be done to facilitate the mixing of the cold liquid with the hot liquid. This will also discourage the growth of anaerobes in the center of the mixture.

To cool large cuts of meat, cut it into smaller portions to hasten the cooling process. Cool the cut pieces at room temperature, wrap, then store in the refrigerator. Never store hot foods in refrigerators as doing so could raise the temperature of the unit and affect the internal storage temperature of stored food.

Reheating

Food should be reheated to a safe internal temperature of at least 74°C (165°F) for at least 15 seconds within two hours. It should then be transferred to a hot-holding equipment afterwards. Food not reheated in two hours should be discarded

To check the temperature of food, instant-read thermometers should be used. The thermometer should be cleaned and sanitized after every use.

It is important not to reheat the food more than once as repeated heating encourage the growth of pathogens, particularly, spore-formers. To minimize reheating, food must be prepared in a quantity no more than necessary and as close to serving time as possible.

Food should only be reheated on cooking ranges, ovens and microwaves, never on hot holding equipment since the latter is not designed to maintain the required temperature. It is advisable that the food be reheated in small batches to reduce heating time

Holding

Holding hot food

When holding hot food, hot holding equipment that can keep foods at (60°C) 140°F should be used. The internal temperature of food must be checked every two hours using a clean and sanitized thermometer. Hot holding equipment such as chafing dishes should never be used for reheating or cooking food. Discard food if it has not been held within the 140°F after four hours.

To avoid contamination, do not mix old food with new food or raw food with cooked.

Holding cold food

Use cold holding equipment that can keep food at 40°F (4.4°C). Ready to eat cold foods should never be placed directly on ice. Pans, plates, and other clean containers should instead be used. Ice should be purchased from a reliable source to ascertain its safety and should drain away from food when used. Drip pans should be cleaned and sanitized after each use. As with the holding of hot food, new food must never be mixed with raw or old food.

Serving

Once food has been prepared for serving, it will no longer undergo any heat treatment. It is therefore important not to recontaminate food by practicing proper serving methods that will assure the consumers of safe and hygienic food.

Utensils that are to be used for serving must be thoroughly cleaned and sanitized before and after each task. Clean and sanitize at least once every four hours during continuous use. Use separate utensils for each food item.

Serving utensils should be stored properly. They can either be placed with the food, with the handle extended above the container's rim or on a clean, sanitized food contact surface.

Serving utensils with long handles should be used to keep hands away from food. Food should be served with tongs or gloves to minimize contact of food with bare hands. Bussing of dirty dishes and clearing tables should always be followed by proper hand washing.

To prevent recontamination of glasses, cups, plates and tableware hand contact with the food contact surface must be avoided. Cups and glasses should be held by the middle, bottom or stem, not at the rim. Plates should be held by the bottom or edge while flatwares and utensils, by the handle.

Cups, plates and bowls should never be stacked as this could result in recontamination. Because glass is breakable, it should never be used to scoop ice. Plastic, metal scoops or tongs should be used instead.

If serving milk, serve it from a refrigerated bulk dispenser or in a single carton.

LO4. PRACTICE PERSONAL HYGIENE AND GROOMING

ASSESSMENT CRITERIA:

1. Personal hygiene is practiced in line with the requirements of the ship's food safety program.
2. Proper procedure of hand washing is applied
3. Appropriate PPE are used
4. HACCP (Hazard Analysis Critical Control Point) / procedures are observed

CONTENTS:

- Approved procedure of hand washing
- Prescribe PPEs
- HACCP (Hazard Analysis Critical Control Point) /Food Safety Management

CONDITIONS:

The following resources should be provided:

- Access to relevant workplace where assessment can take place
- Tools, equipment and materials/supplies relevant to the activity or task

METHODOLOGIES:

- Self-paced Hand-outs/ Module
- Video showing
- Focus group discussion
- Simulation
- Practical exercises

ASSESSMENT METHODS:

- Written Examination
- Oral Questioning
- Portfolio

Apron and Uniform

Work clothes with apron and uniform must be worn inside the kitchen.

Street clothes should never be worn to work as they may be sources of contamination. As much as possible, aprons should be of light color to easily reveal dirt. It is for this season that white aprons are mostly used in food preparation.

Footwear

Because footwear can serve as a source of contamination, it is only necessary to use footwear exclusively for kitchen use. Footwear worn outside the food preparation area should not be worn inside the food preparation area to prevent the possibility of contamination. Closed shoes, not open-toed ones, should be worn at all times.

Facial masks

Facial masks prevent airborne microorganisms from the nose and mouth from getting into food during talking, coughing, or sneezing. These also prevent direct contact of the hands with the nose and mouth which are source of contamination.

Gloves

Gloves act as barrier between the hands and the food. However, these must not be a substitute for proper handwashing. Proper handwashing prior to the wearing of globes should still be observed.

Globes must be sanitized and changed everyday or whenever necessary depending on the load of kitchen activity. They must be devoid if any tear or holes as these are possible sources of contamination. Torn or soiled gloves should be immediately replaced.

HABITS

a. Daily bath

A daily bath is the most basic requirement among food handlers as it ensures cleanliness of the food handler.

b. Trimming of nails

Trimmed nails are a requisite for food preparation. Untrimmed nails are not only unhygienic to look at but are also a potential source of contamination.

c. Proper handwasing

Because of the skin harbors microbial growth, frequent handwashing is essential for all food handlers. Proper handwashing should be practiced before starting work, after touching materials which may be sources of contamination such as raw food and garbage, after touching any body part, after coughing or sneezing, after using the toilet, and whenever else necessary. Cross-contamination can be prevented throught proper handwashing.

Proper handwashing procedure:

1. Rinse hands with potable water
2. Thoroughly soap and lather up to elbow.
3. Thoroughly scrub hands and elbows for 20 seconds.
4. Thoroughly rinse hands and elbows under running water.
5. Dry hands with tissue paper, automatic drier or by air.
6. Use disinfectant, if available

Shaving and haircuts for males

As beards and moustaches are sources of contamination, male food handlers must be required to shave as necessary. Short, neat haircuts must be maintained as well.

Covering of wounds

Wounds or cuts must be properly covered with a moisture-proof bandage which must be frequently changed to prevent the risk of contamination.

Wearing of jewelry

Aside from being a physical hazard, jewerly such as rings, necklaces and bracelets may serve as biological hazards as these have crevices that can harbour microbial growth. Wearing of jewelry must be disallowed at all times.

Wearing of nail polish

Because nail polish can get into food, wearing of nail polish should not be allowed among female food handlers.

Smoking and eating

A high standard of cleanliness must be practiced by food handlers at all times. Any unhygienic practice which could result in cross-contamination of food such as smoking areas must be set up away from the kitchen premises.

Testing of food

When tasting food, a small amount of the dish to be tasted must be transferred into a separate bowl. The dish must be tasted with a separate spoon which must be immediately washed after use.

Other personal habits

Blowing air into plastic bags or using the teeth for opening packages are no-nos in food production. By blowing into food causing cross-contamination. Opening packages using one's teeth and scratching body parts are also not allowed as these are potential source of contamination.

Storage of personal belongings

Personal belongings like bags and clothes should be stored in lockers or cabinets away from food preparation areas.

Education and Training

Appropriate and adequate training of food production personnel must be implemented in order to create understanding and awareness of their responsibilities towards food safety. Use of visual control or reminders in the form of posters and signs is an effective way of reinforcing hygienic habits in the kitchen.